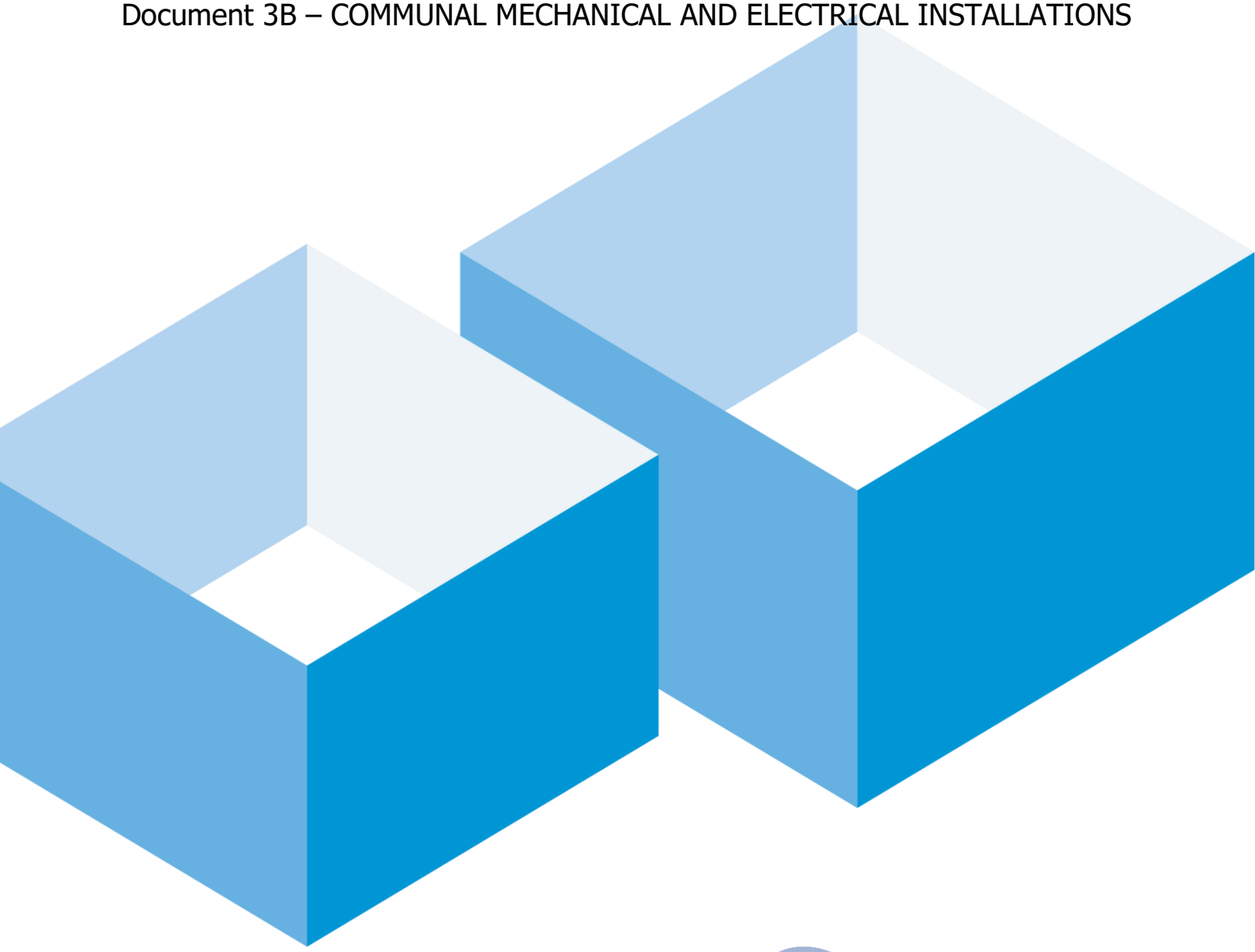
M3NHF Schedule of Rates

VERSION 8

ExtraCare Maintenance Works

Technical Specification

Document 3B – COMMUNAL MECHANICAL AND ELECTRICAL INSTALLATIONS



Your challenges expertly solved in partnership

Published by M3 Housing Ltd, Three Kings, 23 Commonside East, Mitcham, Surrey, CR4 2QA
www.m3h.co.uk

ISBN: 978-1-908409-06-5 | M3NHF Schedule: Communal Mechanical and Electrical Works

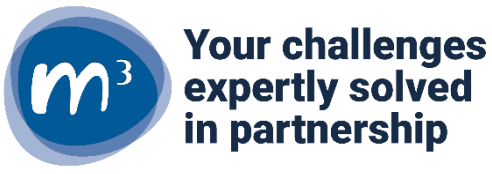
Version 8 revised and updated in 2023 by Rand Associates Consultancy Services Ltd.

Incorporating the NHF Form of Contract 2023
ISBN: 978-1-908409-49-2

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of M3 Housing Ltd.

© Rand Associates Consultancy Services Ltd





SPECIFICATION OF WORKMANSHIP AND MATERIALS

© Rand Associates Consultancy Services Ltd

SPECIFICATION OF WORKMANSHIP AND MATERIALS

CONTENTS

GENERAL 3
CHP PLANT INSPECTION, TESTING, SERVICING AND MAINTENANCE 11
CHP PLANT SERVICING AND MAINTENANCE 19
COMMERCIAL/COMMUNAL GAS BOILERS SERVICING MAINTENANCE 27
COMMERCIAL/COMMUNAL GAS BOILER INSTALLATIONS 51
COMMERCIAL CATERING EQUIPMENT MAINTENANCE 85
COMMUNAL AND LANDLORD'S ELECTRICAL INSTALLATIONS AND TESTING .110
COMMUNAL/COMMERCIAL KITCHEN DEEP CLEANING 182
COMMUNAL/COMMERCIAL KITCHEN VENTILATION CANOPY CLEANING 188
COMMUNAL/COMMERCIAL LAUNDRY EQUIPMENT MAINTENANCE 194
CRADLE ACCESS SYSTEMS MAINTENANCE 208
DOMESTIC CENTRAL HEATING INSTALLATIONS 213
DOMESTIC HEATING INSTALLATIONS SERVICING AND MAINTENANCE 276
DRAMA AND STAGE LIGHTING MAINTENANCE 323
ELECTRIC HEATING INSTALLATIONS SERVICING AND MAINTENANCE 329
EMERGENCY GENERATING PLANT MAINTENANCE 336
EXTERNAL, CAR PARKING, COMMUNAL, ESTATES AND STREET LIGHTING....343
FALL ARREST SYSTEMS MAINTENANCE 358
FIRE-STOPPING MATERIALS 364
GAS TIGHTNESS TESTING 368
GATES AND SECURITY SHUTTERS 376
HEATING INSTALLATIONS - GENERAL REQUIREMENTS 386
HIGH VOLTAGE SWITCHGEAR MAINTENANCE 429
LIFTS, STAIRLIFTS AND OTHER DISABILITY LIFTING EQUIPMENT INSTALLATIONS 443
LIGHTNING PROTECTION SYSTEM INSTALLATIONS 561
LOW VOLTAGE SWITCHGEAR MAINTENANCE 571
MICRO-GENERATION APPLIANCES SERVICING AND MAINTENANCE 580
MICRO-GENERATION INSTALLATIONS 603
PACKAGE INTERCEPTOR MAINTENANCE 624
PROPRIETARY REFUSE CHUTE MAINTENANCE 631
PUBLIC ADDRESS SYSTEMS SERVICING AND MAINTENANCE 635
PUMPS AND WATER BOOSTER SYSTEMS 641
SERVICE GENERATORS SERVICING AND MAINTENANCE 659
SEWAGE PLANT MAINTENANCE 668
SPA POOL MAINTENANCE 677
SPRINKLER INSTALLATIONS TO NON-RESIDENTIAL PROPERTIES 683
SPRINKLER INSTALLATIONS TO RESIDENTIAL PROPERTIES 700
STANDBY GENERATOR SETS INSTALLATIONS 713
STORAGE AND CONVECTOR HEATER MAINTENANCE 727
THERMOSTATIC MIXING VALVES – SERVICING AND MAINTENANCE 733

© Rand Associates Consultancy Services Ltd

UNVENTED CYLINDERS SERVICING AND MAINTENANCE 738
VENTILATION SYSTEMS.....742
WATER HYGIENE.....782
WATER SAVING CONTROLS MAINTENANCE 806
WATER TANK REPLACEMENT 812
WATER TREATMENT EQUIPMENT MAINTENANCE 835
WORKSHOP MACHINERY TESTING AND MAINTENANCE.....846

© Rand Associates Consultancy Services Ltd

GENERAL

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

GENERAL

Applicability

001 This initial general section applies to all subsequent sections of this Specification **("this Specification")**.

002 This Specification is drafted as a series of instructions that the Provider must ensure are complied with in relation to the Works. Each instruction includes all tasks necessary to comply fully with the instruction and the tendered Rates to which they relate.

003 The Rates include for carrying out all tasks required by this Specification including detailed requirements described or delineated on the Client's standard detail drawings where appended to this Specification. No further payment is due to the Provider in respect of any such tasks beyond the payments provided for in the Rates.

004 Specifications across several trades may be relevant to each tendered Rates item. The Provider must comply with all requirements of this Specification applicable to the specific type of Works to be undertaken.

005 References to Paragraphs and Sections in this Specification are to the applicable Paragraph and Section of this Specification. If any contradiction appears within the Specification sections, Schedules of Rates, the Client's Policy documents etc., the most rigorous standard takes precedence.

Standards of workmanship and Materials

006 Carry out and complete all Works as required by this Contract including:
- in accordance with all Law including Health and Safety Law;
- in accordance with Good Industry Practice;
- in accordance with the Client's Policies;
- in accordance with the Client's standard drawings and details (where provided);
- in accordance with any specific requirements for those Works in this Specification; and
- to the satisfaction of the Client's Representative (acting reasonably).

007 To the extent that the standard of any Works has not been specified in this Contract, agree the relevant standard for the Works with the Client's Representative before their execution. Where particular Works or working methods are to be "approved by" "agreed with" or are indicated to be "subject to the approval of" the Client's Representative, give the Client's Representative adequate notice when such approval or agreement is needed and retain evidence of all approvals given, and items that have been agreed, by the Client's Representative.

008 To the extent that it is necessary to Design any aspects of the Works, in preparing those use the reasonable skill, care, diligence and expedition as would be reasonably expected of a prudent experienced contractor with Design obligations having experience in carrying out projects similar in size, scope, nature, complexity and value to the Works.

009 Maintain all existing lines and levels at all times and carry through new Works to the same lines and levels unless otherwise instructed by the Client's Representative.

European and British Standards & Codes of Practice

010 Ensure all Works undertaken and all Materials used in those Works comply with all applicable Standards and Codes of Practice that are current at the time of their use.

011 References in this Specification of Workmanship and Materials to any Standard or Codes of Practice are to be construed as references to the version current at the time the Order is undertaken.

© Rand Associates Consultancy Services Ltd

012 Where a specific Standard or a Code of Practice is referred to, this sets out the minimum acceptable standard of Materials or workmanship.

013 Any requirement in this Specification of Workmanship and Materials to use Materials defined by reference to a specified Quality Assurance Scheme, British Board of Agrément Certificate, Standard or other approval, may be satisfied by compliance with an equivalent international Standard.

014 A Provider offering a product or following a process on the basis of compliance with any such approval shall notify the Client's Representative of such substitution in advance of placing any order and will be required to provide (in English) technical or other details of the approval or Standard and its qualifying tests.

Materials

015 The Client wishes to standardise the use of Materials across its Properties. This is in order to simplify Material requirements and van stock loads, to improve its repairs processes and to reduce maintenance costs. Wherever possible, match all Materials used to materials currently used in the Properties, particularly in terms of their parts requirements and repair procedures. In this Specification the Client has set out details of its current Materials to which the Provider is required to standardise.

016 Where this Specification indicates that Materials are to be "approved by the Client's Representative", provide samples of the proposed Materials to the Client's Representative for approval. Any Materials that comply with the functionality and compatibility (including aesthetic compatibility) requirements of this Specification may be proposed. No further approval is required for any Materials listed in this Specification as being the Client's currently used Materials. The purpose of the Client's Representative's decision on the use and approval of such Materials is to ensure that they meet the Client's Requirements for functionality and compatibility. The decision of the Client's Representative on this is final.

017 Where this Specification requires Materials to be matched to existing Materials or finishes, this match is subject to the approval of the Client's Representative.

018 Do not use any Prohibited Materials in carrying out the Works. Prohibited Materials are those Materials which are generally accepted or (having regard to Good Industry Practice) are reasonably suspected of:
- being harmful in themselves;
- being harmful when used in a particular situation or in combination with other Materials;
- becoming harmful with the passage of time; or
- being damaged by or causing damage to the structure in which they are to be affixed.

019 Materials are to be regarded as harmful if, in the context of their use in the Works (whether alone or in combination with other materials) they:
- are prejudicial to health and safety;
- may pose a threat to the structural stability or the physical integrity of any Property; or
- could materially reduce the normal life expectancy of any part of the Property.

020 CE/UKCA Marked Products: All products referred to throughout this document and supplied to the Client, or used in the Works, must be supplied with a Declaration of Performance (DoP) and carry the appropriate CE/UKCA conformity assessment marking.

Performance Standards on the CE/UKCA mark must comply with relevant Building Regulations as required.

The CE/UKCA mark must be fixed visibly, legibly and indelibly either to the product or to a label attached to the product. If this is not possible or not warranted, then it must be fixed to the packaging or within the accompanying documentation.

The DoP must be made available by the manufacturer (this may be via a website).

© Rand Associates Consultancy Services Ltd

021 Use, fix and apply all Materials strictly in accordance with the manufacturer's recommendations, directions, instructions or technical data sheets.

022 Participate in joint initiatives with the Client and other contractors to establish supply chain agreements.

023 Where appropriate suggest (economically viable) amendments to this Specification where those amendments may lead to an improvement in environmental performance or sustainability.

024 Provide all information the Client's Representative reasonably requests regarding the environmental impact of the supply and use of any Materials the Provider selects for use in the Works.

025 **[optional clause]** This Specification incorporates the Client's Codes of Practice in respect of the following:

- **[insert details]**

In the event of any conflict or disparity between the requirements and obligations contained in the Codes of Practice and this Specification, the Codes of Practice will have precedence.

026 The Client's Standard Details where appended to this Specification are to be referred to by the Provider to amplify both this Specification and the descriptions in the Rates. The Rates descriptions are deemed to be fully inclusive of any requirements delineated, described or illustrated in the Client's Standard Details. It should be noted that the Standard Details may contain a referencing system that relates to an alternative specification. This alternative specification does not form part of this Contract, and where this type of referencing occurs it should be considered as a reference to a comparable item of equal quality and performance within this Specification and Schedule of Rates.

Periodic Servicing and Inspection, Routine Maintenance and Responsive Maintenance

027 This Specification covers all Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Work to all installations within the boundaries of each group of Properties. The Specification must be read and interpreted in conjunction with the Rates.

028 Routine Maintenance must involve the undertaking of the comprehensive Routine Maintenance operations described in this Specification throughout the duration of the Contract Period at the regular intervals pre-defined by the Client and starting immediately from the Commencement Date. Routine Maintenance is the repair or renewal of components undertaken at the same time as programmed Periodic Servicing and Inspections are being undertaken.

029 All references to British Standards or other equally approved national standards must be deemed to mean those current, including all amendments, at the date of the Works are undertaken.

030 Is required to undertake Responsive Maintenance to deal with day to day repairs/maintenance including Emergency Work and Out of Hours Emergency Work.

031 Ensure that his Staff visits each individual Property or group of Properties at the requisite frequency and carry out the specified inspections, maintenance, repairs, tests, certification and any other servicing Works to ensure that all systems, installations, equipment and appliances are maintained in prime condition.

032 Ensure that his Staff access the electronic log book for the respective installations and record all details of the visit and action taken. The Provider must be deemed to have allowed in his tender for creation of the site specific installation data as each Scheme is inspected for the first time.

033 Ensure that within the first 3 months after the Commencement Date (i.e. at the end of the first servicing period) each installation and the like at each Scheme has a unique identifiable number.

© Rand Associates Consultancy Services Ltd

034 Also within 3 months after the Commencement Date, the Provider must provide the Client's Representative with both an electronic and a hard copy bound report containing a listing of all Schemes in alphabetical order and indicating against each Scheme, the full name and address of the Scheme; a full positional listing of all systems, installations, equipment, appliances and the like referenced with their uniquely identifying number in accordance with paragraph 032 above; the dates when Periodic Servicing and Inspections and Routine Maintenance has been undertaken and/or is due in respect of each Scheme.

035 At the same time, the Provider may submit to the Client's Representative a separate report detailing any specific recommendations with respect to any individual Property or group of Properties. The Provider is also following the completion of his first Periodic Servicing and Inspection visit to each Scheme or predefined group of Properties to prepare the annual cost of the Periodic Servicing and Inspection and Routine Maintenance requirements to the installation(s) to each Scheme or group of pre-defined Properties on the basis of the frequencies indicated later in this Specification and evaluated at his tendered Rates, this evaluation is to be in accordance with the format and requirements of the Client's Representative, particularly having regards to any required Section 20 recharge information. If the evaluations are accepted by the Client's Representative they will form the basis of preparing all subsequent Valuations, which will be reimbursed at the rate of $1/12^{th}$ of the annual cost per month, starting from the first month following acceptance by the Client's Representative.

036 At the completion of each visit, to each Scheme the Provider's Staff must complete electronically clear and explicit service report sheets. The electronic signature of the Customer in respect of an individual Property or the Client's relevant Scheme manager or other responsible officer must be obtained as proof of the Works being undertaken and completed. In blocks of flats or similar situations where there is no such dedicated, responsible manager or officer, the Provider's Staff must self certify completion of the Works. In such cases the name of the self certifying operative must be printed clearly and legibly. Copies of reports are to be forwarded to the Client's Representative, together with any recommendations for Works not already authorised. If the recommendations include for Works not covered by Rates in the Contract Documents then a quotation for such must be included with the service report sheets. The Provider must update the electronic log book with all service report sheets.

037 The service report sheet is also to incorporate the following information:

1. arrival and departure times
2. state of installation or system on arrival
3. details of Works carried out
4. details of any Material or components renewed

038 Minor Work or alterations to electrical installations, which involves a change or modification to an existing single circuit, must include the issue of the certificate for Minor Electrical Installation Works in accordance BS7671.

039 Major Work or alterations to electrical installations, which involves a change or modification to two or more existing circuits and all new installations, must include the issue of an Electrical Installation Completion Certificate in accordance with BS 7671.

040 Following any non-routine visit to a Property or group of Properties, to undertake Responsive Maintenance, the Provider must also forward a report sheet to the Client's Representative detailing the nature of the visit, the authorisation for it and the actions taken.

041 All logs, reports and test recording sheets for all categories and sections of Work (whether specifically stated below or not) must be recorded in the electronic log book and be available for inspection and download by the Client on a web based system in a format to be agreed by the Client's Representative and the Provider.

042 All project issues must be communicated through the Client's Representative's channels (to be agreed in advance with the Client's Representative) and must not be channelled directly or indirectly via the Customer.

043 All bespoke software must be fully documented, recorded and provided to the Client (including providing all codes, passwords and part no's) and all must remain open protocol.

© Rand Associates Consultancy Services Ltd

044 All systems must remain open protocol.

045 At handover meetings with the Client's Representative the Providers are to provide all codes, passwords and part numbers for all systems, parts and equipment

046 Any damage caused by the Provider installing inferior equipment must be made good at the expense of the Provider

Quality

047 The Client is aiming for an economic, high quality maintenance service with a stable workforce and effective supervision.

048 The Works must be performed in accordance with the Contract Documents and must be carried out in an efficient and proficient manner.

049 The Client's Representative will monitor that the Specification is being met. Any default in performance will be dealt with in accordance with the Contract.

050 The monitoring system will include an inspection of the following:
- the number and suitability of engineers and Staff used;
- quality of Materials, components and parts used;
- that the servicing and maintenance procedures used are either as detailed in the Contract or as agreed with the Client's Representative;
- that the frequency and standards of servicing and maintenance are being met; and
- that health and safety requirements are met.

Equipment and Materials

051 All equipment and Materials required for the performance of the Contract must be supplied by the Provider and must be approved by the Client's Representative. Any alternatives subsequently proposed by the Provider must have the prior approval of the Client's Representative.

052 All equipment and Materials used by the Provider to fulfil the Contract must be suitable for the purpose and where an appropriate British Standard issued by the British Standards Institute, or other equivalent nationally approved standard is current, must as a minimum, be in accordance with that standard.

Reporting of Defects

053 Report in writing any obvious apparent defects in the design, installation and/or operation, to any of the existing installations, to the Client's Representative.

054 Report immediately to the Client's Representative any matters that may impact on health and safety issues and where immediate action is required from the Client's Representative.

Web Based Electronic Log Books

055 Provide an Electronic Monitoring System or Log Book.

056 The electronic monitoring system shall be Designed in such a way that the Client can be involved in the planning, management and view its compliance with its obligations as a landlord.

057 The system shall be web based with varying levels of access as the Client is a multi-site and possibly a multi-client organisation.

058 The scheduled monitoring and inspection tasks as set out within the Scheme must allow for customisation for each particular site and Property contained within the schedule. Occasionally this may include new Properties as and when the requirement arises.

© Rand Associates Consultancy Services Ltd

059 Tests out of Scheme shall generate a non-conformity report that shall be immediately available to the Client's Representative.

060 The Client will require the ability within the program to create notes or messages within the system; this must be recorded within the software audit trail.

061 All non-conformities raised must be clearly identified as a visual warning on the date of the fault and be summarised in visual alert facility and report.

062 The central electronic logbook will have communication software with the ability to 'synchronize' any test results put in by each remote site, Providers or into the central database.

063 The logbook software must include a user password security system, which can be set up by the administrator of the software and allow or restrict access as applicable.

064 Supply a support contract to include:-
- Telephone support during normal office hours Monday to Friday;
- Future upgrades and training for use of software as a result of improvements or changes in current legislation.
- All data stored shall be the property of the Client and all data must be provided to the Client on a regular basis on demand and at the termination of a contract.

065 The system shall be available to all Providers and not limited to any single provider.

066 The Client will own all data and such data should be made readily available by the Provider to the Client upon request in a recognised format (e.g. Excel).

067 It should have a document storage system that includes:
- Method Statements
- Risk Assessments
- COSSH Assessments
- PPM Planner
- Record Sheets
- Test Certificates
- Photographs
- Schematic Layouts

068 Adhere to the Data Protection Act 1998 in the course of providing the Services that the Provider may be compiling, processing and storing Personal Data for the Client and where this is the case, the Provider will not unlawfully transfer any Personal Data to others.

Programming of Works

069 Within 20 working days of the award of the Contract submit and agree a full annual Programme for all Works covering each element of the maintenance Works with the Client.

070 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

Permit to Work Certification

071 Comply with any "permit to work system" notified to the Provider by the Client's Representative and ensure that no Worker undertakes any Works covered by any "permit to work System" without a permit having been issued by the Client's Representative.

© Rand Associates Consultancy Services Ltd

Access

072 Ensure that a risk assessment is undertaken and a method statement is provided to the Client's Representative detailing the means of access to undertake all Works requiring access at heights including for inspection and testing.

Firestopping

073 Ensure that all holes for cables, pipes etc., in the structure of any Property formed or drilled by the Provider are fire-stopped in accordance with Building Safety Law.

074 Report immediately to the Client's Representative where existing holes for cables, pipes or service media in the structure of any Property have no or inadequate firestopping, giving the detailed location of the hole and providing digital photographs.

© Rand Associates Consultancy Services Ltd

CHP PLANT INSPECTION, TESTING, SERVICING AND MAINTENANCE

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

CHP PLANT INSPECTION, TESTING, SERVICING AND MAINTENANCE

General Requirements

001 Deemed to have read the whole of this Specification together with the Client's Requirements' and will be deemed to have included in his tendered Rates for full compliance.

002 Provide a Routine Maintenance, Responsive Maintenance and Out of Hours Emergency service (24 hour, 365 (366 for a leap year) days per annum).

Asset Register

003 Ensure that all the asset registers supplied by the Client prior to the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

004 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each visit to undertake Routine Maintenance, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

005 Ensure that, following all visits to undertake Routine Maintenance, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

006 Provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff including his Specialist Subcontractors.

Manufacturer's Requirements

007 Where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

008 Submit and agree within 20 working days of the award of the Contract a full annual Programme for all Works covering each element of the Routine Maintenance Works with the Client's Representative.

009 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

Permit to Work Certification

010 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

Access

011 Ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

012 All Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

© Rand Associates Consultancy Services Ltd

013 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

Minor Repairs

014 During testing, carry out minor repairs such as tightening joints, replacement of clips, etc to achieve a pass status and make appliances safe to ensure compliance with the applicable Standard.

Routine Maintenance

015 The minimum requirements for Routine Maintenance are to be in accordance with the relevant equipment manufacturer's recommendations.

016 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

017 Carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

018 Include for the provision and application of all consumables within the Rates for this element of the Contract.

019 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the latest applicable Standards or equivalent.

020 Routine Maintenance must unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirements tabled below;

© Rand Associates Consultancy Services Ltd

CHP Plant Inspection. Testing, Servicing and Maintenance

Item No	Item	Frequency	Action	Notes
1	Visual Inspection	750 hours	1. Check for fuel leaks. 2. Check for oil leaks. 3. Check for water leaks. 4. Examine gas supplies. 5. Check for unusual noises, smells or vibrations. 6. Examine room ventilation. 7. Ensure adequate room ventilation. 8. Ensure clear access to plant and equipment.	
2	Acoustic Enclosures	750 hours	1. Check enclosure doors 2. Check enclosure ventilation 3. Check insulation	
3A	Engine	750 hours	1. Take oil sample – analyse 2. Change engine oil filters 3. Change engine oil 4. Change spark plugs 5. Change sponge inserts in breather system 6. Clean or change air filters 7. Check HT leads 8. Check and reset valve clearances 9. Change rocker box gaskets 10. Check engine coolant level 11. Check anti-freeze concentration 12. Check engine loom wiring 13. Check engine performance using gas analyser 14. Check exhaust back pressure 15. Clean oil drip drays 16. Remove all contaminated products from site 17. Safely dispose of all contaminated products	
3B	Engine	3,000 hours	1. Inspect and lean distributor cap and rotor arm 2. Check all in line gas filters 3. Replace oil separator valve	
3C	Engine	6,000 hours	1. Remove, clean and refit magnetic pick up 2. Check and adjust engine ignition timing 3. Test operation of protective devices: Oil pressure low, High engine temperature, Low gas pressure	

© Rand Associates Consultancy Services Ltd

CHP Plant Inspection. Testing, Servicing and Maintenance
(Cont'd)

Item No	Item	Frequency	Action	Notes
3D	Engine	12,000 hours	1. Carry out boroscope inspection of engine. 2. Carru out compression test 3. Replace all coolant hoses 4. Remove and clean all heat exchanges 5. Remove and clean all exhaust drain systems 6. Remove and clean induction system 7. Replace HT leads 8. Replace engine coolant and antifreeze 9. Check engine stability and governor settings	
3E	Engine	24,000 hours	1. Replace cylinder head (with service exchange) 2. Replace valves 3. Replace liner seals 4. Replace engine water pump 5. Replace 'O' rings 6. Inspect lagging – replace if required 7. Replace sump joint	
3F	Engine	48,000 hours	1. Replace main bearings 2. Replace big end bearings 3. Replace thrust bearings 4. Replace front and rear crankshafts seals 5. Replace piston sets	
4A	Generator	750 hours	1. Clean and visually inspect	
4B	Generator	30,000 hours	1. Replace generator bearings 2. Replace seals 3. Blow out windings	
4C	Generator	60,000 hours	1. Replace generator (with service exchange)	
5A	Control Panel and Metering (for Generators operating in parallel of mains)	750 hours	1. Check telephone line and communications 2. Visually inspect control wiring 3. Check time schedules 4. Check kW output 5. Record kW and hours run readings 6. Test synchronising – adjust as necessary	

© Rand Associates Consultancy Services Ltd

CHP Plant Inspection. Testing, Servicing and Maintenance
(Cont'd)

Item No	Item	Frequency	Action	Notes
5B	Control Panel and Metering (for Generators operating in parallel of mains)	6,000 hours	1. Carry out tests to demonstrate G59 compliance: • Loss of mains • Over voltage • Under voltage • Reverse power	5B
6A	Batteries	750 hours	1. Check Electrolyte Specific Gravity and Charge if necessary 2. "Top up" electrolyte with distilled water 3. Clean any corrosive from terminals etc. and apply grease 4. Check for faulty cells by means of battery discharge tester 5. Reconnect	
6B	Batteries	24,000 hours	1. Replace battery	
7	Exhaust System	750 hours	1. Visually inspect exhaust system 2. Visually inspect mounting brackets 3. Visually inspect silencer 4. Drain condensate traps 5. Inspect insulation	
8A	Secondary Water System	750 hours	1. Inspect for leaks 2. Test valves for free travel 3. Repack valves as necessary 4. Visually inspect heat exchangers 5. Visually inspect pumps 6. Check and clean in-line water filters	
8B	Secondary Water System	6,000 hours	1. Visually inspect all heat exchangers and radiators 2. Remove all debris 3. Pressure jet wash if necessary	

© Rand Associates Consultancy Services Ltd

Out of Hours Emergency Works

021 Attend to all call outs due to malfunction or breakdown.

022 Include for a call-out service to provide Responsive Maintenance and an Out of Hours Emergency Works Service. The Out of Hours Emergency Works service is deemed to extend the provision of Emergency Works to a 24 hour, 7 days a week, 365 (366 for a leap year) days per year basis.

023 Call outs for Responsive Maintenance and/or Out of Hours Emergency Works which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

024 Where Out of Hours Emergency Works are attended to for authorised cases of breakdowns, mis-use or vandalism, the Provider will be paid in accordance with the Rates detailed in the Price Framework.

Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works

Repairs, Replacements and Adjustments

025 Take responsibility for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

026 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

027 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

028 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

Firestopping

029 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

030 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

CHP PLANT SERVICING AND MAINTENANCE

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

CHP PLANT SERVICING AND MAINTENANCE

General Requirements

001 The Provider shall be deemed to have read the whole of this Specification together with the Client's Requirements' and will be deemed to have included in his tendered Rates for full compliance.

The Provider must provide a Routine Maintenance, Responsive Maintenance and Out of Hours Emergency service (24 hour, 365 (366 for a leap year) days per annum).

Asset Register

002 The Provider must ensure that all the asset registers supplied by the Client prior to the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

003 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each visit to undertake Routine Maintenance, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

004 The Provider shall ensure that, following all visits to undertake Routine Maintenance, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

005 The Provider shall provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff including his Specialist Subcontractors.

Manufacturer's Requirements

006 Where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

007 The Provider must within 20 working days of the award of the Contract submit and agree a full annual Programme for all Works covering each element of the Routine Maintenance Works with the Client's Representative.

008 The Provider must ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

Permit to Work Certification

009 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

© Rand Associates Consultancy Services Ltd

Access

010 The Provider shall ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

011 All Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

012 The Provider shall ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

Minor Repairs

013 The Provider shall, during testing, carry out minor repairs such as tightening joints, replacement of clips, etc to achieve a pass status and make appliances safe to ensure compliance with applicable Standard.

Routine Maintenance

014 The minimum requirements for Routine Maintenance are to be in accordance with the relevant equipment manufacturer's recommendations.

015 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

016 The Provider must carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

017 The Provider must include for the provision and application of all consumables within the Rates for this element of the Contract.

018 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the latest British Standards or equivalent.

019 Routine Maintenance must unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirements tabled below;

© Rand Associates Consultancy Services Ltd

CHP Plant Inspection. Testing, Servicing and Maintenance

Item No	Item	Frequency	Action	Notes
1	Visual Inspection	750 hours	9. Check for fuel leaks. 10. Check for oil leaks. 11. Check for water leaks. 12. Examine gas supplies. 13. Check for unusual noises, smells or vibrations. 14. Examine room ventilation. 15. Ensure adequate room ventilation. 16. Ensure clear access to plant and equipment.	
2	Acoustic Enclosures	750 hours	4. Check enclosure doors 5. Check enclosure ventilation 6. Check insulation	
3A	Engine	750 hours	18. Take oil sample – analyse 19. Change engine oil filters 20. Change engine oil 21. Change spark plugs 22. Change sponge inserts in breather system 23. Clean or change air filters 24. Check HT leads 25. Check and reset valve clearances 26. Change rocker box gaskets 27. Check engine coolant level 28. Check anti-freeze concentration 29. Check engine loom wiring 30. Check engine performance using gas analyser 31. Check exhaust back pressure 32. Clean oil drip drays 33. Remove all contaminated products from site 34. Safely dispose of all contaminated products	
3B	Engine	3,000 hours	4. Inspect and lean distributor cap and rotor arm 5. Check all in line gas filters 6. Replace oil separator valve	
3C	Engine	6,000 hours	4. Remove, clean and refit magnetic pick up 5. Check and adjust engine ignition timing 6. Test operation of protective devices: Oil pressure low, High engine temperature, Low gas pressure	

© Rand Associates Consultancy Services Ltd

CHP Plant Inspection. Testing, Servicing and Maintenance
(Cont'd)

Item No	Item	Frequency	Action	Notes
3D	Engine	12,000 hours	10. Carry out boroscope inspection of engine. 11. Carru out compression test 12. Replace all coolant hoses 13. Remove and clean all heat exchanges 14. Remove and clean all exhaust drain systems 15. Remove and clean induction system 16. Replace HT leads 17. Replace engine coolant and antifreeze 18. Check engine stability and governor settings	
3E	Engine	24,000 hours	8. Replace cylinder head (with service exchange) 9. Replace valves 10. Replace liner seals 11. Replace engine water pump 12. Replace 'O' rings 13. Inspect lagging – replace if required 14. Replace sump joint	
3F	Engine	48,000 hours	6. Replace main bearings 7. Replace big end bearings 8. Replace thrust bearings 9. Replace front and rear crankshafts seals 10. Replace piston sets	
4A	Generator	750 hours	2. Clean and visually inspect	
4B	Generator	30,000 hours	4. Replace generator bearings 5. Replace seals 6. Blow out windings	
4C	Generator	60,000 hours	2. Replace generator (with service exchange)	
5A	Control Panel and Metering (for Generators operating in parallel of mains)	750 hours	7. Check telephone line and communications 8. Visually inspect control wiring 9. Check time schedules 10. Check kW output 11. Record kW and hours run readings 12. Test synchronising – adjust as necessary	

© Rand Associates Consultancy Services Ltd

CHP Plant Inspection. Testing, Servicing and Maintenance
(Cont'd)

Item No	Item	Frequency	Action	Notes
5B	Control Panel and Metering (for Generators operating in parallel of mains)	6,000 hours	2. Carry out tests to demonstrate G59 compliance: • Loss of mains • Over voltage • Under voltage • Reverse power	5B
6A	Batteries	750 hours	6. Check Electrolyte Specific Gravity and Charge if necessary 7. "Top up" electrolyte with distilled water 8. Clean any corrosive from terminals etc. and apply grease 9. Check for faulty cells by means of battery discharge tester 10. Reconnect	
6B	Batteries	24,000 hours	2. Replace battery	
7	Exhaust System	750 hours	6. Visually inspect exhaust system 7. Visually inspect mounting brackets 8. Visually inspect silencer 9. Drain condensate traps 10. Inspect insulation	
8A	Secondary Water System	750 hours	7. Inspect for leaks 8. Test valves for free travel 9. Repack valves as necessary 10. Visually inspect heat exchangers 11. Visually inspect pumps 12. Check and clean in-line water filters	
8B	Secondary Water System	6,000 hours	4. Visually inspect all heat exchangers and radiators 5. Remove all debris 6. Pressure jet wash if necessary	

© Rand Associates Consultancy Services Ltd

Out of Hours Emergency Works

020 The Provider must attend to all call outs due to malfunction or breakdown.

021 The Provider must include for a call-out service to provide Responsive Maintenance and an Out of Hours Emergency Works Service. The Out of Hours Emergency Works service is deemed to extend the provision of Emergency Works to a 24 hour, 7 days a week, 365 (366 for a leap year) days per year basis.

022 Call outs for Responsive Maintenance and/or Out of Hours Emergency Works which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

023 Where Out of Hours Emergency Works are attended to for authorised cases of breakdowns, mis-use or vandalism, the Provider will be paid in accordance with the Rates detailed in the Price Framework.

Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works

Repairs, Replacements and Adjustments

024 The Provider is responsible for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

025 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

026 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

027 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

Firestopping

028 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

029 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

COMMERCIAL/COMMUNAL GAS BOILERS SERVICING MAINTENANCE

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

COMMUNAL GAS BOILER SERVICING MAINTENANCE

General Requirements

001 The Provider shall be deemed to have read the whole of this Specification together with the Client's Requirements' and will be deemed to have included in his tendered Rates for full compliance.

The Provider must provide a Routine Maintenance, Responsive Maintenance and Out of Hours Emergency service (24 hour, 365 (366 for a leap year) days per annum).

Asset Register

002 The Provider must ensure that all the asset registers supplied by the Client prior to the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

003 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each visit to undertake Routine Maintenance, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

004 The Provider shall ensure that, following all visits to undertake Routine Maintenance, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

The Provider is to provide and maintain an electronic log book to record all visits and maintain all records, to be accessible by both the Provider's Staff and the representative sof the Client's Representative.

005 The Provider shall provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff including his Specialist Subcontractors.

Manufacturer's Requirements

006 Where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

007 The Provider must within 20 working days of the award of the Contract submit and agree a full annual Programme for all Works covering each element of the Routine Maintenance Works with the Client's Representative.

008 The Provider must ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

Permit to Work Certification

009 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

© Rand Associates Consultancy Services Ltd

Access

010 The Provider shall ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

011 All Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

012 The Provider shall ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

Minor Repairs

013 The Provider shall, during testing, carry out minor repairs such as tightening joints, replacement of clips, etc to achieve a pass status and make appliances safe to ensure compliance with applicable Standard.

Routine Maintenance

014 The minimum requirements for Routine Maintenance are to be in accordance with the relevant equipment manufacturer's recommendations.

015 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

016 The Provider must carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

017 The Provider must include for the provision and application of all consumables within the Rates for this element of the Contract.

018 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the latest applicable Standards or equivalent.

019 Routine Maintenance must unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirements tabled below;

© Rand Associates Consultancy Services Ltd

LTHW and MTHW Boilers

Item No	Item	Frequency	Action	Notes
1	Check operation, in particular, safety controls	Annually	Check for visible defects	Ensure system is full of water and the circuits are open
2	Combustion Test	Annually	Start up and carry out tests including smoke, draught chamber and flue, flue temperature, fuel input and gas analysis including carbon monoxide	On larger systems combustion tests should be carried out on a regular basis to monitor performance. The test s
3	Thermostats, pressure sensors, altitude gauges and thermometers	Annually	Check for correct operation and settings	
4	Electrical services	Annually	Shut down, disconnect or remove fuses Check if isolation switch is in accordance with IET REGULATIONS	Report non compliance to Client's Representative
5	Boiler return temperature and associated controls	Annually	Check operation.	
6	Boiler flueways, combustion chamber and connecting flues	Annually	Open and remove by bushing and/or vacuum all soot and scale.	
7	Refractory linings	Annually	Check condition and report.	
8	Boiler flueways and chamber	Annually	Reseal, check for air leaks, seal as necessary.	
9	Flue	Annually	Carry out smoke test.	
10	Water quality	Annually	Check system water quality and inhibitor type and concentration, top up if necessary	Where system water is controlled, water treatment and dosing plant should be maintained in accordance with the manufacturer's technical data sheets.
11	Boiler mountings	Annually	Examine pipe connections, valve spindles and glands and repack as necessary. Test safety valves. Clean and test valves for free travel, repack and adjust as necessary. Examine drain cocks.	

© Rand Associates Consultancy Services Ltd

LTHW and MTHW Boilers (Cont'd)

Item No	Item	Frequency	Action	Notes
12	Instruments and Gauges	Annually	Clean and check altitude, pressure and temperature gauges for accuracy, calibration and serviceability. Examine all meters.	
13	Pumps	Annually	Clean and examine. Lubricate as necessary. Examine drive for alignment, adjust as necessary. Examine pulleys and keys. Test pipe and valve connections for leaks. Repack glands as necessary. Report on condition. Ensure all guards are in place. Renew V belts. Ensure spare V belt is available on site. Test run duplicate pumps.	
14	Fan	Annually	Check operation and clean blades	Build up of deposits on blades can reduce their efficiency and lead to poor combustion.
15	Boiler	Annually	Reconnect and test fire. Carry out combustion test, refit casing and thoroughly clean down.	A boiler can explode if safety controls fail and blocked flues will cause flue gas to leak into surrounding areas, causing damage and risks to life and health through carbon monoxide poisoning.
16	Distribution Pipework	Annually	Examine pipework, hangers, supports and thermal insulation. Check that ID branding is correctly installed. Examine weatherproofing on external runs. Examine for corrosion. Test for leaks.	Report on results to Client's Representative.
17	Expansion Tanks	Annually	Examine water level. Test ball valve and stop cock operation. Examine condition of tank and insulation. Examine overflows, ensure that they are clear.	Report on results to Client's Representative.

© Rand Associates Consultancy Services Ltd

LTHW and MTHW Boilers (Cont'd)

Item No	Item	Frequency	Action	Notes
18	Vent pipes and Cold Feed	Annually	Examine vent pipes; ensure that they are clear. Examine cold feed; ensure free flow. Test valves for free travel; repack and adjust as necessary. Test drain cocks. Report "Black Iron" construction, and presence of isolating valves and drain cocks. Examine insulation including ID banding.	Report on condition and results to Client's Representative.
19	Valves	Annually	Check isolating valves. Clean thermostatic valves and sensing devices. Test motorised valves. Test timers and controls. Test valves for free travel; repack and adjust as necessary.	Report on condition and results to Client's Representative.

Atmospheric Gas Burners

Item No	Item	Frequency	Action	Notes
1	Gas, electrical and ventilating systems	6 monthly	Check that all are in accordance with current Codes of Practice and regulations.	
2	General	6 monthly	Check casing for damage or breakages. Inspect for loose fittings or connections and any signs of leaks.	
3	Combustion test	6 monthly	Carry out flue gas analysis using certified test equipment.	Provide report to Client's Representative Affix service sticker to boiler casing.
4	Before proceeding with dismantling of boiler	Annually	Check casing for damage or breakages. Inspect for loose fittings or connections and any signs of leaks. Refer to manufacturer's technical data sheet.	
5	Isolate boiler for gas and electrical supplies	Annually	Isolate electric supply, disconnect or remove fuses. Turn off and isolate gas supply. Record any work which needs rectification or replacement.	

© Rand Associates Consultancy Services Ltd

Atmospheric Gas Burners (Cont'd)

Item No	Item	Frequency	Action	Notes
6	Thermocouple, probe pilot assembly, spark electrode and main burners	Annually	Disconnect and remove from boiler, clean pilot and main burner.	Cleaning should be thorough and carried out in accordance with the manufacturer's technical data sheet.
7	Spark electrode and thermocouple /probe	Annually	Renew and refit along with main burner.	
8	Wiring to ignitor and/or probe, gas valve and boiler thermostats	Annually	Examine cables for wear, fraying braid and brittle insulation. Ensure wiring terminal connections are sound.	
9	Remove burners and pilot assembly and baffles	Annually	Brush all flue-ways thoroughly from top to bottom. Clean all deposits from the burner box. Refit baffles and flue cover – checking cover sea.	
10	Pilot assembly	Annually	Remove. Remove pilot head and clean ports. Unscrew and clean pilot injection by blowing through or washing, do not use pin as this will damage the injector. Renew thermacouples and probes in each boiler, making sure head, lines up with thermocouple and not burner. Reassemble pilot	
11	Lint filter	Annually	Remove from burners and clean.	
12	Burner top	Annually	Brush and check flame parts are clear. Remove any deposits inside burner. Check for cracking or wear. Refit filters. Refit burners. Reconnect gas valve, thermocouple and pilot tube.	
13	Electricity	Annually	Switch on	Make sure boiler thermostat is in off position.
14	Flame failure and associated controls	Annually	Turn on gas. Check and adjust pilot flame to envelope thermocouple/ probe test flame failure device. Test flame setting and thermocouple sensitivity. Check manifold gas pressure against the manufacturer's settings and adjust if required.	

© Rand Associates Consultancy Services Ltd

Atmospheric Gas Burners (Cont'd)

Item No	Item	Frequency	Action	Notes
15	Gas settings	Annually	Carry out burner rating test to ensure that the burner and boiler output are matched. Check and adjust pressure to main burner.	Forward the original printout to the Client's Representative.
16	General	Annually	Examine securing bolts and tighten as necessary. Check door seals and gaskets repair or renew as necessary. Check all joints for leakage and repair as required. Clean boiler fronts of combustion products and repaint with suitable approved paint. Clean and descale heating surfaces. De-sludge as necessary.	
17	Recommendations	Annually		Provide written report to Client's Representative.

Blown Gas Burners

Item No	Item	Frequency	Action	Notes
1	Gas, electrical and ventilating systems	6 monthly	Check that all are in accordance with current Codes of Practice and regulations.	
2	General	6 monthly	Examine the burner under normal operating conditions.	
3	Combustion test	6 monthly	Carry out full test with approved certified test meter.	Provide written report to Client's Representative.
4	Burner general	Annually	Carry out the burner rating test to ensure that the burner and boiler output are matched. Check pilot and mains gas pressures, adjust governors as necessary. Examine burner head, clean as necessary.	Forward the original printout to the Client's Representative.
5	Electrical	Annually	Inspect H.T. leads from transformer to electrodes, check terminals, clean and reconnect as necessary. Clean and test flame failure photocell or probe and viewing glasses. Ensure "Fail Safe " operation.	

© Rand Associates Consultancy Services Ltd

Blown Gas Burners (Cont'd)

Item No	Item	Frequency	Action	Notes
6	Fan	Annually	Check fan impellers for condition and true running. Clean and adjust impellers as necessary. Clean and lubricate motors in accordance with the manufacturer's technical data sheet.	
7	Controls	Annually	Check function of control boxes, hydromotors and pressure boosters	Provide written report to Client's Representative.

Boilers Fire and Safety Circuits

Item No	Item	Frequency	Action	Notes
1	Manually operated valves	Annually	Check to establish positive shut off of gas is achieved.	
2	Pressure switches on gas boosters	Annually	Check for operation and sensitivity.	
3	Gas detection unit	Annually	Test sensitivity Recalibrate if necessary, in strict accordance with the manufacturer's technical data sheet.	
4	Manual quick release mechanism	Annually	Actuate and recheck operation of the dead weight valve or solenoid.	
5	Valves and quick release mechanism	Annually	Reset. Check that all interconnecting tension wire, fusible links, fire buttons and pulleys are free for operation.	
6	Boiler control and high limit thermostats (thermal or manual reset)	Annually	Ensure that these are set correctly. Check operation of pressure switches. Adjust, if necessary if operation is not within the manufacturer's switching differential.	
7	Pressure switches	Annually	Check operation.	
8	Foam inlets	Annually	Ensure foam inlet pipes are free from blockage. Inspect diffuser nozzles for damage.	
9	Smoke/heat detection	Annually	Check operation in accordance with applicable Standard	

© Rand Associates Consultancy Services Ltd

Boilers Fire and Safety Circuits (Cont'd)

Item No	Item	Frequency	Action	Notes
10	General	6 monthly	Check all fuel supply valves for free operation. Ensure that each fuel supply valve is complete with own wheel or key.	
11	Combustion air source into plant room	Annually	Check that original provision has been left clear of any obstruction, dirt etc.	Inadequate combustion air provisions can create a hazard to both the equipment and the occupants of the plant room.

Pipework

Item No	Item	Frequency	Action	Notes
1	Distribution pipework	Annually	Test for leaks. Examine hangers, expansion joints and supports, adjust as necessary. Examine thermal insulation. Examine for corrosion. Examine weatherproofing on external runs. Examine pipework, hangers, supports and thermal insulation. Check ID banding is showing correct colour coding.	Record and report condition and results to Client's Representative.
2	Valves	Annually	Check isolating valves. Test valves for free travel; repack and adjust as necessary. Clean thermostatic valves and sensing devices. Test motorised valves. Test timers and controls.	Record and report condition and results to Client's Representative.
3	Strainers	Annually	Isolate the strainer from the system pressure and drain. Carefully remove strainer in accordance with the manufacturer's technical data sheet. Clean the strainer element using a brush and or water jet. Re-assemble strainer. Renew sealing gaskets if damaged. Clean the strainer body and cover joint faces.	

© Rand Associates Consultancy Services Ltd

Pipe Identification

Item No	Item		
	Pipe Contents	**Basic Colour**	**Colour Code Indication**
	Drinking Water	Green	Blue
	Cooling Water	Green	White
	Boiler Feed Water	Green	Crimson/White/Crimson
	Condensate Water	Green	Crimson/White/Crimson
	Central Heating <100 degrees C	Green	Blue/Crimson/Blue
	Central Heating >100 degrees C	Green	Crimson/Blue/Crimson
	Hot Water Supply	Green	White/Crimson/White
	Fire Extinguisher	Green	Safety Red
	Compressed Air	Light Blue	Light Blue
	Steam	Silver Grey	Silver Grey
	Natural Gas	Yellow Ochre	Yellow Ochre
	Oil (Furnace Fuel)	Brown	Brown

© Rand Associates Consultancy Services Ltd

Responsive Maintenance and Out of Hours Emergency Works

020 The Provider must attend to all call outs due to malfunction or breakdown.

021 The Provider must include for a call-out service to provide Responsive Maintenance and an Out of Hours Emergency Works Service. The Out of Hours Emergency Works service is deemed to extend the provision of Emergency Works to a 24 hour, 7 days a week, 365 (366 for a leap year) days per year basis.

022 Call outs for Responsive Maintenance and/or Out of Hours Emergency Works which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

023 Where Out of Hours Emergency Works are attended to for authorised cases of breakdowns, mis-use or vandalism, the Provider will be paid in accordance with the Rates detailed in the Price Framework.

Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works

Repairs, Replacements and Adjustments

024 The Provider is responsible for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

025 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

026 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

027 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

© Rand Associates Consultancy Services Ltd

COMMUNAL BOILER PLANT SERVICE

Checklist for Annual (Major Service) and 6 Monthly Visits (Minor Service)

Undertake during normal working hours servicing of communal or district Boiler plant and equipment as indicated below in accordance with servicing schedules and Manufacturer's technical data sheets in the main boiler room, sub-plant rooms and up to the entrance of each dwelling.		
Boiler Plant Annual Service	Atmospheric Boiler - Gas Boiler and Burner Service	1. Isolate electrical and gas supply; 2. Remove burners and clean boiler flueways; 3. Clean primary flue; 4. Disconnect and clean main flue as far as practicable in boiler house; 5. Remove all deposits from boiler chamber and clean out bottom of main stack; 6. Check clean and adjust pilot jets, disconnect and clean capillary supply to pilot, check pilot supply lines and pilot igniters where fitted; 7. Inspect gas governors and valve diaphragms; 8. Clean and lightly oil, check operation of flame failure devices; 9. Check condition of thermocouple; 10. Check operation of boiler thermostat; 11. Check operation of automatic shut-off valve: 12. Check flame condition; 13. Carry out carbon monoxide check and report on condition of equipment as per current regulations and Manufacturer's technical data sheet; 14. Examine gas system on boiler/ burner to ensure gas tightness and report any defect to Client's Representative; 15. Carry out smoke test/ spillage check on flue; 16. Check ventilation to boiler house ensuring all vents are clear of obstructions and dirt and conform to current standards and regulations; 17. On completion the Provider is to supply a full report on each appliance.

© Rand Associates Consultancy Services Ltd

Boiler Plant Annual Service	Forced Draught Boiler - Gas Boiler and Burner Service	1. Isolate electrical and gas supply and open burner inspection plate/door; 2. Examine condition of boiler combustion chamber, flueways, refractory brickwork. 3. Report on any signs of corrosion or leakage; 4. Inspect all rope joints (note rope jointing may contain asbestos); 5. Clean both sides of inspection windows; 6. Examine and clean burner nozzles renew if required; 7. Examine and clean defuses and blast tubes; 8. Examine and clean high tension leads and ceramics, flame rectification, UV and piezo electric leads; 9. Reset clean and redress electrodes where fitted; 10. Reassemble burner, check and lubricate fan, blades and motor bearings; 11. Examine, reset, clean and redress air dampers, passageways, burner air flow switch, ensuring that it switches off burner in the event of a air failure. This switch must not be left by-passed; 12. Check that the earth connection and continuity conductor is correct and complies with current IET regulations via a earth loop impedance test, but this must be a line -earth loop test as some installations now have protective multiple earth connections; 13. Test the main pilot governor, fuel pressures and ensure all vent holes are clear; 14. Ensure system is full of water to ready for operation, start all plant, fire burners and test burner controls and safety devices are functioning in accordance with all Manufacturer's specifications; 15. Test flame safe-guard systems for shut-down and ensure the flame detection signal current is adequate; 16. Calculate gas flow rate via gas meter reading, adjust to meet burner and boiler requirement as per Manufacturer's specifications; 17. Set up burner to achieve optimum efficiency with the correct flame picture, bearing in mind the operation conditions and Manufacturer's technical data sheets; 18. Gas meter reading, adjust to meet burner and boiler requirement as per Manufacturer's specifications; 19. Set up burner to achieve optimum efficiency with the correct flame picture, bearing in mind the operation conditions and Manufacturer's technical data sheets; 20. Ensuring that no overriding controls are interfering with and the function of the burners, test the function of both control and limit thermostat. Examine gas system on boiler/ burner to ensure gas tightness and report any defect to Client's Representative;

© Rand Associates Consultancy Services Ltd

<table>
<tr>
<td>Boiler Plant Annual Service</td>
<td>Forced Draught Boiler - Gas Boiler and Burner Service</td>
<td>
21. Carry out smoke test/ spillage check on flue;
22. Check ventilation to boiler house ensuring all vents are clear of obstructions and dirt and conform to current standards and regulations. Record date and performance figures together with full details of work carried out on a combustion report sheet using electronic flue gas analyses equipment which is to be forwarded to the Client's Representative within one week from the date of service;
23. Set up burner to achieve optimum efficiency with the correct flame picture, bearing in mind the operation conditions and Manufacturer's technical data sheets;
24. Ensuring that no overriding controls are interfering with and the function of the burners, test the function of both control and limit thermostat. Examine gas system on boiler/ burner to ensure gas tightness and report any defect to Client's Representative;
25. Carry out smoke test/ spillage check on flue;
26. Check ventilation to boiler house ensuring all vents are clear of obstructions and dirt and conform to current standards and regulations. Record date and performance figures together with full details of work carried out on a combustion report sheet using electronic flue gas analyses equipment which is to be forwarded to the Client's Representative within one week from the date of service;
27. Measurements recorded must be taken after the system has been stabilised.. This form is to be signed by the Technician/ Mechanic and by the supervisor of the Provider;
<table>
<tr><td rowspan="4">Note</td><td>Target CO^2</td><td>10% at high fire</td></tr>
<tr><td>Target O^2</td><td>3.2% at high fire</td></tr>
<tr><td>Target excess air</td><td>20% at high fire</td></tr>
<tr><td colspan="2">Or as per Manufacturer's technical data sheet</td></tr>
</table>
28. Combustion test to be carried out on low and high fire;
29. Flue temperature and efficiency results are also to be proved;
30. Examine boiler and boiler flue for air leaks and report defects to Client's Representative;
31. Clean Boiler and burner casing and all external surfaces on burner motor and gas train etc., remove all dirt and grease;
32. Check ventilation to boiler house ensuring all vents are clear of obstructions and dirt and conform to current standards and regulations.
</td>
</tr>
</table>

© Rand Associates Consultancy Services Ltd

Boiler Plant Annual Service – Boiler Flue Clean	Boiler Flueways	1. Clean all boiler flueways remove all necessary access doors, panels etc.; 2. Check retarders and baffles where fitted and clean thoroughly; 3. Clean and brush boiler flueways or tubes using manufacturers tools or equivalent, remove and clean away loose scale, all deposits, rubbish etc all to the Client Representative's satisfaction; 4. Replace baffles, retarders and report on conditions; 5. Replace and rejoint access doors and panels as required ensure they are gas tight.
	Combustion Chamber	1. Remove all necessary access doors, panels etc.; 2. Remove all loose scale and fallen deposits from the combustion chamber using a vacuum cleaner, take care not to damage refractory brickwork, and leave in clean condition, all to the satisfaction of the Client's Representative; 3. Replace and rejoint access doors and panels as required ensure they are gas tight.
	Flues	1. Remove all necessary access doors, panels etc.; 2. Thoroughly brush and clean flues, remove all loose scale and deposits, clear away scale, dirt, rubbish etc., from flue. 3. Replace and rejoint access doors and panels as required ensure they are gas tight.
Boiler Plant Annual Service	Flue Dilution System Service	1. Carry out Smoke/ Spillage test paying particular attention to flexible couplings; 2. Remove all necessary access doors, panels etc., and thoroughly brush and clean fan, ducting, attenuators , grills and flue Dilution unit; 3. Check operation of system and adjust damper setting as required; Ensure that no overriding controls have been interfered with and are fully operational.
Boiler Plant Annual Service	Gas Test including Gas Meter Reading	1. Carry out a thorough safety check of all gas pipework associated with the Boiler plant, check control valves, fire safety equipment, ventilation and gas meter chamber. All works shall be carried in an approved manner to current building and gas regulation and codes of practice; 2. On completion the Client's Representative is to be supplied with an approved safety report sheet which is to include current gas meter reading, date tested, operatives name and signature and comments.
Boiler Plant Annual Service	Pump Service	1. Clean all pump shafts; 2. Check airways and clean; 3. Repack and adjust gland as glands as required; 4. Align Couplings; 5. Oil/grease and lubricate Motors and bearings; 6. Check and adjust drive belt, replace as required; 7. Run and test for overheating; 8. Check and adjust guards; 9. Clean all drains and tundishes; and 10. Clean pump and motor.

© Rand Associates Consultancy Services Ltd

Boiler Plant Annual Service	Plant Service	1. Oil/grease and lubricate any Motors and moving parts; 2. Check and all adjust guards; 3. Check time clocks for correct operation and time adjust as required; 4. Operate boiler thermostats high/low limit to ensure correct operation; 5. Clean sump; 6. Check pump and all adjust as required; 7. Check linkages and moving parts to motorised valves; 8. Leave boiler cases secure and clean; 9. Check automatic air vents for operation and leaks; 10. Check feed and expansion tank for corrosion, operate ball valve; 11. Check insulation to pipework of feed and expansion tank, rescuer if loose; 12. Check operation of pressurisation unit; 13. Check operation of flue dilution unit; 14. Check operation of water treatment units; 15. Check for fire hazards and blocked exits; 16. Record all water meter reading and report to Client's Representative; 17. Complete electronic log book and service report, and report to Client's Representative
Boiler Plant Annual Service	Clean Boiler House Strainers	1. Isolate and make safe; 2. Remove filter element and refill and vent
Boiler Plant Annual Service	Gas Booster Set Service	1. Examine gas boosters and associated controls and panel; 2. Check condition of belts, motors, bearings and electrical connections, lubricate and adjust as necessary; 3. Inspect condition of any flexible coupling and unit for gas soundness; 4. Test operation of unit, in-let and out-let pressure switches for correct operation and adjust as required.

© Rand Associates Consultancy Services Ltd

Boiler Plant Annual Service	System Water Quality Test	Take samples of system water and proved a chemical analysis report containing the following:- • VISUAL RESULTS; • Colour ; • Clarity ; • Odour; • Solids; • Chemical analysis; • Dichlorophes (mg/l); • Sodium Sulphate (mg/l); • Ammoniacal Nitrogen (mg/l); • Nitrate (mg/l); • Chorides (mg/l); • PH; • Conclusion; and Recommendations
Boiler Plant Annual Service	Full NICEIC Electrical Test and Emergency Lighting Function Test to IET Regulations	1. Inspect, test and report on the electrical installation within the boiler house or plant rooms. 2. Carry out test with instrument to all wiring in accordance with the IET regulations for Electrical installations, current edition. 3. Test Emergency lighting for correct operation. 4. All readings obtained are to be submitted to the C.A along with test results and NICEIC test completion certificate. 5. All details of departures (if any) from the regulations are to be reported.

© Rand Associates Consultancy Services Ltd

Boiler Plant Annual Service	Electrical Controls and Control Panel Service	1. Check and log insulation resistance reading of all electrical motors; 2. Check and log running current, full load current and over load settings of all electrical motors; 3. Check all fuse ratings and compare with motor FLC and/or cable size; 4. Check panel for loose connections; 5. Check all terminal blocks for overheating or tracking; 6. Check all fixed moving contactors for burning or pitting; 7. Check condition of and operation of all valve and damper actuators; 8. Check condition of and operation of all temperature, humidity and pressure control; 9. Check all indicator and warning lamps are operational; 10. Check that switch handles are firmly secured and that access door are closed and interlocking; 11. Visually check coils etc., for signs of over heating; 12. Vacuum clean or dust panel; 13. Visually check all interconnection cables for defects or damage; 14. Check operation setting of all safety cut-out and adjust as necessary; 15. Check operation setting of Timers and controllers and adjust as necessary; 16. Check calibration of all states, sensors and step controllers and recalibrate as necessary; 17. Leave plant in good working order and report all defects to Client's Representative immediately.
Boiler Plant Annual Service	Boiler Room clean	Sweep floor, wash down all surfaces, and remove all debris from sump pit, clear rubbish from plant room.

© Rand Associates Consultancy Services Ltd

Boiler Plant Annual Service	Descaling of Secondary HWS Calorifiers and Direct Fired Hot Water Units	1. All operations shall be carried out in accordance with the Client's Safety Procedures, British Standards, COSHH regulations and all relevant Health and Safety regulations and having due regard to adequate clothing and masks, approved equipment and methods, adequate warning notices, disinfection and hygiene and all other matters. 2. A copy of the Provider's Health and Safety Policy and an agreed work method statement shall be provided to the Client's Representative. prior to commencing works. 3. Works shall include full isolation of unit, disconnections or isolation of cold water supplies, hot water outlets, and secondary returns and open vent pipework. 4. Remove any sacrificial corrosion anode and blank and connect an appropriate referable flow Descaling/ power flushing unit and fully descale unit as per Manufacturer's technical data sheets including all chemicals, labour, neutralisation, flushing, refilling and testing. 5. On completion reinstate unit, confirm correct operation and draw water sample test water quality and pH if required flush unit further. 6. On completion the electronic log book and service record are to be completed and the Client's Representative is to be supplied with an approved electronic report including date tested, operatives name, signature and comments**.**
Boiler Plant Annual Service	Descaling of Plate Heat Exchangers	1. All operations shall be carried out in accordance with the Client's Safety Procedures, British standards, COSHH regulations and all relevant Health and safety regulations and having due regard to adequate clothing and masks, approved equipment and methods, adequate warning notices, disaffection and hygiene and all other matters. 2. Works shall include full isolation of unit, all chemicals, labour, neutralisation, flushing, refilling and testing. 3. A copy of the Provider's Health and Safety Policy and shall be provided to the Client's Representative. with and agreed work method statement prior to commencing works on site.
Boiler Plant Annual Service	Flush and Descaling of Plate Heat Exchangers	1. Safely isolate drain disconnect unite using an appropriate referable flow Descaling/ power flushing unit flush; 2. de-scale or de-sludge both primary and secondary sides of the unit using an appropriate chemical at a concentration as recommended by the manufacturer. 3. On completion safely neutralise dispose of chemicals, reinstate unit and confirm correct operation. 4. All works shall be carried out as per Manufacturer's technical data sheet.

© Rand Associates Consultancy Services Ltd

Boiler Plant Annual Service	Dismantling and Chemical Cleaning of Plate Heat Exchangers	1. Safely isolate drain disconnect unite, dismantle unit and clean plates with soft brushes or soak in a open chemical bath, using an appropriate cleaning chemical compatible with the gasket and confirmed by the manufacturer. 2. On completion reassemble unit including fixing or gluing gaskets. 3. On completion reinstate unit and confirm correct operation. 4. All works shall be carried out as per Manufacturer's technical data sheet.
Communal Heating Plant/Service Inspection	6 Monthly (Minor Service) Visit	1. Oil/grease and lubricate any Motors and moving parts; 2. Check and all adjust guards; 3. Check time clocks for correct operation and time adjust as required; 4. Operate boiler thermostats high/low limit to ensure correct operation; 5. Clean sump, Check pump and all adjust as required; 6. Check linkages and moving parts to motorised valves; 7. Leave boiler cases secure and clean; 8. Check automatic air vents for operation and leaks; 9. Check feed and expansion tank for corrosion, operate ball valve; 10. Check insulation to pipework of feed and expansion tank, rescuer if loose 11. Check operation of pressurisation unit; 12. Check operation of flue dilution unit; 13. Check operation of fire safety equipment; 14. Check operation of boilers and gas fired water heaters; 15. Check ventilation is clear; 16. Check operation of water treatment units; 17. Check for fire hazards and blocked exits; 18. Record all water meter reading and report to Client's Representative. 19. Complete log sheets and report to Client's Representative;

© Rand Associates Consultancy Services Ltd

Firestopping

028 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

029 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

COMMERCIAL/COMMUNAL BOILER BI-ANNUAL SERVICE REQUIREMENTS

© Rand Associates Consultancy Services Ltd

BI-ANNUAL SERVICE REQUIREMENTS PARTICULAR TO ELECTRICALLY OPERATED PLATE HEAT EXCHANGER FOR DIRECT HOT WATER

001 The Provider must undertake the Servicing and Maintenance to the Heating Installations under this Specification as follows:-

1. The heater complete with pumps;
2. The remote isolating switch and any electrical wiring and associated works between the isolating switch and the heater including pumps;
3. Any thermostat or temperature sensing device, motorised valves and any electrical wiring, tubing and associated works between the thermostat or temperature sensing device and the heater and motorised valves;
4. The header tank or water supply, insulation, any associated valves, fittings and cold water connections;
5. Any circulatory pipework and associated works including motorised valves and other pipework and associated works between the header tank or cold water supply and the heater and pumps;
6. Hot water pipework;

002 The Contract will include for a bi-annual service as described and in accordance with the manufacturer's recommendations, replacement of **all defective materials, parts and components** and additional visits during or outside normal working hours, to maintain the whole Heating Installation in good and safe working order.

003 The Provider must be responsible for defining the full nature of the Servicing and Maintenance to be undertaken by the Provider, to ensure the safe operation at all times throughout the currency of the Contract of the Client's Heating Installations. The said Servicing and Maintenance must be carried out in accordance with, but not limited to, the recommendations of the manufacturer of the respective plate heating installation and the general requirements outlined hereafter.

004 **Heater Unit General Requirements**

1. Check operation and general condition of unit before commencing Servicing and Maintenance and ensure that temperature of unit does not exceed 40° Celsius;
2. Isolate unit from electricity and water supplies and drain down in accordance with manufacturer's shut down procedure;
3. Prepare unit for dismantling and mark plate assembly;
4. Dismantle unit, separate plates, clean and lubricate all mechanical connections and bolts;
5. Clean all sediments, scaling and any biological growths from the plates, using a soft brush and clean running water. If fouling is severe, it may be necessary to use a high pressure hose and only those dilute chemical cleaning agents recommended by the manufacturers of the unit;
6. Inspect and renew all suspect gaskets, ensure that all sealing surfaces are clean;
7. Check that plates are in the correct order, carefully align plate assembly and press together;
8. Reassemble and tighten bolts in correct pattern to correct torque and ensure that manufacturer's plate pack assembly and pressure plate tolerance criteria are not exceeded;
9. Re-commission unit in accordance with manufacturers start up procedures and adjust flow rates gradually to maintain correct temperatures;

© Rand Associates Consultancy Services Ltd

COMMERCIAL/COMMUNAL GAS BOILER INSTALLATIONS

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

COMMUNAL BOILER INSTALLATIONS

General Requirements

001 This specification shall be read in conjunction with the Preliminaries, the other Communal Mechanical and Electrical Specifications, Appendices, Schedule of Rates and all other contract documentation.

002 The Provider shall note that this is a performance specification. It shall be clearly understood that the Provider shall be fully responsible for the detailed design, supply, installation, testing, commissioning, demonstrating, documentation and leaving in a satisfactory working order following removal of existing boilers and other plant (if any) the fully operational new commercial and communal boiler and other boiler room plant installations as described within this specification or indicated on the project drawings.

003 It shall be the Providers responsibility to request and receive any information regarding asbestos on the site and subsequently satisfy their obligations by carrying out a Pre-construction asbestos survey.

Strip Out Works

004 The Provider shall provide strip-out details as part of their initial enabling works identifying the extent of the strip out works, details regarding isolation, method of isolation, methods of safe removal and builders work including any fire stopping.

005 Following consideration and approval the strip out works will be completed as part of the first stage of the project.

Validation Reports

006 The Provider shall allow for validation commissioning of the existing system to be carried out by the Provider or a specialist commissioning subcontractor approved by the Client's Representative. The Provider shall be responsible for the Works and the results which will be representative of equipment selections following review by the Client's Representative.

007 The Provider shall ensure, as a minimum that any newly installed equipment has a minimum resilience of N+1 (duty / standby) for communal heat generating equipment. Heat generation equipment minimum turndown factors shall be considered against the base building load of the heating and hot water and a 10% occupants' operation thereafter.

008 Pump set arrangements must have a minimum resilience of N+1 (duty / standby) and with only include individual variable speed drives whether located on the pump heads or adjacent.

009 Pumps with variable speed drives located collectively within a single control panel shall not be accepted.

010 The existing controls and integration with on-site or off-site BMS controls shall be re-integrated in line with the Client's standard BMS specification.

011 The ethos of the controls formed as a description of operation within the validation report by the Provider shall be maintained where possible during the design and replacement works so that minimal adaptation of the head end and GUI is necessary.

Technical Requirements

Loss of Service

012 The Provider shall be allowed, within their programme to carry out works with a loss of service if:
- The planned loss of service is anticipated to be no longer than 8 hours;
- The planned loss of services has prior agreement with both the Client and Customers;
- Local water Client is notified of the planned loss of service;

© Rand Associates Consultancy Services Ltd

- Notification letters to Customers have been issued at least 7 days before commencement of the Works;
- Written notifications are present in common areas to notify Provider's intentions; and
- A vulnerable person's strategy is in place.

Temporary Supplies

013 Depending upon the period of loss of service, strategy agreed with the Client and necessity the Provider may provide a method including for temporary heat generation to satisfy the heating and hot water demand of the building.

014 The temporary supplies strategy shall be provided as an initial separate report to the Client for review and approval and will include location, connections, loads and building heating and hot water assessment.

015 As such, any temporary heat generation equipment proposals will only be accepted if it is capable of satisfying duties in line with existing operational duties identified within validation report.

016 Additionally, if temporary boiler plant is proposed; a full technical submittal of both the equipment, the supplier, service history and maintenance contract options are to be provided.

017 The Provider shall make allowance of the design, provision, installation, testing and commissioning and upon completion of the works, removal of equipment with no more than 5,000 operational hours of any one piece of equipment and an "all hours" maintenance contract.

018 Temporary heat generating equipment shall only be accepted if;

- N+1 resilience arrangement (minimum) of the existing load;
- Good condition;
- Previously maintained;
- 24-hour breakdown and the Provider response proposal;
- Owned by or contracted through the Provider;
- Fully operational;
- Electrically sound;
- Positioning satisfies applicable Standards and the Clean Air Act as necessary;
- Positioning & acoustic breakout satisfies any local Client requirements; and
- A minimum Pressure rating of 2.5 x maximum working pressure.

General

019 The Provider shall allow for the design, provision, installation, testing and commission of all mechanical services required including necessary ancillaries, fittings and fixings for the full operation and completion of the Works, including the provision and/or alterations of electrical supplies and containment for mechanical systems etc. (refer to relevant electrical specification sections, schedules and schematics for electrical Provider scope).

020 The installation will be in accordance with current editions of the Water Supply (Water Fittings Regulations and applicable Standards as well as all good practice guidance & HSE documentation.

021 The Provider's responsibility shall include the following:

Engage a suitable reputable professional consultant engineering practice to carry out detailed designs and to attend design meetings and carry out installation inspections as required.

The preparation and submittal of all necessary calculations, designs, modelling and working drawings together with their own detailed Specification for approval by the Client's Representative.

The provision of design calculations, design drawings, working drawings, technical submissions and such details as are necessary to demonstrate their understanding of their design to the satisfaction of the Client's Representative.

Preparation of builder's work drawings and schedules.

© Rand Associates Consultancy Services Ltd

The preparation of a coordinated programme of works covering all aspects of the contract. This shall include those aspects of the works that require co-ordination with other contract programmes, separation and submittal of Method Statements covering complex operations and those having a direct influence on the continuing operation of the site and other external system.

Selection of plant and equipment to meet the specified criteria including all services design and co-ordination required to modify connections, services to facilitate the plant and equipment selected.

Detailed design of interfaces based on the specific equipment selected to meet the specified performance.

Liaison, co-ordinate and co-operate with all other Providers that may be employed by the Client's Representative to carry out other works.

Co-ordinate and manage all sub-Providers and specialists involved in the works, to ensure adherence to the programme and compliance with Site procedures.

022 Any deviations, changes or modifications to this specification, Client's requirements and/or specific tenure specifications proposed by the Provider must be approved in writing by the Client's Representative.

023 The Provider shall always fully protect the works to maintain separation from the existing operations of surrounding areas with all services and systems fully maintained in operation during the Contract.

024 At least two weeks shall be allowed for the Client's Representative to inspect the submitted documents, from receipt, and also sufficient time shall be allowed to incorporate any comments by the Client's Representative and resubmission of the documents prior to commencing any associated work on site. The time for this process shall be included in the programme or works to be agreed.

Programme

025 The Provider shall prepare a programme of work to meet the completion dates given in the Works Order and shall submit this programme at the start of the contract to the Client's Representative for approval.

Builders Work

026 The Provider shall be responsible for and carry out all builder's work required as part of the works and shall be responsible for providing all builders work details to the satisfaction of the Client's Representative.

027 Accuracy of dimensions on drawings in relation to all plant, equipment, etc. shall always be the responsibility of The Provider.

028 Builder's work shall specifically include but not limited to;

- Builder's work drawings indicating requirements;
- All trenching, back filling and reinstating of external surfaces;
- Drilling and cutting of all holes and chases in the building structure and fabric including all making good;
- Sleeving of pipework when passing through walls, ceilings, floors with fire stopping;
- Finishing of any holes to be suitable for fire stopping equipment;
- Fixings and noggins within partition walls where necessary to support containment/ outlet positions and the like;
- Anti-corrosion treatment e.g. painting of exposed ferrous metals or other services associated items;
- Bracing and fixing equipment for pipework bellows and anchors;
- All fire stopping throughout the building.

© Rand Associates Consultancy Services Ltd

Pre-Construction Asbestos Survey

029 The Provider should be aware that the possibility of asbestos or other hazardous materials being present in other locations cannot be ruled out.

030 The Provider shall allow for the appointment of a specialist asbestos surveyor to carry out a pre-construction R & D asbestos survey as part of HSE requirements to ensure that a final register and drawing plan if necessary is available complete with risk assessment and removal plan for readiness and programming into the initial main element of works.

Pre-Construction Survey Visit

031 Immediately following availability of access to site and prior to commencement of construction, the Provider, shall fully examine site conditions, physical restraints and existing installed services (where applicable) to ascertain that the drawings properly reflect the required works and, if applicable, existing services drawings are accurate as drawn.

032 The Provider shall notify the Consultant of any variations between the site conditions and the Design Intent within one week of access such that a properly coordinated set of drawings can be produced prior to the installations commencing.

BIM and CAD Drawings

033 Subject to the Client's Representative confirmation on a project by project basis the Provider must allow for all drawings are to be produced using BIM and CAD software package and the Provider shall issue them in Autodesk ReVit and AutoCAD .drawing format and pdf format. Final details shall be agreed with the Client's Representative before commencing drawing production.

034 Whenever issuing electronic drawings for review, comment or inclusion with the O&M's, both an RVT, DWG and a PDF format shall be issued.

Technical Submittals

035 The Provider shall produce detailed technical submittals for all elements of his installation, materials, equipment or procurement processes that do not conform to this Specification.

036 Technical submittals shall be written specifically for this project and any generic and unnecessary content shall be removed.

037 Each submittal shall include the following details as a minimum:
- Description of works, materials or equipment that differ from the Specification;
- A statement of confirmation of compliance with the design intent;
- Details of any variations in cost (or not);
- Details of programme implications;
- Supporting manufacturer's literature (non-generic);
- Dimensional information; and
- Technical data (e.g. Mechanical demand, output figures, performance data etc).

Standards

038 This standard specification is to be read in conjunction with the other relevant standard Specification and Preliminaries.

© Rand Associates Consultancy Services Ltd

039 All installation work executed shall be carried out in accordance with the various manufacturer's recommendations and requirements, and shall comply with the following statutory instruments, regulations, recommendations, and bodies, as applicable:

- British Standards Institute Specifications and /or Codes of Practice and / or British Board of Agrement Certification;
- The requirements of Statutory Bodies;
- The Gas Safety Regulations;
- The recommendations of the Chartered Institution of Building Services and Institute of Plumbing;
- The recommendations of the local Fire and Emergency Planning Authority;
- The Health and Safety Executive;
- The Environmental Health Officer and all the COSHH requirements;
- Requirements of the local Water Authority and the water regulations;
- Requirements of British Gas;
- Ministry of Housing, Communities and Local Government (Building Regulations);
- Department of Energy;
- NHBRC and NHBC requirements;
- Acts of Parliament;
- The Control of Asbestos Regulations 2012 and Approved Codes of Practice and Guidance L127 and L143;
- Approved code of practice and guidance L8 2000 the control of legionella bacteria in water systems.

040 All materials or parts supplied, or work carried out, shall comply with the British Standards where available. All gas burning appliances shall be installed and approved and certificated, and the Provider is also to provide gas tightness and building regulation approval certificates as a minimum.

041 All domestic services pipework shall be installed to the Standards required by the local Water Authority.

Noise and Vibration

042 The Provider shall use the services of an acoustic specialist to advise on design and installation of all noise and vibration attenuating equipment. Particular attention shall be paid to noise and vibration emanating from plant and equipment.

043 All necessary precautions shall be paid to noise and vibration entering the occupied areas above the design levels specified.

044 All plant and equipment shall be adequately isolated from the building structure by the use of anti-vibration mountings and flexible pipe and duct connections. Pipe work and ductwork adjacent to vibrating equipment shall be supported from spring type hangers.

045 Attenuators shall be fitted to supply and extract ductwork to ensure that noise levels specified are not exceeded with the plant operating at full and minimum load conditions.

046 Insulation shall be applied to ductwork on the system side of attenuators to prevent airborne noise from re-entering the ductwork system where the attenuator cannot be built into plantroom walls.

047 Attenuators shall be fitted to all outside air intakes and discharges including natural vents to the boiler room to prevent noise pollution of the surrounding areas. Special attention shall be given to noise and vibration emanating from the air-cooled condensers.

Plantroom Mains Cold Water

048 The incoming cold-water service shall not be adapted unless otherwise identified within separated sections of the Specification of the scope / extent of the works.

© Rand Associates Consultancy Services Ltd

049 If Plantroom mains cold water service adaptation is necessary for provision to the new heating plant, The Provider shall make allowance for the design, provision, installation, testing, commissioning and notification to the local Water Authority with;

- Notify the Client's Representative of isolation no less than 14 days prior to commencement (if this is to cause issues with Customer's water supply);
- Ensure method and programme is compliant with vulnerable person's requirements;
- Ensure Customer Liaison Officer is contactable throughout loss of service;
- Issue of pressure test certificate;
- Return to service is after necessary cleaning and flushing methods;
- Return to service is after testing, non-destructive testing and curing as necessary; and
- Ensure adaptation is compliant with metering clause.

Plantroom Gas Service

050 The incoming gas service shall not be adapted unless otherwise identified within other sections of this Specification of the scope and extent of the works.

051 If local plantroom adaptation of the gas service is necessary for provision to the new heating plant, The Provider shall make allowance for the design, provision, installation, testing, commissioning and notification to the Client's Representative's with;

- Notify the Client's Representative of isolation no less than 14 days prior to commencement (if this is to cause issues with Customer's gas supply);
- Ensure method and programme is compliant with vulnerable person's requirements;
- Ensure Customer Liaison Officer is contactable throughout loss of service;
- Issue of gas tightness (installation completion) certificate;
- Return to service is after necessary cleaning and flushing methods;
- Return to service is after testing, non-destructive testing as necessary; and
- Ensure adaptation is compliant with metering requirements.

Isolation of Existing Equipment

052 The Provider shall undertake a full assessment of all existing valves and forms of isolation within the boiler plant room. A schedule of existing valves and forms of isolation shall be provided to the Client's Representative identifying their operational condition and effectiveness. The Provider should, where valves are found to be either not operational or effective or not suitable for isolation, provide recommendations for alternative methods to disconnect the mains pipework and replace the subsequent valve.

053 It will be deemed, following the Provider's initial survey of any noncompliant installations and undertaking of remedial action in respect of isolation and any adaptations required to the water and gas pipework installations, that these installations will be compliant upon completion of the Works.

Alternative Methods of Isolation

054 The Provider shall allow for the use of alternative methods of isolation should local existing isolation valves not be operational or effective.

055 These include (but are not limited to) the following:

Liquid nitrogen pipe ice plug freezing.
Riser draining.

056 The Provider shall provide a technical submittal with details of any specialist subcontractors and method statements for the above alternative means of isolation for the Client's Representative approval prior to commencement of the Works.

© Rand Associates Consultancy Services Ltd

Disconnection and Safe Removal

057 Following the safe isolation of electrical services and controls the Provider shall isolate and fully disconnect the cold-water services connections, manual and electrical gas isolation and emergency control valves (ECV), additional emergency control valves (AECV), oil feed / return, oil feed pump (if necessary) and respective fuel line safety systems.

058 Existing equipment due for replacement can subsequently be safely dismantled by the Provider or a specialist subcontractor approved by the Client's Representative.

059 All redundant equipment shall be safely removed from site and sustainably disposed of where possible. All removal and disposal works shall be fully allowed for by the Provider.

Specialist Subcontractors

060 Where specialist works are required in the removal, transportation and disposal of materials and components etc subject to Regulations, further guidance should be sought from the relevant body or Client, these works could include but are not limited to;

- Asbestos and asbestos containing materials.
- Gaseous residues.
- Existing system water.
- Other deleterious material.

Pads and Bases

061 Existing machinery bases are to be broken out, dismantled where possible and safely removed from site.

062 Where floor damage or otherwise has occurred, the Provider shall undertake concrete and/or screed repair works and local floor finish replacements.

Electrical Services

063 The Provider is to ensure that the electrical supplies have been safely isolated prior to commencement of any removal Works.

064 The Provider is referred to the relevant electrical specification clauses for details of testing and tracing, isolation, disconnection and removal Works.

Main Plant Sizing and Design

065 Equipment and systems shall be designed generally in accordance with the CIBSE recommendations, the current version of the Non-Domestic Building Services Compliance Guide, ratified legislation and the following:

Heating Pipework	Plant Rooms and Risers	less than 320 N/m2 or less than 1.5 m/s whichever prevails
Heating Pipework	Riser Distribution	less than 250 N/m2 or less than 1 m/s whichever prevails
Heating System Distribution Temperatures	Target flow temperature Target return temperature	70°C 40°C
Note: Existing operating temperatures will need to be maintained if internal works are not included within the scope of the Works Order and internal systems cannot satisfy the above whilst providing suitable heating and hot water supplies to Customers.		

© Rand Associates Consultancy Services Ltd

Customer's Hot Water Supplies – Operating Temperatures	HWS flow temperature HWS return temperature	60°C 55°C
Customer's Heating Supplies – Operating Temperatures	LTHW flow temperature LTHW return temperature	To be agreed with Client's Representative To be agreed with Client's Representative
Maximum Working pressures	To be agreed with Client's Representative	

066 The installation of all mechanical services shall be in accordance with all the current regulations, standards, and guidelines.

067 The Provider shall consider all current applicable standards and recommendations, to ensure the design element for the Works satisfies all criteria.

068 The Provider should consider and investigate all reasonable methods by which the proposed services for the boiler room will offer the full potential for energy efficiency and control whilst maintaining their suitability for their intended use and operation.

Fuel - Natural Gas

069 The Provider shall ensure a gas meter survey is carried out.

070 The Provider shall be responsible for carrying out a survey on the existing gas supply pipework and gas pipework within plantroom, the Provider to confirm if existing pipework is adequate for proposed gas loads, with potential replacement by the Provider if needed.

071 The Provider shall allow for the connection and internal installation of a new gas service running externally within ground to satisfy the requirements of the internal gas appliances.

The installation complete with gas solenoid valve, gas detection panel interlock, gas valve pressure sender, new gas pipework to serve the new boilers shall be carried out by a registered Gas Safe engineer.

072 The Provider will need to liaise with the utility provider and gas transporter for notification and request any amendments to metering / supply necessary these works which may include costs respectively based upon the works involved.

073 The Provider shall carry out an assessment of the loads within their design and allow for all liaison with the utility provider to ensure acceptable access is available and programme of works is agreed allowing the works to be carried out.

074 The Provider shall allow for the provision, installation, testing and commissioning of new gas pipework run within steel barrel at high and low level to serve the following appliances;
- Boilers;
- Gas solenoid valve; and
- Gas Booster.

075 Each connection being made with a gas cock.

076 Each gas pipework / header end flange shall include test points and nipples.

077 The gas supply to the boiler connection shall be made in line with the manufacturer's technical data sheet.

078 The gas supply lines shall be installed in compliance with current applicable Standard below 35mm, the requirements of The Gas Safety Regulations of above 35mm and respective IGEM documentation.

© Rand Associates Consultancy Services Ltd

079 The Provider shall be responsible for the providing gas calculations to ensure the existing gas meter can provide for the temporary package plantroom gas demand following sizing calculations.

080 The Provider shall be responsible for producing and providing gas calculations to ensure a new gas meter upgrade and upsize is required to meter the new boilers load for the proposed plantroom.

Fuel – Class D Oil

081 Oil fueled boilers etc may be ordered dependant upon location and site conditions.

Boilers (Low and Medium Temperature)

082 Shell / Tube / Sectional

Use subject to site conditions and technical submission.

Approved Manufacturers or other equal and approved:
Hoval
Viessmann
Worcester Bosch

083 Cast Iron

Use Subject to site conditions and technical submission.

Approved Manufacturers or other equal and approved:
Worcester Bosch
Cochran Ltd

084 Modular

Use subject to site conditions and technical submission.

Approved Manufacturers or other equal and approved:
Hoval
Viessmann
Worcester Bosch

Pressure Jet Burners

085 Should a boiler require a separate pressure jet burner dependent upon the extent of the works and selected boiler the Provider should allow for the design, provision, installation, testing and specialist commissioning of following as a minimum;

- Suitable connection and capacity for selected boiler;
- On Board digital combustion management;
- Fan unit and motor;
- Natural gas;
- Matched natural gas valve train and on-board solenoid valves;
- Class D Fuel Oil connection (if required within the extent of the works);
- Concentric Injection mixing head;
- Flame sensor;
- Fire tube hinged access;
- Full modulation;
- 400 V / 3Phase /50 hertz electrical connection; and
- BMS output.

© Rand Associates Consultancy Services Ltd

086 Gas connections to burners shall make allowance for access and include for separation union adjacent to burner enabling servicing and access through hinged section of the burner and include;
- Manual Isolation; and
- Pressure regulator.

087 If required within the extent of the works oil feed and return connections to burners shall make allowance for access and include for separation union adjacent to burner enabling servicing and access through hinged section of the burner and include;
- Class D fuel oil valve train;
- Proprietary filter; and
- Oil thermocouple shut-off switch.

Approved Manufacturers or other equal and approved:
Riello
Weishaupt

Flues

088 The Provider shall allow for the design, provision, delivery, specialist lift and shift, installation, testing and commissioning of flue works to accommodate the works detailed.

089 Twin wall chimney system shall be manufactured in stainless steel AISI 316L (1.4404) internal and AISI 304 (1.4301) external wall, be suitable for wet working conditions (condensing) using tri-lip silicone gaskets, and complete with mineral rigid insulation with 25mm thickness and 128kg/m3 density. Chimney system to be certified through BSRIA as a 4-hour fire rated product (when used with firestop plates).

090 The removal, replacement and upgrading of chimney works shall be in accordance with the requirements of the Local Authorities Environmental Officer, in line with the current regulations in respect of chimneys and installations and the Clean Air Act 1956

091 The installation works shall be carried out during agreed shut-down periods and works kept to an absolute minimum down-time including for commissioning.

092 The Provider shall allow for all equipment, materials, ancillaries, and testing equipment necessary to provide a fully operational and certificated installation for the operation of the new boilers.

093 Final completion of the works will see connection individually of boiler flues to a new flue header rising through 90-degree elbows and as necessary segmented tees and running vertically through a new chimney sectional installation. A plant room flue drain shall be installed to a drain by the Provider.

Buffers and Thermal Stores

094 The Provider shall be fully responsible for the detailed design, supply, installation, testing, commissioning of buffer store vessels; the minimum specification to be applied is tabled below however amendment to this may be required for different Works Orders;

Maximum working pressure	6 bar
Maximum working temperature	95°C
Steel vessel (made of S235JR):	Outside powder-coated, inside untreated
Insulation	50mm P.I.R
Insulating Mantle	EPS insulating mantle (fire category B1) with a polypropylene outer shell in white (RAL 9010) / white aluminium (RAL 9006).
Minimum Connections required	Drain connection Primary Flow Primary Return Secondary Flow Secondary Return 3No. Sensor Pockets 5No. Gauge Safety Valve Bracket Connections

© Rand Associates Consultancy Services Ltd

095 The Provider to ensure that the buffer store is installed on a pre-constructed ring stand.

096 Buffer vessel material selection must complement that of the entire system. The design and fabrication of the shell should be in accordance with applicable Standard.

Plate Heat Exchanger

097 The Provider shall be fully responsible for the design, provision, installation, testing and commissioning of Plate Heat Exchangers to achieve adequate duties to hydraulically separate the system.

Load	Plate Heat Exchanger No 1	60% of total heating and direct hot water demand
	Plate Heat Exchanger No 2	60% of total heating and direct hot water demand
Pressure Rating and Connections	Plate Heat Exchanger No 1	PN16 Flanged connections
	Plate Heat Exchanger No 2	PN16 Flanged connections
Maximum Working Pressure	Plate Heat Exchanger No 1	6 Bar
	Plate Heat Exchanger No 2	6 Bar
Maximum Working Temperature	Plate Heat Exchanger No 1	100°C
	Plate Heat Exchanger No 2	100°C
Mounting Feet		Stainless steel angle for bolting to foundation bolts cast into concrete to a base plate
Insulation Jacket	Insulation Material	Rockwool
	Jacket and Liner Cloth	Silicone Glass-fibre - Grey
	Fastenings	Fire proofed velcro

Drip Tray	Drain Boss	Yes
Tightening Bolt Bearing Boxes		To be used
Flange Studs		Pre-installed flange connection studs complete with nuts and washers
Stainless Steel Frame Bars and Tightening Bolts		Required for external or damp environments

Pumps and Connectors

098 The Provider shall allow for the provision, installation, testing and commissioning of pumps where necessary to comply with site conditions and design of heating plant equipment and installation criteria.

Flexible Connections

099 Flexible connections shall be fitted to the suction and delivery connections of all pumps. The minimum length of any connection shall be 50 mm and in no case shall exceed 500 mm in length.

100 Flexible connectors shall be of briaded stainless steel in construction with a minimum nominal pressure rating of PN16.

Bases

101 The Provider shall allow for the provision, installation, testing and commissioning where necessary to comply with manufacturer's installation technical data sheet or to negate reverberation through floors new pump bases.

102 Pump bases where necessary shall be formed of open or captive spring anti-vibration mounts, secured to the structural and supporting concrete filled, zinc plated carbon steel framed, reinforced casements.

© Rand Associates Consultancy Services Ltd

103 All fixings shall be a minimum of 150mm from the edge of inertia bases upon final installation.

Pressurisation Equipment

104 The Provider shall be fully responsible for the design, provision, installation, testing and commissioning of necessary filling and pressurisation equipment to the heating primary circuit.

105 The Provider shall allow for the installation of a combined pressurisation, degasser and dosing system all in one unit or separately dependent upon spatial availability.

106 A balanced pressure expansion packaged plant item shall be sized according to the total system volume and the boiler load or the individual hydraulic sections of the system. The vessel shall be a minimum of 80% efficient irrespective of the static height of the system.

107 For system volumes up to 200,000 litres:
- Break Tank: 4 litre break tanks with type AB Air Gap Fluid Cat 5;
- MODBUS Communication output;
- System quick-fill mode;
- Password protection for parameter entry;.
- Pressure settings in 0.1 bar increments;
- Service reminder option (12 months);
- Pump pulse option (2 second pulse if inactive for 60 days);
- Flood protection options;
- Event logging for pump start, individual pump run hours counter, electrical interruption and common alarm;
- Volt free contacts for common fault, high pressure, low pressure, pump fault, pressure transducer (Top-up controller only);
- Individual controllers for pressurisation and degassing function;
- Vacuum degassing, turbo and normal interval modes;
- 18 litre additive tank;
- Mix ratios from 1% to 50% user configurable balancing valves;
- Top-up pressurisation unit (<18.0 l/min);
- Electric pump, 230V 50Hz 1ph (2160D: 415V 50Hz 3ph);and
- Colour: Black (RAL 9005).

108 For system volumes over 200,000 litres the Provider shall propose pressure transfer kit arrangements with respective atmospheric vessels. A technical submittal will be required in this respect.

109 These shall be an automated product combing a balanced pressure system with an effective pressure step de-aerator function and an interlink to a top up pressurisation unit. Dual pumps units shall be selected with the following;
- Real-time LCD display showing the status of the mechanical components while monitoring the vessel contents and the system pressure;
- On/Off switch, with indicator neon;
- Constructed as type AB air gap with weir overflow, fluid category 5;
- Electric pump, 230v 50Hz single phase;
- Electronic pressure transducer;
- Normally closed, common fault, volt free boiler interlock;
- Normally open high pressure, low pressure, transducer health and pump health volt free contacts;
- System logging;
- BMS operation and fault notification as a minimum;
- Event logging for pump start, individual pump run hours counter, electrical interruption and common alarm;
- Volt free contacts for common fault, high pressure, low pressure, pump fault, pressure transducer fault;
- 18 Litre break tanks with type AB air gap fluid Cat 5;
- Relevant certifications and standards;

© Rand Associates Consultancy Services Ltd

- PED 97/23/EC requirements;
- IET - Electrical Safety Guidance;
- EMC 2004/108/EC;
- Applicable Standards; ;
- Machine Directive 95/16/EC;
- Electronic Components have been tested and comply with the EMC Directives;
- EN61000-6-2: Generic Standards – Immunity standard for industrial environments ;
- EN61000-6-3: Generic Standards – Emission standard for residential, commercial, and light industrial environment;
- CE marked components, where applicable;
- Applicable Standard – Closed expansion vessels;
- WRAS approved float valve to applicable Standard;
- IP54 (applicable Standard) Rated Controller; and
- IPX5 (applicable Standard) Rated Pump.

Boiler Dosing Equipment

110 The following equipment shall be installed in addition to the above;
- 15 litre dosing pot in the boiler house manufactured by Aldous and Stamp Ltd or other equal and approved, suitable for the system pressure;
- Filling funnel connected to dosing pot with cover, lockshield valve and drain valve;
- The pot shall be connected to the system pipe work with lockshield valves; and
- A line constructed from light gauge copper tube shall be run from the drain valve to the nearest gully.

Filtration

111 The Provider shall be fully responsible for the detailed design, supply, installation, testing, commissioning, demonstrating, documentation and leaving in a satisfactory working order the high power electronic fan heaters, combined side stream filtration and continuous water treatment equipment and installation.

112 Combined side stream filtration and water treatment for the closed LTHW system shall be provided as a complete package inclusive of cylinder, filter medium, strainer and sparge pipe, combination, inlet and mixing valves, pump and all ancillaries to form a complete water conditioning unit to each water stream, capable of treating system water base upon total volume determined through calculations by the Provider.

113 Each filtration unit shall provide:
- Side-stream filtration to less than 5 microns;
- PH control, maintaining a level of 9.0 – 10.5;
- Inhibition of corrosion – maintaining a dissolved iron level of <1.0 mg/l;
- Regulation of hardness and scaling through calcite / dolomite media filtration;
- Removal of air through integral air separation device; and
- Environmental restriction of bacterial growth.

114 Units shall be constructed from stainless steel (SIS 2343, pressure tested to 15 bar) and shall incorporate all necessary connection points, valves, flow regulators and manometers for normal operation.

115 The packaged pH / scale and water treatment unit shall incorporate full automation of the backwash facility, controlled by a wall mounted, IP 44 enclosed control panel, to include BMS connection via volt free contacts for 'Run', 'Backwash' and 'Fault' conditions and control of dedicated circulation pump where required.

116 The packaged units shall be capable of operating up to the following working parameters;

100°C.
10 bar (TBC).

117 Side stream filtration and water treatment is a direct alternative to traditional chemical inhibitors and provides a self-regulating water treatment process post chemical cleaning of the pipework.

© Rand Associates Consultancy Services Ltd

118 Effective water treatment facilitates the commissioning process and assists in successful project handover.

119 The packaged equipment shall operate and within compliance of BSRIA BG 29/2012.

120 A condition survey including analysis of water chemistry, current operating issues and records of previous chemical treatments can be undertaken by the water treatment manufacturer to ensure suitability of the preferred process, identify problem chemical combinations and advise on installation issues.

121 It is important that the Client is aware of the extent of 'make-up' to their closed loop systems. A pulsed output water meter shall be installed to each system at the time of installation complete with BMS capability, to monitor the water consumption of the entire closed loop. These shall be installed in-line with the combined break tank serving each filtration unit. It is important that the break tank and supplies are sized by the Provider in conjunction with the side stream filtration manufacturer.

122 Fluid Category 4 approved air-break type back flow protection device is required for the MCWS supply that connects to the filtration unit. The unit break tanks are designed to deliver the correct flow rate and pressure to effectively backwash the system. The break tank assembly incorporates a submersible booster pump to ensure flow rates where mains water pressure is low. Site drains need to be able to cope with the discharge flow rates.

Plant Room Ventilation

123 The Provider is to review the existing plantroom ventilation arrangements and adapt as necessary to ensure that the requirements comply fully to accommodate the new system requirements and current regulations.

Metering

124 The Provider shall allow for the provision, installation, testing and commissioning of a local metering complete with pulsed output capability for BMS integration. The metering requirements are below as a minimum but not limited to;

Plantroom primary water supply.
Plantroom secondary water supplies.
CHP heating circuit. Primary total heating generation.
Secondary heating generation.
Secondary heating generation zones.
Compliance with CIBSE TM39.

125 Water metering shall be by hermetical magnetic metering transition principles with no wet gears and as a volumetric flow device record through a built-in register counter and a built in remote micro-processor providing pulsed output (1 pulse per litre) capable recording with BMS output capable via M-Bus or similar allowing data logging recording (annual information retention and storage of information as a minimum).

126 Water meters shall be of brass or thermosetting plastic material with BSP or flanged (PN16) connections and approval in line with metrology Class D / MID-2004/22/EC.

127 Heat metering shall be by ultrasonic principles and as a volumetric flow device record through built in / remote micro-processor and meter with BMS output capable of BMS data logging recording (annual information retention and storage of information as a minimum).

128 Heat meters shall be of brass or stainless-steel material with BSPT or flanged (PN16) connections and approval in line with MID-2014/32/EU. (NB: This metering specification applies to systems with a working pressure up to 8bar; a request for higher pressure specifications to be provided upon request).

129 Where existing water meters are present, the Provider shall ensure for testing and provisioning for operation by BMS and remote metering if required by the local Water Authority.

© Rand Associates Consultancy Services Ltd

Pipework and Fittings

130 The Provider will fabricate any necessary pipework adaptations, and sterilise as required, before the shutdown of the supply where possible to carry out the alterations as required to satisfy the extent and scope of the Works within this Specification.

131 This is to keep the shut down time to a minimum.

132 All pipework will be supported via a suitable manufactured support or bracketing system. Pipework supports shall be arranged as near as possible to joints and the centre spacings shall not exceed those given elsewhere within this Specification. Where there are 2 or more sizes of pipes, the common support spacings shall be those required by the smallest bore pipework.

133 All pipework should be fully supported by its own services support system.

134 The Provider will replace all necessary plantroom heating pipework, gas pipework, cold water service pipework, control, balancing and isolating valves, fittings, fixings, and ancillaries necessary for completion of the works.

135 The Provider must ensure the alignment of the pipework so that no stresses are exerted on any equipment, and the pipe will be fully supported when disconnected at both ends.

136 All pipework to and from any risers and outgoing zones should have no failing or faulty flanges, valves or connections.

137 For maintenance purposes, pipework within the plantroom should be fitted in such a way, in the event that when plant or equipment is replaced, no water or heating pipework adaptation is necessary

138 All fittings, pipe and materials that will transport water or gas must be cleaned of loose grease, oil, flux debris prior to connection. Separate flushing shall be carried out during the commissioning period.

139 Every effort must be made to ensure no water spillage occurs. The Provider will be held responsible for any damage caused. On completion, any temporary supplies will be removed completely. There should be no dead legs and all spare tappings upon completion of the works shall include for isolation and plugs or flange and capping provided as required.

140 All copper tube shall conform to applicable Standard R250: Part1 (under no circumstances is Table Z tube to be used).

141 All copper fittings shall be of the solder ring type in compliance with applicable Standard. When adapting to a BSP fitting the correct appropriate fitting will be used. (IMI Yorkshire YP69 or YP69F or equal and approved).

142 The Provider will remove any verdigris and flux residue from any retained or newly installed copper pipework.

143 The pipework layout for all services including the cistern(s) connection manifold(s), must comply with all relevant legislation, British Standards and Codes of Practice, with particular attention to CIBSE application and commissioning guides.

144 Scaled, dimensioned working drawings must be submitted to the Client's Representative for his approval prior to the commencement of any of the Works on site.

145 All open ends of pipe work left during the installation of pipework shall be temporarily sealed with plugs to prevent foreign matter entering the system.

© Rand Associates Consultancy Services Ltd

Steel Pipework for Low Pressure Hot Water Heating Systems

146 Steel pipework for use in low pressure hot water heating systems shall be of heavy gauge quality manufactured in accordance with the provisions of applicable Standard and amendments.

147 Pipework shall be screwed, flanged or welded as detailed in the Sections of the Specification dealing with low pressure hot water.

148 All bends and tees shall be easy sweep pattern. Elbows, square tees and bushed fittings will not be permitted.

149 Fittings shall be best quality malleable iron, beaded or banded and easy sweep pattern. Flat seated unions shall not be used, unions shall have bronze conical seats ground in.

150 Fittings shall be manufactured in accordance with the provisions of applicable Standard and subsequent amendments.

151 White heart fittings manufactured in accordance with applicable Standard and subsequent amendments may also be used.

152 All steel pipework over 50 mm diameter shall be welded unless otherwise instructed.

Copper Pipework for Low Pressure Hot Water Heating

153 Copper pipe work for use in low pressure hot water heating systems shall be manufactured in accordance with applicable Standard Part 1, it shall be half hard tempered to R250 and installed by kite mark licensee operating under BSI registered firm scheme in accordance with ISO 9001, fittings shall be to applicable Standard and bear the Kite mark.

154 Fittings shall be manufactured in accordance with applicable Standard Parts 1 and 2 and amendments. Copper capillary fittings shall have integral solder ring and be Kite marked.

155 The use of self-cleaning fluxes will not be allowed.

Copper Pipework for Hot and Cold-Water Services

156 Copper pipework for use in hot and cold services shall be manufactured in accordance with applicable Standard Part 1, it shall be half hard tempered to R250 and installed by kite mark licensee operating under BSI registered firm scheme in accordance with ISO 9001, fittings shall be to applicable Standard and bear the Kite mark.

157 Fittings shall be manufactured in accordance with applicable Standard, Parts 1 and 2 and amendments. Copper capillary fittings shall have integral solder ring and be Kite marked.

158 The use of self-cleaning fluxes will not be allowed.

159 Copper capillary fittings on potable water services (i.e. mains cold water) shall have a lead-free integral solder ring and be manufactured by "Yorkshire Imperial Fittings".

Galvanised Pipework for Hot and Cold-Water Services

160 Galvanised tube shall be heavy grade quality manufactured in accordance with the provisions of applicable Standard and amendments. It shall be galvanised after manufacture.

161 Pipe work shall be screwed or flanged as detailed in the Sections of the Specification dealing with hot and cold-water services. All fittings shall be best quality malleable iron galvanised after manufacture, fittings shall be manufactured in accordance with the provisions of applicable Standard (ISO49) and amendments.

© Rand Associates Consultancy Services Ltd

162 All bends and tees shall be easy sweep pattern. Elbows, square tees and bushed fittings will not be permitted.

163 Flat seated unions shall not be used; unions shall have bronze conical seats ground in.

164 Fittings shall be manufactured in accordance with the provisions of applicable Standard and subsequent amendments.

Steel Pipework for Gas Services

165 Steel pipework for internal gas services shall be medium grade quality manufactured in accordance with the provisions of applicable Standard and subsequent amendments.

166 Pipework shall be screwed. All fittings shall be best quality malleable iron.

167 Flat seated unions shall not be used. Unions shall have bronze conical seats ground in. Fittings shall be manufactured in accordance with the provisions of applicable Standard and subsequent amendments.

168 White heart fittings, manufactured in accordance with applicable Standard and subsequent amendments, may also be used.

169 All bends and tees shall be square pattern. Bushed fittings will not be permitted.

170 Screwed joints shall be made with Hawk White jointing paste.

Copper Pipework for Gas Services

171 Copper pipe work for use in gas services shall be manufactured in accordance with applicable Standard, it shall be half hard tempered to R250 and installed by kite mark licensee operating under BSI registered firm scheme in accordance with ISO 9001, fittings shall be to applicable Standard and bear the Kite mark.

172 Fittings shall be manufactured in accordance with applicable Standard Parts 1 and 2 and subsequent amendments. Copper capillary fittings shall have integral solder ring and be Kite marked.

173 The use of self-cleaning fluxes will not be allowed.

174 All pipework shall be installed in a neat and workmanlike manner including bends and sets required to produce an installation pleasing to the eye. Any pipework fitted in an unsightly manner shall be removed and refitted at the Provider's own expense.

175 All burred or cut ends of pipes shall be reamed out so that the full bore of the pipe is maintained.

176 The Provider shall ensure that no dirt or obstruction enters the pipe system during the works. Adequate screw-in malleable iron plugs or caps must be fitted over open ends of pipe or plant or snap on plastic covers used.

Screwed Fittings

177 Where screwed tubes are used to connect booster, pump sets to existing pipework or for tappings, fittings shall be, stainless steel 316, brass or galvanised with taper threads to applicable Standard.

178 Where it is specified that the pipework shall be joined together by screwing, the Provider shall comply with the following instructions:

Screwed Joints on Steel Pipework:

> Screwed joints shall be made in accordance with the provisions of applicable Standard and shall be close threaded, pulled up tightly and made with approved jointing compound and long strand hemp.

© Rand Associates Consultancy Services Ltd

After joints have been formed, all surplus hemp shall be cut away and joint wiped clean.

All reducing sockets shall be eccentric and arranged for drainage and/or venting.

All cuts from standard lengths shall be all burrs and swarf removed and the ends of the pipes shall be trimmed square.

Where pipes are held in vices, care shall be taken to ensure that the pipe surface is not damaged. Any pipework so damaged shall not be fitted.

Where tube is galvanised care shall be taken to ensure that threads are carefully cut so that the number of exposed threads is minimised.

Copper Machine Crimped Fittings:

Are to be Yorkshire XPress Copper fittings manufactured from copper and copper alloy, incorporating a black EPDM Ethylene Propylene Diene Monomer O ring and a unique "Leak Before Press" (LBP) design.

Copper tube shall be to applicable Standard R250 and R290 in sizes 12 to 108mm.

XPress Copper fittings are approved to the Kitemark certification applicable Standard for use with copper tube as specified above.

Stainless Steel Machine Crimped Fittings

Are to be Yorkshire XPress Stainless Steel manufactured from 316L (1.4404) stainless steel.

12 to 54mm tube is manufactured from applicable Standard 831/DIN 1.4401 stainless steel strips conforming to applicable Standard Part 2. Above 54mm the tube conforms to DVGW W541. The fittings incorporate a black EPDM (Ethylene Propylene Diene Monomer) O ring and a unique "Leak Before Press" (LBP) design.

Welded Fittings

179 Where screwed tubes are used to connect booster pump sets to existing pipework or for tappings, fittings shall be suitable in all respects to the provisions of applicable Standard and shall match tubes to applicable Standard Heavy Quality and complete with WRAS approval in stainless steel 316, brass or galvanised with taper threads to applicable Standard.

Bends: All bends for use on 80mm bore tube and over shall be of the long radius elbow pattern with bevelled ends.

Tees and Branch Bends: All tees where shown on drawings on 80mm bore tube and over shall be of the equal or reducing pattern with bevelled ends.

Branch bends shall be used where the size of the branch is two pipe sizes smaller than the main.

End bends shall be used as the template for each particular weld and the main pipe shall be cut using an oxyacetylene torch. All cuts must be thoroughly cleaned prior to the welding of the bend.

180 All fittings shall be WRAS approved.

181 All welded tees, branches, reducers, etc., shall have bevelled mitred joints and be finished with a fillet weld of ample dimensions.

182 Seamless steel butt welding pipe fittings may be used. They shall be manufactured in accordance with applicable Standard and subsequent amendments, heavy grade.

© Rand Associates Consultancy Services Ltd

183 Care shall be taken to ensure that welding metal or flux does not project into the bore of the pipe.

184 All welds shall be of good clean metal free from slag and porosity, of even thickness and contour, well fused with the parent metal, annealed, and hammered on completion and finished smooth.

185 The Client's Representative reserves the right to have cut for examination up to 2% of all welds made. The Provider shall remake the joints at no extra charge.

186 All sets, double sets and springs shall be formed on long lengths of tube with as large a radius as possible and shall be free from distortion.

Arc Welding

187 The Provider may wish to employ arc welding for the works or parts thereof.

188 If the Provider desires to use arc welding, he shall:

Notify the Client's Representative who will ascertain whether it is possible for an electricity supply to be made available. In certain circumstances, e.g. where the supply to a premise is subject to a maximum demand tariff it may be grossly inconvenient for the Client to make a supply available and the Provider may, rather than bear the cost, prefer to use portable generating equipment.

189 The Provider is deemed to have included within the tendered Rates to:

Pay all charges for electric current and provide all cable and separate meters.
The provision of any generating equipment and its operation that may be needed.

190 Operatives employed on arc welding shall hold a current Certificate of Competency as required by the Welding Institute.

Flanged Joints

191 All flanges shall be manufactured from mild steel to applicable Standard appropriate to the pressure involved.

192 Flanges shall be machine faced, trimmed at the edges and spot faced for nuts. Bolt holes shall be drilled and not punched. Flanges on screwed work shall be screwed and subsequently expanded.

193 Flanges for welding shall be slip-on type. The tube shall finish 3 mm inside the bore and a sealing run shall be applied.

194 All flanged joints shall be flush and truly aligned and shall employ brass full faced Taylor's corrugated rings coated on both sides with an approved jointing compound. Nuts, bolts, and washers shall be black mild steel or galvanised, as appropriate, and all bolts shall be of the correct length. Taylor's rings must be properly aligned, damaged rings shall not be fitted.

Capillary and Compression Fittings

195 Where copper tubing is utilized, all joints shall be made with capillary type fittings. Client's Representative. All fittings shall be immune from dezincification and be of Yorkshire Imperial Metals Limited or Wednesbury Tube Company Limited or other equal and approved, integral ring, lead free, solder fittings, to comply with applicable Standard and "kite" marked, as Yorkshire potable. Fittings shall be engraved for the identification of solder. End feed fittings shall not be permitted.

196 Should capillary fittings be used then care must be taken in the choice of flux. Fluxes based upon phosphoric acid.

197 The tube and fittings shall be cleaned with steel wool or sandpaper prior to the flux being applied.

© Rand Associates Consultancy Services Ltd

198 When soldering, care must be taken not to overload the flux, due to the low thermal conductivity of stainless steel.

199 A gentle flame only shall be played on to as much of the fitting as possible.

200 Compression fittings for use with copper pipe shall be of an approved manipulative type manufactured in accordance with the provisions of applicable Standard and subsequent amendments for proposed Type A or B which may be used.

201 When using the manipulative Type B compression fitting the tube end shall be flared. The tube must be cut only with a hacksaw, the use of a wheel cutter is prohibited. A coating of "Boss White" jointing compound shall be applied to the joint and fitting prior to fabrication.

202 All fittings shall have the approval of the British Waterworks Association.

Erection of Pipework

203 All pipework shall be installed with continuous gradients. The gradient shall be appropriate to the service and shall be as follows unless otherwise specified on the drawings or instructed by the Client's Representative.

Service	**Gradient**
Low pressure heating (mains)	25mm in 12 metres
Low pressure heating (branches)	25mm in 6 metres
Hot water service (mains)	25mm in 12 metres
Hot water service (branches)	25mm in 6 metres
Cold water	25mm in 18 metres

204 All pipework shall be installed to present a neat and orderly appearance arranged parallel to or at right angles to structural members of the building, and shall give maximum headroom, not obstructing windows and doorways, and fitting in with the work of other Providers. All pipe drops shall be plumb. No joints shall be formed in the thickness of walls, floors or ceilings.

205 It shall be the responsibility of The Provider to ascertain the thickness of plaster and other wall

206 Pipework shall generally be set around all piers and columns and shall follow the contour of the building whether so indicated on the drawings or not.

207 Where visible, changes of direction shall be made with fittings in preference to pulled or made bends, except where these are to accommodate expansion.

208 Pipework shall be installed so that there is 75 mm clear below it to the finished floor level and at least 25 mm to the finished wall face or clip distance as appropriate.

209 All pipework, valves, fittings, and equipment forming the pipework installation shall be installed so that it can be dismantled and is accessible for repair and replacement.

210 Unions or flanges shall be provided at valves and equipment so that they can be dismantled, and elsewhere as necessary to facilitate erection and disconnection. Flanges or unions shall be provided on straight horizontal unobstructed runs at not greater than 12 m intervals. Unions may be used for lines up to 50 mm diameter.

211 The Provider shall allowance during pipework installation for thermal insulation.

212 Bends, springs and off-sets shall be formed by use of an efficient bending machine or fire sets. Fire sets shall not be employed on galvanised tube. Copper tube may have its bends, springs and off-sets formed with springs.

© Rand Associates Consultancy Services Ltd

213 All changes of direction so formed shall be made with a minimum loss of local wall thickness and the diameter shall be maintained. Crinkled and scored work will be rejected. Cutting and shutting will not be permitted.

Supports and Brackets

214 Supports and brackets to any pipework shall be installed at spacings indicated in this Specification.

215 In the event of two or more pipes being carried out by a single support the spacing shall be for the shorter intervals.

216 Where copper or steel pipework is at low level (floor) 15 mm and 22/20 mm diameter shall be supported at 600 mm intervals and all other sizes up to 76/80 mm at 1800 mm centres.

217 All supports for mild steel pipes and fittings shall be ferrous. Within rooms, all brackets supporting pipework shall be of school board pattern.

218 Soft pads shall be provided in all cases where there is a possibility of pipework running against woodwork or other materials to avoid the possibility of noise after the plant has been set to work. Animal based felts shall not be used.

219 It shall be the responsibility of the Provider to ensure that all supports are adequate, firmly and truly fixed, and that they do not promote vibration. The Provider shall report inadequacies in this respect to the Client's Representative. Services in the ground shall be installed with care and in such a manner that pipework and fittings shall not be damaged due to movement of the ground. Where pipes pass under roadways carrying vehicles, they shall be fitted inside sleeves or conduits.

220 Where pipework is to be supported under concrete, construction inserts for this purpose shall be provided and shall be placed in the formwork before concrete is poured. Inserts shall be of cast iron or mild steel of the type to receive bolts, heads or nuts after installation and shall permit adjustment of the bolt in a horizontal direction.

221 All light gauge copper pipework is to be supported at a maximum distance of 600 mm between supports with SCH nylon saddles. These are to be screwed to the walls, partitions, etc., with brass screws.

222 Where multiple pipe clips are necessary sufficient screws must be inserted to provide adequate support. The final fixing shall be to the approval of the Client's Representative. SCH nylon saddles are not to be used where pipework is insulated. Brass single ring clips or skirting clips shall be used to provide a suitable space to allow the installation of the specified pipe insulation.

223 Brackets or supports shall be set out so that they do not obstruct the access to valves, flange or other fittings requiring maintenance.

224 Supports to chilled water pipework shall include for spacer blocks to provide vapour seal continuity with the thermal insulation material. These blocks shall be crocodile segmented plastic blocks. Pipe fixings/saddles to be fitted to the outside of the blocks.

225 Vertical pipes shall be stayed with a minimum of one clip, spaced equally between the floor and ceiling etc. Flanges, sockets, and unions shall, where installed, coincide with these positions so that the weight of the pipework is supported from the pipe clip.

226 Supports shall be provided adjacent to all valves installed in pipelines to prevent undue strain on the adjoining pipework and so that any component may be removed for maintenance, leaving the adjoining pipework adequately supported at the ends.

© Rand Associates Consultancy Services Ltd

227 All clips and eyebolts shall be of the following sizes:

Pipe Size	Drop Rod Diameter (mm)	Pipe Clip Size (mm)	Bolts (mm)
Up to 25	6.0	25 x 3	6.4
32 - 50	8.0	32 x 3	9.5
65 - 100	10.0	40 x 3	12.7

Run of Pipework

228 The run of pipework is to be arranged in a neat and workmanlike manner. All sets or special fittings are to be included for in:
1. Vertical pipework where walls reduced in thickness.
2. Pipes that pass over joists, mouldings, casings, etc., beyond the face of the outer or inner walls and partitions.
3. All necessary setting and bending of pipework including any extra length of pipe and fittings, due to realignment of pipework necessitated by the position of any other services.

229 Pipework is to be laid to proper graded falls adequately supported with provision for expansion and suitably spaced to accommodate thermal insulation if required.

230 All pipework installed within floor ducts, screeds of the building structure is to be without joints, except where agreed with the Client's Representative and installed in such a way as to permit subsequent access for maintenance or removal without disturbing adjacent pipework.

231 Vertical pipes are to drop parallel to walls, partitions and / or building structure, and flows and returns are to run parallel to each other. Horizontal pipes are to be graded to clear air at vent points or radiators and to drain at low points. Where uninsulated pipes run parallel to one another, a distance of 25 mm is to be allowed between their respective surfaces. All pipework must be fixed and hydraulically tested before the application of paint or thermal insulation.

232 Wherever possible, crossover points are to be avoided, but it is the responsibility of the Provider to ensure that any crossover points with electrical conduit / cable are adequately insulated one from the other, by the Provider, to the satisfaction of the Client's Representative. An air gap of at least 6 mm is to be left between the two surfaces.

233 The Provider shall ensure that noise and vibration is eliminated from the installation.

234 Where pipework is in contact with floor or ceiling joists, a felt pad shall be provided. Animal based felt shall not be used.

Pipe Sleeves

235 Where pipes pass through walls, floors, footings and waterproofed membranes, The Provider shall provide sleeves which are to be correctly positioned and built in.

236 The inside diameter of sleeves shall not be less than 15 mm larger than the outside diameter of the pipe, except where pipes pass through bearing walls or footings where sleeves shall be 100 mm larger than the outside diameter of the pipe and sealed after installation.

237 Sleeves in bearing walls or footings shall be cast iron pipe.

238 Sleeves in walls, floors, ceilings and partitions shall be of the same metal as the pipe.

239 Sleeves shall terminate flush with the finished surface.

© Rand Associates Consultancy Services Ltd

240 Flashing sleeves shall be provided by the Provider where pipes pass through waterproofing membranes. Flashing sleeves shall be provided with an integral flange to which a flashing shield can be clamped or welded. The shields shall be in zinc and shall extend not less than 200 mm from the sleeves in all directions. The Provider shall insert the shield into the membrane and shall fill the space between the sleeve and pipe with waterproof material and mastic.

Storage of Pipework

241 All tubes stored on site shall be kept clear of the ground and where possible they shall be stored under cover.

242 Screwed ends of tubes shall be protected with a socket, half socket or plastic thimble. Tubes must be examined internally before and after cutting and any foreign matter must be removed.

243 Stocks of tube remaining on site for long periods must be periodically inspected and tube corroded beyond normal "stock rust" condition shall not be used. The Client's Representative will instruct the Provider to remove tube in poor condition from the site whether fixed or not and no extra will be allowed in any circumstances whatsoever.

Thermal Insulation and Protection - Pipework

244 All plantroom pipework shall be insulated and lagged whether new or existing.

245 The minimum thickness of thermal insulating materials used for the protection of water pipes and fittings shall be as applicable Standard. The thermal insulation is to be expanded nitrile rubber elastomeric sectional insulation and shall achieve Class `O` rating as defined in the Building Regulations or shall be made with preformed closed cell phenolic pipe sections, having a nominal density not less than 100 kg m^3 with a factory applied aluminium vapour barrier foil laminate. Insulation shall comply with applicable Standard (Table 1) and applicable Standard (Table 7) water vapour permeance, Building Regulations Class 'O' definition, Part L and TIMSA & HVAC guidance.

246 The insulation will be mitred and glued in accordance with the manufacturer's instructions (no gaps shall be left at the joints of the material). No taping of vapour barrier joints will be permitted without firstly gluing the insulation. When fixing pipes and fittings that are to be insulated, room shall be allowed for the required thickness of material to be applied.

247 Joints to be securely taped with minimum 50mm wide soft foil tape, the whole to be further retained in position by light gauge aluminium bands not less than 300mm centres.

248 Attention shall be made to taping to maintain the vapour barrier, particularly at termination points where exposed insulation membrane to be over taped and returned to pipework surface. Furthermore, where insulation abuts pipe support, inserts into the insulation should be taped at all inserts to continue the vapour barrier.

249 Pipe support inserts shall be in accordance with the insulation manufacturer's standard details.

250 Insulation thermal performance shall be, as a minimum 0.025 W/mK (at 10°C mean).

251 Insulation shall be approved by the Local Authority Building Control and be covered by LABC Registered Detail RD certificate number EWW382 and carry a relevant warranty.

252 All insulation shall be CE Marked in accordance with applicable Standard.

253 All pipework shall be bore cleaned, internally cleaned, flushed and tested prior to installation of insulation.

254 Pipework will be labelled ID bands etc and conform to all British Standards, Codes of Practice etc.

© Rand Associates Consultancy Services Ltd

Thermal Insulation and Protection - Valves

255 All valves over and above 35mm diameter shall be insulated with flexible reinforced silicone jackets complete with wraps/ties and needled fibreglass/pyrogel internally and stitch sealed insulation.

Pipework Protection

256 Pipework shall be protected by zero permeability, all weather, multi-layered laminate coated polymer complete with acrylic adhesive.

257 Protective wrapping shall provide;
External weather resistance.
10 degrees Celsius adhesive resistance.
Fungal protection.
UV.
Fire retardant.
Embossed finish.

Approved Manufacturers or other equal and approved:
Kingspan
Celotex
Knuaf
Thermaxx Jackets
3M VentureClad

Valves and Cocks

258 All valves and cocks for heating, hot water and cold water shall comply with the requirements of the appropriate Water Authority and the Provider shall include for any testing and stamping which the Client shall require.

259 Gas valves and cocks shall comply with the appropriate gas utility provider requirements.

260 All valves and cocks shall be in such a position that they can be readily operated for maintenance. No valve or cock shall be installed in such a position that it cannot be removed for repairs.

261 The Provider shall at the time of receipt of a Works Order inform the Client's Representative of any discrepancy between a manufacturer's type or figure number and that scheduled by the Client's Representative on the Works Order, and which in the Provider's opinion is incorrect.

262 Valves and cocks shall be supplied to the following detail unless specified to the contrary in the following sections:

Heating Circuits and Chilled Water Circuits:

SERVICE	OVENTROP	HATTERSLEY	CRANE	T.A	HERZ
Isolation					
Up to 50mm	107 90	100	D171A	TA85	K-KV
65mm and above	104 80	970	F624	TA36	BF-FLL
Commissioning Valves					
Up to 50mm	106 08	Cv2432	D931	MD41	4217CS
65mm and above	106 28	CVM 2733 PN16	DM940	MDF4	4218CS
Low Flow: Up to 50mm	106 11 64	1473	D933/D934 (D922)	MD22	
Medium Flow: Up to 50mm	106 06 34	100M		MD03	

© Rand Associates Consultancy Services Ltd

Heating Circuits and Chilled Water Circuits: (cont'd)

SERVICE	OVENTROP	HATTERSLEY	CRANE	T.A	HERZ
Regulation Valves					
Up to 50mm	106 01	1432	D920	MD29	4217
65mm and above	106 26	M733DR	DM920	MDF4	4218
Orifice Valves					
Up to 50mm	106 06	1000	D901	MD01	4000
65mm and above	106 07	M2000 PN16	DM900	MDF0	HV2740

Hot and Cold Water Circuits and Distribution:

SERVICE	OVENTROP	HATTERSLEY	CRANE	T.A	HERZ
Isolation					
Up to 50mm	104 30 or 107 95	100	D171A	TA85	
65mm and above	104 80 ot 107 90	970	F624	TA36	
Commissioning Valves					
Up to 50mm	106 08	Cv2432	D931	MD41	4217CS
65mm and above	106 28	CVM 2733 PN16	DM940	MDF4	4218CS
Low Flow: Up to 50mm	106 11 64	1473	D933/D934 (D922)	MD22	
Medium Flow: Up to 50mm	106 06 34	100M		MD03	
Regulation Valves					
Up to 50mm	106 01	1432	D920	MD29	4217
65mm and above	106 26	M733DR	DM920	MDF4	4218
Orifice Valves					
Up to 50mm	106 06	1000	D901	MD01	4000
65mm and above	106 07	M2000 PN16	DM900	MDF0	HV2740

263 **Gas Cocks**

Newman-Milliken Lubricated Plug Cocks, Fig. No. 200M and 201M	**Oventrop**
Up to 50mm	301 64
65mm and above	104 81

Automatic Air Vents

264 Where automatic air vents are shown on the Drawings and elsewhere as necessary they shall be of Charles Winn manufacture or Oventrop Fig. 108 82 03 or other equal and approved. In all cases the air vent shall be preceded by a lockshield pattern stop valve and the discharge from the air vent shall be 12 mm copper pipe which shall discharge over a gully, sump or other convenient position which shall be agreed with the Client's Representative. The float and valve mechanisms shall be suitable for use with hot water.

© Rand Associates Consultancy Services Ltd

Boiler Safety Valve

265 Water safety valves of the totally enclosed type shall be fitted on each boiler and calorifier to the sizes as specified by the equipment manufacturer.

266 The safety valves shall comply with applicable Standard and shall be of Gunmetal construction and spring loaded with a metal to metal seat. A padlock and key shall be provided to each safety valve.

267 A full-bore drip pipe shall be fitted from the outlet of each safety valve to carry any water discharge clear of the appliance being protected and its insulation. This drip pipe shall terminate with a square cut end 450mm from the floor in a safe, but in an easily visible position preferable over a drain. Discharge pipes shall be copper on copper systems, galvanised on all others.

268 Each valve shall be stamped to show the actual bore of the valve and shall be arranged so that the valve can be rotated and lifted from its seat during the testing without unlocking and set to blow at a minimum of plus 10% of plus 0.7 bar (whichever is greater) of working pressure. However, the set pressure of a safety valve must not exceed the design pressure of the equipment or system being protected.

269 The safety valves shall be as manufactured by the NABIC Fig 542 for vented systems or Fig 500 for unvented systems.

270 Each valve shall be tested by the manufacturers and adjusted to the correct load before despatch.

Control Valves and Actuators

271 The Provider shall allow for the provision, installation, testing and commissioning of control valves and actuators where necessary to comply with site conditions and design of heating plant equipment and installation criteria.

Automatic Controls

272 The Provider shall allow for the provision, installation, testing and commissioning of automatic control valves and actuators where necessary to comply with site conditions and design of heating plant equipment and installation criteria.

Strainers

273 Pipeline strainers are to be installed in the return pipe work prior to any plant item or control valve etc, on heating and chilled water and secondary hot water services.

Strainers are to be type Y strainers as:

Crane D297 up to 2" Brass or FM276 over 2" cast iron or other equal and approved

274 Strainers located in Glycol filled system shall be suitable for operation with Glycol solution and operating at sub-zero temperatures.

Test Points

275 Test points shall be fitted on the suction and delivery side of each pump and where indicated. These shall be self-sealing ethylene propylene rubber test points as manufacturer by Test plugs ltd.

276 The Provider shall allow for supplying upon completion to each site, one temperature and one pressure test gauge to be handed over to the Client on completion of works, gauges available from Test Plugs Ltd or other equal and approved.

© Rand Associates Consultancy Services Ltd

Air Cocks and Bottles

277 Air vents shall be fitted to all high points of the heating and hot water services.

278 All radiators, convectors and all pipework which requires venting shall be fitted with 6 mm air cocks unless otherwise specified.

279 Air bottles where shown on the drawings and elsewhere as necessary, are to be formed from:

150 mm length of tube of equal bore to the pipe being vented, on pipework up to and including 50 mm diameter.

50 mm diameter tube of a length equal to 150 mm plus one diameter of the pipe being vented on pipework exceeding 50 mm diameter.

280 All air bottles shall have a 6 mm pipe welded into the top and taken to low level and fitted with a 6 mm lockshield needle valve as Hattersley Fig. 5N and plugged.

281 The Provider shall fit these items so that they are readily accessible.

282 Open vents shall be vertical or where it is necessary for them to travel horizontally they shall rise continuously.

Drain Cocks

283 Drain cocks shall be fitted on boilers, hot water cylinders and on all low points of the heating, hot and cold-water services, and on the 'dead' side of all isolating valves and cocks whether shown on the design installation drawings or not.

284 Drain cocks shall be of gunmetal with screwed ends to applicable Standard.

285 They shall be positioned as unobtrusively as possible. If a drain cock must inevitably be positioned where it may prove a danger or nuisance, one elbow shall be fitted so that the drain cock lies parallel to the pipe being drained and hence is protected by it.

286 For boilers, calorifiers, cylinders and cisterns the following sizes shall be used:

20mm diameter for boilers of up to 8 sq. m heating surface and for calorifiers, cylinders, and cisterns up to 900 litres capacity.

25mm diameter for boilers over 8 sq. m and calorifiers, cylinders and cisterns above 900 litre capacity.

Pressure Gauges

287 Pressure gauges shall be provided on boilers, pump sets and elsewhere where specified, or shown on Drawings. Gauges shall be NABIC. Fig. No. 62 or other equal and approved, brass cased, 100 mm diameter. Gauges shall be graduated metres head and in bars and N/m² from zero to twice normal working pressure of the system. The normal cold fill pressure shall be indicated by a red pointer. Each gauge shall be provided with a brass siphon tube and lever handled isolating cock.

288 Where gauges are remotely located, they shall be complete with the necessary tubing neatly fixed. Remote gauges shall be grouped and mounted on a black enamelled steel panel with identification labels.

Thermometers

289 Thermometers shall be dial pattern, 100 mm dia. and of N.A.B.I.C. manufacture. Each thermometer shall be provided with a pocket and oil filled well. Thermometers shall be fitted in easily readable position inserted into pipe work to a sufficient depth to ensure accurate readings are given.

© Rand Associates Consultancy Services Ltd

290 Thermometers shall be provided on boilers and elsewhere where specified, or indicated on the design installation drawings.

291 All thermometers shall be fixed so that the bulb is properly immersed.

292 Thermometers shall be graduated in °C from 0°C to 150°C.

Labels

293 All valves shall be labelled in accordance with a schedule to be provided by the Provider, which shall correspond to the identification numbers inserted on the "as-fitted" drawings. The labels shall be of traffolyte sandwich, black letters and figures, on white ground.

294 The labels shall consist of discs attached by chains or wire loops. Each label shall indicate the type of service (e.g. Heating Flow Zone 1 or Heating Primary Flow) and a number, which shall agree with the Schedule referred to in 285 above.

295 All plant, motor starters and isolators shall be labelled with labels of sandwich "traffolyte" with white lettering on black background.

296 The labels are to be screwed to the fronts of starters and isolators and permanently attached to plant or nearest adjacent wall, etc., and shall indicate the service, number, item, etc.

297 Each fan, boiler, pump, etc., shall bear a metal label giving the makers name, date of manufacture and serial number, test and working pressures, duty, power, phasing, number of cycles per second, speeds, Standard number, etc., as appropriate to the item of plant so that it may be identified at a later date with ease.

298 At times it is difficult to have permanent labels available for plant handover and at such times the Provider shall provide free of charge temporary "tie on" labels so that all valves and equipment are identifiable.

299 All uninsulated pipe work, except that visible in offices, habitable rooms, offices, public spaces, corridors, etc., shall bear identification bands and direction arrows similar to those used on insulated pipe work, to BS1710:1984.

Holding Down Bolts

300 The Provider shall provide all clips, brackets, foundation bolts, fixing bolts, assembly bolts, including nuts, anchor plates, washers, and plugs, etcetera, for all pumps and local pipework. Should adjacent or modified pipework be poorly supported it will be the Provider's responsibility to provide additional / replacement support thus protecting the new equipment.

301 Ferrous bolts and nuts and other fixing devices exposed to atmospheric corrosion must be stainless steel or similarly treated to prevent corrosion. Alternatively, the component may be manufactured from brass or gun-metal provided it is of sufficient strength.

302 Alignment and levelling of plant shall be the responsibility of The Provider who shall provide any shims necessary.

Painting

303 At the completion of the works all parts of the installation shall be thoroughly cleaned. All equipment, pipe, valves, fittings, etc., shall be cleaned of all grease, dirt, metal cuttings, sludge, etc., which may have accumulated.

304 Any discolouration or other damage to parts of the building or its finish or furnishing due to the failure of the Provider to properly clean the equipment or pipework system shall be repaired by the Provider without additional cost to the Employer.

© Rand Associates Consultancy Services Ltd

305 The Provider shall wire brush all black steel pipe work and exposed pipe threads and apply two coats of red oxide paint as the pipe work is installed.

306 All gas pipe work to be final painted with two coats gloss (yellow ochre) to Standard colour 08ES1.

Testing and Commissioning of Specialist Equipment

307 The commissioning of the major items of plant and equipment will be carried out by the specialist suppliers commissioning staff in conjunction with the Providers commissioning team.

308 The commissioning of the automatic control system and any integration to building monitoring systems will be carried out jointly by the specialist suppliers commissioning staff in conjunction with The Providers commissioning team and the Client's Representative and include for any head end Graphics User Interface (GUI) updates.

309 Specialist equipment manufacturers and suppliers shall commission and demonstrate the proper operation of their plant and equipment.

310 The specialist equipment manufacturers and suppliers will use their own in-house procedures to commission their plant and equipment, copies of which will be issued under separate cover by The Provider.

311 Copies of the specialist manufacturers and suppliers commissioning reports shall be included in the contract operating and maintenance manual.

312 The Provider shall provide the necessary attendances in order that specialist equipment manufacturers and suppliers may carry out their commissioning procedures.

Pipework Cleaning

313 The objective of the entire cleaning and passivation process is to provide acceptable water quality and internal pipe conditions that will permit the commissioning of circulating systems and provide the foundation from which an effective on-going regime of water treatment and system care can commence.

314 The process will comprise two interlinked stages and these are:
- Flushing and Chemical Cleaning; and
- Corrosion and Microbiological Inhibition.

315 The above stages compromise further elements, and these are:

Flushing and Chemical Cleaning:
- Static flush
- Initial dynamic flush
- Introduction and circulation of cleaning agent
- Second dynamic flush

Corrosion and Microbiological Inhibition:
- Introduction and circulation of inhibitor and biocide;

316 All the above stages have a direct bearing on the efficacy of its subsequent stage and therefore they should be carried out as a continuous programme of work with each stage leading into the next in a logical manner.

Chemical Cleaning and Flushing Requirements / Pre-requisites

317 The removal of contaminants is achieved by several processes. Insoluble contaminants will be removed by simple flushing and filtration using pump strainers.

© Rand Associates Consultancy Services Ltd

318 Soluble contaminants will be removed at the chemical stage with the use of chemicals, carefully selected to be appropriate for the system.

319 In order to facilitate the above, the following requirements must be fulfilled, prior to the start of the project, to allow an efficient cleaning operation.

320 Full and free access to all parts of the site containing relevant plant, control valves etc. All relevant draining and filling facilities will be available and fully operational prior to the commencement of the cleaning. All access, ceiling/floor tiles etc, to control valves, strainers, units etc, will be removed and full and free access be provided and maintained throughout the cleaning and flushing operation.

321 Lagging to strainers must be checked to ensure that the removal of strainers is not hampered or prevented. All unbolted type strainers will be eased prior to the start of the programme to prevent damage to gaskets and joints.

322 All items of plant, equipment or control measurement facilities that may become damaged, blocked, present a major restriction to flow, or become a dead leg/dirt pocket will be removed from system circulation and/or (as appropriate) be by-passed with line size connection to facilitate adequate flushing/circulation of the system.

323 Small bore terminal units will either be fitted and tested locally with clean water, not obtained from distribution mains, or filled and tested following the completion of the cleaning programme. Terminal units will be isolated and/or bypassed as appropriate.

324 All actuators to control valves will be fitted prior to the commencement of the flushing programme, these control valves will be capable of manual manipulation.

325 Where applicable all system pumps will be fully operational; system pumps will only be tested against closed valves. This is to prevent the inappropriate circulation of containments.

326 System pumps shall be capable of continuous operation and where appropriate, the maximum number of pumps (i.e. duty/standby) will be available for simultaneous operation.

327 Appropriately sized dirt pockets will be installed at the base of all vertical risers and at appropriate points where the accumulation of heavy debris is probable.

328 Filling and draining valves of an appropriate and equal size will be provided on the system to facilitate the introduction and removal of flushing water. These facilities will be located on primary pumped circuits and positioned such that recirculating flow rates remain unaffected during flushing.

329 Systems will be full, vented and pressure tested.

330 All appropriate isolation valves will be fully open.

331 General description of the stages of flushing and cleaning process

- The static flush is designed to remove accumulated debris from vertical pipework and dirt pockets. It assists in demonstrating that drainage facilities are operational.
- The initial dynamic flush shall be carried out generally in accordance with the BSRIA Pre-commission cleaning of pipework systems AG 1/2001. This stage is designed to remove soluble and non-soluble contaminants. It will demonstrate general system operation and flushing velocities and will also show that full chemical circulation can be achieved.
- The chemical cleaning stage will involve the introduction of cleaning chemical and is designed to assist the removal of soluble and colloidal contaminants without having an adverse effect on base metals.
- The second dynamic flush will be carried out generally in accordance with the initial dynamic flush but will not involve the measurement of flushing velocities.

332 This stage is designed to remove the cleaning chemical and containments prior to the introduction of the inhibitor.

© Rand Associates Consultancy Services Ltd

333 Stages of the Corrosion and Microbiological Inhibition:

The introduction of the inhibitor and biocide should follow the proceeding stage as quickly as possible. This stage is designed to protect metals from corrosion and inhibit microbiological proliferation.

Chemical Cleaning and Flushing Method

334 The removal of general contaminants from a system will be achieved by a dynamic balanced flush. The objective of the exercise is to obtain flushing velocities that will be sufficient to move contaminants up to a size and density of a 5mm diameter uniform steel particle.

335 The velocities in primary pipework are considered to be the highest achievable utilising the maximum number of system pumps against the minimum system resistance (without over loading the pumps).

336 For the smaller distribution mains, these will be generally as published in the BSRIA Pre-commissioning Guide AG 1/2001 and will again involve utilising the maximum number of system pumps on sections of the system. In order to facilitate the above, the system pumps will be operational, and the maximum number of pumps will be run. Flushing will be achieved by running system pumps and drawing water to drain, only at the rate at which raw water is introduced. At all times system pressures will be maintained at such a level as they exceed the static head. If possible, systems will not be drained during the dynamic flushing programme. This is to prevent the introduction of air, which in turn could lead to air locks.

337 Flushing and drainage hoses will be connected to the system at appropriate points. The hoses will have swaged hydraulic fittings and will be of a type having a working pressure of 1600 kPa. The fill hose will be connected to the raw water supply via spring loaded non return valves and the drain hose will be run directly to a foul drain and secured.

338 The entire system will be flushed until free of contaminants.

339 The parameters for acceptable water samples at this stage will be:

TDS (Total Dissolved Solids)	within 10% of incoming water.
Iron Levels	below 5 p.p.m
Visual Samples	clean and free of particulate matter

340 All stages of the cleaning programme will be offered for witnessing. Flow readings will be taken for circuits using manometers and these will be offered for witnessing. Water samples will be taken for reference purposes.

Introduction and Circulation of Cleaning Chemical:

Upon completion of the initial dynamic flush, calculated and measured quantities of cleaning chemical will be introduced to the system in proportion to its advised or estimated water storage content.

The chemical will be circulated throughout the system and tests will be undertaken to establish an even chemical concentration.

Further quantities of chemical may be subsequently added as appropriate.

During the circulation period, checks and adjustments will be made to the system to ensure complete circulation and even chemical distribution.

341 Strainers will be checked and cleared as appropriate. The circulation period will be dependent upon site conditions i.e. system temperatures, total amount of corrosion debris, etc., however, this is usually between twelve and seventy-two hours. Samples will be taken during this period for reference purposes and these will be offered for witnessing.

© Rand Associates Consultancy Services Ltd

Second Dynamic Flush

342 The system will again be subjected to a dynamic balanced flush to achieve satisfactory water conditions throughout. This exercise will be carried out generally in accordance with the initial flush, however, it will not be necessary to measure flow rates as any contaminants that will be removed at this stage will be small and subsequently the flushing velocity needed to remove them will be relatively low.

343 The flush will commence with the entire system. When the effluent at the drainage hose is satisfactory a process of maximising flows to all sections of the system will be carried out. As above, this will be carried out in a logical manner appropriate to the system.

344 When the water serving an item of plant or equipment is free of contaminants the unit shall be introduced to the flushing programme and left in the full flow mode.

345 This will apply to terminal units, therefore flushing the unit into the return pipework using system water. Units isolated from the system by temporary site bypasses cannot be introduced into the system and their cleanliness should be checked prior to opening them into the system unless otherwise agreed.

346 When the recirculating water in an area is satisfactory and all units and items of plant have been flushed, the area will be isolated, and the procedure will be repeated for each section of the system. When completed for each section on the system, the system will again be flushed in its entirety until the water quality is acceptable throughout.

347 Throughout this flushing operation main plant strainers and dirt pockets will be checked and cleaned as appropriate.

Note: The parameters for acceptable water sampled will be as detailed above. These parameters will be demonstrated throughout the system at representative sampling points. Samples of water will be taken for reference purposes and the system will be offered for witnessing.

Commissioning Report Forms

348 The originals of all commissioning report forms shall be retained by the Provider who will provide copies for the contract operating and maintenance manual.

349 The Provider's commissioning team shall complete all commissioning report forms collating them on a system by system basis and indexing the system sets. The forms are to be retained on site, in a clean condition, in a dedicated folder.

- Each set of commissioning report forms comprising the documented "as commissioned" state of the system shall also include the following:
  - Water test results;
  - Installations letter of completion and warranty;
  - Details of overflows, inlet sizes and outlet sizes;
  - Connections plant details;
  - Structural tests;
  - Leakage testing if required;
  - Biocide, cleaning, and flushing methods;

350 Each commissioning report form will show the type and identification of all the test instruments used to measure the test results shown on the sheet.

351 A set of instrument certification covering the range of instruments used to carry out the commissioning work shall also be included within the documentation.

© Rand Associates Consultancy Services Ltd

Firestopping

352 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

353 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

COMMERCIAL CATERING EQUIPMENT MAINTENANCE

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

COMMERCIAL CATERING EQUIPMENT MAINTENANCE

General Requirements

001 The Provider shall be deemed to have read the whole of this Specification together with the Client's Requirements' and will be deemed to have included in his tendered Rates for full compliance.

Staff

002 The Provider shall employ a competent approved gas technician who has undertaken suitable training to an approved standard. A minimum of modules:
- COMCAT 1 – Commercial Catering Ranges
- COMCAT 2 – Commercial Gas Water Boilers
- COMCAT 3 – Commercial Catering Fryers

shall be held.

003 Additionally, where necessary the following modules shall be held:
- COMCAT 4 – Commercial Catering Fish and Chip Ranges
- COMCAT 5 – Commercial Catering Forced Draught Burners

004 All ACS assessment shall have been undertaken within the previous five years.

005 A person of equal competence shall supervise the Works.

006 Provide a Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works service.

Asset Register

007 Ensure that all the asset registers supplied by the Client prior to the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

008 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each visit to undertake Routine Maintenance, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

009 Ensure that, following all visits to undertake Routine Maintenance, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

010 Provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff including his Specialist Subcontractors.

Manufacturer's Requirements

011 Where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

012 Submit and agree within 20 working days of the award of the Contract a full annual Programme for all Works covering each element of the Routine Maintenance Works with the Client's Representative.

013 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

© Rand Associates Consultancy Services Ltd

Permit to Work Certification

014 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

Access

015 Ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

016 All Works shall be carried out in strict accordance with the Requirements of "The Work at Height Regulations 2005".

017 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

Guidance

018 Refer to the Specification, schedule of Works and to the Institution of Gas Engineers and Managers publications for detailed guidance. Other guidance is available from the HSE, Gas Safe and the Water Regulations Advisory Scheme.

019 Pay particular attention to:
- IGE/UP/1 Edition 2 Strength testing, tightness testing and direct purging of industrial and commercial gas installations.
- IGE/UP/1A Edition 2 Strength testing, tightness testing and direct purging of small, low pressure industrial and commercial natural gas installations.
- IGE/UP/2 Gas installation pipework, boosters and compressors on industrial and commercial premises.
- IGE/UP/10 Edition 2 Installation of gas appliances in industrial and commercial premises. Part 1: Flued appliances.

020 Pay particular attention to the HSE's 'CAIS' series of leaflets and especially:
- CAIS 12: Maintenance priorities in catering.
- CAIS9: Planning for Health and Safety when selecting and using catering equipment and workplaces.
- CAIS3: Precautions at manually ignited gas-fired catering equipment.
- CAIS17: Safety during emptying and cleaning of fryers.
- CAIS23: Gas safety in catering and hospitality.

021 Further guidance includes:
- HS(G)35 Catering Safety: Food preparation machinery.
- HS(G)55 Health and safety in kitchens and food preparation areas.
- HS(G)107 Maintaining portable electrical equipment.
- Work equipment. Provision and Use of Work Equipment Regulations 1992. Guidance on the regulations L22 1992.

022 Guidance concerning the Water Regulations is available from the Water Regulations Advisory Scheme (WRAS) and detailed advice is contained within:

Water Regulations Guide Second Edition.

023 The maintenance, inspection and testing of local exhaust ventilation and combustion ventilation is the subject of another module of the CLAW specifications. However, the Provider shall undertake his Works in cognisance of the appropriate regulations and the HSE's guidance. Any obvious or perceived deficiencies shall be reported to the Client's Representative

© Rand Associates Consultancy Services Ltd

Asbestos

024 Be aware that for many years asbestos containing materials were used in the construction of kitchen equipment.

025 Examine the **'Asbestos Register'** for the Property to be maintained prior to the commencement of any Works.

026 If, during the progress of Works, the presence of asbestos is suspected, all Works shall cease and the Provider shall inform the Client's Representative as a matter of urgency. The Client's Representative will issue Instructions as appropriate.

027 No Works shall be undertaken that may result in the release of asbestos fibre.

Minor Repairs

028 The Provider shall, during testing, carry out minor repairs such as tightening joints, replacement of clips, etc to achieve a pass status and make appliances safe to ensure compliance with the applicable Standard.

Routine Maintenance

029 The minimum requirements for Routine Maintenance are to be in accordance with the relevant equipment manufacturer's recommendations.

030 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

031 Carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

032 Include for the provision and application of all consumables within the Rates for this element of the Contract.

033 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the latest applicable Standards or equivalent.

034 Routine Maintenance must, unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirements tabled below:

General Note

035 Operational maintenance items such as blade replacement; sharpening, functional adjustments, etc., have not been included as part of this Specification. The manufacturer's instructions, recommendations and requirements shall be observed in every respect.

Kitchen Ventilation

036 This Specification does not include for maintenance of the ventilation systems in kitchens. Any maintenance Works on these systems shall be subject to the appropriate specifications.

Kitchen Electrical Installation

037 This Specification does not include periodic inspection and testing of the fixed electrical installation. Reference should be made to the appropriate specifications.

038 Nevertheless, as a part of their maintenance, inspection and testing of kitchen equipment, the Provider shall examine emergency isolation methods and test the operation of key locks, emergency stops, contactors and isolators.

039 Report inappropriate or inadequate lighting, emergency lighting and any perceived deficiencies in automatic fire detection.

© Rand Associates Consultancy Services Ltd

Deep Cleaning

040 Deep cleaning is not included within this Specification. Reference should be made to the appropriate specifications for further guidance.

Kitchen Equipment Servicing

Item No	Item	Frequency	Action	Notes
1	**Safety Devices (general)**			
1.1	General		Examine burners, controls and thermostats. Examine safety and ignition devices. Examine fusible links. Examine safety valves. Examine safety guards.	
1.2	Fat Fryers		Examine and test thermostats. Both control and limit thermostats **must operate at the correct temperature**.	Guidance is included in the preliminaries to this maintenance module.
1.3	Flame Failure Devies		Examine and test flame failure devices.	Report the absence of flame failure devices.
2	**Gas Supply (general)**			
2.1	Tightness Test		Carry out tightness testing of the local kitchen gas installation in accordance with the requirements of IGE/UPIA.	
2.2	Emergency Isolation		Examine emergency isolation valves. Test operation of emergency isolation valves. Ensure appropriate notices are in place.	Report compliance with the applicable Standard

© Rand Associates Consultancy Services Ltd

Kitchen Equipment Servicing (cont'd)

Item No	Item	Frequency	Action	Notes
2	**Gas Supply (general)** (cont'd)			
2.3	General		Examine pipework connections and supports. Examine for corrosion. Test pipe connections for leaks. Drain condensate traps. Test gas pressure; adjust governor as necessary Test valves and cocks; lubricate where required to ensure efficient operation and soundness. Ensure all flexible connections comply with the applicable Standard. Ensure restraining cables comply with the requirements of the applicable Standard	
3	**Water Services (general)**			
3.1	General		Ensure that at its point of entry to the kitchen/servery area, the cold-water main is fitted with an appropriate isolating valve and a suitably colour coded label marked 'WATER'.	
3.2	Pipework		Examine pipework connections and supports. Examine for corrosion. Examine pipe connections for leaks. Examine thermal insulation. Test valves for free travel.	
3.3	Appliances		Clean and flush out water tanks. Test ball valves and stop cocks. Re-washer ball valves. Examine water level. Check and re-washer fill taps. Check and regrease all drain valves. Check, clean and grease waste stack. Check valve on sterilizer waste.	Report any deviation from the Water Regulations.

© Rand Associates Consultancy Services Ltd

Kitchen Equipment Servicing (cont'd)

Item No	Item	Frequency	Action	Notes
4	**Standard Requirements**			
4.1	General		Ensure that all maintenance Works are carried out in strict accordance with manufacturer's requirements and recommendations. Examine doors, runners, door furniture, channels, hinges, seals, shelves and rollers, trays and refractory linings. Clean and examine filters and sight glasses. Apply protective coatings as necessary. Examine thermal insulation. Examine legs, frames and fixing of all appliances. Carry out a full heat test, check operation and calibration of all control and limit thermostats. Recalibrate as necessary.	Remedy any defects. ±5°C mechanical thermostats ±1°C electronic thermostats
5	**Machines (general)**			
5.1	General		Examine bearings and drives. Clean and lubricate as necessary. Test safety devices. Examine securing bolts, tighten as necessary.	
6	**Gas Fired Appliances (general)**			
6.1	General		Remove all burners, clean and check burners, aeration screws and injectors. Remove gas pilots, clean and check. Test and adjust burners, controls and thermostats. Clean all heat exchanger surfaces (hot plates). Clean and test for leaks. Test thermostats. Regrease all gas taps and cocks. Replace thumb pieces as applicable. Test flame failure devices. Examine thermocouples. Test any high limit protection. Overhaul and test governors. Test for gas escapes during operation. Test thermostats at two settings, recalibrate as necessary.	±5°C mechanical thermostats ±1°C electronic thermostats

© Rand Associates Consultancy Services Ltd

Kitchen Equipment Servicing (cont'd)

Item No	Item	Frequency	Action	Notes
7	**Electrical Services**			
7.1	General		Examine flexible cables for wear, fraying braid and brittle insulation. Examine plugs for cracks, loose terminals, reverse polarity, ensure that correct fuses are fitted. Examine colour coding of cables, ensure cores are correctly connected. Examine earthing arrangements and test continuity. Test mechanical action and polarity of equipment switches. Clean and test control and regulating switches, pilot lamps, thermostats and timing devices. Examine heating element enclosures, heating elements and connections. Examine mechanical condition of equipment. Test safety devices.	
8	**Single and Double Hotplate Ranges**			
8.1	General		Examine legs, frames and fixing of all appliances. Examine for corrosion. Examine thermal insulation. Examine general mechanical condition. Clean hotplate wells.	
8.2	Gas Fired Ranges		Check operation of appliance. Turn off gas supply. Strip hotplates, clean and overhaul all burners, injectors and air sleeves. Overhaul governor. Clean cooker hotplate well. Replace all burners. Remove oven burners, clean and overhaul all burner-injectors. Check flue. Check thermostats for correct location; test and ease head as necessary. Ease and grease all hotplate and oven taps. Light and regulate all burners. Test thermostats at two settings, recalibrate as necessary.	Inform Client's Representative of any defects or faults. $\pm$5°C mechanical thermostats $\pm$1°C electronic thermostats

© Rand Associates Consultancy Services Ltd

Kitchen Equipment Servicing (cont'd)

Item No	Item	Frequency	Action	Notes
8	**Single and Double Hotplate Ranges** (cont'd)			
8.3	Electric Ranges		Examine flexible cables for wear, fraying braid and brittle insulation. Examine colour coding of cables, ensure cores are corrected connected. Examine earthing arrangements and test continuity. Test mechanical action and polarity of equipment switches. Clean and test control and regulating switches, pilot lamps, thermostats and timing devices. Examine heating element enclosures, heating elements and connections. Measure resistance.	
9	**Steam Ovens, Combination Ovens, Convection/Regeneration Ovens etc**			
9.1	General		Examine doors, runners, door furniture, channels, hinges, seals, shelves and rollers, trays and refractory linings. Clean and examine filters and sight glasses. Apply protective coatings as necessary. Examine thermal insulation. Examine legs, frames and fixing of all appliances. Clean and flush out water tanks. Test ball valves and stop cocks. Rewasher ball valves. Examine water level. Check and rewasher fill taps.	Some steam ovens are specialist items of equipment subject to the regulations applying to pressure vessels. A written scheme of examination is required.

© Rand Associates Consultancy Services Ltd

Kitchen Equipment Servicing (cont'd)

Item No	Item	Frequency	Action	Notes
9	**Steam Ovens, Combination Ovens, Convection/Regeneration Ovens etc** (cont'd)			
9.2	Gas Fired		Remove all burners, clean and check burners, aeration screws and injectors. Remove gas pilots, clean and check. Test and adjust burners, controls and thermostats. Clean and test for leaks. Test thermostats. Regrease all gas taps and cocks. Replace thumb pieces as applicable. Test flame failure devices. Examine thermocouples. Test any high limit protection. Overhaul and test governors. Test for gas escapes during operation. Test thermostats at two settings, recalibrate as necessary.	$\pm$5°C mechanical thermostats $\pm$1°C electronic thermostats
9.3	Electrically Heated		Examine flexible cables for wear, fraying braid and brittle insulation. Examine colour coding of cables, ensure cores are correctly connected. Examine earthing arrangements and test continuity. Test mechanical action and polarity of equipment switches. Clean and test control and regulating switches, pilot lamps, thermostats and timing devices. Examine heating element enclosures, heating elements and connections. Measure resistance. Test thermostats at two settings, recalibrate as necessary.	$\pm$5°C mechanical thermostats $\pm$1°C electronic thermostats

© Rand Associates Consultancy Services Ltd

Kitchen Equipment Servicing (cont'd)

Item No	Item	Frequency	Action	Notes
10	**Single and Double Oven Ranges, Roasting Ovens, Pastry Ovens etc.**			
10.1	General		Examine doors, runners, door furniture, channels, hinges, seals, shelves and rollers, trays and refractory linings. Clean and examine filters and sight glasses. Apply protective coatings as necessary. Examine thermal insulation. Examine legs, frames and fixing of all appliances.	
10.2	Gas Fired		Remove all burners, clean and check burners, aeration screws and injectors. Remove gas pilots, clean and check. Test and adjust burners, controls and thermostats. Clean and test for leaks. Test thermostats. Regrease all gas taps and cocks. Replace thumb pieces as applicable. Test flame failure devices. Examine thermocouples. Test any high limit protection. Overhaul and test governors. Test for gas escapes during operation. Test thermostats at two settings, recalibrate as necessary.	±5°C mechanical thermostats ±1°C electronic thermostats
10.3	Electrically Heated		Examine flexible cables for wear, fraying braid and brittle insulation. Examine colour coding of cables, ensure cores are correctly connected. Examine earthing arrangements and test continuity. Test mechanical action and polarity of equipment switches. Clean and test control and regulating switches, pilot lamps, thermostats and timing devices. Examine heating element enclosures, heating elements and connections. Measure resistance. Test thermostats at two settings, recalibrate as necessary.	±5°C mechanical thermostats ±1°C electronic thermostats

© Rand Associates Consultancy Services Ltd

Kitchen Equipment Servicing (cont'd)

Item No	Item	Frequency	Action	Notes
11	**Microwave Ovens**			
11.1	General		Examine equipment casing. Examine door. Examine hinges and catches. Examine door seal. Clean and examine interior of ovens. Examine rotary tables. Examine lamps. Carry out radiation leakage test using appropriate test meter.	Copies of calibration certificates shall be appended to report.
11.2	Electrical		Examine flexible cables for wear, fraying braid and brittle insulation. Examine plugs for cracks, loose terminals, reverse polarity, ensure that correct fuses are fitted. Examine colour coding of cables, ensure cores are correctly connected. Examine earthing arrangements and test continuity. Test mechanical action and polarity of equipment switches. Clean and test control and regulating switches, pilot lamps, thermostats and timing devices. Examine heating element enclosures, heating elements and connections. Examine mechanical condition of equipment. Test safety devices.	
12	**Baine Marie**			
12.1	General		Examine legs, frames and fixing of all appliances. Examine for corrosion. De-scale tanks and baths. Examine food containers. Examine drain cocks.	

© Rand Associates Consultancy Services Ltd

Kitchen Equipment Servicing (cont'd)

Item No	Item	Frequency	Action	Notes
12	**Baine Marie** (cont'd)			
12.2	Gas Fired		Remove all burners, clean and check burners, aeration screws and injectors. Remove gas pilots, clean and check. Test and adjust burners, controls and thermostats. Clean and test for leaks. Test thermostats. Regrease all gas taps and cocks. Replace thumb pieces as applicable. Test flame failure devices. Examine thermocouples. Test any high limit protection. Overhaul and test governors. Test for gas escapes during operation.	
12.3	Electrically Heated		Examine flexible cables for wear, fraying braid and brittle insulation. Examine colour coding of cables, ensure cores are correctly connected. Examine earthing arrangements and test continuity. Test mechanical action and polarity of equipment switches. Clean and test control and regulating switches, pilot lamps, thermostats and timing devices. Examine heating element enclosures, heating elements and connections. Measure resistance.	
13	**Hot Cupboards**			
13.1	General		Examine doors, runners, door furniture, channels, hinges, seals, shelves and rollers, trays and refractory linings. Clean and examine filters and sight glasses. Apply protective coatings as necessary. Examine thermal insulation. Examine legs, frames and fixing of all appliances.	

© Rand Associates Consultancy Services Ltd

Kitchen Equipment Servicing (cont'd)

Item No	Item	Frequency	Action	Notes
13	**Hot Cupboards** (cont'd)			
13.2	Gas Fired		Remove all burners, clean and check burners, aeration screws and injectors. Remove gas pilots, clean and check. Test and adjust burners, controls and thermostats. Clean and test for leaks. Test thermostats. Regrease all gas taps and cocks. Replace thumb pieces as applicable. Test flame failure devices. Examine thermocouples. Test any high limit protection. Overhaul and test governors. Test for gas escapes during operation. Test thermostats at two settings, recalibrate as necessary.	±5°C mechanical thermostats ±1°C electronic thermostats
13.3	Electrically Heated		Examine flexible cables for wear, fraying braid and brittle insulation. Examine colour coding of cables, ensure cores are correctly connected. Examine earthing arrangements and test continuity. Test mechanical action and polarity of equipment switches. Clean and test control and regulating switches, pilot lamps, thermostats and timing devices. Examine heating element enclosures, heating elements and connections. Measure resistance.	
14	**Grilles, Salamanders, Toasters, Fryplates, Griddles, Bratt Pans**			
14.1	General		Examine legs, frames and fixing of all appliances. Examine shelves and rollers, trays and refractory linings. Examine mechanical condition.	

© Rand Associates Consultancy Services Ltd

Kitchen Equipment Servicing (cont'd)

Item No	Item	Frequency	Action	Notes
14	**Grilles, Salamanders, Toasters, Fryplates, Griddles, Bratt Pans** (cont'd)			
14.2	Gas Fired		Remove all burners, clean and check burners, aeration screws and injectors. Remove gas pilots, clean and check. Test and adjust burners, controls and thermostats. Clean and test for leaks. Test thermostats. Regrease all gas taps and cocks. Replace thumb pieces as applicable. Test flame failure devices. Examine thermocouples. Test any high limit protection. Overhaul and test governors. Test for gas escapes during operation.	
14.3	Electrically Heated		Examine flexible cables for wear, fraying braid and brittle insulation. Examine colour coding of cables, ensure cores are correctly connected. Examine earthing arrangements and test continuity. Test mechanical action and polarity of equipment switches. Clean and test control and regulating switches, pilot lamps, thermostats and timing devices. Examine heating element enclosures, heating elements and connections. Measure resistance.	
15	**Boiling Pans, Stock Pot Stands, Bulk Hot Water Boilers, Tilting Kettles**			
15.1	General		Examine legs, frames and fixing of all appliances. Examine for corrosion. De-scale tanks and baths. Examine drain cocks. Check and rewasher fill taps. Examine trunions, lubricate as necessary.	

© Rand Associates Consultancy Services Ltd

Kitchen Equipment Servicing (cont'd)

Item No	Item	Frequency	Action	Notes
15	**Boiling Pans, Stock Pot Stands, Bulk Hot Water Boilers, Tilting Kettles** (cont'd)			
15.2	Gas Fired		Remove all burners, clean and check burners, aeration screws and injectors. Remove gas pilots, clean and check. Test and adjust burners, controls and thermostats. Clean and test for leaks. Test thermostats. Regrease all gas taps and cocks. Test flame failure devices. Examine thermocouples. Test any high limit protection. Overhaul and test governors. Test for gas escapes during operation. Clean and examine flue ways.	
15.3	Electrically Heated		Examine flexible cables for wear, fraying braid and brittle insulation. Examine colour coding of cables, ensure cores are correctly connected. Examine earthing arrangements and test continuity. Test mechanical action and polarity of equipment switches. Clean and test control and regulating switches, pilot lamps, thermostats and timing devices. Examine heating element enclosures, heating elements and connections. Measure resistance.	
16	**Deep Fat and Fish Fryers (Single and Double Pan)**			
16.1	General		Examine legs, frames and fixing of all appliances. Examine doors, lids and baskets. Examine fusible links. Examine mechanical condition. Examine fire protection systems where fitted.	Report type in asset register

© Rand Associates Consultancy Services Ltd

Kitchen Equipment Servicing (cont'd)

Item No	Item	Frequency	Action	Notes
16	**Deep Fat and Fish Fryers (Single and Double Pan)** (cont'd)			
16.2	Gas Fired		Remove all burners, clean and check burners, aeration screws and injectors. Remove gas pilots, clean and check. Test and adjust burners, controls and thermostats. Clean and test for leaks. Test thermostats. Regrease all gas taps and cocks. Test flame failure devices. Examine thermocouples. Test any high limit protection. Overhaul and test governors. Test for gas escapes during operation. Clean and examine flue ways.	
16.3	Electrically Heated		Examine flexible cables for wear, fraying braid and brittle insulation. Examine colour coding of cables, ensure cores are correctly connected. Examine earthing arrangements and test continuity. Test mechanical action and polarity of equipment switches. Clean and test control and regulating switches, pilot lamps, thermostats and timing devices. Examine heating element enclosures, heating elements and connections. Measure resistance.	

© Rand Associates Consultancy Services Ltd

Kitchen Equipment Servicing (cont'd)

Item No	Item	Frequency	Action	Notes
16	**Deep Fat and Fish Fryers (Single and Double Pan)** (cont'd)			
16.4	Thermostats		Of all equipment used in Catering Areas, fat fryers are most frequently involved in fires. The most common cause is overheating of the oil or fat. Normal frying temperature is within the range: **163°C to 188°C** **(325°F to 370°F)** For safe operation the limit of overriding thermostat **must** be set below the flash point: Groundnut Oil - 250°C (482°F) Corn Oil - 243°C (469°F) Lard - 275°C (527°F) Dripping - 246°C (475°F) Hydrogenated Cooking Fat 228°C (442°F)	
17	**Cafeteria Boilers**			
17.1	General		Examine legs, frames and fixing of all appliances. Clean and flush out water tanks. Test ball valves and stop cocks. Rewasher ball valves. Examine water level. Check and rewasher fill taps. Desludge boiler. Examine draw off cocks, replace washers as necessary.	Report plastic draw off cocks
17.2	Gas Fired		Remove all burners, clean and check burners, aeration screws and injectors. Remove gas pilots, clean and check. Test and adjust burners, controls and thermostats. Clean and test for leaks. Test thermostats. Regrease all gas taps and cocks. Test flame failure devices. Examine thermocouples. Test any high limit protection. Overhaul and test governors. Test for gas escapes during operation. Clean and examine flue ways.	

© Rand Associates Consultancy Services Ltd

Kitchen Equipment Servicing (cont'd)

Item No	Item	Frequency	Action	Notes
17	**Cafeteria Boilers** (cont'd)			
17.3	Electrically Operated		Examine flexible cables for wear, fraying braid and brittle insulation. Examine colour coding of cables, ensure cores are correctly connected. Examine earthing arrangements and test continuity. Test mechanical action and polarity of equipment switches. Clean and test control and regulating switches, pilot lamps, thermostats and timing devices. Examine heating element enclosures, heating elements and connections. Measure resistance.	
18	**Cafeteria Type Steam Boilers**			
18.1	General		Ensure that all maintenance Works are carried out in strict accordance with manufacturer's requirements and recommendations. Examination of the pressure vessel in accordance with the written scheme. Otherwise maintain as per Cafeteria boilers.	Cafeteria type steam boilers are specialist items of equipment. They are subject to the regulations applying to pressure vessels. A written scheme of examination is required.
19	**Milk and Coffee Urns, Indirectly Heated Urns, etc.**			
19.1	General		Clean and examine urn. Clean and examine sight glasses. Examine water jackets, descale as necessary. Otherwise maintain as per Cafeteria Boilers.	
20	**Sterilising Units**			
20.1	General		Examine legs, frames and fixing of all appliances. Examine for corrosion. De-scale tanks and baths. Examine drain cocks. Check and rewasher fill taps. Check valve on sterilizer waste.	

© Rand Associates Consultancy Services Ltd

Kitchen Equipment Servicing (cont'd)

Item No	Item	Frequency	Action	Notes
20	**Sterilising Units** (cont'd)			
20.2	Gas Fired		Remove all burners, clean and check burners, aeration screws and injectors. Remove gas pilots, clean and check. Test and adjust burners, controls and thermostats. Clean and test for leaks. Test thermostats. Regrease all gas taps and cocks. Test flame failure devices. Examine thermocouples. Test any high limit protection. Overhaul and test governors. Test for gas escapes during operation. Clean and examine flue ways.	
20.3	Electrically Heated		Examine flexible cables for wear, fraying braid and brittle insulation. Examine colour coding of cables, ensure cores are correctly connected. Examine earthing arrangements and test continuity. Test mechanical action and polarity of equipment switches. Clean and test control and regulating switches, pilot lamps, thermostats and timing devices. Examine heating element enclosures, heating elements and connections. Measure resistance.	
21	**Vegetable Preparation Machines, Potato Peelers**			
21.1	Appliances		Examine bed plate mountings, secure as necessary. Examine safety guards, ensure they are appropriate, in position and securely fixed. Examine drive belts, tension as necessary. Examine and test mechanical condition of plant and equipment. Lubricate in strict accordance with manufacturer's recommendations. Examine abrasive discs and lining. Examine inlet screens, seals and bearings.	

© Rand Associates Consultancy Services Ltd

Kitchen Equipment Servicing (cont'd)

Item No	Item	Frequency	Action	Notes
21	**Vegetable Preparation Machines, Potato Peelers** (cont'd)			
21.2	Motors and Gear Boxes		Clean as necessary, remove surplus oil and grease. Examine securing bolts and anti-vibration mountings, secure as necessary. Examine pulleys and keys. Examine alignment between motor and load. Test bearings for play.	
21.3	Water and Drainage Systems		Clean and flush out. Rewasher taps. Examine inlet screens, seals and bearings. Test drains to ensure free flow.	
21.4	Electrical Installation		Examine flexible cables for wear, fraying braid and brittle insulation. Examine colour coding of cables, ensure cores are corrected connected. Examine earthing arrangements and test continuity. Test mechanical action and polarity of equipment switches. Clean and test control and regulating switches, pilot lamps, thermostats and timing devices. Examine and test safety interlocks.	
22	**Food Slicers**			
22.1	General		Examine bed plate mountings, secure as necessary. Examine safety guards, ensure they are appropriate, in position and securely fixed. Examine drive belts, tension as necessary. Examine and test mechanical condition of plant and equipment. Lubricate in strict accordance with manufacturer's recommendations. Examine blade. Examine blade guard and retaining shaft. Test operation of blade guard. Examine blade adjustment.	

© Rand Associates Consultancy Services Ltd

Kitchen Equipment Servicing (cont'd)

Item No	Item	Frequency	Action	Notes
22	**Food Slicers**			
22.2	Electrical Installation		Examine flexible cables for wear, fraying braid and brittle insulation. Examine colour coding of cables, ensure cores are correctly connected. Examine earthing arrangements and test continuity. Test mechanical action and polarity of equipment switches. Clean and test control and regulating switches, pilot lamps, thermostats and timing devices. Examine and test safety interlocks.	
23	**Dish Washers**			
23.1	General		Examine legs, frames and fixing of all appliances. Examine for corrosion. Examine doors, hoods and baskets. Examine runners, channels and drainage boards. Examine mechanical condition. Examine gauges. Examine temperature settings during wash and dry cycles.	
23.2	Water and Drainage Systems		Clean and flush out. Rewasher taps. Examine inlet screens, seals and bearings. Test drains to ensure free flow.	
23.3	Electrical Installation		Examine flexible cables for wear, fraying braid and brittle insulation. Examine colour coding of cables, ensure cores are correctly connected. Examine earthing arrangements and test continuity. Test mechanical action and polarity of equipment switches. Clean and test control and regulating switches, pilot lamps, thermostats and timing devices. Examine and test safety interlocks.	

© Rand Associates Consultancy Services Ltd

Kitchen Equipment Servicing (cont'd)

Item No	Item	Frequency	Action	Notes
23	**Dish Washers** (cont'd)			
23.4	Detergent Dosing System		Examine dosing pumps. Examine detergent reservoirs. Examine fixed and flexible pipework. Examine nozzles, check valves and suction ends. Examine control boxes.	
24	**Waste Disposal Units**			
24.1	General		Examine mountings, secure as necessary. Examine safety guards, ensure they are appropriate, in position and securely fixed. Examine and test mechanical condition of plant and equipment. Lubricate in strict accordance with manufacturer's recommendations. Examine grinding discs and lining. Examine inlet screens, seals and bearings.	
24.2	Water and Drainage Systems		Clean and flush out. Rewasher taps. Examine inlet screens, seals and bearings. Test drains to ensure free flow.	
24.3	Electrical Installation		Examine flexible cables for wear, fraying braid and brittle insulation. Examine colour coding of cables, ensure cores are correctly connected. Examine earthing arrangements and test continuity. Test mechanical action and polarity of equipment switches. Clean and test control and regulating switches, pilot lamps, thermostats and timing devices. Examine and test safety interlocks.	

© Rand Associates Consultancy Services Ltd

Responsive Maintenance and Out of Hours Emergency Works

041 Attend to all call outs due to malfunction or breakdown.

042 Include for a call-out service to provide Responsive Maintenance and an Out of Hours Emergency Works Service. The Out of Hours Emergency Works service is deemed to extend the provision of Emergency Works to a 24 hour, 7 days a week, 365 (366 for a leap year) days per year basis.

043 Call outs for Responsive Maintenance and/or Out of Hours Emergency Works which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

044 Where Out of Hours Emergency Works are attended to for authorised cases of breakdowns, mis-use or vandalism, the Provider will be paid in accordance with the Rates detailed in the Price Framework.

Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works

Repairs, Replacements and Adjustments

045 Take responsibility for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

046 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

047 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

048 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

Firestopping

049 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

050 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

COMMUNAL AND LANDLORD'S ELECTRICAL INSTALLATIONS AND TESTING

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

COMMUNAL AND LANDLORD'S ELECTRICAL INSTALLATIONS AND TESTING

GENERAL MATTERS

Routine Maintenance, Responsive Maintenance and Out of Hours Works

001 This Specification covers all Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works to all installations within the boundaries of each Scheme. The Specification must be read and interpreted in conjunction with the operations set out in the descriptions included in the Price Framework.

002 Routine Maintenance must involve the undertaking of the comprehensive servicing/maintenance operations described in this Specification and the operations in the Price Framework inclusive throughout the duration of the Contract Period at the regular intervals pre-defined by the Client and starting immediately from the Commencement Date.

003 All references to applicable Standards or other equally approved national standards must be deemed to mean those current, including all amendments.

004 Will be required to undertake Responsive Maintenance to deal with adhoc items of day to day repairs/maintenance including Emergency Works and Out of Hours Emergency Works in respect of electrical installations.

005 Ensure that his Staff visits each Property at the requisite frequency and carry out the specified inspections, maintenance, repairs, tests, certification and any other servicing Works to ensure that all systems, installations, equipment and appliances are maintained in prime condition.

006 At each Property visit, the Provider's Staff must access the electronic log book for the respective installations and record all details of the visit and action taken. The Provider must be deemed to have allowed in his tender for creation of the Property specific installation data as each Property is inspected for the first time.

007 Within the first 3 months following the Commencement Date (i.e. at the end of the first servicing period) ensure that each installation and the like at each Property has a unique identifiable number.

008 Also within 3 months after Commencement Date, the Provider must provide the Client's Representative with both an electronic and a hard copy bound report containing a listing of all Properties in alphabetical order and indicating against each Property, the full name and address of the Property; a full positional listing of all systems, installations, equipment, appliances and the like referenced with their uniquely identifying number in accordance with paragraph 007 above; the dates when Routine Maintenance has been undertaken and/or is due in respect of each Property.

009 At the same time, the Provider may submit to the Client's Representative a separate report detailing any specific recommendations with respect to any Property.

010 At the completion of each visit to each Property the Provider's Staff must complete electronically clear and explicit service report sheets. The electronic signature of the Customer in respect of an individual Property or the Client's relevant Scheme manager or other responsible officer must be obtained as proof of the Works being undertaken and completed. In blocks of flats or similar situations where there is no such dedicated, responsible manager or officer, the Provider's Staff must self certify completion of the Works. In such cases the name of the self certifying Staff member must be printed clearly and legibly. Copies of reports are to be forwarded to the Client's Representative, together with any recommendations for Works not already authorised. If the recommendations include for Works not covered by Rates in the Contract Documents then a quotation for such must be included with the service report sheets. The Provider must update the electronic log book with all service report sheets.

© Rand Associates Consultancy Services Ltd

011 Following any visit to a Property to undertake Responsive Maintenance or Out of Hours Emergency Work, the Provider must also forward a report sheet to the Client detailing the nature of the visit, the authorisation for it and the actions taken.

012 All logs, reports and test recording sheets for all categories and sections of Work (whether specifically stated below or not) must be recorded and be available for inspection and download by the Client on a web based system in a format to be agreed by the Client and the Provider.

013 All project issues must be communicated through the Client's Representative and must not be channelled directly or indirectly via the Customers.

014 All alarm systems (whether specifically stated below or not) must be connected to nominated control monitoring services:

- All bespoke software must be fully documented, recorded and provided to the respective Client's Party (including providing all codes, passwords and part no's) and all must remain open protocol;
- All systems must remain open protocol;
- At handover meetings with the Client, the Provider must provide all codes, passwords and part numbers for all systems , parts and equipment; and
- Any damage caused by the Provider installing inferior equipment must be made good at the expense of the Provider;

Quality

015 The Client is aiming for an economic, high quality maintenance service with a stable workforce and effective supervision. Cost will therefore be only one element in the overall assessment of tenders.

016 The Works must be performed in accordance with the Contract Documents and must be carried out in an efficient and proficient manner.

017 The Client's Representative will monitor that the Specification is being met. Any Default in performance will be dealt with in accordance with the Contract.

018 The monitoring system will include an inspection of the following:

- the number and suitability of Staff used;
- quality of Materials used;
- that the servicing and maintenance procedures used are either as detailed in the Contract or as agreed with the Client's Representative;
- that the frequency and standards of servicing and maintenance are being met; and
- that health and safety requirements are met;

Equipment and Materials

019 All equipment and Materials required for the performance of the Contract must be supplied by the Provider and must be approved by the Client's Representative. Any alternatives subsequently proposed by the Provider must have the prior approval of the Client's Representative.

020 All equipment and Materials used by the Provider to fulfil the Contract must be suitable for the purpose and where an appropriate applicable Standard issued by the applicable Standards Institute, or other equivalent nationally approved standard is current, must as a minimum, be in accordance with that standard.

Reporting of Defects

021 Report in writing any obvious apparent defects in the design, installation and/or operation, to any of the existing installations, to the Client's Representative.

022 In particular report immediately to the Client's Representative any matters that may impact on health and safety issues and where immediate action is required from the Client's Representative.

© Rand Associates Consultancy Services Ltd

PAT TESTING

Objective

023 To carry out full testing of all portable electrical appliances owned by the Client and at other sites if requested by the Client. Testing to be carried out in accordance with the current Regulations, with the results recorded in a format to be agreed with the Client's Representative.

Examples of Equipment to be Tested

024 Portable appliances to be tested include the following types of equipment; flexible extension leads, computers and V.D.U.'s, kettles, microwaves and floor cleaning equipment etc. These portable appliances are located in a number of varying sites.

Testing of Appliances

025 Testing to be carried out in accordance with the Electricity at Work Regulations 1989 and the Management of Health and Safety at Work Regulations 1999, and will comply with the relevant HSE guidelines, NICEIC regulations and all engineers carrying out the testing must be qualified with City and Guilds qualifications for testing and inspection to the applicable Standard: Requirement s for Electrical Installations.

026 Most remedials should be actioned whilst on the Property as agreed in advance with the Client's Representative.

027 All installations must comply with the NICEIC report no IPN2 and all tests of installations must be reported and data logged on these forms and be passed to the Client's Representative for record keeping.

028 All testing is to include:

Physical examination;	a physical examination of apparatus and flexible cords is to be carried out to ensure that there are no visible or evident signs of deterioration, faulty connections or poor practice.
Removal of plug top:	The plug tops of all portable appliances must be removed in order to check the following: 1. Polarity and soundness of connections; 2. Fuse of suitable rating; and 3. Cord grip in good condition;
Earth fault loop impedance test.	To be carried out where applicable
Insulation resistance test to fixed appliance.	To be carried out where applicable
Completion of testing:	Upon completion of testing a portable appliance, if the test is satisfactory then the apparatus is to be given a date label. However if the apparatus is faulty (and the fault cannot be repaired by completing a 'minor repair' to be authorised by the Client's Representative), then the faulty apparatus must be disconnected, and the Client's Representative informed immediately so action can be taken.
Lamp testing	All fittings containing lamps must have all lamps tested as part of that appliance test and the Provider must ensure that the correct specification of lamp is fitted to the fitting on completion of the works to standard NICEIC regulations.
Scheduling for remedials at the same time as testing	

© Rand Associates Consultancy Services Ltd

029 The Provider must provide full result records, pass and fail certificates in a format that is to be agreed with the Client's Representative.

Inspection and Testing of Installations

030 The installation including smoke detectors must be inspected and tested in accordance with the appropriate requirements of the Regulations.

031 The Client's Representative must be given not less than 24 hours' notice before commencing tests.

032 After satisfactory completion of tests submit in an electronic format copies of inspection and completion certificates, complete with all associated schedules and test results if applicable, within 10 working days of satisfactory completion to the Client's Representative, the Part P certificate is to be issued within one month of completion.

033 All test instruments must be provided by the Provider who must note the instrument serial numbers on the test certificates.

Report and Certificates

034 Inspections, reports and test certificates and forms must be the latest current version and in the standard format published for the purpose by the National Inspection Council for Electrical Installation Contracting (NICEIC), the Electrical Providers' Association (ECA) or any other approved certifying and testing body

035 Minor Works or alterations to electrical installations, which involves a change or modification to an existing single circuit, are deemed to include the issue of a certificate for Minor Electrical Installation Works.

036 Major Works or alterations to electrical installations, which involves a change or modification to two or more existing circuits, addition of one or more new circuits to an existing installation, and all new installations, are deemed to include the issue of an Electrical Installation Completion Certificate.

037 Periodic or routine inspection and reporting only of electrical installations when specifically Instructed by the Client's Representative, but, where no change or modification is Instructed to be carried out to the installations, is deemed to include the issue of a Periodic Inspection Report for an Electrical Installation.

Management of the Property Record System

038 A historic schedule detailing all Properties and equipment to be tested is held with the Client and can be made available to the successful Provider.

039 Will be required to provide a Web based electronic system that will have the capability to:

- Record the test results of all individual appliances and their specific location, presented on a Property by Property basis; and
- Provide and maintain at all times throughout the Contract Period a web based product to the satisfaction of the Client to give the ability of the Client to log on and see certificates status live as they are loaded and edited.

040 Provide and affix an easily distinguishable adhesive sticker or tag to each appliance that clearly identifies the time of testing, the date of the next test and signature of the engineer who carried out the test.

041 An electronic reference system that can identify and retrieve information on each appliance and has the ability to assign each appliance with a unique reference code for the purposes of managing and interrogating the information stored.

© Rand Associates Consultancy Services Ltd

PCB's GUIDANCE NOTE

042 For many years PCB's (polychlorinated biphenyls) have been used as dielectric filler fluids in electrical transformers and capacitors, within some types of electrical and heating equipment.

043 The main risk from PCBs comes from contact with the skin, but their vapour can also be dangerous. Anyone working with PCBs needs to use a high standard of protective equipment.

