M3NHF Schedule of Rates

VERSION 8.1

ExtraCare Maintenance Works Technical Specification

Document 3A – HARD FACILITIES MANAGEMENT WORKS

Your challenges expertly solved in partnership

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SPECIFICATION OF WORKMANSHIP AND MATERIALS

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ECCT – TECHNICAL SPECIFICATION BASED ON M3NHF SCHEDULE OF RATES – PLANNED MAINTENANCE & PROPERTY REINVESTMENT WORKS – SPECIFICATION – VERSION 8.1

CONTENTS

SPECIFICATION OF WORKMANSHIP AND MATERIALS 1
GENERAL 1
EXCAVATION AND EARTHWORK 7
DEMOLITION 14
ASBESTOS WORKS 21
EXTERNAL WORKS 45
FENCING AND GATES 55
DRAINAGE 73
CONCRETE WORK 83
BRICKWORK AND BLOCKWORK 100
ROOFING 116
SCAFFOLDING AND MEANS OF ACCESS 132
CARPENTRY AND JOINERY 136
REPLACEMENT EXTERNAL, COMMUNAL AND FIRE DOORS 161
REPLACEMENT WINDOWS 213
METALWORK 245
PLASTERWORK AND OTHER FLOOR, WALL AND CEILING FINISHES 250
EXTERNAL AND INTERNAL RETROFIT INSULATION LINING SYSTEMS 260
PAINTING AND DECORATING 277
GLAZING 297
PLUMBING 305
ELECTRICAL WORKS 316
SMOKE, HEAT AND CARBON MONOXIDE DETECTORS 330
INJECTED DAMP PROOF COURSES AND FUNGUS/BEETLE ERADICATION 336
PEST CONTROL 342
ENERGY PERFORMANCE CERTIFICATES 348
AIRTIGHTNESS 350

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GENERAL

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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 amounts, as adjusted by the Provider's tendered Rates where applicable, and the tendered Prices 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, the Price Framework and the Price Schedule.

004. Specifications across several 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 Parts of this Specification are to the applicable Paragraph and Part of this Specification. References to a Paragraph "above" or "below" is a reference to the applicable Paragraph in the same Part of this Specification as that from which the cross reference is made. If any contradiction appears within or between the Specification Parts, Schedules of Rates and / or 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 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 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 Designs 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 Work to the same lines and levels unless otherwise Instructed by the Client's Representative.

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. Where the applicable Standard or equivalent is a British Standard compliance may be satisfied by compliance with any equivalent standard as long as the Provider has satisfied the Client's Representative of the equivalence of the international standard to be Standard quoted.

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

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

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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 any Materials on the basis of compliance with any such approval or international Standard shall notify the Client's Representative of such substitution in advance of placing any order for those Materials and 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. 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.

018. Where this Specification refers to Materials being made of a particular substance, the Provider may, subject to the approval of the Client's Representative, use Materials made of an equivalent substance. Any equivalent Materials that comply with the functionality and compatibility (including aesthetic compatibility) requirements of this Specification may be proposed. The purpose of the Client's Representative's decision on the use and approval of such Materials is to ensure that they meet the Employer's requirements for functionality and compatibility. The decision of the Client's Representative on this is final (other than in cases of manifest error).

019. 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.

020. 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.

021. Sustainable Timber: All timber and wood derived products referred to throughout this document and which are supplied to the Client, or used in the Works, must be procured in accordance with all applicable Law.

022. 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.

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

024. 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.

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

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

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

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

029. At the Client's request provide all information the Client reasonably requests regarding the environmental impact of the supply and use of any Materials the Provider selects for use in the Works.

Temporary facilities

030. **[*optional Paragraph*]** If the Provider considers that decanting elderly, vulnerable, people with disabilities and other occupiers and carers from a Property whilst intrusive Works are undertaken or whilst the Works disrupt washing and/or sanitary facilities, provide (at no extra cost) the following facilities:

Decant Mobile - Daytime Decant

031. Daytime facilities (where agreed before the start of the Works in the form of either a touring caravan used outside homes between 9am and 5pm and then removed, or a mobile unit located in a fixed position supplied with at least the following:

- External door;
- Bedroom;
- A toilet compartment with WC suite, wash-handbasin and shower unit;
- A flued gas fire/electric heater (provide gas where practicable);
- A flued gas fire multi-point water heater or electric water heater;
- Electrical installation complying with the IET Wiring Regulations;
- Mattresses with fireproof removable covers (which shall be thoroughly cleaned and changed after each decant);
- A cooking appliance and fridge;
- Warning notice for health and safety advice to users;
- Fire blanket (to be located by the cooking appliance);
- 1kg-powder fire extinguisher (to be located by the main door);
- Smoke Detector;
- Carbon Monoxide Detector; and
- User's handbook (to be used by Provider when demonstrating the mobile to new occupants).

032. Also supply the following:

- A security cabinet for 2 (two) 13kg (thirteen kilogramme) bottles of propane gas if gas is to be used (red gas bottle);
- Entrance steps, handrails, level access ramp (maximum gradient 1:12) for people with a disability to the satisfaction of the Client's Representative;
- Water supply; and
- Mains sewerage connection (where feasible).

033. Daytime decanting must be as agreed with the Customer and the Client including as to the hours required for the daytime facility, its location and siting. The siting of decant facilities must not inconvenience car parking and/or access to adjoining dwellings.

034. Laundry and storage facilities, telephone connections [or] television aerials [or a dedicated car parking facility] are not required in a daytime facility [**Client to edit**].

035. A portable chemical toilet may be used where no sewer connection is feasible. The toilet must be serviced and emptied at least once a week.

036. Ensure that all Temporary Accommodation, including its location, installation and checking, complies with Health and Safety Law.

037. Comply with any Code of Practice for the transportation, siting and commissioning of caravans published by the National Caravan Council.

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038. Agree the location of the day-time mobile decant facility with the Client's Representative.

039. Service checks are to be carried out by suitably qualified personnel after each decant. These checks should cover:

- Electrical;
- Gas;
- Water;
- Fire prevention equipment;
- Warning Notices; and
- Steps and Handrails.

040. Clean the facility between each change of user.

041. Fix the following notice not less than 200mm x 130mm with the heading printed in red in a prominent position in the Temporary Mobile Accommodation.

ADVICE TO OCCUPIERS

Ventilation

Do not obstruct the ventilators, which are fitted; your safety depends on them.

In Case of Fire

Get everyone out.

Turn off the outside gas valve

Raise the alarm and call the Fire Brigade

Do not stay behind to put the fire out yourself

Do not put yourself at risk

Fire Precautions

Children - must not be left alone in the caravan.

When cooking never leave a cooker unattended

Do not use multi-adaptors.

If you smoke use metal or glass ashtrays-not plastic.

Make sure cigarettes are put out properly

Do not smoke in bed.

Means of Escape

Make sure you know the location and operation of the emergency windows and doors,

Keep door and window keys handy.

Keep all escape routes clear.

If there is smoke, keep low where the air is clearer

Do not go back into the caravan.

Combustible Materials

Keep them clear of all heating and cooking appliances.

Fire Fighting Equipment

In addition to the 1kg powder fire extinguisher by the main exit door, a fire blanket is provided next to the cooker. Make yourself familiar with the instructions on your fire extinguisher and fire blanket and the fire precautions arrangements on site. Do not stay behind to put the fire out yourself. Do not put yourself at risk.

The use of chip pans in mobiles is strictly prohibited.

Permit to Work Certification

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

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Access

043. 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 height including for inspection and testing.

Firestopping

044. 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.

045. 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.

Customer satisfaction

046. On completion of the Works, ask the Customer to complete an electronic Customer satisfaction survey as set out in the Preliminaries.

Health and Safety File

047. Where the Provider is principal designer under the CDM Regulations, prepare a health and safety file for the Works appropriate to the characteristics of the project in accordance with the CDM Regulations.

048. 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 addressed (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; 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).

049. There should be enough detail to allow the likely risks to be identified and addressed by those carrying out the Works. However, the level of detail should be proportionate to the risks.

050. 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.

051. Information must be in a convenient form, clear, concise and easily understandable.

052. Upload the Health and Safety File to the Client's IT system on completion of the Works.

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EXCAVATION AND EARTHWORK

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EXCAVATION AND EARTHWORK

Excavation

001. Leave excavations for the foundations of walls and similar structures exposed until they have been inspected and approved by Building Control. Do not fill in trenches or holds or cover up the concrete until dimensions have been taken by the Client's Representative.

002. Refill any excessive depth to the proper level with concrete (Gen1) as specified in the "Concrete Work" Part of this Specification. Excavate the formation level to such further depth as the Client's Representative Instructs where the bottom of any excavation is found to be soft or otherwise unsound. Fill any extra depth with concrete (for which additional payment is to be made).

003. Any rubble, salvageable building materials and antiquities from the excavations belong to the Client.

004. Check in advance the location of any pipes, cables or any other services when excavations are to be carried out.

Weed killer

005. Use an organic weed killer approved by the Client's Representative and applied in accordance with the manufacturer's technical data sheet. All products must be used and distributed by or under the direct supervision of a person holding an appropriate Certificate of Competence.

006. All material used, and all methods of application and tank mixes shall be in accordance with Health and Safety Law.

007. The application of weed-killer is to be confined to the areas designated on the Area Map appended to the Contract Details. The Client's Representative must be provided with written records showing dates of application, the location of the Works, the chemical and the rate of application.

008. The use of residual herbicides on hard surfaces is strictly prohibited.

Disposal of excavated material

009. Remove from site any surplus excavated material.

Filling

010. Use only clean subsoil free from vegetable soil, roots and rubbish for backfilling around foundations or to make up levels, lay in layers not exceeding 200mm thick and consolidate each layer as required.

Pumping and baling

011. Keep the bottom of excavations free from storm or percolating water by pumping or other means during and throughout the progress of the Works until their completion.

Supporting excavations

012. Support all excavations using earthwork supports to ensure the safety of Staff and the Works to the satisfaction of the Client's Representative.

Work in cold weather

013. Protect excavations against freezing. Do not use frozen materials for backfilling.

Hardcore

014. Use for hardcore only hard dry crushed brick or hard broken rubble stone, or limestone quarry waste, free from mud, dirt, clay, ashes, clinker, asbestos, timber or any other deleterious matter, broken to pass a 75mm diameter ring in all directions, well rolled and consolidated in 100mm layers.

015. Crushed rock under solid floor slabs, sub-bases and road bases shall be sound clean rock in accordance with the applicable Standard or equivalent and shall not be frost susceptible. Sample and test crushed rock in accordance with the applicable Standard or equivalent applicable before commencing the Works and provide evidence of the tests to the Client's Representative on request.

016. Crushed rock sub-bases material to roads and shared surfaces are to be graded in accordance with the following table:

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017.

100mm CRUSHED ROCK:RANGE OF GRADING FOR SUB-BASE MATERIAL	
BS Sieve Size	**Percentage by mass passing.**
125.00mm	100
100.00mm	90-100
90.00mm	82-100
37.50mm	25-52
28.00mm	10-30
14.00mm	0-10
6.30mm	0-6
3.35mm	0-2

018. Crushed rock road-base material to roads, shared surfaces, bases to footpaths/paved areas are to be graded in accordance with the following table:

65mm CRUSHED ROCK:RANGE OF GRADING FOR ROAD-BASE MATERIAL	
BS Sieve Size	**Percentage by mass passing.**
65.00mm	100
50.00mm	67-100
37.50mm	52-70
28.00mm	30-45
14.00mm	10-28
6.30mm	6-10
2.36mm	0-6
1.16mm	0-2

019. Crushed rock under solid floor slabs is to be graded as in the table in Paragraph 017 above, spread and levelled in layers not exceeding 150mm thick, with each layer thoroughly compacted with a vibrating roller, vibrator plate compactor, vibro tamper, power rammer or other approved means.

020. Crushed rock filling behind retaining walls is to be accordance with Paragraph 016 above, graded in accordance with the table below and thoroughly compacted to the satisfaction of the Client's Representative.

BS Sieve Size	**Percentage by mass passing.**
63.00mm	100
37.50mm	85-100
20.00mm	0-20
10.00mm	0-5

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021. Sub-base material is to be spread evenly on the blinded formation. Where the total depth of sub-base is less than 250mm, this shall be spread in one layer so when it is compacted the total depth shall be as required or specified within a =10mm to -30mm tolerance and compacted in accordance with the table in Paragraph 23 below.

022. Road base material is to be laid in layers, the minimum compacted depth of material in one layer shall be 110mm and the maximum compacted thickness in one layer shall be 225mm, compaction shall be in accordance with the table in Paragraph 23 below, the finished levels of the compacted road base material shall be within a +10mm to -15mm tolerance.

023. Base material to footpaths and paved areas shall be spread evenly and compacted with a roller of not less than 2.5 tonnes weight and blinded with just enough stone dust or fine granular material to give a close textured surface.

024. The compaction requirements for Granular sub-base and Road base material are as tabled below:

Type of compaction plant	**Category**	**Number of passes of compaction equipment for layers not exceeding the following compacted depths**			
		110mm	**150mm**	**225mm**	**250mm**
Smooth-wheeled roller (or vibratory roller operating without vibration)	Mass per metre width of roll: Over 2700kg up to 5400kg	16	N/A	N/A	N/A
	Over 5400kg	8	16	N/A	N/A
Pneumatic-tyred roller	Mass per wheel: Over 4000kg up to 6000kg	12	N/A	N/A	N/A
	Over 6000kg up to 8000kg	12	N/A	N/A	N/A
	Over 8000kg up to 12000kg	10	16	N/A	N/A
	Over 12000kg	8	12	N/A	N/A
Vibratory roller	Mass per metre width of vibrating roller: Over 700kg up to 1300kg	16	N/A	N/A	N/A
	Over 1300kg up to 1800kg	6	16	N/A	N/A
	Over 1800kg up to 2300kg	4	6	10	N/A
	Over 2300kg up to 2900kg	3	5	9	10
	Over 2900kg up to 3600kg	3	5	8	9
	Over 3600kg up to 4300kg	2	4	7	8
	Over 4300kg up to 5000kg	2	4	6	7
	Over 5000kg	2	3	5	6
Vibrating plate compactor	Mass per metre^2 of base plate; Over 1400kg/sqm up to 1800kg/sqm	8	N/A	N/A	N/A
	Over 1800kg/sqm up to 2100kg/sqm	5	8	N/A	N/A
	Over 2100kg/sqm	3	6	10	N/A

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Type of compaction plant	Category	Number of passes of compaction equipment for layers not exceeding the following compacted depths			
		110mm	150mm	225mm	250mm
Vibro-tamper	Mass: Over 50kg up to 65kg	4	8	N/A	N/A
	Over 65kg up to 75kg	3	6	10	N/A
	Over 75kg	2	4	8	N/A
Power rammer	Mass: 100kg up to 500kg	5	8	N/A	N/A
	Over 500kg	5	8	12	N/A

Blinding

025. Use for blinding only sand, fine gravel, pulverised fuel ash or other fine materials that are free from dust, spread in one layer, and compacted, well rolled and consolidated., Stone dust blinding to roads and sub-bases is to be compacted to the required thickness by 4 passes of a smooth wheeled roller weighing not less than 8 tonnes.

026. Do not use shale either as hardcore or blinding to hardcore.

027. Use sufficient blinding material to fill the surface to provide a close smooth surface for hardcore.

Topsoil Areas

028. Grade subsoil to landforms in appropriate weather conditions to avoid compaction and to suitable concave/convex profiles according to the Client's Representative's requirements. All landforms shall be suitable compacted.

029. Excavate locally as necessary, areas of thicker topsoil. Small planting beds located in general landscape areas may be excavated separately at a later date.

030. Grade subsoil to achieve the specified finished levels of topsoil especially at kerb edges.

031. Loosen subsoil up to a minimum depth of 150mm immediately prior to topsoil, obtain approval from the Client's Representative for the sub-base before any top-soiling begins on site.

032. Undisturbed topsoil which is to be landscaped is to be prepared as necessary for cultivation operations, in particular:

- Where the ground is hard, break up with a ripper;
- Where the ground is covered with turf or a thick sward, plough or dig over to the full depth of the topsoil; and
- Treat with a suitable herbicide to prevent seeding of weeds

Imported Topsoil

033. Topsoil is to comply with the applicable Standard or equivalent; general purpose grade, it must be free from aggressive weeds and hazardous foreign matter, with less than 10% volume of stones, maximum diameter 50mm, maximum organic content 35% by volume/minimum 10% and a pH range 5.0 to 8.2.

034. The areas to be top soiled shall be cultivated to break up any compaction before being covered by topsoil 400mm thick, provided and spread by the Provider. The quality and depth of topsoil must be approved by the Client's Representative before commencing planting operations.

035. Where the Client's Representative has deemed that the quality of imported topsoil does not meet the minimum grade specified undertake remedial treatment as required by the Client's Representative at the expense of the Provider. This may include improvement by the addition of organic matter, lime and fertiliser.

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036. If required by the Client's Representative either provide a declaration of analysis from the supplier detailing the classification of the topsoil or, have laboratory tests undertaken on samples of the topsoil and provide details to the Client's Representative.

037. Where requested by the Client's Representative have topsoil weighed at a public weighbridge before its delivery to site and produce official dockets to the Client's Representative.

038. Ensure compliance with any necessary Environment Agency declaration of compliance and provenance of all greenfield soil.

039. Do not use topsoil contaminated with sub-soil, rubbish, oil based products or other materials toxic to plant life. Dispose of contaminated topsoil in a manner approved by the Client's Representative.

Topsoil Cultivation

040. Eradicate all existing annual and perennial weeds prior to commencing any cultivations. Any compacted topsoil is to be broken up to its full depth. Cultivate by rotovating to a minimum depth of 150mm in order to produce a fine tilth, any undesirable material brought to the surface including all stones, clay balls over 25mm size, tufts of grass, rubbish and other foreign matter are to be removed from site.

041. Where topsoil is reasonably dry and workable, grade to smooth flowing contours, with falls for adequate drainage removing all hollows, ridges and sharp changes of levels.

042. Unless otherwise Instructed by the Client's Representative, ensure finished levels of topsoil after settlement are 30mm above adjoining paving kerbs, manholes and other horizontal surfaces.

043. Topsoil levels may be adjusted by blade grading ensuring that there is nowhere less than 100mm of topsoil. If the required levels cannot be achieved by the movement of existing soil, seek and comply with Instructions from the Client's Representative.

044. After grading and fertilising, carry out a further cultivation to reduce top 25mm to a fine tilth, apply a balanced fertiliser base dressing approved by the Client's Representative for grassing works to the area to be grassed at a rate of 30g/m^2 and lightly cultivated in.

045. Rake to a true lightly firmed surface, removing all stones and clay balls more than 25mm in any dimension on general areas.

046. Extend cultivations into any adjacent existing grass area to ensure full marrying of levels.

047. Obtain the Client's Representative's approval of the cultivation and seed bed preparation before sowing is carried out.

Finished Levels of Topsoil

048. Ensure that unless otherwise Instructed by the Client's Representative finished levels of topsoil after settlement:

- are 30mm above adjoining paving or kerbs;
- are not less than 150mm below damp proof course of adjoining buildings;
- are graded to give suitable surface drainage away from buildings and to avoid ponding;
- have any slight depressions are to be filled with topsoil and graded appropriately; and
- are married-in with adjoining soil areas.

Geotextile

049. Ensure all non-woven geotextile material manufactured from synthetic or other fibres:

- complies with the applicable Standard or equivalent;
- sustains a load of not less than 2.5KN/m at 5% axial strain determined in a wide strip tensile test;
- allows water to flow in either direction at a rate of not less than 10 litres/ m^2/s under a constant head of 100mm; and
- has a pore opening size distribution between 100*10-6m and 300*100-6m.

050. Lay geotextile material in accordance with the manufacturer's technical data sheet with a minimum lap of 500mm.

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051. The geotextile membrane will be part of the permanent Works to separate earthworks materials to form a permeable membrane. Provide evidence to the Client's Representative, before the geotextile is incorporated into any permanent Works that the geotextile will be sufficiently durable, when installed in contact with materials to be separated to maintain its integrity for at least 20 (twenty) years. Protect geotextile at all times from mechanical and chemical damage. Ensure that the temporary exposure of materials susceptible to light between manufacture and their incorporation into the permanent Works does not exceed 5 (five) hours.

Generally

052. Remove from the Property any imported filling Materials deemed unsuitable by the Client's Representative.

053. Keep excavations and areas to be filled free from soil and rubbish.

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DEMOLITION

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DEMOLITION

GENERAL

Generally

001. Execute all demolition Works and alterations in the most careful manner to avoid damage to the surrounding structures. Make good any damage caused.

002. Do not allow dangerous portions of any structure to remain standing during idle periods or overnight except where this is unavoidable. Where this is unavoidable, adequately strut and prop such portions to ensure their stability until Works recommence.

003. Load and remove from site all materials (including debris) arising from the demolition or alterations. Do not allow these materials to accumulate. Ensure the care and protection of any Materials to be re-used.

004. Bear the risk of any damage in removing, re-fixing and storing old Materials that are set aside for re-fixing. Replace any damaged or defective Materials or missing parts.

Survey

005. Before starting the Works, examine all available information, survey the structure(s), site and surrounding area. When requested by the Client's Representative provide a survey report with a method statement covering all relevant matters listed in the Health and Safety Executive (HSE) guidance in relation to development of safe working practices (www.hse.gov.uk) for further information and describing:

- the form, condition and details of the structure or structures, the site, and the surrounding area;
- the type, location and condition of features of historical, archaeological, geological or ecological importance;
- the type, location and condition of adjoining or surrounding premises that might be adversely affected by removal of the structure or structures, or by noise, vibration and/ or dust generated during deconstruction/ demolition;
- the identity and location of services above and below ground, including those required for the Provider's use, and the arrangements for their disconnection and removal;
- the form and location of flammable, toxic or hazardous materials, including lead-based paint, and proposed methods for their removal and disposal;
- the form and location of materials identified for reuse or recycling, and proposed methods for removal and temporary storage;
- the proposed programme for the Works, including sequence and methods of deconstruction/ demolition;
- details of any specific pre-weakening required;
- the arrangements for protection of Staff and the general public, including the exclusion of unauthorized persons;
- the arrangements for control of site transport and traffic; and
- any special requirements.

Benchmarks

006. Report to the Client's Representative any benchmarks or other survey information found on the structure(s) to be demolished. Do not remove or destroy unless so Instructed in writing.

Existing features and adjacent works to be retained

007. Keep in place and adequately protect from any damage all features and adjacent work/Properties that are to be retained. Protect any trees as required by the applicable Standard or equivalent.

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UTILITIES AFFECTED BY DEMOLITION

Regulations affecting utilities

008. Carry out any Works affecting new or existing services in accordance with all applicable Regulatory Requirements.

Location of services

009. Locate and mark the positions of services affected by the Works. Arrange with the appropriate Utilities for the location and marking of the positions of mains services.

Disconnection of services

010. Before starting demolition, arrange with the appropriate Utility Provider(s) for the disconnection of services and removal of fittings and equipment unless the drawings provided by the Client's Representative state otherwise.

Disconnection of drains

011. Locate and disconnect all disused drains connections. Seal within the site all the connections to existing sewers to the approval of the Utility Provider.

Drains in use

012. Protect drains, manholes, gullies, vent pipes and fittings still in use. Keep them free of debris at all times. Make good any damage arising from demolition. Leave them clean and in working order on completion of the demolition works.

Bypass connections

013. Provide bypass connections as necessary to maintain continuity of services to occupied areas of the Property and adjoining properties. Give a minimum of 72 hours' notice to Customers if shutdown is necessary during changeover.

Services which are to remain

014. Notify the Client's Representative, Utility Provider and Customer of any damage. Repair such damage to the satisfaction of the Client's Representative and Utility Provider.

WORKMANSHIP

Generally

015. Demolish structure(s) in accordance with the Health and Safety Executive (HSE) guidance notices and the applicable Standard or equivalent.

Equipment

016. Use suitable types and standards of cutting and demolition Equipment for the location and type of Works.

Gas or vapour risks

017. Take adequate precautions to prevent fire or explosion caused by gas or vapour.

Flammable liquids & gases

018. When removing tanks and pipes which may have contained flammable liquids or gases:

- inform the appropriate officer of the Statutory Authority and follow any advice given;
- display danger notices;
- prohibit smoking and the use of naked lights;
- use only non-ferrous tools and equipment, with an ample supply of water, to reduce the risk of sparking;
- empty tanks and dispose of their contents to ensure that none enters any drainage system or watercourse; and
- clean tanks and pipes and make them inert as described elsewhere in this Specification or as Instructed by the Client's Representative.

Dust

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019. Reduce dust by for example periodically spraying demolition Works with water (with suitable mitigation to prevent run off entering the drainage system). Use dust sheets and temporary screens.

Health hazards

020. Take adequate precautions to protect Staff and the public from health hazards associated with any dangerous fumes and dust arising during the Works including suitable consideration of/testing for lead contamination in existing painted surfaces.

021. Perform all Works in such a manner to ensure the safety of the Works and the public and so as to cause the minimum inconvenience to the public.

Adjoining properties

022. Leave adequate temporary support and protection for adjoining properties at each stage and arrange for inspection by the Client's Representative when demolishing structure(s).

023. Maintain and alter temporary supports and protection as necessary as the Works progress.

024. Demolish structure(s) causing a minimum of damage to adjoining properties. Leave no unnecessary or unstable projections.

025. Do not disturb any support to the foundations of any adjoining property unless otherwise Instructed.

026. Report to the Client's Representative any defects exposed or becoming apparent in any adjoining property.

027. Promptly repair any damage caused to any adjoining property by demolition work. Make good to ensure safety, stability, weather protection and security.

Structure(s) to be retained

028. Adequately protect all parts of existing structure(s) which are to be kept in place.

029. Cut away and strip out with care the minimum amount necessary so as to keep the amount of making good to a minimum.

030. Prevent debris from overloading any part of the structure which is not to be demolished.

Services which are to remain

031. Notify the Client's Representative and Utility Provider of any damage. Make arrangements for repair to the satisfaction of the Client's Representative and Utility Provider.

Partly demolished structure(s)

032. Leave partly demolished structure(s) in a stable condition, with adequate temporary support at each stage to prevent the risk of uncontrolled collapse.

033. Prevent debris from overloading scaffolding platforms.

034. Prevent access to partly demolished structure(s) by unauthorised persons.

035. Leave safe whilst not working at the Property.

Dangerous openings

036. Illuminate all openings as necessary, provide guarding and barriers at all times, including outside of normal working hours, and take all reasonable steps to prevent access by unauthorised persons.

Asbestos-based materials

037. Where asbestos-based materials are known to be present in the structure(s) to be demolished, ensure they are removed in accordance with the Client's Policy for asbestos removal, the Law and applicable Code of Practice where possible before any demolition works commence.

Unknown hazards

038. Inform the Client's Representative of any unrecorded voids, tanks, chemicals, etc. discovered during demolition works. Agree with the Client's Representative the methods for safe removal, filling, etc.

New openings

039. When forming new openings or altering existing openings:

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- cut away existing arches, lintels or sills;
- provide temporary strutting and supports and shoring;
- cut away for hoist and insert new lintels, including cutting and pinning ends;
- cut away for, and insert new sills, including cutting and pinning ends;
- make good floors up to levels for new thresholds, sills etc., including latex levelling screed;
- wedge and pin up to existing work and build up jambs as described;
- extend and make good finishings to match existing as necessary;
- remove all debris from the Property and site; and
- retain supports until the new Works have adequate strength to support the existing structure.

Taking down

040. When taking down:

- provide temporary support;
- remove all applied finishes;
- make good finishes and match to existing as necessary;
- make good floors up to levels with latex levelling screed; and
- remove all debris from the Property and site.

Building up existing openings

041. When building up existing openings:

- build up with Materials that match existing or as described for the full thickness of the wall;
- cut out existing thresholds, sills, arches, lintels, etc;
- hack off finishings from jambs or reveals before building up;
- prepare surfaces for raising, including lead core or similar damp proof course;
- cut toothing;
- wedge and pin up to existing work as required; and
- extend and make good finishings to match existing as necessary.

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Extending finishings

042. Match all extensions to finishings, plasterwork, ceilings, flooring etc., and any making good exactly to the existing finishings.

MATERIALS

Ownership

043. Components and materials arising from demolition (other than any found during excavations) belong to the Provider unless the Client's Representative has advised before their removal that they are to remain the property of the Client in order to be reused in the Works. Remove all materials other than those belonging to the Client from site as the Works proceed.

044. Maintain and protect all removed Materials that are to remain the property of the Client until they are removed by the Client or reused in the Works.

045. Where possible recycle or reuse materials elsewhere in the Works, other than brick, stone and concrete rubble or other hard material, arising from deconstruction and demolition Works. Such reuse or recycling is subject to compliance with the appropriate specification and in accordance with any Site Waste Management Plan (where required under this Contract). At least 5 (five) Business Days before such reuse, submit full details and supporting documentation to evidence compliance with this Specification to the Client's Representative for approval.

Hardcore

046. Reuse brick, stone and concrete rubble or other hard materials arising from demolition as hardcore, subject to compliance with this Specification.

Bricks

047. Use whole, sound bricks arising from the Works for replacing cracked or defective bricks or filling to existing openings.

Infected Timber

048. Inform the Client's Representative when infected timber is encountered. Remove timber infected by fungal/insect attack from the Property in a way which will minimise the risk of infecting other parts of the building. Destroy it as soon as possible.

WORKMANSHIP

Commencement condition survey

049. Before starting the Works:

- survey the existing state of the Property to be kept in place;
- record the magnitude and extent of all cracks, spalling, flaking and other irregularities of the fabric of the Property; and
- agree the commencement condition survey record with the Client's Representative.

Extent of support work

050. Where necessary, provide support systems to those elements of the Property which are to be retained.

051. Submit detailed proposals including drawings and calculations for all systems to the Client's Representative for approval, and resolve any amendments proposed. This includes structural engineering drawings and calculations for support systems.

052. Provide adequate and stable support systems and thereby maintain the integrity of supported structure for the period of erection to completion of dismantling support systems.

Workmanship

053. Carry out all work in accordance with the Order or any design brief issued with it.

054. Use Staff experienced in the methods of erecting and maintaining support systems to supervise and control the Works.

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Erecting support systems

055. Locate the positions of existing and new services which may be affected by support systems and provide any necessary temporary diversions.

056. Prevent excessive loadings from foundations of support systems being imposed onto foundations of structure to be kept in place.

057. Erect and connect support systems to structure to be kept in place. Take:

- all necessary precautions to prevent damage; and
- due account of movement of the structure which may occur before, during and after demolition.

058. Promptly repair any damage caused to adjoining properties by the erection or connection of support systems. Make good to ensure safety, stability, weather protection and security.

059. Report to the Client's Representative any damage caused to retained features or works by the erection or connection of support systems. Agree the methods of repair with the Client's Representative.

060. Check support systems at agreed stages during erection for compliance with design proposals.

Unknown hazards

061. Inform the Client's Representative of any unrecorded voids, flues, services, etc., discovered during the erection of support systems. Agree with the Client's Representative methods for infill, making good, relocation of support connections, etc.

Loading support systems

062. Complete the erection and connection of the support systems before starting the demolition of any adjoining structures.

063. Inform the Client's Representative when support systems are erected and all connections are made to the structure to be kept in place. Obtain any required permissions to load systems.

Maintaining support systems

064. Provide safe access and safe places of work in the support systems for inspection and maintenance.

065. Regularly inspect and maintain support systems, making good ties, wedges, connections, corrosion protection, etc., as necessary.

066. Adequately protect support systems from impact by vehicles, plant and site operations. Prevent access by unauthorised persons. Leave safe when not working at the Properties and outside the Provider's Working Hours.

Dismantling support systems

067. Inform the Client's Representative when all permanent connections between the supported structure and new construction have been made. Obtain permission before disconnecting and dismantling support systems.

Making good

068. Repair any connection holes made in the structure kept in place, using Materials to match those existing. Repair damage caused to buildings, roads or pavements.

Site clearance

069. Clear away all debris, excess materials and temporary Works and leave the Property and its site in a tidy condition on completion of the Works.

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ASBESTOS WORKS

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ASBESTOS WORKS

GENERAL

Generally

001. Removal of licensed asbestos can only be carried out by an Asbestos Licensed Contractor.

002. Employ the services of an Asbestos Licensed Contractor before undertaking any Asbestos Works. Undertake all works classed as Asbestos Works in accordance with the Law and the general procedures listed in this Specification.

Removal

003. Asbestos should be removed when deemed by the survey risk assessment to be:

- a high risk material i.e. insulation materials;
- in a damaged state;
- breaking away from the substrate base; or
- likely to be abraded or otherwise damaged.

004. As there is a possibility that non-asbestos materials may become contaminated from adjacent asbestos, give consideration to the removal or cleaning of adjoining materials and belongings.

Encasing

005. Encasing is constructing an airtight barrier around the asbestos and is suitable where the cost of removal would outweigh the benefit or risk posed.

006. An encasement can be constructed from wood, metal or sheetrock and all joints must be sealed completely and be airtight.

Encapsulation or sealing

007. Encapsulation is suitable for use when the asbestos present is in a hard to reach place(s).

008. Encapsulation is the application of an impervious materials, secured over or around an ACM and designed to prevent the release of fibres under foreseeable conditions, such as vibration, impact and age degradation.

009. For large areas the cost of encapsulation or sealing may approach the cost of removal. Any eventual removal may be more difficult and costly. Continuing assessment on a periodic basis will be defined by the asbestos survey. A risk assessment will also be required if the encapsulation or sealing option is taken. Not all paints and other surface coatings on the market are suitable. In particular, the sealant should not increase the fire hazard properties of the material being treated. If the asbestos is poorly bonded to the substrate, the application of a coating may result in large sections of the asbestos breaking away from the substrate. The surface to be encapsulated or sealed should be cleaned with an approved "H" type vacuum cleaner to remove all debris and dust particles ensuring good adhesion of the coating to be applied.

Removal and maintenance work

010. Where Asbestos Works is being performed, notify the Health and Safety Executive or other enforcing authorities using Form FODASB5 14 days in advance of the works commencing, except in emergency situations where shorter notice with their agreement can be given.

011. Give reasonable notice to any adjacent Client Parties, Customers and Staff that Asbestos Works are to be carried out, and when it is to be carried out. The notification should also include an explanation of the general procedures and equipment involved and the precautions to be taken in accordance with Law. Dispose of waste asbestos products in accordance with the Laws on hazardous waste, having given at least 3 (three) days' notice to the Environment Agency.

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Notifiable Non-Licensed Work

012. Notifiable non licensed Works (NNLW) is the removal of asbestos materials that would not normally require the Provider to give notification prior to commencement of Works. An example would be the removal of damaged or broken asbestos cement products when the condition or the quantity of the material may give rise to significant quantities of dust and debris. This would mean this Work would be notifiable but not subject to full requirements of licensable Asbestos Works. In such instances, consider if the quantity of Work being carried out to asbestos containing materials would mean the Works are notifiable. In such scenarios use an Asbestos Licensed Contractor, subject to the results of risk assessments.

013. Where NNLW is being performed, notify the relevant enforcing authority using Form ASB NNLW1. Observe the additional requirements and obligations in respect of medical surveillance and maintenance of health records for each Staff member exposed to asbestos.

014. Contact www.hse.gov.uk for further information and guidance on NNLW.

015. In considering whether the Works will require notification of non-licensed Works, consider whether the Works are:

- **Maintenance** e.g. drilling holes to attach fittings or pass cables through, painting, cleaning etc. Maintenance includes some removal where it is incidental to the main task, e.g. removing an asbestos ceiling tile to allow inspection;
- **Removal** e.g. as part of a refurbishment or redesign project; or
- **Encapsulation** e.g. work to enclose or seal asbestos materials in good condition.

016. Also consider whether Air monitoring and control and the collection and analysis of samples will be required.

017. Consider the asbestos type.

- **Is it friable?** Friable means easily crumbled or reduced to powder. The more friable a material is, the more likely it will release asbestos fibres when worked on and the greater the risk of exposure. Work which disturbs more friable materials, e.g. asbestos pipe insulation, will tend to be notifiable non-licensed work and work which disturbs the least friable materials, e.g. asbestos cement, can normally be treated as non-licensed work; and
- **How firmly is the asbestos bonded in a matrix?** (For removal work only). Bonded in a matrix mean the asbestos is coated, covered or contained within another material, such as cement, paint or plastic. ACMs of this type in good condition can usually be treated as non-licensed work. If the ACMs are significantly damaged, and so more likely to release fibres, they will need to be treated as notifiable non-licensed work.

018. Consider the asbestos material's condition:

- **Has the material been damaged or is it in poor condition?** Removal of ACMs in poor condition e.g. due to flood or fire damage, will normally need to be treated as notifiable non-licensed work; and
- **Will the materials' matrix be destroyed when worked on?** e.g, using gel or steam to remove deteriorating textured decorative coatings such as 'Artex' will normally need to be treated as notifiable non-licensed work.

019. Examples of notifiable non-licensed work (NNLW) with asbestos are:

- Using steaming or gelling methods large-scale removal of textured decorative coatings (e.g. beyond that required for maintenance activities such as installation/replacement of smoke alarms and fittings);
- Minor short duration work to remove asbestos insulating board as part of a refurbishment project;
- Minor short duration involving asbestos insulation (e.g. repairing minor damage to a small section of pipe insulation where the exterior coating has been broken or damaged);
- Removal of asbestos cement products (e.g. roof sheeting) where the material has been substantially damaged or broken up (e.g. as a result of fire or flood damage);
- Removal of asbestos cement products (e.g. roof sheeting) where the removal activity will mean that the material will be substantially broken up, creating significant quantities of dust and debris (e.g. 'dropping' an asbestos cement roof); and
- Removal of asbestos paper and cardboard products if not firmly bonded in a matrix.

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020. Carry out all non-licensed and notifiable non-licensed work with asbestos with the **appropriate controls** required by the Health and Safety Executive or other enforcing authorities in place. Ensure those carrying out the Works have had the correct level of **information, instruction and training**, to protect themselves (and others in the area) from the risks to health that exposure to asbestos causes.

021. If the Provider determines that the Works they are about to do are notifiable non-licensed work (NNLW), comply with the additional requirements in the section below on notification.

Notification

022. Notify the relevant enforcing authority of any NNLW with asbestos:

- The notification is to be by using the **online notifications form** (via either a computer or Smartphone);
- All three possible regulators can be notified via this database - the Health and Safety Executive, the local authority and the Office of Rail and Road (see table below);
- Notice is required before the work starts - there is no minimum notice period;
- The Provider does not need to wait for permission from the enforcing authority – the database will provide a PDF copy of the notification;
- If the Provider is are doing a project or contract with multiple NNLW jobs you can notify once for the whole project or contract;
- If the Provider is a licensed asbestos contractor carrying out NNLW work, a notification will still have to be submitted; and
- The **online notifications form** is the only method of notification accepted.

Type of premises/activity	Enforcing Authority
Shops, offices, separate catering services, launderettes, sport, entertainment and recreational activities, exhibitions, church or religious meetings, hotels, camping and caravan sites, wholesale and retail storage	LA (Local Authority)
Factories and factory offices, civil engineering, construction and demolition sites, hospitals, research and development establishments, local government services and educational establishments, fairgrounds, radio, television and film broadcasting, sea going ships, docks, transport undertakings, domestic premises, quarries, farms (and associated activities), horticultural premises and forestry's, mines or quarries and offshore installations, licensed nuclear sites	HSE (Health & Safety Executive)
Railways, railway lines, signal boxes	ORR (Office of Rail and Road)

Designating areas

023. Designate all areas where there is NNLW taking place and mark them with a suitable warning notice. Restrict these areas to those carrying out the Works.

024. Ensure food and drink is never consumed in designated areas.

Medical surveillance

025. All Staff members carrying out NNLW will need to have had a medical examination **at least every 3 (three) years**, as long as the Staff member continues to do NNLW. Any Staff members carrying out NNLW for the first time will have to have an examination before they can start such work:

- medical examinations must include an examination of the chest and a lung function test;
- they need to be carried out by a licensed medical practitioner, e.g. a GP;
- those Staff members already under surveillance via a licensed asbestos contractor and in possession of a valid certificate do not need to have the NNLW medical examination;
- medical examinations should be carried out in work time at the Provider's expense; and

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- the GP must issue a certificate to confirm the examination has taken place and on what date the Provider needs to keep this certificate for 4 years.

Record keeping

026. Keep a register (health record) of NNLW with asbestos for each Staff member exposed to asbestos: This must include:

- the nature and duration of work with asbestos and estimated exposure for each individual Staff member; and
- dates of the Staff member's medical examinations.

027. Keep registers of work (health records) for 40 years (and give them to the Health and Safety Executive or other enforcing authorities or the individual concerned should the Provider cease trading).

028. The need to record exposure does not mean that every non licensed task must have air sampling. There will often be published exposure figures or knowledge within the industry about exposures found at similar lower risk work done in the past. If a task is unusual, then sampling may be required.

Non Notifiable Non Licensed Work

029. Removal of non-licensable asbestos containing materials is included within the Rates (with the exception of the rates in the Asbestos Works section of the Schedule of Rates which are only for the removal and/or encapsulation of licensed asbestos or non-licensed asbestos that may have been contaminated by adjoining licensed asbestos).

030. Non licensed asbestos works are those that:

- are sporadic and of low intensity – to be considered sporadic and of low density the concentration of asbestos fibres in the air should not exceed 0.6f/cubic centimetre measured over 10 minutes;
- are carried out in such a way that the exposure of Staff members to asbestos will not exceed the legal control of 0.1 asbestos fibres per cubic centimetre of air (0.1f/cm^3) (averaged over a four (4) hour period); and
- meet at least one of the four following conditions:
    - It is a short non-continuous maintenance task, with only non-friable materials (friability describes how likely an ACM is to release asbestos fibres when worked on, so non-friable materials will only release a small number of fibres during work);
    - It is a removal task, where the ACMs are in reasonable condition and are not being deliberately broken up, and the asbestos fibres are firmly contained in a matrix e.g. the asbestos is coated, covered or contained within another material, such as cement, paint or plastic;
    - It is a task where the ACMs are in good condition and are being sealed or encapsulated to ensure that they are not easily damaged in the future: or
    - It is an air monitoring and control task to check fibre concentrations in the air, or its condition and analysis of asbestos samples to confirm the presence of asbestos in a material.

031. Examples of non-licensed asbestos work include:

- Cleaning of small quantities of loose/fine debris containing ACM dust (where the work is sporadic and of low intensity, the control limit will not be exceeded and it is short duration work);
- Drilling of textured decorative coatings for installation of fixtures/fittings;
- Encapsulation and sealing –in work on asbestos containing materials (ACMs) that are in good condition;
- Maintenance Works involving:
    - asbestos cement products (e.g. on roof sheeting, tiles and rainwater goods);
    - asbestos in ropes, yarns and woven cloth;
    - asbestos gaskets or asbestos rope cord (including removal as part of the repair and upkeep of equipment) if this can be done without substantial breakage;
    - asbestos containing thermoplastic and vinyl floor tiles, bitumen roof felt, shingles, damp-proofing coatings and mastics;
    - asbestos-containing felt and paper;

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- plastic paint coatings, PVC floors, panels and sealing compounds;
- asbestos-containing conveyor belts/drive belts, bonded rubber, electric cables;
- resin-based ACMs such as friction products (e.g. brake linings); or
- painting/repainting Asbestos Insulating Board) (AIB that is in good condition;

- Removal of:
  - asbestos cement products (e.g. roof sheeting and rainwater goods) providing the material is carefully handled/removed without breaking up, this includes work with asbestos cement which is weathered but not otherwise substantially damaged;
  - small areas of textured decorative coatings using suitable dust-reducing methods, to support other activities such as installation/replacement of smoke alarms and light fittings;
  - textured decorative coatings provide that this can be done without deterioration of the material (e.g. if the backing board is carefully cut around to achieve virtually intact removal);
  - loosely fixed (e.g. screwed) asbestos insulating board (AIB) panels in order to gain access to areas for other Maintenance activities (e.g. under a bath to carry out pipework maintenance, or for access to a ceiling void for repair of lighting) This also includes re-attaching the panels after the work is done;
  - an AIB door with asbestos fireproofing;
  - asbestos cement products (e.g. roof sheeting) where the material will be substantially damaged or broken up (e.g. as a result of fire or flood damage);
  - asbestos cement products (e.g. roof sheeting) where the material will be substantially broken up, creating significant quantities of dust and debris (e.g. dropping an asbestos cement roof); or
  - Asbestos paper and cardboard products if not firmly bonded in a matrix);
- Short duration work:
  - to repair minor damage to AIB;
  - involving drilling holes in AIB (e.g. installing shelving);
  - to remove asbestos insulating board as part of a refurbishment project; or
  - involving asbestos insulation e.g. repairing minor damage to a small section of pipe insulation where the exterior coating has been broken or damaged; or
- Other work:
  - on other materials containing asbestos (such as paints, bitumen, resins, rubber etc.,) where the fibres are bound in a matrix which prevents most of them being released (this includes, typically, aged/weathered AC);
  - associated with collecting and analysing samples to identify the presence of asbestos; or
  - comprising large scale removal of textured decorative coatings using steaming or gelling methods (e.g. beyond that required for maintenance activities such as installation/replacement of smoke alarms and fittings)

032. Certain of the operations listed in Paragraph 031 above, depending on the circumstances in which the Works are undertaken, will also be notifiable to the Health and Safety Executive or other enforcing authorities on form ASB NNLW1, with additional requirements and obligations being placed upon the Provider in respect of medical surveillance and maintenance of health records for Staff exposed to asbestos.

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Demolition and structural alterations involving restricted work

033. Undertake demolition and structural alteration of buildings or other structures containing asbestos material in accordance with the Law. Remove all asbestos products, including asbestos cement sheeting, before demolition is commenced. In some circumstances, partial removal, followed by partial demolition to allow access to previously obstructed asbestos material, may be necessary. In such cases, conduct the partial demolition operation under conditions appropriate to the removal Work. Comply with the techniques for handling and removal of non-friable asbestos-cement products detailed later in this Specification.

REMOVAL OF ASBESTOS

Generally

034. Comply with the guidelines in this section for undertaking the planned and safe removal of asbestos-based materials from buildings, equipment/plant and structures, the equipment that could be used, removal techniques and general safety and hygiene requirements.

035. This section applies to the removal or work on:

- Friable asbestos, including sprayed asbestos coatings used for thermal and acoustic insulation in buildings.
- Decorative coatings in buildings;
- Asbestos-based lagging on boilers and other industrial plant;
- Asbestos cement products;
- Roof coverings;
- Asbestos Insulation Panels;
- Ropes, felts and papers; and
- Other non-asbestos materials that have been contaminated with asbestos.

036. Working with asbestos and asbestos-based products is hazardous. It is the Provider's duty under the Health and Safety Law to provide a healthy and safe place of work. To achieve this, plan the work and adopt good work practices.

037. In any activity involving the removal of asbestos-containing materials the procedures adopted must allow for the containment of asbestos. Take all practicable steps to ensure that Staff and any Client Parties in the area are not exposed to asbestos fibres.

038. NOTE: Removal of friable asbestos that has been used for thermal or acoustic insulation and other stated applications may only be carried out by a competent person(s) with a valid asbestos removal license from the Health and Safety Executive using appropriate guidance, restricted work must always be under direct supervision.

SAFE REMOVAL OF FRIABLE ASBESTOS

Generally

039. This section applies to the removal or work on:

- friable asbestos, including sprayed asbestos coatings used for thermal and acoustic insulation in buildings.
- decorative coatings in buildings; and
- asbestos-based lagging on boilers and other industrial plant.

Information to be provided by the Client

040. The Client will provide the Provider with access to the Client's electronic asbestos register where they can obtain (if available) a copy of the asbestos survey (or suitable representative survey) giving details of the ACM identified to the Provider prior to commencement of any Works.

041. It is recognised that in some cases the full extent of the asbestos material is not known until removal is under way.

042. In the preparation of job specifications by the Provider's Asbestos Licensed Contractor address the following considerations:

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- Location and Status of ACM:
    - Internal;
    - External but protected;
    - External exposed to weather;
    - Enclosed in ducts; "Confined Spaces Considerations";
    - Difficult or unusual site conditions, which will influence the selection or application of removal methods, particularly regarding transport, scaffolding or weather protection; and / or
    - Removal from roof space areas, areas where working at height, confined spaces, or areas with other constraints within a Property; and
- Technical description of the material to be removed with details of the type of asbestos present and any special or unusual materials or circumstances.

043. The extent of the removal Work should be adequately detailed on the Order (subject to Paragraph 020 above), to indicate areas for removal, otherwise, information of the following nature should be provided where available:

- Surface dimensions of flat or large curved areas, thickness of insulation, external diameters of pipes, length of each size pipe, and number and type of pipefittings, e.g. flanged joints, valves, tees, expansion bends. Details are to be provided if asbestos is to be removed from any part of the building's air-conditioning system;
- Details of any pipework sections that are steam or electrically heated and the arrangement of its insulation;
- Details of any section or materials to be left in place;
- Confirmation and details of residual heat that will remain in pipework, boilers, etc.;
- Any unusual or specific hazards associated with the removal Works;
- Temperature considerations — normal working temperature for each portion of the plant concerned, ambient temperature at the removal area;
- Conditions of substrate surfaces — special requirements, such as the removal or otherwise of protective paint or lacquer from pipework or for the application of paint or other protective coatings to the substrate from which the asbestos-based material has been removed;
- Types of fittings and supports and whether or not these may be removed or disposed of with the waste;
- Type of finish required or specification for re-insulation;
- Special service requirements, for example, where there is any potential hazard from contact with live electrical equipment in use in the removal area; attention should be drawn to this fact;
- Where electrical switchgear or panels are to be sealed, consideration should be given to the provision of supplementary ventilation to dispose of potential heat build-up and consequent fire risk;
- Site occupancy restrictions and conditions;
- Adjacent area cleaning (adjacent areas which are to be cleaned or are to be protected from airborne dust and are to be cleaned on completion);
- Safety practices to be followed under relevant legislation; and
- Location of any relevant electrical cables;

044. If necessary, contact the Client's Representative where the Provider's risk assessment states a sample is required, requesting that additional sampling and testing of potential ACMs is necessary.

Information to be supplied by the Provider

045. Notify restricted Works involving asbestos to the Health and Safety Executive 14 days prior to abatement activities commencing.

046. Provide a detailed plan of Work and all method statements with specifications or drawings showing details as required under the Law as follows:

- Type, quantity and extent of isolation required at the asbestos removal area and location of restricted access borders;
- Methods to be adopted when removing material, including details of the contamination control programme, for example, provision of negative air pressure and the location of the exhaust unit;

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- This should include specifications of size, capacity and type of filter, location of decontamination unit and where it is to be discharged;
- Detailed risk assessment for both asbestos and all other perceived risks;
- Waste disposal programme including:
    - On-site storage system;
    - Method of removal from the building;
    - Detailed risk assessment; and
    - Waste disposal site to comply with the Laws on hazardous waste;
- Any other information required to ensure compliance with Law on asbestos and Health and Safety Executive guidance; and
- Where the risk assessment requires that removal operations be undertaken under controlled conditions, ask the Client to appoint a Health and Safety approved analyst to provide assurance that the Provider's operations have been completed in accordance with the Provider's plan of Work and other management duties including air testing, 4 stage clearances and issue certificate of reoccupation.

047. Upload this information is to the Client's electronic asbestos register on completion of the Works.

Guidelines for planning and programming:

048. Consider the removal of all asbestos from a Property at the same time. Agree decanting (if necessary) and/or other management issues with the Client prior to the commencement of Works.

049. Conversely, the work of other Client Parties should be scheduled to preclude them working near to, or accidentally breaking into the asbestos removal area. The Provider is given access to the Client's Electronic Asbestos Register to download survey data if available. Where no relevant sample or survey data exists and the Provider's risk assessment requires that samples should be taken, bring this to the attention of the Client's Representative who will either issue an Order to the Provider or through the Client's own analyst, get a sample or survey completed and uploaded to Client's electronic asbestos register.

050. Give early consideration to the following major points:

- Health and safety of Staff;
- Health and safety of Customers and the general public;
- The most appropriate work methods for the Works;
- Identification of types of asbestos involved;
- Programme of commencement and completion dates. However, it should be recognised that unforeseen problems with removal or the extent of the asbestos cannot always be ascertained prior to removal Work commencing;
- Responsibility for the supply and application of isolating materials, e.g., ropes, barriers, plastic screens, waste containers and warning signs;
- Preparation of surfaces (pre-removal) cleaning;
- Precise information on extent of the work covered by the Contract;
- Limitations of access to the removal area;
- Conditions of employment on the site, including the labour and supervision required and agreed working hours;
- Transport facilities;
- Protected storage area pending the removal of asbestos-based materials;
- Availability of water, power, heat, light and drainage;
- Accommodation, decontamination and canteen facilities;
- Provision of access equipment, such as scaffolding or ladders;
- Protection of adjacent areas, plant and machinery;
- Waste disposal methods and responsibilities and cleanup requirements;
- Temporary sealing of asbestos where necessary;
- Notification to the Health and Safety Executive;
- Responsibility for air monitoring, including clearance monitoring;
- Customers furniture store;
- Decanting arrangements;
- Analyst work area; and
- Transit routes waste disposal facilities.

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Training

051. Instruct all asbestos removal Staff in the relevant aspects of working with or on asbestos to ensure compliance with the Law and associated Approved Codes of Practice, the health hazards associated with asbestos, safe working procedures, and the wearing and maintenance of protective clothing and equipment. The level of training may vary according to the requirements of a job but give all Staff detailed information on the reasons for safety and health precautions.

052. Provide evidence to the Client's Representative before commencing any abatement Works that Staff have received training for task specific removal of non- notifiable, non-licensed, and notifiable non-licensed asbestos containing materials including use of special PPE, cleaning materials, disposal procedures etc.

Supervisory personnel

053. Ensure that supervisory personnel have a detailed knowledge of the precautions and procedures outlined in the Law on asbestos, ACOP HSG 247 and in this Specification. With this knowledge and personal experience, they should assume the following responsibilities:

- To plan the total removal procedure;
- To select the most appropriate technique for removal of asbestos;
- The pre-removal setting up;
- Reassurance Air Tests
- The actual removal and final cleaning operation, 4 stage clearances and certificate of reoccupation as applicable;
- To ensure that all necessary measures are taken to reduce the airborne concentration of asbestos dust to the lowest practicable level;
- To ensure that asbestos fibres and asbestos-containing material do not contaminate adjacent areas;
- To ensure that all Staff under their supervision are adequately trained in the safe working practices outlined in Health and Safety Law and the Law on asbestos;
- To ensure that the removal is continually supervised by Staff and that the operation is carried out in a safe and proper manner, in accordance with the precautions listed in the Law on asbestos;
- To ensure that personal protective equipment is used and maintained in good condition;
- To ensure that the removal site is maintained in a clean condition, that waste is quickly and properly disposed of in accordance with process detailed in Provider's Plan of Work
- To ensure personal hygiene procedures are continually observed;
- To maintain copies of all records and a site log detailing all site operations daily which is signed off by all Parties on site; and
- To supply all information to the Client's Representative (electronically uploading to Client's electronic asbestos register) on completion of the Works.

Site preparation for the removal of friable asbestos from buildings and other structures

054. The plan of Work issued to the Health and Safety Executive or other enforcing authorities will set out the procedures adopted for the removal of friable asbestos must be designed to contain the asbestos and minimise airborne exposure. The steps required will vary from job to job but in all cases will include the following:

- Access to the asbestos removal area must be restricted to those involved in the removal work. A thorough pre clean must be undertaken prior to work area preparation and commencement of abatement activities;
- Contamination of flooring and furnishings with asbestos containing dust must be avoided';
- The drift of airborne fibres must be restricted by ensuring that the removal area is effectively screened off from adjacent areas. This is usually achieved by extracting air from the removal area to ensure that it remains at negative pressure with respect to surrounding areas;
- The precautions taken must be sufficient to ensure that any asbestos contamination in the air or surrounding areas is maintained below 0.01 fibres/ml (for a sample volume of at least 480 litres passed through a filter with an effective diameter greater than 20mm) at all stages during and after the asbestos removal work. The steps to be taken will be determined the likelihood of asbestos fibre release and the size of the job in terms of the time taken to complete it and the area involved. In the following sections, the site preparation that is considered appropriate for three commonly performed removal tasks are specified;

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- The removal of fireproofing, thermal or acoustic insulation applied to structural steel or ceilings, or other similar major asbestos removal jobs;
- The removal of decorative coating containing relatively low percentages of asbestos; and
- Small-scale jobs such as the removal of minor amounts of asbestos pipe lagging.

Preparation of a site for a major removal programme.

055. Where total enclosure of the removal area is required, isolate the area by installing low-density polyethylene sheeting (not less than 1000 gauge) on the floor and walls of the structure. If necessary, erect a temporary timber or metal frame to which the plastic barrier can be attached. Overlap and tape all joints to ensure that the area is completely sealed off. Use adhesives may supplement the use of tape where necessary.

056. Remove existing floor coverings where practicable. Use a double layer of plastic sheeting (suitably fixed by double-sided tape or adhesive to prevent movement between layers) on the floor of the containment area, and a turn-up where the floor joins the sidewalls. Use plywood 6mm between layers to prevent accidental penetration of sheeting.

057. Vertical shafts should be properly sealed off to prevent the thermos-syphon effect spreading asbestos fibres throughout the building.

058. Where asbestos is removed from an entire floor of a multi-storey building, all passenger and goods lifts should be prevented from stopping at the floor from which asbestos is being removed. Asbestos removal Staff may gain access to the floor via the fire stairs or from an elevator dedicated for this purpose. Where a lift is used for access, all exit doors to other floors should be sealed. It is important that emergency escape exits are available when blocking off such areas

059. All movable furniture, plant and fittings shall be removed from the asbestos removal area. The immovable items should be fully wrapped and sealed in suitable plastic sheeting and stored in lockable container on site to facilitate involvement of the Client's loss adjuster; an inventory (including photographs) of all items removed should be taken and where possible their condition agreed with the Customer (signed copy) so that they are effectively isolated from the removal area. In regions of heavy traffic or high wear, additional masking or barricading may be necessary.

060. Where masking operations may liberate asbestos fibres, all Staff in the removal area should wear respiratory protective devices approved for asbestos. This precaution is particularly applicable when removing existing barriers or partitions such as false ceiling tiles. Where asbestos materials may have fallen on to a false ceiling, the ceiling should only be removed under full controlled removal conditions. Any utility or service pipework, which penetrates into the ceiling space, is to be sealed.

061. Except for the Negative Pressure Units ("NPU") all ventilation and air-conditioning networks servicing the removal area should be closed down for the duration of the removal job. All vents should be thoroughly masked to prevent the ingress of asbestos fibres into the duct network. Upon completion and after final cleaning of the removal area, all mechanical ventilation filters for re circulated air should be replaced.

062. Additional care must be taken to ensure that asbestos fibres cannot escape at points where pipes and conduits pass out of the removal area. Greater attention to masking and re-assurance testing should be given in these regions, particularly if service riser-shafts pass through the removal area.

063. To prevent the escape of airborne asbestos fibres from the removal area enclosure, an exhaust extraction fan should be installed in a position to create a negative air pressure of approximately 5 Pascal's (water gauge) within the removal area. While accepting that the measurement of this pressure is not always possible, a good guide to the effectiveness of the system can be gauged from the inwards effect on the plastic tenting. It is a requirement that clear viewing panels be installed at strategic locations throughout the enclosure to allow inspection from outside the enclosure, if clear viewing panels cannot be provided, then install a close circuit TV system with external monitors. If there is a visible bellowing inward, there is good negative pressure. In this arrangement, the major and usually only route of air into the removal area would be through the three-stage unit. The correct flow of air should be verified using the smoke testing method.

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064. The air extracted by this system should pass through an appropriate High Efficiency Particulate Air ("HEPA") filter to remove any asbestos fibres. Ideally, air extraction units should be so situated that access to the filters can be gained from the removal area. This expedites the otherwise difficult decontamination of these units and allows another unit to be brought into service in the event of a breakdown. Where it is not possible to change the filter within the removal area, a temporary enclosure should be constructed around the unit to allow for filter replacement.

065. The HEPA filter should comply with the minimum 99.997 percent efficiency requirement detailed in the applicable Standard or equivalent. A coarse pre-filter should be installed prior to the HEPA filter to prolong the useful life of the high efficiency filter. Where practicable, the discharge point for this extraction unit should be to the outside air, distant from other working areas, air-conditioning inlets or breathing air compressors. Where this is not possible, testing of the exhaust air should be carried out.

066. Extraction equipment should be operated continuously whilst the removal enclosure is in place. Such equipment should be DOP tested every six months.

067. When installing the asbestos removal area containment, extra consideration should be given to the alteration of the fire rating of the building and to the provision of the fire-fighting facilities, emergency exits and emergency lighting.

068. Warning notices stating "Asbestos Hazard Area, Keep Out" shall be placed at entrances to the removal area. These signs are to be placed so they are clearly visible. Other more general signs may be used elsewhere in the Properties to indicate that Works are in progress.

Compliance testing of removal area containment prior to commencement of work.

069. Before any asbestos removal begins in an enclosure, a visual inspection to check the integrity of the structure must be carried out. Smoke testing should also be used to detect leaks and observed by the asbestos analyst.

070. Attention should be given to the bellowing inward of the plastic sheeting. At the beginning of each working period the inspection should be repeated and any defects remedied immediately.

Decontamination facilities.

071. To prevent the escape of asbestos as Staff enter and leave the removal area a specially constructed transit route and mobile or on-site decontamination unit will be required. In all cases where it is deemed necessary to totally enclose the removal area, a decontamination unit consisting of at least three compartments should be used. It is recommended that a 4:1 shower to the Staff member ratio be used for calculating the appropriate size of decontamination unit to be used on any particular project. Where a friable asbestos removal programme is being undertaken, a decontamination unit must be provided that incorporates the following elements or achieves the same or better protection:

- A dirty area having provision for:
    - Removal of contamination from protective clothing, footwear and respirator;
    - Washing footwear in footbath;
    - Storage of contaminated clothing and footwear; and
    - Airflow towards the removal area;
- A Shower Area with hot water adjustable at the source. Body soap liquid and shampoo, nail brushes, mirror, and clean disposable towels; and
- A clean area having provision for:
    - Storage of individual respirators in containers or lockers;
    - Storage of clean clothing; and
    - Airflow towards dirty area.

072. Spring-loaded doors between the areas should be used to ensure that an airlock is maintained as the person passes through the unit.

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073. The decontamination unit should be sited immediately adjacent to, or joined to, the enclosed asbestos removal area where possible. Where it is not physically possible to locate the decontamination unit adjacent to, and joined to, the removal enclosure transit procedures to minimise asbestos contamination should be implemented, such procedures are outlined in the Health and Safety Executive Guidance HSG 247.

074. Decontamination procedures should be followed whenever the Staff member leaves the enclosure. While the protocol to be followed will vary with the design of the decontamination unit, it is recommended that:

- The respirator should be worn and operating until the person has removed all contamination from outer garments and equipment;
- Personnel should not smoke, eat or drink in any part of the decontamination facility;
- The decontamination unit should be regularly cleaned by persons wearing protective clothing
- Standard entry and decontamination procedures should be adopted as set out in this Specification; and
- The decontamination unit must have a copy of the certificate of reoccupation when it arrives at the Property and a 4 stage clearance completed at the end of operations before it leaves the Property which will be completed by the asbestos analyst.

Entry to the Work Enclosure

075. Staff shall enter the clean room of the decontamination unit in groups of no more than two. Staff shall remove all street clothing and store it safely in their assigned locker. The Staff member must remove the respirator from its protective sealed bag and fit it. Battery packs will be held by hand until the Staff member has suited up.

076. When the Staff member has properly fitted and tested the respirator a clean stripping suit will be donned or carried through the shower room into the dirty end of the decontamination unit. At this time with the respirator on, the Staff member will don work clothes and the clean stripping suit. When these items of clothing have been put on, a transit suit shall be put on over all other clothing for transit to the work area. Work clothes that are worn into a contaminated area must be bagged up at the end of each project. Clothing may be laundered utilizing a washing machine equipped with a 5-micron water filter. This washing machine must be a dedicated unit, no other clothing to be laundered in this unit.

077. Transit to the work area shall be by the shortest possible route. Staff will be familiar with the transit route prior to participating in any transit procedure. When the Staff member arrives at the three-stage air lock he/she will enter the clean or exterior chamber and remove the blue transit suit. The Staff member will then pass into the interior or dirty stage of the airlock where boots and gloves will be collected and put on.

078. The Staff member is ready to begin tasks that have been assigned to him/her by the site supervisor.

079. When the Staff member is ready to leave the work area, the Staff member will adhere to the following:

- Staff members must wait inside the work area until permission to exit is given by the site supervisor. When permission to exit is given Staff members will inspect each other while still inside the work area. Any visible debris found shall be removed prior to commencing transit procedure. Boots will be thoroughly inspected at this time and washed;
- When the inside visual examination is complete the first Staff member may enter the dirty end of the three-stage unit to begin transit out. When the Staff member is completely inside the dirty stage he/she must inspect their Personal Protective Equipment ("PPE") and Respiratory Protective Equipment ("RPE") and wipe it down or vacuum where necessary, boots and gloves will be removed and stored safely to one side of the unit. The stripping suit shall then be removed and disposed of in a labelled red asbestos bag provided;
- When the Staff member has completed these steps, that Staff member can step into the clean end of the three stage and don a transit suit. After transit suit has been donned the Staff member may proceed to the decontamination unit via the transit route;
- After arriving at the decontamination unit the Staff member will enter the dirty end making sure to close the door behind them. The transit suit shall be removed first followed by any other clothing. RPE must not be removed or stored in the dirty end of the decontamination unit at any time;

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- The Staff member is now ready to enter the shower unit of the decontamination unit. With their RPE- respirator still fitted the Staff member shall enter the shower unit. Water shall be turned on and temperature adjusted to a comfortable level. Before the Staff member steps under the water stream the battery pack must be turned off and the filter covered. When these steps have been completed the Staff member may step under the water stream allowing water to soak the head and the exterior of their RPE. The Staff member may then remove the RPE and thoroughly clean it making sure not to get water into the motor or battery connections. When the respirator "RPE" is clean it may be hung on a hook while the Staff member thoroughly showers and cleans his/her body; and
- When the Staff member has finished showering the Staff member may then enter the clean room remembering to bring the RPE with them. The RPE shall be bagged prior to the Staff member drying off and getting dressed back into street clothes.

Equipment

080. All tools and electrical equipment, such as H type vacuum cleaners and power tools, should be left in the removal area until the completion of the removal job. When the equipment is removed it should be vacuumed thoroughly and all accessible surfaces wiped over with a damp cloth. When decontamination is not possible, the item should be wrapped in plastic and sealed and only opened in another removal area.

081. Any asbestos contained in the H type Vacuum cleaner should be disposed of as asbestos waste.

082. The H type Vacuum should be cleaned, tested and calibrated at least every month.

Removal techniques for buildings and structures

083. The removal of asbestos-based materials from buildings and other structures should be carried out by methods, which will minimise the release of asbestos fibres into the atmosphere both during and after removal operation. The choice of method is determined by the nature of the asbestos material, the quantity of insulation and its location.

084. Breaking through the finishing compound and cutting the reinforcing wire in the lagging are operations, which can liberate considerable quantities of dust. Care should therefore be taken in the selection of tools and in keeping the insulation wet. Tools should allow cutting of the insulation into small sections while keeping asbestos fibre levels in the removal area to a minimum.

085. Power cables, telephone cables and fire alarms may lie beneath asbestos insulation. These cables must be clearly identified prior to the commencement of any cutting as severe damage and/or hazard to the Staff member could result.

086. As the techniques used for the removal of sprayed thermal insulation from buildings are not dissimilar from those used for removal from steam pipes and boilers, the following removal methods may equally be adapted to the removal of asbestos from industrial plant and machinery.

Protective clothing and equipment

087. Respiratory devices "RPE" and protective clothing "PPE" are required during all abatement activities, adequate rest breaks should be provided for Staff during removal to take into account the physical strain caused by the use of such equipment.

088. The degree of respiratory protection required is determined by the nature of the removal job, the type of asbestos and the potential for exposure to asbestos fibres.

089. A guide to the selection of appropriate respiratory protection for various operations involving asbestos is presented in Paragraphs 125 to 143 of this Part of this Specification.

090. Face masks are to be checked and tested at least every 6 (six) months.

Dismantling of asbestos removal area

091. The asbestos removal Work ordered should only be considered to have been completed when the Provider and/or the Asbestos Licensed Contractor has complied fully with the clearance criteria.

092. On completion of the asbestos removal job, all tools and equipment not used for cleaning should be removed from the removal area so that efficient vacuuming of the inside of the removal area enclosure can be undertaken. In taking these tools and equipment from the removal area, appropriate decontamination procedures should be observed.

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093. After clearance has been given, any sealing plastic used should then be dismantled, folded inwards and placed in appropriate disposal bags and sealed. The sealing plastic should not be reused, but must be treated as asbestos waste. Safety barricades and warning signs should not be removed until the complete area has been thoroughly cleaned.

HANDLING OF NON-FRIABLE ASBESTOS -FRIABLE ASBESTOS

Generally

094. Works of removal and disposal of non-notifiable non licensed, and notifiable non licensed materials in accordance with this Specification are included in the Rates in the Schedule of Rates including:

".3 The removal and disposal of all non-licensed asbestos containing materials, whether it is notifiable or non-notifiable work (in accordance with and as defined in the Law on asbestos) such as textured coatings, asbestos cement sheeting and roof tiles, vinyl floor tiling, gaskets etc.

.4 Working in conjunction with all non-licensed work on asbestos containing materials, whether it is notifiable or non-notifiable work (in accordance with and as defined in the Law on asbestos) such as textured coatings, asbestos cement sheeting and roof tiles, vinyl floor tiling, gaskets etc."

095. Non-friable asbestos products have been compounded from asbestos mixed with cement or other hard bonding materials "asbestos is firmly bound in the matrix of the material". This section recommends precautions to be observed when working with non-friable asbestos products.

096. These products include:

- Flat or corrugated, compressed asbestos-cement sheeting;
- Asbestos-cement pipes for water, drainage and flue gases;
- Roofing slates;
- Floor or wall coverings;
- Asbestos gaskets;
- Pump and valve packings;
- Asbestos bonded into bituminous products;
- Reinforced plastic products;
- Thermoplastic products and backings;
- PVC floor tiles and backings;
- Asbestos-cement ducts; and
- Asbestos-cement drip trays and tank covers.

097. So long as these products are maintained in good order and are not worked on with abrasive cutting or grinding tools they are not likely to present a health risk.

098. New building materials incorporated since 1999 should not contain asbestos.

099. Ensure that precautions are observed during structural alteration or demolition involving asbestos-cement materials and removal of floor and wall coverings containing asbestos.

100. General precautions to be observed for non-friable asbestos products can be found in the Health and Safety Executive guidance "Asbestos Essentials Task Manual"

101. Work procedures must be designed to minimise the generation of dust. Action should be taken to avoid the spread of asbestos fibres. In particular, the following principles should be adopted:

- Abrasive cutting or sanding power tools should not be used on asbestos-containing products. These may generate large amounts of dust containing asbestos;
- Non-powered hand tools such as handsaws should be used;
- Wetting down the material further reduces the release of asbestos fibres when cutting;
- High pressure water jets/guns shall not be used because of the potential to spread asbestos waste over the surrounding environment;
- Work with asbestos-containing products in well-ventilated areas and, where possible, in the open air;
- Good work hygiene principles shall be observed. This may entail the use of plastic drop sheets to collect off-cuts and coarse dust or the use of appropriate vacuum cleaning equipment when necessary;

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- Suitable respiratory protection should be used when airborne asbestos fibres is likely to be present; and
- All off-cuts and collected dust should be disposed of as asbestos waste. (See section 116-126 of this Specification.)

Removal and disposal of asbestos cement sheeting (hazardous waste Law)

102. Observe the following precautions hen removing asbestos-cement roofing, wall sheeting or other asbestos cement products from buildings or other structures:

- The asbestos-cement sheets should be sprayed with a sealing solution or wetted with water, but not with high-pressure water jets. Roofing sheets should not be wetted during freezing weather if it is anticipated that this could create a risk of slipping or falling from the roof;
- Power tools should not be used during removal with the exception of a low RPM drill to remove roofing screws; this method should be used in conjunction with shadow vacuum techniques. Fixings may vary from job to job but in most cases a modified bolt cutter can be used to detach roofing material from substrates. Concrete saws including all electrical grinding equipment must not be used to detach asbestos cement products from substrates;
- Damaged asbestos-cement should be kept wet to reduce levels of dust;
- Asbestos-cement sheets should be removed whole where possible and should be lowered to the ground, not dropped;
- The removed sheets should be stacked on a plastic sheet and not allowed to lie about the site where they may be further broken or crushed by machinery or site traffic;
- All asbestos-containing waste should be wrapped in plastic or otherwise sealed and removed from the site as soon as possible, using covered skips or on a covered lorry;
- The asbestos-containing waste should be disposed of in a manner, and at a site licensed for the storage, labelling and disposal of asbestos waste;
- Asbestos-cement sheets must not be reused or offered for sale;
- Any asbestos-cement residues remaining in the roof space or around the removal area should be cleaned up, using a "H" type vacuum cleaner or suitable wipes if necessary;
- Customers should be decanted or relocated (where appropriate);
- As far as practicable there should be no spread of contamination beyond the work area;
- All windows and doors in the building should be closed or in buildings where there is no ceiling the area below or adjacent to the work should be barriered off; and
- Staff should wear disposable overalls and either a disposable suitable RPE respirator or half-face mask fitted with appropriate dust filters.

Working on brittle roofs

103. Asbestos-cement sheeting is liable to shatter without warning under a person's weight and for this reason roofs that are sheathed in asbestos cement sheeting are included in those roofs known as "brittle roofs".

104. Persons who have the knowledge, experience and resources necessary to allow them to work at heights safely should only undertake the removal of asbestos-cement sheeting from a roof.

105. Consider what hazards are involved and how they can be overcome. In the planning and execution of the Work, a system of Work should be established, taking into consideration the Work to be done, relevant Law, the type of equipment necessary, the training and experience of the Staff involved, and the instruction and supervision required. The system of Work should allow for not only those directly involved in the Work, but also other persons who could be affected.

Removal of vinyl floor and wall coverings containing asbestos

106. NOTE: Dry sanding of vinyl asbestos floor coverings is **prohibited.**

107. Vinyl-asbestos coverings (usually asbestos-backed floor coverings) may still be encountered. They do not usually present a risk on site but breaking up to prepare the surface for replacement, or removal operations, may create a hazard.

108. When working with products that may contain asbestos, ensure that all practicable steps are taken to confirm whether asbestos is present. If there is any doubt about the product being asbestos free after the Provider has completed a risk assessment, inform the Client requesting an Order for the asbestos analyst to have samples taken and laboratory tested to ISO/ICE 17025 undertaken. A product is more likely to contain asbestos if it was installed between 1960 and 1999.

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109. Where the vinyl-asbestos coverings are found (or assumed) to contain asbestos follow the provisions set out in Paragraphs 083 to 086 above.

110. Significant release of asbestos fibres can result when vinyl-asbestos products are abraded by sanding. The work methods and control procedures used when working with vinyl-asbestos products must be designed to limit Staff' exposure to asbestos and the spread of asbestos into the surrounding environment.

111. In deciding the approach that is to be taken in replacing asbestos-backed vinyl products, the Provider may remove the product with a spade or other flat instrument in accordance with Health and Safety Executive Guidance.

MONITORING ASBESTOS IN AIR LEVELS AND CLEARANCE PROCEDURES

Generally

112. The analytical service in monitoring asbestos in air levels and clearance procedures will be undertaken by Asbestos Consultants and Analysts (Specialist Subcontractors) appointed directly by the Provider whose fees and expenses are included in the rates in the Schedule of Rates.

113. The measurement of airborne asbestos fibre levels may be required to verify that asbestos exposure standards have not been exceeded and to check that practices set out in the Health and Safety Executive guidance and these guidelines have been met. The main objective of sampling should be to ensure that the potential for personal exposure has been minimised. Air sampling should always be undertaken by competent laboratory as set out in the second edition of the Health and Safety Executive Guidance HSG 248 (May 2021).

114. The type of monitoring that is applicable will depend on the exposure circumstances and removal methods employed. Advice should always be sought from a competent laboratory that conforms with HSG 248.

115. The determination of airborne asbestos fibre concentrations in air must be carried out in accordance with HSG 248.

Selection of laboratories

116. As set out in the Health and Safety Executive Guidance all involved in asbestos must be competent and the Client's Representative must be satisfied that those employed in asbestos management or removal are competent to standards laid down in Law on asbestos. To demonstrate such competence the laboratory should demonstrate the meet requirements of International Standards Organisation "ISO/ICE 17025" that covers the whole organization in terms of quality systems, control of records, training, test calibration methods etc.

Air sampling

117. The Provider will be issued with an Order to appoint a Health and Safety Executive approved analyst to witness and sign off all test and clearance operations and issue of certificate of reoccupation.

118. Air sampling forming part of the overall asbestos management will include some/all of the following:

- Background sampling to establish the conditions that exist before work is commenced;
- Leak testing to check the integrity of the enclosure deployed in removal or encapsulation activities;
- Personal monitoring to verify that action level predictions are accurate and to facilitate internal risk assessments and control;
- Clearance air monitoring to verify that the area is safe for normal occupation following the removal of asbestos materials; and
- Reassurance sampling — sampling after the working enclosure has been removed or other works in the vicinity of asbestos have been completed.

Visual inspections

119. The appointed analyst will examine the Provider's appointed Asbestos Licensed Contractor's plan of work (method statements) to familiarise themselves with the scope of Works. The first stage in the 4-stage clearance process is for the asbestos analyst to ensure the Works ordered have been completed, what was removed; is there any asbestos remaining in the Work area and the actual asbestos materials that were removed.

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120. The visual inspection second stage of 4 stage clearance is conducted after the removal area has been meticulously cleaned and prior to clearance air monitoring. Inspections, prior to clearance monitoring, will be the responsibility of the Provider, but the asbestos analyst must duplicate this function. The asbestos analyst may request that the Asbestos Licensed Contractor's supervisor accompany them during this exercise. Any asbestos remaining (i.e. that is not visible to the naked eye) will be removed rapidly in the normal cleaning process. In some circumstances sealant may be applied to work surfaces and plastic sheeting after the visual inspection and initial monitoring (see Guideline for the Removal of Enclosure Area Sheeting). Any dust present in the removal area must be treated as if it contains asbestos. If asbestos is not completely stripped from an area because of access difficulties, then it should be sealed, and the location noted.

Clearance indicator air sampling Stage three of 4 stage clearance

121. Following a satisfactory visual inspection, clearance monitoring will be required. The area must be dry, and the negative air switched off and the inlet capped before sampling is started. As far as is practicable the decontamination unit must be isolated from the area being cleared. Clearance air monitoring should be carried out to HSG 248 and a written report issued by the laboratory.

122. Guideline for the removal of enclosure area sheeting

- Clean all internal surfaces including plant cover. Run exhaust air fan to clear area. Switch off fan and cap exit;
- Visual inspection: Carry out clearance monitoring. Is the result 0.01 fibres/ml or below? Strike tenting. Dispose of waste;
- Reoccupation: Is this the first clean? Seal all inner surfaces with spray on sealant. Carry out clearance monitoring;
- Is the result 0.01 fibres/ml or below? Assess where fibre contamination is coming from and take appropriate action; and
- Before tenting is struck, a result below 0.01 fibres/ml is required or confirmation that fibre contamination has not come from the asbestos removal job.

Final Assessment post enclosure/ work area dismantling stage four of 4 stage clearance

123. On satisfactory completion of all previous stages the final stage of the clearance process can commence, the analyst can be present during this process and all PPE and RPE should be worn. All polythene sheeting used in enclosure is disposed of as asbestos waste. In some situations, the asbestos analyst may take a further air test as an additional safety precaution or reassurance air test" after work area is fully cleared.

124. When all stages are completed satisfactorily the certificate of reoccupation is issued for the Work area and before removal from site at the end of the project but after use the decontamination unit is tested and certificate of reoccupation is issued. On completion of removals upload all details of removals on the Client's electronic asbestos register on a Property by Property; room by room basis including inventory of customer's items, waste documentation and copy of certificate of reoccupation and waste notices.

RESPIRATORY AND PERSONAL PROTECTION FOR ASBESTOS WORK

Generally

125. The Provider and Provider Persons involved in work involving asbestos or abatement procedures must be fully conversant with the appropriate control measures necessary to protect against exposure to asbestos fibres. There is a legal requirement placed on the Provider to ensure that their Staff and others in the vicinity are adequately protected from the effects of asbestos.

126. Good occupational hygiene practice requires that all practicable efforts be made to prevent asbestos fibres from entering the air of the workplace. In circumstances where it is impracticable to prevent asbestos from entering the atmosphere, suitable respiratory protective equipment should be worn.

127. An information sheet on approved types of respiratory protection devices is available from the local office of the Health and Safety Executive.

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Standard respirator programme

128. It is essential for all contractors required to use respirators in their work to develop and run a comprehensive respiratory protection programme. There are seven elements to a successful programme, which include:

- The administrative system;
- Knowledge and assessment of the risks involved;
- Control processes;
- Correct selection of respiratory protection Equipment (RPEs);
- Staff training and supervision;
- Medical assessment in compliance with Health and Safety Law on asbestos; and
- Inspection, fit tests and maintenance and storage of RPEs.

Administrative system

129. Written standard operating instructions must be available. These should provide information on the Provider's policy in respect of the issue and use of RPEs. One person should be responsible for the coordination and direction of this policy. Each RPE programme will vary according to the peculiarities of the work being carried out.

Knowledge and assessment of risks involved.

130. The degree of respiratory protection required for asbestos work is determined by:

- The nature of the work;
- The type of asbestos;
- The work methods; and
- Potential for exposure to asbestos.

131. It is essential that a full appraisal of the Work using the above criteria be carried out to assess the likely risk factors and to identify the appropriate safety measures. It may be necessary to undertake environmental background or personnel monitoring to assist with the assessment and this is the responsibility of the Provider and the Asbestos Licensed Contractor (removal contractor).

132. Air contaminated with asbestos fibres will be the major hazard to Staff and the most appropriate control methods will need to be considered in the assessment process. Because the greatest risk is from the inhalation of asbestos fibres, stringent protection measures must be used. Therefore, all Staff likely to be exposed to asbestos must wear approved RPEs for the whole period exposed.

Correct selection of respiratory protection Equipment (RPEs)

133. To determine the correct selection of the most appropriate RPE for asbestos work, the following issues must be addressed:

- Fit to the wearer: If a proper fit cannot be achieved with one type, model or size of respirator, another, which does fit, must be provided;
- Face seal: The presence of facial hair (beard, stubble growth, or sideburns), wearing of spectacles, or facial characteristics may affect the face seal adversely. Positive pressure powered equipment with full-face piece copes better with these problems than non-powered devices;
- Freedom of movement: The need for a Staff member to move freely about a job will influence the type of RPE. While airline respirators offer higher protection the restrictions imposed by the airline may be prohibitive;
- Physical and thermal stress: The wearing of RPE can cause severe problems during asbestos removal because of the physical activity required. In addition, this type of work is often carried out in hot environments. The cooling effect of air-supplied respirators will make them more acceptable and condensation on the visor will not be a problem; and

- Other factors: These could include:
    - The need to communicate;
    - Ease of cleaning; and
    - Availability of replacement parts.

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Staff training

134. The correct and proper use of RPE must be taught to all users. No person should be required to use respirators without first being given training in correct use, operation, care and maintenance, emergency procedures, cleaning and storage requirements.

Medical assessment

135. Any type of respirator may impose undue stress on some users. Give Staff members required routinely to wear respirators the opportunity of a medical assessment to determine if they are able to wear them safely.

Inspection, maintenance and storage of RPE

136. Proper inspection, maintenance and repair of RPDs are an essential part of the respirator protection programme. Face-pieces should be cleaned, dried and stored properly after each use. Regular checks of the diaphragms, valves and face-piece parts will reveal any defect, which should be repaired. The batteries for powered air RPE will require recharging.

Protective clothing - General

137. Appropriate protective clothing will afford protection to asbestos Staff and prevent spreading contamination or health risk to others. All protective clothing used to carry out restricted work must be disposed of as asbestos waste. During other work involving asbestos protective clothing may be reused but appropriate measures must be taken to ensure cleanliness (see section on laundering).

Types of protective clothing

138. Persons involved in working with asbestos should always wear protective clothing which:

- is made of material that resists penetration by asbestos fibres, such as nylon or treated synthetic material;
- covers the body and fits snugly at the neck, wrists and ankles;
- covers the head by having an attached hood; and
- is maintained in good condition and if torn or damaged, is immediately repaired or replaced.

NOTE: Because of the impervious nature of this type of clothing the wearer may become affected by heat stress. Ensure that Staff are knowledgeable on the signs and symptoms of heat disorders and the means to prevent illness caused by heat. There are three types of overalls in general use for asbestos work. Each type of overall has its advantages and disadvantages. The use of disposable or single-use overalls for all asbestos work is advisable because laundering is not required. Where the use of alternative types is necessary the full implications of how they will be cleaned or laundered need to be considered.

139. Disposable or single-use protective clothing which is generally used for one job and discarded as asbestos waste. These are particularly suitable for all types of asbestos work.

140. Overalls made from lightweight synthetic material such as nylon, which is also waterproof, or PVC waterproof clothing should be chosen as an option for the removal of non-friable materials only. The light nylon overall is particularly suitable for large ongoing jobs because they can be washed under a shower when leaving the contaminated area. Laundering is necessary primarily for hygiene. The PVC type overalls can be used in a similar way; however, they are heavy, cumbersome and too hot for longer jobs.

Laundering of asbestos-contaminated clothing

141. The laundering of contaminated overalls presents some difficulties to comply with Law on asbestos:

- The transfer and handling of contaminated overalls may put other people at risk from asbestos. For this reason, contaminated overalls should never be washed in a home laundry and Staff in a laundry handling asbestos-contaminated clothing must take special precautions;
- While the washing process removes asbestos fibres, the spin-drying cycle deposits the fibres on to the garment again;
- During the mechanical drying process asbestos fibres are released into the air. International standards require that clothing which has been used in asbestos work be "...laundered in accordance with the following requirements:

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- The clothing is, wherever practicable, laundered at the place at which the work involving asbestos has been carried out;
- If it is not practicable to launder the clothing at that place, the clothing is, before being taken to the place where it is to be laundered, damped and placed in a closed container impermeable to asbestos dust and conspicuously marked with the words "ASBESTOS CONTAMINATED CLOTHING"; and
- Wherever the clothing is laundered, it is laundered in such a manner as to clean the clothing and to suppress the release of asbestos dust into the air;

- Every Staff member to whom the clothing is given for laundering receives, before being given the clothing, instructions on the precautions to be taken to ensure that the clothing is laundered and handled in such a manner as to protect the safety of every Staff member coming into contact with it during the laundering process; and
- The clothing is not laundered by a Staff member at a Staff member's home.

Footwear

142. Footwear should be adequate for the type of work being undertaken and where possible have no laces.

Gloves

143. If gloves are provided, they should be made of impervious material for ease of cleaning. To assist with manual dexterity disposable type gloves may be more acceptable. On health grounds, there are few reasons to require people handling asbestos casually to wear gloves, however, extended contact with asbestos can lead to asbestos corns or "warts".

STORAGE, LABELLING AND DISPOSAL OF ASBESTOS

Generally

144. This section outlines the steps necessary for the Provider to ensure, as far as is practicable, the prevention of contamination by asbestos from any workplace or Property; to ensure that asbestos-containing materials are stored, labelled where agreed with the Client's Representative and disposed of correctly.

Storage and disposal of asbestos

145. Take all practicable steps to ensure that asbestos waste products are not received into, stored, distributed or dispatched from any place of work unless in suitably sealed and labelled receptacles. The receptacles should be designed, constructed, maintained and closed so as to prevent any of the contents escaping when subjected to the stresses and strains of normal handling.

146. Ensure all dangerous substances are properly packaged and labelled and all asbestos waste shall be sealed in plastic bags (500 gauge thick) and labelled "Asbestos hazard — Wear respirator and protective clothing while handling contents".

147. In addition, bags shall be transported for disposal in UN approved and labelled double layered (red bag on inside clear bag) and have a specified means of closure (PVC tape and swan neck and tape) and are to be placed in a sealed skip when on site and subsequently disposed of in accordance with Health and Safety Law.

148. Sealed Asbestos skips are only to remain on site for the duration of the Works, and once the Works are complete and 4 stage clearance achieved are to be immediately removed. Sealed Asbestos skips remaining more than 24 hours after achievement of 4 stage clearance will be removed by a Client Party and all costs incurred by the Client will be set off against the valuation of the Asbestos Works including an administrative fee of 100% of the cost of the skip removal.

149. Update the Client's electronic asbestos register system after removal of asbestos, putting information against specific locations where asbestos has been removed in each room in each specific Property, including uploading details of any pertinent certificates and waste documentation within 10 days of completion of the Order.

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Handling

150. Ensure that asbestos waste received into or dispatched from any workplace is packed in sealed plastic bags and FIBC's, the following practices applied:

- Pallet loads should be securely fastened by banding (in order to not cut the bags) and covered;
- Pallet loads should be securely mounted on suitable pallets, which can be moved by hoist, forklift truck or other mechanical handling means without damage. Hooks or other sharp equipment should not be used for handling the bags; and
- A supply of suitable adhesive tape should be made available by the Provider to repair any damaged bags. Where the damage cannot be repaired to prevent the release of asbestos during handling, the damaged bag should be placed inside another receptacle, which can be effectively sealed.

151. Asbestos cement sheets and pipes or insulating board should not be broken or cut for disposal in plastic bags. Ensure that these materials are suitably sealed in plastic and transferred to a labelled truck or skip for safe storage prior to being transported to an approved disposal site. The vehicle transporting the waste should be appropriately identified in accordance with Health and Safety Law.

152. The skip or other container must be cleaned thoroughly after use.

153. Manufactured goods containing asbestos, such as boilers, should be sealed or suitably packaged (e.g. by shrink wrapping) to prevent asbestos fibres arising from abrasion during transport.

Disposal at designated landfill of transfer station

154. Asbestos waste may only be deposited at a suitably licensed landfill facility or received by a suitably licensed transfer station prior to onward shipment to a licensed landfill. 3 days' notice must be given to the Environment agency before moving waste and consignment note process as defined in Health and Safety Law must be followed. Producers / licensed waste carriers of asbestos waste should ensure they receive written confirmation of a facility's status to accept such material to ensure compliance with their responsibilities under Health and Safety Law.

Reuse of abated asbestos containing products

155. Do not reuse abated asbestos containing products, such as corrugated roofing and slates.

INSTRUCTION AND TRAINING

Generally

156. This section applies to all Staff who are exposed to and required to work with asbestos including supervisory and maintenance personnel.

Type and scope of instruction and training required

157. Provide instruction and training to all such Staff (including those with supervisory functions) on the hazards, risks and controls as assessed for their particular work and ensure that any Asbestos Licensed Contractor appointed by the Provider meets the requirements of Health and Safety Law in terms of their competence with asbestos. Health and Safety Executive Guidance L143 and HSG 247 provides a list of requirements for persons who work with asbestos.

158. As a minimum provide all such Staff, including temporary Staff, with:

- Training and assessment in line with the ACOP L143 and HSG 247 for the Training of Asbestos Removal Operatives; and
- Safe Pass Training: Where Staff or supervisors are required to operate plant or equipment covered by specific training requirements of Health and Safety Law, ACOPs or guidelines then such training should also be provided.

159. Maintain on site proof that training has been provided in accordance with the above.

Training in maintenance of control equipment

160. Ensure that any person carrying out any maintenance or servicing of exhaust ventilation equipment or other control equipment is competent to carry out the task.

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Training in the use of respiratory protective equipment

161. Provide all Staff members with training on the correct use and maintenance of respiratory protective equipment.

MEDICAL MONITORING

Generally

162. Ensure that Staff have medical examinations in compliance with Law on asbestos (every 3 years for NNLW) and (every 2 years for licensed asbestos removal Staff).