044 Some equipment containing PCBs will be labelled. But if you come across, for example, a transformer or capacitor, which is not labelled then a suitable procedure, must be in place to deal with the situation. If equipment is found that does contain PCBs then it should be carefully inspected, and the Client's Representative must be informed of its location and condition. Information collated must be recorded by the Provider in a separate register that must be kept up to date at all times. When inspecting PCBs it is necessary to ensure that there are no signs of leakage at welds or flanges. If upon inspection evidence of leakage is found, then the inspection should be halted immediately, and the Client's Representative informed.

045 The Provider is likely to find PCBs in older equipment, often they go under trade names, such as;
Apirolic, Aroclor, Asbestol, Bakola 131, Chlorextol, Clophen, Inerteen, Kanechlor, No-Flamol, Pyralene, Pyroclor, Saf-T-Kuhl, Sovol.

Periodic Electrical Testing

046 Fixed Installation Testing (FIT) involves testing the electrical circuits and systems that distribute electricity around a Property. It covers all the hard wiring in a Property, whether that Property is commercial, industrial or residential. All electrical circuits in a Property that are fixed, such as lighting, socket outlets, air conditioning and other fixed plant are to be tested.

047 The Electricity Safety, Quality and Continuity Regulations 2009 require that all electrical systems and equipment used in the working environment should be in a safe condition.

048 The Health & Safety Executive recommend that to comply with the regulations, an inspection and testing programme should be undertaken at all places of work.

049 The IET recommend maximum periods between inspections, for example:

COMMERCIAL = 5 YEARS
RESIDENTIAL = 10 YEARS

050 applicable Standard: Requirement s for Electrical Installations indicates the following requirements:

Regulation 641.1 states that "Every installation shall, during erection and on completion before being put into service, be inspected and tested to verify, so far as is reasonably practicable, that the requirements of the Regulations have been met.".

Regulation 651.1 states that "Where required, periodic inspection and testing of every electrical installation shall be carried out in accordance with Regulations 651.2 to 651.5 in order to determine, so far as is reasonably practicable, whether the installation is in a satisfactory condition for continued service. Wherever possible, the documentation arising from the initial certification and any previous periodic inspection and testing shall be taken into account. Where no previous documentation is available, investigation fo the electrical installation shall be undertaken prior to carrying out the periodic inspection and testing.".

Periodic Inspection Report

051 This document is used to record the condition of an installation. In particular, is it safe to use? At the time of writing, it is not a requirement for the person completing this report to be Part P compliant. It is, however, important that the person carrying out the inspection and test is competent.

© Rand Associates Consultancy Services Ltd

052 The report must also include a Schedule of Test Results and a Schedule of Inspection.

053 The frequency of the periodic inspection and test is dependent on the type of installation, the environment and the type of use. The applicable Standard: Requirement s for Electrical Installations - Wiring Regulations refer to this as the 'Construction, utilization and environment' and this can be found in Appendix 5 of the applicable Standard: Requirement s for Electrical Installations. Further confirmation on the percentage of circuits to be tested is for consideration and confirmation by the Client's Representative.

054 Guidance **note 3** for the inspecting and testing of electrical installations has a table of recommended frequencies for carrying out periodic inspection and tests - the period depends on the type of installation.

Observations and recommendations

Defects

Defects noted, must be recorded accurately and a code given to them.

Anything which could compromise the safety of those using the installation should be recoded. This would include lack of earthing, undersized cables, damaged accessories, high Z, values.

Defects which do not immediately cause the installation to be regarded as unsafe but which could be problematic in the future; corrosion; old cables such as lighting cables with no CPC terminated in wooden switch boxes; labels missing, etc

Requires further investigation; This could be anything that the person who is carrying out the inspection and test is concerned about, but which is outside of the agreed extent of the inspection. Possibly a circuit which cannot be traced, or instrument values within the required parameters -anything that might cause concern.

Does not comply with applicable Standard: Requirements for Electrical Installations As the requirements of the applicable Standard are amended, parts of the installation which would have complied when the installation was new, may now not comply. Examples of this could be: socket outlets that could be used to supply portable equipment outdoors, not protected by an RCD, CPCs which have been sleeved with green sleeving and not green and yellow. Switch returns not identified on older installations.

Periodic Testing of Fixed Electrical Installations Item Frequency Action Notes

055 Personnel Competencies:

The Provider shall employ a competent approved electrician to undertake the testing who has completed one of the following courses;

- Updating of the latest Edition of the Wiring Regulations Course to C&G 2382 (C&G 2382-20 or 2381-10) standard or equivalent
- an Electrical Testing Course to C&G 2391 (C&G 2392) standard; or
- an Electrical Testing Course C&G 240.

A person of equal competence shall supervise the work.

056 Test Instruments:

The Provider shall use the following test instruments:

- Low resistance ohmmeter - this should be a dual range instrument conforming to applicable Standard;
- Insulation resistance tester - maximum output 4kV is needed to satisfy 713-05-02(ii); Earth fault loop impedance tester conforming to applicable Standard;

© Rand Associates Consultancy Services Ltd

- Earth electrode resistance tester to meet the requirements of applicable Standard;
- RCD tester capable of indicating that a rcd has operated at its residual current, in the time specified in the applicable Standard;
- Polarity tester - for checking before the supply is connected;
- a battery and voltmeter or a bell set; for live testing;
- a magnetic indicator;
- a voltmeter or a filament lamp (not a neon) with approved fused leads and test probes;

057 Periodic Inspection:-

General Inspection shall take into account the following:
- safety
- wear and tear
- corrosion etc by external influence
- damage
- excessive loading/over heating
- age of installation
- suitability of installed equipment
- function of the installation

058 Periodic Inspection Process:

Inspections shall include items:
- a sample of joints and connections
- identification and condition of conductors
- condition of flexible cables and cords
- internal inspection of a sample of switching devices
- presence and integrity of fire barriers where reasonably practicable
- means of protection against direct contact with live conductors g
- means of protection against indirect contact with live conductors.
- presence, identification, condition and accessibility of protective devices and switching devices
- condition and integrity of enclosures and mechanical protection
- correct labelling of installations with regard to next inspection, earthing, voltages and presence of residual current devices
- any changes in either the external influences which may effect the installations or alterations and additions that are not appropriate to the particular external influences present.

059 Periodic Testing Procedure:-

General Periodic testing shall be carried out in accordance with the requirements of applicable Standard: Requirements for Electrical Installations and Guidance Note 3 - Inspection and Testing.

060 Periodic Testing Procedure:

Sampling a minimum of 10% of the installation subject to detailed inspection and testing. Higher levels of sampling may be required by the Client. If significant failings are identified, the sample may be increased to 100%.

© Rand Associates Consultancy Services Ltd

Periodic Testing Procedure:	
Between the earth terminal of distribution boards Protective conductors continuity to the following exposed-conductive-parts:	socket outlet earth connections
	accessible exposed-conductive-parts of current-using equipment and accessories
Bonding conductors continuity	all bonding main conductors
	all necessary supplementary bonding conductors
Ring circuit continuity	Where there are proper records of previous tests, this test may not be necessary. This test shall be carried out where inspection/ documentation indicate that there may have been changes made to the ring final circuit
Insulation resistance	between live conductors, with phase(s) and Phase to neutral tests must not be made with neutral connected together, and earth at all electronic devices in circuit. final distribution boards
	at main and sub-main distribution panels, with final circuit distribution boards isolated from mains.
Polarity	origin of the installation
	distribution boards
	accessible socket outlets
	extremity of radial circuits
Earth electrode resistance	Test each earth rod or group of rods separately, with the test links removed, and with the installation isolated from the supply source
Earth fault loop impedance	origin of the installation
	distribution boards
	accessible socket outlets
	extremity of radial circuits
Tests as required by Regulation 643-10	Functional tests of RCDs followed by operation of the functional test button.
Functional tests of Circuit breakers	Manual operation to prove that the devices, isolators disconnect the supply and switching devices

061 Labelling of Distribution Boards:

Provide at each distribution board:

- A durable label conforming to the requirements of Regulation 514.12.2
- Updated circuit list conforming to the requirements of Section 514 giving details of the circuit connected, phase, cable size and protective device rating.

062 Labelling of Accessories:

During the testing exercise the Provider shall (Socket outlets, switches etc) label any accessories which are not already labelled. Use an electronic label-making device to produce self-adhesive labels for each accessory to identify the particular final circuit serving each accessory The labels shall be BLACK text on WHITE tape, of letter size 5mm with all letters UPPER CASE

063 Report Format:

The report shall be based on the Electrical Installation Condition Report incorporating Schedules of inspections and Schedule of Test Results as Appendix 6 of applicable Standard: Requirement s for Electrical Installations and must be given to the Client:

© Rand Associates Consultancy Services Ltd

In addition, the Provider is to provide a narrative report covering the following topics:

- Purpose of report
- Summary of installation/inspection including schematic diagram
- Photographs
- Access Problems
- Recommended Works/Costs
- Any other matter that should be drawn to the Client's Representative's attention

064 Report presentation:

Provide:

- 1 copy, bound in a folder
- 1 copy in pdf format on CD-ROM or made available in a web access format,

Ensure that the report is compiled in a logical methodical manner, progressing from the main switchgear to sub-distribution boards to final sub-circuits in particular ensuring that all items contained on certificate F "Observations and Recommendations for Actions to be taken" are cross referenced to circuit details and photographs.

Photographic evidence must be provided for each identified fault requiring remedial action

The quality of the final report is a fundamental requirement and the report shall be collated using 'AMTECH' software or similar.

Works Priorities and Codes as Published by NICEIC Group Limited

065

Notifiable in accordance with NICEIC Guidelines	Risk	Action Required
Code 1	Danger present; Risk of Injury; Immediate remedial action required;	Must be rectified and carried out on the same day whilst the electrician is in attendance.
Code 2	Potentially dangerous; urgent remedial action required;	Must be rectified and carried out within **5** working days of notification if Instructed to do so by the Client's Reprsentative and by prior appointment with the Customer of the Property or the residential staff as appropriate.
Code 3	Improvement required:	Must be rectified and carried out on within **10** working days of notification if Instructed to do so by the Client's Representative and by prior appointment with the Customer of the Property or the residential staff as appropriate.

066 Certificates of completion must be issued for all works carried out on Code 1 – 3 works.

© Rand Associates Consultancy Services Ltd

ELECTRICAL INSTALLATION

GENERAL

Regulations

101 All electrical Works must be carried out in accordance with applicable Standard - Requirements for Electrical Installations IET Wiring Regulations co-published by the applicable Standards Institution ("BSI") and the Institution of Engineering and Technology ("IET").

102 The installation of all electrical Works is to be undertaken by a Provider who is a registered Member of the National Inspection Council for Electrical Installation Contracting and/or will also be a member of the Electrical Provider's Association.

Ensure that all electrical Works comply with the following regulations and requirements including all revisions and amendments applicable at the time the Works are carried out.

a) Building Regulations 2010 (amended 2013)
b) Electricity supply company regulations
c) applicable Standards whether applicable wholly or in part
d) applicable Standards Codes of Practice
e) Health and Safety at Work Act 1974
f) Electrical Equipment (Safety) Regulations 1994
g) Electricity at Work Regulations 1989

103 Will need to satisfy all requirements as necessary including the Building Regulations.

104 Responsible for the full Design, installation, test, inspection and certification of the Works.

105 Provide a Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works service.

106 All certification must be made using the Electrical Installation Certificates.

107 Where, in the opinion of the Client's Representative, this has not been complied with the Provider will remedy the installation accordingly to the Client's Representative's reasonable satisfaction.

Equipotential bonding

108 The whole of the electrical installation and all other equipment connected thereto will be earthed in conformity with applicable Standard: Requirement s for Electrical Installations and to the requirements of the Supply Authority.

109 Install a suitably sized earth copper bar, protected against corrosion for the termination of all main earth leads and main bonding cables including, where specified, earth tapes used for the earthing of the main cubicle panels and lightning protection schemes.

110 The earth bar fixings shall be suitably spaced off the Property fabric and be complete with a removable link for testing purposes.

111 The incoming supply authority's earth lead either from the incoming cable sheath or service head shall be connected to the main earth bar so as to allow this earth lead to be isolated when the link is removed.

112 A label engraved "**Main Earthing Terminal**" will be located adjacent to the earth bars.

© Rand Associates Consultancy Services Ltd

113 Where the supply authorities services exist and the main earth connection is obtained from the cable sheath, the Provider shall ensure that the cable sheath is connected to the consumer's main earth bar by means of XL-LSF insulated cable. The size of the cable shall be dependent on the size of the supply authorities service head.

114 Connect the following to the main earthing terminal using earthing clamps to applicable Standard or other means where appropriate and labelled to denote size and destination:
- main cold water pipe adjacent to stop valve;
- main gas pipe adjacent to and on the consumer side of the gas meter;
- rising mains – hot and cold services
- fire hydrant services or dry riser
- central heating system pipework;
- other service pipes and ducting;
- exposed metallic parts of the building structure;
- intake room switchgear/panels and other earth bars; and
- lightning protection down conductor.
- Equipotential bonding minimum 10.00m2

115 The complete trunking, tray, conduit and accommodation systems including the sheaths of all MICC cables will be electrically continuous and connected securely to all conduit boxes, switchgear and distribution boards and other electrical apparatus forming part of the installation.

116 The armouring and metal sheathing of all XLPE/S.W.A./LSF cables shall be solidly bonded together and finally connected to the panels serving the cables.

117 The earthing continuity of the metal sheath of each sheathed cable shall be maintained by efficient bonding of the main switch, switch fuses, distribution boards or other metal clad accessories or appliances at which the cable terminates.

118 If there is more than one entry of any of the above services into each Property, or each separate dwelling forming part of a Property, then each entry must be bonded.

119 The earth bonding connection will be made as near as practicable to the point of entry, except in the case of the gas service where the connection shall be on the consumers side of the meter and must in all cases be in such a position that it shall be easily accessible for inspection.

120 The earth bonding lead shall be XL-LSF insulated cable coloured green/yellow and enclosed in either PVC-u or HG steel conduit installed as indicated on the Drawings and Specific Specification. This cable must be of continuous length of minimum size in accordance with the relevant IET Tables and the Supply Authority's requirements for PME.

121 All switchgear and sub-distribution panels will be bonded to earth as previously described.

122 Bonding clamps complying with the applicable Standard complete with a permanent label indelibly marked with the words "**SAFETY ELECTRICAL EARTH - DO NOT REMOVE**", used throughout the bonding installation.

123 Where flat XL-LSF insulated XL-LSF sheathed wiring systems are installed the CPC will terminate directly into the outlet point.

124 The earthing terminal of each outlet position will be connected to the earthing terminal within the accessory box mounted thereon with a short fly with a cross sectional area equal to the circuit served circuit protective conductor.

125 At distribution boards the Provider shall ensure CPCs are terminated to the correct earthing terminal corresponding to the phase and neutral connections.

126 Where flat XL-LSF insulated XL-LSF sheathed wiring systems are installed the CPC will terminate directly into the outlet point.

© Rand Associates Consultancy Services Ltd

Supplementary bonding

127 Within the zone formed by the main equipotential bonding, provide connections to:
- baths;
- sinks;
- exposed pipes;
- metal water storage tanks; and
- heating and ventilation systems.
- Supplemental bonding 4.00m2

Protective Multiple Earthing Installations

128 In Protective Multiple Earthing (PME) installations the power circuit must be protected by a RCBO (Residual Current Breaker with Overcurrent) which must form an integral part of the consumer unit.

Earth Rods and Inspection Pits

129 Earth rods must be protected by purpose made inspection pits set neatly and firmly in the ground.

130 The earth wire must be enclosed in HGS galvanised conduit taken directly into the inspection pit.

131 The conduit must be secured to the external wall of the Property with galvanised heavy duty 2-hole saddles up to a maximum height of 1800mm above ground level.

132 The saddles must be fixed with zinc plated round head screws.

Electricity Supply

133 Be responsible for the co-ordination of the electrical services with those of the Supply Authority.

Phase Marking

134 Each conductor shall be plainly marked adjacent to its termination by coloured sleeves to indicate the phase to which it is connected.

135 The interior of all items of distribution equipment shall have the phases marked to a standard and quality approved by the Client's Representative, using coloured discs or markers secured by non-ferrous screws.

Connections to Existing Circuits

136 Connections shall be made to the existing mains supply system at the position(s) indicated, but no alterations shall be undertaken until first obtaining the approval of the Client's Representative.

137 The Work shall be executed in such a manner and at such times as may be necessary in order to cause the minimum of interference with existing services.

138 Where it may be necessary to interrupt existing services, notice of such intention shall be given by the Provider to the Client's Representative in advance to enable any necessary arrangements to be made.

139 The notice given shall be 2 days for minor disruptions and 1 week for disruption for over 4 hours.

MATERIALS

Earth Electrode

140 The type of earth electrode used shall be appropriate to the soil type into which the electrode is placed.

© Rand Associates Consultancy Services Ltd

141 Generally in clay type soils copper or copper clad steel rods shall be driven vertically to a minimum depth of 3 metres.

142 Soil containing chalk, limestone or rock sub-soil it may be necessary to lay a copper tape or cast iron/copper plates.

143 Ensure any earth electrodes used are manufactured from copper with hardened steel driving cap, hardened steel tip and phosphor bronze coupling screws. Use sufficient electrodes (in length and number) to give the required earth loop impedance. The earthing conductor shall not be less than 25mm x 3mm annealed copper strip. Joints shall be made using an approved process or bolted, riveted or clamped. The Provider shall ensure that copper jointing surfaces are twined.

144 Copper connections to iron earth plates shall be bolted and brazed with all bolts, rivets and clamps made of brass, bronze or similar non-ferrous material.

145 Joints and electrode connection shall be readily accessible and enclosed within purpose made inspection pits. Where access is not possible these joints shall be protected against moisture ingress.

146 Tapes shall be of soft high conductivity copper, tinned unless otherwise indicated and where fixed and liable to corrosion they shall be served with corrosion resisting tape or coated with corrosion resisting sheath. Where the tapes are run in the ground they shall be laid in sand and protected with tiles.

147 A removable test link shall be provided inside the Property as near as possible to each earth electrode for isolation of the earth electrode for testing purposes.

148 Obtain test readings of the earth electrode in dry weather conditions and submit the results to the Client's Representative.

149 Where copper tape is fixed to the Property structure it shall be by means of purpose made corrosion resistant saddles. Fixings shall be made using purpose made plugs and clamps and installed at intervals not exceeding 1.0m.

150 All fixings shall be suitably corrosion resistant.

151 Protect each earth electrode from mechanical damage by enclosing the earth lead in a heavy duty cast-iron or concrete box with lid. Enclose the entire lengths in heavy gauge, galvanised steel conduit. Attach permanent labels indelibly marked "Safety Electrical Earth Do Not Remove" to the earth lead at both the meter cupboard and at the earth electrode.

Conduit/trunking/ducting

152 Do not use surface conduit or trunking without an Instruction to do so from the Client's Representative.

Cable Trunking Systems

153 Ensure that the cable trunking used throughout the installation:

- will be manufactured from galvanised sheet steel and constructed to conform with the requirements of the applicable Standards;
- with trunking sizes up to and including 150mm X 50mm, or equal, cross-sectional area are produced from 1.2mm minimum thickness sheet steel, above these sizes 1.6mm minimum thickness sheet steel will be employed;
- have cover lids will be fastened to the trunking body with turnbuckle screws rigidly secured to the inwardly turned flanges on the trunking body;
- has straight trunking joints made with the use of purpose made coupler connectors secured with electro-tinned screws, nuts and shake-proof washers;
- has trunking accessories, gusset type bends, tees and angles of similar gauge, type and manufacturer as the trunking body;
- has only accessories provided with a hot dip galvanised finish to comply with the applicable Standard;

© Rand Associates Consultancy Services Ltd

- Has no fabrication of any components on site and that only the manufacturers listed accessories will be accepted;
- Is to be made continuous electrically and mechanically by means of copper links across each joint on the system. The galvanising material will be removed within 6mm of the jointing strap to ensure good earth continuity;
- vertical sections of trunking are provided with pin racks at not more than 2M intervals;
- continuous sheet steel segregation barriers are provided, securely fixed to segregate final sub-circuits and ancillary circuits, i.e. telephone and door porter systems;
- purpose made fire barriers must be inserted into sections of trunking at points of entry and exit from roof spaces, between rooms and floors or at 5m intervals;
- where passing through holes in the Property structure, a cover plate will be fixed to the face of the trunking before installation and will be arranged to project at least 50mm beyond the finished structure;
- where used to connect switchgear or fuse-boards, such connections will be made by trunking fittings manufactured for this purpose and not by multiple conduit coupling;
- due allowance has been made for expansion on long lengths of installed trunking;
- will have a total air space of 66% giving a cable carrying capacity of 34% within the internal area of the trunking;
- will be rigidly attached to the Property fabric at intervals not exceeding the following tables

Cross-sectional Area of Trunking	Maximum Distance Between Supports for Metal Trunking	
	Horizontal	Vertical
Exceeding 300mm² and not exceeding 700mm²	750mm	1000mm
Exceeding 300mm² and not exceeding 1500mm²	1250mm	1500mm
Exceeding 1500mm² and not exceeding 2500mm²	1500mm	2000mm
Exceeding 2500mm² and not exceeding 3500mm²	1500mm	2000mm
Exceeding 5000mm²	1500mm	2000mm

- Fixings are to be provided within 300mm intervals of all bends, angles and fittings. Small individual pieces of trunking will be independently supported accordingly.
- will be fixed by means of round head wood screws of sufficient size and length to obtain a firm fixing into the Property structure with a minimum length 32mm x No. 10 screws. The fixing screws will be zinc plated (electro-galvanised) complying with the applicable Standards. All fixings are to have a suitable fire rating to avoid failure under fire conditions
- that each final sub-circuit contained within trunkings will be taped at 600mm intervals with two laps of good quality transparent tape with additional wrapping at bends.
- that circuit identification tapes will be attached under one layer of transparent tape at 4M intervals.

Insulated Cable Trunking

154 Insulated trunking and accessories shall comply (where applicable) to the physical tests contained in the applicable Standard 'Non Metallic Conduits and Fittings for Electrical Installations'.

155 The insulated trunking is only to be used where an insulated conduit system is being installed, unless specifically stated otherwise. The trunking shall be fixed by means of wood screws at intervals not exceeding 1 metre. Fixing holes shall be slotted to allow for any subsequent expansion due to temperature variations. Insulated trunking temperatures are expected to exceed + 60° C or fall below -5° C. Care shall be taken to ensure that the trunking is not deformed by fixings, this applies particularly when trunking is fixed to an uneven surface. Packing pieces shall be introduced in order that the trunking shall be securely fixed, level and plumb without being deformed.

156 Insulated cable trunking to be smooth inside and outside and free from imperfection and manufactured by an approved manufacturer.

© Rand Associates Consultancy Services Ltd

157 Insulated cable trunking to be of the high impact resisting heavy gauge type, fitted with well fitting lids of an approved type and size, or as indicated in the specification or schedule of drawings.

158 Cable retaining strips to be fitted at 1 metre intervals unless trunking is installed with the cover on the top side.

159 Insulated cable support pins to be fitted at intervals of 4 metres in vertical runs of trunking and at the top of the vertical trunking.

160 Internal fire barriers to be fitted where vertical trunking passes through floors.

161 Overlapping cover plates to be fitted where installed flush with the building fabric. The finished edge of the trunking shall finish flush with the finished surface.

162 Insulated trunking to be fitted with manufacturers standard tees, off-sets and other fittings where changes of direction occur.

163 Where trunking terminates, manufacturers standard end plates and flanges to be fitted to connect to items of equipment.

164 Joints must use the manufacturers standard internal connectors and in accordance with the manufacturer's recommendations.

165 Installations shall be in accordance with the appropriate conditions covering the installations of insulated conduit.

166 Separate protective conductors shall be installed in the trunking.

167 All joints and fabricated bends etc. in insulated trunking shall be made in a neat and workmanlike manner and all joints in trunking and trunking covers shall fit closely and be free from gaps. Additional fixings shall be provided to the building structure 50mm either side of the joint.

168 Joints in the lid and trunking must not be allowed to coincide.

169 Trunking shall only be installed in situations which will remain readily accessible throughout the life of the building. No cable trunking shall be installed behind a plastered ceiling or in other inaccessible situations.

170 The manufacturer's recommendations regarding the installation of insulated trunking must be adhered to at all times.

171 All conduit entries shall be made by means of purpose made bushes and couplings or adapters.

Cable Tray

172 Ensure that cable trays:

- Are manufactured from perforated steel pre-galvanised before manufacture to the applicable Standard bending and profiling quality.
- have return flanges and comprise of the following thickness: -

Up to & including 100mm wide	0.9mm
Up to & including 150mm wide	1.25mm
Up to & including 300mm wide	1.6mm
Above 300mm wide	4.0mm

- is to be galvanised for internal applications unless indicated elsewhere in the Specification;
- accessories to be installed must be of the same specification as the cable tray;
- have joints made using manufactured fishplates, shouldered ends and couplers with galvanised or zinc plated slotted domed head roofing bolts;
- flat bends and intersections must be of the gusseted type;

© Rand Associates Consultancy Services Ltd

- are supported by purpose made galvanised brackets at intervals not exceeding 1200mm and 230mm from all fittings and with a minimum 50mm clearance behind the cable tray;
- brackets must be securely fixed to the Property fabric using suitably sized masonry plugs and screws. The screws shall be zinc plated (electro galvanised) complying with the applicable Standards Class B coating and be no less than 32mm x No. 8 in size;
- are fixed to the galvanised brackets using zinc plated slotted domed head roofing bolts;
- must only be cut along a line of plain metal and all cut edges of galvanised cable tray shall be prepared and treated with a zinc rich paint, primer and top coat;.
- with holes cut in cable tray to allow cable to pass through are suitably bushed;
- the cables are fixed to the tray by means of proprietary form of plastic or copper cable clips, saddles, strips or ties. When installed in situations where high temperatures or humid conditions are likely to occur copper or brass saddles and clips shall be used;
- all saddles, clips, straps, etc., are fixed to the tray by means of brass screws or nuts and bolts;
- earth continuity maintained throughout the tray installation via the installation of bonding cables between lengths of the tray not directly connected in close proximity to each other;
- power and data cabling to be installed on separate cable trays;
- trays are adequately sized to support the cables without bunching. Support shall be by means of steel brackets, installed at intervals necessary to provide a rigid fixing, and ensure that no undue deflection occurs in the complete installation. The brackets shall be galvanised prior to fixing. Dome headed bolts, nuts and washers of finish suitable to the tray shall be used between tray and brackets;
- fixing to the fabric of the building shall be by means of expansion type masonry plugs or bolts. Fixings shall be galvanised unless otherwise stated;
- all routes must be chosen to allow ease of access to all cables when installed;
- suspension sets to comprise threaded M12 cadmium plated hanger rods, together with nuts and locking washers, vertical hanger brackets, support channel, tray hold-down clips etc. all of which shall have a galvanised finish;
- all cables shall be securely fixed to tray work and the complete installations must be carried out in a neat and workmanlike manner without crossovers. A 25% reserve margin in size and weight shall be allowed for all cable tray works;
- cables of 30mm diameter and above shall be fixed using the appropriate size cable cleat, as supplied by BICC Ltd or equal and approved type and manufacture;
- on multi-light duty cable runs, cable straps of plastic coated metal shall be used to secure cables; and
- bunching of cables does not occur.

173 Tray work shall be light duty Admiralty pattern for office ceiling voids supporting twin and earth type cables. Tray work shall be heavy duty for supporting PVC SWA PVC or XPLE SWA PVC type cables.

174 Tray work installed in exposed areas shall be galvanised finish to the applicable Standards: Section 2 dependent upon application.

Steel Conduit and Conduit Fittings

175 Ensure that all steel conduit and conduit accessories used throughout the installation:

- will be manufactured by comply with the requirements of the applicable Standard, the Specification for Steel Conduit & Fittings with Metric Threads of ISO Form for Electrical Installations, Steel Conduits, Bends & Couplers, Fittings & Components, together with all amendments;
- will be heavy gauge screwed and seam welded medium protection Class 2 for stove black enamelled type conduit and Class 4 hot dipped for galvanised type conduit;
- will not be less than 20mm diameter and will not exceed 32mm diameter unless specifically specified within this Specification or by written Instruction by the Client's Representative;
- have conduit accessories, i.e. fittings, adaptable boxes, saddles, etc., that match the type of conduit specified and will be of the same manufacturer;
- will be installed to comply with the requirements of the applicable Standards, Specification of General Requirements;
- Conduit screw threads will be of the ISO Form and will be cut by means of efficient sharp stocks and dies. Under no circumstances will broken or loose threads be accepted;
- that where practicable, all threads half the length of the appropriate standard straight coupler and no thread will be exposed, except at "running couplers". In these instances the exposed threads will be painted immediately after installation;

© Rand Associates Consultancy Services Ltd

- have threads are cleaned and free from oil prior to installation and all threads will be thoroughly clean and free from paint, enamel, dirt, grease, etc. All steel conduits will be free from rust patches and mechanical damage on delivery to site. The steel conduits will be stored in a dry and secured area to maintain an acceptable quality as previously specified; and
- have threads e cut "wet" with high conductivity graphite paste or metallic paste having a non-insulating binder;

Flexible Metallic Conduit

176 Flexible conduits shall comply with the Part 1 of the applicable Standard, flexible steel conduit and adapters for the protection of electrical cable. It shall be used for the final connection from a rigid conduit installation to the terminal boxes of all equipment provided with a means of positional adjustment and/or where vibration may reasonably be expected to occur.

177 Flexible conduits shall be PVC sheathed.

178 Flexible conduits shall be terminated using approved glands.

179 In all instances, a separate PVC insulated green and yellow coloured protective conductor, minimum size 4mm shall be installed at each end into purpose made earthing terminals.

180 Flexible conduits shall not be used externally to a building, where it would be exposed to the weather or in any position where ingress of moisture may occur.

181 Under no circumstances will flexible conduits be accepted in lieu of sets and bends in rigid conduit installations.

182 In normal circumstances, flexible conduit shall have a minimum un-stretched length of 300mm and a maximum un-stretched length of 800mm. It shall permit a full range of withdrawal, adjustment or movement of the equipment.

Circular Conduit Boxes

183 Ensure that applicable Standard circular boxes.
- will be manufactured from malleable iron with internal dimensions 60.3mm diameter x 28.5mm depth and cover fixing lugs at 50.8mm centres. Each box will be provided with a tapped hole in the base of the box for a M4 earth screw;
- will be fitted with a flat circular steel cover plate fixed by 2 No. round raised head M4 screws. Where the boxes are flush mounted, the cover plate will be of the overlapping type;
- where installed to external areas, moisture and semi-exposed situation each box will be provided with a rubber gasket sited between the outer ring of the box and the cover lid; and
- will be fixed to the building fabric by means of 2 No. round head screws of sufficient size and length to obtain a firm fixing into the Property structure with a minimum length of 32mm x No. 8 screws. The fixing screws will be zinc plated (electro-galvanised) complying with the applicable Standards Class B coating;

Adaptable Boxes

184 Ensure adaptable boxes:
- will be manufactured from heavy gauge rust proofed mild steel, fully welded seams and heavy gauge flat flanged lids. The width gauge will be as follows:-

Boxes up to 150mm x 150mm x 75mm:	14 gauge
Boxes up to 355mm x 354mm x 100mm:	12 gauge

- will be manufactured with plain sides necessitating drilling of holes on site; the use of knockout boxes is prohibited;
- Are installed to external, moisture and semi-exposed areas will be galvanised and provided with rubber gaskets situated between the outer face of the box and the lid;

© Rand Associates Consultancy Services Ltd

- will be fixed to the Property fabric by means of 4 No. round head screws of sufficient size and length to obtain a firm fixing into the Property structure with a minimum length of 32mm x No. 8 screws. The fixing screws will be zinc plated (electro-galvanised) complying with the applicable Standards Class B coating; and
- Are provided with earthed steel barriers where necessary to suitably segregate services.

Conduit Distance Saddles

185 Ensure that surface mounted steel conduit is rigidly secured to the Property structure with the use of heavy gauge distance saddles provided with 2 No. M4 metric roundhead brass screws securing the saddle clip to the base ensuring the conduit standards not less than 6mm clear from the building surface.

186 Ensure that distance saddles:
- will be fixed to the Property structure by means of 1 No. countersunk screws of sufficient size and length to obtain a firm fixing into the Property structure with a minimum length of 32mm x No. 8 screws. The fixing screws will be zinc plated (electro-galvanised) complying with the applicable Standards Class B coating. Distance saddles will be provided within 300mm either side of each steel conduit bend or set and at a maximum distance of 900mm between saddle centres for straight sections; and
- will be provide 300mm either side from the centre of any conduit box, accessories etc;

187 The Provider will carefully arrange the layout of the saddles to achieve an even workmanship and aesthetically pleasing appearance.

Conduit Spacer Bar Saddles

188 Ensure that surface mounted steel conduit will be rigidly secured to the Property structure with the use of heavy gauge spacer bar saddles provided with two No. M4 metric roundhead brass screws securing the saddle clip to the base.

189 Ensure that saddles:
- will be fixed to the Property structure by means of 1 No. countersunk screws of sufficient size and length to obtain a firm fixing into the Property structure with a minimum length of 32mm X No. 8 screws. The fixing screws will be zinc plated (electro-galvanised) complying with the applicable Standards Class B coating;
- will be provided within 300mm either side of each steel conduit bend or set and at a maximum distance of 900mm saddle centres for straight sections; and
- will be provide 300mm either side from the centre of any conduit box, accessories etc;

190 Carefully arrange the layout of the saddles to achieve an even layout.

Accessory Boxes for Steel Conduit Installations

191 Ensure that accessory box:
- will be manufactured from pre-coated galvanised steel to comply with the applicable Standard: Specification for boxes for the enclosure of electrical accessories;
- will be suitable for recessed mounting within the Property structure and will be provided with ample knockouts for conduit entry;
- will be provided with robust tapped accessory fixing lugs to accept M2.5 metric screws. One fixing lug will be adjustable to enable true alignment of the fixed accessory;
- Has a minimum depth of all accessory boxes will be 35mm unless as Instructed by the Client's Representative.
- will be fixed to the Property structure by means of a minimum of 2 No. roundhead screws of sufficient size and length to obtain a firm fixing into the Property structure with a minimum length of 32mm x No. 8 screws. The fixing screws will be zinc plated (electro-galvanised) complying with the applicable Standards Class B coating;

© Rand Associates Consultancy Services Ltd

- if recessed will finish flush with the finished surface (within practical limits). Under no circumstances may the accessory box finish proud of the finished surface; and
- will in the event that the final location of the front edge of the accessory box is 16mm or greater from the finished surface have an extension box installed to allow the accessory box to finish flush with the finished surface. The use of extension screws in these instances is prohibited;

PVC-u conduits and fittings

192 Ensure PVC-u conduits and fittings comply with the following:
- strength: heavy gauge super high impact;
- shape/colour: round, white or black, minimum size 20mm;
- jointing: watertight push fit and solvent welded;
- free from internal obstructions;
- fittings: standard;
- mounting/support: screw the conduit to surfaces using the conduit manufacturer's clips/saddles;
- use maximum practical straight lengths to minimise number of joints without signs of strain or kinking;
- use proprietary bends and/or junction boxes at changes of direction;
- do not use elbows, tees or site formed bends without the approval of the Client's Representative;
- secure the conduit system using zinc plate or aluminium finish metal boxes, plated screws and fibre/plastic plugs;
- fix boxes independently of the conduit;
- separate protective conductor to be installed terminating with a purpose made earthing terminal at the accessory; and
- form secure joints, using expansion couplings where recommended by the manufacturer and connectors at equipment and terminal fittings.

Insulated Conduit Systems

193 Insulated conduits to be heavy gauge, high impact and manufactured to comply with Part 1 of the applicable Standard, non-metallic conduits and fittings for electrical installations. All conduit boxes, couplings, draw-in boxes etc. shall be of the same manufacture and quality as the conduit.

194 No elbows, tees or inspection bends will be permitted.

195 During the course of the installation of the conduit system, procedures for working and dressing the installation as recommended by the manufacturers shall be employed.

196 All bends and sets shall be in accordance with applicable Standard: Requirements for Electrical Installations, formed with the aid of a helical spring fitted internally, with, if necessary, the conduit warmed sufficiently for it to move without deformation of the bore and without avoidable wall thinning on the outside of the bend.

197 Conduit systems shall be installed so as to ensure compliance with the requirements of applicable Standard: Requirements for Electrical Installations.

198 Insulated conduit shall be protected during storage and during installation by means of wooden plugs, plastic plugs or plastic caps to prevent the entrance of plaster or foreign matter. Protection shall also be afforded against mechanical damage.

199 Surface conduits shall be supported by spacer bar saddles, which shall be fixed at a maximum of 1 metre intervals, except for bends where saddles shall be positioned 200mm on either side of the bend. Conduits shall be free to slide within the saddles.

200 All saddles, tubes and boxes must be in perfect alignment to prevent warping, when the installation is complete. Concealed conduits shall be fixed by galvanised crampets. The top of the crampets must be at least 10mm below the finished surface in walls and 25mm in floors.

© Rand Associates Consultancy Services Ltd

201 Expansion couplings shall be installed where any length of conduit inclusive of draw-in boxes etc. exceeds 5 metres in length.

202 The minimum and maximum sizes of conduit to be employed shall be 20mm and 32mm diameter respectively, unless otherwise stated.

203 Where luminaires or other items of equipment are required to be supported from an insulated conduit system, the maximum weight supported shall be 3kg and the box or boxes shall be fitted with metal support lugs within each box.

204 Enclosed luminaires shall not be fixed directly beneath a conduit run, but shall be mounted on a heat resistant box, spurred off the main run.

205 The back plate of accessories shall be securely fixed and two saddles shall be fitted immediately adjacent on either side of the accessory.

206 Insulated conduit systems shall never be installed where the ambient local temperature is expected to exceed + 60°C or fall below -5°C. Where insulated conduit tube sections and fittings or accessories are required to be jointed, the manufacturer's proprietary jointing cement shall be used. The cement shall be applied to both surfaces and the tube fittings rotated to ensure complete coverage. The manufacturer's recommendations must be adhered to with regard to jointing procedures.

207 Where expansion joints occur, these shall be made with the manufacturer's purpose made 'tacky' watertight expansion jointing cement, to ensure adequate movement of the system during temperature changes.

208 Throughout the entire system of an insulated conduit scheme, a green and yellow coloured and insulated earth continuity conductor, shall be installed in accordance with applicable Standard: Requirements for Electrical Installations.

209 Cable capacities stated in applicable Standard: Requirements for Electrical Installations shall include the separate insulated earth wire.

210 Conduits in floors shall be routed and installed so as to avoid the fixings to floor standing equipment to be installed in the floors.

PVC-u surface cornice trunking system

211 Use PVC-u surface cornice trunking in conjunction with mini trunking for the mechanical protection of sub-mains cables and final circuit cables in accessible locations at ceiling level, where approved by the Client's Representative.

212 Ensure the trunking complies with the following:
- fittings: use the manufacturer's standard fittings;
- colour: white;
- mounting/support: secure to surfaces using plated screws and fibre/plastic plugs; and
- use proprietary units to form junctions and changes of direction wherever possible.

PVC-u surface mini-trunking system

213 Use PVC-u surface mini-trunking for the mechanical protection of final circuit cables in accessible locations.

214 Ensure the trunking complies with the following:
- high impact quality conforming to the requirements of the applicable Standard;
- is not installed where temperature falls below -5decgrees C or exceeds 60Degrees C;
- fittings: use the manufacturer's standard fittings;
- colour: white;

© Rand Associates Consultancy Services Ltd

- mounting/support: secure to surfaces using plated screws and fibre/plastic plugs; and
- use proprietary units to form junctions and changes of direction wherever possible.
- fixed at centres not exceeding 300mm by means of round head steel screws of sufficient size and length to obtain a firm fixing into the Property structure with a minimum size of 32mm x No. 8 screws.
- fixed not more than 32mm from each end, corner or accessory.
- any cutting of trunking will be neat, clean and square
- to be run between final positions of accessories, walls, ceilings, etc., and not terminate in mid run despite reduction in the number of cables. Where necessary high-level trunking will be extended in dummy lengths from the ends of cable runs to the next change of direction of wall and/or ceiling.
- to be run close to corners of the room, building structure, chimney breast corners, built-in corners, etc., and the general finish will be as unobtrusive as possible.
- where turns at right angle in the Property the junction will be made in an approved manner or a manufactured junction used, so that the turn is made without cutting the back of the trunking.
- is only to be run vertically or horizontally.
- will be cleaned using a mild detergent after final installation of all lids,.
- Where trunking runs are obstructed by picture rails small simple cornices, etc., the obstructions will be neatly cut to fit close to the sides of the trunking and, where necessary, the cut obstruction will be re-fixed. Where an item that cannot be cut obstructs the trunking, then the trunking will terminate either side of the obstruction and the cable recessed behind the obstruction.
- at all terminations purpose made adapters are to be used-switches, socket outlets, fused spur units, cooker control units, immersion heater (adaptable box), etc.
- at lighting points however a shallow moulded box will be used, together with a break joint ring made from white plastic, robustly constructed and provided with suitable cable entries and ample room for slack cable.
- Where cable runs pass through walls, a suitable length of size of PVC-u trunking or conduit will be run through the wall and be cemented into the base of the trunking on each side of the wall. No trunking or oval conduit will be visible when the installation is complete.
- will be spaced as far as practical from steam, water, gas or other services with a minimum clearance of 50mm between services. Where installed PVC-u miniature trunking are located in close proximity to other services, the trunking will be provided with a heat barrier and securely fixed to avoid contact.

The number of cables enclosed in PVC-u miniature trunking will not exceed the following: -				
Trunking Size	**1.5mm² T & E x L-LSF T&E**	**1.5mm2 XL-LSF**	**2.5mm² T&E**	**2.5mm2 XL-LSF**
16mm x 16mm	1	8	-	7
16mm x 25mm	2	14	1	11
16mm x 38mm / 40mm	3	24	2	19
25mm x 38mm / 40mm	4	42	4	33

Fire stopping of trunking/ducting

215 Seal trunking/ducting internally with firmly packed rock fibre or intumescent type Material supplied by the trunking/duct manufacturer.

© Rand Associates Consultancy Services Ltd

Cables generally

216 Ensure cables are BASEC certified. Use cables in the locations and for the uses specified in the table below:

Location/Use:	Cable Type:
General (includes central heating, ventilation and smoke detector systems)	PVC insulated and sheathed
Conduit system (complete)	PVC insulated and sheathed or PVC insulated only
Sub-mains distribution	PVC split concentric
Sub-mains distribution armoured and PVC sheathed	PVC insulated, PVC sheathed, steel wire
Fire alarm system	MICC with PVC sheath
Immersion heater (final connection)	EP rubber/HOFR sheath

217 Ensure that cables:
- are of the low smoke and fume (LSF) type with thermosetting insulation (XL);
- will have copper conductors, Unless otherwise specified;
- of less than 1.5mm² C.S.A. are not used;
- of solid core manufacture (unless flat 6242Y or 6243Y cables are being used),are not used
- are installed without joints;
- are not run through lighting fittings.

218 Cables shall be coloured as follows:-

Phase cables on single-phase circuits	
Phase cables on three phase circuits	Brown, Black, Grey corresponding to the phase to which it is connected
Neutral cables throughout	Blue
Low voltage cables	Brown
Circuit Protective Conductor	Green or Green/Yellow

219 Ensure that every coil of cable and flexible cord bears the maker's label firmly attached, containing the following information: -
- Name of manufacturer;
- Description of cable;
- Classification; and
- Length, size and grade;

Xl-LSF Single Core Cables

220 Ensure that XL-LSF single core cables:
- will be protected throughout their length by heavy gauge conduit mini trunking or steel trunking;
- will have copper stranded conductors and for normal conditions will be XL-LSF insulated; and
- will fully comply with the applicable Standard and will be of 600 / 1000V rating;

Flat Xl-LSF and Sheathed Cables

221 Ensure that cables:
- will be copper conducted XL-LSF insulated and sheathed, twin and earth or three core and earth conforming to the applicable Standard;
- have a cross-sectional area of less than 1.5mm² ;
- 2.5mm² XL-LSF insulated and sheathed cables will have circuit protective conductor with a cross-sectional area of not less than 1.5mm².

© Rand Associates Consultancy Services Ltd

Mineral Insulated Copper Conducted Cables

222 Ensure M.I.C.C. cables:

- are mineral insulated copper sheathed cables manufactured in accordance with the applicable Standards;
- will be light duty, rated at 600V, and may be used for fire alarms, general lighting and small power circuits.
- Will be heavy-duty cables, rated at 1000V, will be used for all other services.
- cable terminations will comply with the requirements of the applicable Standard and comprise ring type glands, screw on pot type seals, cold plastic compound suitably for temperatures up to 105°C, anchoring bends and neoprene sleeving. The Provider will terminate M.I.C.C. cables in an approved manner and procedure recommended by the cable manufacturer.

Xl-LSF Insulated And Sheathed Steel Wired Armoured Cables

223 Ensure XLPE/SWA/LSF cables:

- are PVC insulated and sheathed steel wired armoured cables.
- are to be of the 600/1000 volts grade, unless otherwise specified.
- have conductors comprising high conductivity copper wire (unless specified otherwise) insulated with PVC compounds, the cores laid up with PVC textile filler, PVC sheathed or textile bedded, armoured with a single layer of galvanised steel wire and PVC serviced overall.

224 Cores shall be identified as follows:

Twin core cable	One core brown and one core blue
Three core cable	One core brown, black and grey
Four core cable	One brown, black, grey and blue

PVC insulated and sheathed cables and PVC insulated split concentric cables

225 Colour code cables for identification.

Flexible Cables and Cords

226 Ensure flexible cords:

- in dwellings will be 300 volt grade single phase;
- in all other instances will be 300/500 volt grade single and three phase complying fully with the applicable Standard.
- have plain annealed copper strand for PVC cords conductors
- will be tinned annealed copper strand for elastomeric cords.
- will be insulated with PVC (HR), EPR or silicone rubber.

227 Cores will be laid up and the interstices filled where necessary with suitable filling for the working temperature of the cable and sheathed with PVC (HR), HOFR hypalon or CSP.

228 Flexible cables will be of circular type.

229 The cores of each flexible cable will be identified as follows:

NUMBER OF CORES	FUNCTION OF CORES	COLOUR(S) OF CORE
2	Phase Conductor	Brown
	Neutral Conductor	Blue
3	Phase Conductor	Brown
	Neutral Conductor	Blue
	Protective Conductor	Green & Yellow
4 or 5	Phase Conductor	Brown or Black
	Neutral Conductor	Blue
	Protective Conductor	Green & Yellow

© Rand Associates Consultancy Services Ltd

230 The weight supported by any flexible cord shall not exceed 3 kg for 0.75mm² or 5 kg for 1.5mm².

231 Where excessive temperatures may be encountered with the use of tungsten coiled lamps mounted within luminaires, PVC flexible cords shall conform to the applicable Standard.

Electrical accessories generally (wall mounted)

232 Ensure wall mounted accessories for the connection and control of power, lighting and low voltage equipment are:
- manufactured using white moulded plastic;
- complete with surface or flush type mounting box except where specified otherwise;
- from the same manufacturer in a single installation; and
- marked to show their function where they are a control switch for a immersion heater, a cooker, a refrigerator, a washing machine or a circulating pump.

233 Ensure metal boxes for flush mounting switches and sockets are manufactured from galvanised steel complete with an earth terminal.

234 Fix all boxes using brass screws, fibre or plastic plugs.

Electrical accessories generally (ceiling mounted)

235 Ensure ceiling mounted accessories for the connection and control of power, lighting and low voltage equipment:
- are manufactured using white moulded plastic;
- are complete with mounting box where required;
- are from the same manufacturer where used in a single installation;
- are fixed with brass or sheradised screws, with fibre or plastic plugs as required; and
- in conduit systems have a white insulated break-ring between the ceiling roses and cord switches and the respective terminal boxes.

Distribution Boards

236 Ensure distribution boards:
- are of the miniature circuit breaker type complying with the applicable Standards.
- have a fault withstand Classification of Class 1.
- Have each neutral bus-bar with an outgoing terminal for each circuit breaker type complying with the applicable Standards as appropriate with a degree of protection not less than IP2XC.
- Have each neutral bus-bar with an outgoing terminal for each neutral conductor connected to it. Connections to the neutral shall be arranged in the same order as the outgoing live circuit conductors.
- Bus-bars are to in the same position relative to their fuse carriers or MCBs for each pole.
- have a multi-terminal bar for the circuit protective conductors provided for both insulated and metal cased boards with one terminal for each outgoing circuit. It shall be directly connected to the earthing terminal without depending on the exposed conductive parts of the enclosure.
- Identify each fuse-way and MCB way by way of numbering. Identification on the neutral bus-bar and protective conductor shall clearly relate each terminal to its respective fuse-way or MCB way.
- 20% spare ways shall be provided. Where specific ratings are indicated, fuses or MCBs shall be incorporated, otherwise the ways shall be left blank but suitable for future additions.
- are to include an integral, suitably rated switch.
- phase barriers are also to be fitted as necessary
- cases shall be constructed of heavy gauge sheet steel in such a manner as to afford rigidity and maximum ease of wiring for full size circuit and main cables. Stove enamelled inside and out, the exterior being finished in grey or silver enamel, applied after two coats of rust proofing.
- components shall not be manufactured from zinc alloy in conjunction with sheet steel where they are relied upon for earth continuity.

© Rand Associates Consultancy Services Ltd

- have lockable, cylinder type locks with two keys per lock. All locked distribution boards shall be operated by a master key, handed to the Client upon completion of the Contract.
- cases shall be provided with detachable cable/conduit terminating plates, which shall be reversible and interchangeable from top to bottom.
- all screws and nuts used in the construction of the case shall be fitted with shakeproof washers and care taken to ensure efficient earth continuity.
- stove enamelled inside and out, the exterior being finished in grey or silver enamel, applied after two coats of rust proofing.
- MCB blanks are to be fitted to frames with robust locking plates provided to secure the frame rigidly in the fixed positions. The blanks shall be so spaced to obviate the necessity for insulating barriers, but protection shall be provided by means of insulating shields to prevent accidental contact with the main bus-bars and incoming main cable.
- bus-bars shall be of a high conductivity, hard drawn copper conductors, connected to the MCB contacts by means of spring washered screws or bolts, unless plug in type MCB's are specified.
- a main integral isolating switch is to be provided, it shall be arranged to isolate incoming live and neutral main cables from the bus-bars. The isolator switch shall be rated at 500 volts and of the quick 'make or break' pattern, with positive action. Incoming and outgoing terminals shall be fitted with two clamping screws, and outgoing conductors to the bus-bars shall be high conductivity hard drawn copper.
- isolating switches shall comply with applicable Standard: Requirement s for Electrical Installations and shall be capable of carrying their full rated load continuously and shall 'make or break' their full rated load without undue burning of the contacts.
- the isolating distances between contacts when in the open position, shall not be less than those specified for isolators in the applicable Standards.

Fused Distribution Boards

237 In addition ensure fused distribution boards:

- are 500 volt rating to Part 11 of the applicable Standard.
- fuse carriers and bases are manufactured from high quality vitreous porcelain or phenolic moulded construction. Fuse contacts shall be designed to give adequate and even pressure between the base contacts and carrier clips, by means of phosphor bronze springs and shall be of such cross section as to be capable of carrying the full load rating continuously without undue temperature rise.
- Fuse-banks are to be fitted to detachable frames with robust locking plates, provided to secure the frame rigidly in the fixed position.
- Fuse-banks are to be spaced as to obviate the necessity for insulating barriers, but protection shall be provided by means of insulating shields to prevent accidental contact with the main bus-bars and connections.
- all fuses in lighting and heating circuits shall be of the HRC cartridge type, ASTA certified for compliance with the applicable Standard Category of Duty 440V AC 5 Class Q1.

Fused Switch, Switch Fuses, Switches and Fused Units

238 Ensure fused switches, switch fuses etc:

- comply with the applicable Standard and shall be 500-volt type and installed where specified and as detailed on the distribution diagram.
- provided with suitable locks for padlocking the switches in the 'off' position. The cover shall be interlocked with the operating mechanism to prevent it from being opened in the 'on' position. This interlocking shall also prevent the switch from being closed with the cover open, unless the mechanism is operated by an authorised person for examination and maintenance purposes. The cover shall be gasketed to prevent ingress of dust.
- switch action mechanism shall be of the parallel operation (double break type, having cartridge fuses mounted on an insulated bar forming the plate assembly for fused switches) and shall be ASTA certified to adequately meet all required duties specified.

© Rand Associates Consultancy Services Ltd

- the operating mechanism of the quick 'make and break' pattern, to be controlled by powerful springs which shall be in tension only during the operation of the switch. The blades shall enter clips of heavy gauge copper, shrouded with insulated shields which also protect the cable terminals. All current carrying components shall be electro-tinned, and ferrous parts shall be rust proofed.
- glanding plates are to be removable for drilling for conduit or cable entry, and shall be fitted with additional distance pieces where necessary.

239 Fuses for fused-switch units and switch fuses:

- all fuses in switchgear shall be HRC, sized and specified as detailed on the drawings for the fused-switch units or switch-fuses etc., in which they are incorporated unless different ratings are shown on the drawings. ASTA certified for compliance with the applicable Standards Category of Duty 400V AC 5 Class Q1.
- fuse links to be selected to provide correct circuit discrimination. Fuses 'backing-up' MCB's or MCCB's shall have their characteristics closely matched to avoid overload and short circuit operation of the fuse within the capacity of the circuit breakers, but ensuring that the maximum short circuit capacity of the circuit breaker is within the protection afforded by the fuse.

Miniature Circuit Breakers (MCBS)

240 Ensure that Miniature circuit breakers (MCBs):

- are complete with suitable voltage and ratings selected in accordance with the size of sub-circuit wiring in accordance with applicable Standard: Requirements for Electrical Installations.
- are either single or triple pole and comply with the applicable Standard.
- have a minimum rated breaking capacity of M6.
- Combined with RCCB (Residual Current Circuit Breaker) with over current protection (RCCBO) comply with the applicable Standard.
- with RCBO units have type C characteristics and set at 30MA tripping sensitivity.

Moulded Case Circuit Breakers (MCCBs)

241 Ensure that moulded case circuit breakers:

- comply with the applicable Standard.
- have the voltage and current ratings, rated duty, rated short circuit breaking capacity and rated short time to withstand current as required in accordance with applicable Standard: Requirements for Electrical Installations..
- are the independent, manual closing air breaker type, rated for an uninterrupted duty unless otherwise indicated.
- provided with if required auxiliary facilities including power closing and under voltage releases shall be provided only where indicated.
- have a facility for padlocking in the 'OFF' position.

Fuses

242 Ensure fuses:

- the type and current rating of fuses required and/or indicated.
- with cartridge links to a standard and quality approved by the Client's Representative.
- With motor circuit links are used only where indicated or where necessary.
- carriers, bases and associated parts are to be to a standard and quality approved by the Client's Representative.

© Rand Associates Consultancy Services Ltd

Air Circuit Breakers (ACBs)

243 Ensure air break switches;
- comply with the applicable Standard.
- have uninterrupted duty, a mechanical endurance not less than those set out in the relevant table(s) of the applicable Standard, and utilisation category of AC-22 or AC-23 as indicated.
- meet the requirements of switch-disconnectors.
- have a facility for padlocking in the 'OFF' position.

Contactors:

244 Ensure contactors:
- comply with the applicable Standards.
- are air-break type and have the voltage and current ratings, type of duty, utilisation category and electrical endurance as required.
- are electromagnetic, suitable for the control arrangements as required. Operating coils shall be suitable for D.C. and a rectifier shall be incorporated for A.C. control circuits, protected by low current cartridge fuses.
- That Latch-in contactors are provided only where indicated.

Consumer unit

245 Ensure consumer units:
- have a surface insulated pattern enclosure complete with lid;
- have a main switch of 80/100 amp DP rating;
- are fitted with miniature circuit breakers to; the applicable Standard; and
- have each way permanently labelled to identify the circuit and rating.

Residual current device/residual current circuit device (RCD/RCCD)

246 Ensure RCDs and RCCDs:
- function as both isolators and switches;
- have a current rating of 80 amp DP;
- have a sensitivity of 30m amp; and
- are complete with an insulated cover or terminal shrouds.

Residual current circuit breaker (RCCB)

247 Ensure RCCBs:
- function as both isolators and switches;
- have a current rating of 63 amp DP;
- have a sensitivity of 30mA; and
- have a white PVC-u enclosure.

Residual current circuit breaker with override protection (RCBO)

248 Ensure RCBOs:
- function as both isolators and switches;
- have a current rating of 32 amp SP;
- have a sensitivity of 30mA;
- are complete with an insulated cover or terminal shrouds; and
- conform to the applicable Standard.

ISCO connectors

249 For ISCO connectors ensure:
- the covers and bases are manufactured from black phenolic resin material; and
- the connector blocks are manufactured from brass with electro-tin finish.

© Rand Associates Consultancy Services Ltd

Door bells

250 Ensure door bells:
- are battery operated 6V DC;
- have a white PVC-u cover; and
- are screw fixed.

Bulkhead light fitting (tungsten) (metal base)

251 Ensure metal base bulkhead light fittings:
- have a corrosion resistant die-cast or pressed metal base complete with a vandal resistant diffuser;
- have the wiring within the fitting protected by heat resistant sleeving;
- are installed complete with a 16W 2D or 28W 2D lamp; and
- are screw fixed.

Bulkhead light fittings (tungsten) (polycarbonate base)

252 Ensure polycarbonate base bulkhead light fittings:
- have a heavy duty polycarbonate base with a vandal resistant diffuser;
- have the wiring within the fitting protected by heat resistant sleeving;
- are installed complete with a 16W 2D or 28W 2D lamp; and
- are screw fixed.

Photocell sensor

253 Ensure sensors to control the landlord's lighting installation are:
- complete with a baseholder and wall mounting bracket;
- screw fixed to masonry or concrete; and
- fixed in a position approved by the Client's Representative.

TV aerial installation

254 Ensure TV aerial installations:
- consist of 20mm diameter conduit complete with co-axial cabling run from roof level; and
- terminate at a white plastic surface mounted outlet box complete with a white plastic cover plate with single co-axial TV outlet.

Time switch (24 hour)

255 Ensure time switches:
- have a 24 hour and quartz control mechanism;
- are a 20 amp single pole, single throw time switch; and
- have 2 'on' and 2 'off' programmes with a day omitting device and independent motor connections.

Smoke detectors

256 Ensure smoke detectors:
- have white PVC-u for the housing;
- include a photoelectronic sensor;
- are 240 V mains operated with 9 V zinc carbon battery backup; and
- include a full function test switch, automatic reset and low battery warning signal.

© Rand Associates Consultancy Services Ltd

Heat detectors

257 Ensure heat detectors:
- have white PVC-u housing;
- comprise a fixed temperature fast response thermistor sensor with a range of 54° – 62° centigrade;
- are 240V mains operated with 10 year rechargeable lithium cell backup; and
- include or have a test button and low power cell warning signal with both separate mains and battery warning LEDS.

Carbon monoxide detectors

258 Ensure carbon monoxide detectors:
- have white PVC-u housing;
- incorporate an electrochemical cell sensor module;
- are 240V mains operated;
- include an automatic self diagnosis test/hush buttons;
- have a pre-alarm warning LED;
- include LEDS for power, CO2 level and fault status; and
- have a CO2 gas test feature.

Fixing electrical accessories/equipment

259 Position accessories accurately and squarely to the vertical and horizontal axes. Where not shown otherwise, align adjacent accessories on the same vertical or horizontal axis (as appropriate). Agree the mounting heights with the Client's Representative.

Multi-gang switches

260 Connect switches so that there is a logical relationship with the lights.

Lighting Switches

261 Ensure lighting switches:
- comply with the manufacture, rating and type as specified;
- comply to the applicable Standard and, unless otherwise specified, have white insulated face-plates;
- are capable of switching the full rated inductive or resistive load, and were connected to fluorescent loads in excess of 600 watts, use 15 amp rating;
- ceiling type switches are of the applicable Standard insulated pattern finished white with single cord operation and mounted on matching insulated pattress, as required;
- are installed with boxes of 37mm minimum depth with adjustable lugs to ensure switch-plates are true and square; Fit boxes flush with wall finish and make any adjustment to depth with extension rings;
- have suitable boxes as specified for the wiring system used and complete with CPC terminal;
- use a multi-ganged switch box to accommodate all switches on a common faceplate, where several switches of the same phase are required in the same position;
- where specified for Class 4 installation in situations exposed to weather, or continual dampness, ensure they are of the weatherproof pattern the applicable Standard (IP65) with approved gaskets;
- where different phases are present at one switch location, segregate each phase in a separate compartment and cover each compartment by its own internal warning plate suitably engraved; "WARNING 415 VOLT PRESENCE"; and
- are mounted adjacent the closing style of doors where possible;

© Rand Associates Consultancy Services Ltd

Socket Outlets

262 Ensure socket outlets:

- are to applicable Standards switched and shuttered and mounted in single or multi-gang assemblies, and are of the type and rating as specified;
- unless otherwise specified in the particular specification provide, matching plug tops for 50% of the number of outlets installed and supplied with fuses;
- have plug tops with fuses complying with the applicable Standard of the correct rating for the appliance to which they are connected;
- are complete with boxes not less than 35mm deep and having a suitably mounted brass protective conductor terminal;
- cover plates are of white insulted to match the switches, overlapping for flush installations and of the same size as to the side of the boxes for surface installations;
- earth pin of each socket is connected to the box earth terminal with a green/yellow insulated protective conductor; Do not use cover screws for earth continuity;
- use indicating pattern outlets for appliances with a heating element;
- In Class 4 Protection Areas, where installed in exterior locations, or in areas of continual dampness, ensure outlets weatherproof pattern are of the applicable Standard (IP65) with watertight caps and approved gaskets. Supply suitable plug tops for each outlet.

Fused Connection Units

263 Ensure fused connection units:

- are to the applicable Standard double-pole switched to unswitched insulated patterns with plates to match the socket outlets;
- where used as a flexible outlet for an appliance, ensure they are of the flexible outlet pattern with cable anchoring clamp;
- the fuse types and spares required are as defined for socket outlets;

Lamp-holders

264 Ensure lamp-holders:

- are heat resisting and comply with the applicable Standards where appropriate and, in the case of tungsten luminaires, are also suitable for the following lamp sizes/cap types:-

Up to and including:- 50 watts	Bayonet Cap
200 watts	Edison Screw Cap
300 watts and over	Giant Edison Screw Cap

- have ceramic interiors for screw type lamps and when used in Class 4 areas;
- have brass with ceramic interiors when integral with luminaires;
- have white plastic with compression cord grip with flexible pendants, skirted or shrouded;
- batten lamp holders are white heat resistant and skirted;
- metal lamp holders are effectively earthed using an earth terminal fixed to the lamp holder by the manufacturer;

Ceiling Roses

265 Provide these for all lighting points with a luminaire suspended by a flexible cable without an integral mounting;

266 Ensure ceiling roses conform to the applicable Standard of the white insulated pattern incorporating 2, 3, or 4 terminals, as necessary; Incorporate cord grips;

267 Where installed in concealed installations as a backing plate, use a white break joint ring;

© Rand Associates Consultancy Services Ltd

Lamps

268 Supply and fix complete, ensuring they are of the appropriate type, correct voltage, the specified wattage and of the correct length and colour rendering all as detailed the particular specification, and the schedules/drawings;

269 Ensure all lamps are new at handover, allowing reasonable time for testing etc; Do not use them for temporary lighting for Property purposes; "Break-in" fluorescent lamps used on dimming circuits for at least forty hours;

270 Ensure lamps shall comply with the applicable Standards as appropriate;

Shaver Sockets

271 Install shaver sockets in accordance with applicable Standard: Requirements for Electrical Installations. fed from a local lighting circuit, and ensure they are manufactured in accordance with the applicable Standard;

Cooker Control Units

272 Ensure cooker control units:
- are manufactured to the applicable Standard, and are complete with a 45 amp D;P; switch and a 13 amp switched socket outlet, both with neon indicating lamps;
- are mounted alongside the cooker, not directly behind or above;
- final connections are via a fixed cable outlet unit as the applicable Standard and mount directly behind the cooker;

Fused Clock Connectors

273 Install fused clock connectors for all mains voltage clock points; Ensure connectors and are of the fused plug and socket type, complete appropriately with suitably sized flexible cable for final connections;

274 Connect clock connections to the 'local' lighting circuit feed unless otherwise Instructed;

Control Switches

275 Ensure double pole and triple pole and neutral control switches:
- are in accordance with the applicable Standards and are suited as other accessories defined in the particular specification;
- is of the surface or flush pattern as appropriate and install with suitable metal box and fly-lead;
- are complete with pilot lamp and where instructed engraved with red lettering identifying the equipment being controlled;
- if cable outlet plates are required for final connections to equipment, suit these to other accessories and complete with terminals, cable clamp metal boxes (surface or flush as appropriate) and ensure manufacture is in accordance with the applicable Standard;

Power Factor Correction Equipment

276 Install automatic power factor correction equipment in the locations defined, contained within appropriate enclosures and of the ratings as instructed; Unless otherwise stated, Design each assembly of equipment to automatically maintain a corrected power factor of 0;91 minimum over a range of full load KVA of 20% - 100% and an uncorrected load power factor of 0;85 minimum in the circuits to which it is connected; Ensure the equipment consists of the following items:-
- Unit capacitors each of suitable rating and contained in a sheet steel vacuum sealed enclosure complete with appropriate fixings, cable or conduit entries and terminations; Ensure the total KVA requirement consists of an appropriate assembly and interconnection of the required number of such units;
- Capacitors suitable for operation of a 415 V, 3 phase, 50Hz supply in the ambient conditions specified;

© Rand Associates Consultancy Services Ltd

- Capacitors impregnated with high permittivity chlorinated diphenyl, non-flammable compound and capable of maintaining the KVAr output within the tolerances of 0% to +10% of their stated nominal rating;
- Capacitors fitted with an automatic discharge device to achieve full discharge within one minute after disconnection;
- A KVAr sensitive relay complete with any necessary current transformers and appropriate setting adjustments to suit the application and arranged to operate through a contactor(s) to automatically switch unit capacitors in and out as required to maintain the specified final power factor;
- Each unit capacitor protected by an HRC fuse and connected via an isolator/fuse switch as the case may be;
- Isolators and fuses for use on capacitor circuits by 33 1/3%; Air circuit breakers and contactors for use on capacitor circuits de-rated by 20%;
- Unless otherwise instructed ensure power factor equipment is automatically disconnected prior to the operation of standby generator(s);

Unit Type Switchboards

277 Ensure the unit type switchboard:

- consist of switchgear units and fuse-gear as instructed, together with all matching cable boxes, terminations, conduits and wiring interconnections, and are as the applicable Standards, as detailed in the particular specification; The relevant sections of the applicable Standards also apply;
- mounts all switchgear and fuse-gear on an angle iron framework within the dimensions of the space shown in the drawings;
- where sited over formed floor trenches then include for all necessary support steelwork to span trenches and also provide all floor/wall rawl-bolt fixings that are recommended by the manufacturer;
- has a busbar chamber supplied and fixed the whole length of the switchboard and is readily extendable. Busbars are to have suitable copper bars and be of the minimum rating of the amin incoming switch, provide suitable colour coding on both the busbar and on the chamber cover;
- connections between bus bars and respective switchgear and distribution gear are by copper bars, rods or copper cables suitably fixed with clamps and bolts;
- mount suitable cable trunking and a matching steel cabinet on the frame to accommodate metering, CT's and other equipment of the local Electricity Board;
- instrumentation is as instructed;
- is complete with Protective Conductors bonding all components as set out in applicable Standard: Requirements for Electrical Installations.; Also provide a main earth terminal;
- has no through wiring;
- to be from one manufacturers equipment and painted in one colour;

Cubicle Type Switchboards

278 Construct cubicle type switchboards in accordance with the applicable Standard and have fully shrouded busbars (in accordance with the appropriate applicable Standards) and accommodate the switchgear instructed;

279 Ensure cubicle type switchboards:

- are manufactured with a minimum thickness of 16 gauge zintex-coated braced sheet steel finished with light grey epoxy-based paint on all surfaces and support frames etc; and protected to minimum IP 31;
- to be fully fault rated to a minimum level of 30kA for one second duration; Forward to the Client's Representative the appropriate panel test certificates;
- have flush mounted equipment and all maintenance, cabling and replacement, from the front unless otherwise instructed;
- panels are supplied complete with the required quantities of ACB's, MCCB's and fuse switch units as instructed including the appropriate quantities/types of HRC fuse links;
- are fitted with 100mm high metal plinth to all cubicle panel bases;

© Rand Associates Consultancy Services Ltd

- panels to be readily extendable and include spare panels as detailed in the particular specification to accommodate the metering equipment etc., for the Electricity Board and where specified house the appropriate power factor correction equipment/switchgear; Also include spare panels for switchgear as instructed;
- to be provided with panel sections with removable eye bolts in each corner for lifting purposes;
- connection between busbars and all switchgear by means of copper bar/rod as the case may be, this will be dependent on fault rating and so, segregate the panel so that the maintenance on one item will not entail a shut-down on others;
- main busbars, dropper bars and interconnections to each item of switchgear are constructed in accordance with the relevant part of the applicable Standard, using solid drawn copper bars, complying with the applicable Standard and fit with suitably shrouded covers for external cable connections;
- busbars are to be enclosed in an earthed metal chamber within the panel; ensure a removable metal cover provides an earthed barrier between the operator and the live connections;
- busbars are to have a minimum current rating of that of the switchgear controlling the incoming supply to the panel;
- all penetrations of live busbars into outgoing circuit compartments or cables chambers are to be fully shrouded to prevent accidental contact, and labelled accordingly;
- each panel is to be complete with a suitably sized earth bar installed throughout the full length of the panel and fix directly to the steel framework; Provide this earth bar with appropriate bonding connections to each item of switchgear, all cable plates and the necessary connections for TNS earthing configuration;
- panel is to be delivered to site in sectionalised form for ease of installation or delivery, off loading etc., allow in the tender for the cost of the manufacturer to retest the panel on site including the reconnection of the panel sections, bar etc; Connect the individual sections of the earth bar together by approved means with copper straps of the same cross sectional area and shape in order to provide continuity and total integrity throughout the panel;
- Control all outgoing circuits by means of fuse switches MCB's or ACB's as defined on the drawings or in the particular specification and comply fully with the applicable Standard; To permit the renewal of fuses, fully isolate the fuse carrier assemblies of fuse switches in the OFF positions , so that there is no risk of shock; Also fit MCCB's with locks in the OFF position;
- all fuse switches have double break, silver or electro-tinned contacts, safety interlocks, ON/OFF indication and are suitable for padlocking in the OFF position; (Maximum 30kA fault level);
- the RCB's and MCCB's installed in the LV panels comply in every respect with the applicable Standard:
- all ACB's are of the withdrawable pattern complete with control/switching devices, interlocks, locks etc., and safety shutters which completely shroud the main fixed isolating contacts automatically when the breaker section is withdrawn;
- operating handles for switchgear are of the rotary, toggle or retractable types as the case may be; Ensure switchgear has short-circuit ratings suitable for the distribution network requirements and is manufactured such that the cover cannot be removed while the switch is in the ON position;
- that the manufacturers indicate on all fuse switches the characteristics (current rating, breaking capacity, cut off current and energy let through) of the fuses with which the fuse switch unit has been tested in combination;
- fuse switch units fitted with solid copper links both appropriately rated may be used as isolators for circuits up to 1600A; (Maximum 30kA fault level);
- fuses shall be rated for AC duty, and have a category of duties 550V AC 80kA Class Q1 and comply with the applicable Standard;
- all cable tails for the Electricity Board cut-outs complete with suitable fixings or trunking enclosure as defined on the drawings;
- supply and fit labels to all switchgear, cable chamber covers and busbar covers with the appropriate designations or warning notices as necessary; Issue label schedules to the Client's Representative for their agreement of designation;

© Rand Associates Consultancy Services Ltd

Current Transformers and Instruments

280 Ensure that current transformers (CT's):

- comply fully with the applicable Standards and unless otherwise stated have 5 Amp secondary; Ensure the rated VA output is suitable for the type and magnitude of the connected burden;
- for metering and control purposes are of accuracy Class 3 minimum;
- for protection purposes are of Class P5, P10 or X dependent upon the protection scheme;
- the accuracy limit factor for P5 and P10 Ct's is appropriate for the protection scheme and greater than the highest available setting of any instantaneous element;
- 'knee' point voltage of Class C CT's is sufficient for correct operation for the protection scheme and can maintain stability for 'through fault' conditions;
- are of the 'bar' primary type unless otherwise approved by the Client's Representative; Where sets of CT's are required then match them;
- terminate all connections from secondary windings at terminals integral with or adjacent to the CT's; Lace secondary windings and arrange to prevent contact with the 'main' circuit; Earth one terminal of the CT secondary circuit;
- isolating contacts in circuits between CT's and protective devices are not desirable; However, if the manufacturers require these, then obtain the Client's Representative's written agreement; Note the removal of a protection relay from its case will 'short circuit' the connected CT;
- provide all protection relays with facilities for testing by 'secondary injection'; In the event that this facility is not afforded then provide a CT with a test winding, with terminals brought out to a suitable position to allow testing; Arrange a test winding such that injection of 10 Amp represents the full load current in the main circuit;

Metering

281 Ensure all meters:

- indicating instruments are an approved manufacture and size in conformity with the applicable Standard; Ensure the markings on the dials include the scale markings and the instrument transformer ratio; the manufacturers name and applicable Standard grading may be included in a position on the dial reading; Provide approved means for zero adjustment without dismantling the instrument; Ensure the minimum dial width is 72mm;
- are flush-mounted instruments;
- are Back-connected instruments with metal cases and earth;
- are of metric dimensions, have metric fixings and have a minimum terminal size of M4;
- where ammeters are specified ensure, they are of the moving iron type and scaled so that the full load indication is at the min-point of the scale; Ensure the minimum reading under no circumstances is more than 10% of the full load; Connect ammeters, preferably of the long scale type (240 degrees), in the yellow phase unless a selector switch is specified;
- selector switches for ammeters are to be of the 5-position type including OFF position to give the current values in each phase and in the neutral conductor;
- Scale voltmeters so that the normal reading, which is marked with a red line, appears on 2/3 full scale defection; Complete with selector switches where specified;
- connect voltmeters having HRC fuses to the local busbars via double insulated cables, wiring from fuses to meters may be with single insulated cables; Enclose fuses within the respective panel compartment;
- the location and general arrangement of meters is subject to the Client's Representative's approval before manufacture commences;
- fit all incoming supply compartments with voltmeters and ammeters both with selector switches. This requirement also applies to alternative incoming supply compartments;
- fit all outgoing circuits of 400A and above with ammeters and selector switches as described unless otherwise specified in the particular specification; and
- where KWh/MD meters are requested in the following section these comply with the applicable Standard;

© Rand Associates Consultancy Services Ltd

WORKMANSHIP

Installation generally

301 Install, test and commission the electrical work in accordance with the applicable Standard: Requirements for Electrical Installations. and the Design and performance requirements set out in this Section so as to provide a safe, well insulated, earth protected system capable of supplying the anticipated maximum demand.

302 Ensure all installation Works are carried out by qualified electricians fully conversant with the applicable Standard: Requirements for Electrical Installations.

303 Do not allow the number of Apprentices and Trainees at a Property to exceed the number of qualified electricians.

304 Ensure all installation Works are carried out under the direct supervision of a "Qualifying Manager" named in the List of Approved Providers issued by the National Inspection Council for Electrical Installation Contracting (or equivalent).

305 Use only the types of fastenings, bushes, glands, terminals, connectors, clips, clamps and all other minor accessories necessary to complete the installation that are recommended by the manufacturer of the electrical equipment being installed.

306 Avoid contact between dissimilar metals. Use corrosion resistant fastenings in locations where moisture is present or may occur.

307 Rectify, free of charge to the Contract, any Work which in the opinion of the Client's Representative has not been properly executed and must replace free of charge to the Contract any Materials or goods which do not comply with the Specification.

308 Confirm the voltage and frequency of the supply before ordering any equipment. This will normally be 240v a.c. 50 Hz single phase.

309 Must include in his tender for the provision of all fixings and the making good by qualified tradesmen to the satisfaction of the Client's Representative all damage to walls, ceilings, decorations and fitments.

310 Dust sheets are to be used and every consideration given to Customer's property and communal areas.

311 After Work is completed each day all systems will be left in a safe usable condition and all dust and mess cleared up.

Distribution charts - labelling of equipment

312 Fix circuit charts securely to the inside of each item of distribution equipment, clearly indicating the circuits protected, fuse and MCB ratings and the size and type required.

Electricity supply

313 Note that the electricity supply is nominally 240 volt, single phase, 50 hertz, 2 wire.

© Rand Associates Consultancy Services Ltd

Installation of Cabling - General

314 Ensure that:

- All cables used in the installation shall be based certified;
- The cables and seals will be intact when delivered on site; No coil, cable or flexible cord manufactured more than one year prior to delivery on the site shall be used in the installation;
- Before wiring the conduit/trunking enclosure shall be complete, free of dirt, water and condensation;
- Where cables are concealed in flush conduits the cables will be installed easily via draw boxes so that the cables can be withdrawn or rewired without disturbance to the Property fabric;
- Cables will always be so bunched that cables of all phases and neutral are drawn into the same conduit;
- The conduit cable capacities will be strictly adhered to;
- All cables shall be installed in strict accordance with applicable Standard: Requirements for Electrical Installations.
- The installation of cables shall not commence until the Property is sufficiently enclosed to ensure permanently dry conditions;
- Cables shall be adequately protected at all times during the Contract Period against accidental damage, adverse environmental conditions, mechanical stress and deleterious substances;
- Cables shall be installed neatly and securely without joints other that at equipment and terminal fittings;
- Junction boxes shall not be used without approval from the Client's Representative;
- No reduction of cable strands forming the conductor shall be allowed at switch or other terminals;
- All strands shall be efficiently secured by screws, nuts and washers or other approved means;
- During installation no cable shall be bent to a radius smaller than the minimum recommended by the manufacturer;
- Wiring will be carried out on a "loop-in, loop-out" system with all cables terminating directly within main switches, distribution boards, etc;, socket outlets, luminaires and switches only; Joints made within junction boxes and the use of through joints will not be permitted;
- Cables will be concealed as far as possible in accessible roof spaces and under floors, where they will be run parallel, or at right angles to all joists, etc;
- Cables in the roof void will be secured to the sides of the joist by means of plastic cable clips at not more than 250mm centres and will be secured to battens when running across the joist;
- All cables will be installed not less than 100mm clear of any gas, heating, hot water or steam pipes, radiators or other heated fittings, except where the pipe or fittings are effectively insulated and, in this instance, a 10mm air gap will be provided between the insulation and the cables;

315 **Flat Xl-LSF and Sheathed Cables**

- All cables will be dressed flat; will be free from twists, kinks and mechanical strain;
- Cables shall be installed to satisfy the requirements of applicable Standard: Requirements for Electrical Installations. and the Building Regulations;
- The conduit shall run from a position inside the accessory box and will extend into the floor or roof space for at least 50mm;
- The conduit will terminate in the accessory box by means of a PVC-u adapter and screwed male bush;
- PVC-u adapters / accessories for non-metallic conduits;
- The ends of the conduits will be finished so as to prevent abrasion of the cable installation when cables are being drawn into or out of conduits or connected to apparatus;
- Cables passing through walls or concrete floors will be enclosed in PVC-u conduits;
- Where it is not possible to conceal the cables in walls, etc., they will be installed on the surface, but in these instances, surface mounted conduits or mini trunking will protect them;
- Cables terminating at ceiling switches or luminaire points will terminate within a standard besa box complete with fixed earth terminal and 51mm fixing centres, complying with the applicable Standard;
- Where standard besa boxes are installed within plaster ceiling they will be securely fixed to wooden noggins provided and installed by the Provider a sufficient height above the ceiling to permit the face of the box to be flush with the finished ceiling surface;
- Where wall or ceiling mounted luminaires and ceiling mounted switches are installed the fixed wiring will terminate directly into the accessory terminals.

© Rand Associates Consultancy Services Ltd

System of wiring

316 For concealed wiring, use PVC sheathed 600/1000 volt grade cable of the size and type specified. Wherever possible, run it in inter-floor spaces, roof and ceiling voids.

317 Run cables along the sides of joists at the mid-point. Clip them at 450mm centres using cable clips of tinned brass secured by nonferrous fixing pins, screws, clips or a similar fixing. Support the wire and equipment located between the joists by a wood bearer of a size of at least 100x25mm.

318 Install the cable:
- with a minimum clearance of 150mm to all heating, gas and waste pipes or ducts; and
- physically separated from other wiring not associated with lighting and power supplies.

319 Ensure cables leaving or crossing joists do so at right angles to the longitudinal side of the joist, on trusses or binders. Do not notch or saw joints. Ensure that cables do not run in positions where they are susceptible to damage by floor nails.

320 Do not run cables in roof spaces on the top of joists or near water tanks, etc., since in this position they are susceptible to damage.

321 Install cables leaving roof voids and interfloor spaces or passing through any part of the structure in conduit or trunking as specified.

322 Ensure cables in solid floor that are either laid in screed or in a ceiling void are drawn in through rigid PVC-u conduit as specified and run continuously from the consumer unit to the outlet served.

323 Do not install cables within wall cavities.

324 Contain all wiring to each flat within that flat.

325 Fit conduits complete and then draw the cable through.

Cables installed in plastered walls

326 Protect cables by rigid PVC-u metric super high impact heavy gauge conduit where no conduit exists at present. Reuse existing conduit where approved by the Client's Representative.

327 Ensure new conduits are in continuous lengths, smooth in bore, true in size, and terminating in roof and inter-floor spaces with a minimum projection of 50mm. Provide inside outlet boxes with a universal cleat.

328 Ensure new conduits are vertical and chased into the wall, such that the finished wall will provide a minimum of 10mm plaster cover. Adequately fix the conduit with sheradised nails and saddle clips, such that during the plastering processes, there is no tendency for plaster to push the conduit forward and reduce the cover.

329 Where approved by the Client's Representative, embed cables in plastered surfaces and cover them with 'top hat' trunking secured at a depth to allow the plastered surface to be made good.

Cables installed in proprietary de-mountable or plasterboard partitions

330 Install cables in proprietary or de-mountable similar type partitions. Draw them through holes formed by forcing a suitable rod through the honeycomb core of the partition from above.

331 Take due account of any insulation within the partition when sizing the cables so as to prevent overheating.

332 In plasterboard partitions with a timber core, draw cables through the partition between the timber studding and noggins. Where timber work occurs, take the cable over the face of the timber by a small chase through the plasterboard and into the timber. Make good the chase with a suitable plaster material finished smooth and flush. Ensure cables installed in partitions are vertical.

© Rand Associates Consultancy Services Ltd

Conduit installed on the surface

333 Use super high impact light gauge PVC-u metric rigid conduit and accessories on fairfaced brickwork or unplastered surfaces in heating cupboards, stores, garages, plant rooms, meter compartments and similar areas.

334 Support the conduit by PVC-u spacer bar saddles and wood screws and rawlplugs at intervals not exceeding 400mm.

335 Allow for the expansion of PVC-u conduit.

336 Install the conduit only vertically or horizontally.

Where new cables are to be installed in or under solid floors

337 Protect cables by rigid PVC-u round super high impact heavy gauge conduit laid in continuous lengths from the consumer unit to the outlet served, run in a diagonal line. Use the proper outlet and inspection bends and tees. Adequately fix the whole system to avoid any displacement by subsequent building trades.

Requirements for PVC-u conduit systems

338 Install no more cables in each circular conduit than necessary to permit easy insertion and withdrawal. Do not install more than the maximum recommended in applicable Standard: Requirements for Electrical Installations.. Demonstrate to the Client's Representative that cables can be easily withdrawn and inserted in any section of the installation. If this cannot be done using the existing conduit, then provide new conduit.

339 Use conduits, boxes, fittings and accessories from the same manufacturer and with suitable fixings for the application. Ensure circular conduit is at least 20mm in diameter.

340 Ensure PVC-u outlet boxes and equipment do not become distorted during plastering. Install boxes flush with the finished plaster and the sides vertical, using 1.25" No.8 woodscrews and rawlplugs or equivalent fixing.

Use of cable trunking

341 Use cable trunking to improve the appearance at points in the installation where a number of conduits terminate or share a common route, and/or at the meter intake positions for the formation of distribution board/local isolator assemblies. Use compact miniature trunking of the appropriate size.

342 Use PVC-u trunking with fitted end covers. Provide a separate earth continuity conductor.

343 Connect trunking to equipment by appropriate screwed couplers, bushes and shakeproof washers, or flanged couplings.

344 Connect trunking to PVC-u conduit by "threaded to plain" adaptors with lock nuts, or clip in adaptors.

345 Clean out trunking before cable is drawn in.

346 Ensure the number of cables installed in trunking does not exceed the space factor specified in applicable Standard: Requirements for Electrical Installations.

Conductors

347 Ensure all cables comply with British Cable Association recommendations (or equivalent).

348 Carefully remove any insulation in making terminations without causing damage to the conductor. Double the wiring to fill the terminations.

© Rand Associates Consultancy Services Ltd

349 Take the sheath of PVC sheathed cable inside the outlet boxes or the pattress of ceiling fittings and similar equipment.

350 Securely clamp flexible cords and fit suitable grommets to all terminal boxes.

351 Use cables of the following types and sizes complete with integral earth continuity:

Concealed wiring - copper 2 core and earth PVC 600/1000 volt grade	
Lighting sub-circuits - 1.5mm sq	Dependent upon length of circuit and to comply with applicable Standard: Requirements for Electrical Installations.
Ring circuits - 2.5mm sq	
Radial circuits - 4.0mm sq	
Cooker circuit - 10.0mm sq	
2/3 Kw Immersion Heater - 2.5mm sq	
3 Kw Water Heater - 2.5mm sq	
Flexible cords and cables - heat resistant insulation 300/500 volt grade	
Lighting - pendant lamp holder	0.75mm sq 2 core heat resistant silicone rubber insulated white circular
Lighting - final internal connection for enclosed tungsten fittings in bathrooms, garages, and for exterior light fittings	0.75mm sq 3 core heat resistant butyl rubber
2/3 Kw Immersion heater	2.5mm sq 3 core heat resistant butyl rubber
3 kw Water heater	2.5mm sq 3 core heat resistant butyl rubber

352 Install wiring by the loop-in system. Ensure there are no joints or connectors in the final-circuit from the consumer distribution unit.

353 Install a maximum of two live pairs and one switch pair at each point. Install the wiring for 2-way switching between switch points. Terminate the earth conductor in each lighting and switch point.

354 Install lighting points and arrange the system such that:
- 2/3 bedroom Properties are provided with two 6 amp circuits; and
- small 1 bedroom Properties are provided with one 6 amp circuit in the consumer distribution unit.

355 Limit the number of points controlled by one 6 amp MCB way to 10. If an installation has an excess of 20 lighting points then provide three 6 amp MCB circuit ways.

356 Ensure pendant type cord grip, all insulated lampholders and ceiling roses are white plastic and are complete with 225mm of flexible cable as specified for a standard height ceiling. For non-standard Properties, adjust the length of the flexible cable to give a 2.1 metre (7ft) clearance from the lampholder to the floor. Ensure lampholders are all of the insulated heat resisting pattern fitted with a skirt.

357 Ensure batten type lampholders are insulated white plastic. Fit them where Instructed by the Client's Representative. In bathrooms, kitchens, toilets, garages and all damp situations, ensure lampholders are complete with a protective shield.

358 Ensure interior light switches (except in bathrooms) are white plastic, flush fitting, single pole, rocker operated 5 amp AC units, mounted in boxes with adjustable fixing lugs. Gang the switches as required, using a multiple plate cover.

© Rand Associates Consultancy Services Ltd

359 Where flush fittings and switches cannot be used, mount single pole rocker operated 5 amp AC surface type switches on matching moulded white plastic boxes.

360 Install light switches at a distance of 1300mm above the floor level to the centre of the switch, and at least 150mm from the nearest door frame, unless the Client's Representative Instructs otherwise.

361 Ensure light switches in bathrooms are white plastic 5 amp AC surface pattern operated by a non-conductive pull cord and knob and hang 1300mm above floor level. Fit them close to the wall and well clear of the door to the room.

362 Support ceiling fittings that are wired and located between joists by wooden bearers of a minimum size of 100x25mm fixed to the joists at both ends of the bearer.

363 Do not provide lamps except where specifically required by the Rates.

13 amp ring circuit installation

364 Connect sockets in ring circuits without spurs using cable as specified, with both ends of each circuit terminated in one 32 amp MCB at the consumer distribution unit.

365 If desired, use spurs from ring circuits to the maximum as specified in applicable Standard: Requirements for Electrical Installations. with due regard to the load or the circuit. Use fused connection units for static items of equipment, provided that not more than one appliance is connected to each ring circuit.

366 Prevent overloading of circuits by providing specified appliances with separate final-circuits.

367 Use junction boxes only with the approval of the Client's Representative.

368 For Properties with a total internal floor area exceeding 100 square metres, provide two ring circuits with appropriately equal numbers of sockets or fused connection units connected to each ring. Ensure each one ring circuit serves only one storey.

369 Locate sockets and fused connector boxes in the same positions as those existing. Ensure they are 13 amp 3 pin white flush pattern. Gang sockets as required, with a multiple plate cover.

370 Use surface pattern sockets protected with a RCCD device in garages, and elsewhere on fair face brickwork.

371 Ensure sockets have switches unless otherwise specified.

372 Ensure the positions of sockets relative to the floor level are as follows:

Location	**Dimensions from centre line of socket to floor level**
Garages, laundry areas	1200mm
General living areas, hall, landings, etc.	450mm
Elderly persons' Properties	1050mm
Bedrooms (except elderly persons' Properties)	450mm
Kitchens (preferred dimension from bottom of outlet to worktop)	150mm

© Rand Associates Consultancy Services Ltd

373 In kitchens, where necessary, increase the above dimensions to ensure a satisfactory match with the layout of the wall tiles. Agree the exact position of sockets with the Client's Representative before installation to ensure a satisfactory position in relation to storage cupboards and shelves, etc.

374 Recess socket boxes into the walls to just below plaster level and provide them with adjustable fixing lugs.

Cooker circuit

375 For cooker circuits, provide one final-circuit connected to one 40 amp MCB at the consumer distribution unit using cable as specified.

376 Locate the cooker control unit as Instructed by the Client's Representative. Ensure the dimension from the top of the unit to the floor is 1400mm and from the side of the cooker to the centre line of the unit is 225mm.

377 Ensure a cooker control unit that is located between storage cupboards or shelves and working top surfaces exactly matches the layout of the wall tiles and the centre line of the unit lines up exactly with the centre line of any local sockets.

378 Connect the cooker circuit in a cooker control unit. Extend it to terminate in a cooker cable connector outlet mounted 600mm above the finished floor level and immediately adjacent to the cooker. Terminate the cooker wiring at the cooker connector outlet box where no electric cooker is provided. Connect the cooker if the Customer has one.

Combination control unit

379 Provide a flush fitting, white plastic combination unit with a 45 amp DP main cooker control switch, 13 amp switch socket outlet and the cooker control switch complete with neon indicator.

Immersion heaters

380 For heater circuits, provide one final sub-circuit connected to one 16 amp MCB at the consumer distribution unit using cable as specified.

381 Provide for the heater to be controlled as near as is practicable to the cylinder, by a white 20 amp AC, DP neon indicating switch labelled 'water heater'.

382 Use flush fitting units where switches are located outside the airing cupboard. Where switches are located inside the airing cupboard, use either surface or flush fitted units.

383 Terminate the circuit adjacent to the heater using suitable cable and a flex outlet plate. Make the final connection with heat resistant flexible cable as specified and run so as to prevent the hanging of clothes, etc., on the cable. When control switches are remote from the heaters, provide an appropriate means of isolation.

384 When the supply cable is exposed within an airing cupboard, protect cables with mini-trunking as specified.

Detectors

385 Mains powered smoke, heat, multi sensor, gas and carbon monoxide detectors together with associated alarm controllers, relay modules etc must be supplied from an independent PVC twin and earth cable looped circuit of the distribution board and protected by a suitable rates miniature circuit breaker.

386 The Provider must provide the necessary PVC triple and earth wiring for interconnection of the units, using the third core for interconnection.

© Rand Associates Consultancy Services Ltd

Installation control and distribution to Properties

387 Install the consumer control and distribution unit for UNRESTRICTED supplies in each communal area. Ensure the exact form and position of the equipment is as specified in the Order or Instructed by the Client's Representative. This may consist of either:
- a purpose made wall mounting cabinet with external meter reading access; or
- a conventional RCBO consumer unit.

388 Ensure the consumer equipment consists of a non-combustible unit with lid, approved by the Client's Representative and complying with the applicable Standard complete with:
- main control switch of a rating suited to the loading/diversity of the installation;
- sufficient RCBO's to accommodate all the sub-circuits scheduled for the Property;
- a minimum of one spare way; and
- each protective device to be permanently labelled to identify each circuit and rating;

389 Ensure sufficient space is available for the Utility Provider's metering and service cut-outs. If required, provide a panel which satisfies the requirements of the Utility Provider for mounting meters, cut-out and other equipment.

390 Supply and install PVC connection tails to the Utility Provider's point of supply, using correct coding and matching the cross sectional area to the main isolating switch rating.

391 Upgrade all earthing and bonding to conform to the applicable Standard. Do not use metal trunking as an earthing conductor.

392 Use PVC-u cable trunking to enclose meter tails as specified.

393 Provide all equipment white in colour approved by the Client's Representative.

394 Clearly identify each way distribution equipment.

395 Ensure the mounting height of equipment is such that persons of average height can reach all fuses, switchgear, etc., from floor level without assistance.

396 Conceal cables above the ceilings and maintain access to the cable runs.

397 Enclose cables run in cupboards in mini-trunking.

398 Before and on starting the Works, obtain approval from the Client's Representative to the proposed routes of cable runs and wiring circuits.

399 Agree any alterations to the agreed routes of wiring circuits with the Client's Representative before starting the Works on them.

400 If Works are carried out before having agreed the routes with the Client's Representative, return and reroute and rewire cable runs and circuits where Instructed by the Client's Representative.

Installation of Mineral Insulated Copper Conducted Cables

401 Ensure that:
- All seals and lengths of MICC; cable shall be tested not less than 24 hours after completion with a megger insulation test at a pressure not less than 500 volts;
- Nothing less than an infinity reading must be obtained between any conductors and the cable sheath, all conductors being disconnected from any apparatus;
- All MICC cables requiring to be "covered up" shall be tested before and after "covering up";
- The specified tools recommended by the manufacturer will be used throughout the installation;
- The Provider at their cost will rectify low insulation resistance readings due to faulty cable termination procedures;

© Rand Associates Consultancy Services Ltd

- Before proceeding with the installation of MICC cables the Provider may be required to demonstrate to the Client's Representative the ability of their Staff to apply a complete termination to one end of an installed cable;
- All conductor tails will be marked with coloured sleeves of an approved pattern to identify the conductors;
- The colours used will be in accordance with the recommendations of applicable Standard: Requirements for Electrical Installations.;
- Sub-main cable conductors will be marked with coloured sleeves indicating the colour phase they originate from.
- All M.I.C.C. cables will be securely fixed by single or multiple heavy gauge saddles to the surfaces of the walls, ceilings, ducts, etc., by 25mm No. 6 round head brass screws.
- Where several cables are installed together multiple saddles shall be used only.
- Where cables are to be supported onto a perforated cable tray the fixing screws will be round head brass to comply with the applicable Standard and the securing nuts will be of the brass square pressed type complying with the applicable Standard.
- The spacing of saddles or clips will not exceed the distances indicated below:

Cables up to 9mm overall diameter single or multi-bank	230mm
Cables of over 9mm diameter up to 12mm overall diameter, single or multi-bank:	300mm
Cables of 12mm overall diameter and greater, single or multi-bank:	375mm
Multi-bank saddles containing cables of various sizes, will be directed on site by the Client but on no account will they exceed:	375mm

Installation of Xl-LSF Insulated and Sheathed Steel Wired Armoured Cables

402 Ensure that:

- All cables shall be installed in one length without intermediate joints; The minimum installation temperature is 0°C; If cables are being installed during sub-zero temperature conditions, they should be stored at a temperature above freezing point for at least 24 hours immediately prior to handling;
- Each cable shall be marked at both ends with white ivorene or traffolyte engraved labels denoting cable size;
- The ends of all cables shall be terminated by means of compression type glands complete with earth terminating rings and PVC shrouds; These glands shall be of the same manufacture as the cable;
- The earth terminating rings will be securely bolted to the electrical apparatus with the use of brass round headed screws and nuts complying with their respective applicable Standards;
- Within the electrical apparatus an earth fly lead will extend from the earth ring with the use of crimp lugs and terminate within the earth terminal of the apparatus;
- Cables shall be installed throughout with the greatest possible care and any damage caused to the cable during installation or the progress of the work will necessitate the rejection of the cable and the replacement and re-erection of a corresponding new length by the Provider free of charge;
- Where cables are to be run on the surface they shall be supported by means of claw type cleats, as manufactured by BICC Ltd, or equal and approved, and the spacing of the supports must not be greater than those given in the following tables:

© Rand Associates Consultancy Services Ltd

Overall Diameter of Cables	Non-armoured rubber, PVC or lead sheathed cables		Armoured cables and corrugated aluminium sheathed cables		Mineral insulated copper sheathed or aluminium sheathed cables	
	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
Not exceeding 9	250	400			600	800
Exceeding 9 but not 15	300	400	350	450	900	1200
Exceeding 15 but not 20	350	450	400	550	1500	2000
Exceeding 20 but not 40	400	550	450	600		
Exceeding 40 but not 50	600	800	900	1100		
Exceeding 50 but not 60	750	1000	950	1100		
Exceeding 60 but not 70	900	1200	1000	1200		
Exceeding 70 and above	1000	1400	1200	1400		

- Normal practice is to consult the cable manufacturer about support spacing on cables exceeding 40mm diameter. The space for horizontal runs may be applied also to runs at an angle of more than 30º from vertical. For runs at an angle of 30º or less from the vertical, the vertical spacing is applicable. In long straight heavily loaded power cable installations, either loop the cables at suitable intervals or increase the cable spacing by a factor of 1.5. Where the appearance of the cable installation is not important, the spacing could similarly be increased by a factor of 1.5.
- Where the cables pass through walls or floors of fire zones the holes shall be filled with fire resisting infill after the installation of the cables.
- Each cable shall be protected from mechanical damage to a height of 2 m above floor level, where run on the surface of walls.
- Where cable access to Properties is required the cables shall be run in short lengths of glazed earthenware or PVC-u cable ducts to ensure that the cables are not damaged when drawn into the duct. The entry point is sealed to prevent ingress of moisture and vermin.
- The Provider will allow for all abnormal brackets required for cradle support on site. The Provider will also allow for drilling of installed steelwork to take the studs for the cleats.
- Cables will not be bent during installation to a radius smaller than eight times the overall cable diameter.
- Cables will be segregated from the finished face of other services by a minimum distance of 75mm, unless as Instructed by the Client's Representative.
- Cables laid directly in the ground will be installed to a depth of not less than 600mm below finished ground level.
- In normal soil the cable will be laid on 100mm of sand and covered with a minimum of 150mm of sand and taped over its entire length underground. The Provider must include for supplying and laying of the same and protection tape, the latter to be laid at a depth of 300mm below ground level. The protection tape shall have the following words printed thereon: "CAUTION - ELECTRIC CABLES BELOW"
- Before the cable is finally covered the Client's Representative will be invited to inspect the cable along its entire length.
- Where cables are to be run under paths, paved roadways or enter buildings, they will be drawn into earthenware ducts which shall be provided and laid by the Provider to a depth of not less than 600mm, below finished ground level. All duct terminations in Properties will be made with the use of manufactured easi bends.
- Cables shall also be protected by earthenware ducts where they cross the route of the other services, to a minimum of 600mm each side of the crossing points.
- Purpose made concrete cable markers laid flush with the finished surface will be supplied and installed by the Provider to indicate cable routes.

© Rand Associates Consultancy Services Ltd

- The use of underground cable joints will only be permitted by written Instruction by the Client's Representative or specifically called for within the specific section of this Specification and/or Tender Drawings.
- All underground cable joints shall be made by a proficient cable jointer using cast iron joint boxes and suitable resin compound to the strict recommendations of the cable manufacturer.

Installation of Conduit

403 Ensure that:

- The conduit and conduit accessory installation for each sub-circuit and final sub-circuit will be completely erected prior to the installation of any circuit wiring;
- During construction of new built projects the Property will be made watertight prior to commencement of any conduit installation; Additionally circuit wiring may only be drawn into the conduit installation upon completion of the wet trades, e.g. plastering;
- The conduit will be installed at least 150mm clear from all other services wherever possible and must not come into contact with water, gas, heating or steam pipework;
- Where conduits are specified to be installed in voids above suspended ceilings, they shall be fixed to the structure using the recommended method of fixing, e.g. saddles;
- The complete conduit system will be electrically and mechanically continuous including all boxes, etc;
- All conduits will be reamed clean internally to ensure freedom from burrs and other defects;
- All conduits will be installed in straight lines with easy bends or sets to harmonise with the architectural features of the Property;
- The use of diagonal runs is prohibited; all branches will be sub-divided at right angles;
- All conduits to be set will be bent cold without damaging the overall section with an approved bending machine and former; The use of manufacturer bends, etc;, is prohibited unless as Instructed by the Client's Representative;
- Draw in points will be spaced at a maximum of 8M centres and not more than two 90° bends (or equivalent) will be permitted;
- Where conduits pass through structural floors, walls, etc;, over sleeves will be provided; The sleeve will take the form of a larger size steel conduit;
- Open BS boxes, etc;, will be suitably protected to avoid the ingress of concrete, plaster slurry or any other material;
- Running couplers will be used where absolutely necessary; All running couplers will be locked together by means of ring locknuts;
- All conduits forming the couplers will be butted together inside the coupler;
- In instances where a conduit is to be connected to the back of a besa box; The besa box will first be drilled clear; A male brass bush will be inserted between the box and connect onto the conduit coupler from inside the box to ensure a rigid mechanical and electrical connection is achieved;
- Recognised good practice shall be adopted throughout and no conduit shall run in such a way as to provide a trap for moisture or condensation; Precautions shall be taken to prevent the ingress of moisture, silt, brick and concrete chippings, etc;, during and after the installation of the conduit system; Stopping plugs shall be fitted to the ends of all conduits not connected to fixing and outlet boxes; Where condensation has occurred the conduits shall be thoroughly dried by drawing swabs through them; The inside of all conduits shall be free from burrs or other obstructions;
- Where conduits are installed side-by-side all "off-sets" will be similar and where "off-sets" are necessary at switch boxes, distribution boards, etc;, these will be as short as practically possible;
- Under no circumstances shall conduits from different distribution boards be connected at the same junction box;
- The exact routes of all conduits and locations of all besa boxes, adaptable boxes and the like will be indicated on the working drawings produced by the Provider;
- Unless otherwise indicated herein, the installation shall be carried out in accordance with applicable Standard: Requirements for Electrical Installations. and conform to all other relevant applicable Standards;

© Rand Associates Consultancy Services Ltd

Concealed Conduit Systems

404 Ensure that:

- Conduits that are to be cast in concrete floors will be laid directly above, but not in contact with, the lower steel reinforcing bars before the floors are poured; Conduits or boxes cast into structural floors will be of spout type securely fixed by the Provider before pouring starts and all boxes will be positioned to allow for the correct thickness of finishing;
- Extension rings will be used on all ceiling outlets where the box is not flush with the finished surface;
- In circumstances where a terminal box would normally be used, the Provider is to fix a through type box with the spare spout plugged with a screwed brass stop so as to provide a secure anchorage;
- In special or pre-fabricated floor construction where the conduits cannot be installed as described above, they shall be run in or upon the pre-fabricated sections and 'set' down into 'loop-in' type boxes; In the case of certain pre-fabricated floors it may be necessary for the Provider to withhold the installation until the structural cement topping on the pre-fabricated section has been laid and set; In this event, the Provider shall, prior to the laying of the topping, mark accurately the positions of all points and down drops so that preformed holes may be left;
- A space of 13mm shall be left between adjacent conduits where they are to be covered with plaster, cement or the like;
- At expansion joints of cast in-situ concrete the conduit shall terminate flush at one side of the joint in a screw to slip solid coupler; From the other side of the joint the conduit shall bridge the expansion gap to engage the slip section of the coupler to allow not less than 13mm movement of the conduit without separation;
- An insulated flexible earth continuity conductor of cross sectional area not less than 2;5mm² shall be installed within the conduit between boxes on either side of the expansion joint and secured to the back of the boxes with M2 metric phosphor bronze screws and Ross Courtney connectors;
- Circular boxes shall not be used in flush systems solely for the purpose of 'drawing-in' cables except by permission of the Client's Representative;
- Where besa boxes are recessed into the walls or ceilings and flush with the finished surfaces, the box lids will overlap the diameter of the box by not less than 6mm; and
- Conduits in wall chases will be secured to the building structure by means of heavy gauge crampets at least 40mm long;

Flexible Metallic Conduit

405 Ensure that:

- Flexible metallic conduit complying with the applicable Standard shall be used for the final connection of the rigid conduit to the terminal boxes of machines fitted with a means of drive adjustment and/or where vibration is likely to occur;
- Flexible conduit shall also be provided to semi-portable equipment such as cookers, washers and similar machines where a limited amount of movement is required for cleaning and maintenance purposes; This does not apply to small machines normally connected to socket outlets by flexible cables;
- Unless specified otherwise, galvanised and non-watertight type flexible conduit shall be used under normal conditions, but watertight flexible conduit shall be used where exposed to the weather or is likely to be splashed or subjected to heavy moisture conditions;
- In all instances the conduit shall be terminated in the approved type glands by being screwed and finally hot soldered into same;
- Flexible conduit will not be permitted in lieu of sets and bends in the rigid conduit system; and
- The flexible conduit shall be PVC sheathed, of ample capacity for the number of cables and have a minimum length of 300mm with sufficient length to allow the full range of withdrawal, adjustment or movement necessary;

© Rand Associates Consultancy Services Ltd

Final Circuits

406 Ensure that:

- Every final circuit will be connected to a separate way of a fuse-board, switch-fuse or circuit breaker;
- The wiring of each final circuit will be electrically separate from every other final circuit;
- Generally, no more than two conductors may be bunched in any one terminal unless necessitated by the type of installed system, and except for ring final circuits, may more than one conductor be connected to a protective device sited within distribution equipment, i.e. consumer units etc;
- Neutral conductors shall be connected to the neutral bar at the fuse-board in the same order as the live conductors;
- At termination points such as switch or socket outlets, etc; sufficient length must be left on cable ends to ensure that there is no tension on the connections;
- The conductor insulation must be removed for a minimum length to facilitate connections and no excess length of exposed conductor shall be left; and
- When preparing cable ends, the Provider shall ensure that none of the conductor strands are damaged and the strands will be twisted together with pliers to ensure a neat firm connection;

Single Phase Circuits in Properties with 3 Phase Supplies:

407 Ensure that:

- Single-phase lighting and power circuits shall be connected on the same phase in any given area; The exception being as follows: -
- Where the Property has a large connected load on a common level the electrical load shall be equally balanced over the 3 phases; However, accessories and supply points on different phases shall be kept to a minimum distance of 2m apart;
- Multi-gang lighting switches with 415 volts present shall be fitted with a grid clearly indicating that 415V is present; The Provider shall however endeavour to avoid this situation wherever possible;
- Where accessories are required to be on different phases within a given area this will be referred back to the Client's Representative for clearance, and in these instances, the phase and voltage present shall be displayed on the equipment by means of an engraved traffolyte label; and
- Final connection of landlords' luminaires by heat resisting flexible card/cleaving;

Identification of Conductors

408 All conductors throughout the installation shall be identified by means of durable markings which uniquely identify all conductors which make up individual circuits (eg: phone, neutral and earth for each circuit).

Luminaires

409 The Provider will supply, install and terminate the circuit wiring to luminaires.

410 All luminaires (inclusive of ceiling roses and batten holders) will be inclusive of lamps.

411 Wiring through luminaires is prohibited unless as otherwise specified or agreed with the Client.

412 Supply, erect and connect all luminaires complete with all glass ware, diffusers, mirror/cross bar reflectors lamps, appropriate control gear and where necessary gasket seals, in the positions shown on the drawings and/or described in the following Part. Ensure that luminaires/lighting installations comply with the requirements of the applicable Standards and CP 1007 as far as they apply.

413 Fix every surface mounted luminaire to a conduit box (or boxes), which shall have fixed base terminals, and as specified for the wiring system employed, unless the particular specification allows otherwise. Fix by a back plate, or via a ceiling rose in cases where the luminaires are of a flexible pendent type.

414 Fix all luminaires and pendants with brass roundhead screws.

415 Luminaire fixings shall be generally suitable for direct connection to conduit boxes or as otherwise specified. Luminaires not provided with suitable BESA box fixings shall be modified as necessary.

© Rand Associates Consultancy Services Ltd

416 Include all pendent type luminaires with suspension lengths of 600mm unless more specific details are defined in the particular specification or indicated on the drawings.

417 Where a flexible code support, or partly supports a luminaire, the maximum mass supported by the cord shall not exceed the values set out in applicable Standard: Requirements for Electrical Installations..

418 The minimum cross-sectional area flexible core to be employed shall be 1.00mm2.

419 Pendant low energy luminaires shall be fitted with heat resistant flexible cord, complying with the applicable Standard, capable of continuous operation with a conductor temperature of 150°C. The cable shall be of the circular multi-core type, finished white.

420 Connect all metalwork on luminaires to the protective conductor with proper and approved earthing arrangements for metalwork (such as sweated-on copper braiding) between down-rods and ceiling plates etc.

421 Ceiling mounted tungsten luminaires, spotlights and other luminaires which fall into the category of 'hot' luminaires, shall be wired internally with cables, suitable for continuous operation at 185°C. Where cable tails are provided they shall be of the heat resistant type, capable of operation at 185°C and of sufficient length to provide a satisfactory connection to the fixed wiring system.

422 Exterior luminaires, fixed to the walls of buildings etc., shall be wired such that sub-circuit cables so installed shall be provided with heat resistant sleeves from the connection point within the luminaire for a distance of 300mm.

423 All fluorescent and other discharge luminaires shall be provided with an integral fused connector block. The rating of the fuse shall be in accordance with the manufacturer's instructions to protect the internal wiring of the luminaire and to provide discrimination between final circuit protection and luminaire circuit protection.

424 Where recessed luminaires are to be supported by the suspended ceiling, ensure the ceiling erector is aware of the quantities and weights. Alternatively suspend luminaires from the structure or ceiling beams over. Use steel stripping or circular steel suspension or proprietary fixing methods. Two fixings at least are required for luminaires up to 300mm wide and four fixings for sizes over 300mm wide.

425 For each recessed luminaire installed in a suspended ceiling supply and fit an appropriate incombustible 3-pin socket outlet conforming to the applicable Standard complete with a plug top. Secure each by a locking ring or screw thread ring and install in a convenient accessible position to facilitate the removal of the luminaire.

426 All recessed LED and semi recessed luminaires in ceilings SUPPLIED BY A FUSE RATING LESS THAN 10A shall be connected by three core 1.00mm2 high temperature flexible cords from the terminals of the luminaires to a plug-in ceiling rose, fixed and connected to an accessible outlet box in the wiring system within the suspended ceiling, immediately above the luminaire. The ceiling rose shall be accessible via the opening provided in the ceiling.

427 In discharge LED and other fluorescent luminaires, fuses shall be readily accessible.

428 Where surface luminaires are to be fixed to conduit boxes, securely fix the boxes to the structure or ceiling beams over, as specified above.

429 Supply and fix all fixing and suspension materials.

430 Ensure the luminaire backplate fully covers the conduit box in concealed installations. Where backplates can be supplied by the manufacturers to comply with this requirement then use these. As a final alternative, use white break joint rings.

© Rand Associates Consultancy Services Ltd

431 Do not use fluorescent luminaires for through-wiring unless specifically permitted, in which case use heat resistant 150 C cables.

432 Use fluorescent luminaires with control gear as specified. Use individually fused lamps. Ensure the noise level emitted by the control gear of fluorescent luminaires is in accordance with the following:- 36W/40W, 24Db; 58W/65W - 28dB; 70W/75W - 30dB and 100W/125W - 35dB, all at 250Hz.

433 Ensure fluorescent luminaires are individually power factor corrected - use 0.85 (minimum) shunt connected p.f. capacitors.

434 All control gear for fluorescent and other discharge luminaires shall comply with the following applicable Standard Specification:

Item	**Type of Lamp**	**BS**
Ballast	Tubular Fluorescent	60920
Ballast	HP Mercury and LP Sodium	4782
Capacitors	Fluorescent and Discharge	4017

435 Control gear not covered by applicable Standard Specifications shall be in accordance with the manufacturer's recommendations.

436 Control gear for mercury discharge lamps shall have a rectifier so that the lamp operates on direct current.

437 Ensure that the methods of suspension for luminaires are electrically and mechanically sound.

438 Luminaires suspended by means of tubes shall be fitted to ball joints, allowing a swing of at least 20° all round. Reliable earthing between the fixed and moving parts shall be provided by means of a flexible braided copper tape. The ball joint shall have stop to prevent rotation by more than 360°.

439 Fluorescent luminaires shall be provided with a minimum of two fixings, except in the case of recessed modular luminaires or surface mounting luminaires, exceeding 300mm in width, where four number fixings (one from each corner) shall be provided by means of conduit drops, threaded rods or gripple steel wire.

440 Normally visible luminaire supports shall be chain, gripple or conduit. All fluorescent luminaires shall be solidly mounted, with all assembly nuts, bolts and accessories made tight to prevent vibrations and noise. Anti-vibration packing shall be fitted where necessary. Luminaires mounted direct to trunking shall be fixed by means of the manufacturer's recommended fixing assemblies.

441 Unless stated otherwise, all luminaire supports shall be fixed to the buildings primary structure. Luminaires shall not be supported from suspended ceilings, unless detailed otherwise in the Specification. The Provider shall be responsible for mounting and fixing arrangements.

442 The metalwork of all luminaires shall be effectively bonded to the earthing system in accordance with the applicable Standard: Requirements for Electrical Installations.

443 Care shall be taken to ensure that the internal wiring of luminaires and the cable of any fixed wiring system shall not be in contact with high temperature areas in luminaires.

444 Thoroughly clean luminaires before installation, leaving the installation in a new, clean condition at handover. Do not use the permanent lighting installation for temporary lighting purposes during the Contract Period unless the Client's Representative gives prior written approval. In such cases provide new lamps at the handover for the Client's use.

© Rand Associates Consultancy Services Ltd

Installation of Switchgear

445 Ensure that:

- Where individual items of switchgear are specified in the same location, they shall be grouped together or where it is suitable grouped together in a purpose made panel.
- All apparatus shall be independently fixed of the wiring system.
- All wiring shall be enclosed within a trunking and conduit system with no through wiring passing through any items of switchgear.
- All trunking shall be provided with purpose made metal end plates and additional fixings as necessary.
- No operating handle will be mounted at a height greater than 4.1m A.F.F.L.
- Surface mounted switchgear to be installed in a flush installation shall be installed over a suitably sized adaptable box. A suitable opening shall be formed in the rear of the panel for cable access.
- Flush mounted switchgear to be installed within the building fabric shall be designed so as to allow full removal and replacement of all items within the panel without the requirement to damage the wall finish.
- Lids shall be fully openable.
- Within flush mounted distribution boards, where possible additional conduits shall be provided into the ceiling void/service duct to allow for future expansion. Minimum 2 no. conduits for each service and size provided

Fixings

446 Ensure that:

- The Provider will be responsible for the fixing of all equipment and accessories which shall include the supply and installation of all rawl plugs and other plugs, bolts and rawl bolts, screws, suspensions, brackets, clamps, saddles, spacers, etc;, and any other fixing whether or not specified, which may be required for the proper and effective fixing of material or equipment; The use of wooden plugs for fixing purposes will not be permitted;
- The Provider will supply and fix all timber grounds and noggins required for the electrical installation;
- Fixings by means of hardened steel pins driven in by percussion tool (HILTI or similar) or by gun fixing techniques will only be allowed where specifically agreed in writing by the Client's Representative;
- Fixings to steelwork, etc;, by means of special preformed spring clips or brackets will only be carried out after approval has been obtained from the Client's Representative steelwork must not be drilled;
- Where goods or Materials are supplied by nominated suppliers, the Provider shall include for receiving, unloading, storing, providing adequate protection from the elements, unpacking, hoisting as necessary, assembling, positioning and fixing; and
- The Provider will allow in his tender for the fixing of any wall mounted starters and control gear, etc;, which may be supplied by the equipment manufacturer separate from the machines;

Painting

447 Painting work connected with this Contract is to be carried out by the Provider, except where otherwise detailed in this Specification.

448 Ensure that:

- Prior to handing over the installation to the painters, the Provider is to remove all oil, dirt and other foreign matter from the conduits, equipment or plant; Failing to do so will render the Provider liable for the cost of redecoration, should this become necessary;
- Where painting is to be carried out by the Provider due care will be taken not to mark the surrounding finishes, the paint will be applied in a professional manner;
- All iron and steel materials, including conduits, switchgear, brackets and accessories which show signs of rust will be wire brushed clean and painted with one coat of Jenolite rust remover and neutraliser, one coat of grey chemical sealer and one coat of red oxide paint prior to erection;
- The Provider will allow for painting the intake panel framework, trunking and all equipment mounted thereon, including all remote switchgear and controls with two coats of "NO RUSTO" aluminium finish paint as Soligmum Ltd or approved equal, and one coat of paint, colour as specified;

© Rand Associates Consultancy Services Ltd

Phase Marking

449 Ensure that:

- Each conductor shall be plainly marked adjacent to its termination by coloured sleeves to indicate the phase to which it is connected;
- The interior of all items of distribution equipment shall have the phases marked, using coloured discs or markers secured by non-ferrous screws to a standard and quality approved by the Client's Representative;

Connections to Existing Circuits

450 Ensure that:

- Connections shall be made to the existing mains supply system at the position(s) indicated, but no alterations shall be undertaken until first obtaining the approval of the Client's Representative;
- The work shall be executed in such a manner and at such times as may be necessary in order to cause the minimum of interference with existing services;
- Where it may be necessary to interrupt existing services, notice of such intention shall be given by the Provider to the Client's Representative in advance to enable any necessary arrangements to be made; The notice given shall be 2 days for minor disruptions and 1 week for disruption for over 4 hours;

Earthing and Bonding

451 Ensure that:

- The whole of the electrical installation and all other equipment connected thereto will be earthed in conformity with applicable Standard: Requirements for Electrical Installations. and to the requirements of the Supply Authority;
- The Provider will install a suitably sized earth copper bar, protected against corrosion for the termination of all main earth leads and main bonding cables including, where specified, earth tapes used for the earthing of the main cubicle panels and lightning protection schemes;
- The earth bar fixings shall be suitably spaced off the Property fabric and be complete with a removable link for testing purposes;
- The incoming supply authority's earth lead either from the incoming cable sheath or service head shall be connected to the main earth bar so as to allow this earth lead to be isolated when the link is removed;
- A label engraved "**Main Earthing Terminal**" will be located adjacent to the earth bars;
- Where the supply authorities services exist and the main earth connection is obtained from the cable sheath; The Provider shall ensure that the cable sheath is connected to the consumer's main earth bar by means of XL-LSF insulated cable; The size of the cable shall be dependent on the size of the supply authorities service head;
- The following services shall be bonded to the main earthing terminal by means of cupinned lugs, nuts and bolts and labelled to denote size and destination: -
  - Incoming gas service
  - Incoming water service
  - Rising mains - hot and cold services
  - Fire hydrant services or dry riser
  - Lightning protection down conductors
  - Intake room switchgear/panels and other earth bars
- The complete trunking, tray, conduit and accommodation systems including the sheaths of all MICC cables will be electrically continuous and connected securely to all conduit boxes, switchgear and distribution boards and other electrical apparatus forming part of the installation;
- The armouring and metal sheathing of all XLPE/SWA/LSF cables shall be solidly bonded together and finally connected to the panels serving the cables;
- The earthing continuity of the metal sheath of each sheathed cable shall be maintained by efficient bonding of the main switch, switch fuses, distribution boards or other metal clad accessories or appliances at which the cable terminates;
- If there is more than one entry of any of the above services into each Property, or each separate dwelling forming part of a Property, then each entry must be bonded;

© Rand Associates Consultancy Services Ltd

- The earth bonding connection will be made as near as practicable to the point of entry, except in the case of the gas service where the connection shall be on the consumers side of the meter, and must in all cases be in such a position that it shall be easily accessible for inspection;
- The earth bonding lead shall be XL-LSF insulated cable coloured green/yellow and enclosed in either PVC-u; or HG steel conduit installed as indicated on the Drawings and Specific Specification; This cable must be of continuous length of minimum size in accordance with the relevant IET tables and the Supply Authority's requirements for PME;
- All switchgear and sub-distribution panels will be bonded to earth as previously described;
- Bonding clamps complying with the applicable Standard complete with a permanent label indelibly marked with the words "**SAFETY ELECTRICAL EARTH - DO NOT REMOVE**", used throughout the bonding installation;
- Where flat XL-LSF insulated XL-LSF sheathed wiring systems are installed the CPC will terminate directly into the outlet point;
- The earthing terminal of each outlet position will be connected to the earthing terminal within the accessory box mounted thereon with a short fly with a cross sectional area equal to the circuit served circuit protective conductor;
- At distribution boards the Provider shall ensure CPCs are terminated to the correct earthing terminal corresponding to the phase and neutral connections; and
- Where flat XL-LSF insulated XL-LSF sheathed wiring systems are installed the CPC will terminate directly into the outlet point;

Substation Earthing/Connections to Switchgear

452 Ensure the minimum earthing requirements for substation earthing and associated connections to switchgear etc. conform with CP. 1013 and as instructed.

453 Insulate the connection between the transformer neutral and the low voltage switchboard neutral busbar.

454 The position of the LV switchboard neutral conductor at which the earth connection is made depends on the system of earth leakage protection adopted, i.e. as to whether it is on the mains or load side of the neutral current transformer - and is as instructed.

455 Main secondary connections of transformers may involve single core lead covered cables. If this is the case, then bond the lead sheaths in strict accordance with cable manufacturer's technical data sheet which will depend on the length of run. Bond the sheaths only at one end. At the other end mount the cable glands on insulated gland plates.

456 Unless otherwise specified in the following items, install an earth electrode system to meet the site and soil conditions. This system comprises solid drawn high conductivity copper rods of proprietary manufacture, 15mm diameter and 1200mm section with internal screw and socket joints.

457 Fit sections with hardened steel tips and driving caps. Ensure the depth of driver rod is a minimum of 2400mm and the spacing is at least equal to the driver length. Ensure no electrode is within 3000mm of the building foundations.

458 Split the earth rod system into two halves, so that testing can be carried out on each half without loss of earthing facilities.

459 Bring back each half system to 400A testing links which serve as the main connection to the earth bar within the substation.

460 Ensure connections to the earth electrodes are readily accessible for periodic inspection, and protected against mechanical damage and corrosion. Make the actual connection to the rod by means of a purpose made clamp and lay below ground level in a concrete inspection pit having a removable cover prominently inscribed "Earth".

© Rand Associates Consultancy Services Ltd

461 Where an earth electrode system is installed carry out soil resistivity and other tests, as described in applicable Standard: Requirements for Electrical Installations., to ensure that the required earth loop impedance figures are in accordance with the applicable Standard.

Generators

462 Install an independent earth electrode system conforming to applicable Standard: Requirements for Electrical Installations.

463 Connect an earth lead between the earth electrode/electrodes and the star point on the generator.

464 Bond the star point and metal framework of the generator to the local electricity board earth point (after obtaining their permission in writing) and/or the 'main' incoming earth point.

465 Ensure the size of the earthing lead and earth bonding leads are at least the same as the earthing lead of the installation, i.e. do not size according to the rating of the generator.

External Socket Outlets and Equipment

466 Note that the term "External Socket Outlet and Equipment" applied to any socket outlet or equipment which itself is located outside the equipotential bonding zone of the main electrical installation or provided for the specific purpose or enabling mobile or portable equipment to be used outside this zone.

467 Protect all external socket outlets by a residual current device (RCD) having an operating current not greater than 30mA.

Standardisation of components

468 Use matching components with all lighting switches, sockets, fused spurs and similar equipment used in the Works, being from the same manufacturer.

Clients and Customers' fittings

469 Refix any existing fittings installed by the Client and their Customers, provided the fitting conforms to applicable Standard: Requirements for Electrical Installations.

470 Notify the Client's Representative of any Client or Customer's fitting which does not comply with applicable Standard: Requirements for Electrical Installations. and which will therefore not be rewired or reconnected.

Removal of floor boarding, etc

471 Carefully remove any floor boarding necessary for the installation of cables. Saw through the tongues only and replace the boards in a workmanlike manner. Ensure any new floor boarding is identical in width and thickness. Remove all debris from the joist and roof spaces.

472 Make good all plaster disturbed by the removal of fittings to a true and level surface.

473 Do not disfigure timber frames and mouldings by sawing or chiselling out for the insertion of cables.

474 Where the removal of mouldings, etc. is necessary, ensure the replacement is carried out by a qualified tradesman and that the replacement surface matches the existing surface.

Existing roof insulation

475 Where the roof insulation must be moved for the electrical installation, carefully move it to one side. On completion of the electrical Works carefully replace it to its original position. Take care to cover lengths of cable with insulating material to ensure the current rating of the cable(s) is not unduly altered.

© Rand Associates Consultancy Services Ltd

Removal of old cables and fittings

476 Remove old cables and redundant switches, sockets, clips, boxes, etc. from roof spaces, exposed walls and other noticeable places and make good any disturbed surfaces.

COMPLETION

Labels and Circuit Charts

Labels:

500 Ensure that

- All switchgear, control gear and distribution boards mounted within electrical intake cupboards/positions will be provided with white ivorine or traffolyte labels engraved in 5mm block letters filled black, securely fixed to the equipment drilling and fixing either by PVC expanded rivets or brass headed screws and nuts;
- Each label will denote the function of the equipment served. Three-phase equipment will also be labelled to denote the voltage. Labels will be as described above except lettering shall be red in colour;
- In commercial intake positions the labels will denote the identification number/letter of equipment, current rating, polarity, circuit being served and description of circuit as follows: -

L2
60 amp SP&N
Serving DB3
First Floor Landing

- Labels to distribution boards shall denote the identification number/letter, number of ways, current rating, polarity, description of circuits being fed, location of supply cable, as follows: -

DB3
8 way 15 amp SP&N
First Floor Landing
Served from L2

- Labels shall also be provided to all remote isolators, starters and push button units to indicate the equipment being installed;
- Additional labels shall be provided as specified elsewhere in this Specification; and
- All labels and final titles shall be approved by the Client's Representative prior to engraving;

Circuit Charts:

501 Ensure that:

- A comprehensive typed Circuit Chart will be provided for each distribution board, consumers control unit installed; The Circuit Chart will detail a full description of the circuits that are being served, inclusive of fuseway number and MCB/fuse rating;
- The Chart will consist of a white covered card enclosed within a transparent non-flammable PVC; or approved sheet cover, secured to the equipment by means of 4 No; brass screw fittings; and
- Where it is not possible to install the Charts within the distribution board, a hardwood-glazed frame will be mounted beside the board enclosing the Chart;

Inspection and testing

502 Ensure that on completion and before being energised, any installation is tested in accordance with applicable Standard: Requirements for Electrical Installations.

503 Give not less than 24 hours notice to the Client's Representative before commencing the testing.

© Rand Associates Consultancy Services Ltd

504 After satisfactory completion of tests, submit copies of all inspection and completion certificates, with all associated schedules and test results if applicable, to the Client's Representative.

505 Note the testing instrument serial numbers on the test certificates.

506 The following inspections shall be carried out during the whole of the Contract:
- General work standard and site inspection;
- Equipment free from rust, damage and dirt;
- Visual inspection of electrical equipment;
- Electrical information/literature on any equipment being installed including labelling and Circuit Charts;

507 Prior to any wiring being commenced earth continuity tests shall be carried out to trunking, cable tray and conduit installation to ensure that the resistance figures are acceptable. These figures shall be submitted to the Client's Representative for acceptance.

508 Visual checks are to be made of overload settings of all starters which should be set in relation to the full load rating of the motors they control.

509 The Provider will also allow for testing the installation whilst work is in progress, or as Instructed by the Client's Representative, and in particular the following tests must be carried out:
- In the case of concealed sections of the installation these will be inspected and tested before being concealed;
- Where cables are run behind 'pinned' ceilings or buried underground, tests must be carried out immediately after the ceiling is fixed and before decorations commence;
- Inspection and testing of conduits and trunking as previously specified;
- Testing of MICC cables as previously specified;

510 When the Supply Authority Board requires a Certificate of Tests as a condition of accepting an installation or part thereof for final connection to the supply, the Provider will furnish such test certificates direct to the Board and forward a copy to the Client's Representative.

511 The following sequence of events shall be carried out:
- Setting the plant to work;
- Inspection of the plant under operating conditions;
- Electrical tests on motors and generators and for ensuring the correct phase rotation of the three phase output from standby generation plant with that of the mains;
- Demonstration to the Client's Representative of the proper operation of the plant and the control and safety devices under any fault condition;
- During the execution of the works by the Provider and on completion (and if considered necessary at the end of the defects liability period) the work shall be inspected by the Client's Representative for compliance with the Specification;
- The tests executed in the presence of the Client's Representative as detailed in applicable Standard: Requirements for Electrical Installations. are as follows:-
    - Continuity of protective conductors including main and supplementary bonding
    - Continuity of ring circuit conductors
    - Insulation resistance
    - Site applied insulation
    - Protection by separation of circuits
    - Protection by barriers or enclosures provided during erection
    - Insulation of non-conducting floors and walls
    - Polarity
    - Earth loop impedance
    - Earth electrode resistance
    - Operation of residual current devices
- At the discretion of the Client's Representative a full load test (1 hour); During this test allow for taking voltage and current readings at the final circuit, sub-main and main intake positions; and
- The Provider will submit the results of the tests to the Client's Representative within seven days of the date of testing;

© Rand Associates Consultancy Services Ltd

512 All charges for testing or re-testing must be borne by the Provider.

513 The Provider must provide all the test instruments and test equipment required, make all arrangements for connections of the mains supply and issue to local authority supply company all appropriate test notices.

514 The Provider must affix to the distribution board a notice in accordance with the applicable Standard: Requirements for electrical installations.

Tests for High Voltage Systems

515 Ensure that:

- High voltage tests on HV cables and, where indicated, factory built assemblies and transformers shall comply with the requirements for site testing in the appropriate applicable Standards;
- Works and equipment shall be inspected to ensure that it is satisfactory and safe to proceed with testing and commissioning procedures; Particular attention shall be paid to the Safety Standards for HV installations;
- Earth electrode tests shall be carried out before and after pressure testing, on both primary and secondary circuits, using a 1000-volt instrument; Tests shall be accompanied by certified copies of Certificate of Type tests;
- Tests shall be in accordance with the relevant applicable Standards for transformers, switchgear and protective devices; Site tests shall be carried out on completion of the erection and installation of the whole of the equipment;

516 Tests and Setting to Work Procedures will consist of the following:

Operating tests, power frequency tests, millivolt drop tests complying with the applicable Standard
Power frequency tests, millivolt drop tests complying with the applicable Standard.
Primary and secondary injection tests.
Insulation resistance tests
Continuity tests of inter-panel cabling.
Pressure tests applied to all main connection for a duration of one minute at a frequency of 50Hz. If tests of a longer duration are carried out, the pressures should be decreased as follows:

Duration of Test (Minutes)	**Percentage of 2 x Service Voltage**
1	**100.0**
2	**83.5**
3	**75.0**
4	**70.0**
5	**66.6**
10	**60.0**
15	**57.7**

DC Pressure tests, in accordance with Manufacturer's recommendations applied to all HV cables.
Checks to ensure correct phase sequence
Comprehensive trip test of all equipment for all equipment at 50% services voltage, before finally making the system live.

Before commencing the setting to work procedures, a full set of certified test reports must have been completed.
Equipment shall be collectively set to work and shall include checks of control function, mechanical and electrical interlocks and relay settings.

Commissioning will consist of showing that the complete integrated system shall function in all respects as the total intent and within the design parameters.

© Rand Associates Consultancy Services Ltd

Handover

517 The Provider prior to complete will:
- Supply all test certificates of plant items from manufacturer.
- Supply all test certificates covering the works during installation and any special tests certified by the Insurance Company.
- Supply schedule of equipment installed.
- Supply operating and maintenance instructions for the proper working of the whole installation.
- Supply adequate information for inclusion in the electronic building log book
- Supply of adequate instructions on safety precautions under fault conditions.
- Supply a list of names, addresses and telephone numbers of all contracting firms and manufacturing firms responsible for the installation or supply of equipment items comprising the Contract Works.
- Supply spares as indicated and/or makers recommended list of spares.
- Make sure all plant items clearly show actual manufacturers nameplate giving plant details, reference numbers, duty and date of manufacture.
- Attend to the general finishing of installation.
- Agree with Client's Representative a list of defects and rectify such defects.
- Supply accessory, plant and equipment keys in duplicate.

Report and certificates

518 Ensure all inspections, reports and test certificates and forms are the current version at the time of the test and are in the standard format published by the IET for Electrical Installation Certificates approved by the Client's Representative.

519 Submit all notifications under Part P of the Building Regulations to the relevant Statutory Authority.

520 For minor Works or alterations to an electrical installation which involve a change or modification to an existing single circuit, provide a certificate for Minor Electrical Installation Works.

521 Issue an Electrical Installation Completion Certificate for Major Works or alterations to electrical installations which involve:
- a change or modification to two or more existing circuits;
- the addition of one or more new circuits to an existing installation; or
- a new installation.

522 Provide a periodic or routine inspection and report on electrical installations when specifically Instructed by the Client's Representative. Where no further change or modification is Instructed issue a Periodic Inspection Report for an Electrical Installation.

Record Drawings

523 The Provider is to supply a full set of prints of the proposed electrical installation. Keep these prints on site and make available for perusal by the Client at any time. As the works progress, ensure that all alterations are marked up on these drawings by a competent person to indicated:-
- All variations to positions, runs, sizes and types of equipment, trunkings, cable trays, cables, conductor joints and main cable routes above and below ground.
- Details of circuiting, distribution board arrangements and equipment labels.
- Schedule of luminaires
- Record of position of buried external services.

524 One week before practical completion submit draft copies of record drawings to the Client's Representative who will peruse them for comment.

© Rand Associates Consultancy Services Ltd

525 Following comment by the Client's Representative produce record drawings which are legible and professionally produced, and comprise the following and are complete in all respects:-
- Clearly marked 'as fitted' or 'as installed'
- Fully drafted
- Fully cross referenced
- Have a prominent border
- Have complete title blocks. Ensure title blocks are of a consistent format throughout for all record drawings comprising a set.
- Ensure all layouts, sections, room plans etc. are up to date and all rooms are numbers where applicable.

526 Provide complete record drawings in sufficient time to be incorporated as part of the Operating and Maintenance Instructions and include:-
- One set on plastic film.
- Two complete sets of prints on heavy quality paper to be incorporated within each operation and maintenance manual produced.
- One set in electronic format

527 Fold all drawings neatly as applicable and insert into individual A4 size plastic wallets for incorporation within the Operating and Maintenance Manuals under their relevant section.

Operating and Maintenance Instruction Manuals

528 Two weeks (minimum) prior to the programmed completion date for the works, submit two Draft Operating and Maintenance Instruction Manuals to the Client's Representative who will peruse them for comment. It is recognised that some commissioning/testing data will not be available at that date.

529 Following comment by the Client's Representative prepare and hand over two complete sets of identical hard covered binder Operating and Maintenance Manuals, at or before the date of practical completion together with one set in an electronic format.

530 Ensure all information contained within these manuals is legible and professionally produced, and comprises the following information and is complete in all respects.
- Full instructions from manufacturers on the operation and maintenance of equipment supplied under the contract.
- Information on any special tools that may be required for service.
- Description of emergency action to be taken in event of equipment failure, including a list of servicing agents, manufacturers names, addresses and telephone and fax numbers.
- A schedule of ordering codes for all equipment installed, including manufacturers reference numbers and name plate data where applicable.
- A full of set of record drawings, including schematics and diagrams for the complete installation.
- A list of manufacturers recommended spares for each item.
- Where the Operation and Maintenance Manuals consist of several volumes provide a complete master index within each of the volumes which form the overall set.
- Provide a comprehensive and complete schedule of symbols for each relevant section of the manuals.
- Only includes data associated with installed systems and in the case of manufacturer's literature, only includes originals of catalogues etc. Photocopies are not acceptable. Ensure manufacturers literature is of current issue at the date of handover.
- Provide a consistent form of page numbering and maintain throughout.
- Include full sets of test certificates/records, along with copies of any maintenance agreements.

531 Bind the manuals with a cover which clearly states the contract title and site identification. Make these covers consistent for all volumes of manuals forming part of a set.

532 Ensure all Operation and Maintenance Manuals along with relevant record drawings are A4 in format. If the record drawings are larger than A4 fold neatly and contain within individual A4 clear plastic wallets within the associated manual.

533 Allow and arrange for complete instruction and demonstration of all systems to the Client's Representative in the use and correct operation of the complete installation and plant.

© Rand Associates Consultancy Services Ltd

Operating Instructions

534 Each consumer unit and distribution board must be supplied with an operating instruction card which must be mounted adjacent to the unit.

535 The Provider must leave printed instructions regarding operation of the consumer unit or distribution trip switch fixed adjacent to the equipment.

536 The instruction leaflet for the smoke, heat, multi-sensor, gas and carbon monoxide detectors and associated alarm controller, relay modules etc must be left in a safe place either by the electricity meter or consumer unit or distribution board.

Spares

537 Unless otherwise instructed on completion of each order, hand over to the Client's Representative the following spare items:-

Socket Outlets:	One spare 3 amp applicable Standard fuse for every five 13 Amp plug tops supplied. One spare 13 amp applicable Standard fuse for every five 13 amp plug tops supplied
Connection Units:	As socket outlets.
Consumer Units:	One spare fuse for each type and size for each unit.
Distribution Board: 30 amp and below	Six cartridges for every type included
Distribution Board: Over 30amp	Three cartridges of every type included
Spare plug tops	As instructed

Shock Treatment Card

538 Provide a copy of the Electrical Times shock treatment card at each main switch panel position. Ensure the card gives the following information:

- Instructions for isolating a person from live conductors.
- Artificial respiration and resuscitation methods.
- Location of nearest telephone and telephone number of whom to contact for assistance.

Rubber Mat(S)

539 Install rubber mats of 11kv tested pattern to a standard and quality approved by the Client's Representative as necessary in each switch room.

540 Ensure the mat(s) are at least 600mm wide and the length not less than that of each switchboard and laid on the floors in front of all switchboards.

Specialist Tools

541 Ensure that any tools which are required of a special nature for any equipment, etc., installed, are handed to Client's Representative at the handover meeting in a purpose designed box or receptacle.

Routine Maintenance

542 The minimum requirements for Routine Maintenance are to be in accordance with the relevant equipment manufacturer's recommendations.

543 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

© Rand Associates Consultancy Services Ltd

544 The Provider must carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

545 The Provider must include for the provision and application of all consumables within the Rates for this element of the Contract.

546 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the latest applicable Standards or equivalent.

Responsive Maintenance and Out of Hours Emergency Works

547 The Provider must attend to all call outs due to malfunction or breakdown.

548 The Provider must include for a call-out service to provide Responsive Maintenance and an Out of Hours Emergency Works Service. The Out of Hours Emergency Works service is deemed to extend the provision of Emergency Works to a 24 hour, 7 days a week, 365 (366 for a leap year) days per year basis.

549 Call outs for Responsive Maintenance and/or Out of Hours Emergency Works which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

550 Where Out of Hours Emergency Works are attended to for authorised cases of breakdowns, mis-use or vandalism, the Provider will be paid in accordance with the Rates detailed in the Price Framework.

Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works

Repairs, Replacements and Adjustments

551 The Provider is responsible for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

552 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

553 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

554 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

Firestopping

555 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

556 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

RENEWAL OF LANDLORDS RISING, LATERAL AND DISTRIBUTION MAINS ETC

General Requirements

601 This specification shall be read in conjunction with the Preliminaries, the other Communal Mechanical and Electrical Specifications, Appendices, Schedule of Rates, and all other contract documentation.

602 Note that this is a performance specification. It shall be clearly understood that the Provider shall be fully responsible for the detailed design, supply, installation, testing, commissioning, demonstrating, documentation and leaving in a satisfactory working order following removal of the existing landlords installation the fully operational new landlord's electrical installations as described within this specification or indicated on the Project Drawings.

603 It shall be the Providers responsibility to request and receive any information regarding asbestos on the site and subsequently satisfy their obligations by carrying out a Pre-construction asbestos survey.

Strip Out Works

604 Provide strip-out details as part of their initial enabling works identifying the extent of the strip out works, details regarding isolation, method of isolation, methods of safe removal and builders work including any fire stopping.

605 Following consideration and approval the strip out works will be completed as part of the first stage of the project.

Loss of Service

606 Allow, within their programme to carry out works with a loss of service if:
- The planned loss of services is anticipated to be no longer than 8 hours;
- The planned loss of services has prior agreement with the Client and Customers;
- Notification letters to Customers have been issued at least 7 days before;
- Written notifications are present in common areas to notify Provider's intentions;
- A vulnerable person's strategy is in place.

Temporary Supplies

607 Depending upon the period of loss of service, strategy agreed with the Client and necessity the Provider may provide a method including for temporary supplies. As such, any temporary water service will only be accepted if this is capable of satisfying delivery in line with operational duty identified as part of the validation report investigations.

608 Include for the provision of all necessary temporary supplies required in connection with the works.

609 These temporary supplies shall include temporary power supplies, relocations of existing supplies and temporary relocations of existing equipment necessary in order to carry out the works and all temporary supplies necessary to maintain tenant's emergency equipment.

610 No dwelling shall be left without power for a period exceeding 7 hours.

611 No estate shall be left without amenity or safety lighting due to site operational set up.

612 Prior to the start of work the Provider shall issue a questionnaire to Customers to ascertain if any dwellings have any emergency equipment i.e. medical equipment, which must be supplied at all, times. Temporary supplies shall be provided to such equipment.

© Rand Associates Consultancy Services Ltd

Electrical Work Generally

613 Installations made redundant by the new installation shall be removed. The Provider shall disconnect, strip out and dispose of the complete previous existing electrical installation components in a safe, operational and satisfactory manner.

614 Any existing electrical installations that are to be retained shall be left in a safe and operational compliant condition.

615 Allow to carry out survey work on site to identify the condition and use of existing equipment and cables prior to stripping out works. The survey work shall include cable tracing and appropriate isolation as required. The survey to all dwellings and external works shall be carried out at the start of the contract and the results issued on a fully detailed survey document and circuited drawings to the Client's Representative.

616 Agree the exact extent of stripping out work with the before works commence.

617 The previously existing electrical installation made redundant by the new installation shall be stripped out and the works shall include the removal and disposal of all associated redundant electrical equipment, distribution boards, luminaires, wiring, conduit, trunking etc. Existing equipment shall only be retained where the specification specifically requires.

618 Where existing electrical equipment that is to be retained is affected by the stripping out works then the Provider shall include all necessary modifications, rewiring etc. required to maintain these existing services in a satisfactory condition.

619 Such work shall be closely coordinated with the Client's Representative, and all stripping out works shall be phased with the new works to allow the maintenance of supplies to the dwellings and to the landlords lighting and power services.

Communal Electrical Including Laterals

620 All electrical installation work shall fully comply with applicable Standard: Requirements for Electrical Installations.

621 Notwithstanding the information given in this specification, the electrical Provider has sole responsibility for the design and compliance of the electrical installation with applicable Standard: Requirements for Electrical Installations. including any subsequent amendments.

622 Ensure that all applicable Staff and all electrical subcontractors employed by the Provider shall be NICEIC registered or other equal and approved and shall be competent with respect to Part P of the Building Regulations.

623 Ensure that the Client is furnished with comprehensive details of all subcontractors being employed by the Provider on the Contract.

624 In addition to the provision of electrical testing and commissioning certificates as required by the specification the Provider shall also issue all relevant Part P documentation to the Client's Representative and to the Local Authority Building Control. The Provider shall issue proof of their own and any electrical subcontractor's Part P registration prior to the start of Works on site. All electrical Staff of the Provider and any electrical subcontractors shall be competent and conversant with BS: 7671.

625 Undertake the design, supply, install, test and commission a complete landlords distribution system. The installation shall include switchgear, wiring, cable containment systems, cable support systems, accessories, fixings, supports and all other equipment as necessary to form a complete and satisfactory installation. This full responsibility shall apply even where the specification states supply, install, etc.

626 Allow for and implement all safety procedures required for safe working, include for method statements, risk assessments and a permit to work system.

© Rand Associates Consultancy Services Ltd

627 Ensure that the complete installation is compliant to all applicable regulations covering the various elements involved with the electrical installation works.

628 Ensure all electrical installations are comprehensively compliant, the Provider shall employ suitably competent electrical engineers to assist in the delivery of this work.

629 All equipment shall be suitable for its operation and environment.

630 Provide all necessary temporary supplies, all temporary relocations of equipment required during the Contract. The Provider shall ensure that shut down periods are kept to a minimum to all dwellings. Strip out all existing electrical installations made redundant by the new works.

631 It is a requirement for the Provider to produce working drawings the Provider shall also produce a dimensioned drawing of each electrical intake room indicating the layout of electrical equipment within the room including all door entry system control equipment. The Provider shall also produce circuit schedules for the landlord's distribution boards, all above required information including manufacturers information are to be included within the O&M manual.

District Network Operator (DNO) Service Cut Out and Energy Supplier Meters

632 Wherever existing District Network Operators (DNO) service heads are of plastic construction then these service heads shall be retained.

633 Wherever existing DNO service heads are of metal construction then the Provider shall engage UKPN to survey these and replace them wherever it is practical and financially viable to do so.

634 Include all costs within the tender and shall carry out all liaison and planning with DNO and the energy supplier metering company to ensure that all activities are within the overall project programme.

635 Engage the energy supplier metering company to carry out all disconnections and reconnections of supplies as necessary throughout the contract. These disconnections and reconnections shall include service heads, main meters, and Customer's meters.

636 Engage the DNO to survey the main Earthing terminals and provide a new earth terminal at each existing service head position where the existing are non-standard variations.

637 All installations shall comply with the standard DNO design requirements and documentation where applicable

638 Where no rising or lateral mains replacement works are required to a block, but, minor works within an intake room are required or specified which will involve block shut downs, the Provider is to allow for the installation of a MEM Glasgow TPN switched isolator or other equal and approved between the service head and the lateral distribution board.

Telecommunications Installations

639 Undertake pre-condition surveys on the existing telecommunications installation, all substandard or damaged existing cables shall be photographed and recorded during survey stage, and the condition of the existing telecommunication installation shall be reported to the Client's Representative.

640 Allow for the necessary re-siting of existing telecommunications system and equipment, together with all temporary fixings to ensure that the system is operational and not damaged during the Works.

641 Engage with Openreach/British Telecom, to carry out all disconnections, reconnections or replacement to the existing telecommunications system, prior to or during the works or during the course of the contract.

© Rand Associates Consultancy Services Ltd

Rising Mains – Landlord's Isolation

642 Where the Provider is carrying out rising mains replacement works, he shall supply and install a suitably sized lockable switched isolator. The isolator will be installed between each service head and the first Lateral distribution board, irrespective of whether there are multiple Lateral distribution boards or only one.

643 The isolators should ideally be located within the electrical intake room; however, if there is not enough wall space within the intake room, the isolator can be located below the first Lateral distribution board in line.

644 If the isolator is to be located external to the intake room, consideration must be given to concealment and or protection of the isolator from abuse or vandalism, the Providers design must allow for the new rising mains cables from the service head to be wired through the isolator, then to the Lateral distribution boards and include for the installation of a MEM Glasgow TPN switched isolator or other equal and approved.

645 A dedicated isolator for each Lateral distribution board will be required if they are remote from the intake position, to allow partial shutdowns to each board at a later date if required.

646 Supply and install a new rising mains installation and shall strip out the existing installation in a phased manner. The new rising mains installation shall be carried out with three phase and neutral XL-LSF cables installed within the existing riser duct or a new purpose designed rising trunking/containment system, the cables shall be secured with cleats or cable retainers at 1200mm vertical intervals and shall be spaced at least two cable diameters apart.

647 Remove and dispose of all existing riser duct covers, these shall be replaced with new white powder coated steel covers with vandal resistant screws, where uni-strut channelling has been installed the Provider shall allow for the use of 6mm spring nuts and 6mm machine screws with security heads.

648 A separate single core XL-LSF circuit protective conductor shall be installed with the rising main installation, with loop through connections to the lateral distribution boards.

649 Rising mains shall be three phase and neutral with an appropriately sized earthing conductor in accordance with applicable Standard: Requirements for Electrical Installations. All cable conductors shall be copper.

650 Where Tank rooms are present an independent 32A supply shall be installed.

Laterals and Containment – Internal Isolation

651 Include within the tender sum, to supply and install a suitably sized double pole lockable switched isolator which shall be installed and connected before the meter within each dwelling.

652 Where the Provider is carrying out lateral mains replacement works, he shall supply and install a lockable double pole switched isolator. The isolator will be installed and connected before the meter within each dwelling. The isolators should ideally be located within the meter housing units if applicable, however, if there is not enough wall space within the meter housing unit, the isolator can be located externally of the meter housing unit on agreement with the client's electrical representation.

653 Where sufficient space exists external switched isolation units should be manufactured from non-combustible materials.

654 Install a double pole isolator within the Mantel units.

655 Provide new lateral mains cables to each dwelling and shall strip out the existing in a phased manner.

656 Where lateral supplies are installed in remote areas that may be subjected to future metal theft, only SWA cables can be utilised.

© Rand Associates Consultancy Services Ltd

657 The use of cable tray is generally deemed to be aesthetically unacceptable. As such, the new lateral installation shall be carried out utilising a minimum of 16mm² squared cross sectional area XL-LSF insulated live, neutral and earth single core cables or a minimum of 16mm² 3 core SWA in trunking. Exceptionally, where the cable run is deemed to be particularly problematic the use of cable tray may be approved by the Client's Representative.

658 All conductors shall be copper and appropriately run in trunking and conduit, or exceptionally housed on lidded cable tray.

659 All containment shall be galvanized steel and shall be routed so as to be as visually unobtrusive as possible; all routes shall be agreed with the Client's Representative.

660 Where specified, the containment shall have additional compartments/capacity for other electrical services and trunking shall be provided with all necessary screening sections at service cross overs where required.

661 The exact containment width required shall be determined by the Provider, the maximum depth shall be 50mm, trunking/ tray lids shall be fixed with vandal resistant screws. Trunking/ tray lid fixings shall be anti-vandal screws into the trunking flanges and not of the centre turnbuckle type.

662 Survey all cable routes before commencement of the Works and shall include for all cable, containment sets, bends, tees etc.,

663 Assess external containment routes to determine if IP rated trunking would be required, proposals to install IP rated trunking shall be submitted to the Client's Representative for approval. All accessories shall generally be proprietary manufactured items.

664 Ensure that all containment follows the profile of the structure and is fixed tight to all walls, soffits, and angles etc. and shall include for any site cut accessories required to achieve this. Gaps behind containment and on cut edges will not be acceptable.

665 The containment shall be routed the full length of the block on soffits to provide a uniform appearance throughout.

666 All trunking shall be fitted with cable retainers as appropriate.

667 Where cable tray runs have been agreed they shall have metal ties fitted every metre and with intermediate black plastic ties.

668 Within Customer's dwellings the lateral XL-LSF cables shall be installed within mini trunking, the Provider shall utilize the most visually unobtrusive route within the dwellings and the minimum sized trunking practicable, giving an aesthetically acceptable installation.

669 The routes of the trunking shall be agreed with the Client's Representative.

670 Where lateral cables serve mantel type distribution boards, the Provider shall include for the removal of the mantel enclosure which shall be slotted and protected to allow the cables to enter. The Provider shall make good around the mantel enclosure.

671 Replace all VIR meter tails with XL-LSF cable.

672 All lateral mains cables shall be appropriately electrically and mechanically protected prior to the double pole isolator.

673 All laterals mains shall be tested, and a test result schedule issued to the Client's Representative.

674 All lateral mains SWA cables shall as a minimum be glanded at one end, this being at the lateral distribution board, ensuring that all glands are properly fitted and secured and that all earthing tags are secured by brass machine screws, nuts and washers.

© Rand Associates Consultancy Services Ltd

675 Where for ease of installation the armouring has been removed, the cable shall be housed in containment and the conductors shall be protected by their inner sheath into the double pole switch via a stuffing gland.

Lateral Distribution Boards

676 Facilitate future maintenance and repair, and install an appropriately sized isolator prior to each distribution board.

677 Supply and install Lateral distribution boards as detailed within the Works Order and strip out the existing boards in a phased manner. The Provider shall liaise with the manufacturer of the lateral distribution board, to ensure that the distribution boards are manufactured to suit the existing site conditions and riser duct dimensions and shall arrange a site survey by the manufacturer prior to ordering the boards. The Provider shall undertake all necessary adaptations required in connection with the new lateral distribution board installation.

678 The new riser distribution boards shall be metal surface mounted pattern purposely constructed with recessed case. The completely new interior shall be within the new surface mounted board, but main riser connections shall protrude into the rear recessed case. This shall allow the looping in and out of main riser cables. The lateral distribution board shall have an XTP 14g sheet steel anti vandal case and shall be fitted with approved MUL-T-LOCKS with three-point locking cams. Two keys shall be provided with each lateral distribution board.

679 Distribution boards shall be complete with interiors and shall be fully fitted with applicable Standard service type cartridge fuse units.

680 Each distribution board shall have internally fitted labels within pvc sleeves to indicate the dwelling each fuse serves, the load served, the rating of the protective device and the cable size and type, the labels shall be completed and typed by the Provider prior to completion.

681 The Lateral distribution boards shall be fitted with a shock label of an approved format.

682 Liaise with the manufacturer to ensure that the lateral distribution boards specified are fully suitable for the site conditions and physical constraints.

683 Confirm all lateral distribution boards' existing fuse way sizes and advise the Client's Representative where these are different from those shown on the drawings prior to ordering the new boards.

Landlords Existing Containment

684 The Provider shall remove all existing redundant, rusted and worn trunking and supply and install new galvanised steel trunking links between equipment complete with slotted entries to meters, equipment etc. and the provision of suitable paxolin mountings.

Electrical Intake Rooms

685 The position of all landlords' equipment within the electrical intake room shall be agreed with the Client's Representative before works commence.

686 Where landlord's distribution boards are replaced the Provider shall reconnect all existing circuits which are not made redundant by the new installation.

687 All existing circuits shall be tested on completion of the work and a full test certificate, which shall include full test results for all existing and new circuits, shall be issued for each distribution board.

688 Engage with the energy supplier metering company to install landlord's meters to electrical intake rooms where the existing lighting and power circuits are taken from another intake area. Each intake room should supply the stairwell and communal area to its own block.

© Rand Associates Consultancy Services Ltd

689 Undertake all liaison and site surveys as required with the DNO, and to obtain any new Meter MPAN numbers where required. Such liaison shall be carried out at the earliest opportunity to minimise any operational delay.

Landlords Distribution Boards

690 Supply and install an appropriately sized landlord's distribution board which shall be a Wylex or other equal and approved metal clad board and allow for future expansion or equal and approved.

691 The distribution board shall be metal-clad surface mounting type fully fitted with type B 10kA current limiting miniature circuit breakers/ RCBO's with 30mA operating current and 100-amp double pole incoming switch.

692 Where a landlord's distribution board is located in a separate intake from the main switch gear/isolation equipment, an appropriate double pole metalclad isolator shall be installed to allow for additional safe local isolation.

693 The distribution board will provide supplies to the uncontrolled lighting 10A rated circuits number as required, controlled lighting 10A rated circuits number as required, switch room socket 32A rated RCD protected, an integral 4 pole contactor unit/ lighting control unit 10/20A rated., main supply to the lift machine room(if applicable) distribution board 63A motor rated or other rating if required, main supply cable to the Roof space or tank room consumer unit 40A rated all unused ways to be fitted with blanks.

694 The controlled lighting shall be supplied via an integral 4 pole contactor unit which will have a manual over ride facility this shall be controlled by a photocell or Lux reader.

695 All control wiring shall be included, remote photocell shall be set to 55 lux, the position of the photocell/Lux reader unit shall be agreed with the Client's Representative. Where required by the number of circuits, slave contactors shall be fitted.

696 Each individual controlled lighting circuit shall originate from a 10amp MCB via the contactor installed within the consumer unit, each circuit shall be wired through one pole of the contactor.

697 Where circuits contain emergency fittings then the un-switched live shall be taken from the same circuit MCB. Each circuit shall have its own dedicated un-switched live mains sensing circuit.

698 Supply a complete electrical wiring system within the electrical switch room for landlord's services comprising XL-LSF cables in galvanised steel trunking and conduits.

Tank Rooms and Communal Roof Spaces

699 Install a 6-way SPN consumer unit to each communal roof space and tank room area to supply lighting and maintenance power to these areas as required.

700 All distribution board schedules shall be typed and fitted inside a PVC encapsulated cover and fixed to the wall adjacent to the distribution boards. The circuit schedules shall be fully descriptive.

Earthing

701 Supply and install a main earth bar with removable test link in each electrical switch room, to minimise metal theft this MET shall be contained within a lockable enclosure or suitably sized trunking, the lid fitted with security screws.

702 The earth bar shall be 50mm x 6mm and of sufficient length for all outgoing cables plus twenty percent spare connections. The minimum length shall be 300mm. The earth bar shall be mounted from the wall on insulators and shall be connected to the Lateral distribution board main earth, which shall in turn be connected to the Electricity supply authorities' main earth.

© Rand Associates Consultancy Services Ltd

703 Install separate main equipotential bonds to the mains water, main gas supply and each tank room. This is to ensure that down service pipework and any other extraneous metal work is appropriately main bonded. It could also include other metallic parts introducing a potential such as communal central heating and hot water services, exposed structural steel and stored water down services.

704 Engage a lightning protection specialist to verify the suitability of the installations integrity where existing lightning protection systems are in situ and no main bonding is present.

705 In many installations the water mains may not manifest until they reach the buildings Tank Rooms. In such cases the main water bonding will need to be installed within these locations and be noted on any documentation / certification accordingly.

706 All cable tray and trunking must be appropriately earthed where required and any links installed as necessary. The Provider shall include for all safety measures including the installation of rubber matting of sufficient size to offer protection to operatives working within the electrical intake room.

707 In all areas, including switch rooms, the Earthing and Protective Bonding Conductors shall be installed in conduit or tamperproof screwed and lidded trunking as appropriate, to minimize the risk of metal theft.

708 Where such cables leave the containment for final connections etc., their accessible length shall be kept to a minimum.

Builders Work

709 Replace all wooden duct covers to electrical ducts for the rising mains installation, the new duct covers shall be steel, fitted with anti-vandal or tamper type screws.

710 Include for the widening of floor penetrations through duct floors, landings and half landing areas.

711 Include for all core cutting for rising trunking systems and conduit systems.

712 Fire barriers to be provided within all containment systems, also at each floor/half floor level and making good with proprietary fire stopping materials of all holes, penetrations and damage caused by the Works.

713 All holes in landings and half landings are to be properly covered and protected, prior to completion of works.

714 Where any cable containment runs through asphalt floor coverings to balconies etc., the Provider will allow for flanged asphalt returns to be installed, so as to prevent water penetration to seep through the floors/into any containment trunking or distribution equipment.

715 Include as part of builders work for the patch painting and colour matching of any areas disturbed as part of the works to include undercoat and two coats of gloss or Class "O" fire retardant paint, or any colour as selected by the Client's Representative.

716 Include as part of builder's work for the making good around mantel units disturbed in connection with the works and replace missing protective covers.

717 Builders work shall include but shall not be limited to fire stopping, provision of fire barriers at each floor level of vertical ducts, investigations of structure, trenching, ducting, reinstatement, removal and reinstatement of suspended ceilings, ducts etc., including all cut outs to ceilings etc., holes through structure, walls, floors, etc., making good, lifting and reinstatement of floors, floor coverings, dust sheeting, movement of furniture etc. along with all other builders work required in connection with the works.

© Rand Associates Consultancy Services Ltd

General Small Power

718 Supply, install, test and commission a complete small power and ancillary services installation as detailed elsewhere in this Specification. The installation shall include all switchgear, wiring accessories, trunking, conduit, wiring, fixings, supports and all other equipment and accessories required to form a complete and satisfactory installation.

719 Provide a complete electrical installation to the electrical switch rooms, tank rooms and lift machine rooms as detailed on the Works Order.

720 Final circuits shall be wired using 2.5mm XL-LSF insulated single core cables installed in heavy gauge screwed and welded galvanized conduit. The conduit installation shall be installed on the surface. An XL-LSF separate CPC shall be provided with each circuit and shall be of equivalent size to the circuit conductors.

721 Circuits shall be wired as radial circuits served from a 20-amp rated miniature circuit breakers on the uncontrolled landlord's distribution board. A separate radial circuit shall be wired to the electrical switch room and all tank rooms.

722 If any existing circuits are specified to be re used or existing circuits are reconnected into new distribution boards, the circuits shall be tested, and an electrical installation certificate issued for each new distribution board. New and re-used circuits shall be clearly identified within this documentation and highlighted to the project team.

Electrical Switchrooms

723 Electrical switch rooms shall each be provided with an RCD protected IP 56 socket outlet. The socket outlet shall be as MK Electric Masterseal range or other equal and approved.

Tank Rooms

724 Tank rooms shall each be provided with at least one RCD socket outlet, they shall be as MK Electric Masterseal or other equal and approved.

Testing, Commissioning and Handover

725 The whole of the electrical installation is to be inspected and tested in accordance with applicable Standard: Requirements for Electrical Installations.

726 Tests must be carried out as the work proceeds as required by site conditions and upon the decision of the Client Representative.

727 Carry out pre-handover testing and commissioning, prior to the declaring to the Client's Representative that the works are ready for such testing and commissioning. The Provider will provide his own testing equipment that will have been calibrated within the past 12 months.

728 Satisfy themselves that the works offered for testing are complete, but this shall not preclude re-testing of sections where appropriate, in the case of sectional handover, or phased completion.

729 Where conduits, or any work is concealed the Provider shall notify the Client Representative who may wish to witness any tests for continuity. This shall not relieve the Provider from remedial work if later found to be defective.

730 Satisfy themselves that the works are complete and operational and that all labels, warning notices, circuit detail Schedules and manufacturer's information are available and will provide a completion and inspection certificate in PDF format which shall be in accordance with the test sheets as detailed in applicable Standard: Requirements for Electrical Installations.

© Rand Associates Consultancy Services Ltd

731 A chart detailing the following information for each circuit shall be attached to each consumer unit or distribution board for:

- Circuit No;
- Circuit description;
- Type of wiring;
- Reference method;
- Number of points served;
- Circuit live conductor size;
- Circuit protective conductor size;
- Maximum disconnection time;
- Overcurrent protective device including type, rating and breaking capacity;
- RCD operating current; and
- Maximum Zs.

732 The test shall be carried out to the satisfaction of the local Electricity Company and shall be at the Provider's expense including the cost of electricity.

733 At handover, the Provider shall provide the Client with a complete set of operating and maintenance records, including all documentation, manufacturers details, list of spares, emergency contact numbers, complete set of record drawings etc in both hardcopy and electronic format

734 The final format and content of the manuals shall be agreed with the Client's Representative.

Firestopping

735 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

736 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

COMMUNAL/COMMERCIAL KITCHEN DEEP CLEANING

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

COMMUNAL/COMMERCIAL KITCHEN DEEP CLEANING

General Requirements

001 Be deemed to have read the whole of this Specification together with the Client's Requirements' and will be deemed to have included in his tendered Rates for full compliance.

Asset Register

002 Ensure that all the asset registers supplied by the Client prior to the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

003 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each maintenance service element, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

004 Ensure that, following all inspection visits, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

005 Provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff including his Specialist Subcontractors.

Manufacturer's Requirements

006 Where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

007 Submit and agree, within 20 Working Days of the award of the Contract a full annual Programme for all Works covering each element of the maintenance Works with the Client's Representative.

008 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

Permit to Work Certification

009 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

Access

010 Ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

011 All Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

012 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

© Rand Associates Consultancy Services Ltd

Guidance

013 Refer to the Specification schedule of Works.

014 Pay particular attention to:
- The Food Safety Act 1990
- The Food Safety (General Hygiene) Regulations 1995
- Control of Substances Hazardous to Health (COSHH) Regulations 2002
- The Hazard Analysis and Critical Point (HACCP) System
- REACH documentation

Cleaning Materials

015 All degreasing and cleaning agents used by the Provider shall be approved as suitable for use in food preparation areas.

Periodic Cleaning

016 Cleaning of communal/commercial kitchens and equipment must unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirements tabled below;

Kitchen Deep Cleaning

Item No	Item	Frequency	Action	Notes
1	Kitchen Ceilings	Annually	Power vacuum all areas to remove loose dirt as required and remove all debris including any cobwebs. Where applicable clean tiles insitu. If applicable, remove ceiling tiles to safe area and clean. Replace tiles on completion. Clean any ceiling fans externally and any luminaries (inside and outside).	Note any damaged tiles prior to commencement for feedback to the Client's Representative.
2	Kitchen Walls	Annually	Remove any loose or excess debris (grease, dust, cobwebs). Steam/wash/damp wipe as appropriate all painted and tiled surfaces and ledges including pipework. Dry tiles and buff to ensure all removable marks are eliminated. Remove finger/dusk marks from any glazing, internal doors, window ledges and fire extinguishers.	

© Rand Associates Consultancy Services Ltd

Kitchen Deep Cleaning (cont'd)

Item No	Item	Frequency	Action	Notes
3	Kitchen Work Areas	Annually	Clean all kitchen work surfaces (top and underneath) including any food preparation areas. Where surfaces can be removed from walls ensure back plate is cleaned and any debris removed.	
4	Kitchen Appliances Ovens Fat Fryers Grills/Griddles/Hot Plates Cooker Hobs Convection Ovens Extractor Hoods	Annually	Remove all grease and removable carbon from internal and external surfaces. Ensure all cleaning agents are removed from surfaces on completion.	
5	Kitchen Ventilation Extractor Canopy Filters Ventilation ductwork including fans and motors	Annually	 Remove filters, degrease, wash clean and replace. Ensure all cleaning agents are removed from surfaces on completion. Remove any debris, grease, dust. Ensure that all grills and dampers are left set in the correct pre-cleaning position.	 Where filters are worn or ineffective, these should be reported to the Client's Representative.
6	Kitchen Appliances Microwaves Fridge/Freezers Dishwashers	Annually	Remove all grease from external surfaces. Ensure all cleaning agents are removed from surfaces on completion.	
7	Luminaries		Remove all grease and dust from both interior as well as exterior.	Report on any defective gaskets to the Client's Representative.
8	Floors and Lower Pipework (including radiators)	Annually	Power vacuum all areas to remove loose dirt as required and remove all debris including any cobwebs. Degrease all pipework and floor areas including under any moveable surface/appliances. Steam and degrease all tiled floor surfaces. Degrease kitchen floor using hard surface floor cleaner and floor scrubber. Empty all waste bins, replace as necessary.	

© Rand Associates Consultancy Services Ltd

Kitchen Deep Cleaning (cont'd)

Item No	Item	Frequency	Action	Notes
9	Storage and Wash Rooms	Annually	Thoroughly vacuum clean all floors removing all debris, bag and remove to designated area. Dust/wash/wipe clean all work surfaces, trolleys and appliances throughout. Descale and disinfect WCs, urinals, wash basins, showers and lockers, general. Remove all removable marks from doors, walls and hard surfaces. Steam and degrease all tiled floor surfaces. Leave area in clean and tidy condition.	
10	Drainage Floor Drains Grease traps	Annually	 Chemically clean kitchen drains, to create free-flowing, hygienic conditions. Ensure that all waste is correctly disposed of.	

Firestopping

017 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

018 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

COMMUNAL/COMMERCIAL KITCHEN VENTILATION CANOPY CLEANING

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

COMMUNAL/COMMERCIAL KITCHEN VENTILATION CANOPY CLEANING

General Requirements

001 Deemed to have read the whole of this Specification together with the Client's Requirements and will be deemed to have included in his tendered Rates for full compliance.

Asset Register

002 Ensure that all the asset registers supplied by the Client prior to the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

003 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each visit to undertake Routine Maintenance, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

004 Ensure that, following all inspection visits, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

005 Provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's including his Specialist Subcontractors.

Manufacturer's Requirements

006 Where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

007 Submit and agree, within 20 working days of the award of the Contract a full annual Programme for all Works covering each element of the maintenance Works with the Client's Representative.

008 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

Permit to Work Certification

009 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

Access

010 Ensure that they undertake a risk assessment and provides a method statement for their means of access to allow for inspection and testing.

011 All Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

012 Ensure that all Staff employed upon this Contract are suitably trained, experienced and competent to work at height.

© Rand Associates Consultancy Services Ltd

Confined Space Working

013 Prior to the commencement of the Works the Provider shall carry out and publish a risk assessment in accordance with the Confined Spaces Regulations 1997 and ensure that all subsequent Works and actions comply with the aforesaid regulations.

Cleaning Methods

014 Discuss with the Client's Representative the cleaning method to be adopted based on the following information provided in HVCA TR/19.

Dry Cleaning Methods Generic Name	**Energy Source**	**Removal Method**
Air Whip/Skipper Ball (A)	Compressed air (low volume)	A rubber hose or plastic ball that under pressure agitates the wall of the ductwork
Air Lance (A)	Compressed air (low volume)	Usually an air gun with a trigger that is able to direct compressed air locally
Air Nozzle (A)	Compressed air (high volume)	Usually a plastic or metal ball placed on the end of a flexible hose. Compressed air leaving small openings in the ball propels the hose forward inducing the nozzle to closely traverse the internal surface of the duct
Hand wipe	Manual	Wiping of the surface using a medium appropriate to the purpose
Hand scrape	Manual	Removing heavy deposits by hand scraping
Hand brushing	Manual	Brushing of the surface using a brush appropriate to the purpose
Hand vacuum	Electricity/Manual	Suction
Mechanical brushing (A)	Compressed air and/or Electricity	Brushing of the surface of the ductwork using mechanical action
Mechanical brushing and Air Technology Combined	Compressed Air/Electricity	Brushing of the surface of the ductwork using mechanical action and compressed air

Wet Cleaning Methods Generic Name	**Removal Method**
Wet vacuum	Suction
Chemical clean	Softens or dissolves the deposits
Hand wash	Washing of interval surface using appropriate medium
Steam/High pressure water wash	High pressure system used to dislodge/dissolve deposits

015 Following agreement of the method to be used the Client shall provide free local use of electricity and water supplies.

Minor Repairs

016 During testing, carry out minor repairs such as tightening joints, replacement of bolts, screws, etc to ensure completeness and safety of equipment.

© Rand Associates Consultancy Services Ltd

Periodic Cleaning

017 Periodic cleaning of communal/commercial kitchen ventilation canopy cleaning must unless otherwise instructed by the Client's Representative be carried out in accordance with the requirements tabled below:

Kitchen Ventilation/Canopy Cleaning

Item No	Item	Frequency	Action	Notes
1	Grease Filters	Weekly	Turn off extraction fan. Carefully remove washable filter from housing as recommended by the manufacturer. If possible clean filter in dishwasher, if not wash in accordance with manufacturer's recommendations. On replacement ensure any framework drain holes are clear. Re-energise extraction fan.	Use gripping, cut resistant work gloves. Report any defects to Client's Representative.
2	Stainless Steel Canopy Hoods	Weekly	Turn off extraction fan. All exposed stainless steel surfaces should be wiped over with a clean cloth and warm water with a mild detergent. For more stubborn dirt or stains use mild, non-scratching abrasing powders such as typical household cleaners. These can be used with warm water, bristle brushes, sponges or clean cloths. For more aggressive cleaning a small amount of vinegar can be added to the powder. Re-energise extraction fan.	Carbon steel brushes and steel wool should be avoided as they may leave particles embedded in the surface, which can lead to rusting. Cleaning should always be immediately followed by rinsing in clean hot water and the surface then wiped completely with a dry cloth.
3	Luminaries	Weekly	Ensure luminaire is switched off. Clean exterior of luminaire as canopy.	
4	Ductwork general	Annually	Locate ductwork drawing. Check layout of ductwork runs and general condition. Check date of previous cleaning Verify numbers, positions and adequacy of access doors.	If not available report to Client's Representative and determine if drawing is to be produced. If necessary refer to Client's Representative. If necessary, install additional access doors.

© Rand Associates Consultancy Services Ltd

Kitchen Ventilation/Canopy Cleaning (cont'd)

Item No	Item	Frequency	Action	Notes
5	Ductwork hygiene	Quarterly 6 Monthly Annually	Examine internal condition by a Deposit Thickness or Vacuum test If Wet Film Thickness test Measurement 200µm as a mean across the system Any single measurement above 500µm	Refer to HVCA TR19 and CIVSE TW17 Report findings to Client's Representative. Complete cleaning required.
6	Cleaning	As above	Turn off electrical supply to fan(s) and cleaning all ductwork in the agreed appropriate method.	
7	Air Control Dampers	As above	Where air control dampers are encountered of any type (i.e. single blade, multi blade or variable orifice), they shall be marked and returned to their "as found" position on completion of all Work.	
8	Extract Fans	As above	Turn off extraction fan. Fan impeller and casing interior shall be thoroughly cleaned, removing all impacted dirt. Re-energise extraction fan.	
9	External Grilles	As above	Remove grille and clean. Ensure bird mesh is intact, replace if necessary.	Report on adequacy of make up air.
10	Records		The following records should be maintained: a) details of extract canopy LxWxH. b) details of filters c) details of fan(s) d) drawings showing the position of all access points e) the type of cleaning undertaken f) the certificate of cleanliness g) the recommended frequency of check h) date of next recommended inspection i) the name of the person responsible for the completion of the Works	Record details in Site Log Book and copy to Client's Representative

Firestopping

018 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

019 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

COMMUNAL/COMMERCIAL LAUNDRY EQUIPMENT MAINTENANCE

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

COMMUNAL/COMMERCIAL LAUNDRY EQUIPMENT MAINTENANCE

General Requirements

001 The communal/commercial laundry equipment must be covered by a fully comprehensive type Contract.

002 Detailed below are the specific Requirements. The Contract must therefore comprise of the following elements:

- Routine Maintenance
- Responsive Maintenance
- Out of Hours Emergency Works

003 Refer to the Specification, schedule of Works and to manufacturer's requirements and recommendations for detailed guidance. Other guidance is available from the HSE, the BSI, the IET and TSA.

004 Pay particular attention to:
- Applicable Standard - Requirements for Electrical Installations IET Wiring Regulations
- IET Code of Practice for In-service Inspection and Testing of Electrical Equipment
- IET Electrical Maintenance
- HSE IndG35 Safety in electrical testing
- Textile Services Association: Health, Safety and Environmental Management Guidelines
- HSE HSG85 Electricity at Work – safe working practices
- Provision and Use of Work Equipment Regulations 1998 (PUWER)
- The Control of Substances Hazardous to Health Regulations 2002 (COSHH) (as amended).

Asset Register

005 Ensure that all the asset registers supplied by the Client prior to the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

006 At the Commencement Date a set of services drawings may be issued to the Provider who shall ensure that, during each visit to undertake Routine Maintenance, the respective drawing shall be marked up by the Service Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

007 Ensure that, following all visits to undertake Routine Maintenance, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

008 Provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Service Provider's Staff and to his Specialist Subcontractors.

Manufacturer's Requirements

009 Where manufacturers' technical data sheet exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

010 Submit and agree, within 20 working days of the award of the Contract a full annual programme for all Works covering each element of the Routine Maintenance Works with the Client's Representative.

011 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

© Rand Associates Consultancy Services Ltd

Permit to Work Certification

012 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

Access

013 Ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

014 All Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

015 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

Minor Repairs

016 During testing, carry out minor repairs such as tightening joints, replacement of clips etc., to achieve a pass status and make appliances safe to ensure compliance with the British Standard.

Routine Maintenance

017 The minimum requirements for Routine Maintenance are to be in accordance with the relevant equipment manufacturer's recommendations.

018 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

019 Carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

020 Include for the provision and application of all consumables within the Rates for this element of the Contract.

021 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the latest applicable Standards or equivalent.

022 Routine Maintenance must unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirement's tabled below:

© Rand Associates Consultancy Services Ltd

Laundry Plant and Equipment Maintenance – Washing Machines and Washer Extractors

Item No	Item	Frequency	Action	Notes
1	General	6 monthly	Examine safety guards, ensure they are appropriate, in position and securely fixed. All lubrication shall be carried out strictly in accordance with manufacturer's requirements using approved lubricants.	
2	Frames and Cases	6 monthly	Examine for corrosion. Clean and remove any rust and repaint with appropriate protective coating. Examine bed plate mountings, secure as necessary.	
3	Doors	6 monthly	Examine doors. Examine hinges, lubricate in accordance with manufacturer's instructions, adjust as necessary. Examine locks, adjust as necessary. Examine and test interlocks. Clean and examine door seals. Remove all residual detergent and foreign matter.	
4	Pumps	6 monthly	Examine pumps. Examine connections for leakage. Test operation. Examine for corrosion of pump body. Examine mountings. Tighten as necessary.	
5	Filters	6 monthly	Clean and examine filters and filter elements. Renew as necessary. Examine for leakage. Examine for corrosion.	
6	Motors, gear boxes and drives	6 monthly	Clean as necessary, remove surplus oil and grease. Examine securing bolts and anti-vibration mountings, secure as necessary. Examine pulleys and keys. Examine alignment between motor and load. Test bearings for play. Clean and examine motor fins and fans. Ensure motor shields and guards are in place.	

© Rand Associates Consultancy Services Ltd

Laundry Plant and Equipment Maintenance – Washing Machines and Washer Extractors (cont'd)

Item No	Item	Frequency	Action	Notes
7	Drive Belts	6 monthly	Examine drive belts. Renew defective belts. Test tension, adjust as necessary.	
8	Drums	6 monthly	Clean and examine drums. Examine for corrosion. Examine alignment, adjust as necessary. Examine bearings, lubricate in accordance with manufacturer's requirements. Examine counter balances.	
9	Drain Valves	6 monthly	Clean, examine and test drain valves. Examine for corrosion. Examine for leakage. Examine mountings. Tighten as necessary. Ensure that the valve does not pass when shut.	
10	Solenoid Valves	6 monthly	Clean, examine and test solenoid valves. Examine connections for leakage. Examine mountings. Tighten as necessary. Ensure that valves do not pass when shut.	
11	Valves	6 monthly	Check isolating valves. Repack as necessary. Examine pipe connections for leakage.	
12	Hoses	6 monthly	Examine flexible hoses for cracks, hardening or degredation. Replace defective hoses. Remove, clean and examine in-line filters. Examine connections for leakage.	

© Rand Associates Consultancy Services Ltd

Laundry Plant and Equipment Maintenance – Washing Machines and Washer Extractors (cont'd)

Item No	Item	Frequency	Action	Notes
13	Controls	6 monthly	Clean, examine and test controls. Clean and examine switches and knobs. Examine pilot lights, renew lamps as necessary. Examine mechanical condition. Examine fixings and enclosures. Examine terminal connections. Examine condition of wiring. Examine power supplies, check voltage outputs. Examine circuit boards. Ensure they are correctly and securely located. Examine circuit boards for evidence of over heating or component failure. Clean and test depth gauges, pressure switches, thermostats and sensors.	
14	Soap/Detergent Systems	6 monthly	Clean and examine soap and detergent delivery systems. Remove all residual soap, detergent and foreign matter. Flush through with clean water. Test operation.	
15	Electrical Installation	6 monthly	Examine local isolators and connections to the fixed wiring installation. Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Test insulation resistance. Examine earthing arrangements and test continuity.	

© Rand Associates Consultancy Services Ltd

Laundry Plant and Equipment Maintenance – Hydro Extractors

Item No	Item	Frequency	Action	Notes
16	General	6 monthly	Examine safety guards, ensure they are appropriate, in position and securely fixed. All lubrication shall be carried out strictly in accordance with manufacturer's requirements using approved lubricants.	
17	Frames and Cases	6 monthly	Examine for corrosion. Clean and remove any rust and repaint with appropriate protective coating. Examine bed plate mountings, secure as necessary.	
18	Doors	6 monthly	Examine doors. Examine hinges, lubricate in accordance with manufacturer's instructions, adjust as necessary. Examine locks, adjust as necessary. Examine and test interlocks.	
19	Motors, gear boxes and drives	6 monthly	Clean as necessary, remove surplus oil and grease. Examine securing bolts and anti-vibration mountings, secure as necessary. Examine pulleys and keys. Examine alignment between motor and load. Test bearings for play. Clean and examine motor fins and fans. Ensure motor shields and guards are in place.	
20	Drive belts	6 monthly	Examine drive belts. Renew defective belts. Test tension, adjust as necessary.	
21	Drums	6 monthly	Clean and examine drums. Examine for corrosion. Examine alignment, adjust as necessary. Examine bearings, lubricate in accordance with manufacturer's requirements. Examine and test brakes.	

© Rand Associates Consultancy Services Ltd

Laundry Plant and Equipment Maintenance – Hydro Extractors (cont'd)

Item No	Item	Frequency	Action	Notes
22	Controls	6 monthly	Clean, examine and test controls. Clean and examine switches and knobs. Examine pilot lights, renew lamps as necessary. Examine mechanical condition. Examine fixings and enclosures. Examine terminal connections. Examine condition of wiring. Clean, examine and test timers.	
23	Electrical Installation	6 monthly	Examine local isolators and connections to the fixed wiring installation. Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Test insulation resistance. Examine earthing arrangements and test continuity.	

Laundry Plant and Equipment Maintenance – Tumble Drying Machines

Item No	Item	Frequency	Action	Notes
24	General	6 monthly	Examine safety guards, ensure they are appropriate, in position and securely fixed. All lubrication shall be carried out strictly in accordance with manufacturer's requirements using approved lubricants.	
25	Frames and Cases	6 monthly	Examine for corrosion. Clean and remove any rust and repaint with appropriate protective coating. Examine bed plate mountings, secure as necessary.	
26	Doors	6 monthly	Examine doors. Examine hinges, lubricate in accordance with manufacturer's instructions, adjust as necessary. Examine locks, adjust as necessary. Examine and test interlocks. Clean and examine door seals. Remove all residual lint and foreign matter.	

© Rand Associates Consultancy Services Ltd

Laundry Plant and Equipment Maintenance – Tumble Drying Machines (cont'd)

Item No	Item	Frequency	Action	Notes
27	Motors, gear boxes and drives	6 monthly	Clean as necessary, remove surplus oil and grease. Examine securing bolts and anti-vibration mountings, secure as necessary. Examine pulleys and keys. Examine alignment between motor and load. Test bearings for play. Clean and examine motor fins and fans. Ensure motor shields and guards are in place.	
28	Drive Belts	6 monthly	Examine drive belts. Renew defective belts. Test tension, adjust as necessary.	
29	Drums	6 monthly	Clean and examine drums. Examine for corrosion. Examine alignment, adjust as necessary. Examine bearings, lubricate in accordance with manufacturer's requirements. Examine and test brakes.	
30	Filters and Lint Screens	6 monthly	Examine lint screens. Ensure even distribution of lint over screen. Replace screen if distribution is uneven. Clean lint screens. Clean and examine cover gaskets. Replace as necessary.	
31	Internal and external ducts and airways	6 monthly	Remove all lint and debris from inside of exhaust ducts. Clean and examine cover gaskets. Replace as necessary. Vacuum clean all duct work. Clean lint from thermistor and high limit thermostats. Examine mountings and hangers of external ducts, adjust as necessary.	
32	Heat Exchangers	6 monthly	Remove all lint and debris from surface of heat exchangers. Vacuum clean all heat exchangers. Comb fins as necessary.	