Initial medical

163. Any Staff directing other Staff to undertake Asbestos Works must ensure in accordance with Health and Safety Law that the Staff member has:

- a full work history; and
- a medical examination, relevant to persons who work with asbestos including specific examination of the chest and other tests that may be appropriate prior to starting employment in restricted work;

164. Ensure that each Staff member has this asbestos medical biannually.

165. Meet the cost of all medicals (including any medical directed by the Health and Safety Executive)

Personal medical information

166. Personal medical information of each Staff member remains the property of that Staff member. The Provider will receive certification from the medical practitioner stating whether the Staff member is fit or otherwise for the restricted asbestos work. The Staff member should be encouraged to share their medical information, where appropriate, with the Provider.

167. Where a Staff member leaves the employment of the Provider, ensure that the Staff member is aware of the need to continue with biannual medical examinations.

168. Retain all medical records relating to asbestos for a period of 40 years.

Medical examinations

169. The asbestos medical examinations shall be performed by qualified medical practitioners with specialist qualifications in occupational or respiratory medicine and experience in asbestos-related diseases and conditions.

Asbestos Exposure Register

170. Staff who may have been exposed to asbestos should ensure that their names and appropriate details are entered in the Asbestos Exposure Register administered by the Health and Safety Executive.

SPECIALIST EQUIPMENT

Controlled Wetting Equipment

171. Equipment for the controlled wetting of asbestos containing materials is to be in accordance with the applicable Standard or equivalent. It must effectively wet asbestos–containing materials and suppress asbestos fibres both during and after the asbestos removal process, by multi-point injection of sprayed coatings, insulating board, thermal insulation and coatings on pipes, tanks and vessels, or spraying with low-pressure spray heads of liquid on to insulating boards and other material less than 10mm thick to suppress the release of airborne asbestos.

Negative Pressure Units ("NPU")

172. Portable and/or transportable negative pressure units are to be in accordance with the applicable Standard or equivalent. They are to incorporate HEPA filters to the applicable Standard or equivalent for use in the controlled removal of asbestos-containing materials. This requirement also applies to negative pressure units designed to create negative pressure within a portable contamination unit facility or working enclosure and two part negative pressure units.

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Class H Vacuum Cleaners

173. The operation, cleaning and maintenance of Class H (high hazard) vacuum cleaners is to be in accordance with the applicable Standard or equivalent. They are to incorporate a filter conforming to the applicable Standard or equivalent in the controlled removal of asbestos-containing materials.

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EXTERNAL WORKS

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EXTERNAL WORKS

MATERIALS

Hardcore

001. For hardcore in beds and when filling to make up levels under paving, use only good clean hard brick, concrete, hard tiles, stone or ballast, broken before placing to pass a 75mm ring and free from all rubbish and deleterious material.

002. Thoroughly consolidate hardcore to the required levels and contours with a roller, vibrating roller or mechanical punner. Take care that no damage is done to adjacent work.

003. Blind surfaces of hardcore with sand, ashes or other fine material approved by the Client's Representative.

Sub-bases to Roads.

004. Type 1 Sub-base to be unbound mixture made from crushed rock, crushed slag, crushed concrete, recycled aggregates or well burnt non-plastic shale and may contain up to 10% by mass of natural sand that passes a 4 mm test sieve.

005. Type 2 Sub-base to be unbound mixture made from crushed rock, crushed slag, crushed concrete, recycled aggregates or well burnt non-plastic shale, natural gravel and natural sand that passes a 4 mm test sieve.

Precast concrete paving flags

006. Use only precast concrete paving flags of a standard and quality complying with the applicable Standard or equivalent, approved by the Client's Representative, made from natural and crushed aggregate, hydraulically pressed, of uniform natural colour throughout and with a non slip surface finish. Tactile paving flags are to be in accordance with the applicable Standard or equivalent and laid in accordance with that Standard.

007. Lay flags true and square on cement mortar (1:3) dabs with 6mm joints, or sand filled joints and pointed up with cement and sand (1:6) mortar in accordance with the applicable Standard or equivalent and cleaned off on completion.

Precast concrete edgings and kerbs

008. Lay precast concrete edgings and kerbs on edge with top 6mm below the finished level of the adjacent surface and laid in accordance with the applicable Standard or equivalent. All precast concrete edgings and kerbs are to be to the applicable Standard or equivalent.

Bond Coat

009. Bond coats should comply with the applicable Standard or equivalent. The minimum target rate of spread to existing substrates should not be less than 0.3kg/ m^2 of residual binder. For application to newly laid substrates the minimum target rate of spread should not be less than 0.2kg/ m^2 of residual binder.

Asphalt Concrete

010. Asphalt concrete is to be in accordance with the applicable Standard or equivalent and PD 6691 for Category B traffic and laid and compacted to BS 594987 or equivalent.

011. Use a petroleum bitumen binder conforming to Table 1 of BS EN 12592 or equivalent.

	Surface Course	**Binder Course**
Asphalt Concrete Paving for Carriageways and Shared Surfaces	Thickness: 40mm Material: AC14 Close Surf to PD 6691 Table B14 Column 1	Thickness: 60mm Material: AC20 Dense Bin to PD 6691 Table B11 Column 3
Asphalt Concrete Paving for Carriageways and Shared Surfaces –	Thickness: 30mm Material: AC14 Close Surf to PD 6691 Table B14 Column 1	Thickness: 70mm Material: AC20 Dense Bin to PD 6691 Table B11 Column 3

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	Surface Course	**Binder Course**
Basecourse Trafficked		
Asphalt Concrete Paving for Carriageways and Shared Surfaces – Surface Course only	Thickness: 30mm Material: AC14 Close Surf to PD 6691 Table B14 Column 1	
Asphalt Concrete Paving for Carriageways and Shared Surfaces and Humps		Thickness: 40mm Material: AC20 Dense Bin to PD 6691 Table B11 Column 3
Asphalt Concrete/Hot Rolled Asphalt to Carriageways and Shared Surfaces	Thickness: 40mm Material: HRA 30/10F Close Surf to PD 6691 Table C2.A Column 4 Surface Treatment: Uncoated chippings	Thickness: 60mm Material: AC20 Dense Bin to PD 6691 Table B11 Column 3
Asphalt Concrete/Hot Rolled Asphalt to Footpaths	Thickness: 25mm Material: HRA 15/10F Close Surf to PD 6691 Table C2.A Column 3 Surface Treatment: Uncoated chippings	Thickness: 50mm Material: AC20 Dense Bin to PD 6691 Table B11 Column 3

012. Asphalt concrete shall be laid by machine on carriageways and may be laid by hand on footpaths.

Hot Rolled Asphalt

013. Hot rolled asphalt is to be in accordance with the applicable Standard or equivalent and PD 6691 for Category B traffic and laid and compacted in accordance with the applicable Standard or equivalent.

	Surface Course
Hot Rolled Asphalt to Carriageways and Shared Surfaces (surface Course only)	Thickness: 40mm Material: HRA 30/10F Close Surf to PD 6691 Table C2.A Column 4 Surface Treatment: Uncoated chippings
Hot Rolled Asphalt to footpaths	Thickness: 25mm Material: HRA 15/10F Close Surf to PD 6691 Table C2.A Column 3 Surface Treatment: Uncoated chippings

014. Ensure all aggregates used for bituminous surfacing materials are sound, clean, hard broken rock graded to and conforming to the applicable Standard or equivalent. Aggregates in the wearing course in contact with the wheels of vehicles shall have a maximum aggregate abrasive value of 16 and a minimum polished stone value of 45. Hot rolled asphalt to be transported and tested to the applicable Standard or equivalent.

Mastic Asphalt to existing Walkways/Flooring

015. Existing concrete surfaces are to be cleared of any possible contaminates and loose chippings/sections to be removed with minor repairs undertaken to allow coating to act as suitable basecoat. Existing outlets and up-stands should be securely fixed and cleaned of any possible contaminates.

016. Mastic asphalt is to be in accordance with the applicable Standard or equivalent and laid and compacted to the applicable Standard or equivalent. The amount of reclaimed asphalt must be at most 10% by mass of the total mixture.

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017. Use a paving grade petroleum bitumen binder conforming to the applicable Standard or equivalent.

	Surface Course
Mastic Asphalt to Walkways and Flooring	Thickness: 20mm Material: Fine aggregate to the applicable Standard or equivalent Surface Treatment: Uncoated chippings Movement Joints: Proprietary within topcoat, at 6 metre centres or above existing structural expansion joints

Chippings

018. Ensure pre-coated chippings comply with and are applied in accordance with the applicable Standard or equivalent.

Chippings to Asphalt Wearing Surface to Carriageway	Pre-coated nominal size 14mm, maximum aggregate abrasion value at 12 and a minimum polished stone value of 55
Coloured Chippings to Asphalt Wearing Surface to Carriageway	Pre-coated Hardened red pigmented 20mm, maximum aggregate abrasion value at 12 and a minimum polished stone value of 55 coated with escorey red epoxy resin
Un-coated Chippings to Asphalt Wearing Surface to footpaths	Clean dry granite chippings of a light colour, nominal size 10mm, distributed at the rate of 1kg/m^2 and rolled in

Thermostatic Road Marking

019. Use hot thermos-plastic road marking to the applicable Standard or equivalent applied as detailed in Traffic Signs Manual Chapter 8, Traffic Safety Measures and Signs for Roadworks and Temporary Situations.

Interlocking brick/block paving

020. Ensure concrete block paving is of uniform colour throughout and of a size, shape and colour to match existing. Block paviors to be in accordance with and laid in accordance with the applicable Standard or equivalent in either herringbone or stretcher bond.

021. Sand for bedding is to be sharp sand or crushed rock fines, not more than 10%, retained on a 5mm BS sieve and evenly graded to Standard GF85)/4/(MP) or equivalent with fine aggregate with clay, silt and fine dust content not more than 3% by mass, and free from deleterious salts and contaminates.

WORKMANSHIP

Formation

022. Thoroughly compact the bottom of stripped or excavated areas to receive base. Remove any obstructions or soft spots and add and compact suitable additional Material to provide level or graded surfaces of equal bearing capacity.

Bases for paving

023. Immediately after compaction of the earth formation, lay a limestone base with limestone dust blinding in a consolidated layer not exceeding 150mm thick compacted with a vibrating roller or mechanical rammer.

Concrete paving flags

024. Unless specified otherwise elsewhere, lay flags to the applicable Standard or equivalent on a prepared stone base to match existing bonding and on a 25mm thick consolidated bed of semi-dry mortar. Use joints 5 10mm wide pointed with cement mortar (1:3) as the Works proceed. Protect completed paving until the pointed joints have set and then brush off and leave clean.

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Asphalt Concrete and Hot Rolled Asphalt

025. Lay asphaltic concrete and hot rolled asphalt paving to a standard and quality approved by the Client's Representative.

026. Lay and compact asphaltic concrete and hot rolled asphalt in restricted areas by methods that produce a compacted finish equivalent to the thickness achieved by heavy rollers.

Kerbs and edgings

027. Bed kerbs and edgings on concrete and haunched half-way up on the back. Form fine open joints between units. Full height upstand is to be 125mm above road or channel level.

028. Drop kerb upstand shall be 0-10mm for pedestrian crossings, and 25mm for vehicular crossings.

Interlocking brick/block paving

029. Ensure that sub-bases are suitably accurate and to the specified gradients before laying paving.

030. Lay block paving on a well graded sand bed vibrated to provide a thoroughly interlocked paving of even overall appearance with regular sand filled joints and accurate to line, level and profile, and thoroughly compact block paving's with vibrating plate compactor as laying proceeds.

031. Cut blocks/paviors neatly and accurately without spalling to give neat junctions at edge restraints and changes in bond.

Stopcock Pits

032. Construct stopcock pit to specified size, including excavation, disposal, earthwork support, backfill, lay 75 mm concrete base and concrete common bricks to the applicable Standard or equivalent to form half brick wall in cement mortar (1:3 30N/mm^2) in stretcher bond, form 2 number holes each not exceeding 55mm nominal size diameter, and fix only surface box supplied by the Water Authority, bedded in cement mortar (1:3)

Lighting Column Bases

033. Construct lighting column base to specified size, including excavation, disposal, earthwork support, backfill, place mass concrete base with cable recess, base size as table below:

Lighting Column Height	Base Size
5m	600mm x 600mm x 750mm deep
6m	600mm x 600mm x 1000mm deep
8m	600mm x 600mm x 1200mm deep
10m	600mm x 600mm x 1500mm deep
12m	600mm x 600mm x 1800mm deep

Pipe Ducts

034. Pipe ducts are to be laid straight to line, true to gradient or level on the specified bedding material, provide 50mm minim um clearance between pipe ducts when they cross, materials to be:

PIPE DUCT FOR:	
General Use	Unplasticised PVC to the applicable Standard or equivalent complete with drawlines and flexible joints
Street Lighting Cables in Footways to Footpaths	32mm diameter Orange alkathene ducting made from polythene or PVC-u marked with the name of street lighting authority and year of manufacture in 6mm high blue lettering along its entire length with no joints allowed
Street Lighting Cables in Carriageways or Parking Areas	160mm diameter PVC-u to the applicable Standard or equivalent complete with flexible joints

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Identification Tape

035. During backfilling of trenches for electricity service cables, lay continuous colour coded, heavy gauge polythene identification tapes, 300mm below the surface along the route of the cable. Marker tape for street lighting cables shall be 150mm wide coloured yellow and printed its length in 100mm high black lettering with the words caution – street lighting Cable below"

Tree Felling/Removal

036. Felling shall consist of the removal of the complete tree, including the stump to below ground level.

037. If the stump is not to be ground out, leave the stump as low to the ground as possible, unless otherwise Instructed by the Client's Representative.

038. When felling trees in open spaces, if there is a delay between felling and stump removal, leave the stump at a height of at least 1m above ground level to prevent people tripping over it.

039. The resultant hole following stump removal is to be backfilled and consolidated with topsoil to ensure a finish level with the surrounding area. For trees in hard surfaces, the hole shall be backfilled with topsoil to 7cm's below the surrounding area. Before leaving the site unattended, reinstate the surface to match the surrounding area and leave the area safe and level with the surrounding area.

040. Deliver advance warning notices at least one week prior to the removal of any tree to neighbouring households where trees adjoining dwellings are required to be removed. The format of the advance warning notice is to be agreed with the Client's Representative.

041. Take due care when felling or removing trees to avoid damage to property, ground surfaces, animals, people, vegetation and surrounds. Ensure that branches, limbs, trees and stumps are removed using a safe system which complies with recognised procedures. The Client's Representative will require the Provider, in certain cases, to provide a method statement of procedure. Before the Work can be undertaken in such cases, the Client's Representative must approve the working system outlined in the statement.

042. All damage resulting from the felling or removal of trees is the responsibility of the Provider. Carry out all rectification and reinstatement to the satisfaction of the Client's Representative.

043. Remove all arisings from site.

Stump Removal

044. The Client's Representative will specify to the Provider whether stumps are to be grubbed up or ground out.

045. Where trees are removed from streets (hard paved and bitumen macadam areas), the surface must be reinstated and left safe before moving on to the next operation on site.

046. Any hollow remaining after stump removal shall be backfilled and consolidated with a layer of topsoil, 70mm below the surrounding ground level and the original surfacing reinstated. Great care must be taken by the Provider not to damage any services.

047. Where trees are removed from lawns, shrub areas etc., and the location shall be reinstated before proceeding to the next operation. Reinstatement shall consist of backfilling with topsoil and then consolidation. The backfill shall be mounded sufficiently to allow for settlement. Where the surrounding area is grass, sow the new topsoil with an adequate amount of amenity grass seed.

048. Grubbing up of the stump shall consist of the complete removal of the tree stump and roots over 4cms in diameter by hand, machine excavation, winching or other means, trees used as an anchorage for winching operations shall be adequately protected by rubber ties, cordwood or other suitable material in accordance with the applicable Standard or equivalent for tree work

Site/Street Furniture

049. Rotary Driers are to be constructed from:

- Clothes line; 2.6mm diameter, minimum 24m plastic coated line;
- Non-folding arms; 3 or 4 no 25mm diameter aluminium tubes or 25mm x 13mm painted galvanised steel or equivalent section;
- Non-folding stays; 3 or 4 no 2omm diameter aluminium tubes or 13mm x 13mm painted galvanised steel or equivalent section;

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- Brackets: zinc die cast;
- Centre Pole: galvanised hot finished welded hollow section made from steel to the applicable Standard or equivalent, minimum 34mm diameter, minimum 1.7m length; and
- Excavate 450mm deep hole for 300mm x 300mm x 375mm concrete (Gen 3) base, with aluminium tube cast in, backfill and disposal off site.

050. Tubular clothes posts are to be constructed from:

- 50mm heavy duty steel tube 2050mm long;
- Top cross member; 750mm long, twice bored and fitted with 5mm guide rings of 15mm diameter;
- Hitch handles; 5mm diameter bent to butterfly shape with no sharp projections, fitted 1100mm from top of post;
- Fixing lugs; 2 no 200mm x10mm inserted through post at right angles to each other and welded
- Galvanised after manufacture; and
- Excavate 450mm deep hole for 300mm x 300mm x 450mm concrete (Gen 3) base, with post cast in, backfill and disposal off site;

051. Precast concrete clothes posts are to be constructed from:

- Post;125mm x 125mm at base tapered to 90mm x 90mm at top with pyramid top, post 3050mm long, twice holed 75mm from top, and 1500mm from top to accommodate fittings;
- Galvanised hook to top hole, and galvanised "D" shaped tying ring to mid hole; and
- Excavate 550mm deep hole for 450mm x 450mm x 450mm concrete (Gen 3) base, with post cast in, backfill and disposal off site;

052. Litter bins are to be constructed from:

- Hardwood slats on galvanised steel or equivalent frame, and galvanised steel or equivalent liner fixed with a security chain; and
- Ground fixed to insitu concrete (Gen 3) foundation 300mm x300mm x200mm, or post or wall fixed as manufacturer's technical data sheet;

053. Footpath bollards are to comply with the applicable Standard or equivalent and to be constructed from:

- Galvanised tubular steel painted black with bands; and
- Bollards to be set in concrete (Gen 3) base 300mm x 300mm x 375mm concrete base, with high intensity retro-reflective bands set back 500mm from face of kerb to centre of bollard. Excavate, backfill and disposal of excavated materials off site;

Cleaning Existing Paving

054. Clean existing paving with high pressure washer, the Provider is to determine the pressure and any chemical additive necessary to achieve the required level of cleaning. The Provider is to ensure that the pressure washing does not displace any jointing sand/fine aggregate during the cleaning process.

Topsoil and soil ameliorants

055. Prepare undisturbed topsoil in accordance with the applicable Standard. Break up hard ground thoroughly, remove visible roots and large stones with a diameter greater than [75 mm]. Areas to be covered with turf or thick sward are to be rotavated or dig over to full depth of topsoil. At appropriate times treat with a suitable translocated non-residual herbicide.

056. Imported topsoil for multi-purpose use accordance with the applicable Standard for Loamy sand.

057. Imported low fertility topsoil for specific purpose - Low fertility. - soil textural class to the applicable Standard for Sandy loam

058. Sanitised and stabilised composted materials is to be certified to PAS 100 with horticultural parameters:

- pH (1:5 water extract): 7.0-8.7;
- Electrical conductivity (maximum, 1:5 water extract): 200 mS/m;
- Moisture content (m/m of fresh weight): 35-55%;
- Organic matter (minimum): 25%;
- Grading (air dried samples): 99% passing 25 mm screen, and 90% a 10 mm screen mesh aperture;

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- Carbon: Nitrogen ratio (maximum): 20:1;
- Texture: Friable;
- Objectionable odour: Not permitted; and
- Quality Compost Protocol certification: Required.

059. Green compost for soil amelioration to be in accordance with BSi PAS 100:2011 or equivalent, obtained from a PAS 100 (or equivalent) compliant facility.

Spreading Topsoil

060. Spreading topsoil is to be in accordance with the applicable Standard and the following requirements:

- Temporary roads or surfacing: Remove before spreading topsoil;
- Spreading: Spread when reasonably dry, maintaining crumb structure. Do not compact;
- Layers: - Depth (maximum): 150 mm. - Gently firm each layer before spreading the next; and
- Depth after firming and settlement: No greater than 400 mm.

061. The finished levels of topsoil after settlement must be:

- Above adjoining paving or kerbs: 30 mm;
- Within the root spread of existing trees: Unchanged;
- Below dpc of adjoining buildings: Not less than 150 mm;
- Shrub areas: Higher than adjoining grass areas by 30 mm;
- Within root spread of existing trees. Unchanged; and
- Adjoining soil areas. Marry in.

062. Final cultivation of topsoil is to be:

- Compacted topsoil: Break up to full depth;
- Tilth: Loosen, aerate and break up topsoil to a tilth suitable for blade grading;
- Depth: maximum 400 mm;
- Particle size (maximum): 25 mm;
- Timing: Within a few days before planting or sowing;
- Weather and ground conditions: Suitably dry;
- Surface: Leave regular and even;
- Levels: 30mm above surrounding surface;
- Undesirable material brought to the surface;
- Remove visible weeds; and
- Remove roots and large stones with any dimension exceeding 25mm.

063. Grading of topsoil:

- Contours: Smooth and flowing, with falls for adequate drainage; and
- Hollows and ridges: Not permitted.

Seeding/ turfing

064. General Information/Requirements:

- Seeded and Turfed Areas:
    - Growth and development: Healthy, vigorous grass sward, free from the visible effects of pests, weeds and disease;
    - Appearance: A closely knit, continuous ground cover of even density, height and colour; and
    - Climatic conditions: Carry out the work while soil and weather conditions are suitable;.
- Watering:
    - quantity: wet full depth of topsoil;
    - application: even and without displacing seed, seedlings or soil; and
    - frequency: as necessary to ensure the establishment and continued thriving of all seeding/turfing;
- Water restrictions:

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- timing: if water supply is or is likely to be restricted by emergency legislation do not carry out seeding/turfing until instructed. if seeding/turfing has been carried out, obtain instructions on watering;

- Notice, give one week's notice before to the Client's Representative at the following stages:
  - setting out;
  - applying herbicide;
  - applying fertilizer;
  - preparing seed bed;
  - seeding or turfing; and
  - visiting site during maintenance period; and

- Setting out:
  - boundaries: mark clearly; and
  - delineation: in straight lines or smoothly flowing curves as shown on drawings.

065. Preparation

- Soil Requirements:

- Wildflower seeded areas:100mm dressing of low fertility topsoil; or
- Lawn areas: Existing topsoil, incorporated with compost.

- Wildflower Seed Mixture for Wildflower Meadows:

- Supplier: Emorsgate or equivalent approved by the Client's Representative;
- Mixture reference: EM4 or other equivalent approved by the Client's Representative;
- Origin of each species (as defined in Flora Locale's Code of practice for collectors, growers and suppliers of native flora):UK origin; and
- Application rate: 4 g/m².

- Flowering Lawn Seed Mixture for Flowering Lawn:
  - Supplier: Emorsgate or equivalent approved by the Client's Representative;
  - Mixture reference: EL1;
  - Origin of each species (as defined in Flora Locale's Code of practice for collectors, growers and suppliers of native flora): UK origin; and
  - Application rate: 4 g/m².

- Quality of Seed for all Grassed Areas:
  - Freshness: Produced for the current growing season;
  - Certification: Blue label certified varieties:
    - Standard: EC purity and germination regulations;
    - Official Seed Testing Station certificate of germination, purity and composition: Submit when requested; and
  - Samples of mixtures: Submit when requested.

- Quality of Wildflower Seed for Wildflower and Flowering Lawn:
  - Standard: In accordance with Flora Locale's 'Code of practice for collectors, growers and suppliers of native flora';
  - Germination testing: Not required;
  - Freshness of seed: Produced for the current growing season; and
  - Samples: Submit when requested.

- Sowing:
  - General: Establish good seed contact with the root zone;
  - Method: Seed drill, Distribution:2 equal sowings at right angles to each other; and
  - Season: Grass seed generally: April to October.

- Cleanliness
  - Soil and arisings: Remove from hard surfaces; and

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- General: Leave the works in a clean, tidy condition at Completion and after any maintenance operations.

Client's current manufacturers/suppliers/products

066. 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]

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FENCING AND GATES

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FENCING AND GATES

MATERIALS

Generally

001. Follow any timber sizes stated in the Schedule of Rates items rather than any stated in any applicable Standard.

002. Use only galvanised/sheradised ironmongery and fixings.

003. Where the Schedule of Rates refers to posts "not exceeding" a particular size in Orders and for Valuation use the Schedule of Rates item closest to actual post sizes used in the Works.

004. Use cement, water, aggregates and sand as defined in the "Concrete Work" Part of this Specification.

005. Note that different fencing types exist amongst the Properties in a variety of heights and with concrete and metal posts set in earth or concrete.

Timber gates

006. Construct frames with ledge and bracing joints. Bracing shall rise up from the hinged side of the gate.

Metal gates

007. Properly weld together metal gates and grind all welds to a smooth finish, before undertaking galvanising.

Pressure impregnating

008. Where Works are described as 'pressure impregnated with preservative' use pressure pretreated timbers for fencing and gates with organic, solvent-based preservative treatment approved by the Client's Representative. All timber shall receive a double vacuum treatment in accordance with the applicable Standard or equivalent after machining. This treatment shall be a modern, industrial, organic, solvent based wood preservative containing no "red list" biocides. Application must be by low pressure impregnation, giving highly effective protection against wet rot fungi and having a 30 year warranty.

009. Carry out deep cutting, planning and other fabrication before treatment. Where any crosscutting or notching of the pressure impregnated timbers is necessary, liberally treat all new surfaces exposed with a preservative approved by the Client's Representative.

010. Produce a certificate of treatment to cover all timbers processed indicating that the timber has been procured from sources which can independently be verified as being either: from a legal and sustainable source. This shall comply with the UK Timber Regulations (UKTR).

Wood preservatives

011. Thoroughly clean all woodwork to be treated and ensure it is perfectly dry before application. Apply (by brush, trowel, injection or gravity irrigation treatment) the preservative in two coats and work it into all joints. Follow with the second coat before the first coat has dried out. Use only products registered by the Health and Safety Executive (HSE) and listed on the HSE website under non-agricultural pesticides.

Concrete mix

012. Ensure all concrete used for bedding in posts is Gen1 as defined in the "Concrete Works" Part of this Specification.

Nails and screws

013. Ensure nails, screws, clips, wire and other ancillaries and fixings are galvanised and as defined in the "Woodwork" Part of this Specification.

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WORKMANSHIP

Fence route

014. Clear vegetation or other obstructions along fence routes. Remove any humps and fill any hollows with compacted soil to provide a clear way, permitting unobstructed passage on both sides of the fence, approximately level or with smooth undulations.

015. Identify any services in the ground before excavations commence and take appropriate precautions to avoid any damage.

Fence erection

016. Erect fences as follows:

- with posts truly vertical and tops to line;
- with struts uniformly angled to give maximum support;
- with straining posts in strained wire fences located at each end, at each change in direction and at each acute change in level;
- with struts to all straining posts in the direction of the line of the fence; and
- with posts fixed, but if the ground is soft or a post or strut cannot be securely fixed in the manner specified, set in concrete (or additional concrete) or otherwise as approved by the Client's Representative, to make the fence secure.

Fixing posts

017. Fix posts as specified in the applicable Standard or equivalent for the type of fencing involved and in accordance with the following:

- in concrete:
- use appropriate size and depth for size of post; and
- use appropriate size and depth for size of struts;
- using holes with vertical sides; and
- where using:
    - concrete in holes: half fill the hole with concrete with earth above, both well rammed;
    - earth filled holes: keep the hole as small as possible consistent with refilling and compacting with earth (Cleft Chestnut Pale Fencing only); or
    - driven posts: drive without damaging the posts. (Cleft Chestnut Pale Fencing only)

Post spurs

018. Use metal post spurs, where Instructed by the Client's Representative.

Painting

019. Ensure decoration specified in the Schedule of Rates matches the existing unless Instructed otherwise.

Maintaining protective treatments

020. Avoid cutting on site. Make good any damaged protective coatings (e.g. galvanising) to the standard of protection given by the specified coating. Do not cut timber treated with preservative where it will be in the ground. Apply preservative coating to any cuts to treated timber.

Chain-link Fencing

021. Chain-link fencing shall consist of:

- Galvanised steel or equivalent chain link: 50mm mesh, 3.5mm galvanised, fixing to line wire with crimping rings at 300mm centres;
- Line wire: 3mm nominal diameter galvanised plain mild steel wire;
- Posts: for 900mm high fencing, post to be 100mm x 100mm x 1450mm long, parallel sided, weathered on top, reinforced with 4 Nr 6mm diameter mild steel, bars laced with binding wire at 200mm centres, intermediate posts, three times holed, corner and end posts, three times holed both ways, and once holed one way with 12mm diameter holes. End and corner posts to have mortice and 10mm diameter bolt holes to engage stays. Three number line wires at 430mm centres. Excavation for corner and end post holes 450mm x 450mm x 675mm, excavation for intermediate post holes 250mm x 250mm x 675mm, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth;

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- Posts: for 1200mm high fencing, post to be 125mm x 125mm x 1870mm long, parallel sided, weathered on top, reinforced with 4 Nr 6mm diameter mild steel, bars laced with binding wire at 200mm centres, intermediate posts, three times holed, corner and end posts, three times holed both ways, and once holed one way with 12mm diameter holes. End and corner posts to have mortice and 10mm diameter bolt holes to engage stays. Three number line wires at 580mm centres, nominal 3.5mm diameter. Excavation for corner and end post holes 450mm x 450mm x 675mm, excavation for intermediate post holes 250mm x 250mm x 675mm, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth;
- Posts: for 1800mm high fencing, post to be 125mm x 125mm x 2620mm long, parallel sided, weathered on top, reinforced with 4 Nr 6mm diameter mild steel, bars laced with binding wire at 200mm centres, straight run posts, five times holed, corner and end posts, five times holed both ways, and once holed one way with 12mm diameter holes, End and corner posts to have mortice and 10mm diameter bolt holes to engage stays. Three number line wires at 880mm centres, nominal 4mm diameter. Excavation for corner and end post holes 450mm x 450mm x 850mm, excavation for intermediate post holes 300mm x 300mm x 850mm, 100mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth;
- Stays: for chain-link fencing fixed to end and corner posts in-line with fencing, size and length of stay to match height of fence:
    - 900mm Fence = 75mm x 75mm x 1500mm stay;
    - 1200 mm Fence = 100mm x 75mm x 1830mm stay;
    - 1800mm Fence = 100mm x 85mm x 2590mm stay; or
    - alternative in accordance with the applicable Standard or equivalent; and
- Stay parallel sided, splayed and holed at top for stay bolt fixing to posts on top, reinforced with 4 Nr 6mm diameter mild steel, bars laced with binding wire at 200mm centres, three times holed with 12mm diameter holes, bolts for fixing stays 125mm long x 10mm diameter with nut and washer, eye bolts to all cut ends. Excavation for stay holes 600mm x 300mm x 525mm, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth.

Vertical Board Fencing

022. Vertical timber boarded fencing shall consist of:

- 950mm Vertical board (rounded top with bull wire):
    - 2 nr. 44mmx 69mm splayed horizontally softwood runners bolted with 200mm x 10mm diameter bolt with nut and washer at connection of runner and post;
    - 900mm long x 94mm x 20mm board with rounded top, fixed vertically at 114mm centres to runners; and
    - Bull-wire 3.15mm diameter (10SW) galvanised mild steel to the applicable Standard stapled to horizontal runners;
- 1050mm Vertical board (rounded top):
    - 2 nr. 44mmx 69mm splayed horizontally softwood runners bolted with 200mm x 10mm diameter bolt with nut and washer at connection of runner and post;
    - 1000mm long x 144mm x 20mm board with rounded top, fixed vertically at 164mm centres to runners;
- 1050mm Vertical board (square top):
    - 2 nr. 44mmx 69mm splayed horizontally softwood runners bolted with 200mm x 10mm diameter bolt with nut and washer at connection of runner and post; and
    - 1000mm long x 144mm x 20mm board with splayed top, fixed vertically at 164mm centres to runners;
- 1050mm Vertical board (square top with bull-wire):
    - 2 nr. 44mmx 69mm splayed horizontally softwood runners bolted with 200mm x 10mm diameter bolt with nut and washer at connection of runner and post;
    - 1000mm long x 144mm x 20mm board with splayed top, fixed vertically at 164mm centres to runners; and

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- Bull-wire 3.15mm diameter (10SW) galvanised mild steel to the applicable Standard stapled to horizontal runners;

- 1250mm Vertical board (square top):
  - 2 nr. 44mmx 69mm splayed horizontally softwood runners bolted with 200mm x 10mm diameter bolt with nut and washer at connection of runner and post; and
  - 1200mm long x 144mm x 20mm board with splayed top, fixed vertically at 164mm centres to runners;

- 1675mm Vertical board (square top):
  - 3 nr. 44mmx 69mm splayed horizontally softwood runners bolted with 200mm x 10mm diameter bolt with nut and washer at connection of runner and post; and
  - 1600mm long x 144mm x 20mm board with splayed top, fixed vertically at 164mm centres to runners;

- 1675mm Vertical board (square top with bull-wire):
  - 3 nr. 44mmx 69mm splayed horizontally softwood runners bolted with 200mm x 10mm diameter bolt with nut and washer at connection of runner and post;
  - 1600mm long x 144mm x 20mm board with splayed top, fixed vertically at 164mm centres to runners; and
  - Bull-wire 3.15mm diameter (10SW) galvanised mild steel to the applicable Standard stapled to horizontal runners;

- 1875mm Vertical board (square top):
  - 3 nr. 44mmx 69mm splayed horizontally softwood runners bolted with 200mm x 10mm diameter bolt with nut and washer at connection of runner and post; and
  - 1800mm long x 144mm x 20mm board with splayed top, fixed vertically at 164mm centres to runners;

- 1875mm Vertical board (square top) with bull-wire:
  - 3 nr. 44mmx 69mm splayed horizontally softwood runners bolted with 200mm x 10mm diameter bolt with nut and washer at connection of runner and post;
  - 1800mm long x 144mm x 20mm board with splayed top, fixed vertically at 164mm centres to runners; and
  - Bull-wire 3.15mm diameter (10SW) galvanised mild steel to the applicable Standard stapled to horizontal runners;

- 1050mm Vertical board (double narrow board):
  - 2 nr. 44mmx 69mm splayed horizontally softwood runners bolted with 200mm x 10mm diameter bolt with nut and washer at connection of runner and post;
  - Wide board: - 1000mm long x 144mm x 20mm splayed top board, fixed vertically at 204mm centres; and
  - 2 nr narrow boards: – 1000mm long x 72mm 20mm splayed top and fixed vertically to form evenly spaced infill (20mm spaces between all boards);

- 1050mm Vertical board (triple narrow board)
  - 2 nr. 44mmx 69mm splayed horizontally softwood runners bolted with 200mm x 10mm diameter bolt with nut and washer at connection of runner and post;
  - Wide board: - 1000mm long x 144mm x 20mm splayed top board, fixed vertically at 420mm centres; and
  - 3 nr narrow boards:– 1000mm long x 72mm x 20mm splayed top and fixed vertically at 92mm centres to form infill (20mm spaces between all boards);

- 1050mm Vertical board (picket):
  - 2 nr. 44mmx 69mm splayed horizontally softwood runners bolted with 200mm x 10mm diameter bolt with nut and washer at connection of runner and post; and
  - 1000mm long x 72mm x 20mm splayed top board, fixed vertically at 144mm centres; (72mm spaces between all boards);

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- 1050mm Vertical board (staggered height picket):
    - 3 nr. 44mmx 69mm splayed horizontally softwood runners bolted with 200mm x 10mm diameter bolt with nut and washer at connection of runner and post; and
    - Alternate 1000mm/650mm long x 72mm x 20mm splayed top board, fixed vertically at 144mm centres (72mm spaces between all boards);
- 1800mm Diagonal board:
    - 3 nr. 44mm x 69mm splayed horizontally softwood runners bolted with 200mm x 10mm diameter bolt with nut and washer at connection of runner and post; and
    - 144mm x 20mm splayed top edge, fixed diagonally (45% to horizontal) at 175mm centres, splayed ends to board;
- 1800mm Diagonal board (with bull-wire):
    - 3 nr. 44mmx 69mm splayed horizontally softwood runners bolted with 200mm x 10mm diameter bolt with nut and washer at connection of runner and post;
    - 144mm x 20mm splayed top edge, fixed diagonally (45% to horizontal) at 164mm centres, splayed ends to board (20mm spaces between all boards); and
    - Bull-wire 3.15mm diameter (10SW) galvanised mild steel to the applicable Standard stapled to horizontal runners;
- Posts: for 1050mm high fencing:
    - Post to be 100mm x 100mm x 1350mm long, parallel sided , weathered in one direction, reinforced with 4 Nr 6mm diameter mild steel, bars laced with binding wire at 200mm centres, twice times holed both directions with 12mm diameter holes;
    - Posts at 1800mm centres; and
    - Excavation for post holes 300mm x 300mm x 425mm, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth;
- Posts: for 1250mm high fencing:
    - Post to be 100mm x 100mm x 1550mm long, parallel sided , weathered in one direction, reinforced with 4 Nr 6mm diameter mild steel, bars laced with binding wire at 200mm centres, twice times holed both directions with 12mm diameter holes;
    - Posts at 1800mm centres; and
    - Excavation for post holes 300mm x 300mm x 425mm, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth;
- Posts: for 1675mm high fencing:
    - Post to be 125mm x 125mm x 2250mm long, parallel sided , weathered in one direction, reinforced with 4 Nr 6mm diameter mild steel, bars laced with binding wire at 200mm centres, three times holed both directions with 12mm diameter holes;
    - Posts at 1800mm centres; and
    - Excavation for post holes 300mm x 300mm x 725mm, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth; or
- Posts: for 1800mm and 1875mm high fencing:
    - Post to be 125mm x 125mm x 2440mm long, parallel sided , weathered in one direction, reinforced with 4 Nr 6mm diameter mild steel, bars laced with binding wire at 200mm centres, three times holed both directions with 12mm diameter holes;
    - Posts at 1800mm centres; and
    - Excavation for post holes 300mm x 300mm x 800mm, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth.

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Garden Rail Fencing

023. Garden rail fencing 450mm high consisting of:

- 225mm x 50mm softwood horizontal rail with splayed top edge bolted with 150mm long x 9mm diameter bolts with nuts and washers to posts; and
- Concrete posts 750mm long x 75mm x75mm with splayed top edge with two 11mm diameter holes, Excavation for post holes 300mm x 300mm x 425mm, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth.

Cleft Chestnut Pale Fencing

024. Cleft Chestnut Pale Fencing1200mm high to the applicable Standard, type CW120 consisting of:

- 3 lines of (4 strands) twisted wire at 450mm spacing between wire and 75mm spaces between 1200mm long pales;
- 125mm x 125mm x 2050mm long wooden intermediate posts at 2250mm centres;
- 125mm x 125mm x 1870mm long wooden corner posts;
- 100mm x 75mm x 1830mm long wooden straining posts; and
- Posts driven into earth, minimum 300mm deep.

Open Mesh Steel Panel Fencing (General Purpose Grade)

025. Open mesh panel fencing 2000mm high consisting of:

- 50mm x 50mm mesh welded at each intersection, 4mm diameter wire, each mesh panel to be 3025mm wide x 2000 mm high with minimum of 2 horizontal "v" rails to provide rigidity, fixings and clamps to posts as manufacturer's technical data sheet, all wire to be green organic powder coated to the applicable Standard; and
- Posts: galvanised rectangular hollow section, powder coated to match mesh panels.

Metal Fencing

026. 900mm High Steel Bow Topped Fencing constructed from:

- 2 no 40mm x 10mm mild steel horizontal rails with top rail holed at 112mm centres with 13mm diameter holes;
- 540mm girth x 40mm x 10mm intermediate mild steel support once bent and welded centrally to lower horizontal rail with 150mm x 150mm x10mm mild steel base plate welded on;
- 13mm diameter mild steel Uprights with bow tops overall height 815mm welded to the 2 no horizontal rails, Uprights at max 112mm centres;
- Each end of horizontal rail fixed to lug of post with 1 no 6mm diameter x 50mm long mild steel bolt with lock nut and washer.
- 1175mm long x 40mm x 40mm x 3.2mm mild steel hollow section intermediate posts with 4no 40mm x10mm x 3.2mm x 50mm long lugs welded on, each lug with 6mm diameter hole, 150mm x 150mm x 10mm mild steel base plate welded on the base and solid mild steel capping welded to top of posts. Posts at 2600mm centres; or
- 1175mm long x 40mm x 40mm x 3.2mm x 50mm long mild steel hollow section end posts with 2no 40mm x10mm x3.2mm lugs welded on, each lug with 6mm diameter hole, 150mm x 150mm 10mm mild steel base plate welded on and solid mild steel capping welded to top of posts.

All components to be galvanised after manufacture and assembly.

Excavation for intermediate and end post holes 300mm x 300mm x 600mm deep, and 300 x 300mm x 300mm for intermediate supports, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth.

027. 1200mm High Steel Bow Topped Fencing constructed from:

- 2 no 40mm x 10mm mild steel horizontal rails with top rail holed at 112mm centres with 13mm diameter holes;
- 540mm girth x 40mm x 10mm intermediate mild steel support once bent and welded centrally to lower horizontal rail with 150mm x 150mm x 10mm mild steel base plate welded on;
- 13mm diameter mild steel uprights with bow tops overall height 815mm welded to the 2 no horizontal rails, Uprights at 12mm centres;

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- Each end of horizontal rail fixed to lug of post with 1 no 6mm diameter x 50mm long mild steel bolt with lock nut and washer; and
- 1650mm long x 40mm x 40mm x 3.2mm mild steel hollow section intermediate posts with 4no 40mm x 10mm x3.2mm x 50mm long lugs welded on, each lug with 6mm diameter hole, 150mm x 150mm x 10mm mild steel plate welded on the base and solid mild steel capping welded to top of posts. Posts at 2600mm centres; or
- 1650mm long x 40mm x 40mm x 3.2mm mild steel hollow section end posts with 2no 40mm x 10mm x3.2mm lx 50mm long lugs welded on, each lug with 6mm diameter hole, 150mm x 150mm 10mm mild steel base plate welded on and solid mild steel capping welded to top of posts.

All components to be galvanised after manufacture and assembly.

Excavation for intermediate and end post holes 300mm x 300mm x 600mm deep, and 300 x 300mm x 300mm for intermediate supports, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth.

028. 970mm High Steel Double Bow Topped Fencing constructed from:

- 2 no 40mm x 10mm mild steel horizontal rails with top rail holed at 103mm centres with 13mm diameter holes;
- 13mm diameter mild steel Uprights with bow tops overall height 885mm welded to the 2 no horizontal rails, Uprights at 103mm centres;
- Extra bow tops, 13mm diameter mild steel extra bow tops to match profile of bow tops on uprights, both ends welded to bow tops on uprights;
- Each end of horizontal rail fixed to lug of post with 1 no 10mm diameter x 50mm long mild steel bolt with lock nut and washer; and
- 1325mm long x 40mm x 40mm x 3.2mm mild steel hollow section intermediate posts with 4no 40mm x 10mm x 3.2mm x 50mm long lugs welded on, each lug with 12mm diameter hole, 150mm x 150mm x 10mm mild steel plate welded on the base and solid mild steel capping welded to top of posts. Posts at 2000mm centres; or
- 1325mm long x 40mm x 40mm x 3.2mm mild steel hollow section end posts with 2no 40mm x 10mm x3.2mm x 50mm long lugs welded on, each lug with 6mm diameter hole, 150mm x 150mm 10mm mild steel plate welded on the base and solid mild steel capping welded to top of posts.

All components to be galvanised after manufacture and assembly.

Excavation for intermediate and end post holes 300mm x 300mm x 600mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth.

029. 1010mm High Steel Bow Topped Fencing Fixed to wall constructed from:

- 2 no 40mm x 10mm mild steel horizontal rails with top rail holed at 112mm centres with 13mm diameter holes;
- 13mm diameter mild steel Uprights with bow tops overall height 590mm welded to the 2 no horizontal rails, Uprights at 112mm centres;
- Each end of horizontal rail fixed to lug of post with 1 no 6mm diameter x 50mm long mild steel bolt with lock nut and washer; and
- 975mm long x 40mm x 40mm x 3.2mm mild steel hollow section intermediate posts with 4no 40mm x 10mm x3.2mm x 50mm long lugs welded on, each lug with 12mm diameter hole, solid mild steel capping welded to top of posts. Posts at 1900mm centres; post grouted into prepared mortice in brickwork with cement mortar (1:4); or
- 1325mm long x 40mm x 40mm x 3.2mm mild steel hollow section end posts with 2 no 40mm x 10mm x3.2mm x 50mm long lugs welded on, each lug with 12mm diameter hole, solid mild steel capping welded to top of posts, end post supported by extended wall foundations.

All components to be galvanised after manufacture and assembly.

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030. 1000mm High Steel Vertical Bar Railings with separate top rail constructed from:

- 3 no 50mm x 30mm x 2.5mm mild steel rectangular hollow sections horizontal rails;
- 16mm diameter mild steel bars 610mm long, both ends welded to horizontal bars, Bars at maximum 115mm centres;
- Ends of horizontal rails welded to posts; and
- 1325mm long x 50mm x 30mm x3.25mm mild steel rectangular hollow section post, mitre cut and butt welded to horizontal rails, with 150mm x 150mm x 10mm mild steel plate welded on base, posts to have 2 no 12mm diameter holes drilled for M10 x 75mm long galvanised steel or equivalent fixings, and 3 no 12mm diameter galvanised drain holes all on the centreline of post and on both sides of panel, posts at 2000mm maximum centres.

All components to be galvanised after manufacture and assembly.

Excavation for intermediate and end post holes 300mm x 300mm x 400mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth.

031. 1000mm High Steel Vertical Bar Railings with separate top rail constructed from:

- 1 no 50mm x 30mm x 2.5mm mild steel rectangular hollow section horizontal rail set into sliding sockets of posts;
- 2 no 40mm x 12mm mild steel horizontal intermediate rails, both ends once drilled with 6mm diameter hole and bolted to lugs of posts with 6mm diameter bolts 40mm long with lock nuts and washers;
- 16mm diameter mild steel bars 580mm long, both ends welded to horizontal bars, Bars at maximum115mm centres; and
- 1325mm long x 50mm x 30mm x 3.25mm mild steel rectangular hollow section intermediate post with 4 no 40mm x 10mm x 3.2mm x 50mm long lugs welded on, each lug drilled for 6mm diameter hole, 2 no 60mm long mild steel hollow sections welded on to form sliding socket to carry 50mm x 30mm x 3.2mm mild steel hollow section top rails, with 150mm x 150mm x 10mm mild steel plate welded on base and solid mild steel capping welded to top of post, posts at 2000mm maximum centres; or
- 1325mm long x 50mm x 30mm x 3.25mm mild steel rectangular hollow section end post with 2 no 40mm x 10mm x 3.2mm x 50mm long lug welded each lug drilled for 6mm diameter hole, 1 no 60mm long mild steel hollow sections welded on to form sliding socket to carry 50mm x 30mm x 3.2mm mild steel hollow section top rails, with 150mm x 150mm x 10mm mild steel plate welded on base and solid mild steel capping welded to top of post.

All components to be galvanised after manufacture and assembly.

Excavation for intermediate and end post holes 250mm x 250mm x 400mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth.

032. 1100mm Steel Barrier Railings constructed from;

- 50mm x 25mm thick mild steel horizontal top rail;
- 50mm x 10mm mild steel horizontal bottom rail;
- 15mm x15mm vertical mild steel bars 990mm long, both ends welded to horizontal rails, bars at maximum 114mm centres, Central vertical bar to extend down into concrete base;
- Ends of horizontal bottom rails welded to posts, top rail welded to posts as continuous length for length of barrier – all joints in top rail welded to obtain a smooth, continuous finish; and
- 1525mm long x 50mm x50mm mild steel bar intermediate post welded to horizontal rails, posts at 1800mm centres; or
- 1525mm long x 50mm x50mm mild steel bar end post welded to horizontal rails.

All components to be galvanised after manufacture and assembly.

Excavation for centre support, intermediate and end post holes 250mm x 250mm x 400mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth.

033. 1100mm High Steel Barrier Railings fixed to Wall constructed from:

- 50mm x 25mm thick mild steel horizontal top rail;
- 50mm 10mm mild steel horizontal bottom rail;

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- 15mm x15mm vertical mild steel bars 990mm long, both ends welded to horizontal rails, bars at maximum 114mm centres, Central vertical bar to extend down and be grouted into 40mm x 225mm deep pocket drilled into top of existing or new 215mm thick masonry retaining wall;
- Ends of horizontal bottom rails welded to posts, top rail welded to posts as continuous length for length of barrier – all joints in top rail welded to obtain a smooth, continuous finish; and
- 1525mm long x 50mm x50mm mild steel bar intermediate post welded to horizontal rails, intermediate posts at 1800mm centres, posts grouted into 75mm diameter x 450mm deep pockets drilled into top of existing or new 215mm thick masonry retaining walls; or
- 1525mm long x 50mm x50mm mild steel bar end post welded to horizontal rails, posts grouted into 75mm diameter x 450mm deep pockets drilled into top of existing or new 215mm thick masonry retaining walls.

All components to be galvanised after manufacture and assembly.

034. 1800mm High Steel Post Chain Link Fence constructed from:

- Plastic coated steel chain link heavy pattern wire to be Grade "A" (wire core to be zinc coated) 1800mm wide fixed securely to line wires with 2mm nominal plastic coated wire ties Grade "A";
- 3 no strands, plastic coated zinc coated mild steel wire;
- Intermediate posts, 2450mm long, 50mm x 50mm x 3.2mm mild steel rectangular hollow section with plastic insert cap, 3 times drilled for 3mm diameter plastic coated line wire, Posts at 3000mm centres;
- Straining posts: 2325mm long x38mm x 38mm x 2.6mm rectangular hollow section;
- End posts: 2450mm long x 50mm x 50mm x 3.2mm mild steel rectangular hollow section with plastic insert cap, 3 times drilled for 3mm diameter plastic coated line wire;
- Stay: 2200mm long x 25mm x25mm x 2mm mild steel hollow section, 2 times obliquely drilled for 3mm diameter plastic coated line wire; and
- Strut: 500mm long x 25mm x25mm x 2mm mild steel hollow section, one end welded to post, other end obliquely welded to stay.

All posts, stays and struts galvanised after manufacture.

Excavation for intermediate and end post holes 450mm x 450mm x 750mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth.

Excavation for stay and strut post holes 700mm x 450mm x 450mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth.

035. 2440mm High Steel Paladin Type Fencing constructed from:

- Panels: 2440mm x 3025mm long welded mesh (6.0mm diameter horizontal wire, 5.0m diameter vertical wire), each panel having 3 "V" beams built into mesh which span horizontally acting as reinforcing rails, green coloured mesh size 200mm x 25mm;
- Posts: 60 x 60mm mild steel rolled hollow section, green coloured, resistance to bending 8.30m^3, with threaded inserts fitted to front face, fitted with plastic insert cap, supplied with 25mm x25mm slotted clamp bars and 7 no M8 tamper resistant bolts, Posts and clamp bars polyester powder coated green at 2975mm centres; and
- Excavation for post holes 300mm x 300mm x 700mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth.

036. 2000mm High Steel Paladin Type Fencing constructed from:

- Panels: 2000mm x 3025mm long welded mesh (6.0mm diameter horizontal wire, 5.0m diameter vertical wire), each panel having 3 "V" beams built into mesh which span horizontally acting as reinforcing rails, green coloured mesh size 200mm x 25mm;
- Posts: 60 x 60mm mild steel rolled hollow section , green coloured, resistance to bending 8.30m^3, with threaded inserts fitted to front face, fitted with plastic insert cap, supplied with 25mm x25mm slotted clamp bars and 7 no M8 tamper resistant bolts, Posts and clamp bars polyester powder coated green at 2975mm centres; and
- Excavation for post holes 300mm x 300mm x 700mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth.

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Steel Palisade Fencing

037. 2400mm High Steel Palisade fencing constructed from:

- Pales: Corrugated "D" section, 3mm thick galvanised steel or equivalent, fixed at 152mm centres, with rounded tops to pales if adjacent to over-hanging trees or buildings, otherwise triple pointed and splayed, bottom of fence with 50mm ground clearance;
- Rails: 2 no 50mm x 50mm x 2.75mm galvanised steel or equivalent rails, bolted with shear-nuts;
- Posts: 102mm x 44mm x 7.4mm rolled steel joist (RSJ), Posts at 2.75m centres; and
- Fixings: Galvanised steel or equivalent.

All to be hot dipped galvanised to the applicable Standard or equivalent.

Excavation for post holes 350mm x 350mm or 450mm diameter x 750mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth.

Submit manufacturer's and installer's certificates in accordance with the requirements of the applicable Standard or equivalent.

038. 2000mm High Steel Palisade fencing constructed from:

- Pales: Corrugated "D" section, 3mm thick galvanised steel or equivalent, fixed at 152mm centres, with rounded tops to pales if adjacent to over-hanging trees or buildings, otherwise triple pointed and splayed, bottom of fence with 50mm ground clearance;
- Rails: 2 no 50mm x 50mm x 2.75mm galvanised steel or equivalent rails, bolted with shear-nuts;
- Posts: 102mm x 44mm x 7.4mm rolled steel joist (RSJ), Posts at 2.75m centres; and
- Fixings: Galvanised steel or equivalent.

All to be hot dipped galvanised to the applicable Standard or equivalent.

Excavation for post holes 350mm x 350mm or 450mm diameter x 750mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth.

Submit manufacturer's and installer's certificates in accordance with the requirements of the applicable Standard or equivalent.

Timber Gates

039. Timber single leaved Gates 844mm x 1000mm high constructed from:

- 2no 44mm x 69mm softwood runners splayed horizontal;
- 5 no 1000mm long x 144mm x20mm softwood vertical boards at 175mm centres;
- 1 no 44mm x 69mm softwood brace splayed horizontally and fixed diagonally (upwards from hinged side);
- All nailed together with 51mm long x 3.3mm galvanised plain headed nails (or 55mm x 2.1mm Ring shank galvanised nails);
- Hinges: 2 no 300mm x 40mm x 4mm bat and band hinges, coach bolted with nut, and with 3 no 4.1mm diameter countersunk holes at 100mm centres and screwed;
- Hook Plates: 2 no 100mm x 50mm x4mm with 12mm diameter solid mild steel pin welded on face to suit hinge, plate four times holed with 4.1mm diameter holes and screwed to vertical timber rail, top pin to pint upwards, bottom pin to point downwards;
- Catch: bright zinc coated mild steel trip catch;
- Gate stop: 2 no 1000mm long 20mm softwood fence boards returned to meet gate at both sides, nailed to vertical rail and end of runners; and
- Softwood 850mm long x 50mm x 100mm vertical rail bolted to side of gate post with 2 no 200mm long x 10mm diameter bolts with nut and washer, bolts trimmed flush with nut after fitting and touch painted.

If required:

- Gate Posts: 2 no 1350mm long x 100mm x 100mm precast concrete gate post, weathered in one direction, reinforced with 4 no 6mm diameter mild steel bars laced with binding wire at 200mm centres, twice holed in each direction with 12mm diameter holes; and
- Excavation for post holes 300mm x 300mm x 550mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth.

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040. Timber single leaved Gates 855mm x 1600mm high constructed from:

- 3 no 44mm x 69mm softwood runners splayed horizontal;
- 5 no 1600mm long x 144mm x20mm softwood vertical boards at 175mm centres;
- 2 no 44mm x 69mm softwood brace splayed horizontally and fixed diagonally (upwards from hinged side);
- All nailed together with 51mm long x 3.3mm galvanised plain headed nails (or 55mm x 2.1mm Ring shank galvanised nails);
- Hinges: 2 no 300mm x 40mm x 4mm bat and band hinges, coach bolted with nut, and with 3 no 4.1mm diameter countersunk holes at 100mm centres and screwed;
- Hook Plates: 2 no 100mm x 50mm x4mm with 12mm diameter solid mild steel pin welded on face to suit hinge, plate four times holed with 4.1mm diameter holes and screwed to vertical timber rail, top pin to pint upwards, bottom pin to point downwards;
- Bolt: 250mm bright zinc mild steel padlock bolt, two vertical boards cut to form a 100mm diameter hole allow access to bolt from outside;
- Gate stop: 2 no 1600mm long x 20mm softwood fence boards returned to meet gate at both sides, nailed to vertical rail and end of runners; and
- Softwood 1500mm long x 50mm x 100mm vertical rail bolted to side of gate post with 3 no 200mm long x 10mm diameter bolts with nut and washer, bolts trimmed flush with nut after fitting and touch painted.

If required:

- Gate Posts; 2 no 2250mm long x 125mm x 125mm precast concrete gate post, weathered in one direction, reinforced with 4 no 6mm diameter mild steel bars laced with binding wire at 200mm centres, three times holed in each direction with 12mm diameter holes; and
- Excavation for post holes 300mm x 300mm x 550mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth.

041. Timber single leaved Gates 855mm x 1800mm high constructed from:

- 3 no 44mm x 69mm softwood runners splayed horizontal;
- 5 no 1800mm long x 144mm x20mm softwood vertical boards at 178mm centres;
- 2 no 44mm x 69mm softwood splayed horizontally and fixed diagonally (upwards from hinged side) brace;
- All nailed together with 51mm long x 3.3mm galvanised plain headed nails (or 55mm x 2.1mm Ring shank galvanised nails);
- Hinges: 2 no 300mm x 40mm x 4mm bat and band hinges, coach bolted with nut, and with 3 no 4.1mm diameter countersunk holes at 100mm centres and screwed;
- Hook Plates: 2 no 100mm x 50mm x4mm with 12mm diameter solid mild steel pin welded on face to suit hinge, plate four times holed with 4.1mm diameter holes and screwed to vertical timber rail, top pin to pint upwards, bottom pin to point downwards;
- Bolt: 250mm bright zinc mild steel padlock bolt, two vertical boards cut to form a 100mm diameter hole allow access to bolt from outside;
- Gate stop: 2 no 1800mm long x 20mm softwood fence boards returned to meet gate at both sides, nailed to vertical rail and end of runners; and
- Softwood 1700mm long x 50mm x100mm vertical rail bolted to side of gate post with 3 no 200mm long x 10mm diameter bolts with nut and washer, bolts trimmed flush with nut after fitting and touch painted.

If required:

- Gate Posts: 2 no 2250mm long x 125mm x125mm precast concrete gate post, weathered in one direction, reinforced with 4 no 6mm diameter mild steel bars laced with binding wire at 200mm centres, three times holed in each direction with 12mm diameter holes; and
- Excavation for post holes 300mm x 300mm x 550mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth.

042. Timber single leaved Gates 855mm x 1750mm high Diagonal Boards constructed from:

- 3 no 44mm x 69mm softwood runners splayed horizontal;
- 144mm x20mm softwood diagonal boards at 175mm centres;
- 2 no 44mm x 69mm softwood braces splayed horizontally and fixed diagonally (upwards from hinged side);

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- All nailed together with 51mm long x 3.3mm galvanised plain headed nails (or 55mm x 2.1mm Ring shank galvanised nails);
- Hinges: 2 no 300mm x 40mm x 4mm bat and band hinges, coach bolted with nut, and with 3 no 4.1mm diameter countersunk holes at 100mm centres and screwed;
- Hook Plates: 2 no 100mm x 50mm x4mm with 12mm diameter solid mild steel pin welded on face to suit hinge, plate four times holed with 4.1mm diameter holes and screwed to vertical timber rail, top pin to pint upwards, bottom pin to point downwards;
- Catch: bright zinc coated mild steel trip catch;
- Bolt: 250mm bright zinc mild steel padlock bolt, one diagonal board cut to form hand grip;
- Gate stop: 2 no 20mm x 95mm softwood fence boards returned to meet gate at both sides, nailed to vertical rail and end of runners; and
- Softwood 1600mm long x 50mm x 100mm vertical rail bolted to side of gate post with 3 no 200mm long x 10mm diameter bolts with nut and washer.

If required:

- Gate Posts: 2 no 2250mm long x 125mm x 125mm precast concrete gate post, weathered in one direction, reinforced with 4 no 6mm diameter mild steel bars laced with binding wire at 200mm centres, three times holed in each direction with 12mm diameter holes; and
- Excavation for post holes 300mm x 300mm x 550mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth.

043. Timber two leaved Gates each leaf 1205mm x 1000mm high constructed from:

- 2 no 44mm x 69mm softwood runners splayed horizontal;
- 7 no 1000mm long x 144mm x20mm softwood vertical boards at 175mm centres;
- 2 no 44mm x 69mm softwood braces splayed horizontally and fixed diagonally (upwards from hinged side);
- All nailed together with 51mm long x 3.3mm galvanised plain headed nails (or 55mm x 2.1mm Ring shank galvanised nails);
- Hinges: 2 no 300mm x 40mm x 4mm bat and band hinges, coach bolted with nut, and with 3 no 4.1mm diameter countersunk holes at 100mm centres and screwed;
- Hook Plates: 2 no 100mm x 50mm x4mm with 12mm diameter solid mild steel pin welded on face to suit hinge, plate four times holed with 4.1mm diameter holes and screwed to vertical timber rail, top pin to pint upwards, bottom pin to point downwards;
- Catch: bright zinc coated mild steel trip catch;
- Bolt: 250mm bright zinc mild steel padlock bolt, and drop bolt with ground socket to each leaf; and
- Gate stop: 1 no 20mm x 95mm softwood fence boards returned to meet gate at both sides, nailed to vertical rail and end of runners.

Steel Gates

044. Steel single leaved Bow Topped gate 910mm x 825mm high constructed from:

- 40mm x 10mm mild steel frame surround with top rail holed at 112mm centres with 13mm diameter holes; top and bottom rails to over-run gate width on hinge side for form gate hanging lugs, each lug with 6mm diameter hole, gate fixed to lugs of post with 2 no 6mm diameter x 40mm long hardened steel zinc plated hexagon bolts (half threaded) with lock not and washers;
- 13mm diameter mild steel uprights with bow tops overall height 815mm, welded to horizontal top and bottom rails;
- 2 no 40mm x 10mm x 50mm long mild steel lugs, welded to gate frame;
- 100mm long x 90mm x 10mm mild steel plate as stop, rounded corners on exposed side and welded to gate frame; and
- Bolt: 12mm mild steel bolt with handle holed for padlock and 10mm thick back-plate, welded to gate frame and uprights, keeper designed to receive bolt and to be fitted on site with self-tapping/taping bolts.

All galvanised after manufacture and painted on site.

If required:

- Gate posts: 2 no 1175mm long x 40mm x40mm x3.2mm mild steel hollow section with 40mm wide x 10mm x 50mm mild steel lugs welded on to posts, each lug drilled for 6mm diameter

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bolt, 150mm x 150mm x 10mm mild steel base plate welded to bottom of posts, and solid mild steel capping welded to top;
- Hangers for fixing to end posts: 2 no 40mm wide x 10mm x 50mm lugs, once holed for hanging lug, one end welded to end post; and
- Excavation for post holes 300mm x 300mm x 550mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth.

045. Steel two leaved Bow Topped gate each 1227mm x 825mm high constructed from:

- 40mm x 10mm mild steel frame surround with top rail holed at 112mm centres with 3mm diameter holes; top and bottom rails to over-run gate width on hinge side for form gate hanging lugs, each lug with 6mm diameter hole, gate fixed to lugs of post with 2 no 6mm diameter x 40mm long hardened steel zinc plated hexagon bolts (half threaded) with lock not and washers;
- 13mm diameter mild steel uprights with bow tops overall height 815mm, welded to horizontal top and bottom rails;
- 2 no 40mm x 10mm x 50mm long mild steel lugs, welded to gate frame;
- 100mm long x 90mm x 10mm mild steel plate as stop, rounded corners on exposed side and welded to gate frame;
- Bolt: one leaf only, 12mm mild steel bolt with handle holed for padlock and 10mm thick back-plate, welded to gate frame and uprights, keeper designed to receive bolt and to be fitted on site with self-tapping/taping bolts; and
- Drop bolt: with ground sockets on 315mm 70mm x10mm mild steel back plate welded to both gates.

All galvanised after manufacture and painted on site.

If required:

- Gate posts: 2 no 1175mm long x 40mm x40mm x3.2mm mild steel hollow section with 40mm wide x 10mm x 50mm mild steel lugs welded on to posts, each lug drilled for 6mm diameter bolt, 150mm x 150mm x 10mm mild steel base plate welded to bottom of posts, and solid mild steel capping welded to top;
- Hangers for fixing to end posts: 2 no 40mm wide x 10mm x 50mm lugs, once holed for hanging lug, one end welded to end post; and
- Excavation for post holes 300mm x 300mm x 550mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth.

046. Steel single leaved gate 900mm x 850mm high constructed from:

- 25mm x 25mm 3mm mild steel angle frame surround with corners mitred and welded;
- 7 no 10mm x 10mm mild steel balusters with ends welded to horizontal top and bottom rails;
- 2 no 75mm girth x 6mm diameter mild steel hanging lugs, once bent, welded to gate frame;
- Bolt: 130mm long x 10mm x 10mm mild steel with stop welded on, 225mm girth semi-circular support with ends welded to frame, support and frame holed for bolt; and
- 115mm long x 38mm x 38mm x 3mm mild steel angle as stop for fixing to concrete post rounded on four corners and holed for bolt, welded to 125mm long x 12mm diameter mild steel bolt with lock nut and washer and washer welded on as spot-welded to gate frame; or
- 115mm long x 38mm x 38mm x 3mm mild steel angle as stop for fixing to brickwork rounded on four corners and holed for bolt, welded to 2 no 150mm long a 19mm x 5mm mild steel hanger having fishtailed end.

All galvanised after manufacture and painted on site;

- Hangers for fixing to concrete post: 2 no x 450mm girth x 38mm x 6mm straps, each six times bent and twice holed for and closed with 6mm diameter bolts 50mm long with lock nut and washer, and having 25mm x 6mm diameter tube welded on;
- Hangers for fixing to brickwork: 200mm girth x 12mm diameter hanger, fishtailed one end, other end bent for lug.

047. Steel two leaved gate each leaf 1205mm x 850mm high constructed from:

- 25mm x 25mm 3mm mild steel angle frame surround with corners mitred and welded;
- 10 no 10mm x 10mm mild steel balusters with ends welded to horizontal top and bottom rails;
- 2 no 75mm girth x 6mm diameter mild steel hanging lugs, once bent, welded to gate frame;

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- Bolt on one leaf only: 130mm long x 10mm x 10mm mild steel with stop welded on, 225mm girth semi-circular support with ends welded to frame, support and frame holed for bolt, other leaf holed for bolt;
- Barrel bolt: one leaf only, 375mm long with socket; and
- Stop: one leaf only, 200mm long x 50mm x 6mm.

All galvanised after manufacture and painted on site.

- Hangers for fixing to concrete post: 2 no x 450mm girth x 38mm x 6mm straps, each six times bent and twice holed for and closed with 6mm diameter bolts 50mm long with lock nut and washer, and having 25mm x 6mm diameter tube welded on.
- Hangers for fixing to brickwork: 200mm girth x 12mm diameter hanger, fishtailed one end, other end bent for lug.

048. Paladin single gates 1065mm x 2000mm constructed from:

- Gate frame: 50mm x 50mm x 3mm polyester powder coated galvanised mild steel with mesh as Paragraph 035 above clamped to same with 6 no tamperproof bolts and threaded nut inserts, gate complete with adjustable hinges, drop bolt, ground sockets and latch incorporating slip-bolt for Client's padlock; and
- Colour: to be agreed with the Client's Representative.

If required:

- Gate posts: 80mm x 80mm x 6mm mild steel rolled hollow sections;
- Excavation for post holes 500mm x 500mm x 600mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth; and
- Submit manufacturers and installer's certificates in accordance with the requirements of the applicable Standard or equivalent.

049. Paladin double gates 3600mm x 2000mm constructed from:

- Gate frame: 50mmx 50mm x 3mm polyester powder coated galvanised mild steel with mesh as Paragraph 035 above clamped to same with 6 no tamperproof bolts and threaded nut inserts, gates complete with adjustable hinges, drop bolt, ground sockets and latch incorporating slip-bolt complete with 65mm padlock fixed by welding to gate frame with chain (links 40mm x20mm x 5mm); and
- Colour: to be agreed with the Client's Representative.

If required:

- Gate posts: 200mm x 2000mm x 6mm mild steel rolled hollow sections;
- Excavation for post holes 600mm x 600mm x 750mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth; and
- Submit manufacturers and installer's certificates in accordance with the requirements of the applicable Standard or equivalent.

050. Paladin double gates 5880mm x 2000mm constructed from:

- Gate frame: 50mm x 50mm x 3mm polyester powder coated galvanised mild steel with mesh as Paragraph 035 above clamped to same with 6 no tamperproof bolts and threaded nut inserts, gates complete with adjustable hinges, drop bolt, ground sockets and latch incorporating slip-bolt complete with 65mm padlock fixed by welding to gate frame with chain (links 40mm x20mm x 5mm); and
- Colour: to be agreed with the Client's Representative.

If required:

- Gate posts: 200mm x 200mm x 6mm mild steel rolled hollow sections;
- Excavation for post holes 600mm x 600mm x 750mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth; and
- Submit manufacturers and installer's certificates in accordance with the requirements of the applicable Standard or equivalent.

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051. Paladin single gates 1065mm x 2440mm constructed from:

- Gate frame: 50mm x 50mm x 3mm polyester powder coated galvanised mild steel with mesh as Paragraph 035 above clamped to same with 6 no tamperproof bolts and threaded nut inserts, gate complete with adjustable hinges, drop bolt, ground sockets and latch incorporating slip-bolt for Client's padlock; Colour: to be agreed with the Client's Representative.

If required:

- Gate posts, 80mm x 80mm x 6mm mild steel rolled hollow sections;
- Excavation for post holes 500mm x 500mm x 600mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth; and
- Submit manufacturers and installer's certificates in accordance with the requirements of the applicable Standard or equivalent.

052. Paladin double gates 5880mm x 2440mm constructed from:

- Gate frame, 50mm x 50mm x 3mm powder coated galvanised mild steel with mesh as Paragraph 035 above clamped to same with 6 no tamperproof bolts and threaded nut inserts, gates complete with adjustable hinges, drop bolt, ground sockets and latch incorporating slip-bolt for Client's padlock; and
- Colour: to be agreed with the Client's Representative.

If required:

- Gate posts, 200mm x 200mm x 6mm mild steel rolled hollow sections;
- Excavation for post holes 600mm x 600mm x 750mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth; and
- Submit manufacturers and installer's certificates in accordance with the requirements of the applicable Standard or equivalent.

053. Palisade single gate 900mm or 1200mm x 2000mm high constructed from:

- Pales: D section, 3mm fixed at 152mm centres, with rounded tops to pales if adjacent to over-hanging trees or buildings, otherwise triple pointed and splayed;
- Rails: 2 no 50mm x 50mm x 2.75mm steel rails bolted with shear-nuts;
- Gate: complete with adjustable hinges welded to gate and to post;
- Lockable slip bolt and keep: welded to gate and post;
- Drop bolt: welded to gate and keep cast into road surfacing;
- Fixings; Galvanised steel or equivalent;
- All to be hot dipped galvanised to the applicable Standard; and
- Colour: to be agreed with the Client's Representative.

If required:

- Posts: 100mm x 100mm x 8mm rolled steel square section;
- Excavation for post holes 400mm x 400mm x 750mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth; and
- Submit manufacturers and installer's certificates in accordance with the requirements of the applicable Standard or equivalent.

054. Palisade single gate 1065mm x 2400mm high constructed from:

- Pales: D section, 3mm fixed at 152mm centres, with rounded tops to pales if adjacent to over-hanging trees or buildings, otherwise triple pointed and splayed;
- Rails: 2 no 50mm x 50mm x 2.75mm steel rails bolted with shear-nuts;
- Gate: complete with adjustable hinges welded to gate and to post;
- Lockable slip bolt and keep: welded to gate and post;
- Drop bolt: welded to gate and keep cast into road surfacing;
- Fixings: Galvanised steel or equivalent;
- All to be hot dipped galvanised to the applicable Standard; and
- Colour: to be agreed with the Client's Representative.

If required:

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- Posts: 100mm x 100mm x 8mm rolled steel square section; Excavation for post holes 450mm x 450mm x 600mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth; and
- Submit manufacturers and installer's certificates in accordance with the requirements of the applicable Standard or equivalent.

055. Palisade pair of gate 3000mm x 2000mm high constructed from:

- Pales: D section, 3mm fixed at 152mm centres, with rounded tops to pales if adjacent to over-hanging trees or buildings, otherwise triple pointed and splayed;
- Rails: 2 no 50mm x 50mm x 2.75mm steel rails bolted with shear-nuts;
- Gate: complete with adjustable hinges welded to gate and to post;
- Lockable slip bolt and keep: welded to gate and post;
- Drop bolt: welded to gate and keep cast into road surfacing;
- Fixings: Galvanised steel or equivalent;
- All to be hot dipped galvanised to the applicable Standard; and
- Colour: to be agreed with the Client's Representative.

If required:

- Posts: 100mm x 100mm x 8mm rolled steel square section;
- Excavation for post holes 600mm x 600mm x 750mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth; and
- Submit manufacturers and installer's certificates in accordance with the requirements of the applicable Standard or equivalent.

056. Palisade pair of gate 5880mm x 2000mm high constructed from:

- Pales: D section, 3mm fixed at 152mm centres, with rounded tops to pales if adjacent to over-hanging trees or buildings, otherwise triple pointed and splayed;
- Rails: 2 no 50mm x 50mm x 2.75mm steel rails bolted with shear-nuts;
- Gate: complete with adjustable hinges welded to gate and to post;
- Lockable slip bolt and keep: welded to gate and post;
- Drop bolt: welded to gate and keep cast into road surfacing;
- Fixings: Galvanised steel or equivalent;
- All to be hot dipped galvanised to the applicable Standard; and
- Colour: to be agreed with the Client's Representative.

If required:

- Posts, 200mm x 200mm x 8mm rolled steel square section;
- Excavation for post holes 600mm x 600mm x 750mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth; and
- Submit manufacturers and installer's certificates in accordance with the requirements of the applicable Standard or equivalent.

057. Palisade single gate 1065mm x 2400mm high constructed from:

- Pales: D section, 3mm fixed at 152mm centres, with rounded tops to pales if adjacent to over-hanging trees or buildings, otherwise triple pointed and splayed;
- 2 no 50mm x 50mm x 2.75mm steel rails bolted with shear-nuts;
- Gate complete with adjustable hinges welded to gate and to post;
- Lockable slip bolt and keep welded to gate and post;
- Drop bolt welded to gate and keep cast into road surfacing;
- Fixings; Galvanised steel or equivalent;
- All to be hot dipped galvanised to the applicable Standard; and
- Colour: to be agreed with the Client's Representative.

If required:

- Posts:100mm x 100mm x 8mm rolled steel square section;
- Excavation for post holes 400mm x 400mm x 600mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth; and
- Submit manufacturers and installer's certificates in accordance with the requirements of the applicable Standard or equivalent.

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058. Palisade pair of gate 5880mm x 2440mm high constructed from:

- Pales: D section, 3mm fixed at 152mm centres, with rounded tops to pales if adjacent to over-hanging trees or buildings, otherwise triple pointed and splayed;
- Rails: 2 no 50mm x 50mm x 2.75mm steel rails bolted with shear-nuts;
- Gate: complete with adjustable hinges welded to gate and to post;
- Lockable slip bolt and keep: welded to gate and post;
- Drop bolt: welded to gate and keep cast into road surfacing;
- Fixings: Galvanised steel or equivalent;
- All to be hot dipped galvanised to the applicable Standard; and
- Colour: to be agreed with the Client's Representative.

If required:

- Posts, 200mm x 200mm x 8mm rolled steel square section;
- Excavation for post holes 600mm x 600mm x 750mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth; and
- Submit manufacturers and installer's certificates in accordance with the requirements of the applicable Standard or equivalent.

Guarantees and warranties

059. The Provider must supply to the Client's Representative a copy of all relevant guarantees and warranties, applicable to the products installed when requested by the Client or the Client's Representative

Client's current manufacturers/suppliers/products

060. 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]

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DRAINAGE

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DRAINAGE

MATERIALS

Gullies

001. Ensure grating, sealing plates and other metal accessories used are cast iron or equivalent approved by the Client's Representative.

002. Gullies are to be:

- Roddable trapped clay gullies to the applicable Standard with vertical back inlet, 100mm diameter outlet, galvanised 150mm x 150mm cast iron grating and concrete bed and surround;
- Roddable plastic trapped gully with horizontal back inlet, 100mm outlet, grating to suit and concrete (GEN3) bed and surround;
- Roddable plastic trapped gully with vertical back inlet, 100mm outlet, grating to suit and concrete (GEN3) bed and surround;
- Cast iron footway gully 300mm long, 230mm wide x 280mm deep channelled with 100mm diameter outlet and rodding eye, complete with hinged cast iron grating and concrete (GEN3) bed and surround; and
- Road gullies for connection to combined sewage or storm-water systems are to be precast concrete gully chamber, 375mm diameter internal diameter, 750mm deep with 150mm trapped outlet and rodding eye and stopper to the applicable Standard, kite marked certified complete with cast iron gully grating and frame to Class D400, kite marked certified, hinged at one end so that it cannot be removed from frame, and concrete bed and surround; or
- Road gullies for use with precast channels are to be precast concrete gully chamber, 375mm diameter internal diameter, 750mm deep with 150mm trapped outlet and rodding eye and stopper and frame to Class D400, kite marked certified, hinged at one end so that it cannot be removed from frame, and concrete bed and surround.

003. Galvanised cast iron gully gratings are to be 150mm square.

004. Plastic gully gratings are to be 190mm diameter.

005. Dished cast iron gratings and frames for use at pedestrian areas are to be Class B125 kite marked certified at one end so that it cannot be removed from frame.

006. Precast Concrete gully fenders or surround kerbs are to fit around a 150mm square gully and be bedded solidly in cement sand mortar (1:3) centrally over the gully.

Granular beddings

007. Ensure granular bedding for pipes is:

- Class B granular bedding consisting of broken stone or gravel to the applicable Standard graded 20mm to 5mm for pipes up to 525mm diameter and 40mm to 5mm for pipes over 525mm diameter; and
- Class S granular surround consisting of broken stone or gravel to the applicable Standard graded 10mm to 5mm.

Bricks for manholes etc.,

008. Ensure bricks for manholes are:

- Class B clay engineering bricks conforming to the applicable Standard; or
- Concrete bricks conforming to the applicable Standard.

Manhole Ironwork

009. General purpose pattern galvanised malleable cast iron manhole step irons with 230mm long tails to the applicable Standard Type D Class 1, to be inserted during construction of brickwork to manholes.

010. Galvanised malleable cast iron precast concrete manhole pattern with 80mm tails to the applicable Standard for precast concrete manholes.

011. Manhole ladders are to be installed to the applicable Standard if invert of manhole deeper than 3.0m.

012. Where Instructed to be installed handrails for the edge of benching shall be formed from 25mm diameter solid mile steel bar, galvanised after manufacture in accordance with the applicable Standard.

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013. Manhole safety chains are to be galvanised mild steel short link chain to the applicable Standard Class 1 with one end securely attached to a 16mm diameter galvanised mild steel eyebolt and the other end securely fastened to a suitable galvanised wrought iron hook for attaching to similar eyebolts; Safety chains are to be installed where the diameter of the outgoing pipe is 600mm or greater.

014. Access ladders to manholes are to be mild steel to the applicable Standard or equivalent galvanised after fabrication with 64mm x 19mm stringers and 25mm diameter bar rungs, galvanised surface coating to be at least 85 microns thick.

Precast Manhole Components

015. Precast concrete manhole rings are to comply with the applicable Standard, with bitumen coated joints or preformed jointing strips applied in accordance with the manufacturer's technical data sheet to ensure watertight joints.

016. Precast concrete inspection chambers sections with internal dimension 450mm x 600mm to the applicable Standard, with bitumen coated joints or preformed jointing strips applied in accordance with the manufacturer's technical data sheet to ensure watertight joints.

017. Clean all lifting holes in precast units and grout with cement mortar.

018. Do not use step irons for hoisting or lowering components.

019. Precast concrete cover slabs are to comply with the applicable Standard and are to be reinforced with 12mm diameter mild steel bars at 150mm centres both ways.

Manhole Covers and Frames

020. Manhole covers and frames are to be non-ventilating to the applicable Standard or equivalent, bedded on a gauged Class 1 (3:1) sand/cement mortar centrally over opening, level with surrounding finishes and square with joints in surrounding finishes or with any adjacent buildings.

021. Covers and frames to inspection chambers on house drainage (no vehicular loading) are to be class A15, galvanised steel or equivalent single seal type covers, key lifted with four brass locking screws, 600mm x 450mm clear opening.

022. Covers and frames to inspection chambers on house drainage located in driveways /hard-standings are to be Class B125, black coated with 610mmclear opening with single seal, kite marked certified.

023. Covers and frames to manholes not adjacent to carriageways are to be Class B125, ductile iron black coated with 675mm clear opening with single seal, kite marked certified manholes for foul and surface water drains must have the letters FS and SW respectively cast on the lids, the letters must not be less than 35mm high.

024. Covers and frames to manholes in carriageways and public footpaths adjacent to carriageways are to be Class D400, ductile iron black coated single seal with 675mm clear opening, kite marked certified, manholes for foul and surface water drains must have the letters FS and SW respectively cast on the lids, the letters must not be less than 35mm high.

Manhole Channels

025. Manhole channels:

- Form main channel invert for sizes up to and including 300mm diameter with vitrified clay, precast concrete or PVC-u channel with secure anchorage system. Form channel invert for pies over 300mm diameter in granolithic (cement, sand, 20mm coarse aggregate (1:1:2) concrete 50mm thick, laid over concrete benching and trowelled smooth, the depth of the main channel must not be less than the diameter of the largest pipe;
- Vitrified clay channels shall comply with the applicable Standard, kite marked certified, and bedded and pointed in cement mortar (1:3); and
- Precast concrete channels sections shall comply with the applicable Standard, kite marked certified, and bedded and pointed in cement mortar (1:3).

Plastic Inspection Chambers

026. Plastic inspection chambers are to be 450mm diameter chamber with preformed channels to the applicable Standard for location, installed in accordance with the manufacturer's technical data sheet.

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027. Plastic inspection chambers risers with sealing ring are to be 450mm diameter chamber with preformed channels to the applicable Standard or equivalent for location, height of riser, overall height 460mm effective height 235mm installed in accordance with the manufacturer's technical data sheet.

Precast Concrete Inspection Chambers

028. Precast concrete inspection chambers are to be sectional units with internal dimension 450 x600mm to the applicable Standard, set on and including 150mm concrete (Gen 3) base, make all joints between chamber sections with watertight using either a bituminous coating or a preformed jointing strip.

029. Cover and frame to be either to the applicable Standard Class A15 for house drainage with no vehicular loading, galvanised steel or equivalent single seal flat type cover and frame, key lifted with 4 brass locking screws, 600 x450mm clear opening, bedded in1:3 cement mortar centrally over the opening, and level with surrounding finished, and aligned with joints of paving etc.,

Or

030. Cover and frame to be to the applicable Standard Class B125 for house drainage with vehicular loading with single seal black coated with 610 mm clear opening, bedded in 1:3 cement mortar centrally over the opening, and level with surrounding finish.

031. Step irons to be to the applicable Standard to be inserted where depth of chamber greater than 600mm.

Pipelines

032. Pipes shall be constructed from:

- Clay pipes, bends and junctions for foul or combined drainage are to be vitrified clay to the applicable Standard with flexible joints, kite marked certified;
- Clay pipes, bends and junctions for storm-water drainage are to be vitrified clay to the applicable Standard with flexible joints, kite marked certified;
- Plastic pipes, bends and junctions for foul or storm drainage are to be PVC-u to the applicable Standard with flexible joints, kite marked certified; or
- Concrete pipes, bends and junctions are to be to the applicable Standard with flexible joints, kite marked certified, strength Class 120.

Linear Drainage Channels

033. Linear drainage channels shall be constructed from:

- Proprietary precast concrete linear channel 155mm x 80mm deep x 1000mm long, with galvanised mild steel mesh locking grating, loading Class A15 to the applicable Standard, maximum mesh width 10mm, channel to be bedded and haunched with concrete; or
- Polypropylene "U" section linear channel 100mm x 75mm deep x 1000mm long and black plastic grating to the applicable Standard loading grade A15 for pedestrian use, complete with vertical outlet to suit 110mm diameter PVC-u main drainage pipe, and end caps as required, channel to be bedded and haunched with concrete.

Road Gully Gratings

034. Road gully gratings and frames are to be "hinged" heavy duty ductile iron minimum grade D400 in accordance with the applicable Standard and be BSI kite marked.

Septic Tanks

035. Septic Tanks to single Properties are to be:

- Proprietary pre-fabricated septic tank with lockable cover, capacity 3600 litres, with 110mm diameter inlet and outlet pies, and 100mm diameter vent pipe terminating 800mm above ground with a non-return air admittance valve, tanks to be designed and installed in accordance with the recommendations of the applicable Standard or equivalent and BBA certified or equivalent, the design of the tank shall be such that sludge cannot be discharged through the outlet in any circumstances; and
- Channel gratings are to be galvanised mild steel square mesh gratings and set in position.

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WORKMANSHIP

Setting out

036. Set out all drains as Instructed by the Client's Representative and provide all profiles, etc., necessary for the execution of the Works.

Existing drains

037. Check the invert levels of existing drains, sewers and manholes before laying new drains. Notify the Client's Representative immediately if the declared invert levels are found to be inaccurate.

038. Before commencing excavation to expose existing drains, determine the exact line and level of the drain by excavating trial holes by hand. In any case carry out the final 300mm of excavation to expose the pipe by hand to ensure that adjacent lengths of pipe are not damaged by Equipment.

Excavation

039. Excavate trenches for pipes to a sufficient depth and width to enable the pipe and the specified joint, bed, haunch and surround to be accommodated.

040. Ensure that the widths of trenches are within the limits shown in the table below, to a minimum 300mm above the top of the pipe barrel.

041. The minimum width is that width between the faces of the soil required to ensure the correct placing and compaction of bedding material equally on either side of the pipe. All sheeting and supports are outside this width.

042. The maximum width is that width between the faces of the soil which has been used in the structural design of the pipeline, and it includes an allowance for sheeting and tolerance.

Nominal Internal Diameter of Pipe	**Minimum Trench Width**	**Maximum Trench Width**
(mm)	(mm)	(mm)
100	430	630
150	490	690
225	580	780
300	680	880
375	950	1150
450	1030	1230
525	1120	1320
600	1240	1440
675	1330	1530
750	1400	1600
825	1490	1690
900	1920	2120
1050	2100	2300
1200	2290	2490
Above 1200mm	Outside diameter of pipe plus 800mm	Outside diameter of pipe plus 1000mm

043. Thin the bottoms of all excavations and consolidate to the correct levels. Fill unauthorised excavations below the required levels with Materials of the same composition as for drain beds.

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044. Where the bottom is insufficiently firm, excavate until, in the Client's Representative's opinion, a firm bottom is obtained. Make up the level with Materials of the same composition as for drain beds or with a layer of concrete blinding if so Instructed by the Client's Representative.

045. Agree the particulars of such additional Works with the Client's Representative before covering up the Works, otherwise no payment is to be made for such additional Work.

Planking and strutting

046. Take care not to undermine the foundations of buildings. If so Instructed by the Client's Representative, plank and strut or adopt other means to protect the foundations.

Backfilling

047. Backfill trenches to sewers immediately the preceding operations have been completed. Do not backfill trenches for house drains before these have been inspected by Building Control.

048. No backfilling is to be placed in trenches containing water. In trenches in footways, gardens or open country, backfill with selected excavated materials. Selected excavated materials to be readily compactable material, free from tree roots, vegetable matter, building rubbish, frozen soil, clay lumps retained on a 75mm sieve.

049. Backfill may be placed by machine provided the method of operation ensures that the material slides or rolls into position and does not drop from a height.

050. Compact backfill materials in layers not exceeding 300mm thick but do not use heavy compactors before there is 500mm of material over pipe.

051. Make good any subsidence causing damage in surfaces or to adjoining structures that occurs after backfilling.

052. Rectify all damage caused to pipework during backfilling.

Concrete beds and surrounds to precast concrete manholes and road gullies

053. Concrete bed to precast concrete manhole rings is to be 150mm thick grade GEN3 concrete, laid on 75mm concrete grade 10 lean mix blinding concrete.

054. Concrete surround to precast concrete manhole rings is to be 150mm thick grade GEN3 concrete.

055. Bed and surrounds to road gullies to be 150mm thick grade GEN3 concrete.

Concrete beds, haunching and surround to drain pipes with rigid joints

056. Ensure beds are;

- a minimum of 150mm thick below the pipes;
- of the widths described in this Specification or the Schedule of Rates; and
- finished to the correct gradients.

057. After testing, haunch up the drains on both sides in similar concrete to half the diameter of the pipe. Where so Instructed entirely surround vertical clayware drains and other drains with concrete 150mm thick. Set all gullies, shoes, etc., on a base of similar concrete 150mm thick and the sides encased in concrete GEN3 150mm thick.

058. Provide flexible cleavage planes at each joint by means of 25mm thick bitumen impregnated fibreboard through the entire concrete surround.

Concrete beds and surrounds to clay and PVC-u drain pipes with flexible joints

059. Ensure concrete beds and surround to drain pipes with flexible joints are as described in this Specification.

Granular beds and surrounds to drain/sewer pipes with flexible joints

060. Dig out hard obstructions and soft pockets and remove the excavated materials. Fill the resultant void with granular bedding and consolidate it. Lay 75mm concrete blinding where trenches are in made up ground, or wet conditions are encountered.

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061. Ensure drains specified to be "bedded and surround in granular material" are laid on a bed of granular material 150mm deep, spread and compacted and finished to the correct gradients and to the correct widths as Instructed by the Client's Representative. When compacted, form socket holes in the bedding material sufficient to allow the full length of pipe barrels only to rest on them.

062. After bedding, aligning, levelling and testing the drain pipes, place further granular bedding evenly and consecutively on each side to half way up the pipe. Then protect the pipe by a layer of similar granular bedding carefully consolidated by hand to 150mm above the top of the pipe for the full width of the trench.

063. Ensure backfilling for the next 300mm is with normal excavated Materials as described in Paragraph 048 above and carried out by hand with no mechanical ramming.

064. Ensure backfilling for the next 300mm after that is with normal excavated Materials as described in Paragraph 048 above and carried out by hand and/or light mechanical ramming.

Laying drains

065. Lay drains in straight lines to an even gradient from point to point, each pipe being "boned in" and the whole accurately laid and butted closely together at the joints.

066. Set drain pipes passing through foundations so that a flexible drain joint is not more than 150mm from the face of the wall foundations or manholes with a further joint 600mm from the last joint.

067. Commence drains at the lowest point with sockets leading up the gradient.

068. Rest pipes on solid and even foundations for the full length of the barrel with hollows formed in the granular bed or ground for the sockets.

069. Leave trenches open for inspection by the Client's Representative until the drains have been tested and approved.

Gullies etc

070. Set gullies, etc., on concrete seatings, surrounded with concrete and jointed together and to pipes with gaskin and cement and sand mortar or with flexible coupling.

Brickwork in manholes

071. Bed brickwork in manholes in cement mortar (1:3) in an appropriate bond, built fair face with flush joints internally. Where built into manhole walls ensure pipes of 225mm diameter and over have half brick relieving arches over.

PVC-u inspection chambers

072. Ensure PVC-u inspection chambers including all fittings, covers and frames etc., have polypropylene mustow universal chambers.

Precast Concrete Manhole Rings

073. Manhole rings are to be bedded with mortar, proprietary bitumen or resin mastic sealant

Benching

074. Ensure benching in bottoms of manholes is in fine concrete to falls of at least 45 degrees to channels finished with cement and washed sand mortar (1:2) 25mm thick, trowelled hard and smooth with all angles rounded.

Bedding and sealing covers and frames

075. Bed frames to manhole covers in cement mortar (1:3) and the covers in grease and sand.

CCTV inspection of drains

076. Using CCTV survey all pipelines and drains as Instructed and record on digital media, all salient features of their structural and service conditions.

077. The CCTV Survey shall be carried out on new installations when:

- All planned laterals connections have been made and the remaining junctions and laterals are properly capped;
- All debris has been removed from both laterals and pipelines; and

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- All underground services are installed and no further excavation is planned in the vicinity of the pipeline.