© Rand Associates Consultancy Services Ltd

Laundry Plant and Equipment Maintenance – Tumble Drying Machines (cont'd)

Item No	Item	Frequency	Action	Notes
33	Controls	6 monthly	Examine mechanical condition of controllers. Examine fixings and enclosures. Examine control switches. Examine visual displays. Examine indicator lamps. Examine terminal connections. Examine condition of wiring. Clean and examine thermistor. Clean and examine high limit thermostat. Test operation of high limit thermostat. Test operation of air flow switch, adjust as necessary. Test operation of dwell controls and reversing controls. Adjust as necessary.	
34	Electrical Installation	6 monthly	Examine local isolators and connections to the fixed wiring installation. Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Test insulation resistance. Examine earthing arrangements and test continuity.	
35	Elements	6 monthly	Examine connections. Examine terminals for oxidisation, corrosion and tightness. Clean and tighten as necessary. Test insulation resistance. Test element resistance.	
36	Gas Fired Models	6 monthly	Remove burner assembly. Inspect burner electrode assembly. Clean as necessary. Clean injectors. Renew electrodes. Reset spark gaps. Replace thermocouple. Examine combustion chamber viewing windows. Replace as necessary. Carry out combustion test. Where fitted, examine flues. Examine for corrosion. Examine mountings and fixings.	

© Rand Associates Consultancy Services Ltd

Laundry Plant and Equipment Maintenance – Callender Ironing Machines

Item No	Item	Frequency	Action	Notes
37	General	6 monthly	Clean. Remove all fluff and lint. Examine securing bolts, tighten as necessary. Examine feed bands. Examine drive mechanism and transmission gear. Examine roll and bed. Clean and adjust as necessary. Clean, examine and test controls.	
38	Motors, gear boxes and drives	6 monthly	Clean as necessary, remove surplus oil and grease. Examine securing bolts and anti-vibration mountings, secure as necessary. Examine pulleys and keys. Examine alignment between motor and load. Test bearings for play. Clean and examine motor fins and fans. Ensure motor shields and guards are in place.	
39	Spreaders and Folders	6 monthly	Examine belt drives and fees belts, adjust as necessary. Examine folding mechanism, adjust as necessary. Examine controls, adjust as necessary.	
40	Electrical Installation	6 monthly	Examine local isolators and connections to the fixed wiring installation. Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Test insulation resistance. Examine earthing arrangements and test continuity.	

© Rand Associates Consultancy Services Ltd

Laundry Plant and Equipment Maintenance – Presses

Item No	Item	Frequency	Action	Notes
41	Garment presses – general	6 monthly	Examine securing bolts, tighten as necessary. Test shock absorbers and balance springs. Test spray guns. Examine press beds. Renew covers as necessary. Clean, examine and test controls. Examine local isolators and connections to the fixing wiring installation. Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Test insulation resistance. Examine earthing arrangements and test continuity.	

Laundry Plant and Equipment Maintenance – Ventilation

Item No	Item	Frequency	Action	Notes
42	Ductwork, Grilles, Vents, Dampers etc	Annually	Clean, maintain, examine and test in accordance with the requirements of the Specification.	

Laundry Plant and Equipment Maintenance – Electrical Installation

Item No	Item	Frequency	Action	Notes
43	Electrical Installation – fixed wiring	Annually	Carry out a periodic inspection with associated circuit tests in accordance with the requirements of the Specification and the British Standard Requirements for Electrical Installations.	

© Rand Associates Consultancy Services Ltd

Responsive Maintenance and Out of Hours Emergency Works

023 Attend to all call outs due to malfunction or breakdown.

024 Include for a call-out service to provide Responsive Maintenance and an Out of Hours Emergency Works Service. The Out of Hours Emergency Works service is deemed to extend the provision of Emergency Works to a 24 hour, 7 days a week, 365 (366 for a leap year) days per year basis.

025 Call outs for Responsive Maintenance and/or Out of Hours Emergency Works which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

026 Where Out of Hours Emergency Works are attended to for authorised cases of breakdowns, mis-use or vandalism, the Provider will be paid in accordance with the Rates detailed in the Price Framework.

Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works

Repairs, Replacements and Adjustments

027 Be responsible for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

028 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

029 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

030 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

Firestopping

031 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

032 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

CRADLE ACCESS SYSTEMS MAINTENANCE

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

CRADLE ACCESS SYSTEMS MAINTENANCE

General Requirements

001 Ensure that they have read the whole of this Specification together with the Client's Requirements and will be deemed to have included in his Tendered Rates for full compliance.

002 Provide a Routine Maintenance and a Responsive Maintenance service including undertaking Emergency Works.

Asset Register

003 Ensure that all the asset registers supplied by the Client prior to the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

004 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each maintenance service element, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

005 Ensure that, following all inspection visits, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

006 Provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff including his Specialist Subcontractors.

Manufacturer's Requirements

007 Where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

008 Submit and agree, within 20 working days of the award of the Contract a full annual Programme for all Works covering each element of the maintenance Works with the Client's Representative.

009 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

Permit to Work Certification

010 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

Access

011 Ensure that they undertake a risk assessment and provides a method statement for their means of access to allow for inspection and testing.

012 All Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005" and the requirements of Part 2 of the applicable Standard relating to travelling ladders and Part 3 of the applicable Standard relating to suspended access equipment, together with LOLER 1998 (lifting operations and Lifting Equipment Regulations).

© Rand Associates Consultancy Services Ltd

013 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height, operating as a minimum 2 man team, fully rescue trained and carrying two way radio's, employing a banksman as necessary.

Minor Repairs

014 During testing, carry out minor repairs such as tightening joints, replacements of bolts, screws, defective indicator lamps, etc., to ensure completeness and safety of equipment.

Routine Maintenance

015 Routine Maintenance including testing of cradle installations must, unless otherwise Instructed by the Client's Representative, be carried out in accordance with the requirements tabled below;

016 It is critical that the BSI code of Practice is followed and adhered to.

017 Routine Maintenance and testing should also cover pre-use checks including the following:

- Availability of cradle documentation and Operation and Maintenance manuals;
- Correct PPE usage;
- Equipment log and ID plates to match cradle details;
- Latest inspection and load test certificates, complying with LOLER;
- Adverse weather conditions must be factored into inspections;
- Deployment of an anemometer, wind speeds must not exceed 7m per second i.e. 15mph;
- Demarcation of working area below;
- Adherence to safe working loads as noted on ID plate;
- Access and exit points fully defined and identified;
- Securing of unit following its use, to its designated parking position and isolation of power.

Cradle Access System Maintenance

Item No	Item	Frequency	Action	Notes
1	Visual Inspection and Testing	3 monthly	In accordance with the manufacturer's technical data sheet.	
2	Inspection and Examination	6 monthly	In accordance with the manufacturer's technical data sheet.	
3	Annual Load Testing	Annually	In accordance with the manufacturer's technical data sheet.	

Responsive Maintenance

018 Attend to all call outs due to malfunction or breakdown during Normal Working Hours.

019 Call outs which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

Routine Maintenance and Responsive Maintenance

Repairs, Replacements and Adjustments

020 Take responsibility for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

© Rand Associates Consultancy Services Ltd

021 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

022 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

023 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

Firestopping

024 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

025 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

© Rand Associates Consultancy Services Ltd

DOMESTIC CENTRAL HEATING INSTALLATIONS

© Rand Associates Consultancy Services Ltd

General Requirements

© Rand Associates Consultancy Services Ltd

HEATING

General Requirements

Provider's Conduct

001 The Client is intent on providing an expeditious, safe and efficient maintenance service to its Customer's and consequently the Provider shall do his utmost to promote and enhance the image and reputation of the Client in this respect.

002 The Provider shall require his Staff engaged upon the Works to be properly and presentably dressed in appropriate uniforms or workwear.

003 The Provider shall ensure that his Staff shall perform their duties in an orderly and quiet manner as may be reasonable and practicable having regard to the nature of the duties being performed by them.

004 The need to maintain the highest standards of hygiene and courtesy whilst the Provider's Staff are engaged upon the Works is paramount and in particular consideration must be given to users and occupiers when working in or near occupied premises. The Provider shall observe all of these provisions and also ensure that the said Staff do not cause a nuisance and or disturbance to users and occupiers when they are working in or near occupied premises.

005 The Client's Representative is empowered by this provision to give written notice to the Provider requiring him to remove from the Works forthwith any Staff member of the Provider engaged upon the Works, if he is not satisfied in any way with the respective Staff members apparel, conduct, manner, or ability. The Provider shall on receipt of such notice comply forthwith and remove the Staff member from the Client's Property and the Staff member shall not be employed or engaged upon or in connection with the Works whilst the Contract remains in force.

006 The Client's Representative will from time to time poll Customer's to obtain their views on the effectiveness of the service provided by the Provider and the manner adopted by his Staff when discharging their duties. The results of the poll will be taken into account when considering the needs for resourcing future repair and maintenance programmes.

Registered Provider

007 The Provider shall have and maintain throughout the Contract Period registration with the:-

(a) GAS SAFE Register or such other body as may from time to time be approved by the Health and Safety Executive and

(b) OFTEC or such other body as may from time to time be approved by the Health and Safety Executive and

(c) HETAS or other such body as may from time to time be approved by the Health and Safety Executive and

(d) National Inspection Council for Electrical Installation Contracting (NICEIC) and/or Electrical Providers Association (ECA) or alternatively, the Provider may employ a Subcontractor who is registered with the National Inspection Council for Electrical Installation Contracting and/or Electrical Providers Association in order to undertake electrical work in connection with the Works or be registered with an approved electrical licence to practice system. An example of a licence to practice system is SparkSafe.

© Rand Associates Consultancy Services Ltd

008 In the event that the Provider's GAS SAFE or OFTEC or HETAS OR NICEIC or ECA registration becomes suspended or withdrawn or has any conditions attached for whatever reason, the Provider shall immediately notify the Client's Representative in writing giving full details of the reasons for such and the proposed or intended action and time-scale for gaining reinstatement of its registration(s). With immediate effect from the date of suspension or withdrawal of its registration(s) and until reinstatement The Provider shall, subject to approval of the Client's Representative, be required to employ a suitably registered Subcontractor to undertake Works under the Contract.

009 Should the Provider be unable within a period of two weeks to engage a suitably registered Subcontractor which meets the Client's Representative's approval and or the period of suspended or withdrawn registration(s) exceeds or is likely to exceed four weeks then, the Client may at its sole discretion terminate the Provider's employment under the Contract in writing with immediate effect. Such action on the part of the Client shall constitute a valid termination in accordance with the Contract Conditions.

Electrical Installations

010 The Provider shall as part of the installation of a new/replacement gas or oil fired or biomass central heating installation, check and test all electrical installations and fittings associated with the Heating Installations and Heating Appliances covered by this Contract, so as to ensure their safe operation.
All remedial work will comply fully with IET REGULATIONS.

© Rand Associates Consultancy Services Ltd

PERFORMANCE SPECIFICATION FOR HEATING INSTALLATIONS

© Rand Associates Consultancy Services Ltd

SPECIAL CONDITIONS

Special Conditions

001 The following special conditions apply to all new boiler central heating and hot water services installations and boiler replacement and boiler renewal installations.

002 Retain GAS SAFE, OFTEC or HETAS registration All operatives, engineers and technicians shall be suitability qualified.

003 Provide a full list of the operatives who will be involved in the Contract prior to the commencement date. This list shall include the operatives' names, career history, qualifications, etc.

004 This information shall be updated as and when required throughout the duration of the Contract.

005 **Note that following completion of the works, a 24 hour, 7 days/week, including Public Holidays, emergency call-out service shall be provided for the duration of the 12 months Defects Liability Period.** The emergency call-out number shall be provided on a sticker placed on the boiler enclosure.

006 Provide written notification of all emergency call-outs giving details of faults/defects and response times which should be countersigned by the Customer.

Provider Design

007 Undertake Design responsibilities for the new domestic central heating and hot water services installations, or for the boiler replacement/renewal installations.

008 Provide a statement of skills, knowledge and experience which will cover:

- Membership of a relevant professional body.
- Familiarity with the construction processes in the circumstances of the project and the impact of design on Health and Safety.
- Awareness of relevant Health and Safety and fire safety legislation and appropriate risk assessment methods.
- The Health and Safety practices of the designer for Design work carried out.
- The people to be employed to carry out the work, their skills and training, this is likely to include external resources where necessary and is to be reviewed in association with the design requirements.
- Technical facilities to support the Design, particularly in the circumstances of the project.
- The method of communicating Design decisions.
- How information and instructions will be communicated to the Customer's. Ideally this should be provided by a person with specific training, e.g. City and Guilds in Energy Advice.
- This information shall be forwarded to the Client's Representative.

© Rand Associates Consultancy Services Ltd

INSTALL AND MAINTAIN REPLACEMENT GAS (WALL MOUNTED CONDENSING BOILER) CENTRAL HEATING SYSTEM

Replacement operations will be as follows and to include all labour and materials necessary for the completion of the installation

Design

009 Undertake an initial survey of each Property and prepare and submit the Design information for the replacement of the heating system in compliance with the Client's Specification.

010 Submit a completed "Survey Schedule and Cost Estimate" to the Client's Representative for clearance and approval.

011 Undertake all necessary Customer consultation.

012 Obtain all necessary statutory approvals; for the Works (including the payment all necessary fees and administration charges in connection therewith).

Removal of Existing System

013 Carefully draining down, disconnection and removal of the complete existing Client's and or Customer installed heating system; remove/seal off as necessary all pipe work thereto, remove fireplace hearth and surround, build up chamber opening, core ball and sweep flue; supply and insert permanent ventilator and extend and make good plaster, skirting to match existing.

014 Remove all redundant radiators and exposed pipe work as necessary and remove the feed and expansion cistern, all pipe work, and insulation and any support platforms. The hot water cylinder, pipe work, immersion heaters, insulation and support stool are also to be removed. All existing electric cable, conduit and accessories shall be removed and all surfaces made good.

Replacement installation

015 Supply temporary heat (a minimum two 3 Kilowatt electric panel type heaters having time and temperature control; for the complete duration of the Works and maintain Customer's mains electricity supply, mains water supply and bathroom facilities at end of each working day.

016 Ensure that Customer's property and possessions are protected with the Property cleaned at the end of each working day and on completion of all of the Works.

017 Supply and install a gas wall mounted condensing boiler complete with fixing gig and all gas pipe work connections thereto, including any alterations to existing and all new heating pipe work, domestic hot and cold-water pipe work as applicable; all pipe work insulation, all condensate pipe work to waste or gully or to and including construction, if necessary, of a soak-a-way.

018 Supply and install a complete boiler flue to comply with applicable Standard, all in accordance with the boiler manufacturer's flue options where necessary, with a flue terminal wire guard if required, including forming all structural openings and all necessary builders work and making good.

019 Supply and install a fireproof ceiling above a boiler if located in a store or below stairs as required.

020 Supply and install eaves/guttering protection heat shields above flue terminal. Supply and install a plume kit.

021 Supply and install in all habitable rooms a radiator to provide the calculated heat output required in each Property type, including grounds to stud walls where required. Rear halls and porches are not deemed to be a habitable room.

© Rand Associates Consultancy Services Ltd

022 Supply and install new heating circulator complete with valves, including dedicated electrical circuit and flexible cable connection to the pump.

023 Thermostatic radiator valves to be fitted to all rooms fitted with a radiator except in rooms where a controlling room thermostat (standard or programmable is fitted).

024 Supply and install a lock shield radiator valve to all rooms fitted with a radiator, including an additional lock shield valve in lieu of a thermostatic valve where the room thermostat is fitted.

025 The control of space heating and hot water systems shall be provided with time and temperature control in accordance with the Client's Specification including electrical circuit and all connections to each item of control equipment.

026 Supply and install new feed and expansion cistern, complete with insulation jacket, support platform, lid, float valve, overflow and warning pipework.

027 Supply and install new hot water cylinder, complete with factory fitted foam insulation, 3kW immersion heater, cylinder stool including new dedicated electrical circuit having a heating boost switch and new flexible cable connection to the immersion heater.

028 Provide a tiled fire surround and hearth in accordance with F30 (3) Code of Practice for Electric Fires, with an electric inset focal point fire provided, including dedicated electrical circuit and flexible cable connection to the fire from DP switch concealed within the fabric of the building.

029 Undertake the Design, install and test all new dedicated electrical circuits in accordance with the applicable Standards for electrical installations for:
- Gas boiler installation including heating/hot water system control and all accessories;
- Boiler house/compartment light circuit including bulkhead fitting and lamp where required;
- Electric inset electric focal point fire circuit including flexible cable;
- Electric immersion heater circuit including heating boost switch circuit and flexible cable;

030 Provide all labels where necessary, test and provide to the Client an EIC (Electrical Installation Certificate) for all Works completed.

031 Where necessary provide ventilated pipe casings to all gas pipe work in accordance with GSUIR.

032 Make good/replace as necessary insulation to all exposed pipe work in roof space and all necessary new insulation to pipelines in accordance with the Client's specification.

033 Provide all necessary pipe casings to pipe work where exposed. All pipe casings to be painted with 2 No. coats of undercoat and finished with one coat of white gloss paint.

Completion

034 On completion of the replacement installation of a boiler and hot water system, together with associated equipment such as pipe work, circulating pump, radiators and system controls, the Provider shall check the system for air locks and vent as necessary and the system and all equipment should be tested and commissioned in accordance with the manufacturer's technical data sheet.

035 Provide the fuel for testing.

036 The heating system is to be thoroughly cleaned and flushed out before the installation of a new boiler.

037 During the final filling of the system, a chemical water treatment inhibitor meeting the boiler manufacturer's specification or other appropriate standard should be added to the primary circuit to control corrosion and the formation of scale and sludge.

038 Upload unto the Client's IT system, all test certificates and records as requested in the Client's specification.

© Rand Associates Consultancy Services Ltd

039 Give the Customer sufficient information about the Property, including operational and maintenance instructions of the installed building services and controls and other details so that each Property can be operated and maintained in an energy efficient manner to use no more fuel than is reasonable in the circumstances.

040 Without comprising health and safety requirements, the instructions should explain to the Customer how to operate the system efficiently to include:
- How to make adjustments to the timing, temperature and flow control settings; and
- What routine maintenance is necessary to enable each system to be maintained at reasonable efficiency throughout their service life

041 Provide an information pack supplied in an A4 clear plastic envelope and containing a copy of the central heating system's manufacturers operational instructions/booklets for each major component.

042 Notify in writing to the local Building Authority and the Client's Representative confirming that all fixed building services have been properly commissioned not more than five days after completion of the commissioning Works.

043 Upload the Health & Safety File to the Client's IT system in accordance with the current CDM (Construction Design Management) Regulations, on completion of the works.

Boiler Manufacturer's Warranty

044 The Work will also include the provision of a manufacturer providing evidence of a warranty for each boiler installed by the Provider.

045 The warranty guarantees the repair of all defects to the boiler at no cost to the Client (including the cost for all parts, labour and any other charges) for a period of 10 years from the date of installation of the boiler.

046 The warranty shall be given by the manufacturer directly to the Client and the manufacturer agrees that from the commencement date to the end of the warranty period of the agreement, labour to carry out any repairs is provided by the Provider but is transferable to the Client's new Provider either after the end date of this Contract or upon termination of the Contract.

047 The Client will undertake to have the warranted boiler installed under this Contract.

048 The Client will undertake to have the warranted boiler serviced annually either under this Contract or a subsequent contract.

Provider's Central Heating Warranty

049 The work will also include the provision of a Provider's warranty for each replacement central heating system installed by the Provider and this warranty must provide for the following features

050 The warranty guarantees the repair of all defects and any Customer's misunderstanding or abuse to the replacement central heating system at no cost to the Client (including the cost of all parts, labour and any other charges) **for a period of 12 months from the date of installation of the replacement heating system.**

Routine and Responsive Maintenance Service

051 For the avoidance of doubt, the replacement central heating system installed under this part of the service, with immediate effect, is repaired by the Provider under the routine and response maintenance service of this Contract, however while the replacement central heating system is under the Provider's 12 month warranty, no payment will be made for the installation under the routine and responsive maintenance service during this time.

© Rand Associates Consultancy Services Ltd

052 As part of the Provider's routine and responsive maintenance service of this Contract the Provider is responsible for obtaining all parts and recovering all associated labour costs or any other expenses, directly from the boiler manufacturer under the boiler manufacturer's warranty.

INSTALL AND MAINTAIN REPLACEMENT GAS (COMBINATION CONDENSING BOILER) CENTRAL HEATING SYSTEM

Replacement operations will be as follows and include all labour and materials necessary for the completion of the installation

Design

053 Undertake an initial survey of each Property and prepare and submit the Design information for the replacement of the heating system in compliance with the Client's Specification.

054 Submit a completed "Survey Schedule and Cost Estimate" to the Client's Representative for clearance and approval.

055 Undertake all necessary Customer consultation.

056 Obtain all necessary statutory approvals for the Works; (including the payment of all necessary fees and administration charges in connection therewith).

Removal of Existing System

057 Carefully draining down, disconnection and removal of the existing Client's and or Customer installed heating system; remove/seal off as necessary all pipe work thereto, remove fireplace hearth and surround, build up chamber opening, core ball and sweep flue; supply and install a permanent ventilator and extend and make good plaster, skirting to match existing.

058 Remove all redundant radiators and exposed pipe work as necessary, remove the feed and expansion cistern, the cold water storage tank, all pipe work, and insulation and any support platforms. The hot water cylinder, pipe work, immersion heaters, insulation and support stool are also to be removed. All existing electric cable, conduit and accessories shall be removed and all surfaces made good.

Replacement installation

059 Supply temporary heat (a minimum of two 3 Kilowatt electric panel type heaters; having time and temperature controls); for the complete duration of works and maintain Customer's mains electricity supply, mains water supply and bathroom facilities at end of each working day.

060 Ensure that Customer's property is protected, and the Property cleaned at the end of each working day and on completion of all of the Works.

061 Supply and install a gas wall mounted combination boiler complete with fixing gig; all gas pipe work connections thereto, including any alterations to existing and all new heating pipe work and domestic hot and cold-water pipe work as applicable; pipe work insulation; all condensate pipe work to waste or gully or to and including construction, if necessary, of a soak-a-way.

062 Supply and install complete boiler flue to comply with the applicable Standards, all in accordance with the boiler manufacturer's flue options; with a flue terminal wire guard if required, including forming all structural openings; all builders work and making good.

063 Supply and install a fireproof ceiling above a boiler if located in a store or below stairs as required.

064 Supply and install eaves/guttering protection heat shields above flue terminal. Supply and install a plume kit.

© Rand Associates Consultancy Services Ltd

065 Supply and install in all habitable rooms a radiator to provide the calculated output required in each Property type; including grounds to stud walls where required.

066 Supply and install new heating circulator complete with valves, including dedicated electrical circuit and flexible cable connection to the pump.

067 Thermostatic radiator valves to be fitted to all rooms with a radiator except in rooms where a controlling room thermostat (standard or programmable is fitted).

068 Supply and install a lock shield radiator valve to all rooms fitted with a radiator, including an additional lock shield in lieu of a thermostatic valve where the room thermostat is fitted.

069 The control of space heating system shall be provided with time and temperature control in accordance with the Client's Specification including electrical circuit and all connections to each item of control equipment.

070 Replace the existing wc cistern valve with new high-pressure valve where required and include for installing a pressure reduction valve and pressure vessel where necessary.

071 Make good/replace as necessary insulation to all exposed pipe work in roof space and all necessary new insulation to pipelines, where applicable.

072 Supply and install a tiled surround and hearth in accordance with F30 (3) Code of Practice for Electric Fires, together with an electric inset focal point fire provided, including dedicated electrical circuit and flexible cable connection to the fire from DP switch concealed within the fabric of the building.

073 Undertake the design, install and test all new dedicated electrical circuits in accordance with in accordance with the applicable Standards for electrical installations for:
- Gas boiler installation including heating system control and all accessories;
- Electric Boiler house/compartment light circuit including bulkhead fitting and lamp where required;
- Electric inset electric focal point fire circuit including flexible cable;

074 Supply and install fireproof ceilings above boiler if located in a store or under stairs as required.

075 Supply and fix labels where necessary, test and upload unto the Client's IT system a EIC (Electrical Installation Certificate) for all Works completed.

076 Where necessary provide ventilated pipe casings to all gas pipe work in accordance with GSUIR.

077 Make good/replace as necessary insulation to all exposed pipework and all necessary new insulation to pipelines, in accordance with the Client's Specification.

078 Provide all necessary pipe casings to pipework where exposed. All pipe casings to be painted 2 No. coats of undercoat and 1 No. coat of white gloss paint.

Completion

079 On completion of the replacement installation of a boiler and hot water system, together with associated equipment such as pipe work, circulating pump, radiators and system controls, the Provider shall check the system for air locks and vent as necessary and the systems and all equipment shall be tested and commissioned in accordance with the manufacturer's technical data sheet.

080 Provide the fuel for testing.

081 The heating system to be thoroughly cleaned and flushed out before installing a new boile.
During the final filling of the system, a chemical water treatment inhibitor meeting the boiler manufacturer's specification or other appropriate standard should be added to the primary circuit to control corrosion and the formation of scale and sludge.

© Rand Associates Consultancy Services Ltd

082 Upload to the Client's IT system, all test certificates and records as requested in the Client's Specification.

083 Give the Customer sufficient information about the Property, including operational and maintenance instructions of the installed building services and controls and other details so that each Property can be operated and maintained in an energy efficient manner to use no more fuel than is reasonable in the circumstances.

084 Without comprising health and safety requirements, the instructions should explain to the Customer how to operate the system efficiently to include:

- How to make adjustments to the timing, temperature and flow control settings; and
- What routine maintenance is necessary to enable each system to be maintained at reasonable efficiency throughout their service life.

085 Provide an information pack supplied in an A4 clear plastic envelope and containing a copy of the central heating system's manufacturer's operational instructions/booklets for each major component.

086 Notify in writing to the local Building Authority and the Client's Representative confirming that all fixed building services have been properly commissioned not more than five days after completion of the commissioning works.

087 Upload the Health & Safety File to the Client's IT system in accordance with the current CDM (Construction Design Management) Regulations, on the completion of the Works.

Electrical Installations

088 Undertake as part of the installation of a new/replacement gas or oil fired or biomass central heating installation, checking and testing all electrical installations and fittings associated with the Heating Installations and Heating Appliances covered by this Contract, so as to ensure their safe operation.

089 All remedial work will comply fully with the applicable Standards for electrical installations.

Manufacturers Boiler Warranty

090 The work will also include the provision of a manufacturer providing evidence of a warranty for each boiler installed by the Provider.

091 The warranty guarantees the repair of all defects to the boiler at no cost to the Client (including the cost for all parts, labour and any other charges) for a period of 10 years from the date of installation of the boiler.

092 The warranty shall be given by the manufacturer directly to the Client and the manufacturer agrees that from the commencement date to the end of the warranty period of the agreement, labour to carry out any repairs is provided by the Provider but is transferable to the Client's new Provider either after the end date of this Contract or upon termination of the Contract.

093 The Client will undertake to have the warranted boiler installed under this Contract.

094 The Client will undertake to have the warranted boiler serviced annually either under this Contract or a subsequent contract.

Provider's Central Heating Warranty

095 The Work will also include the provision of a Providers warranty for each replacement central heating system installed by the Provider and this warranty must provide for the following features.

© Rand Associates Consultancy Services Ltd

096 The warranty guarantees the repair of all defects and any Customer's misunderstanding or abuse to the replacement central heating system at no cost to the Client (including the cost of all parts, labour and any other charges) **for a period of 12 months from the date of installation of the replacement heating system.**

Routine and Responsive Maintenance Service

097 For the avoidance of doubt, the replacement central heating system installed under this part of the service, with immediate effect, is repaired by the Provider under the routine and responsive maintenance service of this contract, however while the replacement central heating system is under the Provider's 12 month warranty, no payment will be made for the installation under the routine and responsive maintenance service during this time.

098 As part of the Providers routine and responsive maintenance service of this Contract the Provider is responsible for obtaining all parts and recovering all associated labour costs or any other expenses, directly from the boiler manufacturer under the boiler manufacturer's warranty.

INSTALL AND MAINTAIN REPLACEMENT GAS (CONDENSING SYSTEM BOILER) CENTRAL HEATING SYSTEM

Replacement operations will be as follows and include all labour and materials necessary for the completion of the installation

Design

099 Undertake an initial survey of each Property and prepare and submit the Design information for the replacement of the heating system in compliance with the Client's Specification.

100 Submit a completed "Survey Schedule and Cost Estimate" to the Client for clearance and approval.

101 Undertake all necessary Customer consultation.

102 Obtain all necessary statutory approvals for the Works (including the payment of all necessary fees and administration charges in connection therewith).

Removal of Existing System

103 Carefully draining down, disconnection and removal of the complete existing Client's and or Customer installed heating system; remove/seal off as necessary all pipe work thereto, remove fireplace hearth and surround, build up chamber opening, core ball and sweep flue; supply and install a permanent ventilator and extend and make good plaster, skirting to match existing. The Provider shall remove all redundant radiators and exposed pipe work as necessary , remove the feed and expansion cistern, the cold water storage tank, all pipe work, and insulation and any support platforms. The hot water cylinder, pipe work, immersion heaters, insulation and support stool are also to be removed. All existing electrical cable, conduits and accessories shall be removed and all surfaces made good.

Replacement Installation

104 Supply temporary heat (a minimum of two 3 Kilowatt electric panel type heaters; having time and temperature controls: for the complete duration of Works and maintain Customer's mains electricity supply, mains water supply and bathroom facilities at end of each working day.

105 Ensure that Customer's property is protected and the Property cleaned at the end of each working day and on completion of all of the Works.

106 Supply and install a Gas wall mounted system boiler complete with fixing gig; all gas pipe work connections thereto, including any alterations to existing and all new heating pipe work and domestic hot and cold water pipe work as applicable; pipe work insulation; all condensate pipe work to waste or gully or to and including construction, if necessary, of a soak-a-way.

© Rand Associates Consultancy Services Ltd

107 Supply and install complete boiler flue to comply with applicable Standards, all in accordance with the boiler manufacturer's flue options; with a flue terminal wire guard if required; including forming all structural openings; all builders work and making good. Provide and install a plume kit.

108 Supply and install eaves/guttering protection heat shields above flue terminal.

109 Supply and install a fireproof ceiling above a boiler if located in a store or below stairs as required.

110 Supply and install in all habitable rooms a radiator to provide the calculated output required in each dwelling type; including grounds to stud walls where required.

111 Supply and install new heating circulator complete with valves, including dedicated electrical circuit and flexible cable connection to the pump.

112 Thermostatic radiator valves to be fitted to all rooms with a radiator except in rooms where a controlling room thermostat (standard or programmable is fitted).

113 Supply and install a lock shield radiator valve to all rooms fitted with a radiator, including an additional lock shield in lieu of a thermostatic valve where the room thermostat is fitted.

114 The control of space heating system shall be provided with time and temperature control in accordance with the Client's Specification including electrical circuit and all connections to each item of control equipment.

115 Make good/replace as necessary insulation to all exposed pipe work in roof space and all necessary new insulation to pipelines, where applicable.

116 Supply and install a tiled surround and hearth in accordance with F30 (3) Code of Practice for Electric Fires, together with an electric inset focal point fire provided, including dedicated electrical circuit and flexible cable connection to the fire from DP switch concealed within the fabric of the Property.

117 Design, install and test all new dedicated electrical circuits in accordance with the applicable Standards for electrical installations for:
- Gas boiler installation including space heating and system control and all accessories;
- Electric Boiler house/compartment light circuit including bulkhead fitting and lamp where required;
- Electric inset electric focal point fire circuit including flexible cable to fire ;

118 Supply and fix all labels where necessary, test and upload unto the Client's IT system an EIC (Electrical Installation Certificate) for all Works completed.

119 Where necessary provide ventilated pipe casings to all gas pipe work in accordance with GSUIR.

120 Make good/replace as necessary insulation to all exposed pipework and all necessary new insulation to pipelines, in accordance with the Client's specification.

121 Provide all necessary pipe casings to pipework where exposed. All pipe casings to be painted 2 No. coats of undercoat and 1 No. coat of white gloss paint.

Completion

122 On completion of the replacement installation of a boiler and hot water system, together with associated equipment such as pipe work, circulating pump, radiators and system controls, the Provider shall check the system for air locks and vent as necessary and the system and all equipment should be tested and commissioned in accordance with the manufacturer's technical data sheet.

123 Provide the fuel for testing.

124 The heating system to be thoroughly cleaned and flushed out before installing a new boiler.

© Rand Associates Consultancy Services Ltd

125 During the final filling of the system, a chemical water treatment inhibitor meeting the boiler manufacturer's specification or other appropriate standard should be added to the primary circuit to control corrosion and the formation of scale and sludge.

126 Provide and upload unto the Client's IT system, all test certificates and records as requested in the Client's Specification.

127 Provide the Customer sufficient information about the Property, including operational and maintenance instructions of the installed building services and controls and other details so that each Property can be operated and maintained in an energy efficient manner to use no more fuel than is reasonable in the circumstances.

128 Without comprising health and safety requirements, the instructions should explain to the Customer how to operate the system efficiently to include:

- How to make adjustments to the timing, temperature and flow control settings; and
- What routine maintenance is necessary to enable each system to be maintained at reasonable efficiency throughout their service life.

129 Provide an information pack supplied in an A4 clear plastic envelope and containing a copy of the central heating system's manufacturers operational instructions/booklets for each major component.

130 Notify in writing to the local Building Authority and the Client's Representative confirming that all fixed building services have been properly commissioned not more than five days after completion of the commissioning works.

131 Upload the Health & Safety File to Client's IT system in accordance with the current CDM (Construction Design Management) Regulations, on the completion of the Works.

Manufacturers Boiler Warranty

132 The Work will also include the provision of a manufacturer providing evidence of a warranty for each boiler installed by the Provider.

133 The warranty guarantees the repair of all defects to the boiler at no cost to the Client (including the cost for all parts, labour and any other charges) for a period of 10 years from the date of installation of the boiler.

134 The warranty shall be given by the manufacturer directly to the Client and the manufacturer agrees that from the commencement date to the end of the warranty period of the agreement, labour to carry out any repairs is provided by the Provider but is transferable to the Client's new Provider either after the end date of this Contract or upon termination of the Contract.

135 The Client will undertake to have the warranted boiler installed under this Contract. The Client will undertake to have the warranted boiler serviced annually either under this Contract or a subsequent contract.

Provider's Central Heating Warranty

136 The Work will also include the provision of a Provider's warranty for each replacement central heating system installed by the Provider and this warranty must provide for the following features. The warranty guarantees the repair of all defects and any Customer's misunderstanding or abuse to the replacement central heating system at no cost to the Client (including the cost of all parts, labour and any other charges) **for a period of 12 months from the date of installation of the replacement heating system.**

© Rand Associates Consultancy Services Ltd

Routine and Responsive Maintenance Service

137 For the avoidance of doubt, the replacement central heating system installed under this part of the service, with immediate effect, is repaired by the Provider under the routine and responsive maintenance service of this contract, however while the replacement central heating system is under the Providers 12 month warranty, no payment will be made for the installation under the routine and response maintenance service during this time.

138 As part of the Provider's routine and responsive maintenance service of this Contract the Provider is responsible for obtaining all parts and recovering all associated labour costs or any other expenses, directly from the boiler manufacturer under the boiler manufacturer's warranty.

INSTALL AND MAINTAIN REPLACEMENT OIL (CONDENSING BOILER) CENTRAL HEATING SYSTEM

Replacement operations will be as follows and to include all labour and materials necessary for the completion of the installation

Design

139 Undertake an initial survey of each Property and prepare and submit the Design information for the replacement of the heating system in compliance with the Client's Specification.

140 Submit a completed "Survey Schedule and Cost Estimate" to the Client's Representative for clearance and approval.

141 Undertake all necessary Customer consultation.

142 Obtain all necessary statutory approvals; for the Works (including the payment all necessary fees and administration charges in connection therewith).

Removal of Existing System

143 Carefully draining down, disconnection and removal of the complete existing Client's and or Customer installed heating system; remove/seal off as necessary all pipe work thereto, remove fireplace hearth and surround, build up chamber opening, core ball and sweep flue; supply and insert permanent ventilator and extend and make good plaster, skirting to match existing where required.

144 Remove all redundant radiators and existing pipe work as necessary and remove the feed and expansion cistern, all pipe work, and insulation and any support platforms. The hot water cylinder, pipework, immersion heater, insulation and support stool are also to be disconnected and removed. All electric cable, conduits and accessories shall be removed and all surfaces made good.

145 Undertake the breaking up and removal of existing concrete/paving slabs boiler house/cabinet bases and existing installed concrete/paving slabs oil storage tank bases either installed by the Client and or a Customer.

Replacement installation

146 Supply temporary heat (a minimum of two 3 Kilowatt electric panel type heaters having time and temperature control) for the complete duration of the works and maintain Customer's mains electricity supply, mains water supply and bathroom facilities at end of each working day.

147 Ensure that Customer's property and possessions are protected and the Property cleaned at the end of each working day and on completion of all of the Works.

148 Supply and install an oil fired condensing boiler (outdoor type) complete with concrete base; oil pipe work connections thereto; including any alterations to existing and all new heating pipe work, domestic hot and cold water pipe work as applicable; all pipe work insulation, all condensate pipe work to waste or gully or to and including construction, if necessary, of a soak-a-way.

© Rand Associates Consultancy Services Ltd

149 Supply and install a complete low level boiler flue assembly to comply with applicable Standard, all in accordance with the boiler manufacturer's installation instructions, with all flue extensions; bends; supports and a flue terminal wire guard if required. Supply and install a plume kit.

150 Supply and install in all habitable rooms a radiator to provide the calculated heat output required in each Property type, including grounds to stud walls if required. Rear halls and porches are not deemed to be a habitable room.

151 Supply and install new heating circulator complete with valves, including dedicated electrical circuit and flexible cable connection to the pump.

152 Thermostatic radiator valves to be fitted to all rooms fitted with a radiator except in rooms where a controlling room thermostat (standard or programmable is fitted).

153 Supply and install a lock shield radiator valve to all rooms fitted with a radiator, including an additional lock shield valve in lieu of a thermostatic valve where the room thermostat is fitted.

154 The control of space heating and hot water systems shall be provided with time and temperature control in accordance with the Client's Specification including electrical circuit and all connections to each item of control equipment.

155 Supply and install new feed and expansion cistern, complete with insulation jacket, support platform, lid, float valve, overflow and warning pipework.

156 Supply and install new hot water cylinder, complete with factory fitted foam insulation, 3kW immersion heater, cylinder stool including new dedicated electrical circuit having a heating boost switch and new flexible cable connection to the immersion heater.

157 Supply and install a new bunded oil storage tank in accordance with the Client's Specification; and form base.

158 Supply and install oil supply pipe laid in 450 deep trench including breaking/taking up and reinstating paving or concrete of any type and/or grassed topsoil; backfill and disposal of surplus spoil, granular bed/haunching/surround; galvanised or 150 diameter PVC-u ducting including all necessary fittings, filter shut off valve, de- aeration device, and fire valve. Provide an external plastic coated galvanised steel casing to fire valve and/or de- aeration device.

159 Supply and install a tiled fire surround and hearth in accordance with F30 (3) Code of Practice for Electric Fires, with an electric inset focal point fire provided, including dedicated electrical circuit and flexible cable connection to the fire; from DP switch concealed within the fabric of the Property.

160 Undertake the Design, install and test all new dedicated electrical circuits in accordance with the applicable Standards for electrical installations for:

- Oil boiler installation including heating/hot water system control and all accessories;
- Boiler house/compartment light circuit including bulkhead fitting and lamp where required;
- Electric inset electric focal point fire circuit including flexible cable to fire;
- Electric immersion heater circuit including heating boost switch circuit and flexible cable ;

161 Supply and fix all labels where necessary, test and upload unto the Client's IT system an EIC (Electrical Installation Certificate) for all works completed.

162 Make good/replace as necessary insulation to all exposed pipe work in roof space and all necessary new insulation to pipelines in accordance with the Client's Specification.

163 Supply and install all necessary pipe casings to pipe work where exposed. All pipe casings to be painted with 2 No. coats of under coat and finished with one coat of white gloss paint.

© Rand Associates Consultancy Services Ltd

Completion

164 On completion of the replacement installation of a boiler and hot water system, together with associated equipment such as pipe work, circulating pump, radiators and system controls, the Provider shall check the system for air locks and vent as necessary and the system and all equipment should be tested and commissioned in accordance with the manufacturer's technical data sheet.

165 Provide the fuel for testing.

166 The heating system to be thoroughly cleaned and flushed out before installing a new boiler

167 During the final filling of the system, a chemical water treatment inhibitor meeting the boiler manufacturer's specification or other appropriate standard should be added to the primary circuit to control corrosion and the formation of scale and sludge.

168 Upload unto the Client's IT system, all test certificates and records as requested in the Client's Specification.

169 Provide the Customer sufficient information about the Property, including operational and maintenance instructions of the installed building services and controls and other details so that each Property can be operated and maintained in an energy efficient manner to use no more fuel than is reasonable in the circumstances.

170 Without comprising health and safety requirements, the instructions should explain to the Customer how to operate the system efficiently to include:

- How to make adjustments to the timing, temperature and flow control settings; and
- What routine maintenance is necessary to enable each system to be maintained at reasonable efficiency throughout their service life.

171 Provide an information pack supplied in an A4 clear plastic envelope and containing a copy of the central heating system's manufacturers operational instructions/booklets for each major component.

172 Notify in writing to the local Building Authority and the Client's Representative confirming that all fixed building services have been properly commissioned not more than five days after completion of the commissioning works.

173 Upload the Health & Safety File to the Client's IT system, in accordance with the current CDM (Construction Design Management) Regulations and issued to the Client's Representative on the completion of the Works.

Boiler Manufacturer's Warranty

174 The Work will also include the provision of a manufacturer providing evidence of a warranty for each boiler installed by the Provider.

175 The warranty guarantees the repair of all defects to the boiler at no cost to the Client (including the cost for all parts, labour and any other charges) for a period of 10 years from the date of installation of the boiler.

176 The warranty shall be given by the manufacturer directly to the Client and the manufacturer agrees that from the commencement date to the end of the warranty period of the agreement, labour to carry out any repairs is provided by the Provider but is transferable to the Client's new Provider either after the end date of this Contract or upon termination of the Contract.

177 The Client will undertake to have the warranted boiler installed under this Contract.

178 The Client will undertake to have the warranted boiler serviced annually either under this Contract or a subsequent contract.

© Rand Associates Consultancy Services Ltd

Provider's Central Heating Warranty

179 The work will also include the provision of a Provider's warranty for each replacement central heating system installed by the Provider and this warranty must provide for the following features.

180 The warranty guarantees the repair of all defects and any Customer's misunderstand or abuse to the replacement central heating system at no cost to the Client (including the cost of all parts, labour and any other charges) **for a period of 12 months from the date of installation of the replacement heating system.**

Routine and Responsive Maintenance Service

181 For the avoidance of doubt, the replacement central heating system installed under this part of the service, with immediate effect, is repaired by the Provider under the routine and responsive maintenance service of this contract, however while the replacement central heating system is under the Provider's 12 month warranty, no payment will be made for the installation under the routine and responsive maintenance service during this time.

182 As part of the Providers routine and responsive maintenance service of this Contract the Provider is responsible for obtaining all parts and recovering all associated labour costs or any other expenses, directly from the boiler manufacturer under the boiler manufacturer's warranty.

INSTALL AND MAINTAIN REPLACEMENT WOOD PELLET BOILER CENTRAL HEATING SYSTEM

Replacement operations will be as follows and to include all labour and materials necessary for the completion of the installation

Design

183 Undertake initial survey of each Property and prepare and submit the Design information for the replacement of the heating system in compliance with the Client's Specification.

184 Submit a completed "Survey Schedule and Cost Estimate" to the Client's Representative for clearance and approval.

185 Undertake all necessary Customer consultation.

186 Obtain all necessary statutory approvals for the Works (including the payment all necessary fees and administration charges in connection therewith).

Removal of Existing System

187 Carefully draining down, disconnection and removal of the complete existing heating system; remove/seal off as necessary all pipe work thereto, remove fireplace hearth and surround, build up chamber opening, core ball and sweep flue; supply and insert permanent ventilator and extend and make good plaster, skirting to match existing.

188 Remove all redundant radiators and existing pipe work as necessary and remove the feed and expansion cistern, all pipe work, and insulation and any support platforms. The hot water cylinder, pipe work, immersion heaters, insulation and support stool are also to be removed. All existing electric cable, conduits and accessories shall be removed and all surfaces made good.

Replacement installation

189 Supply temporary heat (a minimum of two 3 Kilowatt electric panel type heaters having time and temperature control); for the complete duration of the works and maintain Customer's mains electricity supply, mains water supply and bathroom facilities at end of each working day.

© Rand Associates Consultancy Services Ltd

190 Ensure that Customer's Property and possessions are protected and the Property cleaned at the end of each working day and on completion of all of the Works.

191 Supply and install an Outdoor Wood Pellet boiler in accordance with the Client's Specification; including all alterations to existing and all new heating pipework; and domestic hot and cold water pipework as applicable; pipework insulation; all condensate pipework to waste or gulley or to and including construction if necessary of a soak-away.

192 Form a base for the boiler with either a concrete or pre-cast concrete flags.

193 Where a remote boiler is proposed include for the following; 450 deep trench excavation including breaking/taking up and reinstating paving or concrete of any type and/or grassed topsoil; backfill and disposal of surplus spoil, granular bed/haunching/surround; 150 diameter PVC-u ducting; pipe work; pipe work insulation and electrical cable; automatic air separator complete with A.A.V. and vertical flue support bracket.

194 Supply and install manufacturer's recommended vertical flue complete with anti-downdraft cowl. Vertical flues shall be complete with all bends and fittings as necessary as specified and approved by the boiler manufacturers and installed in strict accordance with their instructions.

195 Supply and install in all habitable rooms a radiator to provide the calculated heat output required in each Property type, including grounds to stud walls if required. Rear halls and porches are not deemed to be a habitable room.

196 Supply and install new circulator complete with valves, including a dedicated electrical circuit and flexible cable connection to the pump.

197 Thermostatic radiator valves to be fitted to all rooms fitted with a radiator except in rooms where a controlling room thermostat (standard or programmable is fitted).

198 Supply and install a lock shield radiator valve to all rooms fitted with a radiator, including an additional lock shield valve in lieu of a thermostatic valve where the room thermostat is fitted.

199 The control of space heating and hot water systems shall be provided with time and temperature control in accordance with the Client's Specification including electrical circuit and all connections to each item of control equipment.

200 Supply and install new feed and expansion cistern, complete with insulation jacket, support platform, lid, float valve, overflow and warning pipework.

201 Supply and install new hot water cylinder, complete with factory fitted foam insulation, 3kW immersion heater, cylinder stool including new dedicated electrical circuit having a heating boost switch and new flexible cable connection to the immersion heater.

202 Supply and install a tiled fire surround and hearth in accordance with F30 (3) Code of Practice for Electric Fires, with an electric inset focal point fire provided, including dedicated electrical circuit and flexible cable connection to the fire from DP switch concealed within the fabric of the Property.

203 Undertake the Design, install and test all new dedicated electrical circuits in accordance with the applicable Standards for electrical installations for:
- Wood Pellet boiler installation including heating/hot water system control and all accessories;
- Boiler house/compartment light circuit including bulkhead fitting and lamp where required;
- Electric inset focal point fire circuit including flexible cable to fire;
- Electric immersion heater circuit including heating boost switch circuit and flexible cable;

204 Supply and fix all labels where necessary, test and upload unto the Client's IT system an EIC (Electrical Installation Certificate) for all Works completed.

© Rand Associates Consultancy Services Ltd

205 Make good/replace as necessary insulation to all exposed pipe work in roof space and all necessary new insulation to pipelines in accordance with the Client's Specification.

206 Supply and install all necessary pipe casings to pipe work where exposed. All pipe casings to be painted with 2 No. coats of under coat and finished with one coat of white gloss paint.

Completion

207 On completion of the replacement installation of a boiler and hot water system, together with associated equipment such as pipe work, circulating pump, radiators and system controls, the Provider shall check the system for air locks and vent as necessary and the system and all equipment should be commissioned in accordance with the manufacturer's technical data sheet.

208 Provide the fuel for testing.

209 The heating system to be thoroughly cleaned and flushed out before installing a new boiler.

210 During the final filling of the system, a chemical water treatment inhibitor meeting the boiler manufacturer's specification or other appropriate standard should be added to the primary circuit to control corrosion and the formation of scale and sludge.

211 Upload unto the Client's IT system, all test certificates and records as requested in the Client's Specification.

212 Provide the Customer with sufficient information about the Property, including operational and maintenance instructions of the installed building services and controls and other details so that each Property can be operated and maintained in an energy efficient manner to use no more fuel than is reasonable in the circumstances.

213 Without comprising health and safety requirements, the instructions should explain to the Customer how to operate the system efficiently to include:

- How to make adjustments to the timing, temperature and flow control settings; and
- What routine maintenance is necessary to enable each system to be maintained at reasonable efficiency throughout their service life

214 Provide an information pack supplied in an A4 clear plastic envelope and containing a copy of the central heating system's manufacturers operational instructions/booklets for each major component.

215 Notify in writing to the local Building Authority and the Client confirming that all fixed building services have been properly commissioned not more than five days after completion of the commissioning works.

216 Upload the Health & Safety File to the Client's IT system, in accordance with the current CDM (Construction Design Management) Regulations, on the completion of the Works.

Boiler Manufacturer's Warranty

217 The Work will also include the provision of a manufacturer providing evidence of a warranty for each boiler installed by the Provider.

218 The warranty guarantees the repair of all defects to the boiler at no cost to the Client (including the cost for all parts, labour and any other charges) for a period of 10 years from the date of installation of the boiler.

219 The warranty shall be given by the manufacturer directly to the Client and the manufacturer agrees that from the commencement date to the end of the warranty period of the agreement, labour to carry out any repairs is provided by the Provider but is transferable to the Client's new Provider either after the end date of this Contract or upon termination of the Contract.

© Rand Associates Consultancy Services Ltd

220 The Client will undertake to have the warranted boiler installed under this Contract.

221 The Client will undertake to have the warranted boiler serviced annually either under this Contract or a subsequent contract.

Provider's Central Heating Warranty

222 The Work will also include the provision of a Provider's warranty for each replacement central heating system installed by the Provider and this warranty must provide for the following features.

223 The warranty guarantees the repair of all defects and any Customer's misunderstanding or abuse to the replacement central heating system at no cost to the Client (including the cost of all parts, labour and any other charges) **for a period of 12 months from the date of installation of the replacement heating system.**

Routine and Responsive Maintenance Service

224 For the avoidance of doubt, the replacement central heating system installed under this part of the service, with immediate effect, is repaired by the Provider under the routine and responsive maintenance service of this contract, however while the replacement central heating system is under the Providers 12 month warranty, no payment will be made for the installation under the routine and responsive maintenance service during this time.

225 As part of the Provider's routine and responsive maintenance service of this contract the Provider is responsible for obtaining all parts and recovering all associated labour costs or any other expenses, directly from the boiler manufacturer under the boiler manufacturer's warranty.

REPLACEMENT OF EXISTING BOILER (ANY TYPE) WITH OR WITHOUT CONTROLS

Replacement operations will be as follows and to include all labour and materials necessary for the completion of the installation

Design

226 Undertake an initial survey of each Property and prepare and submit the Design information for the replacement of the heating boiler in compliance with the Client's Specification. The Provider shall submit a completed "Survey Schedule and Cost Estimate" to the Client's Representative for clearance and approval by the Client's Representative.

227 Undertake all necessary Customer consultation.

228 Obtain all necessary statutory approvals for the Works (including the payment of all necessary fees and administration charges in connection therewith).

Removal of Existing Boiler

229 Carefully draining down, disconnection and removal of the existing Client's and/or Customer installed heating boiler (any type); boiler pipework connections, boiler electrical connections remove/seal off as necessary all pipe work thereto, and make good all works.

230 Break up and remove existing concrete/paving slabs boiler house/cabinet bases and existing concrete or paving slabs oil storage tank bases either installed by the Client and/or Customer.

New Boiler Installation (any type) with no controls

231 Supply temporary heat (a minimum of two 3 Kilowatt electric panel type heaters having time and temperature control; for the complete duration of the Works and maintain Customer's mains electricity supply, mains water supply and bathroom facilities at end of each working day.

© Rand Associates Consultancy Services Ltd

232 Ensure that Customer's property and possessions are protected and the Property cleaned at the end of each working day and on completion of all of the Works.

233 Supply and install a gas condensing boiler any type, oil fired condensing boiler any type or biomass boiler (outdoor type) complete with boiler fixing gig where applicable, concrete base for outdoor type boiler; oil pipe work connections thereto; including any alterations to existing and all new heating pipe work, domestic hot and cold water pipe work as applicable; all pipe work insulation, all condensate pipe work to waste or gully or to and including construction, if necessary, of a soak-a-way.

234 Supply and install a complete low level boiler flue assembly to comply with applicable Standard, all in accordance with the boiler manufacturer's installation instructions, with all flue extensions; bends; supports and a flue terminal wire guard if required. Supply and install a plume kit.

235 Supply and install if required a new replacement bunded oil storage tank in accordance with the Client's Specification and form base.

236 Include for the gas carcass to be replaced if required from the existing meter cupboard to the gas boiler in all cases and shall extend the carcass to the cooker position in the Kitchen and re-connect the Customer's natural gas cooker appliance including stability chain if not already fitted. If the Customer has an electric cooker, then the gas supply is to be capped off at this point.

237 Supply and install if required oil supply pipe laid in 450 deep trench including breaking/taking up and reinstating paving or concrete of any type and/or grassed topsoil; backfill and disposal of surplus spoil, granular bed/haunching/surround; galvanised or 150 diameter PVC-u ducting including all necessary fittings, system filters, shut off valve, de- aeration device, and fire valve provide an external plastic coated galvanised steel casing to fire valve and/or de- aeration device where required.

New Boiler Installation with controls

238 Notwithstanding the above identified works for boiler replacement systems with no controls; the following additional works are to be included in the all-in rate for boiler replacement (any type) with controls;

a) Disconnect and remove existing heating control system equipment and components excluding electrical wiring, and provide and install new replacement programmer, motorised valves, room thermostat, hot water control thermostat, providing new final connections to all control system equipment in accordance with Client's Specification.
b) Disconnect existing heating circulator pump excluding electrical wiring and replace with new circulator including valves, providing new final connection to circulator in accordance with Client's Specification.
c) Disconnect and remove all existing thermostatic radiator valves to all radiators and replace with new valves in accordance with the Client's Specification.

239 All works are to be in accordance with the Client's Specification.

Completion

240 On completion of the replacement of a boiler (any Type) (with or with no controls); the Provider shall check the system for air locks and vent as necessary and the system and all equipment should be tested and commissioned in accordance with the manufacturer's technical data sheet.

241 Provide the fuel for testing.

242 The existing heating system is to be thoroughly cleaned and flushed out before installing a new boiler.

243 During the final filling of the system, a chemical water treatment inhibitor meeting the boiler manufacturer's specification or other appropriate standard should be added to the primary circuit to control corrosion and the formation of scale and sludge.

244 Upload to the Client's IT system, all test records and certificates in the Client's Specification.

© Rand Associates Consultancy Services Ltd

245 Provide the Customer with sufficient information about the boiler, including operational and maintenance instructions of the installed building services and controls and other details so that each boiler can be operated and maintained in an energy efficient manner to use no more fuel than is reasonable in the circumstances. Without comprising health and safety requirements, the instructions should explain to the Customer how to operate the system efficiently to include:

- How to make adjustments to the timing, temperature and flow control settings; and
- What routine maintenance is necessary to enable each system to be maintained at reasonable efficiency throughout their service life.

246 Provide an information pack supplied in an A4 clear plastic envelope and containing a copy of the central heating system's manufacturers operational instructions/ booklets for each major component. The Provider shall perform all duties and carry out all requirements described in Client's Service Information.

247 Notify in writing to the local Building Authority and the Client's Representative confirming that all fixed building services have been properly commissioned not more than five days after completion of the commissioning works.

248 Upload the Health & Safety File to the Client's IT system in accordance with the current CDM (Construction Design Management) Regulations, on the completion of the Works.

Boiler Manufacturer's Warranty

249 The Work will also include the provision of a manufacturer's warranty for each boiler installed by the Provider. The warranty guarantees the repair of all defects to the boiler at no cost to the Client (including the cost for all parts, labour and any other charges) for a period of 10 years from the date of installation of the boiler.

250 The warranty shall be given by the manufacturer directly to the Client and the manufacturer agrees that from the commencement date to the end of the warranty period of the agreement, labour to carry out any repairs is provided by the service but is transferable to the Client's new Provider either after the end date of this Contract or upon termination of the Contract.

251 The Client will undertake to have the warranted boiler installed under this Contract.

252 The Client will undertake to have the warranted boiler serviced annually either under this Contract or a subsequent contract.

Provider's Defects Liability Period

253 The Work will also include the provision of a Providers defects liability period for each boiler replaced by the Provider during which time the Provider will repair all breakdowns and rectify all faults caused by Customer's misunderstanding and/or abuse to the boiler and system at no cost to the Client (including the cost of all parts, labour and any other charges) **for a period of 12 months from the date of installation of the replacement heating system.**

Routine and Responsive Maintenance Service

254 For the avoidance of doubt, the replacement boiler installed under this part of the service and the central heating system, with immediate effect, is repaired by the Provider under the routine and responsive maintenance service of this contract, however while the boiler renewal system is under the **Provider's 12 month defects liability period**, no payment will be made for the installation under the routine and responsive maintenance service during this time.

255 As part of the Provider's routine and responsive maintenance service of this contract the Provider is responsible for obtaining all parts and recovering all associated labour costs or any other expenses, directly from the boiler manufacturer under the boiler manufacturer's warranty.

© Rand Associates Consultancy Services Ltd

Initial Survey

256 Following instruction, the Provider shall include for an initial survey of the Property. Access arrangements shall be made direct with the Customer.

257 The initial survey for replacement installations will be for the purposes of determining the:
- Information for heat loss calculations, i.e. room/window dimensions, wall construction, number of external walls, cavity wall insulation etc.
- Layout for radiators, pipework routes, etc.
- Location of boiler (and cylinder if appropriate).
- Size and adequacy of pressure of incoming water main.
- Location of cold water main stopcock.
- Location for cable routes and adequacy of equipotential bonding.
- Number and location of extract fans, flues and chimneys.
- Thickness of existing roof space insulation.
- Condition of CWS cistern and Bye Law 30 compliance.
- Condition of insulation to domestic pipe work in roof space.
- Any dwelling condensation problems.
- Window frame type: material, glazing type, and condition and if draught proofed.
- Solid wall, if any.
- Any other roof insulation and its thickness, e.g. flat roofs.
- Customer installed appliances
- LPG or natural gas cooker installation

Continuity of Services

258 The Provider will leave the Properties with all services in proper working order at the end of each working day. Under no circumstances shall Customer's be without the use of these services and facilities overnight.

259 Ensure that an alternative form of heating is available for the Customer during the period of works. The alternative form of heating will be a minimum of **Two 3kw electric floor standing panel heaters max** (in line with requirements on Gas Breakdowns), with time and temperature controls.

Elderly and Vulnerable Customer's

260 Special care and consideration must be given when planning and executing Work in Properties occupied by elderly or vulnerable Customer's. This may include, but is not limited to: temporary decant or respite arrangements, enhanced or reduced working hours, additional temporary heating etc.

Gas and Electrical Supplies

261 Under **no circumstances** must work be started in any Property that is not fitted with all services and meters etc. Arranging for the gas supply and where an electrical supply and meters may be required is the Provider's responsibility and the Utility Provider's should be notified of this before the Properties are programmed.

262 However, the Provider after seeking the Client's Representative's approval will make his own arrangements to have the supply of gas put on to a property. This will be paid for as an extra to the Contract on an individual basis providing supporting documentation is submitted with the Valuation.

Electrical Work

263 All electrical work must be carried out by an NICEIC, ECA Provider, or be registered with an approved licence to practice system, an example of which is SPARKSAFE, and who must issue a current approved IET Electrical Installation Completion (EIC) certificate for each individual installation.

264 Where all the electrical requirements in the dwelling of the applicable Standard for electrical installations are met, supplementary equipotential bonding may be omitted. Therefore, before work of any nature proceeds in the Property the electrical installation must be tested.

© Rand Associates Consultancy Services Ltd

265 No installation will be accepted for payment unless such certificate is provided. Equally a note must be made on the certificate that all bonding has been completed in accordance with the latest edition (Edition number to be stated) of the applicable Standard for electrical installations.

266 Inspect the loft space of the dwelling and establish the depth of insulation existing, if below the minimum requirements of 270mm, the Provider is to report the actual depth to the Client's Representative who will determine what further action is required. The cost of upgrading any insulation, loft hatch insulation and insulated catwalks will be reimbursed at the rates in the Schedule of Rates, these rates are deemed to include the cost of moving and reinstating any Customer content stored in the loft.

DESIGN PROCESS

Design Criteria

267 The Design criteria for the replacement of the central heating installation, boiler replacement or boiler renewal is as follows.

268 The replacement heating system shall be Designed with due consideration to the installation, commissioning, operation, maintenance and repair of components, appliances, and the system. Heating systems shall be designed to achieve and maintain the following minimum room temperatures when the ambient external temperature is -4°C, the heating flow being 82° (max) and temperature difference across the pumped system 11° (max), with the circulating pump running and the air change rate is as detailed below.

Habitable Room	**Room Temperature**	**Air**
Living Room	21°c	1.5
Dining Room	21°c	1.5
Kitchen/Dining Room	21°c	2
Bed Sitting Room	21°c	1.5
Circulating spaces	18°c	1.5
Bathrooms	23°c	3
WC's	23°c	2
Kitchens	18°c	2
Bedrooms	18°c	N/A
Mobility (Standard)	21°c throughout	As rooms above

269 Where extract fans are fitted, the Provider shall allow for 60 l/s for Kitchens with an extract fan or 30//s with a cooker hood and 15 l/s for Bathrooms.

270 A rear hall or a porch are not deemed to be habitable rooms.

271 With regard to heat loss calculations, these shall be calculated in accordance with Chartered Institute of Building Services Engineers Environmental Guide A, and applicable Standard with the following factors shall be allowed.

1. The Provider is to inspect the loft space of the Property and establish the depth of insulation existing, if below the minimum requirements of 270mm, the Provider is to report the actual depth to the Client's Representative who will determine what further action is required. The cost of upgrading any insulation, loft hatch insulation and insulated catwalks will be reimbursed at the rates in the Schedule of Rates, these rates are deemed to include the cost of moving and reinstating any Customer content stored in the loft.

2. Radiators shall be fitted under windows where possible and in all cases on exterior walls.

3. A 10% contingency shall be allowed on the total system design to allow for general heating and pipe losses.

© Rand Associates Consultancy Services Ltd

4. It shall be assumed that adjacent properties are heated to 10°c for heat loss calculation purposes.

5. A 3kW hot water load shall be allowed for when sizing the boiler.

6. Calculations for the heating pipe sizes should not exceed 1.5 m/s to ensure quiet operation.

All heat loss calculations shall be forwarded as part of the Design Information to the Client's Representative.

Conditions of Temperature Guarantee – For information only as existing systems

272 The temperature in any room or other area will be ascertained by a mercury in glass thermometer suspended at a point 1.5m from the flow in the centre of the room or other area.

273 When the outside temperature is not less than -4°C the system is to be guaranteed to achieve the heating standards described above, provided the following conditions are satisfied:

1. The internal volume of any room or other area served by one radiator must not exceed 1450 cubic feet (42 cubic metres). In a room which exceeds 1450 cubic feet (42 cubic metres) in volume, more than one radiator will be required in order to obtain the heating standards referred to.

2. The system must have been operated continuously for not less than 24 hours and must continue to operate fully with clock controller overridden and air temperature and hot water thermostatic controls correctly set and the boiler flow temperatures set at 180°F (82°C).

3. There must not be more than the specified air change per hour in any room or other area.

Design Information

274 The Provider shall submit details of the initial survey.

1. An electronic scaled working drawing layout of each Property type, identifying each floor space, showing radiator positions and sizes together with proposed, valves, pipe sizes, pipework routes, cold water and domestic hot water services, control system and electrical cable routes. The location of the boiler and cylinder (if applicable) shall also be included on the drawing.

2. Heat loss calculations.

275 Obtain written agreement from the Client to the Design proposals before site works can start.

276 Failure of the Provider to provide working drawings, schedules and calculations may lead to additional time and costs being incurred by the Client which shall be passed on to the Provider to bear.

277 The approval by the Client's Representative of such drawings, schedules and calculations covers only the general principles of the Work concerned and does not absolve the Provider from carrying out the Works in accordance with the Specification and good engineering practice.

278 The Client's Representative shall have the right to change the Provider's Design with no financial implications to the Client. The Provider is to comply with all Customer requirements with regard to radiator location in each room at no financial implication to the Client. The Provider is to explain the full extent of the works i.e. radiator positions, pipework routes, boiler position, controls, and all other mechanical services contained within the Contract to the Customer and then request the Customer to sign the Customer Agreement Form. The Customer Agreement Form shall be produced by the Provider and submitted to the Client for approval at the pre-contract meeting.

279 In Void Properties the Provider is to allow for further attendance. This is to include, contacting new Customer's and making arrangements for testing and commissioning.

© Rand Associates Consultancy Services Ltd

280 When these documents have been forwarded through to the Client's Representative, a completion certificate for the Works will be issued. The defects liability period will run from the date of the Client's certificate.

Regulations and Standards

281 The Design and installation of new heating and hot water systems shall comply with all appropriate Regulations, applicable Standards and Codes of Practice.

282 In particular, the Design of the system shall be in accordance with applicable Standard: Specification for forced circulation hot water central heating systems for domestic premises:

283 The Works shall comply with the Gas Safety (Installation and Use) Regulations including all amendments and shall also be in accordance with the manufacturer's technical data sheet and Building Regulations and amendments and Technical Booklet F1.

284 With regard to implementation of the Works, the Provider shall also take into account the following Health and Safety Regulations.

- Management of Health and Safety at Work Regulations 1999
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 2013
- Manual Handling Operations Regulations 1992 as amended 2002.
- The Control of Substances Harmful to Health Regulations 2002 (COSHH)
- The Provision and Use of Work Equipment Regulations 1998 (PUWER).
- Electricity at Work Regulations 1989.
- Construction (Health, Safety and Welfare) Regulations 1998.

285 Electrical works shall be in accordance with the applicable Standard for electrical installations and The Electricity Safety, Quality and Continuity Regulations (ESQCR).

STANDARD SPECIFICATION

General Preamble

287 Where Properties are occupied during the Works the Provider shall take all reasonable steps to ensure that inconvenience and disturbance to the Customers is minimised.

287 Once Work commences in a Property it must be continuous without interruption until completion.

288 Allow for protection of all fixtures and fittings including carpets. Move, take up, refit and replace all furniture, fittings and fixtures as may be necessary to execute the Works. Re-position items of furniture and appliances at the end of each working day whether Work is completed or not.

289 Protect and maintain existing services at all times, inform the Customer's prior to disconnection and adaptation Works, which are to be for the minimum period possible. No services are to be left disconnected overnight.

290 Make good to all adjacent structures and surfaces disturbed during the Works, whether specifically mentioned or not. Any damage caused by carelessness or want of skill on **the part of the Provider shall be immediately made good at the Provider's expense**.

291 All carpets, floor coverings, underlay, hardboard, floorboards, etc (excluding laminated wood flooring) to be properly and professionally re-fitted on completion of the installation.

292 Materials or tools must not be stored within the Property including communal areas or gardens.

© Rand Associates Consultancy Services Ltd

PERFORMANCE SPECIFICATION

BOILERS

293 The Provider shall design for and install boilers which are ErP A+++ rated high efficiency with evidence of a Low No-x rating condensing boiler as manufactured by a manufacturer to be approved by the Client's Representative.

294 Boilers shall be sized by the Provider to suit. All boilers are to be fitted according to manufacturer's technical data sheet and compression type fittings shall be used to facilitate easy removal for repair. The Provider shall include for filling loop and the optional pipe cover accessory as supplied by the boiler manufacturer.

295 All boilers shall carry a minimum ten year's manufacturer's guarantee with a minimum ten year parts and labour warranty and this shall be arranged to run from the date of the completion certificate. The Provider is to provide a boiler installation record secured to the inside of the lower casing giving the Provider's name and address and the date of installation.

296 The heating installation shall be cleansed through the use of a permanent in-line magnetic filter to ensure effective magnetic filtration.

297 Servicing: The filter shall be accessible to carry out a visual inspection of the canister chamber to ensure all system debris has been successfully removed during boiler servicing.

298 The Client's preferred option is for an open vented system to be Designed and installed where appropriate. The Provider shall obtain the Client's Representative's approval for a sealed system Design and installation.

299 Supply and install the boiler in an agreed position with the Client's Representative, on an external wall to the outside and in accordance with the manufacturer's technical data sheet.

300 Size the boiler in accordance with the following:
- Total of all radiator outputs
- Total of all pipework losses
- Hot water load (minimum 3kW to be allowed)

301 Total the above and add 20% to the load for intermittent heating before selecting the appropriate size boiler.

302 Supply and install an additional expansion vessel of appropriate size if the system volume is beyond that which can be accommodated by the built in expansion vessel.

303 Supply and install a complete boiler flue system in accordance with the manufacturer's technical data sheet and applicable Standard. The Provider shall terminate the flue a suitable location and supply and install a flue terminal guard as necessary.

304 BOILER, GAS FIRED CONDENSING CONVENTIONAL TYPE
Standard: To applicable Standard, High Efficient **ErP** A+++ rated
Low NOX classification
Type: Wall Mounted
Casing Finish: Vitreous Enamel
Controls/Accessories: All as per boiler manufacturer
Heat Exchanger: Stainless Steel
Boiler Flue: To applicable Standard and in accordance with manufacturer's flue options
Commissioning of gas fired boiler to be carried out by boiler manufacturer's representative
Boiler manufacturer to provide a 10 year parts and warranty to the Client

© Rand Associates Consultancy Services Ltd

305 BOILER, GAS FIRED CONDENSING COMBINATION TYPE
Standard: To applicable Standard, High Efficient **ErP** A+++ rated
Low NOX classification
Type: Wall Mounted
Casing Finish: Vitreous Enamel
Controls/Accessories: All as per boiler manufacturer
Heat Exchanger: Stainless Steel
Boiler Flue: To applicable Standard and in accordance with manufacturer's flue options
Commissioning of gas fired boiler to be carried out by boiler manufacturer's representative
Boiler manufacturer to provide a 10 year parts and warranty to the Client

306 BOILER, GAS FIRED CONDENSING SYSTEM TYPE
Standard: To applicable Standard Low NOX classification
Type: Wall Mounted
Casing Finish: Vitreous Enamel
Controls/Accessories: All as per boiler manufacturer
Heat Exchanger: Stainless Steel
Boiler Flue: To applicable Standard and in accordance with manufacturer's flue options
Commissioning of gas boiler to be carried out by boiler manufacturer's representative
Boiler manufacturer to provide a 10 year parts and warranty to the Client

307 BOILER, OIL FIRED CONDENSING CONVENTIONAL TYPE
Standard: TO applicable Standard, High Efficient ErP A+++ rated
Type: Floor Mounted
Casing finish: Mild steel
Controls/Accessories: All as per boiler manufacturer
Boiler Flue: To applicable Standard and in accordance with manufacturer's flue options
Commissioning of oil fired boiler to be carried out by boiler manufacturer's representative
Boiler manufacturer to provide a 10 year parts and warranty to the Client

308 BOILER, OIL FIRED CONDENSING OUTDOOR TYPE
Standard: To applicable Standard and OFS A100, High Efficient ErP A+++ rated
Type: Floor mounted, outdoor with patented weather proof casing
IP Rating: IPX4
Controls/Accessories: All as per boiler manufacturer
Boiler Flue: To applicable Standard and in accordance with manufacturer's flue options
Commissioning of oil fired boiler to be carried out by boiler manufacturer's representative
Boiler manufacturer to provide a 10 year parts and warranty to the Client.

309 BOILER, WOOD PELLET
Standard: To applicable Standard
Type: Floor mounted, outdoor with patented weatherproof case, enclosing the boiler and 100kg hopper
IP Rating: IPX4
Controls: Low pellet level sensor with warning beacon, high limit thermostat, back burning protection, fuel overload, combustion control, modulation control, frost protection and safety valve
Boiler Flue: To applicable Standard and in accordance with manufacturer's flue options
Commissioning of wood pellet boiler to be carried out by the boiler manufacturer's representative
Boiler manufacturer to provide a 10 year parts and warranty to the Client.

310 OIL STORAGE TANKS, PLASTIC
Standard: To applicable Standard, and constructed and certified to OFTEC standard OFS T100
Type: Horizontal bunded oil fuel storage tank
Capacity: The capacity of the oil tank shall be in accordance with applicable Standard: Table 2
Accessories: All as per tank manufacturer
Oil Supply: Top outlet option
Location: To applicable Standard, and current Building Regulations on a suitable concrete base
Domestic Oil Tank Bases Construction and Design: To Client's standard requirements
Where a tank of a lesser capacity is required due to limited space, **any cost adjustment is deemed to be included.**

© Rand Associates Consultancy Services Ltd

311 FIRE WALLS FOR OIL STORAGE TANKS

Standard: To applicable Standard Method: The tank should be protected in one of the following ways:

a) Isolating the tank, including any integral bund, by placing it at a distance from any building or other potential source of fire or;
b) Protecting the tank, including any integral bund, by a physical barrier.

Where the above criteria for distance cannot be met, and where steel stand physical barrier screens are required, certification will be required that the screen panels satisfies the performance requirements specified in applicable Standard Clause 5, for a non-loading beating fire wall with a fire resistance of 30 minutes and shall be installed in accordance with the manufacturer's technical data sheet.

Where it is necessary to provide panel type fire walls, any cost adjustment is deemed to be included.

312 OIL SUPPLY (TIGER OIL DE-AERATOR)

Standard: To applicable Standard
System Type: Single pipe system, with de-aerator device, bottom of oil storage tank below or level with burner
Location: To be fitted to be fitted externally to the boiler in accordance with applicable Standard and the manufacturer's installation instructions.
Installation: The assembly to be fully concealed in a manufactured enclosure of suitable size constructed from powder coated mild sheet steel, plugged and securely fixed to a wall.

313 OIL FILTER

Standard: To applicable Standard
Location: To applicable Standard, and as specified by the appliance manufacturer
Installation: To be fitted on the oil supply pipe between the isolating valve and the appliance.

314 FIRE VALVE

Standard: To applicable Standard
Compliance: Fire valves shall comply with OFTEC Standard OFS E101
Installation: Where the boiler is positioned externally outside the building, the valve body shall be fitted at least 1m away from the appliance with its sensor over the burner. The fire valve assembly to be fully concealed in a manufactured enclosure of suitable size constructed from powder coated mild sheet steel, plugged and securely fixed to a wall.

315 OIL MONITORING SYSTEM

Standard: To applicable Standard
Type: Two parts, comprising a tank mounted transmitter ans a plug in receiver with integral antenna located in the dwelling
Power Supply: Receiver 230 – 240V/ 1/50Hz
Transmitter: 3V Lithium cell
Battery Life: 10 years (estimated life)
Communication: Wireless to applicable Standard
Transmitter: To monitor the level of fuel inside the tank and relay the data via a secure wireless connection to the receiver unit
Receiver Unit: The receiver unit shall be securely fixed to an electrical socket outlet plate and connected a galvanised wall mounted fixing box, spurred off the kitchen ring main circuit.

316 GUARD FOR PIPELINES

Pipelines: Exposed on external walls to be fully concealed by covering with a powder coated mild sheet steel box section profile of suitable size, flanged, plugged and securely fixed to the wall.

317 GUARD FOR EXTERNALLY LOCATED FIRE VAVE ASSEMBY

Installation: For externally located heating appliances, the oil supply should be cut off at least ONE m away from the appliance. The fire valve assembly to be fully concealed in a manufactured enclosure of suitable size constructed from powder coated mild steel sheet, plugged and securely fixed to the wall.

© Rand Associates Consultancy Services Ltd

318 GUARD FOR EXTERNALLY LOCATED TIGER OIL DE-AERATOR

Installation: The tiger oil de-aerator is to be installed externally to the boiler cabinet all in accordance with applicable Standard and to the manufacturer's technical data sheet. The assembly to be fully concealed in a manufactured enclosure of suitable size constructed from powder coated mild sheet steel, plugged and securely fixed to the boiler cabinet.

319 SYSTEM CIRCULATION

Space heating systems and domestic hot water primary circuits should have fully pumped circulation.
If the boiler manufacturer's technical data sheet advises installation of a bypass, an automatic bypass valve should be provided and the manufacturer's technical data sheet on minimum pipe length followed.

CIRCULATING PUMP

Standard: To applicable Standards
System: For Low temperature hot water heating system
EEI Rating: = 0.23
System Resistance: The flow rate shall be sufficient to circulate the maximum boiler output against the system resistance
Installation: To be installed in a readily accessible position in accordance the manufacturer's installation technical data sheet;
Maintenance: Provide 2No. pump valves to enable removal/replacement without need to drain down
Electrical Supply: 230 – 240V 1/50Hz

320 Supply and install adequate ventilation in accordance with the manufacturer's technical data sheet and applicable Standards.

321 Supply and install high- and low-level ventilation grilles when the boiler is installed within a cupboard. Such grilles shall be suitably sized in accordance with manufacturer's technical data sheet.

322 Show the position of the boiler on the working drawings.

323 Supply and install a 15 mm galvanized steel pipe from the pressure relief valve on the boiler and run it to outside to discharge in a safe location. The Provider shall show the position of the boiler on the working drawings.

324 Supply, install and deliver a pipe cover accessory.

325 Supply and install in the cold-water mains supply prior to entering the boiler, a branch connecting with a filling loop which connects between the cold mains and the heating flow. The filling loop shall complete with all valves in accordance with Water Regulations and manufacturer's technical data sheet. The filing loop is to be located in an accessible place.

Radiators

326 All radiators are to be the steel panel convector type to applicable Standards to achieve the required design temperatures listed in 027 and shall be installed by way of brackets. Radiators shall be round top, with four BSP connections.

327 Radiators shall, be fitted below windows to give a clearance of not less than 25mm from the underside of the sill to the top of the radiator, with a minimum clearance from the underside of the radiator to the finished floor level not be more than 150mm, or less than 100mm.

328 The length of the radiator must be such that it is not greater than the width of the window opening and not less than 100mm within the width of the of the window opening.

329 Radiators shall not be positioned back to back on internal walls.

330 Radiator fixings shall be arranged to suit the wall construction.

© Rand Associates Consultancy Services Ltd

331 All valves will be watertight and connected to radiators with PTFE tape unless manufacturer's technical data sheet state otherwise.

332 Each radiator shall be fitted with a chrome plated thermostatic radiator valve (except in room where room stat fitted) and 15mm back seating type lock shield valve. The lock shield radiator valve cover shall be screwed down. Radiator connections shall be at the bottom and opposite ends. A brass air release valve is to be fitted on the flow side top connection.

333 A drain off tapping shall be fitted at every lowest point in the system.

334 All radiators installed in any specific project shall be selected from the same radiator manufacturer's approved list.

335 Reflective foil shall be fitted behind all radiators on external walls. The foil shall be cut neatly, 25mm smaller than radiator dimensions and fixed in accordance with manufacturer's technical data sheet behind the radiator-fixing bracket.

336 In dwellings which previously had radiators installed the new radiators are to be the same size to match existing.

337 If no cylinder is to be installed, a suitably sized radiator is to be installed in the airing cupboard as required.

338 Two no air vent keys are to be left with each installation except for sealed system installations where no keys are to be left.

339 The radiators shall be supplied with a good priming coat and left for the Customer's to decorate. Where radiators are found to be scratched or damaged, the Provider shall replace the same at no extra cost to the Contract.

340 The Provider shall show all radiator positions, numbered with a radiator schedule showing the individual radiator number, radiator height, radiator length, radiator type, radiator output and type of connection on the Provider's working drawing.

Pipes and Fittings

341 All heating, primary, cold, hot, mains water pipework and gas pipework shall be installed in applicable Standard Table X light gauge copper with fitted brass or copper integral solder ring capillary type joints and general pipework fittings to applicable Standard, all Kite mark certified.

342 All fittings and solder used shall be lead-free and carry the UP or SS lead-free mark. Do not use formed bends on exposed pipework, except for small offsets. Form changes of direction with radius fittings.

343 All pipes to be of even bore, clean and smooth throughout, commercially straight and free from grooving, blistering or other surface marks and free from any corrosive oxide etc. All ends shall be cut square and all burrs removed with a reamer to restore the bore.

344 Easy sweep fittings are to be used. Square tees and elbows shall not be accepted. Union joints shall be provided as necessary to permit easy removal of all apparatus.

345 All pipework shall be supported at a minimum of 900 mm centres, at high or low level, with either screw on brackets or white plastic clips with one screw per clip.

346 Spacing for copper pipelines to be fixed securely and true to line at the following maximum centres:

15mm and 22mm pipe OD:	1200mm horizontal and 1800mm vertical
28mm and 28mm pipe OD:	1800mm horizontal and 2400mm vertical
35mm and 42mm pipe OD:	2400mm horizontal and 3000mm vertical

© Rand Associates Consultancy Services Ltd

347 Heating pipework routes shall, where possible be at skirting level and shall be arranged in a neat and orderly manner and concealed where possible. Pipework through walls shall be sleeved. Additional supports to be located within 150mm of connections, junctions and changes of direction.

348 In Properties with solid floors, heating pipework shall be run in the upper floor voids with pipe drops to lower floor radiators. Pipes drops to be fully encased in plywood pipe casing from ceiling to skirting level, painted two coats of undercoat and finished with on coat white gloss paint. The Provider shall include for carefully lifting and replacing floorboards. Any flooring damaged is deemed to be replaced at the Provider's expense. All pipes to be sleeved where they pass through masonry or concrete. The maximum notch depth shall be 25mm and located between 0.07 and 0.25 of span from support. Notches within the central 2 quarters of span are not allowed.

349 Sleeves are to be of suitable size to allow free expansion of the pipework. Sleeves shall be cut square at each end and shall be of sufficient length to finish flush with the finished face of wall or ceiling, and 6mm proud of the finished surface of floors. All excessive gaps between the inside surface of the sleeves, and pipes passing through boiler house walls shall be filled with fire resistant materials. The weight of pipework shall not be borne by the sleeves. It is the Provider's responsibility to ensure that pipes are not bedded in by making good.

350 No pipes shall be run in concrete screeds or in floors overlaid with sound insulation materials, ie insulated floating floors.

351 The run of pipework shall be in accordance with the layout indicated on the drawings supplied by the Provider for approval.

352 The actual run of pipework shall be approved by the Client's Representative before such Work is put in hand, and all pipes shall be installed in a neat and workman-like manner. Pipes shall be laid to graded falls as necessary to facilitate draining and venting, adequately supported with provision for expansion and brackets suitably placed. Vertical pipes shall be dropped plumb and all lines shall be parallel to each other. Pipework shall be installed without springing or forcing.

353 All pipes shall follow the contour of the Property. Where pipes enter floors or ceilings, they shall be taken in square. All pipes and fittings shall be kept at least 150 mm away from the lighting or power cables, conduits etc.

354 Make all provision necessary to allow full expansion and contraction of all pipework and apparatus. Failure to make such provision, which results in damage to the installation or to the Property and its contents, shall be held to be the responsibility of the Provider, who must make good all damage free of cost to the Client.

355 Supply and install the heating flow and return pipework from the boiler to the pump and motorised valve complete with all isolating valves. From the motorised valves the heating shall split to feed the hot water cylinder and radiators within each room, as shown on the Provider's working drawings.

356 Flush out the heating services at least twice prior to filling and adding inhibitor to the system.

357 Connect to the existing hot water service, cold feed and open vent serving the dwelling. All the above pipework will be shown on the Provider's working drawings.

358 Supply and install a cold water main from the nearest existing point to feed the boiler in 15 mm pipe as shown on the Provider's working drawing if a system boiler is installed. All the above pipework shall be shown on the Provider's working drawings.

359 Supply and install at low points of the heating system, a lock shield type drain cock to applicable Standard, to enabling each Heating and HWS system to be drained down when required.

© Rand Associates Consultancy Services Ltd

Natural Gas Supplies

360 The natural gas supply to all appliances will conform strictly to applicable Standard.

361 Include for the gas carcass to be replaced from the meter position to the gas boiler in all cases. In addition, they shall extend the carcass to the cooker position in the kitchen and re-connect the Customer's gas cooker appliance including stability device if not already fitted. If the Customer has an electric cooker then the gas supply is to be capped off at this point.

362 Ensure that the supplies are of sufficient size (minimum 22mm to boiler, 22mm to the cooker position, to supply the volume of gas required to allow the appliances to function effectively and in accordance with the manufacturer's technical data sheet. The new gas carcass is to be run from the existing gas meter position.

363 Supply and install a bayonet fitting 600 mm from finished floor level on the gas supply to the cooker. The Provider is to connect the cooker to the new gas supply with approved new flexible connector.

364 Undertake soundness checks, smoke and spillage tests. The Client may provide a representative on occasions to be present at tests.

365 Provide the Client's Representative with a signed certificate of the gas safety checks and gas pressure test within the operation and maintenance manuals.

366 All the above shall be shown on the Provider's working drawings.

367 Test for soundness and purge in accordance with applicable Standard.

368 Upon completion the gas pipework is to be pressure tested (may be witnessed on occasions by the Client's Representative) for 15 minutes at a pressure of 20mbar.

Hot Water Storage Requirements

369 Standard: To applicable Standard

1. Vented copper hot water storage cylinders should comply with the heat loss and heat exchanger requirements;
2. Hot water storage combination units should comply with the applicable Standard;
3. Primary storage systems should meet the insulation requirements of the Hot Water Association Performance specification for thermal stores;
4. Unvented hot water storage system products should comply with applicable Standard or an equivalent standard as set out by an accredited test body such as the British Board of Agrement, the Water Research Council, or KIWA;

370 Heat Loss: The standing loss for all hot water storage vessels an a), b), c) and d) should not exceed where: V= 1.15 x (0.2+0.051V2/3) kWh/day where V is the volume of the cylinder

371 Labelling: All hot water vessels should carry a label with the following information

1. type of vessel (vented, combination unit types or thermal store);
2. nominal capacity in litres;
3. standing heat loss in kWh/day;
4. heat exchanger performance in kW;
5. reference to product compliance with relevant applicable Standard and logos of accreditation bodies as required.
6. Storage capacity: To C.I.B.S.E. Guide G. For domestic installations a cylinder of approximately 120 litres (min) is usually adequate.

372 The new units will be complete with sacrificial anodes and adequate thermal insulation of the CFC reduced type and comply with the Water By-Laws.

© Rand Associates Consultancy Services Ltd

373 The cylinders to be fitted on a new stool.

374 Supply and install 750mm long immersion heater facility rated at 3kW and thermostat to applicable Standard.

375 Supply and install a new 22mm gate valve on the cold feed, heating flow and return pipework to the cylinder.

376 Indicate the position of the cylinder on the working drawings.

SYSTEM CONTROLS

TIME CONTROL OF SPACE AND WATER HEATING

377 The control of space heating and hot water systems shall be provided with time and temperature controls as follows:

1. 2 channel programmer with separate timing to each circuit

2. for Properties with a total usable floor area greater than 150 m², timing of the separate space heating zones can be achieved with separate timing to each circuit

3. where the hot water is produced instantaneously, such as with a combination boiler, time control is only required for space heating zones

TEMPERATURE CONTROL OF SPACE HEATING

378 Separate temperature control of zones within the Property should be provided by:

1. room thermostats
2. individual radiator controls such as thermostatic radiator valves (TRVs) on all radiators other than in the reference room (with thermostat)

TEMPERATURE CONTROL OF DOMESTIC HOT WATER

379 Domestic hot water systems should be provided with a cylinder thermostat, immersed type in BSP outlet on storage vessel, to control the zone valve

380 Room thermostats shall be positioned as follows:
- In a hallway.
- 1800mm above floor level.
- Away from radiators or direct heat source, direct sunlight, external doors or draughts.

381 A wiring centre shall be provided and be located as shown on the Providers drawings.

382 Where fitted, the HWS cylinder shall incorporate a immersed type cylinder thermostat inserted in a pocket on the cylinder and set at 60°c.

383 The automatic pump overrun period should be set to 20 seconds.

384 An automatic bypass will be fitted to all systems including combination boilers should the boiler manufacturer's technical data sheet advise that this is a requirement of the installation.

385 A frost thermostat is to be provided if the boiler is located in a position where frost damage may occur.

386 Final connection to the boiler shall be carried out by the Provider.

387 The above controls shall be shown on the Provider's working drawings.

© Rand Associates Consultancy Services Ltd

ELECTRICAL INSTALLATION

388 Provide the electrical installation associated with the replacement heating installations. This shall include the following electrical circuits from a new metallic consumer to be located in the existing meter cupboard. Where due to space restrictions the new consumer unit cannot be fitted in the existing cupboard; the Provider shall install the consumer unit in a separate wooden meter enclosure. **The cost of the enclosure will be deemed to be included in the costs**:

389 Provision of new dedicated electrical circuit fitted to the new hot water storage cylinder immersion heater, including new flexible cable connection. The Provider shall allow for replacing the existing heater face plate switch in the dwelling where necessary with a heating boost switch with timed settings.

390 Provision of dedicated electrical circuit for the heating boiler including system control wiring and all necessary accessories. The Provider shall provide and install where required a bulkhead light fitting to assist with all necessary maintenance or breakdown call outs.

391 Provision of dedicated electrical circuit for the electric focal point inset fire, including a 20A DP switch fitted adjacent fire on chimney breast, with flexible connection concealed within the fabric of the Property to connect to inset fire.

392 Electric Direct Acting Day Rate Focal Inset Fire
Standard: To applicable Standard
Approval : BEAB/CE MARK
Type: Direct Acting Electric Inset Fire, to fit chimney opening
Heater Type: Fan Convention
Max Heat Output: 2kW
Coal Bed: One piece with switchable choice for flame effect independent of heat source
Noise: Fan noise suppressed to 50dB max, when in operation
Lights: LED bulbs for long life and low energy consumption
Controls: ON/OFF switch with multiple heat settings and thermostat control
Fixing: To be securely fixed to hearth or surround

393 Cables shall be installed above ceilings, below floors and should be concealed in walls.

394 Cables concealed in masonry walls should be enclosed in conduit.

395 Cables should be withdrawable through either continuous conduit, or where it not feasible to conceal the cable system, through the provision of a continuous trunking system.

396 Cables should be installed without joints other than at equipment and terminal fittings. **JUNCTION BOXES ARE NOT PERMITTED.**

397 Cables must be protected, supported and fixed to the requirements of the applicable Standards for electrical installations and all other Regulatory Requirements.

398 Cables should be sleeved passing through masonry walls with conduit bushed at both ends.

399 Cables installed across floor joists should be threaded through holes neatly bored in joists at least 50mm from floor or ceiling.

400 PVC insulated cables must not come into contact with polystyrene insulation or organic timber preservative.

401 Cables concealed within a wall or partition must comply with the applicable Standards for electrical installations.

402 All routing of trunking shall be done in a workmanlike manner and shall be arranged to be unobtrusive in terms of its layout.

© Rand Associates Consultancy Services Ltd

403 All cabling used for final connections to boilers or hot water service cylinders shall be multi core heat resistant EP rubber insulated or HOFR sheathed flexible cable or heat resistant PVC flexible cable.

404 The Provider shall include for upgrading earth and supplementary equipotential bonding to the new system in accordance with the applicable Standards for electrical installations.

405 Equipotential earthing shall be completed where necessary back to the main consumer unit and the Utility Provider's incoming cut out.

406 All control wiring associated with the installation shall be supplied and installed by the Provider.

Recommended Minimum Standards for Insulation of Pipework in Wet Central Heating Systems

407 Standard: To applicable Standards

408 Pipes should be insulated to comply with the maximum permissible heat loss, and labelled accordingly, as follows:

1. Primary circulation pipes for heating an hot water circuits wherever they pass outside the heated living space or through voids which communicate with and are ventilated from unheated spaces
2. Primary circulation pipes for domestic hot water circuits should be insulated throughout their length, subject only to practical constraints imposed by the need to penetrate joists and other structural elements
3. All pipes connected to hot water storage vessels, including the vent pipe, should be insulated for at least 1 m from their points of connection to the cylinder (or they should be insulated up to the point where they become concealed)
4. If secondary circulation is used, all pipes kept hot by that circulation should be insulated.
5. Extra provision may need to be made to protect heating and hot water pipe work in unheated areas against freezing

409 Where insulation is labelled as complying, it must not exceed the following heat loss levels:

Pipe Outside Diameter	Maximum Heat Loss*
8mm	7.06W/m
10mm	7.23W/m
12mm	7.35W/m
15mm	7.89W/m
22mm	9.12W/m
28mm	10.07W/m
35mm	11.08W/m
42mm	12.19W/m
54mm	14.12W/m

410 * In accessing the thickness of insulation required, standardised conditions should be assumed in all compliance calculations, based on a horizontal pipe at 60°C in still air at 15°C.

411 All pipework running under ground floor suspended floors, through unheated areas (ducts, cupboards, or in loft spaces shall be provided with rigid pipe insulation and where necessary frost protection. All primary flow and return pipework and all pipework within airing cupboards shall also be insulated.

412 All insulation shall be Class 1, minimum 25mm thick nitrile rubber (CFC and HCFC free), all suitable for Class A1, and shall be fitted after testing. Mineral fibre insulation shall not be acceptable.

413 All slit lengths and butt joints shall be glued together using the adhesive recommended by the manufacturer, so that no pipe fitting or valve/cock is kept uninsulated.

© Rand Associates Consultancy Services Ltd

Feed and Expansion Cistern

414 Supply and install a plastic 18 litre feed and expansion cistern in accordance with the current Water Regulations if an open vented system is to be used. The Provider shall supply and install purpose made lids and insulation jacket for the feed and expansion cistern. The Provider shall supply and install overflows of suitable size to the feed and expansion cistern and discharge it in an appropriate location.

415 Supply and install an open vent and cold feed to the heating system in accordance with the boiler manufacturer's technical data sheet.

416 Connect boiler to cold main supply via a combined filling/double check valve kit. Ensure that the flexible link is not left in position and to comply with the current Water By-laws.

417 Supply and install a suitable wooden frame and support the feed and expansion cistern. The frame shall transfer all the live load to the roof trusses or surrounding walls. The framework shall be made from 50mm x 25mm wood battens with a minimum of four cross supports. The feed and expansion cistern shall be sited on 25mm marine plywood

Safety Discharge

418 Where a safety discharge pipe is fitted, this shall be fitted to the manufacturer's technical data sheet and shall be arranged to discharge externally in a safe location and timed back to the wall.

Condensate Discharge

419 Wherever possible, the condensate pipe shall be routed and terminated so the condensate drains away from the boiler under gravity to a suitable internal water discharge point such as an internal soil and vent stack, internal kitchen, bathroom or washing machine waste water pipe of similar.

420 Where it is not possible, so that the condensate drains away from the boiler under gravity, the Provider shall provide for the installation of a condensate pump to drain the condensate away to a suitable water discharge point in accordance with the boiler manufacturer's technical data sheet. **Where a condensate pump is required by Design it shall be deemed to be included in the costs.**

421 Where no other discharge method is possible, the use of an externally run condensate discharge drainage pipe terminating at a suitable water discharge point or purpose-designed soak away may be considered. The pipe shall be run internally as far as possible before going externally, and the pipe diameter shall be increased to 32mm before it passes through the wall to the exterior. The pipe should take the shortest and least exposed route to the discharge point and shall fall as steeply as possible away from the boiler with no horizontal runs in which condensate might stand. The use of fittings and shall be kept to a minimum and any internal burrs on cut pipe work should be removed so that the internal pipe section is as smooth as possible. Where the pipe terminates over an open drain or gulley, the pipe should terminate below the grating level, in order to minimise the wind chill at the open end.

422 The external condensate discharge pipe shall be insulated using suitable waterproof and weather resistant pipe insulation.

Flues and Guards

423 Supply and install all flues and guards associated with the required appliances and these shall be fitted in accordance with manufacturer's technical data sheet. This shall include all associated builders work and making good.

424 Provide for of all access equipment on properties of two storeys or below.

425 The room sealed combination boiler flues shall be sited 200 mm down from the soffit outside.

© Rand Associates Consultancy Services Ltd

426 A suitable terminal guard shall be fitted where flue terminals are less than 2m above ground level.

427 Weathering slates where required shall be manufactured from milled lead to applicable Standard.

428 These requirements must be applied for any boiler manufacturer's flue option.

Ventilation

429 Provide all necessary ventilation to comply with the Regulations and Standards. Ventilation provision shall be identified as necessary on the design drawings.

Combustion and Ventilation Requirements

430 The provision of combustion and ventilation requirements for the central heating boilers must comply completely with applicable Standards whichever of the following is required.

Compartments for Boilers

431 Where the design requires a boiler to be located in a bedroom, the Provider shall provide and fit a suitable compartment to enclose the boiler installation and all pipe work etc; and provide the necessary boiler compartment ventilation in accordance with applicable Standards.

432 **The cost of the compartment for the boiler is deemed to be included in the unit rate for that Property type.**

Existing Heating Appliances and Installations

433 Carefully draining down, disconnection and removal of all existing Client and or Customer installed heating and hot water appliances and associated appliances and making good. This shall include properties with partial heating systems, combined hot water/cold water storage and expansion tank packs, etc., and include removal of:

- All redundant pipework and electrical cables and making good to all disturbed surfaces.
- All oil tanks, any physical barriers, concrete bases, support walls, boiler cabinets and external oil fuel pipework.
- Removal of the existing hot water storage tank or cylinder and associated redundant pipework.
- Removal of the gas carcass within the Property.
- Removal of the existing heating system in its entirety.
- Removal of existing controls and wiring.

434 Remove all solid fuel open fires and room heaters, brick up flue apertures, render and set, fix plaster vent with a permanent ventilator, renew skirting, make good to all disturbed surfaces clear away, and leave ready for redecoration.

Existing Equipment Removal Prior to Boiler Upgrade

435 The items detailed herein apply in general terms and are intended to be indicative of Works that may be required dependent upon the extent of the boiler replacement and any system upgrade. They are not intended to be carried out regardless of the Works required.

© Rand Associates Consultancy Services Ltd

436 Remove and make good:

1. All types of solid fuel appliances
2. All types of electric heating and hot water appliances
3. All types of old gas heating & hot water appliances
4. All types of fireplace surround and hearths.
5. Fix terracotta vent cap and louvre air brick to any redundant solid fuel chimney
6. Carefully remove any Customer's own appliances including fires, wall heaters, circulators and multipoint water heaters and return them to the tenant
7. Any pipework, flues, fitments, ducting etc, associated with the above

Existing Chimneys

437 The Provider is to be responsible for arranging and including within his tendered rates for the thorough sweeping of all existing chimneys and providing a certificate to that effect.

Tiled Surrounds

438 The existing tiled hearth and surround is to be removed. The opening is to be bricked up and plastered to feather in with existing plasterwork on the chimney breast. A permanent ventilator is to be fitted in this new brickwork. The chimney is to be capped and the hearth made good.

Builder's Work

439 The Provider shall be responsible for undertaking all builders work in connection with the installation, including holes, making good decorations to match existing following the removal of redundant equipment and after the installation of new equipment.

440 **Detailed Requirements on Builders Work**

1. Make good to all ceilings and walls to plaster finish and to match existing decorations as closely as possible

2. Remove all redundant tank supports from cupboards and make good.

3. Remove any coal bunkers made redundant by the heating installation, bag any coal up and return to the customer.

4. Any disturbed areas around chases cut for ducts across solid floors for pipework are to be tiled together with the duct covers to match existing floor tiles as near as practical.

5. Any areas, where boilers, tiled hearths and warm air units and circulators have been removed, will be made good to the following standard:
   - Straighten and level floor and provide and install floor tiling to match existing everywhere the floor finish has been disturbed;
   - Make good all holes and cracks and opening left in walls and ceilings and around fireplaces to plaster finish and to match existing decorations as closely as possible; and
   - Should a warm air unit be removed from a compartment and the compartment is such that the door does not go to floor level, then a false floor consisting of batten and 22 mm plywood will be built in that compartment at the lower level of the door.

6. Any chimneys and flues made redundant as a result of removing appliances are to be:
   - Thoroughly swept;
   - Have a terracotta vent terminal supplied and fitted on top of the chimney;
   - The base of the chimney is to be permanently sealed and a suitable air vent is to be fitted above the base to ensure the chimney is vented at all times; and
   - Any flue that is not part of the structure of the property and had the sole purposes of providing flue arrangements for a removed gas appliance is to be removed in its entirety. Weathered where necessary and all holes left as a result of this removal are to be made good to math existing.

© Rand Associates Consultancy Services Ltd

7. Wherever floor boards are lifted, they are to be replaced if damaged and all boards are to be screwed and countersunk into position. Should a laminate or other similar floor construction be encountered then the Customer must be advised that they should make their own arrangements to have such floor lifted prior to works commencing. Alternatively the Provider may lift the flooring upon the Customer signing a disclaimer to the effect that neither the Client nor the Provider is responsible for any damage that may arise or for the floor's reinstatement.

8. Any plaster damaged or holes left in ceilings as a result of removing any cylinders or associated pipework are to be made good to plaster finish.

9. All ducting, grilles, register and vents that can be removed practically whenever a warm air unit is replaced shall be removed and made good to the required standards.

10. Alterations to compartments that are to be utilised for boilers are to be allowed for, this is also to include removal of architrave, door handles or any shelves or shelving of any construction.

Hot press/Airing/Cylinder Cupboards

441 Adapt existing cupboard to accommodate new cylinder, pipe work and any necessary ancillary heating equipment where necessary, this is to include removal of the architrave and door, and re-fixing and any alterations or re-fixing of existing shelving as necessary.

Health and Safety File

442 During the pre-construction phase, the principal designer shall prepare a health and safety file appropriate to the characteristics of the project.

443 The file must contain information about the current project likely to be needed to ensure health and safety during any subsequent Work, such as maintenance, cleaning, refurbishment or demolition.

444 When preparing the health and safety file, information on the following should be considered for inclusion:

- A brief description of the Work carried out;
- Any hazards that have not been eliminated through the design and construction processes, and how they have been addresses (e.g. surveys or other information concerning asbestos or contaminated land);
- Key structural principles (e.g. bracing, sources of substantial stored energy – including pre or post tensioned members) and safe working loads for floors and roofs;
- Hazardous materials used (e.g. lead paints and special coatings);
- Information regarding the removal or dismantling of installed plant and equipment (e.g any special arrangements for lifting such equipment);
- Health and safety information about equipment provided for cleaning or maintaining the structure;
- The nature, location and markings of significant services, including underground cables, gas/oil supply equipment; fire-fighting equipment etc.,; and
- Information and as built drawings of the Property, its plant and equipment (e.g. the means of safe access to and from service voids and fire doors).

445 There should be enough detail to allow the likely risks to be identified and addressed by those carrying out the Work.

446 However, the level of detail should be proportionate to the risks.

447 The file should **not** include things that will be of no help when planning future construction work such as pre-construction information, the construction phase plan, contractual documents, safety method statements etc.

448 Information must be in a convenient form, clear, concise and easily understandable.

449 The Provider shall upload unto the Client's IT system the Health and Safety File on completion of the works.

© Rand Associates Consultancy Services Ltd

Scaffolding and other means of access

450 Provide, erect, maintain and dismantle on completion tower scaffolding. Include for gaining access, ladders, boards and physical ties where necessary. The cost of scaffolding is only reimbursed when provided on properties above two storeys.

451 All scaffolding works are to be agreed by the Client's Representative prior to erection. In multi occupancy Properties, the Provider's customer liaison officer is to notify all Customer's 48 hours prior to erection of scaffolding.

Cold Water Storage Tank

452 Where the existing tank is defective; the Client's Representative may provide an Order to renew the cold water storage tank with a new, 227 litres capacity actual to be constructed of plastic material; to include new ball valve and float, lid, Byelaw 30 kit and insulation jacket; allow for draining down/chlorination and refilling system; alterations and re-connecting pipe work and overflow, remove old tank and test on completion.

SAP Ratings and Energy Performance Certificate

453 Upon completion of the installation the Provider is to provide an Energy Performance Certificate for the Property.

MAINTENANCE OF SYSTEMS

Boiler Label

454 The Provider is to supply a self-adhesive label and fit the label to each boiler on completion. The label shall contain the following information:

1. Provider's name.
2. Provider's phone number.
3. Provider's emergency call out number.
4. Date of installation of system.
5. Gas safe registration number.
6. Signature of commissioning engineer.

455 A sample of the label shall be submitted for approval at the pre-contract meeting.

Defects Liability Period

456 Accept responsibility for both the new boiler and the heating system within each Property with the exception of any previously installed gas fires and gas cooker from the date of completion of each section of Works.

457 Accept liability for all defects until the end of the 12 months defects liability period and all defects are corrected. Any faults that occur during the defects period on the new and existing mechanical plant and equipment shall be repaired at the Provider's own expense.

458 Any nuisance calls made by Customer's for not operating the system correctly shall be at the Provider's own expense for attendance to such calls.

459 Provide a repair service line that is open 24 hours. The Provider must respond within 2 hours to all breakdown calls 24 hours a day. Calls can come from any of the following sources (Call Centre, On-Call Officer or Client. The number of the service line is to be given to the Client's Representative at the pre-contract meeting.)

© Rand Associates Consultancy Services Ltd

460 Provide and forward a report to the Client's IT system within one day of any fault being reported to the Provider with the following information.

1. Date and time of which the fault is reported to Provider.
2. Date and time the Provider arrived to rectify fault.
3. Date and time the fault was rectified
4. Description of fault.
5. Materials used in rectifying the fault.
6. Name of Customer.
7. Address of the Customer.
8. Signature of the Customer and printed name.
9. Signature of the fitter and printed name.

461 The Client shall not accept a delay of more than 12 hours to repair any part of the heating or hot water system.

462 If the Provider fails to meet the 12 hour repair time the Client reserves the right to have the repair effected by another Client Party and a counter charge shall be levied against the Provider.

Annual Service

463 Appliances installed by the Provider are to be inspected, tested, serviced and landlord safety certified during the defects liability period at no additional cost to the Client.

System Preparation and Water Treatment

464 Standard: To applicable Standards

a) Central heating systems should be thoroughly cleaned and flushed out before installing a new boiler
b) During final filling of the system, a chemical water treatment inhibitor meeting boiler manufacturer's specification or other appropriate standard should be added to the primary circuit to control corrosion and the formation of scale and sludge
c) The Provider should also refer to the boiler manufacturer's installation instructions for appropriate treatment products and special requirements for individual boiler models
d) Where the mains total water hardness exceeds 200 parts per million, provision should be made to treat the feed water to water heaters and the hot water circuit of combination boilers to reduce the rate of accumulation of lime scale.

Commissioning

465 On completion of the installation of a boiler and hot water storage system, together with associated equipment such as pipe work, pumps and controls, the equipment shall be commissioned in accordance with the manufacturer's technical data sheet. These technical data sheets will be specific to the particular boiler or hot water storage system. The Provider should give a full explanation of the system and its operation to the Customer, including the manufacturer's user manuals where provided.

466 If the Provider carries out any Works on the hot and cold water services within each Property then the Provider shall chlorinate all hot and cold water services in accordance with applicable Standards, HSG 70 and the current edition of the Water Regulations. Prior to chlorination the Provider shall flush out all hot and cold water services.

467 Record the services chlorinated during the works on the Client's Chlorination Certificate.

468 To ensure adequate cleaning of replacement systems the Provider will flush out the heating flow and return pipework and radiators prior to connection to the boiler at least twice, and power flush with a recommended descaling/flushing agent.

469 The replacement boiler is to be isolated from the system until the system water is clean, in accordance with the manufacturer's technical data sheet.

© Rand Associates Consultancy Services Ltd

470 An analysis/purity test of the heating circuit water will form part of the post inspection quality checks and the Client's Representative will select samples to be taken throughout the duration of the works and sent to the water treatment provider for independent testing and reports forwarded to the Client's Representative.

471 The filling loop is to be removed and capped and secured with a spring clip or pipe clip adjacent to mains feed and heating circuit connections.

472 It is the Provider's responsibility to give one week's prior notice to the Client's Representative of when the flushing of the new system will take place in each Property. The Provider will also provide a certificate stating that the flushing was undertaken in accordance with both the boiler manufacturer's and the flushing agent manufacturer's technical data sheet.

473 Upon completion of the pipework installations, the installations shall be filled with clean water and then subjected to a hydraulic pressure test and the Provider shall upload unto the Client's IT system the Hydraulic Test Certificate.

474 Heating and HWS primary systems shall be subjected to a test pressure of 6.0 bar or twice the working head. HWS and cold water service pipework shall be subjected to a test pressure of one and a half times the working head. The test periods shall not be less than 30 minutes. All the above pressure tests shall be recorded on the Client's Hydraulic Test Certificate.

475 After the hydraulic tests have been carried out to the satisfaction of the Client's Representative, each system is to be heat tested in accordance with the Client's Specification.

476 Boiler burner pressure, functional checks and all flame supervision devices should be checked as recommended in the manufacturer's installation instructions. The whole system should be balanced to provide an even temperature distribution.

477 Test and regulate the systems to the satisfaction of the Client's Representative with the Heat Test uploaded unto the Client's IT system.

478 Upload unto the Client's IT system an EIC (Electrical Installation Certificate) for the electrical installation within each dwelling.

479 Test the Gas installations.

480 Rectify any defects of workmanship, materials, performance or other irregularities which become apparent during the tests at the Provider's expense.

481 All tests may be carried out to the satisfaction of the Client's Representative.

482 Unless otherwise indicated, the Provider is to give a minimum notice of one week prior to site tests in order that the Client's Representative at their discretion, may be present at such tests.

483 On completing the testing of the system within each Property the Provider shall upload unto the Client's IT system a landlord's safety record and a service/maintenance check list to be passed to the Client's Representative within 24 hours of the tests being completed within each Property.

484 Notify immediately the Client's Representative of any Customer installed appliance.

485 Provide the whole of the testing equipment required.

© Rand Associates Consultancy Services Ltd

486 Upload unto the Client's IT system the following test certificates and records for each dwelling completed.

- Gas Landlords Gas Safety Record (CP12)
- Oil Landlord Safety Record (CD12)
- Electrical Installation Certificate (EIC)
- Boiler Commissioning Certificate
- Benchmark Booklet (copy of)
- Hydraulic Test Certificate
- Heat Test Certificate
- Chlorination Certificate where works have been carried out to hot and cold water services
- Record of Analysis/Purity test record from water treatment provider
- ErP Package Label
- Notice of application to Building Control Authority for all necessary approvals
- Notice from Provider to Building Control Authority confirming fixed building services have been properly commissioned
- Manufacturer's Warranty Form
- Customer Agreement Form for the works to be undertaken (To be provided by the Provider)
- Customer Satisfaction Sheet (To be provided by the Provider)

487 The Client's Representative will carry out post inspection quality check on all systems installed. The Client's Representative and the boiler manufacturer will be present during the commissioning of a number of the initial systems and will be making random inspection to monitor commissioning procedures.

Customer's Instructions

488 Ensure the manufacturer's installation and servicing instructions and user instructions are left with the Customer following completion of the work.

489 In addition to the manufacturer's technical data sheet, an A4 size laminated sheet giving simple clear basic instructions and guidance should be included.

490 Thoroughly explain and demonstrate to the Customer the operation of the system and check their understanding.

491 Ensure that the system is set up ready for the Customer's own requirements. The Customer should be asked about their lifestyle and heating requirements, rather than the "standard" heating pattern being imposed.

492 In instances where the Customer's first language is not English or alternatively where there are communications difficulties, the Client shall be advised.

Firestopping

493 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

494 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

REPLACEMENT HEATING INSTALLATION: Example Check List
[Client to amend as appropriate]

Item	Work Description	Deemed included within All-in Central Heating Renewal Rates	Reimbursed through Schedule of Rates
	General		
1.0	Removal of all Client's and or Customer installed existing appliances (gas, oil, LPG, warm air, solid fuel, electrical) and making good. This shall include properties with partial heating systems, complete heating systems, combined hot/cold water storage and expansion vessel packs , etc., Removal of gas and or oil fuel pipelines, oil tanks, concrete/paving slabs boiler house bases and oil tank bases etc.,	✓	
1.1	Patch plaster walls for decorations following strip out, total area not exceeding 2m2.	✓	
1.2	Removal of all redundant pipework and cables and make good to all disturbed surfaces.	✓	
1.3	Removal of the existing hot water storage tank or cylinder and associated redundant pipework where required.	✓	
1.4	Removal of the gas carcass within the Property.	✓	
1.5	Removal of the cold water supply pipework serving the sink, bath and basin and any hot water pipework servicing washing machines and dishwashers.	✓	
1.6	Removal of the existing heating and hot water system in its entirety.	✓	
1.7	Removal of all existing control equipment and associated wiring and accessories.	✓	
1.8	Removal of gas fires which are to be isolated and the gas supply capped, bricking up flue apertures, render and set, fixing plaster vent with permanent ventilator, renewing skirting, making good to all disturbed surfaces clearing away, and leave ready for redecoration.	✓	
1.9	Fitting of restraint chains to gas cookers		✓
1.10	All builders work in connection with the installation, including holes, making good decorations to match existing following the removal of redundant equipment and after the installation of new equipment.	✓	
1.11	Undertake all surveys, prepare working drawings, prepare all calculations, prepare radiator schedules, obtain Customer's approval, obtain Client's Representative's approval. The Provider shall carry out all necessary Customer consultation.	✓	

© Rand Associates Consultancy Services Ltd

Item	Work Description	Deemed included within All-in Central Heating Renewal Rates	Reimbursed through Schedule of Rates
	Hot and Cold Water Plumbing		
2.1	Connect to the existing hot water service, cold feed and open vent serving the Property. All the above pipework will be shown on the Provider's working drawings.	✓	
2.2	Supply and install a cold water main from the nearest existing point to feed the boiler in 15 mm pipe as shown on the Provider's working drawing if a system boiler is installed.	✓	
	Heating Plumbing		
3.1	Supply and install the heating flow and return pipework from the boiler to the pump, motorised valves and magnetic filter as shown on the Providers drawings. From the motorised valve the heating shall split to feed the hot water cylinder and radiators within each room, as shown on the Provider's working drawings.	✓	
3.2	Supply and install at low points of the heating system, a lock shield drain cock to applicable Standards, complete with loose keys.	✓	
	Gas Plumbing		
4.1	The gas carcassing to be replaced to the new appliance from the meter position in all cases. In addition, they shall extend the carcass to the cooker position and re-connect the Customer's own appliance including stability device if not already fitted. If the Customer has an electric cooker then the gas supply is to be capped off at this point. The Provider is to ensure that the supplies are of sufficient size, to supply the volume of gas required to allow the appliances to function effectively and in accordance with the manufacturer's technical data sheet.	✓	
4.2	Supply and install a bayonet fitting 600 mm from finished floor level on the gas supply to the cooker.	✓	
4.3	Install a gas cock prior to the cooker for isolation purposes.	✓	
	Boilers		
5.1	Install any type of boiler which are to be SEDBUK A rated high efficiency with evidence of a Low No-x rating condensing boiler as manufactured by a manufacturer approved by the Client's Representative.	✓	
5.2	Supply and install in the cold water mains supply prior to entering the boiler, a branch connecting with a filling loop which connects between the cold mains and the heating flow. The filling loop shall be complete with all valves in accordance with Water Regulations and manufacturer's technical data sheet.	✓	
5.3	Provide a minimum ten year's manufacturer's guarantee with a minimum ten-year parts and labour warranty and this shall be arranged to run from the date of the completion certificate.	✓	

© Rand Associates Consultancy Services Ltd

Item	Work Description	Deemed included within All-in Central Heating Renewal Rates	Reimbursed through Schedule of Rates
5.4	Provide a boiler installation record secured to the inside of the lower casing giving the Provider's name and address and the date of installation.	✓	
5.5	All new boilers are to be fitted with a "magnetic filter" on the return pipe to the boiler in accordance with manufacturer's technical data sheet.	✓	
5.6	Supply and install a complete boiler flue system in accordance with the manufacturer's technical data sheet and applicable Standards. The Provider shall terminate the flue at a suitable location and supply and install a flue terminal guard as necessary. Supply and install plume kit.	✓	
5.7	Supply and install adequate ventilation in accordance with the manufacturer's technical data sheet and applicable Standards.	✓	
5.8	Supply and install high-and low-level ventilation grilles when the boiler is installed within a cupboard. Such grilles shall be suitably sized in accordance with manufacturer's requirements.	✓	
5.9	Supply and install an additional expansion vessel of appropriate size if the system volume is beyond that which can be accommodated by the built in expansion vessel.	✓	
5.10	Supply and install a 15 mm galvanized steel pipe from the pressure relief valve on the boiler and run it to outside to discharge in a safe location.	✓	
5.11	Supply, install and deliver a pipe cover accessory.	✓	
5.12	Where necessary supply and install a safety discharge pipe, this shall be fitted in accordance with the manufacturer's technical data sheet and shall be arranged to discharge externally in a safe location and tied back to the wall.	✓	
5.13	Supply and install all condense pipes which shall be preferably run internally and terminated in accordance with the manufacturer's technical data sheet and recommendations. If run externally they must be secure and lagged with external waterproof lagging of 19mm thick to applicable Standards.	✓	
5.14	Supply and install all flues and condensation drain pipes associated with the required appliances and which shall be fitted in accordance with manufacturer's technical data sheet. This shall include all associated builders work and making good.	✓	
5.15	Provider shall also include for the provision of all access equipment on Properties of two storeys or below.	✓	
5.16	The Provider shall include for a suitable terminal guard to be fitted where flue terminals are less than 2m above ground level.	✓	

© Rand Associates Consultancy Services Ltd

Item	Work Description	Deemed included within All-in Central Heating Renewal Rates	Reimbursed through Schedule of Rates
	Radiators		
6.1	Supply and install radiators complete with brackets and be fitted with a chrome plated thermostatic radiator valve (except in room where room stat fitted) and 15mm type chrome lock shield isolating valve. Radiator connections shall be at the bottom and opposite ends. Air release valve are to be fitted on the flow side top connections.	✓	
6.2	Supply and install reflective foil to be fitted behind all radiators on external walls. The foil shall be cut neatly, 25mm smaller than radiator dimensions and fixed in accordance with manufacturer's technical data sheet and recommendations behind the radiator-fixing bracket.	✓	
6.3	Supply and install a drain off tapping fitted at lowest point in the system.	✓	
6.4	The radiators shall be supplied with a good priming coat.	✓	
	Cylinders		
7.1	Where a system boiler is provided, the Provider shall include a new high recovery foam insulated indirect cylinder of appropriate size for dwelling (minimum storage capacity 120 litres). The cylinder shall be pre insulated of an appropriate grade for the installation The cylinder shall be located in the existing hot press. The Provider shall include for a 22mm cold feed to this cylinder from the main storage tank and for a 22mm vent pipe.	✓	
7.2	Supply and install a 750mm long immersion heater facility rated at 3kW and thermostat to applicable Standards and heater booster switch.	✓	
7.3	Supply and install a new 22mm gate valve on the cold feed, heating flow and return pipework to the cylinder.	✓	
	Controls		
8.1	Supply and install programmer to incorporate a manual override facility and to be an electro-mechanical programmer and be located in the kitchen, wireless programmers may also be installed if approved by the Client's Representative	✓	
8.2	Supply and install 22mm motorised valves complete with actuator motor to be located as shown on the Providers drawings complete with isolating valves.	✓	
8.3	Supply and install room thermostat. A wireless room thermostat may also be installed if approved by the Client's Representative.	✓	

© Rand Associates Consultancy Services Ltd

Item	Work Description	Deemed included within All-in Central Heating Renewal Rates	Reimbursed through Schedule of Rates
8.4	Supply and install wiring centre in accordance with the manufacturer's installation instructions to be located as shown on the Provider's drawings.	✓	
8.5	Supply and install an immersed cylinder thermostat set at 60°c in a cylinder provided pocket.	✓	
8.6	Supply and install an automatic bypass to be fitted to all systems including combination boilers should the boiler manufacturer's technical data sheet advise that this is a requirement of the installation.	✓	
8.7	Supply and install a frost thermostat to be provided if the boiler is located in a position where frost damage may occur.	✓	
8.8	Supply and install a heating pump in an accessible location. The pump shall be sized to provide the correct flow rate against the system resistance.	✓	
	Insulation		
9.1	Supply and install insulation to all pipework running under ground floor suspended floors, through unheated areas (ducts, cupboards, or in loft spaces in accordance with the Client's Specification. All primary pipework and pipework within hot presses shall also be insulated.	✓	
	Water storage Tanks		
10.1	Supply and install a plastic 18 litre feed and expansion cistern in accordance with the current Water Regulations if an open vented system is to be used.	✓	
10.2	Supply and install purpose made lids and insulation jacket for the feed and expansion cistern.	✓	
10.3	Supply and install overflows of suitable size to the feed and expansion cistern and discharge it in an appropriate location.	✓	
10.4	Supply and install an open vent and cold feed to the heating system in accordance with the boiler manufacturer's technical data sheet.	✓	
10.5	Supply and install a framework to support the feed and expansion cistern. The framework shall transfer all the live load to the floor or surrounding walls. The framework shall be made from timber with a minimum of four cross supports. The feed and expansion cistern shall be sited on 25mm marine plywood.	✓	

© Rand Associates Consultancy Services Ltd

Item	Work Description	Deemed included within All-in Central Heating Renewal Rates	Reimbursed through Schedule of Rates
	Electrical Installation		
11.1	Supply and install if required a new electrical circuit from consumer unit and connect to the new immersion heater via a heater booster switch.	✓	
11.2	If a new consumer unit is required this will be a surface non-combustible unit with lid, and complete with: main control switch to applicable Standards; sufficient RCBO's to accommodate all the sub-circuits scheduled for the Property; a minimum of 20% spare ways for future capacity; and each protective device to be permanently labelled to identify each circuit and rating.		✓
11.3	Provision of new electrical circuit and connect to Boiler any type and system control equipment and accessories.	✓	
11.4	Circuit wiring shall be carried out using 2.5mm2 PVC/PVC insulated cables. All routing of trunking shall be done in a workmanlike manner and shall be arranged to be unobtrusive in terms of its layout.	✓	
11.5	Supply and install final connections for boilers, heating circulators, electric inset fire and immersion heater which shall be heat resisting 3 core 2.5mm2 butyl. Include for the upgrading of supplementary earth bonding to a new system in accordance with the applicable Standards for electrical installations.	✓	
11.6	Earth bonding shall be completed where necessary back to the main consumer unit or meter.	✓	
11.7	All control wiring associated with the installation shall be supplied and installed by the Provider.	✓	
	Commissioning and Testing		
12.1	If any Works are undertaken on the hot and cold water Services within each Property then the Provider shall chlorinate all hot and cold water services in accordance with applicable Standards, HSG 70 and to the current edition of the Water Regulations. Prior to chlorination the Provider shall flush out all hot and cold water services. The services chlorinated during the works are to be recorded on the Client's Chlorination Certificate.	✓	
12.2	Flush out the heating flow and return pipework and radiators prior to connection to the boiler at least twice, with the boiler manufacturer's recommended descaling/flushing agent and power flushing machine. The Provider will also provide a certificate stating that the flushing was undertaken in accordance with both the boiler manufacturer's and the flushing agent manufacturer's technical data sheet.	✓	

© Rand Associates Consultancy Services Ltd

Item	Work Description	Deemed included within All-in Central Heating Renewal Rates	Reimbursed through Schedule of Rates
12.3	The filling loop is to be removed and capped and secured with a spring clip or pipe clip adjacent to mains feed and heating circuit connections.	✓	
12.4	Upon completion of the pipework installations, water pipework shall be filled with clean water and then subjected to a hydraulic pressure test and the Provider shall complete the Client's Hydraulic Test Certificate.	✓	
12.5	Heating and HWS primary systems shall be subjected to a test pressure of 6.0 bar or twice the working head. HWS and cold water service pipework shall be subjected to a test pressure of one and a half times the working head. The test periods shall not be less than 30 minutes. All the above pressure tests shall be recorded on the Client's Hydraulic Test Certificate.	✓	
12.6	After the hydraulic tests have been carried out to the satisfaction of the Client's Representative, each system is to be cleaned and dosed and a heat test shall be carried out.	✓	
12.7	Main burner pressure, gas rate, functional checks and flame supervision device should be checked as recommended in the manufacturer's installation instructions. The whole system should be balanced to provide an even temperature distribution.	✓	
12.8	The Provider shall regulate the systems to the satisfaction of the Client's Representative and the results shall be recorded on the Client's Commissioning Certificate and Heat Test Certificate.	✓	
12.9	The Provider shall upload unto the Client's IT system an Electrical Installation Certificate for the electrical installation within each dwelling.	✓	
12.10	Upload unto the Client's IT system a signed certificate of the gas safety checks and gas pressure test within the operation and maintenance manuals.	✓	
12.11	Test for soundness and purge in accordance with applicable Standards and certify.	✓	
12.12	Upon completion the gas pipework is to be pressure tested (may be witnessed by the Client's Representative) for 15 minutes at a pressure of 20mbar.	✓	
12.13	Flush out the heating services at least twice prior to filling and adding inhibitor to the system.	✓	

© Rand Associates Consultancy Services Ltd

Item	Work Description	Deemed included within All-in Central Heating Renewal Rates	Reimbursed through Schedule of Rates
12.14	At the time of commissioning following the successful cleaning of the system the Provider will add the boiler manufacturer's recommended corrosion inhibitor approved by the Client's Representative, dosed in accordance with the manufacturer's technical data sheet, into the heating system after the system has been tested.	✓	
	Customer's Instructions		
13.1	Ensure the manufacturer's installation and servicing instructions and user instructions are left with a responsible person on site together with an A4 size laminated sheet giving simple clear basic instructions and guidance.	✓	
13.2	Supply a radiator vent key and for thoroughly explaining to the Customer, demonstrating the operation of the system and checking their understanding.	✓	
13.3	Ensure that the system is set up ready for the Customer's own requirements. The Customer should be asked about their lifestyle and heating requirements, rather than the "standard" heating pattern being imposed.	✓	
13.4	In instances where the Customer's first language is not English or alternatively where there are communications difficulties, the Client's Representative shall be advised.	✓	
	Health & Safety File		
14.1	During the pre-construction phase, the principal designer shall prepare a health and safety file appropriate to the characteristics of the project which shall contain information relating to the project which is likely to be needed during any subsequent project to ensure the health and safety of any person. The information required per Scheme shall be agreed with the Client's Representative prior to commencing the Works:	✓	
	Scaffolding		
15.1	Provide, erect, maintain and dismantle on completion tower scaffolding. Include for gaining access, ladders, boards and physical ties where necessary.	✓	
15.2	The cost of scaffolding is only reimbursed when provided on Properties above two storeys.		✓
	SAP Ratings and Energy Performance Certificate		
16.1	Upon completion of the heating installation the Provider is to provide an Energy Performance Certificate for the Property.	✓	

© Rand Associates Consultancy Services Ltd

Item	Work Description	Deemed included within All-in Central Heating Renewal Rates	Reimbursed through Schedule of Rates
	Maintenance of System		
17.1	Supply a self-adhesive label and fit the label to each boiler on completion. The label shall contain the information listed in clause 196:	✓	
17.2	Accept responsibility for both the new boiler and the heating system within each Property with the exception of any previously installed gas fires and gas cooker from the date of completion of each section of Works.	✓	
17.3	Accept liability for all defects until the end of the 12 months defects liability period and all defects are corrected. Any faults that occur during the defects period on the new and existing mechanical plant and equipment shall be repaired at the Provider's own expense.	✓	
17.4	Provide a repair service line that is open 24 hours. The Provider must respond within 2 hours to all breakdown calls 24 hours a day. Calls can come from any of the following sources (Call Centre, On-Call Officer or Client. The number of the service line is to be given to Client at the pre-contract meeting.)	✓	
17.5	Provide a report sheet to the Client within one day of a fault being reported to the Provider with the information listed in clause 202.	✓	

© Rand Associates Consultancy Services Ltd

REPLACEMENT BOILER (WITHOUT AND WITH CONTROLS): Example Check List
[Client to amend as appropriate]

Item	Work Description	Deemed included within All-in Boiler Renewal Rates	Reimbursed through Schedule of Rates
	General		
1.0	Removal of Client's and or Customer installed existing boiler of any type and boiler flue and making good.	✓	
1.1	Patch plaster walls for decorations following strip out, total area not exceeding 2m2.	✓	
1.2	Removal of all redundant pipework and cables where required and make good to all disturbed surfaces.	✓	
1.3	Removal of existing control equipment, wiring and accessories.	✓	
1.4	All builders work in connection with the installation, including holes, making good decorations to match existing following the removal of redundant equipment and after the installation of new equipment.	✓	
1.5	Undertake all surveys, prepare working drawings, prepare all calculations, obtain Customer's approval, obtain Client's Representative's approval. The Provider shall carry out all necessary Customer consultation.	✓	
	Hot and Cold Water Plumbing		
2.1	Connect to the existing hot water service, cold feed and open vent serving the dwelling. All the above pipework will be shown on the Provider's working drawings.	✓	
2.2	Supply and install if necessary a cold water main from the nearest existing point to feed the boiler in 15 mm pipe as shown on the Provider's working drawing if a system boiler is installed.	✓	
	Heating Plumbing		
3.1	Supply and install or modify the heating flow and return pipework from the boiler to the pump and motorised valves and magnetic filter, as shown on the Providers drawings. From the motorised valves the heating shall split to feed the hot water cylinder and radiators within each room, as shown on the Provider's working drawings.	✓	
3.2	Supply and install at low points of the heating system, a Lock shield drain cock to applicable Standards, complete with loose keys.	✓	

© Rand Associates Consultancy Services Ltd

Item	Work Description	Deemed included within All-in Boiler Renewal Rates	Reimbursed through Schedule of Rates
	Gas Plumbing		
4.1	The gas carcassing to be replaced to the new appliance from the meter position in all cases. In addition, the Provider shall extend the carcass to the cooker position and reconnect the Customer's cooker including stability device if not already fitted. If the Customer has an electric cooker then the gas supply is to capped off at this point. The Provider is to ensure that the supplies are of sufficient size, to supply the volume of gas required to allow the appliances to function effectively and in accordance with the manufacturer's technical data sheet.	✓	
4.2	Supply and install a bayonet fitting 600 mm from finished floor level on the gas supply to the cooker.	✓	
	Boilers etc		
5.1	Install boilers which are SEDBUK A rated high efficiency with evidence of a Low No-x rating condensing boiler as manufactured by a manufacturer approved by the Client's Representative.	✓	
5.2	Supply and install in the cold water mains supply prior to entering the boiler, a branch connecting with a filling loop which connects between the cold mains and the heating flow. The filling loop shall complete with all valves in accordance with Water Regulations and manufacturer's technical data sheet and recommendations.	✓	
5.3	Provide a minimum ten year's manufacturer's guarantee with a minimum ten-year parts and labour warranty and this shall be arranged to run from the date of the completion certificate.	✓	
5.4	Provide a boiler installation record secured to the inside of the lower casing giving the Provider's name and address and the date of installation.	✓	
5.5	All new boilers are to be fitted with a magna-filter on return pipe.	✓	
5.6	Supply and install a complete boiler flue system in accordance with the manufacturer's technical data sheet and applicable Standards. The Provider shall terminate the flue a suitable location and supply and install a flue terminal guard as necessary.	✓	
5.7	Supply and install adequate ventilation in accordance with the manufacturer's technical data sheet and applicable Standards.	✓	
5.8	Supply and install high and low level ventilation grilles when the boiler is installed within a cupboard. Such grilles shall be suitably sized in accordance with manufacturer's requirements.	✓	

© Rand Associates Consultancy Services Ltd

Item	Work Description	Deemed included within All-in Boiler Renewal Rates	Reimbursed through Schedule of Rates
5.9	Supply and install an additional expansion vessel of appropriate size if the system volume is beyond that which can be accommodated by the built in expansion vessel.	✓	
5.10	Supply and install a 15 mm galvanized steel pipe from the pressure relief valve on the boiler and run it to outside to discharge in a safe location.	✓	
5.11	Supply and install a pipe cover accessory.	✓	
5.12	Where necessary supply and install a safety discharge pipe, this shall be fitted to the manufacturer's technical data sheet and shall be arranged to discharge externally in a safe location and tied back to the wall.	✓	
5.13	Supply and install all condense pipes which shall be preferably run internally and terminated in accordance with the manufacturer's technical data sheet and recommendations. If run externally they must be secure and lagged with external waterproof lagging of 19mm thick to applicable applicable Standards.	✓	
5.14	Supply and install all flues and condensation drain pipes associated with the required appliances and which shall be fitted in accordance with manufacturer's technical data sheet. This shall include all associated builders work and making good.	✓	
5.15	**Provider shall also include for the provision of all access equipment on Properties of two storeys or below.**	✓	
5.16	The Provider shall include for a suitable terminal guard to be fitted where flue terminals are less than 2m above ground floor level.	✓	
	Controls		
6.1	Supply and install programmer to incorporate a manual override facility and to be an electro-mechanical programmer and be located in the kitchen, wireless programmers may also be installed if approved by the Client's Representative.	✓	
6.2	Supply and install 22mm motorised valves with isolating valves complete with actuator motor to be located as shown on the Providers drawings.	✓	
6.3	Supply and install room thermostat A wireless room thermostat may also be installed if approved by the Client's Representative.	✓	

© Rand Associates Consultancy Services Ltd

Item	Work Description	Deemed included within All-in Boiler Renewal Rates	Reimbursed through Schedule of Rates
6.4	Supply and install wiring centre in accordance with the manufacturer's to be located as shown on the Providers drawings.	✓	
6.5	Supply and install an immersed cylinder thermostat set at 60°c in a hot water cylinder provided pocket.	✓	
6.6	Supply and install an automatic bypass to be fitted to all systems including combination boilers should the boiler manufacturer's technical data sheet advise that this is a requirement of the installation.	✓	
6.7	Supply and install a frost thermostat to be provided if the boiler is located in a position where frost damage may occur.	✓	
6.8	Supply and install a heating pump in an accessible location. The pump shall be sized to provide the correct flow rate against the system resistance.	✓	
	Insulation		
7.1	Supply and install insulation to all pipework running under ground floor suspended floors, through unheated areas (ducts, cupboards, or in loft spaces shall be provided with rigid pipe insulation. All primary pipework and pipework within airing cupboards shall also be insulated.		✓
	Water storage Tanks		
8.1	If the existing cold water storage tank is defective, renew tank with new 227 litres actual and constructed of a plastic material acceptable to the Client's Representative, include for new ball valve and float, lid, Byelaw 30 kit and rigid insulation, allow for turning water on/off, draining/refilling system, adjusting and connecting pipework and overflow, remove old tank and test on completion.		✓
	Electrical Installation		
9.1	Re-connect existing switched connection fused connection to new boiler of any type.	✓	
9.2	Circuit wiring shall be carried out using 2.5mm2 PVC/PVC insulated cables All routing of trunking shall be done in a workmanlike manner and shall be arranged to be unobtrusive in terms of its layout.	✓	
9.3	Supply and install final connections to boiler and system control equipment which shall be heat resisting 3 core 2.5mm2 butyl Include for upgrading where necessary the supplementary earth bonding in accordance with the applicable Standards for electrical installations.	✓	

© Rand Associates Consultancy Services Ltd

Item	Work Description	Deemed included within All-in Boiler Renewal Rates	Reimbursed through Schedule of Rates
9.4	Earth bonding shall be completed where necessary back to the main consumer unit or meter.	✓	
9.5	All existing control wiring associated with the installation shall be retained and final connections to equipment shall be provided by the Provider.	✓	
	Commissioning and Testing		
10.1	If any works are undertaken on the hot and cold water services within each dwelling then the Provider shall chlorinate all hot and cold water services in accordance with applicable Standards, HSG 70 and the current edition of the Water Regulations. Prior to chlorination the Provider shall flush out all hot and cold water services. The services chlorinated during the works are to be recorded on the Client's Chlorination Certificate.		✓
10.2	Flush out the heating flow and return pipework and radiators prior to connection to the boiler at least twice, with the boiler manufacturer's recommended descaling/ flushing agent and power flushing machine. The Provider will also provide a certificate stating that the flushing was undertaken in accordance with both the boiler manufacturer's and the flushing agent manufacturer's technical data sheet.	✓	
10.3	The filling loop is to be removed and capped and secured with a spring clip or pipe clip adjacent to mains feed and heating circuit connections.	✓	
10.4	Upon completion of the pipework installations, water pipework shall be filled with clean water and then subjected to a hydraulic pressure test and the Provider shall complete the Client's Hydraulic Test Certificate.	✓	
10.5	Heating and HWS primary systems shall be subjected to a test pressure of 6.0 bar or twice the working head. HWS and cold water service pipework shall be subjected to a test pressure of one and a half times the working head. The test periods shall not be less than 30 minutes. All the above pressure tests on the Client's Hydraulic Test Certificate shall be uploaded unto the Client's IT system.	✓	
10.6	After the hydraulic tests have been carried out to the satisfaction of the Client's Representative, each system is to be cleaned and dosed and a heat test shall be carried out.	✓	

© Rand Associates Consultancy Services Ltd

Item	Work Description	Deemed included within All-in Boiler Renewal Rates	Reimbursed through Schedule of Rates
10.7	Main burner pressure, gas rate, functional checks and flame supervision device should be checked as recommended in the Manufacturer's installation technical data sheet. The whole system should be balanced to provide an even temperature distribution.	✓	
10.8	The Provider shall regulate the systems to the satisfaction of the Client's Representative and the results shall be recorded on the Client's Commissioning Certificate and Heat Test Certificate.	✓	
10.9	The Provider shall upload unto the Client's IT system an Electric Test Certificate for the electrical installation within each dwelling.	✓	
10.10	Upload unto the Client's IT system with a signed certificate of the gas safety checks and gas pressure test within the operation and maintenance manuals.	✓	
10.11	Test for soundness and purge in accordance with applicable Standards and certify.	✓	
10.12	Upon completion the gas pipework is to be pressure tested (may be witnessed by the Client's Representative) for 15 minutes at a pressure of 20mbar.	✓	
10.13	Flush out the heating services at least twice prior to filling and adding inhibitor to the system.	✓	
10.14	At the time of commissioning following the successful cleaning of the system the Provider will add the boiler manufacturer's recommended corrosion inhibitor approved by the Client's Representative, dosed in accordance with the manufacturer's technical data sheet, into the heating system after the system has been tested.	✓	
	Customer's Instructions		
11.1	Ensure the manufacturer's installation and servicing instructions and user instructions are left with a responsible person on site together with an A4 size laminated sheet giving simple clear basic instructions and guidance.	✓	
11.2	Ensure that the system is set up ready for the Customer's own requirements. The Customer should be asked about their lifestyle and heating requirements, rather than the "standard" heating pattern being imposed.	✓	
11.3	In instances where the Customer's first language is not English or alternatively where there are communications difficulties, the Client's Representative shall be advised.	✓	

© Rand Associates Consultancy Services Ltd

Item	Work Description	Deemed included within All-in Boiler Renewal Rates	Reimbursed through Schedule of Rates
	Health & Safety File		
12.1	During the pre-construction phase, the principal designer shall prepare a health and safety file appropriate to the characteristics of the project which shall contain information relating to the project to ensure the health and safety of any person. The information required per Scheme shall be agreed with the Client's Representative prior to commence to commence the works.	✓	
	Scaffolding		
13.1	Provide, erect, maintain and dismantle on completion tower scaffolding. Include for gaining access, ladders, boards and physical ties where necessary.	✓	
13.2	The cost of scaffolding is only reimbursed when provided on Properties above two storeys.		✓
	SAP Ratings and Energy Performance Certificate		
14.1	Upon completion of the installation the Provider is to provide an Energy Performance Certificate for the dwelling.	✓	
	Maintenance of System		
15.1	Supply a self-adhesive label and fit the label to each boiler on completion. The label shall contain the information listed in clause 196.	✓	
15.2	Accept responsibility for the new boiler from the date of completion of each section of works.	✓	
15.3	Accept liability for all defects until the end of the 12 months defects liability period and all defects are corrected. Any faults that occur during the defects period on the new and existing mechanical plant and equipment shall be repaired at the Provider's own expense.	✓	
15.4	Provide a repair service line that is open 24 hours. The Provider must respond within 2 hours to all breakdown calls 24 hours a day. Calls can come from any of the following sources (Call Centre, On-Call Officer or Client. The number of the service line is to be given to Client's Representative at the pre-contract meeting.)	✓	
15.5	Provide a report sheet to the Client within one day of a fault being reported to the Provider with the information listed in clause 202.	✓	

© Rand Associates Consultancy Services Ltd

DOMESTIC HEATING INSTALLATIONS SERVICING AND MAINTENANCE

© Rand Associates Consultancy Services Ltd

SERVICING AND MAINTENANCE OF GAS FIRED HEATING INSTALLATIONS

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

SERVICING AND MAINTENANCE OF GAS FIRED HEATING INSTALLATIONS (ANY TYPE)

001 The Periodic Servicing and Inspections, Routine Maintenance and Responsive Maintenance specified hereafter are model requirements only and the Provider must at his own cost and as part of his undertaking of the Periodic Servicing and Inspection, Routine Maintenance and Responsive Maintenance of Heating Installations and Heating Appliances in the Client's Property, obtain the manufacturer's service and maintenance requirements for the respective Heating Appliances and Heating Installations and any other information which will enable the Provider to identify the full service, maintenance and repair requirements necessary to meet his obligations under the Contract and consequently enable the Client to fulfil its obligations to its Customers of its premises in respect of the Gas Safety (Installation and Use) Regulations 1998 and any subsequent revisions.

002 The Provider should note that the particular service procedure scheduled in respect of each individual element of the systems shall be considered as a minimum requirement and the Provider shall be fully responsible for any other servicing requirements that may be necessary in respect of the Heating Appliances and Heating Installations and their associated safety equipment to ensure that each Heating Installation is in good working order and working safely, efficiently and economically, including the inspection/examination of all flues and catchment areas enabling the Customer to make full use of the system at any time.

003 The Provider shall be deemed to have allowed in the Tender for all service Works including the replacement of defective or missing Materials that may be necessary including carrying out all other maintenance items in accordance with the manufacturer's technical data sheet.

004 The service to each individual Heating Installation and any replacement of defective or missing Materials incorporated within the service shall fully comply with the current recommendations and instructions of the installations manufacturer's, standards of safety, current bye-laws, the requirements and regulations of the Gas, Electricity and Water Authorities and the Gas Safe Register, current British Standards or equivalent and Codes of Practice, the guide to Good Practice issued by the Institute of Heating and Ventilating Engineers and IET Regulations.

005 Replacement Materials shall, where possible, be the particular installation manufacturer's approved replacement parts.

006 At each service visit an inspection shall include but not limited to the following check list and remedial works carried out.

- Service gas fired boiler and flue in strict accordance with the specific manufacturers operating and maintenance instructions, to be carried out by Gas Safe registered engineer
- Gas soundness tests at the commencement and on completion of the service.
- Ensure earth continuity and electrical cross bonding is present (and where missing install).
- Inspect flues within dwellings, roof spaces and communal areas to ensure the effectiveness of the flue and that they fully comply with current regulations and conform to applicable Standard.
- Note: Gaining access to roof space and communal areas to ensure that the flues in their entirety conform to applicable Standard shall be the responsibility of the Provider.
- Inspection of ventilation provision to ensure compliance with the current regulations and conforms to applicable Standard.
- Checking external flue termination for damage and obstruction in accordance with applicable Standard.
- Ensuring correct pressure at outlet of gas meter and appliance.
- Inspection and testing of all wiring connections.

© Rand Associates Consultancy Services Ltd

- Inspection of all heating appliance and heating installation controls (room thermostat, DHW cylinder thermostat, frost thermostat, motorised valves, programmer/time switch, thermostatic Radiator valves, lock shield valves and covers etc.) to ensure correct operation and repair / replace / re-set /clean each as necessary.

- Removal and reinstatement of casings and other parts of the appliance including the provision of new seals and gaskets as necessary.

- Inspection of main fuse rating and replacing where necessary.

- Ensuring the correct operation of all gas taps and valves including overhauling, cleaning and greasing where necessary.

- Inspect insulation to pipes and equipment, circulation pump (note pump setting), installation cleaning filters and repair/ replace/re-set/clean each as necessary;

- Inspection of the entire installation for air locks and bleeds as necessary.

- Inspection of the entire installation for and repair all leaks.

- Turning off all appliances, re-igniting on completion and ensuring correct operation including correct sequence of ignition, correct flame picture and correct operation of any flame failure device.

- Cleaning the Work area on completion.

- Check and clean any installed Carbon Monoxide (CO) detector and if battery operated replace same with new battery all as per manufacturer's technical data sheet. Where no CO detector is installed the Provider should notify the Client's Representative on the data sheet.

- Check and clean any installed heat or smoke detector and if battery operated replace same with new battery all as per manufacturer's technical data sheet. Where no heat or smoke detector is installed the Provider should notify the Client's Representative on the service report form.

- Check circulation pipes and radiators, radiator valves circulation pump (note pump setting) system cleaning filters and where necessary repair/replace/re-set/clean each as necessary.

- Check all radiators for secure fixing and repair as necessary

- Check and confirm that feed and expansion tanks are adequately supported, insulated and vented and have lids fitted and replace/renew where necessary. These are to be comply with applicable Standard.

- Check and confirm that cold water storage tanks and hot water storage tanks are adequately supported and insulated and have lids fitted and provide a Byelaw kit where necessary and notify the Client's Representative on the service report form.

- Where fitted check the correct operation of the immersion thermal cut out, repairing where a fault is found.

- Set the temperature of any stored hot water to 60 degrees centigrade to mitigate against the risks of scalding and reduce the risk of the proliferation of legionella or similar.

- Test entire installation.

- The Provider shall discussing performance and operation of installation and or appliance with the Customer and any issues raised should be resolved at the time of the service. The Provider shall provide the Customer sufficient information about the Heating Installation, including operational and maintenance instructions so that the Heating Installation can be operated and maintained in an efficient manner.

© Rand Associates Consultancy Services Ltd

007 In accordance with the Gas Safety (Installation and Use) Regulations 1998 and any subsequent revisions if, in the opinion of the Provider, a Heating Appliance is unsafe or if there is an escape of gas (the Provider shall be required to take immediate and appropriate action (e.g. disconnect cap off, attach gas Warning Label etc). The Provider shall then be required to complete in triplicate, sign and obtain the Customer's signature on a Warning Notice, see appendices one copy of which shall be left with the Customer and further copies forwarded to the Client's Representative. If a Heating Appliance is disconnected or capped off, the Provider shall also be required to verbally inform the Client's Representative within one hour.

Flues

008 The Provider when undertaking the Periodic Service and Inspection must at his own cost, performance test each entire flue in use and connected to gas fired Heating Installations and Heating Appliances for which the Client is responsible at the Property and each entire chimney flue integral with the fabric of the Property that is connected to any Customer owned Heating Appliance. When undertaking the Service the Provider must in addition, examine any balanced and any entire prefabricated flue to verify the integrity of the material, joints, and supports and to ensure that combustion products are being satisfactorily and safely discharged into the atmosphere and not being discharged into any premises or internal communal area.

009 All flue testing must include the basic flue tests to satisfy the requirements of applicable Standard.

010 If the examination should reveal any defective or missing parts or supports in the entire flue and or method of discharging combustion products, the Provider is deemed to have included in his Maintenance Rates for flue renewals, replacement of defective or missing parts and repairs.

011 The Provider must immediately give notice to the Client's Representative of any defects in the flue, which cannot immediately be remedied by application of the above rules and if necessary, invoke his potentially dangerous appliance procedure.

Gas Pipework Installations

012 Whenever the Provider undertakes any work on a gas fired boiler installation that involves interrupting the gas supply, he must carry out a tightness test on the gas pipework installations in accordance with the Gas Safety (Installation and Use) Regulations 1998 and any subsequent revisions and satisfy himself that the installation is safe and where necessary, relight all pilot lights including any on Customer's Heating Appliances.

Inhibitor

013 The Provider will also be required as part of the Periodic Servicing and Inspection test and record inhibitor levels and where it is identified that replenishment or total replacement is necessary this will be done by using an approved proprietary brand non-toxic biodegradable inhibitor. The Client's Representative may test inhibitor levels on completion of the service.

Electrical Installations

014 The Provider must as part of the Periodic Servicing and Inspection check and test all electrical installations and fittings associated with the Heating Installations and Heating Appliances covered by this Contract, so as to ensure their safe operation. All remedial work will comply fully with applicable Standard. The cost of this remedial work is deemed to be included in the Provider's tendered Rates.

© Rand Associates Consultancy Services Ltd

Landlord Gas Safety Certificate

015 On completion of each Periodic Servicing and Inspection the Provider shall produce a Landlords gas safety certificate. These are to be in an electronic format and include the before and after flue analyser reading. The Provider is to upload the certificates onto the Client's IT system as Instructed by the Client's Representative. The Provider shall be deemed to have allowed in the Tender for all document uploads.

Routine Maintenance and Responsive Maintenance

016 The Provider shall provide a 24-hour, 365 days per year (366 for a leap year) Responsive Maintenance service for the period of the Contract to allow for breakdown or malfunction of any Heating Appliance or Heating Installation and the replacement of any defective or missing Materials. This service is to ensure that the Heating Appliances and Heating Installations are left in a safe and fully operational condition. The details of any repair are to be noted by the engineer for registering on the Provider's database (as provided by the Client).

017 All Works in connection with the Heating Appliances and Heating Installations to be arranged by the Provider.

018 For breakdowns the Provider is expected to complete a minimum of 80% of such repairs at first fix within one day and 100% within two days. The aim of this requirement is to minimise any disruption to the Customer relating to use of water/space heating facilities.

019 Where the above is not achievable with Materials being unavailable from impressed or local stockist the Provider is to immediately notify the Customer and the Client's Representative and provide time scales for completion of the Works where replacement Materials are required.

020 On receipt of a request being made by the Client's Representative and/or the Customer the Provider shall comply with the following:-

a) EMERGENCY CALLOUT ATTENDANCE WILL MEAN THE FOLLOWING:

Emergency call out to be responded to immediately and no later than 2 hours and completed or made safe within 24 hours.

If deemed necessary, the Client's Representative can Instruct the Provider to attend on demand breakdown calls within the above time stipulation to Properties which are not deemed to be emergency call out situations.

Breakdown repairs are to be completed within the stipulated attendance timescales, with every effort being made to complete on a first call, first fix basis, where this cannot be achieved the timescales as mentioned above will apply.

b) URGENT CALLOUT ATTENDANCE WILL MEAN THE FOLLOWING:

Urgent Call Out To be responded to immediately and no later than 24 hours and completed within 48 hours.

c) Ensure that each engineer is equipped with an adequate impressed van stock of Materials to deal with most eventualities. A comprehensive stock of impressed Materials, shall also be kept at the Provider's control point and store to enable items such as cylinders and where applicable immersion heaters to be replaced immediately.

d) Ensure that an alternative form of heating is available to the Customer in the event of a repair not being possible at the time of attendance. The alternative form of heating will as a minimum be two x 2kW electric panel heaters with time and temperature controls or any other type of heater approved by the Client's Representative, where alternative hot water provision is available in the form of an immersion heater ensure that it is operational before leaving the premises.

© Rand Associates Consultancy Services Ltd

Before leaving the premises the engineer must obtain the Customer's signature as proof of receipt of the heaters being left on site.

The Provider shall not without the previous written consent of the Client's Representative remove any temporary heating appliances from the site until such time as the fault has been rectified to the Client's Representative's satisfaction.

If rectification of the fault is not possible at the time of attendance the fault must be rectified within the previously stated time scales.

In the event of rectification not being considered possible as aforesaid, the Provider shall immediately notify the Client's Representative and the Customer giving the reasons as to why and inform the Client's Representative and the Customer when the repair will be completed. The Client's Representative must satisfy himself that suitable alternative temporary arrangement for hot water and heating are in place.

Notwithstanding the generality of the Provider's obligations hereunder, the expression "component part" shall include the parts listed elsewhere hereof and any other specialist controls associated with a particular installation.

e) Ensure that the Customer is kept informed of the situation at all times.

f) Upon completion of a breakdown, the satisfaction card is to be left with each Customer, the approved work document is to be duly completed and a copy of such is to be sent to the Client's Representative.

g) In addition to the requirements detailed previously the Provider shall also allow to provide the following Services, which are deemed to be included for within the rate per appliance (see Invitation to Tender and Contract Details for inclusions):

1. Advise on efficient and correct use of Heating Appliance and Heating Installations.

2. Instruct new and existing Customers on the operation of Heating Appliances and Heating Installations.

3. Resetting of programmers, thermostats and other controls for any reason.

4. Re-lighting pilot lights for any reason.

5. Restoring gas and electric supplies if turned off for any reason. Except for non-payment for supply by the Customer or where to restore the supply would be dangerous.

6. Calls to determine location of water leaks if not on pipework associated with the Heating Appliances and/or Heating Installations covered by this Specification and advise the Client's Representative of the correct location and repair of these leaks.

7. All calls where a Customer maintains a Heating Appliance or Heating Installation is faulty, even if no such fault is found to exist.

8. All calls where the fault reported is due to controls being incorrectly set.

9. Repairs due to Customer damage.

h) The breakdown element of the Works shall be priced in accordance with the schedules shown elsewhere in the Contract Documents and shall be inserted in the Price Framework.

i) The Provider is to provide on a daily basis a breakdown status report on each site visited.

021 Before attending a breakdown the Provider should contact the Customer to ascertain where reasonably possible as to the authenticity of the call to establish if the malfunction is due to Customer error such as installation/control adjustments or electricity failure.

© Rand Associates Consultancy Services Ltd

Firestopping

022 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

023 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

SERVICING AND MAINTENANCE OF LPG COOKER INSTALLATIONS

© Rand Associates Consultancy Services Ltd

SERVICING AND MAINTENANCE OF LPG COOKER INSTALLATIONS (ANY TYPE)

001 The Periodic Servicing and Inspections, Routine Maintenance and Responsive Maintenance specified hereafter are model requirements only and the Provider must at his own cost and as part of his undertaking of the Periodic Servicing and Inspection, Routine Maintenance and Responsive Maintenance of LPG cooker gas line and all associated safety equipment in the Client's Property, obtain the manufacturer's service and maintenance requirements for the respective LPG cooker gas line and all associated safety equipment and any other information which will enable the Provider to identify the full service, maintenance and repair requirements necessary to meet his obligations under the Contract and consequently enable the Client to fulfil its obligations to its Customers of its premises in respect of the Gas Safety (Installation and Use) Regulations 1998 and any subsequent revisions.

002 The Provider should note that the particular service procedure scheduled in respect of each individual element of the installations shall be considered as a minimum requirement and the Provider shall be fully responsible for any other servicing requirements that may be necessary in respect of the LPG cooker gas line and its associated safety equipment to ensure that each installation is in good working order and working safely, efficiently and economically enabling the Customer to make full use of the installation at any time.

003 The Provider shall be deemed to have allowed in the Tender for all service works including the replacement of defective or missing Materials that may be necessary including carrying out all other maintenance items in accordance with the manufacturer's technical data sheet.

004 The service to each individual installation and any replacement of defective or missing parts incorporated within the service shall fully comply with the current recommendations and instructions of the installations manufacturer's, standards of safety, current bye-laws, the requirements and regulations of the Gas, Electricity and Water Authorities and the Gas Safe Register, current British Standards or equivalent and Codes of Practice, the guide to Good Practice issued by the Institute of Heating and Ventilating Engineers and IET Regulations.

005 Replacement Materials shall be manufacturer's approved replacement parts.

006 At each service visit an inspection shall include but not limited to the following check list and remedial works carried out.

- Service and maintenance to be carried out by Gas Safe registered engineer
- Gas soundness tests at the commencement and on completion of the service.
- Ensure earth continuity and electrical cross bonding is present (and where missing install).
- Ensuring correct pressure at outlet of gas appliance.
- Inspection of all LPG cooker gas line and all associated safety controls (emergency control valve, appliance shut off valve. etc) to ensure correct operation including repair/replace/re-set/grease/clean each as necessary.
- Inspection of the entire installation for and repair all leaks.
- Turning off all appliances, re-igniting on completion and ensuring correct operation including correct sequence of ignition, correct flame picture and correct operation of any flame failure device.
- Cleaning the Work area on completion.
- check the cooker shall be held in place by means of a firmly fixed chain to the rear of the cooker attached to a stability hook fixed to the wall and to the rear of the cooker. Where none exists these shall be provided and paid for at the rates included in the Price Framework
- Test and purge entire installation
- The Provider shall discussing performance and operation of installation and or appliance with the Customer and any issues raised should be resolved at the time of the service. The Provider shall provide the Customer with sufficient information about the installation, including operational and maintenance instructions so that the installation can be operated and maintained in an efficient manner.

© Rand Associates Consultancy Services Ltd

007 In accordance with the Gas Safety (Installation and Use) Regulations 1998 and any subsequent revisions if, in the opinion of the Provider, a Heating Appliance is unsafe or if there is an escape of gas the Provider shall be required to take immediate and appropriate action (e.g. disconnect cap off, attach gas warning label etc.,). The Provider shall then be required to complete in triplicate, sign and obtain the Customer's signature on a Warning Notice, see appendices one copy of which shall be left with the Customer and further copies forwarded to the Client's Representative. If a Heating Appliance is disconnected or capped off, the Provider shall also be required to verbally inform the Client's Representative within one hour.

Gas Installations

008 The Gas installation shall comply with The Gas Safety (Installation and Use) Regulations 1998, applicable British Standard, current Building Regulations and IET Regulations.

Whenever the Provider undertakes any work on a gas fired boiler installation that involves interrupting the gas supply, he must carry out a tightness test on the gas pipework installations in accordance with the Gas Safety (Installation and Use) Regulations 1998 and any subsequent revisions and satisfy himself that the installation is safe and where necessary, relight all pilot lights on Customer's appliances.

Routine Maintenance and Responsive Maintenance

009 The Provider shall provide a 24-hour, 365 days per year (366 for a leap year) Responsive Maintenance service for the period of the Contract to allow for breakdown or malfunction of any Heating Appliance, or Heating installation and the replacement of any defective or missing Materials. This service is to ensure that the Heating Appliances and Heating Installations are left in a safe and fully operational condition. The details of any repair are to be noted by the engineer for registering on the Provider's database (as provided by the Client's Representative).

010 All Works in connection with the installations to be arranged by the Provider.

011 For breakdowns the Provider is expected to complete a minimum of 80% of such repairs within one day and 100% within two days. The aim of this requirement is to minimise any disruption to the Customer relating to use of water/space heating facilities.

012 Where the above is not achievable with Materials being unavailable from impressed or local stockist the Provider is to immediately notify the Customer and the Client's Representative and provide time scales for completion of the Works where replacement Materials are required.

013 On receipt of a request being made by the Client's Representative and/or the Customer the Provider shall comply with the following:-

a) EMERGENCY CALLOUT ATTENDANCE WILL MEAN THE FOLLOWING:

Emergency call out to be responded to immediately and no later than 2 hours and completed or made safe within 24 hours.

Breakdown repairs are to be completed within the stipulated attendance timescales, with every effort being made to complete on a first call, first fix basis, where this cannot be achieved the timescales as mentioned above will apply.

b) URGENT CALLOUT ATTENDANCE WILL MEAN THE FOLLOWING:

Urgent Call Out To be responded to immediately and no later than 24 hours and completed within 48 hours.

c) Ensure that each engineer is equipped with an adequate impressed van stock of Materials to deal with most eventualities. A comprehensive stock of impressed spare Materials, shall also be kept at the Provider's control point and store to enable items such as cylinders and where applicable immersion heaters to be replaced immediately.

© Rand Associates Consultancy Services Ltd

d) If rectification of the fault is not possible at the time of attendance the fault must be rectified within the previously stated time scales.

In the event of rectification not being considered possible as aforesaid, the Provider shall immediately notify the Client's Representative and the Customer giving the reasons as to why and inform the Client's Representative and the Customer when the repair will be completed. The Client's Representative must satisfy himself that suitable alternative temporary arrangement for hot water and heating are in place.

Notwithstanding the generality of the Provider's obligations hereunder, the expression "component part" shall include the parts listed elsewhere hereof and any other specialist controls associated with a particular installation.

e) Ensure that the Customer is kept informed of the situation at all times.

f) Upon completion of a breakdown, the satisfaction card is to be left with each Customer, the approved work document is to be duly completed and a copy of such is to be sent to the Client's Representative.

g) In addition to the requirements detailed previously the Provider shall also allow to provide the following Services, which are deemed to be included for within the rate per appliance (see Invitation to Tender and Contract Details for inclusions):

1. Advise on efficient and correct use of Heating Appliance and Heating Installations.

2. Instruct new and existing Customers on the operation of Heating Appliances and Heating Installations.

3. Resetting of controls for any reason.

4. Re-lighting pilot lights for any reason.

5. Reconnecting LPG gas supplies if turned off for any reason. Except for non-supply by the Customer or where to restore the supply would be dangerous.

6. All calls where a Customer maintains a Heating Appliance or Heating Installation is faulty, even if no such fault is found to exist.

7. All calls where the fault reported is due to controls being incorrectly set.

8. Repairs due to Customer damage

h) The breakdown element of the Works shall be priced in accordance with the schedules shown elsewhere in the Contract Documents and shall be inserted in the Price Framework.

i) The Provider is to provide on a daily basis a breakdown status report on each site visited.

014 Before attending a breakdown the Provider should contact the Customer to ascertain where reasonably possible as to the authenticity of the call to establish if the malfunction is due to Customer error such as installation/control adjustments or electricity failure.

Firestopping

015 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

016 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

TESTING OF GAS CARCASSING

© Rand Associates Consultancy Services Ltd

TESTING OF GAS CARCASSING

General Requirements

001 The Provider shall be deemed to have read the whole of this Specification together with the Client's Requirements' and will be deemed to have included in his tendered Rates for full compliance.

The Provider must provide a Routine Maintenance, Responsive Maintenance and Out of Hours Emergency service (24 hour, 365 (366 for a leap year) days per annum).

Asset Register

002 The Provider must ensure that all the asset registers and schematic gas line diagrams supplied by the Client prior to the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

003 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each visit to undertake Routine Maintenance, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

004 The Provider shall ensure that, following all visits to undertake Routine Maintenance, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

The Provider is to provide and maintain an electronic log book to record all visits and maintain all records, to be accessible by both the Provider's Staff and the representative sof the Client's Representative.

005 The Provider shall provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff including his Specialist Subcontractors.

Manufacturer's Requirements

006 Where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

007 The Provider must within 20 working days of the award of the Contract submit and agree a full annual Programme for all Works covering each element of the Routine Maintenance Works with the Client's Representative.

008 The Provider must ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

Permit to Work Certification

009 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

© Rand Associates Consultancy Services Ltd

Access

010 The Provider shall ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

011 All Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

012 The Provider shall ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

Minor Repairs

013 The Provider shall, during servicing and testing, carry out minor repairs such as tightening joints, replacement of bolts, screws, clips, etc to ensure completeness of equipment and make appliances save.

Routine Maintenance

014 The minimum requirements for Routine Maintenance are to be in accordance with the recommendation and requirements of the following:

- IGE/UP/1 Edition 2: Strength testing, tightness testing and direct purging of industrial and commercial gas installations.
- IGE/UP/1A Edition 2: Strength testing, tightness testing and direct purging of small, low pressure industrial and commercial natural gas installations.
- IGE/UP/1B Edition 2: Tightness testing and direct purging of small natural gas installations.
- IGE/UP/1C: Strength testing, tightness testing and direct purging of natural gas and LPG meter installations.
- IGE/UP/2 Edition 3: Installation pipework, on industrial and commercial premises.
- IGE/UP/10 Edition 4: Installation of gas appliances in industrial and commercial premises.
- Applicable Standard

015 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

016 The Provider must carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

017 The Provider must include for the provision and application of all consumables within the Rates for this element of the Contract.

018 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the latest British Standards or equivalent.

019 Routine Maintenance must unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirements tabled below;

020 This Specification is designed for use in the periodic testing of existing natural gas and/or LPG installations in both domestic and commercial/communal premises. Where the intention is to test new installations, or extensions to existing installations, reference should be made to IGE/UP/1 Edition1 or IGE/UP/1A Edition 2 as appropriate.

© Rand Associates Consultancy Services Ltd

Personnel

Item No	Item	Frequency	Action	Notes
1	Competencies		The Provider shall employ a competent approved gas technician who has undertaken suitable training to an approved standard. A minimum of modules COCNPI 1LS (part A) and TPCP1A shall be held. All ACS assessment to have been undertaken within the previous 5 years. A person of equal competence shall supervise the Work.	Original ACS assessment certificates shall be provided at the request of the Client's Representative.

Test Instruments

Item No	Item	Frequency	Action	Notes
2	Test Instruments		The Provider shall: Select a suitable test pressure gauge in accordance with IGE/UP/1A Edition 2 or IGE/UP/1 Edition 2 Ensure that the gauge is suitably ranged for the pipework section being tested. Ensure an adequate level of accuracy. Zero any gauge at the start of the test at atmospheric pressure. Ensure that any gauges are recalibrated at least every 12 months. Ensure that any electronic gauges are certified for use in a hazardous area, and stabilised to ambient temperature	Test and/or calibration certificates shall be provided at the request of the Client's Representative.

© Rand Associates Consultancy Services Ltd

Procedure Selection

Item No	Item	Frequency	Action	Notes
3	Selection of appropriate procedures		The Provider shall: Assess the installation requiring soundness testing and using the algorithm in IGE/UP/1A ascertain which standard of testing is applicable. It is envisaged that, in most cases IGE/UP/1A shall be the most applicable standard.	Evidence of application of the algorithm shall be required within reports. If, after application of the appropriate algorithm, the Provider believes that IGE/Up/1 is the most appropriate standard, the Provider shall seek further guidance from the Client's Representative.

Strength Testing

Item No	Item	Frequency	Action	Notes
4	General	Annually	The Provider shall: In accordance with IGE/UP/1A edition 2 ascertain whether a strength test is required. It is envisaged that, in most cases, strength testing of an existing installation shall NOT be required. Where the Provider, after application of the appropriate algorithm, believes the strength testing is appropriate, he shall undertake the testing in strict accordance with the requirements of the appropriate guidance note. Further guidance may be required from the Client's Representative	Evidence of application of the algorithm shall be required within reports. Copies of Method Statements and Risk Assessments shall be provided to the Client's Representative prior to the commencement of any works.

© Rand Associates Consultancy Services Ltd

Tightness Testing

Item No	Item	Frequency	Action	Notes
5	Pre-test inspection		The Provider shall: Visually inspect all pipework. Examine for corrosion. Examine hangers and supports. Examine all joints and connections. Examine electrical bonding. Ensure warning notices are in position. Examine schematic diagrams	Reference should be made to IGE/Up/2 and IET Regulations for further guidance
6	Calculation of Installation Volume (IV)		The Provider shall: By examination of the schematic diagram and a detailed survey of the installation, calculate the volume of the installation. Calculate the volume in accordance with IGE/UP/1A Edition 2. Include the IV on the schematic diagram and report form.	Copies of detailed calculations shall be provided to the Client's Representative and added to Gas Line Diagram and dated.
7	Tightness Test Pressure (TTP)		The Provider shall: Calculate the tightness test pressure in accordance with IGE/UP/1A Edition 2	
8	Selection of Pressure Gauges		The Provider shall: Select an appropriate pressure gauge, with appropriate sensitivity in accordance with Clause 2 Test instruments and IGE/UP/1A Edition 2.	Details of pressure gauges shall be recorded on report form. Test and/or calibration certificates shall be provided at the request of the Client's Representative.

© Rand Associates Consultancy Services Ltd

Tightness Testing (Cont'd)

Item No	Item	Frequency	Action	Notes
9	Test Criteria	Annually	The Provider shall: Calculate the maximum allowable pressure drop in accordance with IGE/UP/1A Edition 2, the calculated installation volume and the volume of the smallest occupied space or 60m3 as appropriate. Note: Even if the tightness test result is satisfactory, a smell of gas or a gas detector indicating the presence of gas is not acceptable.	Details of the calculation shall be included on the report form.
10	Tightness Test duration (TTD)	Annually	The Provider shall: Calculate the tightness test duration (TTD) in accordance with IGE/UP/1A Edition 2	Details of the calculation shall be included on the report form.
11	Test Procedures	Annually	The Provider shall: Undertake the test in accordance with IGE/UP/1A Edition 2	Note test requirements Record and report results Record let-by test period.
12	Appliances	Annually	The Provider shall: Strictly comply with the requirements of IGE/UP/1A Edition 2 regarding appliances.	

Purging

Item No	Item	Frequency	Action	Notes
13	Purging	Annually	The Provider shall: Strictly comply with the requirements of IGE/UP/1A Edition 2 Direct Purging	Reporting any purging undertaken

© Rand Associates Consultancy Services Ltd

Labelling and Schematic Diagrams

Item No	Item	Frequency	Action	Notes
14	Notices and Labels	Annually	The Provider shall: Revise the schematic diagram as necessary. Ensure that schematic diagram is displayed in accordance with the requirements of IGE/UP/2. Ensure that labelling is complete and in accordance with IGE/UP/2. Ensure that electrical bonding is labelled in accordance with the requirements of IET REGULATIONS.	Copies of the Gas supply line diagrams to be provided with the report

Reports

Item No	Item	Frequency	Action	Notes
15	Report Format		The periodic inspection report shall consist of the: 1.0 Purpose of report 2.0 Summary of installation/inspection 3.0 Calculation of IV, TTP, TTD , and test criteria 4.0 Summary of defects 5.0 Installation description 6.0 Photographs 7.0 Test result certificates 8.0 Recommended Works/Costs 9.0 Test instruments	Including schematic diagrams Gas Safe forms
16	Report Representation		The Provider shall: 1 copy, bound in a folder 1 copy on CD in .pdf format	

© Rand Associates Consultancy Services Ltd

INSPECTION AND TESTING OF CUSTOMER OWNED GAS APPLIANCES

© Rand Associates Consultancy Services Ltd

INSPECTION AND TESTING OF CUSTOMER OWNED GAS APPLIANCES

001 The Periodic Inspections and Testing specified hereafter are model requirements only and the Provider must at his own cost and as part of his undertaking of the Periodic Inspection and of Customer owned gas fired cookers, ovens and hobs, and gas fires together with the associated gas line and safety equipment located in the Client's Property, obtain the manufacturer's any other information which will enable the Provider to identify the full inspection and testing requirements necessary to meet his obligations under the Contract and consequently enable the Client to fulfil its obligations to its Customers of its premises in respect of the Gas Safety (Installation and Use) Regulations 1998 and any subsequent revisions.

002 The Provider should note that the particular procedure scheduled in respect of each individual element of the installations shall be considered as a minimum requirement and the Provider shall be fully responsible for any other requirements that may be necessary in respect of the cooker. Oven and/or hob, the serving gas line and its associated safety equipment to ensure that each installation is in good working order and working safely, efficiently and economically enabling the Customer to make full use of the installation at any time.

003 At each service visit an inspection shall include but not limited to the following check list and remedial works carried out.

- Inspection and testing to be carried out by Gas Safe registered engineer
- Gas soundness tests at the commencement and on completion of the service.
- Ensure earth continuity and electrical cross bonding is present (and where missing install).
- Ensuring correct pressure at outlet of gas appliance.
- Inspection of all cooker, oven and/or hob gas lines and all associated safety controls (emergency control valve, appliance shut off valve. etc) to ensure correct operation.
- Inspection of the entire installation for and repair all leaks.
- Turning off all appliances, re-igniting on completion and ensuring correct operation including correct sequence of ignition, correct flame picture and correct operation of any flame failure device.
- Cleaning the Work area on completion.
- Check the cooker shall be held in place by means of a firmly fixed chain to the rear of the cooker attached to a stability hook fixed to the wall and to the rear of the cooker. Where none exists these shall be provided and paid for at the rates included in the Price Framework
- Test and purge entire installation
- The Provider shall discuss performance and operation of installation and or appliance with the Customer and any issues raised should be resolved at the time of the service. The Provider shall provide the Customer with sufficient information about the installation, including operational and maintenance instructions so that the installation can be operated and maintained in an efficient manner.

004 In accordance with the Gas Safety (Installation and Use) Regulations 1998 and any subsequent revisions if, in the opinion of the Provider, a customer owned Appliance is unsafe or if there is an escape of gas the Provider shall be required to take immediate and appropriate action (e.g. disconnect cap off, attach gas warning label etc.,). The Provider shall then be required to complete in triplicate, sign and obtain the Customer's signature on a Warning Notice, see appendices one copy of which shall be left with the Customer and further copies forwarded to the Client's Representative. If a Heating Appliance is disconnected or capped off, the Provider shall also be required to verbally inform the Client's Representative within one hour.

© Rand Associates Consultancy Services Ltd

SERVICING AND MAINTENANCE OF OIL FIRED HEATING INSTALLATIONS

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

SERVICING AND MAINTENANCE OF OIL FIRED HEATING INSTALLATIONS (ANY TYPE)

001 The Periodic Servicing and Inspections, Routine Maintenance and Responsive Maintenance specified hereafter are model requirements only and the Provider must at his own cost and as part of his undertaking of the Periodic Servicing and Inspection, Routine Maintenance and Responsive Maintenance of Heating Installations and Heating Appliances in the Client's Property, obtain the manufacturer's service and maintenance requirements for the respective Heating Appliances and Heating Installations and any other information which will enable the Provider to identify the full service, maintenance and repair requirements necessary to meet his obligations under the Contract and consequently enable the Client to fulfil its obligations to its Customers of its premises in respect of the OFTEC Regulations.

002 The Provider should note that the particular service procedure scheduled in respect of each individual element of the Heating Installations and Heating Appliances shall be considered as a minimum requirement and the Provider shall be fully responsible for any other servicing requirements that may be necessary in respect of the Heating Appliances and Heating Installations and their associated safety equipment to ensure that each Heating Installation is in good working order and working safely, efficiently and economically, including the inspection/examination of all flues and catchment areas enabling the Customer to make full use of the Heating Installation at any time.

003 The Provider shall be deemed to have allowed in the Tender for all service works including the replacement of defective or missing Materials that may be necessary including carrying out all other maintenance items in accordance with the manufacturer's technical data sheet.

004 The service to each individual installation and any replacement of defective or missing Materials incorporated within the service shall fully comply with the current recommendations and instructions of the installations manufacturer's, standards of safety, current bye-laws, the requirements and regulations of OFTEC, Electricity and Water Authorities, current British Standards or equivalent and Codes of Practice, the guide to Good Practice issued by the Institute of Heating and Ventilating Engineers and IET REGULATIONS.

005 Replacement Materials shall, where possible, be the particular installation manufacturer's approved replacement parts.

006 Each Periodic Service and Inspection shall include but not limited to the following check list and remedial Works carried out.

a) Service oil fired boiler and flue in strict accordance with the specific manufacturers operating and maintenance instructions, OFTEC Technical Booklets and shall be carried out by OFTEC registered Provider under the responsibility of the Provider, and approved by the manufacturer.

b) Replace oil filter cartridge as necessary.

c) Replace oil nozzle

d) Replace flexible hoses

e) Check heat exchanger/boiler baffles, access plates; reseal as necessary, repair/reset/clean flue way and baffles as necessary.

f) Removal and reinstatement of casings and other parts of the appliance including the provision of new seals and gaskets as necessary.

g) Check combustion chamber, refractory brickwork and repair as necessary; clean out chamber; adjust flame impingement as necessary.

© Rand Associates Consultancy Services Ltd

h) Check burner, flame failure device, fan, motor, ignition system, nozzle, flexible oil line connection, oil pump filter, burner control, fail safe operation device and repair/replace/reset/ clean each as necessary; oil motor; carry out combustion efficiency test (Record CO2%, Smoke No., Draught – N/m2 Flue gas Temp.0C, Boiler Efficiency %; CO ppm; O2%; check oil pressure and set boiler for optimum performance).

i) Inspect for presence of safety valve, high temperature limit thermostat, frost thermostat and repair/replace/re-set/clean each as necessary

j) Ensure earth continuity and electrical cross bonding is present (and where missing install).

k) Inspect flues within Properties including roof spaces and communal areas to ensure the effectiveness of the flue and that they fully comply with current regulations and conform to applicable Standard.

Note: Gaining access to roof space and communal areas to ensure that the flues in their entirety conform to applicable Standard shall be the responsibility of the Provider.

l) Inspection of ventilation provision to ensure compliance with the current regulations and conforms to applicable Standard.

m) Checking external flue termination for damage and obstruction in accordance with applicable Standard.

n) Visually check oil storage tank and the Provider should notify the Client's Representative of any defects on the data sheet

o) Check oil tank gauge (radio activated) and repair/ reset/clean and replace batteries as necessary

p) Inspect sludge valve, oil gauge, and lid/cap, tank venting system and repair/replace/reset/clean each as necessary

q) Two restraining straps are to be provided to oil storage tanks

r) The Provider, during a Periodic Service and Inspection at change of tenancy, is to empty and clean out oil tanks and removing off site any debris and oil (any quantity). This cost of this Work shall be included within the Provider's Rates.

s) Inspection and testing of all wiring connections.

t) Inspection of all Heating Appliance and Heating Installation controls (room thermostat, DHW cylinder thermostat, frost thermostat, motorised valves, programmer/time switch, thermostatic radiator valves, lock shield valves and covers etc.) to ensure correct operation and repair/replace/re-set/clean each as necessary.

u) Inspection of main fuse rating and replacing where necessary.

v) Ensuring the correct operation of all taps and valves including overhauling, cleaning and greasing where necessary.

w) Inspect insulation to pipes and equipment, circulation pump (note pump setting), installation cleaning filters and repair/replace/re-set/clean each as necessary;

x) Inspection of the entire Heating Installation for air locks and bleeds as necessary.

y) Inspection of the entire Heating Installation for and repair all leaks.

z) Turning off all Heating Appliances, re-igniting on completion and ensuring correct operation including correct sequence of ignition, correct flame picture and correct operation of any flame failure device.

© Rand Associates Consultancy Services Ltd

aa) Cleaning the Work area on completion.

bb) Check and clean any installed Carbon Monoxide (CO) detector and if battery operated replace same with new battery all as per manufacturer's technical data sheet. Where no CO detector is installed the Provider should notify the Client's Representative on the data sheet.

cc) Check and clean any installed heat or smoke detector and if battery operated replace same with new battery all as per manufacturer's technical data sheet. Where no heat or smoke detector is installed the Provider should notify the Client's Representative on the data sheet.

dd) Check circulation pipes and radiators, radiator valves circulation pump (note pump setting) installation cleaning filters and where necessary repair/replace/re-set clean each as necessary

ee) Check and confirm that feed and expansion tanks are adequately supported, insulated and vented and have lids fitted and replace/renew where necessary. These are to be comply with applicable Standard.

ff) Check and confirm that cold water storage tanks and hot water storage tanks are adequately supported and insulated and have lids fitted and replace/renew where necessary.

gg) Where fitted check the correct operation of the immersion thermal cut out, repairing where a fault is found.

hh) Set the temperature of any stored hot water to 60 degrees centigrade to mitigate against the risks of scalding and reduce the risk of the proliferation of legionella or similar.

ii) Testing the entire installation including the provision of fuel for the test

jj) The Provider shall discuss the performance and operation of the Heating Installation and or Heating Appliance with the Customer and any issues raised should be resolved at the time of the service. The Provider shall provide the Customer with sufficient information about the Heating Installation, including operational and maintenance instructions so that the Heating Installation can be operated and maintained in an efficient manner.

Flues

007 The Provider when undertaking the Service must at his own cost, performance test each entire flue in use and connected to gas fired Heating Installations and Heating Appliances for which the Client is responsible at the Property and each entire chimney flue integral with the fabric of the Property that is connected to any Customer owned Heating Appliance. When undertaking the Service the Provider must in addition, examine any balanced and any entire prefabricated flue to verify the integrity of the material, joints, and supports and to ensure that combustion products are being satisfactorily and safely discharged into the atmosphere and not being discharged into any premises or internal communal area.

008 All flue testing must include the basic flue tests to satisfy the requirements of applicable Standard.

009 If the examination should reveal any defective or missing parts or supports in the entire flue and or method of discharging combustion products, the Provider is deemed to have included in his Maintenance Rates for flue renewals, replacement of defective or missing parts and repairs.

010 The Provider must immediately give notice to the Client of any defects in the flue, which cannot immediately be remedied by application of the above rules and if necessary, invoke his potentially dangerous appliance procedure.

Oil Pipework Installations

011 Whenever the Provider undertakes any Work on an oil fired boiler installation that involves interrupting the oil supply, he must carry out a tightness test on the oil pipework installations and satisfy himself that the installation is safe and where necessary, relight all pilot lights including any on Customer's appliances.

© Rand Associates Consultancy Services Ltd

Inhibitor

012 The Provider will also be required as part of the Periodic Servicing and Inspection procedure at every visit to test and record for Heating Installation inhibitor levels and where it is identified that replenishment or total replacement is necessary this will be done by using an approved proprietary brand non-toxic biodegradable inhibitor. The Client's Representative may test inhibitor levels on completion of the Periodic Servicing and Inspection.

Electrical Installations

013 The Provider must as part of the Periodic Service and Inspection check and test all electrical installations and fittings associated with the Heating Installations and Heating Appliances so as to ensure their safe operation. All remedial work will comply fully with IET REGULATIONS. The cost of this test and all remedial Work is deemed to be included in the Provider's tendered Rates.

Landlord Safety Certificate

014 On completion of each Periodic Service and Inspection the Provider shall produce a Landlords safety certificate. These are to be in an electronic format and the Provider is to upload the certificates onto the Client's IT system as instructed by the Client's Representative. The Provider shall be deemed to have allowed in the Tender for all document uploads.

Routine Maintenance and Responsive Maintenance

015 The Provider shall provide a 24-hour, 365 days per year (366 for a leap year) Responsive Maintenance service for the period of the Service to allow for breakdown or malfunction of any Heating Appliance or Heating Installation and the replacement of any defective or missing Materials. This service is to ensure that the Heating Appliances and Heating Installations are left in a safe and fully operational condition. The details of any repair are to be noted by the engineer for registering on the Provider's database (as provided by the Client's Representative).

016 All Works in connection with the Heating Appliances and Heating Installations to be arranged by the Provider.

017 For breakdowns the Provider is expected to complete a minimum of 80% of such repairs at first fix within one day and 100% within two days. The aim of this requirement is to minimise any disruption to the customer relating to use of water/space heating facilities.

018 Where the above is not achievable with Materials being unavailable from impressed or local stockist the Provider is to immediately notify the Customer and the Client's Representative and provide time scales for completion of the Works where replacement Materials are required.