078. The CCTV survey shall be carried out on existing drainage where Instructed by the Client's Representative following the reporting of consistently blocked or partially blocked drains. Arrange for a copy of the video recording to be given to the Client's Representative.

079. All CCTV equipment and technical standards shall comply with the specification of the Water Research Centre.

080. Where defects are exposed in new pipelines or in pipelines still subject to defects liability, remedy them and carry out a further CCTV survey at no cost to the Client. When a final survey acceptable to the Client's Representative has been carried out, provide a copy of the video recording to the Client's Representative.

081. The video recording shall be high quality digital format acceptable to the Client's Representative. At the start of each manhole length the video shall clearly display in Alpha-Numeric form the following information:

1. Camera metreage position in the sewer line;
2. Sewer dimensions;
3. Manhole/pipe length reference number;
4. Date of survey;
5. Road name location;
6. Direct ion of survey;
7. Time of start of survey; and
8. Sewer use.

082. Obtain Instructions from the Client's Representative on remedying any blockages or problems which may be revealed.

Septic Tank Installations

083. Install single Property septic tanks strictly in accordance with the manufacturer's technical data sheet and the recommendations of the applicable Standard or equivalent.

084. Handle tanks with care and lift them using a rope or sling passed through the lifting points provided.

085. Prevent superimposed loading by vehicles within a radius of 5m of the tank.

086. In dry ground conditions place tank on a base or 150mm thickness of broken stone or gravel to the applicable Standard graded 10mm to 5mm, backfill and carefully compact the graded material, filling the tank with water to match the level of backfilling.

087. In wet or poorly drained ground, consolidate 250mm of crushed rock, cover with a polythene membrane and 150mm concrete (Gen 1). Lower the tank on to the concrete and puddle to form a cradle, carefully place and compact concrete (Gen 1) around the tank and bring up to a level 50mm below the outlet pipe, filling the tank with water to match the backfilling.

Septic Tank Sub-Surface Irrigation System

088. Pipes are to be: 100mm diameter perforated PVC-U complying with the applicable Standard or equivalent before perforation and laid to a gradient of 1in 200 or to a layout Instructed by the Client's Representative, at a minimum depth of 500mm. Perforations shall be 8mm diameter, at 75mm centres in three rows giving an angle of perforation of 100%.

089. Pipes should be laid with perforations downwards on 250mm bed of clean filter stone graded 20-50mm, further filter material should be placed to 150mm above the crown of the pipe, and a 500 gauge polythene sheet laid on the stone foiling before backfilling with excavated material.

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Testing

090. Test pipes and manholes by water test or air test to the satisfaction and in the presence of the Client's Representative and the Sewage Utility Provider.

- after haunching or bedding but before backfilling; and
- after completion of the Works.

091. Where possible test each pipe from manhole to manhole, test short branch drains connected to a main drain between manholes as one system with the main drain, test hung branches separately.

092. Water testing is to be undertaken by:

- Applying a test pressure of 1.2m head of water above the invert of the drain at the high end but not more than 6m at low end by means of a standpipe;
- Testing steeply graded drains in stages in order not to exceed the maximum test pressure;
- Allowing a period of 1 hour for absorption; and
- Measuring the loss of water over a period of 30 minutes by adding water from a measuring vessel at regular intervals of 10 minutes and noting the quantity required to maintain the original water level in the standpipe.

The average quantity of water added must not exceed 0.1 litre/100m.mm of pipe diameter.

093. Air testing is to be undertaken by:

- Plug the length of drain to be tested and pump in air until a pressure of 100mm of head of water is indicated in a U tube connected to the system; and
- The air pressure must not fall to less than 75mm head of water during a period of 5 minutes without further pumping, after a period for stabilisation.

094. Testing for Obstruction:

- Check the bore, linearity and jointing of completed lengths of sewer less than 300mm diameter by drawing through a mandrel 750mm long and 12mm less in diameter than the nominal bore of the pipe.

095. Testing for Infiltration:

- Test sewers for infiltration, the amount of infiltration shall not exceed 0.1litres per hour/100m/mm of pipe diameter; and
- Infiltration to manholes shall not exceed 5 litres per hour/manhole.

096. Water-tightness of Manholes, Chambers and Wet Well:

- Manholes, inspection chambers and wet wells shall be inspected to ensure that they are watertight with no identifiable flow of water penetrating the chamber.

097. Provide all necessary testing apparatus and carry out any other tests required by the Client's Representative and the Sewage Utility Provider.

Land Drainage

098. Before starting work on land drainage, check invert levels and positions of existing drains, sewers, inspection chambers, manholes, catch-pits and watercourses against information shown on drawings and report any discrepancies to the Client's Representative.

099. Check position and levels of existing services before commencing excavation, hand dig carefully near to services. Notify the relevant Utility Provider if services are exposed by excavation or if land drainage work crosses the line of a service, follow the Utility Provider's instructions concerning work near services. Replace any marker tape or protective covers disturbed by excavation work in accordance with the Utility Provider instructions.

100. Excavate trenches to a gradient of not less than 1:200 and not more than 1:80. Ensure that the invert to the outfall to open watercourses is no lower than the seasonal peak or 150mm above normal water level, whichever is higher.

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101. Perforated plastic pipes are to be twin walled PVC-u to the applicable Standard with purpose made junctions etc., and flexible joints laid on granular bedding 150mm thickness and backfilled to within 50mm of finished ground level with clean gravel or crushed rock graded as table in Paragraph 103 below, and blind with 40mm bed of sand to the applicable Standard: Gf 85 0/1 (FP) fine aggregate,

102. Perforated concrete sub-base land drainage pipes are to be to the applicable Standard Class H with ogee joints and perforations not greater than 10mm or less than 3mm, total area of holes to be not less than 1000mm/square metre of pipe, laid on concrete bedding with perforations upwards, backfill with crushed rock grades as table in Paragraph 103 below, deposit filter media in layers not exceeding 225mm loose depth and length, compact each layer.

103. Grading of crushed rock for land drainage is to be as table below:

Sieve size	Range of Grading % by weight passing
63mm	100
37.5mm	85-100
20mm	0-20
10mm	0-5

Clean and flush all drains

104. Immediately before handing over m, thoroughly clean all drains and flush all pipelines not exceeding 400mm diameter with clean water while rodding from manhole to manhole with a rubber tipped plunger the same size as the diameter of the pipe.

105. Manholes and inspection chambers must be washed down, emptied and left to dry.

106. Core, clean and flush drains, gullies, manholes, etc. on completion of the Works.

Client's current manufacturers/suppliers/products

107. 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]

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CONCRETE WORK

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CONCRETE WORK

READY-MIXED CONCRETE:

001. The ready-mixed concrete production plant is to be certified by a body accredited by UKAS to the applicable Standard or equivalent for product conformity certification of ready-mixed concrete.

002. Source of ready mixed concrete: Obtain from one source, if possible, otherwise submit the following documentation to the Client's Representative.

- Name and address of depot: Submit before any concrete is delivered.
- Delivery notes: Retain for inspection.

003. Notify any declaration of non-conformity received from the concrete producer immediately to the Client's Representative.

MATERIALS

Cement

004. Use ordinary "Portland" cement in accordance with the applicable Standard delivered to the Property in sound condition. Store and protect it from deterioration due to moisture or other causes.

005. Storage of Cement:

- Arrange delivery in suitable small consignments so that cement will be used within 4 weeks of delivery;
- Store dry in weather-tight structures with a raised floor, or in suitable silos;
- Reject any cement which is set such that it cannot be easily crumbled between the fingers;
- Use cement fresh in the order of its delivery to site; and
- Keep sufficient cement available in store to ensure that concrete work on any section can proceed without interruption.

Aggregates

006. For fine aggregate use only well graded coarse river sand of Grading Zones 1 3, clean natural sand or crushed stones.

007. For coarse aggregate use only natural gravel, crushed gravel, or crushed stone, well graded and of the nominal sizes as specified below.

008. If so Instructed submit samples of aggregates proposed to be used to the Client's Representative for approval. Ensure all subsequent deliveries conform to the approved samples. Arrange for ample supplies to be available of both fine and coarse aggregates of the quality and colour selected.

009. Storage of Aggregates:

- Wash fine and coarse aggregates and store them on a hard, clean, paved self-drained base or in suitable hoppers or containers'
- Ensure that stored aggregates will not become dirty or otherwise contaminated.
- Ensure when they are handled that they remain clean and well graded and keep them separate from each other until placed in the mixer;
- Check by visual inspection each load before tipping and each batch before mixing for consistency of particle shape, accuracy of grading, segregation of particle sizes and cleanliness; and
- Ensure consistency of moisture content of fine aggregate at time of batching, if necessary by allowing stockpiles to drain for not less than 16 hours before use.

Water

010. When mixing concrete use only clean and fresh water from the main that is not below 40 Centigrade at the time of use.

011. Ensure water does not contain any matter injurious to concrete.

Rejected materials

012. Reject and remove immediately from the Property any Materials which have been damaged, contaminated or have deteriorated or do not comply fully with this Specification.

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WORKMANSHIP

013. Concrete mixes

	Designated Concrete for Kerb Bases, Blinding etc.,	**Designated Concrete for Mass Concrete Foundations, Beds etc.,**
Designated Concrete	GEN 1	GEN 3
Reinforcement/embedded metal	None	None
Aggregates – Size (maximum)	20mm	20mm
Aggregates – Coarse recycled concrete aggregate (RCA)	Permitted	Permitted
Aggregates – Other requirements	None	None
Other requirements for cement and combinations	None	None
Consistence class	Provider's Choice	Provider's Choice
Chloride class	Cl 1.0	Cl 1.0
Other requirements for admixtures	None	None
Other requirements	None	None

	Designated Concrete RC 20/25	**Designated Concrete RC 25/30**
Designated Concrete	RC 20/25	RC 25/30
Reinforcement/embedded metal	Yes	Yes
Aggregates – Size (maximum)	20mm	20mm
Aggregates – Coarse recycled concrete aggregate (RCA)	Permitted	Permitted
Aggregates – Other requirements	None	None
Other requirements for cement and combinations	None	None
Consistence class	Provider's Choice	Provider's Choice
Chloride class	Cl 0.4	Cl 0.4
Other requirements for admixtures	None	None
Other requirements	None	None

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	Designated Concrete RC 28/35	**Designated Concrete RC 32/40**
Designated Concrete	RC 28/35	RC 32/40
Reinforcement/embedded metal	Yes	Yes
Aggregates – Size (maximum)	20mm	20mm
Aggregates – Coarse recycled concrete aggregate (RCA)	Permitted	Permitted
Aggregates – Other requirements	None	None
Other requirements for cement and combinations	None	None
Consistence class	Provider's Choice	Provider's Choice
Chloride class	Cl 0.4	Cl 0.4
Other requirements for admixtures	None	None
Other requirements	None	None

	Designated Concrete for Rigid Pavement/Stepped Ramps
Designated Concrete	PAV1
Reinforcement/embedded metal	None
Aggregates – Size (maximum)	20mm
Aggregates – Type/Density	Normal weight
Aggregates – Coarse recycled concrete aggregate (RCA)	Not Permitted
Aggregates – Other requirements	Freeze-thaw resisting
Limiting value for composition – WC ratio (maximum)	0.45
Limiting value for composition – Cement combination content (minimum)	300kg/m^3
Limiting value for composition – Cement combination content (maximum)	Not applicable
Limiting value for composition –Air content minimum	4.5%
Consistence class	Provider's Choice
Cement combination	Main cement and combination type 11
Chloride class	Cl 1.0
Admixtures	For air entrainment see limiting value for composition item

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	Designated Concrete for Rigid Pavement/Stepped Ramps
Colour	Not required
Other requirements	None

Design/Batching and Mixing

014. For each designed mix, before making concrete for use in the Works and whenever a change in the materials or mix proportions is proposed, submit and obtain approval of:

- Details of proposed quantities of each ingredient per cubic metre of compacted concrete and proposed workability; and
- Either existing data or details of appropriate tests on trial mixes to show that the proposed constituent Materials and method of manufacture will produce concrete of the required quality, which will not segregate or bleed and will be capable of being fully compacted.

015. In special circumstances, subject to the consent of the Client standardised prescribed concrete mixes may be substituted for designated concrete.

- Substituted mix must conform to the applicable Standard or equivalent,
- Substitution: In accordance with BS 8500-1 Table A.13 or equivalent. Submit for each substitution, stating reasons; and
- Mixes: If standardised prescribed concretes are made on site, this must conform to the applicable Standard or equivalent.

016. Water content of concrete must be carefully controlled and adjusted to allow for moisture content of aggregates to give consistent quality and workability.

Identity Testing/Certification of Concrete

017. Testing of fresh concrete is to be to the applicable Standard or equivalent as follows:

- Obtain Instructions from the Client's Representative immediately in the case of non-conformity;
- Test concrete on a regular basis for compressive strength at least one sample for each day of use of a particular mix, or as directed by the Client's Representative; and
- Recording: - Maintain complete correlated records including:
    - Sampling, site tests and identification numbers of specimens tested in the laboratory;
    - Location of parts of the structure represented by each sample; and
    - Location in the structure of the batch from which each sample is taken.

018. The testing laboratory: Is to be accredited by UKAS or other national equivalent. The Provider is to submit the name of the testing laboratory and its UKAS reference number well in advance of concrete being supplied.

019. If a concrete sample fails to achieve specified criteria or to pass specified tests, inform the Client's Representative without delay and submit:

- Confirmation of the validity of the test results,
- Proposals for further tests to assess the strength of the concrete in the structure, as set out in the applicable Standard or equivalent and/or
- Proposals for rectification.

Obtain agreement from the Client's Representative to all such evidence and proposals before proceeding. The Client's Representative may issue Instructions for the work to be stopped or delayed until reasons for the failure have been established; possible consequences assessed, and appropriate preventative and remedial measures taken.

Placing and Compacting

020. Form construction joints as follows:

- Carefully brush and spray surface while concrete is still green to remove surface laitance and expose aggregate finish. Obtain agreement from the Client's Representative for any alternative method; and
- Surface is to be clean and damp when fresh concrete is placed against it.

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021. At time of placing ensure that all surfaces on which concrete is to be placed are clean, with no debris, tying wire clippings, fastenings or free water.

022. Inform the Client's Representative before each pour of concrete to allow inspection of reinforcement and surfaces against which concrete is to be placed. Agree with the Client's Representative the period of notice to be given.

023. In placing concrete, the Provider is to:

- Record the time, date and location of all pours;
- Place while sufficiently plastic for full compaction. Do not add water or re-temper mixes. The temperature of concrete at time of placing must be not less than 5 degrees C. Do not place against frozen or frost covered surfaces;
- Place in final position in one continuous operation up to construction joints. Avoid formation of cold joints;
- Do not discharge from an excessive height or through reinforcement or other obstructions in a way which may cause uneven dispersal, segregation or loss of ingredients. Use suitable chutes or trunking to place concrete where necessary;
- Place in layers no thicker than can be effectively compacted with the equipment being used; and
- Do not use vibrators to make concrete flow horizontally into position, except where necessary to achieve full compaction under void formers and cast in accessories and at vertical joints.

024. Fully compact concrete to full depth (until air bubbles cease to appear on the top surface), especially around reinforcement, cast-in accessories, into corners of formwork and at joints. Ensure amalgamation with previous batches, but do not damage adjacent partly hardened concrete. Use mechanical vibration for all reinforced concrete.

025. Sudden irregularities in the flatness of concrete floors is not permitted. When measured to the applicable Standard or equivalent, the variation in gap under a 3m straight edge placed anywhere on the surface to meet the following requirements:

- Floors which are to be self-finished, and floors to receive sheet or tile finishes directly bedded in adhesive: the floor surface regularity to meet Classification SR2; and
- Floors to receive screeds/toppings/beds; the floor surface regularity to meet Classification SR3.

026. Inform the Client's Representative of the number and type of vibrators to be used. Provide standby vibrators. Do not use external vibrators without agreement.

Curing and Protection

027. Curing:

- Prevent surface evaporation from concrete throughout the period(s) specified below by:
  - Retaining formwork in position and, if necessary, covering exposed surfaces immediately after striking, and
  - Covering top surfaces of fresh concrete immediately after completion of placing and compacting, removing covering only to permit any finishing operations and replacing immediately thereafter;
- Maintain surface temperature above 5 degrees C throughout the periods specified below or four days, whichever is the longer;
- Maintain detailed records of location and timing of casting of individual batches, removal of formwork and removal of coverings. Keep on site, available for inspection;
- Coverings for curing may be suitable impervious sheet materials or a suitable curing compound with an efficiency of at least 75%, and:
  - Must be effective in preventing evaporation of water from the concrete, particular attention being paid to sealing at edges and junctions;
  - Must not disfigure permanently exposed surfaces; and
  - Must not affect the satisfactory bond of subsequent construction and finishes; and
- Until the exposed top faces of fresh concrete are in a state suitable to receive sheets in direct contact or a sprayed curing compound as applicable, cover with waterproof sheeting held clear of the surface and well-sealed against draughts at edges and junctions.

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Curing Periods.

028. The curing periods, in days:

Concrete surfaces which will be exposed to frost or chemical attack. Concrete wearing surface floors and pavements. Watertight concrete:		
	Concrete made using OPC, SRPC, RHPC	Concrete made using PPFAC, PBC, PFA, GGBS
November to April	10	12
May to October	7	10
Other structural concrete surfaces: No special requirements if in damp weather and protected from sun and wind, otherwise as follows (cement as above):		
November to April	6	10
May to October	4	7

029. Obtain prior approval for curing periods for mixes using admixtures or other types of cement.

030. Prevent damage to concrete, including:

- Surfaces generally: From site, indentation and physical damage;
- Surfaces to be exposed in the finished work: From dirt, rust marks and other disfiguration; and
- Immature concrete: From thermal shock, physical shock, overloading, movement and vibration.

031. Ensure there is no traffic over, or loading on, concrete for at least seven calendar days after placing.

Work in cold weather

032. Do not concrete when the air temperature is below 40C. Bear the entire risk of concreting done below this temperature.

033. Take adequate precautions to protect concrete from freezing. Bear all risks of damage to concrete from frost action.

034. Keep a reliable maximum and minimum thermometer at the site of any concreting Works.

Designed Joints in Insitu Concrete

035. All joints to be accurately located, straight and well-aligned, and truly vertical or horizontal.

036. Construction/Movement Joints:

- Form joints accurately to detail and in locations shown on the drawings or as Instructed;
- If modifications to any joint or location are necessary on site, agree revisions with the Client's Representative;
- Do not allow concrete to enter any gaps or voids in the formwork or to render the movement joints ineffective;
- Do not allow concrete to impregnate or penetrate any materials used as compressible joint fillers; and
- Do not place concrete simultaneously on both sides of movement joints.

037. Additional construction joints in concrete exposed to view required by the Provider, will not be permitted, unless permission is first given by the Client's Representative.

038. Construct using rigid, grout-tight side forms or stop ends designed to accommodate projecting bars or fabric without temporary bending or displacement.

039. Brush and spray surface of construction joints while concrete is still green and leave a thoroughly roughened exposed aggregate finish.

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040. Tie bars are to be:

- To the applicable Standard or equivalent, clean and free from oil, dirt, loose rust or scale; and
- Fixed securely at the stated centres, and at the required depth, placed centrally on the joint.

041. Dowel bars are to be:

- To the applicable Standard or equivalent, perfectly straight and clean with sawn ends;
- Coated half the length of each bar with suitable proprietary de-bonding compound or fit with a suitable plastic sleeve;
- Fixed securely at the required depth, level at right angles to and centred on the joint; and
- Fitted with a cap at expansion joint, incorporating a compressible material, to de-bonded end of all bars.

042. Sheet joint filler for expansion joints is to be:

- Firm compressible, rot-proof, non-absorbent, non-extruding material;
- Fixed accurately in position; and
- Ensure sufficient space is left for sealant.

043. Sealant for joints is to be:

- Cold-applied sealants complying with the applicable Standard or equivalent; and
- Cured to manufacturer's recommendations to form a durable seal of low modulus elastomeric material.

Worked Finishes to Insitu Concrete

044. Carborundum dust is to be to the applicable Standard or equivalent.

045. Timing:

- Carry out all finishing operations at optimum times in relation to the setting and hardening of the concrete;
- Do not wet surfaces of concrete to assist surface working; and
- Do not sprinkle cement on to surface.

046. Tamped finish is achieved by:

- Float concrete to an even surface with no ridges or steps, then immediately commence curing as specified in Paragraph 027 above;
- When the concrete is suitably stiff, tamp surface in one direction to give a uniform ribbed surface; and
- Resume specified curing without delay.

047. Smooth floated finish is to be achieved by the use of a hand float; skip float or power float to give an even surface with no ridges or steps.

048. Trowelled finish is to be achieved by:

- Float concrete to an even surface with no ridges or steps, then immediately commence curing as specified in Paragraph 027 above;
- When the concrete is suitably stiff, hand or power trowel to give a uniform smooth but not polished surface, free from trowel marks and other blemishes, and suitable to receive the specified flooring material;
- Resume specified curing without delay;
- Adequately protect the surface from construction traffic until flooring material is laid; and
- If, because of inadequate finishing or protection, the surface of the concrete is not suitable to receive the specified flooring material, it must be made good by application of a smoothing compound to the satisfaction of the Client's Representative.

049. Trowelled finish for wearing surfaces is to be achieved by:

- Float concrete to an even surface with no ridges or steps, then immediately commence curing as specified in Paragraph 027 above;
- Successively hand or power trowel at intervals, applying sufficient pressure to close the surface, to give a uniform smooth finish free from trowel marks and other blemishes;
- Resume specified curing without delay; and

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- Complete a sample area of the finished work, size 1m. sq., in advance of the remainder, at a specified location, and allow inspection of appearance before proceeding.

050. Trowelled finish with non-slip additive is to be achieved by:

- Float concrete to an even surface with no ridges or steps, then immediately commence curing as specified in Paragraph 027 above;
- When the concrete is suitably stiff, sprinkle carborundum evenly over the surface at the rate of 1 kg/m sq. and hand trowel to give a uniform smooth, but not polished surface, free from trowel marks and other blemishes;
- Resume specified curing without delay; and
- Complete a sample area of the finished work, size 1m sq., in advance of the remainder, at a specified location, and allow inspection of appearance before proceeding.

051. Brush surface textured finish is to be applied evenly across the concrete road slab or house path in one direction by the application of a wire brush not less than 450mm wide with wire tufts initially 100mm long.

052. Trowelled finish/brush textured finish to paths is applied evenly across the concrete path in one direction by the application of a wire brush not less than 450mm wide with wire tufts initially 100mm long, with a minimum 100mm wide margin trowelled smooth finish as Paragraph 048 above.

Surface finishes - generally

053. Place concrete so that the face is free from voids and shows a uniform distribution of aggregate and uniform texture.

054. Use wrot formwork where a fair finish is required to the concrete surface. After removing the formwork, remove the feathers caused by the joints in the boards. Fill any holes or honeycombing which may have formed in the surface by first drenching with water and then filling the void with cement mortar composed of cement and washed sand in the same ratio as that in the concrete mix.

055. Use surface lined formwork where a perfect finish is required to the concrete. Immediately after removing the forms bring the concrete to a true, smooth and even surface, free from board marks, honeycombing, etc., by rubbing down with carborundum stone dipped in cement grout.

056. When no specific finish is required, tamp upper surfaces to a plain or evenly ribbed finish with tolerances suitable for subsequent Works. When a floated finish is specified, close the surface to produce an even slightly coarse texture free from ridges and depressions.

057. Trowel concrete to receive a thin floor covering by power float or other suitable method to produce a dense very smooth surface that is visually flat and suited to the direct application of thin floor coverings. Ensure there are no Defects in the finished concrete that show through the floor.

058. The maximum permissible deviation from flat is 3mm from a 3.00m straight edge.

FORMWORK FOR INSITU CONCRETE

Preparation

059. Design and construct formwork to withstand the worst combination of:

- Total weight of formwork, reinforcement and concrete;
- Construction loads including dynamic effects of placing, compacting and construction traffic; and
- Wind and snow loads.

060. Temporary Works including propping shall comply with Health and Safety Executive Information Sheet No 56 and the applicable Standard or equivalent Code of Practice for Temporary Works Procedures and the Permissible Stress Design of Falsework.

061. Provide adequate propping to prevent deflection and damage to the structure. Carry down such props to bearings strong enough to provide adequate support.

062. Temporary supports to the formwork shall not be cast into the concrete construction.

063. For work below ground:

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- Vertical faces of strip footings, bases and slabs may be cast against faces of excavation, provided;
- Prior agreement is obtained;
- The faces are sufficiently accurate and stable;
- Adequate measures are taken to prevent contamination of concrete; and
- Faces of walls must be cast against formwork.

064. Basic finish: No particular requirements, except those for tolerances and full compaction.

065. Formed finish: Where the surface is described as having a formed finish, the formwork shall be such as will give a perfectly smooth and even, but not polished surface, with neat sharp arrises.

066. Steelwork: Remove all loose mill scale and loose rust before encasing in concrete.

Construction

067. Construct formwork accurately and robustly with adequate supports to produce finished concrete to the required dimensions. Cast surfaces of concrete must be free from twist and bow (other than any required cambers), all intersections, lines and angles being square, plumb and true.

068. Joints in forms: Construct formwork, including joints in form linings and between forms and completed work, to prevent loss of grout, using seals when necessary. Secure formwork tight against adjacent concrete to prevent formation of steps.

069. Inserts, holes, mortices, chases:

- Confirm positions and details to ensure that alterations to and decisions about their size and location are not made without knowledge and agreement of the Client's Representative; and
- Fix inserts or box out as required in correct positions before placing concrete. Form all holes, mortices and chases. Do not cut hardened concrete without permission.

070. Treatment of formwork:

- Remove, rubbish, debris, water, etc. from the interior of the formwork before concrete is placed; and
- Coat inside surface of formwork with a mould release agent to prevent adhesion to the concrete.

071. Give sufficient notice of intention to place concrete to allow the Client's Representative reasonable time to check the construction and condition of formwork.

072. Use the same type and make of release agent throughout the entire area of any one finish. Use the minimum amount necessary to obtain a clean release and prevent excessive local collection. Prevent release agent touching the reinforcement or other materials not part of the form face or formwork.

Striking

073. Strike formwork without disturbing, damaging or overloading structure, and without disturbing props. The responsibility for safe removal of any part of the formwork and any supports without damaging the structure rests with the Provider. When formwork is struck, any holes shall be filled with suitable concrete and fins shall be carefully removed so that a flat surface is presented.

074. Minimum periods before striking:

- The following periods (in days) for retaining formwork in position before striking apply to ordinary Portland cement concrete with no cement replacement materials or admixtures:

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TABLE: STRIKING TIMES

	Average mean of daily minimum and maximum air temperatures during the period.		
	16 degrees C.	**7 degrees C.**	**3 degrees C.**
Vertical formwork to columns, walls and beams.	0.5	1	2
Soffit forms to slabs.	4	6	8
Props to slabs.	10	15	20
Soffit forms to beams.	10	15	20
Props to beams.	14	21	28

075. Submit details of proposed periods for mixes using admixtures or other types of cement.

076. Days during which the average air temperature is below 2 degrees C shall be disregarded in calculating the minimum time which shall elapse before forms are removed.

REINFORCEMENT FOR INSITU CONCRETE

Reinforcement generally

077. Reinforcing steel must comply with the applicable Standard or equivalent, be cut and bent to the applicable Standard or equivalent and be obtained from a firm holding a valid certification of approval issued under a product certification scheme operated by a third party certification body with appropriate Category 2 accreditation from the United Kingdom Accreditation Service (UKAS).

078. Plain bar reinforcement is to be to BS 4449 Grade 250 or equivalent.

079. Deformed bar reinforcement is to be to BS 4449 Grade 460 or equivalent.

080. Steel fabric reinforcement is to be to the applicable Standard or equivalent.

REFERENCE	**MINIMUM LAPS**
A142	400mm
A193	400mm
A252	400mm
A393	400mm

081. Store reinforcement clear of the ground and prevent contamination by other materials. At time of placing concrete, reinforcement to be clean and free of corrosive pitting, loose mill scale, loose rust, ice, oil and other substances which may adversely affect the reinforcement, concrete, or bond between the two.

Before Fixing

082. Reinforcement must not be roughly handled, dropped from a height, or subjected to shock loading or mechanical damage.

Bending Reinforcement

083. Bend or straighten bars cold, gradually and evenly and in a manner that will not injure the Material.

084. Bend steel to the shape exactly as shown on the drawings. Ensure all bends have an internal radius of at least twice the diameter of the bar.

085. Provide on-site facilities for hand bending to deal with minor adjustments.

086. Projecting Reinforcement:

- Grade 250 bars may be bent to radii not less than indicated in the applicable Standard or equivalent; or
- Grade 460 bars must not be bent or straightened without the approval of the Client's Representative.

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087. Reinforcement may be made up into cages. The cages shall be straight and out of winding when placed in position.

Placing Reinforcement

088. Place reinforcement exactly as directed by the Client's Representative and use the correct concrete cover. Adequately support and bind the reinforcement at intersections with 16 swg soft pliable or annealed mild steel tying wire, steel clips or tack welding if permitted so that displacement does not occur when the concrete is deposited. Wire or clips must not encroach into the concrete cover. Ensure the lap:

- is at least 40 times the diameter of the bar size and at least 300mm; and
- to the mesh is at least 450mm.

089. Spacers to comply with the applicable Standard or equivalent. In addition to supports shown on drawings or schedules, provide spacers and chairs at not more than 1m or 1000mm centres or closer spacing as necessary to support reinforcement in position and maintain the specified cover. Reinforcement must be fixed in position before the concrete is placed.

090. Cover spacers should be staggered on adjacent parallel bars and placed at approximate centres of 50 x diameter of bar but not exceeding 1000mm for individual bars or 500mm for welded fabric.

091. Cover Spacers which will adequately support the reinforcement, adequately resist displacement, not cause indentation of the formwork are to be made from:

- Plastics (perforated to at least 25% of their area),
- Fibre cement, or
- Concrete (strength and durability to match surrounding concrete).

092. The actual concrete cover shall not be less than the required nominal cover minus 5mm.

093. Where reinforcement is located in relation to only one face of a member, the actual concrete cover shall be not more than the required nominal cover plus 5mm on bars up to and including 12mm size, 10mm on bars over 12mm up to and including 25mm size and 15mm on bars over 25mm size. Before concreting check thoroughly that the specified cover dimensions have been obtained.

Holes, chases, fixing blocks, etc.,

094. Incorporate any conduit, pipes, fixing blocks, chases, etc., in concrete members as required. Submit full details of these to the Client's Representative for approval before the Works start. Ensure all fixing blocks, bolts, chases, holes, etc., left in the concrete are:

- of the sizes required; and
- accurately set out and cast with the concrete or boxed out as the Works proceed.

095. Do not cut holes or chases in the concrete unless the Client's Representative Instructs this to be done.

PRECAST CONCRETE – SMALL UNITS

096. Ensure precast concrete is of the mixes specified.

097. Ensure reinforcement is 25mm clear of the soffit of lintels, steps, etc. Hook the ends of bars for a distance of 38mm and crank to resist shear. Mark the tops of members at the time of casting.

098. Reinforce precast concrete not described as reinforced as necessary to withstand handling and temperature stresses.

099. Adequately cure precast concrete before it is handled and fixed in position.

100. Rub down the surfaces of precast concrete described as "finished fair." Neatly stop any holes, etc. Leave the surfaces perfectly smooth with no sharp arrises. Leave remaining faces rough for plastering or rendering unless stated otherwise in the relevant part of this Specification.

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PRECAST CONCRETE - LARGE UNITS

Components

101. Precast concrete stairs shall comply with the applicable Standard or equivalent.

102. Concrete generally: Constituent materials, composition of mixes, production of concrete, information to be provided, sampling, testing and compliance to be in accordance with the applicable Standard or equivalent.

103. The chloride ion content of the constituents of each mix shall comply with the applicable Standard or equivalent.

104. Reinforcement type:

- Plain bar reinforcement to be to the applicable Standard or equivalent Grade 250; or
- Deformed bar reinforcement to be to the applicable Standard or equivalent, Grade 460.

105. Reinforcement generally:

- Reinforcement to be clean and free from corrosive pitting, loose mill scale, loose rust, ice, oil and other substances which may adversely affect the reinforcement, concrete or the bond between the two;
- Fix accurately and securely using tying wire or steel clips. Wire and clips must not encroach into the concrete cover;
- In addition to reinforcement required for structural purposes, precast units must be reinforced as necessary to resist shrinkage and handling stresses.

106. Cover to reinforcement: Minimum nominal cover to reinforcement on exposed faces to be 35mm. Cover spacers must not be used to concrete faces which will be exposed in the finished work.

107. The following tolerances on the nominal dimensions are permitted:

- Length +o/-6mm;
- Depth +/- 3mm; and
- Width +/- 3mm.

108. Moulds must be:

- Constructed accurately to give straight, square and true components;
- Maintained in clean, sound condition and inspected carefully for defects before each reuse;
- Damaged moulds must not be repaired and reused if this would impair the surface appearance of the components;
- Constructed to prevent loss of grout;
- Designed to permit de-moulding without damage to the components; and
- Coated evenly with a suitable release agent, which must not be allowed to touch the reinforcement.

109. Finishes: Exposed surfaces shall have a smooth and even but not polished surface. Arrises or faces which are broken, chipped, cracked, crazed, honeycombed, irregular, inconsistent, stained or otherwise marred such that their appearance or performance is significantly impaired will not be accepted.

110. Casting and curing:

- Thoroughly compact concrete by vibration;
- Do not de-mould components prematurely;
- Prevent damage to and distortion of immature components from movement, vibration, overloading, physical shock, rapid cooling and thermal shock;
- Ensure that components are protected from sun and drying winds until they are at least 5 days old; and
- Do not deliver components on site until at least 14 days after casting.

111. Storage of units: When units are stored they shall be firmly supported at such bearing positions as will ensure that the actual stresses induced are always less than the permissible stresses.

112. Lifting of units: Units shall be lifted only at points indicated by the manufacturer and shall be handled and placed without impact.

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113. End bearing: The minimum end bearing for precast stair units shall be 100mm on brick/blockwork and 75mm on steelwork. Where the top of the supporting member is irregular, the stairs shall be bedded on a layer of mortar.

114. Cutting of units: Units shall only be cut on site in accordance with the manufacturer's technical data sheet and with the Client's Representative's agreement.

115. Repairs to units: Any repairs to precast stairs shall be authorised by the Client's Representative and shall be carried out using a compatible concrete repair material.

116. Loading on units: When the units have been set in position, ensure that they are not overstressed by the placing upon them of heavy loads from other building materials.

117. Mortar for bedding shall be cement lime sand (2:1:6).

Precast/Composite Concrete Decking - Proprietary Floors/Roof Decks

118. Precast concrete floor units:

- Precast concrete floor units shall comply with the applicable Standard or equivalent. The manufacturer shall supply drawings showing the proposed layout of the floor units and a schedule of the reinforcement/pre-stressing wire arrangements to be used in each unit; and
- Grout all joints between units with concrete Grade RC 25/30 as Paragraph 013 above and allow to harden before any loads are applied.

119. Marking of units:

- Each unit shall be indelibly marked in such a manner that by reference to the manufacturers schedule, its nominal size and intended position on the floor layout may be easily found; and
- If the units are of symmetrical section, the face which will be uppermost when the units are in their correct position shall be clearly marked.

120. Dimensions:

- Ascertain from the manufacturer the nominal sizes of the units. The following tolerances on the nominal dimensions are permitted;
- Length +/- 9mm;
- depth +/- 3mm;
- width +/- 6mm; and
- Where there is a camber in the units due to pre-stressing, the variation in camber between adjacent units shall not be greater than 6mm.

121. End bearing: The minimum end bearing for precast floor units shall be 100mm on brickwork/blockwork and 75mm on steelwork. Where the top of the supporting member is irregular, the units shall be bedded on a layer of mortar.

122. Storage of units: When units are stored they shall be firmly supported at such bearing positions as will ensure that the actual stresses induced are always less than the permissible stresses.

123. Lifting of units: Units shall be lifted or supported only at points indicated by the manufacturer and shall be handled and placed without impact.

124. Cutting of units: Units shall only be cut on site in accordance with the manufacturer's technical data sheet and with the Client's Representative's agreement.

125. Repairs to units: Any repairs to precast concrete floor units shall be authorised by the Client's Representative and shall be carried out using a compatible concrete repair material.

126. Loading on units: When the units have been set in position, ensure that they are not overstressed by the placing or storing upon them of heavy loads from other building materials.

127. Mortar for bedding shall be cement lime sand (2:1:6).

128. Lateral restraint straps:

- Ensure that floors tightly abut walls;
- Material/Finish: Galvanised steel or equivalent;
- Size: Not less than 30mm x 5mm cross-section; not less than 650mm long including each end cranked 100mm; and

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- Position with one cranked end in tight contact with cavity face of wall inner leaf, other cranked end grouted into a floor joint.

129. Precast beam and block: (floor)

- Beams: designed to the applicable Standard or equivalent;
- Type: Reinforced pre-stressed concrete T-Beam; and
- Infill blocks: Paragraph 131 below.

130. Detailing of proprietary system:

- Installation details: Submit location and assembly drawings showing every aspect of the construction, incorporated components and features, trimming for voids, holes for services, and related work by others;
- Purpose: To allow checking of compatibility with surrounding structure and coordination of services;
- Submit method statement and risk assessment for installation to the Client's Representative; and
- Submit programme to the Client's Representative well in advance of construction.

131. Standard precast concrete infill blocks: (floor)

- Type: Solid block to the applicable Standard or equivalent;
- Size: 440 x 215 x 100 mm;
- Compressive strength (minimum) 3.5 N/mm²; and
- Transverse load capacity (minimum): 3.5 kN/m² measured on a 420 mm span.

DAMP PROOF MEMBRANES

Bituminous damp proof membrane

132. Thoroughly clean the surfaces to receive the bituminous membrane. Apply this strictly in accordance with the manufacturer's technical data sheet.

Polythene damp-proof membrane

133. Use heavyweight building sheet for any polythene damp proof membrane. Lap all joints and make them with double welt folds. Tape all in accordance with the manufacturer's technical data sheet.

134. Take special care to prevent joints unsealing and to avoid puncturing the sheeting during placing operations, subsequently during the laying of the brickwork or securing fixing grounds. Remove and replace any damaged sheeting.

135. Seal any holes through the damp proof membrane for services by wrapping the pipes in small sheets and using sealing tape around the pipes and main film barrier.

CONCRETE REPAIRS

Repairs to Concrete – Exposed Reinforcement

136. All materials used shall form part of an integrated concrete repair system and the works shall be carried strictly in accordance with the manufacturer's technical data sheet.

- All loose and friable particles and areas of low strength concrete shall be removed and cut back to expose the sound concrete around the reinforcement;
- The sound substrate shall be exposed over the full length of any rusted section of reinforcement, and for at least 25mm of the rust free portions of the bar at either end. Any damaged concrete shall be removed to a minimum depth of 12mm clear space behind the reinforcement, provided that this does not endanger the structural form or stability of the concrete component. The cut area shall be shaped such that a butt edge of at least 10mm deep results in the repair and no feather edges shall be permitted;
- Any surface contaminants which could interfere with the bond, i.e. dirt, oil, grease, etc., shall be removed;
- Remove all corrosion from the exposed reinforcement by grit blasting, to finish with a clean surface and immediately apply a corrosion resistant primer which must provide a good physical key for, and be compatible with the subsequent repair material;
- The repair material shall be a polymer modified cement slurry or a solvent free high build epoxy resin sprinkled with sand or similar materials;

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- If at any point corrosion has reduced the diameter of a reinforcing bar by more than 10%, a new bar shall be lapped with the existing bar all in accordance with the Client's Representative's Instructions before proceeding with the repair;
- The cut back face of the concrete shall be coated with a concrete primer coat of polymer modified cement mortar or any epoxy resin;
- The patch repair mortar shall be purpose designed, factory mixed, polymer enhanced cementitious mortar with aggregate grading appropriate to the thickness of the repair. It shall be capable of being applied in layers up to 25mm thick;
- The material shall be fully compatible with the base materials and any proposed decorative coating and shall be applied strictly in accordance with the manufacturer's technical data sheet; and
- After completion of the full concrete repairs, coat the whole of the surface of the repaired component with a flexible microporous membrane, in accordance with the manufacturer's technical data sheet.

Structural Repairs to Defective Concrete

137. All materials used must be certified in accordance with the applicable Standard or equivalent and form part of an integrated concrete repair system and the works shall be carried strictly in accordance with the manufacturer's technical data sheet:

- Only break out and remove concrete from areas specifically identified and marked out in agreement with the Client's Representative. Before removing any concrete the Client's Representative shall determine the position and depth of the reinforcement using non-destructive test methods and shall mark reinforcement clearly in the vicinity of repairs prior to any works commencing;
- The perimeter of the concrete to be removed shall be saw cut perpendicular to the face of the concrete to a minimum depth of 15mm or to within 10mm of any reinforcement. Cover depths may vary significantly across the structure. If inadequate cover exist for saw cutting, saw cuts shall continue to within 10mm of reinforcement and concrete carefully broken out across the reinforcement face using dry breakout techniques. Saw cuts should be along the lines marked on the concrete surface during the inspection by the Client's Representative;
- Remove all defective concrete as marked until sound concrete is reached to the acceptance of the Client's Representative;
- At the upper limits of the manufacturer's recommended repair volumes, sloping cuts may be used to avid the entrapment of air when the concrete is poured;
- Saw cut edges shall be abraded to ensure a satisfactory key for the repair mortar where directed by the Client's Representative;
- The method of removal and breaking out of defective concrete including the use of dry break-out techniques shall be proposed by the Provider to the Client's Representative for acceptance prior to works commencing;
- Over-break of concrete shall be made good at the Provider's own expense using an approved concrete repair system. Where the Provider feels that the repair area needs to be extended beyond the originally agreed area this must be agreed with the Client's Representative prior to any breaking out works;
- Sound reinforcement damaged during concrete removal shall be made good by the Provider at no additional expense to the Client;
- Existing reinforcement that has corroded and is identified by the Client's Representative as being defective, shall be Instructed to be removed by the Provider;
- All new reinforcement shall be attached to the existing reinforcement either by lapping new and existing reinforcement steel or by using mechanical couplers. Submit the proposed methodology for the fixing of new reinforcement to the Client's Representative for approval; and
- Take measures to keep the site, work areas and access platforms free of concrete debris. Solid material shall not be permitted to accumulate and shall be removed safely off site.

Surface Preparation - Reinforcement

138. Surface preparation for reinforcement shall be as follows:

- Removal of all detrimental contamination and corrosion products within the concrete repair areas to produce a generally bright steel appearance overall;

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- The surfaces shall be free of embosses abrasive particles and corrosion products when viewed through a x10 illuminated magnifying glass and shall be offered up by the Provider for inspection by the Client's Representative;
- Surface preparation of reinforcement shall be completed using dry abrasive blasting, mechanical wire brush or hand tool abrasion techniques as proposed by the Provider as part of the Provider's safe working procedures; and
- Surface preparation methods must be agreed with the Client's Representative prior to Works commencing.

Surface Preparation – Existing Concrete

139. Surface preparation of existing concrete shall be as follows:

- Concrete surfaces shall be clean and dry and free from all grease, oil, dust and loose material;
- Loose material to the interior of repair areas shall be removed by a methodology approved by the Client's Representative;
- The surface shall be such that repair concrete shall flow freely into all voids and be in intimate contact with the existing concrete;
- Where dry breakout percussive methods have been used for concrete removal, surface preparation of the concrete surfaces to the interior of repair areas shall be completed using one of the following methods:
- Dry abrasive blasting;
- Mechanical surface preparation (e.g. scabbling); and
- Hand tool preparation (e.g. wire brushing).

Surface Preparation – Priming of concrete and steel

140. Prior to placing any repair mortar, preparation and priming of the concrete and steel substrates should be undertaken in accordance with the manufacturer's technical data sheet.

Remedial Works to Spalling and Cracks in Concrete Surfaces

141. All materials used shall form part of an integrated concrete repair system and the works shall be carried strictly in accordance with the manufacturer's technical data sheet.

- All loose and friable particles and areas of low strength concrete shall be removed and cut back to expose the sound concrete around the reinforcement;
- Any surface contaminants which could interfere with the bond, i.e. dirt, oil, grease, etc., shall be removed;
- The repair material shall be a polymer modified cement slurry, or a solvent free high build epoxy resin sprinkled with sand or similar materials;
- The cut back face of the concrete shall be coated with a concrete primer coat of polymer modified cement mortar or any epoxy resin;
- The patch repair mortar shall be purpose designed, factory mixed, polymer enhanced cementitious mortar with aggregate grading appropriate to the thickness of the repair. It shall be capable of being applied in layers up to 15mm thick;
- The material shall be fully compatible with the base materials and any proposed decorative coating and shall be applied strictly in accordance with the manufacturer's technical data sheet; and
- After completion of the full concrete repairs, coat the whole of the surface of the repaired component with a flexible microporous membrane, in accordance with the manufacturer's technical data sheet.

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BRICKWORK AND BLOCKWORK

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BRICKWORK AND BLOCKWORK

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 the applicable Standard or equivalent and be manufactured by a firm with their capability assessed and registered with BSI or other quality certification body approved by the Client's Representative.

Lime

002. Use Class B hydrated lime, to the applicable Standard or equivalent

Sand

003. Sand for mortar is to be to the applicable Standard FP or MP Category 3 or equivalent unless specified otherwise. Source mortar for face-work from one source and mix different loads if necessary to ensure consistency of colour and texture'

Sand and aggregate Material Property Limits	**Standard Category for other aggregates and Sand**	**Standard 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 the applicable Standard or equivalent from a competent mortar manufacturer to the satisfaction of the Client, Ordinary Portland cement or equivalent 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 the applicable Standard or equivalent; colour to be as specified or to match existing. Pigments used in lime:sand mortar are to conform to the applicable Standard or equivalent.

Ready to Use Retarded Mortars

009. Ready to use retarded mortars shall be in accordance with the applicable Standard or equivalent and render/plaster mixes shall be in accordance with the applicable Standard or equivalent. Provider the Client's Representative with CE Marked performance information to Annex ZA or equivalent before mixing commences. Ensure:

- All mortar storage containers are kept in good condition;

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- Storage containers are thoroughly cleaned out between fills;
- Storage containers are clearly marked with mortar mix designation i.e. building/plaster/render, date and time of delivery;
- Under no circumstances are partially full storage containers be 'topped up' with fresh mortar;
- The mortar is properly protected from adverse weather conditions, prior to, during and after use; and
- On no account is the mortar to be re-mixed in a mechanical mixer

010. 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.

011. Absolutely no cement or any other additive may be added to the mix on site.

012. 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.

013. All mortar, which has been contaminated in any way, shall be disposed of in such a manner as to render it unusable.

Waterproofing Agents

014. Waterproofing agent is to be to the applicable Standard or equivalent, 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. Do not use admixtures based on calcium chloride and ethylene glycol.

Bonding Agent

015. Bonding agent is to be opaque white non-toxic externally plasticised PVA emulsion of high viscosity and manufactured to the applicable Standard or equivalent. 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

016. Air entraining admixture is to be to the applicable Standard or equivalent, 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

017. Water reducing admixture is to be to the applicable Standard or equivalent, 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.

Common bricks

018. Use clay common bricks to the applicable Standard or equivalent:

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

019. Use concrete common bricks to the applicable Standard or equivalent, with an average compressive strength of 20N/mm^2 with no brick from any 10 no tested having a strength less than 16N/mm sq.

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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

020. Use concrete common bricks to the applicable Standard or equivalent, with an average compressive strength of 30N/mm^2 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

021. Ensure facing bricks and engineering bricks are clay and of a size, type and colour to match the existing bricks.

022. 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

023. Use unglazed clay/concrete air bricks of a colour to match the facing bricks.

Cavity wall insulation – Built in Boards

024. Mineral fibre batt built in cavity wall insulation to the applicable Standard or equivalent made to fill the cavity, with conductivity less than 0.038W/mK, complete with a current BBA certificate or equivalent quality system approved by the Client's Representative.

025. Expanded grey polystyrene injection moulding full fill board cavity wall insulation to the applicable Standard or equivalent with 10mm weathering space, and with conductivity less than 0.032W/mK, and compressive strength more than 70kPa at 10% compression, complete with a current BBA certificate or equivalent quality system approved by the Client's Representative.

026. Composite, full-fill. Cavity wall insulation board, with polyisocyanurate foam to the applicable Standard or equivalent between foil skins faced with a vacuum formed or injected high density polystyrene moulding with weathering space 5mm nominal, thermal conductivity less than 0.023 W/mK, compressive strength > 70kPa at 10% compression, complete with a current BBA certificate or equivalent quality system approved by the Client's Representative.

027. Foil faced polyurethane/polyisocyanurate (PUR/PIR) foam partial fill cavity insulation board to the applicable Standard or equivalent, thermal conductivity less than 0.023W/mK, compressive strength more than 120pKa at 10% compression, with a tongued and grooved edge profile, complete with a current BBA certificate or equivalent quality system approved by the Client's Representative.

028. Foil faced phenolic foam partial fill cavity insulation board to the applicable Standard or equivalent, thermal conductivity less than 0.023 W/mK, compressive strength more than 120pKa at 10% compression, complete with a current BBA certificate or equivalent quality system approved by the Client's Representative.

029. Closed cell polystyrene board wall insulation (for use below ground level) to the applicable Standard or equivalent, thermal conductivity less than 0.038W/mK, compressive strength more than 300pKa at 10% compression, complete with a current BBA certificate or equivalent quality system approved by the Client's Representative. Boards fixed underground to resist uplift or displacement with flooding.

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030. Closed cell foam glass board wall insulation (for use below ground level) to the applicable Standard or equivalent, thermal conductivity less than 0.038W/mK, Compressive strength more than 300pKa at 10% compression, complete with a current BBA certificate or equivalent quality system approved by the Client's Representative. Boards fixed underground to resist uplift or displacement with flooding.

Installation

031. Install in compliance with the manufacturer's technical data sheet and the relevant BBA certificate or equivalent quality system approved by the Client's Representative.

032. Neatly cut and fit insulation securely, with staggered vertical joints and no gaps, and temporarily support in position when necessary. Provide 300mm girth DPM as required at external corners.

033. When available use tongues and groove edge profiled boards.

034. Ensure that board edges are not damaged, and all parts of the inner cavity leaf face are covered.

035. Protect top edges from mortar droppings and ither debris with a temporary batten.

036. Place and secure each course of insulation firmly against the inner leaf, before building up the outer leaf above level of previous course of insulation.

037. Wall ties are to be corrosion proof to suit manufacturer's board fixings including insulation retention clips as necessary and must not be galvanised mild steel.

Mastic compound and sealants

038. Sealants are to conform to the applicable Standard or equivalent:

- low modulus and mould resistant;
- low modulus; or
- fire retardant

039. 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; and
- joints are to the applicable Standard or equivalent

040. Clean surfaces to which sealant is to adhere using methods and materials recommended by the sealant manufacturer's technical data sheet.

041. Remove all temporary coatings, tapes, loosely adhering material, dust, oil, grease and other contaminants which may affect the bond.

042. Keep joints clean and protect from damage until sealant is applied.

043. Protect adjacent surfaces with masking tape to prevent staining and protect surfaces which would be difficult to clean if smeared with primer or sealant.

044. 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.

045. 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.

046. Sealants are not to be applied to:

- damp surfaces (unless recommended otherwise);
- surfaces affected by ice or snow; or
- surfaces during inclement weather.

047. Joints are not to be heated to dry them or to raise the temperature.

048. 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.

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Wall ties

049. Wall ties are to be stainless steel or equivalent 225mm to suit cavity and built in as work proceeds:

- Type; to the applicable Standard or equivalent; and
- Material: Austenitic stainless steel or equivalent conforming to BS-EN 10088-3 Grade 1.4301 (304) or equivalent.

050. Wall ties are to be stainless steel or equivalent 225mm to suit cavity and with suitable fixings for any partial fill boards and built in as work proceeds:

- Type: to the applicable Standard or equivalent; and
- Material: Austenitic stainless steel or equivalent conforming to the applicable Standard or equivalent grade 1.4301 (304).

051. Wall ties are to be stainless steel or equivalent 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 the applicable Standard or equivalent; and
- Material: Austenitic stainless steel or equivalent conforming to the applicable Standard or equivalent grade 1.4301 (304) Product to have BBA certification or equivalent.

052. Wall ties are to be stainless steel or equivalent 275mm to suit 150mm cavity and built in as work proceeds:

- Type: to the applicable Standard or equivalent; and
- Material: Austenitic stainless steel or equivalent conforming to the applicable Standard or equivalent grade 1.4301 (304) Product to have BBA certification or equivalent.

053. 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 the applicable Standard or equivalent;
- Material: Plastic/steel; and
- Supplied and installed in compliance with a BBA certificate or equivalent quality assurance system approved by the Client's Representative.

054. 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; and
- Supplied and installed in compliance with a BBA certificate or equivalent quality assurance system approved by the Client's Representative.

055. 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).

056. Wall ties are to be stainless steel or equivalent ties to timber frames are to conform to the applicable Standard or equivalent:

- Material: austenitic stainless steel or equivalent conforming to the applicable Standard or equivalent; and
- Fixing: Fix securely to timber studs with 50mm x 11 gauge stainless steel or equivalent 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.

057. Spiral stainless steel or equivalent ties for timber frames are to be austenitic stainless steel or equivalent conforming to the applicable Standard or equivalent and installed in accordance with the manufacturer's technical data sheet and the Client's requirements.

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058. Brick extension ties are to conform to the applicable Standard or equivalent:

- Material: 22 gauge austenitic stainless steel or equivalent conforming to the applicable Standard or equivalent;
- Fixing: Fixing screws to be 50mm austenitic stainless steel or equivalent with washers, 155mm austenitic stainless steel or equivalent, Plugs to be 8mm high density polyamide; and
- Sealing: Sealing strip to be neoprene resin-impregnated micro-cellular polythene, self-adhesive 10mm x 20mm x 2.4mm.

059. Wall ties spaced at not more than 225mm centres vertically at vertical edges.

Chimney pots and cowls

060. Clay, clay louvered, and clay "H" type chimney pots as Instructed and approved by the Client's Representative are to be to the applicable Standard or equivalent, 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.

061. 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.

062. 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.

063. Clay anti-draught terminals as Instructed and approved by the Client's Representative are to be to BS EN 13502 or equivalent, 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.

064. Galvanised steel or equivalent 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.

Expansion joints

065. Movement joints are to be formed from 60mm x 18mm wide impregnated compressible insulation board, 25mm polyethylene foam strip and 10mm thiosulphide joint sealant pointed to finish slightly behind the brick face or concrete threshold.

Samples of bricks and blocks

066. Use only common, facing and engineering bricks and lightweight concrete blocks that conform to samples that have been approved by the Client's Representative.

Precast concrete components

067. Unless the Client's Representative Instructs otherwise, bed precast concrete components on mortar with a bearing of at least 150mm, packed on slate.

068. Precast concrete is to be:

Components	**Copings, Pier caps, Chimney cappings, Lintels, Door thresholds**
Designated Concrete	RC 25/30
Reinforcement	To the applicable Standard or equivalent
Aggregate Size	20mm
Coarse recycled concrete aggregates (RCA)	Permitted
Chloride Class	C1.0.4
Finish Requirements	Fair face on exposed surfaces

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Components	**Window Sills**
Designated Concrete	RC 25/30
Reinforcement	To the applicable Standard or equivalent
Aggregate Size	10mm
Coarse recycled concrete aggregates (RCA)	Permitted
Chloride Class	C1.0.4
Finish Requirements	Fair face on exposed surfaces

Prefabricated steel lintols

069. Unless the Client's Representative Instructs otherwise, bed steel lintols on mortar with a bearing of at least 150mm, packed on slate.

070. Lintels are to be hot dipped galvanised steel or equivalent to the applicable Standard or equivalent, BSI kite marked, BBA or equivalent certified quality system as approved by the Client's Representative.

Facing Brick Slips

071. Facing brick slips must be clay of a size, type and colour and to a bond to match existing facework to the Property and are subject to approval of the Client's Representative.

072. Acrylic brick blips must be of a size, type and colour and to a bond to match existing facework to the Property; and are subject to approval of the Client's Representative.

WORKMANSHIP

Brickwork

073. 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.

074. 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.

075. 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.

076. 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.

Cavity walls

077. Construct cavity walls:

- with a cavity minimum 100mm, maximum 150mm wide between the inner and outer casings; and
- bonded together with austenitic stainless steel or equivalent wall ties:
  - spaced according to manufacturer's technical data sheet and to suit cavity width but a maximum of 900mm apart horizontally, each row staggered and 450mm vertically; and
  - spaced at a maximum 225mm apart vertically (to suit blockwork courses) within 225mm of vertical edge of opening.

078. Fit ties for batt type insulated cavity walls with an adjustable plastic anchor for securing the insulation in position against the inner skin of the wall.

079. Keep cavities clear of mortar dropping by draw boards across the cavity. Leave access holes at the bottom of cavities and over lintels for cleaning out. Fill them in after this has been done.

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080. Close cavities of cavity walls with proprietary insulated cavity closers as Paragraphs 151 to 155 below, damaged brickwork closing cavities of hollow walls at sills and jambs of openings is to be repaired with brickwork to match existing, solid for a minimum depth of 100mm, and properly bonded to the surrounding work.

081. Take all precautions whilst undertaking the Works not to lose the integrity of the insulation in existing cavity walls that contain loose fill insulation materials.

Weather and protection

082. 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.

083. Do not carry out bricklaying:

- in driving rain; or
- when the temperature in the open is at or below 50 Centigrade.

084. Use plasticisers only with the Client's Representative's approval. Do not use antifreeze compounds.

085. Adequately protect new brickwork from damage by frost or excessive wet weather.

Fair face

086. 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.

Facework

087. 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.

088. Keep facings free of all mortar splashes, droppings or other blemishes and leave them perfectly clean on completion of the Works.

Damp-proof courses (Polyethylene DPM)

089. Lap damp-proof courses 150mm at all joints and full width at angles and intersections.

Bituminous and silicone waterproofing liquid

090. Ensure surfaces to receive the waterproofing liquid are thoroughly dry and clean.

Pointing

091. 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.

092. Match pointing closely to the existing pointing in finish, colour and texture.

093. 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.

094. 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

095. Adequately protect the Customer's 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.

096. Ascertain whether any flueways 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.

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097. Remove all debris from flueways and from behind fires and appliances on completion of the Works.

CAVITY WALL INSULATION (CWI)

System Guarantees

098. The Provider is to provide a 25 year, third party, insurance-backed guarantee to cover the cavity wall assessment, insulation materials, system and installation. For each Property insulated, a guarantee certificate must be provided stating the exact address of the Property covered by the guarantee.

099. The guarantee must meet the following criteria:

- Provide a minimum guarantee of 25 years;
- Provide assurance that funds are available to honour the guarantee, including in the event the contractor/installer/manufacturer ceases to trade;
- Cover the full replacement of a failed CWI system, including remedial works, materials and installation; and
- Have an independently assessed quality assurance framework in place whereby the quality of the system and its installation are independently assessed by a UKAS accredited body.

100. A list of appropriate guarantees can be found on the Ofgem website under their ECO Guidance. Please note this list is not exhaustive and other appropriate guarantees may be available.

101. All costs associated with providing the guarantee are to be borne by the Provider. Make the Client's Representative fully aware, in advance and in writing, of any maintenance regime required to uphold the guarantee.

PAS 2030

102. The installation must be undertaken by persons with appropriate skill and experience, approved by the manufacturer and in accordance with PAS 2030 or equivalent.

103. Evidence must be provided that the CWI installation contractor has PAS 2030 certification or equivalent and independent quality assurance accreditation.

104. A pre-design survey of the Property is to be carried out by a competent person in accordance with PAS 2030 or equivalent to assess its suitability to receive the insulation. The Client's Representative, Provider and system designer should be made aware of any remedial works required and, if Work is to proceed, these should be carried out prior to installation.

105. Pre-design survey, method statements and the related requirements of PAS 2030 or equivalent are to be provided to the Client's Representative prior to installation.

106. Clear records of Work undertaken must be kept and be presentable at the reasonable request of the Client's Representative to allow monitoring of installation Work.

107. On completion of the Work, a "Declaration of Conformity" to PAS 2030 standard or equivalent shall be provided to the Client's Representative for their records.

Design Considerations

108. The proposed design and installation must not have a negative effect on the ventilation, air quality, humidity and comfort of the Property. When presenting designs, make recommendations for any further measures required to prevent environmental changes occurring as a result of the insulation works, and to ensure the continued or improved comfort of the Customers. The proposed design must, satisfy or exceed the minimum standards in the Building Regulations.

109. The insulation system designer should:

- Calculate U-values in accordance with:
    - the applicable Standard or equivalent; and
    - BRE report BR 443 or equivalent;
- Ensure that thermal bridges, air leakage and condensation are avoided or at least kept to a minimum within the acceptable parameters, in accordance with the following standard methods of calculation and assessment:
    - Hygrothermal performance of building components and building elements. Internal surface temperature to avoid critical surface humidity and interstitial condensation;

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- Thermal bridges in building construction. Heat flows and surface temperatures;
- Thermal performance of buildings. Transmission and ventilation heat transfer coefficients;
- BRE BR 262 – Thermal Insulation: avoiding risks or equivalent; and
- Code of Practice for the Control of Condensation in Buildings or equivalent; and

- Assess the subject walls for the effects of wind-driven rain and the suitability of the proposed system in accordance with:
  - Code of Practice for assessing the exposure of walls to wind-driven rain or equivalent.

Cavity Wall Pre-Installation Inspection

110. Prior to any Works, the Client's Representative must receive evidence from the Provider that the Property has been inspected in accordance with, and independently verified by, the BBA Cavity Assessment Surveillance Scheme (CASS), or other UKAS accredited inspection body or equivalent approved by the Client's Representative by the Client's Representative. The inspection body must satisfy the requirements of PAS 2030 or equivalent, be independent of any system installer or designer and hold UKAS accreditation to either ISO 17065 or ISO 17020 'Type A' or equivalent.

111. The inspection should include an external visual assessment of the elevations, and an internal visual inspection of the Property.

112. A rigid 90-degree optical borescope with attached digital SLR camera or another optical system of comparable image quality should be used to record clear photographs to the Client's Representative's satisfaction. The illumination, depth of field, and camera resolution will be sufficient to clearly identify defects and fibre and expanded polystyrene insulation up to one meter from the camera.

113. Longer focus images may be in black and white or a single illumination colour wavelength, provided that the materials shown in the images are identified. 10 different sample digital photographs of wall cavities, including mineral or glass fibre and cavity bottom debris, shall be submitted to become contractual image quality benchmarks and should include views of materials 1 meter away from the viewing prism or lens.

114. The CWI inspectors may, if they wish, use a thermal imaging camera with an appropriate scale to assist them in deciding where exactly to drill for the boroscope inspection but it should comply with the following pattern:

115. For single storey Properties this will include 3 boroscope readings per elevation:

- One of these will be at least 300mm above the damp proof course;
- One will be within 300mm of the wall plate below the roof (For gable walls this should be along or just above the dividing line between the ground floor accommodation and the loft); and
- One will be below a window sill (For gable walls where there are no windows, this can be halfway up the wall between the ground and roof space line).

116. For two storey Properties this will include 4 boroscope readings per elevation:

- One of these will be at least 300mm above the damp proof course;
- One will be within 300mm of the wall plate below the roof (For gable walls this should be along or just above the dividing line between the first floor accommodation and the loft);
- One will be at first-floor floor joist level (i.e., between ground and first floor); and
- One will be below a second storey window sill (For gable walls where there are no windows, this can be halfway up the wall between the first floor and the loft).

117. Prior to any Works, produce a Property specific report covering:

- Address, postcode and Client's UPRN of the Property being inspected;
- The location of boroscope holes, each with a unique reference number, presented on sketch elevations or photographs;
- Date stamped photographs from boroscope tests with images of similar quality to the benchmark digital images;
- The construction type and its condition, including the build-up of the walls, the condition of masonry and pointing materials and the thickness of each element;
- Condition and width of the cavity and wall ties, including the presence of mortar snots, debris etc., and whether or not it is deemed to be a Hard to Treat cavity;

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- Any visible evidence of continuing or developing structural problems, including steel lintel or wall tie corrosion, settlement or subsidence cracking, movement, failures in structural timber;
- The presence of insulation and its type, e.g., mineral or glass wool (fibre), bonded bead, loose bead, Urea Formaldehyde foam, or insulation board;
- Condition of insulation, including whether the cavity is filled to the correct density in accordance with the system designer specification;
- The original injection drill pattern in relation to whether or not it conformed to the system designer specification for the type of insulation;
- The U-value of the existing construction;
- The presence of an adequate DPC;
- The suitability of the cavity to receive CWI in relation to the property location and exposure, in accordance with the applicable Standard and BRE Report 262 or equivalents;
- Any evidence of voids or other problems caused by insulation failure;
- Where voids or other problems are evident, what are the reasons e.g. insufficient insulation (fibre or bead), settlement of fibre, insufficient glue for bonded beads, boards not properly fitted, etc;
- Locations and severity of any mould, condensation, water penetration or other obvious defects evident internally;
- Locations and severity of any mould, condensation, water penetration or other obvious defects evident externally;
- The presence of openable ventilators and adequate mechanical ventilation in relation to condensation/mould;
- Adequate existing ventilation for any fuel burning appliances located within the Property;
- Any ventilation openings that would require remedial works to ensure they are not compromised during extraction or injection of insulation;
- The location of flues to ensure they are not compromised during extraction or injection of insulation;
- Injection drill holes were adequately filled upon completion of the original installation;
- Boroscope drill holes were adequately filled with sand/cement and to closely match the colour and texture of the existing wall, upon completion of the inspection;
- Any evidence of ingress of CWI materials in roof space/at services;
- Relevant feedback from the Customer;
- Any other information considered relevant e.g. absence of cavity barriers, etc.;
- Conclusions and any recommendations for remedial action to improve or replace insulation if considered appropriate; and
- Any Property constraints that would prohibit the execution of any recommended Works.

Cavity Wall Cleaning

118. Cleaning of cavity walls may only be carried out by a company registered with the BBA Cavity Cleaning Company Scheme, or other UKAS accredited body or equivalent approved by the Client's Representative, that includes for clearing rubble and other material from the cavity in addition to the extraction of insulation.

119. Cleaning may only take place when Instructed by the Client's Representative and is subject to the outcome of the surveillance scheme inspection.

120. The Provider must ensure the cleaning company informs the Client's Representative of any remedial Works that are required, following the independently verified cavity inspection.

121. The Provider must ensure the cleaning company removes rubble within the cavity and any other material that may bridge the cavity. The Client's Representative should be informed of any material that cannot be removed and may compromise the integrity of the cavity.

Cavity Wall Insulation - Injected

122. If mineral fibre this must be of a type certified by BBA at the time of the Works, or equivalent accredited certification as approved by the Client's Representative, as suitable for the purpose and exposure. This must be used only to top up existing mineral fibre insulation and is subject to the outcome of the surveillance scheme inspection. Thermal conductivity max 0.04W/mK, installed to the recommended density and in accordance with the quality assurance certificate and manufacturer's technical data sheet.

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123. This may be expanded polystyrene beads/granules with grey/metallic additive, bonded by adhesive, and certified by the BBA or other equivalent certification body as approved by the Client's Representative as suitable for the purpose and exposure. This is suitable for both existing and newly constructed cavities, subject to the outcome of the surveillance scheme inspection. Thermal conductivity max 0.033W/mK, installed to the recommended density and in accordance with the quality assurance certificate and manufacturer's technical data sheet.

124. The installer must be trained and approved by the system designer, have Trustmark accreditation or equivalent and carry out the installation in accordance with the:

- surveillance scheme;
- the BBA certificate or equivalent;
- the certificate holder's instructions; and
- any additional requirements of the insurance backed guarantee provider.

The completed installation is to be covered by an insurance backed minimum 25-year guarantee.

125. Form injection holes neatly to a regular pattern, wherever possible at the junction of vertical and horizontal mortar joints, and to sizes recommended by the cavity fill manufacturer. Drill additional holes as necessary to ensure a full fill. Avoid damage to damp-proof courses, cavity trays, flues etc., and prevent debris falling into cavity. Form all holes in any one wall before commencing filling of that wall. Fill injection holes, replacing existing material where possible to ensure a close match of colour and texture with the existing surface. Obtain agreement from Client's Representative of finished appearance of first few holes before completing the remainder.

126. During installation check regularly for leakages of insulation and seal immediately.

127. Following completion of the Works, and at the end of each day if the work spans more than one day, check and confirm that all ventilation outlets, flues etc have not been compromised by the injection of insulation and remain in working order, ensuring to clear any blockages immediately.

128. Check for and remove any wall insulation that has been blown up through the top of the cavity into the loft space.

129. Keep a detailed record of the installation including survey results, materials, weather conditions and any unusual features. Records shall be returned digitally to the Client's Representative as a spreadsheet or database in a format compatible with Microsoft Office and named with the Client's UPRN, as approved by the Client's Representative.

130. Submit copies of all certificates, records, guarantees and other documents to the Client's Representative on completion.

Fire-stopping Works – Proprietary Material

131. 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, phenols or halogens, applied as a mortar to the following thicknesses.

Fire Resistance	Minimum Depth of Filling Material
One Hour	50mm
Four Hour	100mm

132. Use 50mm thick non-combustible mineral wool slab as permanent shuttering to fire-stopping compound mortars.

133. 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.

134. 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.

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135. Apply the fire-stopping mortar strictly in accordance with the manufacturer's technical data sheet.

136. 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.

137. Mix the mortar by hand and applied strictly in accordance with the manufacturer's technical data sheet.

138. 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

139. 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.

140. Mix the compound by hand and applied strictly in accordance with the manufacturer's technical data sheet.

141. The Provider or the Provider's approved Subcontractor is to have FIRAS certification (www.firas-database.co.uk) and to produce certified copies of their registration as and when requested by the Client's Representative.

Fire-stopping – Non Proprietary

142. Fire-stopping material to party walls and similar situations can be either:

- Non-combustible mineral wool to the applicable Standard or equivalent, compressed fitted between timber members and fixed with large galvanised nails, cut to profile;
- Non-combustible mineral wool with density ne 80kg/m^3 to the applicable Standard or equivalent, compressed fitted between timber members and fixed with large galvanised nails, cut to profile;
- Non-combustible mineral wool with integral galvanised wire mesh with density ne 80kg/m^3 to the applicable Standard or equivalent, compressed fitted between timber members and fixed with large galvanised nails, cut to profile; or
- Asbestos free mineral fibre reinforced board, moisture resistant to the applicable Standard or equivalent, bedded in mortar to match walling.

143. Fire-stopping to loft access hatch door shall be asbestos free mineral fibre reinforced board, moisture resistant to the applicable Standard or equivalent.

144. Joint sealants are to be intumescent fire resistant mastic to the applicable Standard or equivalent installed in accordance with the manufacturer's technical data sheet.

145. 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.

Removal and Replacement of Failed Wall Tiles

146. Cut out corroded metal ties carefully, causing least possible disturbance to surrounding masonry and remove any associated rust debris.

147. Remedial wall ties shall be manufactured from austenitic stainless steel or equivalent and be capable of meeting the test criteria for Type 2 wall ties.

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Physically Inserted DPCs to Existing Walls

148. When renewing damp-proof courses, cut out brickwork in short hit and miss lengths not exceeding 1.00m at any one time and prevent structural damage, installation is to form a continuous barrier to rising damp, finished flush with face of wall externally and to lap 150mm (minimum) with damp-proof membrane. Replace brickwork before commencing further lengths.

149. The installation is to form a continuous barrier to rising damp, the undertaking of joint cutting is to undertaken in such a manner as to prevent any structural damage. The damp-proof course is to extend the full width of the wall and any finishes. The damp-proof course is to finish flush with external face of wall and internally is to lap 150mm (minimum) with damp-proof membrane.

150. Physically inserted damp-proof course system material is extend the full width of wall and finish and to be either:

- Polyethylene to the applicable Standard or equivalent, weight not less than 1.55kg/m^2; or
- Bituminous Felt to the applicable Standard or equivalent, weight not less than 0.46kg/m^2.

Insulated Cavity Closers and Insulation to Jambs

151. Insulation to window and door jambs must comprise:

- 50mm minimum front to back dimension, notional width 100mm, insulation to be securely built in between inner and outer skins at jambs with vertical damp-proof course;
- Insulation to provide minimum 30 minutes fire resistance in terms of integrity and 15 minutes in terms of insulation when tested to the applicable Standard or equivalent; and
- Thermal conductivity to be no greater than 0.038W/mK, insulation to be under compression within cavity and installed in accordance with the manufacturer's technical data sheet and the Building Regulations.

152. Built in insulated cavity closers must comprise proprietary insulated cavity closer to flush reveal, to bridge between inner and outer skins at window and door reveals:

- Cavity closers to be covered by a current BBA certificate or equivalent quality assurance certificate acceptable to the Client's Representative;
- Rigid PVC-u casing enclosing insulation with double flange to internal and external leaf to provide a key for rendering and plastering;
- Thermal conductivity of insulation to be no greater than 0.038W/mK;
- Cavity closer to provide minimum 30 minutes fire resistance in terms of integrity and 15 minutes in terms of insulation when tested to the applicable Standard or equivalent;
- Installed in compliance with BBA certificate or equivalent quality system acceptable to the Client's Representative; and
- Accessories: Manufacturer supplied compatible Polypropylene or PVC-u wall ties built in in accordance with the manufacturer's technical data sheet.

153. Built in insulated cavity closers must comprise proprietary insulated cavity closer to check reveal, to bridge between inner and outer skins at window and door reveals:

- Cavity closers to be covered by a current BBA certificate or equivalent quality assurance certificate acceptable to the Client's Representative;
- Rigid PVC-u casing enclosing insulation with single flange to internal leaf to provide a key for plastering;
- Thermal conductivity of insulation to be no greater than 0.038W/mK;
- Cavity closer to provide minimum 30 minutes fire resistance in terms of integrity and 15 minutes in terms of insulation when tested to the applicable Standard or equivalent.
- Installed in compliance with current BBA certificate or equivalent quality system acceptable to the Client's Representative; and
- Accessories: Manufacturer supplied compatible Polypropylene or PVC-u wall ties built in in accordance with the Manufacturer's technical data sheet.

154. Built in proprietary insulated cavity closer to bridge between inner and outer skins at window sills:

- Cavity closers to be covered by a current BBA certificate or equivalent quality assurance certificate acceptable to the Client's Representative;
- Rigid PVC-u casing enclosing insulation with double flange to internal and external leaf;
- Thermal conductivity of insulation to be no greater than 0.038W/mK;

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- Cavity closer to provide minimum 30 minutes fire resistance in terms of integrity and 15 minutes in terms of insulation when tested to the applicable Standard or equivalent; and
- Installed in compliance with t BBA certificate or equivalent quality system acceptable to the Client's Representative.

155. Built in insulated cavity closers must comprise proprietary insulated cavity closer to bridge between inner and outer skins at window heads:

- Cavity closers to be covered by a current BBA certificate or equivalent quality assurance certificate acceptable to the Client's Representative;
- Rigid PVC-u casing enclosing insulation with single flange to internal leaf;
- Thermal conductivity of insulation to be no greater than 0.038W/mK;
- Cavity closer to provide minimum 30 minutes fire resistance in terms of integrity and 15 minutes in terms of insulation when tested to the applicable Standard or equivalent; and
- Installed in compliance with t BBA certificate or equivalent quality system acceptable to the Client's Representative.

Client's current manufacturers/suppliers/products

156. 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]

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ROOFING

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ROOFING

GENERAL

Generally

001. Stock adequate compatible Materials for the numerous types of tiled roofs that exist throughout the Properties.

002. Ensure tiles, slates and accessories laid or fitted are of a colour to match the existing.

003. Provide samples of the Materials as and when requested by the Client's Representative. The quality of Material must be not less than that of the samples of the agreed standard. Store Materials so as to prevent damage or the introduction of deleterious matter.

004. Test Materials as and when requested by the Client's Representative and supply certificates from a testing laboratory showing the results of each test.

005. Reinstate or replace any missing or defective battens and roofing felt when undertaking repairs.

MATERIALS

Dry and Wet ridge/hips/valleys/verges

006. Ensure mechanically fixed dry ridge and dry verge Works are compatible with the existing dry ridge and dry verge installation and existing roof coverings.

007. Ridges are to be designed and fitted in accordance with the applicable Standard or equivalent and the manufacturer's technical data sheet and to be formed with either 240mm diameter x 457mm long concrete half-round ridge capping tiles or 237mm x 154mm x 457mm long concrete angled mono ridge capping tiles to the applicable Standards complete with plastic profile filler units to match tile profile, and plastic ridge end caps.

008. Hips are to be designed and fitted in accordance with the applicable Standard or equivalent and the manufacturer's technical data sheet and to be formed with 240mm diameter x 457mm long half round ridge capping tiles to the applicable Standards.

009. Valleys are to be designed and fitted in accordance with the applicable Standard or equivalent and the manufacturer's technical data sheet from neatly and accurately cut tiles to give a valley width of 125mm.

010. Dry cloaked verge systems are to be designed and fitted in accordance with the applicable Standard or equivalent and the manufacturer's technical data sheet. Verge to be formed with one and a half tiles in alternate courses, with overhang kept to a minimum. Under-cloak is to be mineral fibre sheet 150mm x 12mm thick laid between the underlay and tiling batten.

011. Ensure wet ridge and wet verge Works are compatible with the existing wet ridge and wet verge installation and existing roof coverings.

Underlay

012. Lap roof tile underlay a minimum 150mm or length as stated in the manufacturer's technical data sheet at horizontal and vertical joints over adequately supporting members. Underlay should be sealed at penetrations through the roof and at the ridge to accommodate high level void ventilation.

013. As specified by roof designer, underlay to be either:

- Reinforced felt, in repairs only, to the applicable Standard or equivalent; or
- 3 layer composite polypropylene membrane, composed of an impermeable polypropylene film sandwiched between 2 layers of spun-bonded polypropylene with:
    - Tensile strength: min 240N/50m (Longitudinal), 200N/50m (Transverse);
    - Tear Resistance: min 120N (longitudinal), 120N (Transverse);
    - Water Tightness: W1 to the applicable Standard or equivalent; and
    - Certification: British Agrément Board (BBA) or equivalent; or

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- Breather membrane: 3 layer composite membrane, composed of a water vapour permeable membrane, sandwiched between 2 layers of spun-bonded polypropylene. Product to have British Agrément Board certification (BBA) or equivalent:
    - Vapour resistance no more than 0.6MN s/g;
- Tensile Strength: min. 240 N/50 mm (longitudinal), 200 N/50 mm (transverse);
- Tear Resistance: min. 120 N (longitudinal), 120 N (transverse); and
- Water Tightness: W1 to the applicable Standard or equivalent.

014. Follow the applicable Standard Code of Practice for slating and tiling for guidance on the appropriate detailing of roofing components and installing underlay or equivalent.

015. On timber structures use only inodorous sheathing felt or proprietary underlay as specified by the manufacturer as underlay for copper or equivalent, lead and zinc roofing in accordance with the applicable Standard or equivalent.

Battens

016. For the tile battens use good quality deal, reasonably free from knots, clean and with no waney edges and in accordance with the applicable Standard or equivalent impregnated with an appropriate wood preservative before delivery to the Property, as specified under the 'Carpentry and Joinery' Part of this Specification. Tile battens and counter battens to comply with the applicable Standard or equivalent.

017. Fix battens with staggered joints and square butt jointing. These are to span at least 3 supports.

Wood rolls

018. For wood rolls for copper or equivalent, zinc or aluminium roofing use wrot seasoned timber to a tapered profile shown in Code of Practice 143:5, 143:12 and 143:15 or equivalent. Use common rolls approximately 45 x 40mm overall unless otherwise Instructed by the Client's Representative.

019. For wood rolls for lead roofing, use wrot seasoned timber to the smooth rounded profile shown in the applicable Standard or equivalent. Use common rolls approximately 45 x 45mm with a 25mm wide flat base unless otherwise Instructed by the Client's Representative.

Mortar

020. Use cement mortar (1:3) for bedding and pointing as described in the "Brickwork and Blockwork" Part of this Specification but slightly tinted in colour and specially mixed for the purpose.

Nails

021. Use galvanised steel or equivalent clout nails for underlay and battens in compliance with the applicable Standard or equivalent. Use the right size nails for battens to give a secure fixing without splitting the batten. For slates and tiles use aluminium alloy, copper or equivalent, or silicon bronze nails to the applicable Standard or equivalent or other nails approved by the Client's Representative.

022. Use copper or equivalent jagged or ring shank nails, at least 20mm long with large flat heads for lead roofing.

Clips

023. Where roofing slates or tiles are described as fixing with clips, use lead or copper or equivalent clips, approx. 300mm long x 20mm wide. Fix them to the roof batten beneath the slate or tile and bend them up and over the bottom edge of the slate or tile. Use aluminium alloy or stainless steel or equivalent clips to the applicable Standard or equivalent for slates.

Steel hook bolts and nuts and roofing screws

024. Steel hook bolts for fixing corrugated sheets are to be cadmium or zinc coated steel bolts with plastic sleeves and washers to a standard and quality approved by the Client's Representative. Ensure the bolt profile and size suits the sheets and roof members.

025. For corrugated sheets use galvanised drive roofing screws complete with plastic sleeves and washers to a standard and quality approved by the Client's Representative. Seams to be fixed with self-tapping screws or bolts.

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Plywood decking for flat roofs

026. Ensure plywood sheets are for structural use to the applicable Standard or equivalent or equivalent material with Class 3 Bonding (external conditions) to the applicable Standard or equivalent, durability Class H and are to a standard and quality approved by the Client's Representative. Fix sheets at 150mm centres to supports with 50mm x 3mm annular ring shank nails.

Woodwool slab decking for flat roofs

027. Where appropriate, reinforce woodwool slabs to comply with the applicable Standard or equivalent with pressed steel channels. Use galvanised steel or equivalent large flat headed nails as fixings for the slabs of a length to suit the application of galvanised steel or equivalent clips to the applicable Standard or equivalent or such other fixings as the manufacturer of the slabs recommends. Slabs to be cut accurately and fixed with joints tightly butted and centred on supports, ends and cut edges are to be fully supported or reinforced in accordance with the slab manufacturer's technical data sheet.

Wood chipboard decking for flat roofs

028. Ensure chipboard conforms to the applicable Standard or equivalent and is of an appropriate moisture resistant grade suitable for the purpose and fix it with galvanised nails to comply to the applicable Standard or equivalent or screws to a standard and quality and of an appropriate size and gauge approved by the Client's Representative.

Lead

029. Use best milled Code 4 lead for lead roof coverings in accordance with the applicable Standard or equivalent, flashings, soakers, rainwater chutes, valley gutter linings, hips and ridges, colour marked for thickness and weight Provide tacks minimum 40mm wide of the same lead substance at not more than 1 metre centres to flashings.

030. Clips for leadwork are to be 50mm wide and of a length to suit Client's details and to be formed from either:

- Lead or equivalent cut from sheets of the same code as the sheet being secured;
- Copper or equivalent cut from 0.7mm thick sheet to the applicable Standard or equivalent, temper grade ¼ H, dipped in solder, if exposed to view; or
- Stainless steel or equivalent, cut from 28 gauge sheet to the applicable Standard or equivalent, terne coated if exposed to view.

Self adhesive flashings

031. Use self-adhesive flashings in strict accordance with manufacturer's recommendations and only with the approval of the Client's Representative.

032. Fix self adhesive flashings over existing flashing and fillets. Apply an appropriate primer before use to ensure complete adhesion and in strict accordance with manufacturer's recommendations.

Asphalt roofing

033. Use as rubbing sand clean natural coarse sand passing a 600mm micron test sieve.

034. For chippings use hard light coloured non absorbent natural stone graded 6 to 10mm.

035. Use white solar reflective paint.

036. Ensure asphalt roofing subject to traffic is to the applicable Standard Type R988 or equivalent, undercoated and with finishing coat to a standard and quality approved by the Client's Representative.

037. Use glass fibre tissue for the isolating membrane for roofing subject to traffic.

High performance felt roofing

038. Apply high performance felt roofing from an approved manufacturer to suit the relevant sub surface and applied in strict accordance with the manufacturer's technical data sheet.

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High performance "torch on" felt roofing

039. Prepare and apply high performance "torch on" felt roofing from an approved manufacturer to suit the relevant sub surface and applied in strict accordance with the manufacturer's technical data sheet.

040. One layer torch on mineral felt roofing is to be to the applicable Standard Class S3PS or equivalent.

041. Two layer torch on felt roofing is to consist of an intermediate layer of torch on felt roofing to the applicable Standard Class S2PS or equivalent, and a top layer of torch on felt roofing to the applicable Standard Class S2PS or equivalent.

042. Two layer torch on felt roofing with ventilating layer is to consist of a ventilating layer equivalent to Type 3G glass-fibre reinforced bitumen, perforated venting layer and a top layer of torch on felt roofing all to the applicable Standard Class S2P3 or equivalent.

Bitumen primer

043. For felt roofing, use cut back bitumen primer with a maximum volatile solvent 60% by weight and Redwood No. 2 viscosity at 210 Centigrade 25 sec maximum or equivalent.

Bitumen compounds

044. For felt roofing, use a bitumen bonding compound having a penetration of 20/30 at 250C and a softening point (R & B) of 80/1000 Centigrade. For the dressing compound use cut back bitumen to the applicable Standard. Use cold compounds dressing for bonding solar reflective chipping only with the approval of the Client's Representative. Ensure the bitumen coating for lead, copper or equivalent or zinc roofing is a black coating solution to the applicable Standard or equivalent.

WORKMANSHIP

Roof tiling

045. Lay roof tiling in accordance with the applicable Standard or equivalent and in even courses to suit the existing gauging and laps. Secure tiles with the appropriate patent clips and/or nails.

046. Lay and fix underlay with extra-large head nails parallel to eaves, cut neatly and accurately around pipes etc.

047. Battens to be in straight horizontal lines with no batten less than 1200mm long, butt joints are to be centred on supports and must not occur more than once in any group of four batten at any one support, provide additional battens where necessary to prevent underlay being opened at laps by wind suction, fix each batten to each support with round galvanised steel or equivalent nails 65mm long x 3.35mm.

048. Plain tiling is to be laid with each course to a half lap bond with tails aligned and joints slightly open, cut tiles the minimum necessary and then only with a masonry saw to give clean straight edges, nail tiles (minimum) every fifth course using two aluminium alloy nails per tile.

049. Nail fixed interlocking tiling is to be laid with tails aligned, cut tiles the minimum necessary and then only with a masonry saw to give clean straight edge.

050. Clip fixed interlocking tiling is to be fixed in accordance with the manufacturer's technical data sheet, tiling is tiling is to be laid with tails aligned, cut tiles the minimum necessary and then only with a masonry saw to give clean straight edges.

051. Form mechanically fixed dry ridge with underlay overlapping by not less than 150mm, fit correctly sized ridge batten along the apex of the trusses or rafters and secure to each rafter using stainless steel or equivalent straps as supplied by the tile manufacturer and fitted in accordance with their technical data sheet, Fit top tiling batten on either side of ridge, fit top row of tiles to either side of ridge and fix to batten with two aluminium alloy nails per tile. Fit the plastic profile filler units in accordance with the manufacturer's technical data sheet, form ridge with ridge capping tiles and secure to ridge batten through the preformed hole in the ridge to ridge seal using the provided screw and washer. Fit the plastic ridge end caps.

052. Ridges spanning a party wall are to have a fire-stop formed by filling the ridge void with a suitable non-combustible material.

053. Form mechanically fixed dry hip with underlay overlapping by not less than 150mm, form ridge with ridge capping tiles. And neatly and accurately cut mitre tiles at junction with ridge.

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054. Ventilating roof tiles are to proprietary ventilated in-roof ventilator tiles to match interlocking tiles in pattern, colour and texture and to be approved by the Client's Representative, to provide ventilation to the applicable Standard or equivalent, product to have BBA certification or equivalent. Tile to provide 20,000m m^2 free opening and to exclude driven rain and large insects, openings are not to be more than 4mm. Tile to be installed approximately 300mm above the level of the insulation. Tile to have an integral apron and spigot for connection to flexible ducting and fixed in accordance with the manufacturer's technical data sheet.

055. Ridge ventilators are to be a proprietary concrete ridge ventilator tile to provide ventilation to the applicable Standard or equivalent, product to have BBA certification or equivalent. Profile and colour to match adjacent ridge tiles, and mechanically fixed and bedded in accordance with the manufacturer's technical data sheet.

056. Form eaves with a double course of tiles.

057. Form verges with tile and a half in alternate courses including any undercloak and pointed in cement mortar to match the existing mortar. Ensure there are no exposed cut edges of tiles.

Roof slating

058. Close joint natural slate roofing with horizontal and alternate vertical joints ranging through perfectly straight.

059. Head nail slates with two nails to each slate in every course. Secure slates to eaves, verges, ridges, hips, valleys and abutments with two nails to each slate. Ensure there are no exposed cut edges of slates.

060. Form eaves with double course of slates.

061. Form verges with slates and slate and a half slates in alternate courses including any undercloak and bedded, jointed and pointed with mortar, tinted to match the colour of the slates. Ensure there are no exposed cut edges of slates.

062. Ensure ridges and hips are of the type stated in the Schedule of Rates. Bed, joint and point ridge and hip tiles with mortar tinted to match the colour of the tiles or slates.

Fibre cement sheet roofing

063. Where appropriate, incorporate end and side lap sealing strips in fibre cement sheet roofing to the applicable Standard or equivalent.

Galvanised steel or equivalent

064. Lay galvanised corrugated sheeting in accordance with Code of Practice 143 section 4 and 10 or equivalent to allow slight movement between the structural frame and sheeting. Lap all sheets 150mm at the ends and two corrugations at the sides. Fixing by drive screws and washers at maximum 375mm centres, and 2 hook bolts at every purlin. All cut edges of sheets to be coated with acrylic paint.

Reinforced plastics

065. Where specified use reinforced corrugated plastic sheets in limited areas in association with roof sheeting of another Material. Lap at the ends and sides, as for the main roofing Material, and seal with approved woven fibre sealing strip.

Fixing sheets

066. Secure the sheets to steel with galvanised steel or equivalent hook bolts and nuts, and to timber with galvanised steel or equivalent roofing screws. Do not drill steelwork.

Holing sheets

067. Drill sheet fixing holes through the crown of the corrugations 1.5mm larger in diameter than that of the bolt or screw shank.

Safety precautions

068. Prevent unauthorised persons having access to the area below the roof whilst corrugated sheet roofing is under construction. Do not allow any person to go on to roofing without using crawling boards.

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Insulation

069. Butt joint insulation quilts and lay them up to wall plates, leaving sufficient space to maintain adequate ventilation of the roof space. Lay the quilt under electrical cables and over horizontal pipes wherever possible. Do not lay quilt under water storage tanks. Bag quilts to hatches in polythene and securely fix them to the hatch. Insulation to be turned over eaves.

General

070. Clear all debris resulting from roof Works from all gutters.

Leadwork

071. Ensure sheet lead Works are undertaken by skilled lead Staff in accordance with Lead Development Association recommendations and in accordance with the applicable Standard or equivalent. Do not use solder without the approval of the Client's Representative. Undertake close and open nailing with copper or equivalent nails at 25mm and 75mm centres respectively. Do not use lead pieces larger than 3.00m in length or 2.20 m^2 in area.

072. Clips to be fixed with two fastenings not more than 50mm from edge of lead sheet, Clips welted around edges of sheet are to be turned over 25mm.

073. Ensure laps to finishings are no less than 100mm.

074. Form welted joints with a 50mm overlap, 25mm underlap and copper or equivalent or stainless steel or equivalent clips at no more than 450mm centres, welt overlap and clips around underlay, loosely turn over and lightly dress down.

075. Dress underlap to drips with splash lap into rebate along top edge of drip, fix to lower level base with two rows of nails, 25mm and 50mm from face of drip, at 75mm centres in each row, evenly spaced and staggered, dress overlap over drip and form a 75mm splash-lap, secure with lead clips, lead burned to underlap at not more than 300mm centres, with not less than 2 clips per bay.

076. Dress underlaps to drips without splash-laps into rebate along top edge of drip and fix with one row of nails at 50mm centres on centre line of rebate, dress overlap over drip to just short of lower level.

077. Form roll joints without splash-lap over wood core rolls, dress under-cloak three quarters over core roll, fix copper or equivalent or stainless steel or equivalent clips to roll at not more than 450mm centres, dress lead over cloak around core roll with edge welted around ends of clips, finishing 5mm clear of the main surface.

078. Form roll joints with splash-lap over wood core rolls, dress under-cloak three quarters over core roll, and fix with nails at 150mm centres for a distance of about one third of the length of the panel starting from the head of the sheet, dress over-cloak around core roll and extend on to main surface to form a 40mm splash lap.

Lead flashings

079. For flashings use milled sheet lead to comply with and be in accordance with the applicable Standard or equivalent.

080. Dress lead flashings to the appropriate profiles without reducing the thickness of the lead sheet.

081. Turn the top edges, which should be welted of all cover flashings 25mm into grooves chased or cut into brick, blockwork or other cladding material, securely wedged and pointed with low modulus silicone mastic in brick, block, masonry and concrete and in other cladding where appropriate.

Asphalt roofing

082. Lay asphalt roofing generally in accordance with the applicable Standard and the recommendations and publications of the Mastic Asphalt Council or equivalent. Lay underlay loose and with 50mm laps.

083. Lay asphalt roofing in two coats with 150mm laps. Properly bond it to the edges of existing sound asphalt and unless otherwise Instructed by the Client's Representative maintain all existing planes. Provide fillets 50mm on the face at all internal angles. Unless otherwise Instructed by the Client's Representative, ensure that the asphalt surface finish matches the existing surface.

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Felt roofing

084. Roofing felt must comply with the applicable Standard or equivalent unless otherwise specified or guided. Immediately seek Instructions from the Client's Representative if, when removing any defective felt, the base is found to be defective or unsuitable in any way to receive the new felt and that repair of the base is outside the scope of the Order.

085. Lay felts 90 degree to the direction of the roof gradient starting at the lowest point with 75mm side and 100mm end laps, and breaking joints between layers. Apply by mopping, brushing or spraying to achieve an even and full cover of the surface a priming coat recommended for the purpose by the felt manufacturer to all concrete and screed base surfaces. Other than where the Order is for Emergency Works, allow 24 hours to elapse before laying the felt.

086. Partially or fully bond the first layer of felt to the base with oxidised bonding compound to the applicable Standard for Bitumen and bituminous binders Framework for specification of oxidised bitumen or equivalent. Grade as recommended by the felt manufacturer, and heated in thermostatically controlled kettles, to a temperature not exceeding 2150 Centigrade, but sufficient to provide a 2000 Centigrade laying temperature.

087. Effect any partial bonding system by spot, strip or frame bonding the first felt layer with hot bonding compound.

088. Fully bond the perimeter of the roof for a width of 450mm, leaving 150mm wide ventilation channels at appropriate centres.

089. Effect a fully bonded system by applying a continuous even coating of hot bonding compound to the base at the rate of 1.5kg/ m^2. Apply the first layer of felt to provide a complete bond excluding all trapped air. Bond subsequent felt layers to match the underlayer excluding all trapped air. If any air bubbles become apparent in the Works, cut back and renew the felt.

090. Renewing or making good existing roofing:

- Remove existing chippings and clear roof of all dust, dirt, debris, moss and grease;
- Star cut blisters, dry out and re-bond;
- Fill ponded areas of sound roofing to level surface with compound recommended by the felt manufacturer;
- Cut out defective areas of felt, dry out base and patch repair level with existing finish with three layers of matching felt lapped not less than 100mm;
- Cut back to base 150mm width of felt over cracks and splits, dry out and insert 150mm strip of bitumen polyester felt bonded to base at edges only. Fully bond a further layer of bitumen polyester felt over the first strip and lap not less than 100mm onto the existing felt at each edge;
- Remove rainwater outlet gratings and set aside for reuse on completion;
- Cut out all existing skirtings and make good as for new work;
- Renew damaged insulation; and
- Remove waterproof coverings from existing skirtings and re-cover as specified.

091. For chippings use coloured non absorbent natural stone graded 6 to 10 mm/nominal 14 mm single size 6. Ensure gravel guards are fitted to all outlets, scatter chippings at rate of approximately 16kg/ m^2, on completion remove loose chippings.

092. Use cut back bitumen or a suitable cold applied bitumen based adhesive to the applicable Standard or equivalent as a dressing compound for chippings applied at the rate of 1.5kg/ m^2.

Torch on felt roofing

093. Ensure the existing roof is clean and dry. Cut out and patch blisters, nicks etc. If necessary, prime the surface and allow it to dry. Lay sheeting with 75mm side and 100mm end laps. Loose lay the first specified layer to roof surfaces, but do not carry up angle fillets and vertical upstands. Apply flame to the lower surface directed at the junction with the substrate so as to melt the adhesive across the roll width. Unroll felt onto the molten bitumen and press down firmly. Seal laps with wide bladed scraper and seal the plain finish (not mineral surface) by applying heat from above.

094. Use hard light coloured non absorbent natural stone chippings graded 6 to 10 mm/nominal 14 mm single size 6. Ensure gravel guards are fitted to all outlets, scatter chippings at rate of approximately 16kg/ m^2, on completion remove loose chippings.

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095. Use cut back bitumen or a suitable cold applied bitumen based adhesive to the applicable Standard or equivalent as a dressing compound for chippings applied at the rate of 1.5kg/m^2.

Asphalt coverings to balconies and walkways

096. Lay asphalt to balconies and walkways in accordance with the applicable Standard or equivalent and the recommendations and publications of the Mastic Asphalt Council or equivalent. Lay underlay loose and with 50mm laps.

097. Use a glass fibre tissue isolating membrane approved by the Client's Representative.

098. Use bitumen coated 'plain expanded' steel lathing of a minimum 26 swg and a minimum 10 mm short way of mesh.

099. Use a high bond primer as approved by the Client's Representative.

100. Use oxidised bitumen suitable for applying hot as bitumen based bonding compound for bonding vapour barriers and for general bonding purposes.

101. Use clean natural coarse sand passing a 60 micron test sieve for rubbing sand.

102. For chipping, use hard light coloured non absorbent natural stone graded 6 to 10 mm/nominal 14 mm single size 6. Ensure gravel guards are fitted to all outlets, scatter chippings at rate of approximately 16kg/ m^2, on completion remove loose chippings.

103. Use cut back bitumen or a suitable cold applied bitumen based adhesive to the applicable Standard or equivalent as a dressing compound for chippings supplied at a rate of 1.5kg/ m^2.

104. Use a reputable proprietary brand of solar reflective paint approved by the Client's Representative.

105. For aluminium edging, use a proprietary section profiled to suit asphalt manufactured from aluminium.

106. Asphalt concrete to be laid and compacted in accordance with the applicable Standard or equivalent.

107. Hot rolled asphalt is to be transported, laid, compacted and tested to the applicable Standard or equivalent.

Inverted Roof Insulation

108. Inverted roof insulation is to be 200mm thick extruded polystyrene board to the applicable Standard or equivalent, conductivity 0.035 W/mK or less than, strength more than 250pKa at 10% compression, grade/density to be a minimum 30kg/cubic metre. Clean off all dirt and debris from base, lay boards tightly butted and to a broken bond pattern, cut cleanly to fit closely around projections, upstands, rainwater outlets etc., lay surface protection.

Single layer plastic roof covering

109. PVC-u single layer membrane to the applicable Standard or equivalent, minimum thickness 1.2mm laid in accordance with the manufacturer's technical data sheet with not less than 80mm head and side laps secured with the manufacturer's recommended thermal welding, break bond between layers with side laps staggered by one half sheet width, joint edges are to be completed with a bead of liquid PVC, membrane laid on separating layer as recommended by the manufacturer.

110. Warm deck roof designed in accordance with the applicable Standard or equivalent and to comprise foil faced polyurethane /PIR foam insulation board to the applicable Standard or equivalent, conductivity less than 0.023 W/mK, strength more than 140kPa at 10% compression, boards fixed in accordance with the manufacturer's technical data sheet with minimum of 6 fixings per square metre, extra fixings may be necessary around roof perimeter.

111. All edge trims, upstands, flashings, verge trims are to be proprietary items supplied as required by the roof covering manufacturer and formed from PVC coated metal and fixed in accordance with the manufacturer's technical data sheet.

Single Ply Membrane Roofing Systems

112. Clean all stone chippings, moss and debris off the entire roof surface to be re-covered and remove from site, felt blisters to be cut open and the damaged are made good, lay 1000 gauge vapour barrier to be laid loose over the entire roof surface, lay 25mm insulation board or 25mm closed cell moisture resistant board, mechanically fixed to the deck before the roofing membrane is laid.

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113. Butyl rubber based membrane (Polyisobutylene) 0.75mm thick (fabricated in factory to cover the complete roof) laid on one layer of standard sheathing felt laid on existing roofing membrane or vapour barrier, the butyl membrane to be ballasted with 18mm diameter round gravel to a depth of 40mm over the entire roof area. The butyl membrane is to be dressed a minimum of 150mm and fully bonded to the upstands of the roof, at intersections between roof and walls the butyl membrane is to be carried up and fully bonded to the wall, turned and pointed into a wall chase for a minimum of 38mm deep, or dressed behind lead flashings, the edge of the membrane is to pointed with the appropriate mastic, the lead flashing is to carefully dressed down.

114. Eaves are to be finished with PVC coated metal "standard" edge trim and "GutterZ" or equivalent edge trim to all perimeters, butyl membrane is to be stuck down to roof at eaves, a treated timber batten is to be fitted to the eaves where necessary for fixing the trim.

115. Where gutters are incorporated in the roof structure, the insulation is to be stopped at the edge of the gutter, the butyl membrane is to be stuck down to the roof surface in the gutter. The butyl membrane is to be dressed over the eaves and into the gutters or trunk heads and in the case of flat roof outlets, dressed over and into the outlets, fix a 50mm x25mm treated timber batten to all edges to form a stopping piece for the insulation, fixed with suitable fasteners at 400mm centres.

116. EPDM (Rubber Polymer) single ply membrane mechanically attached rubber sheeting, laminated to a non-woven polyester backing to be laid as specified by the Manufacturer's technical data sheet, delivered in sealed rolls and mechanically fixed to decking with galvanised steel or equivalent discs and self-tapping screws. Fixing to be fully treated with a rustproof coating and have a minimum pull out force of 1.5kN per fixing and applied as 4 No fixings per m^2 on flat roof surfaces, 8 no per m^2 on edge zone and 12no per m^2 on corner zone. All joints are to be sealed by using hot bonding splicing machine with a 150mm wide splicing strip specially developed for hot-bonding application.

117. Fully bond the roofing membrane at intersections between roofs and walls with butyl adhesive applied to the wall. Fit lead flashings to prevent the ingress of rain and fully bond the roofing membrane to the wall surface under the lead flashing.

Metal Tile Roofing

118. Metal tile roofing shall comprise:

- Natural stone chip with acrylic overglaze finished proprietary metal roof tiles each size 1330mm x 450mm x 0.9mm thick, pantile in profile, and terracotta or charcoal or green or red in colour, each tile fixed with four no 50mm x 2.5mm coated fixing nails driven through the down turned nose of the tile into 50 x25mm sawn softwood standard battens fixed to each support with round galvanised steel or equivalent nails 65mm long x 3.5mm, with additional battens where necessary to prevent underlay being opened at laps by wind suction;
- Underlay to be reinforced felt to the applicable Standard or equivalent, laid with minimum 150mm horizontal and vertical laps and fixed with galvanised steel or equivalent extra-large head felt nails parallel to eaves so that water will drain freely, laps to coincide with supports, including all abutments, eaves, verges, ridges, hips and valleys; and
- All to be in accordance with Code of Practice for Lightweight Metal Roofing or equivalent.

Metal Profiled /Flat Sheet Claddings

119. Plain Galvanised corrugated iron sheeting is to be in accordance with CP 143-10:1973, 24 gauge in sheets each 1260mm x 370mm, laid in accordance with the Manufacturer's technical data sheets from ridge to eaves, with side-laps being at least 2 corrugations and 150mm minimum end laps, sheets to fixed with drive screws and washers placed at maximum 375mm centres to 38mm x25mm battens, and secured to purlins with at least 2 bolts. Seams to be made watertight with suitable lapping material and secured with self-tapping screws or bolts at maximum 450mm centres. Breathing felt to the applicable Standard or equivalent lapped and carried into gutter is to be installed under corrugated sheeting.

120. Ridge to be galvanised sheet 22mm gauge to comply with the applicable Standard or equivalent, ridge capping to be formed from equal angle pieces with 200mm sides formed to fit securely on top of galvanised roofing sheet.

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Plastic profiled Sheet Claddings

121. PVC-Ue planks (Open 'V' joint, shiplap or Tongued and Grooved) in cladding shall comprise:

- Lightweight foamed cellular core and homogeneous skin of PVC-UE having a nominal thickness of 0.6mm manufactured in accordance with the applicable Standard or equivalent;
- Extruded Cellular Unplasticised (PVC-Ue) Profiles:
    - Standard length: 5m;
    - Cover width: maximum 100mm;
    - Nominal thickness; 6mm;
    - Fire resistant to Class 1Y to the applicable Standard or equivalent;
    - Weight: Not less than 0.50kg metre; and
    - Density: Not less than 500kg/m^3;
- Appearance: Self-coloured smooth semi-matt or glass finish;
- Fixing: Maximum 600mm centres, 5mm gap every 5m run and at abutments for thermal expansion of plank and joint ends;
- Method of fixing: 30mm hot dipped galvanised or stainless steel or equivalent jagged nails with staggered joints;
- Perimeter Trims: Single or two part PVC-Ue trims (capping's, angle pieces, closure pieces, flashings, trims, sill) as manufacturer's technical data sheet; and
- Breather membrane; spun bonded polypropylene BBS certified, vapour resistance to be no more than 0.6MN.s/g and fixed with galvanised or stainless steel or equivalent fixings every 300mm at studs and every 150mm at edges, horizontal laps to be 100mm, vertical laps 150mm and staggered to shed water away from substrate and structure.

122. PVC-Ue chipped finished planks in cladding shall comprise:

- Lightweight PVC-Ue not exceeding 7kg/ m^2 and a density of between 0.5 and 1.5kg/m^3;
- Impact resistance strength: 30k/ m^2;
- Yield Stress: at/more than 14.5N/mm^2;
- Tear Strength: at/more than 13.5N/mm^2;
- Bending Stress: 18N/mm^2;
- Elasticity module; at /more than 640/mm^2;
- Fixings pull out strength: at least 500N;
- Thermal Impact: in accordance with BRE Digest 228;
- Surface spread of flame: both internal and external surfaces to Class O, tested in accordance with the applicable Standard or equivalent, All fixings to be non-ferrous;
- Fixing supports to ETAG001 and ETAG 029;
- Fire resistant to Class 1Y to the applicable Standard or equivalent;
- Weight: Not less than 0.50kg metre;
- Density: Not less than 500kg/m^3; and
- Appearance: Self -coloured smooth semi-matt or glass finish.

123. The system will be required, under testing, to prevent transfer of water across the cavity to the masonry of the existing building under peak pressure testing to Class R7 as set out in the applicable Standard or equivalent.

124. If battens are used to create a minimum 25mm vented cavity they must be formed from the same material as the cladding planks, the vented cavity is to provide adequate ventilation to remove any condensation or water permeating through the system before it reaches the masonry with drainage openings of at least 10mm:

- Defection in accordance with the applicable Standard or equivalent. All testing must be in accordance with the applicable Standard or equivalent;
- The system must be able to accommodate building movement and must be secured to suitable non-ferrous cladding rails/support structure approved by the manufacturer; and
- Aggregate: between 3 and 6mm incorporated into the surface of the cladding under strictly controlled factory conditions with the colour aggregate pre-mixed under quality controlled factory procedures to achieve uniformity.

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125. PVC-Ue Fascia/Barge or Barge Overlay Board shall comprise:

- Profile: Bull nosed or square edge with ribbed back;
- Composition: Low density cellular (closed cell) core and homogeneous impact resistant skin of PVC-UE. Manufactured in accordance with the applicable Standard or equivalent for UV stability and UV aged impact resistance requirements;
- Dimensions: Width Minimum 175mm;
- Thickness: Minimum 9mm;
- Weight: Average density 500kg/m^3, Tolerance deviation of +/-12.5% per m length;
- Tolerances Width: 151mm – 250mm +/- 1.5mm;
- Tolerances Thickness: 5mm – 12mm +/- 0.5mm, over 12mm +/- 0.75mm;
- Tolerances Length: 5m =10mm-00mm;
- Flatness; Must not exceed +/- 0.6mm over 100mm;
- Thermal Movement: Linear thermal expansion of less than 7mm x 10.5 degree C. Tested in accordance with the applicable Standard or equivalent;
- Fire Resistance: Satisfy the requirements of the applicable Standard or equivalent particularly Class 1 spread of flame;
- Colour Fastness: in accordance with the applicable Standard or equivalent;
- Water Absorption: Less than 1% when tested in accordance with the applicable Standard or equivalent;
- Appearance: Self-coloured smooth gloss finish;
- Method of fixing: As specified by manufacturer; and
- Jointing/edge trims: matching colour, single or two part PVC-Ue trims as manufacturer's details and fixed in accordance with manufacturer's technical data sheet.

126. PVC-Ue Fascia or Barge Board:

- As Paragraph 125 above but minimum thickness 16mm.

127. PVC-Ue Soffit Boards shall comprise:

- Profile: Flat solid board plain or shiplap profile sheet, depending upon application;
- Composition: Low density cellular (closed cell) core and homogeneous impact resistant skin of PVC-UE. Manufactured in accordance with the applicable Standard or equivalent for UV stability and UV aged impact resistance requirements;
- Dimensions: Width Variable, but not greater than 300mm;
- Thickness: Minimum 9mm;
- Weight: Average density 500kg/m^3, Tolerance deviation of +/-12.5% per m length;
- Tolerances Width: 151mm – 250mm +/- 1.5mm, 251mm – 350mm +/- 2.00mm;
- Tolerances Thickness: +/- 0.5mm;
- Tolerances Length: 5m - 10mm-00mm;
- Flatness; Must not exceed +/- 0.6mm over 100mm;
- Thermal Movement: Linear thermal expansion of less than 7mm x 10.5 degree C. Tested in accordance with the applicable Standard or equivalent;
- Fire Resistance: Satisfy the requirements of the applicable Standard or equivalent particularly Class 1 spread of flame;
- Colour Fastness: in accordance with the applicable Standard or equivalent;
- Water Absorption: Less than 1% when tested in accordance with the applicable Standard or equivalent;
- Appearance: Self-coloured smooth gloss finish;
- Method of fixing: As specified by manufacturer; and
- Jointing trims: matching colour, single piece PVC-Ue trims as manufacturer's details and fixed in accordance with manufacturer's technical data sheet.

128. PVC-Ue Pre-vented Soffit Boards shall comprise;

- As Paragraph 127 above but with flat solid board pre-vented depending on application.

129. A ten year warranty on the performance and colourfastness of all PVC-UE fascia, barge, soffit board and wall cladding systems must be provided prior to installation.

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130. Eaves Ventilators are to provide a continuous air gap of either 10mm or 25mm to the applicable Standard or equivalent as required, to have BBA certification or equivalent, and to be proprietary preformed PVC-u, provided with fixing holes and with slots in ventilator being not more than 4mm to prevent entry of vermin. Eaves ventilators are to be fixed in accordance with the manufacturer's technical data sheet and are to be either:

- Proprietary behind facia ventilation system: with soffit attachment, fixed behind fascia;
- Proprietary over fascia ventilation system: fixed to top of fascia board;
- Proprietary over fascia ventilation system; with polypropylene felt support, and fixing to top of fascia and rafters;
- Polypropylene twist and lock soffit ventilators, 70mm diameter, designed to exclude wind driven rain and large insects, openings not to exceed 4mm, to provide 10,000 mms/m, installed at 200mm centres, mechanically secured in accordance with manufacturer's technical data sheet; or
- Polypropylene spring fitted ventilators (10-15 degree roof); soffit attachment size 285mm x 115mm, designed to exclude wind driven rain and large insects, openings not to exceed 4mm, to provide 25,000 mms/m, installed at 480mm centres to 10-15 degree roofs, mechanically secured in accordance with manufacturer's technical data sheet.

131. Proprietary rafter tray ventilation system: to have BBA certification or equivalent and to provide ventilation to the applicable Standard or equivalent, with corrugated rigidised PVC-u spacer sheet inserted between rafters at eaves to maintain a continuous 25mm min air path parallel with the roof slope, to prevent insulation blocking the ventilation path to eaves ventilators, and to prevent condensation forming under the underlay. Fitted to project 100mm beyond wall plates. Insulation re-inserted over wall plates but not projecting beyond the end of the spacer sheet. Fitted 800mm along roof slope 25mm deep, cut as required to fit and tacked in place between the rafters at top with galvanised tacks/thick staples.

132. Proprietary rafter tray fly screened ventilation system: to have BBA certification or equivalent and to provide ventilation to the applicable Standard or equivalent, with corrugated rigidised PVC-u spacer sheet inserted between rafters at eaves to maintain a continuous 25mm min air path parallel with the roof slope, to prevent insulation blocking the ventilation path to eaves ventilators, and to prevent condensation forming under the underlay. Fitted to project 100mm beyond wall plates. Insulation re-inserted over wall plates but not projecting beyond the end of the spacer sheet. Fitted 800mm along roof slope 25mm deep, cut as required to fit and tacked in place between the rafters at top with galvanised tacks/thick staples.

133. Proprietary rafter tray ventilation system for refurbishment, installed from underside of roof to avoid disruption of roof covering: to have BBA certification or equivalent and to provide ventilation to the applicable Standard or equivalent, with corrugated rigidised PVC-u spacer sheet inserted between rafters at eaves to maintain a continuous 25mm min air path parallel with the roof slope, to prevent insulation blocking the ventilation path to eaves ventilators, and to prevent condensation forming under the underlay. Adjust to suit roof pitch, pull back existing insulation and push tray into eaves, ensuring not to project beyond the top of the rafters, Fix to wall plate as recommended by the manufacturer, relay insulation over the wall plate but not projecting beyond the end of the spacer sheet. Fitted 800mm along roof slope 25mm deep, cut as required to fit and tacked in place between the rafters at top with galvanised tacks/thick staples.

GRP Flat Roofing

134. GRP Flat roof specification comprises:

- All existing stone chippings, felt coverings etc. are to be cleared from the roof area. Substrate, is to be stripped to expose the main roof joists;
- Additional timber firring pieces are to be fitted to existing joists to give a fall to the new deck;
- The roof is to be re-decked with 3/4" (20mm) exterior Grade Plywood securely anchored with 3" annular ring shank nails and /or 3" plated wood screws to the roof joists;
- Purpose made, pre-moulded, edging trims, wall fillets, gully mouldings are to be supplied as necessary and installed in position;
- A glass-fibre mat of 4oz / m^2 density is to be supplied and laid over the whole roof area. The glass-fibre mat is then to be impregnated with polyester resin onto the new deck to form a seamless GRP membrane;

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- Once curing time has elapsed, usually between 1- 4 hours depending on ambient temperature, a polyester resin gel coat in a chosen colour is to be applied to the whole roof area;
- Where a flat roof meets brick walls, a chase is to be cut into a chosen course approximately 1.5" deep. A glass fibre and resin flashing is to be tailor made to fit into the chase. The chase is then to be re-pointed with conventional sand / cement mortar; and
- Where a flat roof meets a tiled roof, as in the case of a dormer construction, the glass-fibre membrane is to be extended between 150 to 300mm up and under the tiled roof area.

GRP CANOPIES

GRP PURPOSE MADE FRONT DOOR CANOPIES

135. GRP purpose made front door canopies are to meet the following criteria:

- Primary support structure: Existing concrete brick or block work;
- GRP components:
    - Construction: Designed to direct water away from the main structure/Property;
    - Finish: Standard smooth matt finish; and
    - Colour: Dark Grey;
- Nominal size: 1600mm long x 900mm wide x 200mm deep;
- Fire rating:
    - Spread of flame (component external face): Class 0 (National class);
    - Spread of flame (component internal face): As external face;
- Fixings and fasteners: Fixings to be concealed and as tested and recommended by canopy manufacturer to withstand calculated wind and snow loads;
- Joints: Upper-side to have standing seam effect finish at 600mm centres, underside to have timber tongue and groove effect finish; and
- Accessories/Other requirements: Drip bar to front soffit. Provide a sample canopy to the Client's Representative prior to installation.

136. Thermal Performance/Bridging Requirement: Complete thermal design to avoid excessive thermal bridging. Assessed to BRE Information Paper 1/06.

137. Weather Resistance Requirement: Weathertight, with full allowance made for deflections and other movements.

138. Colour Fastness/Appearance of GRP, Colour fastness of pigments: Not less than standard 6 when measured to B01C:LFS6 or equivalent. The Provider is to submit evidence of compliance.

139. Colour fastness / appearance samples are to be provided as follows:

- Weathered samples: If available, submit naturally weathered samples, otherwise submit artificially weathered samples.
- Naturally weathered samples:
    - Pigments and resins: As proposed GRP;
    - Age: Not less than two years; and
    - Action: Submit with new un-weathered control samples.
- Artificially weathered samples:
    - Pigments, resins and gel coat: As proposed GRP;
    - Test method: Accelerated weatherometer subjecting samples to moisture and ultraviolet light;
    - Duration: Not less than 1500 hours; and
    - Action: Submit with new un-weathered control samples.

140. Canopy Design Samples are to be provided as follows:

- GRP samples: Before general manufacture obtain approval of appearance of fully tested compliant design samples;
- Extent: Showing proposed colour, texture and incorporating a completed section of a joint; and
- Action: Obtain Client's Representative's approval of appearance before proceeding. Retain as production control sample.

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Manufacture of GRP Canopies

141. Quality of Work is to conform to:

- Manufacture: Compliant with design and performance requirements;
- Materials: Appropriate and compatible;
- Workmanship: Appropriate and in accordance with manufacturers' recommendations;
- Resins: Used as supplied and not adulterated;
- Standard of finish: Appropriate to end use and position in building; and
- Prohibited blemishes: Including wrinkling, spotting, striations, fibre patterning, fish eyes, blisters, crazing, cracking, dry patches and uneven or inconsistent colour.

142. Manufacturing Accuracy to conform to:

- Finished dimensions of completed units when erected;
- Ambient temperature: Measurements taken at 16-18°C; and
- Maximum permissible deviations as table below:

Overall dimension involved (m)	Up to 2 m	2-3 m
Width and height:	0-2 mm	0-3 mm
Straightness of edges: deviation from intended line, any variation to be evenly distributed with no sudden bends or irregularities.	3 mm	4 mm
Squareness: taking the longer of 2 sides at any corner as a base line, the deviation of shorter side from perpendicular; dimension involved is the shorter side.	3 mm	4 mm
Twist: deviation of any corner from the plane containing the other 3 corners; dimension involved is the shorter side.	3 mm	5 mm
Flatness - deviation under a 1 m straight edge placed anywhere on a flat panel surface:	3 mm	3 mm

143. Suitability of structure:

- Provider's survey;
- Scope: Geometric survey of supporting structure, checking line, level and fixing points;
- Give notice: If structure will not allow required accuracy or security of erection; and
- Setting out: Establish erection datum points, lines and levels.

144. Installation of Interfaces:

- General: Locate flashings, closers etc. correctly with neat overlaps to form weathertight junctions.

NFRC Competent Person Scheme for roofing

145. The Provider or an approved Subcontractor undertaking any aspect of the roofing works should be registered as a member of the NRFC Competent Person (CPS) or equivalent to facilitate the self-certification of residential, industrial and commercial work that falls under the auspices of the Building Regulations Approved Document L1B (as amended 2010, 2011, 2013, 2016 and 2018) or equivalent.

146. The Provider or must submit to the relevant local authority building control department, the relevant Building Regulations Compliance Certificate within 30 calendar days of the completion of any roofing Works that are covered by Approved Document L1B or equivalent. These include:

- Slating and tiling and all other pitched works;
- Felt, single ply and GRP;
- Fully supported lead, copper or equivalent, zinc and standing seam aluminium;
- Liquid applied waterproofing;
- Mastic asphalt;
- Reinforce bitumen membranes;
- Sheeting; and
- Rooflights (inserted between rafters).

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Client's current manufacturers/suppliers/products

147. 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]

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SCAFFOLDING AND MEANS OF ACCESS

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SCAFFOLDING AND MEANS OF ACCESS

001. Provide scaffolding for the Works where required by Regulatory Requirements.

002. Moveable towers can be used where Regulatory Requirements allow this. This is also subject to the approval of the Client's Representative for scaffolding above the equivalent of the ridge line of a two storey Property.

003. Only light short-term Work may be done from ladders where this is in line with the Code of Practice for Ladders.

004. Working platforms required at heights of 2 metres and above must be carried by a properly constructed scaffold. Scaffold may be provided at lower levels.

005. Obtain:

- a licence from the highways authority where scaffold is to be constructed on or over the public highway; and
- permission from the adjoining landowner to occupy the space where scaffolding is erected over an adjoining property.

006. Where scaffold is to be constructed on or over the public highway:

- consult the highway authority whether lighting or any other form of warning is required;
- if so, provide this (with any electrical supply being of a maximum of 100 volts); and
- notify the police where, when and for how long, the scaffold is to be in place.

007. Before erecting any scaffold to which Paragraph 05 above applies, provide evidence to the Client's Representative that the permissions referred to in that Paragraph have been obtained and, where applicable, that the notifications under Paragraph 06 above have been given.

008. Ensure that any temporary roofs are properly designed and secured and must provide calculations and drawings to the Client's Representative (for checking and approval).

009. Before the erection of any scaffolding to three storeys and above:

- submit an engineer's design of the scaffold to the Client's Representative for checking and approval;
- when erected, supply a certificate from a Member of the Institute of Structural Engineers indicating the scaffolding is in good condition and complies in all respects with all relevant Codes of Practice; and
- similarly certify any alteration to the scaffold.

010. Construct all scaffolds in accordance with:

- BS EN12811 – 1 or equivalent; and
- NASC Technical Guidance TG20 for tube and fitting scaffolds or equivalent.

011. For all scaffolds:

- use Equipment in good condition approved by the Client's Representative;
- inspect all components must be inspected prior to use;
- sole plates must carry a minimum of 2 standards and wherever possible be placed parallel to the face of the building;
- they must be rigid and constructed on a solid foundation;
- standards must be upright at all times;
- ledgers must be horizontal and fixed with load bearing coupler;
- gaps in working platforms must not exceed 25mm wide and where necessary the inside boards must be secured to achieve this. No gap is to exceed 6 square inches anywhere. Where third parties are at risk, no gaps are acceptable – nothing must be allowed to fall through or off the platform;
- sufficient positive ties to the main walls of buildings must be fitted;
- fans and/or working areas over entrances and exits must be fully double boarded with a continuous membrane between to stop any matter falling through;
- where hoists are erected in scaffold, extra ties must be used to prevent vibration of the scaffold;
- fit toe boards and guard rails to working or access platforms and to stairs where people working on them could fall 2 metres or more;

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- ensure Materials and items are not thrown, tipped or allowed to fall off the scaffolds or working platforms;
- display a notice saying "Do not use" on partially erected or partly dismantled scaffold; and
- make the scaffold at all times when not in use for undertaking the Works.

012. Scaffold requiring protection from lightning strike in accordance with the applicable Standard or equivalent must be certified by a qualified electrical engineer, when first erected and with regular testing and a certificate being provided at not less than monthly intervals. Copies must be provided to the Client's Representative.

013. Scaffold must be erected, dismantled and altered:

- by competent persons;
- where the scaffolding is over 5m high, under the supervision of a person trained and certificated under the Construction Industry Scaffolders Registration Scheme (or equivalent approved by the Client's Representative);
- in accordance with either:
  - NASC Guidance Document SG4 for tube and fitting scaffolds or equivalent; or
  - the manufacturer's instructions for system scaffolds; and
- so that at all times windows are openable by the occupants from the inside.

014. Scaffolding must be inspected by the Provider's 'competent person' at least every 7 (seven) days. Correct any faults found immediately. A record of such inspections and the Provider's report must be submitted to the Client's Representative within 1 (one) Working Day of each inspection.

015. Where the Client's Representative advises the Provider of this, allow another contractor working directly for the Client to use scaffolding erected by the Provider, subject to that contractor agreeing to comply with any health and safety requirements in relation to the use of that scaffolding reasonably required by the Provider.

016. Scaffolding must be struck within 1 (one) week of the Client having advised the Provider that the Works have been satisfactorily completed, unless the Client requires the scaffolding to be maintained for another contractor working directly for the Client. In these circumstances:

- the scaffolding must be struck within 1 (one) week of the Client having advised the Provider that the scaffolding is no longer required; and
- the Client must pay the Provider for the use of the scaffolding by the Client's other contractor at the rates payable for the use of scaffolding under the Price Framework (even where the payment for the scaffolding to be erected and maintained for the Works was included in the Rates).

017. Payment for scaffolding will be in accordance with the Schedule of Rates for Scaffolding and Means of Access as set out in the Price Framework and (where applicable) Price Schedule.

018. The Rates for scaffolding include for:

- basing out, preparing and levelling of ground, provision of additional support, base plates, spreaders, as necessary;
- protection of the structure, fabric, finishings, roof coverings and scaffolding.
- provision of all tubes and fittings of every description, delivery, handling and removal.
- erecting, supporting, maintaining, adapting and dismantling as required;
- bridging across structures and all other obstructions where necessary;
- removal, temporary storage/re-siting, protection and subsequent reinstatement as required of all TV, radio and telecommunication aerials, satellite dishes and similar items;
- fans, gantries, hoardings, sheeting and double boarding of working platforms to protect entrances, paths, rights of way and other forms of access or thoroughfare unless specifically Instructed by the Client's Representative;
- working platforms to towers and chimney scaffolding;
- toe boards, guard-rails, handrails, safe ladder access, ladders, warning signs and taping;
- ancillary plant and equipment such as tower feet/wheels, out-riggers, cross bracing, gin wheels and ropes;
- lighting and/or alarming where deemed necessary or appropriate and/or as specifically directed by the Client's Representative;
- protection against lighting strike;

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- fixed handholds and physical ties to the structure where necessary, subsequent removal and making good;
- provision of certified structural design calculations and erection certificates to the Client Representative where required;
- reinstatement of ground and making good any damaged surfacing and/or paving if necessary;
- compliance with all Regulatory Requirements including provision of all associated licences, and permits and the payment of all related fees and charges; and
- additional lifts of scaffolding, working platforms, handrails, ladders, other access provisions necessitated by structure/roof design, for example changes in roof pitches at mansards and anything similar.

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CARPENTRY AND JOINERY

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CARPENTRY AND JOINERY

GENERAL

Generally

001. Where necessary cut out for butts/hinges when replacing door or window frames/linings or piecing in new timber.

002. Note that all sawn timber sizes quoted in the Schedule of Rates are nominal sizes.

003. Stain or prime and undercoat all prepared timber all round before fixing, as described in the "Painting and Decorating" Part of this Specification.

004. Comply with the "Painting and Decorating" Part of this Specification where Works include items being painted, decorated, stained, touched up or prepared for decoration. Match the finish and type to the existing or surrounding finish as appropriate.

005. Where painted skirtings and architraves are specified, at the Provider's option use an MDF equivalent where this is approved by the Client's Representative.

006. Match any purpose made items (when specified) to the existing items as far as possible.

MATERIALS

Timber

007. Use only suitable, sound, well-conditioned, properly seasoned preservative treated whitewood from a source approved by the Client's Representative that is free from any defects making it unsuitable for its intended purpose. All timber to be FSC or PEFC certified or from equivalent independently verifiable sustainable sources.

008. Level and pack all structural timber. Structural timber shall comply with the applicable Standard. The dimensions of a timber floor, ceiling or roof member may be determined by the guidance given in the applicable Standard span tables for solid timber members in floors, ceilings and roofs for dwellings published by TRADA or international equivalent. Timber for floors and roofs shall comply with the applicable Standard or equivalent. Strength classes, species, grades and species combinations referred to be as defined in the applicable Standard or equivalent.

009. Cross sectional dimensions are to be either basic sawn or regularised sizes as defined in applicable Standard. Trussed rafter roofs are to be braced to the applicable Standard or equivalent. Structural timber shall be C16 or C24 grade timber to comply with loadings and spans as set out in the applicable Approved Document A of the Building Regulations. The section sizes shall be in accordance with tolerance class 1 of the applicable Standard or equivalent, or CLS/ALS processed sizes in accordance with tolerance class 2 of the applicable Standard or equivalent.

Graded Softwood for Structural Use:

- Stress graded to the applicable Standard or equivalent and so marked; and
- Strength class to the applicable Standard or equivalent.

010. Trussed Rafters are to be designed and fabricated to the applicable Standard or equivalent, truss members shall be 44mm (minimum) finished thickness, ceiling ties and top chord members shall have 97mm finished depth, all trussed rafters shall be nail plate connected.

011. Softwood for use with leadwork shall be planed, free from wanes, pitch pockets, decay and insect attack except pinhole borers, with a moisture content of not more than 22% at time of covering.

012. Cross section dimensions of timber shown on drawings are nominal sizes unless stated otherwise. reduction to finished sizes of planed/regularized timber to be to the applicable Standard or equivalent.

013. Moisture content of timber at time of erection to be:

- Structural timber 20% + or - 2%, kiln dried; and
- Fascias barge boards 18% + or - 2%.

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014. Keep timber dry and do not overstress, distort or disfigure sections or components during transit, storage, lifting, erection or fixing. Store timber and components under cover, clear of the ground and with good ventilation. Support on regularly spaced, level bearers on a dry, firm base. Open pile to ensure free movement of air through the stack. Arrange sequence of construction and cover timber as necessary during and after erection to ensure that specified moisture content is not exceeded. Keep trussed rafters vertical during handling and storage

Preservative treatment of timber

015. Treat softwood described as "treated" or "impregnated" before delivery to the Property with either:

- an appropriate preservative under vacuum pressure with an average net retention of at least 4kg of dry salts per cubic metre; or
- an organic solvent type preservative giving an overall retention of 16Kg of solution per cubic metre of timber

016. Structural timber and fencing:

- Where subsequent cross-cutting or boring of the treated timber cannot be avoided all exposed surfaces shall be liberally swabbed with a proprietary end grain timber preservative to maintain the integrity of the protective system;
- All treated timber shall show only negligible dimensional change or distortion, otherwise it will be rejected;
- The end use of timber must be quoted by the Provider to the treatment company;
- A certificate of treatment to cover all timbers processed shall be supplied by the treatment company to the Provider; and
- A certificate of treatment shall be supplied by the Provider for each batch of timber treated.

Fixings

017. Framing anchors are to be galvanised steel or equivalent, fixed securely using not less than the number of nails recommended by the anchor manufacturer. Nails to be not less than 30mm x 3.75 mm galvanized or sherardized square twist unless recommended otherwise.

018. Truss clips are to be galvanised steel or equivalent, fixed securely with 32mm x 3.5mm galvanised square twisted nails in every hole.

019. Anchor straps are to be galvanised steel or equivalent, fixed securely to timber with three 30mm x 3.75mm galvanized nails and to masonry with four 50 mm x 8 gauge galvanised screws evenly spaced.

020. Lateral restraint straps are to be galvanised steel or equivalent, ensure that cranked end is in tight contact with cavity face of wall inner leaf and is not pointing upwards. Fix noggings and packs beneath straps which span joists/rafters/ties running parallel to wall, noggins and packs to fit tightly and be not less than three quarters of joist/rafter/tie depth. Notch joists so that straps fit flush with surface. Do not notch rafters/ties. Fix straps to joists/rafters/ties with seven 50 mm x 1½ mm gauge galvanised countersunk screws, evenly spread.

021. Bolts and nuts shall be cup square with large washers and nuts, and must comply with the applicable Standard or equivalent. Washers shall comply with the applicable Standard or equivalent.

022. Expanding bolts shall be Grade A4 stainless steel or equivalent and shall be of a type to suit the purpose for which they are required, fixed security in position in accordance with manufacturers technical data sheet.

023. Canopy cleats are to be galvanised steel or equivalent, fixed securely to timber with 50mm x 1½ mm galvanised screws.

024. Retaining strap to be galvanised steel or equivalent, with site applied bituminous paint coating, and bedded securely in mortar.

025. Expanded metal fixing strip to be galvanised expanded metal lathing to the applicable Standard or equivalent zinc coated and fixed securely by building into position.

026. Fastenings for materials and components forming part of external construction to be of corrosion resistant material or have a corrosion resistant finish.

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027. Fastenings for materials and components, forming part of external construction but not directly exposed to the weather to be of corrosion resistant material or have a corrosion resistant finish, directly exposed to the weather to be of corrosion resistant material.

028. Cartridge operated fixings are not to be used without the permission of the Client's Representative. Tools to be manufactured to the applicable Standard or equivalent and Kitemark certified. Fasteners, accessories and consumables to be types recommended by the tool manufacturer. Staff members to be trained and certified as competent by tool manufacturer. Ensure that Staff members take full precautions against injury to themselves and others. Shot fixing is to give secure fixing at 750mm centres.

Nails, etc

029. Use sheradised nails for fixing joinery having an external exposed face in accordance with applicable Standard, punched in below the surface and filled with an approved filler.

Joinery Timber

030. Softwood planed finish joinery timber which will be exposed to view shall be European Redwood minimum density 510kg/m^3, class J10 of the applicable Standard or equivalent.

031. The following defects shall not be permitted: pinholes shown on the surfaces; sloping grain exceeding one in eight; checks, splits and shakes in excess of those permitted by class J10 of the applicable Standard or equivalent; knots, excepting isolated sound tight knots of less than 20mm diameter or no wider than half the width of the section; any evidence of beetle attack or decay. Softwood not exposed to view will be accepted with minor defects with the exception of active beetle attack or decay.

032. Where hardwood is specified, use hardwood of one of the following species of the applicable Standard or equivalent suitable for the purpose, un-replenishable tropical hardwoods are not to be used

Oak	North American	Density range 590-930 kg/m^3
Beech		Density range 700-900 kg/m^3
Ash	North American	Density range 650-850 kg/m^3
Maple	North American	Density range 600-750 kg/m^3
Cherry	North American	Density range 700-900 kg/m^3
Utile		Density range 650-725 kg/m^3
Mahogany	South American	Density range 500-650 kg/m^3
Mahogany	West African	Density range 500-650 kg/m^3
Dark Red Luan	Philippine	Density range 650-725 kg/m^3
Iroko		Density range 650-725 kg/m^3
Dark Red Meranti		Density range 650-725 kg/m^3

033. Tongued and grooved floorboarding is to comply with the applicable Standard or equivalent

034. Ensure the moisture content based products at time of installation: to be no more than:

- internal joinery is no more than 20% (8-12% when timber is in an existing Property which is centrally heated);
- external joinery is no more than 18%.+ or-2%; and
- structural timber is 20% + or -2%, kiln dried.

Plywood, blockboard, particleboard, hardboard etc.,

035. Plywood panel products for structural use shall conform to the applicable Standard or equivalent for designs to the applicable Standard or equivalent plywood may be selected from those listed in the applicable Standard or equivalent or shall have certification from a suitable body such as the British Board of Agrément.

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036. Marine plywood shall comply with the applicable Standard or equivalent, marine plywood manufactured from selected untreated tropical hardwoods, durability class H, surface grade 11, and with sanded surface finish.

037. Plywood designed to the applicable Standard or equivalent shall be subject to the quality control procedures of one of the organisations listed in that Standard, or to the controls listed by the certification body.

038. The specification for plywood shall state the following information where appropriate:

- type;
- standard;
- grade;
- species;
- nominal thickness;
- number of plies; and
- finish (sanded/unsanded).

039. Plywood exposed to the weather shall have no open defects (e.g. checks, knots, holes, splits) on the exposed face(s) unless it is used only for a temporary application such as hoarding.

040. Prior to receiving a painted finish, plywood shall be adequately sanded.

041. All cut edges that may be subject to weather exposure shall be sealed with a suitable sealant or applied finish; typically these shall be one of the following:

- Special sealing compounds, such as pitch epoxy;
- non-setting mastic, where the plywood is set in frames; or
- timber beading bonded with suitable adhesives.

042. In construction the following procedures shall be observed:

- lower edges of boards shall be bevelled to promote shedding of water;
- plywood used as infill panels shall be fully painted before installation and/or assembly;
- cavities behind boards shall be adequately ventilated and drained to allow dispersal of moisture;
- clearance shall be allowed at selected joints to allow free drainage of water;
- plywood junctions with masonry shall provide adequate clearance to allow drainage, prevent capillary absorption of water and provide enough space for maintenance of edge sealing;
- the bottom edges of boards shall stand well clear of flashings, roof coverings, sills, and the ground; and
- exposed and/or inadequately protected fixings shall be of non-ferrous metals and have adequate corrosion resistance.

043. WBP sanded and unsanded finished plywood is to be in accordance with the applicable Standard or equivalent, appearance classification E or I.

044. Oriented strand boards shall be in accordance with the applicable Standard or equivalent and supplied in accordance to use:

- OSB/1 general purpose no loading boards and boards for interior fitments for use in dry conditions;
- OSB/2 load-bearing boards for use in dry conditions;
- OSB/3 load-bearing for use in humid conditions; and
- OSB/4 heavy duty load-bearing boards for use in humid conditions;

045. Particleboards shall be in accordance with the applicable Standard Type 5 or equivalent, for chipboard flooring, use the appropriate waterproof moisture resistant grade suitable for the purpose.

046. Hardboard shall be to the applicable Standard or equivalent. Ensure hardboard used to form bath panels has an enamelled surface and Type TE Tempered.

047. Ensure all block-board complies with the applicable Standard or equivalent and to be to a standard and quality approved by the Client's Representative, lamin-board used is five ply and veneer is of the specified species of timber (but where none is specified, it is an appropriate species of timber).

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Priming

048. Prime timber in accordance with the finish coat specification. Use a primer recommended by the manufacturer of the surface coating.

Preservative treatment of timber

049. Treat softwood described as "treated" or "impregnated" before delivery to the Property with either:

- an appropriate preservative under vacuum pressure with an average net retention of at least 4kg of dry salts per cubic metre; or
- an organic solvent type preservative giving an overall retention of 16Kg of solution per cubic metre of timber.

050. Structural Timber, fencing and other woodwork, shall be treated in accordance with Paragraph 015 above.

- Where subsequent cross-cutting or boring of the treated timber cannot be avoided all exposed surfaces shall be liberally swabbed with a proprietary and grain timber preservative to maintain the integrity of the protective system. All treated timber shall show only negligible dimensional change or distortion, otherwise it will be rejected. The end use of timber must be quoted by the Provider to the treatment company; and
- The Provider must provide a certificate of treatment from the treatment company for all timbers processed.

051. Joinery components and fascias, shall be treated by spirit based double vacuum process and shall be machined to its final dimensions before treatment and then assembled. All treated timber shall show only negligible dimensional change or distortion, otherwise it will be rejected.

052. Treat ground contact timber before delivery to the Property with an appropriate preservative under vacuum pressure with an average net retention of at least 5.4Kg dry salts per cubic metre of timber.

053. Cut timbers to their final dimensions before impregnation. Where this is not possible, liberally swab any sawn or cut faces or borings with an appropriate preservative from the impregnation plants.

054. After treatment, carefully open stack the timber in a well ventilated covered space to enable surplus solvent in the preservative to dry out by evaporation. Ensure all treated timber is dry before incorporation in the Works.

055. Allow items of carpentry timber treated with an appropriate preservative a minimum of 3 weeks air drying period following treatment and before fixing. Allow joinery timbers similarly treated a minimum of 6 weeks air drying following treatment and before fixing.

056. Provide a copy of the relevant Preservation Treatment Certificate to the Client's Representative.

Adhesives

057. Ensure adhesives for:

- exterior use are synthetic resin type WBP; and
- interior use are synthetic resin type of moisture resistant durability ("MR").

Timber fillers for rotted woods

058. Ensure timber fillers for rotted softwoods and hardwoods are a complete system appropriate for the type of wood.

Storage of material

059. Protect joinery from the weather during transit. At all times before fixing, both before and after priming, store it under cover and clear of the ground.

Door frames and linings

060. Ensure external door frames without cills have 12.5mm diameter x 100mm long galvanised steel or equivalent dowels housed into the bottom of each leg leaving 50mm projecting. Ensure the frames for fire resisting doors are of a type approved by the Client's Representative. Ensure frames for half hour doors have 25mm minimum stops.

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Doors

061. Note that fire door ratings in the Schedule of Rates are shown in hours. Ensure the integrity of the door (including all hinges, ironmongery etc) achieves this when fitted to a frame with or without intumescent strips. Where it is necessary to use hinge packers or pads on fire rated doors, frames or door sets ensure that only intumescent types are used.

062. Ensure all external doors (other than flush doors) are from solid timbers. Do not use veneers or laminations.

Ledged and braced doors

063. Ensure ledged and braced doors consist of 3 No. 150mm x 25mm horizontal ledges with bevelled edges, 125 x 25mm, parallel braces and 100 x 19mm tongued and grooved and V jointed matching with:

- the braces being obliquely jointed to the ledges with their lower ends adjacent to the hanging side of the door;
- each board being nailed to the ledges and braces using at least 2 No. nails 50mm long at each ledge and one at each brace;
- the ends of ledges being screwed back to the match boarding from inside and stopped in;
- all timber being primed before the door is assembled; and
- the end grain being primed with two coats of aluminium primer.

Framed, ledged and braced doors

064. Ensure framed, ledged and braced doors consist of 100 x 50mm stiles and top rail, 175 x 38mm middle and bottom rails, 100 x 38mm braces and 100 x 12mm tongued and grooved V matching with:

- the top rail being haunched, morticed and tenoned to the stiles;
- the middle and bottom rails being bare faced, morticed and tenoned to the stiles;
- the top rails grooved to receive the tongues of the tongued and grooved V jointed matching;
- the braces being stub tenoned into the rails and stiles;
- the tongued and grooved V jointed matching being secured to the rails and braces by lost head nails hammered in from the faces;
- all joints being jointed with WBP glue to standard and quality approved by the Client's Representative;
- all boarding and timber faces covered being primed before assembly including all rails, grooves and matching;
- the end grain being primed with aluminium primer;
- the frame being securely cramped;
- all mortice and tenon joints being secured with hardwood wedges well driven home; and
- the whole being assembled perfectly square and free from winding.

Flush doors

065. Ensure 35 or 40mm thick internal flush doors consist of a skeleton or honeycomb core, lipped on two stiles with hardwood strips – each lipping should be a minimum of 6mm and to be full thickness of the door.

066. Hardwood faced doors are to have selected hardwood veneered, MDF or High density chipboard of 3.2mm thickness, Veneer type: Koto, Beech, African Mahogany, Maple, Cheery, Oak or Sapele lippings to match or compliment face veneer, pre-finished factory applied clear lacquer to both faces.

067. Ensure 44mm thick external flush doors are faced on both sides with 6mm external quality resin bonded plywood, for painting or staining to the applicable Standard or equivalent on a solid core. Provide glazing apertures with a rebated, sunk and rounded Utile cover mould and Utile hardwood glazing beads with mitred angles. Ensure the glazing cover piece and beads are no less than that required by the relevant applicable Standard or equivalent for glazed apertures.

068. Opening for glass to be 400mm x 600mm high.

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Half glazed flush doors

069. Ensure the opening for glass in doors described as half-glazed:

- extends the full width between stiles; and
- is at least 680mm high.

070. Ensure:

- glazing apertures are provided with a rebated, sunk and rounded Utile cover mould and Utile hardwood glazing beads with angles mitred; and
- the glazing cover piece and beads are no less than that required by the relevant applicable Standard or equivalent for glazed apertures.

Panel doors

071. Ensure panel doors:

- are jointed with mortice and tenon joints and WBP glue;
- have ply panels that are a minimum of 6mm thick external quality WBP plywood for painting or staining; and
- have the joint between the ply, stiles and rails sealed at the time of assembly with primer.

Fire check flush doors

072. Ensure fire check flush doors are to the fire rating specified in the Schedule of Rates and this Specification.

Windows

073. Provide timber windows with guarantees as table below. Provide timber surrounds for steel windows as approved by the Client's Representative.

Timber Frames	30 year guarantee against fungal attack
Timber Window Manufacturing Defects	10 Year guarantee
Timber Window (Factory Painted External Joinery)	10 Year guarantee (as minimum)
Timber Window (Factory Stained External Joinery	6 Year guarantee (as minimum)
Hardware Components	10 Year guarantee (as minimum)
Double Glazed Units	15 Year guarantee (as minimum)

PVC-u doors and windows

074. Ensure all PVC-u windows and doors are:

- constructed from high impact modified PVC-u; and
- manufactured from base materials guaranteed against decomposition and for colour fastness for a minimum of 25 (twenty five) years.

075. Guarantee the fabrication of all PVC-u frames and sashes against failure of welds, mechanical joints etc., for a minimum of 25 (twenty five) years.

076. Guarantee double glazed units against failure of the unit for a minimum of 15 (fifteen) years.

077. Guarantee hardware components against failure of the unit for a minimum of 10 (ten) years.

078. Protect PVC-u items against damage during the course of fixing.

079. Ensure windows provided can be opened to allow a secure trickle ventilation.

080. Ensure the accurate measurement of the Works and correct any measurement errors. (Tolerances – the overall height and width of an assembled frame shall not differ from the work size by more than +/- 3mm when measured at (20 +/- 5) °C, with a maximum difference of 3mm at any point. For assemblies with outer frames having three or more joints per frame member, the deviation shall not be more than 4mm when similarly measured. Frame assemblies shall be such that they can be installed in a square opening with a maximum difference in the diagonal of 4mm).

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081. Ensure all window frames show a 50mm-60mm face on the outside of the frame.

082. Construct doors from a profile with a minimum of 100mm width showing face.

083. Ensure doors:

- are double panelled type 2XG or 2XGG;
- have the top panel double glazed in toughened glass;
- have a bottom panel similarly double glazed or PVC-u skinned/foam sandwich with PVC-u frame; and
- have the panels screwed and wedged.

084. Use door and window furniture suitable for the doors and windows approved by the Client's Representative comprising:

- 1½ pairs of heavy duty hinges;
- cylinder lock;
- letter plate - white plastic gravity type (front doors only);
- 1 No. heavy duty multi-point lift lever espagnolette locking system with return lever handle action to horizontal position when locked;
- lever handles;
- numerals (front doors only);
- stormproof cill/threshold with integral weather seals; and
- rain deflector/weatherboard;
- for turn tilt windows:
    - a key operated 'tilt barrier' approved by the Client's Representative;
    - child locks, where the windows are fitted on or above the first floor level; and
    - a switch barrier; and
- for casement windows (outward opening):
    - friction hinges with espagnolette fittings and locking furniture on all opening windows irrespective of configuration; and
    - child locks, where the windows are on or above the first floor level.

085. Ensure door and window furniture is SAA or brass finished as approved by the Client's Representative or as specified on the Order.

086. Use only PVC-u windows/doors approved by the Client's Representative unless specified on the Order.

Sealant

087. For pointing around window and door frames use sealants:

- to the applicable Standard or equivalent with fungicide;
- coloured to match existing; and
- that are suitable for sealing to timber, aluminium and PVC-u windows and doors, as applicable.

088. Silicone sealant to the applicable Standard or equivalent with fungicide.

089. Repointing existing door and window frames with silicone sealant is to be undertaken by cutting away the existing mastic pointing with a sharp knife, cutting away any existing sand/cement pointing, ensuring that the surfaces to be jointed are completely dry and clean, the depth of sealant is to fill all resulting voids.

Combustion air grilles

090. When repairing or renewing items which incorporate combustion air grilles:

- use either the salvaged air grille (if it is in sound condition) or combustion air grilles as approved by the Client's Representative; and
- ensure apertures are maintained in the repair or renewed items.

Fibre cement insulating board

091. Use insulating board that is asbestos free and has a sanded finish.

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Boards and panels

092. Do not use cross joints in board coverings.

PVC-u fascias/soffits/cladding and components

093. Ensure PVC-u fascias, soffits, cladding and components are:

- cellular PVC-u with a low density (closed cell) core and homogeneous skin;
- with self coloured, smooth, semi-matt finish; and
- of sections and profiles approved by the Client's Representative.

Architraves, reveal linings, window boards and mouldings

094. Ensure replacement items match the existing (which may be of varying profiles and shapes). Where painted softwood skirtings and architraves are specified, at the Provider's option, use an approved MDF equivalent where approved by the Client's Representative.

095. PVC-u cill board is to be bull nosed or square edged, manufactured from low density cellular (closed cell) core and homogeneous impact resistant skin of PVC-u in accordance with to the applicable Standard or equivalent for UV stability and UV aged impact, resistance requirements.

096. Cill board to be maximum 155mm wide and minimum 9mm thick:

- Weight: Average density 500 kg/m^3;
- Tolerance deviations of: +/-12.5% per m, width +/- 1.5mm, thickness +/- 0.5mm;
- Flatness: Must not exceed +/- 0.6mm over 100mm. Linear thermal expansion of less than 7mm x 10.5 dgs. C;
- Tested in accordance with the applicable Standard Method 13. Fire Resistance or equivalent:
- Satisfy the requirements of the applicable Standard Class 1 Surface spread of flame and Index 1 = 15.4 Fire propagation. Colour Fastness or equivalent;
- Water Absorption: Less than 1.0% when tested in accordance with applicable Standard.
- Appearance: Self-coloured smooth gloss finish;
- Method of Fixing: As specified by manufacturer;
- Proprietary brand of adhesive or low modulus silicon;
- Edge Trims: Matching colour; and
- Edge Trims: Single part PVC-u trims as per manufacturers details and fixed in accordance with manufacturers' technical data sheet.

Polythene vapour barrier

097. For a polythene vapour barrier use a type of sheet approved by the Client's Representative and fixed with all joints lapped and made with double folds and taped.

Ironmongery

098. Carefully wrap and protect ironmongery until completion of the Works. Either replace with new or re lacquer any defaced or damaged ironmongery as Instructed by the Client's Representative.

099. Use screws conforming to the applicable Standard or equivalent, and of a suitable gauge and Material for the purpose and to match the article to be fixed.

100. Lubricate locks, etc., with graphite and leave them in perfect working order on completion of the Works. Properly label and deliver up all keys to or as Instructed by the Client's Representative.

101. Use black japanned tee hinges and Suffolk latches.

102. Ensure that letter plates comply with the Royal Mail's minimum size standards in accordance with to the applicable Standard or equivalent. Ensure letter plates provided in fire doors conform to the fire rating of the door.

103. Unless the Order states otherwise provide all ironmongery to new, renewed or replacement timber doors in accordance with the following:

- for external front doors:
    - 1½ pairs 100mm heavy duty satin stainless steel or equivalent butt hinges to the applicable Standard or equivalent (to be fire rated if for fire doors);
    - 1 No. cylinder security night latch with latch pull, with deadlocking arrangements;

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- 1 No. 65 or 75mm 5-lever mortice deadlock and keep;
- 1 set escutcheons;
- or multipoint locking system;
- 1 No. letter plate - gravity type to the applicable Standard or equivalent; (fire rated for fire doors);
- 1 No. security door chain;
- stormproof sill/threshold with integral weather seals;
- rain deflector/weatherboard;
- intumescent seals (fire doors only); and
- door numerals;

- for external rear doors:
  - 1½ pairs 100mm heavy duty satin stainless steel or equivalent butt hinges to the applicable Standard or equivalent; (to be fire rated if for fire doors);
  - 1 No. 100mm 5-lever mortice lock/latch and keep;
  - 1 set lever furniture/handles;
  - or multipoint locking system;
  - 2 No. mortice security bolts;
  - stormproof sill/threshold with integral weather seals;
  - rain deflector/weatherboard; and
  - Intumescent seals (fire doors only);
- for internal doors:
  - 1 pair 75mm medium duty mild steel with fixed pin (non removable) butt hinges (1½ pair fire rated heavy duty satin stainless steel or equivalent hinges to the applicable Standard or equivalent for fire-check doors);
  - 1 No. 65 or 75mm tubular mortice latch and keep;
  - 1 set lever furniture/handles; and
  - intumescent seals (fire doors only);
- for bathroom/wc doors:
  - 1 pair 75mm medium duty mild steel with fixed pin (non removable) butt hinges (1½ pair fire rated heavy duty satin stainless steel or equivalent hinges to the applicable Standard or equivalent to communal W.C's and bathrooms opening onto a means of escape);
  - 1 No. 65 or 75mm mortice bathroom lock/latch and keep with reversible solid brass latch bolt to the applicable Standard or equivalent;
  - 1 set lever bathroom furniture/handles with snib/indicator, deadbolt operated by turn button with emergency release; and
  - intumescent seals (fire doors only); and
- for external match-boarded doors:
  - 1 pair 457mm steel tee hinges;
  - 1 No. rim lock and keep; and
  - 1 set knob furniture.

104. Ensure that all door hinges, ironmongery and other hardware has a minimum fire rating to match the door, frame or door set on which it is used.

105. Ensure all door furniture is SAA or brass finished as approved by the Client's Representative or as specified on the Order.

Kitchen units/worktops in Repairs

106. Ensure kitchen units are manufactured to meet strength specification level 'H' and have fully repairable carcassing.

107. Ensure worktops are manufactured using laminated moisture resistant chipboard core and are consistent with existing worktops. Ensure all post-formed worktops are constructed using particleboard with minimum 'P5' classification (but if 'P5' is not obtainable construct only square edge and double post-formed worktops using particleboard with minimum 'P3' classification).

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108. Ensure metal fittings and screws conforming to the applicable Standard or equivalent, used in manufacture are plated against corrosion. Use metal corner gussets as fixing posts.

109. Take all necessary precautions to protect units and worktops from damage. Either make good any damage caused or replace Materials as Instructed by the Client's Representative. Ensure that, when fitted, all doors and drawers operate smoothly.

110. Where existing fixing holes cannot be used for hinges, use a steel cabinet strengthening plate, fixed four times to the unit and hinges fixed with self- tapping screws to the plate.

Chrome supporting leg

111. Ensure the worktop supporting leg is 30mm in diameter chrome plated and fixed to the worktop and floor with retaining plates and screws.

112. Aluminium square edge worktop end trim to the applicable Standard or equivalent, fixing with aluminium screws; bedding in silicone sealant.

113. Aluminium insert junctions to the applicable Standard or equivalent, bedding in silicone sealant.

114. Aluminium and rubber clip on cover beads to standard and quality approved by the Client's Representative, fixing with aluminium screws.

115. Chrome cover fillets of an approved type and manufacture, bedding and twice pointing in silicone sealant.

Handrails etc.,

116. Handrail brackets are to be cast aluminium or mild steel and fixed securely to timber with appropriate screws, finish: as specified.

117. Fixing brackets are to be galvanised steel or equivalent to comply with the applicable Standard or equivalent, fixed securely to timber frame with three 30mm x 1½ mm galvanised screws.

118. Newel brackets are to be galvanised steel or equivalent, fixed securely with bolts.

119. Aluminium angle bearers are to comply with BS EN 515, 6063tf or equivalent, anodised finish to the applicable Standard or equivalent, fixed securely to floor with galvanised steel or equivalent screws.

WORKMANSHIP

Generally

120. Ensure carpentry work is framed and put together in a substantial and workmanlike manner.

121. Ensure joinery work is accurately set out, framed and executed in accordance with manufacturer's drawings and finished off in a workmanlike manner.

122. Put together purpose made doors and other framed work immediately upon the general work being commenced, but do not glue and wedge them until the joinery is prepared in readiness for immediate fixing.

123. Finish off machine planning and moulding smooth by hand.

124. Ensure exposed faces of joinery are wrought and all arises slightly rounded.

125. Punch and putty nails and pins in exposed work.

Plugging

126. Note that in this Part of this Specification 'plug', 'plugged' or 'plugging':

- means fix to concrete, brickwork or blockwork and similar surfaces;
- includes supplying and fixing with proprietary fixings; and
- includes shot fired fixing.

127. For bolted joints, locate holes accurately and drill to diameters as close as practical to the nominal bolt diameter and not more than 2 mm larger, place washers under all bolt heads and nuts which bear directly on timber, - tighten bolts so that washers just bite the surface of the timber and at least one complete thread protrudes from the nut. Check at agreed regular intervals up to practical completion and tighten as necessary to prevent slackening of joints.

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128. Ensure that wall plates are positioned and aligned to give the correct span and level for trusses, joists, etc. Wall plate to be fully bedded in fresh mortar in lengths of not less than 3 m with half lap joints. Wall plates shall be treated in accordance with Paragraph 015 above.

129. Installing joists - position at equal centres not exceeding designed spacing and true to level. Install bowed joists with positive camber. Bed hangers directly on and hard against supporting construction, do not use packs or bed on mortar. Cut joists to leave not more than 6 mm gap between ends of joists and back of hanger, rebate joists to lie flush with underside of hangers, fix joists to galvanised steel or equivalent hangers with a nail in every hole, hanger size to suit joist, design load and crushing strength of supporting construction.

130. Trimming openings when not specified otherwise, trimmers and trimming joists to be not less than 25 mm wider than general joists.

131. When installing trussed rafters, carefully inspect each truss before erection to ensure compliance with shop drawings and specification, including grades and sizes of members, types, sizes and positions of nail plates, - gaps between ends of members at joints, and full penetration of nails.

132. Erect trusses plumb, at equal centres not exceeding designed spacing and in accordance with the applicable Standard or equivalent

133. Do not use damaged trusses and do not modify without consent of the Client's Representative. Fix securely with truss clips ensuring that rafters do not bear on wall plates. Do not fix ceiling chords to internal walls until roofing is complete and cisterns installed and filled.

134. Permanent bracing of trussed rafters is to be set out as shown on drawings. Fix bracing and binders to every rafter, strut or tie with not less than two 75mm x 3.35 mm galvanized round wire nails. Any lap joints must be side by side extending over and nailed to at least two truss members. Where a binder crosses a brace, interrupt and plate the binder.

Repairs to Redwood Sills of Timber Windows

135. Cut out decayed timber and carry out repair using 'Dry Flex System' or other equivalent approved by the Client's Representative. All in accordance with 'Window Care Systems' recommendations, approved method of working using correct tools. Maximum dimension of each resin repair as opposed to timber splice to be agreed with the Client's Representative prior to works commencing.

Repairs to Hardwood Sills of Timber Windows:

136. Cut out decayed timber and carry out repair using 'a proprietary timber repair system approved by the Client's Representative. All in accordance with 'Window Care Systems' recommendations, approved method of working using correct tools. Maximum dimension of each resin repair as opposed to timber splice to be agreed with the Client's Representative prior to works commencing.

Repairs to Timber Internal Door Frames:

137. Cut out decayed timber along the grain for a distance of 300mm (min) beyond the last visible sign of attack. The joint of new and existing timber shall be formed by means of 45° - 60° splice. New timber to be jointed to existing by means of galvanised screws or nails and adhesive and plugged and screwed to wall. New timber members shall match profile of existing. ''Dry Flex System'' or other equivalent approved by the Client's Representative may be used as a viable alternative to new timber section. Maximum dimension of each resin repair as opposed to timber splice to be agreed with the Client's Representative prior to works commencing. Dispose of defective timber immediately.

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Repairs to Timber External Door and Window Frames:

138. Cut out decayed timber along the grain for a distance of 300mm (min) beyond the last visible sign of attack. The joint of new and existing timber shall be formed by means of 45° - 60° splice. The new timber shall be redwood to the applicable Standard or equivalent Classes 2 and 3 or hardwood to the applicable Standard or equivalent, double vacuum treated in accordance with applicable Standard and all cut ends shall be dipped in similar preservative fluid before fixing in position. New timber to be jointed to existing by means of galvanised screws or nails and adhesive and plugged and screwed to wall. New timber members shall match profile of existing. ''Dry Flex System'' or other equivalent approved by the Client's Representative may also be used as a viable alternative to new timber section. Maximum dimension of each resin repair as opposed to timber splice to be agreed with the Client's Representative prior to works commencing. Dispose of defective timber immediately.

Repairs to Hardwood Sills of Timber Windows:

139. Cut out decayed timber along the grain for a distance of 300mm (min) beyond the last visible sign of attack. The joint of new and existing timber shall be formed by means of 45° - 60° splice. The new timber shall be hardwood to the applicable Standard or equivalent, Class 1 and all cut ends shall be dipped in similar preservative fluid before fixing in position. New timber to be jointed to existing by means of galvanised screws or nails and plugged and screwed to wall. New timber members shall match profile of existing. ''Dry Flex System'' or other equivalent approved by the Client's Representative may be used as a viable alternative to new timber section. Maximum dimension of each resin repair as opposed to timber splice to be agreed with the Client's Representative prior to works commencing. Dispose of defective timber immediately.

Replacing Structural Members:

140. Cut out decayed/infested timber along the grain for a distance of one metre beyond the last sign of attack. The joint of new and existing timber shall be formed by means of a half lapped joint at least twice the length of the member in depth; the new timbers should make-up the bottom section of the joint if timbers are horizontally placed. For the new timber, use a preservative treated whitewood from a source approved by the Client's Representative. Existing timbers ends exposed by cutting/jointing must be treated with preservative. New timber shall be jointed to existing by means of bolts. Connection to be affected with at least 4 number 12.5mm diameter mild steel bolts with locking nuts and dog washers. New timber members shall match profile of existing. Dispose of defective timber immediately.

Replacing Preservative Treated Structural Members:

141. Cut out decayed/infested timber along the grain for a distance of one metre beyond the last sign of attack. The joint of new and existing timber shall be formed by means of a lapped joint at least twice the depth of the member in length. New timber shall be jointed to existing by means of galvanised bolts. Connection to be effected with at least 4 number 12.5mm diameter mild steel bolts with locking nuts and dog washers. New timber members shall match profile of existing. Dispose of defective timber immediately.

Replacing Treads and Risers:

142. Remove any plasterboard and trimmings as necessary to underside of staircase. Defective treads and risers to staircase are to be removed. Replacement whitewood treads and plywood risers to profile of previous to be housed into string. Wedges and blocks to be adhesive fixed in position. Internal Grade 1-1 plywood risers to be adhesive fixed and screwed to back of treads. All work to be executed from underside. Dispose of defective timber immediately.

Softwood flooring/board flooring

143. Renew floorboards carefully so as to avoid damaging the ceiling below the floor. Remove tongued and grooved boards by carefully sawing through the tongues and forming a heading joint adjacent to a joist. When replacing the boards, provide additional support at the heading joint using timber 50 x 25mm secured to the joist.

144. Where a number of floorboards require renewal, well cramp up the new boards to form tight joints and nail them up with two lost head nails punched and putted per board, per joint. Fix access traps with screws. Take care when fixing the floorboards not to puncture or damage any existing services.

145. Provide all additional support battens, noggins etc., required to support the boards.

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Timber door frames and door linings

146. For new door frames and linings, use a minimum of three sets of fixings to each leg, each set comprising two fixings (either timber plugs and nails or proprietary plastic plugs and screws as appropriate to the quality of the fixing background). Where external door frames do not have timber cills, provide galvanised steel or equivalent dowels in the legs, grouted into the building structure with cement mortar (1:3).

147. Fix existing door frames or linings which have become loose through the frame using proprietary sleeved screw fixing devices approved by the Client's Representative.

148. Sink the heads of fixings below the surface of the frame and the recess and fill them with an approved filler.

Softwood window frames

149. Fix softwood windows and softwood window surrounds in the same way as for fixing door frames and lining legs.

Metal window frames

150. Bed metal windows in a butyl rubber sealant and fix them to wood window surrounds which have been treated to the applicable Standard or equivalent with galvanised or cadmium plated screws or alternatively by stainless steel or equivalent fixing clamps or brackets and proprietary plastic plugs and approved rust proof screws.

Window/door replacement

151. All replacement windows and doors in repairs and ad-hoc renewals are to be to the applicable Standard or equivalent. Undertake window/door replacements that involve removal of the primary frame from the building and associated glazing in accordance with the Building Regulations, Approved Document L.

Fire rated doors/frames/door-sets – repair, replacement and installation

152. Ensure that the repair, replacement and/or installation of internal/external fire rated doors, door frames, door-sets and any associated components such as stops, architraves, thresholds, trims, seals and ironmongery is undertaken only by persons that are properly accredited to do so by having been certified by BMTrada, or other approved equivalent organisation.

Sealant

153. Before pointing around existing window and door frames, pick out all loose materials and insert a cellular backing appropriate to the type of sealant in the joint between the frame and wall. Use a sealant as specified, inserted by pressure gun to form a neat uniform beaded finish.

Stud partitions

154. For stud partitions use suitably sized softwood head and sole plates with studs at 400mm centres horizontally and noggins at 1200mm centres vertically. Butt joint quilts and fill the entire void.

Kitchen units

155. All kitchen units in repairs and ad-hoc renewals are to be to the applicable Standard or equivalent. Fix base units with proprietary metal or plastic fixing brackets, plastic plugs and screws and the joint between the worktop and wall pointed with a neat bead of anti mould white silicone sealant.

156. Fix wall units with proprietary metal or plastic fixing brackets, plastic plugs and screws and also support them on full length softwood cleats of not less than 50 x 25mm.

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Worktops

157. All worktops in repairs and ad-hoc renewals are to be to the applicable Standard or equivalent. Fix worktops to base units on metal or plastic brackets with self-tapping screws. Support worktops with a void under by 50 x 25mm softwood cleats securely fixed to any background on at least three sides. If this cannot be achieved, support the sides affected on a flanged tubular steel support fixed to the floor with proprietary plastic plugs and screws and to the worktop with appropriate self-tapping screws. Seal/treat all cut edges to prevent the ingress of moisture, square cut with matching veneer to exposed ends.

Fixing PVC-u doors and windows

158. PVC-u windows and doors in repairs and ad-hoc renewals are to be to the applicable Standard or equivalent and manufactured to the applicable Standard or equivalent. Take out the existing door/window and hack off render/plaster as far as necessary to accommodate the window fixing cramps in window reveals. Supply and install support lintels over the new window/door opening. Where the original brickwork is carried over the window/door i.e. soldier course, make good the brickwork as necessary. Remove all rubbish and leave the window/door opening ready to receive the new window/door. Lintels to be in accordance with Building Regulations, Approved Document A or equivalent Standard.

159. Fix the PVC-u double glazed window/door with or without a cill directly into the prepared brick reveals using galvanised twist-in-lugs, approved by the Client's Representative, screwed to the reveals using galvanised screws. Seal the windows to the masonry openings with silicone sealant approved by the Client's Representative. Protect the windows during the course of the Works. Fix all windows directly to the inside face of the vertical DPC. Remove all old mastic from the brick face.

160. Where appropriate supply and fix an approved PVC-u cellular core window board, fixed with screw on lugs, fixed to the wall, together with 19mm PVC-u quadrant beading, glued to the window boards and window frame using an appropriate adhesive.

161. Make good to all internal window reveals with backing and finished plaster and leave ready for redecoration.

162. Replace the windows/doors that have been removed with new windows/doors and make them weather-tight before the Staff leave the Property at the end of each Working Day.

Fixings/Adhesives

163. Fixing: Use fixing and jointing methods and types, sizes, quantities and spacings of fastenings which are suitable having regard to nature of and compatibility with product/material being fixed and fixed to recommendations of manufacturers of fastenings and manufacturers of components, products or materials being fixed and fixed to materials and loads to be supported. Provide additional noggings/grounds/bearers as necessary to provide adequate fixing and support.

164. Adhesive types: As specified in the relevant section. Surfaces to receive adhesive to be sound, unfrozen, free from dust, grease and any other contamination likely to affect bond. Where necessary, clean surfaces using methods and materials recommended by adhesive manufacturer.

165. Ensure surfaces to be of sufficient smoothness and evenness to suit gap filling and bonding characteristics of adhesive. Adjust as necessary, ensure that Staff members observe manufacturer's and Law for storage and safe usage of adhesives. Do not use adhesives in unsuitable environmental conditions or beyond the manufacturer's recommended time period. Apply adhesives using recommended spreaders/applicators to ensure correct coverage. Bring surfaces together within recommended time period and apply pressure evenly over full area of contact surfaces to ensure full bonding. Remove surplus adhesive using methods and materials recommended by adhesive manufacturer and without damage to affected surfaces.

166. Fixing Through Finishes: ensure that fastenings and plugs (if used) have ample penetration into the backing.

167. Pelleting: Countersink screw heads 6 mm below timber surface and glue in grain-matched pellets not less than 6 mm thick, cut from matching timber. Finish off flush with face.

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Expanding Polyurethane Foam

168. Expanding polyurethane foam must be of an approved fire resistant type complying with applicable Standard and be of the correct fire performance rating for its intended use or application to ensure Building Regulations compliance.

Sun Pipes

169. Rigid Sun Pipe to Pitched Roof - supply and install to the following specification:

- Pipe material: Rigid aluminium or equivalent;
- Diameter: 240 – 360 mm;
- Tunnel length: Up to 6 m maximum;
- Tunnel reflectance: Greater than 97%;
- Roof terminal: Proprietary polycarbonate dome (opal / UV protected) or 4 mm toughened glass in polyurethane frame or equivalent;
- Ceiling terminal: Double glazed diffuser;
- Accessories: 30° – 45° proprietary bends as required. (Total number of bends to be kept to a minimum);
- Proprietary extension sections as required;
- Flashing: To suit interlocking concrete roof tiling; and
- Installation: In accordance with manufacturers' technical data sheet

170. Flexible Sun Pipe to Pitched Roof - supply and install to the following specification:

- Pipe material: Flexible metallized polyester or equivalent;
- Diameter: 350 – 360 mm;
- Tunnel length: Up to 1.5 m maximum;
- Roof terminal: Polycarbonate dome (opal / UV protected) or equivalent;
- Ceiling terminal: Double glazed diffuser;
- Flashing: To suit interlocking concrete roof tiling; and
- Installation: In accordance with manufacturers' technical data sheet.

171. Rigid Sun Pipe to Flat Roof - supply and install to the following specification:

- Pipe material: Rigid aluminium or equivalent;
- Diameter: 240 – 360 mm;
- Tunnel length: Up to 6 m maximum;
- Tunnel reflectance: Greater than 97%;
- Roof terminal: Proprietary polycarbonate dome (opal / UV protected) or equivalent;
- Ceiling terminal: Double glazed diffuser;
- Accessories: 30° – 45° proprietary bends as required. (Total number of bends to be kept to a minimum);
- Proprietary extension sections as required;
- Flashing: To suit flat roof construction; and
- Installation: In accordance with manufacturers' technical data sheet.

172. Flexible Sun Pipe to Flat Roof - supply and install to the following specification:

- Pipe material: Flexible metallized polyester or equivalent;
- Diameter: 350 – 360 mm;
- Tunnel length: Up to 0.9 m maximum;
- Roof terminal: Proprietary polycarbonate dome (opal / UV protected) or equivalent;
- Ceiling terminal: Double glazed diffuser;
- Flashing: To suit flat roof construction; and
- Installation: In accordance with manufacturers' technical data sheet.

SERVICING OF TIMBER WINDOW FRAMES

General servicing requirements for timber window frames

173. The degree of servicing required to timber window frames will be decided by the Client's Representative. The servicing should fall into one or other of the following categories.

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174. Condition of the frame and sash:

- The simplest form of servicing would be to ease and adjust the opening sash;
- Severely damaged opening sashes should be replaced as original;
- The fixed frame presents greater problems to repair but 'Window Care Dry Flex System' should be considered as a viable alternative to replacement; and
- On completion the bare timber must be coated as original.

175. Conditions of surface coating:

- Do not touch up as weather conditions have an adverse effect on all surface coatings. Instead re-coat all window surfaces as original with light sanding between each coat.

176. Condition of ironmongery:

- Replace damaged ironmongery with matching or product similar to existing ironmongery, fitted as per manufacturer's technical data sheet;
- Back flap or cranked hinges seldom require servicing, but service with light oiling with release oil/lubricant spray;
- Friction hinges require light oiling with release oil/lubricant spray during servicing;
- Replace all defective hinges as recommended by manufacturer;
- Loose casement stays and handles should be re-fixed either by using longer screws or reuse the original screws by plugging the original screw hole;
- Tilt/turn and fully reversible gearing systems should be serviced by a qualified service engineer;
- Trickle vents should be cleaned of all paint, dirt, dust etc. and left in an operational state. Replace parts as necessary;
- Condensation holes/channels were present should be cleaned of all paint, dirt, dust etc. and left in an operational state; and
- All existing safety restrictors to be checked for correct operation. Where correct operation is not being achieved, adjustments should be made. If adjustments do not prove adequate replace the restrictor. On finishing the Property/property, all opening sashes are to be fitted with a safety restrictor. Each Property should be fitted with similar restrictors throughout – thus removing possible confusion in the event of a fire.

177. Condition of glass and glazing:

- All damaged glass should be carefully removed before the removal of glazing slips or facing putty;
- Cracked glass should be taped to prevent accidents;
- When all glass is removed the rebates should be cleaned and primed with the appropriate primer before re-glazing;
- When slip glazing is used the bottom slip must be bedded in 'Dry Seal Elastic;
- Glazing Sealant' to prevent ingress of water; and
- Linseed oil putty must NOT be used.

178. Glazing medium:

- 'Elastic Glazing Sealant' is the only option for face pointing. Linseed oil putty must NOT be used.

179. Draught Proofing:

- Draught proofing to existing window frames can usually be effected by using one of five different methods:
    - Appropriately sized extruded foam with one side self-adhesive fitted to the frame rebate/inside face of sash;
    - A co-extruded flexible seal with the rigid section nailed to the sash and the flap touching the sash. This component may have a metal rigid section;
    - A bulbous extruded seal, again with the flat section nailed to the inside rebate of the frame and the bulbous section touching the sash;
    - Replacement nerprim seals (if fitted) to match existing profile and colour; or
    - Silicon sealing. This method of draught proofing should be avoided and only undertaken after written advice and clarification is received from the Client's Representative.

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In all cases some slight difficulty may be experienced when closing the sash and adjustment of ironmongery may be necessary.

SERVICING OF PVC-U WINDOW FRAMES

General servicing requirements for PVC-U window frames

180. Condition of Ventilation and drainage:

- Clean all trickle vents (either in-frame, in-glazing or other) and condensation holes/channels (where present) of all paint, dirt, dust etc. and leave them in an operational state. Replace parts as necessary.

181. Condition of Seals and gaskets:

- Check neoprene seals and gaskets for wear/failure and replace seals/gaskets as necessary. Replacement seals to match existing profile and colour; and
- Clean of all paint, dirt, dust etc. from seals/gaskets and apply a spray coat of silicate lubricant (remove access lubricant).

182. Condition of Ironmongery:

- Replace damaged ironmongery with matching or product similar to existing ironmongery and fitted as per manufactures instructions;
- Clean hinges of all paint, dirt, dust etc. and leave them in an operational state. Hinge oil/lubricant is to be applied and hinge restraint screws adjusted accordingly. Replace parts as necessary; and
- All existing safety restrictors are to be checked for correct operation. Where correct operation is not being achieved, adjustments should be made. If adjustments do not prove adequate, replace the restrictor.
- On finishing the Property, all opening sashes are to be fitted with a safety restrictor. Each Property should be fitted with similar restrictors throughout – thus removing possible confusion in the event of a fire.

Cleaning PVC-u window frames

183. Sash frames and window frames are to be fully cleaned of all paint, dirt, dust etc. and left in an operational state.

184. Dirty marks on frames can be easily removed by using cleaning materials as indicated in Checklist B at Paragraph 196 below

185. Cleaning cloths should be unbleached cotton. Do not use cloths containing synthetic fibres.

186. Heavy stains and deep scratching can be removed from white profiles only by sanding with a 320/400 grit sanding disc and by polishing using a sisal rotary brush to restore surface finish.

187. On wood grain surfaces care must be taken when cleaning. Seek the manufacturer's advice on damaged wood grain surfaces.

Condition of glass and glazing

188. Check the condition of glass:

- All damaged glass should be carefully removed before the removal of glazing slips;
- Cracked glass should be taped to prevent accidents; and
- When all glass is removed the rebates should be cleaned.

Typical problems and remedial action

189. Incorrect glazing and fixing of frames to masonry are the cause of most maintenance problems. The following is an indication of typical problems and remedial action.

190. Opening sashes that have dropped during use:

- Check hinges for wear/adjustment remove wedge gaskets;
- Remove glazing beads internal or external;
- Repack glass to manufacturers recommendation; and
- Refit glazing slips and gaskets.

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191. Bowed cills/stiles:

- Incorrect packing is generally the case;
- Re-glaze as Paragraph 177 above and secure packers to prevent further movement; and
- Take care not to block drainage/air circulation channels and/or slots.

192. Sashes not sealing properly or engaging keepers:

- Check adjustment hinges and keepers;
- Check that the glass is packed at locking points, if not packed carry out work as manufacturer's technical data sheet;
- Check also that the glass is packed at the position of frame fixings; and
- Check gaskets for wear/failure.

193. Broken/cracked glass:

- Remove if possible pieces of broken glass before removing glazing beads;
- Cracked glass should be taped to avoid accidents, before removing gaskets or glazing beads. Remove gaskets, remove glazing beads;
- Carefully remove damaged unit or sheet glass; and
- Replace and re-glaze as per manufacturer's instruction, taking care to fit packers as recommended.

194. Opening sash adjustment.

- All necessary adjustment should be completed after glazing. All hinges should be lightly oiled at periodic intervals. If glazing is completed as per manufacturer's instruction, little or no adjustment will be necessary. However, should adjustment be necessary the following steps should be taken:
    - Check margin of sash to frame;
    - Remove centre screw on friction arm;
    - Release two outer screws and then reposition the sash;
    - Check that the overlap sash to frame is sufficient (5 mm min);
    - Retighten the outer screws; replace the centre screw to ensure no further movement of the sash. The friction on the friction stay can be adjusted using the screw on the friction stay fixed member; and
    - Where adjustable espagnolettes have been fitted the rollers can be adjusted to gain compression of the weather gasket with the use of an Allen key by turning the rollers about their eccentric cams.

195. Should problems still exist when the sash is closed and the overlap to frame is equal refer to the below table for possible cause.

Upgrading

196. When upgrading from single to double glazing units, consider the strength of the existing hinges with regard to the additional weight of the double glazed unit and replace if required.

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CHECKLIST A

PROBLEM	CAUSE	ACTION
Sash hits keeper	- Frame bowed opening to rear	Re-glaze Reposition hinge
Cam hits striker	- Striker in wrong place	Reposition
Handle operation stiff	- Cams not adjusted - Keepers out of line	- Adjust cam - Realign and oil
Draughts	- Bowing members	- Re-glaze - Fit cavity block
	- Overlap incorrect - Both overlaps incorrect	- Reposition - Remake sash
	- Gasket problem	- Repair or replace
Sash moves too easily	Friction screw set incorrectly	Tighten Friction screw
Sash binding	Friction screw set incorrectly Outer frame bowed	Loosen friction screw Repack outer frame

CHECKLIST B

CONTAMINATION	CLEANING METHOD			
	Scrape off and Polish with Dry Cloth	**Clean with water and mild detergent**	**Clean Off with non-abrasive detergent and**	**Manufacturers specified cleaning**
Bitumen			✓	
Pencil		✓		
Emulsion Paint	✓			
Felt Pen		✓		
Inorganic Grease			✓	
Plaster	✓			
Wood stain		✓		
Ball Pen		✓		
Cellulose Paint				✓
Rust				✓
Soot			✓	
Cement Mortar	✓			
Wax Pen			✓	

197. Manufacturers' specified cleaning agents should be used only by authorised service providers and with extreme care.

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Loft Insulation

198. Mineral Fibre Loft Insulation laid between ceiling ties/joist or over existing quilt must comply with the following:

- Material must be mineral fibre insulation to the applicable Standard or equivalent, manufactured in accordance with applicable Standard as certified under BSI kite marked or other certification scheme acceptable to the Client's Representative;
- Install in accordance with all the provisions of applicable Standard. Pay particular attention of the applicable Standard or equivalent provisions for ventilation to roof space and; avoidance of overheating of electric cables;
- Material must have thermal conductivity of insulation no more than 0.040 W/mK;
- Debris to be removed and any sealing of holes for pipes, lighting drops etc., completed before the installation of the insulation; Insulation to be fitted tightly with closely butted joints, leaving no gaps and extending over wall plates;
- Ensure that eaves ventilation is unobstructed and electric cables are not covered;
- Do not lay insulation directly below water cistern platform(s) – platforms should be elevated above ceiling joist/trusses;
- Lay insulation in two layers where necessary; and
- Install 800mm long plastic spacers to maintain a continuous 25mm minimum airspace above the insulation at the eaves. These are to be secured by tacked to rafters at both sides with galvanised thick staples or tacks, projecting 100mm (measured horizontally) beyond the wallplates. Insulation should cover the wallplates but shall not to project beyond the end of the spacer (described above).

199. Glass Fibre Loft Insulation laid between ceiling ties/joist or over existing quilt must comply with the following:

- Material must be glass fibre insulation to the applicable Standard or equivalent, manufactured in accordance with applicable Standard as certified under BSI kite marked or other certification scheme acceptable to the Client's Representative;
- Install in accordance with all the provisions of applicable Standard. Pay particular attention of the applicable Standard or equivalent's provisions for ventilation to roof space and; avoidance of overheating of electric cables.
- Material must have thermal conductivity of insulation no more than 0.040 W/mK;
- Debris to be removed and any sealing of holes for pipes, lighting drops etc., completed before the installation of the insulation; Insulation to be fitted tightly with closely butted joints, leaving no gaps and extending over wall plates;
- Ensure that eaves ventilation is unobstructed and electric cables are not covered;
- Do not lay insulation directly below water cistern platform(s) – platforms should be elevated above ceiling joist/trusses;
- Lay insulation in two layers where necessary; and
- Install 800mm long plastic spacers to maintain a continuous 25mm minimum airspace above the insulation at the eaves. These are to be secured by tacked to rafters at both sides with galvanised thick staples or tacks, projecting 100mm (measured horizontally) beyond the wallplates. Insulation should cover the wallplates but shall not to project beyond the end of the spacer (described above).

200. Loose mineral fibre loft insulation suitable for blowing must be used only to fill gaps manually and must be used to the applicable Standard or equivalent.

201. Insulated loft access boards shall be supplied and installed as additional loft access boards for inspection/access situated above walls where possible. Boards are to be 1210mmx 475mm (minimum) x 18mm OSB Structural/Flooring grade bonded to 70mm high density insulation, strength 150 kPa at 10% compression, conductivity less than 0.041 W/mK fixed with 4 no long galvanised screws at least 20mm into ceiling joists. Provider 2 boards per Property unless instructed otherwise by the Client's Representative. Leave existing loft boards in position, insulating underneath where possible.

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202. Loft Hatch /Door Insulation and Sealing shall comprise:

- Mineral fibre loft access hatch insulation to the applicable Standard or equivalent, conductivity less than 0.04W/mK, 200mm thick compressed to 120mm minimum held in place with woven fibreglass fabric and galvanised staples fixed to hatch lid frame, area 0.50m^2 nominal area, provide and install an easily compressible rubber self-adhesive 'P' seal fixed onto the timber hatch surround, refit or provide a hook and eye to prevent uplift;
- Mineral fibre loft access door insulation to the applicable Standard or equivalent, conductivity less than 0.04W/mK, 200mm thick compressed to 120mm minimum held in place with woven fibreglass fabric and galvanised staples fixed to door frame, area 0.70 m^2 nominal area, provide and install an easily compressible rubber self-adhesive 'P' seal fixed onto the timber door surround, where necessary nail a 25mm x 38mm PAR softwood batten at 300mm centres round the door to provide a background for the compressible seal 3.4m maximum, refit or provide a small bright finish bolt to compress seal;
- Phenolic foam loft access hatch insulation to the applicable Standard or equivalent, conductivity less than 0.023W/mK, 100mm thick, strength more than150kPa at 10% compression fixed to hatch lid frame, area 0.50 m^2 nominal area, if the hatch is of combustible material nail 12mm plasterboard over before gluing insulation board over, provide and install an easily compressible rubber self-adhesive 'P' seal fixed onto the timber hatch surround, refit or provide a hook and eye to prevent uplift;
- Phenolic foam loft access door insulation to the applicable Standard or equivalent, conductivity less than 0.023W/mK, 100mm thick, strength more than150kPa at 10% compression fixed to hatch lid frame, area 0.70 m^2 nominal area, if the hatch is of combustible material nail 12mm plasterboard over before gluing insulation board over, provide and install an easily compressible rubber self-adhesive 'P' seal fixed onto the timber hatch surround, where necessary nail a 25mm x 38mm PAR softwood batten at 300mm centres round the door to provide a background for the compressible seal 3.4m maximum, refit or provide a small bright finish bolt to compress seal; or
- Proprietary white factory finished polypropylene insulated drop-down hinged loft access hatch to minimum opening width of 520mm, with insulation having a maximum U value of 0.25W/mK with integral draught and vapour seal in accordance with applicable Standard, and secure catch to resist wind uplift, installed in accordance with the manufacturer's technical data sheet.