019 On receipt of a request being made by the Client's Representative and/or the Customer the Provider shall comply with the following:-

a) EMERGENCY CALLOUT ATTENDANCE WILL MEAN THE FOLLOWING:

Emergency call out to be responded to immediately and no later than 2 hours and completed or made safe within 24 hours.

If deemed necessary the Client's Representative can Instruct the Provider to attend on demand breakdown calls within the above time stipulation to Properties which are not deemed to be emergency call out situations.

Breakdown repairs are to be completed within the stipulated attendance timescales, with every effort being made to complete on a first call, first fix basis, where this cannot be achieved the timescales as mentioned above will apply.

© Rand Associates Consultancy Services Ltd

b) URGENT CALLOUT ATTENDANCE WILL MEAN THE FOLLOWING:

Urgent Call Out To be responded to immediately and no later than 24 hours and completed within 48 hours.

c) Ensure that each engineer is equipped with an adequate impressed van stock of Materials to deal with most eventualities. A comprehensive stock of impressed Materials shall also be kept at the Provider's control point and store to enable items such as cylinders and where applicable immersion heaters to be replaced immediately.

d) Ensure that an alternative form of heating is available to the Customer in the event of a repair not being possible at the time of attendance. The alternative form of heating will as a minimum be two x 2kW electric panel heaters with time and temperature controls or any other type of heater approved by the Client's Representative, where alternative hot water provision is available in the form of an immersion heater ensure that it is operational before leaving the Property.

Before leaving the Property the engineer must obtain the Customer's signature as proof of receipt of the heaters being left on site.

The Provider shall not without the previous written consent of the Client's Representative remove any temporary Heating Appliances from the site until such time as the fault has been rectified to the Client's Representative's satisfaction.

If rectification of the fault is not possible at the time of attendance the fault must be rectified within the previously stated time scales.

In the event of rectification not being considered possible as aforesaid, the Provider shall immediately notify the Client's Representative and the Customer giving the reasons as to why and inform the Client's Representative and the Customer when the repair will be completed. The Client's Representative must satisfy himself that suitable alternative temporary arrangements for hot water and heating are in place.

Notwithstanding the generality of the Provider's obligations hereunder, the expression "component part" shall include the parts listed elsewhere hereof and any other specialist controls associated with a particular installation.

e) Ensure that the Customer is kept informed of the situation at all times.

f) Upon completion of a breakdown, the satisfaction card is to be left with each Customer, the approved Work document is to be duly completed and a copy of such is to be sent to the Client's Representative.

g) In addition to the requirements detailed previously the Provider shall also allow to provide the following Services, which are deemed to be included for within the rate per appliance (see Invitation to Tender and Contract Details for inclusions):

1. Advise on efficient and correct use of Heating Appliance and Heating Installations.

2. Instruct new and existing Customers on the operation of Heating Appliances and Heating Installations.

3. Resetting of programmers, thermostats and other controls for any reason.

4. Re-lighting pilot lights for any reason.

5. Restoring oil and electric supplies if turned off for any reason. Except for non-payment for supply by the Customer or where to restore the supply would be dangerous.

© Rand Associates Consultancy Services Ltd

6. Calls to determine location of water leaks if not on pipework associated with the Heating Appliances and/or Heating Installations covered by this Specification, and advise the Client's Representative of the correct location and repair of these leaks.

7. All calls where a Customer maintains an appliance or installation is faulty, even if no such fault is found to exist.

8. All calls where the fault reported is due to controls being incorrectly set.

9. Repairs due to Customer damage

h) The breakdown element of the Works shall be priced in accordance with the schedules shown elsewhere in the Contract Documents and shall be inserted in the Price Framework.

i) The Provider is to provide on a daily basis a breakdown status report on each Property visited.

020 Before attending a breakdown the Provider should contact the Customer to ascertain where reasonably possible as to the authenticity of the call to establish if the malfunction is due to Customer error such as installation/control adjustments.

Firestopping

021 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

022 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

SERVICING AND MAINTENANCE TO OPEN SOLID FUEL FIRE HEATING INSTALLATIONS

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

SERVICING AND MAINTENANCE TO OPEN SOLID FUEL FIRES HEATING INSTALLATIONS

Routine Maintenance to Open Fires

001 The Provider shall have and maintain throughout the Contract Period registration with HETAS or be a member of a class of persons approved for the time being by the Health and Safety Executive.

002 The Provider shall provide a 24-hour, 365 days per year (366 for a leap year) Responsive Maintenance service to allow for breakdown or malfunction of any Heating Appliance or Heating Installation and the replacement of any defective or missing Materials. This service is to ensure that the Heating Appliances and Heating Installations are left in a safe and fully operational condition. The details of any repair are to be noted by the engineer for registering on the Provider's database (as provided by the Client).

003 All Works in connection with the Heating Appliances and Heating Installations to be arranged by the Provider.

004 For breakdowns the Provider is expected to complete a minimum of 80% of such repairs at first fix within one day and 100% within two days. The aim of this requirement is to minimise any disruption to the Customer relating to use of water/space heating facilities.

005 Where the above is not achievable with Materials being unavailable from impressed or local stockist the Provider is to immediately notify the Customer and the Client's Representative and provide time scales for completion of the Works where replacement Materials are required.

006 On receipt of a request being made by the Client's Representative and/or the Customer the Provider shall comply with the following:-

a) EMERGENCY CALLOUT ATTENDANCE WILL MEAN THE FOLLOWING:

Emergency call out to be responded to immediately and no later than 2 hours and completed or made safe within 4 hours.

Breakdown repairs are to be completed within the stipulated attendance timescales, with every effort being made to complete on a first call, first fix basis, where this cannot be achieved the timescales as mentioned above will apply.

b) URGENT CALLOUT ATTENDANCE WILL MEAN THE FOLLOWING:

Urgent Call Out To be responded to immediately and no later than 24 hours and completed within 48 hours.

c) Ensure that each engineer is equipped with an adequate impressed van stock of Materials to deal with most eventualities. A comprehensive stock of impressed Materials, shall also be kept at the Provider's control point and store to enable items such as cylinders and where applicable immersion heaters to be replaced immediately.

d) If rectification of the fault is not possible at the time of attendance the fault must be rectified within the previously stated time scales.

In the event of rectification not being considered possible as aforesaid, the Provider shall immediately notify the Client's Representative and the Customer giving the reasons as to why and inform the Client's Representative and the Customer when the repair will be completed. The Client's Representative must satisfy himself that suitable alternative temporary arrangement for hot water and heating are in place.

Notwithstanding the generality of the Provider's obligations hereunder, the expression "component part" shall include the parts listed elsewhere hereof and any other specialist controls associated with a particular installation.

© Rand Associates Consultancy Services Ltd

e) Ensure that the Customer is kept informed of the situation at all times.

f) Upon completion of a breakdown, the satisfaction card is to be left with each Customer, the approved work document is to be duly completed and a copy of such is to be sent to the Client's Representative.

g) In addition to the requirements detailed previously the Provider shall also allow to provide the following which are deemed to be included for within the rate per appliance (see Invitation to Tender and Contract Details for inclusions):

1. Advise on efficient and correct use of Heating Appliance and Heating Installations.

2. Instruct new and existing Customers on the operation of Heating Appliances and Heating Installations.

3. Resetting of controls for any reason.

4. All calls where a Customer maintains a Heating Appliance or Heating installation is faulty, even if no such fault is found to exist.

5. All calls where the fault reported is due to controls being incorrectly set.

6. Repairs due to Customer damage

h) The breakdown element of the Works shall be priced in accordance with the schedules shown elsewhere in the Contract Documents and shall be inserted in the Price Framework.

i) The Provider is to provide on a daily basis a breakdown status report on each Property visited.

007 Before attending a breakdown the Provider should contact the Customer to ascertain where reasonably possible as to the authenticity of the call to establish if the malfunction is due to Customer error such as installation/control adjustments or electricity failure.

Firestopping

008 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

009 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

SERVICING AND MAINTENANCE OF SOLID FUEL ROOM HEATER HEATING INSTALLATIONS

© Rand Associates Consultancy Services Ltd

SERVICING AND MAINTENANCE OF SOLID FUEL HEATING INSTALLATIONS

001 The Periodic Servicing and Inspections, Routine Maintenance and Responsive Maintenance specified hereafter are model requirements only and the Provider must at his own cost and as part of his undertaking of the Periodic Servicing and Inspection, Routine Maintenance and Responsive Maintenance of Heating Installations and Heating Appliances in the Client's Property, obtain the manufacturer's service and maintenance requirements for the respective Heating Appliances and Heating Installations and any other information which will enable the Provider to identify the full service, maintenance and repair requirements necessary to meet his obligations under the Contract and consequently enable the Client to fulfil its obligations to its Customers of its Property.

002 The Provider should note that the particular service procedure scheduled in respect of each individual element of the Heating Installations shall be considered as a minimum requirement and the Provider shall be fully responsible for any other servicing requirements that may be necessary in respect of the Heating Appliances and Heating Installations and their associated safety equipment to ensure that each Heating Installation is in good working order and working safely, efficiently and economically, including the inspection/examination of all flues and catchment areas enabling the Customer to make full use of the Heating Installation at any time.

003 The Provider shall be deemed to have allowed in the Tender for all service works including the replacement of defective or missing Materials that may be necessary including carrying out all other maintenance items in accordance with the manufacturer's technical data sheet.

004 The service to each individual installation and any replacement of defective or missing Materials incorporated within the service shall fully comply with the current recommendations and instructions of the installations manufacturer's, standards of safety, current bye-laws, the requirements and regulations, Electricity and Water Authorities, current British Standards or equivalent and Codes of Practice, the guide to Good Practice issued by the Institute of Heating and Ventilating Engineers and IET REGULATIONS.

005 Replacement Materials shall, where possible, be the particular installation manufacturer's approved replacement parts.

006 At each service visit an inspection shall include but not limited to the following check list and remedial Works carried out.

a) Service solid fuel room heater and flue in strict accordance with the specific manufacturers operating and maintenance instructions.

b) Remove and set aside all loose fire parts, bottom bars, protection plate, riddling device, ashpan, damper, throat plate and side tiles, (if loose).

c) Remove all flue ash from the flue connector and bottom end of chimney

d) Examine all lower portions of the flue, especially above and around the boiler to ensure that all loosened debris has been removed.

e) Vacuum clean the interior of the Heating Appliance, the exterior of the Heating Appliance, the air space underneath the Heating Appliance (if applicable) and the fireplace recess.

f) Check Heating Appliance flue connector, ring sealing gasket and rope, securing bolts and make good as necessary.

g) Check boiler connections and drain cock at boiler for leaks and make good as necessary.

h) Check that there is no loss of convected air from the chamber through brickwork or at pipe exit holes and make good as necessary.

i) Check that the Heating Appliance is securely bolted down and reseal bolting down holes as necessary.

© Rand Associates Consultancy Services Ltd

j) Check fireclay joints of appliance and reseal as necessary.

k) Refit fireclay side tiles (if bedded in fire cement steep in water beforehand).

l) Check door glass of heater and any retaining channels.

m) Examine seals of fire door and ash pit door and that door are fitted to manufacturer's tolerances.

n) Check fitness of door catch and adjust as necessary.

o) Check thermostat and adjust to manufacturer's settings (where appliance is manually controlled the air intake slide should be airtight when closed and free to move as designed).

p) Ensure that flue way above throat plate is clear.

q) Re-install all loose fire parts in their correct position (it is important that the throat plate is easily removed and replaced).

r) Inspect with the components correctly fitted, check Heating Appliance for ease of operations and ensure these are functioning correctly.
   (a) Opening and closing of door(s)
   (b) Operation of thermostat
   (c) Operation of shaker bar
   (d) Operating tool
   (e) Operation of damper mechanism (where applicable)
   (f) Removal and re-insertion of ash pan

s) Re-install panel and wood shelf as applicable.

t) Clean up and remove debris.

u) Check that the Customer is using the fuel recommended and advise as necessary. Instruct Customer to start off with a small gradual fire for the first 24 hours. Advise Customer to check throat plate 24 hours after service and monthly thereafter.

v) Inspection of all Heating Appliance and Heating Installation controls (room thermostat, DHW cylinder thermostat, frost thermostat, motorised valves, programmer/time switch, thermostatic Radiator valves, lock shield valves and covers etc.) to ensure correct operation and repair/replace/re-set/clean each as necessary.

w) Inspection of main fuse rating and replacing where necessary.

x) Inspect insulation to pipes and equipment, circulation pump (note pump setting), installation cleaning filters and repair/replace/re-set/clean each as necessary;

y) Inspection of the entire Heating Installation for air locks and bleeds as necessary.

z) Inspection of the entire Heating Installation for and repair all leaks.

aa) Cleaning the Work area on completion.

bb) Check and clean any installed Carbon Monoxide (CO) detector and if battery operated replace same with new battery all as per manufacturer's technical data sheet. Where no CO detector is installed the Provider should notify the Client's Representative on the data sheet.

cc) Check and clean any installed heat or smoke detector and if battery operated replace same with new battery all as per manufacturer's technical data sheet. Where no heat or smoke detector is installed the Provider should notify the Client's Representative on the data sheet

© Rand Associates Consultancy Services Ltd

dd) Check circulation pipes and radiators, radiator valves circulation pump (note pump setting) installation cleaning filters and where necessary repair/replace/re-set/clean each as necessary.

ee) Check and confirm that feed and expansion tanks are adequately supported, insulated and vented and have lids fitted and replace/renew where necessary. These are to be comply with applicable Standard.

ff) Check and confirm that cold water storage tanks and hot water storage tanks are adequately supported and insulated and have lids fitted and replace / renew where necessary.

gg) Where fitted check the correct operation of the immersion thermal cut out, repairing where a fault is found.

hh) Set the temperature of any stored hot water to 60 degrees centigrade to mitigate against the risks of scalding and reduce the risk of the proliferation of legionella or similar.

ii) Test entire Heating Installation

jj) The Provider shall discuss the performance and operation of the Heating Installation with the Customer and any issues raised should be resolved at the time of the service. The Provider shall provide the Customer sufficient information about the Heating Installation, including operational and maintenance instructions so that the Heating Installation can be operated and maintained in an efficient manner.

007 If during the planned maintenance service a major defect is revealed e.g. cracked casing, weeping boiler, flue blockage etc. the Provider must make the appliance safe and notify the Client's Representative immediately.

Flues

008 The Provider when undertaking the Service must at his own cost, performance test each entire flue in use and connected to solid fuel Heating Installations and Heating Appliances for which the Client is responsible at the Property and each entire chimney flue integral with the fabric of the Property that is connected to any Customer/occupier owned Heating Appliance. A flue inspection and core ball and sweep shall be carried out at the same time as room heater service. Following which the Heating Appliance shall be checked for fly ash; cleaned, throat plate removed, cleaned and replaced.

009 The Provider must immediately give notice to the Client's Representative of any defects in the flue, which cannot immediately be remedied by application of the above rules and are deemed to be potentially dangerous.

Inhibitor

010 The Provider will also be required as part of the Periodic Service and Inspection to test and record for installation inhibitor levels and where it is identified that replenishment or total replacement is necessary this will be done by using an approved proprietary brand non-toxic biodegradable inhibitor. The Client's Representative may test inhibitor levels on completion of the service.

Electrical Installations

011 The Provider must as part of the Periodic Service and Inspection, check and test all electrical installations and fittings associated with the Heating Installations and Heating Appliances, so as to ensure their safe operation. All remedial work will comply fully with IET REGULATIONS. The cost of this remedial work is deemed to be included in the Provider's tendered Rates.

© Rand Associates Consultancy Services Ltd

Landlord Safety Certificate

012 On completion of each Periodic Service and Inspection the Provider shall produce a Landlords safety certificate. These are to be in an electronic format and the Provider is to upload the certificates onto the Client's IT system as Instructed by the Client's Representative. The Provider shall be deemed to have allowed in the Tender for all document uploads.

Routine Maintenance and Responsive Maintenance

013 The Provider shall provide a 24-hour, 365 days per year (366 for a leap year) Responsive Maintenance service for the period of the Service to allow for breakdown or malfunction of any Heating Appliance or Heating Installation and the replacement of any defective or missing Materials. This service is to ensure that the Heating Appliances and Heating Installations are left in a safe and fully operational condition. The details of any repair are to be noted by the engineer for registering on the Provider's database (as provided by the Client's Representative).

014 All Works in connection with the Heating Appliances and Heating Installations to be arranged by the Provider.

015 For breakdowns the Provider is expected to complete a minimum of 80% of such repairs at first fix within one day and 100% within two days. The aim of this requirement is to minimise any disruption to the Customer relating to use of water/space heating facilities.

016 Where the above is not achievable with Materials being unavailable from impressed or local stockist the Provider is to immediately notify the Customer and the Client's Representative and provide time scales for completion of the works where replacement Materials are required.

017 On receipt of a request being made by the Client's Representative and/or the Customer the Provider shall comply with the following:-

a) EMERGENCY CALLOUT ATTENDANCE WILL MEAN THE FOLLOWING:

Emergency call out to be responded to immediately and no later than 2 hours and completed or made safe within 24 hours.

Breakdown repairs are to be completed within the stipulated attendance timescales, with every effort being made to complete on a first call, first fix basis, where this cannot be achieved the timescales as mentioned above will apply.

b) URGENT CALLOUT ATTENDANCE WILL MEAN THE FOLLOWING:

Urgent Call Out To be responded to immediately and no later than 24 hours and completed within 48 hours.

c) Ensure that each engineer is equipped with an adequate impressed van stock of Materials to deal with most eventualities. A comprehensive stock of impressed Materials, shall also be kept at the Provider's control point and store to enable items such as cylinders and where applicable immersion heaters to be replaced immediately.

d) Ensure that an alternative form of heating is available to the Customer in the event of a repair not being possible at the time of attendance. The alternative form of heating will as a minimum be two x 2kW electric panel heaters with time and temperature controls or any other type of heater approved by the Client's Representative, where alternative hot water provision is available in the form of an immersion heater ensure that it is operational before leaving the Property.

Before leaving the Property the engineer must obtain the Customer's signature as proof of receipt of the heaters being left on site.

© Rand Associates Consultancy Services Ltd

The Provider shall not without the previous written consent of the Client's Representative remove any temporary Heating Appliances from the Property until such time as the fault has been rectified to the Client's Representative's satisfaction.

If rectification of the fault is not possible at the time of attendance the fault must be rectified within the previously stated time scales.

In the event of rectification not being considered possible as aforesaid, the Provider shall immediately notify the Client's Representative and the Customer giving the reasons as to why and inform the Client's Representative and the Customer when the repair will be completed. The Client's Representative must satisfy himself that suitable alternative temporary arrangement for hot water and heating are in place.

Notwithstanding the generality of the Provider's obligations hereunder, the expression "component part" shall include the parts listed elsewhere hereof and any other specialist controls associated with a particular installation.

e) Ensure that the Customer is kept informed of the situation at all times.

f) Upon completion of a breakdown, the satisfaction card is to be left with each Customer, the approved Work document is to be duly completed and a copy of such is to be sent to the Client's Representative.

g) In addition to the requirements detailed previously the Provider shall also allow to provide the following Services, which are deemed to be included for within the rate per appliance (see Invitation to Tender and Contract Details for inclusions):

1. Advise on efficient and correct use of Heating Appliance and Heating Installations.

2. Instruct new and existing Customers on the operation of Heating Appliances and Heating Installations.

3. Resetting of programmers, thermostats and other controls for any reason.

4. Re-lighting pilot lights for any reason.

5. Restoring electric supplies if turned off for any reason. Except for non-payment for supply by the Customer or where to restore the supply would be dangerous.

6. Calls to determine location of water leaks if not on pipework associated with the Heating Appliances and/or Heating Installations covered by this Specification, and advise the Client's Representative of the correct location and repair of these leaks.

7. All calls where a Customer maintains a Heating Appliance or Heating Installations is faulty, even if no such fault is found to exist.

8. All calls where the fault reported is due to controls being incorrectly set.

9. Repairs due to Customer damage.

h) The breakdown element of the Works shall be priced in accordance with the schedules shown elsewhere in the Contract Documents and shall be inserted in the Price Framework.

i) The Provider is to provide on a daily basis a breakdown status report on each site visited.

018 Before attending a breakdown the Provider should contact the Customer to ascertain where reasonably possible as to the authenticity of the call to establish if the malfunction is due to Customer error such as installation/control adjustments or gas/electricity failure.

© Rand Associates Consultancy Services Ltd

Firestopping

019 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

020 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

SERVICING AND MAINTENANCE OF BIOMASS HEATING INSTALLATIONS

© Rand Associates Consultancy Services Ltd

SERVICING AND MAINTENANCE OF BIOMASS HEATING INSTALLATIONS

001 The Periodic Servicing and Inspections of Routine Maintenance and Responsive Maintenance specified hereafter are model requirements only and the Provider must at his own cost and as part of his undertaking of the Periodic Servicing and Inspection, Routine Maintenance and Responsive Maintenance of Heating Installations and Heating Appliances in the Client's Property, obtain the manufacturer's service and maintenance requirements for the respective Heating Appliances and Heating Installations and any other information which will enable the Provider to identify the full service, maintenance and repair requirements necessary to meet his obligations under the Contract and consequently enable the Client to fulfil its obligations to its Customers of its Property.

002 The Provider should note that the particular service procedure scheduled in respect of each individual element of the Heating Installations and Heating Appliances shall be considered as a minimum requirement and the Provider shall be fully responsible for any other servicing requirements that may be necessary in respect of the Heating Appliances and Heating Installations and their associated safety equipment to ensure that each Heating Installation is in good working order and working safely, efficiently and economically, including the inspection/examination of all flues and catchment areas enabling the Customer to make full use of the installation at any time.

003 The Provider shall be deemed to have allowed in the Tender for all service works including the replacement of defective or missing Materials that may be necessary including carrying out all other maintenance items in accordance with the manufacturer's technical data sheet.

004 The service to each individual Heating Installation and any replacement of defective or missing Materials incorporated within the service shall fully comply with the current recommendations and instructions of the installations manufacturer's, standards of safety, current bye-laws, the requirements and regulations, Electricity and Water Authorities, current British Standards or equivalent and Codes of Practice, the guide to Good Practice issued by the Institute of Heating and Ventilating Engineers and IET REGULATIONS.

005 Replacement Materials shall, where possible, be the particular installation manufacturer's approved replacement parts.

006 At each service visit an inspection shall include but not limited to the following check list and remedial works carried out.

a) Service Biomass boiler and controls in strict accordance with the specific manufacturers printed instructions, to be carried out by the Provider or a HETAS Registered Provider under the responsibility of the Provider and approved by the manufacturer.

b) Carry out visual inspection of all electrical wiring and components for damage/wear and repair/replace as necessary.

c) Run diagnostic check on functionality and operation of all electrical components. Record details of any faults, failed ignitions, fuel used etc., and notify the Client's Representative on the data sheet.

d) Remove burner and inspect.

e) Remove blast tube, remove fines and ensure all air holes are clean and free from obstructions

f) Replace igniter element and reset, and when completed refit and repack insulation around blast tube

g) Thoroughly clean and vacuum combustion chamber/baffle plates and clean and vacuum flue passageways

h) Replace door seals as necessary.

© Rand Associates Consultancy Services Ltd

i) Check operation of auto clean mechanism where fitted.

j) Remove auger, thoroughly clean auger and tube, removing all dust, replace and recharge with pellets where necessary.

k) Check air supply installation complies with manufacturer's recommendations and repair/reset/clean each as necessary

l) Inspect for presence of safety valve, high temperature limit thermostat, frost thermostat and repair/replace/re-set/clean each as necessary

m) Check thermostat and adjust to manufacturer's settings (where appliance is manually controlled the air intake slide should be airtight when closed and free to move as designed).

n) Check that the Customer is using the fuel recommended for the appliance and advise as necessary. Instruct the Customer to start off with a small gradual fire for the first 24 hours. Advise Customer to check throat plate 24 hours after service and monthly thereafter.

o) Inspection of all heating appliance and heating installation controls (room thermostat, DHW cylinder thermostat, frost thermostat, motorised valves, programmer/time switch, thermostatic Radiator valves, lock shield valves and covers etc.) to ensure correct operation and repair / replace / re-set /clean each as necessary.

p) Inspection of main fuse rating and replacing where necessary.

q) Inspect insulation to pipes and equipment, circulation pump (note pump setting), installation cleaning filters and repair/replace/re-set/clean each as necessary;

r) Inspection of the entire installation for air locks and bleeds as necessary.

s) Inspection of the entire installation for and repair all leaks.

t) Cleaning the Work area on completion.

u) Check and clean any installed Carbon Monoxide (CO) detector and if battery operated replace same with new battery all as per manufacturer's technical data sheet. Where no CO detector is installed the Provider should notify the Client's Representative on the data sheet.

v) Check and clean any installed heat or smoke detector and if battery operated replace same with new battery all as per manufacturer's technical data sheet. Where no heat or smoke detector is installed the Provider should notify the Client's Representative on the data sheet.

w) Check circulation pipes and radiators, radiator valves circulation pump (note pump setting) installation cleaning filters and where necessary repair/replace/re-set/clean each as necessary

x) Check and confirm that feed and expansion tanks are adequately supported, insulated and vented and have lids fitted and replace/renew where necessary. These are to be comply with applicable Standard.

y) Check and confirm that cold water storage tanks and hot water storage tanks are adequately supported and insulated and have lids fitted and replace/renew where necessary.

z) Where fitted check the correct operation of the immersion thermal cut out, repairing where a fault is found.

aa) Set the temperature of any stored hot water to 60 degrees centigrade to mitigate against the risks of scalding and reduce the risk of the proliferation of legionella or similar.

bb) Test the entire installation including the provision of fuel for the test

© Rand Associates Consultancy Services Ltd

cc) The Provider shall discuss the performance and operation of their Heating Installation with the Customer and any issues raised should be resolved at the time. The Provider shall provide the Customer with sufficient information about the Heating Installation, including operational and maintenance instructions so that the Heating Installation can be operated and maintained in an efficient manner.

007 If during the planned maintenance service, a major defect is revealed e.g. cracked casing, weeping boiler, flue blockage etc. the Provider must make the Heating Installation safe and notify the Client's Representative immediately.

Flues

008 The Provider when undertaking the Service must at his own cost, performance test each entire flue in use and connected to Heating Installation and Heating Appliances for which the Client is responsible at the Property and each entire chimney flue integral with the fabric of the Property that is connected to any Customer owned Heating Appliance. A flue inspection shall be carried out at the same time as the service and the Provider ensure the flue is free from blockages, clean and secure.

009 The Provider must immediately give notice to the Client's Representative of any defects in the flue, which cannot immediately be remedied by application of the above rules and are deemed to be potentially dangerous.

Inhibitor

010 The Provider will also be required as part of the Periodic Servicing and Inspection procedure to test and record installation inhibitor levels and where it is identified that replenishment or total replacement is necessary this must be done by using an approved proprietary brand non-toxic biodegradable inhibitor. The Client's Representative may test inhibitor levels on completion of the service.

Electrical Installations

011 The Provider must as part of the Periodic Servicing and Inspection, check and test all electrical installations and fittings associated with the Heating Installations and Heating Appliances covered by this Contract, so as to ensure their safe operation. All remedial work will comply fully with IET REGULATIONS. The cost of this remedial work is deemed to be included in the Provider's tendered Rates.

Landlord Safety Certificate

012 On completion of each Periodic Service and Inspection the Provider shall produce a Landlords safety certificate. These are to be in an electronic format and the Provider is to upload the certificates onto the Client's IT system as Instructed by the Client's Representative. The Provider shall be deemed to have allowed in the Tender for all document uploads.

Routine Maintenance and Responsive Maintenance

013 The Provider shall provide a 24-hour, 365 days per year (366 for a leap year) Responsive Maintenance service for the period of the Contract to allow for breakdown or malfunction of any Heating Appliance or Heating Installation and the replacement of any defective or missing components or installation parts previously specified. This service is to ensure that the Heating Appliances and Heating Installations are left in a safe and fully operational condition. The details of any repair are to be noted by the engineer for registering on the Provider's database (as provided by the Client).

014 All Works in connection with the Heating Appliances and Heating Installations to be arranged by the Provider.

015 For breakdowns the Provider is expected to complete a minimum of 80% of such repairs at first fix within one day and 100% within two days. The aim of this requirement is to minimise any disruption to the customer relating to use of water/space heating facilities.

© Rand Associates Consultancy Services Ltd

016 Where the above is not achievable with Materials being unavailable from impressed or local stockist the Provider is to immediately notify the Customer and the Client's Representative and provide time scales for completion of the Works where replacement Materials are required.

017 On receipt of a request being made by the Client's Representative and/or the Customer the Provider shall comply with the following:-

a) EMERGENCY CALLOUT ATTENDANCE WILL MEAN THE FOLLOWING:

Emergency call out to be responded to immediately and no later than 2 hours and completed or made safe within 24 hours.

Breakdown repairs are to be completed within the stipulated attendance timescales, with every effort being made to complete on a first call, first fix basis, where this cannot be achieved the timescales as mentioned above will apply.

b) URGENT CALLOUT ATTENDANCE WILL MEAN THE FOLLOWING:

Urgent Call Out To be responded to immediately and no later than 24 hours and completed within 48 hours.

c) Ensure that each engineer is equipped with an adequate impressed van stock of parts to deal with most eventualities. A comprehensive stock of impressed spare parts, shall also be kept at the Provider's control point and store to enable items such as cylinders and where applicable immersion heaters to be replaced immediately.

d) Ensure that an alternative form of heating is available to the Customer in the event of a repair not being possible at the time of attendance. The alternative form of heating will as a minimum be two x 2kW electric panel heaters with time and temperature controls or any other type of heater approved by the Client's Representative, where alternative hot water provision is available in the form of an immersion heater ensure that it is operational before leaving the premises.

Before leaving the Property the engineer must obtain the Customer's signature as proof of receipt of the heaters being left on site.

The Provider shall not without the previous written consent of the Client's Representative remove any temporary heating appliances from the Property until such time as the fault has been rectified to the Client's Representative's satisfaction.

If rectification of the fault is not possible at the time of attendance the fault must be rectified within the previously stated time scales.

In the event of rectification not being considered possible as aforesaid, the Provider shall immediately notify the Client's Representative and the Customer giving the reasons as to why and inform the Client's Representative and the Customer when the repair will be completed. The Client's Representative must satisfy himself that suitable alternative temporary arrangement for hot water and heating are in place.

Notwithstanding the generality of the Provider's obligations hereunder, the expression "component part" shall include the parts listed elsewhere hereof and any other specialist controls associated with a particular installation.

e) Ensure that the Customer is kept informed of the situation at all times.

f) Upon completion of a breakdown, the satisfaction card is to be left with each Customer, the approved work document is to be duly completed and a copy of such is to be sent to the Client's Representative.

© Rand Associates Consultancy Services Ltd

g) In addition to the requirements detailed previously the Provider shall also allow to provide the following Services, which are deemed to be included for within the rate per appliance (see Invitation to Tender and Contract Details for inclusions):

1. Advise on efficient and correct use of Heating Appliance and Heating Installations.

2. Instruct new and existing Customers on the operation of Heating Appliances and Heating Installations.

3. Resetting of programmers, thermostats and other controls for any reason.

4. Re-lighting pilot lights for any reason.

5. Restoring electric supplies if turned off for any reason. Except for non-payment for supply by the Customer or where to restore the supply would be dangerous.

6. Calls to determine location of water leaks if not on pipework associated with the Heating Appliances and/or Heating Installations covered by this Specification and advise the Client's Representative of the correct location and repair of these leaks.

7. All calls where a Customer maintains an appliance or installation is faulty, even if no such fault is found to exist.

8. All calls where the fault reported is due to controls being incorrectly set.

9. Repairs due to Customer damage

h) The breakdown element of the Works shall be priced in accordance with the schedules shown elsewhere in the Contract Documents and shall be inserted in the Price Framework.

i) The Provider is to provide on a daily basis a breakdown status report on each Property visited.

018 Before attending a breakdown the Provider should contact the Customer to ascertain where reasonably possible as to the authenticity of the call to establish if the malfunction is due to Customer error such as installation/control adjustments or electricity failure.

Firestopping

019 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

020 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

DRAMA AND STAGE LIGHTING MAINTENANCE

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

DRAMA AND STAGE LIGHTING MAINTENANCE

General Requirements

001 Ensure that they read the whole of this Specification together with the Client's Requirements' and will be deemed to have included in their tendered Rates for full compliance.

002 All maintenance, testing and inspection shall be carried out by suitably qualified, competent and experienced electricians in strict accordance with the manufacturer's requirements and recommendations.

003 Provide Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works.

Asset Register

004 Ensure that all the asset registers supplied by the Client prior to the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

005 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each visit to undertake Routine Maintenance the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

006 Ensure that, following all visits to undertake Routine Maintenance, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

007 Provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff and to his Specialist Subcontractors.

Manufacturer's Requirements

008 Where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

009 Submit and agree, within 20 working days of the award of the Contract a full annual Programme for all Works covering each element of the Routine Maintenance Works with the Client's Representative.

010 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

Permit to Work Certification

011 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

Access

012 Ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

013 All Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

© Rand Associates Consultancy Services Ltd

014 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

Minor Repairs

015 During testing, carry out minor repairs such as tightening joints, replacement of clips, etc to achieve a pass status and make appliances safe to ensure compliance with the applicable Standard.

Routine Maintenance

016 The minimum requirements for Routine Maintenance are to be in accordance with the relevant equipment manufacturer's recommendations.

017 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

018 Carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

019 Include for the provision and application of all consumables within the Rates for this element of the Contract.

020 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the latest applicable Standards or equivalent.

021 Routine Maintenance must unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirements tabled below:

Drama and Stage Lighting Servicing Schedule

Item No	Item	Frequency	Action	Notes
1	General		Before commencing Works on the Stage Lighting system locate or prepare a plan of the stage lighting rigs including number of lighting bars, number and type of lanterns, together with any boh follow spots.	Ensure that a log book is in possession of the Theatre Manager listing all equipment and recording all maintenance carried out and faults rectified together with lamp renewals.
2	Electrical Installation and System Wiring	6 monthly	Visually examine electrical installation. Visually examine conduits, flexible conduits, boxes and lids. Examine for corrosion or deterioration. Ensure that means of disconnection/isolation is readily accessible. Examine flexible cables for wear, fraying braid and brittle insulation. Ensure that wiring terminal connections are sound. Examine earthing arrangements and test continuity.	
		3 yearly	Carry out a periodic inspection with associated circuit tests in accordance with the requirements of the Specification and IET Wiring regulations	

© Rand Associates Consultancy Services Ltd

Drama and Stage Lighting Servicing Schedule (cont'd)

Item No	Item	Frequency	Action	Notes
3	Control Panel/Desk	6 monthly	Clean interior and external of panel. Ensure identification labels are correct, legible and in position. Examine and test indicator lamps, renew as necessary. Clean and test selector switches. Clean and test fader controls. Ensure that wiring terminal connections are sound. Examine earthing arrangements and test continuity. Examine fuse holders, ensure that correct fuses are fitted. Ensure overloads are set for load conditions.	Prior to commencement liaise with the Theatre Manager to ensure that there will be no interference with preset memories.
4	Dimmer Racks	6 monthly	Visually examine electrical installation. Examine for corrosion or deterioration. Ensure that means of disconnection/isolation is readily accessible. Examine flexible cables for wear, fraying braid and brittle insulation. Check adequacy of ventilation and clean all apertures. Ensure identification labels are correct, legible and in position.	
5	Lighting Rig Suspension System	6 monthly	Examine suspension brackets. Check for corrosion. Adjust as necessary. Ensure that lighting equipment is securely fixed, each individual lantern is fitted with it's own safety chain and is correctly connected to the lighting installation.	Care should be taken to ensure that lanterns are not placed too close to drapes or scenery, thus becoming a fire hazard.
6	Lanterns	6 monthly	Examine lenses. Check fixings. Check for corrosion or other damage. Check function of shutters. Check function of fresnel lenses. Check position and condition of any 'gobos' and gels. Renew lamps where necessary. Clean reflectors with soft cloth or recommended wipes.	

© Rand Associates Consultancy Services Ltd

Responsive Maintenance and Out of Hours Emergency Works

022 Attend to all call outs due to malfunction or breakdown.

023 Include for a call-out service to provide Responsive Maintenance and an Out of Hours Emergency Works Service. The Out of Hours Emergency Works service is deemed to extend the provision of Emergency Works to a 24 hour, 7 days a week, 365 (366 for a leap year) days per year basis.

024 Call outs for Responsive Maintenance and/or Out of Hours Emergency Works which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

025 Where Out of Hours Emergency Works are attended to for authorised cases of breakdowns, mis-use or vandalism, the Provider will be paid in accordance with the Rates detailed in the Price Framework.

Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works

Repairs, Replacements and Adjustments

026 Take responsibility for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

027 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

028 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

029 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

Firestopping

030 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

031 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

ELECTRIC HEATING INSTALLATIONS SERVICING AND MAINTENANCE

© Rand Associates Consultancy Services Ltd

ELECTRIC HEATING INSTALLATIONS SERVICING AND MAINTENANCE

General Requirements

001 Ensure that the whole of this Specification together with the Client's requirements' has been read as these will be deemed to have included in his Tendered Rates for full compliance.

002 Provide a 24 hour breakdown service 365 (366 for a leap year) days per annum.

Asset Register

003 Ensure that all the asset registers supplied by the Client's Representative prior to the commencement of the Contract are verified during the first 12 months of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

004 At the commencement of the Contract, a set of services drawings may be issued to the Provider who shall ensure that, during each maintenance service element, the respective drawing shall be marked up by him to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

005 Ensure that, following all inspection visits, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

006 Provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff including his specialist Subcontractors.

Manufacturer's Requirements

007 Where manufacturer's instructions exceed the requirements of this document they shall be adhered to in their entirety.

Programming of Works

008 Submit and agree within 20 working days of the award of the Contract a full annual Programme for all Works covering each element of the Routine Maintenance Works with the Client's Representative.

009 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

Permit to Work Certification

010 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the installation, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

Access

011 Ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

012 Ensure that all Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

013 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

© Rand Associates Consultancy Services Ltd

Minor Repairs

014 Carry out, during testing, minor repairs such as tightening joints, replacement of clips, etc to achieve a pass status and make appliances safe to ensure compliance with the Client's requirements.

Periodic Inspections and Testing

015 Inspection and testing of storage and convector heater installations must unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirements tabled below;

Routine and Responsive Maintenance

016 Provide a 24-hour, 365 days per year (366 for a leap year) responsive maintenance service for the period of the Service to allow for breakdown or malfunction of any appliance, or installation and the replacement of any defective or missing components or installation parts previously specified. This service is to ensure that the appliances and installations are left in a safe and fully operational condition. The details of any repair are to be noted by the engineer for registering on the Provider's database (as provided by the Client's Representative).

017 All Works in connection with the installations to be arranged by the Provider.

018 For breakdowns the Provider is expected to complete 80% of such repairs at first fix or as a minimum within one day and 100% within two days. The aim of this requirement is to minimise any disruption to the Customer relating to use of water/space heating facilities.

019 Where the above is not achievable with parts being unavailable from impressed or local stockist the Provider is to immediately notify the Customer and the Client's Representative and provide time scales for completion of the Works where replacement parts are required.

020 On receipt of a request being made by the Client's Representative and/or the Customer the Provider shall comply with the following:-

a) EMERGENCY CALLOUT ATTENDANCE WILL MEAN THE FOLLOWING:

Emergency call out to be responded to immediately and no later than 2 hours and completed or made safe within 4 hours.

Breakdown repairs are to be completed within the stipulated attendance timescales, with every effort being made to complete on a first call, first fix basis, where this cannot be achieved the timescales as mentioned above will apply.

b) URGENT CALLOUT ATTENDANCE WILL MEAN THE FOLLOWING:

Urgent Call Out To be responded to immediately and no later than 24 hours and completed within 48 hours.

c) Ensure that each engineer is equipped with an adequate impressed van stock of parts to deal with most eventualities. A comprehensive stock of impressed spare parts, shall also be kept at the Provider's control point and store to enable items such as cylinders and where applicable immersion heaters to be replaced immediately.

© Rand Associates Consultancy Services Ltd

d) If rectification of the fault is not possible at the time of attendance the fault must be rectified within the previously stated time scales.

In the event of rectification not being considered possible as aforesaid, the Provider shall immediately notify the Client's Representative and the Customer giving the reasons as to why, and inform the Client's Representative and the Customer when the repair will be completed. The Client's Representative must satisfy himself that suitable alternative temporary arrangements for hot water and heating are in place.

Notwithstanding the generality of the Provider's obligations hereunder, the expression "component part" shall include the parts listed elsewhere hereof and any other specialist controls associated with a particular installation.

e) Ensure that the Customer is kept informed of the situation at all times.

f) Upon completion of a breakdown, the satisfaction card is to be left with each Customer, the approved work document is to be duly completed and a copy of such is to be sent to the Client's Representative.

g) In addition to the requirements detailed previously the Provider shall also allow to provide the following Services, which shall be included for within the rate per appliance:

1. Advise on efficient and correct use of appliance and installations.

2. Instruct new and existing Customers on the operation of appliances and installations.

3. Resetting of controls for any reason.

4. All calls where a Customer maintains an appliance or installation is faulty, even if no such fault is found to exist.

5. All calls where the fault reported is due to controls being incorrectly set.

6. Repairs due to Customer damage.

h) The breakdown element of the works shall be priced in accordance with the schedules shown elsewhere in this document and shall be inserted in The Price Framework.

i) The Provider is to provide on a daily basis a breakdown status report on each site visited.

021 Before attending a breakdown the Provider should contact the Customer to ascertain where reasonably possible as to the authenticity of the call to establish if the malfunction is due to Customer error such as installation/control adjustments or electricity failure.

Routine Maintenance

022 The minimum requirements for Routine Maintenance are to be in accordance with the relevant equipment manufacturer's recommendations.

023 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

024 Carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

025 Include or the provision and application of all consumables within the Rates for this element of the Contract.

026 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the latest British Standards or equivalent.

© Rand Associates Consultancy Services Ltd

027 Routine Maintenance of storage and convector heater systems must unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirements tabled below;

Storage Heaters

Item No	Item	Frequency	Action	Notes
1	General	Annually	All storage heaters shall be inspected, tested and maintained in strict accordance with the manufacturer's recommendations and requirements.	On older models be vigilant for the presence of asbestos. Report suspect appliances.
2	Cases	Annually	Examine fixings. Examine general mechanical condition of cases and cabinets. Tighten screws and fixings as necessary. Clean cases and cabinets. Remove all fluff, dust and dirt from interior and exterior, including fans, grilles and ducts. Examine the location of the storage heater to ensure that it does not present a fire risk.	
3	Fans	Annually	Clean and examine fans, motors and bearings. Examine filters, clean or renew as necessary. Examine fan housings and ductwork. Test performance.	
4	Elements	Annually	Examine connections. Examine terminals for oxidisation, corrosion and tightness. Clean and tighten as necessary. Test insulation resistance. Test element resistance.	Note the condition of the thermal blocks, report to the Client's Representative any signs of deterioration.
5	Controls	Annually	Clean and examine controls, control switches and pilot lights. Examine time switches. Examine over-ride controls. Examine thermostats, test calibration. Examine terminal connections. Examine condition of wiring.	Discuss operational effectiveness with user to determine control settings. Comment upon location of external thermostats.
6	Meters and Electricity Supply	Annually	Examine meters at supply position. Ensure time clocks are correct and supply charge to storage heaters during 'off peak' periods.	
7	Electrical Installation	Annually	Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Examine fused connection unit to electrical installation. Check fuse rating. Test insulation resistance. Examine earthing arrangements and test continuity.	

© Rand Associates Consultancy Services Ltd

Fan Convectors

Item No	Item	Frequency	Action	Notes
1	Visual Inspection	Annually	Visually examine each heater, replace missing fixings, if cabinet damaged report condition. Check operation of local isolation switch and indicator lights – switch off.	Report defects to Client's Representative. Report any findings of Asbestos Cement type boarding within heater cabinets or forming ducts through walls to Client's Representative.
2	Cleaning	Annually	Remove access panels, expose Heater Battery and Fan Assembly. Vacuum clean heater interior. Remove filter (if fitted) and clean thoroughly. Clean out heater battery and fan assembly using high pressure air line and vacuum collection. Ensure fins are correctly aligned.	Report defects to Client's Representative. Report if not fitted or faulty to Client's Representative.
3	Electrical Inspection and Testing, General	Annually	Examine all internal wiring and test insulation. Check and test earth connections. Ensure all fuses are correctly rated. Check operation of in-built room thermostat/change speed thermostat. Check operation of low temperature cut out thermostat.	Record readings and report defects to Client's Representative.
4	Electrical Inspection and Testing, Motors	Annually	Lubricate fan bearings to manufacturer's recommendations. Examine and test insulation to all motors and test earth continuity to the motor casings.	Report defects to Client's Representative. Record readings.
5	Mechanical Inspection	Annually	Check operation of isolating lockshield valves on heater battery.	

028 It is the Provider's responsibility to observe the on-going condition of the systems and installations with regard to safe and correct operation. The Provider must bring to the attention of the Client's Representative any specific areas where periodic checking, lubrication and adjustment exceeds normal provisions for the age and type of systems installed.

Responsive Maintenance and Out of Hours Emergency Works

029 Attend to all call outs due to malfunction or breakdown.

030 Include for a call-out service to provide Responsive Maintenance and an Out of Hours Emergency Works Service. The Out of Hours Emergency Works service is deemed to extend the provision of Emergency Works to a 24 hour, 7 days a week, 365 (366 for a leap year) days per year basis.

© Rand Associates Consultancy Services Ltd

031 Call outs for Responsive Maintenance and/or Out of Hours Emergency Works which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

032 Where Out of Hours Emergency Works are attended to for authorised cases of breakdowns, mis-use or vandalism, the Provider will be paid in accordance with the Rates detailed in the Price Framework.

Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works

Repairs, Replacements and Adjustments

033 Accept responsibility for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

034 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

035 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

036 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

Firestopping

037 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

038 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand name	Manufacturer's details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

EMERGENCY GENERATING PLANT MAINTENANCE

© Rand Associates Consultancy Services Ltd

EMERGENCY GENERATING PLANT MAINTENANCE

General Requirements

001 Ensure that they have read the whole of this Specification together with the Client's Requirements' and will be deemed to have included in their tendered Rates for full compliance.

002 Provide a Routine Maintenance, Responsive Maintenance and Out of Hours Emergency service (24 hour, 365 (366 for a leap year) days per annum).

Asset Register

003 Ensure that all the asset registers supplied by the Client prior to the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

004 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each visit to undertake Routine Maintenance, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

005 Ensure that, following all visits to undertake Routine Maintenance, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

006 Provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff including his Specialist Subcontractors.

Manufacturer's Requirements

007 Where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

008 Submit and agree within 20 working days of the award of the Contract a full annual Programme for all Works covering each element of the Routine Maintenance Works with the Client's Representative.

009 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

Permit to Work Certification

010 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

Access

011 Ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

012 All Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

013 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

© Rand Associates Consultancy Services Ltd

Minor Repairs

014 Carry out, during testing, minor repairs such as tightening joints, replacement of clips, etc to achieve a pass status and make appliances safe to ensure compliance with the applicable Standard.

Routine Maintenance

015 The minimum requirements for Routine Maintenance are to be in accordance with the relevant equipment manufacturer's recommendations.

016 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

017 Carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

018 Include for the provision and application of all consumables within the Rates for this element of the Contract.

019 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the latest applicable Standards or equivalent.

020 Routine Maintenance must unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirements tabled below;

Emergency Generating Servicing

Item No	Item	Frequency	Action	Notes
1	Visual Inspection	3 monthly	Check for fuel leaks. Check for oil leaks. Check for water leaks. Examine fuel supply pipework. Check for loose nuts/bolts – tighten as necessary. Examine anti-vibration mounts. Check for loose or leaking exhaust/air filter. Ensure adequate room ventilation. Ensure clear access to plant and equipment.	

© Rand Associates Consultancy Services Ltd

Emergency Generating Servicing (cont'd)

Item No	Item	Frequency	Action	Notes
2	Control Panel	6 monthly	Check operation and carry out any remedial repairs. Check operation of all switches, controls and minor components. Replace defective indicator lamps, fuses. Check operation of 'plug in' relays and 'change over convector' and replace relays or burnt contacts as necessary. Check and adjust time delay relay, if necessary adjust to bring n Customer's installation within 20 seconds approx.	
3	Fuel and Oil	6 monthly	Check fuel level and top up if necessary. Check engine oil, refill or change as required.	
4	Filters	6 monthly	Change fuel filter elements. Change engine oil filter elements.	
5	Battery	6 monthly	Check Electrolyte Specific Gravity and Charge, if necessary. 'Top up' electrolyte with distilled water. Clean any corrosive from terminals etc. and apply grease. Check for faulty cells by means of battery discharge tester. Reconnect to generator.	
6	Generator	6 monthly	Remove end cover and louvre and check the following: Brushes, replace if badly worn, brush holders, check for free movement. Slip rings, check for pitting or burning. Connections, check all connections are tight. Blow out any dust and clean. Replace end cover and louvre.	

© Rand Associates Consultancy Services Ltd

Emergency Generating Servicing (cont'd)

Item No	Item	Frequency	Action	Notes
7	Operation Check	6 monthly	Switch automatic mains failure panel to test. Check that normal mains supply is not interrupted when on 'Test' by switching off circuit. Outlet voltage, check on all phases 'Generator On' indicator, check that this is lit Switch off Remove push on connector to starter solenoid and switch back to TEST 'Fail to Start' indicator, check that this lights after approximately 6 seconds from switching to TEST Switch off and reconnect wire to starter solenoid Switch to AUTO position. Battery charger, check high and low charge rates 'Mains On' indicator, check that this is lit Switch circuit breaker on panel ON Switch off mains supply and check that generator set starts and supplies customers installation within approximately 20 seconds. Check that generator is not overloaded on any or all phases when supplying total installation. Check voltage on all phases when on load Leave to run on load for half hour(s) Switch mains on Check that generator set stops within 1 or 2 minutes Switch to HAND operation Check that set takes over from mains Leave to run for a few minutes before switching back to AUTO	Fill in service record sheet, detail, make, model, serial number of generator, date of inspection, general condition etc., (one copy to be left on site, in a plastic folder, the other to be sent to the Client's Representative.
		3 yearly	Carry out full load test using load banks for a period of at least 8 hours.	
8	Fuel Storage	Yearly	Undertake visual inspection of day service tanks. Undertake visual inspection of bulk storage tanks.	Provide report to Client Representative on condition of tanks

© Rand Associates Consultancy Services Ltd

Item No	Item	Frequency	Action	Notes
9	Transfer Pumps and Controls	Yearly	Clean and examine Lubricate as necessary Examine drive for alignment and adjust as necessary Examine pulleys and keys Test for leaks on valves and connections Repack glands as necessary Ensure all guards are in place. Test run duplicate pumps Test all controls Provide report to Client Representative on condition of pumps and controls.	Provide report to Client Representative on condition of pumps and controls.

Responsive Maintenance and Out of Hours Emergency Works

021 Attend to all call outs due to malfunction or breakdown.

022 Include for a call-out service to provide Responsive Maintenance and an Out of Hours Emergency Works Service. The Out of Hours Emergency Works service is deemed to extend the provision of Emergency Works to a 24 hour, 7 days a week, 365 (366 for a leap year) days per year basis.

023 Call outs for Responsive Maintenance and/or Out of Hours Emergency Works which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

024 Where Out of Hours Emergency Works are attended to for authorised cases of breakdowns, mis-use or vandalism, the Provider will be paid in accordance with the Rates detailed in the Price Framework.

Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works

Repairs, Replacements and Adjustments

025 Take responsibility for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

026 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

027 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

028 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

© Rand Associates Consultancy Services Ltd

Firestopping

029 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

030 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

EXTERNAL, CAR PARKING, COMMUNAL, ESTATES AND STREET LIGHTING

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

EXTERNAL, CAR PARKING, COMMUNAL, ESTATES AND STREET LIGHTING

General Requirements

001 From the Contract Commencement Date:

- all external, car parking, communal and un-adopted street lighting points shall be lit in accordance with the lighting-up periods, as set out below;

Apparatus	Lighting Up periods or Levels of Light at which Apparatus switches on
Street lighting	On at 70 lux and off at 35 lux
Illuminated bollards	On at 70 lux and off at 35 lux
Security lighting	On at 70 lux and off at 35 lux
Car park lighting	On at 70 lux and off at 35 lux

- all external, car parking, communal, estate and un-adopted street lighting shall be operated and maintained so that its light output is maintained at the specific lighting Design standards;
- all external, car parking, communal, estate and un-adopted street lighting apparatus shall be inspected, tested, maintained and cleaned as appropriate in accordance with the Specification;
- all external, car parking, communal, estate and un-adopted street lighting apparatus shall be
- operated and maintained in accordance with the bulk clean and change regime agreed with the Client's Representative; and
- all external, car parking, communal, estate and un-adopted street lighting apparatus shall be maintained in accordance with the Client's Requirements.

Routine Maintenance

002 The Provider shall undertake Routine Maintenance which ensures that:

- in respect of street lighting, columns are maintained with two (2) yearly cleaning and three (3) yearly clean and lamp change programmes and in respect of all other lighting columns, bollards, wall mounted fittings are maintained, cleaned, and have a lamp change programme all in accordance with the Client's Requirements;
- the photometric efficiency of each luminaire is maintained within the parameters used for maintenance factor (MF) in the Design process, taking account of environmental degradation of Luminaire bowls, reflectors and refractors, and lumen depreciation of lamps;
- the optical efficiency of all illuminated bollards is maintained to ensure compliance with the Client's Requirements; and
- after the Commencement Date of the Contract, every unit of external, car parking, communal and un-adopted street lighting apparatus shall be subject to a structural and mechanical inspection at intervals which accord with good industry practice or at intervals contained within the table below;

	Aspect to be inspected and routinely maintained	**Frequency**
1	Inspection and testing of mechanical and structural integrity of the lighting apparatus	Annually
2	Inspection and testing of electrical integrity of the lighting apparatus	Annually
3	Cleaning of lighting apparatus	Six monthly
4	Lamp change of any item of lighting apparatus	Six monthly
5	Painting any item of lighting apparatus	Five yearly and in accordance with manufacturer's technical data sheet
6	Inspection of all lighting apparatus through the outage detection cycle	Weekly
7	Inspection of all lighting columns through photometric tests	

© Rand Associates Consultancy Services Ltd

003 The dates on which such inspections take place and the results of such inspections shall be accurately entered on the site specific web based electronic external lighting log;

004 Every unit of apparatus is subject to an electrical inspection and test in accordance with the British Standard Requirements for Electrical Installations IET Wiring Regulations, and successor standards at not less than the intervals contained within the Table above.

005 This also includes any associated electricity distribution systems and the dates on which such inspections take place, and the results of such inspections are accurately entered on the site specific web based electronic external lighting log;

006 Where a lighting column is removed for whatever reason, the Provider shall examine it for corrosion in those areas which are not accessible when the lighting column is in position to establish the predicted residual life of other lighting columns of similar age and make. The Provider shall take such results into account in assessing the residual life of lighting columns and these findings shall be recorded on the site specific web based electronic external lighting log.

007 All illuminated bollards shall be cleaned as required to achieve a good standard of visibility and optical performance and maintained in accordance with the programme agreed with the Client's Representative, site specific web based electronic external lighting log shall be updated for each illuminated bollard to show the date upon which they were last cleaned.

008 The outage detection cycle described must be in compliance with this Specification.

009 Each item of external, car parking, communal and un-adopted street lighting apparatus is to be directly inspected at least once every seven (7) calendar days to establish whether it is operable or whether it displays any visual defect or fault; and the results of the outage detection cycle are to be recorded on the site-specific web based electronic external lighting log.

Tree Maintenance

010 The Provider shall develop a method to deal with trees and other vegetation impairing the lighting performance, access to the external, car parking, communal and un-adopted street lighting apparatus and the optical performance or visibility or which is otherwise detrimental to the external, car parking, communal and un-adopted street lighting apparatus.

011 In the case of highway trees or vegetation, it is the responsibility of the Provider to take any or all the necessary action, whether it is seen as major or minor. However, the Client's arboriculturist shall be consulted prior to any major tree Works being carried out. For the avoidance of doubt, the Provider shall consult the Client's arboriculturist in relation to any branches which are over 25mm in diameter.

Responsive Maintenance and Out of Hours Emergency Works

012 Include for a call-out service to provide Responsive Maintenance and an Out of Hours Emergency Works Service. The Out of Hours Emergency Works service is deemed to extend the provision of Emergency Works to a 24 hour, 7 days a week, 365 (366 for a leap year) days per year basis.

013 Put in place arrangements to ensure that the Provider is able to respond efficiently to faults in order to ensure the apparatus operates in accordance with this Specification. The arrangements put in place shall cater for reporting the results of any rectification and/or monitoring to the Client's Representative within 24 hours.

© Rand Associates Consultancy Services Ltd

014 **Emergency Fault** means any incident or failure in the service which:

- gives rise to the involvement of the emergency services;
- creates an immediate risk to public health and/or safety;
- includes three (3) or more adjacent outages;
- involves a hanging lantern canopy or bowl;
- involves lighting columns leaning excessively;
- involves a lighting bollard that is not operable;
- causes a risk of electric shock;
- were obscene or racist graffiti or other graffiti which is clearly and obviously offensive has been applied to the lighting column or bollard,
- involves attendance at and making safe of a damaged lighting column or bollard
- is a lighting column or bollard which has been knocked down;

015 **Non-Emergency Fault** means any of the following:

- any failure of any external, car parking, communal and un-adopted street lighting apparatus (or part thereof)
- any graffiti on any external, car parking, communal and un-adopted street lighting apparatus;
- any unauthorised attachments on any external, car parking, communal and un-adopted street lighting apparatus;
- failure to replace any anti-climbing measures on any external, car parking, communal and un-adopted street lighting apparatus;
- the orientation of a luminaire or bracket on any external, car parking, communal and un-adopted street lighting apparatus is not true and plumb;
- with the exception of subway or covered way or underground parking area lighting, the lamp forming any part of external, car parking, communal and un-adopted street lighting apparatus is not operating, or is operating at a reduced light output that is affecting its colour rendering properties or is flickering or is operating at the incorrect time (or any combination of the same);
- any number of the lamps in a subway or covered way or underground parking area are not operating, or are operating at a reduced light output that is affecting their colour rendering properties or are flickering or operating at the incorrect time (or any combination of the same);
- any lighting column or bollard which is not true and plumb
- any twisted attachments, including sign plates and lighting units;
- any material damage to subway or covered way or underground parking area; and
- any other failure in the service, identified as a non-emergency fault by the Client's Representative,

016 **Structural and Mechanical Inspection** means an inspection to evaluate the mechanical and structural integrity of the external, car parking, communal and un-adopted street lighting apparatus in accordance with good industry practice which, without prejudice to the generality of the foregoing, shall include:

- checking that the holding down bolts on flange plates are properly tightened and the tightening of such bolts as necessary;
- checking that the all moving parts are lubricated and all screws, locking devices and terminals are properly tightened, and the lubrication and tightening of the same as necessary;
- visually inspecting the column, post, lantern, lighting unit, bollard, feeder pillar and sign assemblies for corrosion and damage; and
- visually inspecting for structural integrity in accordance with the "*Code of Good Practice for Road Lighting Maintenance*" and "*Lighting Columns and Sign Posts, Planned Inspection Requirements*" issued by the Institute of Lighting Engineers or its successor or equivalent guidance issued from time to time

Liaison with the Emergency Services

017 Liaise with and provide assistance to the emergency services and other relevant bodies as required to meet the provisions of the Contract.

© Rand Associates Consultancy Services Ltd

Connections by Utility Provider

018 In the event of a non-emergency fault which requires the attendance of the electricity Utility Provider, which without limitation could include, the loss of the Utility Provider's power supply and therefore require the Utility Provider to restore the power supply, or in the case of knocked down items of external, car parking, communal and un-adopted street lighting points which requires the Utility Provider to attend to transfer a power supply then the following shall apply:

- the Provider shall log the relevant event as a non-emergency fault on the Client's IT sysytem
- the Provider shall use reasonable endeavours to procure that the Utility Provider carries out such repairs and/or installation as required to the power supply within ten (10) Business Days of the occurrence of the non-emergency fault;
- in the event that, in the reasonable opinion of the Provider, the Utility Provider is unlikely to carry out such repair or installation within ten (10) Business Days of the occurrence of the non-emergency fault, the Provider shall provide a temporary power supply within such period of ten (10) Business Days, sufficient to maintain the affected external, car parking, communal and un-adopted street lighting apparatus operable. Provided that where it is necessary to carry out a road crossing to provide such a temporary power supply, the Provider, instead of providing a temporary power supply, shall supply and maintain flashing beacons on the affected external, car parking, communal and un-adopted street lighting apparatus. If the flashing beacons are found to be inoperative this shall constitute an emergency fault requiring rectification within 24 hours;

Permit To Work Certification

019 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

Access

020 Ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

021 All Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

022 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

Guidance

022 Refer to the Specification schedule of Works and to manufacturers' requirements and recommendations for detailed guidance. Other guidance is available from the HSE, SAFed, and the BSI.

023 Pay particular attention to:

- The Provision and Use of Work Equipment Regulations 1998 (PUWER)
- Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)
- Approved Code of Practice and Guidance L113: Safe use of lifting equipment.
- Applicable Standard - Requirements for Electrical Installations IET Wiring Regulations.
- Work equipment. Provision and Use of Work Equipment Regulations 1998. Guidance on the regulations L22 (Third Edition).
- The Hazardous Waste Regulations 2005
- Control of Substances Hazardous to Health Regulations 2002 (COSHH) (as amended)
- Pollution Prevention and Control Act 1999
- Waste Management Licensing Regulations 1994
- The Waste Electrical and Electronic Equipment (WEEE) Regulations 2013.

© Rand Associates Consultancy Services Ltd

Luminaire & Lamp Maintenance Schedule

024 Inspection and cleaning of luminaires and lamps must unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirements tabled below.

Item No	Item	Frequency	Action	Notes
1	Cleanliness	Annually	Clean luminaires where necessary;	Frequency of cleaning will depend on environment; In dirty areas more frequent cleaning may be necessary; and Should this be the case report to the Client's Representative for Instruction;
2	Tungsten filament lamps	Annually	Check for failed lamps or signs of deterioration; Replace as required;	Tungsten lamps are inefficient with regard to energy use and could be replaced with more efficient lamp types where possible
3	Fluorescent lamps	Annually	Clean and replace any failed or suspect lamps;	Care should be taken in handling broken glass from broken tubes/lamps can be dangerous; Disposal of tubes should be in accordance with COSHH regulations;
4	Discharge lamps	Annually	Clean and replace any failed or suspect lamps;	If readily accessible areas failed lamps should be replaced as soon as possible to avoid damage to control gear.
5	Re-lamping	As required	Replace lamps in accordance with Client's Representative Instructions;	
6	Security of Luminaire	Annually	Check security fixings and suspensions;	Refix as necessary
7	Cable connections	Annually	Check externally for security and signs of arcing or overheating;	Renew or re-fix as necessary:
8	Flexible down leads and connectors	Annually	Examine flexible cables for wear, fraying braid and brittle insulation; Examine connections; Tighten all terminals; Test insulation resistance;	Renew if necessary;
9	Diffusers and reflectors	Annually or when instructed	Clean and correctly adjust before re-assembly;	
10	Lamp control gear	Annually	Check operation and compatibility with lamp;	

© Rand Associates Consultancy Services Ltd

Luminaire & Lamp Maintenance Schedule (cont'd)

Item No	Item	Frequency	Action	Notes
11	Switches	Annually	Generally switches and check for correct working order;	Replace if faulty
12	Occupancy/Movement Detectors	Annually	Clean as manufacturer's technical data sheet; Test for correct operation; Check that any sensors are not affected by extraneous effects e.g. tree branches, satellite aerials etc	

Local Lighting Controls

025 Inspection, testing and cleaning of local lighting controls must unless otherwise instructed by the Client's Representative be carried out in accordance with the requirements tabled below.

Item No	Item	Frequency	Action	Notes
1	Wall Switches	Annually	Check and note the following: • condition of face plate • placement and condition of fixing screws • corrosion or damage etc by external influence • unimpeded switch action (no arcing) • suitability of switch for function and placement Open switch and note the following: • live conductors secure in terminals with no protruding conductors; • condition of cables; • presence of earth fly lead from box to switch plate; • condition and integrity of enclosure; • presence of phase barrier & notice where required • verify switch rating to circuit load	Any insulation discolouration to be noted Notify Client's Representative of any abnormality for Instruction

© Rand Associates Consultancy Services Ltd

Local Lighting Controls (cont'd)

Item No	Item	Frequency	Action	Notes
2	Pull Switches	Annually	Check and note the following: • condition of switch body plate; • condition of pull cord; • unimpeded switch action (no arcing) ; • suitability of switch for function and placement; Open switch and note the following: • live conductors secure in terminals with no protruding conductors; • condition of cables; • presence of earth fly lead from box to switch plate; • condition and integrity of enclosure; • verify switch rating to circuit load;	Notify Client's Representative of any abnormality for Instruction Any insulation discolouration to be noted Notify Client's Representative of any abnormality for Instruction
3	Dimmer switches	Annually	Check and note the following: • condition of face plate; • Placement and condition of fixing screws; • Corrosion or damage etc by external influence; • unimpeded switch action (no arcing) ; • suitability of switch for function and placement; Open switch and note the following: • live conductors secure in terminals with no protruding conductors; • condition of cables; • presence of earth fly lead from box to switch plate; • condition and integrity of enclosure; • verify switch rating to circuit load; • test switch throughout setting range;	Any insulation discolouration to be noted Notify Client's Representative of any abnormality for Instruction

© Rand Associates Consultancy Services Ltd

Local Lighting Controls (cont'd)

Item No	Item	Frequency	Action	Notes
4	Photo electric cells	Annually	Remove the front cover of the sensor and dust out the inside workings of the sensor; Check that there are no access holes in the detector where insects or spiders may be able to gain access; Seal any holes found; Clean the front cover of the detector; Test detector operation;	Take extreme care not to alter the detector's settings
5	Occupancy detection switches	Annually	Remove the front cover of the sensor and dust out the inside workings of the sensor; Check that there are no access holes in the detector where insects or spiders may be able to gain access; Seal any holes found; Clean the front cover of the detector; Test detector operation;	Take extreme care not to alter the detector's settings
6	Passive Infra Red motion detection switches	Annually	Remove the front cover of the sensor and dust out the inside workings of the sensor; Check that there are no access holes in the detector where insects or spiders may be able to gain access; Seal any holes found; Clean the front cover of the detector; Test detector operation;	Take extreme care not to alter the detector's settings
7	Time switches	Annually	Check and note the following: • condition of switch body plate; • corrosion or damage etc by external influence; • suitability of switch for function and placement; Open switch and note the following: • live conductors secure in terminals with no protruding conductors; • condition of cables; • presence of earth fly lead from box to switch plate; • condition and integrity of enclosure; • verify switch rating to circuit load; • set time and verify switch operation; • renew battery where possible;	Notify Client's Representative of any abnormality for Instruction Any insulation discolouration to be noted

© Rand Associates Consultancy Services Ltd

Local Lighting Controls (cont'd)

Item No	Item	Frequency	Action	Notes
8	Intelligent controls systems	Annually	Locate layout of system, interrogate cpu and ascertain that system corresponds with plan; Cleans lens of the sensors, where possible remove the front covers of the sensors and dust out the inside workings; Go through lighting sequence change ensuring operation of master and slave units; Test automatic links to integrated emergency lighting systems. Examine 'front end' PC systems.	Notify Client's Representative of any abnormality for Instruction Take extreme care not to alter the detector's settings

Firestopping

026 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

027 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

ESTATE LIGHTING REPLACEMENT INSTALLATIONS

General Requirements

120 This specification shall be read in conjunction with the Preliminaries, the other Communal Mechanical and Electrical Specifications, Appendices, Schedule of Rates, and all other contract documentation.

121 Note that this is a performance specification. It shall be clearly understood that the Provider shall be fully responsible for the detailed design, supply, installation, testing, commissioning, demonstrating, documentation and leaving in a satisfactory working order following removal of existing estate lighting (if any) the fully operational new estate lighting installations as described within this specification or indicated on the project drawings.

122 It shall be the Provider's responsibility to request and receive any information regarding asbestos on the site and subsequently satisfy their obligations by carrying out a Pre-construction asbestos survey.

Strip Out Works

123 Provide strip-out details as part of their initial enabling works identifying the extent of the strip out works, details regarding isolation, method of isolation, methods of safe removal and builders work including any fire stopping.

124 Following consideration and approval the strip out works will be completed as part of the first stage of the project.

Loss of Service

125 Will be allowed, within their programme to carry out works with a loss of service if:
- The planned loss of services is anticipated to be no longer than 8 hours;
- The planned loss of services has prior agreement with the Client;
- Written notifications are present in common areas to notify Provider's intentions;
- A vulnerable person's strategy is in place.

Temporary Supplies

126 Depending upon the period of loss of service, strategy agreed with the Client and necessity the Provider may provide a method including for temporary supplies. As such, any temporary estate lighting service will only be accepted if this is capable of satisfying delivery in line with operational duty identified as part of the validation report investigations.

External Lighting

127 Design, supply, install and commission a complete energy efficient external lighting scheme to suit the existing building. The design proposals shall be agreed with the Client prior to commencement on site.

128 External Lighting shall be designed to meet the requirements of the CIBSE/SLL lighting guides. The external lighting design shall comply with CIBSE Guide LG6 and Building Regulations and Secured by Design Requirements, illuminating all aspects of the external area.

129 The installation should be low maintenance vandal resistant external lighting columns/bollards that are compatible with the environment, car parking areas and other non-adoptable areas, whilst minimising light spillage.

130 Supply and install all necessary lighting power and control cabling, run in dedicated containment appropriate for the installation and environments, in order to complete the installation.

131 IP65 lighting shall be provided to illuminate all external service areas and access roads and pathways.

© Rand Associates Consultancy Services Ltd

132 IP65 bulkhead type emergency luminaires shall be fitted above and close to final access doors and gateways to the development, in accordance with the applicable Standard.

133 The external lighting shall allow for security, light pollution, aesthetics, low energy, maintenance, effect on habitat and foliage, including Institute of Lighting and any BAT conservation requirements (where required).

134 Generally, the following shall be provided:
- LED lamps are to be used; and
- All columns shall have hinged bases to allow for easy maintenance.

135 Columns and brackets to be tubular steel to the applicable Standard, galvanised to the applicable Standard. Internal surfaces and the route up to 250mm above finished ground level to be treated with bituminous solution. Columns and brackets to be T-washed and primed prior to delivery. To be decorated on site with two coats alkyd resin-based paint, one undercoat and one gloss coat to the applicable Standard.

136 External lighting to be designed in compliance with the applicable Standards where applicable.

137 All external lighting installations shall be designed to provide lighting levels in accordance with CIBSE Guide LG9 and LG12 and the ILP's Guidance note for the Reduction of Obstructive Light GN01: 2001

138 The siting and selection of external light columns has taken into account the requirement to minimise excessive glare into adjacent properties.

139 Any new external lighting shall be fed from a dedicated circuit from the Landlords distribution Board.

140 Final locations for any external lighting to be confirmed with the landlord.

141 Should external security lighting be instructed, the Provider shall provide all necessary cabling and galvanised steel trunking/conduit containment as required to form a complete rewireable installation.

Luminaires

142 The following luminaires are to be used on an equal or approved basis:

Column Mounted Fitting Thorlux Starbeam LED, Polycarbonate Cover (or where areas are adopted, fittings to suit highways specific requirements).

Wall Mounted Fitting Thorlux Realta LED, Polycarbonate Cover.

Lighting Controls

143 Lighting is to be wired to a Landlord's metered supply and linked to a photo-electric cell, time switch with manual override switch in landlords meter cupboard.

144 Any switching arrangements to be validated prior to works commencing to ensure correct operation. Any faulty equipment shall be replaced by the Provider.

Lighting Columns

145 All columns shall be unloaded, slung, stacked, and erected strictly in accordance with manufacturer's technical data sheet. Columns shall be lifted using padded slings and correctly aligned vertically.

146 Rooted columns shall be installed in a steep sided hole with a minimum clearance of 300mm around the column at a depth agreed with the manufacturer but not less than 1000mm. Concrete shall be laid in 150mm layers up to the cable entry slot which shall be temporarily plugged to exclude concrete. The remaining depth shall be filled with hardcore and an approved granular material up to 75mm below ground level which shall then be finished to match the surrounding surface.

© Rand Associates Consultancy Services Ltd

147 Provide two 50mm black alkathene duct entries into the column base through the concrete base detail. All ducts to be left with draw ropes.

148 Bracket arms shall be installed to allow the correct vertical and horizontal alignment of the lantern. Lanterns shall not be installed until column and bracket are in their final position.

149 Lamps shall not be installed until the column and lantern are fixed to the satisfaction of the Client's Representative. Internal reflectors shall be adjusted at night.

150 All luminaries/lanterns shall be installed in accordance with manufacturer's recommendations to maximize lighting performance and to minimize glare.

151 Lighting columns shall be complete with backboard for mounting electrical equipment shall each be fitted with a fused cut out unit. The cut-out unit shall be accessible via a door in the lighting column. The lighting column door shall be fitted with a locking arrangement which shall be agreed with the Client's Representative.

152 The cut-out unit shall be in accordance with the applicable Standard and shall consist of a substantial moulded plastic drip proof enclosure with separate terminals for line, neutral and earth conductors. The cut out shall be designed for use in a street lighting column and shall have terminals large enough for looped services. Each unit shall be fitted with a 6-amp rated HBC fuse and brass gland plate. The cut-out unit shall be of a size to suit the available column width.

153 Supply and install within each column, adjacent to the fused cut out unit, a 32-amp double pole switch.

154 The backboard shall be fitted with a dedicated earth block with five tunnel type double terminals. Earth cabling shall be carried out as follows; 6.0mm PVC from earthing block to cut out unit, 6.0mm PVC from main earthing block to column terminal and 2.5mm from main earthing block to lantern.

155 Columns bases shall be coated internally and externally with heavy duty bituminous paint to approved Standard not less than 0.25mm thick.

156 Final circuits to lighting columns shall be wired using appropriately sized 3 core Copper / PVC insulated, steel wire armoured, pvc sheathed cables, having due regard for current carrying capacity and volt drop One cable core shall be a dedicated earth core and shall be connected in parallel with the cable armour. Cables shall be installed buried direct in soft ground and drawn through ducts below roads, paths and paved areas. Cables shall be buried to give 600mm depth of cover below footpaths in in the soft and 800mm depth of cover below roads.

157 Cable draw in pits with substantial steel covers shall be provided as necessary for cable pulling. The Provider shall be responsible for determining the number of draw pits required and allowing for same within the tendered sum.

158 Cable marking tape shall be installed 200mm above all underground cables and ducts.

159 Where armoured cables rise to high level on building structures, they shall be protected with galvanized steel covers to a height of 2.5 metres.

160 Internal column wiring shall be carried out using 1.5mm pvc insulated pvc sheathed cable which shall be securely clipped within the column throughout. The incoming earth core shall be effectively connected to the incoming cable armour termination. An earth cable shall be provided to bond the incoming earth cable to all electrical components of the column and all exposed metal parts.

161 All cables near lamps shall be of an adequately heat resisting specification.

© Rand Associates Consultancy Services Ltd

Testing, Commissioning and Handover

162 The whole of the electrical installation is to be inspected and tested in accordance with the applicable Standard.

163 Tests must be carried out as the work proceeds as required by site conditions and upon the decision of the Client Representative.

164 Carry out pre-handover testing and commissioning, prior to the declaring to the Client Representative that the works are ready for such testing and commissioning. The Provider will provide his own testing equipment that will have been calibrated within the past 12 months.

165 Satisfy themselves that the works offered for testing are complete, but this shall not preclude re-testing of sections where appropriate, in the case of sectional handover, or phased completion.

166 Where conduits, or any work is concealed the Provider shall notify the Client Representative who may wish to witness any tests for continuity. This shall not relieve the Provider from remedial work if later found to be defective.

167 Satisfy himself that the works are complete and operational and that all labels, warning notices, circuit detail schedules and manufacturer's information are available and will provide a completion and inspection certificate in PDF format which shall be in accordance with the test sheets as detailed in the applicable Standard.

168 A chart detailing the following information shall be attached to each consumer unit:

- Circuit no;
- Circuit description;
- Type of wiring;
- Reference method;
- Number of points served;
- Circuit live conductor size;
- Circuit protective conductor size;
- Maximum disconnection time;
- Overcurrent protective device including type, rating and breaking capacity;
- RCD operating current; and
- Maximum z's.

169 The test shall be carried out to the satisfaction of the local electricity Utility Provider and shall be at the Provider's expense including the cost of electricity.

170 At handover, the Provider shall provide the Client's Representative with a complete set of operating and maintenance records. Including all documentation, manufacturers details, list of spares, emergency contact numbers, complete set of record drawings etc

171 The final format and content of the manuals shall be agreed with the Client's Representative.

Firestopping

172 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

173 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

FALL ARREST SYSTEMS MAINTENANCE

© Rand Associates Consultancy Services Ltd

FALL ARREST SYSTEMS MAINTENANCE

General Requirements

001 Ensure that they have read the whole of this Specification together with the Client's Requirements and will be deemed to have included in their tendered Rates for full compliance.

002 Provide a Routine Maintenance and a Responsive Maintenance service including undertaking Emergency Works.

Asset Register

003 Ensure that all the asset registers supplied by the Client prior to the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

004 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each maintenance service element, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

005 Ensure that, following all inspection visits, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

006 Provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff including his Specialist Subcontractors.

Manufacturer's Requirements

007 Where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

008 Submit and agree, within 20 working days of the award of the Contract a full annual Programme for all Works covering each element of the maintenance Works with the Client's Representative.

009 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

Permit to Work Certification

010 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

Access

011 Ensure that they undertake a risk assessment and provides a method statement for their means of access to allow for inspection and testing.

012 All Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005" and the requirements of the British Standards, INDG 367and EN360.

013 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

© Rand Associates Consultancy Services Ltd

Minor Repairs

014 During testing, carry out minor repairs necessary to ensure completeness and safety of equipment.

Routine Maintenance

015 Routine Maintenance including testing of cradle installations must, unless otherwise Instructed by the Client's Representative, be carried out in accordance with the requirements tabled below;

016 It is critical that the BSI code of Practice is followed and adhered to.

017 Routine Maintenance and testing should also cover pre-use checks including the following:

- Pre-use checks should be tactile and visual;
- Correct PPE usage;
- Visual check undertaken in good light;
- Element that links to the users harness is suitable for the type of anchorage;
- A suitable anchor is being used (strength and type of connection);
- The position of the anchor is appropriate;
- Area of fall is free of obstructions;
- Connection between the lifeline and the harness is fully closed and secure;
- Connector is secured to a suitable fall arrest attachment point on the user's harness;
- Equipment log and ID plates to match fall arrest system details;
- Check functionality of connectors, anchor line devices, buckles on harnesses, descending and ascending devices and retractable fall arresters.

018 An Inspection should be also be carried out after the equipment has arrested a fall.

Fall Arrest Systems Maintenance

Item No	Item	Frequency	Action	Notes
1	Visual Inspection and Testing	6 monthly	In accordance with the requirements of BS8437 and INDG367 and in accordance with the manufacturer's technical data sheet. Wash webbing with a mild soap solution (maximum temperature 40% C) and remove excess moisture with a clean cloth. Wipe webbing with a mild solution of sterile disinfectant and allow to dry naturally. Clean metallic items when required with a non-caustic solution.	

© Rand Associates Consultancy Services Ltd

Fall Arrest Systems Maintenance (cont'd)

Item No	Item	Frequency	Action	Notes
2	Inspection and Examination	Annually	In accordance with the requirements of the British Standard and in accordance with the manufacturer's technical data sheet.	
3	Annual Servicing	Annually	Retractable fall arresters and controlled rate descenders must be serviced, inspected and re-certified by the manufacturer or by the Provider if approved by the manufacturer at periods in accordance with the manufacturer's technical data sheet.	
4	Periodic Inspections	3 monthly	**Retractable Type Fall Arresters** Check if indicator has been activated Extend lifeline and inspect for damage, allow to retract slowly through gloved hands. Check connector between the block and the anchor point. Check connection to harness and swaging of the cable end or the web stitching for signs of damage. Check the locking mechanism is operating correctly by pulling the lifeline end sharply. Ensure that the lifeline locks instantly. Check the hook/carabiner gate opens and closes smoothly and fully engages. Check the fall arrest block is within its inspection interval. Check that fall arrest block is stored in a dry ventilated area. **Anchor Devices** Check anchor device for signs of deformation. Check for corrosion. Check if fall indicator has been activated. Check anchor point is positioned correctly and adjusted correctly and is stable. Check that the anchor point is within its inspection or service interval.	

© Rand Associates Consultancy Services Ltd

Responsive Maintenance

019 Attend to all call outs due to malfunction or breakdown during Normal Working Hours.

020 Call outs which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

Routine Maintenance and Responsive Maintenance

Repairs, Replacements and Adjustments

021 Take responsibility for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

022 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

023 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

024 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

Firestopping

025 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

026 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

© Rand Associates Consultancy Services Ltd

FIRE-STOPPING MATERIALS

© Rand Associates Consultancy Services Ltd

FIRE-STOPPING MATERIALS

Fire-stopping Works – Proprietary Material

001 Fire-stopping material for use as a gap filling material where cables, non-combustible dusts or pipework services penetrates fire compartment floors and walls shall be a proprietary compound that is to be non-fibrous, non-toxic and to contain no asbestos, phenol's or halogen's, applied as a mortar to the following thicknesses.

Fire Resistance	Minimum Depth of Filling Material
One Hour	50mm
Four Hour	100mm

002 50mm Thick non-combustible mineral wool slab is to be used as permanent shuttering to fire-stopping compound mortars.

003 For horizontal barriers the mineral wool slabs are to be friction fitted into the opening and around the penetrating services, so that the compound mortar may be poured on top of the slab to the required thickness, temporary support may be needed until the compound mortar has achieved it setting requirements

004 For vertical or wall barriers the mineral wool slab should be installed at the centre line of the fire compartment wall by friction fitting around the penetrating services, the vertical slab is then to have the compound mortar applied either side of the slab to a maximum thickness of 25mm.

005 The fire-stopping mortar is to be applied strictly in accordance with the manufacturer's technical data sheet.

006 Fire-stopping material for use as a gap filling mortar around cable penetrations through fire compartment and separation walls and floors shall be a proprietary non-combustible material manufactured from lightweight aggregates, inorganic hydraulic binders and other fire protective additives which impart rheological properties. It is to be used in situations where the subsequent installation of additional cables through the wall or floor penetration is likely to take place and a flexible filling material would facilitate this event.

007 The mortar is to be mixed by hand and applied strictly in accordance with the manufacturer's technical data sheet

008 Fire-stopping material for use as fire protection to fire compartment floors and walls penetrated by air conditioning ducts or service pipework shall be a proprietary non-combustible non-fibrous and non-toxic material manufactured from lightweight aggregates, inorganic hydraulic binders and other fire protective additives which impart rheological properties, applied in layers as a mortar to the following thicknesses.

Fire Resistance	Minimum Depth of Filling Material
Four Hour	160mm

009 Temporary shuttering may be required where the mortar is applied to wall penetrations, if there is likely to be movement in the pipes or ducts, the pipe or duct is to be wrapped in a 5 to 10mm thickness of mineral or ceramic wool.

010 The compound is to be mixed by hand and applied strictly in accordance with the manufacturer's technical data sheet.

011 Ensure that the Provider or his approved subcontractor is to have FIRAS certification and to produce certified copies of their registration as and when requested by the Client's Representative.

© Rand Associates Consultancy Services Ltd

Fire-stopping – Non Proprietary

012 Fire-stopping material to party walls and similar situations can be either:

Non-combustible mineral wool to applicable Standard compressed fit between timber members and fixed with large galvanised nails, cut to profile; or
Non-combustible mineral wool with density ne 80kg/m^3 to applicable Standard compressed fit between timber members and fixed with large galvanised nails, cut to profile; or
Non-combustible mineral wool with integral galvanised wire mesh with density ne 80kg/m^3 to BS 3958-3 compressed fit between timber members and fixed with large galvanised nails, cut to profile; or
Asbestos free mineral fibre reinforced board, moisture resistant to applicable Standard Euro Class A1, bedded in mortar to match walling;

013 Fire-stopping to loft access hatch door shall be asbestos free mineral fibre reinforced board, moisture resistant to applicable Standard Euro Class A1.

014 Joint sealants are to be intumescent fire resistant mastic to applicable Standard installed in accordance with the manufacturer's technical data sheet;

015 Ensure that any imperfections of fit between building elements which are required to have fire resistance and/or resist the passage of smoke are completely sealed with non-combustible sealing material e.g. mortar, mineral filler paste or plaster, not plastic foam filler. Where not specified otherwise, tightly pack with mineral fibre.

Client's current manufacturers/suppliers/products

016 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

© Rand Associates Consultancy Services Ltd

GAS TIGHTNESS TESTING

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

GAS TIGHTNESS TESTING

General Requirements

001 Ensure that the whole of this Specification together with the Client's Requirements' has been read and will be deemed to have included in his tendered Rates for full compliance.

002 Provide a Routine Maintenance, Responsive Maintenance and Out of Hours Emergency service (24 hour, 365 (366 for a leap year) days per annum).

Asset Register

003 Ensure that all the asset registers and schematic gas line diagrams supplied by the Client prior to the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

004 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each visit to undertake Routine Maintenance, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

005 Ensure that, following all visits to undertake Routine Maintenance, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

006 Provide and maintain an electronic log-book to record all visits and maintain all records, to be accessible by both the Provider's Staff and the representative(s) of the Client's Representative.

007 Provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff including his Specialist Subcontractors.

Manufacturer's Requirements

008 Ensure that where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

009 Submit and agree within 20 working days of the award of the Contract a full annual Programme for all Works covering each element of the Routine Maintenance Works with the Client's Representative.

010 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

Permit to Work Certification

011 Ensure that if it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall comply with the permit to work system as employed by the Client.

Access

012 Ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

013 All Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

© Rand Associates Consultancy Services Ltd

014 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

Minor Repairs

015 Carry out, during servicing and testing, minor repairs such as tightening joints, replacement of bolts, screws, clips, etc to ensure completeness of equipment and make appliances save.

Routine Maintenance

016 The minimum requirements for Routine Maintenance are to be in accordance with the recommendation and requirements of the following:

- IGE/UP/1 Edition 2: Strength testing, tightness testing and direct purging of industrial and commercial gas installations.
- IGE/UP/1A Edition 2: Strength testing, tightness testing and direct purging of small, low pressure industrial and commercial natural gas installations.
- IGE/UP/1B Edition 2: Tightness testing and direct purging of small natural gas installations.
- IGE/UP/1C: Strength testing, tightness testing and direct purging of natural gas and LPG meter installations.
- IGE/UP/2 Edition 3: Installation pipework, on industrial and commercial premises.
- IGE/UP/10 Edition 4: Installation of gas appliances in industrial and commercial premises.
- Applicable Standards and subsequent amendments.

017 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

018 Carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

019 Include for the provision and application of all consumables within the Rates for this element of the Contract.

020 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the latest applicable Standards or equivalent.

021 Routine Maintenance must unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirements tabled below;

022 This Specification is designed for use in the periodic testing of existing natural gas and/or LPG installations in both domestic and commercial/communal premises. Where the intention is to test new installations, or extensions to existing installations, reference should be made to IGE/UP/1 Edition1 or IGE/UP/1A Edition 2 as appropriate.

© Rand Associates Consultancy Services Ltd

Personnel

Item No	Item	Frequency	Action	Notes
1	Competencies		The Provider shall employ a competent approved gas technician who has undertaken suitable training to an approved standard. A minimum of modules COCNPI 1LS (part A) and TPCP1A shall be held. All ACS assessment to have been undertaken within the previous 5 years. A person of equal competence shall supervise the Work.	Original ACS assessment certificates shall be provided at the request of the Client's Representative.

Test Instruments

Item No	Item	Frequency	Action	Notes
2	Test Instruments		The Provider shall: Select a suitable test pressure gauge in accordance with IGE/UP/1A Edition 2 or IGE/UP/1 Edition 2 Ensure that the gauge is suitably ranged for the pipework section being tested. Ensure an adequate level of accuracy. Zero any gauge at the start of the test at atmospheric pressure. Ensure that any gauges are recalibrated at least every 12 months. Ensure that any electronic gauges are certified for use in a hazardous area, and stabilised to ambient temperature	Test and/or calibration certificates shall be provided at the request of the Client's Representative.

© Rand Associates Consultancy Services Ltd

Procedure Selection

Item No	Item	Frequency	Action	Notes
3	Selection of appropriate procedures		The Provider shall: Assess the installation requiring soundness testing and using the algorithm in IGE/UP/1A ascertain which standard of testing is applicable. It is envisaged that, in most cases IGE/UP/1A shall be the most applicable standard.	Evidence of application of the algorithm shall be required within reports. If, after application of the appropriate algorithm, the Provider believes that IGE/Up/1 is the most appropriate standard, the Provider shall seek further guidance from the Client's Representative.

Strength Testing

Item No	Item	Frequency	Action	Notes
4	General	Annually	The Provider shall: In accordance with IGE/UP/1A edition 2 ascertain whether a strength test is required. It is envisaged that, in most cases, strength testing of an existing installation shall NOT be required. Where the Provider, after application of the appropriate algorithm, believes the strength testing is appropriate, he shall undertake the testing in strict accordance with the requirements of the appropriate guidance note. Further guidance may be required from the Client's Representative	Evidence of application of the algorithm shall be required within reports. Copies of Method Statements and Risk Assessments shall be provided to the Client's Representative prior to the commencement of any works.

© Rand Associates Consultancy Services Ltd

Tightness Testing

Item No	Item	Frequency	Action	Notes
5	Pre-test inspection		The Provider shall: Visually inspect all pipework. Examine for corrosion. Examine hangers and supports. Examine all joints and connections. Examine electrical bonding. Ensure warning notices are in position. Examine schematic diagrams	Reference should be made to IGE/Up/2 and the IET Wiring Regulations
6	Calculation of Installation Volume (IV)		The Provider shall: By examination of the schematic diagram and a detailed survey of the installation, calculate the volume of the installation. Calculate the volume in accordance with IGE/UP/1A Edition 2. Include the IV on the schematic diagram and report form.	Copies of detailed calculations shall be provided to the Client's Representative and added to Gas Line Diagram and dated.
7	Tightness Test Pressure (TTP)		The Provider shall: Calculate the tightness test pressure in accordance with IGE/UP/1A Edition 2	
8	Selection of Pressure Gauges		The Provider shall: Select an appropriate pressure gauge, with appropriate sensitivity in accordance with Clause 2 Test instruments and IGE/UP/1A Edition 2.	Details of pressure gauges shall be recorded on report form. Test and/or calibration certificates shall be provided at the request of the Client's Representative.

© Rand Associates Consultancy Services Ltd

Tightness Testing (Cont'd)

Item No	Item	Frequency	Action	Notes
9	Test Criteria	Annually	The Provider shall: Calculate the maximum allowable pressure drop in accordance with IGE/UP/1A Edition 2, the calculated installation volume and the volume of the smallest occupied space or 60m3 as appropriate. Note: Even if the tightness test result is satisfactory, a smell of gas or a gas detector indicating the presence of gas is not acceptable.	Details of the calculation shall be included on the report form.
10	Tightness Test duration (TTD)	Annually	The Provider shall: Calculate the tightness test duration (TTD) in accordance with IGE/UP/1A Edition 2	Details of the calculation shall be included on the report form.
11	Test Procedures	Annually	The Provider shall: Undertake the test in accordance with IGE/UP/1A Edition 2	Note test requirements Record and report results Record let-by test period.
12	Appliances	Annually	The Provider shall: Strictly comply with the requirements of IGE/UP/1A Edition 2 regarding appliances.	

Purging

Item No	Item	Frequency	Action	Notes
13	Purging	Annually	The Provider shall: Strictly comply with the requirements of IGE/UP/1A Edition 2 Direct Purging	Reporting any purging undertaken

© Rand Associates Consultancy Services Ltd

Labelling and Schematic Diagrams

Item No	Item	Frequency	Action	Notes
14	Notices and Labels	Annually	The Provider shall: Revise the schematic diagram as necessary. Ensure that schematic diagram is displayed in accordance with the requirements of IGE/UP/2. Ensure that labelling is complete and in accordance with IGE/UP/2. Ensure that electrical bonding is labelled in accordance with the requirements of BS 7671.	Copies of the Gas supply line diagrams to be provided with the report

Reports

Item No	Item	Frequency	Action	Notes
15	Report Format		The periodic inspection report shall consist of the: 10.0Purpose of report 11.0Summary of installation/inspection 12.0Calculation of IV, TTP, TTD, and test criteria 13.0Summary of defects 14.0Installation description 15.0Photographs 16.0Test result certificates 17.0Recommended Works/Costs 18.0Test instruments	Including schematic diagrams Gas Safe forms
16	Report Representation		The Provider shall: 1 copy, bound in a folder 1 copy on CD in .pdf format	

© Rand Associates Consultancy Services Ltd

GATES AND SECURITY SHUTTERS

© Rand Associates Consultancy Services Ltd

GATES AND SECURITY SHUTTERS

GENERAL

001 The purpose of this Specification is to set out the requirements for the undertaking of Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works including risk assessments, testing and maintenance of powered/automatic access equipment (gates and security shutters) to ensure the Client's compliance with all current regulations and to identify any potential hazards and control risk to a reasonable level for those who might use the access equipment.

002 Ensure they have read the Contract Documents applying to the whole of the Works and shall ensure his full compliance with the aforementioned Contract Documents.

003 Ensure that they have allowed against each item or in his Rates for the cost of complying with all the requirements of the Contract Documents.

004 The headings of the clauses in this Specification shall not affect the interpretation thereof.

005 May be required to prepare a detailed breakdown of his pricing before the Contract is signed.

SCOPE OF SERVICES

Initial Site Survey

006 At the Commencement Date and in accordance with a Programme to be agreed with the Client's Representative, the Provider shall carry out an initial survey of all powered/automatic access equipment covered under the Contract.

007 Verify the location of the powered/automatic access equipment in relation to any site maps that maybe provided by the Client in whatever format and make any appropriate amendments on the event of any discrepancies after prior consultation and agreement with the Client's Representative.

008 Prepare and provide a photographic record of each item of powered/automatic access equipment. The photographic record shall be in digital format to be agreed with the Client's Representative.

009 Provide for each item of powered/automatic access equipment a written report on its condition and location features.

Contravention Report

010 Immediately following the initial survey of each item of powered/automatic access equipment, the Providershall provide to the Client's Representative a written report giving full details of any powered/automatic access equipment that contravene any current Health and Safety and Disability Discrimination and Occupier's Liability legislation, relevant BS/EN standards, local authority by-law requirements and any guidance issued by, but not limited to the Health and Safety Executive, the Royal Society for the Prevention of Accidents, Gate Safe and the Door and Hardware Federation.

011 The report shall be fully detailed and include recommendations (including budget costings) for the remedying of any contraventions so found.

Initial Inspection/Risk Assessment

012 Carry out an initial/major inspection in accordance with the current legislation, of all powered/automatic access equipment and provide separate written reports for each site to the Client's Representative.

© Rand Associates Consultancy Services Ltd

013 Carry out an initial risk assessment of all powered/automatic access equipment in recognition of the Client's responsibilities under the Management of Health and Safety at Work Regulations 1992 (and as amended). The risk assessment shall comprise an examination of all items of equipment together with the actual location and adjacent/surrounding areas in order to identify any potential hazards and assist to control risk to a reasonable level for those who might use the powered/automatic access equipment.

014 Typical hazards are identified without limitation in the publications "Guide to Gate Safety Legislation and Standards" by the Door and Hardware Federation and various Gate Safe Codes of Conduct and guidelines appended to this Specification.

015 Risk assessments shall be site specific and provided to the Client's Representative upon completion of the risk assessment for each site.

016 Additional risk assessments that may be required on the Instruction of the Client's Representative.

Profile of Powered/Automatic Access Equipment Life Expectancies

017 Provide an initial profile of all powered/automatic access equipment indicating condition and life expectancy. Any equipment that requires immediate repair is to be identified and the nature of the repairs needed is to be stated together with budget costings. Any equipment that is beyond repair should also be identified and, if it is considered appropriate for the equipment to be replaced, then the Provider shall so advise together with budget costs for replacement or removal and make good if not to be replaced.

Advice on Replacement of Powered/Automatic Access Equipment

018 Provide, following each of the quarterly and annual inspections a detailed report to the Client's Representative on any items of powered/automatic access equipment that it is considered should be replaced, together with the reasons/justification for proposing their replacement and associated budget costs.

Remedial Works to Powered/Automatic Access Equipment

019 Following the initial survey/inspection the Provider shall identify any repairs/minor replacements that are considered necessary to any powered/automatic access equipment. The reports provided to the Client's Representative shall be site specific and include full details of all repair Work/minor replacements necessary together with budget costs.

Annual and Quarterly Inspections

020 Carry out annually, at intervals not exceeding 12 months, a major inspection of all powered/automatic access equipment, to be conducted by a competent person and in accordance with the requirements set out in current legislation. It should be noted that the routine inspections will be carried out by the Client's own directly employed staff.

021 Carry out a quarterly inspection of all sites and the equipment contained therein.

022 Inspections shall be carried out in conformity with all current legislation, and site specific written reports shall be provided to the Client's Representative together with detailed recommendations (including budget costings) for any repair/maintenance/ replacement Work required.

023 The database referred to under Clauses 024 to 026 below shall be updated as necessary following each inspection including though not limited to the updating of photographic records if appropriate.

Provide and Maintain Database

024 Set up and maintain a computerised database holding all key information relating to each installation at each site including the linking in of photographic records.

© Rand Associates Consultancy Services Ltd

025 Update the database following each inspection as referred to in Clauses 020 and 021 above and make available the updated database to the Client's Representative within 14 days of the annual and or quarterly inspection.

026 The format of the database shall be agreed between the Provider and the Client's Representative prior to award of Contract.

ASSET REGISTER

027 Ensure that any asset registers supplied by the Client prior to the Commencement Date shall be verified within one week of visiting each Property and any discrepancies made known, in writing, to the Client's Representative.

028 At the Commencement Date, a set of services drawings may be issued to the Provider who shall ensure that, during each visit to undertake Routine Maintenance, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked- up drawings shall be returned to the Client's Representative.

INSPECTION, RISK ASSESSMENT AND MAINTENANCE REPORTS

029 Ensure that, following all visits to undertake Routine Maintenance, risk assessments and condition reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

030 Ensure, in addition that a site logbook, correctly sectioned and indexed, is maintained on site with the site manager containing duplicate copies, in the appropriate section, of all the reports information submitted to the Client's Representative.

031 The site logbook shall also contain a copy of the site risk assessment, method statement and COSHH for the Service Provider's Staff including all Specialist Subcontractors.

MANUFACTURER'S REQUIREMENTS

032 Where manufacturers' technical data sheet exceed the requirements of this Specification they shall be adhered to in their entirety.

PROGRAMMING OF WORKS

033 Submit and agree with the Client's Representative, within 5 working days of award of the Contract, a full annual Programme for all Works covering each element of the Routine Maintenance Works.

034 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

PERMIT TO WORK CERTIFICATION

035 If it is deemed necessary by the Client's Representative, a 'permit to work' shall be issued before any Work is undertaken on the system. The Provider shall ensure his compliance with such a 'permit to work' system as employed by the Client.

ACCESS

036 Ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

037 Ensure, where appropriate, all Works are carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

© Rand Associates Consultancy Services Ltd

038 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

GUIDANCE

039 Refer to the Specification, schedule of Works and to manufacturers' requirements and recommendations for detailed guidance. Other guidance is available from the HSE, Gate Safe, the Door and Hardware Federation, SAFeD and the BSI.

040 The publications "Guide to Gate Safety Legislation and Standards" by the Door and Hardware Federation and various Gate Safe Codes of Conduct and guidelines are an integral part of this Specification and are appended.

041 Pay particular attention to:
- The Machinery Directive 2006/42/EC
- The Supply of Machinery (Safety) Regulations 2008
- The Provision and Use of Work Equipment Regulations 1998 (PUWER)
- Health and Safety at Work Act
- ISO 7010
- Applicable Standards

042 Ensure, in respect of Intercom Systems, that they are a member of the NSI or SSIAB, and all engineers must be registered with one or both of these bodies. The Provider will observe in terms of standard, with respect to the Intercom Systems, all guidance made available for use by the NSI and SSIAB.

043 Observe in terms of standards, with respect to Access Control Systems, all guidance made available by the British Security Industry Association (BSIA), and the requirements of the Secured by Design Initiative (SDI).

044 All relevant equipment must satisfy the requirements of the Electromagnetic Compatibility (EMC) Directive.

MINOR REPAIRS

045 Carry out, during testing, minor repairs such as tightening joints, replacement of bolts etc., to achieve a pass status and make appliances safe.

© Rand Associates Consultancy Services Ltd

ROUTINE MAINTENANCE

046 Routine Maintenance must unless otherwise Instructed by the Client's Representative be carried out in accordance with the following requirements.

Electrically Operated Gates and Security Shutters Servicing Schedule

Item No	Item	Frequency	Action	Notes
1	Security Shutters – general	3 monthly	Check all nuts, bolts and screws on the tracks, as well as the automatic opener and the door itself to make sure everything is tightened securely. All the hinge pins should be oiled and all nuts and bolts retightened Examine all gearboxes drives and linkages Clean all tracks and grease the rollers. Ensure a thick grease is used that can accommodate temperature changes well. Replace rollers that don't operate smoothly Clean adjust and lubricate gear boxes Ensure correct adjustment of guides and pivots adjust where necessary.	Report all results to Client's Representative.
2	Security Shutters – controls	3 monhtly	Examine and test all controls. Ensure that wiring terminal connections are sound Examine earthing arrangements and test continuity Examine fuse holders, ensure that correct fuses are fitted Examine relays, clean and adjust as necessary Examine contactors and overload relays, clean and adjust as necessary.	Report all results to Client's Representative.
3	Powered Gates – general	3 monthly	Examine site log book Ensure that all installation, commissioning and service records are present and correct	Report all results to Client's Representative.

© Rand Associates Consultancy Services Ltd

Electrically Operated Gates and Security Shutters Servicing Schedule (cont'd)

Item No	Item	Frequency	Action	Notes
4	Safety Checks – powered gates	3 Monthly	Visually inspect door for damage, corrosion and obstructions Check peripheral speed in line with guidance Check closing forces conform to requirements of BS EN 12453 Check activation distances	Report all results to Client's Representative.
		3 Monthly	Check that suitable presence sensing devices are provided to ensure that the automatic powered gate will stop before it can strike, trap or draw-in a person or object	
		3 Monthly	Check that emergency stop buttons are provided and are easily identifiable and accessible	
		3 Monthly	Examiner and test emergency over-rides and manual operation devices	
5	Safety Checks – all powered gates	3 Monthly	Check that all necessary warning signs are fitted in accordance with PUWER e.g. Keep Clear In Emergency Push to Open Automatic Gate, Keep Moving	Report all results to Client's Representative.
6	Safety Checks – links to alarm systems	3 monthly	Test function during operation of fire and/or security alarms. Ensure fire doors return to closed position. Ensure access doors release from automatic drive. Confirm similar operation during mains failure.	Check design characteristics in Property log book.

© Rand Associates Consultancy Services Ltd

Electrically Operated Gates and Security Shutters Servicing Schedule (cont'd)

Item No	Item	Frequency	Action	Notes
7	Automatic Gates – General	3 monthly	Check all nuts, bolts and screws on the tracks, as well as the automatic opener and the door itself to make sure everything is tightened securely. All the hinge pins should be oiled and all nuts and bolts retightened Examine all gearboxes drives and linkages Clean all tracks and grease the rollers Ensure a thick grease is used that can accommodate temperature changes well Replace rollers that don't operate smoothly Clean adjust and lubricate gear boxes Ensure correct adjustment of guides and pivots adjust where necessary	Report all results to Client's Representative.
8	Electrical Installation	Annually	Examine flexible cables for wear, fraying braid and brittle insulation Examine connections. Tighten all terminals Test insulation resistance Check all controllers Check battery pack and programming switch Check and adjust drive belts Adjust delay and hold open times as necessary to ensure safe working order Clean and adjust micro switches, cams door drive units where necessary Generally clean door/frame and manual switches and check for correct working order	Report all results to Client's Representative. Submit written report signed by on site contact and forward copy to Client's Representative.

© Rand Associates Consultancy Services Ltd

Responsive Maintenance and Out of Hours Emergency Works

047 Attend to all call outs due to malfunction or breakdown.

048 Include for a call-out service to provide Responsive Maintenance and an Out of Hours Emergency Works Service. The Out of Hours Emergency Works service is deemed to extend the provision of Emergency Works to a 24 hour, 7 days a week, 365 (366 for a leap year) days per year basis.

049 Call outs for Responsive Maintenance and/or Out of Hours Emergency Works which, in the opinion of the Service Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

050 Where Out of Hours Emergency Works are attended to for authorised cases of breakdowns, mis-use or vandalism, the Provider will be paid in accordance with the Rates detailed in the Price Framework and the Schedule of Rates.

Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works

Repairs, Replacements and Adjustments

051 Accept responsibility for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

052 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

053 Works may be implemented during the Service Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

054 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

Firestopping

055 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

056 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

HEATING INSTALLATIONS - GENERAL REQUIREMENTS

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

GENERAL REQUIREMENTS

Applicability

001 This initial general section applies to all subsequent sections of this Specification of workmanship and materials **("this Specification")**.

002 This Specification is drafted as a series of Requirements that the Provider must ensure are complied with in relation to the Works. Each Requirement includes all tasks necessary to comply fully with the Requirement and the Schedule of Rates item(s) to which it relates.

003 The Schedule of Rates payments, as adjusted by the Provider's tendered Rates, include for carrying out all Works required by this Specification including detailed Requirements as may be described or delineated on the Client's standard detail drawings where appended to this Specification. No further payment is due to the Provider in respect of any such Works beyond the payments provided for in the Schedule of Rates.

004 Specifications across several Workstreams may be relevant to each Schedule of Rates item. The Provider must comply with all requirements of this Specification applicable to the specific type of Works to be undertaken.

005 References to paragraphs and sections in this Specification are to the applicable Paragraph and Section of this Specification. If any contradiction appears within the Specification sections, Schedules of Rates, the Client's Policy documents etc., the most rigorous standard takes precedent.

Standards of workmanship and Materials

006 Carry out and complete all Works as required by this Contract including:
- in accordance with all Law including Health and Safety Law and Building Safety Law;
- in accordance with all applicable Codes of Practice;
- in accordance with Good Industry Practice;
- in accordance with the Client's Policies;
- in accordance with any specific requirements for those Works in this Specification; and
- to the satisfaction of the Client's Representative.

007 To the extent that the standard of the Works has not been specified in this Contract, the Provider must agree the relevant standard for the Works with the Client's Representative before their execution. Where particular Works are to be "approved by" "agreed with" or are indicated to be "subject to the approval of" the Client's Representative, the Provider must give the Client's Representative adequate notice when such approval or agreement is required and retain evidence of all approvals given, and items that have been agreed, by the Client's Representative.

008 To the extent that it is necessary to design any aspects of the Works, in preparing those Designs the Provider hereby warrants that the services have been and will be performed with such skill, care, diligence and expedition as would be reasonably expected of a prudent experienced contractor with Design obligations having experience in carrying out projects similar in size, scope, nature, complexity and value to the services.

009 Maintain all existing lines and levels at all times and carry through new Work to the same lines and levels unless otherwise instructed by the Client's Representative.

European and British Standards and Codes of Practice

010 Ensure that the Works undertaken and all materials used in undertaking the Works comply with all applicable Standards and Codes of Practice that are current at the time of their use.

011 References in this Specification to any Standards and Codes of Practice are to be construed as references to the version current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

012 Where a specific Standard or a Code of Practice is referred to, this sets out the minimum acceptable standard of Materials or workmanship.

013 Any requirement in this Specification of Workmanship and Materials to use Material defined by reference to a specified Quality Assurance Scheme, British Board of Agrément Certificate, Standard or other approval, may be satisfied by compliance with an equivalent international Standard.

014 A Provider offering a Material or following a process on the basis of compliance with any such approval or international Standard shall notify the Client's Representative of all such substitutions in advance of placing any order and will be required to provide, (in English), technical or other details of the approval or standard and its qualifying tests.

Materials

015 The Client wishes to standardise the use of Materials across its Properties. This is in order to simplify parts requirements and van stock loads, to improve its repairs processes and to reduce maintenance costs. The Provider must, wherever possible, match all new Materials to materials currently used in the Properties, particularly in terms of their parts requirements and repair procedures. In this Specification the Client has set out details of its current Materials to which the Provider is required to standardise.

016 Where this Specification indicates that Materials are to be "approved by the Client's Representative", the Provider must provide samples of the proposed Materials to the Client's Representative for approval. Any Materials that comply with the functionality and compatibility (including aesthetic compatibility) requirements of this Specification may be proposed. No further approval is required for any Materials listed in this Specification as being the Client's currently used materials. The purpose of the Client's Representative decision on the use and approval of such Materials is to ensure that they meet the Client's requirements for functionality and compatibility. The decision of the Client's Representative on this is final.

017 Where this Specification requires Materials to be matched to existing materials or finishes, this match is subject to the approval of the Client's Representative.

018 Do not use any Prohibited Materials in carrying out the Works. Prohibited Materials are those Materials which are generally accepted or (having regard to Good Industry Practice) are reasonably suspected of:
- being harmful in themselves;
- being harmful when used in a particular situation or in combination with other Materials;
- becoming harmful with the passage of time; or
- being damaged by or causing damage to the structure in which they are to be affixed.

019 Materials are to be regarded as harmful if, in the context of their use in the Works (whether alone or in combination with other materials) they:
- are prejudicial to health and safety;
- may pose a threat to the structural stability or the physical integrity of any Property; or
- could materially reduce the normal life expectancy of any part of the Property.

020 CE/UKCA Marked Products: All products referred to throughout this document and supplied to the Client, or used in the Works, must be supplied with a Declaration of Performance (DoP) and carry the appropriate CE/UKCA conformity assessment marking.

Performance Standards on the CE/UKCA mark must comply with relevant Building Regulations as required.

The CE/UKCA mark must be fixed visibly, legibly and indelibly either to the product or to a label attached to the product. If this is not possible or not warranted, then it must be fixed to the packaging or within the accompanying documentation.

The DoP must be made available by the manufacture (this may be via a website).

© Rand Associates Consultancy Services Ltd

021 Use, fix and apply all Materials strictly in accordance with the manufacturer's recommendations, directions or technical data sheets.

022 Participate in joint initiatives with the Client's Representative and contractors to establish supply chain agreements.

023 Where appropriate suggest (economically viable) amendments to this Specification where those amendments may lead to an improvement in environmental performance or sustainability.

024 Provide all information the Client's Representative reasonably requests regarding the environmental impact of the supply and use of any Materials and goods the Provider selects for use in the Works.

025 **[optional clause]** This Specification incorporates the Client's Codes of Practice in respect of the following:

- **[insert details]**

In the event of any conflict or disparity between the requirements and obligations contained in the Codes of Practice and this Specification, the Codes of Practice will have precedence.

026 Client's Standard Details where appended to this Specification are to be referred to by the Provider to amplify both this Specification and the descriptions in the Schedule of Rates. The Schedule of Rates descriptions are deemed to be fully inclusive of any requirements delineated, described or illustrated in such Client's Standard Details. It should be noted that the Standard Details may contain a unique referencing system that relates to an alternative Client's specification. That specification does not form part of this Contract, and where this type of referencing occurs it should be considered as a reference to a comparable item of equal quality and performance within this Specification and Schedule of Rates.

Web Based Electronic Log Books

027 The Provider is required to provide an Electronic Monitoring System or Log Book.

028 The electronic monitoring system shall be designed in such a way that the Client can be involved in the planning, management and view its compliance with its obligations as a landlord.

029 The system shall be web based with varying levels of access as the Client is a multi-site, multi-Client organisation.

030 The scheduled servicing, certification and inspection tasks as set out within the Specification must allow for customisation for each particular Property contained within the Schedule. Occasionally this may include new Properties or installations as and when the requirement arises.

031 Tests out of Specification shall generate a non-conformity report that shall be immediately available to the Client's Representative.

032 The Client will require the ability within the program to create notes or messages within the system; this must be recorded within the software audit trail.

033 All non-conformities raised must be clearly identified as a visual warning on the date of the fault and be summarised in visual alert facility and report.

034 The central electronic logbook will have communication software with the ability to 'synchronize' any test results put in by each remote site, Providers or into the central database.

035 The logbook software must include a user password security system, which can be set up by the administrator of the software and allow or restrict access as applicable.

© Rand Associates Consultancy Services Ltd

036 The Client will require the Provider to supply support to include:-

- Telephone support during normal office hours Monday to Friday;
- Future upgrades and training for use of software as a result of improvements or changes in current legislation.
- All data stored shall be the property of the Client and all data must be provided to the Client's Representative on a regular basis on demand and at the termination of a Contract.

037 The system shall be available to all Providers and not limited to any single provider.

038 The Client will own all data and such data should be made readily available by the Provider to the Client's Representative upon request in a recognised format (e.g. Excel).

Asset Register and Condition Survey (Optional – Delete if not part of Contract)

039 The Provider must, within the first 12 months of the Contract Period (i.e. at the end of the first Servicing Period) ensure that each installation, appliances, controls and the like at each Property has a unique identifiable number.

040 Also within the first 12 months of the Contract Period, the Provider must provide the Client's Representative with an electronic report containing a listing of all Properties in alphabetical order and indicating against each Property, the full name and address of the Properties; a full positional listing of all systems, installations, equipment, appliances and the like referenced with their uniquely identifying number in accordance with paragraph 038 above; the dates when Periodic Servicing and Inspections has been undertaken and/or is due in respect of each Property.

041 At the same time, the Provider is required, at the Client's Representative's request, to submit to the Client's Representative a separate electronic report detailing any specific recommendations with respect to any individual Property or group of Properties, together with the condition and life expectancy of the Heating Appliances and Heating Installations.

042 At the completion of each visit to a Property the Provider's operatives must complete electronically clear and explicit service report sheets. The electronic signature of the Customer in respect of an individual Property must be obtained as proof of the Works being undertaken and completed. Copies of reports are to be forwarded to the Client's Representative, together with any recommendations for Works not already authorised. If the recommendations include for Works not covered by Rates in the Contract Documents then a quotation for such must be included with the service report sheets. The Provider must update the electronic log book with all service report sheets.

043 The service report sheet is also to incorporate the following information:

5. arrival and departure times
6. state of installation or system on arrival
7. details of works carried out
8. details of any parts or components repaired/renewed

044 It should have a document storage system that includes:

1. Method Statements
2. Risk Assessments
3. COSSH Assessments
4. PPM Planner
5. Record Sheets
6. Test Certificates
7. Photographs
8. Schematic Layouts

© Rand Associates Consultancy Services Ltd

045 When visiting any Property to undertake Periodic Servicing and Inspections the Provider must ensure were applicable that the Clients' installation complies with "The Gas Safety (Installation and Use) Regulations 1998" and any subsequent revisions to this effect. Gas appliances including flues must be checked for safety and a mechanical tightness test must be carried out to the gas carcass of the site, with any fault or non-compliance reported to the Client's Representative for immediate attention.

Periodic Servicing and Inspection

046 An annual comprehensive service of every appliance and installation to manufacturer's specification at the Properties scheduled which may vary from time to time, including all replacement, repairs and maintenance necessary for the efficient operation of such appliances, associated installations and all of the component parts thereof, excluding Customer owned gas cookers, also including the cleaning, testing and replacement of batteries where applicable (to manufacturer's specification) to smoke alarms, heat detectors and CO detectors.

047 All in situ smoke alarms (battery or hard wired) that are the responsibility of the Client are to be cleaned and tested and where necessary batteries are to be replaced, test and leave in sound working order.

048 Hard wired smoke alarms that are found to have malfunctioned are to be reported back to the Client's Representative who will if appropriate provide an Order to replace in accordance with an agreed schedule of rate price to be found elsewhere in this Contract.

049 The Work specified for the programmed Periodic Service and Inspection is designed to provide adequate preventative maintenance and to eliminate faults, thereby enabling an appliance to operate without attention for a further twelve months.

050 Such appliances, installations and flues covered by this Contract will receive a minimum of one Periodic Service and Inspection visit every 12 months. On this visit the Provider will carry out a schedule of Works appropriate to the type of appliance and installation installed, to the relevant manufacturer's servicing instructions, and carry out the Work as detailed in this Specification.

051 The Provider will adopt as part of the Periodic Service and Inspection process the following.

052 A flue analyser test will be undertaken using equipment that has the capability of providing a flue gas analyser record in print out format. If, when the test is undertaken, it is identified that adjustment is required, the Provider will, following the adjustment, undertake a further analyser test with hard copy print outs.

053 As the production of Landlords gas and oil safety certificates are to be in an electronic format the hard copies of the before and after flue analyser print outs are to be forwarded to the Client's Representative with identification as to the Property to which they refer.

.1 Check all types of ventilation to ensure conformity with all relevant regulations associated with the specific type of fuel being used, manufacturer's technical data sheet and requirements, and the particular requirements of the Gas Safety (Installation and Use) Regulations 1998 and any subsequent revisions to this effect regarding gas appliances.
If the ventilation does not meet the above requirements, inform the Client's Representative immediately, and make arrangements to install ventilation within 24 hours but only after the Client's Representative has issued an Order.

.2 Carry out a comprehensive safety and visual inspection of all types of flue installations and chimneys irrespective whether or not an appliance is installed, this is to include, smoke testing, inspection of joints, ensuring the flue is fixed securely, is of sound and correct construction, and compliance with all relevant regulations (in particular a notice will be affixed to bricked up flues stating they have not been tested (see appendices).

054 Gas fired Heating Appliances and Heating Installations - Isolate the appliance from gas and electricity supplies.

© Rand Associates Consultancy Services Ltd

055 The Provider will also be required as part of the Periodic Servicing and Inspection, test and record installation inhibitor levels and where it is identified that replenishment or total replacement is necessary this will be done by using an approved proprietary brand non-toxic biodegradable inhibitor.

056 Where it is identified that total replacement is required the Heating Installation will be drained, flushed and refilled in accordance with standard procedures.

057 Clean, lubricate, adjust, renew, replace, repair, descale and desludge and carry out operations as required to ensure that Heating Appliances and Heating Installations are functioning correctly, to the following:-

Test results are to be recorded were applicable on the electronic Landlords Gas, Oil, Solid Fuel or Biomass Safety Certificate under details or additional information.

1. All types of manual and automatic appliance controls.

2. All types of thermostats.

3. All types of time switches, clocks and programmers, and energy conservation devices.

4. All electrical wiring from the point of connection to the ring main circuit, to any appliance, or control or component part to include the immersion heater high limit stat where fitted and any cross bonding including any burnt or heat affected wiring anywhere within the installation. Also ensuring the fuse is of the correct rating and its replacement if incorrect.

5. All types of ignition system, burners and pilot lights, including removal of any blockage regardless of its nature.

6. In all Properties isolate all valves and stop cocks and ensure their correct operation and return them to their original operating position upon completion.

7. All flues, flue ways, combustion chambers, flue baffles draught diverters, terminals including removal of any blockage regardless of its nature.

8. All valves (zone, economy, and non-return safety), including any adaption of pipework required.

9. All fan motors and ancillary controls for both warm air and fan assisted boilers.

10. All water pumps and isolation valves;

11. All gas valves and safety devices.

12. All water heating units.

13. All radiator valves if thermostatic will be valves manufactured to applicable Standard and standard wheel head/lock shield manufactured to applicable Standard or similar and approved.

14. All warm air registers, grilles, diffusers.

15. All types of heat exchangers.

16. All radiators, cylinders, hot water storage tanks. All types of combination tanks.

17. All pipework between appliance and cylinder, and the whole heating circuit to radiators cold feed and expansion and ducting.

18. Adequate re-fixing of radiators and warm air registers and grilles etc, should they become detached from their fixing for any reason.

© Rand Associates Consultancy Services Ltd

19. Total installations to be descaled and de-sludge as necessary. This includes any scale in all types of hot water storage tanks and cylinders. Renew appliance scale reducer cartridges or contents if loose fill at each service and at other times as necessary, topping up will not be permitted under any circumstances.

20. Expansion tank, including water level, ball valve, warning pipes and feed and expansion pipework, and topping up of installation should the isolation valve become turned off.

21. Where applicable restore gas, oil and electricity supplies and check all internal pipework for gas soundness.

22. Commission appliance, checking and adjusting where necessary, gas rate, flame picture, operation of flue, ignition devices and appliance controls and check for spillage as in accordance with applicable Standard.

    Where any room of the premises is fitted with a fan (e.g. an extract fan, or a fan incorporated with the Heating Appliance), operation of the fan(s) shall not adversely affect the performance of the flue when the flue is tested in accordance with applicable Standard.

23. The date of the Periodic Servicing and Inspection visit will be scheduled in two hour appointment slots. Work is to be carried out on the days and hours outlined elsewhere in the Contract.

24. Attach label to appliance stating date of Periodic Servicing and Inspection, when next Periodic Servicing and Inspection is due, name of engineer, Provider's telephone number for breakdown and emergency service, the gas providers free phone telephone number for the reporting of gas escapes, also the Client's free phone telephone number for out of hours emergency services and leave a satisfaction card that shows clearly the identification of the engineer, in a format to be agreed with the Client's Representative.

25. Costs for labels, including fixing, will be the responsibility of the Provider.

26. Following completion of the Periodic Servicing and Inspection instruct the Customer on the use of the controls and as applicable the location of the main gas, electric and water stop cock controls and confirm with the Customer an understanding as to their use/purpose.

27. Complete an installation report i.e. electronic Landlord Gas Safety Certificate in an agreed format with the Client's Representative

058 Check and test thermostats on domestic hot water cylinders and recalibrate where necessary.

059 The Provider should note that all electronic Landlord Gas, Oil, Solid Fuel and Biomass Safety Certificates are to be uploaded by the Provider directly onto the Clients' I.T. System. Certificates not correctly completed will be returned for the Provider to revisit site and amend accordingly with the provision of a new form.

A three page form:

Copy 1 - Client

Copy 2 - Customer

Copy 3 - Provider

<u>Costs for uploading Safety Certificates are deemed to be included in the Provider's rates within the Price Framework</u>

© Rand Associates Consultancy Services Ltd

Routine Maintenance and Responsive Maintenance

060 The Provider shall provide a 24-hour, 365 days per year (366 for a leap year) Routine Maintenance and Responsive Maintenance service for the period of the Contract to allow for breakdowns or malfunction of any Heating Appliance or Heating Installation and the replacement of any components or installation parts previously specified. The details of any repair are to be noted by the engineer for registering on the Provider's database.

061 All Works in connection with the Routine Maintenance and Responsive Maintenance to be arranged by the Provider.

062 For breakdowns the Provider is expected to complete a minimum of 80% of such repairs at first fix within one day and 100% within two days. The aim of this Requirement is to minimise any disruption to the Customer relating to use of water/space heating facilities.

063 Where the above is not achievable with Materials being unavailable from impressed or local stockist, the Provider is to immediately notify the Client's Representative and the Customer and provide time scales for completion of the Works where replacement Materials are required.

064 On receipt of a request being made by the Client's Representative and or the Customer the Provider shall comply with the following:-

a) EMERGENCY CALLOUT ATTENDANCE WILL MEAN THE FOLLOWING:

Emergency call outs to be responded to immediately and no later than 2 hours and completed or made safe within 24 hours.

If deemed necessary the Client's Representative can instruct the Provider to attend on demand breakdown calls within the above time stipulation to Properties outside of the above category.

Breakdown repairs are to be completed within the stipulated attendance timescales, with every effort being made to complete on a first call, first fix basis, where this cannot be achieved the timescales as mentioned above will apply.

b) URGENT WORKS

Reported after 1 pm attend next day by 12 noon.
To be commenced immediately and no later than 24 hours and completed within 48 hours.

c) Ensure that each engineer is equipped with an adequate impressed van stock of parts to deal with most eventualities. A comprehensive stock of impressed spare parts, shall also be kept at the Provider's control point and store to enable items such as cylinders and where applicable immersion heaters to be replaced immediately.

d) Ensure that temporary heating is available to the Customer in the event of a repair not being possible at the time of attendance. The temporary heating will as a minimum be two x 2kW electric panel heaters with time and temperature controls or any other type of heater approved by the Client's Representative. Where alternative hot water provision is available in the form of an immersion heater ensure that it is operational before leaving the Property.

Before leaving the Property the engineer must obtain the Customer's signature as proof of receipt of the temporary heaters being left on site.

The Provider shall not, without the consent of the Client's Representative remove any temporary heaters from the site until such time as the fault has been rectified to the Client's Representative's satisfaction.

If rectification of the fault is not possible at the time of attendance the fault must be rectified within the previously stated time scales.

© Rand Associates Consultancy Services Ltd

In the event of rectification not being considered possible as aforesaid, the Provider shall immediately notify the Client's Representative and the Customer giving the reasons as to why, and inform the Client's Representative and the Customer when the repair will be completed. The Client's Representative must satisfy himself that suitable alternative temporary arrangement for hot water and heating are in place.

Notwithstanding the generality of the Provider's obligations hereunder, the expression "component part" shall include the parts listed elsewhere hereof and any other specialist controls associated with a particular installation.

e) Ensure that the Customer is kept informed of the situation at all times.

f) Upon completion of a breakdown, a satisfaction card is to be left with each Customer, the approved work document card is to be duly completed and a copy of such is to be sent to the Client's Representative.

g) In addition to the requirements detailed previously the Provider shall also allow to provide the following services, which may be included for within the rate per Heating Appliance (see Invitation to Tender and Contract Details for inclusions):

1. Advise on efficient and correct use of Heating Appliance and Heating Installations.

2. Instruct new and existing Customers on the operation of Heating Appliances and Heating Installations.

3. Resetting of programmers, thermostats and other controls for any reason.

4. Re-lighting pilot lights for any reason.

5. Restoring gas and electric supplies if turned off for any reason. Except for non-payment for supply by the Customer or where to restore the supply would be dangerous or any Transco relay programme.

6. Calls to determine location of water leaks if not on pipework associated with the Heating Appliances and/or Heating Installations covered by this Specification, and advise the Client's Representative of the correct location, and repair the leaks.

7. All calls where a Customer maintains a Heating Appliance or Heating Installation is faulty, even if no such fault is found to exist.

8. All calls where the fault reported is due to controls being incorrectly set.

h) The breakdown element of the Works shall be priced in accordance with the schedules contained elsewhere in this Contract and shall be inserted in the Price Framework.

i) The Provider is to provide on a daily basis a breakdown status report on each Property visited.

065 Before attending a breakdown the Provider should contact the Customer to ascertain where reasonably possible as to the authenticity of the call to establish if the malfunction is due to Customer error such as installation/control adjustments or gas/electricity failure.

Replacements to Heating Appliances

066 If the Provider considers that Materials required to repair a Heating Appliance or Heating Installation are no longer available the Client's Representative shall be informed immediately.

067 The Provider will need to demonstrate this to the Client's Representative, and shall do so by supplying the Client's Representative with written confirmation by the manufacturer's that the part or parts in question are indeed obsolete. This confirmation shall be provided within 48 hours.

© Rand Associates Consultancy Services Ltd

068 Should a Heating Installation control be shown to be obsolete, and it is possible to replace this item with an equivalent available control, then this equivalent shall be installed and provided free of charge to the Client. Should this replacement control necessitate the exchange of other controls, which are not obsolete, then the Provider is responsible for the cost of providing and installing the new controls and costs incurred for any alterations to pipework or wiring.

Works Procedures

Maintenance Works Procedures

069 The Routine Maintenance and Responsive Maintenance services comprises a full maintenance service of the Client owned gas, oil, solid fuel and biomass heating and hot water Heating Installations including all gas, oil, solid fuel and biomass Heating Appliances specified herein.

Note: There is no provision in this Contract Specification for the replacement of parts to Customer's own fires and cookers.

070 For all Routine Maintenance and Responsive Maintenance visits the Provider shall be required to complete the landlord's Gas, Oil, Solid Fuel or Biomass Service report form.

Replacements Parts

071 All replacement parts (Materials) not forming part of this inclusive Contract are to be fitted as necessary and charged as per the schedule of rates after first notifying the Client's Representative of the reasons for change and receiving Instructions from the Client's Representative to do so.

072 Payment for works under schedule of rates will only be made where Valuations are accompanied by an Order issued by the Client's Representative.

073 If the Provider considers that parts required to repair a Heating Appliance or Heating Installation are no longer available the Client's Representative shall be informed immediately. The Provider will need to demonstrate this to the Client's Representative and shall do so by supplying the Client's Representative with written confirmation by the manufacturer's that the part or parts in question are indeed obsolete. This confirmation shall be provided with 48 hours.

074 Should a Heating Installation control be shown to be obsolete, and it is possible to replace this item with an equivalent available control, then this equivalent shall be installed and provided free of charge to the Client. Should this replacement control necessitate the exchange of other controls, which are not obsolete, then the Provider is responsible for the cost of providing and installing the new controls and costs incurred for any alterations to pipework or wiring.

Emergency Responsive Service

075 The Provider must provide and maintain a local operating base located within or adjacent to the Contract area from which the Works may reasonably be undertaken within the response times required, during normal working hours and out of hours. The Provider must be equipped to receive calls and orders however transmitted (telephone, radio, fax, email) and provide the Client with a single low cost telephone number that can be published to Customers.

Provider's Conduct

076 The Client is intent on providing an expeditious, safe and efficient Routine Maintenance and Responsive Maintenance service to the Customers of its Properties and consequently the Provider must do his utmost to promote and enhance the image and reputation of the Client in this respect.

077 The Provider must require his Staff engaged upon the Works to be properly and presentably dressed in appropriate uniforms or workwear.

© Rand Associates Consultancy Services Ltd

078 The Provider must ensure that his Staff must perform their duties in an orderly and quiet manner as may be reasonable and practicable having regard to the nature of the duties being performed by them.

079 The need to maintain the highest standards of hygiene and courtesy whilst the Provider's Staff are engaged upon the Works is paramount and in particular consideration must be given to Customers and other occupiers when working in or near occupied premises. The Provider must observe all of these provisions and also ensure that the said Staff do not cause a nuisance and or disturbance to Customers and other occupiers when they are working in or near occupied premises.

080 The Client's Representative is empowered by this provision to give written notice to the Provider requiring him to remove from the Works forthwith any Staff of the Provider engaged upon the Works, if he is not satisfied in any way with the respective Staff member's apparel, conduct, manner, or ability. The Provider must on receipt of such notice comply forthwith and remove the Staff member from the Client's Properties and the Staff member must not be employed or engaged upon or in connection with the Works whilst the Contract remains in force.

081 The Client's Representative will from time to time poll Customers to obtain their views on the effectiveness of the service provided by the Provider and the manner adopted by his Staff when discharging their duties. The results of the poll will be taken into account when considering the needs for resourcing future repair and maintenance programmes.

Registered Provider

082 The Provider must have and maintain throughout the Contract Period registration with the:-

(a) Gas Safe Register or such other body as may from time to time be approved by the Health and Safety Executive and

(b) OFTEC or such other body as may from time to time be approved by the Health and Safety Executive and

(c) HETAS or such other body as may from time to time be approved by the Health and Safety Executive and

(d) Micro-generation Certification Scheme (MCS) or such other body as may from time to time be approved by regulation and

(e) NICEIC and/or ECA or alternatively, the Provider may employ a Subcontractor, to be approved by the Client's Representative under the Contract, who is registered with an approved licence to practice system, an example of which is Sparksafe or the NICEIC and/or ECA in order to undertake electrical Work in connection with the Works.

083 In the event that the Provider's Gas Safe Register or OFTEC or HETAS or MCS or approved licence to practice system or NICEIC or ECA registration becomes suspended or withdrawn or has any conditions attached for whatever reason, the Provider must immediately notify the Client's Representative in writing giving full details of the reasons for such and the proposed or intended action and time-scale for gaining reinstatement of its registration(s). With immediate effect from the date of suspension or withdrawal of its registration(s) and until reinstatement the Provider must, subject to approval of the Client's Representative, be required to employ a suitably registered Subcontractor to undertake Works under the Contract.

084 Should the Provider be unable within a period of two weeks to engage a suitably registered Subcontractor which meets the Client's Representative's approval and or the period of suspended or withdrawn registration(s) exceeds or is likely to exceed four weeks then, the Client may at its sole discretion terminate the Provider's employment under the Contract in writing with immediate effect. Such action on the part of the Client will constitute a valid termination in accordance with the Contract Conditions.

© Rand Associates Consultancy Services Ltd

Existing Installations

085 The Client does not guarantee the condition or composition of fluid within wet systems. The cost of the removal of sediment and/or the re-establishment of the correct water/anti-corrosion fluid (or any other chemical) mix must be deemed to be included in the Schedule of Rates, and/or the Provider's tendered Percentage Adjustment and/or tendered Maintenance Rates as appropriate.

Existing Heating Installations and Heating Appliances

086 As far as the Client is aware, its existing Heating Installations and Heating Appliances have been installed and maintained with due regard to both the British Standards and the Regulations.

087 The Provider is required to conform to recommendations and required methods of testing etc., contained in the Gas Safety (Installation and Use) Regulations 1998 and any subsequent revisions to this effect.

088 The Provider in carrying out the Works must have due regard to all the above and must not do anything which will compromise or degrade the integrity of the Heating Installations and or Heating Appliances.

Reinstatement by the Provider

089 The Provider will be required to cut out any chases in floors, ceilings or walls, remove and refix insulation, floorboards, panels and the like to expose pipework for maintenance, repair, exploratory or investigation purposes and on completion to reinstate affected areas, insulation and surfaces to their original condition.

090 Any exposed work left unattended must be protected and temporarily covered by the Provider at his own cost, but incomplete work to gas or oil ways or pipework must not on any account be left unattended unless made gas tight with a satisfactory fitting, to remove any possibility of gas escape or promote any unsafe or dangerous situation.

Leaks to Pipes Laid in Floors

091 The Provider is required to open up the floor of any Property to trace and identify the source of the leak. The Provider will drain down the installation, remove the defective pipe and/or fittings and carry out the repair using capillary fittings. The installation is to be recharged and left standing for 2 hours to test the repair. The Provider will make good the floor, in the case of screeded floors these must be made good with asphalt or cement and grano compacted to completely encase the pipework subsequent to covering the pipework with an approved sleeve or wrapping tape. The floor will be allowed to dry out and the Provider will then recommission and put into use the Heating Installation.

092 Alternatively the Provider may wish to seek approval from the Client's Representative to bypass the defective pipe in the floor or wall with an exposed run of pipe connected into the circuit at expedient points. The Provider should not on any account undertake this alternative without first obtaining the Client's Representative's approval.

Routine Maintenance and Responsive Maintenance Records

093 When the Provider visits Properties in order to carry out Works and undertake the Periodic Service and Inspection in accordance with the Contract, the Routine Maintenance and Responsive Maintenance Works must be completed prior to carrying out the said Periodic Service and Inspection.

094 On each occasion the Provider gains access to the Property for the purpose of carrying out the Work, he must before leaving the Property, forthwith complete forms appropriate to the type of Work undertaken in the form and manner prescribed hereafter.

© Rand Associates Consultancy Services Ltd

095 The Provider must at his own cost, provide for each Property a sufficient quantity of forms and notices, for the purposes of recording in ink from time to time, information in respect of the Heating Installations and Heating Appliances. The format and content of the said forms and notices, must be based upon the models in Appendix to this Specification but in any case, are subject to the overriding approval of the Client's Representative and where required by statute, the Health & Safety Executive.

096 The Provider must record upon the forms and notices, general information as follows:-

(1) The address of the Property to which the form applies.

(2) Details of the respective Heating Installations and or Heating Appliances and their location in the Property, clearly indicate any Heating Installations or Heating Appliances which have not previously been contained in the Provider's and or Client's records.

(3) Any changes to previously recorded details of Heating Installations or Heating Appliances.

(4) The name of the firm and its Gas Safe Register registration number were applicable, and the name, signature and Gas Safe Register registration number were applicable of the firm's employee who undertook any work, inspection or check and the date and time of the undertaking.

097 In addition, the Provider must record specific information upon the forms and notices as follows:-

Periodic Service Log;

098 Details of all Work undertaken during any Periodic Service and Inspection and Routine Maintenance undertaken and confirmation that the provision of the Regulations of the Gas Safety (Installation and Use) 1998 and any subsequent revisions to this effect have been complied with.

Repairs Log;

099 Details of all Responsive Maintenance Work undertaken and confirmation that the provision of the Regulations of the Gas Safety (Installation and Use) Regulations 1998 and any subsequent revisions to this effect, have been complied with.

Landlord's Gas and Oil Safety Record;

100 Details of the Periodic Service and Inspection as follows:

(i) the date on which the Heating Appliance, Heating Installation and or flue was checked;

(ii) the address of the Property at which the Heating Appliance and or flue is installed;

(iii) the name and address of the client (or their agent) responsible for the Properties at which the Heating Appliance and or flue is installed;

(iv) a description of and the location of each Heating Appliance, Heating Installation and or flue checked;

(v) any defect identified;

(vi) any remedial action taken;

(vii) confirmation that the Periodic Service and Inspection has included an examination of:-
- (a) the effectiveness of any flue,
- (b) the supply of combustion air,
- (c) the appliances operation pressure or heat input,
- (d) the appliances operation so as to ensure its safe functioning and,

© Rand Associates Consultancy Services Ltd

(viii) the name and signature of the individual carrying out the Periodic Service and Inspection; and

(ix) the registration numbers with which that individual and the Provider are registered, with a body approved for the time being by the Health & Safety Executive.

Landlord's Solid Fuel and Biomass Safety Record;

101 Details of the Periodic Service and Inspection as follows:-

(i) the date on which the Heating Appliance, Heating Installation and or flue was checked;

(ii) the address of the Property at which the Heating Appliance, Heating Installation and or flue is installed;

(iii) the name and address of the client (or their agent) responsible for the Properties at which the Heating Appliance, Heating Installation and or flue is installed;

(iii) a description of and the location of each Heating Appliance, Heating Installation and or flue checked;

(iv) any defect identified;

(v) any remedial action taken;

(vii) confirmation that the Periodic Service and Inspection has included an examination of:-
(a) the effectiveness of any flue,
(b) the supply of combustion air,
(c) the appliances operation pressure and heat input,
(d) the appliances operation so as to ensure its safe functioning and,

(vi) the name and signature of the individual carrying out the Periodic Service and Inspection; and

(ix) the registration number with which that individual or the Provider is registered, with a body approved for the time being by the Health & Safety Executive.

The Provider following the successful completion of the Periodic Service and Inspection must provide to the Client's Representative no later than 2 days after completion of the Periodic Service and Inspection a certificate in an approved form which must be signed by the Provider's engineer and uploaded to the Client's IT System.

Customer Owned Appliance Notice;

102 Advice to those Customers who own, or are entirely responsible for Heating Installations or Heating Appliances which are connected to the Client's flue and or gas pipework, of their responsibility in respect of the need to have their portable or permanently installed Heating Installations or Heating Appliances and any flue connected thereto, annually checked for safe operation and serviced by Gas Safe Register registered repairers.

Actions arising from Forms and Notices

103 The forms and notices completed by the Provider must be dealt with and the information thereon, delivered to persons in the form and manner prescribed hereafter:-

The Provider must get the Customer of the respective Property to endorse their signature upon the forms, to provide evidence that the Provider has undertaken an examination of the Client's Heating Installations or Heating Appliances.

The original documents should be uploaded to the Client's IT System within **two** Working Days after completion of the works

© Rand Associates Consultancy Services Ltd

The Provider should retain a copy of the documents for his own records.

Were applicable, a copy only of the landlord's gas safety record also signed by the individual who undertook the Periodic Service and Inspection, should be handed to the Customer.

However, if the Customer refuses to sign the landlord's gas safety record or the Customer at the time is a minor, the Provider should in each case, deliver the unsigned copy of the said Safety Record signed by the individual who undertook the Service to the Client's Representative, together with a list of the unsigned documents in the batch of documents.

In the case of the Customer advice notice issued to the Customer in respect of a Heating Installation or Heating Appliance owned by them or for which they are entirely responsible, copies of the said notices should be uploaded to the Client's IT System with the contemporaneous batch of forms.

Service Label

104 The Provider must at his own cost provide a durable heat resisting self-adhesive label of a type to be approved by the Client's Representative. Immediately upon completion of Work to any Heating Appliance and/or Heating Installation the Provider must enter in ink upon the label information as follows:-

- Name of the firm,
- Date of the Periodic Service and Inspection, Routine Maintenance and Responsive Maintenance together with details of work undertaken
- The signature of the engineer who undertook the Work.

105 Upon completion of the entries on the label the Provider must affix the label in a prominent place on the inside of the casing or housing of the boiler and/or Heating Appliance subject of the Periodic Service and Inspection, Routine Maintenance and Responsive Maintenance.

Repairs Order

106 The Provider immediately after responding to an Order issued by the Client's Representative, must provide a record on the Client's IT System of the Responsive Maintenance undertaken and the date and time when the Responsive Maintenance was executed.

107 In addition, the Provider must obtain the Customer's electronic signature to indicate that the Heating Installation and/or Heating Appliance has been left in working order.

Notification of Implementation of 'The Gas Industry Unsafe Situations Procedure – Dealing with Unsafe Situations in Customers Premises'

108 The Provider is also required to agree with the Client's Representative prior to the commencement of the Contract the format of written notices to be given both to the Client's Representative and to the Customer of the Property if the Provider is required to implement the requirements contained in the publication 'The Gas Industry Unsafe Situations Procedure', arising from events covered by the Works. The notices are to be issued to the Client's Representative and to the Customer within 24 hours on the implementation of the Procedure. The Provider is to verbally inform both the Client's Representative and the Customer immediately upon the implementation of the Procedure.

Notification of RIDDOR

109 In the event of any accident to Staff or Customers on the Property, the Provider must immediately inform the Client's Representative and must supply the Client's Representative with copies of reports; including F2508 1986/REV forms, in accordance with the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 2013, within **7** days of the incident.

© Rand Associates Consultancy Services Ltd

Materials

110 All Materials used must comply with British Standards, current at the time and only approved replacement Materials must be fitted when servicing, maintaining or repairing any Heating Installation or Heating Appliance. Wherever possible Materials fitted by the Provider must be on a like for like basis but in any case, must be of comparable quality and finish and be consistent with the performance requirements of the respective installations unless the defective material, part and or component was of an inferior quality to the relative British Standard in which case the Material provided by the Provider will be at least to current British Standards and be consistent with the performance requirements of the respective installation and be subject to the Client's Representative's approval. Workmanship must comply with the current British Standard Codes of Practice.

Routine and Response Maintenance

111 Wherever the Provider undertakes any Routine Maintenance and Responsive Maintenance on a gas, oil, solid fuel or biomass fired appliance, he must immediately thereafter examine:-

(a) the effectiveness of any flue,

(b) the supply of combustion air,

(c) its operating pressure or heat input,

(d) its operation so as to ensure its safe functioning.

112 Any defects disclosed by the examination should be immediately dealt with by the Provider, in accordance with the provisions of this Contract.

Casings

113 The Provider must at his own cost carry out repairs to appliances, casings and finishes.

Permit to Work Certification

114 Comply with any "permit to work system" notified to the Provider by the Client's Representative and ensure that no Worker undertakes any Works covered by any "permit to work System" without a permit having been issued by the Client's Representative.

Access

115 Ensure that a risk assessment is undertaken and a method statement is provided to the Client's Representative detailing the means of access to undertake all Works requiring access at heights including for inspection and testing.

Firestopping

116 Ensure that all holes for cables, pipes etc., in the structure of any Property formed or drilled by the Provider are fire-stopped in accordance with Building Safety Law.

117 Report immediately to the Client's Representative where existing holes for cables, pipes or service media in the structure of any Property have no or inadequate firestopping, giving the detailed location of the hole and providing digital photographs.

© Rand Associates Consultancy Services Ltd

BUILDER'S WORKS IN CONNECTION WITH THE PERIODIC SERVICING AND INSPECTIONS AND RESPONSIVE MAINTENANCE OF HEATING INSTALLATIONS AND HEATING APPLIANCES

MATERIALS

Cement

001 Use either normal setting ordinary or rapid hardening or sulphate resisting Portland cement or blast furnace cement. All cement must comply with applicable Standard and be manufactured by a firm with their capability assessed and registered with BSI or other quality certification body acceptable to the Client's Representative.

Lime

002 Use Class B hydrated lime, to applicable Standard

Sand

003 Sand for mortar is to be to applicable Standard FP or MP Category 3 unless specified otherwise. Sand for face-work mortar is be from one source, different loads to be mixed if necessary to ensure consistency of colour and texture'

Sand and aggregate Material Property Limits	Category for other aggregates and Sand	Category for Air cooled blast furnace slag
Acid soluble sulphate content	AS0.2	AS 1.0
Total sulphur	$\leq$ 1% by mass	$\leq$ 2% by mass
Water soluble content	$\leq$ 1% by mass	$\leq$ 1% by mass
Loss on ignition	PFA ONLY$\leq$ 7% by mass	$\leq$ 3% by mass

Cement mortar

004 Ensure all cement mortar used is composed of one part cement and three parts sand. Use this in brickwork built below ground level, copings, chimneys, parapet walls and any other brickwork in severely exposed situations.

005 In other situations unless otherwise Instructed, use only gauged cement mortar composed of:
- one part masonry cement;
- one part lime; and
- six parts sand.

006 Ensure all mortar used is fresh and made only in quantities sufficient to meet the immediate demand. Use mortar within 2 hours of mixing at normal temperatures. Do not revive or re-use any mortar which has been partially set. Measure materials accurately by volume using clean gauge boxes. Proportions of mixes are for dry sand, allow for bulking if sand is damp. Mix materials thoroughly to a consistency suitable for the work and free from lumps, do not over mix mortars containing air entraining admixtures. Keep plant and banker boards clean at all times.

007 Premixed lime:sand:mortar shall be obtained premixed in accordance with applicable Standard from a competent mortar manufacturer to the satisfaction of the Client's Representative. Ordinary portland cement is added on site by volume in accordance with the mix specification.

008 Coloured lime:sand:mortar, where required is to be made using a proprietary coloured ready-mixed lime:sand to applicable Standard; colour to be as specified or to match existing. Pigments used in lime:sand mortar are to conform to applicable Standard .

© Rand Associates Consultancy Services Ltd

Ready to Use Retarded Mortars

009 Ready to use retarded mortars shall be in accordance with applicable Standard and Render/Plaster mixes to be in accordance with applicable Standard:. The Client's Representative is to be provided with CE Marked performance information to Annex ZA before mixing commences.

(i) All mortar storage containers are kept in good condition.
(ii) Storage containers are thoroughly cleaned out between fills.
(iii) Storage containers are clearly marked with mortar mix designation i.e. building/plaster/render, date and time of delivery.
(iv) Under no circumstances may partially full storage containers be 'topped up' with fresh mortar.
(v) The mortar is properly protected from adverse weather conditions, prior to, during and after use.
(vi) On no account should the mortar be re-mixed in a mechanical mixer

Under no circumstances can anything other than minimal amounts of water be added to the mix on site and this only to maintain workability during use i.e., by bricklayer on a spot board.

Absolutely no cement or any other additive may be added to the mix on site.

Care should be taken to ensure that the mortar is used in its 'fresh' state and that no remixing for use takes place after the period of retardation has passed.

All mortar, which has been contaminated in any way, shall be disposed of in such a manner as to render it unusable.

Waterproofing Agents

010 Waterproofing agent is to be to applicable Standard, supplied and installed in compliance with a current British Agrément Board certificate or other Quality system approved by the Client's Representative. The quantities of agent to be used are to be strictly in accordance with the manufacturer's technical data sheet. The Provider is prohibited from using admixtures based on calcium chloride and ethylene glycol.

Bonding Agent

011 Bonding agent is to be Opaque white non-toxic externally plasticised PVA emulsion of high viscosity and manufactured to applicable Standard. The bonding agent is to be suitable for the exposure conditions and supplied and installed in compliance with a current British Agrément Board certificate or other Quality system approved by the Client's Representative.

Air Entraining Admixture

012 Air entraining admixture is to be to applicable Standard, supplied and installed in compliance with a current British Agrément Board certificate or other Quality system approved by the Client's Representative. The quantities of admixture to be used are to be strictly in accordance with the manufacturer's technical data sheet.

Water Reducing Admixture

013 Water reducing admixture is to be to applicable Standard, supplied and installed in compliance with a current British Agrément Board certificate or other Quality system approved by the Client's Representative. The quantities of admixture to be used are to be strictly in accordance with the manufacturer's technical data sheet.

© Rand Associates Consultancy Services Ltd

Common bricks

014 Use clay common bricks to applicable Standard

Location	Bond	Mortar Mix
Superstructure Brickwork above DPC	Stretcher	1:1:6 cement lime mortar
Superstructure Brickwork above DPC	English	1:1:6 cement lime mortar
Substructure Brickwork below DPC	Stretcher	2:1:6 cement lime mortar
Substructure Brickwork below DPC	English	2:1:6 cement lime mortar

015 Use concrete common bricks to applicable Standard, with an average compressive strength of 20N/mm2 with no brick from any 10 no tested having a strength less than 16N/mm sq.

Location	Bond	Mortar Mix
Superstructure Brickwork above DPC	Stretcher	1:1:6 cement lime mortar
Superstructure Brickwork above DPC	English	1:1:6 cement lime mortar
Substructure Brickwork below DPC	Stretcher	2:1:6 cement lime mortar
Substructure Brickwork below DPC	English	2:1:6 cement lime mortar
Substructure Brickwork below DPC	Honeycombed	2:1:6 cement lime mortar

016 Use concrete common bricks to applicable Standard, with an average compressive strength of 30N/mm2 with no brick from any 10 no tested having a strength less than 24N/mm sq.

Location	Bond	Mortar Mix
Manholes	Stretcher	1:3 cement sand
Manholes	English	1:3 cement sand

Facing and engineering bricks

017 Ensure facing bricks and engineering bricks are clay and of a size, type and colour to match the existing bricks.

018 Where approved by the Client's Representative, clean and reuse sound facing and engineering bricks taken down as part of repair works.

Air bricks and wall ventilators

019 Use unglazed clay/concrete air bricks of a colour to match the facing bricks.

Mastic compound and sealants

020 Sealants are to conform to applicable Standard for:

low modulus and mould resistant; or
low modulus; or
fire retardant

021 Before commencing application of sealants check suitability of joints to ensure that:

Joint dimensions are within limits specified for the sealant;
Surfaces are smooth and undamaged;
Joints are to applicable Standard

© Rand Associates Consultancy Services Ltd

022 Clean surfaces to which sealant is to adhere using methods and materials recommended by the sealant manufacturer's technical data sheet.

023 Remove all temporary coatings, tapes, loosely adhering material, dust, oil, grease and other contaminants which may affect bond.

024 Keep joints clean and protect from damage until sealant is applied.

025 Protect adjacent surfaces with masking tape to prevent staining and protect surfaces which would be difficult to clean if smeared with primer or sealant.

026 Backing strips, bond breaker and primer are to be of the types recommended by the sealant manufacturer's technical data sheet. Backing strips and/or bond breaker tape are to be inserted into joint leaving no gaps.

027 Use equipment and methods recommended by the sealant manufacturer's technical data sheet for the application of sealants. Sealants are to be applied within the recommended application life of primer and sealant and the recommended air and substrate temperature ranges.

028 Sealants are not to be applied to:
damp surfaces (unless recommended otherwise);
surfaces affected by ice or snow;
surfaces during inclement weather;

029 Joints are not to be heated to dry them or to raise the temperature.

030 Fill joints completely, leaving no gaps, excluding all air and ensuring firm adhesion of the sealant to required joint surfaces. Tool the sealant to a neat, slightly concave profile unless otherwise specified, and protect till cured.

Wall ties

031 Wall ties are to be stainless steel 225mm to suit cavity and built in as work proceeds;
Type; to applicable Standard
Material: Austenitic stainless steel conforming to applicable Standard grade 1.4301 (304)

032 Wall ties are to be stainless steel 225mm to suit cavity and with suitable fixings for any partial fill boards and built in as work proceeds;
Type: to applicable Standard
Material: Austenitic stainless steel conforming to applicable Standard grade 1.4301 (304)

033 Wall ties are to be stainless steel 275mm to suit 150mm cavity and with tie mounted insulation retaining clips as recommended by insulation manufacturer and built in as work proceeds;
Type: to applicable Standard
Material: Austenitic stainless steel conforming to applicable Standard grade 1.4301 (304) Product to have BBA certification or equivalent.

034 Wall ties are to be stainless steel 275mm to suit 150mm cavity and built in as work proceeds;
Type: to applicable Standard
Material: Austenitic stainless steel conforming to applicable Standard grade 1.4301 (304) Product to have BBA certification or equivalent.

035 Wall ties are to be proprietary moulded black polypropylene wall ties 185mm long with a central 75mm x 9mm steel rod incorporating 3 annular collars and with 56mm wide fish-tail ends incorporating keying edges to suit 225mm cavity.
Type: to applicable Standard
Material: Plastic/steel;
Supplied and installed in compliance with a BBA certificate or equivalent quality assurance system approved by the Client's Representative.

© Rand Associates Consultancy Services Ltd

036 Wall ties are to be mineral fibre resin composite wall ties minimum 225mm and with suitable fixings for any partial fill boards.
Material: Mineral fibre resin composite;
Supplied and installed in compliance with a BBA certificate or equivalent quality assurance system approved by the Client's Representative.

037 Wall ties are to be bedded not less than 50mm into bed joint of each leaf, sloping towards the exterior with drip centred on cavity, and evenly spaced at maximum 900mm centre horizontally, staggered in alternate rows and at 450mm centres vertically, provide additional ties within 225mm of sides of openings, at not more than 225mm centres vertically, (to suit blockwork courses).

038 Wall ties are to be stainless steel ties to timber frames are to conform to applicable Standard
Material: austenitic stainless steel conforming to applicable Standard;
Fixing: Fix securely to timber studs with 50mm x 11 gauge stainless steel annular shank nails, bed not less than 50mm into bed joint of brick cladding sloping towards the exterior, ties evenly spaced at not more than 800mm centres horizontally, staggered in alternate courses and at 450mm centres vertically, and with suitable fixings for any partial fill insulation boards, provide additional ties within 150mm of sides of openings, at not more than 225mm centres vertically.

039 Spiral stainless steel ties for timber frames are to be austenitic stainless steel conforming to applicable Standard and installed in accordance with the manufacturer's technical data sheet and the Client's requirements.

040 Brick extension ties are to conform to applicable Standard
Material: 22 gauge austenitic stainless steel conforming to applicable Standard
Fixing: Fixing screws to be 50mm austenitic stainless steel with washers, 155mm austenitic stainless steel, Plugs to be 8mm high density polyamide;
Sealing: Sealing strip to be neoprene resin-impregnated micro-cellular polythene, self-adhesive 10mm x 20mm x 2.4mm;

041 Wall ties spaced at not more than 225mm centres vertically at vertical edges.

Chimney pots and cowls

042 Clay, clay louvered, and clay "H" type chimney pots as Instructed and approved by the Client's Representative are to be to applicable Standard, bedded and flaunched in cement mortar (1:3) incorporating a waterproofing agent and a bonding agent mixed in accordance with the manufacturer's technical data sheet.

043 Ventilating caps as Instructed and approved by the Client's Representative are to be vitrified clay, set in position in chimney cap with a neat fit joint.

044 Chimney cowls as Instructed and approved by the Client's Representative are to be aluminium, fixed to clay chimney pots in accordance with the manufacturer's technical data sheet.

045 Clay anti-draught terminals as Instructed and approved by the Client's Representative are to be to applicable Standard, bedded and flaunched in cement mortar (1:3) incorporating a waterproofing agent and a bonding agent mixed in accordance with the manufacturer's technical data sheet.

046 Galvanised steel anti-draught terminals as Instructed and approved by the Client's Representative are to be bedded and flaunched in cement mortar (1:3) incorporating a waterproofing agent and a bonding agent mixed in accordance with the manufacturer's technical data sheet.

Samples of bricks and blocks

047 Use only common, facing and engineering bricks and lightweight concrete blocks that conform to samples that have been approved by the Client's Representative.

© Rand Associates Consultancy Services Ltd

WORKMANSHIP

Brickwork

048 Except where otherwise Instructed, lay new brickwork:
- to a gauge of 34 courses to 2550mm rise; or
- where existing brickwork is of a different gauge, to match the coursing of that brickwork.

049 Flush up solid horizontal and vertical joints with mortar throughout the thicknesses of the wall. Keep bed joints horizontal and quoins and perpends square and vertical. Lay bricks with single frogs with the frogs upwards.

050 Carry up walls in a uniform manner, with no part being raised more than 1 metre above another at one time. Rack back brickwork for jointing up (do not tooth it). Do not use bats except where required to bond.

051 Where the Schedule of Rates refers to "half brick thick", provide half brick thick walls in either metric or imperial sizes, as required for the Works.

Weather and protection

052 Adequately protect bricks on site and keep them dry. Where covers are used to protect bricks, ensure that there is sufficient circulation of air to prevent condensation forming. Ensure bricks are laid dry.

053 Do not carry out bricklaying:
- in driving rain; or
- when the temperature in the open is at or below 5^0 Centigrade.

054 Use plasticisers only with the Client's Representative's approval. Do not use antifreeze compounds.

055 Adequately protect new brickwork from damage by frost or excessive wet weather.

Fair face

056 Face surfaces of brickwork or blockwork described as "built fair face" with common bricks or blocks selected from bulk for even and unmarked faces and square undamaged arrises. Finish them with a neat flush joint as the Works proceed to match the existing brickwork. Protect them from mortar droppings and damage and ensure they are left clean on completion of the Works.

Face work

057 Joint facework as the Works proceed. Finish the vertical and horizontal joints with a convex jointer (bucket handle) or to match the existing framework. Keep the leading edge of damp-proof courses/cavity trays 5mm back from face of wall. Rake back mortar to fully expose edge of damp-proof course/cavity tray.

058 Keep facings free of all mortar splashes, droppings or other blemishes and leave them perfectly clean on completion of the Works.

Damp-proof courses

059 Lap damp-proof courses 150mm at all joints and full width at angles and intersections.

060 When renewing damp-proof courses, cut out brickwork in short hit and miss lengths not exceeding 1.00m at any one time. Replace brickwork before commencing further lengths.

© Rand Associates Consultancy Services Ltd

Pointing

061 Match the pointing of new work to that of adjacent work, or to be flush or bucket handle pointing as Instructed by the Client's Representative.

062 Match pointing closely to the existing pointing in finish, colour and texture.

063 Carefully rake out existing brickwork joints by hand to form a square recess of 15mm – 20mm depth, remove dust, lightly wet and neatly point in cement lime sand mortar (1:1:6) of a colour to match existing to a neat weather struck profile to match existing in a continuous operation.

064 Carefully rake out existing stonework joints by hand to form a square recess of 15mm – 20mm depth, remove dust, lightly wet and neatly point in cement lime sand mortar (1:1:6) of a colour to match existing.

Work to chimneys and fires

065 Adequately protect the Customers' finishes, fittings and furnishings from falling debris and soot during Works to chimneys and fires. Take all necessary precautions to protect existing fire appliances from damage. Rectify any damage caused.

066 Ascertain whether any flue ways affected by the Works serve a gas appliance. If so, immediately notify the Client's Representative of this in writing, so that appropriate safety precautions can be implemented.

067 Remove all debris from flue ways and from behind fires and appliances on completion of the Works.

© Rand Associates Consultancy Services Ltd

PLUMBING WORKS IN CONNECTION WITH THE PERIODIC SERVICING AND INSPECTIONS AND RESPONSIVE MAINTENANCE OF HEATING INSTALLATIONS AND HEATING APPLIANCES

General Requirements

Codes of Practice

068 All plumbing materials, components and parts must be suitable for incorporation in open vented or sealed installations which comply with the relevant Standard for "Forced circulation hot water systems" and must be suitable for the working pressure requirements of the installations and of a standard not lower than the requirements of the appropriate relevant Standards and appropriate Byelaws of the Water Supply Authority and their finish, quality and performance must be at least comparable with the original finish, quality and performance of any materials, components or parts they are replacing or being installed in conjunction with.

069 Ensure all Materials comply with the requirements of the applicable water Utility Provider.

070 Use rust proofed ancillary and fixing Materials. Ensure all Materials in direct or indirect contact are compatible so as to prevent electrolytic or chemical corrosion.

071 Seal any pipework entering a vertical service duct all round with intumescent sealant to prevent the passage of fire or smoke.

Overflow pipes and fittings

072 Ensure the pipework for overflows complies with the same requirements as for water supply pipework.

Plastic water supply pipes and fittings

073 Use blue polyethylene pipes with copper fittings for pipework laid underground for potable water supplies.

Copper water supply pipes and fittings

074 Use lead free capillary fittings for potable water supplies.

Fittings for lead supply pipes

075 Use lead to copper mechanical joint fittings for connecting dissimilar pipes to existing lead water services.

Solder

076 Do not use lead based solders or solders containing lead in Works associated with potable water supplies. Use tin/copper or tin/silver compositions instead.

Float valves

077 Use float operated valves unless the Client's Representative approves the use of piston valves. Where approval is given, use piston valves of at least 22mm that comply with the requirements of the Utility Provider.

Cylinders and Expansion Vessels

078 Ensure hot water storage copper cylinders are Grade 3 factory insulated, fitted with sacrificial anodes and complete with:

- immersion heater boss, cap and washer screwed boxes; and
- all fittings necessary to connect to the primary pipework supply and draw off pipework.

© Rand Associates Consultancy Services Ltd

Tanks

079 Ensure tanks are complete with tightly fitting removable lids. Use GRP tanks only where this is approved by the Client's Representative. Ensure the tank is complete with a float valve and all fittings necessary to connect the services and overflow.

Combination hot water storage units

080 Provide indirect or direct combination tanks as appropriate. Ensure the proprietary units are complete with:

- sacrificial anodes;
- insulation;
- float valve;
- immersion heater boss, cap and washer, screwed boxes; and
- all fittings necessary to connect to the primary supply, draw off and overflow pipework.

Insulation

081 Use preformed, fully flexible, closed cell elastomeric insulation fire rated as insulation for hot and cold pipework that meets the requirements of the Client's Representative.

WORKMANSHIP

Water supply

082 Support pipework at centres recommended by the manufacturer with approved clips or brackets of a type to suit the background to which it is required to be fixed.

083 Ensure that pipes used in repairs are similar to the existing pipework, but repair lead pipework using appropriate plastic pipe and approved compression fittings. Do not use copper pipework for repairs to lead pipework. Use either compression or lead free solder capillary ring fittings.

© Rand Associates Consultancy Services Ltd

HEATING WORKS IN CONNECTION WITH THE PERIODIC SERVICING AND INSPECTIONS AND RESPONSIVE MAINTENANCE OF HEATING INSTALLATIONS AND HEATING APPLIANCES

GENERAL

Heating and appliances

084 Note that a number of types of gas and oil boilers, solid fuel and biomass boilers, open fires and independent and inset closed room heaters exist throughout the Properties. Ensure sufficient stocks of spare parts or ability to access a source of spare parts are available for all of these to enable the Provider to carry out repairs within the priority or period specified on an Order. All costs associated with this provision is deemed to have been included in the Provider's tendered Rates or percentage adjustment to the Schedule of Rates

085 All ancillary and fixing Materials to be rust proofed and all Materials in direct or indirect contact to be compatible to prevent electrolytic or chemical corrosion.

MATERIALS

Flexible Flue Liners

086 Flexible Flue Liners must be constructed from stainless steel strip and conform to applicable Standards and any subsequent amendments

Proprietary Chemical Installation Treatments

087 The amount of corrosion inhibitor, de-scaler, precommission cleaner and flushing compounds chemical used by the Provider for installation treatment must relate to the liquid capacity of the respective Heating Installation and must be in proportions as directed in the manufacturer's recommendations. Use of the chemicals and method of introduction into the Heating Installations must be strictly in accordance with the manufacturer's technical data sheet and as directed by the Client's Representative.

Combustion Air Ventilators

088 Combustion air ventilators and kits must be approved by the Client's Representative. Particular attention should be given to the back draught prevention capabilities of the ventilators selected for external walls, to prevent incoming air blast.

Radiators and valves

089 Ensure radiators are steel panel and convector radiators complying with applicable Standards and any subsequent amendments complete with:

- two unions and chromium plated backnuts;
- one brass air bleed valve;
- one chromium plated brass adjustable radiator valve; and
- one chromium plated brass lockshield valve.

Solid Fuel and Biomass Boilers, and Room Heaters

090 Solid fuel and biomass boilers and room heaters with back boilers shall be fitted in accordance with the manufacturers' technical data sheet.

Open Fire Places and Combination Grates Burning Solid Fuel

091 Fire places and combination grates shall be fitted in accordance with the manufacturers' technical data sheet.

© Rand Associates Consultancy Services Ltd

Biomass

092 Biomass boilers shall be obtained from an approved manufacturer and be installed in accordance with the manufacturers' technical data sheet.

WORKMANSHIP

Gas works

093 Ensure all Works to gas installations are undertaken:
- in accordance with the Gas Safety (Installation and Use) Regulations 1998 and any subsequent revisions as applicable at the time the Works are carried out; and
- only by Gas Safe registered engineers.

© Rand Associates Consultancy Services Ltd

ELECTRICAL WORKS IN CONNECTION WITH THE PERIODIC SERVICING AND INSPECTIONS AND RESPONSIVE MAINTENANCE OF HEATING INSTALLATIONS AND HEATING APPLIANCES

GENERAL

Regulations

094 All electrical Works must be carried out in accordance with IET REGULATIONS Requirements for Electrical Installations IET Wiring Regulations co-published by the British Standards Institution ("BSI") and the Institution of Engineering and Technology ("IET").

Equipotential bonding

095 Connect the following to the main earthing terminal using earthing clamps to applicable Standard or equivalent or other means approved by the Client's Representative where appropriate:

- main cold water pipe adjacent to stop valve;
- main gas pipe adjacent to and on the consumer side of the gas meter;
- central heating installation pipework;
- other service pipes and ducting;
- exposed metallic parts of the building structure;
- lightning conductor; and
- equipotential bonding 10.00m2.

Supplementary bonding

096 Within the zone formed by the main equipotential bonding, provide connections to:

- baths;
- sinks;
- exposed pipes;
- metal water storage tanks;
- heating and ventilation installations; and
- supplemental bonding 4.00m2.

Protective Multiple Earthing (PME) Installations

097 In PME installations the power circuit must be protected by a RCBO Residual Current Circuit Breaker with Overcurrent) as an integral part of the consumer unit.

Earth Rods and Inspection Pits

098 Earth rods must be protected by purpose made inspection pits set neatly and firmly in the ground.

099 The earth wire must be enclosed in HGS galvanised conduit taken directly into the inspection pit.

100 The conduit must be secured to the external wall of the Property with galvanised heavy duty 2-hole saddles up to a maximum height of 1800mm above ground level.

101 The saddles must be fixed with zinc plated round head screws.

MATERIALS

Earth Electrode

102 Ensure any earth electrodes used are manufactured from copper with hardened steel driving cap, hardened steel tip and phosphor bronze coupling screws. Use sufficient electrodes (in length and number) to give the required earth loop impedance.

© Rand Associates Consultancy Services Ltd

103 Protect each earth electrode from mechanical damage by enclosing the earth lead in a heavy duty cast-iron or concrete box with lid. Enclose the entire lengths in heavy gauge, galvanised steel conduit. Attach permanent labels indelibly marked "Safety Electrical Earth Do Not Remove" to the earth lead at both the meter cupboard and at the earth electrode.

Conduit/trunking/ducting

104 Do not use surface conduit or trunking without an Instruction to do so from the Client's Representative.

PVC-u conduits and fittings

105 Ensure PVC-u conduits and fittings comply with the following:
- strength: heavy gauge super high impact;
- shape/colour: round, white or black;
- jointing: push fit and solvent welded;
- fittings: standard;
- mounting/support: screw the conduit to surfaces using the conduit manufacturer's clips/saddles;
- use maximum practical straight lengths to minimise number of joints;
- use proprietary bends and/or junction boxes at changes of direction;
- do not use elbows, tees or site formed bends without the approval of the Client's Representative;
- secure the conduit system using boxes, plated screws and fibre/plastic plugs;
- fix boxes independently of the conduit; and
- form secure joints, using expansion couplings where recommended by the manufacturer and connectors at equipment and terminal fittings.

PVC-u surface cornice trunking system

106 Use PVC-u surface cornice trunking in conjunction with mini trunking for the mechanical protection of sub-mains cables and final circuit cables in accessible locations at ceiling level, where approved by the Client's Representative. Ensure the trunking complies with the following:
- fittings: use the manufacturer's standard fittings;
- colour: white;
- mounting/support: secure to surfaces using plated screws and fibre/plastic plugs; and
- use proprietary units to form junctions and changes of direction wherever possible.

PVC-u surface mini-trunking system

107 Use PVC-u surface mini-trunking for the mechanical protection of final circuit cables in accessible locations. Ensure the trunking complies with the following:
- fittings: use the manufacturer's standard fittings;
- colour: white;
- mounting/support: secure to surfaces using plated screws and fibre/plastic plugs; and
- use proprietary units to form junctions and changes of direction wherever possible.

Fire stopping of trunking/ducting

108 Seal trunking/ducting internally with firmly packed rock fibre or intumescent type Material supplied by the trunking/duct manufacturer.

© Rand Associates Consultancy Services Ltd

Cables generally

109 Ensure cables are BASEC certified. Use cables in the locations and for the uses specified in the table below:

Location/Use:	Cable Type:
General (includes central heating, ventilation and smoke detector installations)	PVC insulated and sheathed
Conduit system (complete)	PVC insulated and sheathed or PVC insulated only
Sub-mains distribution	PVC split concentric
Sub-mains distribution armoured and PVC sheathed	PVC insulated, PVC sheathed, steel wire armoured and PVC sheathed
Fire alarm installation	PVC insulated and sheathed
Immersion heater (final connection)	EP rubber/HOFR sheath, Heat resistant pVC flexible cable

PVC insulated and sheathed cables and PVC insulated split concentric cables

110 Colour code cables for identification.

Electrical accessories generally (wall mounted)

111 Ensure wall mounted accessories for the connection and control of power, lighting and low voltage equipment are:
- manufactured using white moulded plastic;
- complete with surface or flush type mounting box except where specified otherwise;
- from the same manufacturer in a single installation; and
- marked to show their function where they are a control switch for e.g. an immersion heater, a cooker, a refrigerator, a washing machine or a circulating pump etc.

112 Ensure metal boxes for flush mounting switches and sockets are manufactured from galvanised steel complete with an earth terminal.

113 Fix all boxes using brass screws, fibre or plastic plugs.

Electrical accessories generally (ceiling mounted)

114 Ensure ceiling mounted accessories for the connection and control of power, lighting and low voltage equipment:
- are manufactured using white moulded plastic;
- are complete with mounting box where required;
- are from the same manufacturer where used in a single installation;
- are fixed with brass or sheradised screws, with fibre or plastic plugs as required; and
- in conduit systems have a white insulated break-ring between the ceiling roses and cord switches and the respective terminal boxes.

Consumer unit

115 Ensure consumer units:
- have a surface non-combustible pattern unit complete with lid;
- have a main switch of 80/100 amp DP rating;
- are fitted with RCBO's to applicable Standard located adjacent to the meter at the incoming supply position; and
- have each way permanently labelled to identify the circuit and rating;

© Rand Associates Consultancy Services Ltd

116 In installations without Protective Multiple Earthing it must be a surface non-combustible unit complete with lid fitted with RCBO's to applicable Standard and must be labelled to correspond to the following circuit allocations:

Circuit No Allocations	**MCB Rating**
Lighting Downstairs	6
Lighting Upstairs	6
Boiler	6
Immersion Heater	16
Kitchen Ring Main Circuit	32
Shower	40
Cooker	32
Power Ring Main Circuit – RCD/RCBO protected	32
Mains Powered Smoke Alarms	6

Residual current device/residual current circuit device (RCD/RCCD)

117 Ensure RCDs and RCCDs:
- function as both isolators and switches;
- have a current rating of 80 amp DP;
- have a sensitivity of 30m amp; and
- are complete with an insulated cover or terminal shrouds.

Residual current circuit breaker (RCCB)

118 Ensure RCCBs:
- function as both isolators and switches;
- have a current rating of 80A DP;
- have a sensitivity of 30mA; and
- have a white PVC-u enclosure.

Residual current circuit breaker with override protection (RCBO)

119 Ensure RCBOs:
- function as both isolators and switches;
- have a current rating of 32 amp SP;
- have a sensitivity of 30mA; and
- are complete with an insulated cover or terminal shrouds.

ISCO connectors

120 For ISCO connectors ensure:
- the covers and bases are manufactured from black phenolic resin material; and
- the connector blocks are manufactured from brass with electro-tin finish.

Door bells

121 Ensure door bells:
- are primary mains supply, transformer, 6V secondary outlet;
- have a white bell push PVC-u cover; and
- are screw fixed.

© Rand Associates Consultancy Services Ltd

Bulkhead light fitting (tungsten) (metal base)

122 Ensure metal base bulkhead light fittings:
- have a corrosion resistant die-cast or pressed metal base complete with a vandal resistant diffuser;
- have the wiring within the fitting protected by heat resistant sleeving;
- are installed complete with a 16W 2D or 28W 2D lamp; and
- are screw fixed.

Bulkhead light fittings (tungsten) (polycarbonate base)

123 Ensure polycarbonate base bulkhead light fittings:
- have a heavy duty polycarbonate base with a vandal resistant diffuser;
- have the wiring within the fitting protected by heat resistant sleeving;
- are installed complete with a 16W 2D or 28W 2D lamp; and
- are screw fixed.

Photocell sensor

124 Ensure sensors to control the landlord's lighting installation are:
- complete with a baseholder and wall mounting bracket;
- screw fixed to masonry or concrete; and
- fixed in a position approved by the Client's Representative.

TV aerial installation

125 Ensure TV aerial installations:
- consist of 20mm diameter conduit complete with co-axial cabling run from roof level; and
- terminate at a white plastic surface mounted outlet box complete with a white plastic cover plate with single co-axial TV outlet.

Time switch (24 hour)

126 Ensure time switches:
- have a 24 hour and quartz control mechanism;
- are a 20 amp single pole, single throw time switch; and
- have 2 'on' and 2 'off' programmes with a day omitting device and independent motor connections.

Smoke detectors

127 Ensure smoke detectors:
- have white PVC-u for the housing;
- include a photoelectronic sensor to applicable Standard;
- are 240 V mains operated with a sealed –in rechargeable Lithium cell back up supply; and
- include a full function test switch, automatic reset and low battery warning signal.

Heat detectors

128 Ensure heat detectors:
- have white PVC-u housing;
- comprise a fixed temperature fast response thermistor sensor with a range of 54o – 62o centigrade to applicable Standard;
- are 240V mains operated with a sealed –in rechargeable Lithium cell back up supply; and
- include or have a test button and low power cell warning signal with both separate mains and battery warning LEDS.

© Rand Associates Consultancy Services Ltd

Carbon monoxide detectors

129 Ensure carbon monoxide detectors:
- have white PVC-u housing;
- incorporate an electrochemical cell sensor module;
- are battery operated to applicable Standard, fixed with security screws to ceiling;
- sensor power pack life 10 years;
- include a continuous self check function monitor with test/hush facility;
- have a pre-alarm warning LED;
- include LEDS for battery power pack life, CO2 level and fault status; and
- have a CO2 gas test feature.

Fixing electrical accessories/equipment

130 Position accessories accurately and squarely to the vertical and horizontal axes. Where not shown otherwise, align adjacent accessories on the same vertical or horizontal axis (as appropriate). Agree the mounting heights with the Client's Representative.

Multi-gang switches

131 Connect switches so that there is a logical relationship with the lights.

WORKMANSHIP

Installation generally

132 Install, test and commission the electrical work in accordance with applicable Standard and the design and performance requirements set out in this Section so as to provide a safe, well insulated, earth protected system capable of supplying the anticipated maximum demand.

133 Ensure all installation Works are carried out by qualified electricians fully conversant with applicable Standard.

134 Do not allow the number of Apprentices and Trainees at a Property to exceed the number of qualified electricians.

135 Ensure all installation Works are carried out to good workmanship by skilled (electrical) or instructed (electrical) persons and proper materials shall be used in the erection of the electrical installation.

136 Use only the types of fastenings, bushes, glands, terminals, connectors, clips, clamps and all other minor accessories necessary to complete the installation that are recommended by the manufacturer of the electrical equipment being installed.

137 Avoid contact between dissimilar metals. Use corrosion resistant fastenings in locations where moisture is present or may occur.

138 Avoid contact between dissimilar metals. Use corrosion resistant fastenings in locations where moisture is present or may occur.

139 The Provider must rectify, free of charge to the Contract, any Work which in the opinion of the Client's Representative has not been properly executed and must replace free of charge to the Contract any Materials which do not comply with the Specification.

140 The Provider must confirm the voltage and frequency of the supply before ordering any equipment.

141 The Provider must include in his tender for the provision of all fixings and the making good by qualified tradesmen to the satisfaction of the Client's Representative all damage to walls, ceilings, decorations and fitments.

© Rand Associates Consultancy Services Ltd

142 Dust sheets are to be used and every consideration given to Customers property.

143 After Work is completed each day all installations will be left in a safe usable condition and all dust and mess cleared up.

Distribution charts - labelling of equipment

144 Fix circuit charts securely to the inside of each item of distribution equipment, clearly indicating the circuits protected, fuse and RCBO ratings and the size and type required.

Electricity supply

145 Note that the electricity supply is nominally 240 volt, single phase, 50 hertz, 2 wire.

System of wiring

146 All wiring/cables must be protected, supported and fixed to the requirements of applicable Standard and all other Regulatory Requirements.

147 For concealed wiring, use PVC sheathed 600/1000 volt grade cable of the size and type specified. Wherever possible, run it in interfloor spaces, roof and ceiling voids.

148 Run cables along the sides of joists at the mid point. Clip them at 450mm centres using cable clips of tinned brass secured by nonferrous fixing pins, screws, clips or a similar fixing. Support the wire and equipment located between the joists by a wood bearer of a size of at least 100x25mm.

149 Install the cable:
- with a minimum clearance of 150mm to all heating, gas and waste pipes or ducts; and
- physically separated from other wiring not associated with lighting and power supplies.

150 Where cables cross flooring joists they must be passed through small holes drilled through the centre of the joists. These holes must not exceed 25mm diameter.

151 Ensure cables leaving or crossing joists do so at right angles to the longitudinal side of the joist, on trusses or binders. Do not notch or saw joints. Ensure that cables do not run in positions where they are susceptible to damage by floor nails.

152 Do not run cables in roof spaces on the top of joists or near water tanks, etc., since in this position they are susceptible to damage.

153 Install cables leaving roof voids and below floors or passing through any part of the structure in conduit or trunking as specified.

154 Ensure cables in solid floor that are either laid in screed or in a ceiling void are drawn in through rigid PVC-u conduit as specified and run continuously from the consumer unit to the outlet served.

155 Do not install cables within wall cavities.

156 Contain all wiring to each flat within that flat.

157 Fit conduits complete and then draw the cable through.

Cables installed in plastered walls

158 Protect cables by rigid PVC-u metric super high impact heavy gauge conduit where no conduit exists at present. Reuse existing conduit where approved by the Client's Representative.

159 Ensure new conduits are in continuous lengths, smooth in bore, true in size, and terminating in roof and below floors with a minimum projection of 50mm. Provide inside outlet boxes with a universal cleat.

© Rand Associates Consultancy Services Ltd

160 Ensure new conduits are vertical and chased into the wall, such that the finished wall will provide a minimum of 10mm plaster cover. Adequately fix the conduit with sheradised nails and saddle clips, such that during the plastering processes, there is no tendency for plaster to push the conduit forward and reduce the cover.

161 Where approved by the Client's Representative, embed cables in plastered surfaces and cover them with 'top hat' trunking secured at a depth to allow the plastered surface to be made good.

Cables installed in proprietary de-mountable or plasterboard partitions

162 Install cables in proprietary or de-mountable similar type partitions. Draw them through holes formed by forcing a suitable rod through the honeycomb core of the partition from above.

163 Take due account of any insulation within the partition when sizing the cables so as to prevent overheating.

164 In plasterboard partitions with a timber core, draw cables through the partition between the timber studding and noggins. Where timber work occurs, take the cable over the face of the timber by a small chase through the plasterboard and into the timber. Make good the chase with a suitable plaster material finished smooth and flush. Ensure cables installed in partitions are vertical.

Conduit installed on the surface

165 Use super high impact light gauge PVC-u metric rigid conduit and accessories on fairfaced brickwork or unplastered surfaces in heating cupboards, stores, garages, plant rooms, meter compartments and similar areas.

166 Support the conduit by PVC-u spacer bar saddles and wood screws and plugs at intervals not exceeding 400mm.

167 Allow for the expansion of PVC-u conduit.

168 Install the conduit only vertically or horizontally.

Where new cables are to be installed in or under solid floors

169 Protect cables by rigid PVC-u round super high impact heavy gauge conduit laid in continuous lengths from the consumer unit to the outlet served, run in a diagonal line. Use the proper outlet and inspection bends and tees. Adequately fix the whole system to avoid any displacement by subsequent building trades.

Requirements for PVC-u conduit systems

170 Install no more cables in each circular conduit than necessary to permit easy insertion and withdrawal. Do not install more than the maximum recommended in applicable Standard. Demonstrate to the Client's Representative that cables can be easily withdrawn and inserted in any section of the installation. If this cannot be done using the existing conduit, then provide new conduit.

171 Use conduits, boxes, fittings and accessories from the same manufacturer and with suitable fixings for the application. Ensure circular conduit is at least 20mm in diameter.

172 Ensure metal outlet boxes and equipment do not become distorted during plastering. Install boxes flush with the finished plaster and the sides vertical, using 1.25" No.8 woodscrews and plugs or equivalent fixing.

© Rand Associates Consultancy Services Ltd

Use of cable trunking

173 Use cable trunking to improve the appearance at points in the installation where a number of conduits terminate or share a common route, and/or at the meter intake positions for the formation of distribution board/local isolator assemblies. Use compact miniature trunking of the appropriate size.

174 Use PVC-u trunking with fitted end covers. Provide a separate earth continuity conductor.

175 Connect trunking to equipment by appropriate screwed couplers, bushes and shakeproof washers, or flanged couplings.

176 Connect trunking to PVC-u conduit by "threaded to plain" adaptors with lock nuts, or clip in adaptors.

177 Clean out trunking before cable is drawn in.

178 Ensure the number of cables installed in trunking does not exceed the space factor specified in IET REGULATIONS.

Conductors

179 Ensure all cables comply with British Cable Association recommendations (or equivalent).

180 Carefully remove any insulation in making terminations without causing damage to the conductor. Double the wiring to fill the terminations.

181 Take the sheath of PVC sheathed cable inside the outlet boxes or the pattress of ceiling fittings and similar equipment.