Insulation Boards

203. Insulation boards shall comprise:

- Expanded white polystyrene board to the applicable Standard or equivalent, material to have BBA certification or equivalent, conductivity 0.035W/mK or less than, strength more than 100kPa at 10% compression, neatly cut and fit with no gaps and temporarily support in position where necessary, cut into insulation where this is needed to allow it to bend and rest directly on substrata;
- Expanded grey polystyrene board to the applicable Standard or equivalent, material to have BBA certification or equivalent, conductivity 0.031W/mK or less than, strength more than 100kPa at 10% compression, neatly cut and fit with no gaps and temporarily support in position where necessary, cut into insulation where this is needed to allow it to bend and rest directly on substrata;
- Foil faced polyurethane/PIR foam board to the applicable Standard or equivalent, material to have BBA certification or equivalent, conductivity 0.023 W/mK or less than, strength more than 100kPa at 10% compression, neatly cut and fit with no gaps and temporarily support in position where necessary, cut into insulation where this is needed to allow it to bend and rest directly on substrata;
- Closed cell extruded polystyrene insulation board to the applicable Standard or equivalent, material to have BBA certification or equivalent, conductivity 0.035W/mK or less than, strength more than 100kPa at 10% compression, neatly cut and fit with no gaps and temporarily support in position where necessary, cut into insulation where this is needed to allow it to bend and rest directly on substrata. Where fixed to external walls underground, use suitable adhesive paste to fix, using lines of paste at edges and to form closed shapes no more than 250mm wide/tall, applying pressure until the adhesive sets. Finish the exposed upper edge and its junction with the wall with paste. Use 2 no additional stainless steel or equivalent screws and 20mm washers and plug fixings per m^2 to prevent uplift with any later failure of the adhesive;

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- Foam glass rigid closed cell insulation board to the applicable Standard or equivalent, material to have BBA certification or equivalent, conductivity 0.041W/mK or less than, strength more than 400 kPa to EN826 Annex A. Where fixed to external walls underground, use suitable adhesive paste to fix, using lines of paste at edges and to form closed shapes no more than 250mm wide/tall, applying pressure until the adhesive sets. Finish the exposed upper edge and its junction with the wall with paste. Use 2 no additional stainless steel or equivalent screws and 20mm washers and plug fixings per m^2 to prevent uplift with any later failure of the adhesive;
- Foil faced Phenolic foam rigid sheet insulation board to the applicable Standard or equivalent, material to have BBA certification or equivalent, conductivity 0.023W/mK or less than, strength more than 120kPA at 10% compression, neatly cut and fit with no gaps and temporarily support in position where necessary;
- Expanded Polystyrene insulation board fixed to studs to the applicable Standard or equivalent, material to have BBA certification or equivalent, conductivity 0.032W/mK or less than, strength more than 100kPa at 10% compression, cut and fit neatly with tongue uppermost, leaving no gaps, fix sheets to each support at no more than 600mm centres with 12mm diameter flat head galvanised nails at least 12mm longer than thickness of insulation;
- Foil Faced polyurethane/PIR foam insulation board fixed to studs to the applicable Standard or equivalent faced with plasterboard, material to have BBA certification or equivalent, conductivity 0.023W/mK or less than, strength more than 120 kPa at 10% compression, cut and fit neatly leaving no gaps, fix sheets to each support at no more than 400mm centres with flat head galvanised nails at least 12mm longer than thickness of insulation, fit additional plasterboard so as not to leave vertical faces of insulation board exposed;
- Foil faced rigid sheet polyurethane/PIR foam cavity wall insulation board to the applicable Standard or equivalent, conductivity 0.023W/mK or less than, strength more than 120 kPa at 10% compression, neatly cut and fit with no gaps and temporarily support in position where necessary, install in compliance with any relevant BBA certificate or equivalent quality system approved by the Client's Representatives;
- Mineral fibre vertical insulation mats to the applicable Standard or equivalent, manufactured under applicable Standard as certified under BSI kite marked or other certification scheme acceptable to the Client's Representative, to vertical studding in un-floored loft areas, complete with galvanised mild steel 50mm mesh x 19swg gauge and used from 600mm rolls, 100mm mineral fibre insulation secured behind galvanised light wire mesh tied back to studs every 400mm horizontally and vertically, fixed with 2mm x20mm galvanised mild steel staples to the applicable Standard or equivalent at 400mm maximum centres, all installed in accordance with applicable Standard;
- Mineral fibre vertical insulation mats with integral metal mesh facing to the applicable Standard or equivalent, manufactured under applicable Standard as certified under BSI kite marked or other certification scheme acceptable to the Client's Representative, to vertical studding in un-floored loft areas, tied back to studs every 400mm horizontally and vertically, fixed with 2mm x20mm galvanised mild steel staples to the applicable Standard or equivalent at 400mm maximum centres, all installed in accordance with applicable Standard;
- 50mm Foil faced Phenolic foam rigid sheet insulation board to the applicable Standard or equivalent, material to have BBA certification or equivalent, conductivity 0.023 W/mK or less than, strength more than 120kPa at 10% compression, to vertical studding in un-floored loft areas, nailed in position over studs; or
- 25mm Minimum mineral wool insulation with aluminium foil outer layer, maximum thermal conductivity of 0.04W/mK, wrapped around ductwork in unheated roof-space, taped securely in accordance with manufacturer's technical data sheet.

Thermal and Sound Insulation Quilts

204. Thermal Insulation quilts shall comprise:

- Mineral fibre thermal insulation mat quilt to the applicable Standard or equivalent, conductivity less than 0.040W/mK, compression fit, no gaps fixed between timber studs; and
- Semi-rigid mineral fibre batts to the applicable Standard or equivalent, conductivity less than 0.040W/mK, compression fit, no gaps fixed between metal studs.

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205. Sound insulation quilts shall comprise:

- 25mm minimum mineral fibre sound absorbing quilt , no facing, minimum density 10kg/m^3, fixed to one side of partition, joints butted, gaps < 5mm, securely fixed in place, can be glued or wire reinforced for fixing, head fixing to with galvanised large staples or large headed nails.

Client's current manufacturers/suppliers/products

206. 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]

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REPLACEMENT EXTERNAL, COMMUNAL AND FIRE DOORS

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REPLACEMENT EXTERNAL DOORS - SURVEYING AND INSTALLATION [TOP TIER]

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1. REPLACEMENT EXERNAL DOORS – SURVEYING AND INSTALLATION

General

1-001. For clarity, the Replacement External Door specification sections have been sub divided into tiers as per the table below:

Top tier	Middle Tier	Lower Tier
Replacement external doors – surveying and installation etc.	Replacement External, Communal and Flat Entrance Doors – General	GRP External Door sets and Screens
		Fire Door Sets
		Pre-finished Timber External Door sets and Screens
		Aluminium External Doors and Screens
		Replacement Undecorated Timber External Door Sets and Screens

1-002. In this manner each completed product will be required to meet the specification documents for each of the 3 tiers.

1-003. Example: if work to be undertaken is a GRP External Door, then the specification documents to be used will be:

- Replacement external doors – surveying and installation etc.
  - Replacement External Communal and Flat Entrance Doors – General
    - GRP External Door sets and Screens

Initial Survey

1-004. A list of Properties will be given to the Provider with access details and the Provider is then responsible for arranging access, visiting the Properties, taking measurements and forwarding existing external door dimensions and the Provider's proposed style of replacement door to the Client's Representative for approval.

1-005. External Doors - Whether the new doors are to be GRP, aluminium or timber replacements is dependent on the condition of any existing external door (if present) and therefore matching new proposals with the existing Property and surrounding Client owned Properties.

1-006. The drawings are to include 'sketch elevations' of each door showing the position of each proposed door type and to include details of glass type for each door.

1-007. The proposals are to be approved by the Client's Representative before the Provider commences manufacture.

Site Measurements

1-008. The Provider is responsible for ascertaining the correct dimensions and sizes of every existing external door in each Property.

1-009. The dimensions noted on any schedule issued by the Client's Representative are for guidance only and are approximate measurements. The Provider is responsible for taking all site sizes and measurements for each and every external door opening, and for manufacturing doors accordingly and to the applicable Standard or equivalent. (Windows and doors - Code of practice for the survey and installation of windows and external door-sets) and as recommended in the GGF (Glass & Glazing Federation) "Good Practice Guide for the Installation of Replacement Windows and Doors" or equivalent.

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1-010. This procedure requires a minimum of **8 No measurements** both internally and externally to determine the difference between internal and external reveal sizes. Therefore, internal access to the Property must be gained before manufacturing the doors – this will also enable full Customer consultation and agreement of intended Works. It is the Provider's sole responsibility to obtain the Customer's approval to receive the Works before manufacturing is commenced.

1-011. External doors are in the main fitted from the outside, although the nature of some reveals will permit replacement doors to be fitted from the inside.

1-012. The measurement and fitting of doors must in every case respect the existing cover/rebate to the outer frame of the doors by virtue of any "reverse brick detail" or "check reveal" that may pertain to existing Client Property.

1-013. Where a check reveal is present for weathering purposes, the door manufacturing sizes should be based on achieving a minimum frame overlap of 12 mm on the external leaf. A hole may be drilled thorough the existing frame jamb rebate to establish the check reveal size. A frame may also be built into the check reveal at the head by use of a rebated lintel, and again a minimum frame overlap of 12 mm should be provided where practicable. If an overlap of 12 mm cannot be achieved, this should be discussed with the Client's Representative and an agreement reached regarding the size of the overlap for particular Properties. As the Client owns a large stock of Properties, which vary in construction detailing, long term standard agreements to the amount of overlap will not be made with exception to the dimension stated here.

1-014. The Provider's attention is drawn to the fact that similar external doors in similar Property types may vary in size.

1-015. The Provider is responsible for ascertaining the correct dimensions and sizes of every existing external door in each Property. Measurements for each door (and its location) must be clearly identified on any delivery schedule and each door shall have a clear labelling system to reflect this.

1-016. The use of make-up pieces (clip-on's) will not normally be permitted except with the express **written** authority of the Client's Representative. Written authority does not transfer to the entire Contract, if gained; it must be acquired for individual Property and/or phases.

1-017. Any existing external door opening which will present the Provider with a problem in compliance with the Specification, or in manufacture of a door to suit, must be brought to the attention of the Client's Representative before the door is fabricated. The Client's Representative will issue a written Instruction informing the Provider of what action is to be taken.

1-018. Obtain signed consent from the Customer before manufacture of any external door is undertaken. Payment will be made only on completion of the door being installed into the Property.

Guarantees

1-019. In addition to the Client's rights under the Contract, the Provider is to provide the minimum guarantee tabled below against manufacturing defects etc., on all new GRP, aluminium and timber external doors upon completion of the Works. The guarantee is to include for all profiles, joinery, and for the double glazed units.

1-020. Manufacturers guarantees in all instances are to be for the number of years stated below with no exceptions attached (i.e. end user servicing expectations etc.), this will assure the Client that the manufacturer is confident of their own products durability.

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PVC-u profiles	25 Years
Timber frames	30 Years guarantee against fungal attack
Timber Door Manufacturing Defects	10 year guarantee
Timber Door (Factory Painted External Joinery)	10 Year guarantee (as minimum)
Timber Door (Factory Stained External Joinery)	6 Year guarantee (as minimum)
Hardware Components	10 Years (minimum)
Double Glazed Units	15Years (minimum)

1-021. Doors are to be manufactured under guidelines ISO 14001 (Environmental Management) and ISO 9001 (Quality Management Systems) or equivalents with manufacturing companies holding the relevant accreditation. The Provider should use only manufacturers who promote and maintain an Environmental Policy and are committed to it. The Provider should be able to demonstrate that all operations proactively comply with all applicable Environmental Law.

1-022. The Provider must ensure that the manufacturer provides a good practice guide relating to aftercare and maintenance of their manufactured doors etc. and its component items and that each Customer receives a copy of this.

GENERAL DESIGN OF EXTERNAL DOORS

Doors - Street Properties

1-023. Each Property case may be different and therefore approval will be required for each Property. In all cases, the proposed new style of external doors will need to comply with Building Regulations and in particular fire egress in terms of all habitable rooms.

Timber External Doors

1-024. The Provider is responsible for ascertaining the correct dimensions and sizes of every existing external door in each Property.

General External Door Installation

1-025. All sidelights are to achieve an 'A' energy rating certificated by the British Fenestration Rating Council (BFRC).

1-026. All replacement doors and sidelights must achieve Building Control standard of Maximum U-Value = 1.8 W/ m^2K for units with >50% internal face glazed.

1-027. U-values of external doors and sidelights glass and frames must meet the Building Regulations and must be BFRC Certified and have an "A" Rated Energy Index. Centre Pane "U Value" of 1.2W/m^2K (or better). Thermal Transmittance Whole Window "U Value" of 1.4 W/m^2K (or better).

1-028. All External Doors must pass testing undertaken to PAS 24 and be Secure by Design certified or equivalents. All certification documents are to be forwarded to the Client's Representative and kept updated – this must include test certificate, report and list of tested ironmongery with product manufactures names, type etc. Evidence of compliance with PAS 24 (Specification for Enhanced security performance requirements for door-sets and windows in the UK) or equivalent must be provided to the Client's Representative on request.

1-029. All new external doors and door frames are to match existing size openings in existing positions (i.e. brick reveals to be maintained externally where necessary on all occasions).

1-030. Before installing the new door frame, the existing structural opening should be checked to ensure its stability and existing lintels checked to ensure their condition soundness. Any large repairs should be reported to the Client's Representative.

1-031. It is permissible to "chip back" a small area of plaster (typically 25mm) extending full height up the existing reveals and immediately adjacent to the door frame; this will both facilitate removal of existing door frame and installation of replacement door frame.

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1-032. All openings should be cleaned of debris etc., and any minor making good is expected to be carried out as part of the external door replacement Works.

1-033. All metal fixings should be at least as corrosion-resistant to the applicable Standard Grade 3. 13.5 or equivalent.

1-034. Door frames shall be secured in accordance with the recognised "fixing distances" for strap / lug fixings and through-frame fixings as recommended in the applicable Standard or equivalent.

1-035. Sills must be properly supported and fixed to ensure there is no likelihood of water penetration.

1-036. All internal reveals should be made good and plaster or decorations made good to match existing.

1-037. External sealing should be by means of a cement/sand pointing around the new door frame to conceal larger gaps and then a low modulus white silicone sealant to the applicable Standard or equivalent. Only silicone sealants recommended by the manufacturer/supplier should be used and not general purpose mastics. All abutments of the door frames should have silicone sealant applied.

1-038. Prior to installation, the doors are to be supplied with adequate protection against damage caused by slippage, distortion etc. They must be stored under cover in a dry and secure position, stacked vertically, not horizontally.

1-039. The door frame dimensions must be checked with those of the opening before removal of the existing door frame.

1-040. A craft knife should be used to score around the perimeter of the existing frame in order to minimise damage to plaster/decoration.

1-041. External doors and frames are to be removed and all existing mastic and debris cleaned away. The Provider is to ensure that the work is carried out in a neat and tidy manner, with all rubbish removed to a lockable skip at the end of each Working Day.

1-042. The damp proof course is to be checked by the Provider to ensure one is present and in good condition. Any defects present are to be brought to the attention of the Client's Representative immediately.

1-043. The new door frames must be installed in accordance with the manufacturer's requirements, taking into account the construction of the Property. Fixing methods should take into account thermal movement. The method of fixing should be either through frame fixing or lug fixing.

1-044. Door frames must be installed plumb and square without twisting, racking or distortion of any member in accordance with the manufacturer's installation tolerances.

1-045. The door frame must be centred in the aperture and be positioned so that it does not bridge the damp proof course. The amount by which the new door frame is set back from the outer face of the wall is determined by the requirement to set the internal face as close to the existing internal finishes as possible and by the bridging of the damp proof course.

1-046. The door frames must be secured so that the corner fixings are a minimum of 150mm and a maximum of 250mm from the corner of the frame and the intermediate fixings at centres no greater than 600mm.

1-047. Should the manufacturer require more onerous fixing requirements then these must be adhered to. Care should be taken not to overtighten bolts and that packers/shims are not allowed to fall away. Care should also be taken to ensure that water tightness is maintained where lintels have to be drilled for fixing.

1-048. All screw fixing heads which pass through the profile are to be spot sealed with appropriately coloured or clear silicone sealer or a PVC-u cap.

1-049. Where electrical, television, telephone wires etc., enter a Property either through a hole in the existing door frame, or adjacent to it, then such services must be routed around the door frame. A split plastic tube of suitable diameter and length for entry into the Property should be slipped over the cable so that connections do not have to be disturbed on the appliances, with the ends of the tube sealed with white silicone sealant on completion of the external door installation.

1-050. Where any internal plaster work is disturbed when the existing door frames are removed, make good the plasterwork. PVC-u cover mouldings may be used to a maximum width of 30mm.

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1-051. Internally the door frame must be well caulked and the gap between the reveal finish and the frame flush pointed with a one part white emulsion acrylic painter's caulk.

1-052. Each sidelight must be permanently marked or labelled in an unobtrusive position (not visible when the opening light is closed) showing details of the manufacturer, the job number of the sidelight and the date of manufacture.

1-053. The standard for glass units is BS EN 1279 – Part 2 (also Part 3 for gas filled types) or equivalent.

1-054. Special care and attention must be taken to protect and avoid any damage to external doors and frames. Any damaged external door or frame must be replaced with a new external door or frame and it is at the Client's Representative's sole discretion as to whether a repair to an external door or frame is acceptable.

Safety Laminated Glass

1-055. All glazing in doors in critical locations as defined by the Building Regulations (i.e. glazing below 1500mm height in doors with a zone of 300mm either side of the door) is to have both skins of glass units glazed with laminated low E glass – assumed to be 2 No. skins of 6.8mm laminated safety glass.

1-056. Internal and external panes in sidelights, double glazing units to be laminated glass as default. An exception may be made where a staircase ends or turns immediately inside the doorway – in this instance the internal pane may be toughened (i.e. to reduce impact pressure) – written notification must be given to the Client's Representative. External pane must always be laminated to provide security and satisfy PAS 24 or equivalent.

1-057. All safety glass is to be permanently marked on both panes with kite marks or equivalent, which are to be visible after installation.

1-058. Both sheets of glass making up the sealed double glazed unit must be safety glass where required by the above descriptions.

1-059. Details of external doors in critical locations are to be stated in the Provider's proposals for each new external door when proposed drawings are forwarded to the Client's Representative for approval.

Glazing – General

1-060. External doors and sidelights must be manufactured so that glazing or re-glazing on site is possible without the need to remove the outer frame from the structure of the building.

1-061. All glass and insulated glazed units should be carefully examined for damage, especially at the edges, prior to installation. Defective items must not be used.

1-062. The two panes of glass in the double glazed unit are to be held apart with warm edge technology, spacer bars to improve thermal efficiency and reduce the possibility of condensation forming around the perimeter of the sealed double glazed unit.

1-063. The glazing of the doors or sidelights must be carried out immediately after the installation of the frames and casements.

1-064. On completion of external door installations, all glass to be cleaned internally and externally and left clean and free from blemishes.

1-065. Any glass with scratches cracks or defects to be replaced by the Provider at no charge.

1-066. All external doors and sidelights to be **INTERNALLY GLAZED** in argon filled sealed units in low Emissivity glass, using pre-formed gaskets inserted during the profile extrusion and secured by knock-in PVC-U glazing beads with mitred corners.

1-067. All doors/sidelights must be totally dry-glazed with minimum 12mm wide x 3mm thick double-sided PVC foam closed cell high density security glazing tape on the inside frame rebates. Co-extruded EPDM corded glazing gaskets on the frame are acceptable as an alternative provided that bead security clips are used in conjunction with it.

1-068. Glass shall be at least the minimum thickness to meet wind load requirements indicated in the applicable Standard or equivalent.

1-069. Glazing beads are to be able to withstand the design wind loading in accordance with BS 6375: Part 1 or equivalent and the tests specified in it.

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1-070. Fans are not permitted in sealed units.

1-071. Details of all glass types are to be stated in the Provider's proposals for each new external door or sidelight when proposed drawings are forwarded.

Fire rated doors/frames/door-sets – replacement and installation

1-072. The replacement and/or installation of internal/external fire rated doors, door frames, door-sets and any associated components such as stops, architraves, thresholds, trims, seals and ironmongery must be undertaken only by persons that are properly accredited to do so by having undergone and passed an approved "Fire Door Installation Awareness Course" such as that developed by the British Woodworking Federation (BWF) with the National Open College Network (NOCN), or equivalent.

Certificate of Test Sidelight/doors

1-073. All manufacturers of sidelight/doors etc. shall be required to have a "sample" submitted for testing at an accredited testing station. These samples must be inspected against the requirements set out above. All manufacturers are required to have "third party" registration provided by BBA, BSI or equivalent recognised accredited quality licensing authority for the manufacture sidelights/doors etc.

1-074. A copy of the respective Certificate of Compliance for Secure by Design and PAS 24 must be made available at the time of submitting for inspection, which confirmations that the manufacturer can produce the product to the required standards, along with all testing data. These certificates may form part of the document handover pack and if not supplied on completion and handover of the Work, may delay payment.

Delivery to site of sidelights/doors etc.,

1-075. In each option, primary consideration must be given to Health and Safety Law in respect of site practices:

Option 1 – Pre-glazed

- Will apply where the external door manufacturer is commissioned on a supply only basis; the installation, therefore, being undertaken by the Provider; or

Option 2 – Un-glazed

- Will apply where the external door manufacturer is commissioned on a supply and fit arrangement. This will involve the supply of insulating glass units and pre-formed glazing gaskets to be applied on site in accordance with the manufacturer's technical data sheet.

1-076. Critical considerations to be observed:

- All glazing must conform to the recommendations contained in the applicable Standard or equivalent. The setting and location block positions, frame to glass and bead to glass gaskets etc. with any glass or insulating glass units must be installed in accordance with the relevant manufacturer's technical data sheet and as per the recommendations in the applicable Standard or equivalent;
- All insulating glass units shall be examined for damage prior to installation; defective units shall not be used;
- Insulating units with "low emissivity coatings" shall be oriented in accordance with the manufacturer's technical data sheet; and
- Where safety glazing forms part of a glazing unit, it remains a legal requirement to ensure that the marking remains visible after installation.

Protection, Transportation, Storage & Pre installation check

1-077. Ensure the manufacturer/supplier is responsible for ensuring that all sidelights/doors are suitably protected to avoid damage during transportation and storage.

1-078. Sidelights/doors/glazing units (if applicable) shall not be flat-packed but must be stood vertically during transportation.

1-079. Sidelights/doors/glazing units in storage are to be "kept apart" with soft packing to reduce risk of transport/handling damage.

1-080. Ensure that all sidelights/doors stored on site are housed within a secure weatherproof storage facility on-site until the time of fitting. Pre-finished joinery shall not be stored in direct sunlight.

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1-081. Prior to commencement of installation, undertake the following checks:

- Consult survey sheets and ensure these are correct and clear;
- All survey measurements are recorded;
- The doors/sidelights supplied; are of the correct fenestration and design and in accordance with the external door schedule approved by the Client's Representative;
- The glass type and pattern are correct;
- External door and glass sizes are compatible;
- All trims, gaskets etc., are correct and fitted correctly; and
- Consult survey sheets to ensure external doors supplied are correctly marked and identified to those Properties being replaced.

Site Approval on delivered

1-082. Previous to the benchmark Properties being set, arrange for a sample Pre-Finished, GRP, Aluminium or Timber external door/sidelight to be delivered to site by the manufacturer/supplier for inspection and acceptance by the Client's Representative.

1-083. The manufacturer/supplier in providing the sample for acceptance must demonstrate full compliance with the specification requirements. Evidence of thermal efficiency standards being offered must be available to the Client's Representative for verification.

1-084. The sample external door/sidelight (upon acceptance) will form the "benchmark external door/sidelight" for the remainder of the project.

1-085. The Client's Representative may (at any stage) have any external door/sidelight which is delivered to site, subsequently removed for further inspection/audit and/or independent testing to ensure that the requirements of this Specification are being complied with.

Remove and Install on same Day

1-086. Existing doors to be removed are most likely to be timber in nature, although a small percentage of properties may have original PVC-u external doors and frames. Make every effort to have all existing external doors and frames recycled and provide waste disposal reports to the Client's Representative.

1-087. Replacement external doors and frames must be installed on the same day that the original external doors and frames are removed in order to maintain security and weather tightness of the structure. The existing door frames should be removed with care in order to avoid damage to the Property structure and its finishes and without permitting any subsidence of the structure during or after the operation.

1-088. When providing more than one replacement external door to a single Property the Works should be undertaken on one set day to reduce the amount of disturbance to the Customer.

1-089. Any defects that become apparent in the integrity of the structure upon removal of any door frame should be reported to the Client's Representative immediately.

1-090. If there is a sub-sill or threshold, e.g. concrete, slate, brick or tile, below the existing door frame it must be left in position unless otherwise specified.

Protection of existing fixtures etc.

1-091. Protect floor coverings, furniture and Customer's belongings throughout the duration of the Works.

1-092. The Provider is responsible for moving any furniture, fixtures, Customer's belongings and fittings that may be damaged during the installation of the external doors, prior to commencement of the replacement of any external door and repositioning such items upon completion of the installation to each Property.

1-093. Provide both internal and external protection. After the removal of the existing door, frame and sidelight the Provider is to carefully cut back any internal or external flooring, finishings, cladding, wallpaper and decorations to allow for the installation of the new frames etc. The Provider is responsible for making good all structures, finishings and decorations up to 100mm from the face of the frame or sill.

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1-094. Ensure that clean and sufficient dust sheets or protective coverings are used, when carrying out any Works. Take all adequate provisions to ensure that the soiling or damage to floor coverings and needless damage to decorations are avoided. Clean floor coverings required as a consequence of the Works.

1-095. The Provider must undertake a Schedule of Condition and agree this with the Customer prior to undertaking any Works. This includes taking photographs of any damaged Customer's belongings within the vicinity of the Work prior to commencement of the Works and, where appropriate, obtaining a signed acknowledgement of their condition from the Customer.

Fixings

1-096. Screws used for fixing non-reinforced PVC-u sections will be of carbon steel with a suitable corrosion protective coating and feature a double helical thread, spoon point with a countersunk head.

1-097. Fixings must incorporate a combination square/cross recess drive to provide a non-magnetic stick fit.

1-098. All screws, nuts, bolts and other fastenings must be of corrosion resistant material or be treated to give corrosion resistant properties. When subject to the acetic acid salt spray test specified in the applicable Standard or equivalent for a period of 144 hours, the corrosion resistance of treated mild steel must be equal to or better than that of stainless steel or equivalent samples subjected to the same test conditions.

1-099. All ironmongery, fixtures and fittings must be of materials resistant to, or protected against atmospheric corrosion. Metals in contact with each other must be compatible so as to prevent galvanic corrosion of dissimilar metals by electrolytic action.

1-100. The use of expanding polyurethane foam is not acceptable as a sole method of fixing any door frame into a structural opening, nor is it acceptable to be used as bedding for the door frame.

1-101. Fixing to be as recommended by in the applicable Standard or equivalent, below is a brief summary, actual fixing recommendation should be taken from the applicable Standard or equivalent and its example diagrams:

Secured on all sides (where practicable);
Corner fixings – 150 – 250mm from external corner;
Minimum of 2 fixings per reveal;
If head is fixed with expanding polyurethane foam, then head fixings can be – • Frame width up to 1200mm – no fixings • >1200mm to <2400mm – one central fixing • >2400mm to 3600mm – two equally spaced fixings

1-102. The use of expanding polyurethane foam is permissible in terms of "foam filling" and as a useful addition to mechanical fixings. When the external door is completed and finished there should be no visual evidence of polyurethane foam either internally or externally.

1-103. Installation "packers" should be used to set the door frame onto to allow sealant/mastic to be used as a full fill bedding material. The colour should match the door frame finish.

1-104. Intumescent foam filling is to be used in all external door installations to provide a closure to possible cold bridge of gaps between the wall and the frame. It is only to be used within the depth of the door frame profile i.e. it should not be used to fill gaps to reveals etc. which are to be plastered. Form filling is only in regard to the following situations:

1) <u>To the head of a door frame, where the presence of pre-cast concrete or steel lintels make it impracticable or pose significant difficulties in achieving the recommended fixing distances</u>	<u>Up to 10mm maximum</u>
<u>2) To the sides of door frame to make up expansion/contraction gap left either side as a result of manufactured size of door frame</u>	

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1-105. Foam filling must be to the full depth of the frame using only an approved fire resistant expanding polyurethane foam complying with the applicable Standard or equivalent and be of the correct fire performance rating for Building Regulations compliance.

1-106. All components should be supplied by a manufacturer complying with ISO 9001 accredited quality systems. A certificate passing warranty to the Client is to be issued by the hardware manufacturer on completion of the project.

1-107. Written confirmation of compliance with all of the above should be given to the Client's Representative in advance of commencement on site and will be a condition of the tender.

Fire barriers

1-108. In all methods of construction it is important to ensure that the cavities between internal and external skins are protected at openings for external doors from the spread of fire. If these openings are not protected, in the event of a fire, smoke and fire can spread through the cavity, causing danger to occupants in other parts of the Property not immediately affected by the fire. This issue is of particular concern in timber and metal framed buildings. Comply with the Building Regulations in respect of the requirement for suitable fire barriers to be present in such buildings. Guidance is given in BS 9991, BS 9999 and the Building Regulations Approved Document B.

1-109. The method of construction should be identified, and where the building is of timber or metal frame construction, the type of cavity barrier should be established. Where the barrier is a cavity sock or similar, and is likely to become dislodged or damaged by the removal of the existing frames, this should be noted on the survey sheet, and instruction given to the installation team to ensure that the cavity barrier is either repaired or replaced to maintain the original level of fire protection for the Property.

1-110. NOTE; Timber and metal frame constructions usually have a moisture barrier included in the area around openings, to resist moisture ingress into the cavity that could affect the timber sheathing or metal studwork.

Making Good

1-111. The final covering and treatment of surfaces and their intersections are fundamental to the overall replacement of external doors.

1-112. The primary objective of making good damaged areas adjacent to the external doors is to maintain the weather-tightness and thermal performance characteristics in and around the reveals.

1-113. This protocol described below applies to all external door replacements in order to negate the need for any redecoration during/after external door installation.

1-114. There will be a number of situations (i.e. age of the Property; thickness of plaster reveals; and to some extent "build issues" associated with system-built Properties) that it may not be possible to observe all or part of this protocol. Therefore more damage may be required to the reveals and/or the door frame wall to undertake the required door frame replacement. This could result in the need for some redecoration. Where this is likely to occur, firstly notify the Client's Representative at Design stage. If this is not identified until on-site, note the Properties affected and alert the Client's Representative before Works commence.

1-115. Where full plaster reveals are to be undertaken – i.e. Internal and external making good; this may take place on subsequent Working Days, but the whole operation from start to finish of each door frame must not exceed 3 (three) consecutive Working Days.

1-116. Plaster-Patching - This process will require a small degree of plaster-patching. This will include the following areas:

- All of the reveals immediately adjacent to door frame etc.; and
- Part of the reveals where strap / lug fixings have been employed.

1-117. Finishing Trims are to be cellular extruded PVC-UE trims/beads and must conform to the applicable Standard or equivalent and as the below table:

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	Internal Reveal (3 sides)	**External Bead (3 sides)**
Single bull-nosed PVC-UE trim typically 5–7mm maximum thickness	✓	
Trim width must not exceed 100mm		
Quadrant / Bead typically 12x12mm or 18x18mm maximum **OR** Single bull-nosed PVC-UE trim typically 5 – 7mm maximum thickness		✓
Trim width must be in range 20 – 25mm maximum		

1-118. Trims are not to be used to simply provide or enhance the weather tightness of the door frame or any perimeter joints. Finishing trims shall be used to neaten the interface between frames and opening, they are only to be used in conjunction with the "plaster-patching" / making good situations as stated above. All joints must be left 'neat and tidy' with an acceptable tolerance of +/- 2/3mm on all joints/trim abutments and sealed with sealant of matching colour.

1-119. Internal finishing trims shall be compatible with the Material of the door frame and must be colour-matched.

1-120. External finishing beads/trims shall satisfy the above criteria and be of an exterior quality Material used in accordance with the manufacturer's technical data sheet. External beading is not required where the external reveal has been re-plastered to match existing.

1-121. Door frames should be measured and fitted as described above and beads/trims should only be fitted to the opposite side of the determined cover/overlap. Only in exceptional cases where reveals are determined as flush will internal and external beads/trims be acceptable.

Fixing of Trims/Beads

1-122. All *internal trims* shall be secured in every case to a firm backing (junction of frame and reveal) with a low modulus silicon sealant (as below) and sealed all round.

1-123. All external beams/trims shall be secured in every case to a firm backing (junction of the frame and plaster reveal) with the low modulus silicon sealant (as below) and sealed all round.

Sealants

1-124. Sealants must comply with the applicable Standard or equivalent and be low modulus grade.

1-125. Perimeter joints externally and internally around the "as installed" door frame shall be sealed with a low modulus silicone sealant and "smoothed" to provide a good seal.

1-126. The sealant shall be appropriate to:

- The frame surface and colour;
- Any substrate material;
- The specific joint size and configuration; and
- Potential joint movement and weather exposure.

Implications – Customer's Blinds etc.,

1-127. The inclusion of a finishing trim to existing reveals and sill may in certain circumstances create an issue around the re-fitting of Customer's blinds etc. Pay due regard to the existing sidelight dressing(s). Where finishing trims are required use a "slim-line" version (5mm or less).

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Repairing damaged prefinished coatings on site

1-128. Localised repairs to coatings shall be affected by brush application on site using the same coating Material and build-up as the factory application with no discernible difference upon completion. All repairs shall be carried out in accordance with the joinery manufacturer's technical data sheet, by a competent person and to the satisfaction of the manufacturer and Client's Representative to ensure continuance of the warranty.

Cleaning of External Doors

1-129. The protective tapes shall be removed from the as installed external doors, frames and sidelights immediately or as soon as practicable after installation and the door (frame and glazing) cleaned with a suitable cleaning agent.

Final Completion Checks

1-130. Upon final completion of each and every external door installation, the Provider is to confirm and check the following:

- All glazing beads are adequately fitted and in good order;
- All hardware functions and locks operate correctly and are not stiff to use;
- All frames and glass are free from cracks, breaks and scratches etc. All frames and glass are cleaned and all internals of frames are swept clean;
- All openings are square and operate correctly;
- There is no movement to the door;
- All hinges etc. are clean and operate correctly;
- All making good internally and externally are completed; and
- All trims are clean and sealed.

1-131. Once all the above items are completed, demonstrate the operation of the external door to the Customer and provide the Customer with their own operating instructions for the external doors.

Photographic Evidence – Removal/Installation of Sidelights/Doors

1-132. Take digital photographs of each completed sidelight/door installation.

1-133. The photograph should clearly show the completed internal reveals and identified by address and room (i.e. this may be done by placing an address and room labelled clipboard against the external door at the time of taking the photograph – ensure a clipboard does not block the image of the door).

1-134. The photographs should be retained electronically by the Provider and provided electronically to the Client's Representative in a format approved by the Client's Representative.

Client's current manufacturers/suppliers/products

1-135. 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]

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REPLACEMENT EXTERNAL, COMMUNAL AND FLAT ENTRANCE DOORS – GENERAL [MIDDLE TIER]

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2. REPLACEMENT EXTERNAL, COMMUNAL AND FLAT ENTRANCE DOORS - GENERAL

Secured by Design

2-001. This section is to be read in conjunction with:

- the general specification for 'Replacement Windows and External Doors – Surveying and Installation', which provides details of surveying, sampling, installation, finishing etc.; and
- the applicable Standard (Windows and Doors – Code of Practice for the survey and installation of windows and external door-sets).

2-002. All new external doors must meet the requirements of "Secured by Design" (SBD) certification or equivalent. External Doors must meet PAS 24 Doors of Enhanced Security or equivalent

2-003. All new external doors complete with frames and factory installed double glazing must be high performance proprietary door sets supplied by a certified SBD manufacturer. Fire doors must have additional testing certification in accordance with the applicable Standard or equivalent.

2-004. These may be PVC-u, timber or timber/steel faced, composite door sets complete with a Secured by Design approved locking mechanism.

2-005. PVC-u external doors, timber composite or steel faced composite doors are suitable for areas where high security or severe exposure rating requires greater durability and a multi-point locking mechanism.

2-006. Sample doors complete with proposed locking mechanisms are to be supplied for the approval of the Client's Representative.

Door Sets

2-007. The Door sets must meet the performance standards set out in this Specification. Provide to the Client's Representative a copy of the Secure by Design or equivalent certificate and PAS 24 or equivalent test certificate along with the list of door components/ironmongery as supplied by a UKAS test house prior to commencement of the Contract.

2-008. The door-sets supplied must be to the same specification as those tested.

2-009. All timber doors to be to the Client's schedule of standard external doors.

REF	DOOR TYPE
SE.1SG	Single, small, glazed top panel.
3P.1SG/2SP	Three panel door, top panel double glazed with safety glass, two bottom panels with solid hardwood panels
4P.2SG/2SP	Four panel door, top two panels double glazed with safety glass, two bottom panels with solid hardwood panels
5P.2SG/3SP	Five panel door, top two panels double glazed with safety glass, three bottom panels with solid hardwood panels
6P.2SG/4SP	Six panel door, top two panels double glazed with safety glass, two middle and two bottom panels with solid hardwood panels
6P.6SP	Six panel door, top two panels, two middle and two bottom panels all with solid hardwood panels
FL.1SG	Flush door with 1 single panel of double glazed safety glass
LBS	Ledged, braced and sheeted door
FLBS	Framed, ledged, braced and sheeted door

[*Client to amend ref. nos. as appropriate*]

2-010. Each door-set shall have the name of the manufacturer and date of manufacture clearly stated on one rebate by means of a discrete permanent label to aid future traceability if required.

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2-011. The fitting tolerance must be plus or minus 5mm, it is the Provider's responsibility to take all site dimensions for pricing purposes and for fitting purposes.

2-012. Door sets which are outside the fitting tolerances must be replaced at the Provider's cost.

2-013. Where existing door sets are removed, the new assembly must be installed and left in full working order before the end of the same day.

2-014. If the manufacturer of the door sets is not as listed in Paragraph 2-088 below the manufacturer of the door sets must be as approved by the Client's Representative and a guarantee must be supplied indicating the life of the components.

2-015. Door Frames are to be fitted with weather seals of low density cellular core encased in low friction liner which are capable of taking up reasonable seasonal movement in all temperatures and returning to original profile. The weather seals shall be inserted into a plough within the door frame rebate while being **fitted in one piece with lower ends extending to bottom of trapper bar**.

2-016. Door Frames to be either:

- white reinforced PVC-u to the applicable Standard or equivalent; or
- hardwood complying with the applicable Standard (density range 650-725 kg/m cu) or equivalent with factory applied coating to match door.

Level Access Thresholds

2-017. All external door sets (main and secondary entrances including doors leading onto a patio) must have level access thresholds (max 15mm high threshold).

2-018. Weather bar should be capable of renewal in-situ i.e. without the need to remove the door frame. The weather bar unit shall have a performance rating to comply with the applicable Standard or equivalent.

Door Performance Requirements

2-019. All the external doors must meet the following minimum performance criteria for weather resistance as defined in applicable Standard -Classification for Weather tightness.

Air Permeability	Test Pressure Class 300 Pa Test Method as the applicable Standard or equivalent
Water Tightness	Test Pressure Class 200 Pa Test Method as the applicable Standard or equivalent
Wind Resistance	Test Pressure 2000 Pa Test Method as the applicable Standard or equivalent

2-020. All doors must be completely draught free when closed. The doors are to meet the **Severe Exposure Rating category.**

Side Lights to Living Room External Doors

2-021. If the glazed opening door is in a living room, the sole means of natural daylight and ventilation must not be from that door.

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2-022. Additional opening side light windows with trickle ventilators and security restriction, must be provided in order to allow ventilation to the room without opening the door all year round.

Double Glazing

2-023. All double glazing to any external doors and their associated side lights (or, within 400mm of the door lock) must be have at least one pane of laminated glass to comply with Secured by Design or equivalent.

2-024. Door and side light glazing must be 24 mm hermetically sealed double glazing units manufactured with laminated glass:

- Front door to be in small panels and be obscured;
- Front door must incorporate facilities to view callers; and
- Glazing to rear doors to be clear.

Door Frames

2-025. Door Frames to door handle relationship to allow for a min of 50mm from the frame edge to the lever handle. Lock back-set to accommodate this dimension.

2-026. All frames must have a factory fitted removable weather-strip to frames and weather-strip to the bottom edge of doors.

2-027. Door frame set back must be 65 mm minimum reveal to external face of wall.

2-028. New lintels to windows and external doors must be insulated galvanised steel or equivalent to BS EN 845-2 or equivalent manufactured by an approved manufacturer and have a British Board of Agrément Certificate or equivalent. End bearings must be a minimum of 150 mm.

2-029. All external door frames are to have mastic pointing provided all around. Such mastic pointing must be specified to be applied strictly in accordance with the manufacturer's technical data sheet and good practice. Use two part polysulphide mastics in areas that are vulnerable to vandalism.

Door Ironmongery

2-030. Ironmongery must be provided in full compliance with "Secured by Design". Handles and locks must be easy grip type suitable for use by disabled persons.

2-031. The requirements of Secured by Design (SBD) and the approved and tested locking mechanism of the selected SBD Door Licence Holder may override this section.

2-032. All external doors must be hung on 3 no stainless steel or equivalent grade SS202 or coated zinc alloy patent hinges (having stainless steel or equivalent) pins butt hinges.

2-033. Non-adjustable hinges to be fitted to flush doors.

2-034. Rebated door set hinges to incorporate lateral adjustment.

2-035. Fire door hinges must be CE Marked and tested to the applicable Standard or equivalent. Hinges shall have high corrosion resistance, greater than the applicable Standard grade 4 or equivalent.

2-036. A minimum of 2 no hinge bolts must be fitted to all external access doors providing hinge side enhanced security to PAS 24 or equivalent.

2-037. Doors to have multi-point lever handle security locking mechanism meeting the applicable Standard or equivalent and tested to PAS 24 or equivalent and to comply with (and stamped) Secured by Design or equivalent. Front doors are to be provided with a security chain.

2-038. Multi-point locking espagnolette system to be provided

2-039. Cylinder and Keys: All cylinders to be nickel plated on brass finish. Cylinders should have a large thumb turn to suit the elderly. All cylinders to be double profile and a minimum five pin tumblers, 1000 differs, anti-bump flush. A minimum of 3 keys must be supplied with each cylinder.

2-040. Doors fitted with level handles operational both sides of door.

2-041. Pull handles and push plates: To be provided only where elements of communal accommodation occur.

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2-042. Pull handles must be 230mm x 19mm dia. bolt through fixed and nylon or plastic coated finish. Push plates to be 300 x75 x 1.5mm drilled and countersunk fixed, finishes to match the pull handles.

2-043. Letter plates: Front doors to Properties are to have a telescopic letter plate with external flap (finish to match door ironmongery) and an inward sprung flap, on the inside of the door.

2-044. Letter plates must be draught and fire proofed internally and have a finger hood to prevent access to door locks (minimum distance from door locks 400 mm).

2-045. Intumescent liners and smoke stopping must be provided to fire doors.

2-046. Internal flat entrance door off communal corridors must have a fire and acoustic rated letter plate with integral intumescent liners and a smoke stopped internal letter flap. They must be:

- fire tested to satisfy the requirements of the applicable Standard or equivalent; and
- acoustic tested to satisfy the requirements of the applicable Standard or equivalent to 29db/Rw.

2-047. Door numerals must be provided to the front entrance door of each Property.

2-048. Door stops: All doors are to be provided with floor, wall or skirting mounted rubber stops on a nylon or plastic coated shoe where appropriate to prevent damage to walls or plaster.

2-049. Door closers: Where required, all self-closing fire doors should have size 2 - 6 adjustable strength and back check function overhead closers.

2-050. Concealed door closers and hush latches may be used in individual Properties and flats if approved by Building Control.

2-051. Closers to flats for frail elderly Customers must be the 'swing-free' type operated by the activation of the fire alarm.

2-052. Cabling and transformers must be provided to all wheelchair Property external entrance doors for the future installation of 'power operated' door closers.

2-053. All overhead closers must carry a 10 year guarantee to the applicable Standard or equivalent.

2-054. Door Viewer: Front doors to flats should have a 180 degree chrome plated door viewer fitted at:

- 1500mm above finished floor level for accessible Properties
- 1050mm above finished floor level for wheelchair accessible Properties

2-055. Door Bolts: Bolts to double doors and french windows, should be of brass material satin chrome or satin nickel plated. Flush blots should be fixed in the leading edge of the second opening leaf of a pair of doors with a flat plate at the head and an easy clean socket in the floor.

2-056. Kick Plates: To be provided only to communal accommodation.

2-057. Provide 450mm high coloured plastic kick plates to match the ironmongery on the push side of internal doors in communal and circulation areas and to all flat entrance doors on the corridor side. Flat entrance door kick plate to achieve fire resistance of door set.

2-058. Wall Protection: For internal communal areas only

2-059. Provide flame retardant corner protection to all external wall angles to a height of 1000mm using proprietary PVC-u corner protectors.

Composite Doors -Generally

2-060. Renew main front doors and frames on all Properties that are single family houses only with composite door sets installed by the PRP or Pre-finished Timber manufacturer/Subcontractor.

Doors -Generally

2-061. All front doors are to be styled with upper panels double glazed with laminated safety glass sealed units.

2-062. All rear doors are to be panel door style with upper panel double glazed with laminated safety glass sealed units.

2-063. Customers are to be given the option of cat flaps to be installed to lower panels of rear door.

2-064. Doors within Conservation Areas must be renewed with a pre-finished timber door.

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Composite Front Doors to Houses not within Conservation Areas

2-065. The style and choice of front doors is to be agreed with Customer and Client's Representative on each individual project. The Provider is to provide each Customer with a sheet listing and showing the style of doors available and five colours available. The Provider must ask the Customer to choose and sign the list as to which door they wish and forward a copy of the signed sheets to Client's Representative. The door colour should be either be translucent coatings or from a manufacturer's heritage range. Due to on-site issues with expansion etc., dark coloured doors should be avoided.

2-066. All existing door bells are to be re-fixed.

2-067. Where fanlights are above the doors, the fanlights and frames are to be included as part of the renewal.

2-068. All glazing doors to be double glazed laminated safety glass sealed obscure units unless otherwise Instructed.

2-069. All doors to have brass numbers on the outside and brass draught-proof letter boxes.

2-070. All doors to have brass multipoint lever handles.

2-071. All doors and locks to meet Secure by Design or equivalent, the applicable Standard or equivalent and tested to PAS 24 Standard or equivalent.

Timber Front Doors to Conservation Areas

2-072. The Provider must obtain all statutory consents and permissions required to complete the Work and/or checks to be made to ensure these are in place before ordering Materials and commencing the Works.

2-073. All new timber front doors where requested are to be purpose made pre-primed minimum 44mm thick softwood doors, with hardwood painted frame.

2-074. It is anticipated that most doors will be 4 panel with 2 No. upper panels to be double glazed laminated safety glass sealed obscure units, and 2 No. lower panels to be mouldings to match existing.

2-075. Brass numbers and brass draught-proof letter boxes are to be as Paragraph 2-069 above.

2-076. All doors to have brass mortice night latch and separate 5 lever deadlocks with finger turn snib internally.

2-077. Where fanlights are above the doors, the fanlights and frames are to be included as part of the renewal.

Installation

2-078. Undertake surveys and installation of the doors at the same time as the windows installations.

2-079. Ensure the correct installation of each door-set.

2-080. The door-set shall be placed on a concrete threshold and bedded on a low Modulus Silcon, minimum depth of bed 2mm, maximum depth of bed 4mm. All door-sets shall be installed using heavy duty galvanised perforated metal straps at 150mm from corners and maximum 600mm centres between these fixings.

2-081. Door-sets may also be fixed using through frame fixings provided that the existing reveals are sound.

2-082. Fixings shall be properly countersunk, plugged and head of plug coated to match frame. Split frames (i.e. PVC-u frames) as a result of bad fitting workmanship shall not be accepted and may result in the door-set being entirely replaced at no extra cost to the Client.

2-083. Expanding polyurethane foam must not be used as a sole method of fixing.

Timber Architraves and Sills

2-084. To every new timber door and door frame, carefully remove all existing internal architraves and replace to match existing in pre-primed ogee or similar timber, with mitred joints to architraves. All timbers to be finished in gloss paint.

2-085. All gaps to walls or gaps to joints are to be sealed prior to decorations.

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Painting of Timber Sundries

2-086. To all new timber sill boards, pre-prime, architraves and sill boards before fixing, and then once installed, rub down, fill as necessary and paint 2 No. coats white undercoat and 1 No. gloss white paint, rubbing down between all coats.

2-087. Repaint existing external concrete sills and thresholds externally to the doors and touch up any painted stonework or render around the door frame to match existing, as disturbed during the renewal Works.

Client's current manufacturers/suppliers/products

2-088. 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]

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GRP EXTERNAL DOOR-SETS AND SCREENS [LOWER TIER – Client to delete if not applicable]

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3. GRP ENTRANCE DOOR-SETS AND SCREENS

General

3-001. This section is to be read in conjunction with the general specification for 'Replacement Windows and External Doors – Surveying and Installation' and 'Replacement External Doors – General'.

3-002. This Specification describes the performance criteria to be obtained for the manufacture, supply and installation of inward opening GRP doors and frames and associated PVC-u windows. Provider's must ensure that their proposed system completely satisfies all the relevant standards detailed.

3-003. This Specification applies to ALL Properties and the Provider's Rate covers the location of all Properties and doors being renewed. Properties will usually be occupied during the course of the Works.

3-004. This Specification describes works in detail. However not all items of work will be applicable to each Property, nor are the Works referred to exhaustive. All doors, frames, fanlights and sidelights must pass testing to PAS 24 or equivalent and must be "Secured By Design" or equivalent certified. All certification documents are to be forwarded to the Client's Representative and kept updated – this must include the test certificate, report and list of tested ironmongery with product manufacturer's names, types etc. Evidence of compliance with PAS 24 [Specification for Enhanced security requirements for door-sets and windows in the UK] or equivalent will be a condition of the completion of the Order.

3-005. All doors must achieve Building Control standard of Maximum U-Value = 1.8W/ m^2K.

3-006. Materials specified in this Specification must be used, or equivalent Materials where they have been accepted as equivalent by Client's Representative.

3-007. Stiles and rails to be engineered timber edge bonded with 1.5mm or high strength engineered double plastic composite. Skins to be GRP transfer moulded and U.V. stable, thickness of skin is determined by the door manufacture and as a result of PAS 24 or equivalent testing. Bonding agent is to be moisture cure polyurethane adhesive with core of 39mm CFC free fire resistant rigid foam insulation with the correct fire performance rating to comply with the Building Regulations.

3-008. Door glazing to be double glazed laminated glass fitted in separate glazing cassette mechanically fixed to sub-frame and internally beaded.

3-009. Arrange access with the Customer to carry out a pre-manufacture site survey as recommended by the British Plastics Federation Code of Practice for the Survey of PVC-u Window sets. This survey will include the provision of a pro-forma questionnaire offering the available options from which the Customers can choose.

3-010. The visit must include:

- consulting with the Customer about choices;
- taking measurements sufficient to prepare scale drawings;
- scheduling Customer fittings and their condition; and
- noting any other site condition that may affect installation.

1-136. Customers are to be given a choice of 5 front door types as table below:

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REF	DOOR TYPE
SE.1SG	Single, small, glazed top panel
3P.1SG/2SP	Three panel door, top panel double glazed with safety glass, two bottom panels with solid panels
4P.2SG/2SP	Four panel door, top two panels double glazed with safety glass, two bottom panels with solid panels
5P.2SG/3SP	Five panel door, top two panels double glazed with safety glass, three bottom panels with solid panels
6P.2SG/4SP	Six panel door, top two panels double glazed with safety glass, two middle and two bottom panels with solid panels
6P.6SP	Six panel door, top two panels, two middle and two bottom panels all with solid panels

[Amend ref. nos. as appropriate]

3-011. Other choice options are to be:

Element	Location	Options
Colour	Front/Rear Door	White (RAL 9003)
		Blue (RAL 5004)
		Red (RAL 3002)
		Green (RAL 6009)
Glazing	Front	Obscure - Cotswold
	Rear	Clear only
Ironmongery	Front/Rear	Gold/brass
Surface Finish	Front/Rear	Wood grain effect

3-012. All screen/door styles must be in accordance with modern casement design where possible, allowing for exceptions where fire egress casements are necessary. Unusual aesthetic arrangements are to be referred to the Client's Representative for decision.

3-013. All component parts are to be to all applicable Standards, "Kite marked", or BBA approved or equivalent, verification of which to be supplied on request by the Client's Representative.

3-014. PAS 24 or equivalent certification from the manufacturer and the Provider must be provided to the Client's Representative before manufacture.

3-015. The sidelight/screen types are to be as existing in respect of configuration and opening lights. However, sidelight/screens in conservation areas, areas of outstanding natural beauty or historic buildings must be discussed with the Client's Representative for likely planning approval issues.

3-016. Design drawings are to be prepared by the Provider prior to manufacture. A copy is to be supplied to the Client's Representative before manufacture commences.

3-017. Carry out a pilot installation prior to full commencement of the Works, to ascertain the correct provision and detailing of the installation.

Programme and Security

3-018. In the case of numerous installations a programme for the Works is to be prepared by the Provider and agreed by the Client's Representative, before the Works commence.

3-019. Provide 14 calendar days' notice and agree the timing of the Works with each Customer. Carry out the Works as quickly as possible, in order to reinstate all facilities as soon as is possible. Full security, wind and weather tightness must be provided at the end of each Working Day in each occupied Property to suit the Customer's/Client's needs.

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3-020. The installation of a door and frame, fanlights and sidelights must be carried out in one continuous operation within a single Working Day. The security, wind and weather tightness of the Property must not be compromised at any time.

3-021. All making good of the structure and fabric must be carried out within one Working Day following the installation of the door etc., Any making good must not be left outstanding over a weekend without the permission of the Customer and the Client's Representative.

3-022. The Client's Representative is also to be notified of the proposed commencement and completion dates, and the proposed date for completion inspection once all the Works are completely finished including any snagging by the Provider.

3-023. Agree a maximum number of Properties to be worked on at any one time before the Works programme begins (to suit number of Properties/Contract Period available).

3-024. A Property must be 100% complete prior to commencing on further Properties above the agreed maximum and each completed Property must be signed off by the Customer and the Client's Representative.

Protection

3-025. Protect floor coverings, furniture and Customers belongings throughout the duration of the Works. Move furniture, Customers belongings and everything necessary in order to carry out the Works and minimise disturbance to the Customers as far as possible. On completion of the Works place all previously moved furniture and belongings in locations agreed with the Customers. Dust sheets must be used at all times during the Works to prevent any damage.

3-026. Accept responsibility for any damage to carpets or Customers belongings, undertake a schedule of condition and agree this with the Customer prior to undertaking any Works. Take photographs of any damaged Customer's belongings within the vicinity of the Work prior to commencement, and where appropriate obtain a signed acknowledgement of condition from the Customer.

Stripping Out

3-027. Carefully remove existing doors, frames, sills, fanlights, sidelights and all associated fixings and prepare existing openings to receive the new installation. Dispose of all unwanted material and recycle were possible.

3-028. Take care to carefully remove remaining Customer fixtures and store to one side for reinstalling and refix on completion.

3-029. Carefully remove coatings, panelling, tiles or sheeting of any kind from adjacent walls and ceilings back to the plastered surfaces. Make good, repair or replaster to receive new fittings, tiles and decoration.

3-030. After the removal of the existing door, frame, sill, fanlight and sidelight, carefully cut back any internal or external flooring, finishings, cladding, wallpaper and decorations to allow for the installation of the new frames etc. The Provider is responsible for making good all structures, finishing's and decorations up to 100mm from the face of the frame or sill.

Replacement Doors - General

3-031. Ensure that all door-sets and their installation fully satisfy the relevant standards detailed.

3-032. Manufacture, fabrication and installation should be suitable in all respects for: Low Rise Domestic Structures

3-033. **Important Note:** Dimensions, if shown, are for guidance only and the Provider is responsible for taking all necessary site dimensions to ensure that door-sets are manufactured to fit accurately and properly.

3-034. No frame extensions or make up pieces are to be used to compensate for incorrectly measured openings.

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3-035. Fire doors are to have been tested (at a UKAS accredited test facility) to the applicable Standard or equivalent. Fire doors are to have achieved fire resistance integrity in excess of 30 minutes and a door-set classification of FD30S. On completion of installation, the Client's Representative is to be furnished with 2 copies of all documents within Paragraph 4-078 to 4-081 of the FIRE DOOR SETS [LOWER TIER] Part of this Specification. Each fire door is to be individually referenced, marked and tagged by the fire door manufacture, whereby they are to keep records of all fire doors supplied and present monthly updates to the Client's Representative with the monthly reports.

Construction of Door and Frame

3-036. Door leafs shall be constructed with minimum 4mm high gloss through coloured external Skins, manufactured from gel coat to the applicable Standard or equivalent, coloured to the applicable Standard or equivalent, and one layer of 300gm chopped strand matt and 2 layers of 450gm chopped strand matt to the applicable Standard or equivalent, fully saturated with high heat distortion isophthalic / DCPD polyester resin conforming to the applicable Standard or equivalent type C. Skins shall fully encapsulate a jointed timber frame manufactured from prepared material kiln dried to the applicable Standard or equivalent, and resin laminated CFC free fire resistant rigid polyurethane foam core. The above may be over ruled/enhanced by testing to PAS24 or equivalent (and fire testing, as above, in the case of fire doors).

3-037. Door frames shall be of moulded GRP manufacture or equivalent to the same specification as the door leaf and have a non-staining EPDM compression seal gasket and secondary angled blade neoprene stop seal;

3-038. Door sills, where required for non-wheelchair required access, shall be of moulded GRP manufacture or equivalent to the same specification as the door leaf. They shall be 50mm in height, 150mm in width and designed to accept an approved threshold.

Threshold to Front Doors

3-039. All external door sets (Main and Secondary Entrances including Doors leading onto a patio) must have level access thresholds (max 15mm high threshold) and a minimum clear opening width of 800mm between the blade and the stop, irrespective of the type of accommodation in order to meet the requirements of Lifetime Homes.

3-040. Weather bar should be capable of renewal in-situ – i.e. without the need to remove the door frame. The weather bar unit shall have a performance rating to comply with the applicable Standard or equivalent.

Glazing

3-041. All glazing apertures are to be internally beaded with the double glazed units securely fixed using mechanical means.

3-042. All doors, fan lights and/or side lights shall be glazed with dual sealed double glazing units with at least one pane of laminated glass to comply with Secured by Design or equivalent. Safety glass shall comply with BS EN 12600 and BS 6262 or equivalent.

Ironmongery

3-043. Ironmongery must be provided in full compliance with "Secured by Design" or equivalent. Handles and locks must be easy grip type suitable for use by people with a disability.

3-044. Two door viewers must be provided to all front doors at heights of 1500 and 1050 mm from finished floor level.

3-045. All external doors must be hung on 1½ pairs of heavy duty butt hinges. Fire door hinges must be CE marked and tested to the applicable Standard or equivalent. Hinges shall have high corrosion resistance, greater than applicable Standard grade 4 or equivalent.

3-046. Multi-point locks tested to PAS 24 or equivalent and to comply with (and stamped) Secured by Design or equivalent. Front doors to be provided with a security chain.

3-047. All hardware, where attached to the door-set, shall be fixed with stainless steel or equivalent screws fully penetrating the timber sub frame. For all installations use screws, not rivets, and employ maximum retention. Do not over tighten fixings.

3-048. Fit a D type handle to internal face of door where identified. Position to be agreed with manufacturer.

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Installation of Door-sets

3-049. The door-sets are to be fixed strictly in accordance with the manufacturer's technical data sheet. Care shall be taken to ensure the doors are handled and stored correctly. Frames are to be packed and wedged into the correct position to ensure a square and flat fit before fixing to the reveals.

3-050. The door-set is to be fixed with a minimum of eight M10 x 140mm proprietary frame fixings, direct through frame and finished with colour coded plastic not easy removed cover caps.

3-051. Door frame should be sealed to reveal with low modulus silicone sealant, colour matched to the door frame and neatly executed. A suitable bull nosed cover trim should be used to improve the aesthetic appearance of the joint.

3-052. All protective coverings on door-sets shall be removed on installation. Removal and cleaning of the frames and doors is the responsibility of the Provider.

SIDELIGHTS AND FANLIGHTS

Profile Manufacture

3-053. All sidelights, fanlights, door frames etc., profiles are to be obtained from the same approved system manufacturer.

3-054. The Provider must confirm that the door and doorset manufacturers they propose to use are registered as either having BBA certification (or equivalent) and membership of either the Glass and Glazing Federation or British Property Federation or equivalent. The Provider must supply evidence of this to the Client's Representative on request.

3-055. The sidelights, fanlights, door frames etc., will be manufactured in accordance with applicable manuals for GRP sidelights and door frames. The profile will be manufactured to the applicable Standard or equivalent. Cadmium based stabilisers, and re -work material used in manufacture will not be accepted. The profile must be vent profile manufactured with a euro- groove. All profiles are to be chamfered.

Construction

3-056. All sidelights, fanlights, door frames etc., shall be of all welded construction. All corner joints, transoms and mullions are to be mitred, and fusion welded. All excess materials are to be neatly trimmed and feature grooved. Mechanically jointed transoms may be considered where there are specific design constraints, but only after approval from the Client's Representative. All feature grooves should be straight and of consistent depth throughout their length.

3-057. Each sidelight, fanlight, door frame etc., shall be permanently marked in an unobtrusive position (not visible when the opening light is closed) with the applicable Standard or equivalent, the weather tightness exposure category and the name or trade mark of the manufacturer.

3-058. Reinforcement is to be continuous to a minimum of 85% of the length of the frame, and within 5mm of the weld. Screw fixed to the profile at 250 mm max c/c, with a minimum of three fixings. All reinforcement to be to the profile manufacturer's recommended parameters in either aluminium or galvanised steel or equivalent.

3-059. All sidelights, fanlights, door frames etc., will be constructed with the profile manufacturer's guide lines for pressure equalisation. Face drainage is to be provided. Drainage slots should be a minimum 30mm long and 5mm wide. Internal drainage slots should be offset by a minimum of 50mm from external slots.

3-060. The sidelights, fanlights, door frames etc. are to be internally beaded as recommended in the profile manufacturer's manual and be capable of accepting 24mm hermetically sealed "low emissivity" glass units.

Installation

3-061. The correct installation of GRP sidelights and door frames is critical to achieve maximum performance.

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3-062. Installation shall at all times meet the requirements of BPF/GGF Code Of Practice For The Survey And Installation Of White High Impact Modified Windows (Ref: COP3, parts A&B) or equivalent. The requirement for through frame fixing, cleat fixing and the need for frame extensions will be discussed at appropriate times. Draw these details to the Client's Representative's attention.

3-063. All sidelights etc., are to be glazed from the inside of the building. Glazing systems shall be designed so that the glass cannot be removed from the outside by the use of a thin blade or other simple tool or tools.

3-064. All fasteners used for the installation of GRP door frames, sidelights etc and doors, must meet the following specification:

- Fastener is to be a nylon through frame type with twist proof vanes to ensure mechanical stability and prevent anchor rotation;
- To ensure stress free attachment to the masonry structure and to prevent twisting, racking or distortion of the frame, the anchor body will expand radially along its full length during installation. Fasteners relying on a cone and expanding sleeve are not acceptable due to the increased risk of frame distortion;
- The fastener when installed will be fully concealed within the frame to ensure that the fastener remains tamper proof and secure;
- Maximum distances between fasteners will not be more than 600mm and the minimum distance of fasteners from frame corners, transom or mullion joints will be 150mm; and
- The final securing of fixings must be screw tightened (not hammered) to avoid possible splitting of the frame. If there is any splitting of the frame, the entire door set must be removed, re-framed and replaced at no extra cost to the Client.

Glazing

3-065. Glazing should be to Building Regulations Approved Document N and to the applicable Standard or equivalent. In addition, the manufacturer's recommendations for positioning of glazing blocks and packers must be adhered to.

3-066. Glass to all screens and windows will be hermetically sealed double glazed low emissivity units to BS 952-1 and BS 952-2 or equivalent, units to be fitted in accordance with manufacturer's technical data sheet. Glass to be marked with appropriate labelling which will only be removed after handover is completed.

3-067. Double glazed units are to be manufactured to the following specification 4mm Float Glass - 20mm Argon Gas or equivalent fill - 4mm low emissivity glass overall thickness 28mm. Glass thickness and type shall be selected using the recommendations given in the applicable Standard or equivalent to withstand the calculated design wind pressure relative to the size of pane.

3-068. All glazing to screens and adjacent windows must have at least one pane of laminated safety glass to the applicable Standard or equivalent and marked accordingly. Safety glass shall be fitted where required in accordance with Building Regulations Approved Document N.

3-069. If any panels have any fixtures/fitting etc. attached, they are to contain a ply reinforcement.

3-070. Obscure glass to be Cotswold pattern or equivalent or an obscure pattern of level 5 as a minimum.

Hardware Specification for Fanlights and Sidelights

3-071. Avoid openings in the fanlights/sidelights, as this presents a higher risk of unauthorised door entry, unless this is necessary to provide the room/inner space with an adequate amount of ventilation (see Building Regulations). In these instances, all ironmongery must be as per the windows Specification detailed elsewhere. Restrictors must be concealed and tamper-proof from outside the Property.

3-072. The fanlight/sidelight hardware package must meet the requirements of PAS 24 "Enhanced Security Performance Requirements for Door-Sets and Windows in the UK. External Door-Sets and Windows Intended to offer a level of security Suitable for Dwellings and Other Buildings exposed to Comparable Risk" or equivalent

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Insulated Panels

3-073. On full floor to head height frames, lower panels will be coloured insulated panels to match door panelling. Therefore, the panel's overall thickness and Materials to be used will be determined by the doors PAS 24 certification. All panels will achieve a min thermal resistance equal to or better than the glazed area above.

3-074. All panels to be manufactured to meet all relevant Building Regulations and safety standards with regard to thermal performance, acoustic transmission, and fire protection.

Covers, Trims and Mouldings

3-075. Unless otherwise Instructed all internal heads, jambs, and sills will be finished with a (colour as windows) single bull-nosed PVC-u trim typically 5–7mm maximum thickness of not greater width than 100mm. Scribed, mitred, securely screwed and capped and the edge glued to the frame with a PVC-u cyanoacrylate adhesive to give a neat finish and sealed on all edges using an emulsion acrylic sealant.

3-076. All PVC-U extrusions, mouldings, trims and profiles to windows will be manufactured and installed so that no colour variation exists to the detriment of the aesthetic value of the windows, doors etc. In accordance with colour fastness test methods included in BS EN 12608 or equivalent.

3-077. Trims are not to be used to simply provide or enhance the weather tightness of the window or any perimeter joints. Finishing trims shall be used to neaten the interface between frames and opening, they are only to be used in conjunction with the "plaster-patching" / making good situations. As it is likely that cold bridging may occur, filling at reveals, heads and sills must be plastered prior to fitting of all trims.

3-078. The inclusion of a finishing trim to existing reveals and sill may in certain circumstances create an issue around the re-fitting of Customer's blinds etc. The window installer shall pay due regard to the existing window dressing(s) and where finishing trims are required that a "slim-line" version (5mm or less) is used.

Sealants and Perimeter Pointing

3-079. All external sealants are to be of low modulus silicone and conform to BS 11600 or equivalent and used to seal gaps between window/door assembly and brickwork/plasterwork. Colour matched to windows and neatly executed.

3-080. Internal sealant to be a one-part flexible emulsion acrylic sealant. This sealant may be used to fill cracks or gaps around walls and ceilings, and around all finished PVC-u architraves and trims.

Ventilation

3-081. All openings to be fitted with room ventilation as per window specification detailed elsewhere.

3-082. If required the Provider is to supply and fit a ventilator, which will conform to the Gas Safety Regulations and BS 5440-2 or equivalent, for air supply to gas appliances. This applies to any room containing or used to vent these types of appliances. Type position and quantity of ventilators to be agreed and verified with the Client's Representative prior to work commencing.

3-083. An appropriate **"DO NOT OBSTRUCT"** label approved by the Client's Representative indicating boiler rating, must be fitted to all gas ventilators by the manufacturer.

Completion

3-084. On completion of all Works thoroughly clean all adjacent surfaces affected by the Works.

3-085. All builders rubbish both internally and externally must be removed during and on completion of the Works.

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Client's current manufacturers/suppliers/products

3-086. 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]

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FIRE DOOR-SETS [LOWER TIER – Client to delete if not applicable]

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4. FIRE DOOR-SETS

General Requirements on Fire Door-Sets

4-001. General requirements are set out in the table below:

Scheme Type	Door Replacement	Colours/Choices
Internal Flat Entrance door-sets	Timber Veneer flush faced FD30s/FD60s door-set in accordance with Health and Safety Law on fire safety and the applicable Standard or equivalent Door thickness 44mm and 54mm	Colours to be chosen by Client's Representative and Customer. Locking system – Client's Representative will Instruct whether to retain the existing locking system or to replace with a new locking system
Internal Communal door-sets	Timber Veneer FD30s/FD60s door-set in accordance with Health and Safety Law on fire safety and the applicable Standard or equivalent	Colours to be chosen by Client's Representative and Customer. Locking system – Client's Representative will Instruct whether to retain the existing locking system or to replace with a new locking system.
Internal Cupboard door-sets	Timber Veneer FD30s/FD60s door-set in accordance with Health and Safety Law on fire safety and the applicable Standard or equivalent	Colours to be chosen by Client's Representative and Customer. **All new doors MUST match all other existing or proposed new doors throughout each Scheme.** Client's Representative will Instruct whether to retain the existing locking system or to replace with a new locking system.
External Flat Entrance door-sets	Composite FD30s/FD60s door-set in accordance with Health and Safety Law on fire safety and the applicable Standard or equivalent	Colours to be chosen by Client's Representative and Customers. Locking system – Client's Representative will Instruct whether to retain the existing locking system or to replace with a new locking system.
Combination of Internal & External Flat door-sets	Composite FD30s/FD60s door-set in accordance with Health and Safety Law on fire safety and the applicable Standard or equivalent	Colours to be chosen by Client's Representative and Customers. Locking system – Client's Representative will Instruct whether to retain the existing locking system or to replace with a new locking system.

Internal Flat Entrance Door-sets

4-002. Timber veneer FD30s/FD60s door-set, set within timber or aluminium frames in accordance with Health and Safety Law on fire safety and the applicable Standard or equivalent to provide fire resistance ratings of 30 minutes (or better) and 60 minutes (or better) when tested in accordance with the applicable Standard or equivalent.

4-003. All Materials to have achieved Certifire certification to 30/60 minutes fire resistance, or to have been tested in accordance with the appropriate section of the applicable Standard or equivalent and all door components must comply with Approved Document B of the Building Regulations. All to be installed in strict accordance with manufacturer's technical data sheet with certificate obtained by the Provider at practical completion.

4-004. Please note: If the existing doors are glazed, conduct a survey with the Customers to see whether they wish to retain the glazing or have replacement solid doors. Where possible, the Client would like to prevent glass from being installed due to security risks, fire safety and thermal efficiencies.

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4-005. All doors must include the following elements (if not included with the door-set):

- Combine 15 x 4mm intumescent / brush smoke seals to both side edges and top edge of door leaf successfully tested for fire and smoke performance in accordance with the applicable Standard or equivalent;
- Overhead door closing mechanism affixed to the external side of the door in accordance with the applicable Standard or equivalent;
- 75mm/3" Eurospec or equivalent fire rated door numerals in satin anodised aluminium finish;
- Average size 285mm x 55mm fire and smoke resistant letter plate with Telescopic intumescent liner and nylon or equivalent brush seals fitted to prevent vision through the letterplate and provide draught proofing, complete with a security cowl is available to prevent vision through the letterplate when open, and to inhibit manipulation of locks and bolts all in accordance with BD 9999 or equivalent and Approved Document B of the Building Regulations;
- Complete viewing angle 60 degrees fire rated door viewer with a prism system that allows viewing from up to 2m away. Fire protection is provided by intumescent strip and suitable for 35mm - 62mm thickness doors, one per door, two to be provided for wheelchair users;
- 1½ pairs Eurospec Grade 13 or equivalent ball bearing fire rated hinges manufactured from 304 grade stainless steel or equivalent, CE marked, designed and tested for 44mm doors;
- Locking assembly and door handle ironmongery – thumb turn on the internal face; and
- Fire Safety Signage to comply with Health and Safety Law and the applicable Standard or equivalent for Fire safety signs, notices and graphic symbols or equivalent.

Communal Internal Door-sets

4-006. Timber veneer FD30s/FD60s door-set with clear fire resisting glazing panels set within timber or aluminium frames in accordance with Health and Safety Law on fire safety and the applicable Standard or equivalent to provide fire resistance ratings of 30 minutes (or better) and 60 minutes (or better) when tested in accordance with the applicable Standard or equivalent

4-007. All Materials to have achieved Certifire certification to 30/60 minutes fire resistance, or to have been tested in accordance with the appropriate section of the applicable Standard or equivalent. All door components must comply with Approved Document B of the Building Regulations. All to be installed in strict accordance with manufacturers technical data sheet with certificate obtained by Provider at practical completion.

4-008. All doors must include the following elements (if not included with the door-set):

- Combine 15 x 4mm intumescent /brush smoke seals to both side edges and top edge of each door leaf successfully tested for fire and smoke performance in accordance with the applicable Standard or equivalent;
- Overhead door closing mechanism affixed to the external side of the door in accordance with the applicable Standard;
- 1½ pair Eurospec or equivalent Grade 13 ball bearing fire rated hinges manufactured from 304 grade stainless steel or equivalent, CE marked, designed and tested for 44mm doors to each door leaf;
- Fire Safety Signage to comply with Health and Safety Law and the applicable Standard for Fire safety signs, notices and graphic symbols or equivalent;
- Eurospec or equivalent plain or Push/Pull engraved Fire door rated finger plates to each door leaf;
- Eurospec or equivalent D pull Handle - A versatile range of pull handles in various bar diameters and lengths to each door leaf; and
- Eurospec or equivalent kicking plate to both faces of each door leaf; and either

  - Electromagnetic fire door retainers (hold open devices) can be used to hold a self-closing fire door in the open position with an electrically powered magnet. These devices are usually linked into a building's fire alarm system or are controlled from locally positioned smoke detectors; or
  - Acoustic fire door retainers fitted at the bottom of fire doors and can lock a fire door in the open position by pushing a plunger down. The acoustic fire door retainers then 'listen' for the sound of smoke alarms. Door release mechanism should conform to the applicable Standard or equivalent for electronically powered hold-open devices.

4-009. Internal Cupboard Door-sets (Electric cupboards, meter cupboards, boiler cupboards, storage rooms, cleaning cupboards & Lift rooms etc.).

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4-010. Timber veneer FD30s/FD60s door-set set within timber or aluminium frames in accordance with Health and Safety Law on fire safety and the applicable Standard or equivalent to provide fire resistance ratings of 30 minutes (or better) and 60 minutes (or better) when tested in accordance with the applicable Standard or equivalent.

4-011. All Materials to have achieved Certifire certification to 30/60 minutes fire resistance, or to have been tested in accordance with the applicable Standard or equivalent. All door components must comply with Approved Document B of the Building Regulations. All to be installed in strict accordance with manufacturers technical data sheet with certificate obtained by Provider at practical completion.

4-012. All doors must include the following elements (if not included with the door-set):

- Combined 15 x 4mm intumescent /brush smoke seals to both side edges and top edge of door leaf successfully tested for fire and smoke performance in accordance with the applicable Standard or equivalent;
- Cam action overhead door closing mechanism affixed to the external side of the door in accordance with applicable Standard;
- 1½ pair Eurospec Grade 13 ball bearing fire rated hinges manufactured from 304 grade stainless steel or equivalent, CE marked, designed and tested for 44mm doors;
- Locking assembly and door handle ironmongery – thumb turn on the internal face; and
- Fire Safety Signage to comply with Health and Safety Law and the applicable Standard for fire safety signs, notices and graphic symbols or equivalent.

External Flat Entrance door-sets

4-013. Complete FD30S Composite fire door-set set within timber or aluminium frames and flush finished with a fire resistant glass reinforced plastic textured finish. Fire resistant insulated core which has a leaf thickness of 44mm in accordance with Health and Safety Law on fire safety and the applicable Standard or equivalent, to provide fire resistance ratings of 30 minutes (or better) when tested in accordance with the applicable Standard or equivalent

4-014. All Materials to have achieved Certifire or equivalent certification to 30/60 minutes fire resistance, or to have been tested in accordance with the appropriate section of the applicable Standard or equivalent and all door components must comply with Approved Document B of the Building Regulations. All to be installed in strict accordance with manufacturer's written instructions with a certificate obtained and provided to the Client by Provider at practical completion.

4-015. Please note: If the existing doors are glazed, conduct a survey with the Customers to see whether they wish to retain the glazing or have replacement solid doors. Where possible, the Client would like to prevent glass from being installed due to security risks, fire safety and thermal efficiencies.

4-016. All doors must include the following elements (if not included with the door-set):

- Combine 15 x 4mm intumescent /brush smoke seals to both side edges and top edge of door leaf successfully tested for fire and smoke performance in accordance with the applicable Standard or equivalent;
- Cam action overhead door closing mechanism affixed to side of the door in accordance with the applicable Standard or equivalent;
- 75mm/3" Eurospec or equivalent fire rated door numerals in satin anodised aluminium finish or equivalent;
- Average size 285mm x 55mm fire and smoke resistant letter plate with telescopic intumescent liner and nylon brush seals fitted to prevent vision through the letterplate and provide draught proofing, complete with a security cowl is available to prevent vision through the letterplate when open, and to inhibit manipulation of locks and bolts al in accordance with the applicable Standard or equivalent and Approved Document B of the Building Regulations;
- Complete viewing angle 60 degrees fire rated door viewer with a prism system that allows viewing from up to 2m away. Fire protection is provided by intumescent strip and suitable for 35mm - 62mm thickness doors, one per door, two to be provided for wheelchair users;
- 2 pair stainless steel or equivalent hinges, CE marked, designed and tested for 44mm doors;
- Multi-point automatic multi-point locking assembly and lever/lever configuration door handles to suit Euro profile lock cylinder with 3 keys – thumb turn on the internal face;
- Fire Safety Signage Health and Safety Law and the applicable Standard for fire safety signs, notices and graphic symbols or equivalent;
- Anodised aluminium or equivalent "low mobility" threshold; and

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- Anodised aluminium or equivalent weather bar.

Internal and External Flat Entrance Door-sets

4-017. Complete FD30S Composite fire door-set, set within timber or aluminium frames and flush finished with a fire resistant glass reinforced plastic textured finish and Fire Resistant insulated core which has a leaf thickness of 44mm in accordance with Health and Safety Law on fire safety and the applicable Standard or equivalent to provide fire resistance ratings of 30 minutes (or better) and 60 minutes (or better) when tested in accordance with the applicable Standard or equivalent.

4-018. All Materials to have achieved Certifire or equivalent certification to 30/60 minutes fire resistance, or to have been tested in accordance with the appropriate section of the applicable Standard or equivalent. All door components must comply with Approved Document B of the Building Regulations. All to be installed in strict accordance with manufacturers technical data sheet with certificate obtained by Provider at practical completion.

4-019. Please note: If the existing doors are glazed, conduct a survey with the Customers to see whether they wish to retain the glazing or have replacement solid doors. Where possible, the Client would like to prevent glass from being installed due to security risks, fire safety and thermal efficiencies.

4-020. All doors must include the following elements:

- Combine 15 x 4mm intumescent /brush smoke seals to both side edges and top edge of door leaf successfully tested for fire and smoke performance in accordance with the applicable Standard or equivalent;
- Cam action overhead door closing mechanism affixed to external side of the door in accordance with the applicable Standard or equivalent;
- 75mm/3" Eurospec or equivalent fire rated door numerals in satin anodised aluminium finish;
- Average size 285mm x 55mm fire and smoke resistant letter plate with telescopic intumescent liner and nylon brush seals fitted to prevent vision through the letterplate and provide draught proofing, complete with a security cowl is available to prevent vision through the letterplate when open, and to inhibit manipulation of locks and bolts all in accordance with the applicable Standard or equivalent and Approved Document B of the Building Regulations;
- Complete viewing angle 60 degrees fire rated door viewer with a prism system that allows viewing from up to 2m away. Fire protection is provided by intumescent strip and suitable for 35mm - 62mm thickness doors, one per door, two viewers are to be provided for wheelchair users;
- 2 pair stainless steel or equivalent hinges, CE marked, designed and tested for 44mm doors;
- Multi-point automatic multi-point locking assembly and lever/lever configuration door handles to suit Euro profile lock cylinder with 3 keys – thumb turn on the internal face;
- Fire Safety Signage to comply with applicable Health and Safety Law and where applicable conform to EN ISO 7010 or equivalent;
- Anodised aluminium or equivalent "low mobility" threshold; and
- Anodised aluminium or equivalent weather bar.

4-021. Fire Door manufacturers and suppliers must provide, as a minimum, evidence of testing relating to the following:

4-022. Accreditation to and compliance with:

- UKAS Accredited Fire Testing Laboratory Detailed Report, typically known as a Global Fire Resistance Assessment or equivalent;
- Fire Testing in accordance with relevant the applicable Standard or equivalent for Fire Doors etc.; and
- Compliance (as far as reasonably practicable) with:
    - Fire Safety and associated Technical Booklet Guidance; and
    - BS 9991 or equivalent for Fire Safety in the Design, Management and Use of Residential Buildings – Code of Practice.

4-023. Composite fire door-set manufacturers/suppliers, must at all times demonstrate compliance with the standard specification requirements in terms of certification (and validity of same), product compliance etc.

4-024. The Provider must arrange for the manufacturer/supplier of fire door-sets to submit the following evidence directly to the Client's Representative. This will be held solely by the Client as evidence of accredited fire performance, technical specification and particular features:

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- A Global Fire Resistance Performance Assessment Report for the respective composite fire door-set arrangement from a UKAS or equivalent accredited fire testing laboratory with definitive confirmation that the composite fire door-set when tested to destruction achieves well in excess of the required 30 minutes;
- This to account for a series of glazing options including the addition of glazed top-lights or side-lights within prescribed dimensions. All other components such as hinges, multi-point locking devices, etc., must be fire-rated and hence part of this assessment. The manufacturer/supplier may elect to have a number of the same component, but from different suppliers tested and the outcome reflected in this report;
- A composite fire door-set Installation and Procedure Manual specific to the product. This is to be incorporated by the Provider in Certificate of Conformity confirming that the Fire Door-set has been installed in accordance with the manufacturers recommendations and technical data sheets and exhibits no compromise whatsoever prior to and post its installation;
- Training is undertaken directly by the manufacturer/supplier of the composite fire door-set on their product and installation manual to the Provider in the installation of these door-sets;
- A Manufacturer/Supplier Certificate of Conformity to be issued with delivery of each manufactured fire door-set listing the unique job reference and all of the secondary components (fire-rated letter-plate, eye viewer etc.,); and
- A Manufacturer/Supplier Fire Door-set Monthly Report that records the composite fire door-sets as manufactured. This to be issued to the Client's Representative in a tabular/PDF format on a monthly basis.

Marking of Fire Door-Sets

4-025. All fire door-sets supplied to the Client should be clearly and permanently marked with their declared fire resistance at the manufacture stage. This will be in the form of a circular metallic tag bearing the manufacturer's name and contact details.

4-026. The door-set must, in addition, carry a unique job reference number on the upper RH edge of the door leaf, which, in turn, must relate to the specific Fire Door Certificate issued with the door-set.

4-027. Fire-resisting glass installed as part of the fire door-sets must be identified with an appropriate designation mark. The mark on the glass must be permanent, legible and completely visible after glazing installation. Similarly, this should include as a minimum, the glass manufacturer's name and the product name.

4-028. The Specifying of Fire Door-Sets

4-029. Fire Door-sets are to be available in both FD30s and FD60s configurations. The specification for a fire door-set must include a full description of the elements together with the required fire resistance. This must reflect critical issues such as:

- the overall size of the door-set;
- the proposed mode of operation;
- size and number of any glazed apertures;
- details of any hardware;
- frame details and material being used;
- the presence of any top or side-light glazed panels; and
- requirement in terms of performance seals.

Door Leaves and Frames

4-030. All fire door-sets must be purchased as complete door-sets. This ensures that all of the correct components are fitted and that full assembly instructions are available through the manufacturer.

4-031. Door Leaves are to be constructed from composite materials and be "single swing". The "as installed" door-sets must reflect those features contained in the manufacturers **Global Fire Resistance Assessment Report.**

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4-032. Door frames can be provided (subject to above assessment reports) in hardwood, aluminium or steel. The frame of the door-set should provide support for the door leaf in a "cold state", but also provide adequate support in a fully developed fire. The minimum dimensions for the frame cross- section will be stated in the manufacturer's fire door-set assessment report.

4-033. The timber and metal (aluminium or steel) door frames in terms of their density, dimensions and material should not be less than those tested and recorded within the manufacturers **Global Fire Resistance Assessment Report.**

Intumescent Fire and Smoke Seals

4-034. The intumescent fire and smoke seals used in the fire door-sets must be of the same formulation, dimensions and configuration as that stated in the manufacturers **Global Fire Resistance Assessment Report.**

4-035. These seals must achieve their optimum performance when fitted in the frame of the single leaf, single swing Fire Door-sets. These are normally positioned by the manufacturer at the mid point of the door leaf thickness.

4-036. Fire door-sets are required under Building Regulations to restrict the flow of ambient temperature smoke – all Fire Door-sets, therefore, supplied to the Client must be identified by the suffix "s" – for example, FD30s and fitted with smoke seals.

4-037. Painting of smoke seals or combined intumescent and smoke seals is not permissible as this may inhibit the door-set from latching correctly.

Glazing Apertures

4-038. Fire door-sets as supplied to the Client may have glazed apertures. The door-sets must be designed to receive glazed apertures and fitted into the fire door-set aperture under the strict control of the manufacturer. Under no circumstances must apertures be cut on site.

4-039. The position, number and area of glazed apertures must be the same as that tested as part of the manufacturers **Global Fire Resistance Assessment Report.**

4-040. Only completely tested glazing systems must be used and the manufacturer must identify the glass product type, thickness, glazing seals and beads and any fixings. These must be fully supported by the relevant test evidence.

Fire Door-Set Hardware

4-041. Intumescent materials that have been used to achieve a particular performance in the fire test conditions, with the relevant hardware and the door leaf must be reflected in the completed Fire Door-set to maintain the stated fire performance.

4-042. It is essential that any element of hardware incorporated as part of the composite fire door-sets provides the required intumescent protection. It is recommended in most cases that the hardware is bedded in an intumescent mastic or intumescent pads to restrict heat transfer to the door edge by means of the metal hardware products.

4-043. All hardware/door-set furniture must be fitted in a manner that ensures the fire-resisting properties of the door-set are not compromised.

4-044. Intumescent and fire-rated letter plates and fire-rated eye viewers are a particular requirement of fire door-sets. These must be fitted with an intumescent liner and only fitted where they have achieved the appropriate fire resistance period when tested in-situ with the composite fire door-set.

Finish/Decoration to Fire Door-Sets

4-045. Fire door-sets are not required to provide a specific spread of flame classification unless the Client's Representative specifies otherwise.

4-046. All fire door leaves supplied as part of the composite fire door-set are pre- coloured GRP skins that do not require any form of decoration. Similarly those fire door-sets utilising the aluminium framing system require no form of decoration as these are "powder coated".

4-047. Where there is a hardwood frame as part of a composite fire door-set, particular care must be taken where there may be future re-decoration. The use of heat or chemical strippers must be avoided at all costs as these are liable to damage intumescent fire and smoke seals incorporated within the frame.

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Sample Fire Door-Sets for Approval

4-048. Sample fire door-sets must be delivered to site by the Provider/manufacturer/supplier for inspection and acceptance by the Client's Representative.

4-049. The Provider must demonstrate full compliance of the sample with the requirements of this Specification. Evidence of full compliance with the standard specification requirements and a copy of the relevant test data/**Global Fire Resistance Assessment Report** must be provided in advance to the Client's Representative.

Protection, Transportation, Storage and Pre Installation Check of Fire Door-Sets

4-050. The Provider is responsible for ensuring the fore door sets are suitably protected to avoid damage during transportation and subsequent storage.

4-051. Fire door-sets shall not be flat-packed but stood vertically during transportation.

4-052. Fire door-sets in storage are to be "kept apart" with soft packing.

4-053. The Provider may choose to disengage the overhead door closer for transportation. This is a critical component and part of the fire door-set and must be re-engaged by the Provider prior to installation.

4-054. Ensure that all fire door-sets stored on site are housed within a weatherproof on-site storage facility and protected at all times from moisture and temperature extremes. This should be a well ventilated facility.

4-055. Prior to commencement of installation, undertake the following checks:

- Consult the manufacturer/supplier survey sheets and ensure these are correct and clear;
- Check all definitive survey measurements are recorded;
- Check the fire door-sets as supplied are of the correct fenestration and design; and
- Check all hardware components are intact and engaged (where required).

4-056. All Fire Door-sets are to be measured in accordance with **the applicable Standard or equivalent** and as recommended on the **GGF (Glass & Glazing Federation) Code of Practice (March 2006)** or equivalent. Fire Door-sets will in the main be fitted from the inside, although the nature of some reveals will permit these to be fitted from the outside. The measurement and fitting of fire door-sets must in every case respect the existing cover/rebate to the outer frame of the fire door-sets by virtue of the "reverse brick detail" or "check reveal".

Compatibility of Fire Door-set Framing with Surrounding Structure

4-057. The type of the surrounding structure and / or the wall or partition into which the fire door-set is being installed will have been determined by the fire resistance testing and within the **Global Fire Resistance Assessment Report**. Reference must be made to the manufacturer / supplier for each common area and verified by test evidence.

Installation of Fire Door-sets

4-058. Installation:

- All fire door-sets are to be installed with regard to the following:
- Fire door-set manufacturer/supplier Installation technical data sheets;
- The compatibility of the door-set arrangement (and in particular, the door frame) with the surrounding structure;
- Sealing between the door-set and the surrounding structure;
- Clearance gaps; and
- Under-door (threshold gaps).

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4-059. Where the fire door-sets are installed by the Provider, the following protocol must be followed:

- identify "skilled installers" to the Client's Representative who will be employed in their installation. The "skilled installers" must have undertaken certified training and be classed as an approved person meeting the requirements of the BM TRADA scheme for Q-Mark Fire Door Installation to STD052 or other equivalent approved by the Client's Representative;
- the Provider must similarly be registered as meeting the requirements of the BM TRADA scheme for Q-Mark Fire Door Installation to STD052 or other equivalent approved by the Client's Representative. Provide a copy of the certificate of registration to the Client's Representative before any Fire Doors or Door-sets are installed; and
- organise with the fire door-set manufacturer/supplier, specific training on all aspects of the door-set and importantly the installation technical data sheet. The manufacturer/supplier of the fire door-sets must maintain a record of all training given and must be made available for inspection by the Client's Representative, as and when required. The manufacturer/supplier of the fire door-sets will issue "all persons attending" with a bespoke certificate as proof that training in their respective product has taken place.

4-060. Install the fire door-sets in strict accordance with the installation technical data sheets and ensure that there is adequate sealing with the surrounding structure and that damage is limited (or avoided) with any flame retardant coatings.

4-061. Under no circumstances must the fire door-set arrangement (as supplied) be compromised in the fitting/installation process. This includes making on-site adjustments to key fire-rated components such as "building hardware" with intumescent fire protection.

4-062. In all cases the fire door-set manufacturer/supplier is at liberty to undertake random checks to ensure that their fire door-set arrangement has not been compromised in any way. Where a manufacturer/supplier is of the opinion that any of their fire door-sets have been compromised, this must be referred immediately to the Client's Representative for action.

4-063. Installation Criteria:

- Fire door-sets must be installed plumb and square within the structural aperture, without twist, racking or distortion of any member and in accordance with the manufacturer/supplier recommended and permissible tolerances so as to operate correctly after installation;
- Comply with the manufacturer's/supplier's specified method of installation to ensure that the door-set, when fixed into the wall, will achieve the required fire rating designated for the respective door opening;
- In order to maintain the fire resistance of the compartment walling when fitted with a fire door-set arrangement, the junction between the two elements must be adequately sealed;
- The sealing of these junctions must be in strict accordance with the manufacturer / supplier Installation technical data sheets;
- The composite fire door leaf must be hung to give an equal gap across the heads and down both jambs. To ensure good fire performance and under fire test conditions; this may be in the order of 2 – 4mm;
- The combined intumescent fire and smoke seals (as required and fitted) must allow the door-set to operate without causing significant "frictional issues", and the gap must remain within the "as tested" tolerances;
- The under door/threshold gaps should be pre-determined by the fire door-set manufacturer/supplier and be in accordance with their Installation technical data sheet for the particular fire door-set; and
- When fitted, the fixed or threshold arrangements or the drop- down seal variant should give an "even contact" with the floor, but not create/exhibit significant "frictional issues" that could interfere with the closing action/latching of the fire door-set.

Methods of Fixing for Fire Door-sets

4-064. Fixing Fire Door-sets:

- Fixings for fire door-sets must be strictly in accordance with the manufacturer's/supplier's installation technical data sheets; and
- Fixing methods and distances together with their respective methodology must also be strictly complied in terms of the manufacturer/supplier Installation technical data sheets.

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4-065. Use of Expanding Polyurethane Foam

- The use of expanding polyurethane foam is not acceptable as a sole method of fixing any fire door-set into a structural opening;
- Where the installation of the fire door-set with the adjacent wall substrate may require an element of expanding polyurethane foam, this "foam filling" must be referred initially to the manufacturer/supplier for verification/approval. Where the manufacturer's/supplier's installation technical data sheet permits this or refer to its use, this must be applied strictly as stated in it;
- Where expanding polyurethane foam is used, subject to manufacturer's recommendations, it must not be used to fill gaps exceeding 10mm wide; and
- Foam filling must be to the full depth of the frame using only an approved fire resistant expanding polyurethane foam complying with the applicable Standard or equivalent and be of 4 hour fire performance rating for Building Regulations compliance.

Finishing Off and Making Good

4-066. The final covering and treatment of adjacent surfaces, substrates, and their intersections are key in the overall fire door-set installation process.

4-067. The primary objectives of making good any damaged areas adjacent to the fire door-sets is to:

- Maintain the fire resistance of a fire-resisting or compartment wall;
- Ensure the junction between the two elements are adequately and appropriately sealed; and
- Maintain the required Surface Spread of Flame Classification (Class 0) linked to the Flame Retardant Coatings.

4-068. Plaster-Patching:

- A small degree of plaster-patching will be required from the installation process. This will in all probability relate to reveals immediately adjacent to fire door-set.

4-069. Finishing Trims:

- In most cases the door frame will be fixed directly to the substrate; and
- In a small number of cases, the gap between the door frame and the wall frame may be masked by an architrave both internally and externally. Where this occurs, this should be referred initially to the fire door-set manufacturer/supplier for verification that this type of surrounding structure was determined by the fire resistance test. Additional protection can be facilitated as below.

4-070. Frame to Wall Junction & Adjacent Flame Retardant Paint Coatings:

- Where the surface of the adjacent walling is identified as being plastered over to back of the frame, then there is no real problem with the exception of disturbance to any applied wall applied paint applications – in many cases, these paint applications will be multiple coatings and potentially in a flame retardant paint;
- Where there is disturbance of such surface linings, refer to the paint suppliers for advice and sampling (if required). It is recognised that wall linings disturbed and in a fully developed fire can compromise the common area;
- Where architraves / adjacent panels are present, these should be removed to check that no voids exist between the frame and the adjoining structure;
- If a void is found, the fire door-set manufacturer/supplier should be consulted as stated. As a form of additional protection, the void(s) should be filled with plaster, intumescent material or tightly packed rock-wool. The method of packing will depend on the size of the void – guidance on filling voids satisfactorily is stated in the applicable Standard or equivalent;
- Where fire door-sets are installed and any damage of the adjacent wall surfaces sustained, then a visual inspection should take place and identification made of the "applied paint" – it is expected, for example, within common areas that any of the following paint applications may exist:
    - Flame Retardant Paint;
    - Emulsion;
    - Solvent-based Gloss;
    - Solvent-based Egg-shell; or
    - Textured Coatings;

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- If there is any element of doubt as to the above application, then the Provider must refer to the paint manufacturer for technical advice. This is particularly critical if the topmost paint layering is of a flame retardant paint;
- There are fire hazards associated with multi-layer paint coatings; and
- The common area paint linings and forming part of compartment walling must ultimately achieve a Euroclass A2 Surface Spread of Flame classification. That is readily achievable normally through an "upgrade process" and specification involving flame retardant paints from the Provider's paint manufacturer.

Fire Door-set Inspection Checklist

4-071. **A FIRE DOOR-SET INSPECTION CHECKLIST** requires to be completed where any fire door-set is installed as part of the Works.

4-072. Each Fire Door-set must be individually, independently inspected by a UKAS accredited fire door installation inspector in relation to all issues listed. This information will be critical in maintaining a "level of fire resistance" within the common areas.

4-073. The Inspection Checklist is to give the Client an assurance that the door-set has been independently observed and inspected as installed and that any deficiencies based on the checklist issues have been noted and recorded. The inspector is required to record and advise the Provider and Client's Representative of any such deficiencies.

4-074. The inspection, recording and completion of this Checklist is the responsibility and cost of the Provider. Photographs may be used where necessary as evidence of any significant deficiencies.

4-075. Ensure that any deficiencies identified are remedied without delay.

4-076. Upon completion of any remedial works must sign and issue the Provider's Certificate of Conformity for each Fire Door-set.

PROTOCOL – CERTIFICATION OF FIRE DOOR-SETS

Certification

4-077. Fire Door-sets as supplied to the Client must be "certified" as fit for purpose and capable of achieving the fire resistance and integrity as stated.

4-078. Demonstrate compliance with this Specification.

4-079. Manufacturer/Supplier Certification and Compliance: The Provider shall secure that any Manufacturer/Supplier of Fire Door-sets undertakes the following:

- Tag every Fire Door-set with a round metallic tag affixed to the door leaf with security screws; this must state "FD30s or FD60s" and the respective manufacturer's name and contact number;
- The upper RHS of the Fire Door leaf must bear the unique manufacture job reference assigned to the respective Flat/Maisonette address or communal location – this must relate directly to the MANUFACTURER/SUPPLIER CERTICATE OF CONFORMITY and also be logged to the MONTHLY FIRE DOOR-SET REPORT;
- The MANUFACTURER/SUPPLIER CERTIFICATE OF CONFORMITY must be made available with every Fire Door-set and record the following details:
    - Project/Scheme name & corresponding Project No.;
    - Door-set manufacturer/Supplier details;
    - Manufacturer/Supplier job reference;
    - Provider supply details;
    - Completed Certificate of Conformity Statement;
    - Product supplied Property Address; and
    - Product details;
- The relevant Certificate of Conformity shall be in accordance with a template supplied by the Client to the Provider; and
- A MANUFACTURER/SUPPLIER MONTHLY FIRE DOOR-SET REPORT the format and content of which is to be approved by the Client's Representative must be submitted to the Client's Representative on a monthly basis fully completed as confirmation of all fire door- set locations as supplied in the preceding month. This report must cross-reference with all of the Certificates of Conformity issued.

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Installer Certification and Compliance

4-080. The Provider must undertake the following:

- Undertake all remedial works/deficiencies as identified on the Fire Door-set inspector checklist, format and content to be agreed with the Client's Representative; and
- Warrant that the Fire Door-set as installed has been supplied from a fire door-set manufacturer who holds a current and valid Global Fire Resistance Assessment Report; in addition, warrant that the fire door-set Installation (and any identified deficiencies have been undertaken in strict compliance with the manufacturer/supplier installation technical data sheets and with this Specification and that no compromise of any fire safety component exists.

Client's current manufacturers/suppliers/products

4-081. 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]

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PRE-FINISHED TIMBER EXTERNAL DOOR SETS AND SCREENS [LOWER TIER – Client to delete if not applicable]

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5. PRE-FINISHED TIMBER EXTERNAL DOOR SETS AND SCREENS

Timber Doors

5-001. This Part of this Specification is to be read in conjunction with the general specification for 'Replacement Windows and External Doors – Surveying and Installation' and 'Replacement External Doors – General'.

5-002. All new pre-finished timber doors shall be purpose made pre-treated timber double glazed doors, manufactured to BS644 or equivalent.

5-003. Where required lower panels shall be laminated safety glass or 25mm hardwood raised and fielded panels as appropriate. **Plywood panels shall not be accepted**.

5-004. Hardwood or aluminium glazing beads incorporating an integral EDPM corded lipped gasket shall be fitted to the external face. **The bead type and colour shall be agreed with the Client's Representative**.

5-005. All aluminium glazing beads shall be secured with bead retention clips as standard. Pre-finished hardwood glazing beads shall be fixed either by secret nailing using stainless steel or equivalent or copper or equivalent pins or by stainless steel or equivalent large headed pins. When pinning with stainless steel or equivalent large headed pins care shall be taken to ensure that splitting, head indentation of the glazing bead or breaking of the paint surface by the head does not occur. Bead retention clips may also be used for the securing of hardwood glazing beads.

5-006. All pre-finished door-sets shall be delivered to site totally completed including full coating system, this shall be either opaque or translucent, solvent based or water borne, fully glazed and with all furniture fitted leaving only the need to fix into the prepared opening on site. Note: Projecting furniture i.e. handles, may be supplied unfitted to avoid damage during transit.

5-007. Timber for use in all doors shall be selected hardwood and in the density range of 650kg/m cu. Doors may be flush fitting or rebated over frame.

5-008. Flush fitting doors shall have a minimum thickness of 44mm.

5-009. Rebated doors shall have a minimum thickness of 57 mm.

5-010. Timber for doorframes shall be selected hardwood and in the density range of 650kg/m cu.

5-011. All external edges shall have a radius of not less than 1.5mm and not greater than 3.00mm in accordance with Paint Manufacturers technical data sheet.

Note: It is acceptable for this detail to 'run through' all joint lines.

5-012. Surface waves caused by machining or excessive sanding will not be accepted.

5-013. All frames, mullions, transoms etc., to be to BS 1186-2 or equivalent.

5-014. Timber doors to be set in rebated hardwood frames, and 2XG style pre-primed timber doors with upper panel double glazed with laminated safety glass sealed units.

5-015. Weatherboards to doors are to be included.

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Client's current manufacturers/suppliers/products

5-016. 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]

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ALUMINIUM EXTERNAL DOORS AND SCREENS [LOWER TIER – Client to delete if not applicable]

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6. ALUMINIUM EXTERNAL DOORS AND SCREENS

Generally

6-001. This Part of this Specification is to be read in conjunction with the general specification for 'Replacement Windows and External Doors – Surveying and Installation' and 'Replacement External Doors – General'.

6-002. The Works comprise all the necessary Design Work for and the supply and installation of aluminium external doors and screens, with double glazed units to communal staircases and landings.

Design Standards

6-003. The door system is to comply with the following:

- Glass for glazing – Classification;
- Aluminium and aluminium alloys. Extruded rod/bar, tube and profiles. Mechanical properties;
- Aluminium alloy windows and doorsets Specification;
- Patent glazing and sloping glazing for buildings. Code of Practice for design and installation of sloping and vertical patent glazing or equivalent;
- Fire safety in the design, management and use of residential buildings. Code of Practice or equivalent;
- Specification for impact performance requirements for flat safety glass and safety plastics for use in buildings;
- Glazing for buildings. Code of Practice for safety related to human impact or equivalent;
- Performance of windows and doors. Classification for weathertightness and guidance on selection and specification;
- Performance of windows and doors. Classification for operation and strength characteristics and guidance on selection and specification;
- Specification for powder organic coatings for application and stoving to aluminium alloy extrusions, sheet and preformed sections for external architectural purposes, and for the finish on aluminium alloy extrusions, sheet and preformed sections coated with powder organic coatings;
- Corrosion tests in artificial atmospheres. Salt spray tests;
- Windows doors and rooflights. Design for safety in use and during cleaning of windows, including door-height windows and roof windows. Code of Practice or equivalent;
- Windows and doors. Code of practice for the survey and installation of windows and external doorsets; and
- Specification for improved security single hinged residential doorsets.

6-004. The installation is to comply with all the relevant requirements of Building Regulations Approved Documents.

6-005. All door openings are to be suitable for wheelchair access in accordance with the Building Regulations Approved Document M (Access to and use of buildings). This means that, with the door open, the clear opening width between the jamb of the frame and the hanging style of the door is to be not less than 800mm.

Materials

6-006. All framing and swing doors system must be constructed from aluminium or equivalent 100% recycled and suitable for fire route exits.

6-007. Screws and internal components must be either stainless steel or equivalent, A2 cadmium plated steel or other corrosion resistant material.

6-008. Glazing beads must be aluminium "snap on" type requiring no screws. Dry glazing must be with self-locking plasticised PVC-u gaskets.

Construction

6-009. Framing assembled from pre-finished lengths of aluminium profile, which are square cut. All horizontal members are secured to verticals by screwing into four integral screw splines. All joints to be sealed against the entry of water. Mid rails into framing are to be secured with frame to rail cleats.

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6-010. Door leaf assembled from finished lengths of aluminium profile, which is square cut. Door rails secured to stiles with pre-machined cleats. All joints to be sealed against entry of water. All external-glazing beads must be secured by mechanical means and tamper proof. Stiles to have double weather-stripping as standard.

Ironmongery

6-011. Fire exit doors (opening out) (to comply with the applicable Standard for Building Hardware. Panic exit devices operated by a horizontal bar, for use on escape routes. Requirements and test methods.)):

- 1 No. Flush Fitting Panic Latch;
- 1 No. Pull handle in matching polyester RAL coating to outside;
- 1 No. Door closer;
- 1 No. Modular escape nightlatch with 70mm backset with suited lock;
- 1 No. High Security Electric Strike faceplate; and
- Minimum 3 No. finger guard silver anodised butt hinges.

6-012. Main entrance door:

- 1 No. Pull handles in matching polyester RAL coating;
- 1 No. Flush Fitting Panic Latch;
- 1 No. Low energy swing door operator;
- 1 No. Modular escape nightlatch with 70mm backset with suited lock;
- 1 No. High Security Electric Strike faceplate; and
- Minimum 3 no. finger guard silver anodised butt hinges.

Screen Inserts

6-013. System screen inserts must consist of an outer frame and ventilator frame mitred and mechanically jointed using prepared extruded aluminium corner cleats and stainless steel or equivalent corner chevrons. All joints must be sealed against the entry of water. Infills are secured by snap in beads internally or externally. Integral mullions/transoms are secured by driving screws into extruded screw ports. Structural coupling mullions and transoms are available to construct larger composite window units. Always refer to the System manufacturer's technical data sheets for limitations on frame and vent size.

Colour Finish

6-014. All exposed sections of aluminium extrusion are to be powder coated. Unless otherwise specified all powders must comply with the requirements of the applicable Standard or equivalent and conducted under applicable Standard control conditions. Powder coating application and stoving on aluminium must be carried out in accordance with the applicable Standard or equivalent.

6-015. The powder coating must have a Class 1 surface spread of flame rating to the applicable Standard or equivalent.

6-016. The selected coating must comply with the British Board of Agrément Certificate or equivalent. Colour to be high gloss white.

6-017. All doors are to be permanently marked in an unobtrusive position (not viable when the opening door is closed) with the name and trademark of the system supplier and fabricator.

6-018. Units are to be installed by a Specialist Subcontractor approved in accordance with the Contract Conditions. After installation and glazing, units are to be checked and adjusted as required.

Glass

6-019. Hermetically sealed 24mm double glazed units with clear glass.

Main entrance door to scheme

6-020. Electric swing opener to be installed by a Specialist Subcontractor approved under the terms of this Contract.

6-021. The Provider is to liaise with the Subcontractor for the door entry/warden call system to work on door entry system with regard to the following operations:

- Disconnection system before existing door is removed; and

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- Connection system after installation of new door is installed to allow Customers and central control to open the door remotely.

Proximity Swipe

6-022. External doors to be fitted with a proximity swipe system with capability of reading up to 70 key fobs also to be supplied.

Master Keying

6-023. All new locks are to pass the same key suited to the schemes master suite.

6-024. Copies of keys are to be issued in the first instance to the Client's Representative.

INSTALLATION

Aluminium

6-025. Installation of fenestration systems must be performed by a Subcontractor approved by the Client's Representative in accordance with shop drawings and pointed with a fire grade silicone/mastic sealant, all as approved by the Client's Representative. After installation and glazing, check and adjust, if required, all items furnished under this section.

Glass

6-026. All glazing to be carried out in accordance with the requirements of the Building Regulations. Glass to comply with the applicable Standard or equivalent.

6-027. Safety glass to comply with applicable Standard or equivalent with regard to impact performance and the marking of glass to indicate type and classification, and with regard to minimum thickness' for certain pane sizes.

Protection and Cleaning

6-028. The Provider is responsible for any damage to the Materials incurred during installation and must leave the Works in a clean condition. Protect these Materials from damage by other trades and undertake the final cleaning of the area of the Works.

Fasteners and Fixings

6-029. All aluminium units are to be installed in accordance with the manufacturer's installation technical data sheets.

6-030. Openings should be checked against available drawings or a site survey for correctness and openings should be square and plumb.

6-031. Fixings grounds at head, sill and jamb must be capable of carrying all imposed and dead loads in a stable condition, i.e. there should be no spalling, fissures or general debris.

6-032. Expanding polyurethane foam must not be used as a sole method of fixing.

Approved Fabricators

6-033. If the Provider is not an approved powder coated door and screen manufacturer/contractor, the Provider must sub-contract the work to a fabricator who is capable of being approved by the Client's Representative.

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Client's current manufacturers/suppliers/products

6-034. 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]

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REPLACEMENT UNDECORATED TIMBER EXTERNAL DOOR SETS AND SCREENS [LOWER TIER – Client to delete if not applicable]

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7. REPLACEMENT UNDECORATED TIMBER EXTERNAL DOOR SETS AND SCREENS

Timber Doors

7-001. This Part of this Specification is to be read in conjunction with the general specification for 'Replacement Windows and External Doors – Surveying and Installation' and 'Replacement External Doors – General'.

7-002. All new undecorated timber doors shall be factory primed, purpose made pre-treated timber double glazed doors, manufactured to the applicable Standard or equivalent.

7-003. Where required lower panels shall be laminated safety glass or 25mm hardwood raised and fielded panels as appropriate. **Plywood panels are note acceptable**.

7-004. Hardwood or aluminium glazing beads incorporating an integral EDPM corded lipped gasket shall be fitted to the external face. **The bead type and colour shall be agreed with the Client's Representative**.

7-005. All aluminium glazing beads shall be secured with bead retention clips as standard. Factory primed hardwood glazing beads shall be fixed either by secret nailing using stainless steel or equivalent or copper or equivalent pins or by stainless steel or equivalent large headed pins. When pinning with stainless steel or equivalent large headed pins care shall be taken to ensure that splitting, head indentation of the glazing bead or breaking of the paint surface by the head does not occur. Where this does occur, the indentation shall be filled with approved filler, rubbed down smooth and touched in with approved primer. Bead retention clips may also be used for the securing of hardwood glazing beads.

7-006. All pre-finished door-sets shall be delivered to site totally completed including factory applied primer or base coat stain, this shall be either opaque or translucent, solvent based or water borne, fully glazed and with all furniture fitted leaving only the need to fix into the prepared opening on site and insitu decoration Note: Projecting furniture i.e. handles, may be supplied unfitted to avoid damage during transit.

7-007. Timber for use in all doors shall be selected hardwood and in the density range of 650kg/m cu. Doors may be flush fitting or rebated over frame.

7-008. Flush fitting doors shall have a minimum thickness of 44mm.

7-009. Rebated doors shall have a minimum thickness of 57 mm.

7-010. Timber for doorframes shall be selected hardwood and in the density range of 650kg/m cu.

7-011. All external edges shall have a radius of not less than 1.5mm and not greater than 3.00mm in accordance with Paint Manufacturers technical data sheet.

7-012. Note: It is acceptable for this detail to 'run through' all joint lines.

7-013. Surface waves caused by machining or excessive sanding will not be accepted.

7-014. All frames, mullions, transoms etc., to be to quality standard required by the applicable Standard or equivalent.

7-015. Timber doors to be set in rebated hardwood frames, and 2XG style pre-primed timber doors with upper panel double glazed with laminated safety glass sealed units.

7-016. Weatherboards to doors are to be included.

Decoration of timber door sets and screens

7-017. All new timber external door sets and screens are to be built in prior to full decorations being applied.

7-018. Make good any exposed/damaged surfaces with approved filler. Rub down and leave smooth before applying 1 No. coat of approved primer on base coat stain for bare wood and filled areas.

7-019. Paint 2 No. coats of white undercoat and 1 No. coat of white gloss paint or 2 No./3 No. coats of stain top coat (as recommended by manufacturer), to all surfaces, rubbing down between all coats.

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Client's current manufacturers/suppliers/products

7-020. 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]

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REPLACEMENT WINDOWS

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REPLACEMENT WINDOWS - SURVEYING AND INSTALLATION [TOP TIER]

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1. REPLACEMENT WINDOWS - SURVEYING AND INSTALLATION

General

1-001. For clarity, the Replacement Window specification sections have been sub divided into tiers as per the table below:

Top tier	Middle Tier	Lower Tier
nent windows – surveying and installation etc.	nent Windows – General	nent PVC-u Windows
		nent Pre-finished Timber Windows
		nent Undecorated Timber Windows

- The completed Works must meet the requirement all 3 tiers of specification documents as applicable to the window type.

1-002. Example; if work to be undertaken is a Replacement PVC-u window, then the 3 tiers of specification documents to be used will be:

- Replacement windows – surveying and installation etc.
  - o Replacement Windows – General
    - – Replacement PVC-u Windows

Initial Survey

1-003. A list of Properties will be given to the Provider with access details. The Provider must arrange access, visit the Properties, take measurements and forward the existing window dimensions and the Provider's proposed style of replacement windows to the Client's Representative for approval.

1-004. Windows - Whether the new windows are to be PVC-u or timber replacements is dependent on the condition of any existing double glazed window (if present) and therefore matching new proposals with the existing Property and surrounding Client owned Properties.

1-005. The drawings are to include 'sketch elevations' of each window showing the position of each proposed window type and to include details of opening casements and glass type for each window.

1-006. The proposals are to be approved by the Client's Representative before the Provider commences manufacture.

Site Measurements

1-007. The Provider is responsible for ascertaining the correct dimensions and sizes of every existing window in each Property.

1-008. The dimensions noted on any schedule issued by the Client's Representative are for guidance only and are approximate measurements. The Provider is responsible for taking all site sizes and measurements for each and every window opening, and for manufacturing windows accordingly and to the applicable Standard or equivalent for Windows and doors - Code of practice for the survey and installation of windows and external door-sets and as recommended in the GGF (Glass & Glazing Federation) "Good Practice Guide for the Installation of Replacement Windows and Doors" or equivalent.

1-009. This procedure requires a minimum of **8 measurements** both internally and externally to determine the difference between internal and external reveal sizes. Therefore internal access to the Property must be gained before manufacturing the windows. This will also enable full Customer consultation and agreement of intended Works. It is the Provider's sole responsibility to obtain the Customers approval to receive the Works before manufacturing is commenced.

1-010. Windows are to be fitted from the inside wherever possible, although the nature of some reveals will permit replacement windows to be fitted from the outside.

1-011. The measurement and fitting of windows must in every case respect the existing cover / rebate to the outer frame of the windows by virtue of any "reverse brick detail" or "check reveal" for the Property.

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1-012. Where a check reveal is present for weathering purposes, the window manufacturing sizes should be based on achieving a minimum frame overlap of 12 mm on the external leaf. A hole may be drilled thorough the existing frame jamb rebate to establish the check reveal size. A frame may also be built into the check reveal at the head by use of a rebated lintel, and again a minimum frame overlap of 12 mm should be provided where practicable. If an overlap of 12 mm cannot be achieved, this should be discussed with the Client's Representative and an agreement reached regarding the size of the overlap for particular properties. As the Client owns a large stock of Properties, which vary in construction detailing, long term standard agreements to the amount of overlap will not be made with exception to the dimension stated here.

1-013. Similar windows in similar Property types may vary in size.

1-014. The Provider is responsible for ascertaining the correct dimensions and sizes of every existing window in each Property. Measurements for each window (and its location) must be clearly identified on any delivery schedule and each window shall have a clear labelling system to reflect this.

1-015. The use of make-up pieces (clip-ons) will not normally be permitted except with the express written authority of the Client's Representative. Written authority must be obtained for each individual Property or group of Properties.

1-016. Any existing window opening which will present the Provider with a problem in compliance with the Specification, or in manufacture of a window to suit, must be brought to the attention of the Client's Representative before the window is fabricated. The Client's Representative will issue a written Instruction informing the Provider of what action is to be taken.

1-017. Obtain signed consent from the Customer before manufacture of window is undertaken. Payment will be made only on completion of the window being installed into the Property.

Guarantees

1-018. In addition to the Client's rights under the Contract, the Provider is to provide the minimum guarantee tabled below against manufacturing defects etc., on all new PVC-u and timber windows upon completion of the Works. The guarantee is to include for all profiles, joinery, and for the double glazed units.

1-019. Manufacturers guarantees in all instances are to be for the years stated below with no exceptions attached (i.e. end user servicing expectations etc.), this will assure the Client that the manufacturer is confident of their own products durability.

PVC-u profiles	25 Years
Timber frames	30 Years guarantee against fungal attack
Timber Window Manufacturing Defects	10 year guarantee
Timber Window (Factory Painted External Joinery)	10 Year guarantee (as minimum)
Timber Window (Factory Stained External Joinery)	6 Year guarantee (as minimum)
Hardware Components	10 Years (minimum)
Double Glazed Units	15Years (minimum)

1-020. Windows are to be manufactured under guidelines ISO 14001 (Environmental Management) and ISO 9001 (Quality Management Systems) or equivalent with manufacturing companies holding the relevant accreditation.

1-021. The manufacturer shall provide a good practice guide relating to aftercare and maintenance of their manufactured window/sidelight etc. and its component items. Ensure that each Customer receives a copy of this.

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GENERAL DESIGN OF WINDOWS

Windows - Street Properties

1-022. For the Design of windows to be replaced with storm-proof casements projecting top and side swing hinge see Table 1 at the end of the Part of this Specification on Replacement Windows – General (Middle Tier).

1-023. However, each Property case may be different and therefore approval will be required for each Property. In all cases, the proposed new style of windows will need to comply with Building Regulations and in particular fire egress in terms of all habitable rooms.

Timber Windows

1-024. The Provider is responsible for ascertaining the correct dimensions and sizes of every existing window in each Property.

Emergency Egress Windows

1-025. Every habitable room shall have at least one opening which shall comply with the Building Regulations Emergency Egress Windows, having an unobstructed openable area that is at least 0.33m^2 and at least 450mm high x 450mm wide with the bottom of the openable area not less than 800mm and not more than 1100mm above the floor. Egress hinges should be included, where necessary.

General Window Installation

1-026. All Windows and sidelights are to achieve an 'A' energy rating certificated by the British Fenestration Rating Council (BFRC).

1-027. All replacement sidelights must achieve Building Control standard of Maximum U-Value = 1.8 W/m^{2}K for units with >50% internal face glazed.

1-028. U-values of windows glass and frames must meet the Building Regulations and must be BFRC Certified or equivalent and have an "A" Rated Energy Index. Centre Pane "U Value" of 1.2W/m²K (or better). Thermal Transmittance Whole Window "U Value" of 1.4 W/m²K (or better)

1-029. All windows are to have "child restriction" to limit the uncontrolled opening of the window.

1-030. All windows must pass testing undertaken to PAS 24 or equivalent and be Secure by Design or equivalent certified. All certification documents are to be forwarded to the Client's Representative and kept updated – this must include test certificate, report and list of tested ironmongery with product manufactures names, type etc. The Provider must comply with PAS 24 [*Specification for Enhanced security performance requirements for door-sets and windows in the UK*] or equivalent.

1-031. All new windows are to match existing size openings in existing positions (i.e. brick reveals to be maintained externally where necessary on all occasions).

1-032. Before installing the new window, the existing structural opening should be checked to ensure its stability and existing lintels checked to ensure their condition soundness. Any large repairs should be reported to the Client's Representative.

1-033. It is permissible to "chip back" a small area of plaster (typically 25mm) extending full height up the existing reveals and immediately adjacent to the windows; this will both facilitate removal of existing window and installation of replacement window.

1-034. All openings should be cleaned of debris etc., and any minor making good is expected to be carried out as part of the window replacement works.

1-035. All metal fixings should be at least as corrosion-resistant as per the applicable Standard or equivalent.

1-036. Windows shall be secured in accordance with the recognised "fixing distances" for strap / lug fixings and through-frame fixings as recommended in the applicable Standard or equivalent

1-037. Sills must be properly supported and fixed to ensure there is no likelihood of water penetration.

1-038. All internal reveals should be made good and plaster or decorations made good to match existing.

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1-039. External sealing should be by means of a cement/sand pointing around the new window frame to conceal larger gaps and then a low modulus white silicone sealant to the applicable Standard or equivalent. Only silicone sealants recommended by the manufacturer/supplier should be used and not general purpose mastics. All abutments of the windows should have silicone sealant applied.

1-040. Prior to installation the windows are to be supplied with adequate protection against damage caused by slippage, distortion etc. They must be stored under cover in a dry and secure position, stacked vertically, not horizontally.

1-041. The window dimensions must be checked with those of the opening before removal of the existing window.

1-042. A craft knife should be used to score around the perimeter of the existing frame in order to minimise damage to plaster/decoration.

1-043. Windows to be removed and all existing mastic and debris cleaned away. The Provider is to ensure that the work is carried out in a neat and tidy manner, with all rubbish removed to a lockable skip at the end of each Working Day.

1-044. The damp proof course is to be checked by the Provider to ensure one is present and in good condition. Any defects present are to be brought to the attention of the Client's Representative immediately.

1-045. The new windows must be installed in accordance with the manufacturer's requirements, taking into account the construction of the Property. Fixing methods should take into account thermal movement. The method of fixing must be either through frame fixing or lug fixing.

1-046. Windows must be installed plumb and square without twisting, racking or distortion of any member in accordance with the manufacturer's installation tolerances.

1-047. The outer frame of the window must be centred in the aperture and be positioned so that it does not bridge the damp proof course. The amount by which the new window is set back from the outer face of the wall is determined by the requirement to set the internal face as close to the existing internal finishes as possible and by the bridging of the damp proof course.

1-048. The window frames must be secured so that the corner fixings are a minimum of 150mm and a maximum of 250mm from the corner of the frame and the intermediate fixings at centres no greater than 600mm.

1-049. No fixing must be closer than 150mm to a transom or mullion centre line. Should the manufacturer require more onerous fixing requirements then these must be adhered to. Care should be taken not to overtighten bolts and that packers/shims are not allowed to fall away. Care should also be taken to ensure that water tightness is maintained where lintels have to be drilled for fixing.

1-050. All screw fixing heads which pass through the profile are to be spot sealed with appropriately coloured or clear silicone sealer or a PVC-u cap.

1-051. Where electrical, television, telephone wires etc., enter a Property either through a hole in the existing window, or adjacent to it, then such services must be routed around the PVC-u window frame. A split plastic tube of suitable diameter and length for entry into the Property should be slipped over the cable so that connections do not have to be disturbed on the appliances, with the ends of the tube sealed with white silicone sealant on completion of the window installation.

1-052. Where any internal plaster work is disturbed when the existing windows are removed, make good the plasterwork. PVC-u cover mouldings may be used to a maximum width of 30mm.

1-053. Bathrooms/WC windows must have obscured glazed window panes internally and one clear pane externally forming the double glazed units.

1-054. Remove existing internal window sills and renew with suitably sized PVC-u window sills. Provide any extensions to window frames required to raise height of window openings to 800mm from finished floor level internally if required.

1-055. Internally the PVC-u frame must be well caulked and the gap between the reveal finish and the frame flush pointed with a one part white emulsion acrylic painter's caulk.

1-056. Provide a matching cover bead at the junction of the internal window board or tile sill and the PVC-u window frame to all windows.

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1-057. Each window must be permanently marked or labelled in an unobtrusive position (not visible when the opening light is closed) showing details of the manufacturer, the job number of the window and the date of manufacture.

1-058. The standard for glass units is Part 2 of the applicable Standard or equivalent and Part 3 of the applicable Standard or equivalent for gas filled types.

1-059. Special care and attention must be taken to protect and avoid any damage to windows. Any damaged window must be replaced with a new window, and it must be at the Client's Representative's sole discretion as to whether a repair to a window is acceptable.

Safety Laminated Glass

1-060. All glazing in windows in critical locations as defined by the Building Regulations (i.e. glazing below 800mm internal sill heights in windows is to have both skins of glass units glazed with laminated low E glass – assumed to be 2 No. skins of 6.8mm laminated safety glass.

1-061. Internal and external panes in sidelights, double glazing units to be laminated glass as default. An exception may be made where a staircase ends or turns immediately inside the doorway – in this instance the internal pane may be toughened (i.e. to reduce impact pressure) – written notification must be given to the Client's Representative. External pane must always be laminated to provide security and satisfy PAS 24 or equivalent.

1-062. All safety glass is to be permanently marked on both panes with kite marks showing compliance with the applicable Standard, which are to be visible after installation.

1-063. Both sheets of glass making up the sealed double glazed unit must be safety glass where required by the above descriptions.

1-064. Details of windows in critical locations are to be stated in the Provider's proposals for each new window when proposed drawings are forwarded to the Client's Representative for approval.

Glazing - General

1-065. Windows must be manufactured so that glazing or re-glazing on site is possible without the need to remove the outer frame from the structure of the building.

1-066. All glass and insulated glazed units should be carefully examined for damage, especially at the edges, prior to installation. Defective items must not be used.

1-067. The two panes of glass in the double glazed unit are to be held apart with warm edge technology, spacer bars to improve thermal efficiency and reduce the possibility of condensation forming around the perimeter of the sealed double glazed unit.

1-068. The glazing of the windows must be carried out immediately after the installation of the frames and casements

1-069. On completion of window installations, all glass to be cleaned internally and externally and left clean and free from blemishes.

1-070. Any glass with scratches cracks or defects to be replaced by the Provider at no charge.

1-071. All windows to be **INTERNALLY GLAZED** in argon filled sealed units in low Emissivity glass, using pre-formed gaskets inserted during the profile extrusion and secured by knock-in PVC-U glazing beads with mitred corners.

1-072. All windows/sidelights will be totally dry-glazed with minimum 12mm wide x 3mm thick double-sided PVC foam closed cell high density security glazing tape on the inside frame rebates. Co-extruded EPDM corded glazing gaskets on the frame are acceptable as an alternative provided that bead security clips are used in conjunction with it.

1-073. All glazing to be clear glass except bathrooms and WC's which are to be obscure Cotswold style glass or pattern group 5.

1-074. Glass shall be at least the minimum thickness to meet wind load requirements of the applicable Standard or equivalent.

1-075. Glazing beads are to be able to withstand the design wind loading in accordance with and the tests specified in the applicable Standard or equivalent.

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1-076. **Note:** All timber sliding sash windows to have sash cords and lead weights to box frames to counteract the glazing weights

1-077. Fans are not permitted in sealed units.

1-078. Details of all glass types are to be stated in the Provider's proposals for each new window when proposed drawings are forwarded.

Certificate of Test Window/Sidelight

1-079. All manufacturers of window/sidelight etc. shall be required to have a "sample" submitted for testing at an accredited testing station. These samples must be inspected against the requirements set out above. All manufacturers are required to have "third party" registration provided by BBA, BSI or equivalent recognised accredited quality licensing authority for the manufacture windows/sidelights etc.

1-080. A copy of the respective Certificate of Compliance for Secure by Design or equivalent and PAS 24 or equivalent must be made available at the time of submitting for inspection, which confirmations that the manufacturer can produce the product to the required standards, along with all testing data. These certificates shall be supplied as part of the document handover pack and if not supplied on completion and handover of the Work, may delay Order Completion.

Delivery to site of windows/sidelights etc.,

1-081. In each option, primary consideration must be given to Health and Safety Law in respect of site practices.

1-082. **Option 1** – Pre-glazed - applies where the window manufacturer is commissioned on a supply only basis; the installation, therefore, being undertaken by the Provider; or

1-083. **Option 2** – Un-glazed - applies where the window manufacturer is commissioned on a supply and fit arrangement. This will involve the supply of insulating glass units and pre-formed glazing gaskets to be applied on site in accordance with the manufacturer's technical data sheet.

1-084. Critical considerations to be observed:

- All glazing must conform to the recommendations contained in the relevant parts of the applicable Standard or equivalent. The setting and location block positions, frame to glass and bead to glass gaskets etc. with any glass or insulating glass units must be installed in accordance with the relevant manufacturer's technical data sheet and as per the recommendations in the applicable Standard or equivalent;
- All insulating glass units shall be examined for damage prior to installation; defective units shall not be used;
- Insulating units with "low emissivity coatings" shall be oriented in accordance with the manufacturer's technical data sheet; and
- Where safety glazing is part of a glazing unit, the marking must remain visible after installation.

Protection, Transportation, Storage & Pre installation check

1-085. The Provider must ensure that all windows/sidelights have not been damaged during transportation and storage.

1-086. Windows/sidelights/glazing units (if applicable) shall not be flat-packed, but stood vertically during transportation

1-087. Windows/sidelights/glazing units in storage to be "kept apart" with soft packing to reduce risk of transport/handling damage.

1-088. Ensure that all windows/sidelights stored on site are housed within a secure weatherproof storage facility on-site until the time of fitting. Pre-finished joinery shall not be stored in direct sunlight.

1-089. Prior to commencement of installation, undertake the following checks to ensure that:

- Survey sheets are correct and clear;
- All survey measurements are recorded;

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- The windows/doors/sidelights supplied are of the correct fenestration and design and in accordance with the window schedule approved by the Client's Representative;
- The glass type and pattern are correct;
- Window and glass sizes are compatible;
- All trims, gaskets etc., are correct and fitted correctly; and
- the windows supplied are correctly marked and identified for those Properties in which the windows are being replaced as set out in the survey sheets.

Site Approval

1-090. Before any benchmark Properties are set, arrange for a sample Pre-Finished Timber window / sidelight to be delivered to site for inspection and acceptance by the Client's Representative.

1-091. The Provider in providing the sample for acceptance must demonstrate full compliance with the specification requirements. Evidence of thermal efficiency standards being offered must be available to the Client's Representative for verification.

1-092. The sample window (upon acceptance) will form the "benchmark window" for the remainder of the project.

1-093. The Client's Representative may (at any stage) to have any window which is delivered to site, subsequently removed for further inspection/audit and/or independent testing to ensure that the specification requirements are being complied with.

Remove and Install on same Day

1-094. Existing doors to be removed are most likely to be timber in nature, although a small percentage of properties may have original PVC-u windows. Make every effort to have all existing windows recycled and provide waste disposal reports to the Client's Representative.

1-095. Replacement windows must be installed on the same day that the original windows are removed in order to maintain security and weather tightness of each Property. The existing windows should be removed with care in order to avoid damage to the Property structure and its finishes and without permitting any subsidence of the structure during or after the operation.

1-096. When providing numerous replacement windows to a single Property the Works should be undertaken on one set day to reduce the amount of disturbance to the Customer.

1-097. Any defects that become apparent in the integrity of the structure upon removal of any window should be reported to the Client's Representative immediately.

1-098. If there is a sub-sill or threshold, e.g. concrete, slate, brick or tile, below the existing window frame it must be left in position unless otherwise specified.

Protection of Existing Fixtures etc.

1-099. Protect floor coverings, furniture and Customer's belongings throughout the duration of the Works.

1-100. Move any furniture, fixtures and fittings that might be damaged during the installation of the windows/doors, prior to commencement of the replacement of any window/door and reposition such items upon completion of the installation Works to each Property.

1-101. Maintain both internal and external protection. After the removal of the existing window/sidelight carefully cut back any internal or external flooring, finishings, cladding, wallpaper and decorations to allow for the installation of the new frames etc. Make good all structures, finishings and decorations up to 100mm from the face of the frame or sill.

1-102. Ensure that clean and sufficient dust sheets or protective coverings are used when carrying out any Works. Take all adequate provisions to ensure that the soiling or damage to floor coverings and needless damage to decorations are avoided. Clean floor coverings where required as a consequence of the Works.

1-103. Undertake a Schedule of Condition and agrees this with the Customer prior to undertaking any Works. Take photographs of any damaged Customer's belongings within the vicinity of the Works before starting the Works and obtain a signed acknowledgement of their condition from the Customer.

Fixings

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1-104. Screws used for fixing non-reinforced PVC-u sections must be of carbon steel with a suitable corrosion protective coating and feature a double helical thread, spoon point with a countersunk head.

1-105. Fixings must incorporate a combination square/cross recess drive to provide a non-magnetic stick fit.

1-106. Fixings for friction stay applications must be supplied with a special low profile pan head to prevent fastener head interfering with the friction stay.

1-107. All screws, nuts, bolts and other fastenings must be of corrosion resistant material or be treated to give corrosion resistant properties. When subject to the acetic acid salt spray test specified in the applicable Standard or equivalent for a period of 144 hours, the corrosion resistance of treated mild steel must be equal to or better than that of stainless steel or equivalent samples subjected to the same test conditions.

1-108. All ironmongery, fixtures and fittings must be of materials resistant to or protected against atmospheric corrosion. Metals in contact with each other must be compatible so as to prevent galvanic corrosion of dissimilar metals by electrolytic action.

1-109. The use of expanding polyurethane foam is not acceptable as a sole method of fixing any window into a structural opening, nor is it acceptable to be used as bedding for the window.

1-110. Fixing to be as recommended by the applicable Standard or equivalent. Below is a brief summary. The actual fixing recommendation should be taken from the applicable Standard or equivalent and its example diagrams:

Secured on all sides (where practicable);
Corner fixings – 150 – 250mm from external corner;
No fixings less than 150mm from centre line of a mullion or transom;
Minimum of 2 fixings per reveal;
If head is fixed with expanding polyurethane foam, then head fixings can be – • Frame width up to 1200mm – no fixings • >1200mm to <2400mm – one central fixing • >2400mm to 3600mm – two equally spaced fixings

1-111. The use of expanding polyurethane foam is permissible in terms of "foam filling" and as a useful addition to mechanical fixings. When the window is completed and finished there should be no visual evidence of polyurethane foam either internally or externally.

1-112. Installation "packers" should be used to set the window frame onto to allow sealant/mastic to be used as a full fill bedding material. The colour should match the window finish.

1-113. Foam filling is to be used in all windows installations to provide a closure to possible cold bridge of gaps between the wall and the frame. It is only to be used within the depth of the window frame profile i.e. it should not be used to fill gaps to reveals etc. which are to be plastered. Form filling is only in regard to the following situations:

1)	<u>To the head of a window, where the presence of pre-cast concrete or steel lintels make it impracticable or pose significant difficulties in achieving the recommended fixing distances</u>	<u>Up to 10mm maximum</u>
2)	<u>To the sides of frame to make up expansion/contraction gap left either side as a result of manufactured size of window</u>	

1-114. Foam filling must be to the full depth of the frame using only an approved fire resistant expanding polyurethane foam complying with the applicable Standard or equivalent and be of the correct fire performance rating for Building Regulations compliance.

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1-115. All components should be supplied by a manufacturer complying with ISO 9001 or equivalent accredited quality system. The Provider must arrange for a certificate passing the warranty to the Client to be issued by the hardware manufacturer on completion of the project.

1-116. Written confirmation of compliance with all of the above should be given to the Client's Representative in advance of commencement of the Works on site.

Fire barriers

1-117. In all methods of construction ensure that the cavities between internal and external skins are protected from the spread of fire at the openings for windows so as to prevent the spread of smoke and fire through the cavity. This issue is of particular concern in timber and metal framed buildings. Ensure suitable fire barriers are present in such buildings in accordance with the applicable Standard or equivalent, and Building Regulations Approved Document B.

1-118. The method of construction should be identified, and where the building is of timber or metal frame construction, the type of cavity barrier should be established. Where the barrier is a cavity sock or similar and is likely to become dislodged or damaged by the removal of the existing frames, this should be noted on the survey sheet, and instruction given to the installation team to ensure that the cavity barrier is either repaired or replaced to maintain the original level of fire protection for the Property.

1-119. **NOTE;** Timber and metal frame constructions usually have a moisture barrier included in the area around openings, to resist moisture ingress into the cavity that could affect the timber sheathing or metal studwork." (Extract from the applicable Standard or equivalent)

Making Good

1-120. The final covering and treatment of surfaces and their intersections are fundamental to the overall replacement of windows

1-121. The primary objective of making good damaged areas adjacent to the windows is to maintain the weather-tightness and thermal performance characteristics as required in and around reveals.

1-122. This protocol described below applies to all window replacements and shall be undertaken as the primarily aim to negating the need for any redecoration during/after window installation.

1-123. There will be a number of situations (i.e. age of the Property; thickness of plaster reveals; and to some extent "build issues" associated with system-built Properties) where more damage may be required to the reveals and/or the window/wall to undertake the required window replacement than envisaged in this Specification. This could result in the need for some redecoration. Where this is likely to occur, firstly notify the Client's Representative at Design stage. If this is not identified until on-site, note the Properties affected and alert the Client's Representative before Works commence.

1-124. Where full plaster reveals are to be undertaken – i.e. Internal and external making good; this may take place on subsequent days, but the whole operation from start to finish of each window must not exceed 3 consecutive Working Days.

1-125. Plaster-Patching - This process will require a small degree of plaster-patching. This will include the following areas:-

- All of the reveals immediately adjacent to window frame etc.; and
- Part of the reveals where strap/lug fixings have been employed.

1-126. Finishing Trims are to be cellular extruded PVC-UE trims/beads and must conform to the applicable Standard or equivalent and as the below table:

	Internal Reveal (3 sides)	**External Bead (3 sides)**	**Internal Sill Board**
Single bull-nosed PVC-UE trim typically 5–7mm maximum thickness	✓		
Trim width must not exceed 100mm			
Quadrant / Bead typically 12x12mm or 18x18mm maximum **OR**		✓	

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	Internal Reveal (3 sides)	**External Bead (3 sides)**	**Internal Sill Board**
Single bull-nosed PVC-UE trim typically 5 – 7mm maximum thickness			
Trim width must be in range 20 – 25mm maximum			
PVC-UE Cloaked Trim typically 10–12mm in thickness in every case over-cladding the existing timber sill			✓
Removal of existing sill boards is not permissible as substantial damage is normally inflicted on window wall within rooms			

1-127. Trims are not to be used to simply provide or enhance the weather tightness of the window or any perimeter joints. Finishing trims shall be used to neaten the interface between frames and opening in conjunction with the "plaster-patching"/making good situations as stated above. All joints must be left 'neat and tidy' with an acceptable tolerance of +/- 2/3mm on all joints/trim abutments and sealed with sealant of matching colour.

1-128. Internal finishing trims shall be compatible with the material of the window frame and must be colour matched.

1-129. External finishing beads/trims shall satisfy the above criteria and be of an exterior quality material used in accordance with the manufacturer's technical data sheet. External beading is not required where the external reveal has been re-plastered to match existing.

1-130. Windows should be measured and fitted as described above and beads/trims should only be fitted to the opposite side of the determined cover/overlap. Only in exceptional cases where reveals are determined as flush will internal and external beads/trims be acceptable.

Fixing of Trims/Beads

1-131. All internal trims shall be secured in every case to a firm backing (junction of frame and reveal/existing sill) with a low modulus silicon sealant (as below) and sealed all round.

1-132. All external beams/trims shall be secured in every case to a firm backing (junction of the frame and plaster reveal) with the low modulus silicon sealant (as below) and sealed all round.

Sealants

1-133. Sealants must comply with the applicable Standard or equivalent and be low modulus grade.

1-134. Perimeter joints externally and internally around the "as installed" window shall be sealed with a low modulus silicone sealant and "smoothed" to provide a good seal.

1-135. The sealant shall be appropriate to:

- The frame surface and colour;
- Any substrate material;
- The specific joint size and configuration; and
- Potential joint movement and weather exposure.

Implications – Customer's Blinds etc.,

1-136. The inclusion of a finishing trim to existing reveals and sill may in certain circumstances create an issue around the re-fitting of Customer's blinds etc. Where necessary to enable existing window dressing(s) to be used and finishing trims are required, use a "slim-line" version (5mm or less).

Repairing damaged prefinished coatings on site

1-137. Make localised repairs to coatings by brush application on site using the same coating Material and build-up as the factory application with no discernible difference upon completion. All repairs shall be carried out in accordance with the joinery manufacturer's technical data sheet, and to the satisfaction of Client's Representative and so as to ensure continuance of the warranty.

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Cleaning of Windows

1-138. Remove the protective tapes from the as installed windows immediately or as soon as practicable after installation and clean the window (frame and glazing) with a suitable cleaning agent.

Final Completion Checks

1-139. Upon final completion of each and every window installation, confirm and check the following:

- All glazing beads are adequately fitted and in good order;
- All hardware functions and locks operate correctly and none are stiff to use;
- All frames and glass are free from cracks, breaks and scratches etc.;
- All frames and glass are cleaned and all internals of frames are swept clean;
- All openings are square and operate correctly;
- There is no movement to the window;
- All restrictors, vents and hinges etc. are clean and operate correctly;
- All making good internally and externally is completed; and
- All trims are clean and sealed.

1-140. Once all the above items are completed, demonstrate the operation of the window to the Customer and provide the Customer with their own operating instructions for the windows.

Photographic Evidence – Removal/Installation of Windows/Sidelights

1-141. Take digital photographs of each completed window/sidelight installation. The photograph should clearly show the completed internal reveals and be identified by Property address and room (i.e. this may be done by placing an address and room labelled clipboard against the window when taking the photograph but ensure the clipboard does not the block image of the window).

1-142. The photographs should be retained electronically by the Provider and provided electronically to the Client's Representative in a format approved by the Client's Representative.

Client's current manufacturers/suppliers/products

1-143. 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]

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REPLACEMENT WINDOWS – GENERAL [MIDDLE TIER]

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2. REPLACEMENT WINDOWS – GENERAL

General

2-001. This section is to be read in conjunction with:

- the general specification for 'Replacement Windows and External Doors – Surveying and Installation', which provides details of surveying, sampling, installation, finishing etc.; and
- the applicable Standard (Windows and Doors – Code of Practice for the survey and installation of windows and external door-sets).

2-002. All Windows and sidelights must achieve an 'A' energy rating certificated by the British Fenestration Rating Council (BFRC) or equivalent.

Design of Windows

2-003. On door-sets with sidelight panels, the mullion must have sufficient stiffness to ensure rigidity when the door is closed against it.

2-004. Where existing windows are housed within an existing concrete surround, the Client requires **them be removed.** In all cases this will involve provision of a new sill and repair works. Facing brick constructed Properties may require render bands around the external window reveals. This will be constituted a "structural alteration" under Building Regulations and hence will require a Building Control application.

2-005. Cutting off of extruding element of concrete surround and render patching **is not allowed** as it does not remove the cold bridging issue.

Windows Openings

2-006. All windows are to be fitted with opening restrictors. As far as practicable these should be Egress Easy Clean Hinges.

2-007. All hinge components such as bottom track, link bars and rivets are to be manufactured from Grade 1 Austenitic stainless steel or equivalent to the applicable Standard or equivalent and fitted in accordance with manufacturer's technical data sheet limitations and recommendations. All associated hardware should be approved to PAS 24 or equivalent and meet the applicable Standard Class 4 corrosion resistance or equivalent.

2-008. The protective tapes shall be removed from the windows immediately or as soon as practicable after installation and the window cleaned with a suitable cleaning agent.

2-009. Easy clean facility is to be incorporated to allow the window to slide along the hinge track so as to be cleaned from inside the building to the applicable Standard or equivalent - Windows and doors - Code of practice for the survey and installation of windows and external door-sets. After cleaning, the hinge should allow the window to self-relocate and return to its original position and mode of operation simply by closing the casement.

2-010. All hinges should be BBA Approved or equivalent and include a thermoplastic end point and die cast end cap with self-lubricating surface finish featuring a roof to minimise the build-up of debris.

2-011. Where the site survey and Customer profile information so indicates, fit windows with a clearly visible and intuitive to release restrictor.

2-012. The release mechanism must self-relocate in one action on closure of the vent. All components, rivets and pins should withstand a force of 600N to comply with the applicable Standard BS 6375-2: [*Performance of windows and doors. Classification for operation and strength characteristics and guidance on selection and specification*] or equivalent and the BS 8213-1 [*Design for Safety in Use and During Cleaning of Windows*] or equivalent.

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2-013. The restrictor is to be tested to comply with the BS 6375-2 [Performance of windows and doors. Classification for operation and strength characteristics and guidance on selection and specification] or equivalent and BS 8213-1 [Design for Safety in Use and During Cleaning of Windows] or equivalent to withstand a force of 600N when opened at the restricted position and fitted to provide a maximum opening of 100mm in the restricted position. The restrictor is to be manufactured from stainless steel or equivalent to the applicable Standard Grade 1.4301 or equivalent tested to meet the requirements of the applicable Standard or equivalent and to meet the applicable Standard or equivalent Class 4 corrosion resistance.

2-014. Written confirmation of compliance with all of the above should be given to the Client's Representative in advance of commencing the Works on site.

Weather Performance and Seals

2-015. All new windows must be approved by the Client's Representative and be to BS 6375-1+A1 [*Performance of windows and doors. Classification for weather tightness and guidance on selection and specification* or equivalent to the below levels that will achieve a Class A for mechanical testing to BS 6375 – 2 *Performance of windows and doors: Classification for operation and strength characteristics and guidance on selection and specification* or equivalent:-

- Air permeability – 600 pascals minimum;
- Water tightness – 300 pascals minimum; and
- Wind resistance according to the design wind loading but not less than 2400 pascals.

2-016. All framing including mullions, transoms and couplers shall be capable of withstanding the design wind loadings calculated in accordance with the applicable Standard or equivalent:

2-017. Weather stripping and glazing gasket Material must not have a detrimental effect on the plastic profile.

2-018. Weather strips for PVC-u windows to be co-extruded weldable seals and white gaskets approved to the applicable Standard or equivalent to increase the weather tightness of the windows.

2-019. The weather-stripping must be capable of being renewed without disturbing the glazing system and without removing the outer frame from the structure.

2-020. The weather-stripping must be continuous around the frame.

2-021. Weather strip seals and draught excluders between all timber sashes to be included for all windows.

2-022. Glazing gaskets must be thermoplastic elastomer (TPE) and must be pre- inserted into the profiles.

Window Ventilation

2-023. All window units are to be provided with trickle ventilators to provide 8000mm^2 areas to each habitable room and 4000mm^2 areas to kitchen, bathroom, WC and utility rooms.

2-024. The ventilator is to be fitted with an insect mesh in accordance with the requirements of the applicable Standard or equivalent. Trickle ventilators must be manufactured from either aluminium section with powder coated finish to match window colour, or high impact modified PVC-u.

2-025. All ventilators are required to have their 'equivalent areas' from testing clearly marked on the device. Fit cording or rod devices to ventilators, to ensure ease of use by the Customer, in accordance with the latest guidance in the Building Regulations Approved Documents. For new build applications ventilation requirements must be calculated from the tables in the Building Regulations Approved Documents.

2-026. The Provider is to ensure that all window Designs to habitable rooms have a window opening area of no less than 5% of the floor area. Bring to the attention of the Client's Representative any window Designs included in this Specification that the Provider believes does not meet this criterion, before the manufacture of any windows.

2-027. The type of trickle ventilator to be fitted is to be "glazed in". Due to the Client's requirement that all PVC-u window frames must be fully reinforced (i.e. metal inserted into all profile members) "through frame" design is not permitted on PVC-u windows.

2-028. Front timber windows in Conservation Areas will not normally require trickle ventilators to be installed, as this would be against planning policies.

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Child Restrictors

2-029. Child restrictors are to be fitted to all windows with openings on all floors. The restrictors must not allow opening the window more than 100mm without using the restrictor switch.

2-030. Type of restrictors to the PVC-u windows are to be integral/in-built to hinge or push type fitted within frames on all casements outward openings and the PVC-u switch built into the top sashes on PVC-u sliding sash windows.

2-031. Agree the types of restrictors for timber windows with the Client's Representative prior to installation of windows – examples of types required would be Sash Stop and Limiter to sliding sash windows, and integral/in-built to hinge or button restrictor within the window frame to outward opening casements.

Window Furniture

2-032. Window furniture to openable sashes is to be positioned in the centre line of the frame.

2-033. Push button handles to be fitted to all window openings. As all windows are to be egress. Key operated locks are NOT to be fitted

2-034. Details of window furniture are to be provided by Provider and approved by Client's Representative.

2-035. All handles to casement windows to be lever handles operating a multi-point espagnolette shoot bolt locking system with auto lock button cylinder lock. PVC-u window handles to be white powder coated aluminium and timber windows to be brass effect.

2-036. All side hung casement windows to be fitted with egress hinges with the lower hinge being integral push button restrictor mechanism for two handed full opening operation.

2-037. Top hung casements are to be easy clean hinges of a sufficient size to allow easy cleaning from the inside and integral push button restrictor mechanism.

2-038. There must be a correct correlation of hinge/friction stay capability with maximum vent weight and vent sizes i.e. sash sizes must be no larger than the hinge manufactures product table recommendations.

2-039. All timber sliding sash windows to be fitted with the following furniture:

- Brass Brighton Type or equivalent fasteners to each window;
- 2 No. D brass sash pulls to each upper sash and 2 No. sash lifts to each lower sash;
- Brass sash stop and limiter window locks both sides of each window, to allow window ventilation opening of 100mm with security; and
- Brass dual locking screws to meeting rails of sashes.

2-040. Hardware with provision for adjustment must be accessible for adjustment after the window has been installed. Hardware used to open/close the window must be replaceable without removing the outer frame from the structure.

2-041. All components should be sourced from a manufacturer complying with ISO 9001 or equivalent accredited quality system.

2-042. Ironmongery product manufacturer's limitations must be strictly observed within the terms of their conditions of supply. It is the responsibility of the Provider to ensure that the performance of the window complies with the relevant Standards and the requirements of this Specification for the particular window and that the correct product is chosen for the weight and design of each window system. The Provider must supply the ironmongery manufacturer's product information to the Client's Representative prior to any ironmongery being installed during the manufacture of windows.

2-043. Window hardware must be supplied from a manufacturer holding a product licence under the "Secured By Design" or equivalent to ensure a reasonable level of security for the Customer.

2-044. The Provider must give written confirmation of compliance with all of the above requirements to the Client's Representative in advance of commencement of the Works on site.

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Locking Mechanism

2-045. All windows are to be fitted with a locking mechanism that is BBA or equivalent accredited and must have been tested to the PAS 24 security test or equivalent or be a Secured by Design Licensed Product or equivalent.

2-046. The locking mechanism must have an enhanced grade zinc alloy gearbox and mushroom-headed cams and shoot bolts or equivalents. Where a twin cam type is used, shoot bolts are not required. The corrosion resistance must be to BS EN 1670 Class 3 or equivalent and have a fully adjustable "Twin Cam" high performance "no crop" security locking system operating with up to four pairs of mushroom cams travelling towards each other locking into double-sided fully adjustable cam ± 1mm security keep with a night latch locking facility.

2-047. All window hardware should meet the applicable Standard Class 4 or equivalent for corrosion resistance.

2-048. All components should be capable of sustaining a minimum of 25,000 opening cycles and 1,000 full reverse cycles under 50kg operational load without demonstrating any significant deterioration or deformation that would inhibit its function. All components must be have a manufacturer's guaranteed of the mechanical elements for at least 10 years.

Implications – Customer's Blinds etc

2-049. Where finishing trims are required use "slim-line" versions (5mm or less) if necessary to enable the re-fitting of Customer's blinds etc

Cleanability of Window

2-050. All windows must be cleanable from the inside. The design of openings and fixed units must meet the access standards recommended in the applicable Standard or equivalent and Code of Practice 154 or equivalent.

2-051. New PVC-u sliding sash windows must be capable of tilt inwards to enable cleaning and to have secure brackets fitted within the frames to hold each sash in position when tilted inwards for cleaning.

Client's current manufacturers/suppliers/products

2-052. 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]

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TABLE 1: CHOOSING WINDOW TYPE TO APPLICABLE PROPERTIES

PROPERTIES APPLICABLE TO:			**STORM-PROOF CASEMENTS**	**FLUSH CASEMENTS**	**FULLY REVERSIBLE WINDOWS***	**FULLY REVERSIBLE WINDOWS**
	No of storeys	**Property Type**	Projecting Top & Side Swing Hinge	Projecting Top & Side Swing Hinge	Hotel Hinge – Top Swing	Fully Reversible Hinge
LOW RISE PROPERTIES AND BLOCKS (1 – 3 Storey)	**1**	Bungalows	✓	✓		
	2	Houses	✓	✓		
	2	Flats	✓	✓		
	3	Houses	✓	✓		
MEDIUM RISE BLOCKS (3 – 5 Storeys)	**3**	Flat Blocks		✓	✓*	
	3	Flat over Maisonette		✓	✓*	
	3	Maisonette over Flat		✓	✓*	
	4	Flat Blocks			✓*	
	4	Flat over Maisonette Blocks			✓*	
	4	Maisonette over Maisonette			✓*	
	5	Flat Blocks			✓*	
HIGH RISE STOCK (6 – 20 Storeys)	**6-20**	Multi-Storey Flat Blocks				✓

* Floors 1 & 2 must be FLUSH CASEMENTS to reflect the same "fenestration" as the Fully Reversible Window - Floors 3 - 5 must be FULLY REVERSIBLE (Hotel Hinge)

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REPLACEMENT PVC-u WINDOWS [LOWER TIER – Client to delete if not applicable]

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REPLACEMENT PVC-U WINDOWS

3. MATERIALS AND MANUFACTURE

PVC-u Windows

3-001. This section is to be read in conjunction with the general specification for 'Replacement Windows and External Doors – Surveying and Installation' and 'Replacement Windows – General'.

3-002. All new PVC-u windows shall be purpose made BBA approved or equivalent, fully welded and fully reinforced PVC-u to the applicable Standard or equivalent, PAS 24 or equivalent and Secured by Design or equivalent certified.

3-003. The Provider shall ensure that the windows fabricator is a licensed kite marked manufacturer to the applicable Standard or equivalent, and all products are covered by ISO 9001 or equivalent and with an 'A' energy rating certificated by the British Fenestration Rating Council (BFRC) or equivalent.

PVC-u Window Installations Specific

3-004. Where timber sliding sash windows are to be removed and replaced with PVC-u windows, the new windows must have pressure treated timbers around the windows wrapped in damp proof course to infill the old window sash boxes. The timber packers must then be covered with PVC-u clip on liners, and small gaps (up to 10mm) filled with fire resistant expanding polyurethane in-situ foam with closed cell structure between 65% and 75% complying with the applicable Standard or equivalent and be of the correct fire performance rating for Building Regulations compliance.

3-005. Under no circumstances are the old box frame cavities to be filled with expanding polyurethane foam only. Plaster is then to be made good and new plaster covered with wider PVC-u architraves to reduce damage to wall decorations.

3-006. The use of 'make-up' pieces (clip-ons) as means of standardising manufacturing sizes should not be used under any circumstances without the prior approval of the Client's Representative. Approval will be given only in only special circumstances. Where approval is given the make-up size must not exceed 15mm either at the side or head.

PVC-u Windows Section Profiles and Reinforcement

3-007. The Provider must use only extruded window profiles on the window manufacturer/contractor's kite marked licence and where the testing has been carried out by a third party testing house to the applicable Standard or equivalent.

3-008. The Material from which the extruded four chambers profile sections are made shall consist of white high impact modified un-plasticised poly vinyl chloride or equivalent with a class 1 surface spread of flame resistance to the requirement of the applicable Standard or equivalent.

3-009. Manufactured and extruded hollow PVC-u profiles to the applicable Standard or equivalent. PVC-U Material shall have a multi-chambered design (5 chambers minimum) for enhanced thermal efficiency.

3-010. All joints to be welded joints with a grooved finish.

3-011. Reinforcement to be installed to all casement and frame members.

3-012. Reinforcement is to be fixed with self-tapping stainless steel or equivalent screws to the applicable Standard or equivalent or, sheradised coated steel screws at 300mm centres so that the reinforcement does not move or rattle when the window is in use.

3-013. Reinforcement must be made of hot dipped coated steel reinforcement to comply with the applicable Standard or equivalent or Aluminium reinforcement to comply with the applicable Standard or equivalent or hot dipped prime galvanised steel or equivalent complying with the applicable Standard or equivalent.

3-014. The profile must be extruded from un-plasticised polyvinyl chloride (PVC-u) therefore recyclable at the end of its life. Only those additives and pigments may be used that are needed for the manufacture of the compound and its subsequent conversion into sound, durable extrusions of good surface finish and mechanical strength, as assessed by the requirements of this specification.

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3-015. The PVC-u Material frame that the profiles are to be made from must conform to the specification given in TABLE 2: MINIMUM PROPERTIES OF PVC-u MATERIAL TO BE USED FOR FABRICATION OF WINDOWS on pages 235 & 236 below.

3-016. The tests must be carried out on pressed plaques prepared from milled sheet (with the exception of the impact tests which are carried out on samples cut from the face sides of extruded profile), under standard conditions as specified in the applicable Standard or equivalent.

3-017. The profile wall thickness is to be classified in accordance with BS EN 12608 [Unplasticised polyvinylchloride (PVC-u) profiles for the fabrication of windows and doors. Classification, requirements and test methods] or equivalent.

3-018. The colour of the profile must be uniform and the colour of the profiles in a system must be uniform. The finish of the windows is to be white to 40% gloss (RAL 9003 equivalent). The profile must be free from foreign bodies, cracks or sink marks when viewed by normal corrected vision at 90 degrees to the surface and at a distance of 1 metre in normal diffused north light.

3-019. The profiles must be straight such that the longitudinal axis of the profile as measured on the face surfaces may deviate from the straight line by no more than 1mm/metre.

3-020. Tolerances on external dimensions (from the applicable Standard or equivalent):

External dimension	Tolerance
Depth (D) ≤ 80 > 80	+/- 0.3 +/- 0.5
Overall width (W)	+/- 0.5

3-021. No rework/regrind material is to be used in any section which will be subjected to any weathering. Rework/regrind material will only be allowed in internal glazing bead extrusions.

Construction

3-022. All corners and intersection joints between frames, mullions and transoms must be welded.

3-023. The excess material created by the welding process must be removed by a grooving or flush surface method. In either case, the method used must not weaken the profile or the joint and must retain sufficient wall thickness.

3-024. Only where Instructed by the Client's Representative must windows be provided with external projecting PVC-u sills. The sill must be from the same manufacturer as the PVC-u windows.

3-025. These sills must be properly supported, and hollow sill sections must have end caps to ensure that no water penetration occurs at the end of the sills. The sill and window frame must be jointed in accordance with the manufacturer's technical data sheet to ensure water and weather tight joint.

3-026. Insulated infill panels to window frames must be provided where Instructed by the Client's Representative and fixed with internal glazing beads.

3-027. The panels must consist of an inner core of high density thermal insulation (min 0.033W/m^{2}K) and outer layers of coloured plastic coated steel skins (skins to be a min of 0.5mm think). The colour of the panels must be approved by the Client's Representative, prior to the Provider ordering the panels.

3-028. The finished window must be free from all sharp edges and burrs that might be a hazard to the user.

Performance Requirements

3-029. All windows are to comply with BS 7412 and BS EN 12608 or equivalents.

3-030. Provide test reports prepared by a UKAS accredited testing house to confirm that the windows meet the criteria of BS 7412 and BS EN 12608 or equivalents. The Client's Representative may require the Provider to have any window provided for the Contract tested to check its compliance with these performance requirements.

3-031. The new test methods in the applicable Standard are more demanding than the old. One major factor is the introduction of a final 'safety test' on windows. A 2000 Pa exposure rated window would have to withstand a 'safety' test where gusts of 3000 Pa are applied (both positive and negative pressure).

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Architraves and sills

3-032. For every new PVC-u window and door, carefully remove all existing internal architraves and sill boards and replace to match existing in white PVC-u **with mitred joints** to architraves.

3-033. All trims are to be sealed with white silicon or equivalent to the window frame and sealed to decorations.

3-034. Sill boards must have a rounded nosing finish and be sealed to their undersides with white silicon or equivalent and provided with end caps.

3-035. Provide PVC-u quadrant piece around casement windows to internal recesses.

3-036. Where timber sliding sash windows are to be removed and replaced with PVC-u windows, provide PVC-u liners to inner reveals to form square reveals for new PVC-u windows and cover with wider 150mm PVC-u architraves to minimise disturbance.

Drainage

3-037. The windows must include a self-drainage system by means of slots / holes which do not drain through chambers incorporating reinforcement. All drainage slots / holes must be neatly cut out with no lips to allow free drainage of water from the frames to the outside of the building.

3-038. Matching PVC-u caps must be provided to cover all visible external drainage slots. Care must be taken to ensure that glazing blocks or spacers do not obstruct drainage from the glazing rebate.

Client's current manufacturers/suppliers/products

3-039. 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]

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TABLE 2: MINIMUM PROPERTIES OF PVC-u MATERIAL TO BE USED FOR FABRICATION OF WINDOW		
MATERIAL PROPERTY	**TEST METHOD**	**REQUIREMENT**
Vicat Softening Point	BS 2782-1: Part 1: Method 120B or equivalent	$78^0C \pm 2^0C$
Apparent modulus of Elasticity (flexural)	BS ISO 6721-10 Method 335A or equivalent. Rate 5mm/min	2500 MPa
Impact strength	BS ISO 6721-10: Method 359 or equivalent	$20KJ/m^2$ minimum
% change impact strength after accelerated ageing		70% minimum
Notch impact strength	BS ISO 6721-10: Method 359A or equivalent	$12KJ/m^2$ minimum
Low temperature impact	A 300mm profile sample supported at 200mm centres. Condition at one hour – 10^0C. Strike flat surface with rounded 1kg weight from 1 metre.	
Colour retention after artificial accelerated weathering	BS 2782: Part 5: Method 540D and Method 540G or equivalents. Sample to be exposed to total irradiation of $8GJ/m^2$ in wet/dry cycle.	
Colour retention after natural weathering for a period of 60 months	DIN 3386 or equivalent	Maximum colour change allowed is that rated 3, using the applicable Standard or equivalent Part A03
Heat reversion	200mm of profile tested. Mark profile 1cm from each end and age at 100^0C for one hour. Cool and re-measure distance between marks. Compare before and after ageing and express as % change.	No visible signs of deterioration Maximum reversion allowed – 2%
Profile delamination post heat ageing	200mm of profile tested. Subject sample to 30 minutes at 150^0C. Visually inspect	No bubbles, cracks or delamination should be found
Heat Stability	BS 2782: Part 1: or equivalent: Method 130A	Not less than 85 minutes
Flame Resistance Weld factor	The applicable Standard or equivalent Samples of profile are butt welded together at 180 degrees. Cut sample from joined faces according to requirements of the now withdrawn BS 2782-Part 3: or equivalent Method 320C so that weld line is in the centre. Five samples are tensile tested to the requirements of the now withdrawn BS 2782-3: Method 320 or equivalent at a rate of 5mm/min. Five samples of un-welded section are tested in comparison. Sample condition at 20^0C for 1 hour	Class 1

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TABLE 2: MINIMUM PROPERTIES OF PVC-u MATERIAL TO BE USED FOR FABRICATION OF WINDOW		
MATERIAL PROPERTY	**TEST METHOD**	**REQUIREMENT**
	Weld factor – Maximum stress valve welded. Maximum stress control sample. Profile cut at 45 degrees and welded to give 90 degree corner. Condition at 20^0C for 1 hour. Load applied to deform on leg of corner piece.	
Corner Weld Strength	BS EN ISO 868 or DIN53505 or equivalents – Shore hardness Table D	Deformation of horizontal member should be minimum 5mm with no breakage of the corner weld line.
Hardness		77-79

Notes on tables above Please refer to BS EN 12608 or equivalent for details of test methods and standards.

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REPLACEMENT PRE-FINISHED TIMBER WINDOWS [LOWER TIER – Client to delete if not applicable]

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4. REPLACEMENT PRE-FINISHED TIMBER WINDOWS

Timber Windows

4-082. This section is to be read in conjunction with the general specification for 'Replacement Windows and External Doors – Survey and Installation' and 'Replacement Windows – General'.

4-083. All new pre-finished timber windows shall be purpose made pre-treated timber double glazed windows manufactured to BS 644 or equivalent and PAS 24 or equivalent.

4-084. The Provider must supply timber windows in the ranges required only of the highest standards, all of which have been approved by the British Woodworking Federation's (BWF) Timber Window Accreditation Scheme (TWAS) or equivalent and hold a "third party" registration by BBA or equivalent.

4-085. All timber for constructing windows should be in accordance with BS EN 942 [*Timber in Joinery*] or equivalent and sustainably obtained as per United Kingdom Timber Regulations (UKTR).

4-086. All softwood joinery to be subject to preservation treatment by spirit based double vacuum pressure impregnation in compliance with BS 8417 [*Preservation of wood*] or equivalent. The moisture content of the timber sections shall be in the range of 14 – 16% before assembly and the application of any preservative treatment or coatings.

Timber Window Installations Specific

4-087. Where no 'check' reveal is present, install the new window frame wrapped in a damp proof course approved by the Client's Representative. Where 'checked' reveal is present the window is to be placed directly behind the DPC located behind the external skin.

4-088. The "as installed" windows shall in every case operate correctly.

4-089. As far as reasonably practicable, avoid unnecessary damage to the internal plastered reveals irrespective of how they may be finished (i.e. paint/wallpaper/ tiling etc.,). Use appropriate fixing methods depending on the condition of any cavity closer.

4-090. Maintain the recommended movement gap (typically 5mm) each side for the new frame; once the frame is fixed. This gap (up to maximum 10mm) can be "foam filled" to the full depth of the frame using an approved fire resistant expanding polyurethane foam complying with BS 476 Parts 20 and 22, BS EN 1634-1, BS EN 1366-4 or equivalents which is of the correct fire performance rating for Building Regulations compliance. Fixings should be at least as corrosion-resistant as the applicable Standard or equivalent Grade 3. Windows shall be secured in accordance with the recognised "fixing distances" for strap / lug fixings and through-frame fixings as recommended in BS 8213-4 or equivalent.

Timber Window Styles

Property Type	**Window Type**
Low rise stock (1-3) storeys- Bungalows, houses, flats	Storm proof casement (projecting top and side hung hinge) Flush casement. (projecting top and side swing hinge)
Medium rise stock (3-5) storeys- Flats block, flats over maisonettes (opposite), maisonettes. Over maisonettes	Flush casement. (Projecting top & side swing hinge) Fully reversible windows- (hotel hinge top swing) Floors 1 & 2 will be FLUSH CASEMENTS to reflect the same "fenestration" as the fully reversible window Floors 3-5 will be FULLY REVERSABLE (Hotel Hinge)
High rise stock (6-20) storeys- Multi storey flats	Fully reversible hinge.

4-091. All new timber windows are to be purpose made pre-treated.

4-092. All new windows are to be double-glazed and must have features to match existing, e.g. vertical beadings, curved sashes, cover mouldings and horn details etc.

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4-093. All new windows are to be pre-finished prior to delivery and installation on site.

4-094. All external sills to new windows are to be pre-approved by the Client's Representative.

Timber Windows Architraves and Sills

4-095. For every new timber window, carefully remove all existing internal architraves and sill boards and replace to match existing surrounds, with mitred joints to architraves.

4-096. All gaps to walls or gaps to joints are to be sealed prior to decoration.

4-097. Sill boards are to have rounded bull nose timber finish.

Painting of Timber Windows

4-098. All new timber windows/sidelights etc., shall be delivered to site with the full coating system. All external edges of timber windows shall have a radius of not less than 1.5mm and not greater than 3.0mm in accordance with any paint manufacturer's technical data sheet. This detail is acceptable through all joint lines.

4-099. Where required, pre-prime and paint all new architraves before fixing, and then once installed, rub down, fill as necessary and paint 2 No. coats white undercoat and 1 No. gloss white paint, rubbing down between all coats.

4-0100. Repaint existing external concrete sills externally to the windows and touch up any painted stonework or render around the windows to match existing, as disturbed during the window renewal Works.

Drainage

4-0101. The windows must include a self-drainage system by means of slots/ holes which does not drain through the reinforcement chambers i. All drainage slots/ holes must be neatly cut out with no lips to allow free drainage of water from the frames to the outside of the building.

Client's current manufacturers/suppliers/products

4-0102. 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]

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REPLACEMENT UNDECORATED TIMBER WINDOWS [LOWER TIER – Client to delete if not applicable]

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5. REPLACEMENT UNDECORATED TIMBER WINDOWS

Timber Windows

5-017. This section is to be read in conjunction with the general specification for 'Replacement Windows and External Doors – Survey and Installation' and 'Replacement Windows – General'.

5-018. All new undecorated timber windows shall be factory primed, purpose made pre-treated timber double glazed windows manufactured to BS 644 or equivalent and PAS 24 or equivalent.

5-019. All Timber Window manufacturers shall produce timber windows and the ranges required to the highest standards, all of which have been approved by the British Woodworking Federation's (BWF) Timber Window Accreditation Scheme (TWAS) and hold a "third party" registration by BBA or equivalent.

5-020. All timber for constructing windows should be in accordance with the applicable Standard or equivalent Timber in Joinery and sustainably obtained as per United Kingdom Timber Regulations (UKTR).

5-021. All softwood joinery to be subject to preservation treatment by spirit based double vacuum pressure impregnation in compliance with BS 8417 [*Preservation of Wood*] or equivalent. The moisture content of the timber sections shall be in the range of 14 – 16% before assembly and the application of any preservative treatment or coatings.

Timber Window Installations Specific

5-022. Where no 'check' reveal is present install the new window frame wrapped in an approved damp proof course. Where 'checked' reveal is present the window is to be placed directly behind the DPC located behind the external skin.

5-023. The "as installed" windows shall in every case operate correctly.

5-024. Avoid (as far as reasonably practicable) unnecessary damage to the internal plastered reveals irrespective of how they may be finished (i.e. paint/wallpaper/tiling etc.,). fixing methods will be directly affected by the condition of any cavity closer.

5-025. Maintain the recommended movement gap (typically 5mm) each side of the new window. Once the frame is fixed, this gap (up to maximum 10mm) can be "foam filled" to the full depth of the frame using an approved fire resistant expanding polyurethane foam complying with BS 476 Parts 20 and 22, BS EN 1634-1, BS EN 1366-4 or equivalents of the correct fire performance rating for Building Regulations compliance. Fixings should be at least as corrosion-resistant as BS EN 1670 Grade 3 or equivalent. Windows shall be secured in accordance with the recognised "fixing distances" for strap / lug fixings and through-frame fixings as recommended in BS 8213-4 or equivalent.

Timber Window Styles

Property Type	**Window Type**
Low rise Properties (1-3) storeys - bungalows, houses, flats	Storm proof casement (projecting top and side hung hinge) Flush casement. (projecting top and side swing hinge)
Medium rise Properties (3-5) storeys – flats - in a Block, flats over maisonettes (opposite), maisonettes. Over maisonettes	Flush casement. (Projecting top & side swing hinge) Fully reversible windows- (hotel hinge top swing) Floors 1 & 2 will be FLUSH CASEMENTS to reflect the same "fenestration" as the fully reversible window Floors 3-5 will be FULLY REVERSABLE (Hotel Hinge)
High rise Properties (6-20) storeys - multi storey flats	Fully reversible hinge.

5-026. All new timber windows are to be purpose made pre-treated.

5-027. All new windows are to be double-glazed and must have features to match the existing windows, e.g. vertical beadings, curved sashes, cover mouldings and horn details etc.

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5-028. All new windows are to be factory pre-primed prior to delivery and installation on site.

5-029. All external sills to new windows are to be pre-approved by the Client's Representative.

Timber Windows Architraves and Sills

5-030. For every new timber window, carefully remove all existing internal architraves and sill boards and replace to match the existing surrounds, with mitred joints to architraves.

5-031. All gaps to walls or gaps to joints are to be sealed prior to decorations.

5-032. Sill boards to have rounded bull nose timber finish.

Painting of Timber Windows

5-033. All new timber windows/sidelights etc., shall be delivered to site factory primed. All external edges of timber windows shall have a radius of not less than 1.5mm and not greater than 3.0mm in accordance with any Paint Manufacturer's Technical data sheet. This detail is acceptable through all joint lines.

5-034. All new timber windows/sidelights etc. are to be built in prior to full decoration being applied. Make good any exposed/damaged surfaces with approved wood filler. Rub down and leave smooth before applying 1 No. coat of approved primer to bare wood and filled areas. Paint 2 No. coats of white undercoat and 1 No. coat of white gloss paint to all surfaces, rubbing down between all coats.

5-035. Where required, pre-prime and paint all new architraves before fixing, and then once installed, rub down, fill as necessary and paint 2 No. coats white undercoat and 1 No. gloss white paint, rubbing down between all coats.

5-036. Repaint existing external concrete sills externally to the windows and touch up any painted stonework or render around the windows to match existing, as disturbed during the window renewal works.

Drainage

5-037. The windows must include a self-drainage system by means of slots/ holes which does not drain through the reinforcement chambers. All drainage slots/ holes must be neatly cut out with no lips to allow free drainage of water from the frames to the outside of the building.

Client's current manufacturers/suppliers/products

5-038. 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]

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METALWORK

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METALWORK

MATERIALS

Generally

001. Grades of metals, section dimensions and properties are to be to the appropriate Standard or equivalent. When not specified, select grades and sections are to be appropriate for the purpose.

002. Prefinished metal products may be used if the methods of fabrication do not damage or alter the appearance of the finish, and the finish is adequately protected.

003. Fasteners and fixings are to be to the appropriate Standard or equivalent and, unless specified otherwise, of the same metal as component being fastened, with matching coating or finish.

Mild Steel

004. Ensure steel used is free from imperfections. Before fixing, remove all rust, mill scale, welding slag and flux residue from iron and steel surfaces by wire brushing, scraping, hammering and/or flame cleaning.

005. Hot rolled structural steel long and flat products (excluding structural hollow sections and tubes) are to be to the applicable Standard or equivalent.

006. Fine grain steels, including special steels are to be to the applicable Standard or equivalent.

007. Steels with improved atmospheric corrosion resistance are to be to the applicable Standard or equivalent.

008. High yield strength steel plate and wide flats are to be to the applicable Standard or equivalent.

Galvanised coatings

009. Apply galvanised coatings to the applicable Standard or equivalent.

010. Powder Coatings, unless specified otherwise, must comply with all relevant requirements and the recommendations of the applicable Standard for aluminium alloy backgrounds or equivalent.; the applicable Standard for galvanized steel backgrounds or equivalent; and the Coatings Federation: Code of safe practice - Application of powder coatings by electrostatic spraying or equivalent.

Garage door repairs

011. Ensure fittings and furniture for metal 'up and over' garage doors match the existing fittings.

WORKMANSHIP

General repairs

012. Cut out defective metal balusters and replace with new, including all welded joints. Prime where damaged and leave ready to receive decorative finish.

013. Cut out defective ironmongery and replace with new, including any welding that may be necessary. Prime where damaged and leave them ready to receive the finish.

014. Make good damaged welds including removing the remains of the weld, wire brushing, hacking the surface and re-welding. Prime where damaged and leave it ready to receive the finish, in accordance with the details in the "Painting and Decorating" Specification.

015. Remove a defective arch bar by:

- cutting it out from brickwork;
- providing temporary supports;
- replacing with a new primed mild steel bar; and
- making good the brickwork with a finish to match the existing finish.

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Fabrication

016. Ensure compliance with any stated design and performance requirements. Ensure sections and dimensions are in accordance with the applicable Standard or equivalent. Do not permit contact between dissimilar metals. Mitre corner junctions of identical sections. Use tack welds only for temporary attachment. Make joints with parent material fully bonded throughout with no inclusions, holes, porosity or cracks. Prevent weld splatter falling on surfaces that will be self-finished and visible in completed work. Remove traces of flux residue, slag and weld splatter.

017. Avoid contact between dissimilar metals in components.

018. The finished components are to be rigid and free from distortion, cracks, burrs and sharp arrises, moving parts to be free moving without binding, and corner junctions of identical sections are to be mitred.

019. Cold formed work is to have accurate profiling with straight arises.

020. Surfaces of metals to receive adhesives are be degreased, abraded mechanically or chemically etched and rimed to suit the adhesive being applied,

021. Steel is to be welded to the applicable Standard or equivalent.

022. Stainless steel or equivalent is to be welded to the applicable Standard or equivalent using double butt welds, backing bars, jigging and other methods to remove distortion.

023. Aluminium alloys are to be welded to the applicable Standard or equivalent.

024. Brazing is to be to the applicable Standard or equivalent with butt joints finished smooth and level with adjacent surfaces.

025. All sharp arrises are to be removed from any welding or brazing to prevent hazards.

Welding

026. Welding procedures: Ensure metal arc welding is to the applicable Standard or equivalent.

027. Preparation:

- Joint preparation: Clean thoroughly; and
- Protect surfaces of materials that will be self-finished and visible in the completed work from weld splatter.

028. Jointing:

- Joints: Fully bond the parent and filler metal throughout with no inclusions, holes, porosity or cracks;
- Dissimilar metals: Not applicable;
- Strength requirements: Welds to achieve design loads;
- Heat straightening: Provider to submit proposals;
- Complex assemblies: Agree priority for welding members to minimize distortion caused by subsequent welds;
- Tack welds: Use only for temporary attachment;
- Jigs: Provide to support and restrain members during welding;
- Filler plates: Provider to submit proposals;
- Lap joints: Minimum 5 x metal thickness or 25 mm, whichever is greater; and
- Weld terminations: Clean and sound.

Finishing:

029. Welded and Brazed Joints visible in Complete Work:

- Standard: To the applicable Standard or equivalent. - Preparation grade:P1;
- Butt joints: Smooth, and flush with adjacent surfaces; and
- Fillet joints: Neat. • Grinding: Grind smooth where indicated on drawings.

030. Preparation for Application of Coatings

- General: Complete fabrication, and drill fixing holes before applying coatings; and
- Remove paint, grease, flux, rust, burrs and sharp arrises.

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Balustrades

031. Isolated balustrades shall be mild steel hot dipped after manufacture to the applicable Standard or equivalent. All welding /fabrication of components shall be complete prior to galvanising. Use bolted site connections only, no site welding is permitted. Liberally paint damaged sections of galvanising and exposed bare metal with a proprietary cold galvanising paint. Handrails are to be continuous and smooth to avoid key clamp style fixings.

032. Isolated external balustrades for ramp access to adaptations, steps and stepped ramps shall be 48.3mm circular hollow section mild steel, hot dip galvanised after manufacture to the applicable Standard or equivalent. All welding / fabrication of components shall be complete prior to galvanising. Use bolted site connections only, no site welding is permitted. Liberally paint damaged sections of galvanising and exposed bare metal with a proprietary cold galvanising paint. Handrails are to be continuous and smooth to avoid key clamp style fixings.

Mesh Infill to Handrails

033. Use proprietary mild steel to the applicable Standard or equivalent galvanised diamond pattern mesh netting fixed to existing galvanised steel or equivalent tubular handrails, guarding to provide a minimum horizontal force/metre run of 0.74 kN/m, and galvanised after fabrication. All welding /fabrication of components shall be complete prior to galvanising. Use bolted site connections only, no site welding is permitted. Liberally paint, damaged sections of galvanising and exposed bare metal with proprietary cold galvanising paint.

034. Use proprietary mild steel to the applicable Standard or equivalent galvanised diamond pattern mesh netting fixed to new galvanised steel or equivalent tubular handrails, guarding to provide a minimum horizontal force/metre run of 0.74 kN/m, galvanised after fabrication. All welding /fabrication of components shall be complete prior to galvanising. Use bolted site connections only, no site welding is permitted. Liberally paint damaged sections of galvanising and exposed bare metal with proprietary cold galvanising paint.

Vertical Railings to Galvanised Tubular Handrails

035. Use mild steel to the applicable Standard or equivalent hot dipped galvanised after manufacture vertical railings to new or existing galvanised tubular handrails galvanised after fabrication, all welding /fabrication of components shall be complete prior to galvanising. Use bolted site connections only, no site welding is permitted. Liberally paint damaged sections of galvanising and exposed bare metal with proprietary cold galvanising paint.

Isolated Wall Mounted External Handrails

036. 48.3mm diameter circular hollow section mild steel to the applicable Standard or equivalent hot dipped galvanised after manufacture isolated wall mounted external handrails galvanised after fabrication, all welding /fabrication of components shall be complete prior to galvanising. Use bolted site connections only, no site welding is permitted. Liberally paint damaged sections of galvanising and exposed bare metal with proprietary cold galvanising paint.

PVC-u Handrail Cover

037. Use moulded PVC-u section to suit 50mm x 8mm core rail and installed in accordance with the manufacturer's technical data sheet.

Fixings Generally

038. The methods of fixing and fastenings are to be as specified using fixing and jointing methods and types, sizes, quantities and spacing of fastenings which are suitable having regard to

- The nature of and compatibility with product/material being fixed and fixed to;
- Materials and loads to be supported; and
- the Conditions expected in use.

039. Do not modify, cut, notch or make holes in structural members except as shown on any applicable drawings or as approved by the Client's Representative. All welding/fabrication of components shall be complete prior to galvanising. Do not site wild connections. Use only bolted site connections. Liberally paint damaged sections of galvanising and exposed bare metal with a proprietary cold galvanising paint.

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040. Recommendations of manufacturers of fastenings and manufacturers of components, products or materials being fixed and fixed to.

Completion

041. Upon completion of the installation works, the Provider is to provide the Client's Representative with the manufacturer's maintenance instructions and technical data sheets, guarantees, warranties, test certificates, record schedules and log books.

042. Remove all temporary protective coverings and carry out any cleaning and post installation maintenance in accordance with the manufacturer's technical data sheets.

Client's current manufacturers/suppliers/products

043. 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]

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PLASTERWORK AND OTHER FLOOR, WALL AND CEILING FINISHES

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PLASTERWORK AND OTHER FLOOR, WALL AND CEILING FINISHES

MATERIALS

Cement

001. Use either normal setting ordinary or rapid hardening or sulphate resisting Portland cement or blast furnace cement or equivalent. 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 approved by the Client's Representative.

Lime

002. Use Class B hydrated lime, to the applicable Standard or equivalent.

Sand

003. Sand for mortar is to be to the applicable Standard or equivalent 0/2 FP or MP Category 3 unless specified otherwise. Sand for facework mortar is to be from one source, different loads to be mixed if necessary to ensure consistency of colour and texture.

Sand and aggregate Material Property Limits	Standard Category for other aggregates and sand	Standard 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

004. Where mixes contain lime, the lime, sand and mortar shall be obtained premixed from a competent mortar manufacturer to the satisfaction of the Client's Representative. Ordinary Portland or equivalent cement is to be added on site by volume in accordance with the mix specification.

005. Coloured mortar, where required, is to be made using a proprietary coloured ready-mixed lime:sand to the applicable Standard or equivalent; colour as shown on drawings.

Building paper

006. Building paper is to be water resistant breather type. Starting from the bottom, fix with clout nails or staples in horizontal lengths, with 100mm laps.