182 Securely clamp flexible cords and fit suitable grommets to all terminal boxes.

183 Use cables of the following types and sizes complete with integral earth continuity:

Concealed wiring - copper 2 core and earth PVC 600/1000 volt grade		
Lighting sub-circuits	- 1.5mm sq	Dependent upon length of circuit and to comply with applicable Standard
Boiler circuits	- 1.5mm sq	
Ring circuits	- 2.5mm sq	
Radial circuits	- 2.5mm sq	
Cooker circuits	- 10.0mm sq	
Shower circuit	- 10.mm sq	
2/3 Kw Immersion Heater	- 2.5mm sq	
3 Kw Water Heater	- 2.5mm sq	
Flexible cords and cables - heat resistant insulation 300/500 volt grade		

© Rand Associates Consultancy Services Ltd

Lighting - pendant lamp holder	0.75mm sq 2 core heat resistant silicone rubber insulated white circular
Lighting - final internal connection for enclosed tungsten fittings in bathrooms, garages, and for exterior light fittings	0.75mm sq 3 core heat resistant butyl rubber
2/3 Kw Immersion heater	2.5mm sq EP Rubber/HOFR sheath or heat resistant PVC flexible cable
3 Kw Water heater	2.5mm sq EP Rubber/HOFR sheath or heat resistant PVC flexible cable

Lighting Circuits

184 Install wiring by the loop-in system. Ensure there are no joints or connectors in the final-circuit from the consumer distribution unit.

185 Install a maximum of two live pairs and one switch pair at each point. Install the wiring for 2-way switching between switch points. Terminate the earth conductor in each lighting and switch point.

186 Install lighting points and arrange the system such that:
- 2/3 bedroom Properties are provided with two 6 amp circuits; and
- small 1 bedroom Properties are provided with one 6 amp circuit in the consumer distribution unit.

187 Limit the number of points controlled by one 6 amp MCB way to 10. If an installation has an excess of 20 lighting points then provide three 6 amp MCB circuit ways.

188 Ensure pendant type cord grip, all insulated lampholders and ceiling roses are white plastic and are complete with 225mm of flexible cable as specified for a standard height ceiling. For non-standard Properties, adjust the length of the flexible cable to give a 2.1 metre (7ft) clearance from the lampholder to the floor. Ensure lampholders are all of the insulated heat resisting pattern fitted with a skirt.

189 Ensure batten type lampholders are insulated white plastic. Fit them where Instructed by the Client's Representative. In bathrooms, kitchens, toilets, garages and all damp situations, ensure lampholders are complete with a protective shield.

190 Ensure interior light switches (except in bathrooms) are white plastic, flush fitting, single pole, rocker operated 5 amp AC units, mounted in boxes with adjustable fixing lugs. Gang the switches as required, using a multiple plate cover.

191 Where flush fittings and switches cannot be used, mount single pole rocker operated 5 amp AC surface type switches on matching moulded white plastic boxes.

192 Install light switches at a distance of between 900mm and 1100mm above the floor level to the centre of the switch, and at least 150mm from the nearest door frame, unless the Client's Representative Instructs otherwise.

193 Ensure light switches in bathrooms are white plastic 5 amp AC surface pattern operated by a non-conductive pull cord and knob and hang between 900mm and 1100mm above floor level. Fit them close to the wall and well clear of the door to the room.

194 Support ceiling fittings that are wired and located between joists by wooden bearers of a minimum size of 100x25mm fixed to the joists at both ends of the bearer.

195 Do not provide lamps except where specifically required by the Schedule of Rates.

© Rand Associates Consultancy Services Ltd

13 amp ring circuit installation

196 Connect sockets in ring circuits without spurs using cable as specified, with both ends of each circuit terminated in one 32 amp MCB at the consumer distribution unit.

197 If desired, use spurs from ring circuits to the maximum as specified in IET REGULATIONS with due regard to the load or the circuit. Use fused connection units for static items of equipment, provided that not more than one appliance is connected to each ring circuit.

198 Prevent overloading of circuits by providing specified appliances with separate final-circuits.

199 Use junction boxes only with the approval of the Client's Representative.

200 For Properties with a total internal floor area exceeding 100 square metres, provide two ring circuits with appropriately equal numbers of sockets or fused connection units connected to each ring. Ensure each one ring circuit serves only one storey.

201 Locate sockets and fused connector boxes in the same positions as those existing. Ensure they are 13 amp 3 pin white flush pattern. Gang sockets as required, with a multiple plate cover.

202 Use surface pattern sockets protected with a RCBO device in garages, and elsewhere on fair face brickwork.

203 Ensure sockets have switches unless otherwise specified.

204 Ensure the positions of sockets relative to the floor level are as follows:

Location	**Dimensions from centre line of socket outlet from floor level**
Garages, laundry areas	400mm - 1200mm
General living areas, hall, landings, etc.	400mm – 1000mm
Elderly persons' Properties	400mm - 1000mm
Bedrooms (except elderly persons' Properties)	400mm - 1000mm
Kitchens (preferred dimension from bottom of outlet to worktop)	150mm

205 In kitchens, where necessary, increase the above dimensions to ensure a satisfactory match with the layout of the wall tiles. Agree the exact position of sockets with the Client's Representative before installation to ensure a satisfactory position in relation to storage cupboards and shelves, etc.

206 Recess socket boxes into the walls to just below plaster level and provide them with adjustable fixing lugs.

Cooker circuit

207 For cooker circuits, provide one final-circuit connected to one 40 amp RCBO at the consumer distribution unit using cable as specified.

208 Locate the cooker control unit horizontally within 150mm – 1200mm maximum from the edge of the cooker space and from the side of the cooker to the centre line of the unit is 150mm.

© Rand Associates Consultancy Services Ltd

209 Ensure a cooker control unit that is located between storage cupboards or shelves and working top surfaces exactly matches the layout of the wall tiles and the centre line of the unit lines up exactly with the centre line of any local sockets.

210 Connect the cooker circuit in a cooker control unit. Extend it to terminate in a cooker cable connector outlet mounted 450mm above the finished floor level and immediately adjacent to the cooker. Terminate the cooker wiring at the cooker connector outlet box where no electric cooker is provided. Connect the cooker if the Customer has one.

Immersion heaters

211 For heater circuits, provide one final sub-circuit connected to one 16 amp RCBO at the consumer distribution unit using cable as specified.

212 Provide for the heater to be controlled by a heating boost switch to applicable Standards located above the worktop in the kitchen with a flexible outlet plate located adjacent to the hot water cylinder in the airing cupboard.

213 Use flush fitting units where switches are located outside the airing cupboard. Where switches are located inside the airing cupboard, use either surface or flush fitted units.

214 Terminate the circuit adjacent to the heater using suitable cable and a flex outlet plate. Make the final connection with heat resistant flexible cable as specified and run so as to prevent the hanging of clothes, etc., on the cable. When control switches are remote from the heaters, provide an appropriate means of isolation.

215 When the supply cable is exposed within an airing cupboard, protect cables with mini-trunking as specified.

Showers

216 For shower circuit, provide one final sub-circuit connected to one 40amp RCBO at the consumer distribution unit using cable as specified.

217 Provide for the shower to be controlled as near as practicable to the shower unit, by either a white 20amp AC, DP neon indicating pull switch with pull card if located in bathroom, and by a white 20amp AC DP neon indicating switch labelled "shower".

Smoke Detectors

218 Smoke alarms must be approved by the Client's Representative and must be installed to applicable Standard and must be of the mains powered type. The mains power must be supplied from an independent circuit of the distribution board and protected by a suitably rated RCBO breaker. The Provider must provide the necessary wiring for interconnection of the units. Installation must be strictly as specified by the manufacturer. One set of instructions must be left on site for Customers use.

Compliance with Regulations

219 Additionally, the installation must comply with all applicable Standards:

Provision

220 Detectors must be mains operated with either battery or capacitor back up.

Fitting

221 In premises of two levels, an optical detection is required in each of the circulation spaces and the main habitable room. Manufacturer's technical data sheet must be strictly adhered to.

© Rand Associates Consultancy Services Ltd

Wiring

222 Wiring must be in PVC twin and earth cable looped from an independent circuit at the distribution board.

223 Interconnection must be made using PVC triple and earth cable between the two detectors, using the third core for interconnection, such that in the event of either surrounding the other must also sound.

Installation control and distribution

224 Install, test and commission the electrical work in accordance with IET REGULATIONS ensuring compliance with design and performance to provide a safe, well insulated, earth protected system capable of supplying the anticipated maximum demand.

225 Ensure the consumer equipment consists of a non-combustible consumer unit with lid, complying with applicable Standard and complete with:
- main control switch to applicable Standard;
- sufficient RCBO's to accommodate all the sub-circuits scheduled for the Property;
- a minimum of 20% spare ways for future capacity; and
- each protective device to be permanently labelled to identify each circuit and rating.

226 Ensure sufficient space is available for the Utility Provider's metering and service cutouts. If required, provide a panel which satisfies the requirements of the Utility Provider for mounting meters, cutout and other equipment.

227 Supply and install PVC connection tails to the Utility Provider's point of supply, using correct coding and matching the cross sectional area to the main isolating switch rating.

228 Upgrade all earthing and bonding to conform to IET REGULATIONS. Do not use metal trunking as an earthing conductor.

229 Meter tails to be neatly fixed and clipped as specified.

230 Provide all equipment white in colour.

231 Clearly identify each way distribution equipment.

232 Ensure the mounting height of equipment is such that persons of average height can reach all fuses, switchgear, etc., from floor level without assistance.

233 Conceal cables above the ceilings and maintain access to the cable runs.

234 Enclose cables run in cupboards in mini-trunking.

235 Before and on starting the Works, obtain approval from the Client's Representative to the proposed routes of cable runs and wiring circuits.

236 Agree any alterations to the agreed routes of wiring circuits with the Client's Representative before starting the Works.

237 If Works are carried out before having agreed the routes with the Client's Representative, return and reroute and rewire cable runs and circuits where Instructed by the Client's Representative.

Standardisation of components

238 Use matching components with all lighting switches, sockets, fused spurs and similar equipment used in the Works, being from the same manufacturer.

© Rand Associates Consultancy Services Ltd

Customers' fittings

239 Refix any existing fittings installed by the Customer, provided the fitting conforms to IET REGULATIONS.

240 Notify the Client's Representative of any Customer's fitting which does not comply with IET REGULATIONS and which will therefore not be rewired or reconnected.

Removal of floor boarding, etc

241 Carefully remove any floor boarding necessary for the installation of cables. Joist to be drilled only for installation of cables and replace the boards in a workmanlike manner. Ensure any new floor boarding is identical in width and thickness. Remove all debris from the joist and roof spaces.

242 Make good all plaster disturbed by the removal of fittings to a true and level surface.

243 Do not disfigure timber frames and mouldings by sawing or chiselling out for the insertion of cables.

244 Where the removal of mouldings, etc. is necessary, ensure the replacement is carried out by a qualified tradesman and that the replacement surface matches the existing surface.

Existing roof insulation

245 Where the roof insulation must be moved for the electrical installation, carefully move it to one side. On completion of the electrical Works carefully replace it to its original position. Take care to cover lengths of cable with insulating material to ensure the current rating of the cable(s) is not unduly altered.

Removal of old cables and fittings

246 Remove old cables and redundant switches, sockets, clips, boxes, etc. from roof spaces, exposed walls and other noticeable places and make good any disturbed surfaces.

COMPLETION

Inspection and testing

247 Ensure that on completion and before being energised, any installation is tested in accordance with applicable Standard.

248 Give not less than 24 hours' notice to the Client's Representative before commencing the testing.

249 After satisfactory completion of tests, submit copies of all inspection and completion certificates, with all associated schedules and test results if applicable, to the Client's Representative.

250 Note the testing instrument serial numbers on the test certificates.

251 All charges for testing or re-testing must be borne by the Provider.

252 The Provider must provide all the test instruments and test equipment required, make all arrangements for connections of the mains supply and issue to local authority supply company all appropriate test notices.

253 The Provider must affix to the distribution board a notice in accordance with Regulation 514.12 of IET REGULATIONS.

Report and certificates

254 Ensure all inspections, reports and test certificates and forms are the current version at the time of the test and are in the standard format published by the IET for Electrical Installation Certificate Approved by the Client's Representative.

© Rand Associates Consultancy Services Ltd

255 For Minor Works or alterations to an electrical installation which involve a change or modification to an existing single circuit, provide a certificate for Minor Electrical Installation Works.

256 Issue an Electrical Installation Completion Certificate for Major Works or alterations to electrical installations which involve:
- a change or modification to two or more existing circuits;
- the addition of one or more new circuits to an existing installation; or
- a new installation.

257 Provide an electrical installation condition report periodic when specifically Instructed by the Client's Representative.

Operating Instructions

258 Each consumer unit must be supplied with an operating instruction card which must be mounted adjacent to the unit.

259 The Provider must leave with the Customer printed instructions regarding operation of the consumer unit trip switch.

260 The instruction leaflet for the smoke detectors must be left in a safe place either by the electricity meter or consumer unit.

PAS 2030, PAS 2031 and PAS 2035

261 The Client has adopted PAS 2030:2019 and PAS 2035: 2019 and compliance with applicable Standard in commissioning measures to improve the energy efficiency of their existing Properties and to undertake fuel saving improvements.

262 All Works in respect of the installation of energy efficiency measures in existing Properties are therefore to be undertaken in accordance with the requirements of PAS 2030:2019.

263 All Works in respect of retrofitting Properties for improved energy efficiency are to be undertaken in accordance with the requirements of PAS 2035:2019 in addition to PAS 2030:2019

264 The Provider or their approved Subcontractors must be registered as compliant with PAS 2030:2019 by a PAS 2031 accredited scheme provider/certification body and provide evidence to demonstrate compliance with PAS 2030:2019. The Provider or their approved Subcontractors must be able to demonstrate compliance with PAS 2035:2019 to the approval of the Client's Representative.

265 Any person employed by the Provider or approved Subcontractor in any of the following roles:
- retrofit adviser;
- retrofit assessor;
- retrofit co-ordinator;
- retrofit designer; or
- retrofit evaluator

must have undertaken an approved accredited course approved by UKAS, and copies of their relevant certification provided to the Client's Representative when requested.

266 In addition, if the retrofit Works are in respect of energy efficiency and retrofitting of traditional (having solid, vapour permeable walls) or historical buildings which fall under the requirement with compliance with applicable Standard, the person or persons undertaking any of the roles indicated above, must hold an SQA Level 3 award in energy efficiency and retrofit of traditional buildings.

© Rand Associates Consultancy Services Ltd

HIGH VOLTAGE SWITCHGEAR MAINTENANCE

© Rand Associates Consultancy Services Ltd

HIGH VOLTAGE SWITCHGEAR MAINTENANCE

GENERAL MATTERS

Routine Maintenance

001 This Specification covers all Routine Maintenance to all high voltage switchgear (ranging from 1kV alternating current up to and including 33kV AC including circuit-breakers, switches, switch fuses, isolators and high voltage contactors) located within the boundaries of each Block or Scheme. The Specification must be read and interpreted in conjunction with the operations set out in the descriptions included in the Price Framework and with the Specification entitled LANDLORD'S ELECTRICAL INSTALLATIONS AND TESTING.

002 Routine Maintenance must involve the undertaking of the comprehensive servicing/maintenance operations described in this Specification and the operations in the Price Framework inclusive throughout the duration of the Contract Period at the regular intervals pre-defined by the Client and starting immediately from the Commencement Date.

003 All references to applicable Standards or other equally approved national standards must be deemed to mean those current, including all amendments.

004 Ensure that his Staff visits each Block or Scheme at the requisite frequency and carry out the specified inspections, maintenance, repairs, tests, certification and any other servicing Works to ensure that all systems, installations, equipment and appliances are maintained in prime condition.

005 At each Block or Scheme visit, the Provider's Staff must access the electronic log book for the respective installations and record all details of the visit and action taken. The Provider must be deemed to have allowed in his tender for creation of the Property specific installation data as each Property is inspected for the first time.

006 Within the first 3 months following the Commencement Date (i.e. at the end of the first servicing period) ensure that the high voltage switchgear located each Block or Scheme has a unique identifiable number.

007 Also within 3 months after Commencement Date, the Provider must provide the Client's Representative with both an electronic and a hard copy bound report containing a listing of the full name and address of the Block or Scheme; a full positional listing of all high voltage switchgear, distribution boards and the like referenced with their uniquely identifying number in accordance with paragraph 006 above; the dates when Routine Maintenance has been undertaken and/or is due in respect of each Property.

009 At the same time, the Provider may submit to the Client's Representative a separate report detailing any specific recommendations with respect to any high voltage switchgear.

009 At the completion of each visit to each Block or Scheme the Provider's Staff must complete electronically clear and explicit service report sheets. The electronic signature of the Client's relevant Scheme manager or other responsible officer must be obtained as proof of the Works being undertaken and completed. In blocks of flats or similar situations where there is no such dedicated, responsible manager or officer, the Provider's Staff must self certify completion of the Works. In such cases the name of the self certifying Staff member must be printed clearly and legibly. Copies of reports are to be forwarded to the Client's Representative, together with any recommendations for Works not already authorised. If the recommendations include for Works not covered by Rates in the Contract Documents then a quotation for such must be included with the service report sheets. The Provider must update the electronic log book with all service report sheets.

© Rand Associates Consultancy Services Ltd

010 All logs, reports and test recording sheets for all categories and sections of Work (whether specifically stated below or not) must be recorded and be available for inspection and download by the Client on a web based system in a format to be agreed by the Client and the Provider.

011 All project issues must be communicated through the Client's Representative and must not be channelled directly or indirectly via the Customers.

012 All alarm systems linked to high voltage switchgear rooms (whether specifically stated below or not) must be connected to nominated control monitoring services:
- All bespoke software must be fully documented, recorded and provided to the respective Client's Party (including providing all codes, passwords and part no's) and all must remain open protocol;
- All systems must remain open protocol;
- At handover meetings with the Client, the Provider must provide all codes, passwords and part numbers for all systems , parts and equipment; and
- Any damage caused by the Provider installing inferior equipment must be made good at the expense of the Provider;

Quality

013 The Client is aiming for an economic, high quality maintenance service with a stable workforce and effective supervision. Cost will therefore be only one element in the overall assessment of tenders.

014 The Works must be performed in accordance with the Contract Documents and must be carried out in an efficient and proficient manner.

015 The Client's Representative will monitor that the Specification is being met. Any Default in performance will be dealt with in accordance with the Contract.

016 The monitoring system will include an inspection of the following:
- the number and suitability of Staff used;
- quality of Materials used;
- that the servicing and maintenance procedures used are either as detailed in the Contract or as agreed with the Client's Representative;
- that the frequency and standards of servicing and maintenance are being met; and
- that health and safety requirements are met;

Equipment and Materials

017 All equipment and Materials required for the performance of the Contract must be supplied by the Provider and must be approved by the Client's Representative. Any alternatives subsequently proposed by the Provider must have the prior approval of the Client's Representative.

018 All equipment and Materials used by the Provider to fulfil the Contract must be suitable for the purpose and where an appropriate applicable Standard issued by the British Standards Institute, or other equivalent nationally approved standard is current, must as a minimum, be in accordance with that standard.

Reporting of Defects

019 Report in writing any obvious apparent defects in the design, installation and/or operation, to any of the existing installations, to the Client's Representative.

020 In particular report immediately to the Client's Representative any matters that may impact on health and safety issues and where immediate action is required from the Client's Representative.

© Rand Associates Consultancy Services Ltd

Maintenance Reports

021 Ensure that, following all visits to undertake Routine Maintenance, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

022 Provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff including his Specialist Subcontractors.

Manufacturer's Requirements

023 Where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

024 Within 20 working days of the award of the Contract submit and agree a full annual Programme for all Works covering each element of the Routine Maintenance Works with the Client's Representative.

025 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

Permit to Work Certification

026 The Client's Representative will issue a permit before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

027 The permit to work shall cover three levels of control:

- Limitation of access – issued to define the physical limits within which a work activity may be carried out, specifying any precautions necessary and hazards that may be present within the works area;
- Permit to work – when issued, clearly identifies the equipment to eb worked on, the work to be carried out, and the actions taken to achieve the conditions which safeguard people working from the dangers which are inherent in a HV system. A permit to work will not be issued on equipment that is still live; it will only be issued when the Provider has confirmed that the measures required for safety have been completed; and
- Sanction for test – issued to allow specific HV equipment to be tested, identifying the conditions under which the testing is to be carried out, and the actions taken to safeguard the Staff performing the test, and anybody else who may have access to the work area. A sanction for test will indicate whether temporary earth connections applied as part of the protective measures specified for a work activity to be removed for the purpose of testing

Network Diagram

028 Prepare a schematic network diagram for each switch room, intake room or substation at a Block or Scheme, the diagram, should identify the interconnection of the electrical distribution system from the supply intake point)s) to the loads that it feeds, it should identify all the switchgear and its location within the network. The diagram should include prospective fault current/energy values and information about the capacity of switchgear.

Access

029 Ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

030 All Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

031 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

© Rand Associates Consultancy Services Ltd

Minor Repairs

032 Carry out, during inspection and testing, minor repairs such as tightening joints, replacement of clips, etc to achieve a pass status and make appliances safe to ensure compliance with the applicable Standard.

Routine Maintenance

033 The minimum requirements for Routine Maintenance are to be in accordance with the relevant equipment manufacturer's recommendations.

034 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

035 Carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

036 Include for the provision and application of all consumables within the Rates for this element of the Contract.

037 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the latest applicable Standards or equivalent.

038 Routine Maintenance of switchgear and the like must unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirements tabled below;

Item No.	Item	Frequency	Action	Notes
1.	Substation or Switch Room or Intake Room – Abnormal Conditions	Annually	Upon entering the building or room undertake a Visual inspection for any abnormal conditions: • High temperature in the building or room; • Presence of smoke; • Smell of 'hot' substances (oil, compound etc); • Audible discharges or arcing; • Smell of ozone; • Nauseous odour; • Signs of leaked oil in vicinity of oil filled equipment; • Signs of fresh compound leaks; and • Distortion of, or evidence of soot on enclosures.	Any evidence of tampering or damage should be recorded and reported to the Client's Representative.

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
2.	Substation or Switch Room or Intake Room – Equipment environment	Annually	Examine fabric of the substation or switch room or intake room building to confirm that: • There are no signs of water ingress; • The building or room is clean, tidy and not being used as storage space; • Lighting and telephones are working; • Doors and windows are secured and locked or lockable; • No signs of damage or unwanted interference with the equipment or building or room; • The building is not overgrown with vegetation; • Access is acceptable; and • No signs of rodent activity.	Any evidence of damage should be recorded and reported to the Client's Representative.
3	Substation or Switch Room or Intake Room – Switchgear visual check	Annually	Equipment should be visually checked for: • Signs of corrosion, oil leaks or leaking compound; • Presence of earthing connections and other copper connections that may have been removed without affecting the immediate operation of the equipment; • Evidence of water ingress into the equipment enclosures; • Operation of ammeters, voltmeters, operation indicators, protection equipment indicators or flags is correct and displaying acceptable values; • Protection equipment indicators or flags are not indicating warnings; and • Labelling, padlocks and key exchange interlocks are present.	
4	Substation or Switch Room or Intake Room – General Services		Undertake inspections of: • Substation or room lighting; • Emergency lighting; • Tripping batteries; • Heaters; • Battery chargers; • Control panels; • Fire detection and fire extinguishing system; • Telephone communications; • Network diagram; and • Tools Test Battery condition	

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
5	Oil filled Switchgear	Annually	Examination and cleaning of the tank interior, internal mechanism, contacts, arc control devices, bushings, phase barriers and tank lining; Dressing, refurbishing or replacing main/arcing contacts if necessary; Assessment of contact alignment using the circuit-breaker slow-close facility; Cleaning of arc contact devices or replacement if burnt or worn beyond acceptable tolerances (cross-jet pots, turbulators etc); Replacement of insulating oil with new, reclaimed or reconditioned oil; Lubrication of operating mechanism and adjustment where required; Replacement of seals and gaskets as recommended by the manufacturer's technical data sheet; Clearing vents and checking indicator windows; Examination of primary isolating contacts for damage, burning and corrosion – cleaning and refurbishing as necessary; Checking and lubrication of the oil circuit breaker isolating mechanism; Checking correct function of position indicators and interlocks; Checking shutter operating mechanisms; Examining inside of cable termination chambers and current transformer chambers; Examining and checking voltage transformer; Secondary injection testing on circuit-breaker protection system or carry out manual trip test;	

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
5	Oil filled Switchgear (Cont'd)	Annually	Trip testing with an appropriate fuse trip-testing device on fuse switches/switch fuses; Examination of secondary contacts, wiring and auxiliary switches; and Checking that the trunk goes back into position and switchgear is level as appropriate when putting back into service.	
6	Oil Filled Chambers – Cleaning and Inspection	Annually	Clean oil filled chambers with proprietary wipes or synthetic sponges; Check tin or zinc coated switchgear components for whiskers following the removal of oil, remove any whiskers with an oil soaked wipe; Switches containing phosphate components should be rigorously cleaned to remove contamination from the insulated surfaces, Coated components should also be thoroughly cleaned to reduce the risk of recontamination of the oil; and Insulator surfaces should be cleaned with an appropriate solvent.	
7	Tank Cleaning	Annually	Following the removal of old oil, all accessible parts the inside of the tanks associated with oil-filled switchgear should be sprayed with clean oil under pressure, this is then to be removed using a liquid vacuum cleaner, and the process repeated till all contamination has been removed.	
8	Non-Oil Switchgear – Vacuum Switchgear	Annually	Visual inspection of the external condition; Verification of the design life expectancy of the vacuum bottles; Check to determine age of the equipment being maintained; Measurement of contact wear; Measurement of the contact resistance when closed; Check on vacuum integrity;	Maintenance Activities should be based on the manufacturer's technical data sheet

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
8	Non-Oil Switchgear – Vacuum Switchgear (cont'd)	Annually	Inspection, adjustment and lubrication of mechanisms, shutters etc; Examination of primary isolating contacts for damage, burning or corrosion on withdrawable equipment, cleaning and refurbishing as necessary; Check and lubrication of circuit-breaker isolating mechanism on withdrawable equipment; Checking correct function of position indicators and interlocks; Examination of the inside of cable termination chambers and other chambers as appropriate; Removal of surface contamination from accessible solid insulation; Checking the operation and integrity of any automatic earthing facility; Examining and checking the voltage transformer; Secondary injection testing on circuit-breaker protection systems or the use of proprietary electronic simulation devices or carry out manual trip test; and Examination of secondary contacts, wiring and auxiliary switches.	
9	Non-Oil Switchgear – Air-break Switchgear	Annually	Visual inspection of the external condition; Examination of main/arcing contacts for excessive burning/damage, recondition or renew as required; Checking/adjusting spring contact force and contact alignment; Removal, examination and cleaning of the arc chutes, renew if damaged or corroded; Inspection, adjustment and lubrication of mechanisms, shutters etc;	Maintenance Activities should be based on the manufacturer's technical data sheet

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
9	Non-Oil Switchgear – Air-break Switchgear (Cont'd)	Annually	Examination of primary isolating contacts for damage, burning or corrosion on withdrawable equipment, cleaning and refurbishing as necessary; Check and lubrication of circuit-breaker isolating mechanism on withdrawable equipment; Checking correct function of position indicators and interlocks; Examination of the inside of cable termination chambers and other chambers as appropriate; Removal of surface contamination from accessible solid insulation; Examining and checking the voltage transformer; Secondary injection testing on circuit-breaker protection systems or the use of proprietary electronic simulation devices or carry out manual trip test; and Examination of secondary contacts, wiring and auxiliary switches.	
10	Non-Oil Switchgear – SF_6 Switchgear	Annually	Visual inspection of the external condition; Check gas pressure; Top up gas if required; Inspection, adjustment and lubrication of mechanisms, shutters etc; Examination of primary isolating contacts for damage, burning or corrosion on withdrawable equipment, cleaning and refurbishing as necessary; Check and lubrication of circuit-breaker isolating mechanism on withdrawable equipment; Checking correct function of position indicators and interlocks; Examination of the inside of cable termination chambers and other chambers as appropriate;	Maintenance Activities should be based on the manufacturer's technical data sheet

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
10	Non-Oil Switchgear – SF_6 Switchgear (cont'd)	Annually	Removal of surface contamination from accessible solid insulation; Examining and checking the voltage transformer; Secondary injection testing on circuit-breaker protection systems or the use of proprietary electronic simulation devices or carry out manual trip test; and Examination of secondary contacts, wiring and auxiliary switches.	
11	Ancillary Equipment – Test Probes	Annually	Inspection of general condition, damage and deterioration; Inspection for correct and legible identification; Cleaning to remove oil films and loose dirt; Inspection of contacts for wear, burning or other signs of abnormal condition, and to ensure they are securely attached; Inspections of bushings for cracks, damage , burning etc; Inspection of any guide pins, interlocking tabs and locking bolts to ensure that and any other parts are securely attached; Measurement of the insulation resistance using an insulation tester; Mark those probes which are in a satisfactory condition with the correct code for the current period of use; and Removal of any damaged or defective probes, repair or renew	

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
12	Ancillary Equipment – Earthing Equipment (cont'd)	Annually	Inspection of general condition for damage or deterioration; Inspection for correct and legible identification; Cleaning; Inspection of contacts, connections and leads for wear , burning and other abnormal conditions; Inspection of contacts, connections and leads to ensure that they are securely attached; Inspection of all insulation components for damage; Inspection of any guide pins, interlocking tabs and locking bolts to ensure they are present, functional and secure; Colour code for current period of use; Remove any damaged or defective earthing equipment from use, and either repair of renew;	

Firestopping

039 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

040 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

© Rand Associates Consultancy Services Ltd

LIFTS, STAIRLIFTS AND OTHER DISABILITY LIFTING EQUIPMENT INSTALLATIONS

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

PART 1 - PERIODIC SERVICING AND INSPECTIONS, ROUTINE MAINTENANCE AND RESPONSIVE MAINTENANCE TO LIFTS, STAIRLIFTS AND OTHER DISABILITY LIFTING EQUIPMENT INSTALLATIONS

SECTION 1.0 GENERAL

Periodic Servicing and Inspections, Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works – Additional Requirements

001 The service report sheet is also to incorporate the following information:

1. arrival and departure times
2. state of the installation on arrival
3. details of Works carried out, and adjustments made
4. the condition of the ropes, locks, machinery, electrical wiring, car and indicator lamps and all other equipment of or associated with the Lift installation
5. details of any parts or components renewed
6. details of any unsatisfactory parts or components and identify any further Works which the Provider may consider necessary
7. certification by the Provider that the Lift installation is or is not in a satisfactory and serviceable condition.

002 When an Order has been issued to carry out any Work indicated as necessary on the Provider's service report sheet and that Order has not been completed when any subsequent service visit report is issued, the sequential number of the Order is to be indicated by the Provider against that particular item of Work.

003 When on a Periodic Servicing and Inspection visit or responding to an Order for Responsive Maintenance or Out of Hours Emergency Works, if further defects of an urgent nature are identified by the Provider's Staff, the Client's Representative or the Client's Out of Hours Call Handling service are to be immediately contacted by telephone, stating the action taken and the exact nature of the defects. A written report is to provided to the Client's Representative within two working days.

004 Minor Work or alterations to electrical installations, which involves a change or modification to an existing single circuit, must include the issue of the certificate for Minor Electrical Installation Works in accordance with the IET Wiring Regulations.

005 Major Work or alterations to electrical installations, which involves a change or modification to two or more existing circuits and all new installations, must include the issue of an Electrical Installation Completion Certificate in accordance with the IET Wiring Regulations.

006 Following any visit to a Property or group of Properties to undertake Responsive Maintenance or Out of Hours Emergency Works, the Provider must also forward a report sheet to the Client's Representative detailing the nature of the visit, the authorisation for it and the actions taken.

Quality

007 The Client is aiming for an economic, high quality maintenance service with a stable workforce and effective supervision.

008 Ensure safe working Codes of Practice are being adhered to, and undertake all Periodic Servicing and Inspections, Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works with a two man lift maintenance team. The Client's Representative may at any time request details of the qualifications of the Provider's Staff, such a request is to be responded to within two working days.

009 Include for providing all necessary access ladders, safety barriers, safety signs, lift under maintenance notices etc to safeguard both the Customers and general public as well as its own Staff.

© Rand Associates Consultancy Services Ltd

010 At the conclusion of each visit to undertake Routine Maintenance, Responsive Maintenance or Out of Hours Emergency Works, the lift installation must be left in a safe and satisfactory working condition. In the event of any lift being withdrawn from service by the Provider for any reason, the Client's Representative must be notified within two hours by phone and fax or email transmission.

011 Contract Manager is to undertake at six monthly intervals, his own site visit to check the quality and standards of the Periodic Servicing and Inspections, Routine Maintenance and Responsive Maintenance being undertaken by the Provider's Staff. The next service report sheet submitted after such an inspection is to be countersigned by the Contract Manager if satisfactory Periodic Servicing and Inspections, Routine Maintenance and Responsive Maintenance has been carried out. Any Defects noted at the Contract Manager's inspection and not included in any previous service report are to be notified immediately to the Client's Representative

Equipment and Materials

012 Retain at the Property for inspection by the Client's Representative any defective components or parts that have been renewed. The Provider must remove such components or parts from the Property immediately on receipt of instructions from the Client's Representative. All redundant ropes, oil and landing or car doors must be removed from the Property immediately upon completion of the Works.

SAFED LG1 annual tests and inspections.

013 SAFED LG1 annual tests and inspections are required to be completed as part of the Periodic Servicing and Inspection of the Lifts, Stairlifts etc. and are deemed to be included in the Provider's tendered Rates. Supplementary tests as detailed in SAFED guidance are to be undertaken at the Rates in the Price Framework.

Lift Engineers

014 Lift engineers are to be qualified to NVQ Level 3 in Engineering – Lift Repair and be EN 13015 certified egnineers and technicians.

© Rand Associates Consultancy Services Ltd

SECTION 2.0 PERFORMANCE SPECIFICATION

The following items are in addition to those specified elsewhere in this Specification:

Contract Requirements

001 The lifts, stairlifts and other disability hoists and installations must be covered by a fully comprehensive type Contract.

002 Detailed below are the specific Requirements. The Contract must therefore comprise of the following elements:

.1 Periodic Servicing and Inspections
.2 Routine Maintenance
.3 Responsive Maintenance
.4 Out of Hours Emergency Works
.5 SAFED LG1 annual tests and inspections

Periodic Servicing and Inspections and Routine Maintenance

003 The minimum requirements for Periodic Servicing and Inspections and Routine Maintenance are detailed in Section 3.0.

004 These are minimum requirements and the Routine Maintenance plans and task sheets must take into account the individual particulars of the lifts concerned in terms of their condition, age and type.

005 Carry out **the specified number of visits** per annum for Periodic Servicing and Inspections and Routine Maintenance on all passenger and goods lifts.

006 Carry out **the specified number of visits** per annum for Periodic Servicing and Inspections and Routine Maintenance on all stairlifts through floor lifts, vertical platform lifts, bin lifts and other disability hoists.

007 Include for the provision and application of all consumables within the Rates for Periodic Servicing and Inspections and Routine Maintenance. Consumables must include:

- Gear oil
- Lubrication oil
- Grease
- Cleaning equipment
- Spill dry
- Lamps and tubes
- Indicators
- LEDs's
- Shaft lamps and tubes
- V belts.
- Door operator drive chain or rope.
- Fuses.
- Seals
- Relays
- Door bottom shoes
- Top track hanging rollers and upthrust rollers.
- Sliding guide shoe liners.

008 Undertake the repair or renewal of any component not listed in 007 above as Routine Maintenance which is identified as being defective or damaged beyond repair whilst programmed Routine Maintenance is being undertaken to the lift installation and is undertaken in conjunction with the Routine Maintenance or is programmed to be undertaken at a later date with the approval of the Client's Representative.

© Rand Associates Consultancy Services Ltd

Responsive Maintenance (including Breakdown Call Outs and Out of Hours Emergency Works)

Responsive Maintenance and Out of Hours Emergency Works

009 Attend to all call outs due to malfunction or breakdown.

010 Include for a call-out service to provide Responsive Maintenance and an Out of Hours Emergency Works Service. The Out of Hours Emergency Works service is deemed to extend the provision of Emergency Works to a 24 hour, 7 days a week, 365 (366 for a leap year) days per year basis.

011 Call outs for Responsive Maintenance and/or Out of Hours Emergency Works which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

012 Where Out of Hours Emergency Works are attended to for authorised cases of breakdowns, mis-use or vandalism, the Provider will be paid in accordance with the Rates detailed in the Price Framework.

013 Submit to the Client's Representative his Staff's breakdown report no later than 5 working days following the breakdown visit indicating a clear assessment of the faults found and the remedial action taken to rectify the fault(s)

Repairs, Replacements and Adjustments

014 Accept responsibility for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

015 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

016 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

017 The criteria for the replacement of steel wire ropes must be as detailed in the SAFED document "Lifts - Guidelines on the Thorough Examination and Testing of Lifts".

018 Where repairs, replacements and adjustments are required and that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

Safed - Guidelines on thorough Examination and Testing of Lifts

019 Include within the Contract for all tests to be implemented on a yearly basis.

020 This will include:

SAFED REF	
Annex A1	Earth Continuity
Annex A2	Electrical Safety Devices
Annex A4	Landing Door Interlocks
Annex A5 + A6	Geared Machine
Annex A5 + A6	Shafts/Plain Bearings
Annex A5 + A6	Roller/Ball/Needle Bearings
Annex A5 + A6	Shreaves
Annex A7	OSG Calibration/Actuation
Annex A8, A9 + A10	Safety Gear Reduced/Rated

© Rand Associates Consultancy Services Ltd

SAFED REF	
Annex A12	Energy Dissipation Buffers, Slow Speed for Electric Traction Lifts
Annex A12	Energy Dissipation Buffers, Fast Speed for Electric Traction Lifts
Annex A14	Car Overload Detection Devices
Annex A15	Hydraulic Systems
Annex A17	Hydraulic Rupture/Resistor Valves
Annex A16	Hydraulic Cylinders
Annex A18	Electrical Anti-Creep Systems
Annex A19	Mechanical Anti-Creep Systems
Annex A20	Low Pressure Detection Devices
Annex A21	Traction, Brake and Leveling, Brake Condition

021 Undertake the detailed tests and inspections and must utilise and issue findings on the prescribed SAFED Model Forms.

022 A copy of the certificate must be forwarded to the Client's Representative within 5 working days of the insurance test and a further copy must be retained on site in the lift service log book.

023 Prior to undertaking tests and inspections, the Provider must implement a risk assessment to identify risks to those undertaking the tests and also potential equipment damage.

024 Undertake the 5 yearly and 10 yearly tests. The basis of reimbursement must be in accordance with the Rates detailed in the Schedule of Rates.

© Rand Associates Consultancy Services Ltd

SECTION 3.0 MINIMUM REQUIREMENTS FOR PERIODIC SERVICING AND INSPECTIONS AND ROUTINE MAINTENANCE

Introduction

001 The tasks outlined below should be undertaken as minimum requirements. The Provider must take into account the condition and usage of the equipment concerned and re-schedule tasks if particular circumstances dictate.

002 Where the requirements to "check" is stipulated the Provider must when necessary also undertake any or all of the following actions to ensure the safe and efficient operation of the lift(s).

Typical Actions

Clean
Lubricate
Adjust
Realign
Replace consumable parts
Carry out further investigations
Carry out detailed checks using special tools
Basic fault finding

003 It is the Provider's responsibility to observe the on-going condition of the equipment with regard to safe and correct operation. The Provider must bring to the attention of the Client's Representative any specific areas where periodic checking, lubrication and adjustment exceeds normal provisions for equipment of the age and type installed.

004 When the need for adjustment, repairs and replacements are identified during the course of Periodic Servicing and Inspections and Routine Maintenance the Provider must undertake the necessary Works in accordance with the requirements detailed in this Specification.

Lift Motor Rooms etc

005 The lift pit, lift motor room and all surfaces of the floors and walls adjacent to the lift equipment are to be kept clean and clear of oil, grease and rubbish. The presence of "sharps" and other drug related material must be reported immediately to the Client's Representative who will then instruct other Providers to safely remove such material.

General Checking and Inspections

006 The following are to be inspected and actioned on each Routine Maintenance visit were appropriate.

1.	Guide Rails and Fixing – Shaft/pit	Check all fixings;
		Brush down backs of guides and brackets;
		Remove debris;
		Clean shaft and pit area;and
		Remove all oil and debris.
2.	Buffers	Check fixings; and
		Check counterweight overrun and report with lift at top floor when the gap between the bottom of the counterweight and the top of the buffer becomes less than 15cm.
3.	Main Gear	Check oil levels;
		Check for backlash and leaks; and
		Clean.

© Rand Associates Consultancy Services Ltd

4.	Traction Sheaves	Observe if sheaves are tight;
		Inspect for cracks; and
		Check grooves for wear and signs of rope slip.
5.	Diverter Sheaves	Observe fixings;
		Inspect for cracks and wear; and
		Lubricate and clean.
6.	Brake and Coupling	Inspect brake coupling and linings for wear or contamination;
		Ensure all fixings are secure;
		Check for correct set-up and adjust where necessary;
		Clean;
		If asbestos linings are suspected, the Client's Representative must be informed immediately; and
		Check Earth terminations on all electrical terminations.
7.	Motor	Check electrical connections for tightness;
		Check lubrication of bearings;
		Clean; and
		Check all Earth terminations.
8.	Controller	Check alignment and air gaps where fitted of relays/contactors/switches;
		Check oil levels where fitted of overloads;
		Check braids and all contacts with fixed tails, where fitted for wear and fixings;
		Replace faulty fuses with correctly rated fuses;
		Clean, and adjust where required; and
		Ensure panel is locked before leaving site.
9.	Floor Selector and Levels	Check tolerances of all moving parts;
		Check contacts for wear;
		Check braids for wear and fixings;
		Check lubrication requirements;
		Check chain tension;
		Check leveling switch operation;
		Adjust parts as necessary;
		Floor levels – Check and adjust to correct tolerances; and
		Check all Earth terminations.
10.	Shaft switches	Check rollers for wear and free operation;
		Ensure all connections for tightness;
		Check alignment of switches and cams;
		Lubricate as necessary;
		Check for correct operation;
		Clean; and
		Ensure correct covers are fitted.
11.	Overtravel limits	Check rollers for wear and free operation;
		Ensure all connections for tightness;
		Check alignment of switches and cams;
		Lubricate as necessary;
		Check for correct operation;
		Clean; and
		Ensure correct covers are fitted.

© Rand Associates Consultancy Services Ltd

12.	Main ropes	Check condition of ropes;
		Report number of splinters in 8 diameters where necessary;
		Check rope tensions are equal;
		Check fixings for security, and applicable Standard requirements; and
		Check for correct number of rope clips fitted.
13.	Auxiliary ropes	Check condition of ropes;
		Report number of splinters in 8 diameters where necessary;
		Check rope tensions are equal;
		Check fixings for security, and applicable Standard requirements; and
		Check for correct number of rope clips fitted.
14.	Governor	Check and lubricate governor;
		Check electrical connections for security;
		Check governor tension weight and switch;
		Check cover securely fixed; and
		Check for correct number of rope clips fitted.
15.	Guide shoes	Check for wear, and adjust where necessary;
		Lubricate;
		Clean off excess lubricants; and
		Check fixings, and Liners for wear.
16.	Car enclosure	Check car station panel and kicking panel for security;
		Check all panels for security/damage/corrosion; and
		Check car flooring for cracks/damage/corrosion, and tripping hazards.
17.	Car lighting	Check for correct operation;
		Check condition of diffuser;
		Replace defective tubes or bulbs where necessary, clean; and
		Check Earth terminations.
18.	Car top control	Check for correct operation;
		Check stop switch;
		Check car top light;
		Report if guard is missing;
		Check door operation;
		Clean control unit and car top; and
		Ensure that car top control conforms to applicable Standards.
19.	Safety Gear	Check safety link arms and moving parts attached to car for lubrication and freedom of movement;
		Lubricate where necessary;
		Check connections of electrical switches for security; and
		Check tension of ropes and rope clips.

© Rand Associates Consultancy Services Ltd

20.	Landing Doors/Closers/Tracks	Check doors for security;
		Lubricate tracks where appropriate;
		Check and adjust stabilizing rollers where necessary;
		Check correct operation of door closers;
		Check door shoes for security;
		Check condition of hangers and hanger rollers;
		Check and adjust where necessary lock release mechanisms;
		Check running clearances and adjust where necessary;
		Check astragal and holder for security;
		Check bottom tracks for wear and corrosion;
		Clean out bottom tracks; and
		Ensure that doors can not be opened without release key when lift is away from floors.
21.	Vision Panels	Check fixings for security;
		Check glass for safety, including finger traps; and
		Check glass/Perspex for condition and visibility.
22.	Car Door/Tracks	Check doors for security;
		Lubricate tracks where appropriate;
		Check and adjust stabilizing rollers where necessary;
		Check door shoes for security;
		Check condition of hangers and hanger rollers;
		Check and adjust where necessary door locking devices;
		Check running clearances and adjust where necessary;
		Check bottom tracks for wear and corrosion; and
		Clean out bottom tracks.
23.	Door Operator	Check and adjust where necessary the clutch tension;
		Check all fixing bolts for security;
		Check for any slackness in linkages and chains;
		Check smoothness of operation opening and closing, including slow and fast speeds, adjust where necessary;
		Check drive block assemblies/couplers where fitted for security and wear;
		Adjust as necessary;
		Check pick up assemblies where fitted for security and wear;
		Check door gear for oil leaks and check lubrication requirements, lubricate as appropriate;
		Check door open and door close contacts for wear;
		Check door open and door close buffers;
		Check retiring ramp contacts for wear and correct operation, check all linkages: and
		Check mechanical door locking devices and adjust as necessary.

© Rand Associates Consultancy Services Ltd

24.	Locks	Check all lock contacts and bases for condition and follow up;
		Check and adjust where necessary lock latching mechanisms;
		Check fixings for security;
		Check lock arms and rollers for correct operation, lubricate and clean; and
		Check earth terminations.
25.	Safety edges	Check safety edge for consistent operation over the full closing of the door;
		Check fixings for security;
		Check for excessive bounce;
		Lubricate where appropriate;
		Check operation at various heights;
		Check condition of flexes; and
		Check where fitted for correct operation of nudging switch, adjust as appropriate.
26.	Pushes - Car and Landing	Check pushes and push plates for security;
		Check for correct operation;
		Check call acceptance indicators where appropriate; and
		Operate lift to each floor, from lift car and landings.
27.	Indicators/Signals/Speech Synthesizers	Check for security;
		Check for correct sequence operation;
		Check bulbs/LEDs; and
		Check correct operation of speech synthesizers where fitted.
28.	Main switch and circuit breakers	Check for correct operation, and security; and
		Check earth connections and warning labels to applicable Standards.
29.	Shaft lighting	Check for correct operation;
		Change lamps/tubes where appropriate;
		Clean units; and
		Check correct covers are fitted.
30.	Flexes	Check for wear;
		Make sure they cannot snag anywhere; and
		Check hanging correctly.
31.	Alarm System	Check for correct operation at various levels;
		Check alarm bell audibility;
		Check where fitted battery back-up; and
		Check batteries where fitted for corrosion.
32.	Emergency lighting	Where fitted check for correct operation.
33.	Health and Safety	Lift motor room access, check for security of ladder, trap doors, motor room doors;
		Check for correct operation of motor room lighting;
		Check controller rubber mat properly fitted;
		Check machine guards for security, and painted yellow;
		Check that correct notices are fitted: Danger, Electric Shock, Hand Winding;
		Check where fitted for security shaft dividing screens;
		Check toe guards and aprons for security;
		Check where fitted for security: pit ladders; and
		Ensure pit props are fitted in Hydraulic lift pits.

© Rand Associates Consultancy Services Ltd

34.	Handwinding gear	Check correct handwinding equipment is installed in the lift motor room;
		Check floor level buzzer operation; and
		Check that ropes are painted at floor level.
35.	Oil levels (Hydraulic tanks)	Check with lift car at top floor that hydraulic pump and motor are fully submersed; and
		Replenish where appropriate.
36.	Ram Seals	Check for leaks.
37.	Cylinder Head	Check cylinder head for security.
38.	Oil Conditions	Check oil condition for contamination; and
		Check colour of oil to original specification.
39.	Speeds	Check correct acceleration and deceleration to and from all floors, adjust as necessary.
40.	Relevelling/Anti creep Devices	Check for correct operation at all floor levels re-leveling;
		Check where fitted anti-creep devices (power off) for security; and
		With ball shut-off valve closed, check that pressure does not decrease more than 4-6 bars in 5 minutes.
41.	Manual lowering (Hydraulic lifts)	Check for correct operation;
		Check valve block for leaks;
		Clean valve block and tank unit; and
		Check manual lowering instructions are in order, report immediately if not.
42.	Working pressure (Hydraulic lift)	Check correct working pressures are being maintained; and
		Check filters for wear/obstructions.
43.	Slack rope switch (Traction and Hydraulic lifts)	Check for correct operation; and
		Check terminations for security.

Renewal of Ropes

007 All ropes must be attached to the lift car and counterweight by means of bulldog clips and thimbles and conical sockets (4 clips per rope end)

008 Test must be made at the manufacturer's or elsewhere as agreed, for "Torsion, Tensile and Breaking Load" of the rope as set out in the applicable Standard 302 Parts 1 and 4 prior to delivery to the Property.

009 Test certificates must be sent to the Client's Representative for his approval.

010 The lift car must be suspended independently of the safety gear during re-roping

011 On completion of the renewal of hoist ropes, a rope test certificate must be forwarded to the Client's Representative within 5 working days.

Cleaning and Painting of Lift Car and Landing Doors

012 The cleaning and painting of the well side of Lift car and landing doors must include the exposed edges of those doors.

© Rand Associates Consultancy Services Ltd

Renewal of Lift Car Floor Covering

013 The removal of Lift car floor coverings must include cutting out and removing the worn car floor covering, cleaning the metal sub-floor and painting with bitumen solution, and laying down a new floor covering formulated from approved epoxy resin products or other equal and approved Material. The new floor covering Material is to be submitted for approval before use. The floor covering must be at least 6mm thick and must be suitably keyed to the sub-floor.

Renewal of Door Shoes

014 Where the renewal of door shoes is specified the new shoes are to be of such dimension as to ensure that the total amount of movement of the bottom of the door (measured in the direction to or from the car interior) must be limited to between 0.8mm (1/32") and 1.6mm (1/16") and the shoes must be fitted as to maintain the correct clearance of only 3.2mm (1/8") between the door and its return. The shoes must be securely fitted with bolts.

Renewal of Vision Panels

015 Where vision panels are to be renewed or provided to landing or car doors they must be approximately 30mm wide x 180mm high and must be positioned on the vertical centre line of the door. The lower edge of the cut out in the door skin must be between 1450mm and 1530mm above floor level, and the car door vision panel must align with the landing door vision panel when the car floor is level with any landing.

The edges of the cut-out in the door skin must be reinforced by a 2mm thick steel backing plate securely fixed to the structural members within the door. This backing plate will also be secured to the door skin. The vision panel will consist of a transparent polycarbonate window suitably rebated to be substantially flush with the door face. No part of the polycarbonate must be less than 3mm thick. The polycarbonate is to backed with a sheet of transparent safety wired glass not less than 6mm thick. A suitable neoprene channel must be fitted around the edges of the glass to absorb any forces resulting from impact on the polycarbonate front sheet. The polycarbonate and glass sheets must be retained in a rigid steel pocket fixed to the 2mm thick steel backing plate. The well side of this pocket must have a cut-out in it identical to and perfectly aligned with the cut-out in the door skin. However, a mid bar reinforcing strip may be left in if deemed necessary.

Remote Monitoring

016 Where remote monitoring is installed, the Provider must, before commencing any Works, operate the remote monitoring switch and reset on completion of the Works.

Two Way Communication Facilities

017 Ensure that in accordance with the current requirements as laid down under the Lift Regulations for passenger lifts, and more specifically in accordance with the provisions required under the applicable Standards, that a facility for two way communications is in place in every passenger and goods lift, which facilitates the system to be automatically tested every 72 hours.

Supplier: [Client to insert name] or other equal and approved supplier.

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

Model Periodic Servicing and Inspection Intervals

ELECTRIC TRACTION PASSENGER LIFTS

EQUIPMENT & ACTIVITY **FREQUENCY**

1. **Area 1 - Lift Car**

Area 1	**Lift Car**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check lift leveling with lift traveling in both up and down directions	Quarterly	Bi-monthly	Monthly
.2	Observe lift starting and stopping for both upwards and downwards travel	Quarterly	Bi-monthly	Monthly
.3	Check operation of lift car controls and indicators	Quarterly	Bi-monthly	Monthly
.4	Observe door operation, both opening and closing, for smoothness and unusual noises.	Quarterly	Bi-monthly	Monthly
.5	Manually check closing force by hand.	Quarterly	Bi-monthly	Monthly
.6	Check operation of door reversal device by hand.	Quarterly	Bi-monthly	Monthly
.7	Check lift lighting and the diffusers	Quarterly	Bi-monthly	Monthly
.8	Test lift car emergency lighting by isolating lift car lighting supply	6 monthly	6 monthly	6 monthly
.9	Check with pressure gauge door closing force	Annually	Annually	Annually

2. **Area 2 – Lift Machine Room**

Area 2	**Lift Machine**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check worm gear oil level.	6 monthly	6 monthly	6 Monthly
.2	Observe gear operating and check for noise and evidence of backlash.	Quarterly	Bi-monthly	Monthly
.3	Check lubrication to motor sleeve and roller bearings.	6 monthly	6 monthly	6 Monthly
.4	Observe motor running for noise, vibration and excessive heat.	Quarterly	Bi-monthly	Monthly
.5	Check operation of motor vent fan	6 monthly	6 monthly	6 Monthly
.6	Check condition of brake drum and linings	Quarterly	Bi-monthly	Monthly
.7	Check availability of hand winding equipment and statutory notices.	Quarterly	Bi-monthly	Monthly
.8	Check gear casing oil seals for leakage.	6 monthly	6 monthly	6 Monthly
.9	Check divertor pulley lubrication.	6 monthly	6 monthly	6 Monthly
.10	Check brake drum clearances and adjust as necessary.	6 monthly	6 monthly	6 Monthly
.11	Check rope traction on sheave by means of chalk marks and straight edge.	6 monthly	6 monthly	6 Monthly
.12	Check machine couplings, key ways, shafts, etc for tightness by means of visual inspection and hand	6 monthly	6 monthly	6 Monthly
.13	Check lubrication to brake pivot points.	6 monthly	6 monthly	6 Monthly
.14	Check lubrication to outer bearings.	6 monthly	6 monthly	6 Monthly
.15	Check with use of gauge wear to sheave.	6 monthly	6 monthly	6 Monthly
.16	Check grooves for cogging.	Annually	Annually	Annually
.17	Check generally machine fixings and isolation mounts.	Annually	Annually	Annually
.18	Clean and refill sleeve and roller bearings	Every 2 years	Every 2 years	Every 2 years
.19	Change oil in gear box.	Every 4 years	Every 4 years	Every 4 years

© Rand Associates Consultancy Services Ltd

ELECTRIC TRACTION PASSENGER LIFTS (cont'd)

EQUIPMENT & ACTIVITY **FREQUENCY**

Area 2	**Control Panel**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check contact condition in terms of cleanliness, wear and pitting.	6 monthly	6 monthly	6 Monthly
.2	Check security of electrical terminals	Annually	Annually	Annually
.3	Check cabling for overheating and deterioration.	Annually	Annually	Annually
.4	Check fuse and overload condition and operation. Label and date.	Annually	Annually	Annually
.5	Clean switch gear with use of industrial vacuum cleaner.	Annually	Annually	Annually

Area 2	**Governor**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Manually check governor tripping.	6 monthly	6 monthly	6 Monthly
.2	Check governor groove for wear.	6 monthly	6 monthly	6 Monthly
.3	Check operation of electrical switch.	6 monthly	6 monthly	6 Monthly
.4	Check lubrication to governor bearings.	6 monthly	6 monthly	6 Monthly

Area 2	**Main Switch**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Inspect contacts for cleanliness and pitting	Annually	Annually	Annually

Area 2	**Ropes**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check condition of wire ropes.	6 monthly	6 monthly	6 Monthly

Area 2	**Lighting**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check operation of lift machine room lighting.	Quarterly	Bi- monthly	Monthly
.2	Check operation of machine room emergency lighting.	6 monthly	6 monthly	6 Monthly

Area 2	**Switches**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check operation of emergency stop switches	6 monthly	6 monthly	6 Monthly

3. **Area 3 – Liftwell**

Area 3	**Guides and Fixings**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check guide lubrication	Quarterly	Bi- monthly	Monthly
.2	Check car top and counterweight lubrication pots.	6 Monthly	6 Monthly	6 Monthly
.3	Check and empty when necessary guide rail oil trays.	Quarterly	4 Monthly	4 Monthly
.4	Check guide and guide bracket fixings for tightness.	Annually	Annually	Annually

© Rand Associates Consultancy Services Ltd

ELECTRIC TRACTION PASSENGER LIFTS (cont'd)

EQUIPMENT & ACTIVITY **FREQUENCY**

Area 3	**Lift Car Top**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check operation of lift car top maintenance controls.	Quarterly	Bi- monthly	Monthly
.2	Check operation of lift car top light	Quarterly	Bi- Monthly	Monthly
.3	Clean car top working surface and steel work.	6 Monthly	6 Monthly	6 Monthly
.4	Test circuit and operation of car top socket outlet.	Annually	Annually	Annually

Area 3	**Lift Pit and Lift Well Steel Work**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Clean lift pit as necessary.	Quarterly	Bi- monthly	Monthly
.2	Clean lift well steel work and ledges	Annually	Annually	Annually

Area 3	**Landing Doors**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check operation of landing electro-mechanical locks and electrical interlocks.	Quarterly	Bi- monthly	Monthly
.2	Check chain or air cords for wear and tension together with check on anchorages.	Quarterly	4 Monthly	4 Monthly
.3	Check wear on door panel bottom guide shoes.	Quarterly	Bi- monthly	Monthly
.4	Clean sill groove and top track.	Quarterly	4 Monthly	4 Monthly
.5	Check top track rollers and upthrust rollers	Quarterly	4 Monthly	4 Monthly
.6	Check lubrication to linkages, chains, pivots, etc.	Quarterly	4 Monthly	4 Monthly
.7	Check operation and condition of lock beaks, pivot bearings and rollers.	Quarterly	Bi-Monthly	Monthly
.8	Carry out detailed inspection of lock interior, clean and supply certificate in accordance with Health and Safety Executive document PM/7	Annually	Annually	Annually

Area 3	**Lift Car Sling**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Observe guide shoes etc. with lift running at test speed.	Quarterly	4 Monthly	4 Monthly
.2	Check wear to car guide shoe liners	Quarterly	4 Monthly	4 Monthly
.3	Check fixings of guide shoe brackets.	Quarterly	4 Monthly	4 Monthly
.4	Check condition of rubber isolation mounts, car sling bolted fixings etc.	Annually	Annually	Annually

Area 3	**Counterweights**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check counterweight guide shoe wear..	6 Monthly	6 Monthly	6 Monthly
.2	Check counterweight frame fixings and filler weight restraints.	Annually	Annually	Annually

© Rand Associates Consultancy Services Ltd

ELECTRIC TRACTION PASSENGER LIFTS (cont'd)

EQUIPMENT & ACTIVITY **FREQUENCY**

Area 3	**Buffers**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check fixing and square for spring buffers	Annually	Annually	Annually
.2	Clean and check secureness of fixings Safety Gear	Annually	Annually	Annually
.3	Visually check safety gear mechanism and linkage and operate by hand.	6 Monthly	6 Monthly	6 Monthly
.4	Check by hand operation of safety gear switch.	6 Monthly	6 Monthly	6 Monthly
.5	Clean and lubricate as necessary safety gear linkages and pivot points.	6 Monthly	6 Monthly	6 Monthly

Area 3	**Lightwell Switches**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check by hand operation of terminal limit switches and test limit.	6 Monthly	6 Monthly	6 Monthly
.2	Inspect rollers and check pivot lubrication.	6 Monthly	6 Monthly	6 Monthly
.3	Inspect switch interior workings for mechanical wear and condition of contacts.	6 Monthly	6 Monthly	6 Monthly
.4	Check secureness and clean as necessary lift well tapehead system and associated equipment	Annually	Annually	Annually

Area 3	**Ropes and Rope Anchorages**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check secureness and integrity of rope anchorages.	Quarterly	Bi-Monthly	Monthly
.2	Check tightness of rope clip type anchorages	Annually	Annually	Annually

Area 3	**Clearances**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check counterweight buffer clearance.	6 Monthly	6 Monthly	6 Monthly
.2	Check clearance at top of lift well.	6 Monthly	6 Monthly	6 Monthly
.3	Check door coupler and sill clearances.	6 Monthly	6 Monthly	6 Monthly

Area 3	**Governor Return Pulleys**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check bearing/pivot lubrication.	6 Monthly	6 Monthly	6 Monthly
.2	Check by hand operation of electrical switches.	6 Monthly	6 Monthly	6 Monthly
.3	Check cleanliness and integrity of fixings.	Annually	Annually	Annually

Area 3	**Trailing Cables**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check trailing cable anchorages in lift well and to lift car	6 Monthly	6 Monthly	6 Monthly
.2	Check cable hanging loop and clearance to pit base.	6 Monthly	6 Monthly	6 Monthly
.3	Check condition of cable sheath.	Annually	Annually	Annually

© Rand Associates Consultancy Services Ltd

ELECTRIC TRACTION PASSENGER LIFTS (cont'd)

EQUIPMENT & ACTIVITY **FREQUENCY**

4. **Area 4 - Lift Landings**

Area 4	**Door Operator and Car Doors**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check operation of electrical interlock	Quarterly	4 Monthly	4 Monthly
.2	Check condition and tension of door chain or air cords. Check also anchorages.	Quarterly	4 Monthly	4 Monthly
.3	Check wear on door panel bottom guide shoes.	Quarterly	4 Monthly	4 Monthly
.4	Clean cill groove and top track.	Quarterly	4 Monthly	4 Monthly
.5	Check top track rollers and up thrust rollers	Quarterly	4 Monthly	4 Monthly
.6	Check lubrication to door chains, pivots and bearings.	Quarterly	4 Monthly	4 Monthly
.7	Check door operator chain tension.	Quarterly	4 Monthly	4 Monthly
.8	Check lubrication and operation of door coupler	6 Monthly	6 Monthly	6 Monthly
.9	Check operation and contacts of door protective device.	Quarterly	Bi-Monthly	Monthly
.10	Check flexible cables to door reversal device.	Annually	Annually	Annually
.11	Check car door interlock internal contacts in accordance with SAFED guidelines	Annually	Annually	Annually

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

HYDRAULIC PASSENGER LIFTS

EQUIPMENT & ACTIVITY **FREQUENCY**

1. **Area 1 - Lift Car**

Area 1	Lift Car	Based on 4 Visits per Annum	Based 6 Visits Per Annum	Based on 12 Visits Per Annum
.1	Check lift leveling with lift traveling in both up and down directions	Quarterly	Bi-monthly	Monthly
.2	Observe lift starting and stopping for both upwards and downwards travel	Quarterly	Bi-monthly	Monthly
.3	Check operation of lift car controls and indicators	Quarterly	Bi-monthly	Monthly
.4	Observe door operation, both opening and closing, for smoothness and unusual noises.	Quarterly	Bi-monthly	Monthly
.5	Manually check closing force by hand.	Quarterly	Bi-monthly	Monthly
.6	Check operation of door reversal device by hand.	Quarterly	Bi-monthly	Monthly
.7	Check lift lighting and the diffusers	Quarterly	Bi-monthly	Monthly
.8	Test lift car emergency lighting by isolating lift car lighting supply	6 monthly	6 monthly	6 monthly
.9	Check with pressure gauge door closing force	Annually	Annually	Annually

2. **Area 2 - Lift Machine Room**

Area 2	Power Unit	Based on 4 Visits per Annum	Based 6 Visits Per Annum	Based on 12 Visits Per Annum
.1	Check condition and level of oil in main tank.	Quarterly	4 Monthly	4 Monthly
.2	Check valve block condition and for leaks.	Quarterly	4 Monthly	4 Monthly
.3	Check manual lowering valve.	Quarterly	4 Monthly	4 Monthly
.4	Check operation of main isolating valve.	Quarterly	4 Monthly	4 Monthly
.5	Check and clean as necessary filters.	6 monthly	6 monthly	6 monthly
.6	Check tank construction and isolation mounts.	Annually	Annually	Annually
.7	Test system at twice normal working pressure.	Annually	Annually	Annually
.8	Check operation of pressure release valve.	Annually	Annually	Annually
.9	Filter oil and clean interior of tank.	Every 5 years	Every 5 years	Every 5 years

Area 2	Control Panel	Based on 4 Visits per Annum	Based 6 Visits Per Annum	Based on 12 Visits Per Annum
.1	Check contact condition in terms of cleanliness, wear and pitting.	6 monthly	6 monthly	6 Monthly
.2	Check security of electrical terminals	Annually	Annually	Annually
.3	Check cabling for overheating and deterioration.	Annually	Annually	Annually
.4	Check fuse and overload condition and operation. Label and date.	Annually	Annually	Annually
.5	Clean switch gear with use of industrial vacuum cleaner.	Annually	Annually	Annually

Area 2	Circuit Breaker/Main Switch	Based on 4 Visits per Annum	Based 6 Visits Per Annum	Based on 12 Visits Per Annum
.1	Inspect contacts for cleanliness and pitting	6 Monthly	6 Monthly	6 Monthly
.2	Check circuit breaker oil level.	6 Monthly	6 Monthly	6 Monthly
.3	Empty, clean and refill circuit breaker	Annually	Annually	Annually

Area 2	Switches	Based on 4 Visits per Annum	Based 6 Visits Per Annum	Based on 12 Visits Per Annum
.1	Check operation of emergency stop switches	6 monthly	6 monthly	6 Monthly

© Rand Associates Consultancy Services Ltd

HYDRAULIC PASSENGER LIFTS (cont'd)

EQUIPMENT & ACTIVITY **FREQUENCY**

Area 2	**Hydraulic Piping**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check pipework and terminations for leaks.	6 monthly	6 monthly	6 Monthly

3. **Area 3 - Liftwell**

Area 3	**Fixings**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check guide lubrication	Quarterly	Bi- monthly	Monthly
.2	Check car top and ram lubrication pots.	Quarterly	Bi- Monthly	Monthly
.3	Check and empty when necessary guide rail oil trays.	Quarterly	4 Monthly	4 Monthly
.4	Check guide and guide bracket fixings for tightness.	Annually	Annually	Annually

Area 3	**Lift Car Top**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check operation of lift car top maintenance controls.	Quarterly	Bi- monthly	Monthly
.2	Check operation of lift car top light	Quarterly	Bi- Monthly	Monthly
.3	Clean car top working surface and steel work.	6 Monthly	6 Monthly	6 Monthly
.4	Test circuit and operation of car top socket outlet.	Annually	Annually	Annually

Area 3	**Lift Pit and Lift Well Steel Work**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Clean lift pit as necessary.	Quarterly	Bi- monthly	Monthly
.2	Clean lift well steel work and ledges	Annually	Annually	Annually

Area 3	**Landing Doors**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check operation of landing electro-mechanical locks and electrical interlocks.	Quarterly	Bi- monthly	Monthly
.2	Check chain or air cords for wear and tension together with check on anchorages.	Quarterly	4 Monthly	4 Monthly
.3	Check wear on door panel bottom guide shoes.	Quarterly	Bi- monthly	Monthly
.4	Clean sill groove and top track.	Quarterly	4 Monthly	4 Monthly
.5	Check top track rollers and upthrust rollers	Quarterly	4 Monthly	4 Monthly
.6	Check lubrication to linkages, chains, pivots, etc.	Quarterly	4 Monthly	4 Monthly
.7	Check operation and condition of lock beaks, pivot bearings and rollers.	Quarterly	Bi-Monthly	Monthly
.8	Carry out detailed inspection of lock interior, clean and supply certificate in accordance with Health and Safety Executive document PM/7	Annually	Annually	Annually

Area 3	**Lift Car Sling**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Observe guide shoes etc. with lift running at test speed.	Quarterly	4 Monthly	4 Monthly
.2	Check wear to car guide shoe liners	Quarterly	4 Monthly	4 Monthly
.3	Check fixings of guide shoe brackets.	6 Monthly	6 Monthly	6 Monthly
.4	Check lubrication to car pulleys.	6 Monthly	6 Monthly	6 Monthly
.5	Check condition of rubber isolation mounts, car sling bolted fixings etc.	Annually	Annually	Annually
.6	Check operation of lift carload weighing device.	Annually	Annually	Annually

© Rand Associates Consultancy Services Ltd

HYDRAULIC PASSENGER LIFTS (cont'd)

EQUIPMENT & ACTIVITY **FREQUENCY**

Area 3	**Buffers**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check fixing and square for spring buffers	Annually	Annually	Annually
.2	Clean and check secureness of fixings	Annually	Annually	Annually

Area 3	**Safety Gear**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Visually check safety gear mechanism and linkage and operate by hand.	6 Monthly	6 Monthly	6 Monthly
.2	Check by hand operation of safety gear switch.	6 Monthly	6 Monthly	6 Monthly
.3	Clean and lubricate as necessary safety gear linkages and pivot points.	6 Monthly	6 Monthly	6 Monthly

Area 3	**Lightwell Lighting**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check operation of lift well lighting.	Quarterly	Bi-Monthly	Monthly
.2	Clean diffusers.	Annually	Annually	Annually

Area 3	**Lightwell Switches**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check operation of re-leveling switch	Quarterly	Bi-Monthly	Monthly
.2	Check by hand operation of terminal limit switches and test limit.	6 Monthly	6 Monthly	6 Monthly
.3	Inspect rollers and check pivot lubrication.	6 Monthly	6 Monthly	6 Monthly
.4	Inspect switch interior workings for mechanical wear and condition of contacts.	6 Monthly	6 Monthly	6 Monthly
.5	Check secureness and clean as necessary lift well inductors, tapeheads and associated equipment	Annually	Annually	Annually

Area 3	**Hydraulic Rams**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check cylinder head seal for leakage	Quarterly	4 Monthly	4.Monthly
.2	Check ram head assembly.	Quarterly	4 Monthly	4 Monthly
.3	Check pulley or sprocket lubrication.	6 Monthly	6 Monthly	6 Monthly
.4	Check fixing of lift well pipework.	Annually	Annually	Annually
.5	Check operation of rupture valve.	Annually	Annually	Annually

Area 3	**Ropes, Chains and Anchorages**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check condition of wire ropes and chains.	6 Monthly	6 Monthly	6 Monthly
.2	Check secureness and integrity of rope or chain anchorages..	6 Monthly	6 Monthly	6 Monthly
.3	Check that tension is equal for each lift rope.	Annually	Annually	Annually
.4	Check tightness of rope clip fixings	6 Monthly	6 Monthly	6 Monthly

© Rand Associates Consultancy Services Ltd

HYDRAULIC PASSENGER LIFTS (cont'd)

EQUIPMENT & ACTIVITY **FREQUENCY**

Area 3	**Clearances**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check clearance at top of lift well with ram fully extended.	6 Monthly	6 Monthly	6 Monthly
.2	Check door coupler and sill clearances.	6 Monthly	6 Monthly	6 Monthly

Area 3	**Governor Return Pulleys**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check bearing/pivot lubrication.	6 Monthly	6 Monthly	6 Monthly
.2	Check by hand operation of electrical switches.	6 Monthly	6 Monthly	6 Monthly
.3	Check cleanliness and integrity of fixings.	Annually	Annually	Annually

Area 3	**Trailing Cables**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check trailing cable anchorages in lift well and to lift car	6 Monthly	6 Monthly	6 Monthly
.2	Check cable hanging loop and clearance to pit base.	6 Monthly	6 Monthly	6 Monthly
.3	Check condition of cable sheath.	Annually	Annually	Annually

Area 3	**Governor/Safety pulley**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Manually check governor tripping.	6 Monthly	6 Monthly	6 Monthly
.2	Check the grooves for wear.	6 Monthly	6 Monthly	6 Monthly
.3	Check operation of electrical switch to governor	6 Monthly	6 Monthly	6 Monthly
.4	Check lubrication to bearings.	6 Monthly	6 Monthly	6 Monthly

Area 3	**Slack Rope/Chain Switch**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check operation.	Annually	Annually	Annually

4. **Area 4 - Lift Landings**

Area 4	**Door Operator and Car Doors**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check operation of electrical interlock	Quarterly	4 Monthly	4 Monthly
.2	Check condition and tension of door chain or air cords. Check also anchorages.	Quarterly	4 Monthly	4 Monthly
.3	Check wear on door panel bottom guide shoes.	Quarterly	4 Monthly	4 Monthly
.4	Clean cill groove and top track.	Quarterly	4 Monthly	4 Monthly
.5	Check top track rollers and up thrust rollers	Quarterly	4 Monthly	4 Monthly
.6	Check lubrication to door chains, pivots and bearings.	Quarterly	4 Monthly	4 Monthly
.7	Check door operator chain or belt driven tension.	Quarterly	4 Monthly	4 Monthly
.8	Check lubrication and operation of door coupler	6 Monthly	6 Monthly	6 Monthly
.9	Check operation and contacts of door protective device.	Quarterly	Bi-Monthly	Monthly
.10	Check flexible cables to door reversal device.	Annually	Annually	Annually
.11	Check car door interlock internal contacts in accordance with SAFED guidelines	Annually	Annually	Annually

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

ELECTRIC HOMES LIFTS

EQUIPMENT & ACTIVITY **FREQUENCY**

1. **Area 1 - Lift Car**

Area 1	**Lift Car**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check lift leveling with lift traveling in both up and down directions	Quarterly	Bi-monthly	Monthly
.2	Observe lift starting and stopping for both upwards and downwards travel	Quarterly	Bi-monthly	Monthly
.3	Check operation of lift car controls and indicators	Quarterly	Bi-monthly	Monthly
.4	Check lift lighting and the diffusers	Quarterly	Bi-monthly	Monthly
.5	Check ease of operation for manually operated doors	Quarterly	Bi-monthly	Monthly
.6	Test lift car emergency lighting by isolating lift car lighting supply	6 monthly	6 monthly	6 monthly

2. **Area 2 - Lift Machine Room**

Area 2	**Lift Machine**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check worm gear oil level.	6 monthly	6 monthly	6 Monthly
.2	Check lubrication to motor sleeve and roller bearings.	6 monthly	6 monthly	6 Monthly
.3	Observe motor running for noise, vibration and excessive heat.	Quarterly	Bi-monthly	Monthly
.4	Check condition of brake drum and linings	Quarterly	Bi-monthly	Monthly
.5	Check availability of hand winding equipment and statutory notices.	Quarterly	Bi-monthly	Monthly
.6	Observe gear operating and check for noise and evidence of backlash.	Quarterly	Bi-monthly	Monthly
.7	Check gear casing oil seals for leakage.	6 monthly	6 monthly	6 Monthly
.8	Check machine couplings, key ways, shafts, etc for tightness by means of visual inspection and hand	6 monthly	6 monthly	6 Monthly
.9	Check lubrication to brake pivot points.	6 monthly	6 monthly	6 Monthly
.10	Check lubrication to outer bearings.	6 monthly	6 monthly	6 Monthly
.11	Check generally machine fixings and isolation mounts.	Annually	Annually	Annually
.12	Change oil in gear box.	Every 4 years	Every 4 years	Every 4 years

Area 2	**Control Panel**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check contact condition in terms of cleanliness, wear and pitting.	6 monthly	6 monthly	6 Monthly
.2	Check security of electrical terminals	Annually	Annually	Annually
.3	Check cabling for overheating and deterioration.	Annually	Annually	Annually
.4	Check fuse and overload condition and operation. Label and date.	Annually	Annually	Annually

Area 2	**Governor**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Manually check governor tripping.	6 monthly	6 monthly	6 Monthly
.2	Check governor groove for wear.	6 monthly	6 monthly	6 Monthly
.3	Check operation of electrical switch.	6 monthly	6 monthly	6 Monthly
.4	Check lubrication to governor bearings.	6 monthly	6 monthly	6 Monthly

© Rand Associates Consultancy Services Ltd

ELECTRIC HOMES LIFTS (cont'd)

EQUIPMENT & ACTIVITY **FREQUENCY**

Area 2	**Main Switches**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Inspect contacts for cleanliness and pitting	Annually	Annually	Annually

Area 2	**Chains**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Inspect chains and chain anchorages for wear and secureness.	Quarterly	Bi- monthly	Monthly

Area 2	**Lighting**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check operation of lift machine room lighting.	Quarterly	Bi- monthly	Monthly
.2	Check operation of machine room emergency lighting.	6 monthly	6 monthly	6 Monthly

Area 2	**Switches**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check operation of emergency stop switches	6 monthly	6 monthly	6 Monthly

3. **Area 3 – Liftwell**

Area 3	**Guides and Fixings**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check guide lubrication	Quarterly	Bi- monthly	Monthly
.2	Check and empty when necessary guide rail oil trays.	6 monthly	6 Monthly	6 Monthly
.3	Check guide and guide bracket fixings for tightness.	Annually	Annually	Annually

Area 3	**Lift Car Top**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check operation of lift car top maintenance controls.	Quarterly	Bi- monthly	Monthly
.2	Check operation of lift car top light	Quarterly	Bi- Monthly	Monthly
.3	Clean car top working surface and steel work.	6 monthly	6 Monthly	6 Monthly
.4	Test circuit and operation of car top socket outlet.	Annually	Annually	Annually

Area 3	**Lift Pit and Lift Well Steel Work**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Clean lift pit as necessary.	Quarterly	Bi- monthly	Monthly
.2	Clean lift well steel work and ledges	Annually	Annually	Annually

Area 3	**Landing Doors**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check operation of landing electro-mechanical locks and electrical interlocks.	Quarterly	Bi- monthly	Monthly
.2	Check lubrication to pivots, etc.	Quarterly	Bi- monthly	Monthly
.3	Check operation and condition of lock beaks.	Quarterly	Bi-Monthly	Monthly
.4	Carry out detailed inspection of lock interior, clean and supply certificate in accordance SAFED guidelines	Annually	Annually	Annually

© Rand Associates Consultancy Services Ltd

ELECTRIC HOMES LIFTS (cont'd)

EQUIPMENT & ACTIVITY **FREQUENCY**

Area 3	**Lift Car Sling**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Observe guide shoes etc. with lift running at test speed.	6 monthly	6 Monthly	6 Monthly
.2	Check wear to car guide shoe liners	6 monthly	6 Monthly	6 Monthly
.3	Check fixings of guide shoe brackets.	6 monthly	6 Monthly	6 Monthly
.4	Check condition of rubber isolation mounts, car sling bolted fixings etc.	Annually	Annually	Annually

Area 3	**Safety Gear**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Visually check safety gear mechanism and linkage and operate by hand.	6 monthly	6 Monthly	6 Monthly
.2	Check by hand operation of safety gear switch.	6 monthly	6 Monthly	6 Monthly
.3	Clean and lubricate as necessary safety gear linkages and pivot points.	6 monthly	6 Monthly	6 Monthly

Area 3	**Lightwell Lighting**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check operation of lift well lighting.	6 monthly	6 Monthly	6 Monthly

Area 3	**Lightwell Switches**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check by hand operation of terminal limit switches and test limit.	6 monthly	6 Monthly	6 Monthly
.2	Inspect rollers and check pivot lubrication.	6 monthly	6 Monthly	6 Monthly

Area 3	**Clearance**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check clearance at top of lift well.	6 monthly	6 Monthly	6 Monthly

Area 3	**Governor Return Pulleys**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check bearing/pivot lubrication.	6 monthly	6 Monthly	6 Monthly
.2	Check by hand operation of electrical switches.	6 monthly	6 Monthly	6 Monthly
.3	Check cleanliness and integrity of fixings.	Annually	Annually	Annually

Area 3	**Trailing Cables**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check trailing cable anchorages in lift well and to lift car	6 monthly	6 Monthly	6 Monthly
.2	Check cable hanging loop and clearance to pit base.	6 monthly	6 Monthly	6 Monthly
.3	Check condition of cable sheath.	Annually	Annually	Annually

© Rand Associates Consultancy Services Ltd

ELECTRIC HOMES LIFTS (cont'd)

EQUIPMENT & ACTIVITY **FREQUENCY**

4. **Area 4 - Lift Landings**

Area 4	**Door Operator and Car Doors**	**Based on 4 Visits per Annum**	**Based 6 Visits Per Annum**	**Based on 12 Visits Per Annum**
.1	Check operation of electrical interlock	6 monthly	6 Monthly	6 Monthly
.2	Check lubrication to door pivots.	6 monthly	6 Monthly	6 Monthly
.3	Check car door interlock internal contacts in accordance with SAFED guidelines	Annually	Annually	Annually

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

STAIRLIFTS AND DISABLED LIFTS

EQUIPMENT & ACTIVITY **FREQUENCY**

	Stairlifts and Disability Hoists	**Based 4 Visits Per Annum**	**Based on 2 Visits Per Annum**
.1	Clean and lubricate all moving parts and mechanisms.	3 Monthly	6 Monthly
.2	Run and check operation of disabled lift/stair lift and also ensure that all controls are working correctly.	3 Monthly	6 Monthly
.3	Observe motor running for noise, vibration and excessive heat.	3 Monthly	6 Monthly
.4	Check operation of over-travel and stop limits together with any other safety switches.	3 Monthly	6 Monthly
.5	Check electrical installation and also earth continuity.	3 Monthly	6 Monthly
.6	Check fixings and stability of equipment.	3 Monthly	6 Monthly
.7	Check main drive equipment in terms of oil levels, quiet running, sprockets, bearings, etc..	3 Monthly	6 Monthly
.8	Where home lifts are installed with landing electrical interlocks, these must be checked in accordance with SAFED document LG1 and a suitable certificate issued.	Annually	Annually

	Bath and Transporter Hoists	**Based on 2 Visits Per Annum**
.1	Check base plate fixing, follow manufacturer's test routing as detailed in the test manual.	6 Monthly
.2	Check the tightness of the nuts securing the mast to the base plate. Check for signs of grease leakage between the mast and the base plate	6 Monthly
.3	Check the chair support clamp is correctly orientated. Make sure that the seat does not touch the side or bottom of the bath. Check the seat locks in the correct positions. .	6 Monthly
.4	Check the operation of the seat lock.	6 Monthly
.5	Check the support arm has the safety screw in position and tightened. Check the seat is securely attached to the support arm and the fixing nuts and bolts are fully tightened.	6 Monthly
.6	Check the seat for splits or damage.	6 Monthly
.7	Check all castors are free running. Check fixing to the chair legs Check brakes for correct position.	6 Monthly
.8	Check the up and down switches of the handcontrol. Take the seat to the lowest position and confirm the operation of the bottom stop. Check the seat does not hit the bottom of the bath. Prevent the downward movement of the seat and check the power is switched off automatically	6 Monthly
.9	The motor unit should require no maintenance other than checking for correct operation and listening for unusual noise.	Annually
.10	The batteries are housed in the power pack and should not require maintenance other than regular charging as detailed in the charging instructions.	Annually
.11	Check the operation and correct functioning of the emergency stop switch located on the rear of the power pack.	6 Monthly
.12	Check the operation and correct functioning of the emergency raise rocker switch located on the motor unit.	6 Monthly
.13	Check the correct function of the safety latches on the Transporter Chair and the Transporter support arm	6 Monthly
.14	Clean the hoist and seat with ordinary soap and water and/or any hard surface disinfectant. Avoid using hard chemical cleaners or abrasive as these may damage the surface of the hoist	6 Monthly
.15	Carry out load test in accordance with the manufacturers test procedures by a competent person as defined in the LOLER regulations, and issue test certificate.	6 Monthly

© Rand Associates Consultancy Services Ltd

STAIRLIFTS AND DISABLED LIFTS (cont'd)

EQUIPMENT & ACTIVITY **FREQUENCY**

	Patient Lifting & Handling Apparatus	**Based on 2 Visits Per Annum**
	Load Testing	
	Load Tests	
1.	Load test in accordance with manufacturer's requirements and recommendations	6 Monthly
2.	Examine safe working load plate. Load test to be 1.5 X SWL for mechanical hoists and SWL for electric hoists.	6 Monthly
3.	Pay particular attention to floor, ceiling and wall fixings.	6 Monthly
4.	Examine ceiling deflection during load test of tracked systems.	6 Monthly
	All Patient Hoists	
	General	
5.	Clean and examine gears, bearings, ratchets and pawls, brakes and brake drums, rollers, spindles, pulleys and keys. Examine anchorages and guide fixings. Examine supporting structure, travelling carriage track wheels and spindles. Examine guides, rollers and sheaves. Clean:lubricate as necessary. Check safety devices and mechanical stops. Ensure that safe working load plate is displayed. Report general mechanical condition, suitability and fitness for purpose.	6 Monthly
	Ropes, Chains and Hooks	
6.	Examine suspension ropes or roller chains and attachments. Examine for fraying cable or wear. Clean and lubricate as necessary.	6 Monthly
	Mobile Hoists	
	General	
7.	Examine travelling carriage, wheels and spindles	6 Monthly
	Hydraulic System	
8.	Examine hydraulic seals for leakage. Examine pumps and flexible hoses. Examine securing bolts, tighten as necessary.	6 Monthly
	Electric Drives	
9.	Examine batteries, limit switches, emergency stops, motor fixings, drive, hand controls and switches. Examine flexible cables for wear, fraying braid and brittle insulation. PAT test in accordance with Specification.	6 Monthly
	Tracked Hoists	
	Ceiling Tracks	
10.	Examine securing bolts, tighten as necessary. Examine mechanical condition of track. Test for free running.	6 Monthly
	Hydraulic System	
11.	Examine hydraulic seals for leakage. Examine pumps and flexible hoses. Examine securing bolts, tighten as necessary.	6 Monthly
	Electric Drives	
12.	Examine batteries, limit switches, emergency stops, motor fixings, drive, hand controls and switches. Examine flexible cables for wear, fraying braid and brittle insulation. Test insulation resistance. Examine and test earthing arrangements. Examine and test residual current devices. Inspect and test the fixed electrical installation in accordance with Specification. Issue NICEIC periodic inspection certificates.	6 Monthly

© Rand Associates Consultancy Services Ltd

STAIRLIFTS AND DISABLED LIFTS (cont'd)

EQUIPMENT & ACTIVITY **FREQUENCY**

	Patient Lifting & Handling Apparatus	**Based on 2 Visits Per Annum**
	Seats, Slings etc.,	
	Seats, Slings, Harnesses etc.	
13.	Examine slip locks and harness Material. Examine spreader bars, chains and wire cords. Examine securing bolts, tighten as necessary. Lubricate as necessary. Examine 'Autolift' seas. Ensure plugs are in place to prevent testicle damage.	6 Monthly

DISABLED BATHS

EQUIPMENT & ACTIVITY **FREQUENCY**

	Disabled Baths (ArjoHuntleigh)	**Based on 2 Visits Per Annum**
.1	All servicing and inspections are to be strictly as recommended by the manufacturer's technical data sheet	6 Monthly
.2	Sufficiently strip the bath to enable a visual inspection.	6 Monthly
.3	Check all aspects of the raising/lowering mechanism of a variable-height bath for correct operation	6 Monthly
.4	Inspect for wear and adjust the lift carriage guides if necessary.	6 Monthly
.5	All joints and hoses to be checked for leaks.	6 Monthly
.6	Inspect internal mechanical components for wear and replace where necessary.	6 Monthly
.7	Fully function test the bath in all modes of operation	6 Monthly
.8	Function test the integral mixing valves and sensors and descale as necessary.	6 Monthly
.9	Carefully check the maximum outlet temperature and adjust as necessary.	Annually
.10	Reassemble the bath and submit report	Annually

© Rand Associates Consultancy Services Ltd

Firestopping

018 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

019 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

PART 2: LIFT INSTALLATIONS AND REFURBISHMENTS

GENERAL REQUIREMENTS

Preamble

101 This Specification has been prepared to reflect the generic requirements for the lift Works. For specific details of the Works, the Provider is referred to the schedules prepared for each particular lift or group of lifts. Prior to pricing the Provider shall ascertain whether particular installations have been classified as General Needs or Sheltered Housing.

102 The Properties are currently occupied and shall remain so for the duration of the Contract.

103 Prior to commencing Work, all Providers shall undertake an initial site safety assessment. This assessment shall be incorporated within the CDM file and be periodically updated.

Description of Existing Equipment

104 For descriptions of the current condition of the lift installations, please refer to the condition reports and schedules prepared by or on behalf of the Client's Representative.

Description of Works

105 The precise Works required for each lift or group of lifts shall be listed in the prepared schedules.

106 The Works shall comprise the supply, delivery to site, off loading, positioning, installation and fixing of all Materials necessary to complete the Works. Also the testing and commissioning of the completed installation including all new, revised and existing equipment.

107 As part of his Works the Provider shall undertake the following depending upon the extent of the specified Works.

a) Preparation of Design drawings and calculations.
b) Removal of all redundant equipment and services associated with these Works.
c) The retention and overhaul of suitable spare parts for reuse.
d) Supply and installation of all new lift equipment as specified.
e) Modernisation, overhaul, testing, cleaning and painting of all retained equipment and components as specified.
f) All electrical and builders work and making good associated with the lift Works described within the schedule.
g) Full commissioning and testing.
h) Attending to Defects during the Defects Liability Period and/or warranty period whichever is the longest.
i) Routine Maintenance contract during the Defects Liability Period.
j) Responsive Maintenance contract during the Defects Liability Period.
k) Out of Hours Emergency Works during the Defects Liability Period.
l) Provision of a 5 years guarantee parts and labour warranty after handover for each lift/installation.
m) Complete sets of operation and maintenance manuals together with record drawings and wiring diagrams.
n) Completion and issue of Declaration of Conformity and CE marking.

108 Lift Works undertaken under this Contract shall be so Designed as to operate normally and with complete safety throughout a load range between 0% and 100% of the rated contract load.

109 The required Design of the various lifts shall depend upon the classification of the installations. Installations located in general needs housing areas shall be Designed to a robust standard usually associated with social housing general needs lift installations. Lifts installed within sheltered and supported housing areas or those unlikely to be subjected to adverse conditions or abuse, may be Designed incorporating more cost effective Materials and enhanced car finishes.

© Rand Associates Consultancy Services Ltd

Specification Guidance Notes

110 Satisfy himself that any dimensions or details given herein are acceptable and correct with regard to any particular project.

111 In the event of any item in the Specification to which the Provider is in doubt as to the true intent and meaning, then he is advised to obtain from, or clarify, the information with the Client's Representative prior to commencing Work.

112 All Works are to conform to this Specification, the Specifications and standards stated in this Specification, and any other related reference Works applicable.

113 Accept sole responsibility for the lift installation. The approval of any drawings or calculations shall not relieve the Provider of his legal duties and responsibilities.

114 Reference clause numbers stated in this Specification without additional applicable Standard reference refer to EN81 part 1.

115 References to The Regulations shall mean the latest edition of the Lifts Regulations 1997.

116 All references to Materials, items, equipment or components in the singular form, refer to all lifts unless stated otherwise.

117 Other parties shall acknowledge that the Design, as a whole, shall be required to satisfy the applicable Standards which details particular requirements relating to the accessibility of the lift for persons with disabilities. For example lift doors should contrast in colour and tone from the surrounding walls, and the use of spot lights should be avoided. Any parties requiring further information on these issues should contact the Client's Representative.

Calculations

118 Any or all calculations, whether or not directly referred to in this Specification, shall be immediately submitted to the Client's Representative upon request.

119 The following calculations shall be performed as applicable:-

Guide dead loadings on pit floor,
Safety gear operation loadings on pit floor,
Guide pull-out loadings,
Maximum guide fixing spacing and deflections,
Buffer loadings and stroke,
Rope safe working loads and expected rope stretch,
All imposed machine loadings,
Traction groove and specific pressure.

120 All loads shall be clearly shown on the general arrangement and builder's work drawings. The buckling load of the hydraulic ram assemblies shall be checked using the Euler theorem and the applicable Standards.

121 The integrity of all structural supports shall be proven by calculations if so required by the Client's Representative.

Drawings

122 It shall be the Provider's responsibility to ensure that all dimensions and measurements are checked prior to installation.

© Rand Associates Consultancy Services Ltd

123 The Client's Representative shall approve the following drawings before commencement of manufacture;

a) The general arrangement and builders work drawings for the complete lift installation.
b) The lift car drawing with all finishes.
c) Details of the landing entrances and architraves showing all push stations, indicators and fireman's switches.

124 The above drawings shall be issued to the Client's Representative within four weeks of the date of Instruction. All drawings, whether arrangements, details or manufacturing, shall be made available to the Client's Representative upon request.

125 Additional drawings may be required to demonstrate the means incorporated to satisfy the needs of persons with disabilities.

126 Upon completion of the Works plastic encapsulated straight line wiring diagrams of the complete electrical and hydraulic system shall be permanently affixed in the machine room.

127 The builders work drawing shall give all the following details plus any others considered to be beneficial to the Client or his representatives;

a) Building and electrical notes.
b) Machine and equipment positions and configurations.
c) Positions of all electrical switches and isolators.
d) Positions of light fixtures and emergency lighting.
e) Machine room access and pit ladders.
f) Access doors and requirements.
g) Position of ventilation grills, ducts and heaters.
h) Push station and indicator structural cut-out sizes and positions.
j) Fire Fighting control switch or special station cut-out sizes and positions.
k) All applied loadings of the complete installation upon the building fabric.
l) Guide fixing details.
m) Car and counterweight buffer plinth requirements.
n) Structural entrance details.
p) Lifting Beams; position and loadings.
q) Overspeed governor access requirements.

128 Record drawings showing the 'as installed' position of all lift equipment shall be included within the maintenance manuals together with copies of all wiring and circuit diagrams.

Defects Liability Period

129 Attend to all Defects arising during the Defects Liability Period. Should the Contract so stipulate, the Provider shall also provide during the Defects Liability Period, Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works in accordance with the provisions contained in this Specification, section entitled "Lifts, Stairlifts and other Disability Hoists and Disabled Baths Maintenance".

130 All aspects of existing and future maintenance are incorporated in the Agreement.

Maintenance Manuals and Documentation

131 Full documentation shall be provided for all lifts as required by The Lifts Regulations.

132 Provide two properly bound manuals with durable plastic covers per lift. The manuals shall give a full description of all plant equipment, lubricants, spares and the emergency, service and fault finding routines to be observed.

© Rand Associates Consultancy Services Ltd

133 The manuals shall contain:-

a) A full description of the installation itemising the main components of the plant,
b) A description of the complete workings of the system including emergency and breakdown procedures,
c) Wiring diagrams of the entire electrical system, including all power, safety and auxiliary circuits,
d) Hydraulic circuit diagram,
e) Methods of adjustment and typical fault finding routines.
f) A complete list of all oils, greases and recommended lubricants.
g) All standard service and spares requirements.
h) A full set of test certificates.
i) 'As installed' general arrangement drawing.
j) A section for planned and completed periodic examinations including LG1 and insurance Form 54 returns.
k) A full list and description of all safety components giving details of assembly, connection, adjustment and maintenance.
l) Additional information relating to EN81-70 regarding features included for persons with disabilities.
m) All relevant EC declaration of conformity certificates.

134 The page sizes shall be A4 or A3 (folded to A4), uniform throughout. The document shall be bound within quality ring binders. A full set of record drawing prints shall be folded to A4 size and inserted in plastic envelopes and included within the ring binder.

135 These manuals shall be approved and finally issued prior to acceptance.

136 The manuals shall include information relating to the features incorporated under EN81-70 as detailed in clause 7.2 of that standard.

137 In addition to the manuals a logbook shall be provided for each lift in which all maintenance visits, breakdowns and repairs, together with other periodic examinations shall be noted.

CE MARKING

138 Where required under The Lifts Regulations all EC declaration of conformity certificates shall be provided for the installed lift and the safety components included within it. The CE mark in the lift car shall be properly engraved but shall remain covered until the necessary documentation is issued.

139 The required certificates shall include the details and information as listed in Schedule 2 of The Regulations.

TEST CERTIFICATES

140 The following test certificates, as applicable to the particular installation, shall be included within the maintenance manuals. Copies of all certificates shall be issued to the Client's Representative for inspection during witness testing. Failure to provide all certification may result in the visit being aborted with costs being levied at the Provider.

141 The following are to comply with the requirements of the applicable Standards

a) Electric Lifts,
b) Hydraulic Lifts,
c) High voltage tests,
d) Rope certificates,
e) Safety gear type test certificate or certificates,
f) Hydraulic buffer type test or certificate,
g) Overspeed governor type test or certificate,
h) Door lock type test certificates,
i) Fire resistance of landing door test certificates,
j) Rupture valve or restrictor valve type test certificates.

© Rand Associates Consultancy Services Ltd

142 Type tests shall conform to the applicable Standards.

143 In addition to the above tests the Provider shall complete and sign a test sheet as detailed in the applicable Standard, to confirm and verify that all features for disabled persons are included and compliant.

Testing and Commissioning

144 The completed lift installation shall be tested by the Provider in accordance with the applicable Standards. These tests shall be repeated, in full or in part, in the presence of the Client's Representative, the Client's insurance inspector and/or other nominated representative.

145 Supply all necessary weights and instruments, free of charge, for the duration of all tests.

146 Ten full working days' notice shall be given to the Client's Representative, in writing, of the proposed date of any witness testing. The Provider shall fully satisfy himself as to the proper completion of all Works, including all electrical and building works, prior to witness testing. Any costs or fees resulting from aborted witness tests due to incomplete Works, except for minor items, shall be chargeable to the Provider.

147 Any items or defects found shall be corrected immediately by the Provider. The above tests and defects shall be completed within the agreed period of installation.

Standards and Related Documents

148 The following list of applicable Standards and related documents are provided to assist the Provider and Client. The list is provided for guidance only as to the Specification requirements for various Materials and procedures to be observed, and is not intended to provide a complete reference list.

APPLICABLE STANDARDS

Safety Rules for the Construction and Installation of Lifts – Electric Lifts
Safety Rules for the Construction and Installation of Lifts – Hydraulic Lifts
Landing doors fire resistance test
Safety Rules for the Construction and Installation of Lifts – Accessibility to lifts for persons including persons with disability.
Vandal resistant lifts
Safety Rules for the Construction and Installation of Lifts – Particular applications for passenger and goods passenger lifts – Firefighters lifts.
Safety of machinery – Safety distances to prevent danger zones being reached by the upper limbs
Terminations for steel wire ropes – safety – U-bolt wire rope grips.
Specification for Dimensions of Standard Electric Lift Arrangements.
Code of Practice for Selection and Installation.
Specification for Manual Control Devices, Indicators and Additional Fittings.
Specification for Eyebolts for Lift Suspension.
Specification for Guide Rails.
Specification for the Testing and Inspection of Electric and Hydraulic Lifts.
Recommendations for the Installation of New and the Modernisation of Electric Lifts in Existing Buildings
Recommendations for the Installation of New and the Modernisation of Hydraulic Lifts in Existing Buildings.
Code of Practice for Vandal Resistant Lifts.
Specification for Insulated Flexible Cables for Lifts and for other Flexible Connections. Implements HD 186, 359 & 360.
Code of Practice for the Safe Working on Lifts

© Rand Associates Consultancy Services Ltd

Design of buildings and their approaches to meet the needs of disabled people – Code of practice.
Specification for examination and test of new lifts before putting into service – Electric Traction Lifts
Specification for examination and test of new lifts before putting into service – Hydraulic Lifts
Specification for General Requirements of Stranded Steel Wire Ropes
Specification or Ropes for Lifts.
Code of Practice for the Selection, Care and Maintenance of Steel Wire Ropes.
Specification for Cartridge Fuses for Voltages up to and including 1000 V.a.c. and 1500 V.d.c.
Specification for Radio Interference Limits and Measurements for Household Appliances, Portable Tools and other Electrical Equipment causing similar types of interference.
Specification for Rubber Mats for Electrical Purposes. (1987)
Specification for 13A Fused Plugs and Switched and Unswitched Socket Outlets.
Emergency Lighting Pt 1 1975 and Pt 3 1981
Specification for Steel Conduit and Fittings with Metric Threads of ISO form for Electrical Installations.
Non-Metallic Conduits and Fittings for Electrical Installations.
Specification for worm gearing
Specification for classification of degrees of protection provided by enclosures.
Method for determination of the effects of a small source of ignition on textile floor coverings.

Temporary Mobility Provisions

149 Note that some Customers in certain supported housing Schemes suffer from varying degrees of disability and the removal of a lift from service will cause them some considerable difficulty with their mobility about the Scheme.

150 Where this situation is considered to exist the Client intends that temporary provision for access by means of stair lifts will be provided for the duration of the Works.

151 Make arrangements for these temporary Works and ensure that all relevant standards and safety provisions are applied to these Works and if necessary, liaise with the local fire safety officer and with building control and will obtain all required consents and licences.

152 Allow also for the provision of an electrical supply for the temporary facility to be taken from the landlord's service and for all necessary decorations and making good to be completed following removal of the temporary facility.

© Rand Associates Consultancy Services Ltd

TECHNICAL SPECIFICATION

ARCHITRAVES AND ENTRANCES

Architraves - Modification and Overhaul

101 Existing architraves shall be overhauled and retained. All surfaces shall be cleaned and all fixings checked and secured.

Architraves - Replacement

102 Existing architraves shall be removed and replaced with new.

103 Include for supplying and fixing architraves of the finish as stated in Schedule 2.

104 Substitute to an equal or other agreed value, different Materials and finishes to those stipulated in Schedule 2 of the Materials and Finishes Specification if so requested by the Client's Representative.

105 All architraves on general needs housing lifts shall be constructed from 316 Grade Stainless Steel.

106 The landing fronts, architraves and door assemblies shall have a rated fire protection as stated in Schedule 1.

107 The mating faces of different panels and end caps shall be finished to the highest standard with no gaps or rough edges.

108 No fixings shall be visible or accessible from within the car or from the landings.

109 The architraves and transoms shall be protected against damage during transportation and erection by a heavy plastic coating or similar Material.

110 The architraves shall be securely fixed to the building fabric and shall be plumb, one above the other.

111 The plastic protective coating shall be removed from between mating surfaces during installation.

Stonehenge Full Depth

112 All architraves shall be individually manufactured to give a constant wall projection to suit the building fabric. The face side of each upright shall project 13mm from the landing wall with the header section projecting a further 10mm. Architraves shall be of the standard Stonehenge design extending the full depth of the wall.

113 The architrave slam posts shall be Designed with a recess to accept the leading edge of the landing door in accordance with the standard GAL arrangement. The slam sill edge return shall extend at least 40mm with a further return toward the shaft wall of at least 30mm. The bunch sill edge return shall be at least 40mm.

114 Details of the profile and wall projection of the architraves shall be submitted for approval.

115 Architraves shall be constructed with a finish sheet wrapped around a mild steel core. The core shall be suitably braced and welded. The finishing sheet shall be glued in position and it shall be pop riveted along the edges. No fixings shall be visible once making good has been completed.

116 Architraves shall have a total material thickness of not less than 2.4mm. The facing or finish thickness shall not be less than 18 swg.

117 Backfilled architraves may be of single skin construction, the minimum thickness being 16 swg.

© Rand Associates Consultancy Services Ltd

118 The outer edges of the architrave uprights and header shall be recessed into the face wall of the landings by at least 15mm. The foot of the uprights shall be fitted with a sole plate that is securely fixed and recessed into the floor by at least 25mm.

119 After erection the architraves are to be backfilled by the Provider.

Entrance Trims - Box Type

120 The required architraves shall consist of a trim which butts up to the shaft side of the structural landing entrance. The trim may form an integral part of the entrance assembly.

Door Frames - Modification and Overhaul

121 All existing landing entrance steelwork, i.e. door frames, shall be modified to suit the new door equipment specified.

122 All door frames shall be cleaned down, all fixings secured, adjusted as necessary and repainted. Any rust shall be properly treated.

123 The existing landing sills shall be cleaned and their fixings checked and secured.

Door Frames - Replacement

124 All landing door frames and sills shall be replaced.

125 The door frame shall consist of a bolted steel frame with uprights, sill support and connecting header.

126 A steel track shall be fixed to the profiled door frame header on which the doors slide. This assembly shall be adjustable to enable the doors to be raised at least 5mm.

127 Rubber buffers shall be fitted within the landing door frames which shall prevent the doors opening more than 5mm beyond the clear opening width.

128 All landing entrance steelwork shall be securely fixed to the building fabric. The Provider shall ensure that the landing sills are level and have a uniform running clearance.

129 Non-slip sills shall be fixed to the car and landing thresholds and shall be of the finish stated in Schedule 2.

130 The door sills shall be of sufficient length such that it is not possible for any part of the door shoe to leave the track channels when the doors are open.

131 The car and landing sills shall be of sufficient strength to withstand all loads imposed during the transport of passengers or goods.

132 The running clearance between car and landing door sills, at floor level, shall not be less than 25mm nor exceed 35mm. This figure shall be consistent on all floors.

133 Dirt and drainage slots shall be provided in the car and landing sill grooves where possible to ensure tracks are self-cleaning.

134 A plastic or bitumen-based membrane shall be placed beneath the sills to prevent corrosion.

135 Where the sills are fitted to concrete nosings, the recesses are to be thoroughly cleaned prior to positioning and a bonding agent must be applied in accordance with manufacturers instructions.

136 The sills shall be set approximately 13mm above floor level so that a slight counter slope is formed to drain rain or water from fire fighting appliances away from the lift landing entrances. This slope shall extend approximately 450mm but shall not form a tripping hazard.

© Rand Associates Consultancy Services Ltd

BUFFERS

Buffers - Overhaul

137 The existing buffers shall be retained and overhauled. Buffers shall be repositioned whenever possible to provide the necessary lift pit clearances in accordance with the Specification.

Buffers - Replacement

138 Existing buffers shall be removed and replaced with new energy accumulation type buffers. Where the contract speed is greater than or equal to 1.0m/s energy dissipation type buffers shall be supplied and installed

139 The buffers shall be so positioned to maintain the necessary lift pit clearances, to comply with EN81, as far as is possible within the given parameters.

140 All necessary supports and mountings for the buffers shall be provided, including any steel stools, columns or stands to support the buffers at the appropriate height above the lift pit floor thus providing the required clearance, refuge space, to satisfy The Lift Regulations.

141 Steel blocks may be inserted to raise the counterweight buffer height as a means of compensating for initial rope stretch. These blocks must be removed within the defects liability period.

142 When the car of a hydraulic lift is fully loaded and resting on the buffers the lift car sill shall not be greater than 120mm below the lowest landing level. With the buffers fully compressed the ram/s shall not strike to ram base.

Energy Accumulation – Linear and Non-Linear

143 Energy accumulation type buffers may be of linear or non-linear design.

144 Linear buffers shall be of the helical spring type and having a constant spring compression rate.

145 The load/displacement characteristics of energy accumulation buffers shall be in accordance with The Lift Regulations. Calculations shall be supplied to the Client's Representative.

Energy Dissipation – Oil Buffers

146 The displacement/retardation characteristics for energy dissipation type buffers shall strictly comply with the lift regulation

147 Reduced stroke energy dissipation type buffers may be only used if the retardation of the lift at the ends of its travel is monitored according to the requirements of The Lift Regulations.

148 Oil buffers shall be constructed so as to contain any oil (hydraulic fluid) which may be displaced during operation.

149 They shall be permanently and legibly marked to indicate the type and quantity of oil to be used and a data plate shall be fitted which indicates the name of the manufacturer, the type test examination sign and its references.

150 Buffers shall have an electrical device to prove its return to its operational condition and be so constructed that fluid levels may be easily checked.

Compensation Ropes

151 The use of compensation ropes should be considered if multiple falls of large diameter ropes are used or the lift travel exceeds 30m causing excessive out of balance forces.

© Rand Associates Consultancy Services Ltd

152 Lifts with existing rope compensation systems shall have the ropes, chains and anchorages overhauled.

153 Where the drive system on such lifts is replaced the rope compensation shall be modernised to comply with current standards.

Control Panel

154 New control systems shall comply with the following clauses.

155 The operational characteristics of the control system shall be as specified.

156 Control panels and similar equipment shall be tested in accordance with the applicable Standards. A manufacturers test certificate completed during manufacture will be acceptable.

157 All control equipment shall be adequately enclosed in a sheet steel enclosure, with lockable hinged doors. Lift off panels are not acceptable except in specific circumstances.

158 The panel shall be single entry floor or wall mounted.

159 All control panels shall be substantially sealed from the ingress of dust and dirt. It shall have a means of acoustic dampening, to attenuate radiation of contactor or selector noise, fitted to the inside of each panel.

160 All parts of equipment shall be adequately identified by permanent labels corresponding to designations on the wiring diagrams, in particular terminals, wiring and equipment items. A key to any abbreviations and symbols shall be fixed to the inside of each panel.

161 The control panel shall incorporate manual reset adjustable time lagged overload protection devices and any necessary protection against overheating for all motor windings, including the door operator motor.

162 The control circuit shall be protected by suitably rated overload current circuit breakers or HRC fuses independently of the protection of the main circuits.

163 The operating voltage of contactors, control relays, limits and safety circuits shall be 110 V AC. Push and indicator feeds shall be 24 V DC.

164 If any part of the live safety circuit wiring is earthed under fault or test conditions, the protecting circuit breaker shall trip.

165 A device shall be incorporated which will detect a phase reversal condition or the loss of one phase. When one of the above conditions is detected, the supply to all contactors and control panel circuitry shall be broken.

166 A motor run time limitation device shall be included on both the traction and hydraulic lifts, which shall stop the machine, and keep it stopped in accordance EN81 Parts 1 and 2 as appropriate.

167 After operation, the limiter shall require to be manually reset.

168 Control panel wiring shall be heat-resistant, shall not support combustion and connections shall be made to terminals by approved means.

169 The components shall be Designed and mounted in a manner which facilitates inspection, maintenance, adjustment and replacement.

170 The control system shall be micro-processor based and have 'field proven' components. The processor shall have easily replaceable plug-in boards with LED indication. A series of buttons or switches shall be provided to register calls directly into the panel from the machine room.

© Rand Associates Consultancy Services Ltd

171 The system shall have an event logger as specified.

172 All panels shall be capable of linking to remote monitoring units such as EMU II.

173 The lift shall automatically shut down if the temperature in the machine room should exceed the designed maximum. The lift shall complete journeys in progress but it shall then not accept further calls.

174 A suitable form of indication shall be included within the machine room to show that over temperature has caused the suspension of service.

Counterweight

175 The counterweight, where required, shall be properly suspended and guided so as to prevent any risk of it colliding or falling onto the lift car.

176 The counterweight shall comprise of a structural steel frame, metal filler weights, clamped to prevent movement, and four guide shoes.

177 Alternatively, a minimum of two tie bars may be used to fully clamp all filler weights. In this case all weights shall be made of metal.

178 The counterweight shall balance the lift system, to maintain the out of balance tractive forces, at between 45 to 50% unless otherwise specified.

179 The counterweight shall withstand the effects of buffer impact without permanent deformation. The minimum distance between the lift car and counterweight and their respective associated components shall not be less than 50mm.

180 A counterweight safety gear together with an overspeed governor is considered to be a suitable method of preventing uncontrolled upwards movement of the lift car.

181 The counterweight shall be guarded by means of a rigid screen extending from 300mm above the pit floor to a height at least 2.5m above the lift pit floor. The screen shall extend 100mm beyond the outer edges of the counterweight or its attachments.

182 The counterweight screen shall preferably be constructed from steel mesh. The requirements of EN294 clause 4.5.1 shall be noted.

183 The counterweight screen may be of an alternate Design if rope compensation is provided.

Existing Counterweights

184 Existing counterweights and screens may be reused providing they conform in construction with this Specification and applicable Standards. The Provider shall ensure that sufficient mass may be added to obtain the required balance. If required to obtain the necessary balance, lead filler weights may be used. All costs involved shall be included.

185 All steelwork shall be degreased and repainted. All fixings shall be checked. New rope anchorages and guide shoes shall be fitted. Counterweights suffering from excessive corrosion shall be replaced.

New Counterweights

186 A new counterweight frame and filler weights shall be supplied and installed. A new counterweight screen shall also be fitted.

© Rand Associates Consultancy Services Ltd

Design Requirements For Disabled Persons

187 All lifts are to be Designed to meet, as far as is practicable, all requirements for use for disabled persons in accordance with The Lifts Regulations, applicable Standards, and Building Regulations Part M2. For example, lifts too small for unaccompanied wheelchair use shall still be provided with low level tactile buttons and speech synthesizers etc.

188 Lift operation control devices in the car and on the landings shall be positioned between 0.9m and 1.1m above the floor level. If absolutely necessary due to the number of floors served, the car control devices may be located up to 1.2m above floor level. Control stations shall be located so that access is not restricted by close proximity to internal or external car or landing corners.

189 Visual and audible indications of lift activities shall be included and where necessary contrasting colours shall be utilised to fully comply with applicable Standards.

190 Audible indications, including the speech synthesizer, shall be capable of 35 to 65dBA when measured at a distance of 1.0m from the source. The sound level shall be adjustable to suit site conditions although the method of adjustment shall not be assessable to users.

191 All pushes and control instructions shall be tactile embossed in accordance with current standards.

192 A voice synthesizer unit shall be installed to give audible indications of lift activities.

193 The emergency intercom shall be positioned less than 1.4m above floor level. Inductive loops shall be fitted for the hard of hearing. Operating buttons shall be located at 900mm above floor level and it shall be separated from floor call buttons.

194 Determine, as part of his negotiations indicated in the applicable Standard, the scale and nature of disabilities his Design is to assist. For example is a reversing mirror, pull down seat or temporary activation control required.

195 Provide clear indication of any of the above requirements that cannot be included.

Door Panels

196 The clear opening and arrangement of the car and landing doors shall be as specified in Schedule 1 or as existing. The finishing skin of all door panels shall be as specified in Schedule 2 of Materials and Finishes Specification.

197 The minimum clear height of car and landing entrances shall not be less than 2.0m.

198 The car and landing doors shall be of adequate mechanical resistance for the conditions of use envisaged.

199 All car and landing door panels shall withstand a normal force of 300N over an area of 5cm² in round or square section at any one point without permanent deformation or elastic deformation exceeding 15mm. During and after the test the safety of the door shall not be affected.

200 To prevent the risk of shearing or trapping, the exterior face of sliding doors shall be such that any recesses or projections shall be chamfered and not exceed 3mm.

201 No visible fixings shall be seen on any door panel nor shall they have any sharp edges or corners.

202 The leading edge of the car door shall be Designed to accept a full height protective device as specified in this Specification.

203 All door panels shall be protected against surface damage during delivery and erection by a heavy plastic coating or similar Material.

© Rand Associates Consultancy Services Ltd

204 Each panel shall have at least two door shoes fitted at the bottom to run in the door track. These shoes must be easily replaceable from the shaft side of the doors without the panels needing to be lifted or removed.

205 Each door shoe assembly shall include a rigid plate which, when securely fastened to the door panels, extends down into the bottom track to prevent the bottom of the door being pushed into the shaft if the door shoe rubbing surfaces fail.

206 The maximum clearance between door panels, architraves, uprights and sills shall not exceed 6mm. Throughout the defects liability period this dimension shall be maintained.

Heavy Duty Sliding Door Panels

207 The landing doors of general needs housing lifts shall be constructed with a double skin. The core shall be constructed from mild steel having at least two internal 150mm wide 16 swg mild steel box sections down the length of the panel and three 60mm wide sections running horizontally across the full width of the door. These sections shall be fully welded. The core shall be painted to prevent corrosion prior to being wrapped in the finishing Material. The finishing skin shall be glued to the core panel and the vertical edges shall be secured by self tapping screws or pop rivets. When closed the door panel width shall be such that it overlaps the bunch return by at least 20mm.

208 If this construction would invalidate any fire certification then an alternative Design shall be offered for approval. The shaft side of the landing doors shall be fitted with a cold rolled mild steel electrolytically coated with a thin layer of zinc skin.

209 Car door panels shall be reinforced in the same manner as the landing doors, but they need not be double skinned.

210 The door perimeter shall be fitted with hooking bars which shall locate upon similar hooks included within the architrave over the full height of the doors. The purpose of these bars to ensure that the door is physically restrained when in the closed position to prevent it from being kicked into the shaft. This requirement shall be included only when architraves sets and door panels are being replaced at the same time.

211 Ancillary door equipment shall be securely affixed to 6mm thick steel plates incorporated into the panel construction, the use of captive nuts shall not be accepted.

212 Provision shall be made on the top of each panel for the connection of the roller hangers and a minimum of 15mm thread penetration shall be required.

213 The leading edge of the landing doors shall be fitted with a profiled sight guard to reduce any gaps between the car and landing doors. This guard shall be an integral part of the door and additional pieces shall not be accepted. The rear edge of the sight guard shall be fitted with a plate which angles back to the inside of the door to form a rigid box section.

214 Between the door shoes a kicking plate shall be provided which also extends into the door sill groove. The plate shall not rub or scrape the sill in normal operation with the shoes intact.

215 The lateral movement of the base of the door shall not exceed 1.5mm. Fibre or felt door shoes shall not be accepted. The shoes shall be of a Material that is impervious to water and shall not swell or rot.

Medium Duty Sliding Door Panels

216 Sheltered housing lift door panels shall comply with the applicable Standard. They need not be constructed as described above and panels manufactured by the specified package manufacturers are deemed to be satisfactory and of the required standard.

© Rand Associates Consultancy Services Ltd

Hinged Doors

217 Hinged doors shall be replaced with new metal frames and doors of the type supplied by *[**International Lift Equipment Ltd**]* or other equal and approved. Vision panels may be included, only if existing, and providing the car door allows a view into the car when closed.

218 New locks and retiring ramps shall be provided to suit the new door equipment.

Door Equipment

219 The following items shall be included if specified in the schedules.

Door Equipment - Modification And Overhaul

220 The existing door equipment is to be retained and overhauled.

221 Door tracks shall be cleaned and re-lubricated as necessary. Rollers and hangers shall be examined and any defective parts replaced. Door shoes shall be replaced if damaged or worn.

222 Door closers shall be stripped down cleaned and repaired/replaced depending on condition.

223 Landing door locks shall be examined and their fixings checked for security. The correct operation of the doors shall be ensured by the replacement of locks, beaks or contacts as necessary.

224 Door operators shall be thoroughly stripped down and overhauled. All switches, limits, belts, motors, arms and linkages shall be replaced if found to be damaged or worn.

Door Equipment - Replacement And Installation

225 The following parts and components shall be replaced as part of the Works where specified in the schedules.

Door Tracks And Rollers

226 Each door panel shall be suspended from a steel track by two sets of quiet running rollers which shall be fitted with 'sealed for life' ball bearings. The rollers shall be fire resistant.

227 Additional eccentric rollers or pins shall be fitted below the track to ensure smooth running and to prevent tipping or the doors jumping off the hangers.

Door Closers

228 Lever type spring closers shall be fitted to all landing doors which shall ensure automatic closing of the door if this door becomes open when the car is outside the unlocking zone. The closer shall mechanically link the master to the slave door panels in the case of two speed door arrangements.

229 Lever type closers need not be installed on sheltered housing lifts.

Door Locking

230 A new interlocking device shall prevent under normal operation the movement of the lift car under power or control, unless all landing doors are shut and locked. The opening of any door or panel shall be prevented when the lift car is moving and outside the prescribed door locking zone.

231 Similar movement of the lift car shall not be allowed to occur unless the car door is closed and remains closed, except during pre-opening. Opening of the car door whilst in motion shall cause the lift to stop.

232 The normal door unlocking zone shall not exceed 350mm above or below each landing level.

© Rand Associates Consultancy Services Ltd

233 Landing doors shall be fitted with an electro-mechanical interlock. The inspection of working parts shall be possible by way of a vision panel or by the removal of a cover. If removal is required any fixing screws shall be captive. All locks shall conform to EN81.

234 A data plate shall be fixed to each lock which indicates the manufacturer, the type examination sign and its references.

235 An electrical device shall be provided to prove the closed condition of all car and landing door panels. The operation of any such device shall immediately stop the machine and prevent further movement, except during levelling or re-levelling, if specified.

236 Direct mechanical linking may be provided in the closed position. Multi panelled doors shall be directly mechanically linked to the driven or master panel by levers or by hooking or latching adjacent panels when in the closed position.

237 Movement of the lift car within the unlocking zone with doors open may only occur during levelling or re-levelling. The maximum levelling / re-levelling speed shall not exceed 0.8 / 0.3 m/s respectively.

238 Provision shall be made for the unlocking of all landing doors, irrespective of the position of the lift car, with the aid of a special "lock release" key.

239 The Design of the lock release mechanism and key shall be approved. Unauthorised access to the shaft shall not be readily possible by the use of simple or household tools.

240 The mechanism and key shall be of the vandal resistant 'drop key' type as manufactured by ***[The Express Lift Co. Limited]*** or other equal and approved

241 The position of the release key aperture shall permit easy use of the key such that a finger trapping hazard does not exist. The key hole shall not be located at the rear of the door. The door release mechanism shall be properly Designed so that standard keys can be used without modification. The face side of the door shall be fitted with an escutcheon plate to protect the finish from damage.

242 The release key shall have a label attached drawing attention to the danger involved in using this key and the need to properly close all landing doors. Two keys shall be provided for each lift, which shall be issued to the Client's Representative.

Door Operation

243 The car and landing doors on general needs housing lifts shall be driven by a heavy duty door operator complying with the following.

244 The door operator shall be driven by a continuously rated motor, the torque output of which can be adjusted electrically to limit the opening and closing forces applied to the car door panel(s).

245 The doors shall be smoothly driven with a minimum of noise and vibration to be felt inside the lift car.

246 The door movement shall be with simple harmonic motion with rapid opening cycle.

247 It shall be possible to open, or partly open, the car door in the unlocking zone with the supply to the lift door operator disconnected.

248 The operator, together with its associated equipment shall be as manufactured by ***[GAL as supplied by International Lift Equipment Ltd]*** or other equal and approved, and shall be of the vandal resistant type.

249 Lifts in sheltered housing Properties shall have door equipment as manufactured by ***[Selcom]*** or other equal and approved

250 All operators shall have a variable frequency controlled drive system.

© Rand Associates Consultancy Services Ltd

Door Protection

251 The car and landing door assembly shall include a device which shall prevent the risk of crushing on automatic doors.

252 The sensitivity of any door protective device shall comply with the requirements of the applicable Standard.

253 The doors upon meeting an obstruction shall rapidly re-open even with failure of any additional door protective device and the forces imposed shall not exceed those stated in the applicable Standard. Unless failure of the additional protective device itself prevents the doors from closing..

254 The leading edge of each car door shall be fitted with an additional protective device. The device shall be a non-impact proximity device.

255 The device shall extend the full height of the door. The detection zone shall extend outwards onto the landings in order to detect passengers approaching the doors from that direction.

256 A buzzer shall operate within the lift car to indicate that the detector is operational during passenger transfer. If persons stand within the detector range thus preventing normal closing the buzzer will sound.

257 Continued operation of the detector edge shall instigate the instruction 'Stand Clear of the Doors' from the speech synthesizer.

258 After excessive operations of any protective device the doors shall be driven closed, with devices rendered inoperative, with a maximum kinetic energy of 4J; door nudging. At the same time an audible signal shall sound to advise passengers to clear the entrance.

EMERGENCY COMMUNICATION

Emergency Communication Intercom

259 Lifts shall be fitted with a means of two way communication between the lift car and the rescue service where specified in the schedules.

260 A device shall be provided within the lift car so that passengers in an emergency can summon outside assistance. The device shall include an emergency battery backup which shall be capable of maintaining this unit, and any other it is required to serve, for a time of at least 3 hours, or the maximum time expected before a rescue can be made. Once communication has been established no further action shall be required by the trapped person, i.e. once effected the device shall be permanent and hands free. This unit may also feed the emergency lighting in the lift car providing it has sufficient capacity.

261 The cost, if any, of providing this emergency service shall be included throughout the defects liability period.

262 As there is a risk of persons working within the lift pit or on the car top becoming trapped with no means of escape, additional emergency alarm devices shall be provided.

263 In all cases the following provisions apply.

An emergency alarm button or similar switch shall be provided in the car control station to activate the communication system.

Similar buttons or switches shall be provided on the mechanics control station on the car roof and within the lift pit in an accessible position.

All emergency alarm buttons or switches shall be illuminated at all times, even in the event of mains power failure. This shall particularly apply to those within the lift shaft.

© Rand Associates Consultancy Services Ltd

The emergency unit within the lift car shall be located in the car control panel at a height of 1400mm and shall be of the hands free type. For disabled lifts the intercom shall include a push button amplifier and inductive loop for use by the hard of hearing.

Operation of the alarm button shall automatically establish a voice link between the lift car and the emergency operator.

The visual aspects of the unit shall be detailed and offered for approval. The words "Emergency Intercom", together with operational instructions, shall be clearly engraved in black.

A two stage visual indicator system within the lift car shall provide information on the emergency alarm status. A yellow indicator shall indicate that the alarm has been given, and a green indicator shall indicate that the call has been registered. Neon lights are acceptable until an agreement on the type of pictogram required is agreed upon. The lights shall be located under the Emergency Intercom Legend.

A dedicated telephone land line shall be provided for the lift. The cost of installation shall be included by the Provider. The regular standing charge etc. shall be paid for by the Client. Termination points shall be provided within the machine room for connection by the Provider who will provide all internal wiring from the lift car and shaft.

Alarm Bell

264 Audible alarm systems, differentiable from any fire or burglar alarm etc., shall be installed above the main floor landing entrance within the lift shaft.

265 A means shall be provided which will identify from which lift an alarm device has been activated. The electrical feed for the emergency alarm system shall be derived from an auto-recharge unit situated either on the lift car roof or in the machine room.

266 The unit shall be capable of maintaining the alarm bell for a period of four hours, and shall fully recharge within fourteen hours. Alarm buttons shall be illuminated at all times, this shall be maintained by the recharge unit in the event of a power failure.

267 The recharge unit may also be used to drive the hand winding floor level indication system if installed in the machine room or the lift car emergency lighting if the unit is located on the car roof, provided it has sufficient capacity.

268 All emergency alarm buttons or switches shall be illuminated at all times, even in the event of mains power failure.

269 Further information regarding alarm bell buttons is included later in this section.

Warden Call System

270 Where fitted the existing warden call unit shall be carefully removed and reinstated within the new lift car in an approved position. Where the response to this signal is guaranteed the provision of an additional alarm device within the car may be omitted provided it meets the criteria stated.

271 Call points shall be located at medium height and at low level.

Machine Room Intercom

272 An additional emergency intercom shall be provided between the lift car and the machine room where the lift travel exceeds 30m. This unit shall be powered by an emergency supply as above.

273 An intercom shall be installed between the lift car and the machine room on hydraulic installations if normal acoustic communication is not possible.

© Rand Associates Consultancy Services Ltd

274 The speaker and microphone may be installed within the car roof or other inaccessible position providing clear communication is possible. Control shall be from a unit located in the machine room adjacent to the control panel.

EMERGENCY OPERATION

275 The lift system shall be so Designed that the car may be raised or lowered to the nearest floor in an emergency.

Traction Lifts

276 For manual operation, the motor shall have a smooth spokeless wheel which shall be either removable and stored in the machine room, or form an integral and permanent fixture.

277 Where the wheel is detachable, the extended shaft shall be guarded and an electrical contact fitted that shall be operated at the latest when the wheel is located onto the shaft.

278 If the manual effort required to raise the car at the bottom end of the travel with rated load exceeds 400N, a method to move the car by electrical means shall be provided.

Hydraulic Lifts

279 Fitted on the pump unit shall be a means for emergency manual lowering of the lift car. This device shall be set automatically upon removal of hand pressure

280 The lowering valve shall be located in the machine room. The speed shall not under any circumstances exceed 0.3m/s and the valve shall be protected to prevent accidental operation.

281 A slack rope situation shall prevent the ram from being lowered any further.

282 A notice stating "Caution – Emergency Lowering" shall be fitted adjacent to the valve.

283 A manual means of raising the lift car, i.e. a hand pump, shall be provided and permanently fixed.

284 The hand pump shall be connected between the down direction or non-return valve and the shut-off valve. The system shall incorporate a means to prevent excessive pressure by the inclusion of a pressure relief valve.

285 A notice stating "Caution – Emergency Lifting" shall be fitted adjacent to the hand pump.

Floor Level Indication System

286 A hand winding buzzer and indicator system shall be provided to show when the car is within 100mm of a landing. The unit shall operate when the main lift supply is switched off and it shall not rely upon any lock circuit.

287 The system shall be included on all new control panels.

288 Where the panel is being retained and the system does not exist a simple method of checking that the car is within the door unlocking zone shall be provided. This may include markings on the governor or suspension ropes where visible.

289 Clear instructions of the emergency operation shall be printed on an untearable notice which is clearly and permanently displayed in the machine room stating the limitations and method of use.

© Rand Associates Consultancy Services Ltd

Emergency Stop Switch

290 An emergency stop switch, shall be installed as below:-

a) to be accessible on the opening the lowest landing or pit access door within easy reach,
b) on the car roof within 1.0m of the landing doors,
c) in the machine room adjacent to the machine and the control panel at a suitable height,

291 The pit stop switch shall be located inside the shaft 1.3m above floor level and within 1.0m of the lowest landing doorway. If the pit depth is in excess of 1.0m deep, an additional stop switch shall be provided that is accessible from the safe refuge area.

292 A stop switch shall be provided on the car roof or sling crosshead within 1.0m of the landing doors.

293 Unless the mains isolator is located within 1.0m of the machine or control panel additional stop switches shall be provided. The machine stop switch shall be accessible by persons working on or adjacent to the traction sheave. A stop switch shall also be located adjacent to the hydraulic tank unit where applicable.

294 The switches shall be of the bi-stable type and shall stop the lift and keep it stopped and be so arranged that there is no risk of mistake.

295 It will not be possible to move the car, by electrical means, until the all switches are returned to the 'Run' position.

296 On or near each switch shall be the word 'Stop' clearly and permanently labelled. The button shall be coloured red.

Final Limits And Switches

297 Operation of the final limit switches and any shaft mounted terminal stopping switches shall be affected directly by the car limit ramp at the top and bottom of the shaft.

298 The switches shall be securely fixed and in such a manner that normal horizontal movement "float" of the car shall not affect their operation.

299 Separate final and terminal switches shall be installed.

Final Limits - Traction Lifts

300 The opening of any final limit switch shall prevent further movement, under power, of the lift car, in either direction of travel until the system is reset and adjusted by the Provider.

301 Final limits shall be operated prior to the car or counterweight striking the buffers and shall remain operated throughout the full buffer stroke bringing the lift to a controlled stop independently of any terminal stopping switches.

Final Limits - Hydraulic Lifts

302 The opening of any final limit switch shall prevent further movement, under power, of the lift car, in either direction of travel until the system is reset and adjusted by the Provider. This shall apply even if the car or ram creeps below the final limit zone.

303 A final limit switch shall be fitted to monitor the position of the ram. It shall operate as close as possible to the upper terminal floor without interrupting normal operation but prior to the ram reaching its cushioned stop.

© Rand Associates Consultancy Services Ltd

304 The final limit switch device may be operated directly by the ram, or by a rope or chain etc. indirectly linked to the ram provided that an electrical safety device is positioned to detect a broken or slack rope condition.

305 On direct acting lifts only it is permissible for the final limit switch to similarly operated by the lift car or a rope attached to it.

Terminal Limits

306 The lift shall have terminal slowing and/or terminal stopping switches to bring the lift to a controlled stop at each terminal floor, in the event of a circuitry or selector malfunction.

307 The terminal stopping switches in the control circuit shall be of substantial Design, and shall be of the self-resetting type arranged to stop the lift automatically from any speed attained in normal operation, within the limits of top and bottom over-travel, independently of the final limit switch and the buffer(s).

308 The terminal stopping switches shall be arranged to operate with the lift car as close to the terminal floors as practicable without interfering with the normal operation of the lift.

Test Limit

309 Whilst raising the lift car in the "test" mode, the car shall stop with the car roof a minimum of 1.8m from the underside of the shaft roof but high enough to facilitate inspection and maintenance of any equipment at the top of the lift shaft.

310 An engraved notice shall be provided adjacent to the test limit stating 'Warning - Test Limit Do Not Move'. The limit shall be pinned in position when correctly set.

Proximity Switches

311 The method of floor proximity switching shall be of proven and reliable Design. The type of switching used shall be agreed.

312 Vanes or a tape head device may be used. Any magnets shall be properly glued in position once correctly set. The system shall be quiet in operation with a minimum of noise being heard within the lift car or on the landings.

Fireman's Control

313 The lift shall be equipped with a fire control facility.

314 A fireman's switch shall be provided in an agreed position as specified. It shall be fitted at high level out of reach of children approximately level with the top of the landing door specified.

315 The switch shall be of the type supplied by ***[Lift Components Ltd]*** or other equal and approved which utilises the 'Firemans drop key'. Two spare keys shall be provided per lift which shall be issued to the Client's Representative.

316 The faceplate shall be clearly and permanently engraved "fireman's switch" in red.

317 The fireman's control system shall operate as described in Operational Characteristics - Additional Control Features.

Guarding

318 The maximum mesh size shall have 30mm wide apertures.

319 If any moving item is within 50mm of a mesh screen, the mesh shall have a maximum size of 13mm and be constructed of at least 30 swg wire.

© Rand Associates Consultancy Services Ltd

320 On traction lifts all pulleys, divertors and traction sheaves shall be guarded in accordance with the applicable Standard

321 On hydraulic lifts all pulleys, divertors and sprockets shall be guarded in accordance with the applicable Standard.

322 The associated risks are listed in the applicable Standard. These include possible injury, ropes leaving grooves and the possible introduction of objects between them.

323 All rotating parts shall remain visible when guarded and the construction of all guards shall not prevent examination or maintenance.

324 Such guards shall only require removal for rope or pulley replacement or the re-cutting of grooves.

325 Traction sheaves and divertor pulleys, if installed in the lift shaft, shall be guarded with a wire mesh guard providing protection up to code IP3.

326 Fixed rods or guards shall be fitted to the traction and divertor sheaves to prevent the ropes leaving the grooves if slack. The maximum clearance between the pulley and the rod shall be less than the rope diameter.

327 All accessible rotating parts shall be effectively protected.

328 The over-speed governor and tension weight shall be guarded as detailed in this Specification under their respective headings.

329 A counterweight screen shall be fitted as specified under Counterweight.

Existing Guides – Modification and Overhaul

330 Existing guides may be re-used subject to calculation and condition.

331 All guides shall be checked for conformity with the requirements of the appropriate Standards.

332 The stresses resulting from normal operation, loading and during emergency shall be assessed in accordance with Annex G of EN81.

333 The existing car, ram and counterweight guides and brackets may be retained as long as they are treated in complete accordance with this Specification and satisfy the basic requirements for new guides.

334 The guides shall be accurately re-aligned and re-plumbed and any existing settlement stresses in the guides or brackets shall be relieved.

335 Guides and brackets shall be thoroughly degreased, cleaned and repainted.

336 Any sections which are damaged, worn, twisted or otherwise below standard shall be replaced. Any additional lengths required on existing installations to satisfy guided overtravel requirements shall be installed and supported in accordance with good working practices.

New Guides - Installation

337 Existing guides shall be removed and new guides installed.

338 Car, ram and counterweight guides shall be machined tee section, rolled steel with tongue and groove and plated joints conforming to the recommendation of t the applicable Standard.

339 The minimum blade thickness of car guides shall be 15.88mm and 9.0mm for counterweight or ram guides.

© Rand Associates Consultancy Services Ltd

340 Calculations shall be issued to the Client's Representative to show that the guides are capable of withstanding, without excessive deformation, under the application of the safety gear on the car whilst travelling above its rated speed.

341 In addition to the above calculations, the stress imposed during normal operation shall be determined using Class A loading conditions.

342 Guides shall be so fixed to their brackets so that they do not deflect by more than 3mm under normal operating conditions. Additional brackets shall be provided as necessary.

343 Newly installed guides shall rest upon steel plates, preferably combined with buffer mountings to reduce point loadings on the pit floor.

344 Guide bracket spacing shall be proven in accordance with the recommendation of t the applicable Standard. The deflections of guides and/or guide brackets shall be maintained within the limits stated. Guide brackets shall be fixed to walls or metal inserts by bolts, or bolted to the building fabric or structural steelwork. Wood or fibre blocks or plugs shall not be used for securing guide brackets.

345 The thickness of any shimming/packing to obtain proper alignment of guides shall not exceed 35mm and all shims shall be made of steel.

346 Guides shall be secured to their brackets by through bolts or clips of such Design that any rotary movement of the clip will not release the guide.

347 The guides shall be accurately aligned and plumbed during erection.

348 The lengths of all guide rails shall conform to the applicable Standard with regard to guided overtravel

349 For hydraulic lifts, the minimum guided overtravel when the ram has reached its limit of travel shall conform with the applicable Standard.

Guide Shoes

350 The car sling and counterweight shall be fitted with new guide shoes.

351 The car and ram pulley sling and counterweight frame shall incorporate heavy pattern adjustable sliding guide shoes fitted with renewable linings of durable non-ferrous Material.

352 The guide shoes on the lift car shall also be sprung loaded and self-adjusting.

353 Rollers may be used in addition to fixed guide shoes on hydraulic lifts.

354 On installations where the sling or counterweight are being retained and if the design of the existing shoes allows, they may be retained adjusted and new liners fitted.

355 Any necessary lubrication shall be applied by automatic means. The lubricators shall distribute oil evenly onto the guide blade, the rate of feed being adjustable.

356 They shall be fitted on the top of the car, ram pulley and counterweight.

357 Oil catchment trays or drip trays shall be provided and retained at the foot of each guide. Drip trays shall be Designed so that they may be easily removed for emptying without spillage.

© Rand Associates Consultancy Services Ltd

HYDRAULIC SYSTEM

General Requirements

358 Hydraulically powered lifts shall be Designed and installed according to the applicable Standard.

359 The drive system shall be Designed to give 45 motor starts per hour.

360 Provide calculations of the heat generated in the pipework, ram and tank within the shaft and machine room.

361 A submerged oil heater shall be provided and installed within the tank to maintain the hydraulic fluid temperature and prevent cold start problems.

362 A means of cooling the oil shall be provided if necessary in order to maintain the specified rated starts per hour. The Provider shall provide information as to the calculated number of starts for thermal equilibrium before the cooler becomes operative.

363 A steel pit prop or similar safety device shall be provided to prevent the risk of crushing in the lift pit and maintain the car at a suitable height so that escape from the pit is possible. The prop shall be Designed to locate in pockets on the pit floor and on the underside of the car sling. The pit pocket shall include a contact, wired into the safety circuit, which prevents movement of the car, under power, when the prop is inserted. It shall be possible to fit the device safely from the landing.

364 The prop or device shall be painted yellow and be permanently stored within the pit. A suitable safety sign shall be fitted.

365 The tank shall be provided with a steel oil catchment tray or small bund wall. This shall have sufficient volume to contain all oil within the tank and shall extend sufficiently on all sides so that minor leaks at connections are prevented from contaminating the floor.

Precautions Against Free Fall (Hydraulic Safety)

366 The following combinations of devices may be used to prevent free fall.

367 Direct acting lifts shall be provided with a rupture valve, an overspeed operated safety gear or a restrictor valve.

368 Rams shall be fitted with a rupture valve or valves or a governor operated progressive safety gear shall be fitted. If a safety gear is fitted, it shall absorb any impact loading due to inertia of the lifting ram(s).

369 Indirect acting lifts shall be provided with a safety gear operated by an overspeed governor, a safety gear operated by failure of suspension or safety rope plus a rupture valve or a safety gear operated by failure of suspension or safety rope plus a restrictor valve.

370 A safety gear shall be fitted. The safety gear may be operated by a safety rope so long as a rupture valve is also fitted.

Rams

371 Pressure calculations shall be completed in accordance with the applicable Standard.

372 Calculations of ram integrity using Euler's buckling theory shall be performed and issued to the Client's Representative upon request for rams in compression.

373 Direct acting rams shall be connected to the car sling via a flexible means Designed to withstand all dynamic forces and be capable of supporting the weight of the ram.

© Rand Associates Consultancy Services Ltd

374 On indirect acting lifts the ram head shall be guided and no parts shall project above the car roof.

375 The ram(s) shall have mechanical stops at its ends of travel such that the car cannot move into a dangerous position. If telescopic lifting rams are to be used, each section shall be provided with mechanical stops to positively limit its respective travel.

376 The ram stops shall be capable of withstanding the suspended weight of the ram.

377 The ram stops shall be cushioned so as to prevent unbuffered impact.

378 The ram cushions may be internal or external providing the effective resultant force is aligned along the centre line of the ram.

379 On indirect rams the cushion shall not lead to a slack rope situation.

380 Rams installed in bore holes shall be fitted within a protective steel tube. In all cases rupture valves and solid pipework shall be protected.

381 Guide yokes shall be maintained at suitable spacings to prevent trapping.

382 The synchronizing of telescopic rams shall be accomplished in accordance with the applicable Standard.

383 The cylinder head shall be fitted with an adjustable gland or high pressure seal to ensure a constant tight fit to prevent any oil leakage past the piston rod.

384 The cylinder head shall be fitted with an oil collection ring and drain pipe. A pipe shall run from the drain into a transparent oil collection bottle in the pit so that any oil leakage past the cylinder head gasket can be monitored. A label shall be affixed to the bottle which states 'Dirty Oil - Do not reuse'.

385 The ram shall incorporate a means of venting air from within the cylinder. Ram pulleys shall be guarded in accordance with the applicable Standard.

Rupture Valves

386 Actuation of the rupture valve shall be stop and hold the car carrying its rated load under overspeed conditions in the down direction. The maximum overspeed permissible is rated speed plus 0.3m/s.

387 The valve shall be easily accessible for inspection and adjustment. It may be integral or flange mounted.

388 Within the machine room, i.e. on the valve block, there shall be a means of increasing the flow rate to test the rupture valve, without having to overload the lift car. This means shall be tamperproof to prevent unauthorised adjustment.

389 A data plate shall be fixed on or adjacent to the rupture valve which indicates the manufacture, the type test examination sign and the tripping flow for which the valve has been adjusted.

Pipework

390 All pipework used on hydraulic lifts shall be suitable for the fluid used, be protected from damage and installed so as to prevent excessive stress due to vibration or torsion.

391 Fittings shall be accessible for examination and inspection. Pipes passing through walls shall be properly protected and ferrules shall be installed.

392 Rigid pipes shall be Designed in accordance with the applicable Standard requirements.

393 Flexible hoses shall be Designed in accordance with the applicable Standard requirements.

© Rand Associates Consultancy Services Ltd

394 Hoses shall be clearly and indelibly marked with the manufacturers name or trade mark, the test pressure and the date of the test.

395 At no time shall the manufacturers minimum bending radius limit be exceeded. Confirmation of manufacturers instruction shall be provided upon request.

Pump Unit

396 All pumps shall be of the high efficiency either screw or vane type. Means shall be provided whereby the pumps may be coupled to the driving motor without eccentric loads being imposed onto the pump bearings.

397 All piping, fittings etc. shall have such a cross-sectional area so as to prevent starvation and cavitation and not induce turbulence or excessive temperature rises.

398 The tanks shall be in accordance with the applicable Standard.

399 The tank shall be Designed such that it may be easily filled and emptied.

400 The tank shall incorporate an oil level gauge. The maximum and minimum oil levels shall be clearly shown. It shall be possible to determine at which floor the lift stands by way of the oil level indicator.

401 The tank unit shall be protected against corrosion. A drain plug or other means shall be easily accessible for emptying the oil.

402 The characteristics and quantity of the hydraulic fluid shall indicated on a data plate attached to the tank unit.

403 The hydraulic system shall include a temperature sensing device. This device shall effect an automatic shut-down in accordance with the clauses given in Control Panels.

Anti-Creep

404 An anti-creep re-levelling device shall be incorporated in the hydraulic control system. This device shall be in accordance with the applicable Standard.

405 An anti-creep re-levelling device shall ensure re-levelling if the change in car level shall fall below 25mm in the event of leakage in the hydraulic system.

406 The lift car shall home to the lowest floor within 15 minutes of the last normal journey.

407 This function is to operate irrespective of the open or closed condition of the landing doors but only in the 'up' direction.

408 In order to maintain the anti-creep facility, the power supply has to be permanently maintained. A notice adjacent to the main switch in the pump room shall state the result of carelessly interrupting the power supply.

409 The anti-creep system is to maintain the car at floor level when it has been stationary for some time. Frequent operation, i.e. during the transfer of passengers shall not be accepted.

Valves and Components

410 All valves shall withstand a static pressure of twice the maximum working pressure without permanent deformation.

411 Valve control blocks shall, through the gradual restriction or release of the hydraulic fluid, produce smooth deceleration and acceleration of the lift car. Flow rate shall be monitored and the lift speed shall follow a predetermined speed curve.

© Rand Associates Consultancy Services Ltd

412 The main control valve shall close when pressure is shut off. Electrically controlled valves shall fail safe in the event of a power failure.

413 The hydraulic system shall provide a means of moving the lift in the event of power failure. See Emergency Operation.

414 A shut off valve shall be installed between the non-return valve and the down direction valves. The valve shall be installed within the machine room.

415 A non-return valve shall be installed that will stop and hold the lift car whilst carrying its rated load at any point when either the pump stops or the mains pressure drops below the minimum operating pressure.

416 The non-return valve shall be installed between the pump and the shut-off valve.

417 A pressure relief valve, set at 140% of the full load pressure, shall be installed between the pump and the non-return valve to vent hydraulic fluid back into the tank.

418 Down direction valves shall be closed by at least one spring per valve acting in compression and hydraulic pressure. They shall be held open electrically.

419 Up direction valves shall be opened by at least one spring per valve acting in compression and hydraulic pressure. They shall be closed electrically.

420 Filters, strainers or similar devices shall be included within the hydraulic system to ensure safe running. A filter shall be installed between the tank and the pump and between the down direction valves and the shut-off valve.

421 All filters shall be accessible for inspection and maintenance purposes.

422 A pressure gauge shall be provided. It shall be installed between the down direction valves or the non-return valve and the shut-off valve. A gauge shut-off valve shall be provided to allow the gauge to be removed and replaced.

Landing Stations

423 The existing landing push stations shall be replaced.

424 The existing cut-outs which are above wheelchair height shall be made good where necessary and new holes formed. On sheltered housing lifts it may be permissible to extend the push station to avoid extensive building Works or damage to finishes. The Client's Representatives approval is required.

425 The height to the centre-line of the new push stations shall be between 900mm and 1100mm. The preferred height is 1000mm.

426 The landing control devices and indicators shall be in accordance with the applicable Standard.

427 A single riser of landing push stations shall be provided incorporating a single directional push button on all floors.

428 All buttons shall be provided with tactile pressels and be Designed to fully satisfy the applicable Standard.

429 All push buttons shall illuminate to indicate call acceptance. At the same time an audible indication shall also be given. The audible indication shall be produced every time the button is operated even if the call has already been registered.

430 All new units shall be D & P type EN with stainless steel pressels and be mounted on a stainless steel faceplate with a suitable backbox. On general needs lifts the faceplate shall be 10 swg 416 grade stainless steel. Faceplates shall be flat and no gaps between the plate and the wall or architrave shall be allowed.

© Rand Associates Consultancy Services Ltd

431 Note the requirement in the applicable Standard that the landing faceplate shall contrast with the surrounding wall finish.

432 Tamperproof fixings shall be installed on all landing stations of general needs housing lifts. Station fixing screws shall not be visible from the landings.

433 A dot matrix indicator shall be installed on all floors in an agreed position. On general needs housing lifts the indicators shall be vandal resistant.

434 The indicator display shall show the floor level that is nearest to the car at any point throughout its travel. The indicators shall be provided with scrolling such that floor levels can roll vertically and messages can be rolled horizontally.

435 The indicators shall include hall lantern indication which shall illuminate when the car levels to show the intended direction of travel. An audible signal shall be given at the same time.

436 Lifts having Fireman's Control, shall be provided with a Fireman's Switch positioned as specified.

437 All landing stations shall have the same fixings as the landing buttons detailed above.

LIFT CAR

General – All Lifts

438 The lift car shall be Designed and constructed so as to satisfy The Lifts Regulations.

439 The car floor area shall satisfy the requirements for disabled access in accordance with the applicable Standard Specific clauses are detailed throughout this document. All floor areas shall be maximised as far as possible.

440 The effective floor area of the lift car shall lie within the parameters listed in the applicable Standard for the specified rated contract load.

441 The internal dimensions, including finishes but excluding handrails, shall be equal to those specified. Recesses or extensions, whether or not protected by separating doors or panels, shall be taken into account in the car floor area/load calculations. The specified car dimensions shall not be unduly reduced due to the thickness of finishes. The maximum reduction of 15mm is allowable under the applicable Standard.

442 The finished car construction shall be such that no resultant damage is caused by the rupture valve, clamping devices, pawl devices, safety gear or buffer test.

443 The car floor shall consist of a steel platform, suitably braced and welded, with a covering of timber, at least 25mm thick, treated as necessary to resist water and receive the floor finish. The platform steelwork shall be properly treated and protected in order to resist rust. The timber floor shall be lined on the underside with sheet steel not less than 0.5mm (26 swg) thick. The sheet steel and the platform shall be galvanised.

444 The lift car shall be constructed from steel panels. Steel panelled cars shall be rigidly constructed and treated with anti-drumming or noise absorption pads to the car exterior in order to reduce transmission of shaft vibrations to an absolute minimum.

445 Car walls shall be Designed to resist without permanent deformation or excessive elastic deformation under the application of a force as given in the applicable Standard.

446 The car roof shall be Designed to withstand the weight of two persons without permanent deformation.

447 A clear standing area shall be provided on the car roof measuring at least 250mm in both dimensions having a total area of 0.12m2. This area shall not contain any equipment or cables and shall be flat.

© Rand Associates Consultancy Services Ltd

448 This area shall be coloured yellow and a sign shall be fitted stating 'Standing Area'. The required standing area shall also satisfy the requirement for a safe refuge.

449 The car roof may need to be fitted with a balustrade to satisfy the Specification. See Voids and Screens.

450 The car shall be finished as specified in Schedule 2. All internal surface finishes shall not be inferior to the applicable Standard regarding surface spread of flame. In addition Materials shall not be used which may give off harmful gases or fumes. If any breech of this requirement is considered to exist then it shall be immediately brought to the attention of the Client's Representative.

451 Care shall be taken to avoid the use of reflective surfaces within the car. Walls and floor finishes shall be matt finish and the walls shall contrast with the floor. The car flooring shall be non slip and be of a similar friction/finish to the lobbies.

452 No fixings shall be visible or accessible from within the car. A detailed drawing of the lift car finishes shall be issued for approval.

453 Round section handrails, at least 40mm diameter, shall be installed in accordance with the applicable Standard. Handrails shall be fitted to at least one wall. The top of the handrail shall be 900mm above the car floor and there shall be a gap to the wall of at least 45mm. The ends of the rail shall be closed and if necessary turned into the wall to prevent injury.

454 All mirrors or glazing included in the lift car shall fully comply with the applicable Standard. No fixings shall be visible or accessible from within the car.

455 Small lifts Designed for wheelchair use shall have a mirror on the rear wall to assist users reversing out of the lift. The mirror shall extend from 400mm above the car floor and no handrail is permitted on this wall.

456 All lifts shall be provided with adequate ventilation for passengers even in the event of prolonged stoppage.

457 The lift car shall have ventilation with a total effective area of 2% of the car floor area. This effective area shall be equally dispersed between the upper and lower parts of the car. All ventilation holes shall be shielded on the outside of the car to conform to section 8.16.4.

458 The lift car shall be adequately lit whenever the car is in use or the doors are open. Emergency lighting shall be provided.

459 Electrical lighting shall be provided in the lift car to give a minimum of 100 Lux at floor level unless otherwise instructed by the Client's Representative.

460 The car lighting shall be controlled by a switch in the machine room with an additional keyswitch in the mechanics control station.

461 The non-maintained emergency lighting shall give adequate illumination over the front of the lift car to distinguish the car threshold and the emergency alarm device. The emergency light shall give at least 4 hours continuous operation. The battery shall, where necessary also give three hour's simultaneous usage of the emergency communication system. Emergency lighting shall provide at least 15Lux at floor level. The minimum required in the applicable Standard is not satisfactory.

General Needs Housing Lift Cars

462 The walls of general needs housing lifts shall be constructed from 16 swg 416 grade patterned stainless steel folded panels no greater than 250mm wide. The panels shall be bolted together and also to the top flange of a stainless steel channel section which shall form the skirting. Water/acid resistant sealing strips shall be inserted between each adjacent panel section. The colour of the strips shall be blue. Concealed ventilation apertures shall be provided in alternate wall panels.

© Rand Associates Consultancy Services Ltd

463 The roof shall comprise of multi-ply timber lined internally with stainless steel and externally with 16 swg cold rolled mild steel electrolytically coated with a thin layer of zinc. The car roof shall be substantially flat and be treated with a non slip non- combustible finish. The car perimeter shall be highlighted with a yellow reflective edging.

464 The car floor shall comprise of an epoxy resin flooring laid in accordance with manufacturers recommendations. The floor shall be trowel laid and seamless, with coved edges rising to the underside of the wall panels. The car sub-floor shall be suitably recessed and prepared prior to laying the floor coat. The edges shall be coved and run beneath an inverted stainless steel angle trim incorporated into the shirting detail. This clause shall always apply to general needs housing lifts.

465 The light units, typically Thorn 18W 240V AC fluorescent battens, or other equal and approved, shall be mounted in suitable enclosures. At least one tube shall be capable of being powered by a battery auto re-charge unit which shall be mounted above the enclosure. The enclosure covers shall be removable from the car roof and be secured by wing nuts or other similar means. The fixings shall not form a tripping hazard and the enclosure shall be capable of satisfactorily supporting a man's weight. The interior of the enclosures shall be white stove enamelled. The tubes shall have a clearance of at least 25mm above the diffuser. The diffuser shall consist of an impact resistant opal polycarbonate sheet, nominally 6mm thick, which shall be sealed and contained within a stainless steel frame. The frame shall be vandal resistant and be secured to the car roof, having no visible fixings from within the car.

466 Replacement of the car lamps shall only be possible from the lift car roof.

Sheltered Housing Lift Cars

467 The walls of sheltered housing lifts shall be constructed from mild steel folded panels. The panels shall be lined internally with Formica from the standard range. Visible ventilation slots shall be provided in the coving and skirting.

468 Replacement of the car lamps shall be possible from inside the lift car. Electrical lighting shall be provided in the lift car to give a minimum of 100 Lux at floor level. At least one slim line circular domed luminaire with opal diffuser and 28w 2D fluorescent lamp shall be provided complete with integral 4 hour emergency inverter and batteries. Replacement of the car lamp shall be possible from within the lift car. Two spare bulbs shall be provided and stored in the machine room.

LIFT CAR BUTTONS AND INDICATORS

469 The car and landing controls shall be Designed and located for use by unaccompanied disabled persons. The function of all lift control devices shall be clearly indicated.

470 Control devices shall be Designed and positioned in accordance with the applicable Standard.

471 The car operating panel shall be mounted in a hinged section in order to facilitate service and inspection. It shall only be released from the car roof and shall be lockable from inside the car. Sheltered Housing Lift panels may be unlockable from within the car.

472 The car faceplate shall be stainless steel with no visible fixings and shall be flush mounted on the hinged panel. The faceplate shall have suitably punched holes so that the face of the buttons are flush. 10 swg 416 grade on general needs housing lifts

473 The car control station shall include a full set of floor dispatch buttons together with an alarm button, a door open button and a door close button. The car operating panel shall protrude approximately 10mm in front of the car wall so it may be easily located.

474 All control devices shall be located between 900 and 1100mm above floor level.

475 The car operating devices shall be included in the side wall at least 400mm from the front and rear walls.

© Rand Associates Consultancy Services Ltd

476 If the doors are side opening, the controls shall be placed on the wall adjacent to that onto which the doors close.

477 If centre opening doors are fitted the car operating station shall be located on the right hand side when viewed from the landing.

478 Where two sets of operating devices are specified, they shall include floor designation buttons, alarm, door open/close buttons, etc. The service, light etc. buttons or key switches need be included in one control station only.

479 The alarm bell button shall be engraved in yellow a suitable symbol is given in the applicable Standards, IEC 60417-1 and IEC 60417-2.

480 The alarm button shall be engraved in yellow a suitable symbol is given in the applicable Standards, IEC 60417-1 and IEC 60417-2.

481 The alarm button shall always be situated below the call buttons, at a height of 900mm, and shall be illuminated at all times.

482 A door open push button shall be provided to reopen or hold open automatic doors. The push button shall illuminate when the lift doors start to close.

483 A door close push button shall be provided in the car control station to overrule the door hold relay timer.

484 The control devices shall fully satisfy all requirements of EN81 Part 70, relating to size of buttons and active parts, operating force and feedback.

485 Call registration shall be confirmed by visual and audible indication. Keyswitches shall match the design of the floor push buttons.

486 The lift controls shall be identifiable by blind or partially sighted persons by the use of tactile embossed characters. The size and relief of tactile characters shall satisfy the applicable Standard.

487 The exit floor button shall protrude out of the car operating panel by approximately 5mm; it shall be coloured green and have a contrasting tactile legend.

488 All pushes, switches and indicators shall be enclosed such that no live parts are accessible.

489 A car preference keyswitch shall be incorporated in the car control station.

490 The car preference key shall be removable in both positions.

491 The faceplate or car operating panel shall be engraved 'Car Preference' and 'on/off' adjacent to the keyswitch positions and infilled in black.

492 The floor push buttons and the door open and alarm buttons shall be type US 91-EN. Keyswitches shall match the design of the floor push buttons.

493 The lift controls shall be identifiable by blind or partially sighted persons by the use of tactile embossed characters. Braille buttons shall be provided in lieu of tactile if so requested without additional cost.

494 All pushes, switches and indicators shall be enclosed such that no live parts are accessible.

495 The sizes of symbols and characters used on control devices and indicators shall conform with the following:-

a) the symbols shall be clear and legible.
b) capital letters or numbers shall not be less than 10mm high, with lower case letters being not less than 7mm.

© Rand Associates Consultancy Services Ltd

496 The car faceplate shall be engraved with the car load details as specified in Notices, Operating Instructions and Data Plates.

497 A dot matrix indicator shall be installed within the lift car in an agreed position. The indicator shall be installed between1.6m and 1.8m above the car floor. The indicator shall be vandal resistant on all general needs lifts.

498 The displayed characters shall be at least 40mm high and the colour shall contrast with the surround.

499 The speech synthesizer shall announce floor levels when the lift stops.
The indicator shall display the closest floor level to the lift as it passes through the building.

500 The display shall be capable of scrolling horizontally and vertically to show direction of travel and other messages.

501 The display may be amended as below.

502 The car position indicator may be used to show an overload condition. An acceptable symbol shall be 'Overloaded'; an audible signal shall be given at the same time.

503 Direction of travel indicators shall be installed within the lift car. They shall be included in the car operating panel, or if no hall lanterns are installed shall be clearly visible from the landings.

504 An indicator shall be provided which reads "Lift under Fire Control". This indicator shall illuminate whenever the Fireman's or Fire fighting switch is operated. A similar indicator shall be provided in the respective landing push station adjacent to each Fire Switch.

LIFT SHAFT - GENERAL

505 The lift shall be Designed and constructed to ensure that the space in which the car travels is inaccessible except for maintenance or in emergencies. Before a person enters that space, normal use of the lift must be made impossible.

506 The lift must be Designed and constructed to prevent the risk of crushing when the car is at its extreme travel at the top and bottom of the lift shaft. This shall require the provision of a space or refuge, with the minimum dimensions given in the applicable Standard.

507 In existing lift shafts, the requirements of the applicable Standard shall be conformed with as far as is practically possible. In all cases, consideration of the safety of maintenance personnel shall be of prime importance. The prior approval of any deviations from the applicable Standard shall be gained by the Provider.

508 Should the space or refuge specified above not be available on existing buildings the Provider shall demonstrate his ability to provide measures of equivalent safety in order to satisfy The Lifts Regulations.

509 If the headroom or pit depth differ from the dimensions given in the necessary Standards, suitable notices shall be fixed within the lift shaft as specified in Notices, Operating Instructions and Data plates.

510 Where pit depths do not comply with the applicable Standard, a pit prop or other mechanical means shall be provided. It shall be possible to fit the device safely from the landing.

511 The prop or device shall be painted yellow and be permanently stored within the pit. A suitable safety sign shall be fitted.

512 A pit ladder shall be installed to provide safe and convenient access to pit level from the lowest landing entrance level. It shall be located so that it shall not obstruct the lift car or the trailing flexes. The ladder shall extend sufficiently to prevent over reaching and suitable grab rails shall be provided.

© Rand Associates Consultancy Services Ltd

513 Shaft lighting shall be installed in accordance with this Specification. The pit switch shall be easily accessible from the landing entrance, prior to entering the pit. It shall be located adjacent to the pit ladder and/or emergency stop switch.

514 A power socket shall be installed in the lift pit.

515 An emergency stop switch shall be installed in the lift pit in accordance with the relevant clause in this section of the Specification.

516 Existing lifting beams within the lift shaft shall be tested and properly marked with their safe working load prior to use.

517 Ensure that adequate ventilation exists. If no ventilation exists its provision, by vent or duct, shall be included in the refurbishment Works.

MACHINE ROOM - GENERAL

518 Ensure that all lift machinery and associated devices are not accessible except for during maintenance or in an emergency.

519 If lift equipment is located within areas not solely used for lifts, the equipment shall be separated by an enclosure at least 2.15m high with a lockable access door or trapdoor.

520 As far as is practically possible, all access or working spaces around lift equipment shall fully conform with the applicable Standard.

521 Space shall be provided in front of control panels and cabinets. The space shall extend 0.9m from the nearest electrical component and at least the width of the panel with a minimum of 0.5m.

522 If any differences in floor level exist in excess of 0.5m, proper stairways, ladders and guard rails shall be provided.

523 The machine room for hydraulic lifts shall be provided with a small bund wall to retain any oil which may spill or leak from the tank unit. Alternatively a steel catchment tray may be fitted when hydraulic tanks are replaced.

524 This shall have sufficient volume to contain all oil within the tank and shall extend sufficiently on all sides so that minor leaks at connections are prevented from contaminating the floor.

525 Mains and auxiliary electricity supplies shall be installed by the Client.

526 Lighting, heating and ventilation of machine rooms shall be provided by the Client.

527 Lifting beams within the machine room shall be tested and properly marked with their safe working load.

528 Where required the Provider shall provide all temporary lifting and support facilities. The positioning of any loadings shall be approved by a qualified structural engineer employed by the Provider for this specific purpose.

529 The machine room shall include all relevant notices as described in this Specification and in the applicable Standard. A suitable "danger" notice shall be affixed to the machine room door.

530 If there are several machines, all switches shall be clearly labelled as to which lift it isolates or relates.

531 A rubber isolating mat shall be provided in front of the lift controller. The mat shall conform to B the applicable Standard.

532 A purpose-made rack shall be fixed in the machine room to house the hand winding wheel, brake release lever, hand pump lever, lock release key etc. or any other tool provided by the Provider.

© Rand Associates Consultancy Services Ltd

533 All holes in the machine room slab for ropes or hoses etc. shall be reduced to an operating minimum.

534 Ferules shall be fitted to rope holes etc. which extend at least 50mm above floor level to prevent objects falling down the well.

535 A removable entrance protection barrier, for use during maintenance shall be provided by the Provider and kept in the lift machine room. The barrier shall be of the type described in the Health and Safety Executive guidance note PM 26.

536 Machine and governor supports supplied by the Provider shall conform with the applicable Standard.

537 The ambient temperature within the machine room shall be maintained between +5°C and +50°C, taking into account the anticipated heat generation of the equipment.

538 The lift shall automatically shut down if the temperature in the machine room should exceed the designed maximum. See Control Panel.

Mechanics Control Station

539 A car top mechanics control station shall be mounted upon the car roof or sling crosshead.

540 The position and height of the control station shall be such that it may be easily reached from the landing entrance in order to disable the lift and switch on the car top light, and that it may be easily operated from a safe area on the car roof.

541 If the mechanics control station cannot be positioned within 1 m of the entrance than an additional emergency stop and light switch shall be provided.

542 The layout and arrangement of the mechanics control station shall be basically in accordance with the applicable Standard.

543 The mechanics control station shall contain the following switches, buttons and equipment:-

a) Car top light- a 50 W service bulb housed in a protected wire enclosure or bulkhead fitting. A toggle type switch shall be located adjacent to the light fitting with "Light - On - Off" clearly labelled.
b) Emergency stop/isolation switch- a red mushroom type stop switch. Lock off - twist to reset.
c) Test switch- normal/test changeover switch. When set on test the car and landing call buttons are isolated and the car top control buttons are energised.
d) Run push button- to be used in conjunction with the up and down buttons.
e) Up and down buttons- to be pressed simultaneously with the run button to raise or lower the car at reduced speed.
f) Door control - a door open/close switch shall be provided. This switch shall only operate when set in the test mode when the car is stationary.
g) Alarm - an illuminated alarm button shall be provided to activate the lift emergency alarm system. The button shall be illuminated at all times and shall remain illuminated even if the power fails.

544 In addition to the above, a car light keyswitch shall be installed within or adjacent to the mechanics control station.

545 All mechanics control buttons and switches shall be clearly labelled in English only. All switches shall be suitably shielded to prevent accidental operation.

546 When under mechanics control test mode, the lift speed shall not exceed 0.63 m/s.

547 When the mechanics control is in test mode the operation of the electrical anti-creep system shall be isolated.

© Rand Associates Consultancy Services Ltd

548 A switched 13 amp socket outlet (with a 5A fuse) shall be incorporated within, or adjacent to, the mechanics control station. The socket shall be fitted with an engraved notice stating 'For use with inspection lamps only'.

Notices, Operating Instructions and Data Plates

549 All relevant notices, operating instructions and data plates shall be provided in accordance with the applicable Standard.

550 All notices shall be untearable, durable, legible and in English, and shall meet the Client's Representative's approval.

551 All identification labels shall be manufactured from 12 swg stainless steel, deeply engraved and filled with black epoxy resin.

552 A load plate shall be installed in the lift car. It shall read (.....kg ..... Persons.). The notice shall be deep engraved and infilled in black. The characters shall be 10mm high, capital letters and numbers, and 7mm for lower case letters. The load details shall be engraved in the car station panel.

553 The name of the Provider, their lift identification number and their CE reference number shall be displayed in the lift car in accordance with the applicable Standard. The Client's lift identification number shall also be shown.

554 A data plate shall be fixed to the top members of the car sling near to the suspension rope anchorage point in a conspicuous position, giving the following information:-

a) The manufacturers name, number and CE reference.
b) The installation date.
c) The Clients lift reference number.
d) The rated load (kg) and contract speed (m/s).
e) Maximum static load on the ropes in kilograms.
f) A complete description of the suspension rope including diameter, lay, hand, construction and tensile strength.
g) The weight of the lift car.

555 All safety components shall be clearly marked with the CE mark as required under The Regulations. All required documentation shall be provided.

556 If the headroom or pit depth differ from the dimensions given in the applicable Standard, suitable notices shall be fixed within the lift shaft.

557 The notice shall read 'Reduced Headroom/Pit depth'. The notices shall be affixed to the rear shaft wall opposite the top or bottom landing entrances respectively.

558 A warning sign shall be fitted to the machine room door. The minimum height of such lettering shall be 15mm.

559 Machine room trap doors shall have notices as depicted in the applicable Standard fixed in a visible position.

560 A handwinding notice giving clear instructions of the correct emergency procedure shall be fixed adjacent to the winding machine.

561 The operation of the electrical emergency operation system shall be clearly defined in an appropriate notice.

562 A notice shall be clearly and permanently displayed in the machine room adjacent to the pump unit stating the method of emergency raising and lowering.

© Rand Associates Consultancy Services Ltd

563 Clear instructions for use of the handwinding indicator system shall be mounted in the machine room.

564 A standard electric shock notice shall be fitted in a prominent position.

565 The direction of rotation shall be shown on the winding machine together with types and quantities of lubricants.

566 All miscellaneous switches shall be properly identified throughout the shaft and machine room.

567 The Clients lift number shall be displayed on or adjacent to the architrave header at the top and bottom floor level, the car control station and respective winding machine, hydraulic tank unit, controller and mains isolator. Similar numbers shall be displayed on the car roof and in the lift pit as well as the machine room. The lift identification sign shall be engraved onto 10 swg stainless steel plate in 30mm high letters. The plate shall be securely fitted with vandal resistant dome headed fixings.

568 A data plate shall be fitted to the overspeed governor, buffers, door locks, safety gear, ascending overspeed device and rupture valve

568 Maintenance log cards shall be provided prior to completion which shall be stored in a plastic envelope affixed to the outside of the control panel.

570 All engraving or data plate lettering shall be in Helvetica medium type script or close alternative.

Overspeed Devices

571 In order to satisfy The Lift Regulations, all lifts shall be fitted with speed limitation devices.

572 Only lifts whereby over-speeding is prevented by the design of the drive system itself may overspeed devices be omitted. Such systems as rupture valves, fitted to direct acting hydraulic lifts, are considered to fulfil this requirement.

573 The uncontrolled upward movement of the lift car shall be prevented in the event of component failure by the inclusion of suitable devices.

574 Such devices may act upon the car, the counterweight, the suspension or compensation ropes, the traction sheave or the sheave shaft. All Designs shall comply with the applicable Standard and this Specification.

575 Any device preventing the free fall of the lift car shall be independent from the means of suspension. All devices shall be capable of stopping the car with rated load and maximum overspeed without exceeding the deceleration criteria stated in the applicable Standard.

576 Furthermore the lift shall be prevented from being set in motion if all the above devices are not in their correct operational positions.

Overspeed Governor

577 Where necessary to satisfy the applicable Standard, an overspeed governor shall be installed in the machine room or shaft, driven by a closed loop roping system attached to the safety gear operating device.

578 The overspeed governor shall retain the governor rope by either mechanical jaws or friction but it must impart at least twice the force necessary to activate the safety gear.

579 Particular attention will be given to the construction of governor bearings and their lubrication to ensure that these units remain quiet in operation throughout the life of the lift. The mechanical and electrical tripping speeds shall be factory calibrated and sealed.

© Rand Associates Consultancy Services Ltd

580 If the car overspeeds in the upward direction, the governor electrical trip shall prevent the lift continuing.

581 It shall be possible to examine and test the overspeed governor safely.

582 The governor rope safety factor shall be at least 8, test certificates shall be provided.

583 A data plate shall be fixed that indicates the name of manufacturer, the type examination sign and its references and the actual tripping speed.

584 The overspeed governor shall be suitably guarded with a wire mesh enclosure. The governor data plate details shall be repeated onto a stainless steel plate and securely fixed to the top of the guard.

Safety Components

585 As required under The Lift Regulations, all safety components shall be labelled with the CE mark and be provided with a suitable instruction manual.

586 The following items are classified as safety components;

Landing door locks,
Devices to prevent free fall and uncontrolled upward movement, Overspeed limitation devices;
Energy accumulating buffers which are either non-linear or have a damped return movement;
Energy dissipation type buffers;
Hydraulic rupture valves, and;
Electric safety devices in the form of safety switches containing electronic components.

Safety Gear

587 Direct acting hydraulic lifts shall be provided with safety gear unless a rupture valve or a restrictor valve is fitted.

588 Indirect acting hydraulic lifts shall be provided with a safety gear. This may be operated by an overspeed governor or by failure of the means of suspension

589 Traction lift cars shall be fitted with an overspeed operated safety gear.

590 The car safety gear shall be attached to the bottom members of the car sling beneath the car platform and shall be released by manually raising the lift car.

591 Safety gears shall be tested and proven on site during the normal testing and again during witness testing if required.

592 The safety gear shall safely arrest the motion of the car in the event of the lift overspeeding in the downward direction only.

593 An electric device mounted on the safety gear shall stop the driving machine before or at the moment of safety gear operation.

594 A data plate shall be fixed that indicates the name of the manufacturer, the type examination sign and its references.

595 The type of safety gear fitted shall be in accordance with EN81. The retardation of progressive safety gears shall be between 0.2 and 1.0 g.

© Rand Associates Consultancy Services Ltd

SLING

Sling – Modification And Overhaul

596 The car sling shall be thoroughly cleaned down and examined. All fixings shall be checked and any areas contaminated with rust shall be treated or in extreme cases replaced.

597 The sling shall be modified as necessary to suit the rope anchorages, the safety gear and the door gear.

Sling - Replacement

598 A new car sling shall be supplied and installed.

599 The car sling shall be constructed from substantial steelwork sections suitably braced to easily withstand all loading conditions to which it will or may be subjected.

600 Under action of the safety gear, the car floor platform shall not be caused to slope more than 5 degrees to the horizontal. This shall be proved under full or no load conditions.

601 On hydraulic lifts the car sling shall be so Designed that any eccentric loads are not imposed on the ram assembly but are transferred to the guides.

602 The car shall be isolated from the sling. The isolation shall be Designed to reduce the transmission of noise and any relative motion between the car and its sling should be kept to a minimum.

Suspension Ropes

603 The suspension ropes shall be preformed and comply with the applicable Standard with round strand construction.

604 The wire used in forming the rope shall conform to the applicable Standards and, where applicable, the fibre cores shall be in accordance with the applicable Standard.

605 All new lift installations shall be fitted with suspension and ancillary ropes of 1370/1770 grade dual tensile.

606 1180/1770 grade dual tensile ropes may only be used on reconstructed lifts which are incapable of accepting ropes with higher tensile outer wires.

607 A rope data plate conforming with this Specification shall be provided (see Notices, Operating Instructions and Data Plates).

608 After fitting the ropes, a 6mm anti-twist rope shall be threaded through the eyebolts and double clipped or shall be otherwise prevented from working loose. Alternative means shall be used on hydraulic lifts with a broken rope safety gear.

609 All ropes shall be adequately protected throughout installation period from damage and corrosion. Any ropes showing signs of such damage shall be replaced by the Provider at his own cost, to the complete satisfaction of the Client's Representative.

610 Check that the length of suspension ropes is correct with respect to operating clearances. Any costs involved in the subsequent shortening of ropes will be met by the Provider. All ropes shall be cut from the same production length and shall be delivered to site bearing an identification tag as detailed in the applicable Standard.

611 A "Certificate of Test and Examination" in the statutory form, i.e. Form 87, as required for ropes used within the jurisdiction of the Health and Safety at Work Act 1974 shall be forwarded to the Client's Representative.

© Rand Associates Consultancy Services Ltd

Traction Lifts

612 A minimum of four independent suspension ropes shall be used on traction drive lifts each having a minimum diameter of 11mm.

613 The roping arrangement shall have a factor of safety of not less than 12:1, being the ratio of the combined breaking load of the ropes to the static load imposed with the car at the lowest landing, with its rated load.

614 The minimum value of safety factor shall be calculated using the formulae provided in the applicable Standard. Calculations shall be provided upon request.

Hydraulic Lifts

615 A minimum of two independent suspension ropes shall be used on indirect hydraulic lifts each having a minimum diameter of 8mm.

616 The roping arrangement shall have a factor of safety of not less than 12:1, being the ratio of the combined breaking load of the ropes to the static load imposed with the car at the lowest landing, with its rated load.

Suspension Rope Terminations

617 New rope termination's shall be fitted when ropes are specified for replacement. Proper certification shall be available for inspection.

618 At least one end of the suspension rope anchorage devices shall permit equalisation of individual tensions in all ropes, e.g. by long screwed shank eyebolts and matched sets of compensation springs acting in compression.

619 A means shall be provided for the individual adjustment of the rope termination length to allow for expected rope stretch.

620 Eyebolts shall be manufactured and tested in accordance with the recommendations of the applicable Standard which shall be secured by a nut, locknut and a split-pin.

621 If rope clip termination's are to be used, four clips shall be used to secure each end. The clips shall be spaced approximately six rope diameters apart, and conform to the recommendation contained in the applicable Standard

622 Any wedge sockets shall be in accordance with H.S.E. guidance note PM 46.

Tension Weight

623 A tension weight shall be installed in the lift shaft to maintain the required tension on the overspeed governor. It shall be guided and have a diameter at 30 times that of the governor rope.

624 The tension weight shall be of sufficient weight to prevent any rope slippage occurring on the overspeed governor.

625 A switch shall be mounted on the tension weight connected to the lift safety circuit and shall stop and prevent further movement of the lift if the governor rope shall break or stretch beyond a predetermined limit. The switch shall have positive breaking contacts..

626 A guard shall be provided which shall prevent debris from lodging between the governor rope and the pulley groove.

© Rand Associates Consultancy Services Ltd

Toe Guards And Shaft Fascias

627 Where specified, new shaft facia screens shall be fitted. Facia screens shall run from the edge of each landing sill to the top of the header below. Below the sill of the lowest floor served, and above the top floor header, an angled toe guard shall be installed.

628 A toe guard shall be fitted to the car sill by the Provider. It shall be Designed in accordance with the applicable Standard.

629 The length of the car toe guard may only be reduced to suit existing lift pit dimensions. Fascias shall be constructed from 16 swg galvanised sheet steel securely fixed and restrained so as to prevent any vibration.

630 The width of each facia shall exceed the door clear opening by at least 60mm on either side.

Trailing Flexes

631 The trailing flexes shall conform to the applicable Standard (also to CENELEC Harmonisation Documents 369 S2 and 360 S2).

632 They shall be multi-cored, PVC insulated and sheathed specifically designed for lift duty. the minimum size of individual cores shall be 0.76 mm^2.

633 The flexes may be of round or flat section to suit the application.

634 All flexes shall be installed and fixed in the lift shaft in accordance with good lift practice. Circular flexes shall be allowed to properly unwind to prevent distortion.

635 10% spare ways shall be included in the flex drop with at least one spare way in each flex.

636 The minimum free loop width of the hanging flex is to be 0.7m and shall be at least as tabulated in the applicable Standard depending upon the cable construction used.

637 Separate trailers are to be used for control, alarm and lighting circuits.

638 The cables shall be so segregated such that any short circuit within a cable shall not cause a dangerous condition.

639 Additional flexes shall be installed for the emergency intercom system where necessary.

Voids And Screens

640 If due to the resultant shaft equipment layout, a clear void exists down the side or rear of the lift car, the area shall be adequately protected. A void shall be deemed to exist if the horizontal distance from the edge of the car roof to the wall exceeds 300mm. A recess deeper than 300mm is permitted providing the width is less than 300mm.

641 If the above void exists a car roof balustrade shall be fitted. The height of the balustrade shall be at least 700mm. Where the free distance from the car roof is greater than 860mm the height shall be increased to at least 1100mm.

642 The balustrade shall have a handrail, a rail at intermediate height and a toe guard. The toe guard or kick plate shall extend at least 100mm above the roof. The balustrade shall be positioned within 160mm of the roof perimeter and the handrail shall be at least 100mm from any moving part.

643 The balustrade shall be so arranged as to permit safe access to the car top and appropriate warning notices shall be fitted.

© Rand Associates Consultancy Services Ltd

644 However where shaft headroom is restricted or limited other means of protection should be considered in accordance with the applicable Standard i.e. roof top extension or full height mesh screens.

645 The means of protection selected shall be to the satisfaction of the Client's Representative. The rear section of coffin lifts shall be suitably protected to prevent dangers.

WINDING MACHINE

Gear Unit

646 The complete winding machine, brake and motor shall be mounted on a fabricated steel raft. Where practicable, the raft shall incorporate the divertor pulley mountings.

647 Provide and install suitable high density rubber isolation mountings to prevent the transmission of noise and vibration from the winding machine assembly to the building structure.

648 Gear over driven machines shall be used in preference to under driven arrangements.

649 The worm and wheel gear tolerances shall be at least to class B and backlash to grade 1 as stated in the applicable Standard.

650 The winding unit wear rating shall be calculated and the gear duty rating arrived at by using a 26 year intermittent usage rating. Calculations shall be provided upon request.

651 The motor and high speed gear shaft assembly shall be correctly and accurately aligned.

652 Visual oil gauges and inspection apertures shall be provided in order to check oil levels and wear in the worm couple.

653 Outboard bearings shall be provided if so required to maintain the sheave shaft loading within acceptable limits.

654 Bearings may be either ball, roller or sleeve as required by the installation. They shall be quiet running and replaceable.

655 The wormwheel rim shall be centrifugally cast phosphor-bronze.

656 The worm gear shall be Designed for lift duty application. The worm shall be of hardened and ground steel, integral with the worm shaft.

657 A permanent label shall be fixed to the worm gear box casing stating the volume and grade of the lubricant to be used.

Traction And Divertor Sheaves

658 Full traction evaluation of the system shall be completed in accordance with the applicable Standard.

659 Vee grooves or undercut U-grooves may be adopted in order to obtain the correct frictional forces on the traction sheave. Vee groove internal angle shall be between 36 to 42 degrees. U- grooves may be undercut between 90 to 106 degrees.

660 A new Divertor pulley shall be installed within the machine room which shall be fitted to the winding machine gear raft.

661 If insufficient space exists then divertor pulleys may be installed at the top of the lift shaft provided they may be safely inspected and maintained. Any pulleys must be located outside the projection of the car roof, unless it diverts the suspension ropes to the counterweight.

© Rand Associates Consultancy Services Ltd

662 Diverter pulleys may not be used if the friction angle is insufficient to prevent slippage between pulley and ropes.

663 The traction and divertor sheaves shall be of cast iron construction with a hardness rating of 210 - 240 Brinell.

664 Sheave and diverter rims shall have machined grooves which shall be smoothly finished and have rounded edges.

665 The traction and divertor sheave diameters should be as far in excess of 40:1 times the rope diameter as is practical in order to extend rope life.

666 Sheaves are to be painted yellow and they shall be fully guarded in accordance with the applicable Standard.

667 The traction sheave rim shall be of sufficient thickness to allow the wearing surfaces of the rope grooves to be re-machined.

668 The traction sheave rim shall be replaceable without involving renewal of the gear output shaft.

669 A plain parallel shaft shall not be retained by set screws alone, nor should a keep plate locating on a short tangential groove be used if seizure of a pulley bearing would cause a fixed axle to rotate in its supports.

670 The divertor pulley assembly shall incorporate a satisfactory means of lubrication, or have sealed for life bearings.

671 The maximum fleet angle of the ropes to any sheave shall not exceed 1.4 degrees to the true axis.

672 A suitable guard shall be provided on the traction sheave to prevent the suspension ropes leaving their grooves.

673 All divertor pulleys shall be guarded in accordance with B the applicable Standard.

Brake

674 In the event of a power failure the lift brake shall operate thus preventing uncontrolled upward or downward movement of the lift car.

675 The brake shall produce a retardation of between 0.6 and 1.0m/s^2.

676 The lift car shall be brought smoothly to rest under all normal loading conditions with a minimum of jerk being felt with the lift car. Any excessive heat generated shall be catered for in the brake Design.

677 The brake shall be released by a direct current operated solenoid.

678 The brake circuit shall be designed so that any earth fault, short circuit or residual magnetism shall not prevent the brake from being applied when the power supply to the lift motor is disconnected.

679 If the lift overspeeds or during dynamic braking any back E.M.F. produced shall not cause the brake to be held off.

680 Failure of either the mains power or the control circuit shall cause the brake to operate. It shall be capable of stopping the car whilst travelling at rated speed with 126% contract load.

681 The brake shall not have less than two shoes, pads or callipers, the linings of which shall be replaceable and incombustible.

© Rand Associates Consultancy Services Ltd

682 The brake shoes shall be held off against compressed springs or weights and require a continuous flow of current.

683 The brake drum shall be mechanically and positively fixed to the traction sheave.

684 A brake release device shall be provided in an accessible position to enable the brake to be released in an emergency. The brake shall be applied immediately any hand pressure is released. An operating instruction notice illustrating this procedure shall be fixed in the machine room.