MEMBRANES

Workmanship generally:

007. Apply Materials carefully to provide a completely waterproof, continuous membrane. Laps are to be not less than 300mm. Ensure that surfaces to be covered are clean, dry, smooth and free from voids, sharp protrusions and frost. Protect finished sheeting adequately to prevent puncturing during following work. Cover sheeting with permanent overlying construction as soon as possible. Immediately prior to covering, check for damage and repair as necessary. Where services pass through sheeting, make junctions completely watertight by forming collars to pipes. Identify the position of adjoining damp proof courses and expose to view where concealed. Thoroughly clean away all mortar, debris and dirt from vicinity of DPCs, including any projecting portions of DPCs. DPCs which project from the wall: Lap by 200mm with sheeting and fully bond/seal to projecting DPC.

POLYTHENE DPM:

008. Type: PIFA - Standard 6/83A:1995 or equivalent. Min.300 micrometres / 1200 gauge. Lay sheets neatly and tuck well into angles to prevent bridging. If sheets cannot be kept dry, double welted joints may be used provided they are temporarily weighted to hold the folds in position prior to laying concrete or insulation. Form folded welts at corners in upstands.

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RADON GAS IMPERMEABLE MEMBRANE BARRIER SHEETING SYSTEM (300µm):

- Primary protection for use in Zone 1 at ground level with ground supported and suspended concrete floors;
- Performance:
    - Radon Permeability 12x10-12m²/s: Laboratory Test; and
    - Low temperature flexibility to the applicable Standard or equivalent – No cracking at -25º Centigrade;
- Products:
    - Low Density Polyethylene (LDPE) sheet, minimum 300 micrometres (1200 gauge);
    - Tensile strength to the applicable Standard Method 326E: 1995 or equivalent.
    - Minimum 13N/mm²;
    - Elongation to the applicable Standard or equivalent: Minimum 450%;
    - Tear Resistance to the applicable Standard: Method 360C or equivalent; and
    - Minimum 100N;
- Accessories:
    - 5mm polypropylene geotextile protection layer for gas membrane barrier;
    - 30mm double sided butyl tape self-adhesive bonding strip sealant for compression joints; to be non-hardening permanently flexible and durable;
    - 110, 120 or 130mm nominal diameter take external dimension of pipe preformed Top Hat pipe collars section (for service pipes); and
    - 110 -140mm diameter adjustable stainless steel or equivalent clip;
- Preparation:
    - Barriers shall be stored rolled up in a dry area until they are to be used; keep away from sharp objects and chemical solvents; and
    - Store rolls on their sides under cover until needed;
    - To offer protection against granular fill or rough surfaces of pre-cast concrete units; lay down geotextile protection layer; and
    - Installation in accordance with manufacturer's technical data sheet.

009. RADON GAS IMPERMEABLE MEMBRANE BARRIER SHEETING SYSTEM (300µm):

- Primary protection for use in Zone 2 at ground level with ground supported and suspended concrete floors;
- Performance:
    - Radon Permeability 12x10-12m²/s: Laboratory Test;
    - Low temperature flexibility to the applicable Standard or equivalent – No cracking at -25º Centigrade;
    - Form an airtight, durably sealed, barrier across the whole of the building; including the floor, internal walls and both external and party walls - along with the associated cavities; and
    - Carefully install and seal sections of the barrier; ensure airtight sealing at all joints, laps, service entries and cavity trays;
- Products:
    - Low Density Polyethylene (LDPE) sheet, minimum 300 micrometres (1200 gauge);
    - Tensile strength to the applicable Standard Method 326E: 1995 or equivalent.
    - Minimum 13N/mm²;
    - Elongation to the applicable Standard or equivalent;
    - Minimum 450%.;
    - Tear Resistance to the applicable Standard or equivalent: Method 360C; and
    - Minimum 100N;
- Accessories:
    - 5mm polypropylene geotextile protection layer for gas membrane barrier;

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- 30mm double sided butyl tape self-adhesive bonding strip sealant for compression joints; to be non-hardening permanently flexible and durable;.
- 110, 120 or 130mm nominal diameter take external dimension of pipe preformed Top Hat pipe collars section (for service pipes); and
- 110 -140mm diameter adjustable stainless steel or equivalent clip;

- Preparation:
  - Barriers shall be stored rolled up in a dry area until they are to be used; keep away from sharp objects and chemical solvents; and
  - Store rolls on their sides under cover until needed;
  - To offer protection against granular fill or rough surfaces of pre-cast concrete units; lay down geotextile protection layer; and

- Installation in accordance with manufacturer's technical data sheet.

010. INSTALLATION OF RADON GAS IMPERMEABLE MEMBRANE:

- Form an airtight, durably sealed, barrier across the whole of the building; including the floor, internal walls and both external and party walls - along with the associated cavities;
- Carefully install and seal sections of the barrier; ensure airtight sealing at all joints, laps, service entries and cavity trays; and
- Application and arrangement:
  - Remove loose debris from the surface of the concrete slab. The surface of the slab should be smooth and free from projections or indentations;
  - Cover entire site with main membrane barrier to be loose-laid directly onto a protection layer (as recommended by manufacturer) on concrete slab; overlap joints150mm between sheets; lay main membrane barrier neatly, tuck well into angles to prevent bridging and creasing;
  - Repair or replace any damaged areas;
  - Take care to ensure all joints have a clean, dry and dust-free overlap;
  - Carry edges of membrane under DPC of external walls. Avoid slip panes as per PD 6697:2010 or equivalent;
  - Provide 600mm wide membrane strip under internal walls; overlap joints 150mm with the main membrane barrier;
  - In the case of an extension to an existing Property, cut a chase in the existing wall and tuck in the membrane. If there is a radon membrane in the existing floor, make the cut slightly above or below;
  - For service pipe penetrations through the main membrane barrier, cut a hole in the barrier so that it fits neatly around the penetration and install preformed "Top Hat" pipe collars membrane sections ensuring 150mm overlap with main membrane barrier;
  - Ensure a secure gas-tight seal connection at membrane barrier overlaps using one strip of double-sided tape; 2 No. strips to be used to seal "Top Hat" pipe collar sections - firstly tape butt joint main membrane barrier to service pipe and secondly, membrane barrier to "Top Hat" Section;
  - Install and tighten adjustable stainless steel or equivalent clip around top of "Top Hat" pipe collars to ensure a gas tight seal is maintained around service penetrations; and
  - Ensure that the barrier is not punctured as building work continues; any damage must be repaired before laying the floor slab; cover the barrier with the permanent over lapping construction as soon as possible.

Slip Resistance

011. The Pendulum Test Value (PTV) should be 36+ (CoF) or above when tested, wet or dry as appropriate for the anticipated service conditions including any likely surface contamination by the method described in and required by the applicable Standard or equivalent.

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012. For plaster, use Gypsum building plasters or 'Pre mixed Lightweight Plaster', plaster to the applicable Standard or equivalent (see below) to a minimum thickness of 8mm, Finish Plaster to the applicable Standard or equivalent; minimum thickness of 2mm to bonding plaster, minimum thickness of 3mm when applied to plasterboard.

Types of gypsum binders and gypsum plasters	
Designation	**Notation**
Gypsum Binders e.g.:	A
• gypsum binders for direct use or further processing (dry powder products);	A1
• gypsum binders for direct use on site	A2
• gypsum binders for further processing (e.g. for gypsum blocks, gypsum plasterboards, gypsum elements for suspended ceilings, gypsum boards with fibrous reinforcement)	A3
Gypsum plaster:	B
• gypsum building plaster;	B1
• gypsum based building plaster;	B2
• gypsum-lime building plaster;	B3
• lightweight gypsum building plaster;	B4
• lightweight gypsum based building plaster;	B5
• lightweight gypsum –lime building plaster;	B6
• gypsum plaster for plasterwork with enhanced surface hardness.	B7
Gypsum plaster for special purposes:	C
• gypsum plaster for fibrous plasterwork;	C1
• gypsum mortar;	C2
• acoustic plaster;	C3
• thermal insulation plaster;	C4
• fire protection plaster;	C5
• thin coat plaster, finishing product;	C6
• finishing product.	C7

Bonding agent

013. Where bonding agents are permitted, use an opaque white non-toxic externally plasticised PVA of high viscosity manufactured to the applicable Standard or equivalent solution to sound surfaces, with a 1:3 solution to be applied to soffits.

Metal lathing, beads and stops

014. Ensure steel lathing is of the plain expanded type having a minimum weight of 1.6Kg/m^2.

015. Ensure beads and stops are of an appropriate profile and:

- for internal use are galvanised; or
- for external use are manufactured from stainless steel or equivalent or PVC-u to the applicable Standard or equivalent.

Plasterboard

016. Plasterboard is to be to the applicable Standard or equivalent; core density of 6kg/m^2 for 12.5mm board. Product selection to be restricted to materials with a minimum 75% recycled content.

017. Dry lining is to be to the applicable Standard or equivalent, core density of 10kg/m^2 for a 12.5mm board; taper edged.

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Wall tiling

018. Plain cushion edge white or coloured glazed ceramic tiles to the applicable Standard or equivalent size 6mm minimum thickness. Waterproof adhesives for ceramic tiles to be to the applicable Standard or equivalent. Waterproof grout to the applicable Standard or equivalent. Wall tiling for repairs is to match existing for repairs to existing tiled surfaces.

Sealant

019. Sealants are to be:

- gun grade white silicone mould resistant sealant to the applicable Standard or equivalent low modulus;
- gun grade white silicone sealant to the applicable Standard or equivalent low modulus; or
- fire retardant sealant to the applicable Standard or equivalent.

Textured decorative finish

020. Use a plastic compound textured decorative finish. Apply it to provide a finish to match the existing finish. Apply to no less than the minimum thickness stated in the manufacturer's technical data sheet.

Steel lathing beads and stops

021. Lathing to Timber or Masonry to be either:

- Zinc coated lathing to the applicable Standard or equivalent zinc coated Reference L3 fixed with staples at 150mm centres; or
- Stainless steel or equivalent lathing to the applicable Standard or equivalent stainless steel or equivalent Reference SWL fixed with stainless steel or equivalent staples at 150mm centres.

022. Lathing to External Wall Insulation to be either:

- Stainless steel or equivalent lathing to the applicable Standard or equivalent stainless steel or equivalent Reference HWL fixed with stainless steel or equivalent staples and ties at 150mm centres; or
- Glass or Carbon reinforced lathing, with fibres encapsulated against alkali attack, strength and stiffness greater than that for stainless steel or equivalent, fixed with stainless steel or equivalent staples and ties at 150mm centres.

023. Stretch lathing and fix securely in accordance with manufacturer's technical data sheet to give a taut firm base for plaster/rendering, fix with the ling way of the mesh at right angles to supports and with all strands sloping in the same direction, Lap side edges not less than 100mm. Lap ends 50mm at supports and 100mm between supports. Laps must not occur within 100mm of angles or bends. Tie all edges and ends together with 1.2mm wire ties at not more than 150mm centres. Ensure all joints have a 100m lap and are wired at centres not exceeding 75mm.

024. Angle beads are to be either:

- PVC-u angle bead with 25mm x 25mm lugs to take 2mm plaster to the applicable Standard or equivalent; or
- PVC-u angle bead with 40mm x 40mm lugs, depth to suit external render.

025. Bell cast beads are to be PVC-u with 25mm x 45mm lugs.

026. Stop beads are to be PVC-u edge bead 25mm wide.

027. Fix beads and stops with galvanised steel or equivalent or stainless steel or equivalent nails or mortar or render dabs on accordance with the manufacturer's technical data sheet.

Plasterboard, Dry Lining and Thermal Boards

028. Fix plasterboard to soffits or studding with 32mm x 12 swg galvanised clout headed nails for 10mm boards and 38mm x 12 swg galvanised clout headed nails for 12.5mm boards at intervals suitable for the particular application. Provide all supporting members as necessary for fixing the plasterboard. Do not use cross joints in boards. Seal all exposed and cut edges with PVAC sealer.

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029. Horizontal joints will not be permitted on dry lining unless the wall height exceeds the maximum manufactured board dimension. All joints are to be taped and finished to a flush seamless finish. Jointing material is to be to the applicable Standard or equivalent. Seal all exposed and cut edges with PVAC sealer.

030. Ensure flush joints between plasterboards and at the junction between walls and soffits with straight edged and level finish plaster. Cover them with 90mm wide jute scrim cloth bedded in neat board finish. Apply a coat of neat d finish plaster at least 5mm thick immediately after the joint application has set but before it dries out.

031. Fix dry lining to metal framing with drill point ("jack point") drywall screws at 300mm centres to vertical studs, around openings and at board edges.

032. Ensure that backing walls are dry and direct bond dry lining with a gypsum based adhesive, seal perimeter and around openings with gypsum adhesive.

033. Ensure the plaster finish to thermal board consists of two coats of premixed lightweight plaster total thickness of plaster system of at least 13mm as follows:

- the first coat being scratch coat of bonding plaster; followed by
- a coat of appropriate finish plaster trowelled to a smooth finish.

Plaster on concrete soffits

034. Ensure the plaster finish to concrete soffits consists of two coats of premixed lightweight plaster, to a total thickness of plaster system of at least 10mm as follows:

- the first coat being a bonding scratch coat; followed by
- a finishing coat trowelled to a smooth finish.

Plaster on solid vertical backgrounds

035. Ensure the plaster finish to solid vertical backgrounds consists of two coats of lightweight premixed plaster to a total thickness of plaster system of at least 13mm as follows:

- the first coat being:
  - on low suction backgrounds, a bonding plaster scratch coat containing exfoliated vermiculite; or
  - on normal suction backgrounds, a scratch coat of HB browning plaster containing expanded perlite aggregate; and
- the second coat being finish plaster containing exfoliated vermiculite aggregate trowelled to a smooth finish.

Dissimilar Solid Backgrounds for Plaster:

036. Where plaster is to be continued without break across joints between dissimilar solid backgrounds which are rigidly bonded or tied together, cover the joints with a 200 mm wide galvanized mesh strip (backgrounds in the same plane) or with galvanized corner mesh (internal angles) fixed at not more than 600 mm centres along both edges, unless specified otherwise.

Dissimilar Solid Backgrounds for Plaster (Lintels):

037. Where plaster is to be continued without break and without change of plane across the face of a lintel which is not wider than 300 mm and is rigidly bonded or tied to the plaster background:

- Cover the face of the lintel with building paper to the applicable Standard or equivalent extending 25 mm on to the adjacent background; and
- Overlay with expanded galvanized steel lathing extending 50 mm beyond the edges of the paper and securely fix with masonry nails at not less than 100 mm centres along both edges.

038. Alternatively, a suitable paper and mesh lathing may be used.

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Dissimilar Solid Backgrounds for Rendering:

039. Where rendering is to be continued without break across joints between dissimilar solid backgrounds which are in the same plane and rigidly bonded or tied together, cover joints with a 150 mm wide strip of building paper to the applicable Standard or equivalent overlaid with 300 mm wide stainless-steel lathing fixed at not more than 600 mm centres along both edges, unless specified otherwise.

Conduits

040. Conduits bedded in undercoat to be covered with 90 mm wide jute scrim bedded in finishing coat mix, pressed flat and trowelled in. Do not lap ends of scrim.

Cement beds, backings and renderings

041. Unless the Client's Representative Instructs otherwise, ensure all beds, backings and renderings are composed of one part Portland or equivalent cement to three parts sand, by volume. Keep the water content as low as possible and ensure it does not exceed 18 litres per 50 Kg of cement (including the moisture content in the sand).

042. Brush sub-bases and backgrounds free of all dust. Well wet them and coat them with cement slurry before applying the screeds. Alternatively, use 1:10 EVA bonding adhesive instead of cement slurry.

043. Where the beds, backings or renderings are specified as waterproof, incorporate waterproofer to the applicable Standard or equivalent in the mix.

044. Expansion joints should be placed to form bays not exceeding 3.50m x 3.50m. Finish off the surfaces of beds and backings to receive the appropriate tiling, paving or other finishing.

045. External rendering is to be to the applicable Standard or equivalent. Ensure external renderings have a surface finish to match the existing renderings.

Granolithic finish

046. Ensure granolithic finish is composed of 1 part cement to 1-part fine aggregate to 2 parts coarse aggregate 10mm maximum size, all measured by weight. Add the minimum amount of water necessary to give sufficient workability for laying and compacting. All granolithic repairs are to match existing.

047. Thoroughly scabble, clean, wet and treat the base for granolithic application either by brushing on a neat cement grout or an EVA emulsion bonding agent. Lay the granolithic finishing in bays not exceeding 15m^2 with the bay proportions being such that the ratio of sides will not exceed 1:1 1/2.

048. Ensure the minimum thickness is 19mm to a sound loadbearing concrete base. To prevent dusting, avoid excessive trowelling. Carry out curing for at least 4 days or, if the Client's Representative so Instructs, for longer.

049. Ensure the deviation from the level is no more than +/- 3mm in 3m.

050. Steel trowel the granolithic to produce a close knit surface and either tool it by stud rolling or sprinkle it with non-slip grains to produce an anti slip finish as Instructed by the Client's Representative.

Wall tiling

051. Fix tiles to the backing with straight joints on a combed bed of waterproof adhesive. Ensure all exposed edges of tiles are round edged. Either round edge or mitre the external angles, at the Provider's discretion. Form exposed stop end corners using double bullnose tiles.

052. Fill the joints between tiles solid with waterproof grout. Tool off the joints and clear off all residual adhesive and grout from the tiles and surrounding surfaces on completion of the Works.

Quarry and Ceramic floor tiling

053. Lay tiles either on a bed of cement and sand (1:3) or on a cementitious adhesive bed to BS ISO 13007 or equivalent 3 6mm thick, which makes full contact with the tile and background.

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Suitability of Backgrounds/Bases

054. Before starting work ensure that backgrounds/bases:

- are sufficiently flat to permit specified flatness of finished surfaces, bearing in mind the permissible minimum and maximum thicknesses of the bedding material; and
- have been allowed to dry out by exposure to the air for not less than the following:
    - Concrete slabs: 6 weeks;
    - Cement: sand screeds: 4 weeks;
    - Rendering: 2 weeks; or
    - Gypsum plaster: 4 weeks.

Plain Coloured Skirting To Existing Painted Plaster

055. Tiles: Plain coloured unglazed ceramic skirting tiles, minimum rounded top edge, coved bottom to the applicable Standard or equivalent, Size: 8mm minimum. Joint width: 3mm:

- Background/Base: Existing painted plaster; and
- Grouting material: Waterproof grout.

Setting Out

056. Ensure that:

- Joints are true to line, continuous and without steps;
- Joints on walls are truly horizontal, vertical and in alignment round corners;
- Joints in floors are parallel to the main axis of the space or specified features; and
- Cut tiles/slabs are kept to the minimum, as large as possible and in unobtrusive locations.

Before laying tiles obtain confirmation of setting out to satisfaction of the Client's Representative.

Flatness of Wall Tiling

057. Sudden irregularities not permitted. When measured with a slip gauge in accordance with the applicable Standard or equivalent, the variation in gap under a 2 m straight edge placed anywhere on the surface to be not more than 3 mm.

Flatness of Floor Tiling

058. Sudden irregularities not permitted. When measured with a slip gauge in accordance with the applicable Standard or equivalent, the variation in gap under a straight edge (with feet) placed anywhere on the surface to be not more than 3mm over a 2m straight edge.

Vinyl and thermoplastic tiles

059. Unless the Client's Representative Instructs otherwise, lay tiles in accordance with applicable Standard with straight joints on a combed bed of adhesive to a standard and quality approved by the Client's Representative. Match the size, colour and pattern of the tiles as nearly as possible to any existing surrounding tiles.

Vinyl and other Resilient Sheet Floor Coverings

060. Unless the Client's Representative Instructs otherwise, vinyl and other resilient sheet floorings are to be of a standard, quality and laid in accordance with the applicable Standard or equivalent.

061. All non slip floor coverings to be 2mm thick anti slip vinyl sheet floor coverings to in accordance with the applicable Standard or equivalent and to have a Pendulum test value (PTV or slip resistance value) (36+ (CoF) or above) as tested to in accordance with the applicable Standard or equivalent and a Surface roughness (Rz) (20+µm (microns) or above) to in accordance with the applicable Standard or equivalent. Floor covering to be complete with aluminium threshold strips at doors

Textured decorative finish

062. Fill joints in plasterboard to receive decorative textured finish with plastic filler. Cover them, while wet, with wet strength paper scrim or while wet or dry, with glass fibre membrane scrim tape. Allow this to dry before applying the finishing coat. Apply the finishing coat evenly. Tool or brush this to match the existing surrounding finishes or as the Client's Representative Instructs otherwise.

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Labour and sundry items

063. Cut and fit and/or make good all wall and floor finishings around any kind of obstruction or projection of a permanent nature from the wall background or floor base including any:

- structural elements;
- pipework, ducting and their brackets and supports;
- fittings and appliances in connection with the electrical, water, gas heating, air conditioning, communication and waste disposal systems; and/or
- fittings and any permanent object in connection with any permanent parts of the Property.

064. Unless the Client's Representative Instructs otherwise, maintain plasterwork, renderings, backings, asphalt and any applied finishes in the same plane as any existing surrounding similar applications. Make a fair joint between the new application and any existing surrounding application.

Client's current manufacturers/suppliers/products

065. 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]

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EXTERNAL AND INTERNAL RETROFIT INSULATION LINING SYSTEMS

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EXTERNAL AND INTERNAL RETROFIT INSULATION LINING SYSTEMS

GENERAL

IWI/EWI System Guarantee

001 Provide a 25 year, third party, insurance-backed guarantee to cover the external wall insulation materials, system and installation. For each Property insulated, a guarantee certificate should be provided stating the exact address of the Property covered by the guarantee. The Provider shall provide written details of the future maintenance regime to ensure compliance with the detailed terms of the insurance backed guarantee.

002 The guarantee must meet the following criteria:

1. Provide a minimum guarantee of 25 years.
2. Provide assurance that funds are available to honour the guarantee, including in the event the contractor/installer/manufacturer ceases to trade.
3. Cover the full replacement of a failed EWI system, including remedial works, materials and installation.
4. Have a quality assurance framework in place whereby the quality of the system and its installation are independently assessed by a UKAS accredited body.

003 A list of appropriate guarantees can be found on the Ofgem website under their ECO Guidance. Please note this list is not exhaustive and other appropriate guarantees may be available.

004 All costs associated with providing the guarantee are to be borne by the Service Provider and the Service Provider must make the Client's Representative fully aware in advance and in writing of the maintenance regime required to uphold the guarantee.

PAS 2030: 2023 and PAS 2035: 2023

005 The Client has adopted PAS 2030:2023 and PAS 2035: 2023 and compliance with applicable Standards in commissioning measures to improve the energy efficiency of their existing Properties and to undertake fuel saving improvements.

006 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 2030:2023.

007 All works in respect of retrofitting dwellings for improved energy efficiency are to be undertaken in accordance with the requirements of PAS 2035:2023 in addition to PAS 2030:2023.

008 Must be registered as compliant with PAS 2030:2023 by a PAS 2031 accredited scheme provider/certification body and provide evidence to demonstrate compliance with PAS 2030:2023 and PAS 2035:2023 in support of their Tender submission.

009 Any person or firm proposed by the Provider to undertake 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 are to be provided when requested by the Client

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010 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 Standards, 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 and evidence of this is to be provided when requested by the Client.

PAS 2030 and installation

011 The installation must be undertaken by persons with appropriate skill and experience, approved by the manufacturer and in accordance with PAS 2030.

012 Evidence must be provided that the IWI/EWI installation contractor has PAS 2030 certification.

013 A pre-design survey of the Property is to be carried out by a competent person in accordance with PAS 2030 to assess its suitability to receive the insulation. The Client's Representative, Service Provider and system designer should be made aware of any remedial Works required and, if Work is to proceed, these should be carried out prior to installation.

014 Pre-design survey, method statements and the related requirements of PAS 2030 are to be provided to the Client prior to installation.

015 Clear records of work undertaken must be kept and presentable at the reasonable request of the Client to allow monitoring of installation Work.

016 On completion of the Work, a "Declaration of Conformity" to PAS 2030 standard shall be provided to the Client's Representative for their records.

Design Considerations

017 The proposed Design and installation must not have a negative effect on the ventilation, air quality, humidity and comfort of the Property. When presenting Designs, the Provider must make recommendations for any further measures required to prevent environmental changes occurring as a result of the insulation works, and to ensure the continued or improved comfort of the Customers. The proposed Design must as a minimum satisfy Building Regulations.

018 The insulation system designer should:

- calculate U-values in accordance with:
- applicable Standards
- BRE report BR 443
- ensure that thermal bridges, air leakage and condensation are avoided or at least kept to a minimum within the acceptable parameters as delineated in applicable Standards, in accordance with the following methods of calculation and assessment:
    - Hygrothermal performance of building components and building elements. Internal surface temperature to avoid critical surface humidity and interstitial condensation.
    - Thermal bridges in building construction. Heat flows and surface temperatures.
    - Thermal performance of buildings. Transmission and ventilation heat transfer coefficients.
    - BRE BR 262 – Thermal Insulation: avoiding risks.
    - Code of Practice for the Control of Condensation in Buildings.
- assess the subject walls for the effects of wind-driven rain and the suitability of the proposed system in accordance with:
    - Code of Practice for assessing the exposure of walls to wind-driven rain.
    - Ensure that the wall insulation will meet the appropriate Building regulations standard set out in Approved Document B Fire Safety; ensuring appropriate cavity barriers, detailing to building services, penetrations, fire breaks and all materials specified insulation should be non-combustible , Euroclass A1 ir A2 -s1,dO standard for combustibility even in locations where not mandated by regulation.

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019 Existing walls that are considered to be vapour permeable shall only be insulated using vapour permeable finishes, adhesives and insulation such as wood fibre. The thickness of the insulation should be limited to a maximum of 100mm.

020 Where the existing construction is not considered to be vapour permeable, vapour closed insulation materials may be used.

INTERNAL WALL INSULATION (IWI)

Generally

021 Design and installation should be carried out in accordance with the BRE Good Practice Guide 138 – Internal wall insulation in existing housing, and is to be undertaken by a PAS 2030 certified specialist installer and according to manufacturer's standard details and construction methodology.

022 Materials used must be certified by the BBA or equivalent. Fire classification of the Materials is to be tested to applicable Standard and the design and installation to be in strict compliance with the BBA certificate. If there is any doubt as to the suitability of the system on the subject building, the Service Provider must seek clarification from the certificate holder.

023 Remove and securely fit new fixtures and fittings to match existing or as Instructed by the Client's Representative, such as skirting, architraves, picture rails, curtain back boards, etc.

024 Strip any gloss paint or vinyl wallpaper from wall. Ensure that the plasterwork on the wall to receive insulation is dry.

025 Survey the walls to assess flatness and the presence of moisture, to determine which method of installation is best suited.

026 Insulation can be applied directly to the plasterwork providing it is not defective.

027 If plasterwork is defective, for example blistering, cracking, efflorescence, it is to be hacked off and debris removed from site, and a parge coat of cement and sand (1:3) applied with a float finish. Allow sufficient time for drying out before installing insulation.

028 If the plasterwork is defective due to water ingress/rising damp/mould etc., carry out necessary remedial works and treatments and make good. Following treatment/repairs, allow sufficient time for drying out before installing insulation.

029 Extend electrical wiring towards the inside face of the insulation layer and fit new face plates.

030 Generally direct electrical cables away from internally insulated walls, and if this is not possible take measures to avoid accidental damage of wiring, over-heating and early degradation of PVC sheathed cables, in accordance with BR 262. Avoid contact between PVC insulated wiring and polystyrene insulation.

031 Relocate and securely fit central heating pipes and radiators towards the inside face of the insulation layer.

032 Remove and securely fit new PVC-u window sills to suit thickness of new insulation backed plasterboard.

033 Tape perimeter of openings with airtightness tape, where new windows and/or doors are being installed along with the IWI,

034 Where practical, return the insulation along walls perpendicular to external walls (e.g. internal and party walls) for a minimum distance of 1m, to reduce the thermal bridge at this point.

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Internal Insulation Applied Directly to Walls

035 Provide insulation (the type and thickness specified to meet the required U-value) backed, 12.5mm plasterboard with integral vapour control layer and taped joints fixed to the walls using plaster adhesive recommended by the plasterboard manufacturer where the background plaster is smooth, level and dry. The adhesive is to be applied to the insulation board in strips. To prevent air movement between the insulation board and the background plaster, and the spread of fire gases at floors, ceilings and adjacent walls; a continuous band of adhesive is to be applied to the perimeter of the wall and to the surround of any opening, in accordance with the manufacturer's instructions. In addition mechanical fixings should also be utilised, sufficient to prevent collapse in the event of a fire.

036 Plasterboards incorporating plastic insulation are also to be secured with recommended screw mechanical fixings in addition to the adhesive described above, to prevent the insulation collapsing in a fire.

037 Provide Insulation (the type and thickness specified to meet the required U-value) backed, 12.5mm plasterboard with integral vapour control layer and taped joints fixed to the walls using plaster dabs recommended by the plasterboard manufacturer can be utilised where the background plaster is not smooth and level but is dry. To prevent air movement between the insulation board and the background plaster, and the spread of fire gases at floors, ceilings and adjacent walls; a continuous band of adhesive is to be applied to the perimeter of the wall and to the surround of any opening, in accordance with the manufacturer's instructions. In addition mechanical fixings should also be utilised to prevent collapse in the event of a fire.

038 Provide, where the background is uneven or has been previously treated for damp, preservative treated timber battens screwed or nailed to the existing plastered or newly re-parge coated brick wall, a high performance breather membrane, high wet strength, water resistance and high vapour permeability CE and BM TRADA Certified breather membrane is to be provided between the timber battens and the background wall.

039 Provide Air tightness flexible grummets and install where any pipe or cable penetrates the vapour membrane; damage to the vapour membrane caused by the penetration of pipes or cables is to be repaired using tapes recommended by the vapour membrane manufacturer.

040 Provide a compressed flexible insulation/flexible expanding foam seal at the perimeter of the plasterboard where abutting other floor, wall and ceiling finishes.

041 Provide insulation backed plasterboard of a higher performing insulation than that of the main walls is to be provided and installed to all reveals, heads and sills, and sealed against the window or door frame or lining with a flexible sealant. Thickness of insulation is to be determined by thermal bridging calculations and depth of window/door frames so as not to inhibit the operation of opening the window or door.

042 Provide existing and proposed, project specific thermal resistance and transmittance values based on proposed material and fixings, calculated and declared to applicable Standards.

043 U-values are to meet Building Regulations, unless a lower value is requested by the Client's Representative.

Insulation Fitted between battens

044 Provide preservative treated sawn softwood battens, 50mm wide or proprietary timber battens incorporating a cork laminate to reduce thermal bridging, at least the thickness of the insulation, screwed or nailed to the wall at maximum 600 centres, a high performance breather membrane, high wet strength, water resistance and high vapour permeability CE and BM TRADA Certified breather membrane is to be provided between the timber battens and the background wall.

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045 Provide rigid insulation board (the type and thickness specified to meet the required U-value) cut and friction-fitted between battens and a vapour protection membrane is to be fixed to the face of the battens and insulation.

046 Provide 12.7mm Plasterboard with taped joints fixed to the timber battens, if a pipework service zone is required, this is to be formed in 38mm x 38mm preservative treated softwood battens fixed to the insulation retaining battens before the application of the plasterboard.

047 Alternatively insulation backed plasterboard with an integral vapour membrane and taped joints may be used to increase the U-value and reduce thermal bridging.

048 Provide air tightness flexible grommets and instal where any pipe or cable penetrates the vapour membrane; damage to the vapour membrane caused by the penetration of pipes or cables is to be repaired using tapes recommended by the vapour membrane manufacturer.

049 Provide a compressed flexible insulation/flexible expanding foam seal at the perimeter of the plasterboard where abutting other floor, wall and ceiling finishes.

050 Insulation backed plasterboard of a higher performing insulation than that of the main walls is to be provided and installed to all reveals, heads and sills, and sealed against the window or door frame or lining with a flexible sealant. Thickness of insulation is to be determined by thermal bridging calculations and depth of window/door frames so as not to inhibit the operation of opening the window or door.

051 Provide existing and proposed, project specific thermal resistance and transmittance values based on proposed material and fixings, calculated and declared to applicable Standard.

052 U-values are to meet Building Regulations, unless a lower value is requested by the Client's Representative.

Separate Inner Lining

053 Provide in situation where the existing wall was previously subject to rain penetration and remedial works have been carried out, or it is bowed or uneven, separate timber studs to create a minimum 30mm air gap between the wall and the rear face of the insulation. Preservative treated sawn softwood studding 50mm wide x depth of mineral fibre or other insulation, at maximum 600mm centres are to be braced between the floor and the ceiling.

054 The air gap is to be ventilated to the exterior, at the top and bottom of the wall.

055 Provide mineral fibre insulation (the type and thickness specified to meet the required U-value) stapled to studwork, other insulation material is to be cut and friction fitted between the studding.

056 Provide a vapour protection membrane across the face of the studwork and covered on the internal face by 12.7mm plasterboard with taped joints. A pipework service zone can be formed with 38mm x 38mm preservative treated sawn softwood battens before the application of the plasterboard.

057 Provide air tightness flexible grummets and instal where any pipe or cable penetrates the vapour membrane; damage to the vapour membrane caused by the penetration of pipes or cables is to be repaired using tapes recommended by the vapour membrane manufacturer.

058 Provide a compressed flexible insulation/flexible expanding foam seal at the perimeter of the plasterboard where abutting other floor, wall and ceiling finishes.

059 Provide insulation backed plasterboard of a higher performing insulation than that of the main walls is to be installed to all reveals, heads and sills, and sealed against the window or door frame or lining with a flexible sealant. Thickness of insulation is to be determined by thermal bridging calculations and depth of window/door frames so as not to inhibit the opening the window or door.

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060 Provide existing and proposed, project specific thermal resistance and transmittance values based on proposed material and fixings, calculated and declared to applicable Standard.

061 U-values are to meet Building Regulations, unless a lower value is requested by the Client's Representative.

EXTERNAL WALL INSULATION

Rendered External Wall Insulation (EWI)

062 EWI shall be installed to low-rise (1-3 storey) Properties only. If a building higher than 3 storeys is to be considered to receive EWI, this work should be procured as a specialist project outside of this Contract.

063 The majority of external wall insulation works is likely to be carried out to existing solid masonry walls. However, where cavity walls are being considered for thermal upgrade, the cavities must be fully filled with insulation.

064 The design and installation of insulated render systems is to be undertaken by a PAS 2030 certified specialist Sub-contractor or Supplier, using proprietary products and the system manufacturer's standard details and construction methodology. (See General Notes).

065 The external wall insulation system and all associated products are to be accredited by the BBA or the BRE or equivalent and guaranteed by the system manufacturer for a minimum of 25 years. (See General Notes)

066 Provider is responsible for obtaining all necessary Statutory approvals.

067 Provider must, prior to the design and specification of the work, have a survey of the substrate walls carried out by a trained assessor or installer. A survey should be provided for each dwelling and should record, but is not limited to, the following:

- whether there is space available for the installation of EWI and access for future maintenance.
- any areas not suitable to receive EWI.
- an assessment of the vapour permeability of the walls
- a line and level survey and any requirement for dubbing out.
- aesthetic features to be retained or recreated (particularly in conservation areas).
- building dimensions including openings, recesses and protrusions (bay windows etc.).
- a schedule of services that require removal or relocation prior to the insulation works, and reinstatement once the installation is complete, e.g. communications cables, heating pipework, gas and electricity meters, gullies and rainwater goods.
- a schedule of fixtures and fittings that require removal prior to the insulation works, and reinstatement once the installation is complete e.g. fences, gates, satellite dishes.
- vegetation on or adjacent to the substrate that requires removal (algae, vines).
- existing defects to the substrate and the remedial work required before installation, e.g. cracking, bulging, spalling, rising and penetrating damp, mould.
- A schedule of existing DPC level, movement joints and fire breaks, also indicated on a drawing.
- results of structural pull-out tests for a mechanically fixed system, of which a minimum of 15nr. are spread across the subject building to determine the suitability of the substrate for the EWI and to the number and type of fixings.
- results of a pull-off test for methods using adhesive only, and adhesive with mechanical fixings.

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068 Ensure that the face of the external wall is to be free of all structural and non-structural protrusions, which if Instructed are to be taken back to the face of the external wall, and any exposed reinforcing bars treated with cement slurry. Rainwater and Soil, Vent and Waste pipework, overflows, external services, condensate pipework, and electrical, telephone, tv and satellite cabling is to be temporary removed and reconnected to maintain services and reconnected on completion of the Works including providing any additional pipework or sleeves to accommodate additional width of insulated rendering. All air vents, balanced flues, condensing flues, extract fans and other grilles are to be taken out and set aside, and later re-fixed including additional sleeves or spigots on completion of the Works. Insulation and reinforcing mesh is to be notched and cut around pipework, cabling, vents etc., penetrating the external wall. Render is to be made good around pipework, cabling, vents etc., penetrating the external wall.

069 Store all external wall insulation boards and system accessories such as rails, beads, renders and sealants in accordance with the manufacturer's technical data sheet. External wall insulation boards should be stored in a location that is clean, dry and level, with the boards protected in a manner that avoids accidental damage from impact, water damage or degradation due to exposure to sunlight. Care should be taken to ensure the boards are protected following manufacture, during transportation and whilst stored on site.

Criteria for External Wall Insulation and Accessories

070 Proposed design should include for insulation to all areas of the building, to provide a complete envelope, except at the discretion of the Client's Representative and should satisfy the Building Regulations.

071 Mechanically fix rigid insulation (of the type and thickness specified to meet the required U-value and suitable for the construction type) to the face of the external wall utilising a PVC track and rail system as recommended by the system manufacturer.

072 Provide existing and proposed, project specific thermal resistance and transmittance values based on proposed material and fixings, calculated and declared to applicable Standard.

073 U-values are to meet Building Regulations, unless a lower value is requested by the Client's Representative.

074 Aim to achieve an improved U-value of 0.20 W/m²K or better.

075 The system designer shall provide U value calculations and a condensation risk analysis for both types of insulation to confirm that the target U value is achieved and that interstitial condensation will not occur within the structure. These U value calculations shall include for the point thermal transmittance of the fixings (Chi).

076 All mechanical fixings e.g. base rails, corner edge and stop beads are to be fibre-reinforced plastic or PVC-u. Metal fixings are not permitted.

077 EWI must extend beyond the level of the top of the existing floor insulation by a minimum of 400mm. If no floor insulation exists, or it is not clear, gauge where the insulation would logically be or will be installed in the future.

078 The main EWI material should terminate at existing DPC level and the DPC extended through the thickness of the EWI. Below DPC level a water resistant insulation such as extruded polystyrene should be used. Insulation below DPC to be a minimum of 30mm thinner than main wall insulation and a bell cast drip formed.

079 Return EWI into the heads, sills and reveals of all openings using a thinner, higher performing insulation as described above. The thickness of return insulation is to suit thickness of existing frame, so as not to inhibit the operation of opening the window or door.

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080 To reduce thermal bridging, and where new windows and/or doors are being installed along with the EWI, position them so that either the front or rear face of the windows/doors sits flush with the outer face of the masonry wall. If the rear face is flush with the wall, ensure the weight of the windows/doors is adequately supported in a manner suitable for the substrate. The installation should be made airtight and weathertight.

081 The EWI installation must be continuous, air-tight and water-tight. Where EWI cannot physically connect with the insulation of another element, e.g. roof insulation, provide a minimum overlap of 400mm.

082 The system designer is to provide a full set of project specific design details showing all junctions, including but not limited to soffits, reveals, sills, copings, abutments, ground floor, below DPC and around services. Further detail should be provided of the following:

- details showing number and pattern of fixings, location of base rails, beads, reinforcement mesh, sealant locations, DPC's, fire barriers and movement joints;
- details showing how fixtures and fittings will be secured to the EWI covered substrate;
- details showing how to protect exposed edges of insulation, in locations such as eaves, gables, soffits and opening, by the use of overhangs, sealants, flashings and over-cladding window sills.

Integrity

083 Installation must be:

- weather tight under all anticipated conditions;
- capable of resisting all dead loads and design live loads, including impact and wind loads, and accommodate all thermal and structural movements without damage.

Impact Loading

084 Impact resistance of finished walls when tested to 3 and 10 joule hard body impacts in accordance with ETAG 004 and ISO 7892 "Vertical building elements – Impact resistance tests – impact bodies and general test procedures" must achieve a classification of Category 11. It must have impact resistance strength of 30kJ/m².

Resistance to Thermal Shock and Rainwater Penetration

085 The system must be tested and have passed the hygrothermal test as defined in ETAG 004 Clause 5.1.3.2.1. Hygrothermal Behaviour.

Wind Loading

086 Design wind loads: Wind loads to be used in testing are to be calculated in accordance with t applicable Standards or equivalent and Codes of Practice.

- ultimate limit state wind load calculations;
- calculations and specifications to adequately accommodate all potential foreseeable failures.

087 The system designer must submit structural calculations for the Client's Representative's approval to demonstrate that the system can resist an Ultimate (factored) wind suction load for the building under consideration, in accordance with applicable Standards.

088 These calculations must include an assessment of the pull over strength of the fixing washer heads through for example 60mm phenolic foam and 100mm enhanced expanded polystyrene insulation materials. A minimum factor of safety 2 should be applied to the characteristic pull through values that are obtained using the test method given in ETAG 004 clause 5.1.4.3.1 "Pull-through tests of fixings".

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Fire Resistance

089 Fire classification of the system is to be tested to applicable Standard, the insulation is to be non-combustible Euroclass A1 or A2-s 1 d and the design and installation to be in strict compliance with the BBA certificate or equivalent. If there is any doubt as to the suitability of the system on the subject building, the Provider must seek clarification from the certificate holder.

090 Non-combustible insulation should be fixed for a minimum distance of 100mm around the circumference of boiler flues.

Preparation

091 Prior to installation, prepare the substrate by carrying out remedial work as identified by the survey, brush and wash walls with suitable mild detergent and allow to dry.

092 Remove areas of render thought to be in poor condition and hammer test and remove locally any loose render. Make good with sand and cement or a proprietary render repair system.

093 Extend eaves and gable overhangs where necessary to protect the top of the EWI.

094 Hammer test and remove any loose material and dub out if necessary, ready to receive the insulation and render system.

095 Treat areas of moss, algae and mould growth with a fungicidal treatment approved by the system manufacturer.

096 Remove all fixtures and fittings attached to wall such as timber fence posts, gates etc. Take note of the exact position of satellite dishes before removal to enable reinstatement in the correct location.

097 Relocate all down pipes, ventilation pipes, storm and foul gullies to accommodate insulation thickness and reconnect where necessary for continued operation during installation.

098 Extend all services ducts to suit the thickness of insulation.

099 Install movement joints as recommended by the system manufacturer/designer.

100 EWI installed to second storey walls and above should have at least one stainless steel fixing per square metre and fire breaks at each floor as advised in BRE Report BR 135: 2013.

101 In all instances, provide fire breaks at party/compartment wall locations, the fire breaks shall be part of the overall External wall insulation system Design and are to provide 1 hour fire resistance.

Installation

102 The EWI must be installed in accordance with the BBA or equivalent certificate and manufacturer's recommendations, and by installers trained and approved by the certificate holder.

103 Installation should be in accordance with the Best Practice Guide: External Wall Insulation 2015, published by INCA.

104 Fix insulation boards in a staggered pattern in full contact with the substrate to eliminate air gaps behind the insulation. Fix either mechanically, with adhesive, or with both depending on the project specific recommendations.

105 Fix adjacent boards tightly and avoid gaps. Cut boards as required, to a minimum width of 200mm.

106 All gaps between insulation boards should be filled with slips of insulation or PUR foam sealant.

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107 Once installed, insulation boards should be protected from getting wet until the render can be applied. Wet board boards should be replaced before rendering.

108 Polyester powder coated aluminium over sills and window reveals integrated into new windows and fully compatible with the external wall insulation system to be installed. Window sills are to provide a minimum 35mm projection in front of new render line.

109 Re-attach all rainwater down pipes, soil vent pipes and other lightweight items to the new substrate using spiral anchors.

110 Re-attach all medium weight items such as light fittings to the new substrate using cantilevered fixings.

111 Re-attach timber fence posts, satellite dishes and other heavy items on treated timber grounds fixed directly to the masonry wall, within the insulation layer. Timber grounds should be the same thickness as the insulation.

Beads, Drips etc.

112 Install stainless steel, polyester powder coated aluminium or PVC-u angle beads on all external angles and reveals strictly in accordance with the system manufacturer's technical data sheet.

113 Install polyester powder coated aluminium eaves flashings, and eaves flashing overtrims strictly in accordance with the system manufacturer's technical data sheet.

114 Install polyester powder coated aluminium adjustable apex flashing trims cut to suit to provide a minimum 40mm overhang beyond the render surface strictly in accordance with the system manufacturer's technical data sheet.

115 Install stainless steel, polyester powder coated aluminium or PVC-u under sills or over sills drip beads strictly in accordance with the system manufacturer's technical data sheet.

116 Install stainless steel, polyester powder coated aluminium or PVC-u bell cast drip beads at the base of any wall rendering in accordance with the system manufacturer's technical data sheet.

117 Install stainless steel, polyester powder coated aluminium or PVC-u stop end beads at the exposed end of any wall rendering, strictly in accordance with the system manufacturer's technical data sheet.

118 Apply silicone sealant at any abutment of the rendering system to door or window frames, bottom of wall insulation, and any other non-insulated projection.

Finishes

119 All rendering to be in accordance with applicable Standards.

120 Application should occur only on dry days and finishing coats should be applied away from direct sunlight and heavy winds to avoid cracking caused by premature curing.

121 The minimum overall thickness for render is 6mm, with the final thickness being as per the system manufacturer's recommendations.

122 Use self-coloured render, colour to be confirmed with Client's Representative.

Base renders

123 Apply, for thin coat systems, a 2 layer base coat with polypropylene or glass fibre mesh pressed into the first layer.

124 Fix metal laths to the insulation before the base coat of render for thick coat systems.

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125 Prepare surface of base coat as recommended and leave to dry for the application of the finishing coat.

Base renders

Cement render

126 Provide pre-mixed with additives applied in two or three coats as specified, (total 16 – 25mm thick), reinforced with either stainless or galvanised steel reinforcing mesh fixed to face of insulation. Movement joints are to be provided at 5m intervals both horizontally and vertically, render to be applied strictly in accordance with the manufacturer's technical data sheet.

Polymer-modified cementitious render (PMCR)

127 Provide pre-mixed with additives and polymer applied in one or two coats as specified (total 6 -12 mm thick) reinforced with mineral fibre or glass mesh fixed to face of insulation, render to be applied strictly in accordance with the manufacturer's technical data sheet.

Acrylic render

128 Provide pre-mixed acrylic and high quality sand/aggregates applied in two coats (4-6mm) reinforced with mineral fibre or glass mesh fixed to face of insulation, render to be applied strictly in accordance with the manufacturer's technical data sheet.

Hydraulic lime renders

129 Provide pre mixed with additives hydraulic lime render, applied in one 10-13mm base coat to foamglas insulation, reinforced with glass fibre mesh reinforcement fixed to face of insulation, and finished with 3mm decorative layer, render to be applied strictly in accordance with the manufacturer's technical data sheet.

Insulating renders

130 Provide pre mixed with additives and polystyrene balls, perlite or vermiculite insulating aggregate, applied to door and window reveals, reinforced with either stainless or galvanised steel reinforcing mesh fixed to face of reveal, render to be applied strictly in accordance with the manufacturer's technical data sheet.

Hemp – line render

131 Pre mixed with additives lime render blended with hemp, applied in coats to achieve a total thickness of 50mm directly to face of brickwork, finished with a lime plaster finishing coat, reinforced with either stainless or galvanised steel reinforcing mesh fixed to face of brickwork, render to be applied strictly in accordance with the manufacturer's technical data sheet.

Finish topcoats

Silicone and Acrylic renders

132 Apply silicone and acrylic finishing coats strictly in accordance with the manufacturer's technical data sheet to ensure consistency of finish, texture and architectural finish are to be as specified, method of application can be by trowel, rollers or spray as specified.

Aggregate dash

133 Aggregate dash or spar dash or pebbledash is to conform to applicable Standard.

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Scratch plaster or Scrapped finish

134 Provide pre- coloured specialist render with a large grain size for a textured finish when scratched, applied strictly in accordance with the manufacturer's technical data sheet.

Roughcast render

135 Provide cement based polymer modified self-coloured render incorporating an aggregate of small evenly sized pebbles to provide a textured finish, applied over a base coat and dash receiver, to conform to applicable Standard

Spray render or Tyrolean finish

136 Provide waterproof Tyrolean render sprayed using a splatter machine in layers to a minimum coat thickness of 4mm onto smooth coloured polymer-rendered layer, applied strictly in accordance with the manufacturer's technical data sheet.

Coloured Smooth/Flat render

137 Pre-mixed coloured render, applied strictly in accordance with the manufacturer's technical data sheet.

Mock brick

138 Three coat polymer based render applied in accordance with manufacturer's technical data sheet to give the appearance of brickwork.

Brick Slips

Clay or Concrete slips

139 Provide proprietary clay or concrete brick slips fixed to and including profiled polystyrene and wire mesh proprietary slop mounting system fixed to face of insulation, installation of slips to be strictly in accordance with the manufacturer's technical data sheet, bond of brickwork and jointing and pointing to be as specified.

Acrylic slips

140 Provide proprietary acrylic "brick" slips fixed to face of coloured smooth finished rendering, installation of slips to be strictly in accordance with the manufacturer's technical data sheet, bond of brickwork to be as specified.

Reveals and Base of Walls

141 Ensure that all rendering systems are to be returned into reveals and heads of door and window openings, incorporating a reduced thickness of higher performing insulation board fixed to existing reveal or soffit, and a stainless steel or PVC-u angle bead fixed to face of insulation, all to be installed in accordance with the system manufacturer's technical data sheet.

142 Ensure that the base of the rendering system is finished with a bell cast feature complete with stainless steel or PVC-u bell cast drip bead fixed to face of brickwork, all to be installed in accordance with the system manufacturer's technical data sheet.

143 Ensure that the face of the masonry below the base of the rendering system at DPC level is finished with extruded polystyrene insulation to extend at least 400mm below top of floor insulation and finished with render/calcium silicate boarding, all to be installed in accordance with the system manufacturer's technical data sheet.

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144 Ensure that the face of the structure below the base of the rendering system at DPC level is finished with 50mm low moisture absorption extruded polystyrene insulation (Jablite Basetherm board or other equal and approved) with Structherm Ejot H1 eco x 95mm or other equal and approved plastic or metal hammer or torque drill fixings complete with integral plastic washers installed at 600mm centres between DPC and ground level to extend at least 400mm below top of floor insulation and finished with render/calcium silicate boarding, all to be installed in accordance with the system manufacturer's technical data sheet.

Insulated Structural Cladding to Crosswall Constructed Dwellings

145 Remove all fixtures and fittings attached to wall such as timber fence posts, gates etc. Take note of the exact position of satellite dishes before removal to enable reinstatement in the correct location.

146 Relocate all down pipes, ventilation pipes, storm and foul gullies to accommodate insulation thickness and reconnect where necessary for continued operation during installation.

147 Extend all services ducts to suit the thickness of insulation.

148 Remove existing areas of cladding to expose column bases and carry out in conjunction with the Client's appointed Structural Engineer an inspection to assess the structural integrity of the Property. Undertake any repairs identified from the Structural Engineer's report.

149 Allow for packing out if necessary to the existing façade with treated timber battening to take out any steps in the line of the walls, the general line and level of the walls should be checked.

150 Apply fungicidal wash to the existing timber studding in accordance with the manufacturer's technical data sheet.

151 The cladding panel cage is to be Structherm SPL or other equal and approved incorporating a 70E fire retardant enhanced EPS insulation core, panels 2450mm high x 1200mm wide, boards 2400mm high x 1200mm,

Structural Cladding Panel Cage Thickness	**70E Fire Retardant Enhanced EPC Insulation Core Thickness**	**Base profile with nosing**	**Stop bead with nosing**
75mm	50mm	95mm	90mm
100mm	75mm	120mm	115mm
125mm	100mm	145mm	140mm
150mm	125mm	170mm	165mm

152 The cage is to covered with stainless steel 200mm and 400mm rigid joint mesh in sheets 2400mm long, mechanically fixed clipped to the cage using Vertex or Hartco or other equal and approved clips installed at 150mm centres, all joints should be meshed together with foam filler strips. Stainless steel 300mm x 100mm rigid corner 2400mm long are to be fixed at internal and external angles. and 400mm rigid joint mesh in sheets 2400mm long The cage is to be fixed with Ejot or other equal and approved RA-p 7.5 x 80mm fixings with stainless steel washer plate ay 600mm centres to existing timber studs and brickwork, strictly in accordance with the manufacturer's technical data sheet.

153 Vertical fire breaks required at party/compartment walls and window and door surrounds are to be mineral fibre minimum 100mmwide and 100mm thickness, fully bedded on HP12 and fixed with stainless steel DMH 8/35 x 170E fire fixings and DMT 80E stainless steel washers at 600mm centres.

154 All joints and interfaces must be sealed with type F Class 25HM sealant. All junctions are to be double sealed with Compriband TP600 10/2 or TP600 10/5-10 or other equal and approved tape and with a low modulus silicone mastic sealant for windows, cills, door frames etc.

155 Insulation to reveals, masonry cross wall brick piers and part walls is to be 20mm Phelonic insulation board fixed with IDK-N 8/60 x 75mm long or 6 x 60mm hammerfix or similar fixings.

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156 Insulation to brick plinths is to be 70mm Jablite basetherm or other equal and approved High Density EPS board

157 Apply render consisting of Structherm FR basecoat 24-26mm or other equal and approved applied in two coats, 14- 16mm scratch coat, and a 8-10mm floated coat applied in accordance with the manufacturer's technical data sheet, the render is to have Structhern CPR or other equal and approved primer applied using roller or brush application to an even coverage

158 Finish the base of the cladding system with a heavy duty polyester powder coated galvanised steel base profile with nosing. all to be installed in accordance with the system manufacturer's technical data sheet. Heavy duty polyester powder coated galvanised steel HF full system stop beads with nosing and filler strips are to be provided.

159 Provide PVC-u clip on render stop end beads, thin coat corner beads with fibre mesh, and movement beads installed strictly in accordance with the system manufacturer's technical data sheet.

160 Apply Structherm CS15-A or other equal and approved silicone finishing or top coats strictly in accordance with the manufacturer's technical data sheet to ensure consistency of finish, texture and architectural finish as specified, method of application can be by trowel, rollers or spray as specified.

161 Apply anti-graffiti coatings to rendered finishes when instructed, these are to be Hydron NU-CRYL AG render coat or other equal and approved applied strictly in accordance with the manufacturer's technical data sheet.

162 Ensure that the face of the structure below the base of the rendering system at DPC level is finished with 50mm or 70mm low moisture absorption extruded polystyrene insulation (Jablite Basetherm board or other equal and approved) with Structherm Ejot H1 eco or other equal and approved plastic or metal hammer or torque drill fixings complete with integral plastic washers installed at 600mm centres between DPC and ground level to extend at least 400mm below top of floor insulation and finished with render/calcium silicate boarding, all to be installed in accordance with the system manufacturer's technical data sheet. Insulation to have a 50mm or 70mm wide 0.7mm aluminium box profile fixed to substructure at 300mm centres with 8/60 hammer screw bead fixings

163 Ensure that the base of the substrata rendering system is finished with a bell cast feature complete with a PVC-u thin coat bell cast drip bead fixed to face of structure, all to be installed in accordance with the system manufacturer's technical data sheet.

164 Provide polyester powder coated extruded aluminium over-cills to suit profile of existing cills when instructed complete with welded corners, upstands, end caps as necessary, over-cills to be sealed with low modulus silicone sealant.

Insulated Façade Panels

165 Removal and replacement of façade panels is to be undertaken within the same single working day ensuring that the Property remains fully watertight and secure with all services reconnected.

166 The sequence of undertaking the Works on a panel by panel basis will incorporate:

- temporary disconnect and set aside services and fittings;
- remove facias, soffit boards etc;
- protect retained finishes;
- break up section and prepare slab;
- remove and clear away existing façade panels including windows and doors;
- install prefabricated or site assembled panel to structure;
- install external sheathing board and seal;
- install windows, door frames and doors;
- glaze windows and seal;
- reconnect services and fittings;
- complete cladding rails, flashings and cladding panels;

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- install internal trims and cill boards;
- redecorate and make good.

167 Carefully break out 40mm x 60mm wide section of existing concrete floor screed where floor abuts existing façade panels, include for taking up and setting aside existing carpet grippers and carpet to facilitate installation of new panels, protect retained finishes. Dress all surfaces that have been broken up and remove all loose debris and materials and ensure base is level , ready for installation of new panels, where main posts are to be installed allow for breaking out 300mm x 300mm x 40mm deep section of floor structure. Abrade concrete surfaces and ensure all are free from laitance, oil and grease or other contaminants to ensure areas are clean and open to achieve a good mechanical key, apply Wykamol or other equal and approved epoxy coating EP40 damp proof membrane.

168 Provide the structural framing to the replacement façade panels comprising Kingspan Kingframe steel framimg system (SFS) or other equal and approved with 'U' track and 'C' section stud profiles (74mm x 2mm) pre-hot dipped galvanised cold rolled cold rolled steel components with guaranteed yield strength of 390N.mm2, to be assembled with head and base track and vertical studs at 600mm centres and complete with all accessories, and installed in accordance with the manufacturer's technical data sheet. All ends are to cut square and all edges protected with zinc rich paint. Fixing of components shall be with self tapping screws

169 Framing can be either pre-fabricated off site and delivered complete with sheathing board or proprietary board finish, or assembled on site from individual components including additional studding as framing around openings , and bolt fixing of frame to existing structure to be Ejot (or other equal and approved) 6.3 x 32mm hex head anchors to structure at 600mm centres and G8.8 with locking nut and washers to all brackets and steel connections.

170 Install perimeter of framed panel on suitable damp proof course material and sealed with low modulus silicone.

171 Fill any cavity openings in the structure with Kingspan kootherm PVC-u extrusion J section cavity closers or other equal and approved before the steel framed panels are installed.

172 The external face of the panel is to be covered with sheathing board either supplied already installed on pre-fabricated panels or installed on site, the sheathing board is to be 12.5mm Siniat weather defence 2G (or other equal and approved) external square edge glass fibre mat faced moisture resistant gypsum based board fixed in accordance with the manufacturer's technical data sheet to the steel framing and with 60mm taped joints.

173 Install 50mm Isover (or other equal and approved) mineral wool steel framed insulated infill batts fit securely with close butted joints as infill to steel framing, friction fitted between steel framing, fixed at head of frame with timber battens or proprietary clips.

174 Install 70mm Kingspan K15 Kooltherm or other equal and approved Rainscreen insulation board fixed to sheathing board in accordance with the manufacturer's technical data sheet, Joints of insulation board are to be taped with 75mm wide self adhesive aluminium foil rainscreen cladding tape. Exposed edges of the insulation board are to be protected by a suitable self-adhesive aluminium fila tape with a 50mm minimum wide overlap onto the insulation board face.

175 The inner face of steel framing is to be covered in either:

1. 12.5mm Soundbloc MR (or other equal and approved) gypsum plasterboard fixed at 300mm centres maximum with dry wall screw fixings with Gyproc scrim tape, and two coat board finish skim plaster including all mechanically fixed skim beads.

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2. 12.5mm Soundbloc MR (or other equal and approved) gypsum plasterboard fixed at 300mm centres maximum with dry wall screw fixings with Gyproc scrim tape, and 27mm Gyproc Thermaline plus (or other equal and approved) board complete with PVC-u white angle trim to cover joint between Soundbloc and Thermaline boards, joints to be reinforced with Gyproc paper joint tape and filled for required fire resistance and fixed with drywall crew fixings, and apply two coats dry wall sealer prior to installation.

3. 62.5mm Kingspan Kooltherm K18 (or other equal and approved) insulated plasterboard installed and finished in accordance with the manufacturer's technical data sheet.

176 If a vapour control layer is required to be provided, this is to be installed with the minimum number of joints, with 150mm laps and sealed with a double side tape.

Rainscreen to Insulated Panels

177 Install Nvelope or other equal and approved Omega and Zed profiles installed vertically at maximum 600mm horizontal centres and fixed to external insulation clad panels in accordance with the manufacturer's technical data sheet, allow for installing black polyester powder coated Zed profiles at perimeter edges to provide shadow gap detail.

178 Install Steni Colour or other equal and approved façade fibreglass reinforced polymer composite panels with a smooth of electron beam cured acrylic 6.5mm thick, fixed in accordance with the manufacturer's technical data sheet with colour matched mechanical rivet fixings into predrilled holes, fixings to be set at maximum 600mm centres horizontally and vertically and to be located at maximum 40mm from side reveals and 75mm from top and bottom edges, all rivet holes to be aligned horizontally and vertically to provide a neat aesthetic appearance. Vertical and horizontal panel joints are to be 8mm. Horizontal joints are to be Steni (or other equal and approved) Corner Profile. External corners are to be Steni (or other equal and approved). Perforated closers are to be installed at cill level to prevent entry of birds and vermin.

179 High level cappings and low level cills, trims and other flashings are to fabricated from polyester powder
coated aluminium to applicable Standards and to match colour of panels.

Client's current manufacturers/suppliers/products

180 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]

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PAINTING AND DECORATING

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PAINTING AND DECORATING

GENERAL

Benchmark Standard

001. Prior to the commencement of painting, the Client's Representative, the Provider and the Paint and Decorative Materials Manufacturer will meet on site to identify a number of Properties which are agreed as being representative in condition and substrate types of the Properties that exist throughout the relevant estate or programme of Works. The Client's Representative shall have the final decision on the Properties identified as the benchmark Properties.

002. The selected Properties will be known as the "benchmark Properties" against which decorating materials performance will be measured during the course of the Contract and the agreed addresses will be recorded.

003. Prior to commencement of re-decoration to the remainder of the estate or programme of Works, the benchmark Properties will be prepared and redecorated strictly in accordance with the contract/technical decorating specifications and monitored by the Client's Representative.

004. Upon completion of the benchmark Properties, the Client's Representative, Provider and Paint and Decorative Materials Manufacturer will meet again to "sign off" the Properties provided the required standards of workmanship and materials have been achieved. The signing off should be in conjunction with the Client's Decorative Materials Performance Record – Benchmark Properties Form.

005. Ensure that the standards of preparation and decoration on the benchmark Properties are applied to the remaining Properties within the estate or programme of Works.

General obligations

006. Ensure that the selected paint and decorative materials manufacturer is consulted prior to the commencement of any painting and decorating Works.

007. Ensure that all Staff engaged to carry out the painting and decorating Works are suitably trained to achieve the quality standards and levels of service indicated in this Specification and individual Property, estate or programme of Works requirements.

008. Meet the quality standards and levels of service required both in surface preparation and decorative materials application by those members of Staff engaged for this purpose. Ensure that a suitably qualified Supervisor is appointed to control work sequencing, quality standards and to ensure that each Property is left clean and tidy at the end of each Working Day.

009. Adhere wholly to the "Technical Painting and Decorating Specification" prepared and supplied by the Paint and Decorative Materials Manufacturer and using the specified paint and other decorative materials so that the application to various surfaces, preparation, initial and final coats achieve the optimum performance as stated. Use the paint and other decorative materials stated in the "Technical Painting and Decorating Specification" specific to the project Property, estate or programme of Works.

010. Provide a minimum of one week's notice to all Customers prior to preparation or painting and decorating Works being carried out on their Property.

011. Ensure that the standards of preparation and painting and decorating application to the Benchmark Properties is compliant with the Technical Painting and Decorating Specification" provided and subsequently "signed off" by the authorised representative of the Paint and Decorative Materials Manufacturer and the Client's Representative.

012. Ensure the remaining Properties on the estate or programme of Works achieve equitable painting and decorating standards in terms of quality and performance as the previously agreed Benchmark Property.

013. Maintain a responsible waste management system, i.e. that paint and decorative materials tins and containers are re-cycled and not disposed of to landfill sites and provide evidence of this to the Client's Representative.

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Paint and Decorative Materials Manufacturer

014. The paint and decorative Materials manufacturer is the Supplier engaged by the Provider or a Subcontractor to supply paint and other decorative Materials, training and technical support for the Works.

015. The Provider shall secure that the paint and decorative Materials manufacturer liaises with the Client's Representative and the Provider to identify and agree benchmark Properties for each Scheme or Programme of Works.

016. The Provider shall ensure that all of the paint and decorative Materials supplied for the Contract are in full compliance with this Specification.

017. The Provider shall ensure that the paint and decorative Materials manufacturer provides any necessary on-site training in the use of their products for each Property, Scheme or Programme of Works (if required) and retains a record of the training undertaken and who received that training.

018. The Provider shall ensure that the paint and decorative Materials manufacturer inspects and surveys each Property, Scheme or the Properties included in a Programme of Work and prepares the applicable "Technical Painting and Decorating Specification" recommending the preparation, applications and paint and other decorative Material products applicable to the Works identified as being required to be undertaken. The Provider shall ensure that this Specification, which if followed will validate any guarantees given by the paint and decorative materials manufacturer as to the expected life and performance of the paint and decorative Material products used.

019. The Provider shall ensure that the paint and decorative Materials manufacturer liaises fully with the Client's Representative, the Provider and if applicable any approved painting Subcontractor to provide an effective site monitoring of standards and advisory service which ensures best practice in the use of their products. The Provider shall ensure that the paint and decorative Materials manufacturer:

- completes the Client's Quality Monitor Form on a bi-weekly basis; and
- provides a written report in an electronic format to the Client's Representative following each inspection.

020. The Provider shall ensure that on the completion of the Works to each Property, Scheme, or Programme the paint and decorative Materials manufacturer collates a comprehensive Property, Scheme or Programme of Work specific technical report in an electronic format and submits it to the Client's Representative. This technical report must provide clear evidence of the following:

- a comprehensive Technical specification that identifies all of the Materials used (trade names permitted) with their associated warranties and where they have been applied;
- Site Monitoring Reports – details of any site visits, any findings identified and what action(s) were taken/requested in terms of remedial works;
- where communal hallways have been repainted – full details of flake sampling, independent analysis and what recommendations were followed on site, details of tag(s) affixed and photographic record of their location(s);
- training specifically requested by the Provider on any paint or decorative Materials;
- confirmation that details of all paint and other decorative Material products and the quantities supplied are held by the paint and decorative Materials manufacturer on their internal IT system for future reference; and
- Fire certification certificates as applicable on the application of fire retardant paints and the achievement of Eurocalss B surface spread of flame.

Redecorate/touch up/make good

021. Note that "redecorate/touch up" or "make good decoration" includes preparation, priming, one undercoat and either one gloss coat to previously painted surfaces or reinstating any stain or clear finish for previously stained or clear finish surfaces.

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MATERIALS

Generally

022. The products supplied must be applied in accordance with the relevant product Technical Data Sheet. In addition, all products should be used in accordance with BS 6150 [*Code of Practice for Painting Buildings*] or equivalent and BS 8000 Part 12 [*Workmanship on Building Sites*] or equivalent as set out in the table below. When applying coatings, in order to ensure optimum protection and durability, it is essential to achieve the required coverage rate, particularly when using medium/high build finishes,

AREA	LONGEVITY	BASE	RE-COAT Within	COVERAGE
Previously painted woodwork	Up to 8 Years	Solvent or Water Based	8-16 Hours	18m^2/litre
Previously stained woodwork	Up to 10 Years	Solvent or Water Based	16 Hours	20m^2/litre
Previously painted landscape timber (i.e. fencing etc.,)	Up to 8 Years	Solvent or Water Based	16 Hours	12m^2/litre
Previously painted masonry walls	Up to 15 Years	Solvent or Water Based	1 -2 Hours	14 -16m^2/litre
Previously painted masonry walls	Up to 15 Years	Solvent/Oil Based	12 Hours	8m^2/litre
Previously painted masonry walls	Up to 15 Years	Water Based	2 – 4 Hours	12 – 14m^2/litre
Previously painted metalwork	Up to 8 Years	Solvent or Water Based	4 – 8 Hours	15m^2/litre

AREA OF WORK	CERTIFICATION
All paint	BBA Accreditation or equivalent
Painting Buildings	BS 6150 or equivalent - Code of Practice
Workmanship on Building sites	BS 8000 or equivalent – Code of Practice
Paints and varnishes	BS EN ISO 12944 or equivalent
Protective coating of iron and steel structures against corrosion	BS EN ISO 12944 or equivalent

023. The Materials supplied must achieve failure free repaint and redecoration cycles of at least 15 years for masonry substrate and at least 8 years for all other substrates. The Provider must ensure that the paint and decorative Materials manufacturer "demonstrates compliance" to the Client's Representative. The Provider must ensure "premium products" are provided in all cases to secure that the paint and decorative Materials Supplier warrants the paint life as set out in the table above.

024. Obtain undercoats and finishing coats for an individual surface from the same manufacturer.

025. Ensure paints are delivered to the Property in sealed containers as received from the manufacturer and no labels are removed or painted out. Use the paint without adulteration.

026. Under no circumstances thin paint supplied by the manufacturer unless approved by the Client's Representative. When such approval has been granted, carry out thinning with thinners of the type stated in the manufacturer's technical data sheet.

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027. Execute painting in shades approved by the Client's Representative. Submit samples of tints before ordering Materials. Ensure each coat of paint matches the finished shade, and where tint types are required by the manufacturer's technical data sheet, they are used.

028. Provide samples of Materials to the Client's Representative for approval in sample tins filled 7/8 full after the contents of the container or kettle have been thoroughly stirred and mixed. Record all relevant details of the Materials sampled.

029. Immediately remove any unsatisfactory Materials from the Property and make good any Works executed with such defective Materials.

030. The Rates include for the use of varied colours in the Works and for the execution of sample patches, as required by the Client's Representative.

031. Use water based paints where appropriate.

Knotting

032. Use a best quality shellac knotting compound, dissolved in methylated spirits. Cover all knots and resinous parts.

Stopping

033. Ensure stopping/filler for:

- plasterwork - is a plaster based filler applied to a PVA solution primed surface, or a proprietary filler suitable for plaster repairs;
- internal woodwork, hardboard, fireboard and plywood - is a proprietary wood filler either suitably pre-coloured to match the base material or of a neutral colour and capable of being stained to match the required colour when stain is applied;
- external woodwork – is a proprietary filler recommended for external use approved by the Client's Representative, (and tinted to match the colour of the stained/varnished finish where appropriate); and
- clear finished woodwork - is tinted to match the surrounding woodwork.

Primer for alkaline surfaces

034. For alkaline surfaces use an alkali resistant sealer/primer and finish with a top coat of the type stated in the manufacturer's technical data sheet.

Primer for iron and steelwork

035. Prime iron and steelwork with a primer of the type stated in the manufacturer's technical data sheet for the subsequent finish coats.

Primer for galvanised iron and steelwork

036. Prime galvanised iron and steelwork with a primer that is compatible with the subsequent finish coats. Pretreat new galvanised surfaces with a mordant solution before priming.

Primer for hardboard

037. Where hardboard is not factory primed or sealed, use a suitable primer of the type stated in the manufacturer's technical data sheet for the subsequent finish coats.

Primer for woodwork

038. For woodwork, use a finishing ready mix primer obtained from the maker of the undercoat and finishing coats.

Primer for oily or resinous timbers

039. For British Columbia pine (Douglas fir) or other oily or resinous timber, use an aluminium based priming paint not darker than the applicable Standard, Colour 00A01 or equivalent approved by the Client's Representative which is compatible with the subsequent coats of the type stated in the manufacturer's technical data sheet.

Primer for stains

040. For stain finishes, ensure surfaces are clean, rubbed down to an even finish and lightly keyed to every coat except the top coat.

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Stabilising sealer

041. Use a type and make of stabilising sealer recommended by the manufacturer of the undercoat and finishing coat.

Chemical stripper

042. Ensure chemical paint stripper is water soluble.

Anti fungal solution

043. Ensure an anti-fungal solution is appropriate to the surface being treated and is used in accordance with Health and Safety Law.

PREPARATION OF SURFACES

Preparations

044. Thoroughly prepare all surfaces to a high standard of preparatory work. Note that "prepare" used in the Schedule of Rates includes all Works described below including washing down, rubbing down, filling in pin and plug holes, priming and painting extra coats, but excluding paint removal.

045. Report any necessary paint removal to the Client's Representative and agree the extent of this with the Client's Representative before starting this Work. Note that no payment will be made for paint removal unless this is done.

046. Apply a liberal brush coat of timber preservative conforming to Building Establishment Technical Note No. 24 (or equivalent) to existing bare non-durable timber surfaces. Allow adequate time for this to dry before overcoating.

047. Rub down previously painted surfaces in good condition with abrasive paper. Fill cracks as described in Paragraph 033 above. Subject to Paragraph 045 above, remove existing paint in poor condition completely using a non-caustic paint remover.

048. Treat stains on the ceiling before decoration to prevent them bleeding through subsequent decorative coatings with a proprietary stain stop or blocker appropriate to the substrate and in keeping with the requirements of the finish to be applied.

049. Use tinted undercoats if the Client's Representative so Instructs.

Approval

050. Where specified, obtain the approval of the Client's Representative to the preparation of surfaces before applying any coating.

Stopping

051. Where stopping/filling is referred to in this Part of this Specification, use the appropriate stopping as described in the Materials Paragraphs of this Part of this Specification.

Burning off

052. Burn off and rub down to remove paint from wooden surfaces. Fill in cracks, knot, prime and stop woodwork so exposed all as described for new Work, rub down with fine abrasive paper and apply one additional undercoat before painting as specified. Burning off is not permitted indoors without the express written permission of the Client's Representative.

Plaster, render, concrete and brickwork

053. Remove plaster or mortar splashes from the decorated surfaces by scraping. Stop all holes, cracks, etc. Brush down the whole surface to remove dust and loose material. Remove all traces of mould oil by scrubbing with water and detergent and rinsing with clean water to remove all detergent.

054. Allow plaster surfaces to dry out completely before decorating, (i.e.< 10% moisture content).

055. Remove efflorescence first by wiping dry with a dry course cloth and then with a damp cloth. Leave the surfaces for 48 hours to see if efflorescence has ceased and clean the surfaces to remove dirt, dust, etc. Allow the surfaces to dry out thoroughly before painting is commenced. When efflorescence has occurred or is suspected, defer painting as Instructed by the Client's Representative. New plaster/render should be allowed to dry for a minimum of 28 calendar days before decorating.

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056. Cut out loose and defective rendering and make good before redecoration. Stabilise existing surfaces to be redecorated with a stabilising agent of 1:10 PVA solution or 1:3PVA solution to soffits.

Plasterboard to receive direct redecoration

057. Finish the joints in plasterboard ceilings to receive textured decorative finishings as described in the 'Plasterwork and Other Floor, Wall and Ceiling Finishes' Specification.

058. Iron and steel

059. Remove rust, mill scale, welding slag and flux residue from iron and steel surfaces by wire brushing, scraping, hammering, flame cleaning, etc.

Previously painted metalwork

060. Thoroughly clean down all paintwork which is in sound condition and rub down with abrasive paper. Remove small areas of defective paint and all rust and loose scale by chipping, scraping and wire brushing back to clean metal. Prime the metal so exposed immediately after preparation with one coat of primer and apply one additional undercoat before painting.

061. Remove large areas of defective paint by using a non-caustic stripper appropriate to the substrate and in accordance with the technical data sheet for the subsequent coats or by chipping, scraping and wire brushing back to clean metal. In all cases where rust is apparent, scrape the rusting section and a sufficient area around it clean of all paint and rust and coat it with a rust inhibiting primer approved by the Client's Representative in addition to the priming coat described.

Defective putties

062. Hack out defective, cracked or uneven putties to glazing, prepare and prime the rebates as required and make good the putties before any painting is carried out. Allow putties to form a hard skin before painting with an oil based paint or allow no less than 14 calendar days drying time where water based paint/stain is to be applied.

Hardboard

063. Remove dirt and grease from hardboard surfaces. Before priming ensure all nail holes and other imperfections are stopped/filled in.

Plywood

064. Fill as required with a plastic based filler before priming/staining. Prime surfaces of internal plywood before painting with one coat of primer, filled as required with a plastic based filler. Rub and dust down and apply a second coat of primer/stain.

065. Before final priming/staining ensure that all imperfections are stopped, rubbed down and brushed off. Prime/stain surfaces of external plywood before painting with one coat of primer/stain. Where stain is to be applied use a stainable filler, or a filler pre-coloured to match the stain finish. Rub and dust down and apply a second coat of primer/stain.

Woodwork to be painted

066. Before fixing woodwork, rub down surfaces that will be visible after fixing. Scorch back excess resin from live knots and resin pockets. Coat all knots and resinous areas with fresh knotting. Prime all surfaces, ensure all nail holes and other imperfections are stopped/filled. Rub down the whole surface and brush off all dust before the undercoat is applied.

Previously painted woodwork

067. Wash down thoroughly with sugar soap or white spirit solution all paintwork which is in sound condition and allow to dry. Rub down to a smooth surface with an abrasive paper, achieving the final pre-paint finish with a fine grain abrasive paper to achieve a finish free from abrasive marks. Rinse well with clean water and allow to dry. Fill in cracks, etc., as described for new woodwork.

068. Remove small areas of cracked or defective paint by carefully scraping back to a firm edge. Knot, prime and stop woodwork so exposed as described for new work. Sand with fine abrasive paper and apply one additional undercoat before painting if required.

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069. Apply a liberal coat of brush applied water repellent timber preservative conforming to the recommendations of the applicable Standard or equivalent to bare existing non-durable timber surfaces or surfaces with defective areas of paint film. Allow adequate time to dry before overcoating.

070. On existing coated timber, remove any degraded surface timber by sanding down to clean sound timber. Remove resinous exudations by heat using hot air gun. Apply 2 coats of knotting to affected areas and any exposed knots and allow to dry.

071. On existing coated timber, remove dirt, algae and dead fibre by means of high pressure power hosing, apply one coat fungicide and leave for 72 hours.

Woodwork to receive a clear finish

072. Stop/fill holes and other imperfections in surfaces that are to receive a clear finish. Rub down the whole surface and brush off all dust.

073. Prepare existing varnished surfaces in sound condition by cleaning down with a suitable detergent and thoroughly rinsing them. Lightly key sound existing finishes to an even finish over the entire surface ensuring that all existing finish sheen is removed.

074. Strip and revarnish existing varnished surfaces in unsound condition.

Woodwork to receive stain finish

075. Prepare previously treated and untreated surfaces that are to receive a proprietary stain finish in accordance with the manufacturer's technical data sheet.

WORKMANSHIP

Paint

076. In order to eradicate any unauthorised addition of thinners or driers, or other adulteration of paint:

- give adequate supervision during the painting work to ensure that paint is not adulterated;
- note that if cases of unauthorised or excessive thinning or other adulterations are discovered, the Client's Representative may require the removal of the Staff members concerned;
- ensure a notice is exhibited drawing the attention of Staff to the Client's requirement to use paint as supplied by the manufacturer and the consequences of a breach of this requirement; and
- note that similar requirements will apply to Subcontractors.

Stirring of Materials

077. Thoroughly stir the contents of all cans and containers of Materials before and during use. Suitably strain them as and when necessary.

Application

078. Apply coatings by brush or roller. Use sprays only with the prior approval of the Client's Representative. Where spray application is approved it shall be applied as directed by the manufacturer, including thinning with thinners of a type and to a ratio that complies with the manufacturer's technical data sheet.

Priming of glazing beads

079. Prime/stain glazing beads, rebates and the backs of beads at the same time as priming/staining the window frames.

Condition of priming

080. If the priming/staining has in any way deteriorated or has been damaged by the time of the first coat, rub down and reprime/re-stain the affected portions, or the whole if necessary. Where required, touch up with the same primer/stain or equivalent all articles, such as the windows, that were primed by their manufacturers.

Coatings to be dry

081. Allow coatings to dry thoroughly for the time specified by the manufacturer before applying succeeding coats.

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Painting windows/doors

082. Do not paint windows or doors in the closed position.

Rubbing down

083. Rub down and de-nib undercoats for paints and clear finishes to a smooth surface with abrasive paper. Remove all dust before the succeeding coat is applied.

Differing colours of undercoats

084. Ensure each succeeding coat of priming and undercoating paint is sufficiently different in colour to be readily distinguishable.

Unsuitable conditions

085. Do not apply coating:

- to surfaces affected by wet, damp, foggy or frosty weather or other unsuitable conditions;
- to any damp surface;
- in temperatures below 50 Centigrade; or
- when heat is likely to cause blistering or wrinkling.

086. Take all necessary precautions including restrictions on working hours, providing temporary protection and allowing extra drying time, to ensure that coatings are not adversely affected by climatic conditions before, during and after application.

Protection of wet surfaces

087. Take adequate care to protect surfaces whilst still wet, by the use of screens and 'wet paint' signs where necessary. Take responsibility for any damage which may be caused by or through wet paint.

Damage to adjoining surfaces

088. Take care not to damage or stain other Works when storing Materials, preparing surfaces, or applying paint or stains. Remove all such stains, making good the stained surface and touching up any paintwork disturbed.

Cleanliness

089. Keep surfaces clean and free from dust during the painting processes. Do not carry out painting in the vicinity of other operations which might cause dust. Provide a suitable movable receptacle into which all liquids (including slop washings) are placed. Ensure this is not tipped down any of the gullies, manholes, sinks, basins, water closets or any other sanitary fittings. Remove all solid refuse or inflammable residues from the Property.

Removal of ironmongery

090. Remove surface fixed ironmongery, fittings and door/window furniture (except hinges) before painting and refix them on completion.

Radiators

091. Take down radiators to allow the proper decoration of the surfaces behind. Refit the radiators and refill the systems including inhibitor and balance if required.

Protection of furniture

092. Protect all furniture and fittings, use dust sheets and remove items such as curtains before commencing the Works. Rehang or reinstate on completion of the Works.

Protection:

093. Adequately protect both internal and external surfaces which are not to be coated, by covering with dust sheets or other suitable materials. Display 'Wet paint' signs and provide barriers where necessary to prevent damage to freshly applied coatings.

Concealed Joinery Surfaces

094. Where one or more additional coats are specified to be applied in the factory, they must be applied to all surfaces, including those which will be concealed when incorporated into the Property.

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Painting Existing Concrete

095. Preparation: - Remove surface salts and other loose material with stiff brush. Leave for 48 hours and repeat process if necessary. Apply one coat of fungicide solution and leave for 72 hours, apply one coat proprietary sealer/primer, carefully remove all loose or defective areas of coating to a firm edge. Thoroughly clean by wiping down with white spirit or washing with water containing detergent. Remove heavy deposits of oil, grease, etc. with a suitable proprietary cleaning solution, sand down surfaces while still wet to provide a key, rinse off and allow to dry, patch prime as specified. fill joints, cracks, holes and other depressions with filler worked well in and finished off flush with surface. Sand smooth and remove dust, apply additional coats to areas where paint has been removed to restore the original coating thickness (Bring forward). Sand down junctions to give a flush surface.

096. Apply an initial coat of exterior quality water based masonry paint and one finishing coat of exterior quality water based masonry paint.

Painting New Concrete

097. Preparation: - Remove surface salts and other loose material with stiff brush. Leave for 48 hours and repeat process if necessary. Apply one coat of fungicide solution and leave for 72 hours, apply one coat proprietary sealer/primer, apply one coat of exterior quality water based masonry paint thinned as necessary in accordance with the manufacturer's technical data sheet. Sand down junctions to give a flush surface.

098. Apply an initial coat of exterior quality water based masonry paint and one finishing coat of exterior quality water based masonry paint.

Painting Existing Render

099. Preparation: Take back to a firm edge all areas of poorly adhering or defective coatings. Remove all loose or powdery material by vigorously brushing down with suitable stiff brushes and dust off. Where appropriate on smooth surfaces, rub down sound areas to produce the necessary key for good adhesion and dust off. Cut out and make good all cracks, holes, open joints and other imperfections etc., with an approved proprietary filler, rub down smooth and dust off. Prime all sound bare areas exposed by the removal of coatings with one coat of exterior quality water based masonry paint, thinned as necessary in accordance with the manufacturer's technical data sheet. Apply stabilising primer to all areas. Bring forward all areas which during preparation were taken back to bare substrate or disfigured/exposed by the removal of the previous coating with one coat of exterior quality water based masonry paint of the selected shade.

100. Apply initial coat of exterior quality water based masonry paint and one finishing coat of exterior quality water based masonry paint.

Painting New Render

101. Preparation: Thoroughly clean down to remove all surface contamination, mortar splashes, nibs etc. Allow to fully dry. Cut out and make good all cracks, holes, open joints and other imperfections etc., with an approved proprietary filler, rub down smooth and dust off. Apply one coat of exterior quality water based masonry paint, thinned as necessary in accordance with the manufacturer's technical data sheet.

102. Apply initial coat of exterior quality water based masonry paint and one finishing coat of exterior quality water based masonry paint.

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Painting Existing Concrete/Render with Anti-Graffiti Paint

103. Preparation: Carefully remove all loose or defective areas of coating to a firm edge. Thoroughly clean by wiping down with white spirit or washing with water containing detergent. Remove heavy deposits of oil, grease, etc. with a suitable proprietary cleaning solution. - Sand down surfaces while still wet to provide a key. Rinse off and allow to dry, patch prime as specified, fill joints, cracks, holes and other depressions with filler worked well in and finished off flush with surface. Sand smooth and remove dust. Apply additional coats to areas where paint has been removed to restore the original coating thickness (Bring forward). Sand down junctions to give a flush surface.

104. Apply initial coat of two pack water based epoxy anti-graffiti paint and one finishing coat of two pack water based epoxy anti-graffiti paint.

Painting New Concrete/Render with Anti-Graffiti Paint

105. Preparation: Remove surface salts and other loose material with stiff brush. Leave for 48 hours and repeat process if necessary. Apply one coat of fungicide solution and leave for 72 hours, fill joints, cracks, holes and other depressions with filler worked well in and finished off flush with surface. Sand smooth and remove dust. Apply one coat proprietary sealer/primer. Sand down junctions to give a flush surface.

106. Apply initial coat of two pack water based epoxy anti-graffiti paint and one finishing coat of two pack water based epoxy anti-graffiti paint.

Painting Existing Coated Brickwork/Blockwork

107. Preparation: Carefully remove all loose or defective areas of coating to a firm edge. Thoroughly clean by wiping down with white spirit or washing with water containing detergent. Remove heavy deposits of oil, grease, etc. with a suitable proprietary cleaning solution. Sand down surfaces while still wet to provide a key. Rinse off and allow to dry, patch prime as specified. Fill joints, cracks, holes and other depressions with filler worked well in and finished off flush with surface. Sand smooth and remove dust. Apply additional coats to areas where paint has been removed to restore the original coating thickness (Bring forward). Sand down junctions to give a flush surface.

108. Apply one initial coat of exterior quality solvent based masonry paint, and one finishing coat of exterior quality solvent based masonry paint.

Painting New Brickwork/Blockwork

109. Preparation: Carefully remove all loose mortar etc. Thoroughly clean by wiping down with white spirit or washing with water containing detergent. New brickwork/blockwork: Remove surface salts and other loose material with stiff brush. Leave for 48 hours and repeat process if necessary. Apply one coat of exterior quality solvent based masonry paint thinned as necessary in accordance with the manufacturer's technical data sheet. Sand down junctions to give a flush surface.

110. Apply one initial coat of exterior quality solvent based masonry paint, and one finishing coat of exterior quality solvent based masonry paint.

Painting Existing Plaster – Oil based Paint

111. Preparation: Remove dirt and surface deposit with a stiff brush and rub down to remove nibs, trowel marks, plaster and paint splashes. Widen cracks sufficiently to receive proprietary filler. Brush cracks to remove any loose plaster and fill with proprietary filler and rub flush with surface. Apply one coat proprietary primer/sealer.

112. Apply one initial coat of oil based vapour barrier paint and one finishing coat of oil based vapour barrier paint.

Painting New Plaster – Oil based Paint

113. Preparation: Lightly rub over-trowelled glossy plaster with worn abrasive paper. Fill all depressions, holes and cracks and lightly rub down flush with surface, apply one coat proprietary sealer/primer.

114. Apply one initial coat of oil based vapour barrier paint and one finishing coat of oil based vapour barrier paint.

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Painting Existing Plaster – Emulsion Paint

115. Preparation: - Remove dirt and surface deposits with a stiff brush. Widen cracks sufficiently to receive proprietary filler. Brush cracks to remove any loose plaster and fill with proprietary filler and rub flush with surface. Rub down to remove nibs, trowel marks and plaster and paint splashes, lightly rub over-trowelled glossy plaster with worn abrasive paper, fill all depressions, holes and cracks and lightly rub down flush with surface, apply one coat proprietary sealer/primer.

116. Apply two finishing coats of emulsion paint.

Painting New Plaster – Emulsion Paint

117. Preparation: - Remove dirt and surface deposits with a stiff brush. Rub down to remove nibs, trowel marks and plaster splashes, lightly rub over-trowelled glossy plaster with worn abrasive paper, fill all depressions, holes and cracks and lightly rub down flush with surface, apply one coat proprietary sealer/primer, apply one coat of emulsion paint thinned as necessary in accordance with the manufacturer's technical data sheet.

118. Apply two finishing coats of emulsion paint.

Painting Existing Plaster – Eggshell Paint – Fire Retardant Paint

119. Preparation: Thoroughly clean down the surfaces to remove all dirt, grease and surface contaminants. Carefully scrape back to a firm edge all areas of poorly adhering or defective coatings. Powdery and friable surface coatings are to be completely removed by scraping, brushing and washing. Allow the surface to fully dry before proceeding. Where appropriate rub down sound areas to produce the necessary key for good adhesion and feather broken edges of existing coating. Dust off. Make good holes, cracks and other imperfections with an approved proprietary filler, rub down and dust off.

120. Initial coats: Prime all sound bare areas with one coat of eggshell paint thinned in accordance with the manufacturer's technical data sheet.

121. Apply two finishing coats of eggshell paint.

Painting New Plaster – Eggshell Paint – Fire Retardant Paint

122. Preparation: Remove dirt and surface deposits with a stiff brush. Rub down to remove nibs, trowel marks and plaster splashes, lightly rub over-trowelled glossy plaster with worn abrasive paper, fill all depressions, holes and cracks and lightly rub down flush with surface, apply one coat proprietary sealer/primer, apply one coat of eggshell paint thinned in accordance with the manufacturer's technical data sheet.

123. Apply two finishing coats of eggshell paint.

Painting Existing Plaster – Vinyl Matt Paint

124. Preparation: Thoroughly clean down the surfaces to remove all dirt, grease and surface contaminants. Carefully scrape back to a firm edge all areas of poorly adhering or defective coatings. Powdery and friable surface coatings are to be completely removed by scraping, brushing and washing. Allow the surface to fully dry before proceeding. Where appropriate rub down sound areas to produce the necessary key for good adhesion and feather broken edges of existing coating. Dust off. Make good holes, cracks and other imperfections with an approved proprietary filler, rub down and dust off.

125. Initial coats: Prime all sound bare areas with one coat of vinyl matt paint thinned in accordance with the manufacturer's technical data sheet.

126. Apply two finishing coats of vinyl matt paint.

Painting New Plaster – Vinyl Matt Paint

127. Preparation: Remove dirt and surface deposits with a stiff brush. Rub down to remove nibs, trowel marks and plaster splashes, lightly rub over-trowelled glossy plaster with worn abrasive paper, fill all depressions, holes and cracks and lightly rub down flush with surface, apply one coat proprietary sealer/primer, apply one coat of vinyl matt paint thinned in accordance with the manufacturer's technical data sheet.

128. Apply two finishing coats of vinyl matt paint.

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Painting Existing Painted Internal Surfaces – Anti Graffiti Paint

129. Preparation: Remove existing graffiti with an approved appropriate graffiti removal system, thoroughly clean down the surfaces to remove all dirt, grease and surface contaminants. Carefully scrape back to a firm edge all areas of poorly adhering or defective coatings. Powdery and friable surface coatings are to be completely removed by scraping, brushing and washing. Allow the surface to fully dry before proceeding. Where appropriate rub down sound areas to produce the necessary key for good adhesion and feather broken edges of existing coating. Dust off. Make good holes, cracks and other imperfections with an approved proprietary filler, rub down and dust off.

130. Prime all sound bare areas with one coat of anti-graffiti paint sealer, bring forward sealed areas with anti-graffiti paint primer, apply two finishing coats of anti-graffiti paint.