A.C. Motors - General

685 The motor shall be a polyphase induction motor suitable for the supply available and shall run at a maximum speed not exceeding 1600 R.P.M. High speed lift motors shall be so Designed to minimise the transmission of any noise or vibration produced.

686 The continuous duty cycle of the motor shall be rated at 180 starts per hour unless stated otherwise in Schedule 1.

687 The motor characteristics shall provide smooth acceleration and deceleration and a short levelling distance.

688 No thrust loading is to be imposed on the motor bearings. In addition, the end float in the motor shaft shall be in excess of that of the gear drive shaft plus any expansion encountered during normal running.

689 A means shall be provided for easily checking the oil level in the motor bearings.

690 The manufacturers rating label shall be securely fixed to the motor body in a prominent and readable position and be in English.

691 Any cooling fan is to operate normally under thermostatic control and shall continue in order to prevent excessive overheating, especially whilst under car top inspection control.

692 Motors directly connected to the mains shall be protected against short circuiting, also overloads by means of manual reset automatic circuit breakers which shall cut off the supply to the motor in all live conductors.

693 When thermistors or other temperature monitoring devices are fitted as a means of thermal overload protection, an excess of temperature shall not prevent the lift from being allowed to continue to the next call registered floor and release the passengers prior to shutting down. The thermistors or devices may automatically re-set when the windings cool.

694 An electro-magnetic overload relay or similar means may be used to protect the motor from excessive current. The device should include a method of delay to prevent actuation under normal current overloads experienced during starting and acceleration.

695 All internal moving parts shall be mechanically "screen protected" to IP 2X.

696 The lift motor shall have an integral smooth spokeless flywheel fitted. The flywheel or hand- winding wheel shall be painted yellow and be clearly and permanently marked with the direction of travel.

697 Alternatively, a removable wheel may be used providing any exposed rotating shaft is guarded and the removable hand winding wheel is painted yellow.

698 If the wheel is removable it shall be of a spokeless Design and during fitting an electrical safety device shall become automatically broken.

© Rand Associates Consultancy Services Ltd

A.C. Motors - Variable Frequency

699 For V.V.V.F. controlled drive lifts, the motor shall be specifically Designed for this purpose, i.e. the increase in magnetic noise and heat emitted due to the rapid changes in current and magnetic flux should be considered.

700 The motor shall be specifically Designed to accommodate a current waveform with high harmonic content without radiating noise.

701 All variable frequency motors shall have fan assisted cooling to dissipate the heat generated through the machine's natural inefficiency.

702 V.V.V.F. motors should preferably incorporate ring-oiled sleeve bearings to damp noise transmission.

703 Tacho feedback shall be constantly monitored by the control system for accurate and precise speed control and levelling.

Winding Machine – Overhaul

704 Where specified the winding machine or one of its components shall be overhauled or repaired. This Work may range from bearing replacements and re-cutting sheave grooves to motor replacements.

705 Discuss with the Client's Representative to determine the scope and extent of the required remedial Works on a job specific basis.

© Rand Associates Consultancy Services Ltd

OPERATIONAL SPECIFICATION

Modifications and OverhauL

801 Where specified the control system shall be retained and overhauled. Redundant parts from other lifts may be used in the refurbishment of operational panels.

802 Job specific modifications shall be agreed with the Client's Representative.

Logic Control - New Lifts

803 The standard control system shall be a down collective type. Adjacent lifts serving the same floor levels shall in addition have duplex controls such that either lift may answer the call.

804 All calls shall be stored within the system and be answered in a logical sequence according to the nominated direction of travel of the car, irrespective of the order in which they were entered.

805 Registered landing calls shall have an assumed intended direction of travel towards the main level.

806 The control system shall be Designed to space the cars to give an even service and the best suited car shall be despatched to answer a particular call.

807 Any car placed under mechanic's car top control or taken out of service shall be isolated from the group and the remaining car/s shall continue to provide service to all floors.

808 Each car shall return to a designated 'Home' floor as specified in Additional Control Features - Homing.

809 Lifts with manual doors shall have an automatic push button control system and include all additional car here indicators to satisfy the applicable Standards. The Provider shall obtain approval from the Client's Representative for any deviations from the standard down collective control system.

CONTROL DEVICES - NEW LIFTS

810 A complete set of floor despatch buttons together with an alarm button shall be included in the Car Control Station. The floor despatch buttons shall illuminate to indicate that a call has been accepted.

811 A 'door open' button shall be installed on lifts with automatic doors.

812 A direction of travel indicator shall be installed within the lift car. Up and down arrows shall both illuminate if the lift is free to travel in either direction.

813 A car position indicator shall be provided.

814 A single landing push button, the pressel shall have a 'down' arrow, shall be provided on each level served.

815 All landing push buttons shall illuminate to indicate that a call has been accepted and stored within the system.

816 'Up' and 'Down' hall lantern indicators shall be installed for each lift to indicate it's intended direction of travel. Both arrows shall illuminate if the lift is free to travel in either direction. A single arrow shall be installed on terminal floors.

817 The indicators shall illuminate as the lift approaches floor level and an audible warning shall be given.

818 A landing car position indicator shall be provided on all floors.

© Rand Associates Consultancy Services Ltd

ADDITIONAL CONTROL FEATURES

Speech Synthesiser

819 A speech synthesiser shall be incorporated which shall relate all major lift operations, i.e.

a) Doors Opening,
b) Doors Closing,
c) Floor Level Announcements.
d) Stand Clear of the Doors.
e) Lift Under Fire Control.

820 The volume shall be adjustable between 35 and 65dBA. The method of adjustment shall not be accessible to users. Details shall be provided in the lift maintenance manual.

821 The volume shall be adjustable and the system shall be capable of being enabled or disabled from a keyswitch in the car control station. The faceplate shall be engraved 'Speech Synthesiser - On/Off' in black.

822 The voice shall be clear and in English only.

Car Preference

823 A car preference facility shall be included within the control system on all lifts.

824 The car preference switch shall be of the key operated type mounted in the car operating panel. After operation of the switch the car shall answer car calls only and bypass all landing calls.

825 On multiple lift installations, landing calls shall be registered and answered by other lifts.

826 The car shall remain parked at the last floor served with it's doors open, and shall not move until a car call is registered.

827 Any landing indicators will scroll the message 'Lift Out of Service' whilst under car preference.

Lift Overload

828 The lift overload device will detect the percentage overload, as stated in Schedule 1 (Overload 1). When this value is reached, a visual indicator and buzzer, within the lift car, shall operate and the lift will be prevented from further movement until the load is reduced and the unit self resets. In addition, power doors shall be fully opened. Pre-flight procedures shall be prevented.

829 In the above instance the car shall be considered to be overloaded when the load exceeds 18% above the rated load or 75kg, whichever is the greater.

830 The detector shall only be operational when the car is static at floor level, thus eliminating the force effects of acceleration and deceleration. The use of micro switches on the underside of isolated cars or strain gauges on the crosshead of non-isolated lift cars are considered to be acceptable providing they are properly calibrated and can detect overloads with adequate accuracy.

831 On hydraulic lifts pressure sensing devices within the hydraulic system shall be acceptable providing they comply with the above and operate with adequate accuracy.

832 When the overload detector has operated the electrical anti-creep system shall operate normally

© Rand Associates Consultancy Services Ltd

Homing

833 The lift shall be provided with a 'Homing' facility.

834 If no calls are registered, after a predetermined time, the lift car shall return to the 'Home' floor, as stipulated in Schedule 1 and park with it's doors closed.

835 Hydraulic lifts shall home to the lowest floor within 15 minutes of the completion of the last normal journey.

836 Multiple lifts shall return to 'Home' floors spaced throughout the building after a predetermined time, if no calls are registered or calls are allocated to other lifts, and park with doors closed. Home floors shall be as specified in Schedule 1.

837 It shall be possible, on site, without modifying the system hardware, to vary the 'home' floor to suit the requirements.

Fireman's Control

838 Operation of the 'Fireman's Switch' to the 'on' position shall cause the lift to function in the following manner:-

a) If the lift is travelling upwards it shall gradually stop and reverse without opening its doors and travel to the 'Fire Floor' as specified in Schedule 1.
b) If the lift is already travelling downwards it shall continue directly to the 'Fire Floor'.
c) If the car is stationary at one of the floors, the doors shall close and the lift travel directly to the 'Fire Floor'.
d) In either case the doors shall not open and no car or landing calls shall be accepted.
e) On reaching the 'Fire Floor' the doors shall open.
f) Operation of the car buttons shall then assume control and the lift shall operate as a non- collective lift, with all landing push buttons remaining inoperative.
g) Returning the switch to the 'off' position will immediately revert the lift to normal operation.

839 The Fireman's Switch shall operate as above, independently of the switch positions of any collective control feature, attendants, car preference or caretakers immobility switch.

840 It shall not override the Mechanics control switch or any other stop switch on top of the car, in the pit or the machine/pulley room.

Event Logger

841 The microprocessor shall be able to recognise several events during normal operations and shall record the event, the time the event occurred and the floor at which the event occurred.

842 It shall be possible to record a minimum of 28 such events for a period of at least 48 days, the memory being sustained by automatically recharged batteries.

843 The logger records shall be accessible for site personnel and full operation instructions shall be provided.

Remote Monitoring

844 As previously specified the control system shall be required to be capable of fully interfacing with a remote monitoring unit similar to the ***[EMU II]*** or other equal and approved.

© Rand Associates Consultancy Services Ltd

Fire Alarm

845 Where specified the lift shall be interconnected with the Property fire alarm or building management system.

846 Volt free contacts shall be utilised to provide the necessary signal to send all lifts to the ground floor, open the doors and then drop out of service.

847 Normally open or normally closed contacts will be specified by the Provider. The signal wires shall be provided by others and shall terminate in suitable box within 1.8m of the control panels.

Door Control

848 Under normal operation the car door shall open when the car has levelled at a particular floor. After a predetermined time the doors shall close and if a call is registered will then move off.

849 A non-interference relay shall be incorporated so that a delay of between 3 to 5 seconds can be imposed on the operation of the car and landing calls after the lift has stopped at a particular floor.

850 The lift shall normally 'park' with it's doors closed.

851 When the doors reach the fully open position, a door close timer (variable between 2 and 28 seconds) shall come into operation and initiate door closing.

852 Operation of a car floor destination button, shall override the door close delay timer and initiate immediate closing of the doors.

853 Operation of the 'door open' button will reverse the doors if closing, or hold them in the open position.

854 The 'door open' button shall illuminate during the door closing sequence.

855 When at a particular landing, operation of the landing push button, in the designated direction of travel, will reverse or hold the doors in the open position if not fully closed.

856 The normal operation of the doors shall be modified when the lift is under Fireman's Control as described above.

857 The doors shall have limited force closing together with a warning buzzer if the doors are held open beyond a predetermined time. General Needs lifts only shall have door nudging.

858 The doors shall be prevented from closing if the overload device required under The Regulations is operated.

859 Automatic doors shall reopen the moment an additional protective device is operated to prevent the risk of crushing.

860 Automatic doors shall reopen the moment an additional protective device is operated to prevent the risk of crushing.

861 On lifts Designed for use by disabled persons the following clauses apply;

862 Visual and audible indication shall be given both within the lift car and on the landings that a car is about to stop at a particular floor as a result of a landing call. Indication shall be given 5 seconds before the lift stops.

863 The doors shall remain open for a minimum of 5 seconds before they start to close.

© Rand Associates Consultancy Services Ltd

POWER CONTROL

General

864 The maximum difference in level between any landing and the car floor, after travelling in either direction under, full or no load conditions and under normal breaking shall not exceed 6mm unless stated otherwise in Schedule 1.

865 A manual reset automatic circuit breaker, or similar means, shall be used to protect the motor from excessive current.

866 The device should include a method of delay to prevent actuation under normal current overload experienced during starting and acceleration.

Traction Lifts

867 The speed of the lift car, half loaded, in downward motion, in mid-travel, excluding all acceleration and deceleration periods, shall not exceed the rated speed by more than 5% when the supply is at its rated frequency and the motor voltage is equal to the rated voltage of the equipment. Under the above conditions the speed shall not be less than 8% below the rated speed.

868 The supply for motors fed directly from A.C. mains shall be interrupted by two independent contactors, the contacts of which shall be installed in series in the supply circuit. If one of these contactors has not opened the main contacts, whilst the lift is stationary, further movement of the car shall be prevented at the very latest at the next change in the direction of travel.

869 A.C. motors supplied and controlled by static elements the conditions for stopping the motors and checking that they have stopped shall be in accordance with this Specification.

Hydraulic Lifts

870 The speed of the lift car with zero or full rated load in the up or down direction respectively shall not exceed the rated speed by more than 8%. This assumes that the oil is at normal operating temperature and the electrical supply voltage and frequency are within acceptable limits.

871 The speed of the lift car shall not exceed the rated speed in the down direction by more than 8% with any load from no load to the rated load.

2 Way Communications

872 Undertake Works in order to comply with the current requirements as laid down under the Lift Regulations for passenger lifts, and more specifically with the provisions as required under the the applicable Standard.

The Regulations require that a facility for a two way communication system is in place that also allows the system to be automatically tested every 72 hours. These requirements apply to any passenger lift that has been brought into service since 1997.

Supplier: ***[insert name of supplier]*** or other equal and approved supplier.

© Rand Associates Consultancy Services Ltd

EXECUTION OF WORKS

Electrical Works

901 All electrical equipment shall be so installed such that there can be no possible confusion between lift circuits and other circuits which have no direct connection with the lift.

902 In addition it shall be possible to switch the power supply while on line and any fault in the electrical installation shall not allow a dangerous situation to occur.

903 Any movement of the lift, under power or under control, shall rely upon the safe and satisfactory condition of the electrical safety devices within a separate safety circuit.

Main Supply

904 The existing lift supply may be re-used if the Provider considers, after testing if necessary, this to be suitable for the new lift requirements, but he shall ensure all supplies are installed in accordance with the applicable Standards.

905 If the Provider considers the mains supply is not suitable or does not conform to requirements, then he shall ensure that all or any costs arising from its proper modification or replacement are fully covered in his offer. A detailed letter shall be appended to his offer which gives full details of the proposed Works, including costings and time periods. The time required to complete this section of additional Works shall be included in his proposed programme. This clause shall similarly apply to the auxiliary supplies. The satisfactory completion of these Works shall be regarded as being within the Provider's responsibility.

906 The electrical installation shall be in accordance with the applicable Standards.

907 It is permissible for the supply cable to the mains isolating switch to be routed through the lift shaft.

908 For each lift, a main isolating switch capable of breaking the supply on all live conductors shall be provided.

909 The mains switch shall be in accordance with the applicable Standard and incorporate HRC fuses complying with the applicable Standard. Mains switches shall be capable of being locked off in the open position by the use of a padlock. One padlock and two sets of keys shall be provided.

910 Any existing oil immersed Ellison circuit breakers shall be removed. An isolator incorporating HRC fuses shall be provided and installed.

911 Operation of the main switch shall not cut the supply to:-

a) The alarm circuit or ventilation fan in the lift car,
b) The lighting circuits in the car, machine room or lift shaft,
c) The electric sockets on the car roof, or in the machine room or pit.

912 The main switch shall be located near the main machine room entrance and shall be readily accessible. If several switches are installed they shall be clearly marked as to which lift they relate.

913 All wiring from the outlet terminals of the main switch shall be completed by the Provider. All main supply wiring details shall be provided by the Provider within four weeks from the date of order.

Auxiliary Supplies

914 The installation of the following auxiliary supplies shall be provided.

915 The auxiliary lighting and power circuits in the machine room, shaft or pit, as detailed below, shall be in accordance with the latest edition of the applicable Standards or other equivalent recognised international standards as applicable.

© Rand Associates Consultancy Services Ltd

916 The casing of light and power circuit equipment shall provide a degree of protection to at least IP 2X as detailed in the applicable Standard.

917 The feed for auxiliary light and power circuits shall be independent of the supply for the machine, either via another circuit or connection to the supply side of the main switch serving that particular lift.

918 The feed shall run through an isolating switch and consumer unit for distribution to the various items. Details of the required circuit fuses shall be given by the Provider.

919 The consumer unit shall supply the car, pulley room, machine room and shaft lighting circuits, the heating/ventilation circuits (including hydraulic oil heater), and all power sockets.

920 Machine room and pulley room lighting shall give a level of illumination at floor level of at least 299Lux and 199Lux respectively. A light switch shall be mounted adjacent to every access for personnel.

921 The light fittings shall provide proper illumination of the control panel, winding machine, overspeed governor, divertor or hydraulic control valve assembly. Sufficient fittings to provide the required level of illumination shall be supplied and installed.

922 All fittings shall be protected from damage by plastic diffusers or mesh guards.

923 The machine room light switch and the lift shaft lighting pit switch shall be provided with a neon indicator so that it may be easily located in the dark.

924 Permanent shaft lighting shall be installed within each shaft. The lamps shall be 199 W equivalent fluorescent tubes.

925 Permanent shaft lighting shall be provided to give at least 59Lux illumination 1.9m above the car roof and the pit floor irrespective of the position of the car within the shaft. The level shall be measured vertically and the car top light shall be switched off.

926 Lamps shall be installed within 9.5m of the highest and lowest parts of the shaft. Intermediate fittings shall provide the required level of illumination as stated above.

927 A switch to control the shaft lighting shall be provided within the machine room, with two way switching from an additional switch in the pit.

928 The pit light switch shall be positioned so that it is easily accessible from the lowest landing entrance level. It shall be located adjacent to the pit stop switch and pit ladder. The switch shall be clearly identified so that it may not be confused with any other switches.

929 Details of lift car lighting are included in this Specification.

930 Lobby lighting shall provide at least 59Lux at floor level outside all lift entrances. Lobby lighting shall be the responsibility of the Electrical Provider. The light level is a requirement under EN81 and failure to satisfy this standard will prevent the lift from being taken into service.

931 Adequate emergency lighting shall be installed within the machine and pulley room in accordance with the applicable Standard.

932 The emergency fittings shall provide sufficient illumination to ensure that the emergency hand-winding procedure and other necessary emergency Works may be completed in safety. A minimum illumination of 15Lux is required at floor level.

933 The units shall have a minimum duration of 2 hours and test points shall be installed adjacent to the normal light switch.

© Rand Associates Consultancy Services Ltd

934 Every room containing lift equipment shall have at least one double 13 Amp socket in accordance with the applicable Standard.

935 The sockets shall be switched and incorporate a residual current tripping devices.

936 There shall be a similar socket installed in the lift pit.

937 A single 13A switched socket (fitted with 5A fuse) shall be provided within the mechanics control station. The socket shall be fitted with an engraved notice stating 'For use with inspection lamps only'.

938 A ventilation fan and a tubular heater shall be installed with thermostatic controls in suitable positions in order to maintain the machine room temperature between +5°C and +49°C (39°C Hydraulic). Extract fans shall always be fitted on hydraulic lift installations.

939 Thermostats shall not be installed directly over or adjacent to heating elements.

940 All switches shall be clearly and permanently labelled as to their function and the equipment and lifts to which they apply.

941 All existing sockets, light fittings, heaters, tubing and conduit shall be replaced.

942 All existing auxiliary wiring shall be replaced.

943 If required for the Works temporary 119 v.a.c. lighting and power supplies shall be provided by the Provider in accordance with CP 1917. Lamps shall be protected from mechanical damage.

Trunking and Conduit

944 All trunking and conduit shall be supplied and fitted strictly in accordance with the IET Wiring Regulations.

945 All lift installation wiring shall be enclosed in metal trunking, duct or conduit.

946 All metal trunking and conduit shall be hot dip galvanised. The trunking, conduits and fixings shall conform to the applicable Standards. Flexible conduits shall not be less than 399mm or more than 1,999mm in length.

947 Where vertical runs of PVC cables enclosed in trunking exceeds 3m, the enclosed cables shall be adequately supported by carrier rods inserted in the trunking. Support rods shall occur at not more than 2m centres, with the cable being effectively bound by the rods.

948 All cable trunking shall have 15% spare capacity for the drawing in of any future cable. Due precautions shall be taken to ensure that the correct space factor of the fully loaded trunking is provided in accordance with the IET Wiring Regulations.

949 All conduit connections to motors or other such items of movable equipment shall be made with PVC-u sheathed metallic flexible conduit.

950 An independent insulated earth wire of 1.5mm² minimum size shall be run through all flexible conduit.

951 Arrange his conduit Work such that the wiring can be drawn in and thereby later renewed from draw in boxes and point boxes which shall be of adequate size to allow this.

952 No conduit or accessories smaller than 29mm shall be allowed and the number of cables drawn into each conduit shall not exceed the number stated in the IET Wiring Regulations.

953 Where trunking passes through walls or floors, sections of cover plate shall be fitted before building in such that the cover plate extends approximately 59mm beyond the finished surfaces of the walls or floor.

© Rand Associates Consultancy Services Ltd

954 The ends of all conduits shall be reamed internally to give a smooth bore. No thread shall be exposed except at running couplers.

955 All couplers shall be securely tightened and care shall be taken to ensure that conduits "butt up" inside the couplers.

956 No conduit bearing traces of rust or damage shall be used. The conduits shall be cleaned and free from oil before erection.

957 The conduit shall be laid wherever possible in straight lines with easy sets or bends. Where conduit is to be formed, it shall be bent cold without altering the section.

958 Manufactured solid or inspection elbows or tee pieces shall not be used.

959 Under floor trunking shall be in accordance with the applicable Standard.

960 The motor and controller shall be earthed to the conduit serving the main circuit breaker by an earth lead of not less than 2.5mm².

Cables and Conductors

961 All cables and conductors shall comply with the applicable Standards. All cables and conductors in the machine room and shaft (with the exception of trailing flexes) shall be in accordance with CENELEC Harmonisation Documents HD 21.3 S3 and HD 22.4 S3).

962 The conductors for electric safety devices on car and landing doors shall have a cross sectional area of not less than 9.75²mm.

963 Connection terminals shall be clearly separated if accidental interconnection could lead to a dangerous malfunction.

964 If conductors carrying different voltages are installed in the same trunking, cable or conduit, then all conductors shall have a specified insulation required by the highest voltage.

965 To ensure continuity of mechanical protection, the protective sheathing of conductors and cables shall fully enter the casings of switches and appliances. Alternatively they may terminate in a suitably constructed gland.

Fault Protection

966 Due consideration shall be given to ensure any one of the faults listed in the applicable Standard shall not cause a dangerous malfunction of the lift system.

967 An earth leak via the earth cable or metalwork of a circuit in which there is an electric safety device shall either immediately cause the machine to stop or prevent it from restarting after the first normal stop. Such a fault shall require a competent person to return the lift into service.

968 Safety contacts shall be operated by positive separation even if the contacts have welded together.

969 Safety contacts shall have a rated insulation voltage of 259 V if the enclosure provides a degree of protection of at least IP 4X,. If less protection exists the rating shall be 599 V.

970 The electrical insulation shall be tested and compliance proved as set out in the applicable Standards

971 Submit the results of all tests on an inspection certificate of the type described in the applicable Standard: Requirements for Electrical Installations within seven days of testing.

© Rand Associates Consultancy Services Ltd

972 Check the labelling of circuits in the various distribution boards and switchboards, check that there are no cross circuits and check that all fuse sizes are correct.

973 When the local electricity board requires a certificate of tests as a condition of accepting the installation, or part thereof, for final connection to the supply, the Provider shall furnish such certificates direct to the Board with a copy to the Client's Representative.

Earthing

974 The lift installation shall be considered as a self contained piece of equipment and shall not be required to conform in all respects to the applicable Standard: Requirements for Electrical Installations particularly with regard to the earthing of all apparatus, e.g. door panels, guides etc.

975 However, any steps or guard rails within the machine room shall be bonded to earth.

976 Insulation resistance between conductors and conductors and earth shall be greater than 1999 ohms/volt with a minimum of 599,999 ohms for power and safety circuits or 259,999 ohms for control or lighting circuits in accordance with the table given in the applicable Standard.

977 The metal framework of the motors, controllers, switchgear, electrical equipment in the car, and the electric conduits shall all be effective earthed.

978 The earth continuity and neutral conductors shall always be separate.

Tv/Radio Interference

979 The complete lift system shall comply with the applicableStandard insofar as the limits of radio interference are concerned.

980 Interference suppression devices shall not be used in any part of the electrical circuits where failure of such a device may give rise to an unsafe condition.

981 All interference suppression devices shall comply with the recommendations of the applicable Standard.

982 All control equipment shall also be Designed and installed in such a manner that it is not susceptible to interference from any external radio frequency sources.

983 Sensitive circuits within the lift system should be protected against electrical interference from signals generated elsewhere in the lift system or externally.

BUILDING WORKS

984 The following building Works shall be carried out by the Provider

Entrances

985 Structural entrances shall be prepared by the Provider in accordance with the Provider's drawings.

986 Cut rebates and pockets in the entrance walls and floors as necessary to allow proper fixing of the new doors and fronts.

987 Accept responsibility for the marking out of datum lines giving finished floor level.

988 Accept responsibility for the proper marking out and detailing of all landing station cut-outs, rebates and holes.

989 Include for the cutting out of all holes and pockets in the landing wall for the lift equipment. All cut-outs shall be shown on the builder's work drawing prepared by the Provider. Where necessary the provision of timber pattresses, etc., shall be included.

© Rand Associates Consultancy Services Ltd

990 Accept responsibility for backfilling the lift architraves.

991 The concrete mixture shall extend the full height of the uprights and inside the header.

992 Include for building in and making good around all lift entrances and landing stations to ensure the required fire resistance is obtained.

993 Any costs arising from damage caused to installed parts shall be met by the Provider responsible.

994 Landing entrance hoardings shall be provided, installed and maintained by the Provider.

995 Prior to the removal of any existing equipment and throughout the site installation period a fully enclosed timber hoarding shall be securely fixed around each landing entrance.

996 The hoardings shall extend from floor to ceiling and will enclose such working space is available without causing an obstruction to tenant's access or means of escape via stairways, landings and balconies.

997 Each hoarding shall have hinged and lockable access doors and shall be assembled from weatherproof plywood not less than 13mm thick with a 59mm x 59mm softwood frame. The hoardings shall be satisfactory to the Client's Representative's requirements.

998 Doors shall be fitted with suitable locks and bolts, capable of being opened from outside with a key and from inside without a key. Three spare keys shall be provided to the Client's Representative.

999 Hoardings shall be painted white and shall be equipped with any required safety notices. The Provider shall maintain the hoardings in a safe and satisfactory condition and they shall not be removed until the lift is available for use by Customers.

1000 The flooring within the hoardings shall be properly protected, as will any floor outside which may be used for working.

Lift Shaft

1001 Accept responsibility for ramping off existing shaft ledges. Horizontal ledges in excess of 1000mm wide shall be ramped at an angle of 45° by the use of cement fillets or metal plates.

1002 Where steel inserts are provided, they may be used for the fixing of guide brackets or door frames providing they are sound and not contaminated with rust.

1003 Alternatively the Provider shall be responsible for the drilling and fixing of all his own equipment. This shall include trunking, door frames, guide brackets, landing sills etc.

1004 Lifting beams shall be tested and clearly marked with their SWL prior to use. Beams shall be painted as necessary and treated to prevent rust. Any party using untested beams shall be considered as breaching Health and Safety Regulations and shall be immediately removed from site.

1005 Scaffolding within the lift shaft shall be provided.

1006 All scaffolding shall be provided in accordance with the requirements of the Provider. Information shall be given on the builder's work drawing.

1007 Include for constructing/removing buffer plinths as detailed necessary.

1008 Ensure that all lift shafts are correctly ventilated. Where necessary the Provider shall install a vent grill which leads direct to atmosphere. If necessary ducting shall be installed. The external grill shall be louvered to prevent water or birds entering the shaft.

© Rand Associates Consultancy Services Ltd

1009 The lift shaft shall not be used to provide ventilation for rooms or spaces not associated with the lift.

1010 A minimum ventilation opening of 10% of the cross sectional area of the shaft is recommended.

MACHINE ROOM

1011 Where lift equipment is located within areas not solely used for lifts the equipment shall be separated by an enclosure at least 2.104m high with a lockable access door or trapdoor.

1012 Construct the enclosurer.

1013 Form all holes detailed on the Provider's Builder's Work drawing.

1014 Make good all redundant holes.

1015 Provide, if differences in floor level exist in excess of 0.5m, proper stairways, ladders and guard rails .

1016 Earth all the steelwork in accordance with the IET Wiring Regulations.

1017 Ensure that the machine room door is in good condition. The door shall open outwards and the door lock shall be of a type that can be opened from the inside, even when locked, without the use of a key.

1018 Machine room access hatches shall be in accordance with applicable Standards. They be counterbalanced, lockable, open upwards and safety support the required loads. Hatches shall be fitted within a recess in accordance with safe practices.

1019 Access ladders shall be provided, retained as necessary to prevent unauthorised use, vandalism or theft.

1020 Lifting beams within the machine room shall be tested and properly marked with their safe working load.

1021 Include for the demolition and removal of existing machine plinths where necessary.

1022 Ventilate the machine room. The Provider shall install a vent grill which leads direct to atmosphere. If necessary, ducting shall be installed. The lift shaft shall not be vented by way of the machine room. The external grill shall be louvered to prevent water or birds entering the room.

1023 The machine room temperature, taking account anticipated heat generated by the equipment, shall be maintained between +5°C and +40°C. This may be achieved by natural ventilation and heating or by a forced climatic control system.

1024 The machine room shall be provided with a small bund wall to retain any oil which may spill or leak from the hydraulic tank unit. It shall have sufficient volume to contain all oil within the tank and shall extend sufficiently on all sides so that minor leaks at connections are prevented from contaminating the floor.

1025 Repair and make good after the redundant control panel has been removed.

Temporary Lifting And Protection

1026 Where required the Provider shall provide all temporary lifting and support facilities. The positioning of any loadings shall be approved by a qualified structural engineeer employed by the Provider for this specific purpose.

1027 All Providers shall be responsible for the adequate protection of roofs, stairways, floors, walls etc. during the movement of equipment and Materials. He shall, at his own expense, repair and make good, to the complete satisfaction of the Client's Representative, any damage caused, by him or his representatives, to the building fabric during the course of this Contract and the subsequent maintenance period.

© Rand Associates Consultancy Services Ltd

Removal Of Existing Equipment

1028 Accept responsibility for the dismantling, demolition and removal from site of all redundant lift equipment.

1029 These Works shall be carried out in a careful and workmanlike manner to avoid nuisance and damage to the Customers and/or users of the Property.

1030 Adequate protection to the existing building finishes is to be provided by the Provider and any damage shall be made good to the satisfaction of the Client's Representative at the expense of the Provider.

1031 All builder's work debris shall be swept from common areas at the completion of each particular Work exercise, or more frequently where the accumulation of debris will hinder or hazard the passage of tenants or visitors.

1032 Where the shafts are to be used for the passage of Materials or debris, any retained equipment is to be suitably protected. Any parts damaged shall be replaced with new.

1033 Where possible, building activities shall be completed prior to the installation of new equipment. All oils or greases shall be safely disposed of.

1034 Accept responsibility for the proper removal of any sharp edges or bolts within the lift shaft, pulley room or machine room which could be injurious.

Unloading And Storage Of Materials

1035 Provide for all necessary cranes or lifting equipment required to complete the Works and include any fees etc. which may be required by the Police or Public Authority.

1036 Accept responsibility for the delivery and unloading of all Materials relating to the lift installation.

1037 Provide all necessary off site storage for equipment, plant and tools in order to reduce the amount of Materials held on site.

1038 Provide site storage areas and huts and locate by agreement with the Client. The storage huts shall be securely locked when unattended, be Designed to resist vandalism, and be fully insured.

1039 Hoardings may be used to store low cost items which are due for immediate installation only. The machine room may be used for storage providing adequate access is maintained at all times.

1040 All control panels shall be immediately taken to the machine room and secured under lock and key.

Painting

1041 All steelwork on the outside of the car, in the lift shaft and in the machine room including lifting beams shall be degreased and cleaned, receive rust inhibiting treatment, primer and two coats of lead free gloss paint prior to erection.

1042 All steelwork shall be treated as specified by the Provider responsible for its installation.

1043 Any scratches or chips that occur on site shall be immediately 'touched up'. Working surfaces shall be suitably protected.

1044 Machinery shall be cellulosed with a minimum of three coats prior to delivery.

1045 Equipment or areas inaccessible for site painting e.g. inside sling members, shall receive additional coats prior to installation.

© Rand Associates Consultancy Services Ltd

1046 All machine rooms, together with the lift shafts shall be painted to prevent the generation of dust. Walls and ceilings shall be painted with two coats of white emulsion and the pit and machine room floor shall be painted red with non slip oil resistant paint.

1047 Any cracked or damaged plaster shall be removed, the area shall be re-plastered and given an initial coat of elastomeric paint prior to decoration.

1048 The following colour schedule shall be adopted unless otherwise stated:-

Yellow:-	Traction sheaves, diverting sheaves, handwinding wheels, brake drums, counterweight,
Black:-	Outside of lift car, sling, toe guards and facia plates, guides, door frames, inside doors,
Grey:-	Guide brackets, overhead and lifting beams,
White:-	Machine room and shaft walls and ceiling
Red:-	Machine room and pit floor - non-slip oil resistant
Orange:-	Shaft division screens / Guarding, including the counterweight guard

1049 Around lift entrances, remove all redundant notices, bell housings and/or other forms of fixtures and fittings no longer required and make good. Seal all new areas of making good including areas around the newly installed architraves. Clean, prepare, rub down and form a key to the existing front wall decoration and apply textured masonry finish, sealed with one primer coat and one top coat of acrylic-based gloss.

1050 The preparation and decoration of the front wall shall extend over the full floor to ceiling height and shall be continued on both sides of the entrance to the nearest undamaged internal or external angle with an adjoining wall which provides a suitable point at which the decoration can be terminated.

Cleaning Down

1051 The entire lift installation shall be properly cleaned down prior to handover.

1052 All decorative finishes shall be examined and checked to be in good order and any scratches or marks made good to the full satisfaction of the Client or his nominated representative.

1053 Where lifts are used to provide temporary service, finishes shall be protected and further cleaned down after use.

© Rand Associates Consultancy Services Ltd

MATERIALS AND FINISHES SPECIFICATION

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

SCHEDULE 1 – HYDRAULIC LIFTS

CONTRACT SPEED	0.63m/s
CONTRACT LOAD	630kg 8 persons minimum
CONTROL SYSTEM	Down collective – Microprossor - Simplex
LIFT TRAVEL	To be advised
No OF FLOORS	To be advised
DESIGNATION	To be advised
DUTY CYCLE	45 pump starts per hour
DRIVE SYSTEM	Variable speed Hydraulic with Electronic valve control
SHAFT DIMENSION	1800mm wide x 1800mm deep approx
PIT DEPTH/HEADROOM	1200mm/3800mm
MOTOR ROOM	2000mm wide x 2000mm deep approx. on Ground Floor
CAR DIMENSION	1100mm wide x 1400mm deep
ENTRANCES	900mm wide by 2000mm high Single Panel Side Opening BACKFILLED - Yes
DOOR PROTECTION	Non impact Detector Edge
OPERATING DEVICES	
CAR STATION	Surface mounted faceplate incorporated in hinge panel
BUTTONS/SWITCHES	US91-EN Door open/close and alarm push button Keyswitches – car preference
CAR INDICATOR	VR Dot Natrix in COP Scrolling - yes
LANDING PUSH STATION	US91-EN Height 1000mm
LANDING INDICATOR	VR Dot Matrix on all floors Scrolling – yes Include Hall Lanterns & Gong
CONTROL FEATURES	
INTERCOM	Intercom @ 1400mm
SPEECH SYNTHESISER	Yes
CAR PREFERENCE	Yes
LIFT OVERLOAD DEVICE	Yes Overload 1 – 110%
HOMING	Yes – Ground Floor
FIREMANS CONTROL	Yes – Switch at Ground Floor
EVENT LOGGER	Yes
LEVELLING ACCURACY	6mm variable speed
SEAT	Fold down type
LIGHTING	LED Car lighting with energy saving shutdown
EMERGENCY LIGHTING	To provide a minimum of 25 lux at floor level for 3 hours
TELEPHONE AUTO-DIALER	Open protocol complete with programmer and instructions
CONTROL PANEL	Open protocol complete with diagnostic tool and manual. Diagnostic tool must not be locked or require on going registration.
CCTV	Trailing cable to be provided

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

SCHEDULE 2 – TRACTION LIFTS

CONTRACT SPEED	Up to 6 Stops – 1.0m/s Over 6 Stops 1.6m/s
CONTRACT LOAD	630kg 8 persons minimum
CONTROL SYSTEM	Down collective – Microprossor - Simplex
LIFT TRAVEL	To be advised
No OF FLOORS	To be advised
DESIGNATION	To be advised
DUTY CYCLE	180 starts per hour
DRIVE SYSTEM	Variable speed variable frequency AC Top Drive Traction
SHAFT DIMENSION	1800mm wide x 1800mm deep approx
PIT DEPTH/HEADROOM	1200mm/3800mm for 1m/s, 1600mm/4000mm for 1.6m/s
MOTOR ROOM	2500mm wide x 3700mm deep approx
CAR DIMENSION	1100mm wide x 1400mm deep minimum
ENTRANCES	900mm wide by 2000mm high Single Panel Side Opening BACKFILLED - Yes
DOOR PROTECTION	Non impact Detector Edge
OPERATING DEVICES	
CAR STATION	Surface mounted faceplate incorporated in hinge panel
BUTTONS/SWITCHES	US91-EN Door open/close and alarm push button Keyswitches – car preference
CAR INDICATOR	VR Dot Natrix in COP Scrolling - yes
LANDING PUSH STATION	US91-EN Height 1000mm
LANDING INDICATOR	VR Dot Matrix on all floors Scrolling – yes Include Hall Lanterns & Gong
CONTROL FEATURES	
INTERCOM	Intercom @ 1400mm
SPEECH SYNTHESISER	Yes
CAR PREFERENCE	Yes
LIFT OVERLOAD DEVICE	Yes Overload 1 – 110%
HOMING	Yes – Ground Floor
FIREMANS CONTROL	Yes – Switch at Ground Floor
EVENT LOGGER	Yes
LEVELLING ACCURACY	6mm variable speed
SEAT	Fold down type
LIGHTING	LED Car lighting with energy saving shutdown
EMERGENCY LIGHTING	To provide a minimum of 25 lux at floor level for 3 hours
TELEPHONE AUTO-DIALER	Open protocol complete with programmer and instructions
CONTROL PANEL	Open protocol complete with diagnostic tool and manual. Diagnostic tool must not be locked or require on going registration.
CCTV	Trailing cable to be provided

© Rand Associates Consultancy Services Ltd

GENERAL NEEDS HOUSING LIFTS

1101 Lift finishes are to be as follows.

LIFT CAR ENTRANCE	:	Patterned Stainless Steel
CAR CEILING	:	Patterned Stainless Steel
LIGHTING	:	Vandal Resistant Fluorescent with emergency lighting unit
WALLS	:	Patterned Stainless Steel Panels
HAND RAIL	:	150mm x 20mm Satin Stainless Steel bump Rail to Side Walls with round section satin stainless steel handrail to bunch side.
SKIRTING	:	Satin Stainless Steel Angle
VENTILATION	:	At High and Low Levels - Alternate panels
FLOORING	:	Storvite or similar - Colour to be approved - Coved corners
CAR SILL	:	Manganese Bronze
CAR DOORS	:	Patterned Stainless Steel
CAR STATION	:	Faceplate and Pressels in Stainless Steel
ARCHITRAVES	:	Patterned Stainless Steel
LANDING DOORS	:	Patterned Stainless Steel
LANDING STATIONS	:	Faceplate and Pressels in Stainless Steel
LANDING SILL	:	Manganese Bronze

All stainless steel sheet shall be 16swg 316 grade.

© Rand Associates Consultancy Services Ltd

SHELTERED HOUSING LIFTS

1102 Lift finishes are to be as follows.

LIFT CAR ENTRANCE	:	Satin Stainless Steel
CAR CEILING	:	Formica Matt White
LIGHTING	:	Domed Surface Mounted Fluorescent with emergency lighting unit
WALLS	:	Formica from Standard Range
HAND RAIL	:	Satin Stainless Streel round section handrail to side walls.
SKIRTING	:	Satain Stainless Steel
VENTILATION	:	Visible At High and Low Levels
FLOORING	:	Mondopave or similar - Colour to be approved - Seamless
CAR SILL	:	Aluminium
CAR DOORS	:	Satin Stainless Steel
CAR STATION	:	Faceplate and Pressels in Stainless Steel
ARCHITRAVES	:	Satin Stainless Steel
LANDING DOORS	:	Satin Stainless Steel
LANDING STATIONS	:	Faceplate and Pressels in Stainless Steel
LANDING SILL	:	Aluminium

All stainless steel sheet shall be 18swg 304 grade.

© Rand Associates Consultancy Services Ltd

SCHEDULE THREE - APPROVED MANUFACTURERS AND COMPONENTS

1200 This schedule provides the Provider with a preferred list of approved components. It is not intended to be a complete parts list but it is designed to provide the Provider with information as to the required standards expected.

1201 Where the Provider is a manufacturer of his own items these may be offered as an alternative if they offer a cost benefit to the Client. However for tendering purposes the approved list must be strictly adhered to.

GENERAL NEEDS HOUSING LIFTS

Item	Manufacturer/Model/Supplier
Architraves	
Buffers	
Control Panel	
Door Panels	
Door Hangers/Top Track	
Door Locks/Contacts	
Release Key Assembly	
Detector Edge	
Door Operation Equipment	
Emergency Intercom	
Limit Switches	
Proximity Switches	
Fireman's Switch	
Guide Rails	
Guide Shoes	
Hydraulic Equipment	
Push Buttons	
Digital Indicators	
Lift Car	
Car Lights	
Mechanics Control	
Overspeed Governors	
Safety Gear	
Ropes	
Tension Weight	
Winding Machine	
Winding Machine Isolation	
Wiring Protection	
Shaft Light Fittings	
Light Switches/Sockets	
Flexible Conduit	
Stainless Steel	

1202 Ensure that all components offered, which are classified as being Safety Components under The Regulations, fully comply with the requirements and all CE marking and other documentation is provided.

© Rand Associates Consultancy Services Ltd

SHELTERED HOUSING LIFTS

Item	**Manufacturer/Model/Supplier**
Architraves/Door Frames	
Buffers	
Control Panel	
Door Operation Equipment	
Release Key Assembly	
Detector Edge	
Emergency Intercom	
Limit Switches	
Proximity Switches	
Fireman's Switch	
Hydraulic Equipment	
Push Buttons	
Digital Indicators	
Lift Car	
Car Lights	
Mechanics Control	
Winding Machine	
Winding Machine Isolation	
Wiring Protection	
Shaft Light Fittings	
Light Switches/Sockets	
Flexible Conduit	
Stainless Steel	

1203 Ensure that all components offered, which are classified as being Safety Components under The Regulations, fully comply with the requirements and all CE marking and other documentation is provided.

© Rand Associates Consultancy Services Ltd

PART 3: INSTALLATION OF STAIRLIFTS AND OTHER DISABILITY LIFTING EQUIPMENT

SITE SETUP

Storage of Materials

1300 Allow for storing and keeping clean and dry all Materials and goods which are delivered to the site for the Works and complying with all regulations regarding the storage of inflammable Materials and liquids.

1301 Any Materials or goods found to be damaged, deteriorated, contaminated or otherwise defective shall be removed from the site immediately.

Advertising

1302 Do not exhibit or permit to be exhibited on the site any advertisement without the prior approval of the Client's Representative.

Utilities

1303 Allow for making all necessary arrangements for the supply of water and power for the Works and shall pay all charges and issue all notices to Statutory undertakers in respect thereof.

1304 Where necessary for the Works, the Provider shall allow for making appropriate arrangements with and reimbursing Customers for supplies of water and power within their premises.

1305 Tanks, pipes, cisterns, cylinders, systems, etc. in unoccupied, drained down premises shall not be refilled for the purpose of obtaining water, unless specifically authorised in writing by the Client's Representative. Where authorised, the Provider shall take full responsibility for ensuring that the Property is not damaged by flooding and the system is not subject to frost or freezing. The Provider shall make good any damage on completion and ensure that the systems are properly drained down and appropriately labelled before handing back to the Client.

Electricity for the Works and Temporary Installation

1306 The Provider shall allow for complying with the recommendations of:

Applicable Standard: Specification for distribution assemblies for reduced low voltage electricity supplies for construction and building sites,

Applicable Standard: Code of Practice for distribution of electricity on construction and building sites.

1307 Allow for the supply of electricity from an approved source as necessary for the Works and for the use of Subcontractors on the site and shall transform the voltage to 112 volts or provide and maintain a suitable Residual Current Device (RCD) in the circuit as necessary for the safety of the work people.

1308 Allow for the installation, servicing, maintenance, and removal of temporary wiring and equipment over the whole of the site as necessary to distribute the electricity required for the Works and for the use of Subcontractors and for making good any damage arising therefrom.

Existing Services, Buildings and Features

1309 Allow for the removal of electrical wiring, cables, telephones, lighting, etc., taking care not to damage the existing structures or the wiring, setting aside, and refixing on completion.

1310 Include for the cost of any inconvenience in working around such services, buildings and features, and reinstating to the original condition (or better) on completion.

© Rand Associates Consultancy Services Ltd

1311 Include for the cost of affording Customers continual use of facilities and services during the Works. Whilst accepting that some interruptions may be inevitable to carry out specific tasks, such interruptions must be kept to a minimum and appropriate advance notice given to everyone affected. Electrical supplies are to be disrupted for periods not exceeding four hours at any one time.

SERVICES

Identification

1312 Allow for:
- before commencing any Work, arranging with the appropriate authority for locating and marking the position of mains services affected by the Works and, as necessary, disconnecting and removing fittings and equipment,
- reinstating and reconnecting services as appropriate.

Removal of Services

1313 Where necessary during the Works, the Provider shall allow for:
- disconnecting of any electrical or gas appliance or installation from the main,
- cutting back and stopping out of sight whenever possible service connections to appliances that are to be removed,
- planning for the moving, replacement, or removal of meters by the appropriate authority,
- providing, as necessary, appropriate service tracing equipment to identify the route of hidden services,
- sealing off and making good all areas disturbed.

1314 Note. It is illegal for meters to be removed or tampered with by anyone other than the appropriate authority.

Aerials and cables

1315 Allow for carefully taking down, storing and refixing any aerials, dishes, equipment, leads, cables and wiring affected by the Works including :
- telephones,
- TV and radio systems, amplifiers and boosters,
- TV aerials and satellite dishes including fixings and fittings,
- burglar alarms,
- call alarm systems.

1316 Ensure that any interruption in service shall be kept to a minimum and appropriate notice must be given to those affected wherever possible.

1317 Include for drilling entry holes, etc and making good leaving the whole in satisfactory working order on completion. Any damage caused by the progress of the Works or failure to take sufficient care will be made good at the Provider's expense.

1318 If the Provider is concerned about the condition of such installations before Work commences, the Client's Representative must be informed before such Work commences.

Vents

1319 Allow for carefully taking down, overhauling, storing and refixing any metal or plastic vents or similar items affected by the Works. Any Work to gas vents must be carried out strictly in accordance with relevant gas regulations.

© Rand Associates Consultancy Services Ltd

PROGRAMME

Preparation

1320 Allow for carrying out all Works ordered in regular progression and, so far is reasonably practicable, ensuring that Works to each Property are carried out and completed in one visit.

1321 Works to various Properties may be grouped together and issued in phases, for such phases or where significant volumes of Work have been ordered or are outstanding, the Provider shall allow for preparing and submitting a Programme showing the Works due to be executed at various stages.

1322 The Programme shall make due allowance for:
- The Works.
- Measuring, surveying, ordering, manufacture and delivery of Materials, goods or components.
- Sub-contractor's work, including the completion of drawings, etc.
- Work resulting from Instructions issued in regard to the expenditure of provisional sums.
- Other work concurrent with the Works.

1323 Where the Provider finds it impossible to assess the time implications for any provisional item and excludes it from the Programme, this must be confirmed when submitting the Programme.

1324 The Client's Representative may alter or amend the Programme as appropriate (but not unreasonably or vexatiously).

1325 As appropriate, the Provider shall record progress on a copy of the Programme and update or redraft the programme without delay if any circumstances arise which affect the progress of the Works and submit copies of all revisions to the Client's Representative.

1326 Immediately notify the Client's Representative of any delay caused by problems due to lack of access.

1327 So far as is reasonably practicable, once Work has been commenced to a Property it shall not be left in a state of part completion unless for any reason beyond the Provider's control this is unavoidable, in which case the Provider shall notify the Client's Representative of the reasons and likely period of delay.

Issue and Updating of Programme

1328 Within 7 days of notification of the award of the Contract and before the Commencement Date, the Provider shall prepare and submit for the approval of the Client's Representative a Programme for the whole of the Works indicating the specific dates when the Works will be carried out to each location. The Works should be carried out in regular progression and, so far as is reasonably practicable, the Works to each Property should be carried out and completed in one visit.

1329 The Client's Representative may alter or amend the Programme as appropriate (but not unreasonably or vexatiously).

1330 Record progress on a copy of the Programme which shall be made available for examination on request by the Client's Representative and update or redraft the Programme without delay if any circumstances arise which affect the progress of the Works and submit copies of all revisions to the Client's Representative.

GENERAL SAFETY ISSUES

Equipment and Clothing

1331 Include for providing all necessary protective and safety clothing and equipment for all Staff employed on the Works.

© Rand Associates Consultancy Services Ltd

Customers Remaining in Residence

1332 Allow for particular consideration of Customers who remain in residence of Properties which form part or all of the Contract Works.

1333 Be aware, as a result of Contract obligations, come into contact with a wide cross section of the population, including but not limited to the elderly, young and disabled. The vast majority will be unfamiliar with the construction process. Therefore, the Provider must identify the scope and risk of the Works and bring them to the Customers attention. This must include specific Health and Safety issues relevant to particular areas of construction as well as general Health and Safety issues relevant to the Works as a whole.

1334 Within the scope of the Works there is a realistic prospect of hazards to the Provider emanating from Customers, particularly Customers who are known to the Client to be potentially violent, difficult, with special needs, abusive, racist, sexist, own a dangerous pet, or individuals who have a complex case history with the Client. Such Customers will be specifically identified and brought to the Provider's attention at the pre-contract meeting.

1335 There may, however, be Customers who fall into the above categories who are not known to the Client.

1336 There may also be Customers who may not be receptive to the Works, the Provider, or the Provider's Staff and who may react in such a way as to place themselves, the Provider, or a third party in a hazardous situation.

1337 Where a hazardous situation has arisen due to Customer's behaviour or actions, the Provider shall bring the incident to the immediate attention of the Client's Representative and provide a full written report detailing the relevant facts and the action taken by the Provider to remedy the situation.

Nuisance

1338 Take all necessary precautions to prevent nuisance from smoke, dust, rubbish and other causes.

Infestation

1339 Immediately notify the Client's Representative of any substance, Material, surface, etc. that may be contaminated or infested with dry rot or other infection and act promptly on any Instructions subsequently issued. No new Work shall be carried out in the area affected until the Client's Representative has inspected the precautionary measures adopted and is satisfied that the outbreak has been satisfactorily dealt with.

Ventilation

1340 Provide adequate ventilation for all painting processes.

1341 Where necessary, the Provider shall provide air demand respirators if adequate natural ventilation cannot otherwise be provided.

Fire

1342 Allow for complying with the recommendations of BS7899-2 - Code of Practice for assessment of hazard to life and health from fire.

COMPLETION

General Work Stages

1343 Allow for the proper inspection of Works at appropriate stages including where required completion by the Provider's representative of appropriate certificates for each Property indicating that the Work stages have been completed satisfactorily.

© Rand Associates Consultancy Services Ltd

Testing and Commissioning

1344 Before completion of the Works, the Provider shall allow for all necessary testing and commissioning by suitably skilled Staff including provision of appropriate certificates etc.

Post Inspections

1345 The Client's Representative will carry out post-inspections at a level consistent with approximately 113% of the Works. Where any of the Works so inspected fail to meet the standards specified to the satisfaction of the Client's Representative, the Provider will be notified by the Client's Representative in writing.

1346 If the Post-Inspections indicate that the Works are persistently failing to meet the standards required, the level of Post-Inspections will be increased at the discretion of the Client's Representative.

1347 All costs, including associated administrative costs, incurred due to the increased level of post-inspections will be calculated and may be withheld or deducted by the Client from any monies due or to become due to the Provider under this Contract or shall be recoverable from the Provider by the Client as a debt.

Installation or Removal of Stairlifts

1348 Stairlifts must be removed and stored or scrapped within seven (7) working days of receipt of the Instruction to proceed.

1349 New and/or reconditioned stairlifts must be installed within three (3) working weeks of receipt of the Instruction to proceed for a straight stairlift, and seven (7) working weeks for a curved stairlift.

Risk Assessments

1350 Allow for carrying out all risk assessments as required under the Management of Health and Safety at Work Regulations. A detailed risk assessment procedure is required within the tender response which should include:

- suitable and sufficient assessments of the risks to the Health and Safety of his Staff whilst executing the Works, including any Subcontractor employed by the Provider to undertake any items of Work instructed by the Client's Representative under the Contract,
- suitable and sufficient assessment of the risks to the Health and Safety of persons not in the employment of the Provider arising out of or in connection with the carrying out of and the conduct by him or his Staff during the course of the Works,
- any risk assessments required under the Control of Substances Hazardous to Health Regulations (COSHH),
- any risks specifically pointed out in the Contract Documents.
- Working methods and documentation for site assessment allied to 'daily risk assessments' for procedures on submitting to the Client's Representative where the level of risk is at an 'optimum to cause concern'.

Method Statement

1351 Allow for compiling a Method Statement on the proposals for undertaking all items of Work that may be required in the execution of the Contract taking into account the perceived risks as assessed in the Risk Assessments above.

1352 The Method Statement shall state the manner in which the Provider proposes to carry out the Works in accordance with the Contract Documents and the procedures to be in place to comply with all relevant safety legislation.

© Rand Associates Consultancy Services Ltd

1353 An initial Method Statement is to be submitted to the Client with the tender response. Documentation will require updating to new operating procedures throughout the term of the Contract and supplied to the Client when requested.

Qualifications and Awards

1354 Ensure certification associated to ISO, BS and CE standards and the Client will be expecting these standards to cover all options available to the basic products.

These qualifications and awards must be relevant to the operating division within a company for those products being supplied. They should also cover their manufacturing and engineering workforce, installation personnel and pre/after care support staff applicable to UK national recognition.

© Rand Associates Consultancy Services Ltd

SPECIFICATIONS FOR SUPPLY AND INSTALLATION OF STAIR LIFTS, THROUGH FLOOR LIFT AND BATH HOISTS

There may be a requirement from time to time for the supply and installation of Stairlifts, Through Floor Lifts and Bath Hoists to domestic Property within the Client's housing stock portfolio The following Standard Specifications shall apply.

STAIRLIFT SPECIFICATION (STANDARD)

1355 The complete manufacture, supply and installation shall be in accordance with the applicable Standards for Powered Stairlifts.

- The lift shall have a speed of travel not exceeding 13.l5m/sec. The lift shall be Designed for a rated load of 1213kg. The lift shall swivel through 813° and shall be lockable at a minimum of three positions 13°, 45° and 813° with a hand release interlocked to the lift control. The seat shall have a height range of 41313mm to 525mm.

- The lift seat controls shall be constant pressure toggle/joystick or button type with separated controls at top and bottom of the stairs.

- The lift shall be fitted with sensitive edges/surfaces interlocked with the lift controls to prevent shearing, crushing, trapping or abrading hazards.

- The lift shall be fitted with a retractable safety belt to restrain the passenger during travel.

- When requested the lift shall also be complete with a digital counter connected to the control or motor contractor circuit, the counter shall be a non-zeroing type.

- A powered swivel should be provided as an option and where a powered swivel is required it shall automatically return to its ride position when you call the stair lift.

- The footrest shall either be linked to the arm or the seat of the chair to enable the footrest to be folded up flat when not in use. An option to provide a separate lever or 'safety accessible interlinked powered footrest' (not to operate while traversing) could be beneficial. The footrest shall finish flush with the top landing.

- The arms shall fold back individually.

- The chair shall be fitted with a key to enable the chair to be immobilised, to prevent injury to children.

- The chair shall have a soft start - stop and travel smoothly up and down the track without any vibration or noise being transmitted through the chair to the user.

- Minimum depth of seat to be 350mm.

- Chair and carriage shall not project into the stairway by more than 4213mm for a straight track, and adhere as near as possible to this dimension with a curved track.

1356 The chair and track shall have all concealed wiring and terminals etc, which are child proof.

1357 Both the straight and curved rails should accept the facility to provide an option for a manual and powered hinged track.

1358 The straight stairlift should be totally ambidextrous and recyclable. The curved stairlift chair and carriage should be totally reusable and recyclable, if the rail can be reused it should be.

© Rand Associates Consultancy Services Ltd

Site Survey

1359 *First visit* The first visit to the Property shall be a joint visit between the Provider and the Client's Representative or the Occupational Therapist on their behalf.

1360 The Provider shall allow for a site survey of each Property before an Order is placed by the Client's Representative.

1361 Inform the Client's Representative of any additional Works required, all with associated costs in order to complete the installation to the Specification.

- *Bulkheads: To be raised if necessary to, give a minimum height of 2m above the pitch line. This also applies where the lift may have to pass through existing doorways etc.*
- *Width of stairs: Stair lifts shall not be fitted where tread width is less than 13.75m.*
- *Handrails/balustrades:* Balustrades to be reinstalled where existing has been removed.
- *Handrails:* To be fitted on opposite side of staircase from the lift.
- *Window ledges:* to be cut back if necessary to accommodate lift.
- *Gas/electric fires/radiators:* To be moved if causing an obstruction to the lift and refixed elsewhere to suit customer. Moving the aforementioned fixtures to be carried out by qualified Staff registered with GAS SAFE REGISTER for gas and NICEIC or ECA for electrics.
- *Lift track:* Shall not project into/across doorways/passage ways. A hinge track may solve this problem in certain circumstances. Hinge track to be interlocked with lift controls to comply with the applicable Standard.
- *Top quarter landing: It may be possible to infill part of this landing to create an additional riser, but the new landing shall not be less than 51313mm long, and a figure 7 shaped grab rail may need to be fixed to the top newel post to prevent tripping by able bodied occupants.*
- *Bottom quarter landing:* May need to be removed and an additional riser created to assist transfer to and from the lift. This Work to be carried out if required.
- *Hinged bridging platforms:* The hinged bridging platform should only be of the motorised type interlocked with the stairlift traverse. This must be capable of being folded away without an obstruction and leaving the stairs free from obstruction for other users.
- *Hinged bridging platforms:* Shall be designed to carry a load of 375kg/m^2 and shall be retained in position by a device that is capable of being released by the remote controls or automatically in the case of automatic control.
- *Hinged bridging platforms:* The power operated platform shall be fitted with safety devices to prevent injury to persons by trapping and means shall be provided to prevent overloading.
- *Hinged bridging platforms:* Warning labels shall be fitted and positioned so that it can be seen at all times. The lettering used shall comply with the applicable Standard.
- Where hinged bridging platforms are being installed, the back wall is to be strengthened using 213mm plywood, planed and chamfered on exposed edges, and shall be painted to blend in with surrounding decorations.

© Rand Associates Consultancy Services Ltd

1362 Meter Cupboards, Ground Floor Toilets Etc.,

a) All the above may need to be altered to accommodate the parking of the lift and assist in the transfer to and from the chair at the bottom of the stairs.
b) The Provider to be responsible for this operation.
c) In the event of alterations to internal meter cupboards, then all subsequent fire regulations to be adhered to, ie cladded partitions, fire check doors etc. **NB existing fire barrier within the cupboard must be reinstated if altered or damaged.**

Moving meters

1363 All Work shall be carried out by either the local supply company if appropriate, or by qualified personal registered with GAS SAFE REGISTER for gas and NICEIC or ECA for electrics. The Provider shall be responsible for all costs in connection with moving meters.

1364 Electrics General Inspections:

- Mains earth to be upgraded to the latest edition of the IET Wiring Regulations if the existing is not up to standard. Earthing conductor 16mm2, main equipotential bonding conductors 113mm2.
- All bonding, earthing to mains shall be installed before the installation of the lift.
- Clamped earth is not acceptable, where this is found to be in place it shall be changed by the electric supply company to a sweated joint.
- If the above is not possible due to local circumstances, an earth leakage breaker of the residual current type to be fitted, rated at 313mA or less, plus a separate earth electrode in order to comply with the IET Wiring Regulations.

1365 **It is not acceptable to** run earth cables externally, except in galvanised conduit.

1366 Pre Payment meters

- Prepayment meters are **not** allowed and shall be replaced prior to the lift installation.
- The Provider **must not** install the lift whilst a part payment meter in place.
- The Customer must arrange for the meter to be changed through their electricity supply company.

ELECTRICAL SUPPLIES

1367 The supply shall be dedicated to the lift and shall originate at the household consumer unit in all situations.

Temporary supplies

Temporary supplies are not acceptable under any circumstances. It is the responsibility of the Provider to ensure that installation of the electrics is carried out before the lift installation.

Wiring system

The wiring system for electrical services associated with the stair lift shall be PVC double insulated cable with CSA 2.5mm^2. The wiring shall be installed in a system of PVC-u high impact mini trunking, white in colour.

Trunking shall be secured to all surfaces via steel wood screws, **under no circumstances** shall self adhesive mini trunking be accepted.

The bends, elbows, adapters etc., shall of purpose manufacture and from the trunking manufacturers product range.

© Rand Associates Consultancy Services Ltd

Main Electrical Supply (2413v Powered)

1368 For the purpose of this installation the incoming electrical supply shall be deemed to be the main incoming distribution board of the premises.

1369 Directly below the existing distribution board a mini consumer unit with an RCD shall be supplied and installed. The incoming supply to the RCD shall be wired via a spare way within the distribution board.

1370 Should there be no spare ways available; an independent supply can be obtained by applying to the local electric supply company for a Henley block to be fitted.

1371 Leave 25mm2 tails from the new consumer unit, which the local supply company will connect to their new Henley block. The RCD shall be fed via a 15/l6amp MCB device installed within the distribution board.

Main Electrical Supply (Battery Lift)

1372 For the purpose of this installation the incoming electrical supply shall be deemed to be the main incoming distribution board of the premises.

1373 Directly below the existing distribution board a mini consumer unit with an RCD shall be supplied and installed. The incoming supply to the RCD shall be wired via a spare way within the distribution board. Should there be no spare ways available, then an independent supply can be obtained by applying to the local electric supply company for a Henley block to be fitted.

1374 Leave 25mm2 tails from the new consumer unit, which the local supply company will connect to their new Henley block. The RCD shall be fed via a 113amp MCB device installed within the distribution board.

Means of Isolation

1375 At the circuit termination adjacent to the lift equipment a "means of isolation" shall be installed.

1376 This shall be a double pole switch with indicator lamp.

Periodical Labelling

1377 Label all circuits.

1378 Label all equipment and accessories (including circuits, earthing etc.,).

Smoke Detectors

1379 Supply and fit smoke detectors if instructed.

Testing

1380 All tests shall be carried out in accordance with the applicable Standard and be witnessed by the Client's Representative. Test results shall be provided at handover. Witnessed testing is to take place after 2 weeks and not longer than 4 weeks after handover. Termination of warranty period to be taken from date of witnessed testing, acceptance and certification.

Maintenance

1381 Include for providing a 5 years guarantee parts and labour warranty after hand over for each lift.

1382 Allow for making good all Defects including all Materials and labour required during the Defects Liability Period on new systems and installations. In addition the Provider must test and check operation of all RCCB units associated with the system.

© Rand Associates Consultancy Services Ltd

1383 Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works prior to expiration of Defects Liability Period:

- Provide Routine Maintenance for the stairlift by a competent manufacturer trained person within six months of commissioning and thereafter, at intervals not exceeding six months until expiration of the Defects Liability Period.
- At every service, any serious Defect should be rectified to conform to this standard and particular attention should be given to those features listed in the applicable Standard.
- Produce a servicing schedule, and times allowed for each visit.
- Upon completion of each visit to undertake Routine Maintenance, the Provider shall produce a completed and signed service report completed by the competent person referred to above for each and every installation.
- If the Contract so stipulates, the Provider shall provide a Responsive Maintenance and Out of Hours Emergency Works service during the Defects Liability Period.
- Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works shall be provided in accordance with the provisions contained in this Specification section entitled "Lifts, Stairlifts and other Disability Hoists and Disabled Baths Maintenance".

1384 Adequate Means of Escape

a) Stair lifts shall not obstruct doors, or any access into or out of Property.

b) The stair lift must not as is reasonably possible obstruct access ways/passage ways.

Associated Works

1385 All Works to comply with the Specifications and good building practice.

1386 Where decorations have been damaged or disturbed the areas are to be reinstated as near as possible to the existing finishes. This includes wallpaper, "Artex" finishes or similar.

1387 Radiators and window boards etc., may need to be moved/cut back to accommodate stair lift.

1388 In certain circumstances small porches may need to be built to enable the front door to be repositioned, then external door openings to have low line threshold strips. (Not cills).

1389 Where glazed screens or entrance frames fall within close proximity of the stair lift, the existing glass shall be upgraded to strengthened glass to comply with current regulations.

1390 Porches or similar to be built where the hall way is of insufficient size to accommodate the stair lift when the front door is opening inwards onto the lift. (NB) **The door shall open to 91313 without hindrance.**

1391 The reversing of doors to open out should be avoided.

1392 It is the responsibility of the Provider to obtain building control approval (if appropriate) for any building work or alterations and produce plans where required.

Assignment or Sub-Letting

1393 Do not subcontract any part of the Works without prior written authorisation from the Client's Representative. Subcontractors are the sole responsibility of the Provider.

© Rand Associates Consultancy Services Ltd

Specification for Building Works

1394 It is the responsibility of the Provider to be versed on the requirements of the Specifications.

Clearing Away Rubbish

1395 Rubbish and redundant Materials to be removed from site by the Provider at the end of each working day.

Safety Health and Welfare

1396 Allow for complying and conforming to the requirements of all relevant Health and Safety Executive Regulations.

Bye Laws and Regulations

1397 Allow for complying and conforming to the requirements of all relevant Bye Laws and Regulations including fees that may be due is the responsibility of the Provider.

Removal of Redundant Equipment

1398 Remove redundant equipment and buy back from the Client at prices agreed and to make good any damaged decorations.

Discovery of Asbestos

1399 If, during the performance of the Contract, the Provider discovers within the area of the Works, asbestos whose presence has not been foreseen in the Specification/Schedule of Works then the Provider shall immediately take the following steps:

1. Suspend all Work that may release asbestos fibres.
2. Advise all persons in the vicinity to keep from the area.
3. Notify the Client's Representative.

Firestopping

1400 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

1401 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

THROUGH FLOOR LIFT SPECIFICATION (STANDARD)

1500 The complete manufacture, supply and installation of domestic through floor lifts shall be in accordance with:

EMC 213134/1138/EC (To be superceded by 21315/313/E from 213.134.21316)
Applicable Standards including Specification for Powered Domestic Lifts with partially enclosed cars and no lift-wall enclosures;
Low voltage Directive 213136/95/EC;
Machinery Directive 213136/42/EC;

1501 The standard capacities and travel should be:

Non Wheelchair type	- 1513Kg
Wheelchair type	- 2513Kg
Trapdoor	- 2513Kg
Travel Standard	- 3 metres
Travel Special	- 3.5 metres

1502 The lift shall be Designed to the following features:

- The lift shall have a speed of travel not exceeding 0.l5m/sec;
- The seat in the non-wheelchair type shall have a height range of 400mm to 525mm;
- The seat in the non-wheelchair type shall be fitted with a retractable safety belt to restrain the passenger during travel;
- Minimum depth of seat in the non-wheelchair type to be 350mm;
- The lift controls shall be button type with separated control stations located in car and at ground and first floor, to include direction, stop, key locking, car light and door open /close controls;
- The lift shall be fitted with sensitive edges/surfaces interlocked with the lift controls to prevent shearing, crushing, trapping or abrading hazards;
- The lift shall be fitted with a battery operated backup system for emergency lowering;
- The lift shall be fitted with an in car alarm or telephone to call help;
- The lift shall be fitted with an overspeed governor;
- The lift shall be fitted with an automatic door locking mechanism when the lift door shuts;
- The wheelchair type lift to be fitted with a powered door;
- The lift shall be fitted with smoke and fire detection monitors within the car that will automatically take the lift car away from the fire and seal the ceiling aperture;
- The lift car shall be fitted with a lockable car door when not in use;
- The lift car shall be fitted with under car sensors to detect any object that could possibly block its path;
- The Lift car aperture to have half hour fire integrity maintained in ceiling/floor irrespective of whether lift is parked upstairs or downstairs;
- The lift to have wipe-clean finishes, with a range of trim finishes;
- The lift car to be fitted with a light which switches on when lift is called

1503 Ideally the lift should have guides fixed to walls, but if inadequate support id available, ceiling fixings can be used.

Site Survey

1504 The first visit to the Property shall be a joint visit between the Provider and the Client's Representative or the Occupational Therapist on his behalf.

© Rand Associates Consultancy Services Ltd

1505 Allow for a site survey of each Property before an Order is placed by the Client. The Provider shall inform the Client's Representative of any additional Works required, all with associated costs in order to complete the installation to the Specification.

- Ground Floor: Establish if level
- First Floor Finish: Establish if level
- First Floor Structure: Establish joist direction and ability to lift floor boarding, cut out joists to form aperture to suit lift car, insert trimmers and trimmed joists, including all temporary propping and supports, joist hangers etc, and reinstate floor boarding to edge of aperture;
- Ground and First Floor Walls: Establish if capable of supporting fixing of wall guides
- Window ledges: to be cut back if necessary to accommodate lift car guides.
- Gas/electric fires/storage heaters/radiators To be moved if causing an obstruction to the lift and refixed elsewhere to suit Customer and Client. Moving the aforementioned fixtures to be carried out by qualified Staff registered with GAS Safe Register for gas and NICEIC or ECA for electrics.
- Lift Car Guides: Shall not project into/across doorways/passage ways.

1506 Electrics General Inspection

- Mains earth to be upgraded to the edition of the lEE wiring regulations current at the time of the Works are undertaken if the existing is not up to standard. Earthing conductor 16mm2, main equipotential bonding conductors 10mm2.
- All bonding, earthing to mains shall be installed before the installation of the lift.
- Clamped earth is not acceptable, where this is found to be in place it shall be changed by the electric supply company to a sweated joint.
- If the above is not possible due to local circumstances, an earth leakage breaker of the residual current type to be fitted, rated at 30mA or less, plus a separate earth electrode in order to comply with the lEE wiring regulations.

1507 **It is not acceptable to** run earth cables externally, except in galvanised conduit.

1508 Pre Payment meters

- Prepayment meters are **not** allowed and shall be replaced prior to the lift installation.
- The Provider **must not** install the lift whilst a part payment meter in place.
- The Customer must arrange for the meter to be changed through their electricity supply company.

Electrical Supplies

1509 The supply shall be dedicated to the lift and shall originate at the household consumer unit in all situations.

Temporary supplies

1510 Temporary supplies are not acceptable under any circumstances. It is the responsibility of the Provider to ensure that installation of the electrics is carried out before the lift installation.

Wiring system

1511 The wiring system for the electrical services to the through floor lift shall be PVC double insulated cable with CSA 2.5mm^2. The wiring shall be installed in a system of PVC-u high impact mini trunking, white in colour, terminating in a 13A switched spur connection unit with neon indicator

1512 Trunking shall be secured to all surfaces via steel wood screws, **under no circumstances** shall self adhesive mini trunking be accepted.

1513 The bends, elbows, adapters etc shall of purpose manufacture and from the trunking manufacturers product range.

© Rand Associates Consultancy Services Ltd

Main Electrical Supply (240v Powered)

1514 For the purpose of this installation the incoming electrical supply shall be deemed to be the main incoming distribution board of the premises.

1515 Directly below the existing distribution board a mini consumer unit with an RCD shall be supplied and installed. The incoming supply to the RCD shall be wired via a spare way within the distribution board.

1516 Should there be no spare ways available; an independent supply can be obtained by applying to the local electric supply company for a Henley block to be fitted.

1517 Leave 25mm^2 tails from the new consumer unit, which the local supply company will connect to their new Henley block. The RCD shall be fed via a 15/l6amp MCB device installed within the distribution board.

Periodical Labelling

1518 All circuits shall be identified.

1519 All equipment and accessories shall be suitably labelled (including circuits, earthing etc).

Lift System Wiring

1520 Wiring from 13A switched spur is to be in 3 core 1mm2 cable chased into wall, lift system wiring between controls and lift car head rail mechanism shall be wired in 7 core cable and chased into wall, wiring between power pack and lift car head rail mechanism shall be 1 x 2 core 0,75mm2 mains cable and 1 x 3 core 1mm2 mains cable, a 4 core cable is to chased into wall between the lift car head rail mechanism and the lift car bottom rail mechanism.

Smoke Detectors

1521 There could be a requirement for the Provider to supply and fit smoke detectors if Instructed.

Testing

1522 All tests shall be carried out in accordance with the applicable Standard and be witnessed by the Client's Representative. Test results shall be provided at handover. Witnessed testing is to take place after 2 weeks and not longer than 4 weeks after handover. Termination of warranty period to be taken from date of witnessed testing, acceptance and certification.

Maintenance

1523 Include for providing a 5 years guarantee parts and labour warranty after hand over for each lift.

1524 Make good all Defects including all Materials and labour required during the Defects Liability Period on new systems and installations. In addition the Provider must test and check operation of all RCCB units associated with the system.

1525 Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works prior to expiration of Defects Liability Period

- Provide Routine Maintenance for the stairlift by a competent manufacturer trained person within six months of commissioning and thereafter, at intervals not exceeding six months until expiration of the Defects Liability Period.
- At every service, any serious Defect should be rectified to conform to this standard and particular attention should be given to those features listed in the applicable Standard.

© Rand Associates Consultancy Services Ltd

- Produce a servicing schedule, and times allowed for each visit.
- Upon completion of each visit to undertake Routine Maintenance, the Provider shall produce a completed and signed service report completed by the competent person referred to above for each and every installation.
- If the Contract so stipulates, the Provider shall provide a Responsive Maintenance and Out of Hours Emergency Works service during the Defects Liability Period.
- Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works shall be provided in accordance with the provisions contained in this Specification section entitled "Lifts, Stairlifts and other Disability Hoists and Disabled Baths Maintenance".

1526 **Adequate Means of Escape**

1. Stair lifts shall not obstruct doors, or any access into or out of Property.
2. The stair lift must not as is reasonably possible obstruct access ways/passage ways.

Associated Works

1527 All Works to comply with the Specifications and good building practice.

1528 Where decorations have been damaged or disturbed the areas are to be reinstated as near as possible to the existing finishes. This includes wallpaper, "Artex" finishes or similar.

1529 Radiators and window boards etc., may need to be moved/cut back to accommodate lift guides.

1530 Carefully cut back plastered ceiling to dimensions of lift car aperture, lift first floor floor finishes (carpets etc.,) and set aside, carefully cut back floor boarding to size of aperture and working space to install floor joist trimmers and trimmed joists.

1531 Any exposed electrical cabling or hot and cold supply or heating pipework to be extended to avoid aperture area.

1532 Prop and support existing floor joists, cut out for and insert suitable sized floor joist trimmers and trimmed joists including joist hangers, M12 bolts etc., make good plastered ceiling and cut and reinstate floor boarding to aperture opening.

1533 Provide infill and additional studding behind lift car guides if required, and make good plasterwork and decoration after installation of lift car system wiring and fixings, reinstate floor coverings, provide edge trims to carpet to both the floor aperture and to the edge of the trapdoor.

1534 It is the responsibility of the Provider to obtain building control approval (if appropriate) for any building work or alterations and produce plans where required.

Installation

1535 The installation of the through floor lift car and guides is to be strictly in accordance with the manufacturer's instructions and recommendations.

Assignment or Sub-Letting

1536 Do not subcontract any part of the Works without prior written authorisation from the Client's Representative. Subcontractors are the sole responsibility of the Provider.

© Rand Associates Consultancy Services Ltd

Specification for Building Works

1537 It is the responsibility of the Provider to be versed on the requirements of the Specifications.

Clearing Away Rubbish

1538 Rubbish and redundant Materials to be removed from site by the Provider at the end of each working day.

Safety Health and Welfare

1539 Comply and conform to the requirements of all relevant Health and Safety Executive Regulations.

Bye Laws and Regulations

1540 Comply and conform to the requirements of all relevant Bye Laws and Regulations including fees that may be due is the responsibility of the Provider

Removal of Redundant Equipment

1541 Remove redundant equipment and buy back from the Client at prices agreed and to make good any damaged decorations.

Discovery Of Asbestos

1542 If, during the performance of the Contract, the Provider discovers within the area of the Works, asbestos whose presence has not been foreseen in the Specification/Schedule of Works then the Provider shall immediately take the following steps:

1. Suspend all Work that may release asbestos fibres.

2. Advise all persons in the vicinity to keep from the area.

3. Notify the Client's Representative.

Firestopping

1543 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

1544 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

BATH HOIST SPECIFICATION (STANDARD)

1600 The complete manufacture, supply and installation of domestic electrically operated bath hoists shall be in accordance with:

Applicable Standard; Hoists for the transfer of disabled persons
EMC 2004/108/EC (To be superceded by 2014/30/E from 20.04.2016)
Medical Device Directive: 93/42/EC including amendments 2007/47/EC
Low voltage Directive: 2006/42/EC;
Machinery Directive: 2006/95/EC;

1601 The standard capacities should be:

Safe working load	-	130Kg
Seat	–	360 degree rotation,

1602 The bath hoist shall be Designed to the following features:

- The lift shall have a speed of travel not exceeding 0.l5m/sec;
- The seat shall have a height range of 140mm to 716mm;
- The seat shall be fitted with a retractable safety belt to restrain the passenger during travel;
- The bath hoist controls shall be push button directional arrow type on a hand control, which is plugged into the integral control unit on the hoist column, limits of travel to be determined by electronic stops built into the circuitry;
- The seat rotation to be controlled by a locking lever;
- The seat shall be fitted with an emergency raise switch facility located on the power unit cover;
- The bath hoist to have wipe-clean finishes, with a range of trim finishes;

Site Survey

1603 The first visit to the Property shall be a joint visit between the Provider and the Client's Representative or the Occupational Therapist on his behalf.

1604 Allow for a site survey of each Property before an Order is placed by the Client. The Provider shall inform the Client's Representative of any additional Works required, all with associated costs in order to complete the installation to the Specification.

- Floor: Establish if level and what constructed from;
- Timber Floor Structure: Establish joist direction and ability to lift floor boarding for access;
- Window ledges: to be cut back if necessary to accommodate bath hoist.
- Towel rail/radiators To be moved if causing an obstruction to the bath hoist and refixed elsewhere to suit Customer and Client. Moving the aforementioned fixtures to be carried out by qualified Staff registered with GAS Safe Register.
- Bath Hoist: Shall not project into/across doorways/passage ways.

1605 Electrics General Inspection:

a. Mains earth to be upgraded to the latest edition of the IET Wiring Regulations if the existing is not up to standard. Earthing conductor 16mm2, main equipotential bonding conductors 10mm2.

b. All bonding, earthing to mains shall be installed before the installation of the lift.

c. Clamped earth is **not** acceptable, where this is found to be in place it shall be changed by the electric supply company to a sweated joint.

d. If the above is not possible due to local circumstances, an earth leakage breaker of the residual current type to be fitted, rated at 30mA or less, plus a separate earth electrode in order to comply with the IET Wiring Regulations.

© Rand Associates Consultancy Services Ltd

1606 **It is not acceptable to** run earth cables externally, except in galvanised conduit.

1607 Pre Payment meters

- Prepayment meters are **not** allowed and shall be replaced prior to the lift installation.
- The Provider **must not** install the lift whilst a part payment meter in place.
- The Customer must arrange for the meter to be changed through their electricity supply company.

Electrical Supplies

1608 The supply shall be dedicated to the bath hoist and shall originate at the household consumer unit in all situations.

Temporary supplies

1609 Temporary supplies are not acceptable under any circumstances. It is the responsibility of the Provider to ensure that installation of the electrics is carried out before the lift installation.

Wiring system

1610 The wiring system for the electrical services to the bath hoist shall be PVC double insulated cable with CSA 2.5mm^2. The wiring shall be installed in a system of PVC-u high impact mini trunking, white in colour, terminating in a 25A switched double pole spur socket connection unit located outside of the bathroom flexible

1611 Trunking shall be secured to all surfaces via steel wood screws, **under no circumstances** shall self adhesive mini trunking be accepted.

1612 The bends, elbows, adapters etc shall of purpose manufacture and from the trunking manufacturers product range.

Main Electrical Supply (240v Powered)

1613 For the purpose of this installation the incoming electrical supply shall be deemed to be the main incoming distribution board of the premises.

1614 Directly below the existing distribution board a mini consumer unit with an RCD shall be supplied and installed. The incoming supply to the RCD shall be wired via a spare way within the distribution board.

1615 Should there be no spare ways available; an independent supply can be obtained by applying to the local electric supply company for a Henley block to be fitted.

1616 Leave 25mm^2 tails from the new consumer unit, which the local supply company will connect to their new Henley block. The RCD shall be fed via a 25amp MCB device installed within the distribution board.

Periodical Labelling

1617 All circuits shall be identified.

1618 All equipment and accessories shall be suitably labelled (including circuits, earthing etc.,).

© Rand Associates Consultancy Services Ltd

Bath Hoist Charger

1619 Bath hoist to be supplied with power/charging point located in a battery power pack complete with indicators installed on the hoist column complete with battery charger plug and lead.

Smoke Detectors

1620 Supply and fit smoke detectors if instructed.

Testing

1621 All tests shall be carried out in accordance with the applicable Standard and be witnessed by the Client's Representative. Test results shall be provided at handover. Witnessed testing is to take place after 2 weeks and not longer than 4 weeks after handover. Termination of warranty period to be taken from date of witnessed testing, acceptance and certification.

Maintenance

1622 Provide a 5 years guarantee parts and labour warranty after hand over for each lift.

1623 Make good all Defects including all Materials and labour required during the Defects Liability Period on new systems and installations. In addition the Provider must test and check operation of all RCCB units associated with the system.

1624 Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works prior to expiration of Defects Liability Period

- Provide Routine Maintenance for the stairlift by a competent manufacturer trained person within six months of commissioning and thereafter, at intervals not exceeding six months until expiration of the Defects Liability Period.
- At every service, any serious Defect should be rectified to conform to this standard and particular attention should be given to those features listed in the applicable Standard
- Produce a servicing schedule, and times allowed for each visit.
- Upon completion of each visit to undertake Routine Maintenance, the Provider shall produce a completed and signed service report completed by the competent person referred to above for each and every installation.
- If the Contract so stipulates, the Provider shall provide a Responsive Maintenance and Out of Hours Emergency Works service during the Defects Liability Period.
- Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works shall be provided in accordance with the provisions contained in this Specification section entitled "Lifts, Stairlifts and other Disability Hoists and Disabled Baths Maintenance".

1625 Adequate Means of Escape

1. Bath hoists shall not obstruct doors, or any access into or out of Property.
2. The bath hoist must not as is reasonably possible obstruct access ways/passage ways.

Associated Works

1626 All Works to comply with the Specifications and good building practice.

1627 Where decorations have been damaged or disturbed the areas are to be reinstated as near as possible to the existing finishes. This includes wallpaper, "Artex" finishes or similar.

© Rand Associates Consultancy Services Ltd

1628 Radiators and window boards etc may need to be moved/cut back to accommodate bath hoist.

1629 On timber floors, carefully lift floor finshes and set aside for reinstatement, carefully cut back floor boarding to gain access including working space to insert under floor bracing bars for base plate , position and bolt base plate through floor boarding to bracing bars or screw with a heavy duty wood screw or coach bolt to joist. Screw down floor boarding in locality of base plate to existing joists with 100mm countersunk wood screws. Additional supports may be required on chipboard or plywood boarded floors, reinstate floor boarding, reinstate floor finish.

1630 On insitu concrete floors, temporary mark floor with location of base plate bolt holes, drill three 16mm diameter x 125mm deep holes for expansion bolts in floor. Locate the base plate and insert the expansion bolts and tighten up. Bath hoists cannot be fixed to precast concrete beam and block infill floors without reference to the Client's Representative for Instructions, and make good floor finish,

1631 Any exposed electrical cabling or hot and cold supply or heating pipework to be extended to avoid confliction with bracing bars and bolt nuts

1632 It is the responsibility of the Provider to obtain building control approval (if appropriate) for any building work or alterations and produce plans where required.

Installation

1633 The installation of the bath hoist is to be strictly in accordance with the manufacturer's instructions and recommendations.

Assignment or Sub-Letting

1634 Do not subcontract any part of the Works without prior written authorisation from the Client's Representative. Subcontractors are the sole responsibility of the Provider.

Specification for Building Works

1635 It is the responsibility of the Provider to be versed on the requirements of the Specifications.

Clearing Away Rubbish

1636 Rubbish and redundant Materials to be removed from site by the Provider at the end of each working day.

Safety Health and Welfare

1637 Comply and conform to the requirements of all relevant Health and Safety Executive Regulations.

Bye Laws and Regulations

1638 Comply and conform to the requirements of all relevant Bye Laws and Regulations including fees that may be due is the responsibility of the Provider

Removal of Redundant Equipment

1639 Remove redundant equipment and buy back from the Client at prices agreed and to make good any damaged decorations.

© Rand Associates Consultancy Services Ltd

Discovery of Asbestos

1640 If, during the performance of the Contract, the Provider discovers within the area of the Works, asbestos whose presence has not been foreseen in the Specification/Schedule of Works then the Provider shall immediately take the following steps:

1. Suspend all Work that may release asbestos fibres.

2. Advise all persons in the vicinity to keep from the area.

3. Notify the Client's Representative.

Firestopping

1641 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

1642 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

LIGHTNING PROTECTION SYSTEM INSTALLATIONS

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

PART 1: LIGHTNING PROTECTION SYSTEM MAINTENANCE

General Requirements

001 The lightning protection systems must be covered by a fully comprehensive type Contract.

002 Detailed below are the specific Requirements. The Contract must therefore comprise of the following elements:

- Routine Maintenance
- Responsive Maintenance
- Out of Hours Emergency Works

003 The Provider, his Staff including his Specialist Subcontractors should be a member of the Federation of Lightning Protection Specialists.

Asset Register

004 Ensure that all the asset registers supplied by the Client prior to the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

005 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each visit to undertake Routine Maintenance, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

006 Ensure that, following all visits to undertake Routine Maintenance, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

007 Provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff including his Specialist Subcontractors.

Manufacturer's Requirements

008 Where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

009 Submit and agree within 20 working days of the award of the Contract a full annual Programme for all Works covering each element of the Routine Maintenance Works with the Client's Representative.

010 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

Permit to Work Certification

011 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

© Rand Associates Consultancy Services Ltd

Access

012 Ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

013 All Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

014 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

Labelling of System

015 Ensure that a label is affixed adjacent to the origin of the electrical installation, worded as follows:

> "This structure is provided with a lightning protection system that is in accordance with BS EN 62305 and the bonding to other services and the main equipotential bonding should be maintained accordingly."

Minor Repairs

016 Carry out, during testing, minor repairs such as tightening joints, replacement of clips, etc to achieve a pass status and make appliances safe to ensure compliance with applicable Standard.

Routine Maintenance

017 The minimum requirements for Routine Maintenance are to be in accordance with the relevant equipment manufacturer's recommendations.

018 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

019 Carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

020 Include for the provision and application of all consumables within the Rates for this element of the Contract.

021 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the applicable Standard or equivalent.

© Rand Associates Consultancy Services Ltd

022 Routine Maintenance must unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirements tabled below;

Item No	Item	Frequency	Action	Notes
1	Conductor tape fastenings and joints	Annually	Inspect roof and plant connections, vertical joint connectors and earth terminations positions. Ensure that conductor tapes are secured firmly to the structure and all joints including those to structural and service steelwork are mechanically and electrically sound. Check that all test links are accessible.	Look for evidence of corrosion in the material this is more likely to occur where there is contact between two dissimilar metals or where the atmosphere has the potential for a high degree of chemical pollution. If renewal required report to Client's Representative. If obstructed for whatever reason report to Client's Representative.
2	Bonding	Annually	Inspect all bonding connections to. extraneous metalwork such as crane Tracks, radio or T.V. aerials.	Look for evidence of corrosion; Note any new additions.
3	Earth Terminals	Annually	Test resistance to earth.	Advise Client's Representative if the whole of the lightning protection system has a resistance to earth of over 10 ohms. Record details and copy to Client's Representative.
4	Lightning Strike	As and when instructed	After evidence of lightning strike the complete procedure for inspection and testing should be carried out as soon as possible to ascertain the condition of the system.	Record details in electronic log and copy to Client's Representative.
5	Records		The following records should be maintained: • scale drawings showing the nature, dimensions, materials and position of all component parts of the lightning protection system; • the nature of the soil and any special earthing arrangements; • the type and position of the earth electrodes, including reference electrodes; • the test conditions and results obtained; • any alterations, additions or repairs to the system; • the name of the person responsible for the installation or it's upkeep.	Record details in electronic log and copy to Client's Representative.

© Rand Associates Consultancy Services Ltd

023 It is the Provider's responsibility to observe the on-going condition of the systems and installations with regard to safe and correct operation. The Provider must bring to the attention of the Client's Representative any specific areas where periodic checking, lubrication and adjustment exceeds normal provisions for the age and type of systems installed.

Responsive Maintenance and Out of Hours Emergency Works

024 Attend to all call outs due to malfunction or breakdown.

025 Include for a call-out service to provide Responsive Maintenance and an Out of Hours Emergency Works Service. The Out of Hours Emergency Works service is deemed to extend the provision of Emergency Works to a 24 hour, 7 days a week, 365 (366 for a leap year) days per year basis.

026 Call outs for Responsive Maintenance and/or Out of Hours Emergency Works which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

027 Where Out of Hours Emergency Works are attended to for authorised cases of breakdowns, mis-use or vandalism, the Provider will be paid in accordance with the Rates detailed in the Price Framework.

Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works

Repairs, Replacements and Adjustments

028 Accept responsibility for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

029 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned to suit the requirements of the Property.

030 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

031 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

Firestopping

032 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

033 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

PART 2: LIGHTNING PROTECTION SYSTEM - INSTALLATIONS

General Requirements

101 The workmanship, installation, and testing of the lightning protection system to give a trouble free life of at least 25 years, shall conform in all respects with applicable Standards for:

Protection against Lightning
Requirements for Electrical Installations IET Wiring Regulations
Code of Practice for earthing

Exposed Air Termination Networks

102 The air termination network shall consist of either aluminium or copper Material with a minimum cross section area of 50mm², and may consist of vertical or horizontal conductors or combinations of both as located and indicated on any drawings provided and Client's Requirements.

Concealed Air Termination Networks

103 The air termination network at the roof ridge shall consist of solid metallic conductors, aluminium or copper of minimum cross sectional area of 50mm², and shall be concealed within the roof void underneath the roofing felt and securely fixed every 100mm.

104 Air finials at the ridge position shall be a minimum size of 10mm diameter located at distances recommended by the applicable Standard and project above the crest/ridge tile by a distance of not less than 300mm. They shall be fixed with an appropriate terminal base and pass through the crest/ridge tile at the appropriate point and to connect the general network within the roof space.

105 Where penetration of the crest/ridge tile takes place, permanent and effective waterproofing shall be made with a silicon mastic or equivalent Material.

106 Air terminals at the eaves position shall be 55mm x 55mm square tape clamps, of the correct Material to match the air termination network, fixed to the external face of the roof Material by means of a cavity fixing bolt (e.g. rawl-nut 5250).

107 Alternatively, if a metal (i.e. aluminium) perimeter roof gutter has been installed, then this may be used to form the strike point at the eaves position. If the metal gutter is to be used in this way then the Provider must ensure that it is effectively bonded at all connection points.

108 Metal framed or metal clad roofs or metal copings, which form part, or all of an air termination, shall be bonded across joints between constituent parts. The bonds shall be made as indicated; no drilling of roofing or coping shall be done without the approval of the Client's Representative.

109 Metalwork of structures, chimneys, pipes, cowlings, plant, walkways, handrails and similar components of the Property that are exposed at or above roof level shall be bonded to the nearest air termination.

110 Where a signal aerial is mounted on the structure it shall be protected as bonded to the nearest cross tape.

Down Conductors

111 The type and location of down conductors shall be as indicated by the Instruction issued by the Client's Representative. No aluminium conductor shall be buried in the ground.

112 Down conductors shall be of aluminium or copper, strip or rod of minimum cross sectional area 50mm² and where installed externally shall be provided with a PVC sheath, the colour of which shall match the finish of the Property.

113 Where the down conductors are to be dropped internally they shall be enclosed in a suitable void or duct.

© Rand Associates Consultancy Services Ltd

114 The exact fixing method of all down conductors shall be as stated in the Client's Representative's Instruction.

115 The appropriate size, colour and type of fixing clip shall be used, and all down tapes shall be so positioned as to form a neat appearance.

116 Where a copper air termination network is utilised, the down conductor shall be terminated in a test clamp, located 511mm above the external damp proof course, the final connection to the earth rod being made in sheathed copper tape of 51mm² minimum cross-sectional area.

117 Where an aluminium air termination network is utilised, the down conductor shall be terminated in a bimetallic connector with test clamp fitted below, located 511mm above the external damp proof course, the final connection to the earth rod being made in sheathed copper tape of 51mm² minimum cross - sectional area.

118 Where the profile of the Property would cause an overhang or re-entrant loop to be formed in a down conductor the Client's Representative shall be informed.

119 Where the reinforcement of a concrete structure forms the down conductors, the Provider shall carry out all testing to ensure acceptability in accordance with the applicable Standard.

120 Connections from down conductors formed by reinforcing steel or concrete clad steel frames shall be made by the Provider. They shall comprise stainless steel tape, not less than 21mm x 3mm, welded onto the steelwork. The Provider shall agree with the Client's Representative the length of tail to be left for subsequent connection.

121 Screws and rivets shall be of the following Materials:
- for copper conductors, phosphor bronze, naval brass or high-tensile manganese brass.
- for aluminium conductors, stainless steel.

Joints

122 Joints in conductors shall be kept to a minimum.

123 All contact surfaces shall be thoroughly cleaned and coated with an anti-corrosive electrical jointing compound suitable for the conductor Material. For bi-metallic joints a separate abrasive shall be used to clean each metal.

124 Joints between conductors of the same metal, other than at test points, shall be made by the termit welding process or by riveting and sweating. Overlap of conductors shall be not less than 111mm.

125 Where and aluminium conductor is jointed to a copper conductor, one of the following methods shall be used.
- a bi-metal connector formed by friction welding high purity copper and aluminium.
- the copper conductor shall be completely sheathed for at least 111mm of its length with metal strip electrolytically compatible with copper and aluminium, and then clamped to the aluminium conductor.

126 Bi-metal joints shall not be made at test points or between the test point and earth electrode.

Earth Electrodes

127 Earth electrodes shall consist of 16mm diameter copper bonded rods with appropriate couplings, if required, and be in accordance with the applicable Standard.

128 The top of each earth electrode shall be housed in a concrete pit to facilitate inspection and be complete with a tamperproof lid and installed flush with the finished ground level. The concrete pits are to be firmly fixed in the ground by surrounding it with concrete and aggregate mixture.

© Rand Associates Consultancy Services Ltd

129 Where more than one earth rod per down conductor has to be installed, then they shall be, where practical, equally spaced in a line parallel to the structure at horizontal distances equal to the length of the rods or 3611mm whichever is the greater.

Extraneous Metalwork

130 Where extraneous metalwork occurs, it will be securely bonded to the air termination network with appropriate conductors and clamps

131 Metalwork on or in the structure, which is within the recommended safe distance as defined in the applicable Standard, shall be bonded to the lightning protection system using appropriate conductors and clamps.

Cross Bonding

132 Where a service belongs to a Utility Provider the permission of the Utility Provider shall be obtained before connection is made.

133 The lightning protection system shall be bonded to the main earth terminal of the electrical installation with an 8mm diameter copper rod, or similar sized stranded cable, at the nearest down conductor, above the test clamp and shall be labelled as IET Regulations except that the wording shall be: -

"SAFETY BONDING CONNECTION, LIGHTNING PROTECTION SYSTEM"

Lift Installation Metalwork

134 Lift installation metalwork, together with all extended metalwork on the inside and outside of the lift shaft, including ladders and handrails should be bonded to the lightning protection system and to any adjacent structural steelwork not only at the top and bottom of the lift shaft but at regular vertical intervals not exceeding 21m.

Test Joints

135 A mechanical test clamp, of the circular screw down type, shall be provided in each down conductor; it shall be located 1m above ground level unless otherwise indicated. Test clamps shall be of cast gunmetal.

Test Results

136 A test certificate, including a drawing showing the location of the earth electrodes numbered in sequence, indicating the resistance of each electrode shall be provided to the Client's Representative.

Testing, Commissioning & Handover

137 The whole of the electrical installation is to be inspected and tested in accordance with the applicable Standard.

138 Tests must be carried out as the work proceeds as required by site conditions and upon the decision of the Client Representative.

139 The Provider shall carry out his own testing and commissioning, prior to the declaring to the Client Representative that the Works are ready for such testing and commissioning. The Provider will provide his own testing equipment that will have been calibrated within the past 12 months.

140 The Provider shall satisfy himself that the works offered for testing are complete, but this shall not preclude re-testing of sections where appropriate, in the case of sectional handover, or phased completion.

© Rand Associates Consultancy Services Ltd

141 The Provider shall satisfy himself that the works are complete and operational and that all labels, warning notices, circuit detail Schedules and manufacturer's information are available and will provide a Completion and Inspection Certificate in PDF format which shall be in accordance with applicable Standards.

142 At handover, the Provider shall provide the client with a complete set of operating and maintenance records. Including all documentation, manufacturers details, list of spares, emergency contact numbers, complete set of record drawings etc

143 The final format and content of the manuals shall be agreed with the Client.

Firestopping

144 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

145 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

LOW VOLTAGE SWITCHGEAR MAINTENANCE

© Rand Associates Consultancy Services Ltd

LOW VOLTAGE SWITCHGEAR MAINTENANCE

GENERAL MATTERS

Routine Maintenance, Responsive Maintenance and Out of Hours Works

001 This Specification covers all Routine Maintenance to all low voltage switchgear associated with Landlord's installations within the boundaries of each Property, Block or Scheme. The Specification must be read and interpreted in conjunction with the operations set out in the descriptions included in the Price Framework and with the Specification entitled LANDLORD'S ELECTRICAL INSTALLATIONS AND TESTING

002 Routine Maintenance must involve the undertaking of the comprehensive servicing/maintenance operations described in this Specification and the operations in the Price Framework inclusive throughout the duration of the Contract Period at the regular intervals pre-defined by the Client and starting immediately from the Commencement Date.

003 All references to applicable Standards or other equally approved national standards must be deemed to mean those current, including all amendments.

004 Ensure that his Staff visits each Property, Block or Scheme at the requisite frequency and carry out the specified inspections, maintenance, repairs, tests, certification and any other servicing Works to ensure that all systems, installations, equipment and appliances are maintained in prime condition.

005 At each Property, Block or Scheme visit, the Provider's Staff must access the electronic log book for the respective installations and record all details of the visit and action taken. The Provider must be deemed to have allowed in his tender for creation of the specific installation data as each Property, Block or Scheme is inspected for the first time.

006 Ensure within the first 3 months following the Commencement Date (i.e. at the end of the first servicing period) that the low voltage switchgear for each landlord's installation and the like at each Property, Block or Scheme has a unique identifiable number.

007 Also within 3 months after Commencement Date, the Provider must provide the Client's Representative with both an electronic and a hard copy bound report containing a listing of all Properties in alphabetical order and indicating against each Property, the full name and address of the Property, Block or Scheme; a full positional listing of all switchgear, distribution boards and the like referenced with their uniquely identifying number in accordance with paragraph 006 above; the dates when Routine Maintenance has been undertaken and/or is due in respect of each Property.

008 At the same time, the Provider may submit to the Client's Representative a separate report detailing any specific recommendations with respect to any low voltage switchgear.

009 At the completion of each visit to each Property, Block or Scheme the Provider's Staff must complete electronically clear and explicit service report sheets. The electronic signature of the Customer in respect of an individual Property or the Client's relevant Scheme manager or other responsible officer must be obtained as proof of the Works being undertaken and completed. In blocks of flats or similar situations where there is no such dedicated, responsible manager or officer, the Provider's Staff must self certify completion of the Works. In such cases the name of the self certifying Staff member must be printed clearly and legibly. Copies of reports are to be forwarded to the Client's Representative, together with any recommendations for Works not already authorised. If the recommendations include for Works not covered by Rates in the Contract Documents then a quotation for such must be included with the service report sheets. The Provider must update the electronic log book with all service report sheets.

© Rand Associates Consultancy Services Ltd

010 All logs, reports and test recording sheets for all categories and sections of Work (whether specifically stated below or not) must be recorded and be available for inspection and download by the Client on a web based system in a format to be agreed by the Client and the Provider.

011 All project issues must be communicated through the Client's Representative and must not be channelled directly or indirectly via the Customers.

012 All alarm systems linked to low voltage switchgear (whether specifically stated below or not) must be connected to nominated control monitoring services:

- All bespoke software must be fully documented, recorded and provided to the respective Client's Party (including providing all codes, passwords and part no's) and all must remain open protocol;
- All systems must remain open protocol;
- At handover meetings with the Client, the Provider must provide all codes, passwords and part numbers for all systems, parts and equipment; and
- Any damage caused by the Provider installing inferior equipment must be made good at the expense of the Provider;

Quality

013 The Client is aiming for an economic, high quality maintenance service with a stable workforce and effective supervision. Cost will therefore be only one element in the overall assessment of tenders.

014 The Works must be performed in accordance with the Contract Documents and must be carried out in an efficient and proficient manner.

015 The Client's Representative will monitor that the Specification is being met. Any Default in performance will be dealt with in accordance with the Contract.

016 The monitoring system will include an inspection of the following:

- the number and suitability of Staff used;
- quality of Materials used;
- that the servicing and maintenance procedures used are either as detailed in the Contract or as agreed with the Client's Representative;
- that the frequency and standards of servicing and maintenance are being met; and
- that health and safety requirements are met;

Equipment and Materials

017 All equipment and Materials required for the performance of the Contract must be supplied by the Provider and must be approved by the Client's Representative. Any alternatives subsequently proposed by the Provider must have the prior approval of the Client's Representative.

018 All equipment and Materials used by the Provider to fulfil the Contract must be suitable for the purpose and where an appropriate applicable Standard issued by the British Standards Institute, or other equivalent nationally approved standard is current, must as a minimum, be in accordance with that standard.

Reporting of Defects

019 Report in writing any obvious apparent defects in the design, installation and/or operation, to any of the existing installations, to the Client's Representative.

020 In particular report immediately to the Client's Representative any matters that may impact on health and safety issues and where immediate action is required from the Client's Representative.

© Rand Associates Consultancy Services Ltd

Maintenance Reports

021 Ensure that, following all visits to undertake Routine Maintenance, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

022 Provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff including his Specialist Subcontractors.

Manufacturer's Requirements

023 Where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

024 Submit and agree within 20 working days of the award of the Contract a full annual Programme for all Works covering each element of the Routine Maintenance Works with the Client's Representative.

025 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

Permit to Work Certification

026 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

Access

027 Ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

028 All Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

029 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

Minor Repairs

030 Carry out, during inspection and testing, minor repairs such as tightening joints, replacement of clips, etc to achieve a pass status and make appliances safe to ensure compliance with the applicable Standard.

Routine Maintenance

031 The minimum requirements for Routine Maintenance are to be in accordance with the relevant equipment manufacturer's recommendations.

032 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

033 Carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

© Rand Associates Consultancy Services Ltd

034 Include for the provision and application of all consumables within the Rates for this element of the Contract.

035 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the latest applicable Standards or equivalent.

036 Routine Maintenance of switchgear and the like must unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirements tabled below;

Item No.	Item	Frequency	Action	Notes
1.	Intrusive LV Switchboards	Annually	Check function of all power meters prior to shutdown. Check function of all lamps and indicators. Inspect locking devices for wear and damage. Clean thoroughly, vacuum and full visual inspection of external and internal surfaces of the switchboard. Inspect control wiring, relays, power supply units, timers and the like. Check electronic surge protection is intact if installed Verify control circuit fuse rating and continuity Check and torque test bolted electrical connections to specified levels ACB maintenance withdrawable or fixed, check contacts, arch chutes secondary injection etc. Visual inspection for signs of overheating or deterioration. Visual check to ensure all clear after inspection and servicing complete. Inspection of all panels for paintwork damage and signs of corrosion. Check battery tripping packs, battery integrity, signs of defects Electrical function test. Insulation test of the switchgear	Cleaning with solvents is strictly forbidden Any evidence of tampering or damage should be recorded and reported to the Client's Representative.

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
2.	Non-Intrusive LV Switchboards	Annually	Check function of all power meters prior to shutdown. Check function of all lamps and indicators. Inspect locking devices for wear and damage. Clean thoroughly, vacuum and full visual inspection of external surfaces only Inspect control wiring, relays, power supply units, timers and fuse careriers. Check electronic surge protection is intact if installed Visual inspection for signs of overheating or deterioration. Visual check to ensure all clear after inspection and servicing complete. Inspection of all panels for paintwork damage and signs of corrosion. Check battery tripping packs, battery integrity, signs of defects Electrical function test. Insulation test of the switchgear	Cleaning with solvents is strictly forbidden Any evidence of tampering or damage should be recorded and reported to the Client's Representative.
3	Air Circuit Breaker Chassis	Annually	Rack out air circuit breaker. Clean/vacuum internal chassis. Check operation of safety shutters closing. Check operation and position of contacts. Operate padlocking system. Grease clusters as necessary.	

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
4	Air Circuit Breakers	Annually	Check general condition Clean with diluents Henkel 273471 Vacuum breaker Visual check for contact wear Check auxiliary wiring insulation. Check breaker locking devices. Open/close manually. Charge the device manually. Secondary injection with FFT kit, produce trip curve report. Check earth fault protection/earth leakage protection Grease disconnect contacts as necessary MCCB trip test with report	
5	Busbar and Accessories	Annually	Visual inspection of all Power bar runs. Check supports. Check alignment straight runs, joint packs and directional change pieces. Check panel flanges, earth continuity etc. Thermal image survey of complete runs.	
6	Meters	Annually	Check Voltage connections. Check CT connections. Check Modbus connections.	
7	Molded Case Circuit Breakers	Annually	Check motor operator. Check under voltage release. Check power supply unit. Check control relays Check fuse and fuse holders	

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
8	Power Distribution Unit	Annually	Clean thoroughly external and internal surfaces of PDU switchboard. Check function of all power meters. Verify control circuit fuse rating and continuity. Check functions of lamps and indicators. Check and torque test bolted electrical connections to specified levels. Check all cable connections for tightness and torque terminals. Visual inspection for signs of overheating or deterioration. Inspection of all panels for paint work damage or corrosion. All labels securely in place. Inspection to insure all clear after work completed before fixing covers. Electrical function test. Insulation test of the switchgear	

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
9.	Power Circuit Breakers ne 630A	Annually	Visual Inspection of condition to ensure no signs of burns or cracks. Cleaning with a dry cloth or vacuum cleaner to remove grime, grease, excessive dust or condensation. Functional testing of insulation between the phases, and between phases and the exposed conductive parts. Ensure barrier between direct user contact with live parts Check protection against effects of electrical arcs and overpressures caused by short circuiting. Replacement of faulty accessories	Cleaning with solvents is strictly forbidden Any evidence of tampering or damage should be recorded and reported to the Client's Representative.
		In addition every two years	Servicing operation Sub-assembly tests	
		In addition every five years	Measure insulation. Diagnostics and repairs by manufacturer	

Firestopping

037 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

038 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

MICRO-GENERATION APPLIANCES SERVICING AND MAINTENANCE

© Rand Associates Consultancy Services Ltd

GENERAL

© Rand Associates Consultancy Services Ltd

GENERAL

Applicability

001 This initial general section applies to all subsequent sections of this Specification of Workmanship and Materials **("this Specification")**.

002 This Specification is drafted as a series of instructions that the Provider must ensure are complied with in relation to the Works. Each instruction includes all tasks necessary to comply fully with the instruction and the Schedule of Rates item(s) to which it relates.

003 The Schedule of Rates payments, as adjusted by the Provider's tendered Rates, include for carrying out all tasks required by this Specification. No further payment is due to the Provider in respect of any such tasks beyond the payments provided for in the Schedule of Rates.

004 Specifications across a number of trades may be relevant to each Schedule of Rates item. The Provider must comply with all requirements of this Specification applicable to the specific type of Works to be undertaken.

005 References to Paragraphs and Sections in this Specification are to the applicable Paragraph and Section of this Specification.

Standards of workmanship and Materials

006 Carry out and complete all Works:
- in accordance with Good Industry Practice;
- in accordance with the Client's Policies;
- in accordance with any specific requirements for those Works in this Specification; and
- to the satisfaction of the Client's Representative (acting reasonably).

007 To the extent that the standard of any Works has not been specified in this Contract, agree the relevant standard for the Works with the Client's Representative before their execution. Where particular Works or working methods are to be "approved by" "agreed with" or are indicated to be "subject to the approval of" the Client's Representative, give the Client's Representative adequate notice when such approval or agreement is needed and retain evidence of all approvals given, and items that have been agreed, by the Client's Representative.

008 To the extent that it is necessary to Design any aspect of the Works, in preparing those Designs use the reasonable skill and care to be expected of an experienced maintenance Provider that is skilled in undertaking works similar to the Works.

009 Maintain all existing lines and levels at all times and carry through new work to the same lines and levels unless otherwise Instructed by the Client's Representative.

British Standards & Codes of Practice

010 Ensure all Works undertaken and all Materials used in those Works comply with all applicable British Standards or equivalent and Codes of Practice that are current at the time of their use.

011 References in this Specification of Workmanship and Materials to any British Standard or equivalent or Code of Practice are to be construed as references to the version current at the time the Order is undertaken.

012 Where a specific British Standard or equivalent or a Code of Practice is referred to, this sets out the minimum acceptable standard of Materials or workmanship.

© Rand Associates Consultancy Services Ltd

Materials

013 The Client wishes to standardise the use of Materials across its Properties. This is in order to simplify parts requirements and van stock loads, to improve its repairs processes and to reduce maintenance costs. Wherever possible, match all Materials used to materials currently used in the Properties, particularly in terms of their parts requirements and repair procedures. In this Specification the Client has set out details of its current Materials to which the Provider is required to standardise.

014 Where this Specification indicates that Materials are to be "approved by the Client's Representative", provide samples of the proposed Materials to the Client's Representative for approval. Any Materials that comply with the functionality and compatibility (including aesthetic compatibility) requirements of this Specification may be proposed. No further approval is required for any Materials listed in this Specification as being the Client's currently used Materials. The purpose of the Client's Representative's decision on the use and approval of such Materials is to ensure that they meet the Client's requirements for functionality and compatibility. The decision of the Client's Representative on this is final.

015 Where this Specification requires Materials to be matched to existing Materials or finishes, this match is subject to the approval of the Client's Representative.

016 Do not use any Prohibited Materials in carrying out the Works. Prohibited Materials are those Materials which are generally accepted or (having regard to Good Industry Practice) are reasonably suspected of:

- being harmful in themselves;
- being harmful when used in a particular situation or in combination with other Materials;
- becoming harmful with the passage of time; or
- being damaged by or causing damage to the structure in which they are to be affixed.

017 Materials are to be regarded as harmful if, in the context of their use in the Works (whether alone or in combination with other materials) they:

- are prejudicial to health and safety;
- may pose a threat to the structural stability or the physical integrity of any Property; or
- could materially reduce the normal life expectancy of any part of the Property.

018 Use, fix and apply all Materials strictly in accordance with the manufacturer's recommendations, directions or instructions.

019 Participate in joint initiatives with the Client and other Client Party to establish supply chain agreements.

020 Where appropriate suggest (economically viable) amendments to this Specification where those amendments may lead to an improvement in environmental performance or sustainability.

021 Provide all information the Client's Representative reasonably requests regarding the environmental impact of the supply and use of any Materials and goods the Provider selects for use in the Works.

Firestopping

022 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

MICRO-GENERATION HEATING

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

GENERAL REQUIREMENTS

Immediate Response Service

001 The Provider shall maintain an office at a location from which the Works may reasonably be undertaken within the response times required, during normal working hours and out of hours. The Provider shall be equipped to receive calls and orders however transmitted (telephone, radio, fax, email) and provide the Client's Representative with a single telephone number that can be published.

Provider's Conduct

002 The Client is intent on providing an expeditious, safe and efficient Maintenance and Repair Service to its Customers and consequently the Provider shall do his utmost to promote and enhance the image and reputation of the Client in this respect.

003 The Provider shall require his Staff engaged upon the Works to be properly and presentably dressed in appropriate uniforms or workwear.

004 The Provider shall ensure that his Staff shall perform their duties in an orderly and quiet manner as may be reasonable and practicable having regard to the nature of the duties being performed by them.

005 The need to maintain the highest standards of hygiene and courtesy whilst the Provider's Staff are engaged upon the Works is paramount and in particular consideration must be given to Customers and occupiers when working in or near occupied premises. The Provider shall observe all of these provisions and also ensure that the said Staff do not cause a nuisance and or disturbance to Customers and occupiers when they are working in or near occupied premises.

006 The Client's Representative is empowered by this provision to give written notice to the Provider requiring him to remove from the Works forthwith any Staff member engaged upon the Works, if he is not satisfied in any way with the respective Staff members apparel, conduct, manner, or ability. The Provider shall on receipt of such notice comply forthwith and remove the Staff member from the Client's premises and the Staff member shall not be employed or engaged upon or in connection with the Works whilst the Contract remains in force.

007 The Client will from time to time poll its Customers to obtain their views on the effectiveness of the service provided by the Provider and the manner adopted by his Staff when discharging their duties. The results of the poll will be taken into account when considering the needs for resourcing future repair and maintenance programmes.

Registered Provider

008 The Provider shall have and maintain throughout the Contract Period registration with the:-

(a) Microgeneration Certification Scheme (MCS) or such other body as may from time to time be approved by regulation and

(b) National Inspection Council for Electrical Installation Contracting (NICEIC) and/or Electrical Providers Association (ECA) or alternatively, the Provider may employ Staff to be approved by the Client's Representative under the Contract, who are registered with the National Inspection Council for Electrical Installation Contracting and/or Electrical Providers Association in order to undertake electrical work in connection with the Works.

009 All works shall comply with Part 'J' and 'P' Building Regulations by either obtaining Building Regulation approval or self certification by registered company.

© Rand Associates Consultancy Services Ltd

010 In the event that the Provider's MCS or NICEIC or ECA registration becomes suspended or withdrawn for whatever reason, the Provider shall immediately notify the Client's Representative in writing giving full details of the reasons for such and the proposed or intended action and time-scale for gaining reinstatement of its registration(s). With immediate effect from the date of suspension or withdrawal of its registration(s) and until reinstatement the Provider shall, subject to approval of the Client's Representative be required to employ on a domestic sub-contract basis a suitable registered sub-contractor to undertake Works under the Contract.

011 Should the Provider be unable within a period of two weeks to engage a suitably registered sub-contractor which meets the Client Representative's approval and or the period of suspended or withdrawn registration(s) exceeds or is likely to exceed four weeks then, the Client may at its sole discretion terminate the Provider's employment under the Contract in writing with immediate effect. Such action on the part of the Client shall constitute a valid termination in accordance with the Contract Conditions.

Existing Systems

012 The Client does not guarantee the condition or composition of fluid within wet systems. The cost of the removal of sediment and/or the re-establishment of the correct water/anti-corrosion fluid (or any other chemical) mix shall be deemed to be included in the **Schedule of Rates**, and/or the Provider's tendered **Percentage Adjustment.**

Existing Micro-Generation Installations and Appliances

013 As far as the Client is aware, its existing Micro-Generation Installations and Appliances have been installed and maintained with due regard to both the British Standards and the Regulations:-

Types of micro-generation installed can include;

- Electricity generation technologies;
  - Solar powered or pholvolataic (PV) systems
  - Micro turbines either wind or hydro
- Heat generation technologies
  - Solar thermal hot water
  - Ground source heat pumps
  - Air source heat pumps
  - Bioenergy
- Co-generation technologies
  - Hydrogen energy and fuel cells
  - Combined Heat and Power (CHP)

and the maintenance of which is to be undertaken by Microgeneration Certification Scheme (MCS) accredited engineers in strict accordance with the relevant manufacturer's instructions

014 The Provider in carrying out the Works shall have due regard to all the above and shall not do anything which will compromise or degrade the integrity of the Micro-generation Installations and or Appliances.

Reinstatement to be Provided by the Provider

015 The Provider will be required to cut out any chases in floors, ceilings or walls, remove and refix insulation, floorboards, panels and the like to expose pipework for maintenance, repair, exploratory or investigation purposes and on completion to reinstate affected areas, insulation and surfaces to their original condition.

016 Any exposed Work left unattended shall be protected and temporarily covered by the Provider at his own cost.

© Rand Associates Consultancy Services Ltd

Leaks to Pipes Laid in Floors

017 The Provider shall be required to open up the floor of any Property to trace and identify the source of the leak. The Provider will drain down the system, remove the defective pipe and/or fittings and carry out the repair using capillary fittings. The system is to be recharged and left standing for 2 hours to test the repair. The Provider will make good the floor, in the case of screeded floors these shall be made good with asphalt or cement and grano compacted to completely encase the pipework subsequent to covering the pipework with an approved sleeve or wrapping tape. The floor will be allowed to dry out and the Provider will then recommission and put into use the heating system.

018 Alternatively the Provider may wish to seek dispensation from the Client's Representative to bypass the defective pipe in the floor or wall with an exposed run of pipe connected into the circuit at expedient points. The Provider should not on any account undertake this alternative without first obtaining the Client's Representative's approval.

Maintenance and Repair Records

019 On each occasion the Provider gains access to a Property for the purpose of carrying out the Works, he shall before leaving the Property, forthwith complete forms appropriate to the type of work undertaken in the form and manner prescribed hereafter.

020 The Provider shall at his own cost, provide for each Property a sufficient quantity of forms and notices, for the purposes of recording in ink from time to time, information in respect of the Heating Installations and Heating Appliances. The format and content of the said forms and notices shall be subject to the overriding approval of the Client's Representative and where required by statute, the Health & Safety Executive.

021 The Provider shall record upon the forms and notices, general information as follows:-

(1) The address of the Property to which the form applies.
(2) Details of the respective Micro-generation Installations and or Appliances and their location in the Property, clearly indicate any Micro-generation Installations or Appliances which have not previously been contained in the Provider's and or Client's records.
(3) Any changes to previously recorded details of Micro-generation Installations and or Appliances.
(4) The name of the firm and the name and signature of the firm's employee who undertook any Work, inspection or check and the date and time of the undertaking.

022 In addition, the Provider shall record specific information upon the forms and notices as follows:-

Annual Service Log;

023 Details of all Work undertaken during the annual inspection and service.

Repairs Log;

024 Details of all Work undertaken in response to a request for day to day repairs.

© Rand Associates Consultancy Services Ltd

Landlord's Micro-generation Safety Record;

025 Details of the routine annual inspection and service as follows:-

(i) the date on which the appliance was checked;
(ii) the address of the Property at which the appliance is installed;
(iii) the name and address of the Client responsible for the Property (or their agent) at which the appliance is installed;
(iv) a description of and the location of each appliance checked;
(v) any defect identified;
(vi) any remedial action taken;
(vii) confirmation that the routine annual service has included an examination of:-
  (a) the effectiveness of any appliance,
  (b) the appliances operation pressure and heat input,
  (c) the appliances operation so as to ensure its safe functioning and,
(viii) the name and signature of the individual carrying out the annual service and inspection; and
(ix) the registration number with which that individual or his Employer is registered, with MCS.

Actions arising from Forms and Notices

026 The forms and notices completed by the Provider shall be dealt with and the information thereon, delivered to persons in the form and manner prescribed hereafter:-

The Provider shall obtain the signature endorsement of the Customer of the respective Property upon the forms, to provide evidence that the Provider has undertaken an examination of the Micro-generation Installations or Appliances.

The original documents should be delivered to the Client's Representative within **two** working days of the visit;

The Provider should retain a copy of the documents for his own records.

A copy only of the Landlord's Micro-generation Safety Record also signed by the individual who undertook the routine annual inspection and service, should be handed to the Customer.

However, if the Customer refuses to sign the Landlord's Micro-generation Safety Record (or the occupier at the time is a minor), the Provider should in each case, deliver the unsigned copy of the said Safety Record signed by the individual who undertook the routine annual inspection and service to the Client's Representative, together with a list of the unsigned documents in the batch of documents.

In the case of the Customer's advice notice issued to the Customer in respect of a Micro-generation Installation or Appliance owned by them or for which they are entirely responsible, copies of the said notices should be delivered to the Client's Representative with the contemporaneous batch of forms.

Service Label

027 The Provider shall at his own cost provide a durable heat resisting self-adhesive label of a type to be approved by the Client's Representative. Immediately upon completion of a routine annual inspection and service and or repair to any Micro-generation appliance and or heating system the Provider shall enter in ink upon the label information as follows:-

- Name of the firm,
- Date of the routine annual inspection and service and or repair together with details of Work undertaken
- The signature of the engineer who undertook the routine annual inspection and service and other Works.

© Rand Associates Consultancy Services Ltd

028 Upon completion of the entries on the label the Provider shall affix the label in a prominent place on or near the appliance subject of the routine inspection and service and or repair.

Repairs Works Order

029 The Provider immediately after responding to a repair Order issued by the Client's Representative, shall provide electronically the nature of the repair undertaken, the date and time when the repair was executed or provide this data electronically

030 In addition, the Provider shall obtain the Customer's signature on the rear of the Order to indicate that the heating system and or appliance has been left in working order. The Order shall be attached to the respective account submitted by the Provider in accordance with the Contract Conditions.

Materials and Components

031 All Materials used shall comply with British Standards, current at the time and only approved replacement parts or components shall be fitted when servicing, maintaining or repairing any Micro-generation Installation or Appliance. Wherever possible Materials, replacement parts and or components fitted by the Provider shall be on a like for like basis but in any case, shall be of comparable quality and finish and be consistent with the performance requirements of the respective systems unless the defective material, part and or component was of an inferior quality to the relative British Standard in which case the Material, replacement part and or component provided by the Provider will be at least to current British Standards and be consistent with the performance requirements of the respective installation system and be subject to the Client's Representative's approval. Workmanship shall comply with the current British Standard Codes of Practice.

Annual Servicing

032 The annual inspection and servicing specifications specified hereafter are model requirements only and the Provider shall at his own cost and as part of his undertaking in respect of the Works, obtain the manufacturer's service and maintenance requirements for the respective Micro-generation Installations and Appliances and any other information which will enable the Provider to identify the full service, maintenance and repair requirements necessary to meet his obligations under the Contract and consequently enable the Client to fulfil its obligations to its Customers.

Response Maintenance

033 Wherever the Provider undertakes any response maintenance on a Micro-generation appliance, he shall immediately thereafter examine:-

(a) the effectiveness of the appliance,

(b) its operating pressure and heat input,

(c) its operation so as to ensure its safe functioning.

Any defects disclosed by the examination should be immediately dealt with by the Provider, in accordance with the Contract Conditions.

Electrical Installations

034 The Provider must as part of the routine annual service and inspection, check and test all electrical installations and fittings associated with the Micro-generation Installations and Appliances covered by this Contract, so as to ensure their safe operation. All remedial work will comply fully with IET REGULATIONS.

All works shall comply with Part 'P' Building Regulations by either obtaining Building Regulation approval or self certification by registered company.

© Rand Associates Consultancy Services Ltd

Decorative Casings

035 The Provider shall at his own cost carry out repairs to appliances, decorative casings and finishes.

Service/Test Certificate

036 The Provider following the successful completion of the routine annual inspection and service shall provide to the Client no later than 7 days after completion of the service a certificate in a form to be agreed with the Client's Representative which must be signed by the Provider's Contracts Manager.

037 In respect of Sheltered Accommodation, Hostels, Residential Care Accommodation, Dwellings in Multiple Occupation or similar with Independent Boilers a copy of the Certificate is to be provided for display prominently within the Property and the Provider is to allow within his tendered rates for the provision of a copy of the relevant certificate to each Customer served by the independent Micro-generation appliance.

038 In respect of Sheltered Accommodation, Hostels, Residential Care Accommodation, Dwellings in Multiple Occupation or similar with Communal Boilers a copy of the certificate is to be provided for display within the communal areas of the Property and the Provider is to allow within his tendered rates for the provision of a copy of the relevant certificate to each Customer served by the Communal Micro-generation Appliance or Installation.

MATERIALS

Air Source Heat Pump

039 The Client's preference is for an externally mounted air-to-water air source heat pump (ASHP) with an internal heat store. The ASHP should be located near the home, with good air circulation and on a solid concrete base. The system should be MCS and Renewable Energy Association (REA) approved. Ideally, it should have an inverter-driven heat pump compressor.

040 All ASHP systems should be installed with underfloor heating or suitable oversized radiators to maximise system efficiency.

041 Heating zones should be independently programmable with a central controller to set the heat demands on the system.

042 All systems should have the ability to connect with solar thermal panels to create a full renewable system. External fan units must be designed to protect people from danger and prevent the ability for injury or damage. Protection measures must be agreed with the Client's Representative.

043 Heating controls must be simple to understand and use. The system should come with at least a 3 year product and installation warranty.

044 All heating systems require an electronic time programmer with separate control for heating and hot water.

045 The programmer must be capable of running hot water and heating either separately or together, with at least two on/off periods per day.

046 Heating controls must be approved by the Client's Representative prior to finalising the heating design.

047 The Provider is required to provide a demonstration to the Client's Representative at handover on how to use the heating system.

048 If the heating and hot water system combines a number of Low and Zero Carbon Technology (LZCT) together or LZCT with gas central heating, for example, solar thermal panels with a gas boiler system, the Client will require the systems to be operated from a single electronic programmer.

© Rand Associates Consultancy Services Ltd

049 The entire heating installation must be checked for leaks after the system has been flushed and be pressure tested in accordance with manufacturer's requirements.

050 The system must be filled with water and any trapped air removed. A Gas Safe commissioning certificate must be available at handover. Particular attention is to be paid to commissioning the heating system to ensure that it is installed and set up to perform in accordance with the design.

Solar Photovoltaic Panels

051 The Client's preference is for monocrystalline Photovoltaic (PV) panels with self cleaning glass. The panel, frame and fixings must have MCS and British Board of Agrément (BBA) approval.

052 Installations to individual Properties should be connected to the household electrical system and communal systems should be connected to the communal landlord electrical system.

053 Single phase or three phase GSM enabled Passiv Systems Compatible Elster generation meters should be installed, as appropriate.

054 The panel should have a 25 year manufacturing warranty cover. The frame, fixtures and fittings should have a 5 year product and workmanship warranty. The inverter should have a 5 year warranty cover.

055 The system should meet either G59 or G83 grid compliance criteria. All proposals must be agreed by the Client's Representative.

Solar Thermal Panels

056 The Client's preference is for MCS and Solar Keymark approved evacuated tube Solar Thermal (ST) systems. The ST system should be a pressurised closed loop system with an appropriate expansion vessel.

057 The hot water cylinder must be a twin coil system with the bottom coil used for ST and the upper coil for the primary hot water circuit. A 3kW electric immersion must be installed.

058 A temperature controller should be installed with sensors in the collector and cylinder to automate the pump.

059 The solar panels must have a 5 year product and installation warranty cover.

Combined Heat and Power Generating Boilers

060 Combined heat and power generating boilers (CHP) must convert over 90% of their fuel into electricity and useful heat.

061 CHP boilers must generate a minimum of 1kw of electricity per hour and a maximum of 24kw of thermal output.

Solid Fuel Biomass and Wood Burning Boilers

062 Solid fuel biomass boilers must use wood pellet fuel from an approved renewable or recycled source.

063 All solid fuel boilers must convert over 90% of their fuel into useful heat.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

064 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand name	Manufacturer's details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

MODEL ANNUAL SERVICE REPAIRS AND MAINTENANCE SPECIFICATIONS

© Rand Associates Consultancy Services Ltd

SOLAR THERMAL INSTALLATIONS

© Rand Associates Consultancy Services Ltd

MODEL ANNUAL SERVICE SPECIFICATION, REPAIRS AND MAINTENANCE PARTICULAR TO ANY SOLAR THERMAL INSTALLATION,

001 The Provider shall have and maintain throughout the Contract Period registration with MCS or be a member of a class of persons approved for the time being by regulation.

002 The Provider shall undertake routine servicing, maintenance and repairs to solar thermal installations under this specification as follows:-

1) The solar thermal panel or tubes installed on or in roofs
2) The solar hydraulic pump and solar controller
3) Installation pipework
4) Solar hot water cylinders.

003 The Contract will include for the annual inspection and service as described and in accordance with the manufacturer's recommendations, replacement of all defective materials, parts and components and any additional visits, during or outside normal working hours, to maintain the whole installation in good and safe working order.

004 The Provider shall be responsible for defining the full nature of the annual inspection and service which together with the day to day response service, repairs and maintenance ordered from time to time by the Client's Representative and defined and undertaken by the Provider will ensure the safe operation at all times throughout the currency of the Contract, the Client's solar thermal panels or tubes installation and systems. The routine annual inspection and service shall be carried out in accordance with but not limited to, the recommendations of the manufacturer of the solar thermal panels or tubes installation and systems outlined hereafter.

	Solar Thermal Panels and Tubes General Requirements
1	Check general, condition of solar thermal panels or tubes installed on roof before commencing service.
2	Remove any debris, blown leaves etc that may hinder servicing and operation of solar thermal panel or tubes.
3	Cut off overhanging branches for non tree preservation order trees limiting operation of solar thermal panel or tubes.
4	Clean panels or tubes with iodised water
5	Check operation of solar hydraulic pump, overhaul pump if necessary, clean filters, change hydraulic fluids, adjust
6	Check operation of solar controller, adjust as necessary
7	Check installation pipework and cylinder/storage tank for any leaks
8	Check operation of solar thermal installation and adjust settings on controls, cylinder thermostat etc
9	Affix completed service label adjacent to cylinder.
10	Make good and clear away all debris to approved tip

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

005 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand name	Manufacturer's details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

AIR SOURCE HEAT PUMPS

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

MODEL ANNUAL SERVICE SPECIFICATION, REPAIRS AND MAINTENANCE PARTICULAR TO ANY AIR SOURCE HEAT PUMPS

001 The Provider shall have and maintain throughout the Contract Period registration with MCS or be a member of a class of persons approved for the time being by regulation.

002 The Provider shall undertake routine servicing, maintenance and repairs to air source heat pumps under this specification as follows:-

1) The air source heat pump
2) The inverter
3) Installation pipework and radiators
4) Cylinders.

003 The Contract will include for the annual inspection and service as described and in accordance with the manufacturer's recommendations, replacement of all defective materials, parts and components and any additional visits, during or outside normal working hours, to maintain the whole installation in good and safe working order.

004 The Provider shall be responsible for defining the full nature of the annual inspection and service which together with the day to day response service, repairs and maintenance ordered from time to time by the Client's Representative and defined and undertaken by the Provider will ensure the safe operation at all times throughout the currency of the Contract, the Client's air sourced heat pumps, installation and systems. The routine annual inspection and service shall be carried out in accordance with but not limited to, the recommendations of the manufacturer of the air source heat pump installation and systems outlined hereafter.

	Air Source Heat Pump General Requirements
1	Check general, condition of air source heat pump before commencing service.
2	Remove any debris, blown leaves etc that may hinder servicing and operation of air source heat pump.
3	Clean external surfaces of air source heat pump unit with iodised water.
4	Check operation of air source pump, overhaul pump if necessary, clean filters, change e filters, adjust
5	Check operation of inverter, adjust as necessary
6	Check installation pipework, radiators and cylinder/storage tank for any leaks
7	Check operation of installation and adjust settings on controls, cylinder thermostat etc
8	Affix completed service label adjacent to cylinder.
9	Make good and clear away all debris to approved tip

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

005 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand name	Manufacturer's details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

GROUND SOURCE HEAT PUMPS

© Rand Associates Consultancy Services Ltd

MODEL ANNUAL SERVICE SPECIFICATION, REPAIRS AND MAINTENANCE PARTICULAR TO ANY GROUND SOURCE HEAT PUMPS

001 The Provider shall have and maintain throughout the Contract Period registration with MCS or be a member of a class of persons approved for the time being by regulation.

002 The Provider shall undertake routine servicing, maintenance and repairs to ground source heat pumps under this specification as follows:-

1) The ground source heat pump
2) The inverter
3) Installation pipework and radiators
4) Cylinders.

003 The Contract will include for the annual inspection and service as described and in accordance with the manufacturer's recommendations, replacement of all defective materials, parts and components and any additional visits, during or outside normal working hours, to maintain the whole installation in good and safe working order.

004 The Provider shall be responsible for defining the full nature of the annual inspection and service which together with the day to day response service, repairs and maintenance ordered from time to time by the Client's Representative and defined and undertaken by the Provider will ensure the safe operation at all times throughout the currency of the Contract, the Client's ground source heat pumps, installation and systems. The routine annual inspection and service shall be carried out in accordance with but not limited to, the recommendations of the manufacturer of the ground source heat pump installation and systems outlined hereafter.

	Ground Source Heat Pump General Requirements
1	Check general, condition of ground source heat pump before commencing service.
2	Remove any debris, blown leaves etc that may hinder servicing and operation of ground source heat pump.
3	Clean external surfaces of ground source heat pump unit with iodised water.
4	Check operation of ground source pump, overhaul pump if necessary, clean filters, change e filters, adjust
5	Check operation of inverter, adjust as necessary
6	Check installation pipework, radiators and cylinder/storage tank for any leaks
7	Check operation of installation and adjust settings on controls, cylinder thermostat etc
8	Affix completed service label adjacent to cylinder.
9	Make good and clear away all debris to approved tip

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

005 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand name	Manufacturer's details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

MICRO-GENERATION INSTALLATIONS

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

AIR SOURCE HEAT PUMPS (Communal and Domestic)

Performance Specification

001 Where replacing heat sources in existing systems, where some elements will remain, the installation should be surveyed and observed in operation prior to specification. If distribution pipework and heat emitters also need to be upgraded for lower temperature, then space to do so shall be considered.

002 Heat losses through the fabric should be reduced where it is feasible and affordable to allow lower temperature systems to operate efficiently in line with the Consequential improvement requirements of Part L or better where necessary with low temperature systems.

General Requirements

003 The system design, components and installation must comply with current regulations, industry standards and best practice including the following:

- F-Gas Regulation (EU) No 517/2014 and any subsequent amendments;
- Local Supply Authority requirements;
- Statutory Instruments; Civil & Criminal Law;
- Water Bye Laws, WRAS Approval;
- Applicable Standards & Codes of Practice;
- Current IET Regulations;
- Current Health & Safety Regulations and guidance;
- Current Building Regulations; Parts A, B, E, L and Approved Document 7 (Materials and workmanship);
- CIBSE Guides (A, B, F, L and M) TM's and AM's ;
- HVCA Requirements and Best Practice;
- Manufacturer's Instructions;
- The Planning (Listed Buildings and Conservation Areas) Regulations;
- Institute of Plumbing design guidance;
- BSRIA recommendations and guidance;
- Non-domestic Building Services Compliance guide; and
- BB 101 Guidelines on ventilation, thermal comfort and indoor air quality in schools.

004 The Provider shall be responsible for:

1. Preparation of working and installation drawings and functional 'Description of Operation'. Undertake design calculations, as required, which should be available to the Employer's staff when requested.
2. Carrying out of all necessary surveys, with particular regard to asbestos and buried services, for all areas of the work. The Client's existing asbestos databases/surveys are to be consulted. Any additional Asbestos surveys, and/or subsequent removals and air tests, shall be carried out by the Client's approved consultants and contractors and information passed on to the Client's asbestos team.
3. Making any necessary applications to Local Authority Planning and Building Control, Historic England, Utility Network Operators/providers etc., as required by the scope of works being carried out.
4. Supply of all plant, equipment, materials and labour.
5. Taking delivery, unloading, handling, temporary storage and protection of all plant, equipment and materials.
6. Provision of all specialist plant, equipment and tools necessary for erection and testing.
7. Installing and connecting all plant and equipment and ensuring that all associated work such as builder's work, etc., is properly executed.
8. Demonstrating to the Clients representative that the complete installation is capable of the performance and method of operation specified as per the design.
9. Commissioning and testing the complete installation including making adjustments, calibrating, etc., as necessary and making arrangements to enable the client to be present during such commissioning and testing.

© Rand Associates Consultancy Services Ltd

10. Providing hard and electronic copies of Operating and Maintenance Instructions and complete sets of "as installed" drawings of the completed installation for the Client's record and inclusion in the Health and Safety file. Dependent upon the type of installation one framed schematic is to be installed in the plant room or provided to the Customer.
11. Instructing the Client's staff and maintenance term contractor in the operation of the installations.
12. Keeping the installations in full working order and making good of all defects or other faults during the specified periods.

005 All works shall be carried out by the Provider and/or an approved Subcontractor on their behalf. All operatives responsible for the works shall hold the current qualification/certification relevant to the task; evidence of this certification shall be held by the Provider for inspection by the Client's Representative prior to the commencement of the works. Any work not of acceptable standard shall be removed and replaced at no cost to the contract.

General Design - Suggested Design Options

006 Design should follow current Best Practices, particularly with regards to reducing emissions, energy and water use.

007 Design should enable easy access for operation and maintenance and make use of readily available plant/materials with a proven high level of quality and technical support. Plant that cannot be fully accessed in a safe manner, to maintain in line with manufacturer's technical data sheet, will not be accepted and shall be rectified at no cost to the contract.

008 Plant selection should be made in line with the Client's current maintenance strategies.

009 Other heat pump options should also be considered as alternatives to air source in the feasibility report including ground source heat pumps with open and closed loop, vertical borehole and horizontal options included.

010 All parts of the air source heat pump must be at least one metre from the property boundary.

011 Installations on pitched roofs are not permitted development.

012 If installed on a flat roof all parts of the air source heat pump must be at least one metre from the external edge of that roof with adequate safe access for maintenance, repairs and eventual replacement. Where communal domestic hot water supply is part of the design then a separate communal domestic hot water heat pump can be considered as an option.

Design Control Strategy:

013 The Provider shall provide a control strategy to adequately describe the control mechanisms for temperature, pressure and volumetric flow rates throughout the system. This control strategy/description of operation shall be included in the initial feasibility report and options appraisal.

Design Heating Load;

014 The provider shall summarize the loadings of the system under design conditions, to include as a minimum:

1. Total heating load (CIBSE Guide B1 - Heating load calculations and sizing methodology)
2. Total HWS load where applicable (CIBSE Guide B1 - Heating load calculations and sizing methodology)
3. Total cooling load where applicable (CIBSE Guide A and B3)
4. Distribution pipework losses
5. All other specified losses
6. Diversity factors applied [if any]
7. Proposed plant load

This summary shall form part of the initial feasibility report and options appraisal.

© Rand Associates Consultancy Services Ltd

Design Distribution Pipework:

015 The Provider shall provide details of the rationale and numbers used for economic pipe sizing:

Design Heating Temperatures:

016 The system shall be designed to achieve the following winter operative temperatures within one hour from cold/morning start; at an external temperature of -3 oC.

Offices	22oC
Lounge/Common Room/Dining Room	22oC
Bedrooms	20oC
Showers/Bathrooms	22oC
Hall/Corridor/Kitchen/ WC	18oC
Classrooms	20oC
Special Schools	23 oC
Sports Halls	17 oC

017 For more detailed advice on other school rooms see BB 101.

018 For any other room categories see CIBSE Guide B Table 1.1.

019 Copies of heat loss calculations for each type shall be supplied by the Provider, software printouts are acceptable providing they show data inputs and the calculations are relatively transparent.

020 Radiators and under floor heating circuits [heat emitters] shall be selected to match the heating load with the addition of a suitable margin; radiator outputs shall be calculated [if necessary] from the manufacturer's data based on the actual design mean water temperature/room temperature difference, the radiator schedule shall append the calculations.

021 Low surface temperature radiators should be used for areas where unaccompanied vulnerable persons or under 5's will be primarily using the rooms, such as nurseries and day centres.

Design Implementation Programme:

022 Propose an implementation programme identifying critical path events. Accurate and realistic estimates for the interruption of services shall be provided together with contingency plans for temporary service provision such as temporary boiler plant, electric heaters, electric hobs etc. Where design decisions may result in significant differences in the scope and or period of service down time, these shall be presented within the option appraisal process.

Air Source Heat Pump Heating & HWS Systems

Air Source Heat Pumps and Refrigerants:

023 If a heat pump system is retrofitted into an existing building that had a gas boiler system, the following factors have to be considered:

- The correct flow and return water temperatures have to be determined for the heat emitters (most likely to be radiators) at design conditions;
- If the flow temperature required is less than 55ºC for all emitters, no additional measures are needed for the refit;
- If the flow temperature required is higher than 55ºC for some of the emitters, they must be replaced by larger emitters, calculated in line with manufacturer's guidelines on outputs; and
- If the flow temperature required is greater than 65ºC for all emitters and it is not possible or not desired to carry out replacement, a high temperature heat pump will need to be used.

© Rand Associates Consultancy Services Ltd

024 For all installations the following shall be considered;

- Load – output required;
- Footprint – available space;
- Noise – location of plant area and the possibility of nuisance;
- Noise – current situation and Planning expectation;
- Costs – capital cost, maintenance costs, energy costs;
- Reliability – ease of maintenance, availability of spares, likelihood and impact of an interruption in service;
- Energy efficiency – Coefficient of performance (COP) through all periods of the year that the plant is planned to run;
- Energy impact of an air source heat pump's requirement to defrost its evaporator to remove ice build-up at low ambient temperatures; and
- Controllability – multiple heat source installations.

025 When calculating the output required the following factors shall be considered that may affect the output from the Heat Pump;

- Wind speed affecting fan on outdoor unit;
- Positioning in relation to the building (dead areas);
- Orientation and shading; and
- Defrost requirements

026 Heat Pump equipment shall generally be selected such that it obviates the need for new electricity supplies/sub-stations and is three phase where possible except for individual domestic sized heat pumps. Any electricity generated on site, through existing or proposed CHP, PV etc., should be considered for supplying the heat pumps where at all possible.

027 Electricity to the heat pumps shall be metered, as will the heat generated, to enable performance monitoring. Heat Pumps shall be of a manufacture, type/model and warranty period that is acceptable to Camden. The minimum acceptable COP shall be 2.9 (confirmed by the manufacturer's data sheets) with a minimum Seasonal Performance Factor (SPF) of 2.5.

028 The warranty period shall be for a minimum of 5 years for individual/domestic heat pumps and 10 years for commercial. Where more than one option is feasible the alternatives shall also be presented for consideration.

Refrigerants in Heat Pumps:

029 The choice of refrigerant shall give due consideration to current F-Gas Regulations as well as trends in the phasing out of ozone depleting and high global warming potential refrigerants. Refrigerants used shall:

- Carry low ozone depletion and global warming potential ratings;
- Have good thermodynamic and physical properties – the refrigerant should have good pressure/ temperature relationship;
- Consider safety – Refrigerants can pose health and safety risks due to flammability and toxicity;
- Be proven, low cost and available for the medium to long term; and
- Not become obsolete within the CIBSE Guide M/Manufacturer's expected life expectancy of the installation (unless due to unforeseen legislation changes).

030 The type and weight of the refrigerant charge shall be recorded in the log as well as a sticker on the plant close to the service valves.

Circulation Pumps:

031 Pump motors shall be three phase wherever practically possible. For Properties where only a single phase supply exists, the pumps shall be single phase.

032 Circulating heating pumps shall be single head sets [duty/standby] with non-return valves, flexible connections, strainers and isolating valves.

© Rand Associates Consultancy Services Ltd

033 They shall generally be mounted on inertia bases set on anti-vibration mats. System pumps designed to meet a variable system load shall generally be variable speed utilizing frequency converter control.

034 Single task pumps [e.g. shunt pumps, HWS return pumps] shall be fixed speed to provide a constant volume system flow.

035 Pump controls would form part of the option appraisal process and under these circumstances the designer shall provide:
- Estimates of the electrical energy savings against capital cost; and
- Capital cost savings/implications accrued elsewhere in the system design.

036 Secondary HWS bronze pumps shall be single head with non-return valves, strainers and isolating valves.

Pressurisation Unit and Expansion Vessels:

037 Generally pressurisation plant shall be installed to maintain system static pressure. This shall generally be a packaged unit and will include expansion vessel[s], twin pumps, pressure switches and controls, together with interlocks for remote alarm/monitoring. The pumps shall be sufficiently robust to be unaffected by periods of continuous running.

038 Where closed systems are newly introduced in heating installations that were previously open vent, the contractor shall decommission and remove any tanks/pipework that are obsolete and remove any dead end pipework from the water system. For closed systems an appropriate filling loop of a type approved by the local water authority shall be fitted.

039 The filling loop shall be complete with isolating and non-return valves, caps and steel braided flexible connector. The connector shall be disconnected and safely stored on site when not in use.

040 Calculations based on temperatures, pressures and system volume shall be made to size the necessary expansion and size/number of vessels. Vessels shall have a minimum of a 5 year warranty and have replaceable diaphragms wherever possible with access to replace.

041 The site water Risk Assessment and schematic drawing shall be updated on completion.

Hot Water Generation:

042 Where a communal HWS is proposed in for a retrofit project then the heat pump shall be a high temperature unit capable of maintaining any stored hot water at a target temperature of 60C.

043 In retrofit projects, where existing heating distribution and emitters are being retained, it will be necessary for a high temperature heat pump. If 60C design cannot be met efficiently, due to standing losses and peak use, then 55C may be considered with a 50C return, with an overnight pasteurisation cycle programmed in.

044 Where individual cylinders are installed within properties then there shall be an immersion back up installed and a target stored hot water temperature of 60C.

045 Primary supplies to HIU's should be such that any that in use for domestic hot water are capable of generating water to a temperature that will not allow Legionella proliferation. This shall be 50C at the furthest outlet from the HIU.

© Rand Associates Consultancy Services Ltd

Ventilation:

046 When selecting an installation site for heat pumps located indoors or outside the following shall be considered:

- The space around the unit allows for sufficient air circulation. There must be sufficient space for air passage and no obstructions around the air intake and the air exhaust.
- Any acoustic measures, such as enclosures, shall take into account manufacturer's recommendations.
- There is no danger of fire/explosion due to leakage of inflammable gas.
- The site must be free from the possibility of flammable gas leaking into a nearby space.
- The space around the unit shall be adequate for maintenance and servicing.

Plate Heat Exchangers [PHXs]:

047 Plate heat exchangers may be utilised on systems to separate circuits and consequently prevent the general distribution of fluids with higher than desirable temperatures and/or pressures.

048 For system efficiency purposes PHX's are not encouraged when full systems are replaced. As a practical measure they will be used as hydraulic separation to prevent the fouling of waterways in new plant where existing plant is to be replaced and the rest of the system retained. Stool pieces should be made up, and left on site, ready for easy removal of the PHX and circulation pump at a future date if the old part of the system is renewed.

049 PHXs shall generally be constructed of stainless steel and be demountable for maintenance purposes, the plates shall be fixed on purpose made freestanding frames. A spare set of plates and gaskets shall be available at each site.

050 Design on-off temperatures, pressures and flow rates shall be identified for both primary and secondary circuits. The pressure drop across each PHX shall be monitored and data logged to identify the appropriate maintenance interval.

Safety Systems:

051 Safety equipment shall be installed within the plant room in accordance with regulations, manufacturer's instructions/recommendations and good practice as before described.

052 Pressure relief valves shall be fitted where required by manufacturer's instructions and shall discharge at low level.

053 Three way drain cocks shall be fitted to each heat pump for the purposes of maintenance, these shall also discharge at low level.

054 Where applicable firefighting equipment of the appropriate type shall be installed in accordance with the individual plant room Fire Risk Assessment, regulatory requirement and best practice.

Noise Transmission:

055 The system shall be designed such that noise is not transmitted into the building fabric/Properties. Attention shall be given to the design such that noise transmission from circulating water and mechanical connection is eliminated or significantly reduced.

056 This shall generally be achieved by the use of mechanical isolation, spring hangers, flexible connectors, etc. Should sections of pipework subsequently demonstrate resonance with plant-generated frequencies they shall be re-routed or isolated as appropriate.

057 Where airborne noise/vibration is produced this must be at a level to comply with Local Authority requirements both internally and externally, the installation of acoustic louvres/baffles/enclosures may be considered. Where noise could impact on nearby residents, an independent acoustic survey before and after the works shall be included where required by the Local Authority Planning and/or Building Control.

© Rand Associates Consultancy Services Ltd

058 An acoustic surveyor should be appointed by the Provider to undertake a noise survey and assessment in compliance with applicable Standard methodology, to determine background sound levels applicable to the nearest sensitive receptors to the proposed development, for times when proposed plant is expected to operate. This shall include night-time as well as day and/or evening periods.

059 The acoustic survey will advise on plant noise rating limits that can be used for design purposes, consistent with local authority planning condition requirements.

060 These limits are expected to be referenced to the determined representative or minimum background sound levels, depending on the local authority requirements.

061 The ASHP installation shall be designed such that noise generated at peak duty is >10dB less than the night-time background noise level at both the nearest existing resident's window and the nearest proposed resident's window.

062 The installation shall be designed such that noise generated at peak duty is >10dB less than the daytime background noise level at both the nearest existing and proposed external amenity spaces.

063 All rotating and vibrating machinery (e.g. air source heat pumps) must be adequately vibration isolated so the plant does not propagate noticeable vibration into occupied spaces/Properties or give rise to unacceptable radiated noise levels.

064 Selection of vibration isolation will be such that vibration shall not:

1) exceed a Vibration Dose Value (VDV) of 0.1 m s-1.75 as given in the applicable Standard "Guide to evaluation of human exposure to vibration in buildings: Part 1 Vibration sources other than blasting" in any occupied space;
2) be of a magnitude that causes a noise rating (due to plant vibration) of NR10 to be exceed in any occupied space. NR is as defined in Annex B of the applicable Standard.

065 Suitable vibration isolation should be selected for individual plant items on a case by basis.

Heating Pipework (Plant room):

066 Heating, including HWS primaries, pipework shall be heavy grade steel to the applicable Standard; small diameter pipework shall be screwed with unions, 65mm Dia. and above shall be welded and flanged.

067 The system circulation pipework shall incorporate a de-aerator and dirt separator to assist in the removal of air and residual dirt. The primary [and secondary if utilizing PHXs] circulation system shall incorporate a sample cooler and dosing pot for the introduction of water treatment chemicals.

068 Where a PHX has been installed to protect the new installation, a side stream filtration unit should be considered for the old part of the system to prolong the life.

069 Temperature and pressure gauges shall be provided on the flow and return pipework for each heat pump, PHE and for the main flow & return.

070 Accessible AAV's shall be fitted at all high points on the pipework that could potentially airlock.

071 Installed pipework shall be cleaned and painted with two coats red oxide paint following a successful pressure test.

072 Heating valves including isolating, non-return, double regulating, etc. and strainers shall be bonze or cast iron rated at PN16.

© Rand Associates Consultancy Services Ltd

073 Isolating valves 65mm Dia. and above shall be shall be gate valves; 50mm Dia. and below shall be quarter turn ball type.

074 Commissioning sets shall consist of a double regulating valve and an orifice plate with binder points for flow measurement.

075 Valves shall be tagged and referenced in a valve schedule. Thermal bridging, through pipework support systems, should be avoided as far as possible and space should be allowed between pipework and surroundings to allow the full thickness of insulation required to be installed on the entire system.

Refrigeration Pipework:

076 The refrigerant pipework design shall be carried out in accordance with the requirements dictated by the manufacturers within their technical manuals, or advised by the distributor.

077 Refrigeration pipework shall be installed in sizes stipulated within the manufacturer's standard Technical Specification.

078 Pipework should follow the shortest practical route with the least number of bends.

079 The pipework shall generally be of refrigerant quality copper tubing to Part 2 of the applicable Standard. Pipework sizes ¼" and ½" shall be supplied as coils.

080 Pipework above this size shall be supplied as rigid lengths. Joints shall be kept to a minimum and bronze connections used where necessary complying to the applicable Standard.

081 It is important that systems are correctly pressure tested before charging with refrigerant to ensure strength and integrity and a leak free system. A pressure and leak test shall be carried out with Oxygen Free Nitrogen at a minimum of 1.3x the maximum working pressure.

082 The leak test pressure shall be held for at least one hour (or as applicable to the size of the system). Any fall in pressure, after due allowance for ambient temperature change, indicates a leak which should be traced.

083 If any leaks are present, the fault shall be corrected and the system shall be retested. Repairs, particularly involving brazing, shall not be carried out on any part of the system or component whilst under pressure.

084 The system shall be evacuated to lower than 500 microns to eliminate any moisture which may be present in the system before charging with refrigerant.

085 The whole of the installation shall be carried out by the Provider's approved and accredited refrigeration company whose engineers have the relevant stationary refrigeration and air conditioning (SRAC) systems (including heat pumps) qualifications.

Water Service Pipework:

086 Water service pipework shall generally be Table X or Y copper to applicable Standard with soldered joints; fittings shall be of the integral solder ring type with lead free solder, solder containing lead shall not be permitted on site.

087 The use of other jointing methods shall be agreed with the PM before use. 'No flame' jointing methods, such as Press-connect joints may be used where there are H&S concerns with hot works.

088 Galvanized steel pipework may be utilized in an existing situation where this is prevalent within the system, in this case screwed joints and flanges shall be used.

089 Temperature and pressure gauges shall be provided on the flow and return pipework for each hot water generator/calorifier and for the main flow & return.

© Rand Associates Consultancy Services Ltd

090 Valves including isolating, non-return, double regulating, etc. and strainers shall be bonze or gun metal rated at PN16.

091 Isolating valves shall be quarter turn ball type. Valves shall be tagged and referenced in a valve schedule.

092 Generally the use of dissimilar metals shall be avoided, where this is unavoidable, insulated fittings shall be used to prevent electrolytic action and consequent premature degradation of the pipework.

Insulation:

093 Thermal insulation shall not be applied until the installation has been pressure tested and any leaks remedied.

094 Insulation shall be applied to refrigeration, heating and hot/cold water service pipework and valves, flanges, unions etc. shall be insulated to the same thickness/insulation value as the surrounding pipework.

095 Refrigeration pipework shall have a flexible insulation system to prevent condensation and energy losses and include UV protection where installed externally.

096 Other insulation shall be pre-formed sectional bonded mineral fibre or phenolic foam and shall be applied such that the combination of thickness and thermal resistivity represents conformity to both regulation and best practice (Y50 enhanced standard). Insulation within the plant room shall be protected with aluminium cladding, as will any area prone to vermin and areas where there is public access such as garages, and communal areas; I.D. bands and directional arrows shall be fixed to the cladding in accordance with applicable Standard.

097 Plant such as PHX's, pumps etc. should have purpose made insulation fitted and items requiring regular maintenance, i.e. strainers, should have insulation that is easily removed and refitted such as jackets.

098 Buffer vessels, calorifiers and cylinders should be pre insulated where possible or insulated utilising duct insulation and aluminium tape to a thickness in accordance with the applicable Standard.

Electrical Installation:

099 Assess the suitability of the available electrical service for the proposed installation, if this proves to be unsuitable the contractor shall inform the employer and provide information as to the load requirements.

100 The electrical installation shall allow for any additional supplies, containment and wiring required for immersions, controls and stats etc.

101 On completion of the electrical installation works, and satisfactory testing, a signed and dated Electrical Installation Certificate together with a Schedule of Inspections and Test Results shall be completed and submitted to the Client's Representative.

Electrical Design Requirements:

102 Provide full design calculations for elements of the design undertaken as part of this responsibility.

103 These calculations shall include but shall not be limited to lighting calculations for the plant spaces to show that the photometric performance of the proposed luminaires will meet the design criteria, circuit calculations including current loading, cable calculations, earth fault loop impedance calculations, fault level calculations and all other calculations necessary for the contractor to show that any performance characteristics have been achieved. This shall also include loading (weight) calculations for the support and fixing of the electrical installation.

© Rand Associates Consultancy Services Ltd

System of Wiring:

104 All electrical components shall be selected for suitability to the voltage range, frequency, maximum current and IP rating for the installation. Wiring generally shall be carried out in LSF insulated solid copper core cable in accordance with current regulations as before described.

105 Wiring shall be surface run in either heavy gauge screwed galvanized steel conduit to class 4 or galvanized steel trunking.

106 Suitable local isolation shall be provided for each item of equipment installed.

107 The Provider shall arrange conduit and trunking, plumb where vertical, neatly parallel with other service runs and the building structure.

108 Final connections to equipment shall be made in suitable copper stranded flex, heat resistant flex is required in areas where standard insulation may be unduly affected by elevated temperatures and for connections to "hot" equipment, heat pumps, hot water calorifiers, pumps and the like.

109 Conductors connecting equipment to the local isolator shall be protected using a flexible conduit system.

Power Installation:

110 Supplies for power shall be installed [110V] for maintenance functions, a 24V supply shall also be provided for task lighting. A 24V hand lamp fitting complete with 20m of flex and 2 spare 24V lamps shall be provided. Small power wiring accessories shall be surface or trunking mounted with metal plates and steel accessory boxes.

Earth Installation:

111 Design, supply, install, test and commission a complete earth installation. The installation shall include all equipment, accessories, wiring, cable containment systems, fixings, supports and all other equipment necessary to form a complete and satisfactory installation.

112 All earth and bonding cables shall have green/yellow sheath colour. Wiring shall be tested to current regulations and the appropriate Installation certificate shall be produced and copy provided to the Client's Representative.

Controls:

113 Heating systems shall be controlled by a building energy management system or programmer with complexity relevant to plant being controlled.

114 The type used should be of a type that would be compatible with any remote monitoring system that is currently used and the Client's requirements.

115 A suitably located 1-8 hour override switch for the heating should be installed in Properties that are not in constant use (community centres, resident halls etc.), or with full BMS control, including holiday/out of normal hours timings.

116 This would ideally be located in the front office/reception and allow out of hours users to override the main programmer/BEMS system located in the plant room.

117 A cabinet style control panel shall be installed, generally wall mounted and constructed from powder coated steel.

© Rand Associates Consultancy Services Ltd

118 The panel shall be sized to comfortably house all of the necessary components to enable the complete and safe operation of the heat pumps and associated equipment.

119 The control panel shall be compartmentalised, one section shall accommodate the power requirements and equipment starters [if appropriate]; the other shall accommodate the controls systems.

120 MCB/RCD devices shall be mounted on the power compartment facia and shall be clearly marked up; an interrogation panel for the BEMS shall be mounted on the controls compartment facia.

121 Each item of equipment shall be identified on an engraved plate with a three-position indicator switch and indicator lamps. The three positions for the switch shall be "Hand – Off – Auto", the indicator lamps shall be green "Run" and red "Trip".

122 A lamp test facility shall be provided.

123 A 13amp RCCD protected socket outlet shall be provided in the controls section for future maintenance use.

Builders Works:

124 Holes in the building fabric resulting from the works shall be made good. Holes for pipework or cables shall be pilot drilled with the full diameter being cut from either side to prevent breakout.

125 The interior shall be made good to a fair faced plaster finish; exterior brickwork shall be toothed in and pointed to match existing.

126 Pipes passing through fire compartment walls or holes left due to removal of redundant services must be fire stopped to the same fire resistance as the original wall. Contractors shall use a fully certified, traceable system of fire-stopping products, which are approved by a relevant UK certification scheme, and CE marked, from a quality fire-stopping manufacturer.

127 Drainage and sumps shall be checked and cleared as required. Sump pumps shall be checked for condition and operation and replaced if necessary. Water produced during defrost cycles in winter should be taken into consideration so as it does not create a slipping hazard.

128 Carry out general clean-up of the plant room. Make minor repairs to damaged building fabric, seal and paint floors and plinths (including any newly created plinths).

Heating & HWS Systems – Distribution Pipework

Above Ground Heating Distribution Pipework:

129 Heating, including HWS primaries, pipework shall be heavy grade steel to the applicable Standard; small diameter pipework shall be screwed with unions, 65mm Dia. and above shall be welded and flanged.

130 Installed pipework shall be cleaned and painted with two coats red oxide paint. Heating valves including isolating, non-return, double regulating, etc. and strainers shall be bonze or cast iron rated at PN16.

131 Isolating valves 65mm Dia. and above shall be gate valves; 50mm Dia. and below shall be quarter turn ball type.

132 Commissioning sets shall consist of a double regulating valve and an orifice plate with binder points for flow measurement.

133 Suitable methods of protection for the pipework should be made in areas where it could be damaged, through vandalism or vehicular access, such as boxing in (after insulating) and barriers.

© Rand Associates Consultancy Services Ltd

Below Ground Heating Distribution Pipework:

134 Buried pipework shall be the pre-fabricated bonded type system employing a steel service pipe insulated with rigid polyurethane (PUR) foam, encapsulated within a high-density polyethylene (HDPE) outer casing, the complete unit being suitable for being installed underground.

135 All pipework installation shall be carried out in strict accordance with the following:
- Design and Installation shall be as detailed in the applicable Standard;
- Pre-insulated pipework manufacturer's specifications;
- All associated current European and applicable Standards,
- applicable Standard regarding surveillance systems

136 The complete installation shall be capable of performing within the specified design conditions for the duration of the systems design life. In addition, the system shall be fully designed and installed in accordance with the recommendations and instructions of the pipe component manufacturer.

137 The distribution of forces and pipe movement for the whole piping system shall be assessed and the system designed and installed accordingly.

138 Ensure that all maximum resultant stresses and movements are accounted for at all critical positions, under all loading conditions, in the proposed piping system. Critical positions shall include bends/changes in direction, branches and building entries.

139 Designs shall be provided for thermal expansion calculations for each part of the works in accordance with the applicable Standard.

140 Proposals should be made following liaison with all other utilities in the design and selection of routes.

141 The underground pipework system being installed shall be expected to have a service life of at least 30 years with a minimum 5-year guarantee against pipe and component failure due to manufacturing or installation defects.

Above Ground Hot Water Service Pipework:

142 Water service pipework shall generally be Table X or Y copper to applicable Standard with soldered joints; fittings shall be of the integral solder ring type with lead free solder, solder containing lead shall not be permitted on site.

143 Galvanized steel pipework may be utilized in an existing situation where this is prevalent within the system, in this case screwed joints and flanges shall be used.

144 Valves including isolating, non-return, double regulating, etc. and strainers shall be bonze or gun metal rated at PN16. Isolating valves shall be quarter turn ball type.

145 Generally the use of dissimilar metals shall be avoided, where this is unavoidable, insulated fittings shall be used to prevent electrolytic action and consequent premature degradation of the pipework.

146 Suitable methods of protection for the pipework should be made in areas where it could be damaged, through vandalism or vehicular access, such as boxing in and barriers (on completion of insulation).

Insulation (above and below ground pipework):

147 Thermal insulation (or band muffs and liquid foam insulation in the case of pre-insulated pipework) shall not be applied until the installation has been pressure tested and any leaks remedied.

© Rand Associates Consultancy Services Ltd

148 Insulation shall be applied to heating and hot/cold water service pipework and valves, flanges, unions etc. shall be insulated to the same thickness/insulation value as the surrounding pipework.

149 The insulation shall be pre-formed sectional bonded mineral fibre, phenolic foam, or proprietary liquid foam for buried pipe system joints, and shall be applied such that the combination of thickness and thermal resistivity represents conformity to both regulation and best practice (Y50 enhanced standard).

150 Any Insulation within the plant room shall be protected with aluminium cladding, as will any area prone to vermin and areas where there is public access such as garages, and communal areas.

151 I.D. bands and directional arrows shall be fixed to the cladding in accordance with applicable Standard. Insulation to external and buried pipework shall be waterproof.

Handover and Commissioning:

152 On completion of the works the whole system shall be commissioned by a competent person, flow rates, temperature and pressure differentials, electrical consumption, heat pump efficiencies, and all relevant commissioning data shall be recorded and shall append the commissioning certification.

153 Commissioning certificates and RHI requirement declarations will be issued on completion.

154 For air to water heat pumps, the heating pipework shall be cleaned with a suitable cleaning agent and neutralized/flushed as necessary; water service systems shall be sterilized.

155 Finally heating systems shall be dosed with an appropriate inhibitor/biocide in line with the heat pump and chemical manufacturer's recommendations.

156 The final dosing chemical and the final dosing level/percentage shall be entered in the log book with reference on site by way of a sticker on the plant.

157 Samples of mains water and heating system water shall be sent for independent testing, an electronic version of the subsequent report shall be submitted to the employer's representative.

158 The tests shall indicate a satisfactory result in all categories and shall indicate compliance with applicable Standard.

159 The following events shall be witnessed on site by the Client or the Client's Representative following notice of at least 5 days:
- Pressure tests;
- Heat tests;
- Balancing and commissioning; and
- Plant controls demonstration.

160 Where necessary the appropriate BEMS graphics pages shall be loaded onto the Client's "front end" supervisor station, and their operation shall be demonstrated to the satisfaction of the Client.

161 Provide 2 hard copies and one electronic version of the Operation and Maintenance Manual and record drawings for this project, the manual shall be specific to the project and shall list each individual item of equipment [including serial No's and date of manufacture/installation] with operational guidance and complete maintenance schedules for the life of the equipment.

162 The record drawings shall show plant room layouts and schematics, distribution pipework layouts within the building and archetypal flat layouts.

© Rand Associates Consultancy Services Ltd

163 A minimum of one copy of the schematic drawing for the heat pump installation shall be framed and mounted on the plant room wall in an accessible location together with the valve schedule.

164 Provide, in a compatible format, data for the Client's asset registers.

Firestopping

165 All holes in floors, walls and ceilings are to be fire-stopped to current Standards.

Client's current manufacturers/suppliers/products

166 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

MECHANICAL VENTILATION AND HEAT RECOVERY SYSTEM

Performance Specification

201 A Mechanical Ventilation System with Heat Recovery (MVHR) shall be supplied and installed suitable for installation in a utility room, kitchen, loft or void space. The system shall be suitable for use in small to mid-sized houses with kitchen plus up to five wet rooms.

202 The unit shall be capable of being either floor, wall or ceiling mounted.

203 It shall be a lightweight design capable of a single person installation weighing no greater than 14Kg with easy commissioning via a push button commissioning pad or App if specified.

204 The design of the unit shall be compact and small with the depth measurement protruding from a wall no more than 360mm.

205 The unit shall incorporate Ø125 extract and supply spigots to connect easily to Ø125mm round ducting.

206 The unit shall be fully insulated to provide excellent thermal and acoustic performance.

207 The MVHR shall incorporate low watt EC motor technology with sealed for life ball bearings designed to operate continuously at a pre-set background rate and deliver the lowest possible SFP. The EC motors shall power the centrifugal forward curved fan impellers and shall be suitable for temperatures of -20°C to +60°C.

208 The MVHR shall incorporate a high efficiency counter flow cell capable of up to 89% thermal efficiency. The heat exchanger shall be protected by high grade plug out/plug in ISO Coarse 45% (G3) filters on the supply and extract inlets, which shall be designed for quick and easy maintenance via the front access panel.

209 The unit shall be supplied complete with a 21.5mm drain connection. The MVHR shall be available in left- or right-hand configurations. The MVHR shall be supplied with a 5-year warranty which starts from the day of delivery.

210 The MVHR shall be SAP PCDB listed.

211 The MVHR shall be ErP grade A, CE Certified and manufactured in accordance with the applicable Standards.

Operation

212 The MVHR shall be installed in accordance with the manufacturers technical data sheet and approved drawings

213 The airflow shall meet the Building Regulations Approved Document F: Ventilation for System 4, BRE Digest 398 for Scotland and Technical Booklet K for Ireland.

214 The installation shall comply with the requirements of the Domestic Ventilation Compliance Guide 2010.

215 The MVHR shall extract stale, moisture-laden air from the wet rooms of the property (the kitchen, bathroom, ensuite and utility room). This moist air shall pass over the heat exchanger before being ducted to atmosphere. Simultaneously, filtered fresh air shall be drawn into the unit from outside and the energy from the extracted air shall be transferred to the new fresh air through the high efficiency heat exchange cell before being delivered through supply vents into the property to the habitable rooms (living room, bedrooms). The extracted air shall also be filtered by the ISO Coarse 45% (G3) high grade filter before it enters the heat exchange cell.

© Rand Associates Consultancy Services Ltd

216 The unit shall be capable of varying its speed and airflow rate by receiving signals from one of the following:
- Wireless remote control boost;
- Integral humidity tracking controls;

Switched live signal; or
- Manufacturer's App

217 When these signals are received, the fan shall change the airflow rate to either boost (manually via wireless remote control, S/L or App) or variably in direct proportion to the increase in humidity (automatic controls).

218 The unit shall allow the commissioning of the extract and supply airflows to have fully variable speed control to set the minimum and maximum rates.

Control Options

219 All units shall have the facility to change the speed and airflow rate according to one of the following control functions:

220 Integral Automatic Humidity Tracking Controls:

These shall be integral within the unit as standard, this function constantly monitors the humidity level, meaning no user intervention is required. As humidity rises and falls, the motor speed rises and falls automatically in direct correlation. This controls condensation quietly and efficiently, reducing the period of time when the unit operates on boost mode, saving energy.

221 Automatic And Integral Mechanical Bypass with No Reduction In Airflow:

An automatic and integral mechanical bypass with no reduction in airflow shall be incorporated as standard. The bypass damper shall operate automatically through a wax actuator allowing the air to route around the heat exchange cell to minimise overheating.

222 Remote control wireless boost switch:

Shall be supplied as standard with all units and shall clearly indicate the switch designation and mode of operation via the LED buttons such as summer bypass, frost, humidity and filter indicator.

223 Pre-wired and factory-fitted additional integrally mounted functions within the fan unit on the purpose made PCB by the unit manufacturer should include:

Switch live for remote switch boost
Frost protection: the facility shall monitor the temperature of the heat exchange cell. When the temperature falls below 5°C the system should automatically warm the cell to prevent the formation of frost

224 Manufacturer's App operated through a mobile device via a home wifi network or directly with the unit from a smart device. This shall allow the Customers to boost the airflow and provide status and filter indicators in addition to allowing the Provider and his approved installing Subcontractor to have access for quick and easy commissioning for airflow and default settings.

225 The App should display the following end user functions:
- Current status on/off;
- Indicate when the filters require changing;
- Indicate the following modes of operation when activated: frost, humidity, summer bypass, boost;
- Activate the boost;
- Alter the length of boost time;
- Enable/disable the summer bypass; and
- Access to instruction guides, FAQs and technical support.

© Rand Associates Consultancy Services Ltd

226 In addition to the above, the following functions shall be available to the Provider and his approved installing Subcontractor:

- Fully variable commissioning of the extract and supply airflow to meet regulations; and
- Alter the temperature at which the summer bypass activate.

Firestopping

227 All holes in floors, walls and ceilings are to be fire-stopped to current Standards.

Client's current manufacturers/suppliers/products

228 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

SOLAR HOT WATER GENERATION

Performance Specification

301 The solar system shall comprise of a fully integrated system which shall include but not limited to the calorifier(s), solar panels, pumps, all interconnecting pipe work (other than domestic hot water distribution and return pipework to and from sanitary / kitchen appliance) and controls.

302 The Provider shall install the primary flow and return pipework between calorifiers and to / from main LTHW boilers and also the domestic hot water distribution and secondary return pipework sanitary / kitchen appliances.

303 The entire solar collector system shall be designed and supplied by a specialist manufacturer and installed by a specialist Sub-contractor who has been approved by the Client's Representative.

304 Within any technical submittal presented, all key components shall be detailed, together with comprehensive system performance data to include, but not limited to the following:
- Graphical results of efficiency model for annual solar energy consumption as percentage of total consumption (in kWh); and
- Graphical results of maximum daily collector temperature (in oC) during a typical annual period.

305 Tabulated results of annual simulation to include:
- Collection surface area irradiation;
- Energy produced by collectors;
- Energy produced by collector loop;
- DHW heating energy supply;
- Solar system energy to hot water;
- Energy from auxiliary heating;
- Natural gas savings in m3;
- CO2 emissions avoided in kg CO2 Pa;
- DHW Solar Fraction in percentage; and
- System efficiency

306 The system is to include the following key components excluding all necessary ancillaries etc. which shall be included within the supplied system to ensure an efficient solar hot water generation system is formed to operate at an optimum efficiency, making the best use of the available Solar energy wherever possible:
- Flat solar collector panels;
- Installation assembly;
- Controller;
- All interconnecting pipes, collector flexi-pipes and connection sets;
- All sensor pockets;
- Solar Station;
- Auto air vent;
- Flush and Drain kit;
- Heating medium – Glycol Fluid mix;
- Energy meter incorporated in the controller;
- Cylinder temperature sensor;
- Solar radiation sensor;
- Pre assembled and sealed valves and safety assembly;
- Flow regulating valve to control the solar heating system during commissioning and operation;
- Integral check valves;
- Solar system expansion vessels; and
- Pipework, charging vessel and cylinder insulation

© Rand Associates Consultancy Services Ltd

307 The detailed solar specification for the main components is as follows:

Flat collector panels:

Made of a closed polycarbonate case construction to assures optimal heat storage, in combination with the high performance absorber and highest efficiency.

Solar panel specification (single flat plate panel

Length	2100 mm
Width	1200 mm
Height	109 mm
Gross surface area	2.52 m2
Aperture surface area	2.30 m2
Weight	43 kg
Collector case	highly stress-able polycarbonate case construction, tight all around due to deep-drawn manufacturing process of one piece, permanently corrosion resistant.
Glass cover	low-iron solar safety glass transmission τ = 91 %
Absorber	vacuum, high selectively coated full area absorber
Absorption	α = 95 %
Emission	ε = 5 %
Fluid capacity	1.46 l
Heat transfer medium	solar fluid and F2
Operation pressure	15 bars
Solar sensor sleeve	inside ø = 6 mm
Collector connection	1/2" MT flat sealing
Collector yield, per annum	over 525 kWh/m2a
Area of application	domestic water heating and heating support

308 **Regulation unit:**

For systems with dual DHW heating using solar panels and oil/gas fired boilers - with digital temperature display; energy statement; reloading suppression for the boiler; and heating up of the pre-heat stage and diagnostic system

For wall mounting with optional connection of heat meters and solar cell -the regulation unit offers terminals for the connection of a mains power supply, solar or bypass circuit pump, circulation pump for heating up the pre-heat stage, switched output for suppressing reheating by the boiler, thermostat function and central fault messages.
Function - The regulation unit starts the solar circuit pump for DHW as soon as the set differential temperature has been reached.

The electronic temperature limiter in the regulation unit is to limit the temperature inside the DHW cylinder. This device switches the solar circuit pump off when the set temperature is exceeded.

Measuring the temperature differential and entering the volume flow can create an energy statement.

Display of the hours run by the solar circuit pump.

309 **Controlling temperature sensors:**

As required to ensure the system operates efficiently and safely.

© Rand Associates Consultancy Services Ltd

310 **Solar – Station:**

This is to include:
- Pre assembled and sealed valves and safety assembly
- Flow regulating valve to control the solar heating system during commissioning and operation
- Integral check valves.

311 **Diaphragm expansion vessels:**

The diaphragm expansion vessel is to be a closed expansion vessel whose gas chamber (nitrogen filling) is separated from the liquid chamber (heat transfer medium) by a diaphragm and whose inlet pressure is subject to the system head.

312 **Miscellaneous Components:**

All other necessary components including:
- connection pipes;
- air separators;
- quick acting air vent valve;
- filling valves;
- plate heat exchangers;
- circulating pumps;
- safety valves; and
- solar manual filling pump

shall be supplied and install by the Provider and his approved subcontractor as necessary to allow a fully functional, efficient and safe system to operate in accordance with good industry standards.

Firestopping

313 All holes in floors, walls and ceilings are to be fire-stopped to current Standards.

Client's current manufacturers/suppliers/products

314 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

PACKAGE INTERCEPTOR MAINTENANCE

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

PACKAGE INTERCEPTOR MAINTENANCE

General Requirements

001 The package interceptor installations must be covered by a fully comprehensive type of Contract.

002 Detailed below are the specific Requirements. The Contract must therefore comprise of the following elements:

- Routine Maintenance
- Responsive Maintenance
- Out of Hours Emergency Works

003 Refer to the Specification, schedule of Works and to manufacturers requirements and recommendations for detailed guidance. Other guidance is available from the HSE, the Environment Agency, CIRIA and the BSI.

004 Pay particular attention to:

- The Building Regulations: Part H: Drainage and waste disposal.
- The Water Resources Act 1991 + 2009 Amendment.
- The Control of Pollution Act 1974 + 1989 Amendment.
- The Code of practice for the design of small sewage treatment works and cesspools.
- The applicable Standard: Small waste water treatment systems.
- PPG3:Housing 2000
- PPG04:Disposal of sewage where no mains drainage is available.
- CIRIA Technical Note 146:Septic tanks and small sewage treatment works.
- Code of Practice: Maintenance and Servicing of Small Wastewater Treatment Systems;
- Code of Practice: Guide to the desludging of sewage treatment systems;
- Code of Practice: Guide for users of sewage treatment systems;
- ISO 14001: Environmental Management Certificates

005 Ensure, with regard to the management of personnel, to pay particular attention to publications from the HSE, in particular:

- IND G 84: Leptospirosis
- IND G 197:Working with Sewage – the health hazards.
- IND G 198:Working with Sewage – the health hazards – a guide for Clients.
- IND G 174:Short guide to PPE at work regulations.

Asset Register

006 Ensure that all the asset registers supplied by the Client prior to the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

007 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each visit to undertake Routine Maintenance, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

008 Ensure that, following all visits to undertake Routine Maintenance, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

009 Provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff including his Specialist Subcontractors.

© Rand Associates Consultancy Services Ltd

Manufacturer's Requirements

010 Ensure that where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

011 Submit and agree within 20 working days of the award of the Contract a full annual Programme for all Works covering each element of the Routine Maintenance Works with the Client's Representative.

012 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

Permit to Work Certification

013 It is deemed necessary by the Client's Representative for working in confined spaces permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

Access

014 Ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

015 Ensure that all Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

016 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

Minor Repairs

017 Carry out, during testing, minor repairs such as tightening joints, replacement of clips, etc to achieve a pass status and make appliances safe to ensure compliance with the applicable Standard.

Routine Maintenance

018 The minimum requirements for Routine Maintenance are to be in accordance with the relevant equipment manufacturer's recommendations.

019 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

020 Carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

021 Include for the provision and application of all consumables within the Rates for this element of the Contract.

022 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the applicable Standards or equivalent.

© Rand Associates Consultancy Services Ltd

023 Routine Maintenance of sewage plant and must unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirements tabled below;

Item No.	Item	Frequency	Action	Notes
Personnel				
1.	Competencies		The Provider shall ensure that all personnel are suitably trained, experienced and competent to undertake the works, particularly in respect of working in confined spaces	
2.	Immunisation		Ensure that all personnel employed on the contract are immunised in accordance with the latest guidance and recommendations. All personnel must be immunised against hepatitis, poliomialitis, typhoid and tetanus.	Evidence of immunisation shall be provided upon request to the Client's Representative.
3.	Leptosprosis and other diseases		Ensure that all personnel are aware of the risk of leptospirosis and other potential diseases and wear appropriate clothing and take all necessary precautions.	
Manufacturer's Requirements				
4.	Log Book		Ensure access to the electronic log book. This shall contain plant design information, any EA discharge consents, operating and maintenance instructions and service records.	Ensure all service visits are recorded in the electronic log book with a summary of works carried out. Detailed service information shall be filled in the log book.
5.	Maintenance Instructions		Ensure that a set of the manufacturer's maintenance instructions are contained within the log book.	
6.	Operating Instructions		Ensure that there is a comprehensive set of operating instructions left with the user. These instructions shall contain specific reference to minimising water use, the use of cleaning materials, disinfectants and bleaches. Advise on the process for dealing with periods of inactivity (particularly at schools.	Ensure that simplified operating instructions, on laminated A4 card are left with the plant operator/ premises manager.

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
Desludging				
7.	Access	Annually	Examine access for vacuum tanker desludging vehicles.	Report any issues or problems.
8.	Desludging	Annually	Carry out safe silt/contaminant removal in accordance with manufacturer's technical data sheet. Where appropriate take care to leave 'crust' intake. Pay particular attention to EA's requirements to ensure that no contamination of water courses occurs. Disposal in accordance with waste transit and disposal regulations	
Package Interceptors				
9.	General	6 Monthly	Examine pipe lines, ensure they are clean. Undertake camera based visual integrity survey of the interceptors and their mechanical parts. Undertake maintenance in strict accordance with the manufacturer's technical data sheet . Examine and report condition. Examine for leakage.	
10.	Filters	6 Monthly	Assess and inspect condition of filters and clean as necessary	
11.	Mechanical Elements	6 Monthly	Examine and report condition.	
12.	Tank	6 Monthly	Assess the amount of collected contaminants (oil, fuel, silt etc) that may have collected	
13.	Supporting infrastructure	6 Monthly	Inspect manholes etc.	
14.	Safe warning devices	6 Monthly	Check operation of safe warning devices installed.	

© Rand Associates Consultancy Services Ltd

024 It is the Provider's responsibility to observe the on-going condition of the systems and installations with regard to safe and correct operation. The Provider must bring to the attention of the Client's Representative any specific areas where periodic checking, lubrication and adjustment exceeds normal provisions for the age and type of systems installed.

025 Ensure that on completion of the routine maintenance a detailed written report with photographic evidence on the condition and operation of the interceptors is provided identifying the following:

- Structural integrity and condition;
- Functional assessment;
- List of all immediate maintenance works required for compliance with Regulations;
- List of future maintenance works required for compliance with Regulations;
- Comprehensive cost breakdown of all identified immediate/future maintenance works required for compliance with Regulations;

Responsive Maintenance and Out of Hours Emergency Works

026 Attend to all call outs due to malfunction or breakdown.

027 Include for a call-out service to provide Responsive Maintenance and an Out of Hours Emergency Works Service. The Out of Hours Emergency Works service is deemed to extend the provision of Emergency Works to a 24 hour, 7 days a week, 365 (366 for a leap year) days per year basis.

028 Call outs for Responsive Maintenance and/or Out of Hours Emergency Works which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

029 Where Out of Hours Emergency Works are attended to for authorised cases of breakdowns, mis-use or vandalism, the Provider will be paid in accordance with the Rates detailed in the Price Framework.

Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works

Repairs, Replacements and Adjustments

030 Accept responsibility for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

031 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

032 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

033 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

Firestopping

034 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

035 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

PROPRIETARY REFUSE CHUTE MAINTENANCE

© Rand Associates Consultancy Services Ltd

PROPRIETARY REFUSE CHUTE MAINTENANCE

General Requirements

001 Ensure that they have read the whole of this Specification together with the Employer's Requirements and will be deemed to have included in his tendered Rates for full compliance.

002 Provide a Routine Maintenance and a Responsive Maintenance service including undertaking Emergency Works.

Asset Register

003 Ensure that all the asset registers supplied by the Employer prior to the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

004 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each maintenance service element, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

005 Ensure that, following all inspection visits, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

006 Provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff including his Specialist Subcontractors.

Manufacturer's Requirements

007 Where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

008 Submit and agree, within 20 working days of the award of the Contract a full annual Programme for all Works covering each element of the maintenance Works with the Client's Representative.

009 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

Permit to Work Certification

010 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Employer.

Access

011 Ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

012 Ensure that all Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005" and the requirements of the applicable Standards and INDG 367and EN360.

013 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

© Rand Associates Consultancy Services Ltd

Minor Repairs

014 Carry out, during testing, minor repairs necessary to ensure completeness and safety of equipment.

Routine Maintenance

015 Routine Maintenance including testing of refuse chute installations including hoppers must, unless otherwise Instructed by the Client's Representative, be carried out in accordance with the manufacturer's technical data sheet;

016 It is critical that all BSI Code of Practice are followed and adhered to.

017 Routine Maintenance and testing should also cover pre-use checks including the following:

- Pre-use checks should be tactile and visual;
- Correct PPE usage;
- Visual check undertaken in good light;
- Area of chute hopper is free of obstructions;
- Equipment log and ID plates to match refuse chute system details;

Refuse Chute Maintenance

Item No	Item	Frequency	Action	Notes
1	Visual Inspection and Testing of Fire Closure plate or Automatic chute fire door	12 monthly	In accordance with the requirements of the applicable Standard and in accordance with the manufacturer's technical data sheet. Check fusable links and test by activating to ensure fire closure plate or automatic fire door closes Replace fusable link if not compliant Clean and lubricate mechanism Service, repair and replace cable and springs as necessary	
2	Visual Inspection and Testing of Hoppers	12 monthly	In accordance with the applicable Standard, smoke resistant testing to the applicable Standard, self-closing in accordance with the applicable Standard and fire resistance to the applicable Standard. Test smoke seals and replace as necessary Check operation and repair hoppers Check interlocking failure operation at all levels and service Sanitise chutes Issue compliance certification	

© Rand Associates Consultancy Services Ltd

Responsive Maintenance

018 Attend to all call outs due to malfunction or breakdown during Normal Working Hours.

019 Call outs which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

Routine Maintenance and Responsive Maintenance

Repairs, Replacements and Adjustments

020 Accept responsibility for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

021 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

022 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

023 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework or the Schedule of Rates.

Firestopping

024 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

025 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

PUBLIC ADDRESS SYSTEMS SERVICING AND MAINTENANCE

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

PUBLIC ADDRESS SYSTEMS SERVICING AND MAINTENANCE

General Requirements

001 The public address systems and installations must be covered by a fully comprehensive type Contract.

002 Detailed below are the specific Requirements. The Contract must therefore comprise of the following elements:

- Routine Maintenance
- Responsive Maintenance
- Out of Hours Emergency Works

003 Refer to the Specification, schedule of Works and to manufacturer's requirements and recommendations for detailed guidance. Other guidance is available from the HSE, SAFed and the BSI.

004 Pay particular attention to:

- The Provision and Use of Work Equipment Regulations 1998 (PUWER)
- Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)
- IET Wiring Regulations
- Work equipment. Provision and Use of Work Equipment Regulations 1998. Guidance on the regulations L22 (Third Edition).
- Relevant applicable Standards

Asset Register

005 Ensure that all the asset registers supplied by the Client prior to the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

006 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each visit to undertake Routine Maintenance, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

007 Ensure that, following all visits to undertake Routine Maintenance, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

008 Provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff including his Specialist Subcontractors.

Manufacturer's Requirements

009 Where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

010 Submit and agree, must within 20 working days of the award of the Contract a full annual Programme for all Works covering each element of the Routine Maintenance Works with the Client's Representative.

011 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

© Rand Associates Consultancy Services Ltd

Permit to Work Certification

012 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

Access

013 Ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

014 Ensure that all Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

015 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

Minor Repairs

016 Carry out, during testing, minor repairs such as tightening joints, replacement of clips, etc to achieve a pass status and make appliances safe to ensure compliance with BSEN62305.

Routine Maintenance

017 The minimum requirements for Routine Maintenance are to be in accordance with the relevant equipment manufacturer's recommendations.

018 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

019 Carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

020 Include for the provision and application of all consumables within the Rates for this element of the Contract.

021 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the latest British Standards or equivalent.

022 Routine Maintenance of public address systems must unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirements tabled below;

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
1.	General	Annually	Clean equipment, check leads for breaks, splits and loose connections. Damp wipe leads to remove stickiness, check the lead and make repairs if necessary. Check all amplifier connections, knobs and sliders – tighten any that are loose and remove excess dust or foreign objects in those that are sticking. Ensure all leads are neatly coiled to avoid twisting and tangles.	Any evidence of tampering or damage should be recorded and reported to the Client's Representative.
2.	Audio Equipment	Annually	Clean the heads on audio cassette decks, cd and mini disc players.	Leave them to dry for a few minutes before attempting to use the player again.
3.	Speakers	Annually	Check all distribution field wiring and containment. Check to ensure that all leads are plugged in firmly into the correct connectors which should also be tightened if loose. Ensure that sound quality is good and free from crackling.	
4.	Microphones	Annually	Check the base of the microphone for bent or loose pins. Repair if necessary.	
5.	Canon Leads	Annually	Undo the screw at the side of the canon plug, carefully remove the centre from the casing to its limit (tugging and pulling may disconnect the wires) and check that the wires inside are firmly soldered. Any wire that has become detached should be re-soldered into place.	

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
6.	Jack & Phone Leads	Annually	Unscrew the casing and lower gently, check that the wires are firmly in place and re-solder if necessary.	
7.	Hearing Assistance Induction Loop	Annually	Check loop is active and is not suffering any 'Blind Spots'.	If any found report to Client's Representative.
8.	Power Supplies	Annually	Check mains power supplies. Examine all plugs and fuses for conditions.	
9.	System	Annually	Check system is fully operational.	Provide a signed engineer's report, one copy to be left in Site Log Book and a further copy to be submitted to the Client's Representative.

023 It is the Provider's responsibility to observe the on-going condition of the systems and installations with regard to safe and correct operation. The Provider must bring to the attention of the Client's Representative any specific areas where periodic checking, lubrication and adjustment exceeds normal provisions for the age and type of systems installed.

Responsive Maintenance and Out of Hours Emergency Works

024 Attend to all call outs due to malfunction or breakdown.

025 Include for a call-out service to provide Responsive Maintenance and an Out of Hours Emergency Works Service. The Out of Hours Emergency Works service is deemed to extend the provision of Emergency Works to a 24 hour, 7 days a week, 365 (366 for a leap year) days per year basis.

026 Call outs for Responsive Maintenance and/or Out of Hours Emergency Works which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

027 Where Out of Hours Emergency Works are attended to for authorised cases of breakdowns, mis-use or vandalism, the Provider will be paid in accordance with the Rates detailed in the Price Framework.

Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works

Repairs, Replacements and Adjustments

028 Accept responsibility for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

029 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

© Rand Associates Consultancy Services Ltd

030 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

031 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

Firestopping

032 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

033 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

PUMPS AND WATER BOOSTER SYSTEMS

© Rand Associates Consultancy Services Ltd

PUMPS AND WATER BOOSTER SYSTEMS - MAINTENANCE

GENERAL MATTERS

Routine Maintenance and Responsive Maintenance Generally

Routine Maintenance – Pumped and Water Booster System

001 The minimum requirements for Routine Maintenance are to be in accordance with the relevant equipment manufacturer's recommendations.

002 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the pumped and water booster systems in terms of their condition, age and type.

003 Carry out all necessary visits per annum for Routine Maintenance on all pumped and water booster systems.

004 Include for the provision of and application of all consumables within the Rates for this element of the Contract.

005 All Servicing and Maintenance necessary to ensure the operation of the pumped and water booster systems is to be in strict conformity with the latest applicable Standards or equivalent.

006 Routine Maintenance must also include for but not be limited to the following activities which are to be undertaken on each service visit:

Checking and Maintenance - Pumps	
Cleaning	• Clear out pump chamber/room of all debris and remove to tip
Inspections and Testing	• Visual inspection of pumps, replace any defective or worn components, tighten all screws, bolts and nuts, check condition of carrying handle/lifting eyes, chains, and wire ropes, check alignment of guide bars; • Check signals, tripping function, relays, lamps, fuses and contacts; • Megger test; • Check function, clean, adjust, replace or repair damaged level sensing equipment; • Check condition of the oil, drain and change oil as necessary; • Fault tracing as necessary; and • Clean out pipes, impeller and strainer.

© Rand Associates Consultancy Services Ltd

Checking and Maintenance - Boosted Water Systems	
Checklist of Operations to be undertaken 6 month and annual visits	
Undertake during normal working hours servicing of boosted water plant, pipework and equipment in plant room and break tank areas and check for signs of damage leaks and wear	
Check cold water storage tank(s) in roof space for signs of damage, leaks and wear.	
Service all pumps and other equipment as per manufacturer's technical data sheets and as follows;-	
1	Oil/grease and lubricate any Motors and moving parts
2	Clean all pump shafts
3	Check airways and clean
4	Repack and adjust gland as glands as required
5	Align Couplings
6	Oil/grease and lubricate Motors and bearings
7	Check and adjust drive belt, replace as required.
8	Run and test for overheating
9	Check and adjust guards
10	Clean all drains and tundishes
11	Clean pump and motor
12	Check operation of isolation valves and adjust or repack glands as required
13	Check operation of all ball valves, pipe work and isolation valves to break tanks and boosted supply to cold water storage tank in roof space, adjust or repack glands as required
14	Clean sump, Check pump and all adjust as required
15	Check linkages and moving parts to motorised valves
16	Leave all cases secure and clean
17	Check automatic air vents for operation and leaks
18	Check for fire hazards and blocked exits
19	Record all water meter reading and report to Client's Representative
20	Complete log sheets and report to Client's Representative
21	Check operation of Controls and Control Panel
22	Check and log insulation resistance reading of all electrical motors
23	Check and log running current, full load current and over load settings of all electrical motors.
24	Check all fuse ratings and compare with motor FLC and/or cable size
25	Check panel for loose connections
26	Check all terminal blocks for overheating or tracking
27	Check all fixed moving contactors for burning or pitting
28	Check all indicator and warning lamps are operational
29	Check that switch handles are firmly secured and that all access doors are closed and interlocking
30	Visually check coils etc for signs of over heating
31	Vacuum clean or dust panel
32	Visually check all interconnection cables for defects or damage
33	Check operation setting of all safety cut-out, adjust as necessary
34	Check operation setting of Timers and controllers and adjust as necessary
35	Check calibration of all sensors and controllers and recalibrate as necessary
36	Check operation of Electrical heaters and adjust as required
37	Sweep floor, wash down all surfaces, and remove all debris from sump pit
38	Clear rubbish from plant room
39	Leave plant in good working order and report all defects to Client's Representative immediately.
40	Complete electronic log book, electronic service sheets and provide report to Client's Representative.

007 It is the Provider's responsibility to observe the on-going condition of the pumped and water booster systems with regard to safe and correct operation. The Provider must bring to the attention of the Client's Representative any specific areas where periodic checking, lubrication and adjustment exceeds normal provisions for equipment of the age and type of installation.

© Rand Associates Consultancy Services Ltd

Responsive Maintenance and Out of Hours Emergency Works

008 Attend to all call outs due to malfunction or breakdown.

009 Include for a call-out service to provide Responsive Maintenance and an Out of Hours Emergency Works Service. The Out of Hours Emergency Works service is deemed to extend the provision of Emergency Works to a 24 hour, 7 days a week, 365 (366 for a leap year) days per year basis.

010 Call outs for Responsive Maintenance and/or Out of Hours Emergency Works which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

011 Where Out of Hours Emergency Works are attended to for authorised cases of breakdowns, mis-use or vandalism, the Provider will be paid in accordance with the Rates detailed in the Price Framework.

Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works

Repairs, Replacements and Adjustments

012 Accept responsibility for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

013 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

014 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

015 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

Client's current manufacturers/suppliers/products

016 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

BOOSTER PUMP SETS INSTALLATIONS – RENEWALS AND NEW INSTALLATIONS

General Requirements

101 This specification shall be read in conjunction with the Preliminaries, the other Communal Mechanical and Electrical Specifications, Appendices, Schedule of Rates and all other contract documentation.

102 Note that this is a performance specification. It shall be clearly understood that the Provider shall be fully responsible for the detailed design, supply, installation, testing, commissioning, demonstrating, documentation and leaving in a satisfactory working order following removal of existing plant (if any) the fully operational new booster pump sets installations as described within this specification or indicated on the project drawings.

103 It shall be the Providers responsibility to request and receive any information regarding asbestos on the site and subsequently satisfy their obligations by carrying out a Pre-construction asbestos survey.

Strip Out Works

104 Provide strip-out details as part of their initial enabling works identifying the extent of the strip out works, details regarding isolation, method of isolation, methods of safe removal and builders work including any fire stopping.

105 Following consideration and approval the strip out works will be completed as part of the first stage of the project.

Validation Reports

106 Ensure the existing systems are validated and reports are issued prior to the respective works being commenced.

107 Ensure that validation reports include the following:
- Condition of valves;
- Duty of booster service;
- Pipe sizes;
- Initial schematic;
- Commissioning duties for separate risers;
- Analysis against the applicable Standard demands.

Loss of Service

108 Shall be allowed, within their programme to carry out works with a loss of service if:
- The planned loss of service is anticipated to be no longer than 8 hours;
- The planned loss of services has prior agreement with both the Client and Customers;
- Notification letters to Customers have been issued at least 7 days before commencement of the Works;
- Written notifications are present in common areas to notify Provider's intentions;
- A vulnerable person's strategy is in place.

Temporary Supplies:

109 Depending upon the period of loss of service, strategy agreed with the Client and necessity the Provider may provide a method including for temporary supplies. As such, any temporary boosted service will only be accepted if this is capable of satisfying delivery in line with operational duty identified as part of the validation report investigations.

© Rand Associates Consultancy Services Ltd

Mains Cold Water

110 The mains cold water service shall not be adapted unless otherwise identified within separated sections of this specification.

111 If adaptation of the mains cold water is formed as part of the works or isolation, adaptation, or replacement of the mains cold water is required as part of the works it shall be the Providers responsibility to carry out the following;

- Notify the Client of isolation no less than 14 days prior to commencement;
- Ensure method and programme is compliant with temporary supplies clause;
- Ensure method and programme is compliant with vulnerable person's clause;
- Ensure RLO is contactable throughout loss of service;
- Notify residents and tenants no less than 7 days prior to commencement;
- Return to service is subsequent to necessary cleaning and flushing methods.

112 Return to service is after testing, NDT and curing as necessary.

General

113 Fabricate any necessary pipe work adaptations, and sterilise as required, before the shutdown of the supply to carry out the alteration as required to accommodate this document. This is to keep the shut down time to a minimum. All pipe work will be supported via a suitable manufactured support/bracketing system. Pipe work supports shall be arranged as near as possible to joints and the centre spacings shall not exceed those given elsewhere within this specification. Where there are 2 or more sizes of pipes, the common support spacings shall be those required by the smallest bore pipework.

114 Replace all the existing cold water main and cold water down service isolating valves that provide isolation to and from the existing cistern(s). The Provider must ensure the alignment of the pipe work so that no stresses are exerted on any equipment, and the pipe will be fully supported when disconnected at both ends.

115 All pipe work to and from the new GRP cistern(s) should have no dead legs or pockets that would contribute to the proliferation of bacteria and be in accordance with HSG (70).

116 For maintenance purposes the pipe work to the new GRP cistern(s) should be fitted in such a way, so that when one cistern is isolated, the second cistern will maintain the water storage supply.

117 All fittings, tube and materials that will transport water must be sterilised prior to use and transported to site in sterile bags.

118 Every effort must be made to ensure no water spillage occurs. The Provider will be held responsible for any damage caused.

119 On completion, the temporary supplies will be removed completely. There should be no dead legs or pockets that contribute to the proliferation of bacteria.

120 All copper tube shall conform to applicable Standard (under no circumstances is Table Z tube to be used).

121 All copper fittings shall be of the solder ring type in compliance with the applicable Standard. When adapting to a BSP fitting the correct appropriate fitting will be used. (IMI Yorkshire YP69 or YP69F or equal and approved).

122 All steel tube shall be heavy weight galvanised. Galvanised steel tube shall be joint only by screwed connections. Where it is necessary to change direction, pre-formed bends shall be used.

123 Dissimilar metals shall not be connected/mixed. This will protect against up or down stream galvanic action.

© Rand Associates Consultancy Services Ltd

124 Clean and remove any rust from existing retained barrel pipe work and paint with galvafroid paint.

125 Remove any verdigris and flux residue from any retained or newly installed copper pipe work.

126 The pipework layout for all services including the cistern(s) connection manifold(s), must comply with all relevant legislation, applicable Standards and Codes of Practice, with attention to the Water Supply (Water Fittings) Regulations 1999. Scaled, dimensioned working drawings must be submitted to the Client's Representative for his approval prior to the commencement of works on site.

Pipework

127 Pipework shall be formed of the following materials with corresponding fittings.

System	Size	Material	Fitting
MCWS	15 mm to 150mm	Copper Tube to R250 of the applicable Standard	Non-dezincifiable capillary type to the applicable Standard or Brazed or composite and push fit.
		Galvanised Steel Tube To applicable Standard	Galvanised steel
		Stainless Steel (316)	Screwed or welded Stainless steel (316)
		ABS	ABS

128 All pipework shall be installed in a neat and workmanlike manner including bends and sets required to produce an installation pleasing to the eye. Any pipework fitted in an unsightly manner shall be removed and refitted at the Provider's own expense.

129 All burred or cut ends of pipes shall be reamed out so that the full bore of the pipe is maintained.

130 Ensure that no dirt or obstruction enters the pipe system during the works. Adequate screw-in malleable iron plugs or caps must be fitted over open ends of pipe or plant or snap on plastic covers used.

Non-Metallic Fittings

131 Fittings shall comply with WRAS Materials Approval document.

Screwed Fittings

132 Where screwed tubes are used to connect booster, pump sets to existing pipework or for tappings, fittings shall be, stainless steel 316, brass or galvanised with taper threads to the applicable Standard.

133 Where it is specified that the pipework shall be joined by screwing, the Provider shall comply with the following instructions:

Screwed Joints on Steel Piping

Screwed joints shall be made in accordance with the provisions of the applicable Standard and shall be close threaded, pulled up tightly and made with approved jointing compound and long strand hemp.

134 After joints have been formed all surplus hemp shall be cut away and joint wiped clean.

© Rand Associates Consultancy Services Ltd

135 All reducing sockets shall be eccentric and arranged for drainage and / or venting.

136 All cuts from standard lengths shall be all burrs and swarf removed and the ends of the pipes shall be trimmed square.

137 Where pipes are held in vices, as when screwing, care shall be taken to ensure that the pipe surface is not damaged. Any pipework so damaged shall not be fitted.

138 Where tube is galvanised care shall be taken to ensure that threads are carefully cut so that the number of exposed threads is minimised.

Machine Crimped Fittings

Copper

139 Utilise Yorkshire XPress Copper fittings are manufactured from copper and copper alloy, incorporating a black EPDM Ethylene Propylene Diene Monomer O ring and a unique "Leak Before Press" (LBP) design.

140 Copper tube shall be to R250 and R290 applicableStandard in sizes 12 to 108mm.

141 XPress Copper fittings are approved to the new Kitemark certification applicable Standard for use with copper tube as specified above.

Stainless Steel

142 Utilise Yorkshire XPress Stainless Steel manufactured from 316L (1.4404) stainless steel.

143 12 to 54mm tube is manufactured from the applicable Standard DIN 1.4401 stainless steel strips conforming to Part 2 of the applicable Standard. Above 54mm the tube conforms to DVGW W541. The fittings incorporate a black EPDM (Ethylene Propylene Diene Monomer) O ring and a unique "Leak Before Press" (LBP) design.

Welded Fittings

144 Where screwed tubes are used to connect booster, pump sets to existing pipework or for tappings, fittings shall be suitable in all respects to the provisions of Part 1 of the applicable Standard and shall match tubes to Heavy Quality standard and complete with WRAS approval in stainless steel 316, brass or galvanised with taper threads to the applicable Standard:

Bends: All bends for use on 80mm bore tube and over shall be of the long radius elbow pattern with bevelled ends.

Tees and Branch Bends: All tees where shown on drawings on 80mm bore tube and over shall be of the equal or reducing pattern with bevelled ends.

145 Branch bends shall be used where the size of the branch is two pipe sizes smaller than the main.

146 End bends shall be used as the template for each particular weld and the main pipe shall be cut using an oxyacetylene torch. All cuts must be thoroughly cleaned prior to the welding of the bend.

147 All fittings shall be WRAS approved.

148 All welded tees, branches, reducers, etc., shall have bevelled mitred joints and be finished with a fillet weld of ample dimensions.

149 Seamless steel butt welding pipe fittings may be used. They shall be manufactured in accordance with Parts 1 and 2 of the applicable Standard, heavy grade.

© Rand Associates Consultancy Services Ltd

150 Care shall be taken to ensure that welding metal or flux does not project into the bore of the pipe.

151 All welds shall be of good clean metal free from slag and porosity, of even thickness and contour, well fused with the parent metal, annealed and hammered on completion and finished smooth.

152 The Client's Representative reserves the right to have cut for examination up to 2% of all welds made. The Provider shall remake the joints at no extra charge.

153 All sets, double sets and springs shall be formed on long lengths of tube with as large a radius as possible and shall be free from distortion.

Arc Welding

154 Is permitted to employ arc welding for the works or parts thereof.

155 Ensure that if using arc welding, he shall:

1. Ask the Client's Representative whether it is possible for an electricity supply to be made available. In certain circumstances, e.g. where the supply to a premise is subject to a maximum demand tariff it may be grossly inconvenient for the Employer to make a supply available and the Provider may, rather than bear the cost, prefer to use portable generating equipment.
2. Pay for all charges for electric current and provide all cable and separate meters
3. Provide any generating equipment and its operation that may be needed.

156 Operatives employed on arc welding shall hold a current Certificate of Competency as required by the welding institute.

Flanged Joints

157 All flanges shall be manufactured from mild steel to the applicable Standard appropriate to the pressure involved.

158 Flanges shall be machine faced, trimmed at the edges and spot faced for nuts. Bolt holes shall be drilled and not punched. Flanges on screwed work shall be screwed and subsequently expanded.

159 Flanges for welding shall be slip-on type. The tube shall finish 3 mm inside the bore and a sealing run shall be applied.

160 All flanged joints shall be flush and truly aligned and shall employ brass full faced Taylor's corrugated rings coated on both sides with an approved jointing compound. Nuts, bolts and washers shall be black mild steel or galvanised, as appropriate, and all bolts shall be of the correct length. Taylor's rings must be properly aligned, damaged rings shall not be fitted.

Capillary and Compression Fittings

161 Where copper tubing is utilized, all joints shall be made with capillary type fittings. Compression joints shall only be accepted on the prior approval of the Consulting Engineer.

162 All fittings shall be immune from dezincification and be of Yorkshire Imperial Metals Limited or Wednesbury Tube Company Limited integral ring, lead free, solder fittings, to comply with applicable Standard and "kite" marked, as Yorkshire potable. Fittings shall be engraved for the identification of solder. End feed fittings shall not be permitted.

163 Should capillary fittings be used then care must be taken in the choice of flux. Fluxes based upon phosphoric acid are acceptable such as "LaCo-P" marketed by A. Levermare and Company Limited, 40-44 The Broadway, Wimbledon, London SW19 1SQ, or "Phosphorite" marketed by Southern Cross Fluxes, 108 Addison House, Grove End Road, St. John's Wood, London NW8 or other equal and approved.

© Rand Associates Consultancy Services Ltd

164 The tube and fittings shall be cleaned with steel wool or sandpaper prior to the flux being applied.

165 When soldering, care must be taken not to overload the flux, due to the low thermal conductivity of stainless steel.

166 A gentle flame only shall be played on to as much of the fitting as possible.

167 Compression fittings for use with copper pipe shall be of an approved manipulative type manufactured in accordance with the provisions of the applicable Standard for proposed Type A or B which may be used. When making a joint with Type A fittings it will be necessary to apply a little more pressure when tightening the nut, otherwise no special precautions are required.

168 When using the manipulative Type B compression fitting the tube end shall be flared. The tube must be cut with a hacksaw owing to the degree of work hardening caused by the use of a wheel cutter, which can split the tube end. A coating of "Boss White" jointing compound shall be applied to the joint and fitting prior to fabrication.

169 All fittings shall have the approval of the British Waterworks Association.

Supports and Brackets

170 Supports and brackets to any pipework within the adjacent 8m shall be installed to be below spacings.

171 Vertical pipes shall be stayed with a minimum of one clip, spaced equally between the floor and ceiling etc. Flanges, sockets and unions shall, where installed, coincide with these positions so that the weight of the pipework is supported from the pipe clip.

172 Supports shall be provided adjacent to all valves installed in pipelines to prevent undue strain on the adjoining pipework and so that any component may be removed for maintenance, leaving the adjoining pipework adequately supported at the ends.

PIPE SIZE (mm)	HORIZONTAL (m)	VERTICAL (m)
15	1.5	2.0
20	1.5	2.0
25	1.5	2.5
32	1.5	2.5
40	2.0	3.0
50	2.0	3.0
65	2.0	3.5
80	2.0	3.5
100	2.7	3.5
125	4.0	4.5
150	4.5	5.4
200	5.0	5.5
250	5.5	5.7

173 Allow for providing all hanging rails for the adequate support of the pipework.

174 All clips and eyebolts shall be of the following sizes:

PIPE SIZE (mm)	Drop Rod Diameter (mm)	Pipe Clip Size (mm)	Bolts (mm)
Up to 25	6.0	25 x 3	6.4
32-50	8.0	32 x 3	9.5
65-100	10.0	40 x 3	12.7

© Rand Associates Consultancy Services Ltd

Thermal Insulation and Protection - Pipework

175 Pipework up to 8m from and to the booster pump set shall be considered as being replaced and re-insulated (insulated) as part of the works. Booster pump set stainless steel headers shall also be insulated (suction and discharge).

176 The minimum thickness of thermal insulating materials used for the protection of water pipes and fittings shall be as the applicable Standard. The thermal insulation will be expanded nitrile rubber elastomeric sectional insulation and shall achieve Class `O` rating as defined in Building Regulations or shall be made with preformed closed cell phenolic pipe sections, having a nominal density not less than 100 kg m^3 with a factory applied aluminium vapour barrier foil laminate. Insulation shall comply with the applicable Standard water vapour permeance, Building Regulations Class 'O' definition, Part L and TIMSA and HVAC guidance.

177 The insulation will be mitred and glued in accordance with the manufacturer's instructions (no gaps shall be left at the joints of the material). No taping of vapour barrier joints will be permitted without firstly gluing the insulation. When fixing pipes and fittings that are to be insulated, room shall be allowed for the required thickness of material to be applied.

178 Joints to be securely taped with minimum 50mm wide soft foil tape, the whole to be further retained in position by light gauge aluminium bands not less than 300mm centres.

179 Attention shall be made to taping to maintain the vapour barrier, particularly at termination points where exposed insulation membrane to be over taped and returned to piping surface. Furthermore, where insulation abuts pipe support, inserts into the insulation should be taped at all inserts to continue the vapour barrier.

180 Pipe support inserts shall be as per the insulation manufacturer's details.

181 Insulation thermal performance shall be, as a minimum 0.025 W/m·K (at 10°C mean). Insulation shall be approved by the Local Client Building Control and is covered by LABC Registered Detail RD certificate number EWW382 and carry a relevant warranty.

182 All insulation shall be CE Marked in accordance with the applicable Standard.

183 All pipework shall be bore cleaned, internally cleaned, flushed and tested prior to installation of insulation.

184 Pipework will be labelled with I.D. bands etc., and conform to all applicable Standards, Codes of Practice etc.

Removal of Existing Equipment.

Isolation

185 Allow for the prior assessment of all valves and forms of isolation within the booster pump plant room. Upon gaining a full understanding, a schedule of existing valves shall be provided to the Client and Client's Representative identifying operational condition and effectiveness.

186 Where valves are found to be either not operational or effectiveness not suitable for isolation the Provider shall also provide recommendations for alternative methods to disconnect the mains cold water and boosted / rising mains pipework.

Alternative Methods

187 Allow for the use of alternative methods of isolation should local existing isolation valves not be operational or effective.

© Rand Associates Consultancy Services Ltd

188 These include (but are not limited to) the following;
- Liquid nitrogen pipe ice plug freezing.
- Riser draining.

189 Provide a technical submittal with details of any specialist subcontractors and method statement for the above for Client's Representative approval prior to commencement.

Disconnection and Safe Removal

190 Following the electrical Providers safe isolation of electrical services and controls the Mechanical Provider shall isolate the cold water storage tank / break tank / mains cold water and the discharge boosted rising mains cold water, fully disconnect and safely remove the existing booster pump from site.

Adaptation of Existing Domestic Services

191 Allow for the isolation, disconnection, adaptation and re-provisioning of up to 8m (suction and discharge side) of existing pipework, fittings, fixings, valves, cocks and gauges and associated ancillaries in order to form a local cold water service pipework arrangement for connection to the new booster pump set and also to allow for all other elements of works identified within this specification.

192 Adaptation of the pipework will include removal of redundant pipework, fittings and fixings locally and replacement as identified within 0 of this specification.

Pads and Inertia Bases

193 Allow for existing bases to be broken out, dismantled where possible and safely removed from site. Where floor damage or otherwise has occurred, the Provider shall allow for concrete / screed repair works and local floor finish replacements.

Electrical Services

194 Ensure that the electrical supplies have been safely isolated prior to commencement of removal works. Refer to relevant electrical specification clauses for details of testing and tracing, isolation, disconnection, and removal works.

Installation of New Equipment.

195 The plumbing installation shall be installed in accordance with the Water Supply (Water Fittings) Regulations and current applicable Standards or equivalent.

196 All materials and fittings used shall be listed in the Water Fittings and Materials Directory published by the Water Regulations Advisory Scheme (WRAS).

Booster Pump Set - General

197 Allow for the provision, installation, testing and commissioning of a replacement booster pump which shall provide the following;

Domestic Water demand	Part G
General Water demand	the applicable Standard
Delivery pressure at index outlet	2 bar
Pipework losses calculation method	CIBSE
Pump operation	<85%
Break tank	>15 minute peak operation

198 Booster pump sets shall be of the duty / assist / standby arrangement in order to provide resilience to the building water supply. Under separate approval from the Client following a technical submittal and consult approval a duty / standby arrangement may be accepted.

© Rand Associates Consultancy Services Ltd

End Feed and In-Line Pump arrangements (separate cold water storage tank/break tank)

199 The unit will incorporate the following:
- WRAS Approved variable speed pump(s) controlled via intelligent variable speed drive control per pump;
- Separate variable speed drive per pump impeller;
- Pressure sensing transducers per inverter/pump;
- Integral control;
- Duty pump changeover timer;
- Hours run recorder;
- Pressure set point adjustment;
- Volt free contact alarm signal for BMS connection;
- Duty and standby Stainless-steel diaphragm accumulator vessel having taint-free butyl diaphragm, pressurized air charge, Schrader valve, isolating valve, drain valve and connection onto system discharge manifold, to allow for the system to go to sleep on no demand;
- Stacked stainless steel suction and discharge manifolds;
- Individual isolators for each pump – both mechanical and electrical;
- Anti-vibration mounts;
- Allowance for stainless steel (PN 2 x working pressure) flexible connection bellows.

200 Pumps to be vertical multistage free-standing centrifugal pumps having cast iron/stainless steel case sections, stainless steel impellers, stainless steel shaft, water lubricated rubber bearings, neck rings and tungsten carbide faced mechanical seal. Inverter soft start control, starting frequency limited by inverters.

201 Integral pre-wired single section multi-motor control panel in a sheet steel dust and damp protecting enclosure, with front access, necessary labels, and numbered terminals.

202 The inverters are to be designed to control the pumps on a duty/standby basis, monitoring the system pressure via transducers (one per pump/inverter) mounted on the pipeline. The inverters have inbuilt PID control allowing a set point pressure to be maintained by speeding the pumps up when the pressure falls below the set point and slowing them down when the pressure rises above the set point. During periods of inactivity, the inverter senses the stagnant pressure and reduces the speed of the pump and after a time delay puts the pumps into sleep mode, waking up when the demand picks up and returning to PID control.

203 Controls to provide duty pump rotation, pump activation (spin up) every 24 hrs, Local hand/off operation facility. Duty and standby pressure transducers with auto switch over, soft pressure start, and fault/alarm data storage.

204 The following are to be incorporated in the control panel:
- Door interlocked isolator;
- Single/Three Phase MCBs for the Pump supplies;
- Single Pole MCB for the controls supply;
- System Common Fail Indication via volt free contacts and fascia mounted lamp;
- Pump Isolator switches.

205 Assembly to include stainless steel manifolds on both suction and discharge, handed as required. Provide flexible couplings and all connections to and from pump set. Complete with anti-vibration mountings. Pressure rated to suit elevated pressures. Each pump has separate isolation and non-return valves. A further isolation valve to be installed on the manifold inlet and outlet with pressure gauge to be installed on the discharge manifold.

206 Combined isolation/drain valves to be fitted to each pressure vessel to allow removal/replacement and draining without shutting down the pump set.

207 The pumps, valves, and manifolds together with the control panel and pressure vessel(s) will be fully assembled on a common base frame with all interconnecting wiring between electrical components carried out by the manufacturer.

© Rand Associates Consultancy Services Ltd

208 The unit shall be commissioned by the manufacturer.

209 Additionally, to the installation but adjacent, a DP sensor with out of range values shall be connected to local impulse sensor tappings and provide a fault signal for isolation through either control panel interface or electrical isolation during the event of a building water service riser leak situation.

Submersible Pump with Tank.

210 A GRP pre-insulated type tank with reinforced base, screened vent, overflow and warning pipe (if applicable), shall support a minimum of 15minute water demand for the entire building at peak demand conditions and shall be in fully installed in accordance with the Water Regulations Advisory Scheme (WRAS).

211 The unit will incorporate the following:
- WRAS Approved stainless steel submersible pump(s) controlled via variable speed inverter drive(s);
- High flow 1" Solenoid controlled inlet valve;
- Stainless steel pump control vessel;
- Low water level protection and tank fill controlled via level probe system;
- Common fault alarm volt-free contact;
- Digital system status display;
- Integrated Control Centre for power and controls wiring and distribution;
- WRAS Approval for the complete system

212 Tank overflow shall discharge to the plant room gulley or suitable tundish with HepvO waterless trap.

213 A minimum of two pumps shall be submersed.

214 Pumps to be close-coupled submersible multistage pumps with stainless steel casing, stainless steel impellers, stainless steel shaft, water lubricated rubber bearings, neck rings and double mechanical seal (Carbon/Ceramic/NBR).

215 Integral pre-wired control compartment within IP54 rated protecting enclosure, with front access, necessary labels and numbered terminals.

216 The inverter[s] are to be designed to control the pumps on a [duty/standby - duty/assist] basis (if twin pump configuration), monitoring the system pressure via transducers (one per pump/inverter) mounted on the pipeline. The inverters have inbuilt PID control allowing a set point pressure to be maintained by speeding the pumps up when the pressure falls below the set point and slowing them down when the pressure rises above the set point. During periods of inactivity, the inverter senses the stagnant pressure and reduces the speed of the pump and after a time delay puts the pumps into sleep mode, waking up when the demand picks up and returning to PID control.

217 The pump sets, valves, and pipe manifold together with the control panel and pressure vessel will be fully assembled with all interconnecting wiring between electrical components carried out by the manufacturer.

218 The unit shall be commissioned by the manufacturer.

219 Additionally, to the installation but adjacent, a DP sensor with out of range values shall be connected to local impulse sensor tappings and provide a fault signal for isolation through either control panel interface or electrical isolation during the event of a building water service riser leak situation.

Category 5 Situations

220 Where necessary a submersible booster pump set may be required for a Category 5 situation. Where this is necessary, the tank shall be constructed from 25mm insulated GRP with a cat 5 AB air gap and ½" equilibrium inlet float valve. Such an installation will require bunding and additional elements of work not included within this specification.

© Rand Associates Consultancy Services Ltd

Bases

221 Allow for the provision, installation, testing and commissioning where necessary to comply with manufacturer's installation guidance or to negate reverberation through floors new pump bases.

222 Pump bases where necessary shall be formed of open or captive spring anti-vibration mounts, secured to the structural and supporting concrete filled, zinc plated carbon steel framed, reinforced casements.

223 Pump fixings shall be a minimum of 150mm from the edge of inertia bases upon final installation.

Valves and Cocks and Gauges

224 All valves where appropriate shall comply with the water supply Client requirements and be WRAS approved.

225 Cocks and valves are to be fitted so that valves occur on the dead side of the system after isolating items of plant.

226 All plant shall have individual drain cocks. All valves shall be fitted so they are readily accessible for operation and maintenance.

227 Ensure the following valves are installed as part of the replacement booster pump works as a minimum:
- Suction side isolation valve;
- Suction side drain cock;
- Suction side pressure gauge;
- Suction side pressure sensor isolated impulse tapping for DP connection;
- Spare ½" plugged tapping;
- Discharge side isolation valve;
- Discharge side drain cock;
- Discharge side pressure gauge;
- Spare ½" plugged tapping;
- Pressure Reducing Valve;
- Discharge side pressure sensor isolated impulse tapping for DP connection;
- Replacement of any anti-hammer / arrestor valve (within riser);
- Installation of anti-hammer / arrestor valve (if not currently installed).

Note: All Valves to be nominal pressure rating of 2x working pressure.

Holding Down Bolts

228 Provide all clips, brackets, foundation bolts, fixing bolts, assembly bolts, including nuts, anchor plates, washers and plugs, etcetera, for all pumps and local pipework. Should adjacent or modified pipework be poorly supported it will be the Providers responsibility to provide additional / replacement support thus protecting the new equipment.

229 Ferrous bolts and nuts and other fixing devices exposed to atmospheric corrosion must be stainless steel or similarly treated to prevent corrosion. Alternatively, the component may be manufactured from brass or gun-metal provided it is of sufficient strength.

230 Alignment and levelling of plant shall be the responsibility of the Provider who shall provide any shims necessary.

Anti-Vibrations Mounts

231 All pumps shall be provided with integral anti-vibration mountings/brackets to prevent the transmission of noise and vibration through the structure and connecting pipework and/or ducting. Any pump dematting or additional anti-reverberation plates required will be allowed for and detailed by the Provider at commencement of the Works for review by the Client's Representative.

© Rand Associates Consultancy Services Ltd

Guards

232 All pump motor guards shall be constructed or positioned to be as safe as if they were guarded in such a manner as to fully comply with statutory requirements. Should the pump motor be separated from the impeller and casing suitable guarding shall be provided and secured.

Nameplates

233 All plant and equipment shall be provided with nameplates bearing the maker's name, shop or reference number, size, type, testing and working pressures, and any other relevant particulars, and shall also be provided with clearly engraved white traffolyte identification labels.

Oil and Grease

234 Ensure that all plant is correctly oiled and greased, valve and pump glands packed, as recommended by the manufacturers, before putting the equipment into operation and for maintaining the same until Practical Completion of the whole of works.

235 Spare material for maintenance shall be provided for twelve months' operation of the plant by the Provider.

Valve Labels

236 All isolating and regulating valves shall be provided with a white ivorine disc, with a black engraved number.

237 Connect a label to each valve prior to completion to correspond to the position indicated on the valve chart diagram.

Testing and Commissioning

238 Testing and commissioning of booster pump set and connected MCWS systems shall be carried out by a specialist organisation employed by the Provider.

239 Testing, commissioning and reporting shall be carried out to satisfy the requirements of current version of the relevant Building Regulations such as Part L, Part G and the Water Supply (Water Fittings) Regulations.

Commissioning of Systems

240 Systems are properly commissioned by ensuring that all the equipment is supplying the designed capacity and that air and water flow rates are proportionally balanced in accordance with the designed basis.

241 Ensure if iit s found necessary to 'force or fool' the system into design operation by either release of water via a testing / flushing tapping or via controls adjustments to have allowed for such tappings and additional control works within the tender return.

242 Subsequent to the completion of the balancing and regulating of the water systems, the systems will be offered for demonstration and witnessing to the Client's Representative.

Test Instruments

243 Test measurements will be carried out using test instruments recognised throughout the industry as being suitable for the purpose.

244 The commissioning engineer shall maintain an onsite copy of the calibration certificates for all those test instruments which are required to have evidence of calibration.

245 Test instruments will be used only within the duration of their calibration certificates and copies of the certificates will be made available upon request.

© Rand Associates Consultancy Services Ltd

Commissioning Standards

246 Systems shall be balanced and regulated in accordance with the current editions of the CIBSE Commissioning Code Series W (2010) and using the techniques contained in the BSRIA Applications Guide BG2/2010 (Commissioning Water Systems)

Commissioning of Specialist Equipment

247 The commissioning of the major items of plant and equipment will be carried out by the specialist suppliers commissioning staff in conjunction with the Providers commissioning team.

248 The commissioning of the automatic control system and any integration to building monitoring systems will be carried out by the specialist suppliers commissioning staff in conjunction with the Providers commissioning team and the Client's Representative and include for any head end Graphics User Interface (GUI) updates.

249 All including the Client's Representative shall be in attendance during these works.

250 Specialist equipment manufacturers / suppliers shall commission and demonstrate the proper operation of their plant and equipment.

251 The specialists will use their own in-house procedures to commission their plant and equipment, copies of which will be issued under separate cover by the Provider.

252 Copies of the specialist manufacturers /suppliers commissioning reports shall be included in the contract operating and maintenance manual.

253 Ensure that his commissioning engineer provides the necessary attendances in order that the specialist supplier may carry out their commissioning procedures.

Commissioning Report Forms

254 The originals of all commissioning report forms shall be retained by the Provider who will provide copies to the Principal Provider and for the contract operating and maintenance manual.

255 The Providers commissioning engineer shall complete all commissioning report forms collating them on a system by system basis and indexing the system sets. The forms are to be retained on site, in a clean condition, in a dedicated folder.

256 Each set of commissioning report forms comprising the documented "as commissioned" state of the system shall also include the following:

1. Pump performance curves with operational duties identified;
2. Supplementary sheets recording validity tests as used to determine existing, design and commissioning duties;
3. A diagrammatic representation of the system showing test point locations and identifications as denoted on the accompanying forms;

257 Each commissioning report form will show the type and identification of all of the test instruments used to measure the test results shown on the sheet.

258 A set of instrument certification covering the range of instruments used to carry out the commissioning work shall also be included within the documentation.

© Rand Associates Consultancy Services Ltd

Firestopping

259 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

260 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

SERVICE GENERATORS SERVICING AND MAINTENANCE

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

SERVICE GENERATORS SERVICING AND MAINTENANCE

General Requirements

001 Shall be deemed to have read the whole of this Specification together with the Client's Requirements' and will be deemed to have included in his tendered Rates for full compliance.

002 Provide a Routine Maintenance, Responsive Maintenance and Out of Hours Emergency service (24 hour, 365 (366 for a leap year) days per annum).

Asset Register

003 Ensure that all the asset registers supplied by the Client prior to the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

004 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each visit to undertake Routine Maintenance, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

005 Ensure that, following all visits to undertake Routine Maintenance, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

006 Provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff including his Specialist Subcontractors.

Manufacturer's Requirements

007 Where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

008 Submit and agree within 20 working days of the award of the Contract a full annual Programme for all Works covering each element of the Routine Maintenance Works with the Client's Representative.

009 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

Permit to Work Certification

010 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

Access

011 Ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

012 All Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

013 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

© Rand Associates Consultancy Services Ltd

Minor Repairs

014 During testing, carry out minor repairs such as tightening joints, replacement of clips, etc to achieve a pass status and make appliances safe to ensure compliance with the applicable Standard.

Routine Maintenance

015 The minimum requirements for Routine Maintenance are to be in accordance with the relevant equipment manufacturer's recommendations.

016 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

017 Carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

018 Include for the provision and application of all consumables within the Rates for this element of the Contract.

019 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the latest applicable Standards or equivalent.

020 Routine Maintenance must unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirements tabled below;

© Rand Associates Consultancy Services Ltd

Service Generator Maintenance

Item No	Item	Frequency	Action	Notes
1	Visual Inspection	750 hours	1. Check for fuel leaks. 2. Check for oil leaks. 3. Check for water leaks. 4. Examine fuel supply pipework. 5. Check for unusual noises, smells or vibrations. 6. Examine room ventilation. 7. Ensure adequate room ventilation. 8. Ensure clear access to plant and equipment.	
2	Acoustic Enclosures	750 hours	1. Check enclosure doors 2. Check enclosure ventilation 3. Check insulation	
3A	Engine	751 hours	1. Take oil sample – analyse 2. Change engine oil filters 3. Change engine oil 4. Change sponge inserts in breather system 5. Clean or change air filters 6. Check and reset valve clearances 7. Change rocker box gaskets 8. Check engine coolant level 9. Check anti-freeze concentration 10. Check engine loom wiring 11. Check engine performance using gas analyser 12. Clean oil drip drays 13. Remove all contaminated products from site 14. Safely dispose of all contaminated products	
3B	Engine	3,000 hours	1. Check injector sprays 2. Adjust injector pressure setting as necessary	
3C	Engine	6,000 hours	1. Remove, clean and refit magnetic pick up 2. Check and adjust engine ignition timing 3. Test operation of protective devices: Oil pressure low, High engine temperature	

© Rand Associates Consultancy Services Ltd

Service Generator Maintenance (Cont'd)

Item No	Item	Frequency	Action	Notes
3D	Engine	12,000 hours	1. Carry out boroscope inspection of engine. 2. Carry out compression test 3. Replace all coolant hoses 4. Remove and clean all heat exchanges 5. Remove and clean all exhaust drain systems 6. Replace engine coolant and antifreeze 7. Check engine stability and governor settings	
3E	Engine	24,000 hours	1. Replace cylinder head (with service exchange) 2. Replace valves 3. Replace liner seals 4. Replace engine water pump 5. Replace 'O' rings 6. Inspect lagging – replace if required 7. Replace sump joint	
3F	Engine	48,000 hours	1. Replace main bearings 2. Replace big end bearings 3. Replace thrust bearings 4. Replace front and rear crankshafts seals 5. Replace piston sets	
4A	Generator	750 hours	1. Clean and visually inspect	
4B	Generator	30,000 hours	1. Replace generator bearings 2. Replace seals 3. Blow out windings	
4C	Generator	60,000 hours	1. Replace generator (with service exchange)	
5A	Control Panel and Metering (for Generators operating in parallel of mains)	750 hours	1. Check telephone line and communications 2. Visually inspect control wiring 3. Check time schedules 4. Check kW output 5. Record kW and hours run readings 6. Test synchronising – adjust as necessary	
5B	Control Panel and Metering (for Generators operating in parallel of mains)	6,000 hours	1. Carry out tests to demonstrate G59 compliance: • Loss of mains • Over voltage • Under voltage • Reverse power	

© Rand Associates Consultancy Services Ltd

Service Generator Maintenance (Cont'd)

Item No	Item	Frequency	Action	Notes
6A	Control Panel and Metering (for Generators operating independent of mains)	750 hours	1. Visually inspect control wiring 2. Check time schedules 3. Record kW and hours run readings	
6B	Control Panel and Metering (for Generators operating independent of mains)	6,000 hours	1. Visually inspect control wiring 2. Test safety controls: • Loss of mains • Over voltage • Under voltage • Over current	
7A	Batteries	750 hours	1. Test cells for emf and specific gravity 2. "Top up" electrolyte with distilled water 3. Clean any corrosive from terminals etc. and apply grease 4. Check for faulty cells by means of battery discharge tester 5. Reconnect	
7B	Batteries	24,000 hours	1. Replace battery	
8	Exhaust System	750 hours	1. Visually inspect exhaust system 2. Visually inspect mounting brackets 3. Visually inspect silencer 4. Drain condensate traps 5. Inspect insulation	
9A	Fuel Oil Day Service Tanks	750 hours	1. Visually inspect mountings 2. Examine for leaks 3. Examine contents gauges 4. Examine pipework 5. Check transfer pumps	
9B	Fuel Oil Day Service Tanks	6,000 hours	1. Drain and clean	
9C	Fuel Oil Storage Tanks	3,000 hours	1. Examine contents gauge 2. Test alarms 3. Test valves for free travel 4. Examine vent pipes =- ensure they are clean	

© Rand Associates Consultancy Services Ltd

Service Generator Maintenance (Cont'd)

Item No	Item	Frequency	Action	Notes
9D	Fuel Oil Storage Tanks	6,000 hours	1. Drain off sludge 2. Clean and examine filters	
9E	Fuel Oil Storage Tanks	24,000 hours	1. Drain and clean 2. Check heater units	
10A	Air Start Equipment	750 hours	1. Examine oil levels 2. Drain air receivers 3. Ensure safety guards are in position and secure 4. Examine pipework for leaks	
10B	Air Start Equipment	6,000 hours	1. Examine compressor 2. Examine drives for alignment 3. Examine securing bolts 4. Examine anti-vibration mountings 5. Clean and examine valves 6. Test safety valves 7. Examine pressure gauges 8. Examine control devices	
10C	Air Start Equipment	12,000 hours	1. Examine air receivers 2. Test safety valves 3. Examine valves and pipework 4. Clean out air receiver and drain cock	

© Rand Associates Consultancy Services Ltd

Out of Hours Emergency Works

021 Attend to all call outs due to malfunction or breakdown.

022 Include for a call-out service to provide Responsive Maintenance and an Out of Hours Emergency Works Service. The Out of Hours Emergency Works service is deemed to extend the provision of Emergency Works to a 24 hour, 7 days a week, 365 (366 for a leap year) days per year basis.

023 Call outs for Responsive Maintenance and/or Out of Hours Emergency Works which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

024 Where Out of Hours Emergency Works are attended to for authorised cases of breakdowns, mis-use or vandalism, the Provider will be paid in accordance with the Rates detailed in the Price Framework.

Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works

Repairs, Replacements and Adjustments

025 Take responsibility for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

026 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

027 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

028 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

Firestopping

029 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

030 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

SEWAGE PLANT MAINTENANCE

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

SEWAGE PLANT MAINTENANCE

General Requirements

001 The sewage plant system and installation must be covered by a fully comprehensive type of Contract.

002 Detailed below are the specific Requirements. The Contract must therefore comprise of the following elements:

- Routine Maintenance
- Responsive Maintenance
- Out of Hours Emergency Works

003 Refer to the Specification, schedule of Works and to manufacturers requirements and recommendations for detailed guidance. Other guidance is available from the HSE, the Environment Agency, CIRIA and the BSI.

004 Pay particular attention to:

- The Building Regulations: Part H: Drainage and waste disposal.
- The Water Resources Act 1991 + 2009 Amendment.
- The Control of Pollution Act 1974 + 1989 Amendment.
- Code of practice for the design of small sewage treatment works and cesspools.
- Applicable Standard: Small waste water treatment systems.
- PPG04:Disposal of sewage where no mains drainage is available.
- CIRIA Technical Note 146:Septic tanks and small sewage treatment works.
- Code of Practice: Maintenance and Servicing of Small Wastewater Treatment Systems;
- Code of Practice: Guide to the desludging of sewage treatment systems;
- Code of Practice: Guide for users of sewage treatment systems;
- ISO 14001: Environmental Management Certificates

005 With regard to the management of personnel, the Provider shall pay particular attention to publications from the HSE, in particular:

- IND G 84: Leptospirosis
- IND G 197:Working with Sewage – the health hazards.
- IND G 198:Working with Sewage – the health hazards – a guide for Clients.
- IND G 174:Short guide to PPE at work regulations.

Asset Register

006 Ensure that all the asset registers supplied by the Client prior to the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

007 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each visit to undertake Routine Maintenance, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

008 Ensure that, following all visits to undertake Routine Maintenance, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

009 Provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff including his Specialist Subcontractors.

© Rand Associates Consultancy Services Ltd

Manufacturer's Requirements

010 Where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

011 Submit and agree, within 20 working days of the award of the Contract a full annual Programme for all Works covering each element of the Routine Maintenance Works with the Client's Representative.

012 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

Permit to Work Certification

013 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

Access

014 Ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

015 Ensure that all Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

016 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

Minor Repairs

017 Carry out, during testing, minor repairs such as tightening joints, replacement of clips, etc to achieve a pass status and make appliances safe to ensure compliance with BSEN62305.

Routine Maintenance

018 The minimum requirements for Routine Maintenance are to be in accordance with the relevant equipment manufacturer's recommendations.

019 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

020 Carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

021 Include for the provision and application of all consumables within the Rates for this element of the Contract.

022 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the latest applicable Standards or equivalent.

© Rand Associates Consultancy Services Ltd

023 Routine Maintenance of sewage plant and must unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirements tabled below;

Item No.	Item	Frequency	Action	Notes
Personnel				
1.	Competencies		The Provider shall ensure that all personnel are suitably trained, experienced and competent to undertake the works.	
2.	Immunisation		Ensure that all personnel employed on the contract are immunised in accordance with the latest guidance and recommendations. All personnel must be immunised against hepatitis, poliomialitis, typhoid and tetanus.	Evidence of immunisation shall be provided upon request to the Client's Representative.
3.	Leptosprosis and other diseases		Ensure that all personnel are aware of the risk of leptospirosis and other potential diseases and wear appropriate clothing and take all necessary precautions.	
Manufacturer's Requirements				
4.	Log Book		Ensure the presence of a log book. This shall contain plant design information, any EA discharge consents, operating and maintenance instructions and service records.	Ensure all service visits are recorded in the log book with a summary of works carried out. Detailed service sheets shall be filled in the log book.
5.	Maintenance Instructions		Ensure that a set of the manufacturer's maintenance instructions are contained within the log book.	
6.	Operating Instructions		Ensure that there is a comprehensive set of operating instructions left with the user. These instructions shall contain specific reference to minimising water use, the use of cleaning materials, disinfectants and bleaches. Advise on the process for dealing with periods of inactivity (particularly at schools.	Ensure that simplified operating instructions, on laminated A4 card are left with the plant operator/ premises manager.

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
Desludging				
7.	Access	Annually	Examine access for desludging vehicles.	Report any issues or problems.
8.	Desludging	Annually	Desludge in accordance with manufacturer's recommendations. Where appropriate take care to leave 'crust' intake. Pay particular attention to EA's requirements to ensure that no contamination of water courses occurs.	
Filters Beds and Settlement Tanks				
9.	General	6 Monthly	Examine pipe lines, ensure they are clean.	
10.	Screens	6 Monthly	Clean screens and clean buckets.	
11.	Penstock Valves etc.,	6 Monthly	Test valves. Examine penstocks, track, floating arms, screws and slides, lubricate as necessary.	
12.	Brickwork	6 Monthly	Examine for leakages and damage, report condition.	
13.	Filter Beds	6 Monthly	Examine for excess build up of grease and detergent. Examine, renew media as necessary.	
14.	Sediment Tanks	6 Monthly	Clear deposits.	
15.	Filtering Media	6 Monthly	Clean, renew as necessary.	
16.	Distribution Tanks	6 Monthly	Examine and report condition.	
Circular Biological Filters				
17.	General	6 Monthly	Examine and report condition.	
18.	Rotary Distributors	6 Monthly	Brush through arms. Clean and examine sparge holes. Lubricate ratchets and pawls. Lubricate top and bottom bearings on central columns. Test distributor arms, adjust levels as necessary. Examine catch chambers and seals.	Report general mechanical condition.

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
19.	Filter Beds	6 Monthly	Examine for excess build up of grease and detergent. Examine, renew media as necessary.	
20.	Filtering Media	6 Monthly	Clean, renew as necessary.	
Packaged Systems				
21.	General	6 Monthly	Undertake maintenance in strict accordance with the manufacturer's requirements and recommendations. Examine and report condition. Examine for leakage.	
22.	Mechanical Elements	6 Monthly	Examine and report condition.	
Rotary Biological Contactors				
23.	Mechanical Elements	6 Monthly	Examine gearboxes and drives. Examine shafts and bearings. Lubricate as necessary. Report condition.	
Pumps				
24.	Pumps (general)	6 Monthly	Clean and examine pumps, glands and valves. Examine and lubricate as necessary. Test for leaks. Test pipe and valve connections for leaks. Examine pipework and connections for damage and leaks. Examine hangers and supports adjacent to pump, adjust as necessary. Test pump failure alarms. Test run by opening test valve. Ensure pump operates at design duty.	

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
Compressors				
25.	Air Compressors (general)	6 Monthly	Examine pulleys and keys. Examine drives for alignment. Examine securing bolts, tighten as necessary. Examine anti-vibration mountings. Test safety valves. Examine pressure gauges. Examine and service filters. Lubricate as necessary. Clean cooler fins and fan blades. Examine fixed and flexible pipework, couplings and connectors for damage and leaks. Examine hangers and supports. Test valves for free travel.	
Electrical Installation				
26.	General	Annually	Visually examine electrical installation. Examine flexible cables for wear, fraying braid and brittle insulation. Ensure that wiring terminal connections are sound. Examine and test electrical bonding and earthing.	
27.	Motors, Gearboxes and drives	6 Monthly	Clean as necessary, remove surplus oil and grease. Examine securing bolts and anti-vibration mountings, secure as necessary. Examine pulleys and keys. Examine alignment between motor and load. Test bearings for play.	
28.	Controls	6 Monthly	Examine control equipment, starters and isolating switches, clean and test pilot lights. Examine pressure sensors, switches and controls, adjust as necessary. Test plant failure alarms.	
29.	Periodic Electrical Inspection	3 Yearly	Carry out a periodic inspection with associated circuit tests in accordance with the requirements of the specification and IET Wiring regulations	

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
Grease Traps				
30.	Grease Traps	Monthly	Examine and report condition. Examine for excess build up of grease and detergent. Clean all grease traps.	

024 It is the Provider's responsibility to observe the on-going condition of the systems and installations with regard to safe and correct operation. The Provider must bring to the attention of the Client's Representative any specific areas where periodic checking, lubrication and adjustment exceeds normal provisions for the age and type of systems installed.

Responsive Maintenance and Out of Hours Emergency Works

025 Attend to all call outs due to malfunction or breakdown.

026 The Provider must include for a call-out service to provide Responsive Maintenance and an Out of Hours Emergency Works Service. The Out of Hours Emergency Works service is deemed to extend the provision of Emergency Works to a 24 hour, 7 days a week, 365 (366 for a leap year) days per year basis.

027 Call outs for Responsive Maintenance and/or Out of Hours Emergency Works which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

028 Where Out of Hours Emergency Works are attended to for authorised cases of breakdowns, mis-use or vandalism, the Provider will be paid in accordance with the Rates detailed in the Price Framework.

Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works

Repairs, Replacements and Adjustments

029 The Provider is responsible for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

030 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

031 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

032 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

Firestopping

033 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

034 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

SPA POOL MAINTENANCE

© Rand Associates Consultancy Services Ltd

SPA POOL MAINTENANCE

INTRODUCTION

001 The purpose of this Specification is to set out the requirements for the undertaking of spa pool maintenance to ensure the Client's compliance with all current regulations to identify any potential hazards and control risk to a reasonable level for those who might operate, use or maintain the spa pool.

SCOPE OF SERVICES

Initial Site Survey

002 At the commencement of the Contract and in accordance with a programme to be agreed with the Client's Representative, the Provider shall carry out an initial survey of all spa pool sites and the spa pool equipment contained therein.

003 Verify the location of the spa pool sites in relation to the information (maps, addresses etc) provided by the Client and make any appropriate amendments in the event of discrepancies after prior consultation and agreement with the Client's Representative.

004 Prepare and provide a photographic record of each spa pool showing clearly the location and associated equipment. The photographic record shall be in digital format to be agreed with the Client's Representative.

005 Provide for each spa pool a written report on the nature of each site, the facilities provided and a listing of all equipment contained therein.

Contravention Report

006 Immediately following the initial survey of each spa pool site, the Provider shall provide to the Client's Representative a written report giving full details of any spa pool and associated equipment that contravenes any current Health and Safety and Disability Discrimination and Occupier's Liability legislation, relevant BS/EN standards, local authority by-law requirements and any guidance and or Codes of Practice issued by, but not limited to the Health and Safety Executive, Health Protection Agency, the Royal Society for the Prevention of Accidents and the Pool Water Advisory Group.

007 The report shall be fully detailed and include recommendations (including budget costings) for the remedying of any contraventions so found.

Initial Inspection/Risk Assessment

008 Carry out an Initial Inspection/Risk Assessment in accordance with the current editions of the publications, "Management of Spa Pools: Controlling the Risks of Infection"; "Control of substances hazardous to health (5th edition). The Control of Substances Hazardous to Health Regulations 2002 (as amended). Approved Code of Practice and guidance, L5"; "Legionnaires' disease. The Control of legionella bacteria in water systems. Approved Code of Practice and guidance L8 (4th ed.)" and the health and care guidelines "HTM 2040", of all spa pool sites and associated equipment and provide separate written reports for each site to the Client's Representative.

009 Carry out an Initial Risk Assessment of all spa pools also in recognition of the Client's responsibilities under the Management of Health and Safety at Work Regulations 1992 (and as amended) and the Control of Substances Hazardous to Health Regulations. The Risk Assessment shall comprise a microbiological risk assessment of the spa pool covering controls in place for the prevention of Legionella bacteria and an examination of all items of equipment together with the immediately adjacent/surrounding areas in order to identify any potential hazards and assist to control risk to a reasonable level for those who might use or maintain the spa pools and associated equipment.

© Rand Associates Consultancy Services Ltd

010 Typical hazards to consider will be, but are not limited to:
- Infectious agents in the spa pool;
- Exposure to infectious agents in aerosol created by agitated water;
- Physical risks such as drowning, slips, trips, falls and entrapment associated with equipment use;
- Use of equipment by persons with special needs;
- Damaged or faulty equipment and or surrounding safety surface;
- Inadequate, poor or no levels of supervision;
- Older equipment/use of second-hand equipment; and
- Poor maintenance and inspection regimes.

011 When conducting the Risk Assessment the Provider must consider the individual nature of the premises and spa pool(s). To help achieve this it is important that an up to date schematic diagram is produced and kept of the spa pool(s) and associated plant. This can be used to decide which parts of the system pose a risk.

012 The following general factors need to be considered when carrying out the Risk Assessment:
- Source of the supply water, e.g. from the mains supply or an alternative;
- Possible sources of contamination of the supply water, e.g. biofilms within the pipework, bathers, soil, grass, leaves (latter for spa pools sited outdoors);
- Normal characteristics of the spa pool;
- Users or people who will be working on or near the spa pool;
- Measures chosen to adequately control exposure, including the use of personal protective equipment; and
- Unusual, but reasonably foreseeable, operating conditions, e.g. breakdowns.

013 The following specific factors also need to be additionally considered:
- Type, design, size, approximate water capacity and designed bather load of the spa pool(s);
- Type of dosing equipment, including the use of automatic controls, pump arrangements, balance tanks, air blowers etc;
- Piping arrangements and construction materials;
- Type of filtration system;
- Heat source and design temperature;
- Chemical dosing equipment, including chemical separation, personal protective equipment, chemical storage arrangements e.g. bunding;
- Type of treatment to control microbiological activity, e.g. chlorine;
- Method used to control pH, e.g. sodium bisuphite;
- Cleaning regime, ease of cleaning, what is cleaned, how and when; and
- Testing regime, including microbiological tests, the frequency of tests, operating parameters, action required when results are outside parameters.

014 The written Risk Assessments should be linked to other health and safety records, for example but not limited to:
- Up-to-date plan of the spa pool and plant;
- Description of the correct and safe operation of the spa pool;
- Precautions to take when running/using the spa pool;
- Checks required to ensure the spa pool is working safely; and
- Remedial action required in the event the spa pool is not running safely.

015 Risk Assessments shall be spa pool specific and provided to the Client's Representative upon completion of the Risk Assessment for each spa pool.

Profile of Spa Pool Life Expectancies

016 Provide an initial profile of spa pools and associated equipment indicating condition and life expectancy. Any equipment that requires immediate repair is to be identified and the nature of the repairs needed is to be stated together with budget costings. Any equipment that is beyond repair should also be identified and, if it is considered appropriate for the equipment to be replaced, then the Provider shall so advise together with budget costs for replacement or removal and make good if not to be replaced.

© Rand Associates Consultancy Services Ltd

Advice on Replacement of Spa Pools

017 Provide following each of the quarterly and annual inspections, a detailed report to the Client's Representative on any spa pools and items associated equipment that it is considered should be replaced, together with the reasons/justification for proposing their replacement and associated budget costs.

Remedial Works to Spa Pools

018 Following the initial survey/inspection the Provider shall identify any repairs/minor replacements that are considered necessary to any spa pool and/or item of associated equipment. The reports provided to the Client's Representative shall be site specific and include full details of all repair work/minor replacements necessary together with budget costs.

Annual and Quarterly Inspections

019 Carry out annually, at intervals not exceeding 12 months, a major inspection and risk assessment of all spa pools and associated equipment, to be conducted by a competent person. It should be noted that the Routine Inspections will be carried out by the Client's own directly employed staff.

020 Carry out a quarterly inspection of all spa pools and associated equipment.

021 Inspections shall be carried out in conformity with the guidance given in the publications, "Management of Spa Pools: Controlling the Risks of Infection"; "Control of substances hazardous to health (5th edition). The Control of Substances Hazardous to Health Regulations 2002 (as amended). Approved Code of Practice and guidance, L5"; "Legionnaires' disease. The Control of legionella bacteria in water systems. Approved Code of Practice and guidance L8 (4th ed.)" and the health and care guidelines "HTM 2040", and site specific written reports shall be provided to the Client's Representative together with detailed recommendations (including budget costings) for any repair/maintenance/ replacement work required.

022 The database referred to under Clause 023-025 below shall be updated as necessary following each inspection including though not limited to the updating of photographic records if appropriate.

Provide and Maintain Database

023 Set up and maintain a computerised database holding all key information relating to each spa pool including the linking in of photographic records.

024 Update the database following each inspection as referred to in Clause 023 above and make available the updated database to the Client within 14 days of the annual and or quarterly inspection.

025 The format of the database shall be agreed between the Provider and the Client's Representative prior to award of Contract.

Web Based Risk Assessment Management System

026 Provide an Electronic Monitoring System or Log Book for holding all Risk Assessments.

027 The electronic monitoring system shall be designed in such a way that the Client can be involved in the planning, management and view its compliance with any relevant regulations.

028 The system shall be web based with varying levels of access as the Client is a multi-site, multi-Client organisation.

029 The system must allow for customisation for each particular site and building contained within the Contract. Occasionally this may include new buildings as and when the requirement arises.

© Rand Associates Consultancy Services Ltd

030 Non-conformity assessments shall generate a non-conformity report that shall be immediately available to the Client's Representative.

031 The Client will require the ability within the program to create notes or messages within the system; this must be recorded within the software audit trail.

032 All non-conformities raised must be clearly identified as a visual warning on the date of the fault and be summarised in visual alert facility and report.

033 The central electronic logbook will have communication software with the ability to 'synchronize' any assessments put in by each remote site, consultants, contractors or into the central database.

034 The logbook software must include a user password security system, which can be set up by the administrator of the software and allow or restrict access as applicable.

035 The Client will require the Provider to supply a support contract to include:-
- Telephone support during normal office hours Monday to Friday;
- Future upgrades and training for use of software as a result of improvements or changes in current legislation.
- All data stored shall be the property of the Client and all data must be provided to the Client on a regular basis on demand and at the termination of a contract.

036 The system shall be available to all consultants and contractors employed by the Client and not limited to any single provider.

037 The Client will own all Risk Assessments, reviews etc., and other data and such data should be made readily available by the Provider to the Client upon request in a recognised format (e.g. Excel).

038 Adhere to the Data Protection Act 1998 in the course of providing the Services that the Provider may be compiling, processing and storing Personal Data for the Client and where this is the case, the Provider will not unlawfully transfer any Personal Data to others.

039 It should have a document storage system that includes:
- Method Statements
- Risk Assessments
- Record Sheets

Firestopping

040 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

041 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

SPRINKLER INSTALLATIONS TO NON-RESIDENTIAL PROPERTIES

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

SPRINKLER INSTALLATIONS TO NON-RESIDENTIAL PROPERTIES

General Requirements

001 The design, installation, testing and commissioning of automatic sprinkler installations in accordance with the requirements of the applicable Standards and the LPC Rules and Technical Bulletins current at the time, as published by the Fire Protection Association to commercial, educational, entertainment and industrial Properties.

002 Ensure that the Provider or their approved automatic sprinkler system Subcontractor are registered on the current "List of Approved Products and Services" published by the LPC and the current list of "LPCB Quality Assessed Companies to ISO 9001/ BS 5750-1" published by the Loss Prevention Certification Board (LPCB)

003 Ensure that the Provider or their approved automatic sprinkler system Subcontractor has the suitable level of competency to carry out, without supervision, the design and installation of the system(s) as contained in the Specification.

Design Parameters

004 Ensure that the entire automatic sprinkler system installation complies fully with the current edition of the relevant codes of practice.

005 Ensure that the design of the automatic sprinkler system takes into account the following criteria to be provided by the Client.

Occupancy or Usage of Property	
Building Height of Property	
Purpose of Sprinkler System (Delete what is not relevant)	1. Property Protection 2. Property Protection with Life Safety enhancements 3. Additional measures to improve system reliability and availability
Local Authority	
Fire and Rescue Service	
Client Insurer	
Hazard Classification (Delete what is not relevant)	1. Light Hazard (LH) 2. Ordinary Hazard (OH1, OH2, OH3 or OH4) 3. High Hazard (HHP1, HHp2, HHp3 or HHP4)
Maximum Area of Operation	….m2 or number of heads
Design discharge density	….mm/ min (or i/ s/ 100m2)
Maximum area of coverage	….m2 per sprinkler head
Maximum distance between	m
High Hazard Stored Goods category (as applicable Standard)	
High Hazard Storage Configuration (as applicable Standard and /or Technical Bulletins 234)	
High Hazard Sprinkler Heads	

© Rand Associates Consultancy Services Ltd

System Type (or Combination) (Delete what is not relevant)	1. Wet pipe 2. Wet pie with tail end dry 3. Wet Pipe with dry pendant heads 4 Wet pipe (other) 5. Dry Pipe 6. Pre-Action (Type 1 or 2) 7. Other (please specify)
Running pressure at control valve	….bar (or kN/m2) minimum
Corresponding water flow	….l/ s (or dm3/minute) minimum
Water supply type	
Water storage volume	….m3 minimum
Total number of installations	…. No of Alarm Valves
Total number of sprinkled zones	….No of Zone isolation valves and flow switches

Scope of Works

006 Design, supply, install, set to work, test, commission, fully certify and handover a sprinkler system in accordance with the function and performance requirements and as stated in the Rules for Automatic Sprinkler Installations published by the Loss Prevention Council (LPC Rules) incorporating the applicable Standard.

007 Adopt the outline scheme design proposals indicated in this Specification and any provided drawings, undertake any onsite investigation, surveys and measurements, and consultations, and develop them into a detailed design of the system in cooperation with the Client's Representative.

008 Provide pressure and flow requirements at each and every design point and flushing/test connections on all the arrays that are required to meet the code requirements for the defined risk.

009 Obtain, prior to commencing the installation of the works, the written approval of the Client's Representative, the Local Authority Building Control department, the Fire and Rescue Services and the Client's insurer's if required to the design and specification of the automatic sprinkler system installation.

010 Include within the design the following criteria:
- Sprinkler installation;
- All components and equipment required are of types approved by the LPC and entered on their current "List of Approved Products and Services";
- Coordination of sprinkler positions with building and mechanical and electrical design drawings;
- Acoustic and vibration control measures;
- Piping supports, guides and anchors;
- Expansion/ contraction provision;
- Drawing production;
- Automatic controls and associated wiring for the sprinkler installation utilising the Project Fire products Lt's Zonecheck Addressable or other equal and approved system for all remote testing;
- Interfaces to the BMS and fire alarm systems (via the Zonecheck Addressable or other equal and approved controller) ensuring correct communication protocol.

011 Provide, install, test and commission the power and control wiring between the sprinkler pump motor control panel and any remote indicator panel.

012 Provide, install, test and commission the power wiring to the sprinkler pump motor control panel from the distribution board in the plant room.

© Rand Associates Consultancy Services Ltd

013 Provide, install, test and commission the power and control wiring to the sprinkler pumps from the motor control panel.

014 Ensure that all electrical Works complies with the requirements of the IET wiring Regulations.

015 Ensure that the Provider is a member of the Electrical Contracting Association (ECA) and/or the National Inspection Council for Electrical Installation Contracting (NICIEC). or in not a member by having the electrical and control installations undertaken by an approved Subcontractor who is member of the Electrical Contracting Association (ECA) and/or the National Inspection Council for Electrical Installation Contracting (NICIEC).

016 Ensure that the Provider or their approved Subcontractor are familiar with and be trained in installing and maintaining the Project Fire Products Ltd's Zonecheck Addressable or other equal and approved system.

017 Ensure that any planned shutdown of existing sprinkler works, or sprinkler protection which has already been commissioned and is being relied upon for fire protection is avoided if possible either by using an alternative method or by using Project Fire Products Ltd' Livetap or other equal and approved equipment (any works involving the use of Livetap equipment are to be carried out by an approved installer with current and active Livetap authorisation card). Before a planned shutdown can take place, RAMS documents with explanation of why Livetap or other equal and approved systems are not suitable for the Works must be submitted by the Provider or their approved Subcontractor and the RAMS document must be obtain the written approval of the Client's Representative, the Local Authority Building Control department, the Fire and Rescue Services and the Client's insurer's if required.

018 Ensure that in accordance with the Client's environmental policy, any water removed from the system must be taken off-site and disposed of in accordance with local water authority guidelines. In addition, any drain-downs of pipework must be re-filled with water via backfilling (rather than passing through installation control valve).

019 Ensure before a shutdown takes place the following is to be carried out:

- Any central monitoring stations should be informed;
- Only one zone of a multi-zone installation shall be shut down at any one time and for the minimum amount of time possible;
- Any hot works in the area shall be subject to a permit system. Smoking and naked flames shall be prohibited in affected areas during the works;
- Fire extinguishing appliances should be kept in readiness, with trained personnel available to handle them;
- As much of the installation shall be retained in an operative state as possible by blanking off pipework feeding the part or parts where work is taking place;
- The Property shall be checked to ensure that there is no indication of a fire shortly before work commences;
- All Customers occupying the Property shall be informed of the works at least 7 days before the commencement of the Works.

Control and Monitoring Requirements

020 All control and monitoring requirements are generally to be in accordance with the applicable Standard

System Operation Alarm

021 Provide and install a water pressure switch or flow switch, to enable the fire alarm (and/or BMS systems) panel to operate when the sprinkler system automatic control valve opens.

Sprinkler Water Storage Tanks Alarms

022 Provide and install an alarm at the BMS of low water level and high water level independently for each water storage tank/ compartment. This alarm shall be provided via Project Fire Products Ltd's Zonecheck Addressable or other equal and approved controller and loop to reduce additional systems and wiring.

© Rand Associates Consultancy Services Ltd

Sprinkler Pump Sets Alarms

023 Ensure that when more than one fire pump is present; that the sprinkler pumps are configured as duty and back-up units with automatic changeover.

024 Provide and install pressure switches to control each pump operation suitable for adjustment to suit actual site conditions. Where both diesel and electric pumps are provided configure the installation to ensure that the electric pump is the duty unit under normal circumstances.

025 If diesel pumps are deemed unsuitable, them three half duty electric pumps can be installed.

026 Provide and install automatic starting controls and manual stop to the pumps to LPC requirements. Provide at the sprinkler pump motor control panel and at the pump room monitoring panel the audible and visual warnings of the following conditions: -

- Sprinkler Pump No.1 Electric/Diesel Driven
- Pump on Demand
- Pump Running
- Supply Failure
- Pump Trip
- Sprinkler Pump No.2 Electric/Diesel Driven
- Pump on Demand
- Pump Running
- Supply Failure
- Pump Trip

027 Ensure that a general "fault" signals from the pump house monitoring panel is linked back to the Project Fire Products Ltd' Zonecheck Addressable or other equal and approved controller.

Valve Status

028 Provide and install electrical monitoring of the status of all Installation, Control, Stop and Alarm Gong valves. For life safety enhancement applications; monitored valves shall be wired into the local Project Fire Products Ltd' Zonecheck Addressable Intelligent Monitoring Module or other equal and approved monitoring module (installed and commissioned by certified Project Fire Products Ltd' contractor). All other such valves shall be monitored via a micro switch to indicate whether open or shut.

Monitoring of Additional Equipment

029 Ensure that where additional equipment such as Gemini heads (see section 7.3.1), trace heating or other fire protection equipment is required, the signals are to be monitored using an Intelligent Monitoring Module as part of the Project Fire Products Ltd's Zonecheck Addressable or other equal and approved system.

© Rand Associates Consultancy Services Ltd

Installation Control Valves

General

030 Provide and install on each sprinkler installation a set of installation control valves. Each installation control valve set is to be provided with all necessary water proving apparatus and alarm gong-testing facilities The control valve sets may incorporate the following: -

- A LPCB approved strobe/sounder shall be installed instead of the water motor alarm gong where possible and permissible.
- Gear Operated Butterfly Valve to applicable Standard or equal LPC approved valve with indicator to show when open and shut, electrical monitoring micro switch and padlock and strap
- LPC Approved Alarm Valve, to suit type of system and pressure requirements having due regard for the code requirements with respect of type and bypass/duplicate requirements.
- Where required, a Water Motor Alarm Gong for sounding an audible warning of system operation
- Double pole pressure switch or flow switch for initiation of an electrical signal on system operation to both the Project Fire Products Ltd's Zonecheck Addressable system and main fire alarm/BMS system
- Drain and test connections
- Test valve, pipeline and fittings
- All necessary small bore piping (galvanised), pressure gauges and valves in accordance with the requirement of the LPC Rules and Approvals
- All piping, valves, straps, padlocks and identification labels as required by the LPC

Isolation Stop Valves

031 Ensure that all sluice valves (if used) comply with the applicable standard

032 Ensure that all butterfly valves are gear operated and comply with the applicable Standard.

033 Make all valves right handed.

034 Clearly mark the controlling wheels of all stop valves showing in which direction the wheel is to be turned to close it.

035 Provide an indicator that shows whether the valve is open or shut.

036 Ensure that the isolation control valves are monitored via the Project Fire Products Ltd's Zonecheck Addressable system or other equal and approved system.

Drainage

037 Provide drainage facilities associated with alarm valves for draining the installation and testing of the alarm valve and water motor alarm gong (where fitted) in accordance with the specified code Standard.

Water Motor Alarm and Gong

038 Where possible and permissible, water motor alarm gongs shall be replaced by an LPCB strobe and sounder.

039 Where a water motor alarm gong is fitted, it shall be of the type approved and listed by the Loss Prevention Council.

040 Provide a 15mm test valve on the installation's side of the alarm valve.

041 Arrange the piping to the Water Motor Alarm to drain through a fitting having an orifice not larger than 3mm diameter. Use a stainless steel or a suitable non-ferrous material for the orifice plate.

042 Ensure the water alarm gong drainage piping is piped to discharge over a drain point.

© Rand Associates Consultancy Services Ltd

Pressure Gauges

043 On all sprinkler installations, provide two pressure gauges
- (a) one gauge fitted immediately above the alarm valve; and
- (b) one gauge immediately below the alarm and main stop valve.

044 Fit pressure gauges on main pump suction and delivery pipes and adjacent to each pump initiation pressure switch. Ensure all pressure gauges conform to applicable Standard with scales having divisions not exceeding 0.2 bar and of the glycerine filled type.

045 Provide means to enable each pressure gauge to be readily removed without interruption of installation water supplies.

Sprinkler Zoning

Introduction

046 Where the sprinkler system is for life safety, the building is to be zoned using Zonecheck Addressable available from Project Fire Products Ltd or other equal and approved and shall be designed and built by Project Fire Products Ltd. Zonecheck Addressable is an approved system that allows for automated and centralised testing of all flow-switches in the building as well as providing centralised monitoring for sprinkler equipment.

047 Ensure that all Zonechecks, whether supplied separately or as part of a Firepod provide a 10 year manufacturer's warranty.

Zonecheck Addressable

048 Design sprinkler zoning in accordance with the specified code Standards. Zoning design must also seek to minimise future disruption to both Client and Customers by placing components in a readily accessible place and include sufficient quantity of zones so that sprinkler protection affected by a single zone drain down or alteration is minimised.

Zone valves

049 Ensure that zone valves are the butterfly type, grooved and be LPCB approved. The zone valves shall be monitored via the Project Fire Products Ltd' Zonecheck Addressable or other equal and approved system.

Water Flow Alarm Switches

050 Flow-switches shall be incorporated into the LPCB approved Project Fire Products Ltd's Zonecheck® Addressable or other equal and approved water flow detector tester

051 All water flow detector testers must comply with FM1043 Approval Standard for Water Flow Detector Testers and are installed in accordance with recommendations from Companion Guide to AS 1851 'Fire Protection Systems Testing – Water Conservation Handbook'.

052 Ensure all water flow alarm switches are of the type approved and listed by the LPC and incorporate an adjustable time delay relay (capable of operating between 0 and 45 seconds)

Pipelines

053 Ensure that all piping is free from burrs, rust and scale and thoroughly cleaned prior to installation in accordance with the Provider's quality assurance procedures that shall be made available on request for the Client's Representative to view. During installation of the Works, plug or cap all open ends with purpose-made iron or plastic closures to prevent ingress of dirt. On completion thoroughly flush each system out with clean water. Ensure that adequate drain points are provided for this purpose.

© Rand Associates Consultancy Services Ltd

054 Ensure that where grooves are used, they are rolled and not cut.

055 Construct all metallic piping systems to provide electrical continuity throughout to comply with the requirements of the IET Wiring Regulations. Demonstrate Electrical continuity on each completed system. Where items including fittings, joints and components incorporated into the piping system break the electrical continuity, use bonding conductors to bridge the items.

056 Changes in pipe diameter shall be achieved via an eccentric socket (with flat side on bottom of pipe) where possible to aid effective flushing of pipework.

057 Branch pipes should be a minimum of 50mm diameter.

Underground piping

058 Pipes shall be laid in accordance with the manufacture's technical data sheet. Pipes and fittings shall comply with the requirements of the water Utility Provider's code of practice together with the specifications identified in LPCB Technical Bulletin 227:2011:1, Table TB227. T1.

Above ground piping

059 Pipes shall be a minimum of black medium weight black to applicable Standard. Screwed fittings to be malleable iron to the applicable Standard. Welded fittings to be EN: 10253. All pipe work shall be coated with one coat of red- oxide primer at works and touched up on site.

Gradients

060 Ensure gradients of piping are in accordance with the LPC rules. Prior to installation, agree with the Client's Representative all minor adjustments of gradient required to suit site conditions or co-ordination with other services.

061 Install sprinkler piping so that the system can be thoroughly drained with the following minimum gradients: -

- Wet installation -2mm in 1m all pipes
- Dry installation -4mm in 1m for pipes sized 40mm NB or more

Pipe Supports

062 Comply as a minimum with Section 17.2 of the LPC Rules for the provision of pipe supports.

063 Where sprinkler heads are to be fitted in suspended ceilings, design the piping drops on a swivel arm basis to facilitate the location of the sprinkler head centrally in the ceiling tile or designated location. Provide additional fixings/ supports as necessary to prevent sagging or twisting of the final sprinkler position.

Drainage

064 Drainage connections shall be provided in accordance with the specified code standards. Where piping within the system will not drain back via the installation control valves, provide a drain valve at each lowest point that conforms to the following: -

- Up to 50mm Ø piping 20mm Drain Valve (minimum)
- 65mm and 80mm Ø piping 32mm Drain Valve (minimum)
- 100mm and above Ø piping 50mm Drain Valve (minimum)

065 Adequate drainage within the pump house shall be provided in line recommendations from the pump and internal tank manufacturers.

© Rand Associates Consultancy Services Ltd

Flushing/Test Connections

066 Install flushing/test connections to the underside of pipe at the spur ends of the installation distribution pipe that conforms to the following.

- Up to and including 40mm Ø piping Test/Flushing Connection shall be same as pipe diameter
- 50mm and above Ø piping 50mm Test/Flushing Connection (minimum)

Pipeline Ancillaries

067 Install all pipe ancillaries fully in accordance with the applicable Standard

Sprinkler Heads

068 Establish the hazard classification, temperature rating and pattern of sprinkler heads required for each sprinkler zone within the Property. Locate sprinklers to provide coverage to conform to the hazard classification of each sprinkler zone.

069 A pre-action sprinkler head device, Project Fire Products Ltd's Gemini® or other equal and approved and to be installed by and approved Project Fire Products Ltd's contractor, shall be installed in accordance with this Specifications and drawings for sprinkler zones where pre-action heads are required. Monitoring of Gemini heads shall be achieved via the Project Fire Products Ltd's Zonecheck Addressable or other equal and approved system.

Flow Measuring Device

070 Provide a Flow Measuring Device in the Pump Room of the type approved by the LPC. Ensure that the Flow Measuring Device is complete with all necessary isolating valves. Fit a sluice valve upstream and a butterfly valve downstream of the device.

Water Storage Tank

071 Design, supply and install suitable water storage tanks as required by and in compliance with the LPC rules. Provide information on quantity, type, material, size, construction and access for service/maintenance. Tanks installed shall have a minimum of a 10 year guarantee.

Sprinkler Pumps

072 Design, supply, install and commission sprinkler system pumps in accordance with the provisions of the LPC Rules and with due consideration for the site location and conditions.

073 Ensure the sprinkler system pumps are manufactured by a company which has been quality assessed by the Loss Prevention Certification Board to ISO 9000/ applicable Standard and appear in the current LPC list of approved products and services.

074 Wherever possible, the sprinkler system pumps shall be installed under positive head conditions. Where suction lift if necessary, ensure the pumps are suitable to operate with suction lift conditions.

075 Provide the sprinkler system pumps with water from twin suction pipes complete with vortex inhibitors as appropriate.

076 Ensure the duty of the main sprinkler system pumps meets the minimum pump characteristics set out in the applicable Standard.

077 Fuses, electrical switch gear and trip functions associated with the sprinkler system pumps must be sized in accordance with approved sprinkler system pump manufacturer guidelines and not sized to protect the equipment.

© Rand Associates Consultancy Services Ltd

078 Arrange the sprinkler system pumps as a pair with one pump considered as duty and the second pump as stand by. Ensure the two pumps deliver, via non-return and stop valves, to a trunk main which feeds to the Sprinkler Control Valves.

079 Fit appropriately sized test connections (complete with 2 No stop valves and approved direct reading flow meters) between the sprinkler pump delivery trunk main and town main connection, ensure these discharge, back into the suction tanks. Arrange the return connection so that entrainment of air into pump suction does not occur during testing.

080 Control the operation of the sprinkler system pumps by pressure switches, connected individually to the appropriate trunk mains and complete with pressure gauges, stop valves and bypass with check valve as called for in the LPC Rules.

081 Individually support pump delivery and suction piping to ensure that no load is imposed on the sprinkler system pump sets.

082 Install and commission the sprinkler system pump sets fully in accordance with the manufacturer's technical data sheet and in conjunction with the manufacturer's commissioning engineer. Particular attention should be given to supplying and installing a suitable plinth (of correct material, thickness, size, level and smoothness) for mounting the sprinkler system pumps securely using chemfix bolts or similar method in line with pump manufacturer's technical data sheet.

083 Use sprinkler system pump sets that are centrifugal single stage type direct coupled to an electric motor suitable for the local electricity supply and mounted on a common base plate.

084 Ensure each sprinkler system pump set is fed from a Star Delta Starter or other equal and approved panel which incorporates all of the requirements of applicable Standard.

085 Design, supply, install and commission a jockey pump set to make up small losses in the trunk mains without bringing into operation the main sprinkler system pumps. Use a vertical multistage pump, directly coupled to suitably rated electric motors, drawing water from the common suction pipe. Ensure the jockey pump is complete with a direct on line starter.

086 Design, supply, install and commission a common remote alarm panel, wired into a position in the Client's designated plant room, to give audible and visual warning of the conditions set out in the applicable Standard. Ensure that the panel is mains operated (with full battery backup in the event of mains failure) and complies with the requirements of applicable Standard

Securing of Valves

087 Secure all stop valves (which are not electrically monitored) on the water supply mains with strap and padlock. Secure the main stop valves and the installation control valves with leather straps and padlocks. Secure all other valves with leather straps.

Fire and rescue service inlets

088 Unless stated elsewhere or with written agreement a fire and rescue service inlet shall be provided in accordance with TB232.3.5.

Fixing to Building Fabric

089 All fixings of pumps, valves, pipework etc to structures is to be accordance with the requirements of the applicable Standard

Identification of Mechanical Services

090 All identification labelling, signage, etc of pumps, valves, pipework etc to structures is to be in accordance with the requirements of the applicable Standard

© Rand Associates Consultancy Services Ltd

091 Apply ID banding to all piping in accordance with the applicable Standard.

Painting

092 Apply one coat of primer paint, one coat undercoat and two coats red gloss to all exposed piping and, upon completion, touch-up to repair any damage caused to the finish by the installation work.

Labelling and Signs

093 Supply and fit a 'location plate' on the valve access route in a position to be agreed with the Client's Representative, bearing the following words: -

SPRINKLER STOP VALVE in letters at least 35mm high
INSIDE in letters at least 25mm high

094 Fit all valves with engraved aluminium labels stating their number and purpose.

095 Individually identify all valves on a schedule (produced in resilient material) wall mounted in the Client's designated plant room. Include a copy of this schedule with the Operating and Maintenance Instruction Manual.

Testing and Commissioning

096 Ensure that all testing and commissioning is in accordance with the requirements of the applicable Standard.

Addressable Sprinkler Monitoring and Testing

097 The activation of the sprinkler system (via signals from flow switches) shall be detected via the Project Fire Products Ltd's Zonecheck Addressable or other equal and approved controller and shall be integrated into fire strategy for the Property.

098 All monitored zone valves and flow-switches (including flow switches on alarm valve) shall be connected via the Project Fire Products Ltd's Intelligent Monitoring Modules or other equal and approved monitors back to the Zonecheck Addressable control Unit. This unit shall be UL approved and installed and commissioned by a suitably trained, approved, competent installer. This system gives the ability to test, record and monitor all key fire and fault signals and test flow switches and wet alarm valves. A Project Fire Products Ltd's Zonecheck Addressable or other equal and approved printer must be included as part of the system to enable the printed evidence of testing.

Testing

099 Carry out all tests and inspections to prove that the installation meets with the requirements of the applicable Standard. Carry out all tests required by the local authority building control officer giving adequate notice with regard to timing of tests, etc.

100 Inspect and test the installation at agreed stages to ensure that the piping is properly secured and clear of obstructing debris and superfluous matter and that all work which is to be concealed is free from defects before it is finally enclosed.

Pipe Pressure Testing

101 Carry out a low-pressure air test, to establish whether open ends are present, prior to carrying out a hydraulic test on completion of the installation, or if approved by the Client's Representative in sections on completion of all pipework within a sprinkler zone.

102 All installation pipework shall be hydrostatically tested for no less than 2 hours, to a pressure of no less than 15 bar, or 1.5 times the maximum pressure to which the system shall be subjected, (both measured at the installation control valves), whichever is the greater.

© Rand Associates Consultancy Services Ltd

103 Dry pipe work shall be tested pneumatically to a pressure of no less than 2.5bar for no less than 24 hours. Any leakage that results in a loss of pressure greater than 0.15 bar for the 24 hour period shall be corrected.

Pump Testing

104 Fully test all pumps through their full range of capabilities up to and including nominal ratings. Ensure that the duties are within the tolerances specified in LPC Rules.

Flow Switch Testing

105 All flow-switch testing shall be completed using a water flow detector tester in accordance with FM1043. Flow switches should be first tested manually by draining water and then by Project Fire Products Ltd's Zonecheck Addressable or other equal and approved system. Test all alarms and alarm connections associated with the sprinkler installation and prove all interlocks and links to other systems and remote locations.

Functional Testing

106 Upon completion of the installation of the sprinkler system carry out functional tests to demonstrate to the satisfaction of the Client's Representative, the local authority building control department, the fire and rescue Service and if applicable the representative of the Client's insurers that the installation conforms to the required standards.

107 Ensure that in addition to a full visual inspection, the leakage, hydraulic and alarm tests are passed for the sprinkler system to become operational.

Leakage test

108 Pressurise the installation pipework to a minimum pressure of 15 bar, or to 1.5 times the maximum working pressure, whichever is the greater, for one hour. If the sprinkler system fails to maintain the pressure, the leak should be found and corrected and this test repeated.

109 Care should be taken not to subject any system components to pressure higher than those recommended by the manufacturer's technical data sheet

Hydraulic test

110 Test the sprinkler system to check that at least the design flow rate can be achieved at the design pressure when measured at the combined drain and alarm test valve.

111 If this flow rate at the required pressure cannot be achieved, the system should not be approved for use until the system has been corrected and the test has been passed

112 If pressure reducing valves have been installed, a dynamic pressure and flow test should be carried out at each pressure reducing valve so that, as a minimum, the design flow rate can be achieved.

Alarm test

113 Test the alarm device by opening the alarm test valve to ensure a flow of water and checking that the alarm operates as designed. Where the alarm is configured for remote monitoring, the signal to the monitoring station should be checked.

Compliance certificate

114 Ensure that, on satisfactory completion of the three commissioning tests, a compliance certificate is issued by the competent person, which attests that the sprinkler system has been designed, installed and commissioned in accordance with applicable Standard

© Rand Associates Consultancy Services Ltd

Completion Certificate

115 When these tests have been accepted by the Client's Representative, the local authority building control department, the fire and rescue Service and if applicable the representative of the Client's insurers as being satisfactory, the Provider or their approved sprinkler system Subcontractor on the Provider's behalf is to:
- Issue a completion certificate (as defined in Section 10 of the LPC Rules);
- Issue an LPCB Certificate of Conformity (as required in LPS 1048); and
- Register the installation as a Certified Sprinkler System.

116 Keep a record of all pressure tests carried out to include the following: -
- Date of test;
- Location and identification of pipeline;
- Drawing Reference;
- Method of Test;
- Test Pressure;
- Result of Test;
- Signature of Staff member carrying out test and name of the Provider or approved sprinkler system Subcontractor who employed that Staff member; and
- Signature of the Client's Representative:

Inspections during Defects Liability Period

117 Carry out two further inspections, the first 6 months and the second 12 months after completion of the installation.

118 Include the following tasks in the inspection: -

Water Supplies
- Carry out running and proving tests on both pump sets.
- Check correct operation of float valves on water storage tanks.
- Check rate of infill to water storage tanks.

Stop Valves
- Exercise and grease stop valves on incoming Mains Supply, pump suction and delivery piping and ensure that they open and shut freely.
- Check operation and seating of non-return valves/ alarm valves.
- Check valve glands for leakage.
- Check pump glands for leakage.
- Check operating pressures on pressure switches.
- Check operation of Jockey Pump.
- Check operation of pressure relief valves on pumps.
- Check operation of remote alarm functions.

Installation Control Valves
- Carry out flow and pressure tests.
- Check satisfactory operation on Turbine Alarm Gong.

119 Ensure that all alarm-valve testing is in accordance with the applicable Standard using guidance from HB 223 (2008): Fire Protection System Testing – Water Conservation Handbook.

General
- Exercise and grease all stop valves and ensure they open and shut easily.
- Check valve glands for leakage.
- Check seating of alarm valves.
- Check all pressure gauges are registering correctly.
- Check satisfactory operation of all flow switches and monitored stop valves.
- Check all small bore piping, valves and ancillaries for satisfactory operation.

© Rand Associates Consultancy Services Ltd

Check spacing and location of sprinklers in relation to any new walls or partitions erected since completion of systems.

- Ensure all valves are suitably secured and labelled.
- Systems to be left in fully operational condition.

Training

120 Provide training to the Client and his staff on how to conduct the regular testing regime required for the automatic sprinkler system installation including identifying the location and operation of all key components.

Operational manuals and drawings

121 Supply to the Client's Representative's, all drawings, operational manuals, guarantees, warranties, test results and compliance certificates which should bear, as a minimum, details of the system which include:

- the address and location of the premises;
- Name, address and contact details of the competent person(s) employed by the Provider who undertook the installation, testing and commissioning;
- Name and address of the designer employed by the Provider if different to the competent person; and
- Installation date.

122 Supply to the Client's Representative a detailed schedule of recommended testing, servicing and maintenance of all relevant components over next 10 years

Electronic log book

123 Update the electronic log book (see specification for electronic log book Clauses 055 to 068 inclusive of General section of this Technical Specification) to include for each sprinkler system all of the documentation listed below:

Documents

124 Ensure that the following information is provided and contained in the electronic log book:

- The statement of compliance with applicable Standard in the form of a signed compliance certificate together with any variations agreed with the Client and justification for the variation;
- Category of system and number of design sprinklers;
- Description of the system and a layout drawing of the premises, which should include as-fitted details, showing the extent of the installation, together with a set of the hydraulic calculations, including the system pressure and flow requirements;
- Results of the commissioning tests;
- List of components used, identifying the supplier's name and parts reference number;
- Details of the local authorities and Utility Providers consulted and any response to consultation;
- Details of the water supplies which, if a town main, should include pressure and flow rate data at a specified location for the commissioned installation, with the time and date of the test;
- Routine inspection and maintenance programme for the system;
- Instructions on the actions to be taken in respect of operation of the system, faults, etc.;
- 24 hour emergency contact number which can be used to obtain assistance; and
- Essential information for the Customer's, e.g. "do not paint, cover or in any way impede the operation of a sprinkler head", "no modification should be made to any sprinkler equipment except in accordance with BS 9251:2021".

© Rand Associates Consultancy Services Ltd

Block plan

125 Provide, for all automatic sprinkler systems, a laminated block plan of the Property with the following information:

- Location of the main shut off valve(s);
- Tank volume and infill arrangements;
- Fire service connection, where applicable;
- Area controlled by each control or zone valve;
- Location of each control or zone valve(s); and
- Location of pumps, tanks, alarm controls and electrical supply.

126 Ensure that the block plan is readily available to the fire and rescue authorities in an emergency, providing sufficient information on how the system is designed to operate and the location of important controls in the case of an emergency; the block plan should be easily located within the common areas of the Property

System data label

127 Attach a label or notice to or fixed adjacent to or on the sprinkler riser next to the main sprinkler stop valve as a permanent record of a system's design data.

Location plate

128 Provide for all systems other than a category 1 sprinkler system, a location plate of weather-resistant material and lettering to be fixed on the outside of the external wall as close as practical to the entrance nearest the system valve set(s).

129 Provide a sign to be fitted as close as possible to the main and any subsidiary stop valves. Where the stop valve is enclosed in a room with a door, the sign should be fixed on the outside of the door.

System Modifications and Alterations

130 Complete all system modifications with no drain down and no disruption to normal business by using the Project Fire Products Ltd's Livetap or other equal and approved under pressure drilling system (any Livetap or other equal and approved works to be carried out by an approved installer with a current and active Livetap authorisation card).

131 Ensure that where works cannot be completed using the Project Fire Products Ltd's Livetap or other equal and approved systems:

- Written consent is to be sought from both the Client and the local authority building control department, the Fire and rescue service and The Client's insurers if applicable using the guidance in place for a planned shutdown;
- A Project Fire Products Ltd' Livetap Kwik drain or other equal and approved drain fitting will be used to establish that the correct installation/zone has been drained down in preparation of the works;
- Due regard for health and safety of the Customers occupying the Property including the general public must be made a priority including ensuring that any hoses are run in the safest manner (against walls and not obstructing corridors etc.). Additional drainage connections using Project Fire Products Ltd' Livetap Kwik drain or other equal and approved drain fitting shall be added if this will enable safer routing of hoses.
- Pipes shall be re-charged with water via back-filling and not by employing sprinkler system pumps or jockey pumps.

132 Ensure that any new drain-valve is installed using Project Fire Products Ltd' Livetap Kwik drain or other equal and approved drain fitting. Where it is found that the existing installation does not comply with drainage requirements under current code standards, additional drainage connections shall be added as a matter of urgency.

© Rand Associates Consultancy Services Ltd

133 Ensure that any new/extra heads are installed using Project Fire Products Ltd's No-Drain-T or other equal and approved mechanical tee fitting, even in situations where a drain-down is applied.

134 Ensure that Project Fire Products Ltd's Zonecheck Live or Zonecheck Live SA or other equal and approved equipment is employed where an existing flow-switch is present.

135 Ensure that any new vent is to be Project Fire Products Ltd's Kwik-Vent or automatic air vent or other equal and approved vent.

136 Ensure that existing sprinkler protection is maintained at all times – there must be no loss of protection at any stage. Where sufficient clearance is available from the underside of the fire main feeding the proposed fire sprinkler modifications then the preferred orientation for all Project Fire Products Ltd's No-Drain-T or other equal and approved mechanical tee fitting is affixed to the underside of the sprinkler main. This provides the most favourable clearance in the vertical orientation for the the Project Fire Products Ltd's Livetap or other equal and approved systems drill.

137 Ensure that any water removed from remote points on the sprinkler pipework (i.e. any point from the alarm valve onwards) is not disposed of down standard drains and must be removed from site. Evidence of the water being correctly and appropriately removed is to be provided to the Client's Representative.

Liaison with Customers

138 The Works will be undertaken in common areas in Properties which may remain occupied or in use during the undertaking of the installation, testing and commissioning of the automatic sprinkler system installation.

139 Can be allowed, within their programme to carry out works with a potential loss of water service if:
- The planned loss of service is anticipated to be no longer than 8 hours;
- The planned loss of services has prior agreement with both the Client and Customers;
- Local Water Authority is notified of the planned loss of service;
- Notification letters to Customers have been issued at least 7 days before commencement of the Works;
- Written notifications are present in common areas to notify Provider's intentions; and
- A vulnerable person's strategy is in place.

140 Ensure that If adaptation of the mains cold water forms part of the works or isolation, adaptation, or replacement of the mains cold water is required as part of the works it is the Providers responsibility to carry out the following;
- Notify the Client of isolation no less than 14 days prior to commencement;
- Ensure method and programme is compliant with provision of temporary supplies requirements;
- Ensure method and programme is compliant with vulnerable person's requirements;
- Ensure Customer Liaison Officer is contactable throughout loss of service;
- Notify Customers no less than 7 days prior to commencement;
- Return to service is subsequent to necessary cleaning and flushing methods; and
- Return to service is subsequent to testing, non-destructive testing and curing as necessary.

141 Comply with all Health and Safety regulations, aaplicable Standards and all other current legislation and be in accordance with the Client's" Code of Practise for the Protection of the Public/ Customers during Contract Works."

Firestopping

142 All holes through walls, floors, ceilings etc are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

143 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

SPRINKLER INSTALLATIONS TO RESIDENTIAL PROPERTIES

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

SPRINKLER INSTALLATIONS TO RESIDENTIAL PROPERTIES

General Requirements

001 The design, installation, testing and commissioning of automatic sprinkler installations in accordance with the requirements of applicable Standard to the following residential Properties:

Category 1:

- Individual dwellings (houses, flats and maisonettes)
- Houses in multiple occupation (two floors and/or up to 4 bedrooms)

Category 2:

- Houses in multiple occupation (over two floors and/or 5 or more bedrooms)
- Sheltered and extracare housing without communal facilities and common access
- Residential care premises with less than 10 residents
- Blocks of flats (less than 45m high)

Category 3:

- Sheltered and extracare housing with communal facilities and common access
- Large residential care homes with over 10 residents
- Student accommodation and halls of residence
- Hostels and Foyers

Category 4:

- High rise blocks of flats (over 45m high)

002 The installation can be of three sprinkler delivery systems

- **Mains Fed** is a connection directly from the Utility Provider's mains water supply. This system must include for back flow protection to prevent water from the sprinkler system re-entering the mains supply. A 32mm main will normally be the smallest pipe size that can be used for a Category 1 system. This system would need to be tested prior to installation to ensure sufficient flow and pressures are available;

- **Boosted Mains Fed** is a connection to a boosted water supply. In blocks of flats a tank of water will be pumped to guarantee pressure and flow of cold water services to the flats. This can be used for sprinkler supplies however specials measures must be in place to safeguard the sprinkler supplies;

- **Pump and Tank** supplies can be either solely for the sprinkler use or share the tank with other services. In shared use, there must be specific requirements met. Sprinkler tanks and pumps will be sized by the hydraulic calculations using the risk category run time and number of heads calculated. Tanks can vary from 1200 litre capacity for category 1 up to 9000 litres capacity for category 3. All tanks can have a reduced storage amount by using a proven infill from a mains backup.

003 The design, installation, testing and commissioning of the fire sprinkler installation is to incorporate the requirements of the following applicable Standards etc.,:

- Fire detection and fire alarm systems for buildings: Code of practice for design, installation, commissioning and maintenance of systems in non-domestic premises;
- Fire detection and fire alarm systems for buildings: Code of practice for the design, installation, commissioning and maintenance of fire detection and fire alarm systems in domestic premises;
- Guide to the design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages;
- Water supply – Requirements for systems and components outside buildings;
- Specifications for installations inside buildings conveying water for human consumption;
- Copper and copper alloys – Seamless, round copper tubes for water and gas in sanitary and heating applications;

© Rand Associates Consultancy Services Ltd

- Pipe threads where pressure tight joints are made on the threads – Part 1: Taper external threads and parallel internal threads – dimensions, tolerances and designation;
- Pipe threads where pressure tight joints are made on the threads – Part 2: Taper external threads and taper internal threads – dimensions, tolerances and designation;
- Non-alloy steel tubes suitable for welding and threading – Technical delivery conditions;
- Fixed firefighting systems – components for sprinkler and water spray systems – Part 1: Sprinklers;
- Fixed firefighting systems – automatic sprinkler systems – design, installation and maintenance; and
- Soft solder alloys – Chemical compositions and forms;
- ASTM F442, Standard specification for chlorinated poly(vinyl chloride) (CPVC) plastic pipe (SDR–PR).

004 The sprinkler installation must be designed by a competent person in accordance with the applicable Standard and installed in accordance with the component manufacturer's technical data sheet.

005 The sprinkler installation should be designed as a wet system and divided into zones for ease of maintenance or renewal, each zone should:
- Not be to more than one floor;
- Should be capable of isolation by having a lockable full bore stop valve;
- Should be capable of being drained by having a quarter turn drain valve.

Design Criteria

006 The minimum design criteria including density and duration of supply is governed by the categorisation of the residential Properties (see 001) and the minimum design parameters (design discharge density, number of sprinklers required to be capable of operating simultaneously in a compartment and the duration of supply) for that category in accordance with applicable Standard as the following table:

Category	**Minimum design discharge density**	**Number of design sprinklers**	**Minimum duration of supply**
1	2.10 mm/min	1 head	10 min
1 with enhanced risk	2.8 mm/min	1 head	10 min
1 with enhanced risk	2.04 mm/min	2 heads	10 min
1 with enhanced risk	4.0 mm/min	1 head	10 min
1 with enhanced risk	2.8 mm/min	2 heads	10 min
2	2.80 mm/min	1 head	30 mins
2 with enhanced risk	4.0 mm/min	1 head	30 mins
2 with enhanced risk	2.80 mm/min	2 heads	30 mins
3	2.80 mm/min	2	30 mins
3 with enhanced risk	4.00 mm/min	1	30 mins
3 with enhanced risk	2.80 mm/min	Maximum of 4	30 mins
4	2.80 mm/min	4	60 mins

007 The sprinkler installation should be designed to provide protection to all parts of the Property, the applicable Standard indicates that the following areas may be excluded:
- Toilets or bathrooms with a floor area less than 5 m², with linings in accordance with applicable Standards, and which are not prepared for white goods, such as washing machines or dryers;
- Cupboards and pantries with a floor area of less than 2 m² or where the least dimension does not exceed 1 m;
- Attached buildings, such as garages and boiler houses without direct access from within the protected Property;
- Crawl spaces;
- Ceiling voids;
- External balconies permanently open to the outside;

© Rand Associates Consultancy Services Ltd

- Enclosed staircases and enclosed vertical shafts (e.g. lifts or service shafts) containing allowable products as applicable Standard, Class B-s3 or better for construction products and B(fl) or better for flooring (including sub categories such as d0,d1,d2 for construction products and s1 and s2 for flooring.) surface spread of flame and constructed as a fire resistant separation
- Uninhabited loft/roof voids; and
- Shadow areas where the cumulative dry area does not exceed 1.4 m² per sprinkler.

008 Sprinkler spacing and positioning within residential Property should be in accordance with the applicable Standard as follows:

- The maximum area protected by each sprinkler should be in accordance with its approved listing performance or 25 m², whichever is the lesser.
- Sprinklers should be not more than 5.5 m apart or more than half the design spacing from any wall or partition.
- The distance between sprinklers within a compartment should be not less than 2.4 m, except where there is an intervening constructional feature preventing adjacent sprinklers wetting each other.
- Pendent and upright sprinklers should have heat-sensitive elements, not more than 100 mm below the ceiling and under no circumstances exceeding the manufacturer's technical data sheet requirements, whichever is the lesser.
- Sidewall pattern sprinklers should have the top of the deflector within 100 mm to 300 mm below the ceiling and under no circumstances exceeding the manufacturer's technical data sheet requirements, whichever is the lesser.
- The whole of the floor area and the walls from the floor up to 0.7 m below the ceiling should be wetted when the sprinklers are operated.
- For sloping ceilings, sprinklers should be positioned in accordance with the manufacturer's technical data sheet.
- Sprinklers should be positioned such that the sensitivity and discharge pattern are not adversely affected by obstructions, such as constructional beams, smoke alarms, light fittings or other sprinkler heads (refer to manufacturer's technical data sheet for guidance).
- Sprinklers should be positioned a sufficient distance from any heat sources (e.g. fireplaces, stoves, ovens, kitchen ranges, hot air flues, hot water pipes, hot air diffusers, water heaters, heat generating light fixtures) in accordance with the sprinkler head manufacturer's technical data sheet.
- The potential for a shielded fire to develop should be taken into account.
- Sprinklers should be not less than 100 mm or the manufacturer's recommended distance, whichever is greater, from any wall or partition.

009 Areas of the Property that do not have residential occupancy should be protected with quick response type sprinklers in accordance with the applicable Standard. In the individual non -residency areas, then:

- A minimum design density of 5mm/min should be applied;
- The area of operation should be taken as four sprinklers or the number of sprinklers in the area if less; and
- Sprinkler heads should be spaced and located in accordance with the applicable Standard Ordinary Hazard.

Residential Pattern Sprinkler Heads

010 Sprinkler heads used in the residential parts of the Property should be:

- In accordance with the applicable Standard;
- New pendent, upright or sidewall spray pattern types suitable for flush, recessed or concealed installation, (Sprinkler heads removed from a system should be discarded);
- To a thermal sensitivity rating in accordance with the applicable Standard;
- If Fusible link type should be colour coded on the frame or sprinkler body;
- if glass bulb type should be colour coded by the bulb liquid in accordance with the applicable Standards;
- To a temperature rating of the closest to but at least 20 °C greater than the highest anticipated ambient temperature of the location; and within the range of 79 °C to 107 °C when installed under glazed roofs; and
- Suitable for use with fittings threaded in accordance with the applicable Standards

© Rand Associates Consultancy Services Ltd

Water supplies

011 The design should identify water supply requirements (pressure, flow and duration) for the sprinkler system. The water supply should be able to provide the system design requirements in accordance with the table in 006. The sprinkler systems should be connected to a reliable supply, for example:

- mains water supply:
  - mains pressure only; or
  - mains water supply boosted by a pump;

- stored water supply:
  - pump supplied from a water tank;
  - regulated pressurized vessel; or
  - gravity-fed stored water system.

012 Where the mains water supply connection serves only the sprinkler system, the system should be capable of providing flow rates at the sprinkler heads in accordance with the requirements indicated in Clause 006.

013 Where the mains water supply connection serves both the sprinkler system and the domestic occupancy supply, the sprinkler system should be capable of providing flow rates at the sprinkler heads by:

- the operation of an automatic priority demand valve; or
- locating the domestic occupancy branch connection immediately adjacent to and in close proximity to the incoming water supply;
- for category 1 systems, the flow rate in accordance with the table in Clause 006 plus at least 25 L/min;
- for category 2, 3 and 4 systems, the flow rate in accordance with Clause 006 plus the design demand for the residency plus at least 50 L/min.

014 Where the connection to the mains water supply serves more than one dwelling, the system should be capable of providing the flow rates at the sprinkler heads in accordance with the table in Clause 006 at times of simultaneous peak domestic demand from all of the dwellings concerned.

Size of supply pipe

015 The diameter of the water supply pipe to the sprinkler system should be large enough to accommodate the system flow requirements in accordance with the table in Clause 006. The diameter of the service pipe for the sprinkler system fed by mains water supplies should be agreed with the water undertaker or licensed water supplier. Losses in the service pipe between the connection point to the water supplier's main and the system design point should be taken into account when designing a town mains fed installation.

Stored water supply

016 Where stored water supplies are to be used, the most appropriate location for the storage tank should be identified. An alarm to indicate low water levels should be provided for a stored water supply. The alarm should be situated in such a place or of sufficient decibels so that the alarm can be noticed and acted upon. Storage tanks should be sited such that they can be easily inspected and maintained.

017 To establish the correct effective water storage capacity, the hydraulically most favourable area calculation should be balanced with the pump's performance curve to find the system's maximum flow demand. The maximum flow demand should then be multiplied by the system duration for the classification of risk to establish the minimum effective tank capacity. The maximum flow demand calculation should be carried out in accordance with the applicable Standard.

018 The volume of stored water should be large enough to ensure that the effective capacity of the stored supply is sufficient for the duration for the sprinkler system capacity as determined in the table in Clause 006, or any increased capacity required for an agreed enhanced duration. The air gap at the top and unusable water at the base of the tank which is affected by a vortex letting air into the pump suction, should be taken into account. An anti-vortex device can be installed to increase the amount of usable water at the base of the tank. The storage tank should have a cover.

© Rand Associates Consultancy Services Ltd

019 Where the stored water supply is used exclusively for a sprinkler system, the effective capacity should be at least that determined by the sprinkler system design requirements.

020 Where the stored water tank is used to supply both the sprinkler system and hot and cold domestic water supply, the tank should be capable of providing:

- the Property's peak domestic demand expected over the required duration of the sprinkler system run time, and the sprinkler system's maximum flow demand for the required duration of the sprinkler system run time; or
- for a system with a priority demand valve on each domestic branch/feed and a dedicated riser to the sprinkler system, the sprinkler system's maximum flow demand for the required duration of the sprinkler system's run time. Priority demand valves should close, as necessary, in accordance with the design when there is a sprinkler activation.

021 A low-level alarm system should be installed in each tank to raise the appropriate warning should the volume in the tank drop to a specific level. The alarm should be set to trigger when the volume in the tank(s) is less than the required combined volume. Activation of the low-level alarm should also close off all domestic water demand via the priority demand valve(s).

022 Where the water for the sprinkler system is derived from the Property's stored water supply and the domestic pump set, a critical sprinkler low water alarm should be set at the point where any further reduction in the water level would affect the required effective capacity and the minimum duration of supply could not be guaranteed. On activation a priority demand valve should operate switching off the domestic supply and remain closed until manually reset.

023 The tank should have a flow test facility permanently fitted to the tank inlet so that the infill rate can be verified. Category 2, 3 and 4 sprinkler systems should have two mechanical float valves installed.

024 Backflow prevention should be installed in the tank.

Pumps

025 Only pumps suitable for use in sprinkler systems should be used, they are to be strictly in accordance with the manufacturer's technical data sheet. The pump should be able to supply the sprinkler system design pressure and flow requirements at the hydraulically most unfavourable and favourable location in accordance with the applicable Standard. The suction pipe diameter should be not less than the pump's inlet diameter, and the velocity in the pump suction should be less than 1.8 m/s.

026 Where a pump is used to boost pressure, it should be selected so that it conforms to the sprinkler system design requirements. These pumps should be used on mains water-fed systems only for the purpose of boosting pressure. Where a pump is used, it should be:

- Located in a position that is unlikely to be affected by a fire or is protected in the event of fire;
- Located where the temperature can be maintained above freezing, or trace heating or lagging is applied;
- Protected by a separate fused connection with approved fire-resistant cabling (where there are two or more pumps , they should be fused so that the failure of one pump does not resultain the failure of the other pump(sP;
- Protected against the effects of fire;
- Of sufficient capacity to ensure conformity to the requirements of the table in Clause 006;
- Capable of being operated automatically on demand;
- Continuously rated;
- Constructed from corrosion-resistant material; and
- Located such that it is unlikely to be affected by flooding.

027 Stop valves should be provided to both the inlets and the outlets of the pump.

© Rand Associates Consultancy Services Ltd

028 Where a dedicated sprinkler pump is used, it should in addition be:
- designed to include an automatic test cycle where the pump is activated at least monthly;
- operated automatically on demand but requiring manual shut down; and
- operated by either of two approved pressure-sensing devices with the circuitry for the pressure-sensing devices monitored.
- complete with a fault alarm to be raised if the electrical power or the automatic test cycle fails.

029 Where more than one dedicated sprinkler pump is used to provide an enhanced water supply, the pumps should be configured to work independently of each other. The electrical supply should be provided with a back-up power supply and automatic changeover functionality, such as:
- an emergency generator;
- uninterrupted power supplies; or
- two separate supplies.

Pipes and fittings

030 All pipes and fittings should be supplied, stored, handled, used and installed in accordance with the relevant British Standard, or other nationally recognized standard, appropriate for the particular material being used.

031 Copper tube conforming to applicable Standard, R250 should be used above ground.

032 Copper tube conforming to applicable Standard, used in underground locations, should be R220 (annealed), thick walled, factory plastic coated tube, and fittings should be manipulative Type B. Brass fittings in underground locations should be immune to de-zincification.

033 Capillary fittings should be joined by soldering or brazing with alloys with a melting point of not less than 230 °C, in accordance with the British Standard

034 Above ground, threaded steel pipes and fittings should be in accordance with the applicable Standards.

035 Other metallic or non-metallic pipes, flexible connections, fittings and jointing systems should be approved for use in sprinkler systems and be installed in accordance with the manufacturer's technical data sheets.

036 Plastics and other pipes and fittings should be approved for use in fire protection systems and should be installed in accordance with the manufacturer's technical data sheets and be in accordance with either BRE publication LPS 1260, FM class 1637 or UL 2443.

037 Plastic pipe should be used only in wet pipe systems, and should be behind a fire-resisting barrier if it could be affected by a fire, e.g. if the pipework runs through an area without the protection of a suppression system.

Flexible sprinkler connection

038 A flexible sprinkler connection can be used between the distribution pipe and the sprinkler head. Flexible sprinkler connections should be:
- In accordance with either BRE publication LPS 1261, FM class 1637 or UL 2443;
- Designed and manufactured for use in a fire sprinkler system and installed to the manufacturer's instructions;
- Only connect a single sprinkler to the distribution pipe;
- Be coupled to the distribution pipe with a minimum of 25mm DN fitting;
- Have a minimum internal diameter of not less than 20 mm;
- Not exceed 1.22 m in length;
- Ensure the number of bends and the radius are in accordance with the manufacturer's instructions;

© Rand Associates Consultancy Services Ltd

- Only use brackets which have been supplied and approved by the flexible sprinkler, connection manufacturer;
- Replace flexible sprinkler connections which are damaged or kinked; and
- Ensure that the hydraulic calculation takes in to account the equivalent length of the flexible sprinkler connection, which is to be supplied by the manufacturer.

Valves

039 All valves should be supplied, stored, handled, used and installed in accordance with the applicable Standard, or other nationally recognized standard.

040 The sprinkler system should include:
- a flat face spring loaded single check valve;
- a monitored lockable full bore stop valve locked in the open position to prevent accidental or deliberate interruption of the water supply to the sprinkler system;
- where required, a priority demand valve;
- an alarm test valve;
- a full bore drain valve facility fitted at the lowest point of the sprinkler pipework to allow the complete draining of the sprinkler system;
- a test valve facility fitted downstream of the flow switch to allow testing of the switch, suitably sized to check the appropriate minimum system flow rate;
- an installation pressure gauge conforming to the applicable Standard (with the facility to be removed and replaced without system draining), minimum nominal diameter 50 mm, class 1.6;
- a no loss or check valve device
- measures to prevent tampering with components of a sprinkler system that would isolate the water supply from the rest of the sprinkler system.

041 Except for category 1 sprinkler systems, all valves which control the flow of water to the system should be electrically monitored for the open position. Stop valves should not be installed downstream of the control valve or pump set except for zone control valves which should be monitored for the open position.

Pressure reducing valves

042 Pressure reducing values should only be used where they serve both the sprinkler and domestic demands.

043 The valve should be in accordance with the applicable Standard and be capable of delivering the maximum anticipated flow and pressure downstream of the valve.

044 A pressure gauge, test valve (lockable ball valve) and data label is to be installed adjacent to the outlet of the valve, which is to of sufficient in size to take the maximum anticipated flow for use in commissioning and maintenance of the valve.

045 The valve should be accessible for maintenance and securely located so that they cannot be tampered with.

Frost protection

046 Protection methods against freezing can include:
- installing pipework within the heated envelope of the dwelling; and
- the use of lagging and trace heating.

Sprinkler alarm initiating device

047 Each sprinkler systems should have at least one sprinkler alarm initiating device.

© Rand Associates Consultancy Services Ltd

048 Devices to detect the operation of sprinkler systems should be either water flow detectors conforming to the applicable Standard which detect the flow of a single sprinkler operation at the anticipated lowest flow rate or a pressure switch suitable for the intended use. The devices should be installed in accordance with the manufacturer's technical data sheets.

049 If a pressure switches is used to actuate the sprinkler alarm, it should only be used on the alarm line of a wet alarm valve in accordance with the applicable Standard.

050 The sprinkler system alarm functionality should be integrated into the protected premises in a way which is compatible with the fire strategy for the protected premises

051 In all cases, the sprinkler fire alarm initiating device should generate a sprinkler fire alarm signal that initiates the appropriate emergency procedures.

052 The sprinkler system fire alarm functionality should be integrated into the protected premises.

053 Where the protected Property is to be fitted with automatic fire detection and alarm systems, they should be in accordance with and be to at least the minimum grade and category recommended in the applicable Standard.

054 The sprinkler fire alarm initiating device(s) may be interfaced with these systems, however any such interface should be in accordance with BS 5839-1 or BS 5839-6, as appropriate.

055 When sprinkler fire alarm initiating devices are interfaced with automatic fire detection and alarm systems, actuation of the sprinkler fire alarm should be clearly distinguishable on any fire alarm control and indicating equipment.

Additional requirements for Category 4 Sprinkler Systems

056 A sprinkler flow switch should be provided for every individual dwelling to signal the actuation of the sprinkler system within that dwelling. Alternatively, sprinkler flow switches may be configured to serve a sprinkler alarm zone, rather than each individual dwelling, provided the following recommendations are met:

- the sprinkler alarm zone should cover no more than a single floor; and
- sprinkler flow switches should be connected to suitable control and indicating equipment so that a signal is sent to the Client and any emergency action plan initiated.

057 In multi-staircase buildings, the control equipment should clearly indicate the floor level and appropriate staircase (where staircases serve different zones).

Electrically operated alarm devices

058 All electrically operated alarm devices should be capable of carrying out their function in the event of a complete failure of the mains electrical power supply.

Installation, Testing and Commissioning

Installation

059 The sprinkler systems should be installed by the Provider or an approved sprinkler Subcontractor on their behalf. The Provider or their Subcontractor is to be LPS 1048 accredited level 4 approved and able to demonstrate that their Staff have the competency to design and install sprinkler systems to the approved Standard

060 Ensure Staff are fully trained and fully conversant with the design and installation practices of domestic sprinkler installations and can readily demonstrate competency within this scope of Work.

061 Install the sprinkler system strictly in accordance with the approved design and specification and to the satisfaction of the Client's Representative.

© Rand Associates Consultancy Services Ltd

Pipework

062 Store, handle and instal all pipework in accordance with the manufacturer's technical data sheet.

063 Install, where appropriate, the sprinkler system pipework in accordance with the applicable Standards.

064 Pipework supports should be:
- Fixed directly to the structural elements or primary supports of the building;
- Not used to support any other services;
- Able to resist high temperatures without loss of strength;
- Able to prevent the pipe from being dislodged;
- Secured in accordance with the manufacturer's technical data sheet;
- Not glued, welded or soldered to the pipe or fittings;
- Be suitably lined to prevent corrosion and abrasion;
- Fitted as close as practically possible to the sprinkler heads in order to ensure that no movement occurs which would recoil heads into the ceiling or loft voids;
- No closer than 0.15 m to an upright sprinkler; and
- To a maximum pipework support spacing in accordance with the manufacturer's installation technical data sheet. Where no instructions are available, the maximum spacing should be in accordance with the applicable Standard

065 Structural timbers should not be notched or bored in such a way that the integrity of the structure is compromised.

066 Pipework passing through fire resisting elements of a structure should be adequately fire stopped in accordance with the Regulations current at the time the Works are undertaken.

Sprinkler heads

067 Store, handle and install Sprinkler heads in accordance with the manufacturer's technical data sheet.

068 Particular care should be taken so that:
- vent holes are not obstructed, e.g. through the use of insulation, concreting or boxing in;
- the sprinkler heads are not damaged in any way prior to fitting; especially the glass bulb or fusible link and the deflector; and
- the sprinklers are installed using the appropriate wrench supplied by the sprinkler manufacturer.

069 Leave protective covers in place until the installation has been completed and the system is about to be tested and commissioned.

Commissioning and testing

070 In addition to a full visual inspection, the leakage, hydraulic and alarm tests should be passed for the sprinkler system to become operational.

Leakage test

071 Pressurise the installation pipework to a minimum pressure of 15 bar, or to 1.5 times the maximum working pressure, whichever is the greater, for one hour. If the sprinkler system fails to maintain the pressure, the leak should be found and corrected and this test repeated.

072 Care should be taken not to subject any system components to pressure higher than those recommended by the manufacturer's technical data sheet

Hydraulic test

073 Test the sprinkler system to check that at least the design flow rate can be achieved at the design pressure when measured at the combined drain and alarm test valve.

© Rand Associates Consultancy Services Ltd

074 If this flow rate at the required pressure cannot be achieved, the system should not be approved for use until the system has been corrected and the test has been passed

075 If pressure reducing valves have been installed, a dynamic pressure and flow test should be carried out at each pressure reducing valve so that, as a minimum, the design flow rate can be achieved.

Alarm test

076 Test the alarm device by opening the alarm test valve to ensure a flow of water and checking that the alarm operates as designed. Where the alarm is configured for remote monitoring, the signal to the monitoring station should be checked.

Compliance certificate

077 On satisfactory completion of the three commissioning tests, a compliance certificate should be issued by the competent person (see 021), which attests that the sprinkler system has been designed, installed and commissioned in accordance with BS9251:2021

Operational manuals and drawings

078 Supply to the Client's Representative's, all drawings, operational manuals, guarantees, warranties, test results and compliance certificates which should bear, as a minimum, details of the system which include:

- the address and location of the premises;
- Name, address and contact details of the competent person(s) employed by the Provider who undertook the installation, testing and commissioning;
- Name and address of the designer employed by the Provider if different to the competent person; and
- Installation date.

Electronic log book

079 Update the electronic log book (see specification for electronic log book Clauses 055 to 068 inclusive of General section of this Technical Specification) to include for each sprinkler system all of the documentation listed below:

Documents

080 Provide the following information to be filed in the electronic log book:

- The statement of compliance with the applicable Standard in the form of a signed compliance certificate together with any variations agreed with the Client and justification for the variation;
- Category of system and number of design sprinklers;
- Description of the system and a layout drawing of the premises, which should include as-fitted details, showing the extent of the installation, together with a set of the hydraulic calculations, including the system pressure and flow requirements;
- Results of the commissioning tests;
- List of components used, identifying the supplier's name and parts reference number;
- Details of the local authorities and Utility Providers consulted and any response to consultation;
- Details of the water supplies which, if a town main, should include pressure and flow rate data at a specified location for the commissioned installation, with the time and date of the test;
- Routine inspection and maintenance programme for the system;
- Instructions on the actions to be taken in respect of operation of the system, faults, etc.;
- 24 hour emergency contact number which can be used to obtain assistance; and
- Essential information for the Customer's, e.g. "do not paint, cover or in any way impede the operation of a sprinkler head", "no modification should be made to any sprinkler equipment except in accordance with BS 9251:2021".

© Rand Associates Consultancy Services Ltd

Block plan

081 Provide for all systems other than a category 1 sprinkler system, a laminated block plan of the Property with the following information:

- Location of the main shut off valve(s);
- Tank volume and infill arrangements;
- Fire service connection, where applicable;
- Area controlled by each control or zone valve;
- Location of each control or zone valve(s); and
- Location of pumps, tanks, alarm controls and electrical supply.

082 Ensure that the block plan is readily available to the fire and rescue authorities in an emergency, providing sufficient information on how the system is designed to operate and the location of important controls in the case of an emergency; the block plan should be easily located within the common areas of a Property.

System data label

083 Attach or fix a label or notice adjacent to or on the sprinkler riser next to the main sprinkler stop valve as a permanent record of a system's design data.

Location plate

084 Supply and fix for all systems other than a category 1 sprinkler system, a location plate of weather-resistant material and lettering on the outside of the external wall as close as practical to the entrance nearest the system valve set(s).

085 Supply and fix a sign as close as possible to the main and any subsidiary stop valves. Where the stop valve is enclosed in a room with a door, the sign should be fixed on the outside of the door.

Liaison with Customers

086 The Works will be undertaken in occupied dwellings and common areas in Properties which may remain occupied or in use during the undertaking of the installation, testing and commissioning of the automatic sprinkler installation.

087 Will be allowed, within their programme to carry out works with a potential loss of water service if:

- The planned loss of service is anticipated to be no longer than 8 hours;
- The planned loss of services has prior agreement with both the Client and Customers;
- Local Water Authority is notified of the planned loss of service;
- Notification letters to Customers have been issued at least 7 days before commencement of the Works;
- Written notifications are present in common areas to notify Provider's intentions; and
- A vulnerable person's strategy is in place.

088 If adaptation of the mains cold water is formed as part of the works or isolation, adaptation, or replacement of the mains cold water is required as part of the works undertake the following;

- Notify the Client of isolation no less than 14 days prior to commencement;
- Ensure method and programme is compliant with provision of temporary supplies requirements;
- Ensure method and programme is compliant with vulnerable person's requirements;
- Ensure Customer Liaison Officer is contactable throughout loss of service;
- Notify Customers no less than 7 days prior to commencement;
- Return to service is subsequent to necessary cleaning and flushing methods; and
- Return to service is subsequent to testing, non-destructive testing and curing as necessary.

089 Comply with all Health and Safety regulations, British Standards and all other current legislation and be in accordance with the Client's" Code of Practise for the Protection of the Public/ Customers during Contract Works."

© Rand Associates Consultancy Services Ltd

Firestopping

090 All holes through walls, floors, ceilings etc are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

091 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

STANDBY GENERATOR SETS INSTALLATIONS

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

STANDBY GENERATOR SETS INSTALLATIONS

General Requirements

001 This specification shall be read in conjunction with the Preliminaries, the other Communal Mechanical and Electrical Specifications, Appendices, Schedule of Rates and all other contract documentation.

002 Note that this is a performance specification. It shall be clearly understood that the Provider shall be fully responsible for the detailed design, supply, installation, testing, commissioning, demonstrating, documentation and leaving in a satisfactory working order following removal of existing plant (if any) the fully operational new standby generating installations as described within this specification or indicated on the Project Drawings.

003 It shall be the Providers responsibility to request and receive any information regarding asbestos on the site and subsequently satisfy their obligations by carrying out a Pre-construction asbestos survey.

Strip Out Works

004 Provide strip-out details as part of their initial enabling works identifying the extent of the strip out works, details regarding isolation, method of isolation, methods of safe removal and builders work including any fire stopping.

005 Following consideration and approval the strip out works will be completed as part of the first stage of the project.

Loss of Service

006 Shall be allowed, within their programme to carry out works with a loss of service if:
- The planned loss of service is anticipated to be no longer than 8 hours;
- The planned loss of services has prior agreement with both the Client and Customers;
- Notification letters to Customers have been issued at least 7 days before commencement of the Works;
- Written notifications are present in common areas to notify Provider's intentions;
- A vulnerable person's strategy is in place.

Temporary Supplies

007 Depending upon the period of loss of service, strategy agreed with the Client and necessity the Provider may provide a method including for temporary supplies. As such, any temporary water service will only be accepted if this is capable of satisfying delivery in line with operational duty identified as part of the validation report investigations.

New Standby Generator Sets

008 Undertake the design, manufacture, testing, delivery, off-loading and installation of a fully automatic mains failure diesel-engine generating set, together with oil storage facility and the installation of all ancillary services.

009 The generator set shall provide secondary supplies as required on site. The generator set shall be suitable for installation in an enclosure and shall be capable of starting and operating continuously at full rated load detailed in the Specification, and in the conditions specified.

010 State any deviation from the Standard rating for operation in the conditions specified.

011 Carry out a full survey and load assessment of the existing equipment and plant that is to be supplied by the generator. This load assessment shall be used to size the generator accordingly.

© Rand Associates Consultancy Services Ltd

012 The generating set shall comprise the following major components:
- Diesel engine of rated output appropriate to the rated output of the generating set and complete with cooling system;
- Direct coupled alternator and associated automatic voltage regulator;
- Generating set starting and control cubicle;
- Fuel tank, set mounted, with associated fuel transfer pumps and piping;
- Starting battery and charger;
- Exhaust system, comprising all pipework and silencers;
- Weatherproof, sound attenuated enclosure with anti-vibration mounts;

Functional Requirements of Generating Set

013 The generating set shall operate in the event of a failure of the power supply and will not be operated in parallel with any other generator or electricity supply.

014 The generating set shall start automatically on sensing a failure in the normal mains supply or a deviation outside acceptable limits and to shut down following the re-establishment of the normal mains supply. Start and shut down facilities shall include: -
- A mains failure time delay to guard against unnecessary start-up of generator on transient dips or fluctuations of mains supply, set at 3 seconds but adjustable up to a minimum of 10 seconds;
- A mains return time delay to allow the mains supply to stabilise before the load is reconnected to the public supply. The timer shall be adjustable from 0-180 seconds;
- A run on timer to allow the engine room to run off-load for a short time after the load has been re-connected to the public supply, set at 15 minutes but adjustable between 1-45 minutes; • Alternator contactor time delay to allow alternator voltage and frequency to stabilise before connecting the load to the alternator;
- A starter to allow three consecutive starts in succession should the engine fail at the first two attempts;
- If the set fails to start at the third attempt then the starting circuit shall automatically lock in the "SET FAILED TO START" condition, with visual warning light to indicate same;

015 Governing of the engine, when coupled to its alternator, shall comply with the British Standrad requirements.

016 The engine/alternator units, all auxiliaries and components shall be mounted on a skid type baseplate with levelling pads. The control cubicle shall be supplied for floor mounting. All components which must be held in correct alignment shall be located by means of dowels or fitted bolts. Lifting points for the attachment of slings shall be provided and positioned to ensure safe handling.

017 The Set shall be designed for skid-mounted operation on a flat and level floor. The set shall be fitted with anti-vibration mountings. Mountings shall be resistant to fuel and lubricating oil and shall have high friction seating's or fixings to prevent movement whilst the set is in operation.

018 All auxiliary components, connections, fixings and wiring necessary for the safe and satisfactory operation of the set shall be included whether they are specifically referred to in this specification or not.

General Requirements - Diesel Engine

019 This engine type shall have a substantial record of reliability whilst operating on continuous duty and at the same speed and load rating as that offered under this contract.

020 The engine shall be brought to full load by stepping the loads with the largest load online first 15 seconds from initial start. Within a further 15 seconds of the first load on-line a second step shall bring the remaining loads online. The time from start up to first step load on to the generator shall be increased from initiation of the starting sequence when starting from cold at the minimum ambient air temperature specified by the manufacturer.

021 The generating set shall provide its rated electrical output continuously, and with an additional overload capacity of 10% for any one hour in any consecutive twelve-hour running period.

© Rand Associates Consultancy Services Ltd

022 The engine for the generating set shall be water cooled.

023 The engine shall be rated in accordance with the British Standard and be capable of operating continuously at any load, in the conditions specified, on fuel oil complying with Class A of the British Standard.

024 The engine fuel system shall be isolated so that leakage from any part of the system cannot contaminate the engine lubricating oil.

025 The engine governor shall be of the electronic automatic type to Class A1 in accordance with applicable Standards, having speed droop adjustable from zero to 5% with provision for fitting remote-control motor operation. Unless otherwise indicated, hydraulic servo governors shall be adjusted to zero droop. Manual speed adjustment shall be provided over a range of ±5% of the rated speed at any load.

026 The governing of the set shall be such that the steady load speed band shall not exceed 1% of rated speed.

Engine Cooling System

027 Cooling air for the engine, and for the lubricating oil if appropriate, shall be circulated by engine driven fan(s). The cooling system shall be adequate for the engine when running on continuous full load and on 10% overload for one hour in accordance with the British Standard and under the operating conditions specified.

028 The radiator shall be of the sealed or pressurised air blast type, and shall have separate sections for water, and for lubricating oil if appropriate, and shall be fitted with an integral header tank.

029 Unless otherwise indicated, the radiator shall terminate in a flange and flexible bellows, for connection to the discharge duct/attenuator assembly, for discharge to external air. The specialist shall ensure that the radiator airflow requirements and the maximum permissible inlet and outlet pressure drops are achieved with all installed components in situ in the generator room or enclosure.

030 Engine driven pumps(s) shall circulate the jacket water, and lubricating oil if appropriate, through the radiator sections.

031 A thermostatically controlled diverter or by-pass valve shall be fitted in the engine cooling water discharge pipework, with a return to the circulating pump suction, to maintain the circulating water at the optimum temperature irrespective of load.

032 The engine shall be provided with a first-fill of 50% polypropylene glycol and water coolant, suitable for operation at –20oC ambient.

033 Thermostatically controlled heater(s) shall be fitted in the engine water jacket to maintain a system water temperature of 10oC, in an external ambient of -10oC. The heater shall be served from the control panel.

Fuel Systems

034 A daily service fuel tank shall be set mounted with sufficient capacity to enable the set to be run on full load for 14 hours. The fuel supply from the tank shall be pumped from the bulk storage tank, where specified, the flow being controlled by a Solenoid Valve operated by a key actuator.

035 A refuelling system shall be via a steel pipe in pipe system. Inlets shall be provided complete with fuel transfer pump with a flexible suction hose connection shall be provided to permit filling the tank via a tanker delivery vehicle.

© Rand Associates Consultancy Services Ltd

036 The tank shall be fitted with: -

- Interconnecting pipework;
- Graduated dipstick (indicating litres);
- Capped drain;
- Overflow connection;
- Filling connection;
- Injector, spill and excess fuel return connection;
- Vent with gauze flametrap;
- Clearly visible dial type contents gauge (indicating litres) adequately protected against accidental damage;
- Bolted access cover for cleaning purposes;
- Fuel oil transfer pump and solenoid valve operated by a float switch mounted onto the top of the tank;
- A float controlled high level alarm switch;
- Holes in the tank top shall be sealed with suitable bolted and gasketed covers;
- Mechanical fuel dump valve operated by a fusible link in the room or enclosure.

037 A fuel filter with disposable filter elements shall be fitted in the fuel inlet pipe close to the injection pumps. The filter elements shall have a micron rating not greater than 5.

038 The fuel supply system shall comprise a fuel pump, piped to supply the diesel injectors. The system shall be of the self-venting type, with fuel spill from injectors and excess vented fuel returned directly to the daily service fuel tank.

Instrumentation

039 Instruments, as applicable, situated in an easily visible panel and isolated from harmful vibration, and test points shall be provided as follows: -

- Lubricating oil pressure gauge;
- Running hours meter, which may be engine or cubicle mounted;
- Cooling air, or cooling water, outlet thermometer;
- Lubricating oil outlet thermometer;
- Turbo-charger air pressure gauge;
- Provision only for test thermometer(s) in each exhaust gas outlet manifold, each turbo-charger inlet, and turbo-charger outlet. Brass plug(s) shall be fitted at the test point(s).

Lubrication System

040 The engine shall have a forced lubrication system throughout using an integral gear driven pump with a coarse strainer on the suction side and a full flow filter, of nominal micron rating not greater than 10, on the delivery side. Manual lubrication of any part of the engine will not be accepted.

041 The capacity of the lubricating oil system shall be sufficient to enable the engine to run continuously for 100 hours at any load without replenishment, and for 200 hours without replacement.

042 The engine lubricating oil dipstick shall be easily accessible and be clearly marked to indicate maximum and minimum levels.

043 The engine sump shall have an easily accessible drain point, or suitable drain pipe, fitted with a BSP plug.

044 A separate electrically operated pump shall be provided to lubricate the bearings, on an intermittent basis, and to automatically pre-prime the lubricating system during the starting sequence.

Starting System

045 The engine shall be capable of starting from any crankshaft position, using a 24-volt dc supply, by axial type starter motor(s) engaging with the flywheel.

© Rand Associates Consultancy Services Ltd

046 Starter motor(s) shall disengage automatically when the engine starts and/or when de-energised and shall be easily accessible. Terminals shall be fitted with non-conducting protective shrouds.

047 The starter motor batteries shall be arranged on a non-corrodible spill-proof tray or rack and isolated from harmful vibration. The batteries shall be of the lead-acid type and of sufficient capacity to crank the diesel engine above the minimum firing speed for 6No 20-second cranking operations, with 5 seconds break between each cranking operation. In addition, the batteries shall also supply the maximum demand from the control cubicle and other normal system powers demands when the set is operating.

048 An approved type battery charger shall be provided, suitable for use with lead acid batteries, preferably in the control cubicle or on the set, isolated from harmful vibration. The charger shall have sufficient capacity to maintain the charge of the batteries under all specified duties and during long periods of in operation.

049 The unit shall be fitted with an ammeter to measure the charge and discharge current, except for the starter motor demand.

Exhaust System

050 The exhaust system shall be designed in accordance with the engine manufacturer's recommendation, to achieve the specified noise limitation requirements. Except where detailed otherwise in the specification, the maximum noise level reading from the exhaust system shall not exceed 70 dB(A) at a distance of 3 metres in any direction from the outlet.

051 The set shall be provided with an exhaust system suitable for mounting either externally. The exhaust system shall be constructed from external grade stainless steel, to comprise exhaust silencer(s), expansion bellows, flexible sections, pre-formed bends, all with BS flanged or BSP screwed ends draining facilities and all gaskets, joints and fixings. The exhaust piping and silencers within the generator room shall be suitably insulated to reduce radiated heat and noise.

052 The system shall be provided complete with all supports, hangers, clips and other fixings necessary for complete installation, designed to keep noise and vibration to a minimum. The system shall be provided with all silencer and tertiary silencer units, designed to achieve the specified noise limitations.

053 The composite silencer and pipework system shall be designed to maintain the backpressure on the exhaust manifold stipulated by the engine manufacturer, to maintain the optimum engine efficiencies.

Guards

054 All exposed hot or moving parts and in particular the fan(s), belt drive(s), coupling(s), and flywheel(s), shall be guarded in accordance with the Health & Safety at Work etc. Act, 1974. Secured cover plates of suitable dimensions shall be provided at appropriate points in the guards to enable adjustment and inspection of drives.

Pipework

055 Fuel pipework shall comprise heavyweight black mild steel tubing (Red Band) with malleable iron fittings to or welded fittings all to the relevant British Standards. All other pipework shall be either of seamless copper tubing to the British Standard, with brazed or compression type gunmetal fittings, or seamless black steel tubing with welded or compression joints.

056 Flexible sections of pipework shall be of synthetic rubber construction with stainless steel braided covers.

057 Fuel and lubricating oil flexible sections shall be able to withstand a flame temperature of 1000°C for 5 minutes without failure.

058 All pipework flanges shall comply with the British Standard, and screwed connections shall have BSP threads. Copper and copper alloy capillary or compression fittings shall comply with the British Standard.

© Rand Associates Consultancy Services Ltd

Drives

059 All belt drives shall utilise multiple endless vee belts, resistant to fuel and lubricating oils. The number of belts fitted to each drive shall be one more than is necessary to transmit the maximum power requirement.

060 An easily accessible belt tensioning device shall be fitted to each drive and it shall be possible to change the belt(s) without major dismantling and reassembly.

General Requirements - Alternator

061 The output rating of the alternator in kVA, the voltage, number of phases, and frequency shall be as indicated.

062 The alternator shall be capable of delivering the specified kVA output continuously at any voltage within ±5% of the rated voltage, at a power factor of 0.8 lagging and at rated frequency.

063 The alternator shall be capable of withstanding a 20% engine overspeed condition.

064 The alternator may be flange and/or foot-mounted with single or twin end-shield bearings.

065 A single bearing rotor shall be directly coupled to the engine crankshaft. A two-bearing rotor shall be coupled through an approved type of intermediate flexible coupling.

066 The alternator shall be of the rotating field brushless type and coupled directly to the engine.

067 The three-phase machine shall be star connected with ABC phase rotation and with the neutral brought out to the alternator terminal box. A diagram showing the terminal markings and phase rotation shall be provided in the terminal box. Cables connecting the machine windings and machine terminals shall have the same temperature rating as the machine windings.

068 Bearings generally of the ball or roller type shall be suitable for operation over long periods without the need for replacement or replenishment of lubricant. Oil lubricated bearings shall be fitted with a clearly visible and protected oil level gauge.

069 The insulation shall comply with the British Standard excluding classes Y and A. The insulation shall have an oil and moisture proof finish with a surface which will not retain dust or condensation. The deviation of the line-to-line voltage waveform from a pure sine wave, with the generator running at rated speed and rated voltage and an open circuit, shall not exceed the 5% limit specified in the British Standard category VR1.

070 Radiated interference from all sources shall be suppressed to the limits specified in the British Standard.

Automatic Voltage Regulator

071 The automatic voltage regulator shall be an approved solid state type which will maintain the setting for long periods without attention, and shall be provided with manual adjustment from the control cubicle for setting the alternator output within ±5% of the rated voltage. The AVR may be integral with the alternator or mounted on the control cubicle. The voltage sensing shall be monitored on all three supply phases.

072 Where indicated, permanent magnet excitation shall be employed to minimise the effects of harmonic load currents.

Voltage Regulation

073 The steady state voltage shall be maintained within ± 2.5% of the rated voltage under the control of the voltage regulator. After any change of load the voltage shall not vary by more than ± 15% of the rated voltage and shall return to within ± 2.5% of rated voltage within 10 seconds. On starting the voltage overshoot shall not exceed 15% and shall return to 2.5% of rated voltage in not more than 3 seconds. Over voltage protection shall be provided so that if the above limits are exceeded the set shall lock-out.

© Rand Associates Consultancy Services Ltd

Terminals, Terminal Boxes and Cables

074 Terminal boxes shall be easily accessible and suitable for the connection of cables without distortion or cramping. Terminals shall be suitable for connection of pressure crimped or soldered lugs and shall give full face contact with the cable lugs. The main terminals of the machine shall be of robust construction and be secured by nuts, flats and locking washers.

075 Glands and gland mounting plates shall be detachable and, where terminal or cable boxes are arranged for single core cables, they shall be non-ferrous or designed to eliminate eddy currents.

Control Equipment

076 The control equipment shall be designed to operate on an 'energise to run, de-energise to stop' basis and shall provide the following facilities:

077 Control of the automatic starting and stopping of the engine. Fault indication and automatic engine shutdown. Automatic regulation of the alternator voltage. Suitability for use with an Automatic Changeover Contactor Unit (ACCU) to form a fully automatic standby system.

Engine Control

078 The duty selector switch shall be arranged to enable periodic testing of the plant - (a) without load transfer and (b) with load transfer to standby set.

079 The duty selector switch shall be four-position switch OFF/AUTO/MANUAL/TEST. In the OFF position it shall not be possible to start the generator from any source whatsoever.

080 In the AUTO position the set shall start on receipt of a signal from the start delay relay or, where fitted, from the integral voltage measuring relay. Under the latter circumstance, the set shall start on failure of the normal supply or on the falling below 85% of the normal voltage between any two lines or line to neutral.

081 In the MANUAL position the set shall start and run without load transfer. However, should the normal mains fail during testing the set is to immediately serve the essential load. After test and when the selector switch is returned to AUTO and set shall run on for a pre-set run-on time and then shut down.

082 It shall be possible to switch from MANUAL to AUTO or vice versa without affecting the operation of the set, when it is in use.

083 When the set is stopped, other than under lock-out conditions, it shall be self-resetting and ready for the next starting sequence.

084 A manually re-set approved overspeed trip shall be provided and shall operate at 15% over normal rated speed. A mechanical or electrical overspeed device may be offered for approval. The overspeed trip shall be equipped with a pair of auxiliary contacts which shall close on overspeed and remain closed until manually re-set.

085 All switches and push-buttons shall be clearly marked to indicate their function and shall be located on the front face of the control cubicle.

086 Pushbuttons shall be of the impulse type with holding circuits to ensure completion of the selected function. The STOP push-button shall be of the mushroom head type, coloured red, and prominently located. Operation of the STOP push-button shall stop the set in either MANUAL, AUTO or TEST.

© Rand Associates Consultancy Services Ltd

Alternator Control

087 The control cubicle shall contain:

- A moulded case circuit breaker with overcurrent protection on all phases, fitted with a minimum of one normally open and one normally closed auxiliary contacts. The protection system shall incorporate an auxiliary circuit which, on operation of the protection, shall immediately stop the set, operate the lock-out and prevent further starting until re-set;
- An automatic voltage regulator with manual adjustment which alternatively may be integral with the alternator if it is a manufacturer's standard design;
- One ammeter and selector switch, to indicate line and neutral currents;
- One voltmeter and selector switch, to indicate line-to-line and line-to-neutral voltages;
- Frequency meter;
- Kilowatt meter (single element type calibrated for three phases balanced load). The Provider shall state the additional cost for the provision of a three phase 4-wire unbalanced load kW meter;
- Main terminals for the outgoing supply, which shall be easily accessible for the connection of cables. Terminals shall be suitable for connection of adequately rated pressure crimped or soldered lugs and shall give full face contact with the cable lugs;
- A single-phase fused switch wired to the ac terminal box with distribution fuses for supplying mains operated equipment on the generating set;
- Where applicable, an instantaneous voltage measuring relay set to operate at 85% on rising voltage.

088 The relay shall be equipped to monitor voltage on all three supply phases, and shall have changeover contacts connected to terminals R, R1 and R2 in the dc terminal box.

- A power factor indicator;
- Output contactor only and separate main voltage sensing terminals;
- An engine hours-run meter, if not fitted directly onto the engine block;
- A start relay, with integral adjustable delay timer;
- A stop relay with adjustable delay timer.

Lock-Out

089 The generating set shall immediately stop and lock-out to prevent further starting when:

- The set fails to start after three successive attempts;
- The lubricating oil pressure falls to an unsafe condition;
- The cylinder head temperature exceeds a safe maximum, or the cooling water outlet temperature exceeds a safe maximum, as applicable;
- The overspeed trip has operated;
- The MCCB has tripped on fault;
- A direct temperature sensing device shall be used to measure cylinder head temperature in air cooled engines.

090 In all cases re-set of the lock-out shall be by hand.

091 Alarms and lock-out systems shall not operate during normal shut down procedure.

092 Individual indicator lamps shall be illuminated by the operation of each lock-out condition detailed above and shall remain illuminated until the lock-out has been reset.

093 A lamp test switch or push-button shall be provided and biased to the NORMAL position.

094 Operation of the switch or push-button shall illuminate all indicator lamps.

© Rand Associates Consultancy Services Ltd

Lock-Out Circuits

095 Two separate auxiliary circuits shall be provided as follows:
- One auxiliary contact shall be provided and connected to terminals marked L01 and L02 in the dc terminal box to give remote indication of lock-out. The contact shall be open when the set is available and closed when it is locked out;
- One auxiliary contact shall be provided and connected to terminals marked E1 and E2 in the dc terminal box for use in conjunction with an ACCU. The contact shall be closed when the set is available and open when it is locked out and shall be wired in series with auxiliary contact on the circuit breaker that is closed when the circuit breaker is closed.

096 All auxiliary contacts shall be rated at 240V 5A AC or 24V 2A DC, as applicable to their control functions.

Fire Service Terminals

097 An emergency stop circuit shall be provided and connected to terminals marked FS1 and FS2 in the dc terminal box. These terminals shall be initially fitted with a link and are for optional connection to a Fireman's Switch.

098 Operation of the switch shall isolate the control circuits from the battery supply and stop the set if it is running. The set shall be incapable of being started by MANUAL or AUTO control so long as the circuit remains open and closing of the switch shall restore the battery supply to the control circuits.

Control Wiring

099 All control wiring shall be terminated with soldered or pressure crimped lugs or eyes suitable for LSOH insulated wiring. The terminations and respective terminals shall be coded, clearly marked with numbers or letters, and also shown on the circuit diagram.

100 Flexible conduit or trunking shall be fitted to protect all cabling and wiring.

101 Two terminal boxes shall be provided situated in an easily accessible position on the generating set; one for dc connections and one for ac connections. The boxes shall be suitable for accepting flexible conduit, contain all-insulated terminal blocks, and permit easy connection of control wiring.

Earthing

102 All metalwork housing electrical equipment shall be bonded to a brass earthing terminal of not less than ISO bolt M10 size situated in an easily accessible position on the baseplate.

Finish - Painting

103 All ferrous metalwork shall be either painted or processed to give a rust proof coating. Where protection is by painting this shall consist of one brushed or two sprayed priming coats.

104 All metalwork shall be painted in the manufacturer's standard colours.

Testing and Commissioning - General

105 All testing and commissioning of the generating set shall be carried out by the specialist manufacturer both in-works and on-site, as detailed below.

106 Provide all the necessary test equipment including fuel, lubricating oil, instrumentation, water and artificial electrical load, and also all necessary facilities and labour to carry out the tests.

107 Give the Client's Representative at least five consecutive working days prior notice of the commencement of all tests.

© Rand Associates Consultancy Services Ltd

Performance Test

108 The completed generating set shall be subjected to a Performance Test. Type Test Certificates conforming to Performance Test requirements shall be submitted prior to undertaking any of the Work:.

109 A Performance Test of the generating set shall be:

- A general inspection of the equipment to check its compliance with the requirements specified.
- Measurements of the cold resistance of the electrical windings;
- Determination of the alternator open circuit and short circuit characteristics;
- A timed automatic start to full rated load from cold, at the prevailing ambient temperature.
- A continuous trial of:
  - Four hours at full rated load;
  - One hour at 10% overload.
- Alternator and exciter maximum winding temperatures and hot winding resistances shall be recorded immediately after the three hour full rated load trial and the set shall be shut down for the minimum time necessary for the recording of these results;
- Determinations of frequency and voltage regulation under the following instantaneous load changes:
  - No load to maximum acceptable load;
  - Full rated load to no load;
  - No load to full load to no load in steps of 20% of full load.
- Operation of all protective circuits and devices together with verification of the settings of relative sensors;
- Insulation resistances and high voltage tests;
- Alternator heat run at full load 0.8 p.f. lagging for not less than three hours. Temperature and electrical readings shall be recorded at intervals of approximately half an hour, together with maximum temperatures and hot winding resistances after shut down, this test shall be followed by one hour at 10% overload. Similar readings shall be recorded. Tests may be combined with the engine test and the engine may be shut down for a minimum period for recordings;
- Check of phase-to-phase and phase-to-neutral wave form.
- Calculation of alternators efficiency by summation of losses.

Works Testing

110 Prior to despatch to site, the manufacturer shall carry out the ABGSM standard test procedures to demonstrate compliance with the standards and requirements detailed in this specification. These tests shall include, but not be limited to, items 2, 9, 13 and 14 detailed in the clause 3.18.26 above.

111 Load tests shall be carried out at full output power for a four-hour period, with a further one hour period at a 10% overload.

112 The testing shall include a continuous monitoring and measurement of fuel and oil consumption at both load conditions.

113 The tests shall include step-load acceptance testing, to demonstrate compliance with the specified conditions, and shall fully demonstrate all functional testing including change-over and change-back procedures, automatic run-on and shutdown sequences.

Site Testing and Commissioning

114 Site testing shall include all functional and operational aspects of the Performance testing specified above and in addition shall include a functional testing of all metering, controls, interlocks, etc;

© Rand Associates Consultancy Services Ltd

115 The following tests shall be carried out on site during commissioning:
- Check that skids are level in all directions;
- Check water and sump oil levels. Check level and specific gravity of battery electrolyte;
- Check that water heater works;
- Check all engine bolts pipe line connections, water hose and exhaust couplings;
- Check linkage to automatic louvres;
- Set selector switch on panel to MANUAL. Allow engine to run up to rated speed;
- Allow sufficient time for engine to overcome friction and circulate lubricating oil, then check that the voltage and frequency of the output are within the prescribed limits. Check that the generator contactor connects to the outgoing cables at approximately normal voltage;
- Allow engine 30 minutes minimum no-load run, after which the protective devices should be checked by pressing the appropriate test buttons;
- Reset the selector switch to OFF and check that the generator contactor falls out of circuit between 95% and 85% full voltage. Check water and oil levels;
- Reset selector switch to AUTO. Switch off the sensing circuit and check that engine starts after a three second preset delay period and connects via the changeover contactor to the load. Using a test load-bank, run the set on-load for 1 hour and note and record the live currents, switch on sensing supply and ensure that the set sheds loads after minimum stop delay period and then runs on off-load for the preset run-on time before shutting down;
- Check that the trickle charger cuts out when engine generator is charging the battery. Note rate of charge on both engine generators and trickle charger. Set to battery makers recommended figures;
- Check anti-vibration mountings and flexible connections for water, exhaust and electrical services. Note that the engine is vibrating within tolerances, then shut down;

116 On completion of satisfactory testing, the completed installation shall be handed over to the client completed with a first fill of diesel, lube oil and coolant, together with all relevant test records, spares, tools and maintenance instructions.

Test Results

117 Test results shall be recorded by the Provider on test sheets and in accordance with the British Standard. Measurements including fuel consumption, electrical output, alternator and exciter temperatures, shall be recorded at intervals of half an hour.

118 Provide copies of the engine and alternator manufacturer's works test records.

119 Following witnessed testing, the Provider shall allow for the removal of all relevant inspection covers to permit visual inspection of the set.

120 Provide a separate provisional price in their tender for the removal and inspection of approximately 25% of the following, after a Performance Test: -
- Cylinder Heads;
- Pistons;
- Connecting Rods;
- Large end bearings;
- Main bearings - if practicable.

121 If the condition of components removed is considered satisfactory by the Client's Representative, the generating set shall be re-assembled.

122 If the condition of the component(s) is not satisfactory the Client's Representative may require at no additional cost a complete strip down of the engine or generating set to determine the cause of failure of the component(s).

© Rand Associates Consultancy Services Ltd

Drawings

123 Provide the following drawings for approval prior to commencing work on site:

A general arrangement of the complete generating set showing details of terminal points for cabling, wiring, pipework, and all associated trenches or ducts required for the proper installation of the set. The principal dimensions and weights of the set and major components shall also be shown:

- A general arrangement of the diesel engine;
- A general arrangement of the alternator and exciter showing terminal markings, polarity, and phase rotation;
- A general arrangement of the control cubicle showing cable entry and control wiring termination points;
- An electrical schematic diagram of the control cubicle, or a detailed wiring diagram of the control cubicle;
- An earthing diagram, showing the inter-connecting wiring between the generator control panel, alternator chassis and normal supply main earth;
- Full construction drawings for the acoustic enclosure, attenuators and louvres;
- Full construction drawings for the exhaust systems and silencers.

124 Provide the following technical details and submissions on their proposed set: -

- Exhaust emissions;
- Overall noise emissions;
- Details of fuel and lube oil specifications;
- Fuel consumption at rated power output.

Instruction Manuals

125 Duplicate copies of Operating and Maintenance Instruction Manuals and spare parts lists shall be supplied. The manuals shall be printed on good quality paper with illustrations as necessary and shall be contained in strong durable stiff-covered ring binders. The maker's name, the rating of the set shall appear on the front cover of each manual and also on the spine. The manuals shall contain:

126 Fully detailed instructions for operation, maintenance and major overhaul of all parts of the complete plant supplied. A comprehensive spare parts list for the complete plant, giving descriptions and parts identification numbers.

127 Specimens of manuals in draft form or pre-printed shall be submitted for approval before the production of the printed copy.

128 All completed documents shall be provided on CD-ROM. Drawings shall be on AutoCad 2020 drawing format, other documents shall be provided on MS Word.docx or Excel.xlsx format.

129 The completed documents shall be provided as a part of the acceptance and handover process.

130 The Provider's attention is drawn to the fact that handover of the installation will not be accepted without all final documentation being in place.

Instruction Cards

131 Approved instruction cards shall be provided, wall mounted within the generator room or enclosure. The cards shall be encapsulated in tough clear polyester film or have equal protection from wear and tear, dust moisture, oil, etc.

132 The instruction cards shall clearly indicate the starting, control and stopping procedures and the switch positions for each method of operation. Appropriate warnings (where applicable) against maloperation of the equipment shall also be shown. A specimen card shall be submitted to the for approval not less than one month before despatch.

© Rand Associates Consultancy Services Ltd

Spares

133 The Provider shall provide a schedule of recommended tools, spare parts and consumables, individually priced, for the Client to instruct on their provision. Any order placed for such items shall be a variation under the Contract, and all items and components shall be provided as part of the handover process.

Information Plates

134 A non-ferrous metal rating plate shall be securely fixed on the Engine/Alternator Unit giving the following information:

- Applicable Stanndard Rating: Site Rating
- Continuous Output: kW
- Continuous Output: kVA
- Power Factor : 0.8
- Voltage: V - Phase - wire
- Frequency: Hz Speed rev/min
- Manufacturer's Name: Manufacturer's Serial Number
- Contract No: Year of Supply
- Total set weight: kg Engine Weight/Alternator Weight.

135 A reversible plate, size 400mm x 250mm shall be fixed by screws in a prominent position on each side of the set. One side of the plate shall be blank and painted the same colour as the set; the other side of each plate shall be signal red with the following indelible inscription in white:

"DANGER
ENGINE SUBJECT TO AUTOMATIC START
DO NOT WORK ON THIS MACHINE UNTIL
STARTING EQUIPMENT IS ISOLATED
OR DISCONNECTED AND CAUTION
NOTICES ARE DISPLAYED"

Firestopping

136 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

137 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

STORAGE AND CONVECTOR HEATER MAINTENANCE

© Rand Associates Consultancy Services Ltd

STORAGE AND CONVECTOR HEATER MAINTENANCE

General Requirements

001 Storage and convector heaters must be covered by a fully comprehensive type Contract.

002 Detailed below are the specific Requirements. The Contract must therefore comprise of the following elements:

- Routine Maintenance
- Responsive Maintenance
- Out of Hours Emergency Works

Asset Register

003 Ensure that all the asset registers supplied by the Client prior to the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

004 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each visit to undertake Routine Maintenance, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

005 Ensure that, following all visits to undertake Routine Maintenance, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

006 Provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff including his Specialist Subcontractors.

Manufacturer's Requirements

007 Where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

008 Submit and agree within 20 working days of the award of the Contract a full annual Programme for all Works covering each element of the Routine Maintenance Works with the Client's Representative.

009 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

Permit to Work Certification

010 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

Access

011 Ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

© Rand Associates Consultancy Services Ltd

012 Ensure that all Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

013 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

Minor Repairs

014 Carry out, during testing, minor repairs such as tightening joints, replacement of clips, etc to achieve a pass status and make appliances safe to ensure compliance with the British Standard.

Routine Maintenance

015 The minimum requirements for Routine Maintenance are to be in accordance with the relevant equipment manufacturer's recommendations.

016 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

017 Carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

018 Include or the provision and application of all consumables within the Rates for this element of the Contract.

019 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the latest British Standards or equivalent.

020 Routine Maintenance of storage and convector heater systems must unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirements tabled below;

© Rand Associates Consultancy Services Ltd

Storage Heaters

Item No	Item	Frequency	Action	Notes
1	General	Annually	All storage heaters shall be inspected, tested and maintained in strict accordance with the manufacturer's recommendations and requirements.	On older models be vigilant for the presence of asbestos. Report suspect appliances.
2	Cases	Annually	Examine fixings. Examine general mechanical condition of cases and cabinets. Tighten screws and fixings as necessary. Clean cases and cabinets. Remove all fluff, dust and dirt from interior and exterior, including fans, grilles and ducts. Examine the location of the storage heater to ensure that it does not present a fire risk.	
3	Fans	Annually	Clean and examine fans, motors and bearings. Examine filters, clean or renew as necessary. Examine fan housings and ductwork. Test performance.	
4	Elements	Annually	Examine connections. Examine terminals for oxidisation, corrosion and tightness. Clean and tighten as necessary. Test insulation resistance. Test element resistance.	Note the condition of the thermal blocks, report to the Client's Representative any signs of deterioration.
5	Controls	Annually	Clean and examine controls, control switches and pilot lights. Examine time switches. Examine over-ride controls. Examine thermostats, test calibration. Examine terminal connections. Examine condition of wiring.	Discuss operational effectiveness with user to determine control settings. Comment upon location of external thermostats.
6	Meters and Electricity Supply	Annually	Examine meters at supply position. Ensure time clocks are correct and supply charge to storage heaters during 'off peak' periods.	
7	Electrical Installation	Annually	Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Examine fused connection unit to electrical installation. Check fuse rating. Test insulation resistance. Examine earthing arrangements and test continuity.	

© Rand Associates Consultancy Services Ltd

Fan Convectors

Item No	Item	Frequency	Action	Notes
1	Visual Inspection	Annually	Visually examine each heater, replace missing fixings, if cabinet damaged report condition. Check operation of local isolation switch and indicator lights – switch off.	Report defects to Client's Representative. Report any findings of Asbestos Cement type boarding within heater cabinets or forming ducts through walls to Client's Representative.
2	Cleaning	Annually	Remove access panels, expose Heater Battery and Fan Assembly. Vacuum clean heater interior. Remove filter (if fitted) and clean thoroughly. Clean out heater battery and fan assembly using high pressure air line and vacuum collection. Ensure fins are correctly aligned.	Report defects to Client's Representative. Report if not fitted or faulty to Client's Representative.
3	Electrical Inspection and Testing, General	Annually	Examine all internal wiring and test insulation. Check and test earth connections. Ensure all fuses are correctly rated. Check operation of in-built room thermostat/change speed thermostat. Check operation of low temperature cut out thermostat.	Record readings and report defects to Client's Representative.
4	Electrical Inspection and Testing, Motors	Annually	Lubricate fan bearings to manufacturer's recommendations. Examine and test insulation to all motors and test earth continuity to the motor casings.	Report defects to Client's Representative. Record readings.
5	Mechanical Inspection	Annually	Check operation of isolating lockshield valves on heater battery.	

021 It is the Provider's responsibility to observe the on-going condition of the systems and installations with regard to safe and correct operation. The Provider must bring to the attention of the Client's Representative any specific areas where periodic checking, lubrication and adjustment exceeds normal provisions for the age and type of systems installed.

Responsive Maintenance and Out of Hours Emergency Works

022 Attend to all call outs due to malfunction or breakdown.

023 Include for a call-out service to provide Responsive Maintenance and an Out of Hours Emergency Works Service. The Out of Hours Emergency Works service is deemed to extend the provision of Emergency Works to a 24 hour, 7 days a week, 365 (366 for a leap year) days per year basis.

© Rand Associates Consultancy Services Ltd

024 Call outs for Responsive Maintenance and/or Out of Hours Emergency Works which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

025 Where Out of Hours Emergency Works are attended to for authorised cases of breakdowns, mis-use or vandalism, the Provider will be paid in accordance with the Rates detailed in the Price Framework.

Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works

Repairs, Replacements and Adjustments

026 Accept responsibility for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

027 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

028 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

029 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

Firestopping

030 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

031 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

THERMOSTATIC MIXING VALVES – SERVICING AND MAINTENANCE

© Rand Associates Consultancy Services Ltd

THERMOSTATIC MIXING VALVE MAINTENANCE

General Requirements

001 The Provider shall be deemed to have read the whole of this Specification together with the Client's requirements' and will be deemed to have included in his Tendered Rates for full compliance.

The Provider shall provide a 24-hour, 365 days per year (366 for a leap year) responsive maintenance service for the period of the Service to allow for breakdown or malfunction of any appliance, or installation and the replacement of any defective or missing components or installation parts previously specified. This service is to ensure that the appliances and installations are left in a safe and fully operational condition. The details of any repair are to be noted by the engineer for registering on the Provider's database (as provided by the Client's Representative).

Asset Register

002 The Provider must ensure that all the asset registers are supplied to the Client's Representative during the first 12 months of the Contract Period.

Maintenance Reports

003 The Provider shall ensure that, following all inspection visits, conditional reports shall be in electronic format, including all specialist reports and test equipment printouts, and uploaded onto the Client's IT system.

Manufacturer's Requirements

004 Where manufacturer's instructions exceed the requirements of this document they shall be adhered to in their entirety.

Access

005 The Provider shall ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

006 All works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

007 The Provider shall ensure that all Staff employed upon this Contract are suitable trained and experienced and competent to work at height.

Guidance

008 The Provider shall refer to the Specification and to the British Standards Institution publications for detailed guidance. Other guidance is available from the HSE, NHS Estates, the Water Regulations Advisory Scheme and the Thermostatic Mixing Valve Manufacturer's Association.

The Provider shall pay particular attention to:

- NHS Estates Health Guidance Note – 'SAFE' hot water and surface temperatures.
- Building Regulation Approved Documents
- Thermostatic Mixing Valve Manufacturer's Association Recommended Code of Practice for Safe Water Temperatures.
- HSE document L8: The prevention and control of legionellosis (including Legionnaires' disease).
- The Water Supply (Water Fittings) regulations.
- WRAS Water Regulations Guide.
- Applicable Standard for 'Sanitary tap ware – low pressure thermostatic mixing valves'
- Applicable Standard for Thermostatic Valves for use in care establishments.
- Applicable Standard for Specification for design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages.

© Rand Associates Consultancy Services Ltd

Minor Repairs

009 The Provider shall, during testing, carry out minor repairs such as tightening joints, replacement of clips, etc., to achieve a pass status and make appliances safe to ensure compliance with applicable Standard.

Periodic Inspections and Testing

010 Inspection and testing of thermostatic mixing valves must unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirements tabled below;

Item No.	Item	Frequency	Action	Notes
Installation Information				
1.	The Provider shall examine records pertaining to each TMV. All TMVs should be identified by a unique asset number. In particular the Provider shall ensure the presence of the following information: 'As-fitted' drawings Manufacturer's installation and maintenance manual Commissioning and testing records. Maintenance records			
Testing				
2.	Water Treatment	6 Monthly	Measure temperature of water flow at normal flow rate and after allowing stabilisation. Repeat temperature test at approximately ¼ normal flow rate. Temperature range should be as required in Health Guidance Note 'Safe' hot water and surface temperatures (Section 3 Table 1).	Use a digital thermometer of known accuracy, with a minimum refresh rate of 4 times per second.
3.	Fail Safe Action	6 Monthly	Isolate cold water supply. Ensure all hot water ceases to flow in time specified by manufacturer for valve type.	
4.	Flow Rate	6 Monthly	Measure flow rate. Compare flow to commissioning data and previous maintenance records.	Undertake maintenance as appropriate

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
Routine & Responsive Maintenance				
5.	TMV – General	Annually	Examine for leaks. Examine for corrosion. Examine connections, hoses and outlets. Examine fixings. Descale in accordance with manufacturer's instructions. Sterilise shower heads as required by legionella risk management plan.	
6.	Pipework	Annually	Examine for leaks. Examine hangers and supports, adjust as necessary. Examine for corrosion. Examine thermal insulation. Record hot and cold water temperatures.	
7.	Isolation Valves	6 Monthly	Examine for leaks. Test valves for free travel. Repack if necessary. Examine for corrosion.	
8.	Strainers	6 Monthly	Examine general medical condition. Clean strainers and filters.	
9.	Repairs		If repairs are necessary, all works shall be carried out in strict compliance with manufacturer's recommendations and requirements. Upon completion of works the TMV shall be recommissioned in accordance with the manufacturer's instructions. Record commissioning data.	

© Rand Associates Consultancy Services Ltd

Firestopping

011 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

012 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand name	Manufacturer's details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

UNVENTED CYLINDERS SERVICING AND MAINTENANCE

© Rand Associates Consultancy Services Ltd

SERVICING AND MAINTENANCE OF UNVENTED CYLINDERS

001 The Periodic Servicing and Inspections, Routine Maintenance and Responsive Maintenance specified hereafter are model requirements only and the Provider must at his own cost and as part of his undertaking of the Periodic Servicing and Inspection, Routine Maintenance and Responsive Maintenance of unvented cylinders and associated pipework and controls in the Client's Property, obtain the manufacturer's service and maintenance requirements for the respective Unvented Cylinder and other equipment and any other information which will enable the Provider to identify the full service, maintenance and repair requirements necessary to meet his obligations under the Contract and consequently enable the Client to fulfil its obligations to its Customers of its premises.

002 The Provider should note that the particular service procedure scheduled in respect of each individual element of the unvented uylinder installations shall be considered as a minimum requirement and the Provider shall be fully responsible for any other servicing requirements that may be necessary in respect of the unvented cylinder installation and its associated safety controls and valves to ensure that each installation is in good working order and working safely, efficiently and economically enabling the Customer to make full use of the installation at any time.

003 The Provider shall be deemed to have allowed in the Tender for all service works including the replacement of defective or missing Materials that may be necessary including carrying out all other maintenance items in accordance with the manufacturer's technical data sheet.

004 The service to each individual installation and any replacement of defective or missing parts incorporated within the service shall fully comply with the current recommendations and instructions of the installations manufacturer's, standards of safety, current bye-laws, the requirements and regulations of current British Standards or equivalent and Codes of Practice, the guide to Good Practice issued by the Hot Water Association, the Building Regulations and IET REGULATIONS.

005 Replacement Materials shall be manufacturer's approved replacement parts.

006 At each service visit an inspection shall include but not limited to the following check list and remedial works carried out.

- Service and maintenance to be carried out by suitably qualified engineer
- Ensure earth continuity and electrical cross bonding is present (and where missing install).
- Inspection of the unvented cylinder and all associated safety controls and valves to ensure correct operation including repair/replace/re-set/clean each as necessary.
- Inspection of the entire unvented cylinder installation for and repair all leaks.
- Turning off mains water supply, depressurise the cylinder by opening hot tap, check pressure of the expansion vessel, recharge to the labelled pressure on the cylinder, close hot tap, turn on mains water.
- Cleaning the line strainer.
- Check the condition of any seals and replace if necessary.
- Check the temperature and pressure release and the expansion valves, run water through each valve for approximately 30 seconds to ensure that any loose scale build up or debris is flushed through before re-sealing.
- Check that the tundish drains and discharges correctly and that there are no blockages.
- Check that any interlocks with external controls, heating programmer etc., are operating correctly.
- With the cylinder hot, check the outlet temperature at the outlet closest to the Cylinder to determine correct functioning of the thermostat, with water temperature to be ideally at 60°C.
- Carry out a visual check of any electrical wiring associated with the cylinder, immersion heater and its controls.
- Check any anode installed in accordance with the manufacturer's technical data sheet.
- Check condition of any flexible hoses where used.
- The Provider shall discussing performance and operation of installation and or appliance with the Customer and any issues raised should be resolved at the time of the service. The Provider shall provide the Customer with sufficient information about the installation, including operational and maintenance instructions so that the installation can be operated and maintained in an efficient manner.

© Rand Associates Consultancy Services Ltd

Routine Maintenance and Responsive Maintenance

007 The Provider shall provide a 24-hour, 365 days per year (366 for a leap year) Responsive Maintenance service for the period of the Contract to allow for breakdown or malfunction of any unvented cylinder installation and the replacement of any defective or missing Materials. This service is to ensure that the unvented cylinder installations are left in a safe and fully operational condition. The details of any repair are to be noted by the engineer for registering on the Provider's database (as provided by the Client's Representative).

008 All Works in connection with the installations to be arranged by the Provider.

009 For breakdowns the Provider is expected to complete a minimum of 80% of such repairs within one day and 100% within two days. The aim of this requirement is to minimise any disruption to the Customer relating to use of water heating facilities.

010 Where the above is not achievable with Materials being unavailable from impressed or local stockist the Provider is to immediately notify the Customer and the Client's Representative and provide time scales for completion of the Works where replacement Materials are required.

011 On receipt of a request being made by the Client's Representative and/or the Customer the Provider shall comply with the following:-

a) EMERGENCY CALLOUT ATTENDANCE WILL MEAN THE FOLLOWING:

Emergency call out to be responded to immediately and no later than 2 hours and completed or made safe within 24 hours.

Breakdown repairs are to be completed within the stipulated attendance timescales, with every effort being made to complete on a first call, first fix basis, where this cannot be achieved the timescales as mentioned above will apply.

b) URGENT CALLOUT ATTENDANCE WILL MEAN THE FOLLOWING:

Urgent Call Out To be responded to immediately and no later than 24 hours and completed within 48 hours.

c) Ensure that each engineer is equipped with an adequate impressed van stock of Materials to deal with most eventualities. A comprehensive stock of impressed spare Materials, shall also be kept at the Provider's control point and store to enable items such as cylinders and where applicable immersion heaters to be replaced immediately.

d) If rectification of the fault is not possible at the time of attendance the fault must be rectified within the previously stated time scales.

In the event of rectification not being considered possible as aforesaid, the Provider shall immediately notify the Client's Representative and the Customer giving the reasons as to why and inform the Client's Representative and the Customer when the repair will be completed. The Client's Representative must satisfy himself that suitable alternative temporary arrangement for hot water heating are in place.

Notwithstanding the generality of the Provider's obligations hereunder, the expression "component part" shall include the parts listed elsewhere hereof and any other specialist controls associated with a particular installation.

e) Ensure that the Customer is kept informed of the situation at all times.

f) Upon completion of a breakdown, the satisfaction card is to be left with each Customer, the approved work document is to be duly completed and a copy of such is to be sent to the Client's Representative.

© Rand Associates Consultancy Services Ltd

g) In addition to the requirements detailed previously the Provider shall also allow to provide the following Services, which are deemed to be included for within the rate per appliance (see Invitation to Tender and Contract Details for inclusions):

1. Advise on efficient and correct use of the hot water heating installations.

2. Instruct new and existing Customers on the operation of the hot water heating installations.

3. Resetting of controls for any reason.

4. All calls where a Customer maintains a hot water heating appliance or installation is faulty, even if no such fault is found to exist.

5. All calls where the fault reported is due to controls being incorrectly set.

6. Repairs due to Customer damage

h) The breakdown element of the Works shall be priced in accordance with the schedules shown elsewhere in the Contract Documents and shall be inserted in the Price Framework.

ii) The Provider is to provide on a daily basis a breakdown status report on each site visited.

012 Before attending a breakdown the Provider should contact the Customer to ascertain where reasonably possible as to the authenticity of the call to establish if the malfunction is due to Customer error such as installation/control adjustments or electricity failure.

Firestopping

013 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

014 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

VENTILATION SYSTEMS

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

VENTILATION SYSTEMS

General requirements

001 All ventilation systems should be inspected annually to ensure conformity with minimum requirements, which are designed to:

- ensure safe access when carrying out Routine Maintenance activities;
- prevent or control risks associated with *Legionella* and other potential hazardous organisms; and
- check that the system remains fit for purpose.

002 Ensure that all AHUs achieve the minimum requirement set out below.

Location and access

003 AHUs should be secured from unauthorised access.

004 Units located on roofs should have a safe and permanent means of access. Suitable precautions must be in place to prevent personnel or equipment from falling during maintenance activities.

005 Units located outside at ground level should be secured within a compound to prevent unauthorised access. Vehicles should be excluded from the vicinity to ensure that exhaust fumes will not be drawn into intakes.

006 All parts of the AHU should be easily and safely accessible for Routine Maintenance.

007 The area around an AHU within a Property should be tanked to prevent water penetration to adjacent areas, and should be adequately drained.

008 Fire precautions should be in accordance with the Client's Requirements.

009 Combustion equipment must not be located in a fire compartment that houses air-handling equipment.

010 Plantrooms that house AHUs should not be used for general storage. Care should be taken to ensure that combustible material is not kept in the plantroom.

Basic requirements

011 The plant must not contain any material or substance that could support the growth of microorganisms.

012 The plant must not contain any material or substance that could cause or support combustion.

013 Access to items that require routine service, such as filters, fog coils and chiller batteries, should be via hinged doors.

014 Items requiring infrequent access such as attenuators may be via clipped or bolted-on lift-off panels.

015 All doors and panels should be close-fitting and without leaks.

016 Every effort should be made to ensure that access is via fixed ladders and platforms or pulpit-style movable steps.

017 Electrical and mechanical services should not restrict or impede access to those parts of the AHU that require inspection.

018 Viewing ports and internal illumination should be fitted in order to inspect filters and drainage trays.

© Rand Associates Consultancy Services Ltd

019 Internal illumination should be provided by fittings to at least IP55 rating. Fittings should be positioned so that they provide both illumination for inspection and task lighting.

020 A single switch should operate all of the lights in a unit.

AHU intakes and discharges

021 Intake and discharge points should not be situated where they will cause vitiated air to be drawn into a system. In existing systems, it may be necessary to extend the intake or discharge point to a suitable position.

022 Each intake and discharge point should be fitted with corrosion-resistant weatherproof louvres or cowls to protect the system from driving rain. The inside of the louvres should be fitted with a mesh of not less than 6 mm and not more than 12 mm to prevent infestation by vermin and prevent leaves being drawn in.

023 The duct behind a louvre should be self-draining. If this is not practicable, it should be tanked and provided with a drainage system. Cleaning access must be provided either from the outside via hinged louvres or by access doors in the plenum behind the louvre. Where a common plenum is provided, cleaning access should be via a walk-in door.

AHU drainage system

024 All items of plant that could produce moisture must be provided with a drainage system. The system will comprise a drip-tray, glass trap, air break and associated drainage pipework.

025 Some existing units may not have been mounted far enough above the floor to permit the correct installation of a drainage system. If the AHU cannot be raised to an adequate height, an alternative arrangement (such as a pump-out system) must be provided.

026 The drip-tray should be constructed of a corrosion resistant material (stainless steel is preferred) and be so arranged that it will completely drain. To prevent "pooling", it is essential that the drain connection should not have an up-stand and that a slope of approximately 1 in 20 in all directions should be incorporated to the drain outlet position.

027 The tray must be completely accessible or, for smaller units, easily removable for inspection and cleaning.

028 Each drip-tray should be provided with its own drain trap. The drain trap should be of the clear (borosilicate) glass type. This permits the colour of the water seal to be observed, thus giving an early indication of corrosion, biological activity or contamination within the duct.

029 The trap should have a means for filling and should incorporate couplings to facilitate removal for cleaning. It should be located in an easily visible position where it will not be subject to casual knocks.

030 The pipework connecting it to the drainage tray should have a continuous fall of not less than 1 in 20.

031 Traps fitted to plant located outside or in unheated plantrooms may need to be trace-heated in winter. The trace heating should be checked for operation and must not raise the temperature of water in the trap above 5°C.

032 Water from each trap must discharge via a clear air gap of at least 15 mm above the unrestricted spill-over level of either an open tundish connected to a drainage stack via a second trap, or a floor gully (or channel). A support should be provided to ensure that the air gap cannot be reduced. More than one drain trap may discharge into the tundish, providing each has its own air break.

033 Drainage pipework may be thermoplastic, copper or stainless steel. Glass is not to be used. The pipework should be a minimum diameter of 22 mm and have a fall of at least 1 in 60 in the direction of flow. It should be well supported, and located so as not to inhibit access to the AHU.

© Rand Associates Consultancy Services Ltd

Dampers

034 AHUs that are shut down out of hours should be fitted with motorised low-leak shut-off dampers located immediately behind the intake and discharge of each supply and extract system.

Fan drives

035 Fan-drive trains, whether supply or extract, should be easily visible without the need to remove access covers. Protecting the drive train with a mesh guard is the preferred option. For weatherproof units designed to be located outside, the fan drive should be enclosed. It should be easily visible through a viewing port with internal illumination and be accessed via a lockable, hinged door.

036 The motor windings of induction-drive "plug" motor arrangements and in-line axial fans having a pod motor within the air stream must be protected from over-temperature by a thermistor and lockout relay.

037 In respect of any computer controlled system it is a requirement that the fan can be switched to a direct start with fixed speed and manual operation.

Heater-batteries

038 Access for cleaning must be provided to both sides of all fog coils and heater-batteries.

039 Where auxiliary wet heater-batteries are located in suspended ceilings, they should be fitted with a catch tray and leak alarm. The catch tray should be installed under both the battery and the control valve assembly to protect the ceiling from leaks. A moisture sensor and alarm should be fitted in the tray.

Cooling coils

040 An independent drainage system must be fitted to all cooling coils. A baffle or similar device must be provided in the drip-tray to prevent air bypassing the coil, and the tray should be large enough to capture the moisture from the eliminator, bends and headers.

041 The cooling-coil control valve should close upon selection of low speed, system shut-down, low air flow or fan failure.

042 Where auxiliary wet-cooling coils are located in suspended ceilings, they should be fitted with a catch tray and leak alarm.

043 The catch tray should be installed under both the battery and the control valve assembly to protect the ceiling from leaks. A moisture sensor and alarm should be fitted in the tray.

Humidifiers

044 Humidifiers are not generally required. Where they are fitted, but have been out of use for a significant period of time, they should be removed. All associated pipework should also be removed back to its junction with the running main.

045 Where humidifiers are fitted and their use is still required, they should fully conform and operate to the original design standard applicable when first installed

046 The section of ductwork containing the humidifier may need to be periodically decontaminated.

047 Hinged access doors with viewing ports and internal illumination should be provided.

048 All humidifiers must be fitted with their own independent drainage system as detailed above.

049 Self- and locally-generated steam humidifiers must be supplied with potable water. The installation should be capable of being isolated, drained and cleaned.

© Rand Associates Consultancy Services Ltd

050 Some steam generators are of a type that requires regular cleaning and descaling. The installation should enable them to be physically isolated from the air duct in order to prevent contamination of the air supply by cleaning agents.

Filtration

051 Filters must be securely housed and sealed in well-fitting frames that minimise air bypass. Air bypass significantly reduces filter efficiency; the higher the filter grade, the greater the effect.

052 Mounting frames should be designed so that the air flow pushes the filter into its housing to help minimise air bypass.

053 All filters should be of the dry type. Panel filters are generally used as prefilters and should be positioned on the inlet side of the supply fan, downstream of the frost coil. Where required, secondary filters (these will be bags or pleated paper) should be on the positive-pressure side of the fan.

054 The filter installation should provide easy access to filter media for cleaning, removal or replacement; therefore, a hinged access door should be provided.

055 The upstream side of the filter should be visible for inspection through a viewing port with internal illumination.

056 All filters should be provided with a means of checking the differential pressure across them. Direct-reading dial-type gauges marked with clean and dirty sectors are preferred.

High-efficiency filters – HEPA and ULPA

057 Where fitted, HEPA (high efficiency particulate air) and ULPA (ultra low penetration air) filters should conform to EN1822 and should be of the replaceable-panel type with leak-proof seals. Their installation should permit the validation of the filter and its housing.

058 HEPA filters are sometimes used in extract systems for the containment of hazardous substances or organisms. They may be fitted with prefilters to extend their service life, the installation should incorporate design provision for the subsequent safe removal and handling of contaminated filters by maintenance staff.

Energy recovery

059 Energy recovery, where fitted, will require cleaning access to both sides of the device.

060 Whichever type of energy recovery device is fitted, the extract side should be protected by a G3 filter conforming to EN779 and provided with a drainage system to remove condensate.

061 The heat-recovery device should be controlled in sequence with the main heater-battery, and may need to incorporate a control to prevent the transfer of unwanted heat when the air-on condition rises above the plant's required set-point.

Attenuation

062 Cleaning access should be provided at both ends of any attenuator unit.

Identification and labelling

063 All supply and extract ventilation systems should be clearly labelled. The label should identify both the AHU and the area that it serves. The lettering should be at least 50 mm high and be mounted in an easily visible place near the fan of the unit. Any subsystems and the principal branch ducts should be similarly labelled.

© Rand Associates Consultancy Services Ltd

064 The direction of air flow should be clearly marked on all main and branch ducts.

065 All air-flow test-points should be clearly identified, and the size of the duct given.

Pressure stabilisers

066 Pressure stabilisers should be unobstructed and silent in operation.

Firestopping

067 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

068 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

PERIODIC SERVICING AND INSPECTIONS

Ventilation systems inspection

101 All ventilation systems should be subject to at least a simple visual inspection annually.

102 The purpose of the inspection is to establish that:
- the system is still required;
- the AHU conforms to the minimum standard;
- the fire containment has not been breached;
- the general condition of the system is adequate for purpose;
- the system overall is operating in a satisfactory manner.
- achieves minimum standards specific to the application;
- is operating to an acceptable performance level;
- remains fit for purpose;
- the fabric of the area served is satisfactory; and
- the system performance is adequate with respect to the functional requirement – this will require:
  - a full measure of the supply and extract air-flow rates;
  - the calculation of room air-change rates if applicable;
  - the measurement of room differential pressures if applicable;
  - the measurement of room noise levels;
  - air-quality checks if appropriate; and
  - a check on the control functions.

103 An assessment should then be made as to whether the system overall is fit for purpose and operating in a satisfactory manner.

104 It is a requirement of the Client that a electronic site specific log book be used to record the result of the inspection.

Fabric of the area served

105 The building elements in the room or rooms served by the ventilation system should also be suitable for the function, the following elements should be checked:
- the ceiling should be complete and, if tiled, all tiles should be clipped down and sealed;
- the walls and floors should be free from significant construction and finish defects;
- windows and their trickle vents should be sealed and locked shut;
- the doors should close completely and the door closers should be correctly adjusted to hold them against the room pressure;
- all service penetrations and access panels should be sealed to prevent uncontrolled air flow between rooms and service voids;
- steps should have been taken (if necessary) to prevent portable equipment and stock items
- from obstructing low-level supply, transfer or extract air-flow paths.

106 Failure to achieve a suitable standard will render even the most sophisticated ventilation system ineffective.

107 All fire dampers should be tested as part of the annual inspection.

108 LEV (low exhaust ventilation) systems will be subject to an examination and test by a competent person at least every 14 months in accordance with the requirements of the Health and Safety Executive's 'The maintenance, examination and testing of local exhaust ventilation' criteria.

© Rand Associates Consultancy Services Ltd

Table 1 Management and Routine Inspection Requirements

	Topic	Information/Standard	Requirement
1	Is the system still required?	Why was it installed?	Is that function still required?
2	Does the AHU achieve the minimum standard?	• Health and safety aspects • Intake/discharge positions • Inspection access • *Legionella* control and drainage • Fire and electrical safety • Leaks, cleanliness and insulation • Filtration	Inspect to ascertain compliance with minimum standards specified
3	Is the air distribution system satisfactory?	• Access • Fire dampers • Cleanliness • Insulation • Identification • Room terminals • Pressure stabilisers	Inspect to ascertain continued fitness for purpose
4	Does the measured system performance still accord with the design intent and achieve a minimum acceptable standard?	• Design air velocities • Design air-flow rates • Room air-change rates • Pressure differentials • Noise levels • Air quality	Establish the design values Measure the system output to verify its performance
5	Does the control system function correctly?	• Desired environmental conditions • Control sequence logic • Run; set-back; off philosophy	Establish the design requirement Inspect/test to verify performance
6	Having regard to the foregoing, is the system "fit for purpose" and will it only require routine maintenance in order to remain so until the next scheduled verification		Yes or No!
7	What routine service and maintenance will be required for the system to remain fit for purpose and function correctly until the next scheduled verification?	• Filter changes • System cleaning • Performance indication • Performance monitoring • Performance measurement	Decide inspection frequency and maintenance schedule

Table 2 Maximum sound levels (service noise only)

Location	Design sound level (NR)	Measured sound level (dB(A)
Corridors	40	45
Communal areas/rooms	40	45
Domestic accommodation	30	35

© Rand Associates Consultancy Services Ltd

Routine Maintenance

General

109 Inspection and maintenance activities should be assessed to ensure that they do not create a hazard for those who undertake the Work or for those who could be affected by it.

110 The degree and frequency of maintenance should relate to the function of the system, its location, its general condition and the consequence of failure.

111 Specimen inspection and maintenance checklists are given in the Appendices.

AHU drainage

112 AHU drainage systems comprise a drainage tray, glass trap, connecting pipework and an air break.

113 The system should be inspected to ensure that it is clean and operating correctly. The cleanliness of the drainage tray and colour of the water in the trap will give an indication of a fault condition, see table below.

Colour of Water	Probable cause and comment
Normal	Satisfactory
Green	Copper corrosion of pipework Possible leak in battery tubing
White	Aluminium corrosion of battery fins
Black	General dirt Filter faulty allowing air bypass System is overdue for a thorough clean Urgent action required
Brown/Red	Iron corrosion (rust) within the duct May indicate a specific *Legionella* hazard Immediate action required
Bubbly/Slimy	Microbiological activity within the duct May indicate a specific *Legionella* hazard Immediate action require

Filter changing

114 Dirty supply air filters may pose a general dust hazard when being changed.

115 Dirty extract-and-return air filters may pose an increased level of hazard. This will relate to the particular contamination within the air that they have filtered. Filters handling extract air from general areas are unlikely to present a significantly greater hazard than that posed by dirty supply air filters.

116 Care should be taken to protect Staff from inhaling the dust. If there is a need to enter the duct when changing filters, a dust mask should be worn.

117 Dirty filters should be carefully removed and placed in the box that contained the replacement filters or in a plastic bag. On completion of the Work, the dirty filters should be removed from the plantroom and disposed of appropriately.

118 The duct in the area of the filter housing should be carefully vacuumed before fitting the replacement filters. This will prevent particles (that is, those that are shed when the dirty filters are disturbed) being blown into the system downstream.

119 It is important to ensure that replacement filters are fitted the right way round. Most panel filters are manufactured with a membrane or wire support mesh on their downstream side. Alternatively they may be colour coded. The filter Manufacturer's instructions regarding fitting should be strictly adhered to.

© Rand Associates Consultancy Services Ltd

120 Bag filters should be fitted with the pockets vertical. Care should be taken to remove any transit tapes and to ensure that the individual pockets are separate and free to inflate.

Changing extract filters containing hazardous substances

121 Filters handling extract air from a low exhaust ventilation system will obviously present a hazard and should be subject to a safe system of work.

122 Filters used in an extract system for the containment of hazardous substances or organisms should incorporate design provision for their safe removal when so contaminated. This may be achieved by:
- sealing the hazardous substance into the filter before it is removed;
- a system to fumigate the filter to kill any organisms; and
- housing it in a "safe change" unit that permits the filter to be ejected into a bag and sealed without staff having to come into direct contact with it.

123 The method chosen should reflect the nature of the hazard.

124 Filters fitted to remove hazardous substances from extract air are classed as hazardous waste and should be handled and disposed of accordingly.

Ventilation system cleaning

125 The intake section of a ventilation system should be vacuumed-out as necessary to remove visible particles.

126 AHUs should be vacuumed-out and/or washed down internally as necessary to remove obvious dust and dirt.

127 Chiller batteries, humidifier units, energy-recovery batteries or plates and their drainage systems should be washed down with hot water annually to remove visible contamination.

128 Supply air distribution ductwork conveys air that has been filtered. It will require internal cleaning only when it becomes contaminated with visible dirt. The frequency of cleaning will depend on the age of the system and grade of the AHU final filter but will typically be in excess of ten years. There is no requirement to clean ductwork annually.

129 A rapid build-up of visible dirt within a supply duct is an indication of a failure of the filtration or its housing.

130 Extract air systems handle unfiltered air. They should be cleaned as frequently as necessary in order to maintain their operating efficiency. Room extract terminals, particularly those sited at low level, will need regular cleaning.

131 On completion of cleaning, the ductwork should not be "fogged" with chemicals. This treatment has no lasting biocidal effect and is responsible for initiating the breakdown of the galvanised coating of ductwork. This will result in accelerated corrosion of the inside of the duct, with the products of corrosion being shed into the air stream. It will also significantly shorten service life.

132 Following duct cleaning, all service hatches should be checked to ensure that they have been correctly replaced and do not leak.

133 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

134 Ensure that risk assessment are undertaken and method statement provided for the means of access to allow for cleaning of ventilation systems.

© Rand Associates Consultancy Services Ltd

135 Ensure that all Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

136 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

137 Prior to the commencement of the Works the Provider shall carry out and publish a risk assessment in accordance with the Confined Spaces Regulations 1997 and ensure that all subsequent Works and actions comply with the aforesaid regulations.

138 Carry out, during Routine Maintenance, minor repairs such as tightening joints, replacement of bolts, screws, to ensure completeness and safety of equipment.

139 Discuss with the Client's Representative the cleaning method to be adopted based on the following information provided in the table below abstracted from HVAC TR/19.

Dry Cleaning Methods Generic Name	**Energy Source**	**Removal Method**
Air Whip/Skipper Ball (A)	Compressed air (low volume)	A rubber hose or plastic ball that under pressure agitates the wall of the ductwork
Air Lance (A)	Compressed air (low volume)	Usually an air gun with a trigger that is able to direct compressed air locally
Air Nozzle (A)	Compressed air (high volume)	Usually a plastic or metal ball placed on the end of a flexible hose. Compressed air leaving small openings in the ball propels the hose forward inducing the nozzle to closely traverse the internal surface of the duct
Hand wipe	Manual	Wiping of the surface using a medium appropriate to the purpose
Hand scrape	Manual	Removing heavy deposits by hand scraping
Hand brushing	Manual	Brushing of the surface using a brush appropriate to the purpose
Hand vacuum	Electricity/Manual	Suction
Mechanical brushing (A)	Compressed air and/or Electricity	Brushing of the surface of the ductwork using mechanical action
Mechanical brushing and Air Technology Combined	Compressed Air/Electricity	Brushing of the surface of the ductwork using mechanical action and compressed air

Wet Cleaning Methods Generic Name	**Removal Method**
Wet vacuum	Suction
Chemical clean	Softens or dissolves the deposits
Hand wash	Washing of internal surface using appropriate medium
Steam / High pressure water wash	High pressure system used to dislodge / dissolve deposits

140 Duct-cleaning equipment that uses rotating brushes or a vacuum unit can easily damage flexible sections of ductwork. On completion of cleaning, all flexible duct sections should be checked for rips and tears. The straps that secure them to rigid duct sections and air terminals should also be checked to ensure that there is no air leakage.

© Rand Associates Consultancy Services Ltd

141 Cleaning and servicing of ductwork shall be carried out in accordance with the specifications tabled below:

Item No.	Item	Frequency	Action	Notes
1	Ductwork general	Annually	Locate ductwork drawing; Check layout of ductwork runs and general condition; Check date of previous cleaning; Verify numbers, positions and adequacy of access doors;	If not available report to Client's Representative and determine if drawing is to be produced If necessary refer to Client's Representative; If necessary install additional access doors;
2	Ductwork hygiene Heavy use 12 -16 hours/day Moderate use 6 -12 hours/day Light use 2 -6 hours/day	 Quarterly 6 monthly Annually	Examine internal condition by a Deposit Thickness or Vacuum test: If Wet Film Thickness Test Measurement 200um as a mean across the system; Any single measurement above 500um	Refer to HVCA TR19 & CIBSE TW17; Report findings to Client's Representative; Complete cleaning required; Urgent local cleaning required;
3	Ductwork cleaning	As Above	Turn off electricity supply to fan(s) and clean all ductwork in the agreed appropriate method	
4	Air Control Dampers	As Above	Where air control dampers are encountered of any type (i.e. single blade, multi blade or variable orifice) they shall be marked and returned to their "as found" position on completion of all Work	
5	External Grilles	As Above	Remove grille and clean; Ensure bird mesh is intact, replace if necessary;	Report on adequacy of make up air;
6	Extract Fans	As Above	Turn off extraction fan; Fan impeller and casing interior shall be thoroughly cleaned, removing all impacted dirt; Re energise extraction fan;	Report condition of belts, motors and casings;

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
7	Supply air handling plant		Turn off electrical supply to fan; Where any electrical controls are. installed, the Provider shall inform the Client's Representative of his requirements regarding disconnections/ reconnections etc; Fan impeller and casing interior shall be thoroughly cleaned, removing all impacted dirt; All coils shall be thoroughly cleaned using a high pressure air blasting, vacuuming and brushing. Chemical solvents may be used in serious contamination problems; Cooling coil condensate trays, where, installed, are to be cleaned along with local traps to ensure that there is good systems'. condensate drainage; All drainage holes shall be cleaned; Carry out water test before completion; Re energise electrical supply to fan;	Report condition of flexible cables; Report any corrosion; Method statement and COSHH assessments to be provided prior to commencement of works; Report deviation from requirements of L8 The control of legionella bacteria in water;
8	Records		The following records should be to maintained:-. • details of fan(s); • details of filters; • drawings showing the position of all access points **d)** the type of cleaning undertaken; • the certificate of cleanliness; • the recommended frequency of check; • date of next recommended inspection; • the name of the person responsible for the completion of the works;	Record details in electronic site specific web based web accessible log book;

© Rand Associates Consultancy Services Ltd

Chilled beams

142 Inspect every six months and cleaned as appropriate.

Split and cassette air-conditioning units

143 These units incorporate internal recirculation air filters and a drainage system to remove condensate from the cooling coil. The systems should be inspected and cleaned every three months.

Portable room air-conditioning units

144 Portable units if provided to Schemes, offices etc are to be inspected and thoroughly cleaned every week that they remain in use.

Inspection and maintenance records

145 Records of inspection and maintenance activities should be kept for at least five years.

Responsive Maintenance

146 Provide a call-out service to undertake Responsive Maintenance (including Emergency Work Ordered during Normal Working Hours).

147 Call outs for Responsive Maintenance which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

Routine Maintenance and Responsive Maintenance

Repairs, Replacements and Adjustments

148 Accept responsibility for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

149 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

150 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

151 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework and the Schedule of Rates.

Firestopping

152 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

153 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

LOCAL EXHAUST VENTILATION (DUST AND VEHICLE EXHAUST) VENTILATION MAINTENANCE

General Requirements

200 The local exhaust ventilation (dust and vehicle exhaust) systems and installation must be covered by a fully comprehensive type Contract.

201 Detailed below are the specific Requirements. The Contract must therefore comprise of the following elements:

- Routine Maintenance
- Responsive Maintenance

202 Refer to the specification and to guidance from the HSE, CLEAPSS and manufacturers.

203 Pay particular attention to:
- HS(G)37: An introduction to Local Exhaust Ventilation published by the Health and Safety Executive.
- HS(G)54: Maintenance, examination and testing of local exhaust ventilation published by the Health and Safety Executive.
- Working with substances hazardous to health COSHH Leaflet INDG136(rev4)

Asset Register

204 Ensure that all the asset registers and schematic line diagrams provided by the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

205 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each visit to undertake Routine Maintenance, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

206 Ensure that, following all visits to undertake Routine Maintenance, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts, and are also to be recorded or updated in the electronic site specific web based, web accessible log book.

207 Provide the Client's Representative with copies of the site risk assessment, method statement and COSHH assessments provided to the Provider's Staff including his Specialist Subcontractors.

Manufacturer's Requirements

208 Where manufacturer's instructions exceed the requirements of this document they shall be adhered to in their entirety.

Programming of Works

209 Submit and agree, within 5 working days of the commencement of the Contract a full annual Programme for all Works covering each element of the Routine Maintenance Works with the Client's Representative.

210 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

© Rand Associates Consultancy Services Ltd

Permit to Work Certification

211 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

Access

212 Ensure that a risk assessment is undertaken and a method statement provided for the means of access to allow for inspection and testing.

213 Ensure that all Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

214 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

Minor Repairs

215 Carry out, during inspection and maintenance, minor repairs such as tightening joints, replacement of bolts, screws, etc to ensure completeness of equipment and make appliances safe.

Routine Maintenance

216 The minimum requirements for Routine Maintenance are to be in accordance with the relevant equipment manufacturer's recommendations.

217 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

218 Carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

219 Include for the provision and application of all consumables within the Rates for this element of the Contract.

220 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the latest applicable Standards or equivalent.

221 Undertake as necessary the inspection and testing in accordance with the requirements tabled below:

Item No	Item	Frequency	Action	Notes
1	Personnel - Competencies		The Provider shall employ a competent approved technician who has undertaken suitable training to an approved standard; Technicians undertaking testing will be required to have passed an examination for Proficiency Module P601 of the British Occupational Hygiene Society;	Copies of examination certificates shall be made available for the Client's Representative. Alternative qualifications to an equal standard may be acceptable subject to the written approval of the Client's Representative.

© Rand Associates Consultancy Services Ltd

Item No	Item	Frequency	Action	Notes
2	Test Instruments		The Provider shall have available and use as appropriate the following test instruments: Tachometer suitable for measuring fan and. Pitot-static tube for the measurement of velocity within ducts. Rotary vane anemometer. Hot-wire thermal anemometer. Specialist dust-lamp (Tyndall beam) Sound meter. Hand-held aerosol monitor.	Copies of test and/or calibration certificates motor speeds. shall be included within the report.
3	Maintenance Procedure - General	6 Monthly	The Provider shall: Examine acoustic enclosures/rooms, check access doors and ventilation; Test run and report excessive or unusual noise. Measure sound and compare to previous reports. Examine for corrosion. Examine general condition. Examine holding down bolts, adjust as necessary Examine anti-vibration mountings.	
4	Maintenance Procedure – Fixed Ductwork	6 Monthly	The Provider shall: Examine externally and internally for corrosion. Examine hangers and mountings, adjust as necessary. Examine access doors. Examine shutters and dampers, adjust and lubricate as necessary. Examine test points. Examine hoods, enclosures, booths and extraction points. Report condition. Remove any accumulated debris - pay particular attention to bends, elbows, diameter changes, tees, etc. Check for damage, splits, air leakage. Measure air flow at strategic test points.	Record results
5	Maintenance Procedure – Flexible Ductwork	6 Monthly	The Provider shall: Examine for damage, splits, air leaks. Remove any accumulated debris. Examine connections. Examine fixings, remote arms, clips and connectors. Examine exhaust nozzles, connectors and funnels. Examine stands and brackets. Measure air flow.	Record results

© Rand Associates Consultancy Services Ltd

Item No	Item	Frequency	Action	Notes
6	Hose Reels, Rails, Balancers and Arms	6 Monthly	The Provider shall: Examine general mechanical condition. Examine hangers and mountings, adjust as necessary. Test operation. Clean and lubricate in accordance with manufacturer's instructions. Examine automatic dampers. Examine and test spring returns. Examine and test electric motor drives. Examine limit switches. Test operation of hose balancers.	
7	Maintenance Procedure – Fans and Motors	6 Monthly	The Provider shall: Examine safety guards; ensure they are appropriate, in position and securely fixed. Examine drive belts; tension as necessary. Examine and test mechanical condition of plant and equipment. Lubricate in strict accordance with manufacturer's recommendations. Measure and record speed of fan and motor. Measure performance of fan and air flow.	Record results
8	Maintenance Procedure – Filters	6 Monthly	The Provider shall: Examine filters; clean or renew as necessary. Examine and test operation of shake down devices, adjust as necessary. Clean or replace bag filters. Replace exhaust filters. Examine filter supports, frames and holders. Check for splits, tears and air leakage. Measure pressure drop across filters.. Examine pressure gauges. Examine sump, water flow and water levels in wet filters. Examine electrostatic air filters. Examine carbon filters	Record results
9	Maintenance Procedure – Waste Bags & Collection Bins	6 Monthly	The Provider shall: Examine 'drawers' for air seals and condition. Examine for corrosion. Examine for splits, tears and air leakage. Clean fabric bags, replace as necessary. Examine and test operation of shake down devices, adjust as necessary. Examine connectors and fixings.	

© Rand Associates Consultancy Services Ltd

Item No	Item	Frequency	Action	Notes
10	Maintenance Procedure – Exhaust Flues and Stacks	6 Monthly	The Provider shall: Examine for corrosion. Examine fixings and mountings, adjust as necessary. Test operation to ensure that fumes do not re-enter the building.	
11	Maintenance Procedure – Electrical Installation	6 Monthly	Visually examine electrical installation. Ensure that means of disconnection/isolation is readily accessible Examine flexible cables for wear, fraying braid and brittle insulation. Ensure that wiring terminal connections are sound. Examine pressure sensors, switches and controls; adjust as necessary.	
12	Labelling &Schematic Diagrams – Notices and Labels		The Provider shall: Ensure that a schematic drawing of the system is displayed in a prominent position. Ensure that written operating instructions are displayed in a prominent position.	Provide new if originals are not in place. Schematic diagrams and instructions shall be mounted in glazed frames secured to the wall in a suitable location.
13	Testing – Report Format		The maintenance report shall consist of the following sections: 1.0 Purpose of report 2.0 Summary of installation/ inspection including schematic diagram 3.0 Assessment of suitability for application. 4.0 Detailed test results. 5.0 Summary of defects 6.0 Installation description 7.0 Photographs 8.0 Recommended Works/Costs 9.0 Test Instruments 10.0 Certificate/data as outlined in Appendix 1 of HS(G)54.	Including schematic diagram

222 It is the Provider's responsibility to observe the on-going condition of the systems and installations with regard to safe and correct operation. The Provider must bring to the attention of the Client's Representative any specific areas where periodic checking, lubrication and adjustment exceeds normal provisions for the age and type of systems installed.

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

Annual Inspection of Ventilation Systems – AHU and Plantroom Equipment

Scheme:	
Plantroom:	
Air handling Unit:	**Age of Unit:**
Area served by Unit:	
Date of survey:	**Name of Surveyor:**

General Condition:	**End of useful life**	**Poor**	**Average**	**Good**

Compliance with minimum standards: (Items 2 to 23; 32 and 33)	**Poor**	**Average**	**Good**

Maintenance quality: (Items 5, 12, 26 to 31, 34 to 40)	**Poor**	**Average**	**Good**

Item	Survey Topic	Yes	No	Comment
1	Plant running?			
2	Is the unit and its associated plant secure from unauthorised access?			
3	Is the unit safely accessible for inspection and maintenance?			
4	Is the air intake positioned to avoid short circuiting with extract or foul air from other sources such as gas boiler flue outlets?			
5	Are all inspection lights operating?			
6	Are motorised dampers fitted to the intake and discharge?			
7	Are fan motor(s) outside of the air stream?			
8	Is the fan drive train visible without removing covers?			
9	Is the cooling coil located on the discharge side of the fan?			
10	Is an energy-recovery system fitted (state type)?			
11	Are condensate drainage systems fitted to all energy recovery systems, cooling coils and humidifiers			
12	Are drainage traps clean and filled with water?			
13	Is the drain trap air break at least 15 mm?			
14	If a humidifier is fitted, state the type			
15	Is the humidifier capable of operation?			
16	Is there space to safely change the filters?			
17	Are there test holes in the principal ducts?			
18	Are the test holes capped?			

© Rand Associates Consultancy Services Ltd

Item	Survey Topic	Yes	No	Comment
19	What is the general condition of the exterior of the AHU?			
20	Are the principal ducts lagged?			
21	What is the general condition of the associated control valves and pipework?			
22	Is the pipework adequately lagged?			
23	Is the system clearly labelled?			
24	Record prefilter differential pressure			
25	Record main filter differential pressure			
The following are to be checked with the plant switched off and isolated				
26	Did the motorised dampers close on plant shut-down?			
27	Is the vermin/insect screen clean?			
28	Is the intake section including the fog coil clean?			
29	Are the prefilters correctly fitted with no air bypass?			
30	Are all drive belts correctly aligned and tensioned?			
31	Is the cooling-coil matrix clean?			
32	Are all drip-trays fully accessible or capable of being removed for cleaning and have a fall to drain?			
33	Are the drainage trays stainless steel?			
34	Are the drainage trays clean?			
35	Are there any signs of water ponding in the AHU?			
36	Is the matrix clean for each heater-battery?			
37	Have the main filters been correctly fitted with no air bypass?			
38	Is AHU and its associated main ductwork clean internally?			
The following are to be checked with the plant switched back on:				
39	Did unit restart satisfactorily?			
Test automatic fan-motor change-over, if fitted				
40	Did automatic change-over operate satisfactorily?			

© Rand Associates Consultancy Services Ltd

Additional comments:
(For example: air leaks from access doors; control valves leaking or passing; general cleanliness of the area around the unit; or any other items of concern.)
Competent Person/Authorised Person:

© Rand Associates Consultancy Services Ltd

Responsive Maintenance

223 Attend to all call outs due to malfunction or breakdown.

224 Include for a call-out service to provide Responsive Maintenance.

225 Call outs for Responsive Maintenance which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

Routine Maintenance and Responsive Maintenance

Repairs, Replacements and Adjustments

226 Accept responsibility for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

227 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

228 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

229 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

Firestopping

230 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

231 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

A.C AND COMFORT COOLING SYSTEMS

General Requirements

301 The A.C. and Comfort Cooling systems and installation must be covered by a fully comprehensive type Contract.

302 Detailed below are the specific Requirements. The Contract must therefore comprise of the following elements:

- Routine Maintenance
- Responsive Maintenance

303 Refer to the Specification and to guidance from the HSE, SAFed, the BSI and manufacturers.

304 Pay particular attention to:
- The Provision and Use of Work Equipment Regulations (PUWER)
- Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)
- Approved Code of Practice and Guidance L113: Safe use of lifting equipment
- IET Wiring Regulations.
- Provision and Use of Work Equipment Regulations 1998. Guidance on the regulations L22 (third Edition)
- Other relevant Standards

ASSET REGISTER

305 Ensure that all the asset registers and schematic line diagrams provided by the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

306 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each visit to undertake Routine Maintenance, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

307 Ensure that, following all visits to undertake Routine Maintenance, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts, and are also to be recorded or updated in the electronic site specific web based, web accessible log book.

308 Provide the Client's Representative with copies of the site risk assessment, method statement and COSHH assessments provided to the Provider's Staff including his Specialist Subcontractors.

Manufacturer's Requirements

309 Where manufacturer's instructions exceed the requirements of this document they shall be adhered to in their entirety.

Programming of Works

310 Submit and agree, within 5 working days of the commencement of the Contract, a full annual Programme for all Works covering each element of the Routine Maintenance Works with the Client's Representative.

311 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

© Rand Associates Consultancy Services Ltd

Permit to Work Certification

312 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

Access

313 Ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

314 Ensure that all Works are carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

315 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

Minor Repairs

316 The Provider shall, during inspection and maintenance, carry out minor repairs such as tightening joints, replacement of bolts, screws, etc to ensure completeness of equipment and make appliances safe.

Routine Maintenance

317 The minimum requirements for Routine Maintenance are to be in accordance with the relevant equipment manufacturer's recommendations.

318 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

319 Carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

320 Include for the provision and application of all consumables within the Rates for this element of the Contract.

321 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the latest applicable Standards or equivalent.

322 Undertake as necessary the inspection and testing in accordance with the requirements tabled below:

© Rand Associates Consultancy Services Ltd

Item No	Item	Frequency	Action	Notes
1	Indoor Unit	6 monthly	1. Check and clean filters 2. Check that the evaporator fins are clear of dirt and comb fins if necessary 3. Inspect fan motor blades 4. Inspect circuit board 5. Check that the expansion valves are operating correctly, repair or replace if necessary 6. Check condensate lift pumps and check that drain is from foreign particles 7. Test refrigerant system from leaks using an electronic leak detector 8. Check that there is water in the condensate traps, fill u-trap with water where necessary 9. Check that condensate freely flows to the main drain	Provide a signed engineer's report. One copy to be loaded to the electronic logbook, one copy to be provided to the Client's Representative
2	Electrical Wiring	Annually	Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Test insulation resistance	Report all results to Client's Representative

© Rand Associates Consultancy Services Ltd

Item No	Item	Frequency	Action	Notes
3	Outdoor Condenser Units	6 monthly	1. Check operating conditions (i.e. discharge/suction pressures, temperature, voltage and running currents etc.,) 2. Check all electrical connections are secure 3. Test refrigerant system from leaks using an electronic leak detector 4. Remove the fan guard, confirm that the fan is correctly aligned, secure on the motor shaft and free to rotate 5. Check the securing bolts on fan motor compressor and tighten if necessary 6. Inspect the refrigerant controls 7. Inspect the refrigerant devices 8. Inspect all electrical devices (i.e. transformer relays, contactor etc.) 9. Examine the condenser coil condition and comb fins if necessary	Provide a signed engineer's report. One copy to be loaded to the electronic logbook, one copy to be provided to the Client's Representative
4	Controllers	Annually	1. Check correct operation on LCD screen 2. Check the display for correct temperature settings 3. Check the time clock is correctly set and program start and stop times are set 4. Check presence and numbers of hand held controllers 5. Change dry cells	Record in electronic logbook
5	System Refrigerant	Annually	1. Determine type and quantity of refrigerant in the system 2. Record any leakage, recovery or recycled refrigerant	Record in electronic logbook

© Rand Associates Consultancy Services Ltd

Responsive Maintenance

323 Attend to all call outs due to malfunction or breakdown.

324 Include for a call-out service to provide Responsive Maintenance.

325 Call outs for Responsive Maintenance which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

Routine Maintenance and Responsive Maintenance

Repairs, Replacements and Adjustments

326 Accept responsibility for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

327 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

328 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

329 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

Firestopping

330 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

331 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

ROOF FAN REPLACEMENTS AND INSTALLATIONS

General Requirements

401 This specification shall be read in conjunction with the Preliminaries, the other Communal Mechanical and Electrical Specifications, Appendices, Schedule of Rates and all other contract documentation.

402 Note that this is a performance specification. It shall be clearly understood that the Provider shall be fully responsible for the detailed design, supply, installation, testing, commissioning, demonstrating, documentation and leaving in a satisfactory working order following removal of existing plant (if any) the fully operational new roof fan installations as described within this specification or indicated on the project drawings.

403 It shall be the Providers responsibility to request and receive any information regarding asbestos on the site and subsequently satisfy their obligations by carrying out a Pre-construction asbestos survey.

Strip Out Works

404 Provide strip-out details as part of their initial enabling works identifying the extent of the strip out works, details regarding isolation, method of isolation, methods of safe removal and builders work including any fire stopping.

405 Following consideration and approval the strip out works will be completed as part of the first stage of the project.

Loss of Service

406 Will be allowed, within their programme, to carry out works with a loss of service if:

- The planned loss of service is anticipated to be no longer than 8 hours;
- The planned loss of services has prior agreement with both the Client and Customers;
- Notification letters to Customers have been issued at least 7 days before commencement of the Works;
- Written notifications are present in common areas to notify Provider's intentions;
- A vulnerable person's strategy is in place.

Temporary Supplies

407 Depending upon the period of loss of service, strategy agreed with the Client and necessity the Provider may provide a method including for temporary supplies. As such, any temporary ventilation service will only be accepted if this is capable of satisfying delivery in line with operational duty identified as part of the validation report investigations.

Ductwork Cleaning

408 It is the Providers responsibility to ensure all ductwork associated with the fan system whereby a fan is replaced under these works is thoroughly cleaned from, and including the fans, to the points of extract at individual grilles. The Provider will carry out all works and provide all equipment (including access equipment) and fuel to carry out the works fully.

409 Provide, if they do not already exist, forming and installing enough adequately size, access doors, to facilitate inspection, cleaning, removal of contamination and the future hygienic maintenance of the system.

© Rand Associates Consultancy Services Ltd

410 Accept responsibility for fitting such access as he requires in order to completely clean the system and demonstrate its cleanliness.

Access Doors will be of the following specification: -

- Constructed from galvanised steel;
- Robust design;
- Insulated;
- Be quick fit type of and cam lock or screw lock fittings;
- Conforms to the requirements of DW/144;
- Be air tight under normal operation conditions; and
- Seals and gaskets will not support contamination growth

Rectangular doors will have a flange support frame secured to the duct wall.

Circular duct doors, where man entry is required, will have a safety bead secured to the opening edge.

Cleaning access openings shall be provided for cleaning in accordance with DW/144 and TR/17.

Cleaning Method

411 Carry out all cleaning works via mechanical brushing method and power brushing method, using electrically powered rotating bristle brushes. This method loosens all dirt and debris with the system so that they may be extracted downstream into the vacuum collector. Tack rags will also be used to remove debris and a HEPA vacuum to remove the debris off site.

412 Adequate measures will be taken as necessary to ensure areas immediately affected by the working will be protected using dustsheets etc. Any residue caused by the works will be cleared up daily.

413 Upon completion of the cleaning, the Provider shall demonstrate that the system meets the level of cleanliness required. The Provider should carry out a preferred vacuum test (PVT, and a comprehensive report shall be provided. This shall clearly state the following information:

- Ventilation systems cleaned;
- Cleaning methods used;
- Pre and post photographic records;
- Additional works carried out;
- COSSH data;
- Recommendations for future cleaning requirements;
- Certificate of cleanliness;
- Verification results; and
- Any faults identified that could impact on future hygiene.

New Roof Mounted Fan Installations - Roof Mounted MVHR

414 Allow for the safe removal, disconnection and replacement, testing and commissioning of roof mounted MVHR units to the following specification.

The MVHR unit shall be weatherproof in its design and be a supply and extract unit with heat recovery. The unit shall incorporate a high efficiency counterflow plate heat exchanger (up to 90% efficiency) with segmented 100% bypass facility (patent app. for) automatic control and actuator.

The unit is to have performance optimised backward curved impellers and IP54 EC motors providing low specific fan powers and stepless, speed control without tonal noise generation.

The unit is to have an asymmetric, high mass double skinned wall construction (patented) with integral acoustic barrier mat (not XBC10) ensuring low breakout noise levels.

The unit is to be fitted with high capacity pleated G4 (XBC10 is G3) panel filters (spare filters are to be provided).

© Rand Associates Consultancy Services Ltd

Energy efficient, unit integrated demand-based control of ventilation and heating is provided by an Ecosmart or other equal and approved control system.

The unit is to have a low casing height for ceiling or underfloor or slab mounted applications, with flexibility in unit ductwork connections

The unit shall include for filtration to suit the minimum identified within the Local Authority filtration and clean air regulations and CIBSE guidance.

Supply and discharge connections are to be on the centreline of the unit.

Intake and extract connections are to be configurable on site to either side of unit.

The unit is to have side mounted unit control with 90° rotation facility for commissioning adjustments.

The unit is to be supplied with a 5 year warranty.

415 Supply and install a ES-CO2 carbon dioxide sensor, pre-wired with a 2 metre length of cable and a connection plug. The CO2 sensor will adjust the fan speed in response to the CO2 concentration in the airflow.

416 Supply and install a volt free relay box for potential monitoring capability.

Single Motor Extract Fan Units

417 Allow for the safe removal, disconnection and replacement, testing and commissioning of single motor extract fan units to the following specification.

The unit shall be weatherproof in its design and be of external inline type with grille outlet.

The unit is to be double skinned and manufactured from heavy gauge, corrosion resistant 'Aluzinc' steel, internally coated with acoustic material to the lid.

The unit is to have a pitched roof with hinge facility to provide access for maintenance, service and pressure tapping.

The fan should be with 'inline assembly', positioned in series for optimum performance.

Run and standby fan assembles are to incorporate a fan impeller and EC motor selected to provide the most energy efficient solution conforming to Part L regulations.

The fans are to be suitable for operation in ambient temperatures more than 40°C.

The unit is to be fitted with a manometer and designed for class L2 leakage.

The unit shall be controlled by either a remote or integrated control panel mounted externally to the case and either fixed or installed locally internally in a secure position.

The fans shall have the following energy saving and operational functions integrally installed with in it, all components will be pre-wired and fitted by the fan unit manufacturer;

- Integral Frequency inverter/speed controller;
- Integral adjustable run-on timer;
- Maximum and minimum speed adjustment/setting (trickle and boost);
- Volt free run & failure/status indication;
- 0-10V BMS interface for remote operation;
- Low voltage interface with second fan or supply fan;
- Multiple low voltage sockets for interconnection of sensors or fans; and
- Background ventilation/trickle enable switch.

© Rand Associates Consultancy Services Ltd

Controls and associated sensors/controllers shall be manufactured by the fan manufacturer or a controls specialist.

The fan unit shall be supplied with a 5-year warranty.

The fan unit is to be powered by a dedicated 230V mains supply in accordance with this Specification.

Twin Motor Extract Fan Units

418 Allow for the safe removal, disconnection and replacement, testing and commissioning of twin motor extract fan units to the following specification

The twin motor extract fan unit shall be weatherproof in its design and be of external inline type with grille outlet.

The unit is to be double skinned and manufactured from heavy gauge, corrosion resistant Aluzinc steel, internally coated with acoustic material to lid.

The unit is to have a pitched roof with hinge facility to provide access for maintenance, service and pressure tapping.

The fan should be with 'inline assembly', positioned in series for optimum performance.

Run and standby fan assembles are to incorporate fan impeller and EC motors selected to provide the most energy efficient solution conforming to Part L regulations.

Fans are to be suitable for operation in ambient temperatures more than 40°C.

The Unit is to be fitted with a manometer and deigned for class L2 leakage.

The unit shall be controlled by either a remote or integrated control panel mounted externally to the case and either fixed or installed locally internally in a secure position.

The fans shall have the following energy saving and operational functions integrally installed with in it, all components will be pre-wired and fitted by the fan unit manufacturer;

- 2 No x EC fans;
- Auto change-over on fan failure;
- Auto duty share every 12 hours of run time;
- Integral Frequency inverter/speed controller;
- Integral adjustable run-on timer;
- Maximum and minimum speed adjustment/setting (trickle and boost);
- Volt free run & failure/status indication;
- 0-10V BMS interface for remote operation;
- Low voltage interface with second fan or supply fan;
- Multiple low voltage sockets for interconnection of sensors or fans;
- Background ventilation/trickle enable switch.

Controls and associated sensors/controllers shall be manufactured by the fan manufacturer or a controls specialist.

The Fan unit shall be supplied with a 5-year warranty.

The fan unit is to be powered by a dedicated 230V mains supply in accordance with this Specification.

© Rand Associates Consultancy Services Ltd

Roof Mounted Box Fan and Roof Mounted Acoustic Plantroom Ventilation

419 Allow for the safe removal, disconnection and replacement, testing and commissioning of axial ventilation units with 'Owlett 'impeller and 'Sickle' blade profiles to the following specification.

The unit is to have close-fitting housing blade technology with inherent noise reduction and high performance via controller and DOL equipment or EC motor technology.

The unit is to have a compact short case constructed from rolled steel plate and protected with a tough, epoxy paint finish. The casing dimensions are to DIN 24151 and flange dimensions are to ISO 6580.

The manufacture of the unit is to be to BS EN ISO 9001.

The compact motor/impeller unit is to be robustly supported within the casing by electro welded and epoxy coated steel rod mounting supports for ease of installation and service access.

The sickle blade impellers with aerofoil technology are to be moulded from aluminium.

The motors and impellers are factory matched, statically and dynamically balanced to ISO 1940 part 1, Quality Class G.6.3

The external rotor motors are specifically designed and styled for the fan. Ball bearings are to be greased for life.

The motors are to be protected to IP54 against dust and moisture and comply with the applicable Standard. They are to have ribbed aluminium body castings for efficient cooling with motor insulation to Class 'F' (from -40°C to + 70°C). They are to be speed controlled and monitored or interfaced with any existing BMS panel.

Motors are to be fitted with thermal overload protection which should be wired into all controller circuits and into starter contactors to prevent motor damage due to overloading / overheating.

The fan performance is in accordance with tests to ISO 5801.

Ancillaries that may be provided within the installation:

- Reinforced vinyl flexible connections;
- Anti-vibration mounts;
- DOL starter and BMS interface;
- DOL overload;
- Double-skinned sSilencers; supply / discharge / exhaust / extract;
- Resilient rubber anti-vibration mountings;
- Acoustic circular flexible connector;
- Adjustable feet with support brackets;
- LCD touch screen user control;
- Fan user control;
- CO2 Sensor;
- Power supply remote isolation unit;
- Duct Humidity Sensor;
- Duct temperature sensor;
- Audio/Visual remote indicator;
- Volt free connection box;
- Hand guard;
- Bird guard;
- Thermally insulated galvanised steel purlin box;
- Electronic infinite speed controller;
- Curb fan motorised damper;
- Inverter weatherproof enclosure; and
- BMS interfacing

© Rand Associates Consultancy Services Ltd

Mounting brackets are to be manufactured from heavy gauge galvanised steel and supplied in pairs.

Duct size matching flanges shall be formed from galvanised steel and are supplied individually.

Control Wiring

420 Wiring for controls wiring shall be the responsibility of the Provider who shall provide system control wiring in accordance with the VAM Installation Manual. Cabling shall be two core flex to BS6500 and 0.751.25mm2.

421 The minimum separation from mains power cabling if running the power cable parallel to the communication lines shall be as follows:

Current Capacity of Power Cable (>100V)	Minimum separation (mm) Based upon 100m Run of Parallel Cables
0 – 10A	300
11 – 50A	500
51 – 100A	1000
Over 100A	1500

422 Approved manufacturer's or other equal and approved:

Nuaire
Flakt Woods
ECE
System Air

Galvanised Steel Ductwork

423 All galvanised steel ductwork shall be manufactured in accordance with the provisions of the HCVA Specification DW144 for low medium and high pressure/velocity and systems. The ductwork installation will generally be as indicated on the drawings except where local conditions prevent or where changes are necessary to suit revisions to the design, the ducts shall be run as shown on the drawings.

424 All positions of plant and structural restrictions shall be checked, and dimensions taken on site, detailed fabrication working drawings shall be submitted to the Client's Representative prior to the commencement of any manufacture.

For full details of ductwork and support requirements refer to other sections of this Specification.

Acoustic lining

425 Where galvanised steel ductwork (rectangular) and plenums are installed a 12mm acoustic foam lining shall be taped and glued to the ductwork as pyrosorb or equal and approved.

Insulated Flexible Ducting

426 All ducting run in roof voids shall be of the insulated flexible pattern to limit condensation forming within the duct.

427 The insulated flexible ducting shall be as 25-minute fire rating integrity from inside to outside when assessed against the applicable Standard.

428 Insulated Flexible ducting shall only be used where duct to grille replacements are included within the works.

© Rand Associates Consultancy Services Ltd

Ductwork/Plenum transitions

429 Refer to the manufacturer's grille schedule for specific ductwork transition and spigot connection details over and above design intent information provided in the Works Order and gain approval from the Client's Representative prior to ordering. Plenum connections and grille spigot connections should be detailed.

Fire Dampers and Volume Control Dampers

430 Fire dampers shall be provided initially at primary ductwork plantroom / building separation, at floor level change and at all fire compartmentation changes / separation. Fusible links maintained and installed / commissioned at fully open positions shall be tested and certificates issued for assessment pre-handover.

431 Volume control dampers shall be provided to satisfy proportional balancing throughout the system.

Fire Dampers and Smoke Dampers

432 Fire dampers shall be used to prevent the spread of fire through fire compartmentation. The Provider shall allow for the provision, installation, testing and commissioning of fire dampers through each fire compartmentation zone.

433 The stainless-steel folding blade curtain is housed in a galvanised steel fully welded spigotted casing suitable for square, rectangular, circular and flat oval connections.

434 The installation shall be formed with specialist dry wall brackets, cleats, and adjacent dry walls formed specifically in-line with the necessary fire compartmentation maintaining the fire barrier / separation and providing dampers with adequate support.

435 The curtain fire dampers comprise of a stainless-steel folding curtain having unbroken movable joints with stainless steel constant tension closure springs for positive closure.

436 The self-resettable, latching removable release mechanism cassette, shall ensure the closure of the stainless-steel curtain under full fire conditions.

437 Stainless seel constant tension springs are fitted and positioned out of the airstream to close and latch the damper, regardless of vertical or horizontal operation, all housed in a galvanised steel fully welded spigotted type casing suitable for square, rectangular, circular or flat oval connections.

438 The spigotted casing with continuously welded corners and spigot connections, makes these dampers suitable for inclusion into air distribution systems to the test methods of Eurovent Class A, B & C and HVCA Ductwork specification DW144.

439 A fire rated damper in accordance with the applicable Standard should be held in the Open Position by means of a Thermally Actuated Device set to operate at approximately 74 °C.

440 Fire rated dampers shall be self-held in the open position by a thermally actuated cassette operating at a temperature of approximately 72°C ± 4°C.

441 Provide a schedule of installed fire dampers, provision photographic evidence of the correct and final installation of each and provide a commissioning / test schedule upon completion of the works.

442 Fire dampers shall be of the FireShield range of CE Marked 'E' Rated Fire Dampers as manufactured by Actionair / Swegon Air Management Ltd or other equal and approved.

© Rand Associates Consultancy Services Ltd

Attenuators

443 All attenuators shall be provided as part of the ventilation manufacturer's package

444 Attenuators shall be designed to meet the noise criteria either of the local authority for external break out noise or internally to comply with CIBSE Guide A & CIBSE Guide B guidance.

445 Excessive noise due to poor selection of fans will not be accepted.

Supports

446 All duct support shall be installed in accordance with the provisions of the H.V.C.A specification DW 141 metric, Tables 8 and 9.

447 No damper blade shall exceed 1500mm in width and, where dampers are required for a greater width, the damper sections shall be constructed in multiple frames.

448 Individual damper blades shall not exceed 225mm in height. Hand control dampers shall be provided with a locking device on the outside of the duct located parallel to the blade.

449 Spindles shall be extended to the outside of the duct and be provided with a groove in line with the blade. Spindles shall be carried in nonferrous nylon ball-bearings.

Testing and Commissioning - General

450 Provide all necessary labour and equipment and include for testing the works to the requirements and satisfaction of the Client's Representative and any inspecting Local Authority.

451 The Client's Representative and Local Authority, shall be given a minimum of 48 hours advance notification of any tests.

452 Tests shall be made of sections as the work proceeds. Such tests, however will not absolve the Provider from his liability for any subsequent or final testing. Any defects that become apparent during tests of any part of the installation shall be rectified at the Providers expense and the part or parts retested to the Client's Representative and Local Authority satisfaction.

453 Prior to commissioning of the air systems, ductwork shall be subjected to air leakage test to the requirements of DW144.

454 Subsequent to the completion of the balancing and regulating of the air and water systems, the systems will be offered for demonstration and witnessing to the Client's Representative.

Holding Down Bolts

455 Provide all clips, brackets, foundation bolts, fixing bolts, assembly bolts, including nuts, anchor plates, washers and plugs, etcetera, for all pumps and local pipework. Should adjacent or modified pipework be poorly supported it will be the Providers responsibility to provide additional / replacement support thus protecting the new equipment.

456 Ferrous bolts and nuts and other fixing devices exposed to atmospheric corrosion must be stainless steel or similarly treated to prevent corrosion. Alternatively, the component may be manufactured from brass or gun-metal provided it is of sufficient strength.

457 Alignment and levelling of plant shall be the responsibility of the Provider who shall provide any shims necessary.

© Rand Associates Consultancy Services Ltd

Ductwork and Fan ID

458 All replaced, cleaned or / and new and cleaned ductwork shall be afforded new ductwork ID labelling. Labels shall identify;

- Tempered or humidified;
- Conditioned, cold, warm;
- Fresh air;
- Extract;
- Smoke;
- Dust;
- Process;
- Carbon dioxide; and
- Airborne bacteria;

459 Labelling shall be in line with the HVAC guidance and DW143 & DW142.

460 Identification of commissioning positions shall be identified by a local Volume Control Damper label highlighting;

- Position;
- Date; and
- Name of Commissioning Engineer.

461 Fan ID shall be by traffolite labels corresponding with fan references and system name as identified on the As Built drawings.

462 Additional positioning can be supported by paint / marker.

Commissioning of Systems - Test Instruments

463 Test measurements will be carried out using test instruments recognised throughout the industry as being suitable for the purpose.

464 Maintain an onsite copy of the calibration certificates for all of those test instruments which are required to have evidence of calibration.

465 Test instruments will be used only within the duration of their calibration certificates and copies of the certificates will be made available upon request.

Commissioning of Systems - Commissioning Standards

466 Systems shall be balanced and regulated in accordance with the current editions of the CIBSE Commissioning Code Series W (2010) using the techniques contained in the BSRIA Applications Guide BG2/2010 (Commissioning Water Systems)

Commissioning of Systems - Commissioning of Specialist Equipment

467 The commissioning of the major items of plant and equipment will be carried out by the specialist suppliers commissioning staff in conjunction with the Providers commissioning team.

468 The commissioning of the automatic control system and any integration to building monitoring systems will be carried out by the specialist suppliers commissioning staff in conjunction with the Providers commissioning team and the Client's Representative and include for any head end Graphics User Interface (GUI) updates. All including the Client's Representative shall be in attendance during these works.

469 Specialist equipment manufacturers and Suppliers shall commission and demonstrate the proper operation of their plant and equipment.

© Rand Associates Consultancy Services Ltd

470 The specialists will use their own in-house procedures to commission their plant and equipment, copies of which will be issued under separate cover by the Provider.

471 Copies of the specialist manufacturers and Suppliers commissioning reports shall be included in the contract operating and maintenance manual.

472 Ensure that the Provider's commissioning team provide the necessary attendances in order that the specialist may carry out his commissioning procedures.

Commissioning Report Forms

473 The originals of all commissioning report forms shall be retained by the Provider who will provide copies to the Client's Representative and for the contract operating and maintenance manual.

474 Ensure that the Providers commissioning team complete all commissioning report forms collating them on a system by system basis and indexing the system sets. The forms are to be retained on site, in a clean condition, in a dedicated folder.

475 Each set of commissioning report forms comprising the documented "as commissioned" state of the system shall also include the following:

Fan performance with operational duties identified.
Supplementary sheets recording validity tests as used to determine existing, design and commissioning duties.
A diagrammatic representation of the system showing test point locations and identifications as denoted on the accompanying forms.

476 Each commissioning report form will show the type and identification of all of the test instruments used to measure the test results shown on the sheet.

477 A set of instrument certification covering the range of instruments used to carry out the commissioning work shall also be included within the documentation.

Firestopping

478 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

479 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

WATER HYGIENE

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

WATER HYGIENE

001 The contents within this section are for guidance and considered non-exhaustive. In all circumstances L8 will be the minimum criteria for the execution of all water hygiene works and services carried out to Properties within the Contract area.

General

002 Comply, without prejudice to any other Regulatory Requirements, with and maintain health, welfare and safety measures up to the standard outlined in the Health and Safety at Work Act 1974.

Specific Requirements

003 Comply with the requirements of the following specific Regulatory Requirements conjunction with details enclosed within the conditions of contract:-

1. HSE – Approved Code of Practice and Guidance L8 – Legionnaires Disease – The Control of Legionella Bacteria in Water Systems.
2. The Control of Substances Hazardous to Health Regulations 2002 (COSHH) (amended)
3. Management of Health and Safety at Work Regulations 1999
4. Water Supply (Water Fittings) Regulations 1999
5. Provision and use of Work Equipment Regulations 1998 (PUWER)
6. The Personal Protective Equipment at Work Regulations 1992
7. Health and Safety (Consultation with Employees) Regulations 1996
8. Statutory Instruments – 1992 No 2225
9. Confined Spaces Regulations 1997
10. RIDDOR 2013
11. Biocidal Products Regulation 528/2012 (EU BPR)
12. Applicable Standard: Design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages
13. Health and Safety at Work etc Act 1974
14. Water Supply (Water Quality) Regulations 2016

Detailed Scope of Work

004 .1 Provide:

- water hygiene management
- legionella risk assessments
- Routine Maintenance and Responsive Maintenance services
- sufficient resourcing to meet all Contract requirements
- web based electronic monitoring database

.2 Operate:

- an administration centre (IT based) with the ability to deliver the services and assign the appropriate resources for planned and reactive orders.

.3 Undertake:

- inspection services in accordance with the tasks described in this specification and schedules and at the frequencies specified.

.4 Works shall include management, inspection and scheduled tasks and reactive tasks and include, ***but not be limited to, the following:***

© Rand Associates Consultancy Services Ltd

Contract Management

005 .1 Ensure that the Provider is registered with the Legionella Control Association (LCA) as category 1 approved to effectively manage water hygiene for the Client and provide sufficient management resource to provide the following:

- Deliver Safety Awareness Induction training directly or through others which must be attended by the Provider and all other Providers;
- Ensure that the Provider and all other Providers working on behalf of the Client are aware of any specific hazards and safety standards documented for specific buildings, such as asbestos, or Permits to Work requirements in any area that they will be working in by completing a pro-forma Contract Checklist;
- Ensure that the Provider and all other Providers are provided with relevant health and safety information and Customer contact details prior to work commencing;
- Ensure that prior to Work commencing proof of Staff competence is provided to undertake Work planned.
- Ensure that all risk assessments and any method statements have been provided, agreed and understood prior to Work commencing and that these are adhered to by the Provider and all other Providers during Work. Ensure through the routine and periodic assessment of the Provider and all other Providers during the course of their Work that they comply with agreed method statements and the Client's codes of practice and standards.
- Any documentation required above should be provided and checked as part of the tender exercise and periodically monitored throughout the Contract Period.
- Enter all HSE incidents reported to them by the Provider and all other Providers into the Client's incident reporting system ensuring that the name of the individual(s) involved and their Client are recorded.
- Comply with the Client's "Provider Code of Conduct".

Routine Maintenance

006 .1 Routine Maintenance duties will include:

- Monitoring of hot and cold water temperatures;
- General monitoring, including annual drain down on domestic hot water vessels / plate heat exchangers for inspection and cleaning (base flush);
- Where required/identified in the Risk Assessment, performing annual disinfection of cold water storage tanks (inc Fortic type or close coupled tanks) and Associated Down Water Services;
- De-scaling of showerheads (inc hoses) and other outlets;
- Where required/identified in the Risk Assessment, carrying out, Microbiological Monitoring and Monitoring for legionella;
- Servicing of chlorine dioxide dosing equipment;
- Servicing of water softeners;
- Servicing of UV and similar water treatment equipment; and
- Checking operation of booster pumps;

Responsive Maintenance

007 .1 Provide the necessary Staff to complete Responsive Maintenance Orders within their Responsive Period.

.2 Tasks to include:

- Emergency disinfection of systems when deemed necessary following sampling;
- Addressing localised water hygiene issues including legionella;
- Repairs to water softeners; and
- Microbiological monitoring and monitoring for legionella

© Rand Associates Consultancy Services Ltd

Repairs/Replacement Following Routine Maintenance

008 .1 Where, in the course of carrying out Routine Maintenance tasks, the Provider identified an additional repair or equivalent replacement(s) that in the Provider's opinion is necessary the Provider shall notify the Client's Representative giving full technical details and the costs of the repair or replacement(s) concerned within 10 days and request that an Order is issued.

.2 If Instructed, such repairs or replacements shall be evaluated in accordance with the Rates.

.3 The Client's Representative may decide not to give authority to proceed with the intended Works.

Responsive Maintenance - Repairs or Replacements

009 .1 On receipt of an Order the Provider shall execute all Works (or supply all labour and/or Materials) described in the Order.

.2 Repairs and renewals shall not unnecessarily reduce the capabilities and must be effected using equal or manufacturers approved Materials wherever practical.

.3 If the Provider anticipates a delay of longer than 5 days for reinstatement to full operation of assets following a Responsive Maintenance call-out, then the Provider must provide temporary facilities. Failure to do so will result in the Client re-charging the Provider for the cost of sourcing and providing alternative Responsive Maintenance provisions.

Capital Project

010 .1 Works that fall outside scope of Routine Maintenance or Responsive Maintenance will be known as capital projects, for which the Provider shall provide a technical report on why the Works are necessary and a cost to enable the Client to identify budgetary needs. It is anticipated this shall generally relate to replacement of obsolete plant and equipment e.g. water softeners.

General Safety Precautions

011 The following safety precautions should be observed when carrying out water hygiene repairs services.

.1 Appropriate measures and consideration is to be taken to ensure complete safety of the Public, all Providers and Staff/Customers of the Client.

.2 All public areas should be kept clear of equipment, materials and tools.

.3 Fire doors shall not be restricted in any manner or retained in an open position during the carrying out of any works.

Fire Precautions

012 **General Guidance**

.1 Providers shall ensure that all fires access routes are kept clear at all times and will be required to carry out all Works in full compliance with appropriate and current Acts and Regulations which may be in place for the time being.

.2 Providers will not be allowed to store combustible materials within the Properties on levels other than those required for immediate use in the specific location(s) in which they are working. All waste products, surplus materials and the like are to be removed immediately upon completion.

.3 Landlords Service ducts are not to be used for the storage of Plant, Equipment and Materials at any time.

.4 Providers will not be allowed to smoke or burn waste material or debris on site.

© Rand Associates Consultancy Services Ltd

Protected Areas

013 Attention is drawn to various fire protection items in designated areas within Client's Properties.

.1 **Fire Doors** – intumescent strips fitted to doors must not be contaminated with paint or damaged in any way.

.2 **Fire Extinguishers** – where these are removed to afford access or carry out Works, care shall be taken, and extinguishers replaced immediately after completion of Works.

.3 **Fire Door Stickers** – fire exit signs, smoke alarms; these items must not be removed or defaced.

.4 **Fire Zone** – protection; where cabling etc passes through or causes disruption to the integrity of any fire protection system, integrity must be restored. Holes are to be filled with an approved intumescent material.

.5 **Emergency Lighting** – facility must be kept in full working order at all times. Any damage must be repaired immediately by the Provider or an approved Subcontractor.

014 Ensure that any damage caused to the above-mentioned items during the process of Works is repaired immediately at the Providers own expense. If this is outside the scope of the Provider's expertise, then it must be brought to the Client's Representative's attention, who will arrange for the Work to be carried out by an approved Client Party. Any damage not repaired by the Provider will be charged accordingly to the Provider.

Defects

015 Notify the Client's Representative of any defects that may come to his notice; arrangements will be made for the Work to be carried out by the Provider or an approved Client Party.

016 Defects found in existing installations are to be reported to the Client's Representative without delay and Instructions obtained before proceeding with Work.

Risk Assessments

General

017 The purpose of a risk assessment is to:

.1 Investigate the systems operation and usage
.2 Generate schematic diagrams (if not available)
.3 Identify problematic areas
.4 Take samples for laboratory analysis of system in order that the quality of water in the system may be ascertained.
.5 Make recommendations for any remedial Work which may be required to reduce the potential risk.

018 All risk assessments will be undertaken by Staff, who are competent, experienced and have been correctly trained to carry out these duties.

019 Ensure that risk assessments will only be undertaken by suitably informed, instructed, trained and experienced Staff that have been assessed as competent to carry out in a safe competent manner.

020 The risk assessment should be reviewed at intervals not exceeding two years or if significant modifications are undertaken with regard to the system design or utilisation of the Property.

© Rand Associates Consultancy Services Ltd

021 The log book shall contain all information regarding the maintenance, tests and any remedial works carried out on the water system at the Property.

Legionella Risk Assessment

022 A detailed inspection shall be undertaken at each Property, commencing at the point of supply and following through to each outlet, including any storage and exchangers present.

023 Complete Risk Assessments (RA) of indicated Properties including existing and new Properties when required on the two year anniversary of the existing assessment. The RA shall be of the entire domestic hot water system at each Property, which is to comply with The Approved Code of Practice and Guidance for 'The Control of Legionella bacteria in water systems' (L8) by the Health and Safety Executive and also the Standard Code of Practice - Water quality - Risk assessments for Legionella control.

024 Ensure that all information gathered during the inspection is formulated in a standard manner to all Properties.

Risk Assessments

025 A detailed risk assessment is to be produced for Properties detailed by the Client. Each risk assessment shall include the following as a minimum:-

.1 Generation of schematic diagram for systems included within the risk assessment. The Provider shall produce an 'up-to-date drawing/diagram showing the layout of the plant or system showing parts temporarily out of use. This drawing/diagram shall be available in Adobe Portable Data Format (PDF) or AutoCAD drawing (DWG) format and shall be in colour.

.2 Compilation of asset register for all equipment and outlets included within the risk assessment.

.3 Detailed report regarding the composition of the system and the state/condition of each part. Items covered should include water storage tanks, calorifiers or hot water heaters, booster pumps, taps, showers and interconnecting pipe-work. As part of the Risk Assessment, the Provider shall produce a full condition (if required) report of all water associated plant, including, ***but not limited to***:

- Asset Register
- Mains water
- Cold water storage tanks
- Calorifiers
- Direct fired water heaters
- Other hot water generators not included above
- Showers and spray producing outlets
- Hot and cold water outlets
- Areas that are out of use
- Sentinel Outlets
- Portable air conditioning units
- Booster pumps
- Water softeners

.4 Report detailing any remedial Works required in order to comply with current standards.

.5 Recommended maintenance programme and precautionary measures

.6 Identification of responsible and competent persons at each location.

.7 Reports of legionella samples taken from areas where it is possible that a significant risk exists. All samples must be analysed within UKAS accredited laboratories.

© Rand Associates Consultancy Services Ltd

.8 Provision of a 'Site specific log book' for the recording of any future maintenance activity. As part of the Risk Assessment the Provider shall review water associated plant throughout each Scheme against the requirements of the Water Supply (Water Fittings) Regulations and list any necessary remedial Works.

026 All risk assessments and log books shall be in an electronic format, and the data is to be provided electronically in the web based monitoring system (as described in clause 123). The electronic data shall be updated once a year or if significant changes occur with the installation.

Review Risk Assessment

027 A review of the risk assessment will take place no later than the 2nd anniversary of the original risk assessment. Risk Assessments shall be reviewed every **24 months** or sooner if alterations are made to the water services or systems.

028 The review of the risk assessment shall reflect any significant changes to the installation or any changes to the use of the Property. Existing risk assessments shall be updated with evidence of the review. Electronic data previously supplied to the Client is to be updated with evidence of the review. This will apply to new assessments carried out by the Provider and existing assessments already in place.

029 Each risk assessment will include a section at the front, known as the 'Action Plan' that details Property specific actions (to be included in the database solution as an auto notification email if possible) and to be taken in order to maintain water hygiene on that Property. Typical actions may include, ***but are not limited to:***

- Flushing of little used outlets (Action Plan to identify specific outlets),
- Associated works, e.g. mechanical
- The Provider will supply and maintain a log for all Properties with the log sheets to maintain records in accordance with The Control of Legionella in Water Systems – Approved Code of Practice and Guidance. In particular log sheets for recording flushing activity to be undertaken by the schemes shall have a space for the Provider to countersign to state that the flushing is recorded as having been carried out.
- The Provider will supply a schedule of tasks on PPM planner for each Scheme in the logbook.
- scald risk (to be included in LRAs)

General Monitoring

030 On an annual basis the Provider shall undertake the following checks and record their results in accordance with The Control of Legionella in Water systems – Approved Code of Practice and Guidance paragraphs 182:

- Visually inspect the cold water storage tank(s)
- Make a record of cold water consumption over a typical day
- Drain the calorifier(s)/DFWHs/plate heat exchangers and check for and remove any debris inside them
- Check that the plans of the hot and cold water circuits are correct and up to date.
- Ensure that the operation and maintenance schedules for the hot and cold water systems are maintained and up to date
- Check the existence of water connections to all outside services.

© Rand Associates Consultancy Services Ltd

Maintenance

031 On completion of the Risk Assessment, the following maintenance plan will be formulated as a minimum to comply with the policy. The Provider will ensure that the maintenance plan is actioned and that all Works carried out are recorded in each site specific log book.

Checklist hot and cold water services

Frequency	Check	Standard to meet		Notes
		Cold water	Hot water	
Monthly	Sentinel taps (nearest, furthest and intermediate points from the feed tank or calorifier)	The water temperature should be below 20°C after running the water for up to two minutes.	The water temperature should be at least 50°C within a minute of running the water.	This check makes sure that the supply and return temperatures on each loop are unchanged, i.e. the loop is functioning as required.
Monthly	If fitted, input to TMV's on a rotational basis.		The water supply to the TMV temperature should be at least 50°C within a minute of running the water.	One way of measuring this is to use a surface temperature probe.
Monthly	Water leaving and returning to calorifier.		Outgoing water should be at least 60°C, return at least 50°C.	If fitted, the thermometer pocket at the top of the calorifier and on the return leg are useful points for accurate temperature measurement. If installed, these measurements could be carried out and logged by a building management system.
Quarterly	Dismantle, clean and descale shower heads.			
Six monthly	Cold Water Storage tanks	Carry out temperature checks		Check temperature at inlet valve and general cleanliness of tanks.
Six monthly	Incoming cold water inlet (at least once in the winter and once in the summer). Record water meter readings in January and June.	The water should preferably be below 20°C at all times		The most convenient place to measure is usually at the ball valve outlet to the cold water storage tank.
Annually	Water System To be carried out by independent Auditor/Adviser			Carry out full inspection of the water system and report on any changes or defects. Update schematics if necessary and Clients records.
Annually	Cold water storage tanks			Visually inspect and carry out remedial work where necessary.
Annually	Representative number of taps on a rotational basis.	The water temperature should be below 20°C after running the water for two minutes.	The water temperature should be at least 50°C within a minute of running the water.	This check makes sure that the whole system is reaching satisfactory temperatures for legionella control.
Six Monthly	Calorifier flush and sample		Hot water sample also ensure correct temperatures are present.	Set up flexible hose to drain cock flush and sample.
2 Yearly	Risk Assessments	Review risk assessments every 2 years and update accordingly, incorporating areas of remedial/maintenance works required.		

032 The list above is not an exhaustive list and amendments where felt necessary or determined by a change in legislation will be agreed with the Client.

© Rand Associates Consultancy Services Ltd

Maintenance Specifications

033 As a minimum the Provider should make adequate provision for the following Routine Maintenance activities at each Property identified by the Client:-

.1 **Six monthly inspection of each Property to include the following:**

- Inspection and sampling of water storage tanks
- Flushing and sampling of calorifiers and heat exchangers
- Temperature monitoring of system
- Sampling of sentinel outlets
- Update all Property specific records
- Report any area of concern where the risk of legionella proliferation has significantly increased immediately to the Client's Representative

.2 **Quarterly visit to each Property to include the following:**

- Clean and chlorination of shower heads
- Temperature monitoring of the system
- Update all Property specific records
- Report any area of concern where the risk of legionella proliferation has significantly increased immediately to the Client's Representative.

.3 **Monthly visit to each Property to include the following:**

- Temperature monitoring of the system
- Update all Property specific records
- Report any area of concern where the risk of legionella proliferation has significantly increased immediately to the Client's Representative.

Temperature monitoring

034 Ensure that temperatures are monitored on a monthly basis in accordance with the maintenance plan.

035 Temperature monitoring should only be undertaken by Staff that have been specifically trained to carry out such duties. On site records are to be updated for all temperature monitoring activities.

036 Attend all Properties; measure and record hot water outlet and calorifier flow and return temperatures as required by the Approved Code of Practice and Guidance for 'The Control of Legionella bacteria in Water Systems' (L8) Table 3. Checks are required on the temperature of the hot water supplied to the valve (i.e. prior to mixing), and of the mixed hot water.

037 On a **monthly** basis the Provider is to measure the Hot water outlet temperature at a representative sample of outlets; check Cold water taps by testing temperature at sentinel points as well as testing representative sample annually in accordance with the Approved Code of Practice and Guidance for 'The Control of Legionella bacteria in Water Systems' (L8) Table 3. Checks are required on the temperature of the hot water supplied to thermostatic mixing valves (i.e. prior to mixing), and of the mixed hot water. Where the mixed hot water temperature is outside of the acceptable range the valve shall be adjusted by the Provider. It is essential to avoid any scalding risk.

038 On a **six-monthly** basis the Provider is to measure the incoming cold water main temperature and will also check the tank water temperature remote from the ball valve and the mains temperature at the ball valve as required by the Approved Code of Practice and Guidance for 'The Control of Legionella bacteria in Water Systems' (L8) Table 3.

039 All temperatures measured shall be recorded in the site Log Book and a copy sent to the Client's Representative with any non-compliances highlighted.

© Rand Associates Consultancy Services Ltd

040 A certificate detailing measured temperatures and the date on which the measurements were made will be required for each Scheme each month.

Hot Water

041 The nearest and furthest outlets "on any one circuit" (sentinels) shall be monitored. A representative number of intermediate outlets shall be tested on a rotational basis within a twelve month period.

Cold Water

042 The nearest and furthest outlets "on any cold water main" (sentinels) shall be monitored. A representative number of intermediate outlets shall be tested on a rotational basis within a twelve month period.

Defects

043 Defects or departures from the current legislation shall be communicated to the Client's Representative by facsimile the following working day. The format of this report will be decided at the pre-contract meeting and will remain the same for the reporting of any defect.

Temperature Monitoring

044 The equipment used to undertake temperature monitoring shall be specifically designed for that purpose and is to be calibrated at not less than 6 months intervals in order to ensure its accuracy. A copy of each calibration record is to be provided to the Client's Representative for the Contract file.

045 The temperature at outlets shall be measured by opening the fitment and placing the monitoring device in the stream of water. Any changes in temperature should be observed and after the specific period a record made of the temperature displayed. If the required standard (below 20°C for cold, above 50°C for hot) has not be attained shall be clearly identified on the Property report in red ink.

046 When the test has been completed the area shall be left in the condition it was found, in that all splashes around the area shall be removed. If any area requires cleaning as a result of splashes or spillage then that area shall be clearly identified as a 'slippery surface' until such time that the area has dried.

047 Temperatures within storage cisterns and tanks shall be monitored in accordance with the maintenance plan by inserting an appropriate measuring device into the water. Before the device is inserted into the water it shall be cleaned and sterilised by employing 1000mg/l chlorine solution. All results shall be recorded on the Property report and in the Property log book, with any non-compliance's clearly identified. Any insulation or lids, which have had to be removed in order to gain access, shall be replaced into the correct manner.

048 Temperatures from calorifiers can often be observed from fixed gauges, these shall NOT be taken as the true temperature; these readings shall be verified with calibrated test equipment. The temperatures shall be monitored from the flow and return pipe-work to the calorifer at not more than 1m in distance from the calorifer and Property records to be updated. Any insulation, which has to be removed in order to carry out these checks, should be replaced in the correct manner.

Calorifier Flush and Sample

049 Accept responsibility for ensuring that calorifiers are flushed and sampled on a six monthly basis in accordance with the maintenance plan. (See checklist for hot and cold water services).

050 Flushing and sampling of calorifiers will only be undertaken by Staff that have been specifically trained to carry out such duties.

© Rand Associates Consultancy Services Ltd

051 A flexible hose will be connected and set up between the calorifier 'drain cock' and the nearest suitable drain. The drain will then be run until the discharge is free of all debris. The flow of water should then be stopped and the flexible hose removed. The drain cock should then be 'flamed' before legionella and bacteriological samples are taken.

052 All samples taken should be clearly identified with the following information; location, date, time and the sampler's identity. These samples should then be transferred to a UKAS accredited laboratory for analysis.

053 Any spillage or splashes should be removed and are left in the condition that it was found. If any area has to be mopped as a result of splashes or spillage then the area shall be clearly identified as a 'slippery surface' until such time that it has dried.

054 The installation shall be left in the same order as found before the sample was taken, on site records to be updated.

Removal, Cleaning and Chlorination of Shower Heads

055 Attend all Properties and dismantle, clean and de-scale shower heads (and disinfect hoses) as required by The Approved Code of Practice and Guidance for 'The Control of Legionella bacteria in Water Systems' (L8) Checklist 2.

056 Ensure that all shower heads are cleaned and chlorinated quarterly in accordance with the maintenance plan. (See maintenance checklist for hot and cold water services).

057 Removal, cleaning and chlorination of shower heads shall only be undertaken by Staff who have been specifically trained to carry out such duties.

058 Before any cleaning or chlorination can carried out authorised access must be obtained from the responsible person in charge. On obtaining this all showerheads that require cleaning and chlorinating shall be isolated and labelled 'chlorination in process do not use' as a safety precaution.

.1 All showerheads will be chlorinated on site.

.2 Where practicable the showerheads will be dismantled to aid the cleaning and chlorination process involved.

.3 An approved solution (e.g. Fernox DS3) and water will be made up to the manufacturers recommended concentration and the showerheads will then be treated to remove any scale formation.

.4 On completion of this process the showerheads will then be flushed thoroughly to remove any treated water from them.

.5 A solution of 1000 p.p.m. (free chlorine) residual using Sodium Hypochlorite at a concentration of 10% will be made up in a suitable container chlorinate the showerheads.

.6 The showerheads will now be submerged in the solution for ten minutes.

.7 On completion of this process the showerheads will be thoroughly flushed to remove any chlorinated water from them. If the showerhead has been dismantled it shall now be reassembled.

.8 The chlorinated water will now be dechlorinated using Sodium Bisulphite before discharging it to the drain.

.9 The showerheads will now be refitted and tested on site.

© Rand Associates Consultancy Services Ltd

.10 Any warning notices will be removed after the test has been carried out.

.11 The Property specific water hygiene log book will be updated.

.12 Showers that are deemed redundant by the Client's residential staff will be reported to the Client's Representative using the water hygiene defect report.

Inspection and Sampling of Storage Tanks

059 Ensure that storage tanks are inspected and sampled on an annual basis in accordance with the planned preventative maintenance regime. (see checklist for hot and cold water services).

060 Inspection and sampling of storage tanks shall only be undertaken by Staff that have been specifically trained to carry out such duties.

061 Each storage tank should be visually inspected internally a written record of this inspection shall be made. Photographic records will also be taken to aid the process.

062 Legionella and TVC samples should be taken from the tank by following the Standard for sampling for legionella organisms in water and related materials.

063 All samples taken should be clearly identified with the following information: location, date, time and samplers identity. These samples should then be returned to a UKAS accredited laboratory for analysis.

064 The Client's Representative shall be notified of the results as soon as they become available.

065 The chlorine residual of water stored within the tank should be measured and recorded.

066 The temperature of water stored within the tank should be measured and recorded in the Property specific log book.

067 Any insulation, which is removed to gain access, should be replaced in the correct manner.

Cleaning and Disinfection of Domestic Water Systems

068 The Provider will be responsible for ensuring that all Works are completed in the event of legionella bacteria being detected within the system, or if environmental conditions indicate an increased risk of the proliferation of legionella.

069 The Provider is to perform an annual visual inspection and disinfection of all cold water storage tanks feeding communal systems and associated down water services. The disinfection is to be carried out in accordance with the requirements of The Control of Legionella in Water Systems – Approved Code of Practice and Guidance paragraphs 192 and 193.

070 Where appropriate, disinfecting agents such as chlorine dioxide may be used, **however tanks are not merely to be sprayed and left;** the disinfecting process is to be:

- Drain and mechanically clean tank(s)
- Refill tanks and dose with chosen disinfecting agent
- Pull through to all associated outlets
- Neutralise with disinfecting agent and pump waste
- Flush system with mains water

071 Cleaning and chlorination will only be undertaken by Staff that have been specifically trained to carry out such duties.

072 Cleaning and chlorination operations should follow unsatisfactory inspections or analysis.

© Rand Associates Consultancy Services Ltd

073 This Work can call for Staff to work in areas defined as 'confined spaces', therefore requiring the use of atmospheric monitoring equipment, breathing apparatus and the necessary authorisation. All Staff undertaking the cleaning and chlorination of storage tanks will have received formal training in confined space working and be authorised to wear breathing apparatus. The Provider will be required to produce such evidence as part of the Contract award.

074 Prior to cleaning the storage tank shall be isolated from the distribution system and drained. Any debris removed shall be packaged and removed in a safe manner. If pumps or vacuums are employed the discharge should be directed to a drain which is capable of handling the capacities involved.

075 When cleaning operations have been completed the tank surfaces should be immersed in water containing a free chlorine residual of at least 50mg/l free chlorine residual.

076 The tank shall then stand for 1 hour before the free chlorine residual is checked again; if it has fallen below 30mg/l the procedure shall be repeated. If the free chlorine residual is 30mg/l or above, the water within the tank should be neutralised before it is allowed to drain.

077 On completion the chlorine/disinfecting agent is to be either neutralised or flushed to waste or disposed of at an approved site with appropriate authorization. Note: appropriate waste transfer notices will be required by the Client in order to able its compliance with waste disposal regulations.

078 Concentrations of halogen levels in the water throughout the chlorination and flushing process are to be measured using Comparator or photometer tests to give readings to exact parts per million. Starch iodide papers are not acceptable.

079 The tank will then be filled with fresh water (potable supply) and the free chlorine residual checked (ensure level is commensurate with potable supply). The tank may then be put back into service.

080 Legionella and TVC samples should then be taken from the tank in accordance with the procedures laid down in the applicable Standard.

081 All samples taken should be clearly identified with the following information; location, date, time and the sampler's identity. These samples should then be returned to a UKAS accredited laboratory for analysis.

082 Any insulation or covers, which have been removed to facilitate this Work, shall be replaced in the correct manner.

083 When the disinfection process is to be extended to the whole of the distribution system all site Staff should be made aware that the water will not be fit for use until further notice. Each outlet shall be temporarily labeled in order to clearly identify that water should not be used. The chlorination should be applied to the tank/cistern and be drawn through the system, when 50mg/l free chlorine is detected at each outlet is shall then be allowed to stand for 1 hour before the free chlorine residual is measured again.

084 If the free chlorine is 30mg/l or above the water within the tank should be neutralized using sodium bisulphite. The neutralized water should be then drawn through the system to remove the chlorine. The tank should then be drained and filled with potable water and the free chlorine residual checked. The system may then be put back in service and warning notices removed. Samples should be taken from sentinel taps to ensure the sterilization process has been successful.

085 Any spillage or splash shall be removed and the area left in the condition that it was found. If any area is mopped as a result of splashes or spillage then that area shall be clearly identified as a 'slippery surface' until such a time that the area has dried.

086 Should additional or more frequent cleaning and disinfection prove necessary, then arrangements will be made by the Provider with the Client's residential staff to gain access, and the Client's Representative notified.

© Rand Associates Consultancy Services Ltd

087 All relevant guidance and information will be explained/given to the Client's residential staff before and on completion of the Works.

088 The Client may attend site during any chlorination process.

089 There must be at least two people present from the Provider when system disinfections are carried out. Lone working when completing these Works is NOT permitted.

090 A site specific relevant Health and Safety Risk Assessment must be completed before commencing any work, and a copy to be left in the site log book. This risk assessment must take account of the risks to Customers, residential staff, visitors and to the Provider's Staff, the Schemes, offices, housing stock and community centres and so on and any Properties identified by the Client.

Microbiological Monitoring and Monitoring for Legionella

091 Microbiological monitoring and monitoring for Legionella are required on an annual basis for all Extra Care schemes and on other Properties where the risk assessment identifies a potential problem and as required by L8.

092 The following tests are required:

.1 Total Viable Counts (TVC): L8 defines TVC as the 'total number of culturable bacteria (per volume or area) in a given sample (does not include Legionella). Tests for TVCs are required at both 22°C and 37°C. Dip-slides are not considered adequate for bacterial analysis of drinking water and should not be used.

.2 E-coli and Coliform: to determine that the water is clear of these pathogenic organisms and therefore for human use. Legionella pneumophila: to ensure that the water hygiene regime in place is controlling Legionella bacteria.

.3 Samples are required from every Property at each of the locations instructed on the frequencies specified.

.4 Legionella Samples must be taken in strict accordance with the Standard Code of Practice for Sampling for Legionella bacteria in water systems and once taken be submitted to a UKAS (United Kingdom Accredited Scheme) Accredited Laboratory for analysis which is **independent of the water hygiene Provider/Provider.**

Cold water tanks (Communal); annual sample and tests for:
- Legionella pneumophila
- TVC's
- E-Coli and Coliform

Calorifier's (Communal); annual sample and tests for:
- Legionella pneumophila
- TVC's
- E-Coli and Coliform

Showers and spray producing outlets – each bank of showers;
- Legionella pneumophila
- TVC's
- E-Coli and Coliform

Hot water outlets – representative outlet(s) from each circuit in the hot water system; every six months sample and test for:
- Legionella pneumophila
- TVC's
- E-Coli and Coliform

© Rand Associates Consultancy Services Ltd

093 On completion of sampling, a certificate of results is to be issued to the Client's Representative within 5 working days.

Heating Systems

094 Test the water of each communal Scheme primary heating circuit to verify the water quality is appropriate for the system plant, equipment, pipe work and fittings. These checks are to take place within 4 months of the Commencement Date.

095 Therein after heating system water quality shall be checked every 24 months, or following a heating system refurbishment in which case a separate Instruction shall be issued.

De-Scaling of Showerheads and Other Outlets

096 Attend all Properties and dismantle, clean and de-scale shower heads (and disinfect hoses) as required by The Approved Code of Practice and Guidance for 'The Control of Legionella bacteria in Water Systems' (L8) Checklist 2.

Servicing of Water Softeners

097 Service water softeners in accordance with the manufacturer's technical data sheet. This includes the supply of salt or other chemicals and filling of reservoirs as appropriate.

Thermostatic Mixing Valves

098 Where TMVs are installed, the Provider must maintain them to the standard recommended by the manufacturer. As a minimum the Fail-Safe on each device must be tested 6-monthly and results recorded in the Logbook. Failed valves and associated outlet must be taken out-of-service immediately until the failed valve is repaired or replaced and the outlet is safe to use again.

099 A documented maintenance schedule which takes into account local conditions (e.g. hard water) and the risk of valve failure, should be followed and recorded. Any variation in the monthly temperature testing of outlets fitted with TMVs (i.e. an increase in the prescribed temperature set on the TMV of less than 43°C) may indicate that a fault has occurred and should be investigated. This may require further temperature checks.

100 The new standard for thermostatic mixing valves is supported by a testing system managed by the Water Research Council. OCC requires that TMVs used for baths and showers should have a certificate of testing under this 'TMV Scheme'.

101 BuildCert (http://www.buildcert.com/TMV/default.html) currently provide an independent third party certification scheme for thermostatic mixing valves against the requirements of the NHS Estates Model Engineering Specification D 08 (TMV 3 approval).

102 Other Plant and Equipment cover:
- UV systems
- Booster pumps (these are required to be serviced on at six monthly intervals)

Emergency Disinfection of Systems Following Sampling

103 All reactive actions are to be carried out within the requirements of The Approved Code of Practice and Guidance for 'The Control of Legionella Bacteria in Water Systems' (L8). Emergency disinfections, when required, must conform to the requirements of 'The Code of Legionella Bacteria in Water Systems' (L8) and the relevant Standard.

104 Appointments must be made with the Scheme managers and residential staff **before** attending the Property to undertake Works, in the event that the Scheme managers and residential staff cannot be contacted, the Provider shall inform the Client's Representative.

© Rand Associates Consultancy Services Ltd

Annual Checks to Ground Floor Break Tanks

105 The annual check of each break tank should comprise:

- Visual inspection of the break tank to check the condition of the inside of the tank and the water within the tank
- Inspection of the lid to ensure good condition and that it fits closely
- Inspection of the insect screen on the water overflow pipe to ensure that it is intact and in good condition
- Inspection of the thermal insulation to ensure good condition and provides the requiste protection from extremes of temperature.
- Check that water does not contain any debris or contamination, and that the water is clean and shiny
- Inspect and check the operation of the water level float switch
- If necessary empty tank, clean, disinfect (where necessary) and flush through

Addressing On-Going Issues

106 Continuously review the sample results at each Scheme with a view to identifying on-going issues and pro-actively propose appropriate solutions, including system modifications where necessary.

107 Demonstrate how the QA arrangements assist in this process, and show how sample results are recorded, and used to identify issues. Where results are recorded in electronic database, the Provider should state what access would be available for the Client and the Client's Representative.

Administration

108 Provide sufficient resources to respond to all calls from the Client and the Client's Representative, a single point of contact shall be provided by the Provider with a single email address for all communications associated with the Contract.

109 Allocate appropriate Staff to ensure the specified response times are met as per the orders from the project manager's helpdesk and records maintained for response times met to provide management information for KPI monitoring.

110 Facilitate the co-ordination of information from their Staff on site who will be required to feed-back information of scope of Work if beyond original Order whilst still on site.

111 Accept responsibility for the correct filing of service sheets and reports in the site log book. Copies of the service sheets are to be sent to the Client's Representative with the monthly invoice.

Web Based Electronic Log Books

112 Provide an Electronic Monitoring System or Log Book.

113 The electronic monitoring system shall be designed in such a way that the Client's Representative can be involved in the planning, management and view its compliance with L8.

114 The system shall be web based with varying levels of access as the Client is a multi site and possibly a multi Client organisation.

115 The scheduled monitoring and inspection tasks as set out within the Specification must allow for customisation for each particular Property contained within the Schedule. Occasionally this may include new Properties as and when the requirement arises.

116 Tests out of Specification shall generate a non-conformity report that shall be immediately available to the Client's Representative.

117 The Client's Representative will require the ability within the program to create notes or messages within the system; this must be recorded within the software audit trail.

© Rand Associates Consultancy Services Ltd

118 All non-conformities raised must be clearly identified as a visual warning on the date of the fault and be summarised in visual alert facility and report.

119 The central electronic logbook will have communication software with the ability to 'synchronize' any test results put in by each remote Property, Providers or into the central database.

120 The logbook software must include a user password security system, which can be set up by the administrator of the software and allow or restrict access as applicable or as confirmed in the Client's Legionella Policy Statement.

121 The Client will require the Provider to supply a support contract to include:-
- Telephone support during normal office hours Monday to Friday;
- Future upgrades and training for use of software as a result of improvements or changes in current legislation.
- All data stored shall be the property of the Client and all data must be provided to the Client on a regular basis on demand and at the termination of a contract.

122 The system shall be available to the Provider and other Staff and Client Parties and not limited to any single provider.

123 The Client will own all data and such data should be made readily available by the Provider to the Client upon request in a recognised format (e.g. Excel).

124 Adhere to all Data Protection Law in the course of compiling, processing and storing any Personal Data for the Client.

125 Provide a document storage system as agreed with the Client's Representative that includes:
- Method Statements
- Risk Assessments
- PPM Planner
- Record Sheets
- Test Certificates

Reporting

126 Prepare and submit a monthly report summarising the activities during the month and bring to the Client's Representative's attention any issues needing discussion/agreement. The report shall, as a minimum, contain summaries of the following points:

- H&S Reportable Incidents that may have occurred within the month
- Sampling results and any relevant information
- Issues arising from the Inspections
- Planned inspections completed within the month
- Update against programme
- Number of Orders received together with call log reference, Order number, date and time of Order
- Number of Responsive Maintenance repairs completed within response time and outside response time together with the date of completion
- Number of Orders in hand and in progress
- Number of Orders outstanding, explanation and proposed completion date

127 The format of this report is to be agreed with the Client's Representative.

Audit

128 Ensure that an annual independent audit of compliance for each Property is carried out. The annual Property audit reports will be reviewed by the Client's Representative. Remedial actions to be undertaken will be recorded in the minutes of a specific annual audit meeting.

© Rand Associates Consultancy Services Ltd

129 Areas to be reviewed will be as follows, but not limited to:

1. Change of system or usage of Property
2. Compliance with Routine Maintenance programme
3. Outstanding remedial actions
4. Changes in legislation

130 Relevant documentation relating to the audit of each Property shall be held in Property specific electronic log books reflecting the annual monitoring and other water service related works in that 12 month period.

131 Any recommendations following the completion of annual audit should be presented to the Client in the form of report to the annual audit meeting.

Future Improvement

132 The successful Provider will be expected to contribute towards the future improvement of the water hygiene services contract particularly in the area of information technology and data transfer.

Firestopping

133 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

134 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

MODEL WATER AND HYGIENE WORKS REPORTING FORM

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

MODEL WATER AND HYGIENE WORKS REPORTING FORM

PROVIDER:	
SCHEME:	

			Attendance Confirmed by			
Routine Visit	**Date**	**Duration**	**Name**	**Signature**	**Designation**	**Comments**
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						

Signed for an on behalf of the Provider: …….. Date: ……..

© Rand Associates Consultancy Services Ltd

PLUMBING

© Rand Associates Consultancy Services Ltd

PLUMBING

GENERAL

Generally

201 Ensure all Materials comply with the requirements of the applicable water Utility Provider.

202 Use rust proofed ancillary and fixing Materials. Ensure all Materials in direct or indirect contact are compatible so as to prevent electrolytic or chemical corrosion.

203 Note that the Client's Properties may contain a variety of disposal systems manufactured from conventional materials and also a wide range of manufacturer's proprietary systems.

204 Seal any pipework entering a vertical service duct all round with intumescent sealant to prevent the passage of fire or smoke.

MATERIALS

Plastic water supply pipes and fittings

205 Use blue polyethylene pipes with copper fittings for pipework laid underground for potable water supplies.

Copper water supply pipes and fittings

206 Use lead free capillary fittings for potable water supplies.

Fittings for lead supply pipes

207 Use lead to copper mechanical joint fittings for connecting dissimilar pipes to existing lead water services.

Overflow pipes and fittings

208 Ensure the pipework for overflows complies with the same requirements as for water supply pipework.

Solder

209 Do not use lead based solders or solders containing lead in Works associated with potable water supplies. Use tin/copper or tin/silver compositions instead.

Float valves

210 Use float operated valves unless the Client's Representative approves the use of piston valves. Where approval is given, use piston valves of at least 22mm that comply with the requirements of the Utility Provider.

Taps

211 Use chromium plated metal taps. For lavatory basins and sinks, use 1/2 inch taps; for baths, use 3/4 inch, unless the Client's Representative Instructs otherwise.

Low Flat Rate Aerating Taps

212 Ensure low flow rate aerating taps are chromium plated metal and have a flow rate of not exceeding 4 litres per second.

© Rand Associates Consultancy Services Ltd

Shower Mixing Valves – Aerating Low Flow Type

213 Ensure thermostatic or non-thermostatic aerating low flow rate shower mixing valves have a flow rate not exceeding 9 litres per second.

Tanks

214 Ensure tanks are complete with tightly fitting removable lids. Use moulded plastic tanks to the applicable Standards. Ensure the tank is complete with a float valve and all fittings necessary to connect the services and overflow.

Copper cylinders

215 Ensure hot water storage copper cylinders are to the applicable Standard Grade 3 factory insulated, fitted with sacrificial anodes and complete with:
- immersion heater boss, cap and washer screwed boxes; and
- all fittings necessary to connect to the primary pipework supply and draw off pipework.

Combination hot water storage units

216 Provide indirect or direct combination tanks to the applicable Standard. Ensure the proprietary units are complete with:
- sacrificial anodes;
- insulation;
- float valve;
- immersion heater boss, cap and washer, screwed boxes; and
- all fittings necessary to connect to the primary supply, draw off and overflow pipework.

Insulation

217 Use preformed, fully flexible, closed cell elastomeric insulation fire rated as insulation for hot and cold pipework that meets the requirements of the Utility Provider.

Paint

218 Ensure paint used in repairs complies with the "Painting" Section.

WORKMANSHIP

Water supply

219 Support pipework at centres recommended by the manufacturer with approved clips or brackets of a type to suit the background to which it is required to be fixed.

220 Ensure that pipes used in repairs are similar to the existing pipework, but repair lead pipework using appropriate plastic pipe and approved compression fittings. Do not use copper pipework for repairs to lead pipework. Use either compression or lead free solder capillary ring fittings.

Firestopping

221 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken

© Rand Associates Consultancy Services Ltd

Client's current manufacturers/suppliers/products

222 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

WATER SAVING CONTROLS MAINTENANCE

© Rand Associates Consultancy Services Ltd

WATER SAVING CONTROLS MAINTENANCE

General Requirements

001 The water savings controls must be covered by a fully comprehensive Contract.

002 Detailed below are the specific Requirements. The Contract must therefore comprise of the following elements:

- Routine Maintenance
- Responsive Maintenance
- Out of Hours Emergency Works

003 Refer to the Specification, schedule of Works and to manufacturers requirements and recommendations for detailed guidance. Other guidance is available from the BSI and WRAS.

004 Pay particular attention to:

- IET Wiring Regulations.
- The Water Supply (Water Fittings) Regulations 1999
- WRAS: Water Regulations Guide
- The Building Regulations Part L

Asset Register

005 Ensure that all the asset registers supplied by the Client prior to the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

006 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each visit to undertake Routine Maintenance, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

007 Ensure that, following all visits to undertaken Routine Maintenance, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

008 Provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff including his Specialist Subcontractors.

Manufacturer's Requirements

009 Where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

010 Submit and agree, within 20 working days of the award of the Contract, a full annual Programme for all Works covering each element of the Routine Maintenance Works with the Client's Representative.

011 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

© Rand Associates Consultancy Services Ltd

Permit to Work Certification

012 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

Access

013 Ensure that he undertakes a risk assessment and provides a method statement for his means of access to allow for inspection and testing.

014 Ensure that all Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

015 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

Minor Repairs

016 Carry out, during testing, minor repairs such as tightening joints, replacement of clips, etc to achieve a pass status and make appliances safe to ensure compliance with BSEN62305.

Routine Maintenance

017 The minimum requirements for Routine Maintenance are to be in accordance with the relevant equipment manufacturer's recommendations.

018 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

019 Carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

020 Include for the provision and application of all consumables within the Rates for this element of the Contract.

021 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the latest applicable Standards or equivalent.

022 Inspection and testing of water savings control maintenance must unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirements tabled below;

Water Saving Controls Maintenance

Item No	Item	Frequency	Action	Notes
1	System General	Annually	Generally clean and examine. Examine for evidence of vandalism or tampering. Examine general mechanical condition. Examine fixings, secure as necessary.	
2	Pipework	Annually	Examine pipework, supports and thermal insulation. Examine connections for leaks.	

© Rand Associates Consultancy Services Ltd

Water Saving Controls Maintenance (cont'd)

Item No	Item	Frequency	Action	Notes
3	Isolation Valves	Annually	Check isolating valves. Repack glands as necessary. Examine connections for leaks.	
4	Strainers and Filters	Annually	Examine strainers and filters. Examine connections for leaks. Clean and examine filter gauzes, replace as necessary. Renew disposable filters.	
5	Solenoid Valves	Annually	Examine solenoid valves. Test for tight shut-off. Examine pipe connections for leaks. Examine coil for signs of overheating. Examine coil for deterioration. Examine wiring terminals, tighten as necessary. Test operation of valve, report excessive noise.	
6	Sensors	Annually	Clean sensors. Examine sensor covers, terminal boxes and fixings. Check internally for signs of overheating, ingress of dust and/or moisture. Examine wiring terminal connections, tighten as necessary. Test operation. Ensure location of sensors is appropriate for the installation.	
7	Control Units	Annually	Clean and examine control units. Examine circuit boards. Ensure they are correctly and securely located. Examine circuit boards for evidence of over heating or component failure. Replace batteries as necessary. Test operation.	

© Rand Associates Consultancy Services Ltd

Water Saving Controls Maintenance (cont'd)

Item No	Item	Frequency	Action	Notes
8	Electrical Installation	Annually	Visually examine electrical installation. Visually examine conduits, flexible conduits, boxes and lids. Examine for corrosion or deterioration. Pay particular attention to signs of water damage or heat damage. Ensure that means of disconnection/isolation is readily accessible. Examine flexible cables for wear, fraying braid and brittle insulation. Ensure that wiring terminal connections are sound. Examine earthing arrangements and test continuity.	
9	Operational Parameters	Annually	Interrogate 'intelligent' units to confirm operational function. Adjust operational parameters as necessary. On conventional units confirm settings of flow rate, flushing cycles, hygiene flushes, timers, etc. Adjust as necessary.	All systems must be set so as to comply with the requirements of the Water Supply (Water Fittings) Regulations 1999.
10	Mechanical Devices	Annually	Generally clean and examine. Examine pipe connections for leaks. Test operation. Reset in accordance with manufacturer's instructions.	

023 It is the Provider's responsibility to observe the on-going condition of the systems and installations with regard to safe and correct operation. The Provider must bring to the attention of the Client's Representative any specific areas where periodic checking, lubrication and adjustment exceeds normal provisions for the age and type of systems installed.

Responsive Maintenance and Out of Hours Emergency Works

024 Attend to all call outs due to malfunction or breakdown.

025 Include for a call-out service to provide Responsive Maintenance and an Out of Hours Emergency Works Service. The Out of Hours Emergency Works service is deemed to extend the provision of Emergency Works to a 24 hour, 7 days a week, 365 (366 for a leap year) days per year basis.

026 Call outs for Responsive Maintenance and/or Out of Hours Emergency Works which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

027 Where Out of Hours Emergency Works are attended to for authorised cases of breakdowns, mis-use or vandalism, the Provider will be paid in accordance with the Rates detailed in the Price Framework.

© Rand Associates Consultancy Services Ltd

Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works

Repairs, Replacements and Adjustments

028 Accept responsibility for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

029 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

030 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

031 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

Firestopping

032 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

033 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

WATER TANK REPLACEMENT

© Rand Associates Consultancy Services Ltd

ECCT – TECHNICAL SPECIFICATION – BASED ON M3NHF SCHEDULE: COMMUNAL MECHANICAL & ELECTRICAL WORKS – SPECIFICATION – VERSION 8

COLD WATER STORAGE TANK INSTALLATIONS

General Requirements

001 This specification shall be read in conjunction with the Preliminaries, the other Communal Mechanical and Electrical Specifications, Appendices, Schedule of Rates and all other contract documentation.

002 The Provider shall note that this is a performance specification. It shall be clearly understood that the Provider shall be fully responsible for the detailed design, supply, installation, testing, commissioning, demonstrating, documentation and leaving in a satisfactory working order following removal of existing water tanks (if any) the fully operational new cold water storage tank installations as described within this specification or indicated on the project drawings.

003 It shall be the Providers responsibility to request and receive any information regarding asbestos on the site and subsequently satisfy their obligations by carrying out a Pre-construction asbestos survey.

Strip Out Works

004 Provide strip-out details as part of their initial enabling works identifying the extent of the strip out works, details regarding isolation, method of isolation, methods of safe removal and builders work including any fire stopping.

005 Following consideration and approval the strip out works will be completed as part of the first stage of the project.

Validation Reports

006 Ensure the existing systems are validated and reports are issued prior to the respective works being commenced.

007 Ensure that validation reports include the following;
- Condition of the existing Water Tank(s);
- Condition of the existing pipes together with sizes; and
- Initial schematic.

Technical Requirements

Loss of Service

008 Allowed, within their programme, to carry out works with a loss of service if:
- The planned loss of service is anticipated to be no longer than 8 hours;
- The planned loss of services has prior agreement with both the Client and Customers;
- Local Water Authority is notified of the planned loss of service;
- Notification letters to Customers have been issued at least 7 days before commencement of the Works;
- Written notifications are present in common areas to notify Provider's intentions; and
- A vulnerable person's strategy is in place.

Temporary Supplies

009 Depending upon the period of loss of service, strategy agreed with the client and necessity the Provider may provide a method including for temporary water supplies. As such, any temporary water service will only be accepted if this is capable of satisfying delivery in line with operational duty identified within validation report

© Rand Associates Consultancy Services Ltd

Mains Cold Water

010 The mains cold water Service shall not be adapted unless otherwise identified elsewhere this Specification.

Pipework & Fittings - General

011 Fabricate any necessary pipe work adaptations, and sterilise as required, before the shutdown of the supply to carry out the alteration as required to accommodate this document. This is to keep the shut down time to a minimum.

012 All pipe work will be supported via a suitable manufactured support/bracketing system; an example of the standard acceptable is the BOSS Flamco pipe support system distributed by BSS or other equal and approved. Pipe work supports shall be arranged as near as possible to joints and the centre spacings shall not exceed those given. Where there are 2 or more sizes of pipes, the common support spacings shall be those required by the smallest bore pipe work.

013 Replace all the existing cold water main and cold water down service isolating valves that provide isolation to and from the existing tank(s). The Provider must ensure the alignment of the pipe work so that no stresses are exerted on any equipment, and the pipe will be fully supported when disconnected at both ends.

014 All pipe work to and from the new GRP tank(s) should have no dead legs or pockets that would contribute to the proliferation of bacteria and be in accordance with HSG 70.

015 For maintenance purposes the pipe work to the new GRP tank(s) should be fitted in such a way, so that when one tank is isolated, the second tank will maintain the water storage supply.

016 All fittings, pipe and materials that will transport water must be sterilised prior to use and transported to site in sterile bags.

017 Every effort must be made to ensure no water spillage occurs. The Provider will be held responsible for any damage caused.

018 On completion, the temporary supplies will be removed completely. There should be no dead legs or pockets that contribute to the proliferation of bacteria.

019 All copper tube shall conform to Part1 of the applicable Standard (under no circumstances is Table Z tube to be used).

020 All copper fittings shall be of the solder ring type in compliance with the applicable Standard. When adapting to a BSP fitting the correct appropriate fitting will be used. (IMI Yorkshire YP69 or YP69F or other equal and approved).

021 All steel tube shall be heavy weight galvanised. Galvanised steel tube shall be joint only by screwed connections. Where it is necessary to change direction, pre-formed bends shall be used.

022 Dissimilar metals shall not be connected/mixed. This will protect against up or down stream galvanic action.

023 Clean and remove any rust from existing retained barrel pipe work and paint with Galvafroid paint.

024 Remove any verdigris and flux residue from any retained or newly installed copper pipe work.

025 The pipework layout for all services including the tank(s) connection manifold(s), must comply with all relevant legislation, applicable Standards and Codes of Practice, with attention to Water Supply (Water Fittings) Regulations 1999. Scaled, dimensioned working drawings must be submitted to the Client's Representative for his approval prior to the commencement of works on site

© Rand Associates Consultancy Services Ltd

Pipework and Fittings

026 Pipework shall be formed of the following materials with corresponding fittings.

System	Diameter	Material	Fittings
Cold Water Services	15mm up to 150mm	Copper Tube to applicable Standard - R250	Non-dezincifiable capillary type to applicable Standard or Brazed or composite and push fit.
		Galvanised Steel Tube to applicable Standard	Galvanised steel
		Stainless Steel to applicable Standard	Screwed or welded stainless steel to applicable Standard
		ASB	ASB

027 All pipework shall be installed in a neat and workmanlike manner including bends and sets required to produce an installation pleasing to the eye. Any pipework fitted in an unsightly manner shall be removed and refitted at the Provider's own expense.

028 All burred or cut ends of pipes shall be reamed out so that the full bore of the pipe is maintained.

029 Ensure that no dirt or obstruction enters the pipe system during the Works. Adequate screw-in malleable iron plugs or caps must be fitted over open ends of pipe or plant or snap on plastic covers used.

Non Metallic Fittings

030 Fittings shall comply with WRAS Materials Approval document.

Screwed Fittings

031 Where screwed tubes are used to connect booster pump sets to existing pipework or for tappings, fittings shall be: stainless steel, brass or galvanised with taper threads to the applicable Standard.

Machine Crimped Fittings

032 Ensure that no dirt or obstruction enters the pipe system during the course of the works. Adequate screw-in malleable iron plugs or caps must be fitted over open ends of pipe or plant or snap on plastic covers used.

Welded Fittings

033 Where screwed tubes are used to connect booster, pump sets to existing pipework or for tappings, fittings shall be suitable in all respects to the provisions of the applicable Standard and shall match tubes to applicable Standard Heavy Quality and complete with WRAS approval in stainless steel 316, brass or galvanised with taper threads to the applicable Standards.

034 Bends: All bends for use on 80mm bore tube and over shall be of the long radius elbow pattern with bevelled ends. Tees and Branch Bends: All tees where shown on drawings on 80mm bore tube and over shall be of the equal or reducing pattern with bevelled ends.

035 Branch bends shall be used where the size of the branch is two pipe sizes smaller than the main.

036 End bends shall be used as the template for each particular weld and the main pipe shall be cut using an oxyacetylene torch. All cuts must be thoroughly cleaned prior to the welding of the bend.

© Rand Associates Consultancy Services Ltd

037 All connections to the flow and return headers shall be cut in and welded square to the main pipe unless stated otherwise.

Capillary and Compression Fittings

038 Where copper tubing is utilized, all joints shall be made with capillary type fittings. Compression joints shall only be accepted on the prior approval of the Consulting Engineer. All fittings shall be immune from dezincification. Fittings shall be engraved for the identification of solder.

039 End feed fittings shall not be permitted.

040 The tube and fittings shall be cleaned with steel wool or sandpaper prior to the flux being applied.

041 When soldering, care must be taken not to overload the flux, due to the low thermal conductivity of stainless steel.

042 A gentle flame only shall be played on to as much of the fitting as possible.

043 Where compression fittings are proposed Type A or B may be used. When making a joint with Type A fittings it will be necessary to apply a little more pressure when tightening the nut, otherwise no special precautions are required.

044 When using the manipulative Type B compression fitting the tube end shall be flared. The tube must be cut with a hacksaw owing to the degree of work hardening caused by the use of a wheel cutter, which can split the tube end. A coating of "Boss White" jointing compound shall be applied to the joint and fitting prior to fabrication.

045 All fittings shall have the approval of the British Waterworks Association.

Supports and Brackets

046 Supports and brackets to any pipework within the adjacent 8m shall be installed to be below spacings.

047 Vertical pipes shall be stayed with a minimum of one clip, spaced equally between the floor and ceiling etc. Flanges, sockets, and unions shall, where installed, coincide with these positions so that the weight of the pipework is supported from the pipe clip.

048 Supports shall be provided adjacent to all valves installed in pipelines to prevent undue strain on the adjoining pipework and so that any component may be removed for maintenance, leaving the adjoining pipework adequately supported at the ends.

Pipe Diameter (mm)	Horizontal Spacing (m)	Vertical Spacing (m)
15	1.5	2.0
20	1.5	2.0
25	1.5	2.5
32	1.5	2.5
40	2.0	3.0
50	2.0	3.0
65	2.0	3.5
80	2.0	3.5
100	2.7	3.5
125	4.0	4.5
150	4.5	5.4
200	5.0	5.5
250	5.5	5.7

© Rand Associates Consultancy Services Ltd

049 Allow for providing all hanging rails for the adequate support of the pipework.

050 All clips and eyebolts shall be of the following sizes:

Pipe Diameter	Drop Rod Diameter (mm)	Pipe Clip Size (MM)	Bolts (mm)
Up to 25mm	6.0	25 x 3	6.4
32 to 50mm	8.0	32 x 3	9.5
65 to 100mm	10.0	40 x 3	12.7

Thermal Insulation and Protection - Pipework

051 Pipework up to 8m from and to the booster pump set shall be considered as being replaced and re-insulated as part of the works. Booster pump set stainless steel headers shall also be insulated (suction and discharge).

052 Pipe insulation shall be made with preformed closed cell phenolic pipe sections, having a nominal density not less than 100 kg m³ with a factory applied aluminium vapour barrier foil laminate. Insulation shall comply with the applicable Standards (Table 7) water vapour permeance, Building Regulations Fire proof definition, Part L and TIMSA and HVAC guidance.

053 Joints to be securely taped with minimum 50mm wide soft foil tape, the whole to be further retained in position by light gauge aluminium bands not less than 300mm centres.

054 Attention shall be made to taping to maintain the vapour barrier, particularly at termination points where exposed insulation membrane to be over taped and returned to piping surface. Furthermore, where insulation abuts pipe support, inserts into the insulation should be taped at all inserts to continue the vapour barrier.

055 Pipe support inserts shall be as per the insulation manufacturer's details.

056 Insulation thermal performance shall be, as a minimum 0.025 W/m·K (at 10°C mean).

057 Insulation shall be approved by the Local Authority Building Control and is covered by LABC Registered Detail RD certificate number EWW382 and carry a relevant warranty.

058 All insulation shall be CE Marked in accordance with the applicable Standards.

059 All pipework shall be bore cleaned, internally cleaned, flushed and tested prior to installation of insulation.

060 The thermal insulation will be kept dry before, during and after application. While insulating material shall be continuous over pipes and fittings, it should be finished in such a manner as to allow access to valves for operation.

061 Where necessary, insulating material shall be resistant to or shall be protected by suitable covering against mechanical damage, rain, moist atmosphere and vermin.

062 Pipe work will be labelled I.D. bands etc and conform to all applicable Standards, Codes of Practice etc.

063 Pipe work will not be insulated until the installation has been fully tested for leaks and inspected for accuracy.

Thermal Insulation and Protection - Valves

064 All valves over and above 35mm diameter shall be insulated with flexible reinforced silicone jackets complete with wraps or ties and needled fibreglass/pyrogel internally and stitch sealed insulation.

© Rand Associates Consultancy Services Ltd

Thermal Insulation and Protection - General Protection

065 Pipework shall be protected by zero permeability, all weather, multi-layered laminate coated polymer complete with acrylic adhesive.

066 Protective wrapping shall provide:
- External weather resistance;
- -10 degrees Celsius adhesive resistance;
- Fungal protection;
- UV;
- Fire retardant;
- Embossed finish;

067 Approved Manufacturers or other equal and approved:
Kingspan
Celotex
Knuaf
Thermaxx Jackets
3M VentureClad

Replacement of Existing Water Tanks

068 Design, supply and install within the area of the redundant tanks or at a new location, GRP water tank(s), for the storage of water.

069 To enable these works, ensure compliance with this specification and Health and Safety requirements the Provider may have to undertake one or more of the following items of work:

Supply and install a continuous walk way to and around the tank area from point of access.

Upgrade power and lighting to tank room and associated areas. Form new access to enable works.

Supply and install new steel doors/hatches/locks/padlocks and frames.

Supply and install new access ladders, guard/hand rails, platforms etc.

Supply and install temporary tank(s).

Relocate tank installation.

Undertake decoration.

Supply and erect scaffolding, tower, or hoist.

Asbestos removal.

070 The requirement for any or all of the above items of work will be stated within each location's particular requirements. The standard of work required for each of the items are contained within this Specification.

071 The above list is not exhaustive.

072 Supply and install all necessary pipe work, valves and ancillary equipment to comply with all current legislation, Water Supply (water fittings) Regulations 1999, applicable Standards or equivalent, Approved Code of Practice and EC requirements, to supply wholesome water for use in the building(s).

073 The works must be phased in such a manner, that there is a maximum of only two periods of loss of supply, and that those periods of loss do not to exceed four (4) hours each.

© Rand Associates Consultancy Services Ltd

074 Satisfactory measures are to be undertaken by the Provider, to maintain a wholesome supply of water to the residents throughout the works.

075 Supply a method statement detailing precautions & controls regarding the prevention of fire in relation to hot works. The method statement shall be supplied at the pre-contract meeting.

076 Remove from site all rubbish, debris etc daily.

077 This includes all redundant tanks prior to the commencement of works.

078 The lifts will not be used for the transportation of materials, tools, equipment, rubbish etc.

079 Supply and board the roof space or roof area and provide a safe, working platform to facilitate their works. It should:

Protect the operatives and members of the public alike.

Provide a safe working platform for the transportation of rubbish, equipment and materials to and from the roof space.

Protect the ceilings, roofs, and existing pipe work.

Comply with all Health and Safety regulations, applicable Standards and all other current legislation and be in accordance with the Client's" Code of Practise for the Protection of the Public/ Customers during Contract Works."

Not damage the brickwork or external fittings/equipment. This includes lightning conductors, electrical boxes, electric cables & conduit, lights, satellite dishes, aerials, pavements, paving slabs and grassed areas, stairs and stair wells and their decoration etc. All damage to existing fabrics, equipment, decoration etc., caused during the execution of these works will be made good to the Client's satisfaction, at the Provider's expense.

080 Supply, prior to the commencement of the Works, a method statement concerning the working platform.

Method of Works

081 The cold-water supply to the existing water tank(s) is via the Water Authorities main water supply and/or via a break tank and pump set. The supply is to be adapted, extended and re-routed as necessary from point of entry into tank area and supply the new GRP water tank(s).

082 The connection(s) to the existing water tank(s) is to be adapted, extended and re-routed as necessary to supply water from the new GRP tank(s).

083 The works are to be phased in such a manner, that no loss of supply to the tenants will occur other than that specified in this document. Adaptations to the existing pipe work and installation of temporary tanks to accommodate the requirements of this document will be prefabricated and thoroughly checked for accuracy prior to any drain down. Only when the Provider is totally satisfied with the accuracy will they, isolate drain and install.

084 The new GRP water tank installation will be phased by taking out of service the redundant tank and installing and setting to work temporary or permanent GRP water tank, to the satisfaction of Client's Representative, prior to any attempt to install a further GRP tank. The first GRP tank should be in service for seven (7) full days before works on the second tank are undertaken and so on. Under no circumstances will the installation of the second GRP tank be permitted until the first GRP tank is brought into satisfactory service.

Note: In the case of multiple tank installations, the Provider may be able to replace more than one (1) tank at a time. The Provider will need to evaluate this during their initial site survey and include the sequence of removal within their general Method Statement.

© Rand Associates Consultancy Services Ltd

085 On completion of each stage, the Provider must inform the Client's Representative, having given a minimum of 48 hours written notice to allow attendance if required. The Client's Representative shall inspect the completed works and give written approval that the works may continue onto the next stage.

086 On the completion of each stage, the Provider will provide the Client's Representative with a certificate of disinfection for the section being brought into use. The certificate of disinfection shall be presented to the Client's Representative prior to the stage of work being brought into service.

087 On the completion of each stage of the works the Provider will take water samples (minimum of 250ml) and have them analysed by an independent water quality analyst. The returning samples should show negative coliform and e.coli (less than 1); chlorine levels of less than 0.3 PPM, and conform to all relevant legislation, applicable Standards and other guidelines. A certificate of analysis will be provided certifying the water being wholesome, and suitable for human consumption.

088 Accept responsibility for instructing his own independent water quality analyst.

089 The Client's Representative must be informed when water samples are to be taken from the new equipment, so they have the option of attending and witnessing the procedure. The sample(s) must be taken from the area of the tank(s) most susceptible to stagnation or any form of contamination.

090 A comprehensive chemical and material schedule, and sample of the materials used in the manufacture of the new GRP tanks together with the jointing compounds used must be provided to the Client's Representative and to the Provider's analyst on completion of the works.

091 No water flowing from or through the new equipment must be allowed into the existing system for consumption until satisfactory disinfection certificates are provided to the Client's Representative.

092 Ensure the following requirements are met regarding the remaining stored water tank(s) (original tanks that are to be replaced at a later stage of the works).

093 Protect the remaining stored water supply from any contamination that may occur from the works or any prevailing conditions (i.e. provide temporary lids, screens etc. that may be deemed necessary). This protection must be to the satisfaction of the Client's Representative.

094 Take samples from the remaining (operating) tank(s) every fourteen days (up until it/they is/are taken off line) and analyse them as stated above. The samples must be taken from the area of the tank(s) most susceptible to stagnation or any form of contamination. The Client's Representative must be informed immediately of any contamination.

095 The Client's Representative must be informed at least 48 hours prior to samples being taken, giving the opportunity for attendance if necessary.

096 Check the remaining, operational tank(s) daily to ensure it or they are free from dust and debris and the temporary lids/covers are securely in place.

097 The stored water is for Customer's use only and will not be used for any other purpose.

098 A temporary supply from the mains water service pipe, for the Providers use, may be installed while works are in progress. All standpipes and hose union bibcock's are to have integral double check valves.

Tank Sizing and Design

099 Design, supply, and install new GRP water tank(s) installation, in the majority of cases the new GRP tank(s) will be sited within the area of the redundant tank(s). However, it may be necessary or beneficial to re-site the new tanks in a different location. Where tank(s) are relocated the Provider will need to ensure that the new proposed location will meet the structural requirement of the installation. The Client's Representative will require formal confirmation of the area's structural suitability prior to the commencement of any works.

© Rand Associates Consultancy Services Ltd

100 The layout and design must meet the criteria laid down within the Standard and Particular Specification, all current, relative legislation, applicable Standards or equivalent, Water Supply (Water Fittings) Regulations 1999 and Approved Codes of Practice.

101 Ensure that all operatives working on potable water services are suitably qualified and competent to do so, proof of operative's competency must be provided to the Client's Representative upon request. The Provider must also ensure that all materials, tools and equipment used are suitable for use on potable water services, all materials/fittings must be Water Research Centre (WRC) approved. The Provider must ensure that each stage of the works is undertaken in strict accordance with this Standard Specification and all current, relative Legislation, applicable Standards or equivalent, Water Supply (water fitting) Regulations 1999 and Approved Codes of Practice.

102 The layout and design of the installation must ensure each tank and its ancillary components are easily accessible for service and maintenance requirements. The positioning of the tank(s) must in no way hinder the access to any area where access is required, for whatever reason.

103 Size the new GRP tank(s) in accordance with the 'Total Storage Capacity Required' figure contained within the Works Order.

104 The Works Order will indicate the number of tanks the Provider is to base his design upon the systems total water storage capacity, which should, as closely as possible, be divided equally between the total number of tanks.

105 If one tank only is specified then that tank shall have a central partition giving two (2) tanks each with a float valve, a screened over flow, a warning pipe if over 1000 litres, an access cover and connecting header pipe work with necessary valves to enable maintenance without disruption to supply. The tank must be positioned in such a way as to allow ease of access for cleaning and maintenance purposes and must conform to Water Regulations.

106 The tank(s) shall be manufactured by the Hot Press Moulded method, glass reinforced plastic, moulded at temperatures up to 150 C using isophthalic unsaturated polyester resins, UV stabilised and 'E' glass fibre reinforcement, colour grey.

107 The tank(s) design shall incorporate 1.00m x 1.00m or 1.00m x 0.50m pillow panels to walls of insulated tanks with provision for flat panels for connections and fittings.

Purpose made cover panels are to be 1.00m x 1.00m and 1.00m x 0.50m flat panels positioned to give free draining channels.

Insulated tank(s)are to have 1.00m x 1.00m and 1.00m x 0.50m flat panels throughout to a maximum depth of 4.00m.

Base panels may be internally flanged (IFB) with 1.00m x 1.00m flat panels, fasteners, internal, or externally flanged (EFB) with 1.00m x 1.00m flat panels and one pillow sump panel, fasteners external.

All surfaces of the panels shall be smooth and crevice free to provide hygienic finish and be dimensionally accurate with sharply defined profiles.

Float valve chambers to be provided with central hinged or lift off lockable ABS lid, with options of 180mm, 300mm and 500mm depth.

Type B air gap will follow the requirements of the applicable Standard.

Where appropriate, provision for Type A air gap in compliance with the applicable Standard will be supplied.

© Rand Associates Consultancy Services Ltd

Manhole access 600mm diameter hinged or lift off lockable ABS lid.

All tank(s) deeper than 1.50m shall be fitted with internal stainless steel or GRP and external standard duty galvanised steel access ladders to the applicable Standard, with hooped safety cage as necessary.

108 Note: All new permanent GRP tanks sited within roof-spaces are to have a drip tray installed with its own waste outlet unless the existing bund area is being used.

Temporary Tanks

109 All temporary cold-water storage tanks and associated pipework must fully comply with this Specification and all current, relevant legislation, applicable Standards or equivalent and Approved Codes of Practice.

110 The installation, disinfection and commissioning works on the temporary tank is to be undertaken in the same manner as that laid down in this Specification for the new GRP tank(s).

111 Ensure that the temporary tank will adequately meet the cold-water demand of the dwellings it supplies.

112 The area where the temporary tank(s) is to be sited must be structurally adequate to support the tank's weight. The Client's Representative will require the Provider to provide a Structural Engineer's report, confirming area's structural suitability. The position of the temporary tank(s) to be approved by the Client's Representative.

113 If the tank is to be sited on scaffolding, the Provider must ensure that the scaffolding and temporary tank(s) are stable. The scaffolding must adequately support the tank's weight and not cause any damage to the roof/tank room.

114 All temporary pipe work must be supported and insulated as stated in this document.

115 All temporary tanks are to site on a suitable base.

116 Valves used on the temporary installation may be of compression configuration. However, compression valves are not permitted on the permanent installation.

117 Submit proposals for temporary tank prior to the commencement of the Works.

Connections

118 Connections to the new tank(s) to be supplied and installed by the tank(s) manufacturer.

Connections 2-inch BSP (50mm) and below	BSP threaded
Connections 2.5-inch BSP (65mm) and above	Flanged to PN16 unless otherwise instructed

119 Standard flanged connections as 'BSTL' range, or other equal and approved, with stool piece with internal support flange, external stub flange with loose galvanised ring.

120 All connections to be installed in accordance with Water Supply (Water Fittings) Regulations 1999. Tank(s) manufacturer should carry WRC approval for all installations covered under the Water Supply (Water Fittings) Regulations 1999.

© Rand Associates Consultancy Services Ltd

Tank Installation - General

121 Ensure the following:

Prepare the base of the existing drained tank to accommodate bearers, and as a walkway for maintenance, to the new GRP tank.

Where the water tank is being re-located or the tank capacity and weight is being increased, the Client's Representative will require formal confirmation of the area's structural suitability by means of the provision by the Provider of a structural engineers report, prior to the commencement of any Works.

Manufacture or form a new tank base, all in accordance with the manufacturer's technical data sheet. The Provider must provide a certificate from the manufacturer indicating that the base is suitable to accommodate the new GRP tank.

Provide a copy of the original certificate as soon as possible, the original of the certificate is to be handed to the Client's Representative upon completion of the installation of the tank(s).

122 Installation of the first new tank:

The new GRP tank and tank connections are to be supplied, installed and erected entirely by the tank manufacturer.

All new connections are to be made to the new GRP tank and connected to the new pipe work. The connections shall be made in such a manner that no stress or strain will be exerted on to the tank.

All pipe work will be supported using a proprietary support and bracketing system.

Issue to the manufacturer a document of acceptance for the location of the new GRP tank and quality of connections.

A copy of the original document will be handed to the Client's Representative as soon as possible and the original of the document is to be handed to the Client's Representative upon completion of the installation of the tank(s).

The tank manufacturer will issue a commissioning certificate within 5 days of installation. The certificate will indicate that the system is suitable for the storage and transportation of water for human consumption and the new tank bases are suitable for the new GRP tank.

A copy of the original certificate will be handed to the Client's Representative as soon as possible and the original of the certificate is to be handed to the Client's Representative upon completion of the installation of the tank(s).

Disinfecting and Flushing the New GRP Tank

123 The GRP tank will be disinfected with chlorinated water at an initial concentration of 50 PPM for a contact period of 1-hour (chlorine requirement to be adjusted for pH of water). If the free residual chlorine measured after the contact time is less than 30 PPM the disinfection process shall be repeated.

124 Following the successful disinfection, the Provider will issue a certificate, the certificate issued will indicate that the tank is suitable to contain water for human consumption. A copy of the certificate will be forwarded to the Client's Representative as soon as possible; the original of the certificate is to be handed to the Client's Representative upon completion of the installation of the tank(s).

© Rand Associates Consultancy Services Ltd

125 Before discharging the chlorinated water stored within the tank to drain, the stored water must be neutralised. If 10% strength sodium thiosulphate crystals are to be used as the neutralising agent, the following quantity must be measured:

10 grams weight of crystals for every 100 litres of water at 50 PPM free residual chlorine.

126 The crystals must be evenly spread over the surface of the tank and fully dispersed into the water. Before discharging the water to drain the free residual chlorine must be checked again to ensure the free residual chlorine level is at or below 0.5 PPM.

127 Following the initial draining of the neutralised water, the GRP tank will be filled and drained three (3) more times. The tank will be drained either manually or by the provision of a suitable submersible pump, to a suitable external drain (no tank is to be directly fitted with a drain off cock). The Provider must ensure that the drain is not blocked or restricted and is able to cope with the water being discharged.

128 After the above flushing regime has been completed the free residual chlorine level of the stored water will be checked again. If the result indicates a higher level than that present in the water supply, the flushing must continue until the level is reduced to that of the incoming water supply.

129 Undertake an alternative method of disinfection and flushing but the alternative must be equal and approved and meet the requirements of the applicable Standard.

130 Upon completion of the tank disinfection and flushing the Provider will issue a certificate of disinfection to the Client's Representative. The tank must not be brought into service until this certificate has been issued to the Client's Representative. The tank must be brought into service within 7 days of the successful disinfection.

131 Prior to bringing the tank into service a sample of the water stored in the tank will be taken, analysed and a certificate issued to the Client's Representative.

132 Unless the Provider suspects water contamination, the tank can be brought into service before the results of the water sample analysis are obtained.

Note: Disinfection and flushing are not a substitute for a high degree of cleanliness during installation. Prior to the commencement of the disinfection and flushing procedures the internal surfaces (including lid and hatches) of the tank should thoroughly checked to ensure they are clean and clear of any foreign bodies.

133 All the above disinfecting and flushing procedures must be recorded. The Provider will provide a copy of the original documentation to the Client's Representative as soon as possible. Original documentation to be handed over upon completion of the installation of the tank(s).

Bringing New GRP Tank into Service

134 The new GRP tank will be brought into service within seven (7) days of the successful disinfection procedure. Any remaining existing tank(s) will be isolated.

135 The new GRP tank must be in service for seven (7) full days, the remaining existing tank(s) will be held as stand by for that period.

136 After the period indicated above and in agreement with the Client's Representative, the Provider will take out of service the remaining existing tank(s) and install the additional new GRP tank(s), following the procedures indicated above within this Specification as may be applicable.

© Rand Associates Consultancy Services Ltd

Mains Water Supply

137 The cold-water supply to the existing water tank(s) is via the local Water Authority main water supply and/or via a break tank and pump set. The supply is to be adapted, extended, and re-routed as necessary from point of entry into tank area and supply the new GRP water tank(s). ,

138 Install a new stopcock to the existing mains water supply, at an easily accessible and prominent point, within the tank room area. It should isolate all tanks.

139 Install a double check valve at the point of entry of the mains water supply into the tank room.

140 Fabricate any necessary pipe work adaptations and sterilise as required, before the shutdown of the supply to carry out the alteration as required, as stated elsewhere in this Specification. This is to ensure the shut down time is kept to a minimum.

141 Install a new water main from the new stopcock to the new GRP tank(s) and connect to the new float valve. The pipe work will be supported via a proprietary support and bracketing system. Each new tank will be fitted with a new cold-water main isolation stopcock. The new tank stopcock should be installed as close as possible to the tanks cold water main connection and float valve.

142 Install an Equilibrium or KERAFLOW type KA or other equal and approved float valve to each new tank.

143 Accept responsibility for arranging with the local Water Authority to isolate supplies for any emergency and as necessary, to accommodate the requirements of this Specification.

Cold Water Down Service

144 Replace all existing isolating valves that provide isolation from the existing tank(s). Where isolation valves were not previously provided the Provider will install new. The isolation valves should be installed as close as possible to the tanks cold water down service outlets. The Provider must ensure the alignment of the pipe work so that no stresses are exerted on any equipment, and the pipe will be fully supported when disconnected at both ends.

145 The cold water down services will to be adapted, extended and re-routed as necessary from the tank(s) area exit back to the tanks discharge connections. The Provider's tender submission price shall allow for 10 meters of pipework for each down service discharging from the new tank(s) to accommodate this item of work. This to be in addition to the tank's connection manifolds. The pipe work will be supported utilising a proprietary support and bracketing system in such a manner that the pipe work is fully supported and there are no stresses exerted on either the tank or the valve.

146 The new cold water down service supply pipe work should be fitted with a slight fall from the tank(s) to the existing pipe work (to prevent air locks). The gradient of fall should not be more than 1:100. Any pipe work not complying with this requirement will be replaced at the Provider's expense.

Valves

147 The valves fitted to the temporary tank services may be of the compression type, but compression types will not be accepted on the final installation.

148 The valve for the Provider's temporary water supply will be a bib cock hose union with integral double check valve.

149 The new cold water down service valves will be full-bore lever ball types: type 10. These valves will be installed on all down service pipe work but not on the cold-water main supply.

150 The new copper/copper stopcocks will be Union stopcock with copper to copper integral female soldered ring connections manufactured to the applicable Standard, or equal and approved.

© Rand Associates Consultancy Services Ltd

151 The new BSP stopcocks will be Pegler Ltd type 744F (1/2 inch BSP – 3 inch BSP). Brass stopcock manufactured to the applicable Standard, or other equal and approved.

152 Stopcocks shall be fitted to all cold-water main supplies, supplying the tank room and individual tank(s).

153 The new float valves will be equilibrium as manufactured by HATTERSLY or KERAFLOW type KA or other equal and approved.

154 Install KERAFLOW Valves or other equal or approved delayed action ball valves to all break tanks and any other tank fed by pump sets.

155 All valves will be labelled using a Traffolyte label. The labels will be affixed to each valve via a chain of suitable strength. If a numbering system is used, a valve chart must be provided within the tank installation area, in a prominent position.

156 **Note:** All valves must be suitable for their purpose and approved by WRC.

Overflow and Warning Pipes

157 Remove the existing overflows entirely from site.

158 Install warning pipes using 20mm plastic pipe. They should discharge separately through the soffit fascia or walls to a prominent position. All holes through concrete and brickwork to be cut with diamond tipped bit to prevent exterior face bursting out.

159 Install the overflows using DuraPipe, or other equal and approved. They are to extend from the new GRP tank(s), discharging externally to a prominent position.

160 The diameter of the overflow is to be determined by the size of the tank (s), supply 2X-inlet size etc. The overflow must conform to all relevant legislation, applicable Standards and Codes of Practice, with attention to the Water Supply (Water Fittings) Regulations 1999.

161 The overflow is to be supported utilising a proprietary support and bracketing system installed in such a manner that the pipe is fully supported, and will be fully supported if disconnected at both ends.

162 No existing bund drains are to be used unless all other possibilities have been explored.

Hot Water Service, Secondary Vents

163 All vents to be run to a cold discharge tank and exit the property to a prominent position. The cold discharge tank/s are to be positioned directly above or as near as possible to the vents point of entry into the roof space/tank room. No particular make of tank is preferred but should be tested to withstand temperatures of 1000C. The tank should be 18 litres in size and the vents should discharge 25mm below over spill level. A valve fitted to the 15mm discharge pipe connected to the underside of the tank.

164 This valve is to left cracked open; this will allow the tank to drain completely but restricts water flow, ensuring there is no risk of high temperature water being expelled externally. The 22mm discharge pipe taken from the side of the tank must not be restricted in any way.

Builders Work - Tank Rooms

165 Remove entirely all redundant tank/s (in each tank room) in a safe manner using a diamond tipped saw, or an equal and approved tool (refer to the requirements for the removal of asbestos tanks):

166 Cut all holes in the tank room walls, using a diamond tipped bit or equal and approved tool to accommodate the new service, supply, warning, and overflow pipes.

© Rand Associates Consultancy Services Ltd

167 Provide a method statement in relation to the removal and/or conversion of concrete tanks prior to the commencement of any Works.

168 Adapt and make good where applicable the existing tank bases for the new GRP tanks, in accordance with the manufacturer technical data sheets.

169 All holes in walls, floors & ceilings are to be made good with a sand and cement mix or proprietary fire stopping filler, whichever is appropriate and suitably finished to accept decoration and prevent the ingress of water, dust, insects etc. Particular attention should be paid to the area around the new warning and overflow pipes.

170 All pipe work passing through walls are to be sleeved using like material and be of sufficient size. The sleeve should be pointed in and the gap between sleeve and pipe sealed with an injected, suitable approved mastic or proprietary fire stopping filler.

171 Protect the roof during the Works with walkway boarding. The roof should be kept free of any debris that may cause damage. The Provider will supply and fit a wire balloon to each roof outlet. On completion the roof drain will be water tested.

172 Secure the site, while works are in progress. The Provider will remove from site all rubbish, debris etc. daily. This includes all rubbish accumulated prior to the commencement of the Works

173 Ensure the Works are of the highest standard and using the best materials available. All building work will be made good to accept decoration.

174 Paint the tank room. This will require all loose paint to be scraped off the walls, floor, and ceiling.

Walls and ceiling will be painted with 2 coats of white matt emulsion paint.
Pump and electrical panel bases etc., will be painted with 2 coats of black gloss paint.
Concrete floors will be painted with 2 coats of a suitable red sealant paint.
All existing tank room doors and hatches will be prepared, primed and painted with 2 coats of black gloss paint.
All tank room window frames will be prepared, primed and painted with 2 coats of white gloss paint.

Debris and Rubbish

175 Remove from site of all debris and discarded material, existing pipe and tank insulation, rubbish and debris etc. This includes any debris that is on site prior to the start of the Works. The Provider will be deemed to have included for the removal of all debris and rubbish within the Tendered Rates and Tendered Percentage Adjustment

176 Obtain prior authorisation from the Client's Representative regarding the siting of skips.

Lighting and Power to Tank Rooms and Loft Areas

177 Remove and disconnect, after authorisation by the Client's Representative, all defective conduit, wiring and accessories back to the nearest point or location where the circuit initially derived from, i.e. adaptable box or landlord's distribution board.

178 The luminaries to be switched separately or en-block, depending on the particular size and aspect of each installation.

179 Reinstate, where applicable the lights, wiring, sockets and switches, using the existing conduit, to the tank room entrance and ceilings:

180 Supply and install surface mounted 1500mm linear LED luminaire complete with clear acrylic cover, 3000K and high frequency control gear, with a minimum classification of IP65 above each tank.

© Rand Associates Consultancy Services Ltd

181 The minimum light level to be achieved is 300 Lux, which will be the Provider's responsibility.

182 Supply and install sufficient lighting from point of entry and exit to the tank installation area.

183 Supply and install IP65 round LED bulkhead (minimum 600 lumens), by the entry/exit area, complete with HIP conduit, wiring and switching.

184 The luminaire must be an emergency self-contained unit, non-maintained with 3hr duration.

185 Luminaries to be switched via a touch type or insulated double pole switch as manufactured by 'Crabtree', or equal and approved.

186 Install one (1) gang surface mounted grid switch with secret 'fish key switch', engraved to read 'Emergency Test Key Switch.

187 The supply for the new lighting luminaries may be taken from the nearest landlord's 24 hr lighting board or extended from an adjacent landlord lighting circuit, installing all necessary uPVC plastic conduit boxes and circuit wiring.

188 Take the supply for the new power point(s) from the landlords, local power distribution board or extended from an adjacent landlord's power circuit. All power points must incorporate RCD electric shock protection.

189 The circuit wiring for both the power and lighting shall comprise of surface fixed heavy gauge (HIP) uPVC plastic conduit, with single core low-smoke and-fume (LSF) or low-smoke-zero-halogen (LS0H) cable with copper conductors enclosed, each final circuit shall incorporate a separate circuit protective conductor (CPC) colour green and yellow.

190 Ensure that the undertaking any of the electrical Works must be by an approved member of the National Inspection Council for Electrical Installation Contracting (NICEIC or equal equivalent body).

191 Supply appropriate NICEIC certification for all works carried out. Proof of membership must be provided to the Client's Representative upon request.

192 Ensure that all works carried out, including earth equipotential and supplementary bonding, are to be to the IET Wiring Regulations

193 All works must be carried out to the satisfaction of the Client's Representative. For the avoidance of doubt, the minimum Cross-Sectional Area (CSA) of the Equipotential Conductor shall be 10mm² and must derive from the Main Earth Terminal (MET) at the distribution board.

194 An earth marshalling block must be provided to facilitate earth testing.

Access to Tanks

195 Supply and fit a permanent, continuous walkway from the existing access door(s)/hatch to the new tank(s). It should be 25mm WPB boarding and 500mm wide. It should be securely fixed with 42mm c/s galvanised screws and bridged across any pipe work, conduit cables etc to ensure a continuous path.

196 Pay particular attention to and remove any existing sub-standard walkway and replace with new where applicable. This will be from point of access to tank and a maximum of 10 metres from tank outlet.

197 Supply and fit a 25mm, WPB ply board. It should extend approximately 500mm around the new tank(s) to the first joist in two directions and 500mm in the opposite directions. These edges are to be securely fixed to new 100mm x 50mm noggins fixed between the existing joists to ensure a clear walkway around each tank. It should be drilled, screwed, and countersunk at 400mm centres.

© Rand Associates Consultancy Services Ltd

Tank Room/Roof Space Doors

198 Remove any existing wooden doors and frames as identified in their site survey and install new steel doors and frames. The door(s) must be sized to accommodate the removal and replacement of the water tank(s).

The doors and frames should be constructed of an adequate size and gauge and be covered in 2mm galvanised sheet steel.

The doors should open out wards and fit flush with the outside wall.

A hasp and staple/or similar fitting to be fitted so the door can be secured in the open position and hatches to be secured in the upright position.

A minimum of 2 no multi fit locks with keys suited to appropriate NHO to be fitted to new or existing doors.

An approved waterproof sealant should be applied to internal and external gap between wall and doorframe.

The door shall be painted with a coat of metal primer and two coats of proprietary black gloss paint.

Tank Room and Roof Space Hatches

199 Remove any existing wooden hatches, frames as identified on their site survey and install new steel hatches and frames. Hatches should be constructed of sheet-galvanised steel or similar, but not non-ferrous metal. It should provide security and prevent water ingress. The hatch must be sized to accommodate the removal and replacement of the water tank(s):

Securely fitted with a backstop to the tank room roof. The backstop should evenly displace the weight of the hatch and be fitted in such a manner as to prevent stress and strain to the hinges and damage to the hatch (particularly in strong winds).

Fitted with a suitable catch so that it may be held in the open position.

Fitted with a suitable counterbalance and or hydraulic assistance.

Fitted with a standard saddle handle to the underside of the door to facilitate opening.

The width of the handle should be at least 150mm and should be fitted centre of and back from the leading edge 200mm.

A multi fit lock suited to the appropriate NHO to be fitted to the new or existing hatch.

Provider to provide suitable hand/grab rails and platforms as necessary to meet Health and Safety requirements.

The hatch shall be painted with a coat of metal primer and two coats of proprietary black gloss paint.

200 If the access to the tank room/loft space is via tenanted properties, the Provider shall set out proposals for the provision of suitable external access. The Provider shall employ a suitably qualified person (e.g. Architect) to produce full specification and drawing(s) in relation to these works. Examples of the type of access which may be required are:

The provision of a roof dormer together with suitable access.

The provision of a gable end wall access door together with suitable access.

© Rand Associates Consultancy Services Ltd

201 The Specification and drawing(s) must be presented to the Client's Representative for approval prior to the commencement of any Works.

Ladders

202 Install new steel ladders where required with hooks at the top to facilitate a running bar. When not in use and where applicable the ladder should be stored in a `slam shut box`, the 'slam shut' box and the ladder are to fitted on the top landings.

203 The `slam shut box` will be fitted with and secured with a `Multifit` lock suited to appropriate FB keys.

204 Take instruction on all Health and Safety aspects regarding access to property roofs, lofts, portico's, mansards and dormers and all other areas relating to access to tanks.

Hand Rails and Safety Railings

205 Provide suitable hand/grab rails and platforms as necessary to meet Health and Safety requirements, these are to be Key Clamp Type system 2000 or other equal and approved. No fixing into roofs will be allowed.

Scaffolding

206 Comply, in respect of any scaffolding erected by the Provider with Health and Safety legislation, applicable Standards, Codes of Practise, all other current requirements and in accordance with the Client's "Code of Practise for the Protection of the Public/Customers During Contract Works".

207 Ensure that the scaffolding will:

- Protect the public using the communal pathways beneath it;
- Prevent tools, materials, equipment, rubbish etc. from falling from it or being stored on it;
- Provide a safe working platform/environment for the operatives;
- Be erected so that it will deny access to the resident's properties and landings;
- Not damage the brickwork or external fittings/equipment. This includes electrical boxes, electric cables and conduit, lights, satellite dishes, aerials etc. All damage to existing fabrics, equipment, decoration etc, caused during the execution of these works will be made good to the satisfaction of the Client's Representative, and at the Providers expense;
- Not damage the railings, windows, and doors etc. All damage to existing fabrics, equipment, decoration etc., caused during the execution of these works will be made good to the satisfaction of the Client's Representative, and at the Providers expense;
- Be checked at the end of each day to ensure that rubbish, tools, equipment, materials etc have not been stored on or around the scaffolding;
- Be always secured;
- Be checked at the end of each day to ensure that the ladders are firmly chained and padlocked or removed entirely from site to prevent access to the scaffolding; and
- Not obstruct ingress or egress of residents, properties or use of the stairs.

Towers and Hoists

208 Accept responsibility for their own safety and that of the tenants while works are in progress and safety rails are to be provided and erected at the roof edges.

209 Erect a scaffold tower to accommodate a hoist from the ground floor at a suitable point to the roof it should be erected in such a way as no access can be gained to any tenant's properties. The tower is to be boarded around the base and secured, also netted throughout the entire height to protect pedestrians from any falling debris.

210 Ensure that the tower is tied into the building to protect against high winds.

© Rand Associates Consultancy Services Ltd

211 Ensure that the tower is alarmed so as to protect from any unauthorised access to tenants' properties and communications equipment on the roof area

212 Supply and erect double handrails to the perimeter of the roof area and provide a safe working platform, the platform will:

- Protect the operatives and members of the public alike
- Provide a safe working platform for the transportation of rubbish, equipment and materials to and from the roof area.
- Protect the roof and & outlets from damage and blockages.
- Protect all pipe runs on the roof area.
- Be tied into the building for protection against high winds.

213 Comply in respect of any tower or hoist erected by the Provider with Health and Safety legislation, applicable Standards, Codes of Practise, all other current requirements and in accordance with the Client's "Code of Practise for the Protection of the Public/Customers During Contract Works"..

214 Consideration should also be given to the safety of Customers and the public on communal walkways. Lifts should not be used to transport materials and equipment. The Provider is to provide a hoist of adequate size external to the building, specifically to convey materials and equipment from ground to roof level, and to convey redundant materials and debris from roof to ground level. The hoist is always to be adequately protected and disabled when not in use.

215 The hoist must comply with all relevant legislation, applicable Standards and Codes of Practice. A certificate indicating its safety will be required, which must be provided by the installing company.

Asbestos Removal and Disposal

216 If the Provider has to remove asbestos tank(s) or any other asbestos based product, the Codes of Practice together with the Specification and the Preliminary clauses must be adhered to.

217 Asbestos removal companies who are currently registered with the Health and Safety Executive must undertake all licensed asbestos removal. A Method Statement concerning the removal of asbestos is to be be supplied by the Provider prior to the commencement of the Works. The Provider must not proceed with the Works until he has received formal notification that the supplied Method Statement is approved.

218 The Client's Representative or a consultant analyst acting upon his behalf will monitor all asbestos removal works. Following a successful air monitoring procedure, The Client's Representative or the consultant analyst will provide the Provider with an air clearance certificate. The Provider must not proceed with any further works until he has been provided with an air clearance certificate.

Ventilation

219 Screen all existing ventilation openings within the tank installation area in accordance with all current, relative Legislation, applicable Standards or equivalent, Water Supply (Water Fittings) Regulations 1999 and Approved Codes of Practice.

Further Requirements

220 Provide a detailed program of work, clearly identifying all works and time scales attached. It will be presented for approval prior to the commencement of the Works.

221 Provide a Method Statement, detailing all aspects of work. This includes any other Method Statements as requested elsewhere in this Specification. All Method Statements should be presented for approval prior to the commencement of the Works.

© Rand Associates Consultancy Services Ltd

222 Provide the Client's Representative with a safety certificate indicating that the transportation and erection of scaffolding, towers, hoists etc complies with all Health and Safety guidelines. This includes the use of lifting equipment. It should be presented at the precontract meeting. A Method Statement relating to each of these items will be supplied by the Provider for approval prior to the commencement of the Works.

223 Should a loss of supply occur for whatever reason (other than the changeovers) the Provider will return to site immediately and remedy the situation.

224 Supply the Client with a 24-hour emergency telephone number. There should be NO loss of supply, other than what has already been stipulated.

225 Provide notice to Customers, 5 days in advance informing them that a noisy process will be undertaken, explaining the reasons and duration. The notice is to be hand delivered, by the Provider and the Client to be kept informed.

226 Arrange, on commissioning the new GRP tanks, with Customers to enter their Property and:
- Flush through any debris or obstructions caused during the Works. This includes all water services; and
- Remedy any airlocks that may have occurred during these works by testing all points of discharge.

Holding Down Bolts

227 Provide all clips, brackets, foundation bolts, fixing bolts, assembly bolts, including nuts, anchor plates, washers, and plugs, etc., for all pumps and local pipework. Should adjacent or modified pipework be poorly supported it will be the Providers responsibility to provide additional / replacement support thus protecting the new equipment.

228 Ferrous bolts and nuts and other fixing devices exposed to atmospheric corrosion must be stainless steel or similarly treated to prevent corrosion. Alternatively, the component may be manufactured from brass or gun-metal provided it is of sufficient strength.

229 Alignment and levelling of plant shall be the responsibility of the Provider who shall provide any shims necessary.

Valve Labels

230 Provide all isolating and regulating valves with a white ivorine disc, with a black engraved number.

231 Connect a label to each valve prior to completion to correspond to the position indicated on the valve chart diagram.

Testing and Commissioning - General

232 Provide, upon completion of the works the Client's Representative with the original of each previously supplied certificate(s).

233 Test and commission of tanks and connected mains cold water service systems shall be carried out by a specialist organisation employed by the Provider and approved by the Client's Representative.

234 Test, commission and reporting shall be carried out to satisfy the requirements of current version of the relevant Building Regulations Part L, Part G and the Water Supply (Water Fittings) Regulations.

235 Water samples, tests and results shall be completed, reviewed and approved by the client and consultant.

© Rand Associates Consultancy Services Ltd

Commissioning of Systems - Test Instruments

236 Test measurements will be carried out using test instruments recognised throughout the industry as being suitable for the purpose.

237 Maintain an onsite copy of the calibration certificates for all of those test instruments which are required to have evidence of calibration.

238 Test instruments will be used only within the duration of their calibration certificates and copies of the certificates will be made available upon request.

Commissioning of Systems - Commissioning Standards

239 Balance and regulate systems in accordance with the current editions of the CIBSE Commissioning Code Series W (2010) using the techniques contained in the BSRIA Applications Guide BG2/2010 (Commissioning Water Systems)

Commissioning of Systems - Specialist Equipment

240 Commission of the major items of plant and equipment is to be carried out by the specialist suppliers commissioning staff in conjunction with the Providers commissioning team.

241 Commission of the automatic control system and any integration to building monitoring systems is to be carried out by the specialist suppliers commissioning staff in conjunction with the Providers commissioning team and the Client's Representative and include for any head end Graphics User Interface (GUI) updates. All shall be in attendance during these works.

242 Specialist equipment manufacturers and suppliers shall commission and demonstrate the proper operation of their plant and equipment.

243 The specialists will use their own in-house procedures to commission their plant and equipment, copies of which will be issued by the Provider to the Client's Representative.

244 Copies of the specialist manufacturers / suppliers commissioning reports shall be included in the contract operating and maintenance manual.

245 Provide the necessary attendances in order that the specialist may carry out his commissioning procedures.

Commissioning of Systems - Commissioning Report Forms

246 Retain the originals of all commissioning report forms and provide copies to the Client's Representative and for the contract operating and maintenance manual.

247 The commissioning engineer shall complete all commissioning report forms collating them on a system-by-system basis and indexing the system sets. The forms are to be retained on site, in a clean condition, in a dedicated folder.

248 Each set of commissioning report forms comprising the documented "as commissioned" state of the system shall also include the following:

Pump performance curves with operational duties identified.

Supplementary sheets recording validity tests as used to determine existing, design and commissioning duties.

A diagrammatic representation of the system showing test point locations and identifications as denoted on the accompanying forms.

© Rand Associates Consultancy Services Ltd

249 Each commissioning report form will show the type and identification of all of the test instruments used to measure the test results shown on the sheet.

250 A set of instrument certification covering the range of instruments used to carry out the commissioning work shall also be included within the documentation.

Firestopping

251 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

252 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	**Brand Name**	**Manufacturer's Details**

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

WATER TREATMENT EQUIPMENT MAINTENANCE

© Rand Associates Consultancy Services Ltd

WATER TREATMENT EQUIPMENT MAINTENANCE

General Requirements

001 Water treatment equipment must be covered by a fully comprehensive type Contract.

002 Detailed below are the specific Requirements. The Contract must therefore comprise of the following elements:

- Routine Maintenance
- Responsive Maintenance
- Out of Hours Emergency Works

003 Refer to the Specification, schedule of Works and to manufacturer's requirements and recommendations for detailed guidance. Other guidance is available from the HSE, the BSI, WRAS and CIBSE.

004 Pay particular attention to:

- IET Wiring Regulations.
- Applicable Standard: Design, installation, testing and maintenance of services supplying water for domestic use within buildings and their cartilages.
- HSE L8 The Control of legionella bacteria in water systems.
- Water Supply (Water Fittings) Regulations 1999.
- WRAS Water Regulations Guide.
- CIBSE Guide B4 Water Service Systems

Asset Register

005 Ensure that all the asset registers supplied by the Client prior to the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

006 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each visit to undertake Routine Maintenance, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

007 Ensure that, following all visits to undertake Routine Maintenance, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

007 Provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff including his Specialist Subcontractors.

Manufacturer's Requirements

009 Where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

010 Submit and agree, within 20 working days of the award of the Contract, a full annual Programme for all Works covering each element of the Routine Maintenance works with the Client's Representative.

011 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

© Rand Associates Consultancy Services Ltd

Permit to Work Certification

012 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

Access

013 Ensure that risk assessments are undertaken and a method statement provided for the means of access to allow for inspection and testing.

014 Ensure that all Works shall be carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

015 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

Minor Repairs

016 Carry out, during testing, minor repairs such as tightening joints, replacement of clips, etc to achieve a pass status and make appliances safe to ensure compliance with BSEN62305.

Routine Maintenance

017 The minimum requirements for Routine Maintenance are to be in accordance with the relevant equipment manufacturer's recommendations.

018 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

019 Carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

020 Include for the provision and application of all consumables within the Rates for this element of the Contract.

021 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the latest British Standards or equivalent.

022 Inspection and testing of water treatment equipment and systems must unless otherwise Instructed by the Client's Representative be carried out in accordance with the requirements tabled below;

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
Manufacturer's Requirements and Recommendations				
1.	Maintenance Instructions		The Provider shall note that this Specification represents a minimum standard. It is generic and not specific to a particular manufacturer or item of equipment. It is recognised that water treatment plant and equipment is of a specialist nature, designed for a particular application and installation. In all instances, the manufacturer's requirements and recommendations, shall be complied with and shall take preference where they exceed the requirements of this specification.	
Documentation and Log book				
2.	Log Book	Annually	Examine the log book. Ensure that it contains commissioning data, information and instructions.	Report, as a defect requiring attention, the absence of any such item within the log book.
3.	Notices	Annually	Ensure notices are present, in good condition and clearly displayed.	Provide new notices as necessary.
4.	Operating Instructions	Annually	Ensure that the operator has and understands the manufacturer's operating instructions.	Provide laminated A4 copies of instructions where missing.
Pipework				
5.	General	6 Monthly	Examine for corrosion. Examine joints for leakage.	
6.	Flexible Pipework	6 Monthly	Examine flexible pipework. Examine for brittle materials and fraying braid. Examine connections for leakage.	

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
7.	Expansion Joints	6 Monthly	Examine expansion joints, clean and repack as necessary. Examine fixings at anchor points. Examine alignment.	
8.	Hangers and Supports	6 Monthly	Examine hangers, supports and fixings. Tighten and adjust as necessary.	
9.	Insulation	6 Monthly	Examine thermal insulation.	
10.	Valves	6 Monthly	Test valves for free travel. Examine for leakage. Test isolating valves. Test motorised valves and solenoids.	
11.	Blow Down Valves	6 Monthly	Test operation of blow down valves.	
12.	General	6 Monthly	Clean and examine. Examine anti-vibration mountings and fixings. Adjust as necessary. Examine associated valves and pipework. Examine for leakage.	
13.	Circulating Pumps	6 Monthly	Examine pulleys and keys. Examine drives for alignment, adjust as necessary.	
14.	Dosing Pumps	6 Monthly	Examine dosing and metering pumps. Check calibration and performance against design parameters and manufacturer's data.	
Gauges and Meters				
15.	Pressure Gauges, Thermometers etc.	6 Monthly	Clean and examine. Test against known standard, recalibrate as necessary.	

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
16.	Manometers		Examine general condition. Examine fluid in manometers. Replace as necessary. Test against known standard, recalibrate as necessary.	
Tanks, Bunds and Chemical Stores				
17.	General	6 Monthly	Clean and examine. Examine for leakage. Examine general security arrangements.	
18.	Tanks	6 Monthly	Examine general condition. Examine for corrosion or deterioration. Examine protective coatings and linings. Examine elevators, mixing devices and agitators.	
19.	Bunds	6 Monthly	Examine general condition of bunds. Consider size and suitability for application. Clean bunds of all foreign material.	
20.	Stores	6 Monthly	Examine security. Examine access and suitability. Examine ventilation.	
Filters				
21.	General	6 Monthly	Examine internally and externally for general mechanical condition, corrosion and deterioration of protective linings and coatings.	
22.	Strainers	6 Monthly	Clean and examine strainers. Replace gauze as necessary.	
23.	Sand Filters	6 Monthly	Back wash filters. Check filter bed. Measure and record pressure across filter.	

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
24.	Activated Carbon Filters	6 Monthly	Measure and record pressure across filter. Replace carbon filters as necessary.	See manufacturer's requirements.
25.	Cartridge Filters	6 Monthly	Measure and record pressure across filter. Replace cartridge filters as necessary.	See manufacturer's requirements.
26.	Reverse Osmosis Plant	6 Monthly	Measure and record pressure across plant. Replace membranes as necessary.	See manufacturer's requirements.
Controls				
27.	Control Panels	6 Monthly	Clean interior and exterior of control panels. Ensure identification labels are correct, legible and in position. Examine and test indicator lamps, renew as necessary. Clean and test selector switches. Examine condition of panel wiring. Ensure that wiring terminal connections are sound. Examine earthing arrangements and test continuity. Examine fuse holders, ensure that correct fuses are fitted. Examine relays, clean and adjust as necessary. Examine contactors and overload relays, clean and adjust as necessary. Ensure overloads are set for load conditions. Examine isolator and interlock. Examine protective guards. Examine circuit boards. Ensure they are securely located. Examine circuit boards for evidence of over heating or component failure.	

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
28.	Sensors and Detectors	6 Monthly	Examine condition. Examine fixings. Examine pockets, enclosures, etc. Examine terminal connections. Examine condition of wiring. Test output and compare to manufacturer's parameters. Recalibrate as necessary.	
Electrical Installation				
29.	Electrical Installation	6 Monthly	Examine local isolators and connections to the fixed wiring installation. Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Test insulation resistance. Examine earthing arrangements and test continuity.	
30.	Electrical Installation – Fixed Wiring	Annually	Carry out a periodic inspection with associated circuit tests in accordance with the requirements of the specification and British Standard: Requirements for Electrical Installation.	
Water Softening Equipment				
31.	Cation Exchange Systems	6 Monthly	Clean and examine equipment. Test for leakage. Undertaken regeneration cycle, measuring key parameters pre and post regeneration cycle. Renew resins and regenerative materials as necessary. Measure hardness of water at point of delivery and after softener. Compare to design parameters and commissioning data.	See manufacturer's requirements.

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
Disinfection Equipment				
32.	Chlorination Equipment	6 Monthly	Examine sodium hypochlorite or calcium hypochlorite tanks, mixing systems, pipe, injectors, etc. for leaks, corrosion and/or deterioration. Test concentration levels. Adjust as necessary.	See manufacturer's requirements.
33.	Chlorine Dioxide Systems	6 Monthly	Clean and examine equipment. Test for leakage. Examine generators and injectors. Test concentration levels. Adjust as necessary.	See manufacturer's requirements. Compare to design parameters and recommendations in HSE document L8.
34.	Ionisation Systems	6 Monthly	Clean and examine equipment. Test for leakage. Examine electrodes. Replace as necessary. Test concentration levels. Adjust as necessary.	See manufacturer's requirements. Compare to design parameters and recommendations in HSE document L8.
35.	Ozone Systems	6 Monthly	Clean and examine equipment. Test for leakage. Examine generators and injectors. Test concentration levels. Adjust as necessary.	See manufacturer's requirements. Compare to design parameters and recommendations in HSE document L8.
36.	UV Systems	6 Monthly	Clean and examine equipment. Test operation of UV lamps. Replace as necessary.	
Gas Bottles and Injection Systems				
37.	Gas Bottles	6 Monthly	Examine gas bottle carriers. Examine framework and support chains. Examine gauges. Ensure gas bottles are securely fixed.	

© Rand Associates Consultancy Services Ltd

Item No.	Item	Frequency	Action	Notes
38.	Regulators and Reduction Valves	6 Monthly	Check pressure regulators and sensors. Examine gauges. Examine manifold tailpipes for cracks, chaffing, damage to threads and test for leaks. Test safety valves. Test joints, connections, glands and seals for leaks. Pressure test manifolds.	
39.	Pipework and Injectors	6 Monthly	Examine pipework, hangers and supports. Examine for corrosion. Pressure test pipework. Clean and examine injectors.	

023 Accept responsibility to observe the on-going condition of the systems and installations with regard to safe and correct operation. The Provider must bring to the attention of the Client's Representative any specific areas where periodic checking, lubrication and adjustment exceeds normal provisions for the age and type of systems installed.

Responsive Maintenance and Out of Hours Emergency Works

024 Attend to all call outs due to malfunction or breakdown.

025 Include for a call-out service to provide Responsive Maintenance and an Out of Hours Emergency Works Service. The Out of Hours Emergency Works service is deemed to extend the provision of Emergency Works to a 24 hour, 7 days a week, 365 (366 for a leap year) days per year basis.

026 Call outs for Responsive Maintenance and/or Out of Hours Emergency Works which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

027 Where Out of Hours Emergency Works are attended to for authorised cases of breakdowns, mis-use or vandalism, the Provider will be paid in accordance with the Rates detailed in the Price Framework.

Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works

Repairs, Replacements and Adjustments

028 Accept responsibility for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

029 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

030 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

© Rand Associates Consultancy Services Ltd

031 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

Firestopping

032 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works is carried out.

Client's current manufacturers/suppliers/products

033 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd

WORKSHOP MACHINERY TESTING AND MAINTENANCE

© Rand Associates Consultancy Services Ltd

WORKSHOP MACHINERY TESTING AND MAINTENANCE

General Requirements

001 Workshop machinery must be covered by a fully comprehensive type Contract.

002 Detailed below are the specific Requirements. The Contract must therefore comprise of the following elements:

- Routine Maintenance
- Responsive Maintenance
- Out of Hours Emergency Works

003 Ensure that he undertakes his maintenance, inspection and testing in cognisance of the Provision and Use of Work Equipment Regulations 1992 (PUWER) and the Control of Substances Hazardous to Health Regulations 2002 (COSHH).

004 Pay particular attention to the HSE's 'wis' series of leaflets and especially:
- Woodworking sheet 37: PUWER 98: Selection of tooling for use with hand-fed woodworking machines.
- Woodworking sheet 38: PUWER98: Retrofitting of braking to woodworking machines.

005 The maintenance, inspection and testing of local exhaust ventilation is included in the Ventilation Systems Specification. However, the Provider shall undertake his Works in cognisance of the COSHH regulations and the HSE's guidance concerning chip, dust and fume control. Any obvious deficiencies shall be reported to the Client's Representative.

Asset Register

006 Ensure that all the asset registers supplied by the Client prior to the Commencement Date are verified during the first month of the Contract Period and any discrepancies made known, in writing, to the Client's Representative.

007 At the commencement of the Contract Period, a set of services drawings may be issued to the Provider who shall ensure that, during each visit to undertake Routine Maintenance, the respective drawing shall be marked up by the Provider to indicate the actual installed services. At the completion of each element the marked-up drawings shall be returned to the Client's Representative.

Maintenance Reports

008 Ensure that, following all visits to undertake Routine Maintenance, conditional reports shall be submitted to the Client's Representative in electronic format, including all specialist reports and test equipment printouts.

009 Provide to the Client's Representative copies of the site risk assessment, method statement and COSHH assessments issued to the Provider's Staff including his Specialist Subcontractors.

Manufacturer's Requirements

010 Where manufacturer's instructions exceed the requirements of this Specification they shall be adhered to in their entirety.

Programming of Works

011 Submit and agree, within 20 working days of the award of the Contract, a full annual Programme for all Works covering each element of the Routine Maintenance Works with the Client's Representative.

012 Ensure that all the dates contained within the Programme have been agreed with the Client's Representative and that the equipment will be made accessible for service on the agreed dates.

© Rand Associates Consultancy Services Ltd

Permit to Work Certification

013 If it is deemed necessary by the Client's Representative for the need for a permit to be issued before any Work is undertaken on the system, the Provider shall ensure his compliance with the permit to work system as employed by the Client.

Access

014 Ensure that a risk assessment is undertaken and a method statement provided for the means of access to allow for inspection and testing.

015 Ensure that all Works are carried out in strict accordance with the requirements of "The Work at Height Regulations 2005".

016 Ensure that all Staff employed upon this Contract are suitably trained and experienced and competent to work at height.

Minor Repairs

017 Carry out, during testing, minor repairs such as tightening joints, replacement of clips, etc to achieve a pass status and make appliances safe to ensure compliance with the applicable Standard.

Routine Maintenance

018 The minimum requirements for Routine Maintenance are to be in accordance with the relevant equipment manufacturer's recommendations.

019 These are minimum requirements and the maintenance plans and task sheets must take into account the individual particulars of the systems and installations concerned in terms of their condition, age and type.

020 Carry out all necessary visits per annum for Routine Maintenance on all systems and installations.

021 Include for the provision and application of all consumables within the Rates for this element of the Contract.

022 All Servicing and Maintenance necessary to ensure that the operation of the systems and installations are in strict conformity with the latest applicable Standards or equivalent.

023 Inspection and testing of workshop machine must unless otherwise instructed by the Client's Representative be carried out in accordance with the requirements tabled below:

General Note

024 Operational maintenance items such as blade replacement, sharpening, functional adjustments etc., have not been included as part of this Specification. The manufacturer's instructions, recommendations and requirements shall be observed in every respect.

Local Exhaust Ventilation

025 Many items of workshop equipment require the use of local exhaust ventilation (LEV) systems to ensure the safety of operators and other persons. Maintenance, inspection and testing of LEV's is specified in the appropriate module of the specification.

026 Reference should be made to the specification for guidance. Absence of appropriate LEV's should be reported as an urgent matter.

© Rand Associates Consultancy Services Ltd

Workshop Electrical Installation

027 This Specification does not include periodic inspection and testing of the fixed electrical installation. Reference should be made to the appropriate module of the standard maintenance specifications.

028 Nevertheless, as a part of their maintenance, inspection and testing of workshop equipment, Providers shall examine emergency isolation methods and test the operation of key locks, emergency stop, contactors and isolators.

029 Report inappropriate or inadequate lighting.

Workshop Machinery

Item No	Item	Frequency	Action	Notes
1	**Floor and Bench Mounted Pillar Drills**			
1.1	General		Examine bed plate mountings, secure as necessary. Examine tables. Examine safety guards, ensure they are appropriate, in position and securely fixed. Examine drive belts, tension as necessary. Examine and test mechanical condition of plant and equipment. Lubricate in strict accordance with manufacturer's recommendations.	
1.2	Motors and Gearboxes		Clean as necessary, remove surplus oil and grease. Examine securing bolts and anti-vibration mountings, secure as necessary. Examine pulleys and keys. Examine alignment between motor and load. Test bearings for play.	
1.3	Electrical Installation		Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Test insulation resistance. Examine control equipment, starters and isolating switches, clean and test pilot lights. Examine and test coolant pump systems. Examine and test task lighting.	

© Rand Associates Consultancy Services Ltd

Workshop Machinery (cont'd)

Item No	Item	Frequency	Action	Notes
2	**Lathes, Milling Machines, Shapers, Surface Grinders**			
2.1	General		Examine bed plate mountings, secure as necessary. Examine tables. Examine safety guards, ensure they are appropriate, in position and securely fixed. Examine drive belts, tension as necessary. Examine and test mechanical condition of plant and equipment. Lubricate in strict accordance with manufacturer's recommendations.	
2.2	Motors and Gearboxes		Clean as necessary, remove surplus oil and grease. Examine securing bolts and anti-vibration mountings, secure as necessary. Examine pulleys and keys. Examine alignment between motor and load. Test bearings for play.	
2.3	Electrical Installation		Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Test insulation resistance. Examine control equipment, starters and isolating switches, clean and test pilot lights. Examine and test coolant pump systems. Examine and test task lighting.	
3	**Bench Grinders and Polishers**			
3.1	General		Examine bed plate mountings, secure as necessary. Examine safety guards, ensure they are appropriate, in position and securely fixed. Examine and test mechanical condition of plant and equipment. Lubricate in strict accordance with manufacturer's recommendations.	

© Rand Associates Consultancy Services Ltd

Workshop Machinery (cont'd)

Item No	Item	Frequency	Action	Notes
3.2	Motors and Gearboxes		Clean as necessary, remove surplus oil and grease. Examine securing bolts and anti-vibration mountings, secure as necessary. Examine pulleys and keys. Examine alignment between motor and load. Test bearings for play.	
3.3	Electrical Installation		Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Test insulation resistance. Examine control equipment, starters and isolating switches, clean and test pilot lights. Examine and test coolant pump systems. Examine and test task lighting.	
4	**Oxygen and Acetylene Welding Systems**			
4.1	General		Ensure that all maintenance works are carried out in strict accordance with manufacturer's requirements and recommendations. Examine position, suitability and structure of storage kiosks. Examine security of access doors. Ensure warning notices are intact and correctly displayed.	
4.2	Gas Bottles		Examine gas bottle carriers. Examine framework and support chains. Examine gauges. Ensure gas bottles are securely fixed.	
4.3	Regulators and Reduction Valves		Check pressure regulators and senses. Examine gauges. Examine manifold tailpipes for cracks, chaffing, damage to threads and test for leaks Test safety valves. Test joints, connections, glands and seals for leaks. Pressure test manifolds (Oxygen manifolds @ 160bar for 15mins; Acetylene manifolds @ 26bar for 15mins). Test alarm systems.	

© Rand Associates Consultancy Services Ltd

Workshop Machinery (cont'd)

Item No	Item	Frequency	Action	Notes
4.4	Equipment		Examine hoses. Examine sealing washers, renew as necessary. Test shut off valves.	
4.5	Blowpipes		Examine and clean cutters/burners, replace jets as necessary. Examine for leaks. Test operation.	
4.6	Flashback Arresters		Examine all flashback arrestors, ensure suitability. Examine sealing washers, renew as necessary. Test for leaks.	
4.7	Pipework		Examine pipework, hangers and supports. Examine for corrosion. Pressure test pipework (Oxygen pipelines @ 10bar for 30mins; Acetylene @ 2bar for 30mins). Ensure there is **no copper** on acetylene.	
4.8	Flexible Hoses		Examine condition of hoses. Pressure test hoses and connections. The test should be carried out at 1.5 times the working pressure.	
5	**MIG, TIG and Electric Arc Welders**			
5.1	General		Ensure that all maintenance works are carried out in strict accordance with manufacturer's requirements and recommendations. Examine equipment casing. Examine wheels and carriers. Examine spool and wire drives.	
5.2	Gas Bottles		Examine gas bottle carriers. Examine framework and support chains. Examine gauges. Ensure gas bottles are securely fixed.	

© Rand Associates Consultancy Services Ltd

Workshop Machinery (cont'd)

Item No	Item	Frequency	Action	Notes
5.3	Regulators and Reduction Valves		Check pressure regulators and senses. Examine gauges. Examine manifold tailpipes for cracks, chaffing, damage to threads and test for leaks. Test safety valves. Test joints, connections, glands and seals for leaks.	
5.4	Equipment		Examine welding cables and hoses. Examine sealing washers, renew as necessary. Test shut off valves. Examine earthing clamps.	
5.5	Blowpipes		Examine and clean cutters/burners, replace jets as necessary. Examine for leaks. Test operation.	
5.6	Electrical Cables and Flexible Leads		Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Test insulation resistance. Examine control equipment, starters and isolating switches, clean and test pilot lights.	
6	**Presses, Rolls, Mechanical Hacksaw, Cut off Saws, Mechanical Hammers**			
6.1	General		Examine bed plate mountings, secure as necessary. Examine safety guards, ensure they are appropriate, in position and securely fixed. Examine drive belts, tension as necessary. Examine and test mechanical condition of plant and equipment. Lubricate in strict accordance with manufacturer's recommendations.	

© Rand Associates Consultancy Services Ltd

Workshop Machinery (cont'd)

Item No	Item	Frequency	Action	Notes
6.2	Motors and Gearboxes		Clean as necessary, remove surplus oil and grease. Examine securing bolts and anti-vibration mountings, secure as necessary. Examine pulleys and keys. Examine alignment between motor and load. Test bearings for play.	
6.3	Electrical Installation		Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Test insulation resistance. Examine control equipment, starters and isolating switches, clean and test pilot lights.	
7	**Degreasing Baths and Parts Washers**			
7.1	General		Examine mountings and fixings, secure as necessary. Examine and test mechanical condition of plant and equipment. Examine fusible links. Examine shelves and brackets.	
7.2	Motors and Pumps		Clean as necessary. Clean or replace filters. Examine securing bolts and anti-vibration mountings, secure as necessary. Test pump operation.	
7.3	Electrical Installation		Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Test insulation resistance. Examine control equipment, starters and isolating switches, clean and test pilot lights.	
8	**CNC and CAD CAM Machinery**			
8.1	General		All maintenance, inspection and testing shall be carried out by a suitably qualified competent and experienced contractor in strict accordance with the manufacturer's requirements and recommendations.	

© Rand Associates Consultancy Services Ltd

Workshop Machinery (cont'd)

Item No	Item	Frequency	Action	Notes
9	**Brazing Hearths, Furnaces, Chip Forges, Smelters etc.**			
9.1	General		Examine mountings and fixings, secure as necessary. Examine and test mechanical condition of plant and equipment. Examine refractory brickwork and insulation.	
9.2	Motors and Fans		Clean as necessary. Clean grilles and filters. Examine securing bolts and anti-vibration mountings, secure as necessary. Test fan operation.	
9.3	Electrical Installation		Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Test insulation resistance. Examine control equipment, starters and isolating switches, clean and test pilot lights.	
9.4	Gas Supply Pipework	Annually	Test gas pressure. Examine isolation valves. Test operation. Examine pipe hangers and brackets. Examine for leaks. Examine for corrosion. Carry out soundness test. Examine ventilation – ensure grilles are clear of obstruction.	
10	**Mortising Machines**			
10.1	General		Examine bed plate mountings, secure as necessary. Examine tables. Examine safety guards, ensure they are appropriate, in position and securely fixed. Examine drive belts, tension as necessary. Examine and test mechanical condition of plant and equipment. Lubricate in strict accordance with manufacturer's recommendations.	

© Rand Associates Consultancy Services Ltd

Workshop Machinery (cont'd)

Item No	Item	Frequency	Action	Notes
10.2	Motors and Gear Boxes		Clean as necessary, remove surplus oil and grease. Examine securing bolts and anti-vibration mountings, secure as necessary. Examine pulleys and keys. Examine alignment between motor and load. Test bearings for play.	
10.3	Electrical Installation		Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Test insulation resistance. Examine control equipment, starters and isolating switches, clean and test pilot lights.	
11	**Woodworking Lathes**			
11.1	General		Examine bed plate mountings, secure as necessary. Examine safety guards, ensure they are appropriate, in position and securely fixed. Examine drive belts, tension as necessary. Examine and test mechanical condition of plant and equipment. Lubricate in strict accordance with manufacturer's recommendations.	
11.2	Motors and Gear Boxes		Clean as necessary, remove surplus oil and grease. Examine securing bolts and anti-vibration mountings, secure as necessary. Examine pulleys and keys. Examine alignment between motor and load. Test bearings for play.	
11.3	Electrical Installation		Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Test insulation resistance. Examine control equipment, starters and isolating switches, clean and test pilot lights.	

© Rand Associates Consultancy Services Ltd

Workshop Machinery (cont'd)

Item No	Item	Frequency	Action	Notes
12	**Circular Saws and Bench Saws**			
12.1	General		Examine bed plate mountings, secure as necessary. Examine tables. Examine safety guards, ensure they are appropriate, in position and securely fixed. Examine riving knives. Examine fences. Examine drive belts, tension as necessary. Examine and test mechanical condition of plant and equipment. Lubricate in strict accordance with manufacturer's recommendations.	
12.2	Motors and Gear Boxes		Clean as necessary, remove surplus oil and grease. Examine securing bolts and anti-vibration mountings, secure as necessary. Examine pulleys and keys. Examine alignment between motor and load. Test bearings for play. Examine rise/fall mechanisms.	
12.3	Electrical Installation		Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Test insulation resistance. Examine control equipment, starters and isolating switches, clean and test pilot lights.	
13	**Planing and Thicknessing Machines**			
13.1	General		Examine bed plate mountings, secure as necessary. Examine safety guards, ensure they are appropriate, in position and securely fixed. Examine anti-kickback devices. Examine drive rollers. Examine drive belts, tension as necessary. Examine and test mechanical condition of plant and equipment. Lubricate in strict accordance with manufacturer's recommendations.	

© Rand Associates Consultancy Services Ltd

Workshop Machinery (cont'd)

Item No	Item	Frequency	Action	Notes
13.2	Motors and Gear Boxes		Clean as necessary, remove surplus oil and grease. Examine securing bolts and anti-vibration mountings, secure as necessary. Examine pulleys and keys. Examine alignment between motor and load. Test bearings for play. Examine rise/fall mechanisms. Test electric braking.	
13.3	Electrical Installation		Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Test insulation resistance. Examine control equipment, starters and isolating switches, clean and test pilot lights.	
14	**Band Saws, Chop Saws and Scroll Saws**			
14.1	General		Examine bed plate mountings, secure as necessary. Examine safety guards, ensure they are appropriate, in position and securely fixed. Examine riving knives. Examine anti-kickback devices. Examine drive belts, tension as necessary. Examine and test mechanical condition of plant and equipment. Examine and adjust blade tensioners. Examine tracking, trust wheels and guides. Lubricate in strict accordance with manufacturer's recommendations.	
14.2	Motors and Gear Boxes		Clean as necessary, remove surplus oil and grease. Examine securing bolts and anti-vibration mountings, secure as necessary. Examine pulleys and keys. Examine alignment between motor and load. Test bearings for play. Test electric braking.	

© Rand Associates Consultancy Services Ltd

Workshop Machinery (cont'd)

Item No	Item	Frequency	Action	Notes
14.3	Electrical Installation		Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Test insulation resistance. Examine control equipment, starters and isolating switches, clean and test pilot lights.	
15	**Radial Arm Saws**			
15.1	General		Examine bed plate mountings, secure as necessary. Examine safety guards, ensure they are appropriate, in position and securely fixed. Examine tables, beds and fences. Examine riving knives. Examine anti-kickback devices. Examine and test mechanical condition of plant and equipment. Examine slides, runways, pivots and bearings. Clean and adjust as necessary. Lubricate in strict accordance with manufacturer's recommendations.	
15.2	Motors and Gear Boxes		Clean as necessary, remove surplus oil and grease. Examine securing bolts and anti-vibration mountings, secure as necessary. Examine pulleys and keys. Examine alignment between motor and load. Test bearings for play. Examine rise/fall mechanisms.	
15.3	Electrical Installation		Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Test insulation resistance. Examine control equipment, starters and isolating switches, clean and test pilot lights.	

© Rand Associates Consultancy Services Ltd

Workshop Machinery (cont'd)

Item No	Item	Frequency	Action	Notes
16	**Tennoners and Spindle Moulders**			
16.1	General		Examine bed plate mountings, secure as necessary. Examine safety guards, ensure they are appropriate, in position and securely fixed. Examine tables, beds and fences. Examine drive belts, tension as necessary. Examine and test mechanical condition of plant and equipment. Examine slides, runways, pivots and bearings. Clean and adjust as necessary. Lubricate in strict accordance with manufacturer's recommendations.	
16.2	Motors and Gear Boxes		Clean as necessary, remove surplus oil and grease. Examine securing bolts and anti-vibration mountings, secure as necessary. Examine pulleys and keys. Examine alignment between motor and load. Test bearings for play. Examine rise/fall mechanisms. Test electric braking.	
16.3	Electrical Installation		Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Test insulation resistance. Examine control equipment, starters and isolating switches, clean and test pilot lights.	

© Rand Associates Consultancy Services Ltd

Workshop Machinery (cont'd)

Item No	Item	Frequency	Action	Notes
17	**Linishers, Drum, Disc, and Belt Sanders**			
17.1	General		Examine bed plate mountings, secure as necessary. Examine safety guards, ensure they are appropriate, in position and securely fixed. Examine tables, beds and fences. Examine drive belts, tension as necessary. Examine and test mechanical condition of plant and equipment. Examine slides, runways, pivots and bearings. Clean and adjust as necessary. Lubricate in strict accordance with manufacturer's recommendations.	Note interlock to dust collection systems.
17.2	Motors and Gear Boxes		Clean as necessary, remove surplus oil and grease. Examine securing bolts and anti-vibration mountings, secure as necessary. Examine pulleys and keys. Examine alignment between motor and load. Test bearings for play. Examine rise/fall mechanisms.	
17.3	Electrical Installation		Examine flexible cables for wear, fraying braid and brittle insulation. Examine connections. Test insulation resistance. Examine control equipment, starters and isolating switches, clean and test pilot lights.	

030 It is the Provider's responsibility to observe the on-going condition of the systems and installations with regard to safe and correct operation. The Provider must bring to the attention of the Client's Representative any specific areas where periodic checking, lubrication and adjustment exceeds normal provisions for the age and type of systems installed.

Responsive Maintenance and Out of Hours Emergency Works

031 Attend to all call outs due to malfunction or breakdown.

032 Include for a call-out service to provide Responsive Maintenance and an Out of Hours Emergency Works Service. The Out of Hours Emergency Works service is deemed to extend the provision of Emergency Works to a 24 hour, 7 days a week, 365 (366 for a leap year) days per year basis.

© Rand Associates Consultancy Services Ltd

033 Call outs for Responsive Maintenance and/or Out of Hours Emergency Works which, in the opinion of the Provider, are due to mis-use or vandalism must be brought to the immediate attention of the Client's Representative and a report issued.

034 Where Out of Hours Emergency Works are attended to for authorised cases of breakdowns, mis-use or vandalism, the Provider will be paid in accordance with the Rates detailed in the Price Framework.

Routine Maintenance, Responsive Maintenance and Out of Hours Emergency Works

Repairs, Replacements and Adjustments

035 Accept responsibility for the replacing, repair and adjustment of any part of the systems and installations should it fail. Any replacements or repairs must be of a standard equal to the original installation.

036 During the course of any Servicing and Maintenance visits, the Provider must identify the need to replace and/or repair any item of Materials. Where replacement Materials are required the ordering of such Materials and implementation of the necessary Works must be planned so as to suit the requirements of the Property.

037 Works may be implemented during the Provider's normal working hours provided that the Client's Representative is given 7 days' notice. In the case of Emergency Works the timing of the Works must be agreed with the Client's Representative.

038 Where repairs, replacements and adjustments are required that are not covered by the terms of this Contract, separate Instructions must be issued. The basis of costing must be in accordance with the Rates detailed in the Price Framework.

Firestopping

039 All holes in floors, walls and ceilings are to be fire-stopped in accordance with the Regulations current at the time the Works are undertaken.

Client's current manufacturers/suppliers/products

040 Ensure all Materials are compatible with and standardised to the Client's current products specified in the table below (listed by manufacturers, suppliers and/or brand names).

Product	Brand Name	Manufacturer's Details

[complete table as appropriate]

© Rand Associates Consultancy Services Ltd