Painting Internal Surfaces – Anti Graffiti Paint

131. Preparation: Thoroughly clean down the surfaces to remove all dirt, grease and surface contaminants. Powdery and friable surface coatings are to be completely removed by scraping, brushing and washing. Allow the surface to fully dry before proceeding. Where appropriate rub down sound areas to produce the necessary key for good adhesion and feather broken edges of existing coating. Dust off. Make good holes, cracks and other imperfections with an approved proprietary filler, rub down and dust off.

132. Prime all sound bare areas with one coat of anti-graffiti paint sealer, bring forward sealed areas with anti-graffiti paint primer, apply two finishing coats of anti-graffiti paint.

Painting Existing Painted Internal Surfaces – Euroclass B Fire Retardant Finish

133. Preparation: Remove existing graffiti with an approved appropriate graffiti removal system, thoroughly clean down the surfaces to remove all dirt, grease and surface contaminants. Carefully scrape back to a firm edge all areas of poorly adhering or defective coatings. Powdery and friable surface coatings are to be completely removed by scraping, brushing and washing. Allow the surface to fully dry before proceeding. Where appropriate rub down sound areas to produce the necessary key for good adhesion and feather broken edges of existing coating. Dust off. Make good holes, cracks and other imperfections with an approved proprietary filler, rub down and dust off. Seal marks or suspect areas and surfaces that remain powdery and friable after thorough preparation with one coat of stain blocker.

134. Finishing system: Apply three coats of Euroclass B standard paint as Instructed by the Client's Representative. Fire retardant basecoat applied strictly in accordance with the manufacturer's technical data sheet. Apply two finishing coats of eggshell paint.

Painting New Internal Surfaces – Euroclass B Fire Retardant Finish

135. Preparation: Thoroughly clean down the surfaces to remove all dirt, grease and surface contaminants. Allow the surface to fully dry before proceeding. Where appropriate rub down sound areas to produce the necessary key for good adhesion. Dust off. Make good holes, cracks and other imperfections with an approved proprietary filler, rub down and dust off.

136. Finishing system: Apply three coats of Euroclass B standard paint as Instructed by the Client's Representative. Fire retardant basecoat applied strictly in accordance with the manufacturer's technical data sheet. Apply two finishing coats of eggshell paint.

Painting Previously Painted Internal Metal – Gloss Paint

137. Preparation: Thoroughly clean down to remove all surface contamination. Carefully scrape back to a firm edge all areas of damaged paint coatings. Scrape and wire brush corroded steel to produce a clean metal surface. Rub down with a suitable abrasive and dust off. All surfaces should be prepared to the minimum standard recommended in the applicable Standard or equivalent at the time of coating. Prime all bare metal with two coats of zinc phosphate primer, applied in accordance with the manufacturer's technical data sheet. Bring forward primed areas with one coat of undercoat.

138. Apply two finishing coats of 8 years all weather protection metal gloss finish paint, applied in accordance with the manufacturer's technical data sheet.

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Painting New Internal Metal – Gloss Paint

139. Preparation: Thoroughly clean down to remove all surface contamination. Rub down with a suitable abrasive and dust off. All surfaces should be prepared to the minimum standard recommended in the applicable Standard or equivalent at the time of coating at the time of coating. Prime all metal with two coats of zinc phosphate primer, applied in accordance with the manufacturer's technical data sheet. Apply one coat of undercoat.

140. Apply two finishing coats of 8 years all weather protection metal gloss finish paint, applied in accordance with the manufacturer's technical data sheet.

Painting Previously Painted External Metal – Gloss Paint

141. Preparation: Thoroughly clean down to remove all surface contamination. Carefully scrape back to a firm edge all areas of damaged paint coatings. Scrape and wire brush corroded steel to produce a clean metal surface. Rub down to smooth edges with a suitable abrasive and dust off. All surfaces should be prepared to a minimum standard recommended in the applicable Standard or equivalent at the time of coating. Prime all bare metal with two coats of zinc phosphate primer or other equal approved, applied in accordance with the manufacturer's technical data sheet. Bring forward primed areas with one coat of undercoat.

142. Apply two finishing coats of 8 years all weather protection metal gloss finish paint, applied in accordance with the manufacturer's technical data sheet

Painting New External Metal – Gloss Paint

143. Preparation: Thoroughly clean down to remove all surface contamination. Rub down with a suitable abrasive and dust off. All surfaces should be prepared to the minimum standard recommended in the applicable Standard or equivalent at the time of coating at the time of coating. Prime all metal with two coats of zinc phosphate primer, applied in accordance with the manufacturer's technical data sheet. Apply one coat of undercoat.

144. Apply two finishing coats of 8 years all weather protection metal gloss finish paint, applied in accordance with the manufacturer's technical data sheet.

Painting Galvanised steel or equivalent – Gloss Paint

145. Preparation: Wash with white spirit to remove dirt and grease then wash with mild detergent solution and rinse off with clean water. Pretreat with mordant solution. Retreat non-blackened areas to achieve blackening of whole of surface. If galvanizing is defective obtain instructions before proceeding.

146. Apply one coat zinc phosphate primer, apply one coat of undercoat.

147. Apply two finishing coats of 8 years all weather protection metal gloss finish paint, applied in accordance with the manufacturer's technical data sheet.

Painting Previously Painted Internal Timber – Gloss Oil Paint

148. Preparation: Carefully scrape back to a firm edge all areas of poorly adhering or defective coatings. Rub down to feather broken edges of existing coating and dust off. Wash down the surfaces with soap and water, detergent solution or suitable solvent to remove all dirt, grease and surface contaminants. Whilst wet, rub down the surfaces with a suitable abrasive, taking care to avoid exposing timber on sharp edges. Finally rinse down and allow to dry. Make good all nail holes, open joints and open grain etc with an approved proprietary filler, rub down smooth and dust off. Apply two thin coats of knotting solution to all knots and resinous areas and allow to harden. Spot prime any bare metal, metal fixings, nail heads etc., with one coat of metal primer; prime all bare areas and areas exposed by the removal of coatings with one coat of wood primer, thinned as manufacturer's technical data sheet. Bring forward areas with undercoat.

149. Apply one coat of oil based undercoat and one finishing coat of gloss oil based paint.

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Painting Previously Painted Internal Timber – Gloss Water Based Paint (Micro Porous)

150. Preparation: Carefully scrape back to a firm edge all areas of poorly adhering or defective coatings. Rub down to feather broken edges of existing coating and dust off. Wash down the surfaces with soap and water, detergent solution or suitable solvent to remove all dirt, grease and surface contaminants. Whilst wet, rub down the surfaces with a suitable abrasive, taking care to avoid exposing timber on sharp edges. Finally rinse down and allow to dry. Make good all nail holes, open joints and open grain etc., with an approved proprietary filler, rub down smooth and dust off. Apply two thin coats of knotting solution to all knots and resinous areas and allow to harden. Spot prime any bare metal, metal fixings, nail heads etc., with one coat of metal primer; prime all bare areas and areas exposed by the removal of coatings with one coat of wood primer, thinned as manufacturer's technical data sheet. Bring forward areas with undercoat.

151. Apply one coat of water based undercoat and one finishing coat of micro porous gloss water based paint.

Painting New Internal Timber – Gloss Oil Paint

152. Preparation: Wash down the surfaces with soap and water, detergent solution or suitable solvent to remove all dirt, grease and surface contaminants. Whilst wet, rub down the surfaces with a suitable abrasive. Finally rinse down and allow to dry. Make good all nail holes, open joints and open grain etc with an approved proprietary filler, rub down smooth and dust off. Apply two thin coats of knotting solution to all knots and resinous areas and allow to harden. Spot prime any bare metal, metal fixings, nail heads etc., with one coat of metal primer; apply one coat of wood primer.

153. Apply two coats of oil based undercoat and one finishing coat of gloss oil based paint.

Painting New Internal Timber – Gloss Water Based Paint (Micro Porous)

154. Preparation: Wash down the surfaces with soap and water, detergent solution or suitable solvent to remove all dirt, grease and surface contaminants. Whilst wet, rub down the surfaces with a suitable abrasive. Finally rinse down and allow to dry. Make good all nail holes, open joints and open grain etc with an approved proprietary filler, rub down smooth and dust off. Apply two thin coats of knotting solution to all knots and resinous areas and allow to harden. Spot prime any bare metal, metal fixings, nail heads etc., with one coat of metal primer; apply one coat of wood primer.

155. Apply two coats of water based undercoat and one finishing coat of micro porous gloss water based paint.

Painting Previously Painted External Timber – Exterior Quality Gloss Paint

156. Preparation: Thoroughly clean down surfaces to remove all dirt, grease and surface contaminants. Remove all areas of blistered, poorly adhering or defective coatings. Where flaking has occurred or coatings are defective, the entire member or section must be stripped back to the nearest joint. Open up all joints which are not tight fitting and rake out thoroughly. Rub down to feather broken edges of existing coating and dust off. Abrade the surfaces in the direction of the grain to remove any grey denatured timber and raised grain, round all sharp edges. Make good all cracks, nail holes, open joints and open grain etc., with an approved proprietary filler, rub down smooth and dust off. Apply two thin coats of knotting to all knots and resinous areas and allow to harden. Spot prime any bare metal, metal fixings, nail heads etc., with one coat of metal primer. Prime all bare areas and areas exposed by the removal of coatings with one coat of exterior preservative primer. Bring forward all primed and/or filled areas to match existing with one coat of 8 years all weather protection exterior micro porous flexible undercoat of appropriate shade.

157. Apply one coat of 8 year all weather protection micro porous undercoats of appropriate shade, and one finishing coat of 8 year all weather protection micro porous exterior high gloss paint.

Painting New External Timber – Exterior Quality Gloss Paint

158. Preparation: Thoroughly clean down surfaces to remove all dirt, grease and surface contaminants. Abrade the surfaces in the direction of the grain to remove any grey denatured timber and raised grain, round all sharp edges. Make good all cracks, nail holes, open joints and open grain etc., with an approved proprietary filler, rub down smooth and dust off. Apply two thin coats of knotting to all knots and resinous areas and allow to harden. Spot prime any bare metal, metal fixings, nail heads etc., with one coat of metal primer. Apply one coat of exterior preservative primer.

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159. Apply one coat of 8 year all weather protection micro porous undercoats of appropriate shade, and two finishing coats of 8 year all weather protection micro porous exterior high gloss paint.

Painting Previously Painted Internal Plastic – Gloss

160. Preparation: Carefully scrape back to a firm edge all areas of poorly adhering or defective coatings. Rub down to feather broken edges of existing coating and dust off. Wash down the surfaces with soap and water, detergent solution or suitable solvent to remove all dirt, grease and surface contaminants. Whilst wet, rub down the surfaces with a suitable abrasive. Finally rinse down and allow to dry. Prime all bare areas with preservative primer. Bring forward all primed areas with one coat of gloss paint.

161. Apply one finishing coat of gloss paint.

Painting Previously Painted External Plastic – Gloss

162. Preparation and making good: Carefully scrape back to a firm edge all areas of poorly adhering or defective coatings. Rub down to feather broken edges of existing coating and dust off. Wash down the surfaces with soap and water, detergent solution or suitable solvent to remove all dirt, grease and surface contaminants. Whilst wet, rub down the surfaces with a suitable abrasive. Finally rinse down and allow to dry. Prime all bare areas with preservative primer. Bring forward all primed areas with one coat of 8 year all weather protection micro porous exterior gloss.

163. Apply one finishing coat of 8 year all weather protection micro porous exterior gloss paint.

Previously Wood-stained Internal Timber – Decorative Protection

164. Preparation: Carefully scrape back to a firm edge all areas of poorly adhering or defective coatings. Rub down to feather broken edges of existing coating and dust off. Wash down the surfaces with soap and water, detergent solution or suitable solvent to remove all dirt, grease and surface contaminants. Whilst wet, rub down the surfaces with a suitable abrasive, taking care to avoid exposing timber on sharp edges. Finally rinse down and allow to dry. Make good all nail holes, open joints and open grain etc., with an approved proprietary filler, rub down smooth and dust off. Touch in any bare areas with one coat of decorative wood-stain of appropriate shade, thinned as manufacturer's technical data sheet.

165. Apply two finishing coats of decorative wood-stain of selected shade, apply wood-stain in flowing coats, redistribute excess material by brushing before wood-stain has set, allow not less than 24 hours between coats.

New Internal Timber – Decorative Protection

166. Preparation: Wash down the surfaces with soap and water, detergent solution or suitable solvent to remove all dirt, grease and surface contaminants. Rinse down and allow to dry. Make good all nail holes, open joints and open grain etc., with an approved proprietary filler, rub down smooth and dust off. Apply one coat of decorative wood-stain of appropriate shade, thinned as manufacturer's technical data sheet.

167. Apply two finishing coats of decorative wood-stain of selected shade, apply wood-stain in flowing coats, redistribute excess material by brushing before wood-stain has set, allow not less than 24 hours between coats.

Previously Opaque Wood-stained External Timber – Decorative Protection

168. Preparation: Thoroughly clean down surfaces to remove all dirt, grease and surface contaminants. Remove all areas of blistered, poorly adhering or defective coatings. Where flaking has occurred or coatings are defective, the entire member or section must be stripped back to the nearest joint. Open up all joints which are not tight fitting and rake out thoroughly. Rub down to feather broken edges of existing coating and dust off. Abrade the surfaces in the direction of the grain to remove any grey denatured timber and raised grain, round all sharp edges. Make good all cracks, nail holes, open joints and open grain etc., with an approved proprietary stopper/filler designed for use with a wood-stain system, rub down smooth and dust off. Apply two thin coats of knotting solution to all knots and resinous areas and allow to harden. Prime all sound bare areas and areas exposed by the removal of coatings with one coat of 8 year all weather preservative basecoat. If required, touch in any primed areas with 8 year all weather protection stain to match the surrounding timber for colour and build. Allow to dry.

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169. Apply two finishing coats of opaque 8 year all weather protection wood-stain of selected shade, apply wood-stain in flowing coats, redistribute excess material by brushing before wood-stain has set, allow not less than 24 hours between coats.

Opaque Wood-stained New External Timber – Decorative Protection

170. Preparation: Thoroughly clean down surfaces to remove all dirt, grease and surface contaminants. Abrade the surfaces in the direction of the grain to remove any grey denatured timber and raised grain, round all sharp edges. Make good all cracks, nail holes, open joints and open grain etc., with an approved proprietary stopper/filler designed for use with a wood-stain system, rub down smooth and dust off. Apply two thin coats of knotting solution to all knots and resinous areas and allow to harden. Apply one coat of 8 year all weather preservative basecoat.

171. Apply three finishing coats of opaque 8 year all weather protection wood-stain of selected shade, apply wood-stain in flowing coats, redistribute excess material by brushing before wood-stain has set, allow not less than 24 hours between coats.

Previously Transparent Wood-stained External Timber – Decorative Protection

172. Preparation: Thoroughly clean down surfaces to remove all dirt, grease and surface contaminants. Remove all areas of blistered, poorly adhering or defective coatings. Where flaking has occurred or coatings are defective, the entire member or section must be stripped back to the nearest joint. Open up all joints which are not tight fitting and rake out thoroughly. Rub down to feather broken edges of existing coating and dust off. Abrade the surfaces in the direction of the grain to remove any grey denatured timber and raised grain, round all sharp edges. Make good all cracks, nail holes, open joints and open grain etc., with an approved proprietary stopper/filler designed for use with a wood-stain system, rub down smooth and dust off. Apply two thin coats of knotting solution to all knots and resinous areas and allow to harden. Prime all sound bare areas and areas exposed by the removal of coatings with one coat of 8 year all weather preservative basecoat. If required, touch in any primed areas with 8 year all weather protection stain to match the surrounding timber for colour and build. Allow to dry.

173. Apply two finishing coats of transparent 8 year all weather protection wood-stain of selected shade, apply wood-stain in flowing coats, redistribute excess material by brushing before wood-stain has set, allow not less than 24 hours between coats.

Transparent Wood-stained New External Timber – Decorative Protection

174. Preparation: Thoroughly clean down surfaces to remove all dirt, grease and surface contaminants. Abrade the surfaces in the direction of the grain to remove any grey denatured timber and raised grain, round all sharp edges. Make good all cracks, nail holes, open joints and open grain etc., with an approved proprietary stopper/filler designed for use with a wood-stain system, rub down smooth and dust off. Apply two thin coats of knotting solution to all knots and resinous areas and allow to harden. Apply one coat of 8 year all weather preservative basecoat.

175. Apply three finishing coats of transparent 8 year all weather protection wood-stain of selected shade, apply wood-stain in flowing coats, redistribute excess material by brushing before wood-stain has set, allow not less than 24 hours between coats.

Previously Varnished Internal Timber – Polyurethane Varnish

176. Preparation: and making good: Carefully scrape back to a firm edge all areas of poorly adhering or defective coatings. Rub down to feather broken edges of existing coating and dust off. Wash down the surfaces with soap and water, detergent solution or suitable solvent to remove all dirt, grease and surface contaminants. Whilst wet, rub down the surfaces with a suitable abrasive, taking care to avoid exposing timber on sharp edges. Finally rinse down and allow to dry. Make good all nail holes, open joints and open grain etc with an approved proprietary filler, rub down smooth and dust off. Touch in any bare areas with one coat of interior polyurethane varnish or other equal approved, thinned as manufacturer's technical data sheet.

177. Apply two finishing coats of gloss, satin or matt interior polyurethane varnish as specified, brush well in avoiding aeration and layoff, rub down lightly between coats along the grain.

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Previously Preservative Treated Sawn Timber; External

178. Preparation: Brush down to remove loose fibres, grey denatured timber and poorly adhering or defective coatings. Thoroughly clean down the surfaces with soap and water, detergent solution or suitable solvent to remove all dirt, grease and surface contaminants. Rinse with clean water and allow to dry. Surfaces which are contaminated with mould and/or vegetable growths should be scraped and treated with an appropriate fungicidal wash applied strictly in accordance with the manufacturer's technical data sheet. Ensure all surfaces are completely dry. Apply two thin coats of knotting solution to all knots and resinous areas and allow to dry. Spot prime all knots and bare areas with two coats of coloured timber preservative primer.

179. Apply one or two (as specified by Client's Representative) finishing coats of opaque fencing timber preservative of selected shade.

Preservative Treated New Sawn Timber; External

180. Preparation: Brush down to remove loose fibres and grey denatured timber Thoroughly clean down the surfaces with soap and water, detergent solution or suitable solvent to remove all dirt, grease and surface contaminants. Rinse with clean water and allow to dry. Apply two thin coats of knotting solution to all knots and resinous areas and allow to dry. Spot prime all knots and bare areas with two coats of coloured timber preservative primer.

181. Apply two finishing coats of opaque fencing timber preservative of selected shade.

Stripping Wallpaper

182. Strip wall paper, lining paper, etc., clear away debris, remove dirt and surface deposits with a stiff brush, rub down to remove trowel marks, plaster and paint splashes. Lightly rub glossy plaster with worn abrasive paper. - Fill all depressions, holes and cracks with suitable filler and lightly rub down flush with surface.

Vinyl Covered Backgrounds

183. Where these are to be stripped, the paper backing may be retained as a lining if in good condition and firmly adhering. Stick down any lifting edges and corners.

Treatment of Organic Growths

184. Remove all loose growths and infected coatings/decorations. Apply appropriate biocidal solution to growth areas and surrounding surfaces. Scrape or brush off all dead growth. Remove infected materials immediately to ensure that no other areas become infected. Apply appropriate residual effect biocidal solution to inhibit re-establishment of growths. Biocides must be approved and registered by the Health and Safety Executive (HSE) and listed as surface biocides.

Hanging Wallpaper, Lining Paper etc

185. All joints must be truly vertical and/or horizontal, straight and fully adhered with edges neatly cut to ceilings and skirtings. Finished coverings must be securely adhered, smooth and free of air bubbles, wrinkles, gaps, tears, adhesive marks and stains.

Sizing

186. Where specified size surfaces with a solution of wallpaper paste diluted in accordance with the manufacturers technical data sheet.

Lining Paper

187. Apply size to walls and hang lining paper with adhesive to the applicable Standard or equivalent with butt joints and turn all edges. When not specified otherwise, select type and weight to suit covering and background. Hang lengths with butt joints; do not overlap. Hang lengths transversely to direction of covering. Leave to dry for 24 hours before hanging covering.

Adhesive

188. When not specified otherwise, use a type recommended by the covering manufacturer or, in the absence of such recommendation, use a type approved by the Client's Representative. Adhesives must contain a fungicide and be made up in accordance with the manufacturer's technical data sheet.

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Coverings

189. Self-edged coverings are to be trimmed to a true straight edge before hanging, unless the manufacturer recommends overlap joints. Hang wall coverings vertically unless specified otherwise. Hang ceiling coverings parallel to the main window wall unless specified otherwise. Isolate any metallic foil/fabric coverings from electrical contact.

Joints in Coverings

190. Hang lengths with neat butt joints with the patterns matching where applicable. Hang lengths with neat, overlapped joints only when permitted by the covering manufacturer where butt joints are impractical.

191. Hang lengths in one piece wherever possible. Cross joints are only permitted where single lengths are impractical.

Joints in Coverings - Overlapped and Cut

192. Hang lengths with neat, overlapped joints. Cut through when stable to a true straight edge, without damaging the background, and bond joints. Hang lengths in one piece wherever possible. Cross joints are only permitted where single lengths are impractical.

Shading

193. Use lengths in the sequence they are cut from the roll. Check each length for colour and pattern match before hanging.

194. Do not reverse alternate lengths unless recommended by the covering manufacturer.

195. Check for shade variation after hanging the first three lengths. Inform the Client's Representative of any variation before proceeding.

Graffiti Removal

196. Apply a low odour bio-degradable chemical remover to the graffiti treating small areas at a time.

197. After the detergent remover has taken effect, the surface can be cleaned using a hot/cold power washer with a fan jet head. Pressure should be restricted to less than 1500PSI to avoid possible damage to masonry surfaces.

198. All applications shall be carried out in accordance with Health and Safety requirements and with the manufacturer's technical data sheet. Suitable detergent cleaners only shall be selected for the surface to be cleaned.

Mould Growth Treatment

199. Clean all infected surfaces and surrounding area with anti-bacterial mould growth remover.

200. Wash down cleaned surfaces and apply anti-fungicidal solution to prevent re-growth.

201. Where repainting is required proprietary anti-fungicidal paint systems shall be used.

202. All paint and chemical solutions must be applied strictly in accordance with the manufacturer's health and safety instructions on their technical data sheet. Fully comply with all health and safety requirements.

Cleaning Rainwater Gutters and Pipes

203. Clear all dirt and debris from inside of gutter and clean.

204. Clean out defective joints of gutters and seal with suitable jointing material to satisfaction of the Client's Representative.

205. Clean outside face of gutters, when the inside has been cleaned.

206. Clear all dirt and debris from inside of rainwater pipes.

207. Clean out defective joints of rainwater pipes and seal with suitable jointing material to satisfaction of the Client.

208. Clean outside face of downpipes, when the inside has been flushed.

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Client's current manufacturers/suppliers/products

209. 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]

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GLAZING

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GLAZING

MATERIALS

Glass

001. Clear float, obscured pattern and Georgian wired glass shall comply with the applicable Standard or equivalent.

002. Laminated safety, toughened glass and polycarbonate sheet shall comply with the applicable Standard or equivalent.

003. Panes are to be accurately and squarely cut, with clean, undisfigured, free from all specks, bubbles, bladders and all other defects, and having undamaged edges and surfaces, to suit the sizes of the openings. Dimensions of the edge, cover and clearance, the positions and materials of distance pieces, and the setting and location blocks are all to be to the requirements of the applicable Standard or equivalent and the glass and sealant manufacturer's recommendations.

004. For clear float glass, use 'ordinary glazing quality'.

005. For obscure/patterned glass, use clear cast glass either to match the existing glass or of a pattern approved by the Client's Representative.

006. For polished plate glass, use 'glass for glazing quality'.

007. For wired glass, use Georgian wired cast or Georgian wired polished plate glass, as specified. Ensure the wire extends to the edges of the glass and is free from rust. Cut Georgian wired glass to ensure that any edge is parallel to the alignment of the wires. Care to be taken to ensure that the wires in adjacent panes line up either horizontally or vertically.

Double and triple glazed units

008. Ensure flat dual/hermetically sealed double glazing units are manufactured using low-E coating on inner face s and have a minimum 5 (five) year guarantee. Provide details of the guarantee to the Client's Representative. Units to comply with the requirements of the applicable Standard or equivalent, with units to be clearly marked on at least one section, the spacer bar with the BS kitemark or equivalent standard or compliance with the applicable Standard or equivalent, the manufacturer's name and number and the date of manufacture, to the month. All units to have argon gas filling.

009. Secure double glazed units into rebates with double-sided PVC-u foam closed cell high density security glazing to PAS 24 or equivalent.

010. Install units in accordance with the applicable Standard or equivalent, and the Glass and Glazing Federation Glazing Manual or equivalent.

Putty

011. For glazing to wood use timber slips and sealants.

012. On timber windows the bottom slip shall be a proprietary drained aluminium bead complete with end caps and spacers, use linseed oil putty or equivalent.

Intumescent mastic

013. Ensure mastic to fire doors/windows is of a type of fire protection sealant to the applicable Standard or equivalent and approved by the Client's Representative.

Plastic Protection Channels:

014. Preformed proprietary protection channels must suit the particular glass thickness and be fitted securely to bottom edge of glass.

Condensation Channels

015. Proprietary pre-formed PVC-u/metal condensation channels are to be complete with stop ends, glazing gaskets and proprietary fixings. Channel to be bedded in recommended sealant to bottom member of window.

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Ventilated Glazing Beads

016. Proprietary pre-formed PVC-u or aluminium ventilated glazing beads are to be complete with stop ends, glazing gaskets and proprietary fixings and fixed in accordance with manufacturer's technical data sheet.

Glass Locking System

017. Use a proprietary pre-formed plastic/metal body and clip and fix in accordance with manufacturer's technical data sheet.

WORKMANSHIP

Glazing generally

018. Glass shall comply with the applicable Standard or equivalent. Undertake all glazing in accordance with the applicable Standard or equivalent, the Glass and Glazing Federation Code of Practice or equivalent and the Building Regulations.

019. Ensure that glass/plastics, surround materials, primers, mastics, sealers and paints which are used together are compatible.

020. Safety Glass – to identify the grade of safety glass used, each pane should be indelibly marked so that the marking is visible after installation. The markings should include:

- The manufacturer's name or trade mark;
- The product number for the type of glass;
- The impact performance classification, which must be to be to the applicable Standard or equivalent for (as applicable):
- toughened glass;
- laminated glass; and / or
- heat soaked thermally toughened glass.

021. Fire Glass – all glazing units forming or part of a composite unit i.e. door, window, sidelight etc., should be manufactured to allow compliance with fire testing and rated accordingly to the component unit as a whole and comply with the Building Regulations.

022. Accurately and squarely cut glass with clean, undisfigured and undamaged edges and surfaces, to size with a small clearance. Provide a clearance of 3mm on timber, 5mm on PVC-u windows all round between the edge of the double glazed unit and the frame to permit drainage and ventilation. Cut Georgina Wired glass to ensure that any edge is parallel to the alignment of the wires. Take care to ensure that the wires in adjacent panes line up either horizontally or vertically.

023. Ensure glass, except that bedded in patent glazing strip, is bedded back and front and around the perimeter with mastic neatly trimmed and cleaned off.

024. Ensure glazing is sprigged to wood, or fixed with aluminium, timber beads or PVC-u beads and security clips or double edged security tape.

025. If gasket glazing is required, ensure the glazing gaskets and weather seals are extruded from EPDM (Ethylene Propylene Diene Monomer) or equivalent.

026. Install obscured glass in single glazing with the "rough" side to the inside of the Property. Install obscure glass to sealed double glazed units with the "rough" side to the inside of the unit and the obscure glass to the inside of the Property.

027. Seal and prime rebates and beads before glass is inserted.

Double glazing units

028. Glazing packers are to be in accordance with the applicable Standard or equivalent and should not obstruct the drainage with profile specific bridging packers used. Use setting blocks and distance pieces so as to centralise the glass, unit or infill within the opening and ensure that it cannot move in the wind. Use setting blocks at the bottom edge of the frame. For fixed windows, position them as near the quarter points as possible. Where it is necessary to avoid undue deflection of the frame, place them nearer the sides, but never less than 85mm from the corner. Use setting blocks that are 3mm wider than the glass unit or infill and as thick as the designed edge clearance. Allow for toeing and healing.

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029. Use setting blocks that are at least 25mm in length and approximately 2 No evenly spaced for each metre of major glass dimension to BS 8213-4- or equivalent. For vertically pivoted windows, use setting chocks that are at least 75mm in length. Do not place blocks where these will inhibit drainage.

030. Use location blocks between the edges of the glass unit or infill and at the top and sides of the frame in an opening light.

031. Use distance pieces 25mm long and 3mm less in height than the rebate depth. Ensure the thickness is at least 3mm and such as to ensure that the glass is held firmly in the glazing rebate. Insert rigid PVC-u shims if necessary, to ensure that the distance pieces are a tight fit between the face of the glass and rebate. For beads which fit into continuous grooves, insert the first distance pieces 75mm from each corner, and the remainder at approximately 30mm centres. For beads fixed by screws or other studs, insert the distance pieces at the fixing points provided.

032. Composition of Double Glazing Units as tabled below:

DOUBLE GLAZING UNITS TO DOORS – CLEAR SAFETY		
Pane material/thickness		
Inner pane 6.8mm laminated clear low-E glass	12mm thermally broken warm edge spacer bar with 90% argon fill	Outer pane 6.8mm laminated clear glass
Overall thickness of the units: Not less than 25.6mm		

DOUBLE GLAZING UNITS TO DOORS – OBSCURE SAFETY		
Pane material/thickness		
Inner pane 6.8mm laminated clear low-E glass	12mm thermally broken warm edge spacer bar with 90% argon fill	Outer pane 6.8mm laminated obscured pattern safety glass
Overall thickness of the units: Not less than 25.6mm		

DOUBLE GLAZING UNITS TO SIDELIGHTS – OBSCURE SAFETY		
Pane material/thickness		
Inner pane 4mm toughened clear low-E glass	14mm thermally broken warm edge spacer bar with 90% argon fill	Outer pane 6.8mm laminated obscured pattern safety glass
Overall thickness of the units: Not less than 24.8mm		

DOUBLE GLAZING UNITS TO SIDELIGHTS – CLEAR SAFETY		
Pane material/thickness		
Inner pane 4mm toughened clear low-E glass	14mm thermally broken warm edge spacer bar with 90% argon fill	Outer pane 6.8mm laminated clear safety glass
Overall thickness of the units: Not less than 24.8mm		

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DOUBLE GLAZING UNITS TO WINDOWS – CLEAR FLOAT		
Pane material/thickness		
Inner pane 4mm clear low-E glass	16mm thermally broken warm edge spacer bar with 90% argon fill	Outer pane 4mm clear glass
Overall thickness of the units: Not less than 24mm		

DOUBLE GLAZING UNITS TO WINDOWS – OBSCURE		
Pane material/thickness		
Inner pane 4mm clear low-E glass	16mm thermally broken warm edge spacer bar with 90% argon fill	Outer pane 4mm obscured pattern group 4 glass
Overall thickness of the units: Not less than 24mm		

DOUBLE GLAZING UNITS TO WINDOWS – CLEAR SAFETY		
Pane material/thickness		
Inner pane 4mm toughened clear low-E glass	16mm thermally broken warm edge spacer bar with 90% argon fill	Outer pane 4mm toughened clear glass
Overall thickness of the units: Not less than 24mm		

DOUBLE GLAZING UNITS TO WINDOWS – CLEAR SAFETY		
Pane material/thickness		
Inner pane 6.8mm laminated clear low-E glass	16mm thermally broken warm edge spacer bar with 90% argon fill	Outer pane 6.8mm laminated clear glass
Overall thickness of the units: Not less than 29.6mm		

DOUBLE GLAZING UNITS TO WINDOWS – CLEAR FLOAT		
Pane material/thickness		
Inner pane 4mm clear low-E glass	20mm thermally broken warm edge spacer bar with 90% argon fill	Outer pane 4mm clear glass
Overall thickness of the units: Not less than 28mm		

DOUBLE GLAZING UNITS TO WINDOWS – OBSCURE		
Pane material/thickness		
Inner pane 4mm clear low-E glass	20mm thermally broken warm edge spacer bar with 90% argon fill	Outer pane 4mm obscured pattern group 4 glass
Overall thickness of the units: Not less than 28mm		

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DOUBLE GLAZING UNITS TO WINDOWS – CLEAR SAFETY		
Pane material/thickness		
Inner pane 4mm toughened clear low-E glass	20mm thermally broken warm edge spacer bar with 90% argon fill	Outer pane 4mm toughened clear glass
Overall thickness of the units: Not less than 28mm		

DOUBLE GLAZING UNITS TO WINDOWS – CLEAR SAFETY		
Pane material/thickness		
Inner pane 6.8mm laminated clear low-E glass	20mm thermally broken warm edge spacer bar with 90% argon fill	Outer pane 6.8mm laminated clear glass
Overall thickness of the units: Not less than 33.6mm		

DOUBLE FIRE GLAZING UNITS– CLEAR SAFETY		
Pane material/thickness		
Inner pane 6.8mm laminated clear low-E glass	12mm thermally broken warm edge spacer bar with 90% argon fill	Outer pane 6mm clear Georgian Wire Fire Glass
Overall thickness of the units: Not less than 24.4mm		

DOUBLE FIRE GLAZING UNITS– OBSCURE SAFETY		
Pane material/thickness		
Inner pane 6.8mm laminated clear low-E glass	12mm thermally broken warm edge spacer bar with 90% argon fill	Outer pane 6mm Georgian Wire Fire Glass obscured pattern group 1
Overall thickness of the units: Not less than 24.4mm		

FIRE GLAZING, DOUBLE FIRE GLAZING UNITS– CLEAR SAFETY		
Pane material/thickness		
Inner pane 4mm toughened clear glass	Stainless steel or equivalent spacer bar with argon gas filling	Outer pane 11.0mm safety fire grade glass fully UV stable, clear
Overall thickness of the units: Not less than 24.0mm		

FIRE GLAZING, DOUBLE FIRE GLAZING UNITS– TEXTURED/PATTERNED SAFETY		
Pane material/thickness		
Inner pane 4mm toughened textured/ patterned glass	Stainless steel or equivalent spacer bar with argon gas filling	Outer pane 11.0mm safety fire grade glass fully UV stable, clear
Overall thickness of the units: Not less than 24.0mm		

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FIRE GLAZING, DOUBLE FIRE GLAZING UNITS– TEXTURED/PATTERNED SAFETY		
Pane material/thickness		
Inner pane 4mm toughened textured/ patterned glass	Stainless steel or equivalent spacer bar with argon gas filling	Outer pane 11.0mm safety fire grade glass fully UV stable, clear
Overall thickness of the units: Not less than 24.0mm		

FIRE GLAZING, DOUBLE FIRE GLAZING UNITS– CLEAR SAFETY		
Pane material/thickness		
Inner pane 6.8mm laminated clear (safety Class A) glass	Stainless steel or equivalent spacer bar with argon gas filling	Outer pane 7.0mm internal fire grade glass fully UV stable, clear
Overall thickness of the units: Not less than 24.0mm		

FIRE GLAZING, DOUBLE FIRE GLAZING UNITS– CLEAR SAFETY		
Pane material/thickness		
Inner pane 4mm toughened clear glass	Stainless steel or equivalent spacer bar with argon gas filling	Outer pane 10.0mm safety fire grade glass fully UV stable, clear
Overall thickness of the units: Not less than 24.0mm		

FIRE GLAZING, DOUBLE FIRE GLAZING UNITS– TEXTURED/PATTERNED SAFETY		
Pane material/thickness		
Inner pane 4mm toughened textured/ patterned glass	Stainless steel or equivalent spacer bar with argon gas filling	Outer pane 10.0mm safety fire grade glass fully UV stable, clear
Overall thickness of the units: Not less than 24.0mm		

FIRE GLAZING, DOUBLE FIRE GLAZING UNITS– CLEAR SAFETY LOW –E HARD COAT		
Pane material/thickness		
Inner pane 4mm toughened low-E hard coat clear glass	Stainless steel or equivalent spacer bar with argon gas filling	Outer pane 10.0mm safety fire grade glass fully UV stable, clear
Overall thickness of the units: Not less than 24.0mm		

FIRE GLAZING, DOUBLE FIRE GLAZING UNITS– CLEAR SAFETY		
Pane material/thickness		
Inner pane 6.4mm laminated clear (safety Class B) glass	Stainless steel or equivalent spacer bar with argon gas filling	Outer pane 7.0mm external fire grade glass fully UV stable, clear
Overall thickness of the units: Not less than 24.0mm		

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Neoprene glazing gaskets

033. Fit glass to PVC-u windows using glazing gaskets appropriate to the window. Angle all glazing gaskets if possible, but in any event mitre all corners and comply with Paragraph 024 above.

Cleaning

034. Remove cement and plaster based spillage whilst wet. Remove all smears and excess glazing materials. Leave glazing clean and free from scratches inside and out.

Damage

035. Replace all glass and fixing materials broken or damaged before completion and redecorate.

Fire Resistant Glazing

036. When specified on the Order, use fire resistant Glazing Cassette to Door Sets with cassette interlocking system with male/female connectors, 24.4mm double glazing unit comprising 6.8mm laminated clear low–E safety glass inner pane, 12mm thermally broken warm edge spacer bar with 90% argon fill, 6mm clear Georgian wired fire glass or 6mm Georgian wire fire glass obscure pattern group 1, fire retardant glazing sealant as intumescent aperture lining/filler, installed in accordance with UKAS accredited report for fire resistant glazing and in accordance with glazing manufacturer's technical data sheet.

037. When specified on the Order, use fire resistant Glazing Cassette to Door Sets with cassette interlocking system with male/female connectors, 26mm double glazing unit comprising 6.8mm laminated clear low–E safety glass inner pane, 12mm thermally broken warm edge spacer bar with 90% argon fill, 6mm clear Georgian wired fire glass or 6mm Georgian wire fire glass obscure pattern group 1, fire retardant glazing sealant as intumescent aperture lining/filler, installed in accordance with UKAS accredited report for fire resistant glazing and in accordance with glazing manufacturer's technical data sheet.

038. When specified on the Order, use fire resistant glazing to fanlights and sidelights with 24.4mm double glazing unit comprising 6.8mm laminated clear low–E safety glass inner pane, 12mm thermally broken warm edge spacer bar with 90% argon fill, 6mm clear Georgian wired fire glass or 6mm Georgian wire fire glass obscure pattern group 1, fire retardant glazing sealant as intumescent aperture lining/filler, installed in accordance with UKAS accredited report for fire resistant glazing and in accordance with glazing manufacturer's technical data sheet, aluminium powder coated glazing bead extrusion with flexible intumescent glazing compound to entire length of glazing bead extrusion and fixing in accordance with the manufacturer's technical data sheet.

Client's current manufacturers/suppliers/products

039. 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]

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PLUMBING

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PLUMBING

GENERAL

Generally

001. Ensure all Materials comply with the requirements of the applicable water Utility Provider.

002. 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.

003. 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.

004. Seal any pipework entering a vertical service duct all round with intumescent sealant to prevent the passage of fire or smoke.

MATERIALS

Plastic rainwater gutters and pipes

005. Match the colour of the systems, the profile of gutters and the rainwater pipe jointing and fixing to the existing systems unless the Client's Representative Instructs otherwise.

Cast iron rainwater gutters and pipes

006. For gutters use half round or ogee. Match all new gutters and pipes to the existing system unless the Client's Representative Instructs otherwise. Use time saver joints. Flexi seal connectors are not to be used.

Aluminium rainwater gutters and pipes

007. Ensure aluminium rainwater disposal systems match the existing system.

Plastic soil and vent pipes

008. Ensure the colour and jointing and fixing match the existing pipework unless the Client's Representative Instructs otherwise.

Cast iron soil and vent pipes

009. Ensure the jointing and fixing methods match the existing pipework unless the Client's Representative Instructs otherwise. Use time saver joint. Flexi seal connectors are not to be used.

Plastic waste pipes, fittings and traps

010. Use PVC-u plastic to the applicable Standard or equivalent for soil/ventilating pipework and fittings. Use polypropylene plastic to the applicable Standard or equivalent for waste and warning pipework, fittings and traps. Fully protect any external polypropylene and ABS pipes and fittings from sunlight. Ensure waste pipes, fittings and traps match the existing waste systems unless the Client's Representative Instructs otherwise.

Copper or equivalent waste pipes and fittings

011. Ensure the gauges of pipework and types of fittings match those of the relevant existing pipework.

Plastic water supply pipes and fittings

012. Use blue polyethylene pipes with copper or equivalent fittings for pipework laid underground for potable water supplies.

Copper or equivalent water supply pipes and fittings

013. Use lead free capillary fittings for potable water supplies.

Fittings for lead supply pipes

014. Use lead to copper or equivalent mechanical joint fittings for connecting dissimilar pipes to existing lead water services.

Overflow pipes and fittings

015. Ensure the pipework for overflows complies with the same requirements as for water supply pipework.

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Solder

016. Do not use lead based solders or solders containing lead in Works associated with potable water supplies. Use tin/copper or equivalent or tin/silver compositions instead.

Float valves

017. Use float operated valves.

Taps

018. Use chromium plated metal taps. For lavatory basins and sinks, use ½ inch taps; for baths, use 3/4 inch.

019. Taps to kitchen sinks for persons with a disability use:

- deck pattern chromium plated kitchen sink mixer with metal handle lever action operation control with colour discs, left hand red for hot and right hand blue for cold.

020. Taps to baths for persons with a disability use:

- deck pattern chromium plated bath pillar taps suitable for both high and low pressure with metal handle lever action operation control with colour discs, left hand red for hot and right hand blue for cold.

021. Taps to wash hand basins for persons with a disability use:

- vertical pattern chromium plated basin taps with metal handle lever action operation control with colour discs, left hand red for hot and right hand blue for cold.

Sanitary fittings

022. Ensure all sanitary fittings are approved by the Client's Representative.

023. For lavatory basins and pedestals, to the applicable Standard or equivalent use white vitreous china or equivalent with:

- size 560mm x 440mm, one tap hole with pedestal;
- wall brackets secured in accordance with the manufacturer's technical data sheet;
- chromium plated to the applicable Standard or equivalent deck mounted mono mixer, quarter turn lever action;
- chromium plated rotative clicker waste stopper;
- polypropylene trap, 76mm seal, with combined overflow; and
- all fittings necessary to connect to services and disposal systems.

024. For hand rinse wash basins, to the applicable Standard or equivalent use white vitreous china or equivalent with:

- size 360mm x 265mm, one tap hole without pedestal;
- wall brackets secured in accordance with the manufacturer's technical data sheet;
- chromium plated deck mounted mono mixer, quarter turn lever action;
- chromium plated rotative clicker waste stopper;
- polypropylene trap, 76mm seal, with combined overflow; and
- all fittings necessary to connect to services and disposal systems.

025. For corner rinse wash basins, to the applicable Standard or equivalent use white vitreous china or equivalent with:

- size 500mm x 400mm, one tap hole without pedestal;
- wall brackets secured in accordance with the manufacturer's technical data sheet;
- chromium plated deck mounted mono mixer, quarter turn lever action;
- chromium plated rotative clicker waste stopper;
- polypropylene trap, 76mm seal, with combined overflow; and
- all fittings necessary to connect to services and disposal systems.

026. For baths, use heavy duty pressed steel or equivalent to the applicable Standard or equivalent, with bolt on adjustable legs.

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027. Supply baths with:

- 1700 mm rectangular pattern, single centre tap holes, twin handle grips and slip resistant base;
- chromium plated deck pattern over bath/shower fitting comprising height adjustable lockable slide rail, shower bracket, fastening set, shower hose (minimum 1500mm) soap dish and adjustable head outlet;
- chromium plated deck mounted mono mixer to match mono basin mixer, quarter turn lever action;
- chromium plated rotative clicker waste stopper;
- DN 40 polypropylene shallow seal trap with combined overflow;
- bolt on adjustable feet;
- galvanised mild steel floor plates to be provided under bath feet; and
- all fittings necessary to connect to services and disposal systems.

028. Supply baths with:

- 1500 mm rectangular pattern, single centre tap holes, twin handle grips and slip resistant base;
- chromium plated deck pattern over bath/shower fitting comprising height adjustable lockable slide rail, shower bracket, fastening set, shower hose (minimum 1500mm) soap dish and adjustable head outlet;
- chromium plated deck mounted mono mixer to match mono basin mixer, quarter turn lever action;
- chromium plated rotative clicker waste stopper;
- DN 40 polypropylene shallow seal trap with combined overflow;
- bolt on adjustable feet;
- galvanised mild steel floor plates to be provided under bath feet; and
- all fittings necessary to connect to services and disposal systems.

029. Where it not feasible to install a gravity over bath/shower mixer assembly, a deck mounted quarter turn lever action chromium plated bath filler mixer taps with maximum mixed water outlet temperature for bath fill of 480C, an electric shower is also to be provided over the bath.

030. For WC pans to the applicable Standard or equivalent, use white vitreous china or equivalent toilet pan, horizontal outlet, standard pan connector to the applicable Standard or equivalent to 'P', 'S' or turned 'P' coloured to match pan; and, thermoplastic Type 2 seat and cover to the applicable Standard or equivalent, with thermoplastic colour matched plastic hinges, buffers to be either synthetic or natural rubber or thermoplastic with a minimum of two integral distance pieces or a maximum of four buffers attached to underside of seat, seat colour black or white.

031. For dual flush WC cisterns to the applicable Standard or equivalent, use white vitreous china or equivalent type for use with close coupled suites. Ensure the cisterns are complete with:

- lid;
- ball valve low pressure type;
- siphon;
- cistern to be dual flush 6 litres/4.5 litres capacity with dual flush button;
- wall brackets;
- cistern inlet connector to wc pan; and
- all fittings necessary to connect to services, disposal systems and overflow.

032. For Close Coupled WC Pan and Cistern to the applicable Standard or equivalent as follows:

- White vitreous china or equivalent pan to the applicable Standard or equivalent;
- Thermoplastic Type 2 seat and cover to the applicable Standard or equivalent, with thermoplastic colour matched plastic hinges, buffers to be either synthetic or natural rubber or thermoplastic with a minimum of two integral distance pieces or a maximum of four buffers attached to underside of seat, seat colour black or white;
- Standard pan connector to BS 5627 or equivalent to 'P', 'S' or turned 'P' coloured to match pan;
- White vitreous china or equivalent cistern to the applicable Standard or equivalent with lid;
- Dual flush 6 litres/4.5 litre capacity to BS 1125 or equivalent;
- Operating control, ball valve low pressure type to the applicable Standard or equivalent, diaphragm pattern of copper or equivalent alloy/plastic construction with plastic float to the applicable Standard or equivalent;
- Dual flush button operating mechanism, with cistern inlet connector to WC Pan; and

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- Internal overflow into WC pan through the flush valve supplied by the manufacturer.

033. Provide Automatic WC Pan and Cistern as follows:

- Automatic WC shower toilet providing flushing, washing and warm air drying WRAS approved;
- Combined WC/Bidet with addition of drying air to the applicable Standard or equivalent;
- White vitreous china or equivalent arrangement with low level wash down and horizontal outlet;
- Seat and cover as supplied by manufacturer;
- Pan connector, standard to the applicable Standard or equivalent 'S' trap (vertical fall) or 'P' trap (horizontal) white to match pan;
- Cistern, as supplied by the manufacturer;
- Flushing operation, as supplied by the manufacturer;
- Operating control, as supplied by the manufacturer;
- Water service, 15mm cold water service only with isolation valve, from storage or mains water supply;
- Boiler capacity, as supplied by the manufacturer;
- Cistern capacity, as supplied by the manufacturer; and
- Internal overflow into WC pan through the flush valve, as supplied by the manufacturer.

Electrical services are to be 230/240V 1 Phase 50Hz AC earthed supply, Maximum Power 1300 watts, Load 10A, Rating IPX4. Install a fused spur for isolation, located in accordance with the applicable Standard or equivalent for electrical installations. Raise the height above floor level to enable easy transfer from wheelchair to WC pan.

034. Provide a Bidet to the applicable Standard or equivalent as follows:

- Pedestal type in white vitreous china or equivalent with over-rim supply;
- Water supply fittings, pillar taps or centre set taps with pop up waste, chromium plated or equivalent finish;
- Standard waste, DN30 flush grated waste fitting, standard to the applicable Standard or equivalent, un-slotted tail, brass, with external parts chromium plated with solid brass back nut or equivalent materials; and
- Standard 50mm (minimum) seal polypropylene trap DN30 kite marked to the applicable Standard or equivalent.

Stainless steel or equivalent sinks

035. Provide stainless steel or equivalent inset sinks to the applicable Standard or equivalent with single bowl, single drainer, 2 tap holes. Supply 0.9mm satin polish finish sinks with:

- deck pattern chromium plated sink mixer with metal handle control with colour discs, red for hot and blue for cold;
- DN 40 chromium plated combined plug type waste and overflow unit with unslotted or slotted tail (for use with an appliance with overflow);
- DN 40 polypropylene 76mm (minimum) seal trap to the applicable Standard or equivalent chrome plated sink waste chain and stay with black rubber or plastic plug; and
- all fittings necessary to connect to services and disposal systems.

Shower trays and enclosures

036. Provide fibreglass or equivalent level access shower trays to the applicable Standard or equivalent (CE Mark = EN14527-CL2 or equivalent size 850mm x 1200mm wherever possible (but on site variations may be considered) as follows:

- Weight – loading of 380 kilos/60 stone;
- Level access (no greater than 5mm above finished floor level at point of entry with rounded/bevelled lip);
- Waste – shower trap with removable waste fitting (supplied as standard with shower tray) and installed in accordance with the manufacturer's technical data sheet;
- Sealing – seal to be achieved between wall and shower with proprietary shower sealing tape, all other sealing as per manufacturer's technical data sheet and mould resistant sealant to the applicable Standard or equivalent low modulus; and
- Workmanship – tray to be installed no greater than 5mm above finished floor level with rounded /bevelled lip at point of entry. The point of entry is the line where the finished floor and edge of shower tray butts.

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037. Provide fibreglass or stone resin step in shower trays to the applicable Standard or equivalent (CE Mark = EN14527 CL2 or equivalent), size 850mm x 1200mm wherever possible (but on site variations may be considered) as follows:

- Weight – loading of 380 kilos/60 stone;
- Step in tray (a maximum step of 85mm is recommended);
- Waste – shower trap with removable waste fitting (supplied as standard with shower tray) and installed in accordance with the manufacturer's technical data sheet;
- Sealing – seal to be achieved between wall and shower with proprietary shower sealing tape, all other sealing as per manufacturer's technical data sheet and mould resistant sealant to the applicable Standard or equivalent low modulus; and
- Workmanship – tray to be installed no greater than 5mm above finished floor level with rounded /bevelled lip at point of entry. The point of entry is the line where the finished floor and edge of shower tray butts.

038. Provide fibreglass wet room former to the applicable Standard or equivalent (CE Mark = EN14527 CL2 or equivalent), 850mm x 1200mm wherever possible (but on site variations may be considered) as follows:

- Weight – loading of 380 kilos/60 stone;
- Fibreglass floor former with integral floor covering;
- Waste – shower trap with removable waste fitting (supplied as standard with shower tray) and installed in accordance with the manufacturer's technical data sheet; and
- Sealing – seal to be achieved between wall and shower with proprietary shower sealing tape, all other sealing as per manufacturer's technical data sheet and mould resistant sealant to the applicable Standard or equivalent low modulus.

039. Shower Tanking System, Liquid Applied Tanking To Floors as follows:

- Acrylic based flexible waterproofing liquid applied in accordance with manufacturer's instructions as part of a shower tanking system;
- Background: sand/cement screed;
- Preparation: primed as recommended by manufacturer; and
- Area: to cover entire shower room floor.

040. Shower Tanking System, Liquid Applied Tanking to Walls as follows:

- Acrylic based flexible waterproofing liquid applied in accordance with manufacturer's instructions as part of a shower tanking system;
- Background: plaster skim;
- Preparation: primed as recommended by manufacturer; and
- Area: to cover walls from floor to ceiling, a minimum of 150mm beyond dimensions of shower tray or former.

041. Shower Tanking System Polyester Tape as follows:

- Reinforcement for junctions of walls, floors, shower bases, upstands, outlets, cracks and joints; and
- Applied in accordance with manufacturer's instructions as part of a shower tanking system.

042. Provide shower enclosure manufactured to the applicable Standard or equivalent (CE Mark = EN14428 CA-IR-DA or equivalent) as follows:

- Half height bi-fold/tri-fold toughened glass/plastic enclosures which shall not break or shall break safely;
- Powder coated aluminium frame and plastic parts;
- All seals to be watertight with 180 degree rise and fall hinges;
- Magnetic closing doors with locking handle and fitted seals;
- Fitted with full height shower curtain and H track curtain rail, supplied with all necessary heavy duty clip, fixings and hooks;
- Curtains to be durable polyester weighted by 50 grams to prevent swing; and
- Sealing – fit as manufacturer's technical data sheet to ensure all seals on moving parts are watertight when in operation. Fixed sealing undertaken using mould resistant sealant to the applicable Standard or equivalent low modulus.

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043. Provide shower enclosure manufactured to the applicable Standard or equivalent (CE Mark = EN14428 CA-IR-DA or equivalent as follows:

- Half height bi-fold/tri-fold toughened glass/plastic enclosures which shall not break or shall break safely;
- Polished chrome frame and plastic parts;
- All seals to be watertight with 180 degree rise and fall hinges;
- Magnetic closing doors with locking handle and fitted seals;
- Fitted with full height shower curtain and H track curtain rail, supplied with all necessary heavy duty clip, fixings and hooks;
- Curtains to be durable polyester weighted by 50 grams to prevent swing; and
- Sealing – fit as manufacturer's technical data sheet to ensure all seals on moving parts are watertight when in operation. Fixed sealing undertaken using mould resistant sealant to the applicable Standard or equivalent low modulus.

044. Provide shower enclosure manufactured to the applicable Standard or equivalent (CE Mark = EN14428 CA-IR-DA or equivalent) as follows:

- Full height toughened glass/plastic enclosures with watertight door seals and magnetic closing doors and fitted seal;
- Powder coated aluminium frame and plastic parts; and
- Sealing – fit as manufacturer's technical data sheet to ensure all seals on moving parts are watertight when in operation. Fixed sealing undertaken using mould resistant sealant to the applicable Standard or equivalent low modulus.

045. Provide ABS Plastic grab rails as follows:

- All rails shall be manufactured from ABS plastic (virtually indestructible plastic) and shall have a slip resistant grip with broad flanged fittings to be plastic welded to rail for fixing with non-corrosive screws to wall or floor;
- All rails to have easy bends and no sharp corners;
- Rails should contract in colour and luminance with the background against which they are seen;
- It is of the utmost importance that the wall construction should allow a secure fixing of grab rail to suit changing needs or specific needs of an individual;
- The grab rail shall be 32mm to 35mm diameter fixed with a clearance between the rail and the wall of 50mm to 60mm with a good grip when wet;
- The rail should not deteriorate when exposed to extremes of heat and cold; and
- Sizes to suit site conditions and left or right handing.

046. Provide Grab Rail - single or double folding rails as follows:

- Manufactured from 32mm to 35mm diameter mild steel and coated with a white epoxide/polyester finish and fitted with a strongly constructed locking device to enable the rail to be locked in the vertical position;
- Double folding rails shall be fitted with a toilet roll fitment;
- Drop down rails should be of a type that can be pulled down by a person when seated on the WC;
- They shall incorporate vertical support struts, set back from the front edge of the rail by at least half its projection from the wall so as not to impede wheelchair access; and
- Projection of rails shall vary according to need.

047. Provide Grab Rail - double folding rails with foot support as follows:

- Manufactured from 32mm to 35mm diameter mild steel and coated with a white epoxide/polyester finish and to be used where the mechanical strength of the wall is doubtful;
- In the down ward position the supporting leg shall take most of the applied load;
- In the upright (Vertical) position the locking device shall enable the rail to be used as a HAND HOLD and shall not be considered as suitable as a GRAB RAIL when in the vertical position; and
- Projection of rails shall vary according to need.

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048. Provide shower curtain tracks as follows:

- Track may be straight, 'L' shaped or 'U' shaped;
- Rail shall be manufactured from anodised aluminium; and
- Rail is to be easy to bend and supplied with all necessary fixing brackets and hooks.

049. Provide shower curtain as follows:

- Curtain to be shower proof plastic with hem weighted by 50 grams to ensure correct hanging and supplied with all necessary clips and fixings.

050. Provide shower seat as follows:

- Seat to be manufactured to the applicable Standard or equivalent
- Wall mounted seat with height adjustable support legs and be able to fold upwards when not in use;
- Complete with fixed or detachable padded seat, back and arms for extra comfort;
- Powder coated frame;
- Stainless steel or equivalent rawlbolt fixings to suit wall construction in accordance with the fixing manufacturer's technical data sheet; and
- Weight – not to exceed a loading of 254 kilos/40 stone.

051. Padded Back Rest (for toilet seat) as follows:

- Type: Back rest for disabled toilet;
- Materials:
    - Rail: 32 mm (nominal) diameter steel coated formed into shape with easy bends and no sharp corners, polyester powder coated finish; and
    - Pad: Polyurethane foam, wipe clean and splash-proof;
- Colour: White, unless recommended otherwise for visual contrast;
- Fixing: Broad flanged fittings fixed with non-corrosive screws as recommended by manufacturer and suitable for wall construction to ensure a secure fixing;
- To withstand a maximum test load of 135kg and rated load of 90kg; and
- Nominal dimensions:
    - Tube diameter: 32mm;
    - Flange centres: 400mm;
    - Flange diameter: 84mm;
    - Tube wall thickness: 1.5mm;
    - Projection from wall (with pad): 314mm; and
    - Pad size: 280 mm wide x 140 mm high x 60 mm thick.

052. Bath/Shower Screen as follows:

- Type: 6mm toughened safety glass shower screen, tested to the applicable Standard or equivalent;
- Wall post and screen profile; polished aluminium or equivalent;
- Hinge; rise and fall mechanism – left or right fitting;
- Nominal dimensions; 1500mm height x 800mm wide;
- Fixing – Supplied with all necessary fixing brackets, seals, cover caps; and
- Sealing – fit as per manufactures technical data sheet to ensure all seals on moving parts are watertight when in operation. Fixed sealing undertaken using mould resistant sealant to the applicable Standard or equivalent low modulus.

053. Bath/Shower 2 Panel Screen as follows:

- Fixed panel and door screen used to allow door opening, due to closely fitted adjacent wash hand basin;
- Type: 6mm toughened safety glass shower screen, tested to the applicable Standard or equivalent;
- Wall post and screen profile; polished aluminium;
- Hinge; rise and fall mechanism – left or right fitting;
- Nominal dimensions; 1500mm height x 1400mm wide;
- Fixing – Supplied with all necessary fixing brackets, seals, cover caps; and

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- Sealing – fit as per manufactures technical data sheet to ensure all seals on moving parts are watertight when in operation. Fixed sealing undertaken using mould resistant sealant to the applicable Standard or equivalent low modulus.

054. Provide thermostatic shower mixing valve to the British Standard BEAB Care, TMV2, YMV3 and WRAS or equivalent as follows:

- Thermostatic shower control to mix hot and cold water to the desired water temperature;
- Surface mounted shower control, with extended lever control to distinguish between flow and temperature for use by a person with a disability;
- Chrome plated finish;
- Temperature range, Thermostatic control range 35 to 45 degrees C;
- Inlet water supply temperatures, 15 degrees C Cold and 65 degrees C Hot;
- Maximum hot water system temperature: 60 degrees C;
- Automatic shut down within 3 seconds in the event of failure in the cold water supply;
- Multi-mode showerhead with a 1m (minimum) length slide bar and soap dish, 1.5m (minimum) length flexible hose with retaining ring and all necessary fittings for surface fixing;
- Minimum maintained pressure: 0.1bar;
- Maximum maintained pressure: 5.0 bar; and
- Maximum static pressure: 10.0 bar.

Tanks

055. Ensure tanks are complete with tightly fitting removable lids. Use moulded plastic tanks to the applicable Standard or equivalent. Ensure the tank is complete with a float valve and all fittings necessary to connect the services and overflow.

Copper or equivalent cylinders

056. Ensure hot water storage copper or equivalent cylinders are to the applicable Standard or equivalent 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

057. Provide indirect or direct combination tanks to the applicable Standard or equivalent 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

058. 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

059. Ensure paint used in repairs complies with the "Painting and Decorating" Specification.

WORKMANSHIP

Water supply

060. 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.

061. 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 or equivalent pipework for repairs to lead pipework. Use either compression or lead free solder capillary ring fittings.

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Sanitary appliances

062. Properly install sanitary fittings. Take care to ensure that integral overflows are not obstructed with jointing compounds. Fix sanitary fittings securely to structure without taking support from pipe lines, level and plumb and fall to drain as intended, use jointing and bedding compounds as recommended by the manufacturers of appliances, accessories and pipes technical data sheets to form watertight joints between appliances and backgrounds (except cisterns) , and between appliances and discharge pipes, Ensure that noggins, bearers etc., necessary to support sanitary appliances and fittings are accurately positioned and securely fixed.

063. Isolate the waste, taps and other fittings from the sanitary fittings with the appropriate flexible washers making an effective seal.

064. On cisterns, obtain from manufacturer, float operated valve matched to pressure of water supply, fix overflow pipe to falls and located to give visible warning of discharge.

065. Assemble taps, fix securely, making a watertight seal with the appliance, a suitable set of flanged insert plug/sleeve and washers shall be fitted to each and evert tap for securing tap in position and for anti-rotation purpose.

066. Assemble wastes and overflows to appliances, bed in waterproof joint compound and fix with a resilient washer between appliance and backnut.

Rainwater Harvesting- Design Criteria

067. The collection tank is to be buried. Rainwater is to enter the drainage system through sealed gullies and pass through a pre-filter to remove leaves and other debris prior to entering the collection tank. A submersible pump controlled by the monitoring and sensing panel is to deliver recycled rainwater on demand. The non-potable distribution pipework to the washing machine, cleaner's tap, outside tap and toilets etc., must either be a boosted system or configured for a header tank in the loft, with mains supply back-up with monitors and sensors located in or adjacent to the header tank.

068. Rainwater harvesting systems must include an automatic switchover to the mains water back-up supply, upon depletion of the stored rain water.

Grey Water Recycling – Design Criteria

069. Waste water from baths, showers and washbasins collected by conventional pipework, is to be collected in a pre-treatment sedimentation tank to remove larger dirt particles. Water then is to pass to the aerobic treatment tank in which cleaning bacteria ensure that all bio-degradable substances are broken down. The water then passes onto a third tank, where an ultra-filtration membrane is to remove all particles larger than 0.00005 mm, (this includes viruses and bacteria) to disinfecting the recycled grey water. A fourth tank is to store the clean water from where it is pumped on demand under the control of monitors and sensors in the control panel. Recycled grey water may be used for toilet and urinal flushing, for laundry and general cleaning, and for outdoor use such as vehicle washing and garden irrigation. If there is insufficient space, then the tanks may be buried but with adequate arrangements for maintenance access.

070. Grey water harvesting systems must include an automatic switchover to the mains water back up supply, upon depletion of the stored grey water.

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Client's current manufacturers/suppliers/products

071. 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]

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ELECTRICAL WORKS

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ELECTRICAL WORKS

General

Equipotential bonding

001. General: Subject to Paragraph 007 below, connect the following extraneous-conductive metallic parts to the main earthing terminal:

- metal water installation pipes;
- metal gas installation pipes, as near practical to the point of entry of the service into the premises and before any branch pipework where the meter is fitted externally. (Where practicable the connection shall be made within 600mm of the meter outlet union where the meter is installed internally);
- central heating system pipework;
- other installation pipework (including oil and gas supply pipes) and ducting; and
- exposed metallic structural parts of the building.

002. Sizes of bonding conductors are given the IET Wiring Regulations.

Supplementary equipotential bonding

003. General: Within the zone formed by the main equipotential bonding, provide connections to:

- baths;
- sinks;
- exposed pipes; and
- heating systems.

004. In locations containing a bath or shower, supplementary equipotential bonding is to comply with the applicable Standard or equivalent

005. Sizes of supplementary equipotential bonding conductors are given in the IET Wiring Regulations.

006. Electrical equipment and/or electrical circuits installed in a room containing a bath or shower shall have RCD protection, complying with the applicable Standard or equivalent.

007. Where all electrical requirements in the Property are met to the standard required by the IET Wiring Regulations, supplementary equipotential bonding as Paragraph 002 above may be omitted.

MATERIALS

Earth Electrode

008. Comply with the following for the earth electrode:

- General: Conductive part, which may be embedded in the soil or in a specific conductive medium, in contact with the earth;
- Materials: Copper or equivalent, with hardened steel driving cap, hardened steel tip and phosphor bronze coupling screws or equivalent materials; and
- Mechanical protection: Each earth electrode shall be protected from mechanical damage by enclosing in a heavy duty cast-iron box with lid or a heavy duty concrete box with lid. The earth lead shall be enclosed, where exposed in heavy gauge galvanised steel or equivalent conduit. Permanent labels to the applicable Standard or equivalent indelibly marked "Safety Electrical Earth Do Not Remove" shall be attached to the earth lead at both the meter cupboard and at the electrical electrode.

Conduit/trunking/ducting

009. Do not use surface conduit or trunking without an Instruction to do so from the Client's Representative.

Steel Conduit and fittings

010. Steel conduit and fittings shall comply with the following:

- Type: Plain threadable rigid conduit;
- Size: In accordance IET Wiring Regulations;
- Fittings: Circular boxes shall be malleable cast-iron or equivalent;
- Finish: Class 4 hot dipped galvanised;
- Mounting/support: Conduit shall be secured to surfaces using galvanised steel or equivalent clips/saddles; and

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- Installation: Use maximum practical lengths to minimise number of joints. Form bends by machine and remove burrs from cut ends. Use bends and or/junction boxes at changes of direction. Do not use elbows or tees without the consent of the Client's Representative. Conduit system to be secured using brass screws and fibre/plastic plugs. Boxes must be fixed independently of conduit. Tightly screw all joints to ensure electrical continuity, with no thread showing. All threads are to be treated with rust inhibiting paint. Use expansion couplings where conduit crosses movement joints in structure. Make secure connections to boxes, trunking etc., with screwed coupling and provide rubber bushes at open ends.

PVC-u conduits and fittings

011. Ensure PVC-u conduits and fittings comply with the following:

- strength: heavy gauge super high impact;
- shape/colour: round, white;
- 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

012. 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

013. 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; and
- 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

014. Seal trunking/ducting internally with firmly packed rock fibre or intumescent type material supplied by the trunking/duct manufacturer.

Cables generally

015. Ensure cables are BASEC certified. Use cables in the locations and for the uses specified in the table below:

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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 armour and PVC sheathed
Fire alarm system	PVC insulated and sheathed
Immersion heater (final connection)	EP rubber/HOFR sheath, Heat resistant PVC flexible cable

PVC-u insulated and sheathed cables and PVC-u insulated split concentric cables

016. Colour code cables for identification.

Electrical accessories (wall mounted)

017. 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.

018. Ensure metal boxes for flush mounting switches and sockets are manufactured from galvanised steel or equivalent complete with an earth terminal.

019. Fix all boxes using brass screws with fibre or plastic plugs.

Electrical accessories (ceiling mounted)

020. 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

021. 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 the applicable Standard or equivalent;
- located adjacent to the meter at the incoming supply position; and
- have each way permanently labelled to identify the circuit and rating.

022. In installations without Protective Multiple Earthing it must be a surface non-combustible unit complete with lid, fitted with RCBO's to the applicable Standard or equivalent and must be labelled to correspond to the following circuit allocations:

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Circuit No Allocations	RCBO Rating
Lighting Downstairs	6
Lighting Upstairs	6
Boiler	6
Immersion Heater	16
Kitchen Ring Main Circuit	32
Shower	45
Cooker	32
Power Ring Main Circuit – RCD/RCBO protected	32
Mains Powered Smoke Alarms	6

Residual current device/residual current circuit device (RCD/RCCD)

023. 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)

024. 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 enclosure.

Residual current circuit breaker with override protection (RCBO)

025. Ensure RCBOs:

- function as both isolators and switches;
- have a current rating of 80A DP;
- have a sensitivity of 30mA; and
- are complete with an insulated cover or terminal shrouds.

ISCO connectors

026. 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

027. Ensure door bells:

- are primary mains supply, transformer, 6v secondary outlet;
- have a white bell push PVC-u cover; and
- are screw fixed.

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Bulkhead light fitting (fluorescent) (metal base)

028. 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 20W compact fluorescent lamp with integrated control gear;
- lamp efficacy to be greater than 45 lumens per circuit-watt;
- controlled manually by Customers; and
- are screw fixed.

Bulkhead light fittings (fluorescent) (polycarbonate base)

029. 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 20W compact fluorescent lamp with integrated control gear;
- lamp efficacy to be greater than 45 lumens per circuit-watt;
- controlled manually by Customers; and
- are screw fixed.

Photocell sensor

030. 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

031. Ensure TV aerial installations:

- consist of 20mm diameter PVC-u 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)

032. 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

033. Ensure smoke detectors:

- have white PVC-u for the housing;
- have a minimum 10 year life expectancy;
- include a photo-electronic sensor to BS EN 14604 or equivalent;
- are 240 V mains operated with a sealed-in rechargeable Lithium cell back up supply; and
- include a full function test/hush button control, automatic reset, Green and Red LED indicators to confirm alarm status and low power cell warning signal.

Heat detectors

034. Ensure heat detectors:

- have white PVC-u housing;
- have a minimum 10 year life expectancy;
- comprise a fixed temperature fast response thermistor sensor with a range of 54o – 62o centigrade to BS EN 61326 or equivalent;
- are 240V mains operated with a sealed-in rechargeable Lithium cell back up supply; and
- include or have a test button control function, Green and Red LED indicators to confirm alarm status and low power cell warning signal.

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Carbon monoxide detectors

035. Ensure carbon monoxide detectors:

- have white PVC-u housing;
- have a minimum 10 year life expectancy;
- incorporate an electrochemical cell sensor module;
- are battery operated to BS 50291 or equivalent 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, CO level and fault status; and
- have a CO gas test feature.

Fixing electrical accessories/equipment

036. 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

037. Connect switches so that there is a logical relationship with the lights.

WORKMANSHIP

Installation

038. Install, test and commission the electrical work in accordance with IET Wiring Regulations and the design and performance requirements set out in this Part of this Specification so as to provide a safe, well insulated, earth protected system capable of supplying the anticipated maximum demand.

039. Ensure all installation Works are carried out by qualified electricians fully conversant with the IET Wiring Regulations to good workmanship by skilled (electrical) or instructed (electrical) persons and proper Materials shall be used in the electrical installation.

040. Do not allow the number of Apprentices and Trainees at a Property undertaking electrical Works to exceed the number of qualified electricians.

041. Ensure all installation Works are carried out under the direct supervision of a "Qualifying Manager" named in the List of Approved Contractors issued by the National Inspection Council for Electrical Installation Contracting (or equivalent).

042. 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.

043. Avoid contact between dissimilar metals. Use corrosion resistant fastenings in locations where moisture is present or may occur.

044. Confirm the voltage and frequency of the supply before ordering any equipment.

045. Supply all fixings and make good all damage to walls, ceilings, decorations and fitments to the satisfaction of the Client's Representative.

046. Use dust sheets and protect the Customer's possessions.

047. After Works are completed each day leave all systems in a safe usable condition and clean up all dust and mess.

Circuit chart

048. Provide a laminated durable copy of the Schedule relating to the Consumer Unit(s) and securely fix it within or adjacent to each Consumer Unit in accordance with Regulation No. 514.9.1 of the IET Wiring Regulations.

Electricity supply

049. Note that the electricity supply is nominally 240 volt AC, single phase, 50 hertz, 2 wire.

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System of wiring

050. For concealed wiring, use PVC sheathed 600/1000 volt grade cable of the size and type specified. Wherever possible, run it in within floor, roof and ceiling voids.

051. 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.

052. 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.

053. 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.

054. 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.

055. Do not run cables in roof spaces on the top of joists or insulation. All cables in a roof space shall be clipped to horizontal timber tray supported on battens secured above roof trusses and kept clear of thermal insulation.

056. Install cables leaving roof voids and within floor spaces or passing through any part of the structure in conduit or trunking as specified.

057. 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.

058. Do not install cables within wall cavities.

059. Contain all wiring to each Property that is a flat within that Property.

060. Fit conduits complete and then draw the cable through.

061. Cables must be protected, supported and fixed to the requirements of IET Wiring Regulations.

Cables installed in plastered walls

062. 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.

063. Ensure new conduits are in continuous lengths, smooth in bore, true in size, and terminating in roof spaces and within floor spaces with a minimum projection of 50mm. Provide inside outlet boxes with a universal cleat.

064. 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.

Cables installed in plasterboard partitions

065. 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.

066. Take due account of any insulation within the partition when sizing the cables so as to prevent overheating.

Conduit installed on the surface

067. 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.

068. Support the conduit by PVC-u spacer bar saddles and wood screws and rawlplugs at intervals not exceeding 400mm.

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069. Allow for the expansion of PVC-u conduit.

070. Install the conduit only vertically or horizontally.

Where new cables are to be installed in or under solid floors

071. 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

072. 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 the IET Wiring Regulations. 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.

073. 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.

074. 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

075. 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.

076. Use PVC-u trunking with fitted end covers. Provide a separate earth continuity conductor.

077. Connect trunking to equipment by appropriate screwed couplers, bushes and shakeproof washers, or flanged couplings.

078. Connect trunking to PVC-u conduit by "threaded to plain" adaptors with lock nuts, or clip in adaptors.

079. Clean out trunking before cable is drawn in.

080. Ensure the number of cables installed in trunking does not exceed the space factor specified in the IET Wiring Regulations.

Conductors

081. Ensure all cables comply with British Cable Association recommendations (or equivalent).

082. Carefully remove any insulation in making terminations without causing damage to the conductor. Double the wiring to fill the terminations.

083. Take the sheath of PVC-u sheathed cable inside the outlet boxes or the pattress of ceiling fittings and similar equipment.

084. Securely clamp flexible cords and fit suitable grommets to all terminal boxes.

085. Use cables of the following types and sizes complete with integral earth continuity:

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Concealed wiring - copper or equivalent 2 core and earth PVC 600/1000 volt grade	
Lighting sub-circuits - 1.5mm sq	Dependent upon length of circuit and to comply with the IET Wiring Regulations
Boiler circuits - 1.5mm sq	
Ring circuits - 2.5mm sq	
Radial circuits - 2.5mm sq	
Cooker circuit - 10.0mm sq	
Shower 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 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

086. Install wiring by the loop-in system. Ensure there are no joints or connectors in the final-circuit from the consumer distribution unit.

087. 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.

088. 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.

089. Limit the number of points controlled by one 6 amp RCBO way to 10. If an installation has an excess of 20 lighting points then provide three 6 amp RCBO circuit ways.

090. 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.

091. 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.

092. 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.

093. Install light switches at a distance of between 450 and 1200mm 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.

094. Ensure light switches in bathrooms are white plastic 5 amp AC surface pattern operated by a non-conductive pull cord and knob and hang not more than 900mm above floor level. Fit them close to the wall and well clear of the door to the room.

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095. 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.

096. Do not provide lamps except where specifically required by the Schedule of Rates.

13 amp ring circuit installation

097. Connect sockets in ring circuits without spurs using cable as specified, with both ends of each circuit terminated in one 32 amp RCBO at the consumer distribution unit.

098. Prevent overloading of circuits by providing specified appliances with separate final-circuits.

099. For Properties with a total internal floor area not exceeding 100 square metres on a single level, provide one ring circuit with appropriate numbers of sockets or fused connection units connected to the ring and one kitchen ring main.

100. Properties with a total internal floor area exceeding 100 square metres or Properties on two or more levels, are to have a minimum of two ring circuits with the appropriate number of sockets or fused connection units connected to the ring, in addition to a kitchen ring main.

101. 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.

102. Use surface pattern sockets protected with a RCBO device in garages, and elsewhere on fair face brickwork.

103. Ensure sockets have switches unless otherwise specified.

104. Ensure the positions of sockets relative to the floor level are as follows:

Location	**Dimensions for socket outlets to floor level**
Garages, laundry areas	450mm - 1200mm
General living areas, hall, landings, etc.	450mm - 1200mm
Elderly persons' Properties	450mm - 1200mm
Bedrooms (except elderly persons' Properties)	450mm - 1200mm
Kitchens (dimension from bottom of outlet to worktop)	Within 100mm and 300mm above worktop level

105. In kitchens, where necessary, increase the above dimensions to ensure a satisfactory match with the layout of the wall tiles. Sockets to be aligned level with each other throughout the room. 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.

106. Recess socket boxes into the walls to just below plaster level and provide them with adjustable fixing lugs.

Cooker circuit

107. For cooker circuits, provide one final-circuit connected to one 32 amp RCBO at the consumer distribution unit using cable as specified.

108. Locate a flush fitting, white plastic cooker control unit with a 45 amp DP main cooker control switch, complete with neon indicator, horizontally within 150-1200mm maximum from the edge of the cooker spaces 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 150mm. Where a Customer owns a separate hob and oven, provide a separate 45A DP switch and cooker connection unit below worktop for each appliance.

109. Ensure a cooker control unit that is located between storage cupboards or shelves and working top surfaces aligns with other sockets around the worktop.

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110. Connect the cooker circuit in the 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

111. For heater circuits, provide one final sub-circuit connected to one 16 amp RCBO at the consumer distribution unit using cable as specified.

112. Provide for the heater to be controlled by a heating boost switch to BS EN 60699-1 or BS EN 60730-1 or equivalents located above the worktop in the kitchen with a 20A switch located adjacent to the hot water cylinder in the hot press.

113. Use flush fitting units where switches are located outside the hot press. Where flex outlets are located inside the hot press, use either surface or flush fitted units.

114. Terminate the circuit adjacent to the heater using suitable cable and 20A switch. 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.

115. When the supply cable is exposed within a hot press, protect cables with mini-trunking as specified.

Showers

116. For shower circuit, provide one final sub-circuit connected to one 45amp RCBO at the consumer distribution unit using cable as specified. Provide for the shower to be controlled as near as practicable to the shower unit, by a white 45amp AC, DP neon light or indicating flag pull cord switch located in bathroom.

117. New showers are to ne 9.5KW electric shower unit to, BS EN 60335-2 or equivalent, BEAB, BEAB CARE, RNIB, CE or equivalent marked and WRAS or equivalent approved complete with installation set maximum temperature control, phased shut down, low pressure indicator, installation set timer setting, including plugging walls as necessary, connect to water and electrical supplies including provision of shower circuit including mini-trunking or rigid PVC-u conduit chased to walls etc., incorporating RCBO protection, controlled with 45A DP switch with neon light or indicator flag, all adjustments to pipework, adjust electrical supply as necessary, fill, test, and undertake tests, provide certificate, and remove all waste.

118. Showers are to be supplied with fixed sliding rail, twist and lock shower head mechanism, shower hose with adjustable shower head outlet and soap dish.

Smoke Heat Detectors

119. Smoke alarms must be approved by the Client's Representative and must be installed to BS 5839-6 or equivalent 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 RBCO breaker. 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. The alarm system shall be tested and a certificate supplied to the Client's Representative in accordance with BS 5839-6 or equivalent.

120. Detectors must be mains operated with either battery or capacitor back up.

121. In premises of two levels, an optical detector is required in each of the circulation spaces and the main habitable room. Manufacturer's technical data sheet requirements must be strictly adhered to.

122. Wiring must be in PVC twin and earth cable looped from an independent circuit at the distribution board.

123. 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

124. Install, test and commission the electrical work in accordance with the IET Wiring Regulations ensuring compliance with design and performance, to provide a safe, well insulated, earth protected system capable of supplying the anticipated maximum demand.

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125. Ensure the consumer equipment consists of a non-combustible metal consumer unit with lid complying with the IET Wiring Regulations complete with:

    - main control switch to BS EN 61439-3 or equivalent;
    - sufficient RCBO's to accommodate all the sub-circuits scheduled for the Property; and
    - additional 20% spare way capacity to the number of electrical circuits installed.

126. 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.

127. 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.

128. Upgrade all earthing and bonding to conform to the IET Wiring Regulations. Do not use metal trunking as an earthing conductor.

129. Meter tails are to be neatly fixed and clipped as specified.

130. Provide all equipment white in colour.

131. Clearly identify each way on distribution equipment.

132. Ensure the mounting height of equipment is such that persons of average height can reach all fuses, switchgear, etc., from floor level without assistance.

133. Conceal cables above the ceilings and maintain access to the cable runs.

134. Enclose cables run in cupboards in mini-trunking.

135. Before and on starting the Works, obtain approval from the Client's Representative to the proposed routes of cable runs and wiring circuits.

136. Agree any alterations to the agreed routes of wiring circuits with the Client's Representative before starting the Works on them.

137. 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

138. Use matching components with all lighting switches, sockets, fused spurs and similar equipment used in the Works, being from the same manufacturer.

Customer's fittings

139. Refix any existing fittings installed by the Customer, provided the fitting conforms to the IET Wiring Regulations.

140. Notify the Client's Representative of any Customer's fitting which does not meet the IET Wiring Regulations and which will therefore not be rewired or reconnected.

Removal of floor boarding, etc

141. Carefully remove any floor boarding necessary for the installation of cables. Saw through the tongues only and replace the boards in a workmanlike manner. Joists to be drilled only for the installation of cables. Ensure any new floor boarding is identical in width and thickness. Remove all debris from the joist and roof spaces.

142. Make good all plaster disturbed by the removal of fittings to a true and level surface.

143. Do not disfigure timber frames and mouldings by sawing or chiselling out for the insertion of cables.

144. Where the removal of mouldings, etc. is necessary, ensure the replacement is carried out by a tradesperson qualified in accordance with Paragraph 4.1.1 [*Staff of the Provider and Subcontractors*] of the Preliminaries and that the replacement surface matches the existing surface.

Existing roof insulation

145. 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.

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Removal of old cables and fittings

146. 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

147. Ensure that before being energised any installation is tested in accordance with the IET Wiring Regulations.

148. Give not less than 24 hours' notice to the Client's Representative before commencing the testing.

149. 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.

150. Note the testing instrument serial numbers on the test certificates.

151. 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.

152. Affix to the distribution board a notice in accordance with applicable Standard.

Report and certificates

153. Ensure all inspections, reports and test certificates and forms are the version at the time of the test and are in the standard format published by IET, the National Inspection Council for Electrical Installation Contracting (NICEIC), the Electrical Contractors' Association (ECA) or other certifying and testing body approved by the Client's Representative.

154. 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.

155. 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.

156. Provide an electrical installations condition report when specifically Instructed by the Client's Representative.

Operating Instructions

157. Each consumer unit must be supplied with an operating instruction card which must be mounted adjacent to the unit.

158. Leave printed instructions regarding operation of the consumer unit trip switch with the Customer.

159. The instruction leaflet for the smoke detectors must be left in a safe place either by the electricity meter or consumer unit.

Client's current manufacturers/suppliers/products

160. 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]

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SMOKE, HEAT AND CARBON MONOXIDE DETECTORS

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OPTICAL SMOKE ALARM TECHNICAL SPECIFICATION

001. Each optical smoke alarm installed must:

- carry the BSI Kitemark or equivalent to indicate type testing to BS EN 14604 or equivalent;
- meet the requirements of Grade D (and exceed the requirements of Grades E and F) as defined in the applicable Standard or equivalent;
- carry the CE mark or equivalent to indicate conformance to Low Voltage and Electromagnetic Compatibility Directives;
- have an optical (photoelectric) sensor with large volume chamber and large high sensitivity photodiode. The sensor chamber shall have an insect resistant fine mesh screen with holes less than 0.030 inches;
- operate on a 230V AC Mains Power Supply with built-in tamper proof rechargeable vanadium pentoxide lithium standby cells, capable of lasting at least 10 years and powering the alarm initially for at least 6 months in the event of mains power failure. The lithium cell manufacturer shall provide a minimum 10-year life expectation for the rechargeable cells;
- be supplied with a built-in surface mounting plate, with integral terminal block and cable cover and incorporate a foam gasket fitted to the mounting plate to prevent dust ingress into the unit;
- connect to the mains and interconnect/control connections automatically as it slides on to the mounting plate;
- disconnect from the mains and interconnect/control connections as it slides off the mounting plate, without the need for a lead and connector;
- have all mains wiring covered by a cable cover so that the mains cable is not visible when the smoke alarm is removed from the ceiling, obviating the need for a ceiling pattress or dry lining box;
- have a built-in sounder giving a minimum sound output of 85dB(A) at 3 metres. The diameter of the piezo disc in the sounder shall measure 35mm and have wire contacts soldered directly on to the piezo disc;
- have an interconnection capability, so that if one alarm sounds all interconnected alarms sound;
- have a remote test facility via a separate remote control switch to test circuitry, sensor and horn (red LED shall flash rapidly) and to activate all interconnected alarms in the system. The remote control switch shall also have a remote 'locate' facility (to identify audibly the source of an alarm signal when the system is sounding). All units except the alarm that has triggered and sent out the interconnect signal shall be silenced when this switch is activated. The remote control switch shall also have a 'silence' facility for false alarm control. pressing and resetting the 'silence' switch shall silence nuisance alarms. A red LED on the alarm cover shall flash every 10 seconds to indicate that alarm is in 'hush' mode and automatically reset in approximately 10 minutes;
- have an automatic self-test feature which tests the chamber every 40 seconds and the unit bleeps (without red LED flash) if it is degraded;
- have a manual integral test/hush button to test circuitry, sensor and horn and activate all interconnected alarms in the system. This button shall also operate a 'Hush' feature to silence nuisance alarms. A red LED shall flash every 10 seconds to indicate that alarm is in 'hush' mode and shall automatically reset after approximately 10 minutes;
- have a separate green LED mains indicator light to confirm the integrity of the mains power supply;
- have a separate red LED which will flash every 40 seconds to indicate full auto test of circuitry and the rechargeable cells. The red LED shall flash rapidly in alarm condition and flash once every ten seconds whilst the unit is in a de-sensitive (hush) condition;
- have a RF (radio frequency) wireless interconnect capability when used with an RF base. In this case other RF products can be connected;
- be controllable via an optional wall-mounted hardwired or RF remote control switch;
- have a low power cell-warning signal, which must operate with or without mains power present;
- have an anti-tamper locking device to prevent unauthorised removal of the alarm without the use of a tool;
- have a dust cover fitted to protect it from contamination during installation;
- have two separate sets of instructions supplied with it- one for the installer and one for the Customer; and
- have a 5 year manufacturer's guarantee.

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HEAT ALARM TECHNICAL SPECIFICATION

002. Each heat detector installed must:

- carry the BSI Kitemark or equivalent to indicate type testing to BS 5446 or equivalent for a Class A1 device;
- be CE marked or equivalent to indicate conformance to BS EN 60065 for Low Voltage, and BS EN 50082-1 or equivalent for Electromagnetic Compatibility Directives or equivalents;
- be of the fixed temperature thermistor type, temperature range 540C to 620C (1290F - 1440F);
- operate on a 230V AC mains power supply and have built-in tamper proof rechargeable standby cells, capable of lasting at least 10 years and powering the alarm initially for at least 6 months in the event of mains power failure. The rechargeable cell manufacturer shall provide a minimum 10 year life expectation for the rechargeable cells;
- be supplied with a built-in surface mounting plate, with integral terminal block and cable cover and incorporate a foam gasket fitted to the mounting plate to prevent dust ingress into the unit. The alarm shall connect to the mains and interconnect/control connections automatically as it slides on to the mounting plate. The alarm shall disconnect from the mains and interconnect/control connections as it slides off the mounting plate, without the need for a lead and connector;
- have all mains wiring covered by a cable cover so that the mains cable is not visible when the alarm is removed from the ceiling, obviating the need for a ceiling pattress or dry lining box;
- have a built-in sounder giving a minimum sound output of 85dB(A) at 3 metres. The diameter of the piezo disc in the sounder shall measure 35mm and have wire contacts soldered directly on to the piezo disc;
- have an interconnection capability so that if one alarm sounds all interconnected alarms sound;
- have a remote test facility via a separate remote control switch to test circuitry, sensor and horn (red LED shall flash rapidly) and to activate all interconnected alarms in the system. The remote control switch shall also have a remote 'locate' facility (to identify audibly the source of an alarm signal when the system is sounding). All units except the alarm that has triggered and sent out the interconnect signal shall be silenced when this switch is activated. The remote control switch shall also have a 'silence' facility for false alarm control. Pressing and resetting the 'silence' switch shall silence nuisance alarms. A red LED on the alarm cover shall flash every 10 seconds to indicate that alarm is in 'hush' mode and automatically reset in approximately 10 minutes;
- have a manual integral test/hush button to test circuitry, sensor and horn and activate all interconnected alarms in the system. This button shall also operate a 'hush' feature to silence nuisance alarms. A red LED shall flash every 10 seconds to indicate that alarm is in 'hush' mode and shall automatically reset after approximately 10 minutes;
- have a separate green LED mains indicator light to confirm integrity of mains power supply;
- have a separate red LED which shall flash every 40 seconds to indicate full auto test of circuitry and the rechargeable cells. The red LED shall flash rapidly in alarm condition and flash once every ten seconds whilst the unit is in a de-sensitive (hush) condition;
- have a RF (radio frequency) wireless interconnect capability when used with an RF base. In this case other RF products can be connected;
- be controllable via an optional wall-mounted Hardwired or RF Remote Control Switch;
- have an anti-tamper locking device to prevent unauthorised removal of the alarm without the use of a tool;
- have a dust cover fitted to protect it from contamination during installation;
- have two separate sets of instructions supplied with it - one for the installer and one for the Customer; and
- have a 5 year manufacturer's guarantee.

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MAINS POWERED CARBON MONOXIDE (CO) ALARM

003. Each mains powered carbon monoxide alarm supplied must:

- carry the BSI Kitemark or equivalent to indicate type testing to BS EN 50291 or equivalent;
- be CE marked or equivalent to indicate conformance to Low Voltage and Electromagnetic Compatibility Directives;
- have a new generation electrochemical cell type carbon monoxide sensor which checks CO level every 70 seconds. Each unit shall be calibrated and tested in CO gas to ensure accuracy. The sensor module should plug into base of unit. The amber 'fault' light should flash once every 40 seconds (without a beep) to indicate the sensor should be replaced;
- have a high level of selectivity - no false alarms when exposed to the following interference gases for 2 hours: (as per UL2034sec.38) Methane 500ppm, Butane 300ppm, Heptane 500ppm, Ethyl Acetate 200ppm, Isopropyl Alcohol 200ppm and Carbon Dioxide 1000ppm;
- be 220 – 240V AC, 50 Hz mains powered with power consumption shall be: 1 Watt, 60mA or less;
- be supplied complete with sealed-in tamper proof rechargeable vanadium pentoxide lithium standby cells, designed to last at least 10 years without the need for replacement and which will power the unit for a minimum of 30 days in the event of mains failure.. The cell manufacturer shall provide a minimum 10 yr life expectation for the rechargeable cells;
- be supplied with a surface mounting plate, with integral terminal block, cable cover and incorporate a foam gasket fitted to the mounting plate to prevent dust ingress into the unit. The terminal block shall be permanently fitted to the mounting plate. The built-in rechargeable cells shall connect as the alarm is slid on to the mounting plate. There shall be an option for conduit (up to 25 x 16mm) to be attached to the top or bottom of the unit for surface wiring;
- be able to be ceiling or wall mounted;
- have a hard-wire interconnect capability such that if one alarm sounds all interconnected alarms sound. Additionally, an RF interconnect option shall be available when used with an Interface Module;
- have a remote test facility via a separate remote control switch to test circuitry, sensor and horn (red LED shall flash rapidly) and to activate all interconnected alarms in the system. The remote control switch shall also have a remote 'locate' facility (to audibly identify the source of an alarm signal when the system is sounding. All units except the alarm that has triggered and sent out the interconnect signal shall be silenced when this switch is activated. The remote control switch shall also have a 'silence' facility for false alarm control. Pressing and resetting the 'silence' switch shall silence nuisance alarms. A red LED on the alarm cover shall flash every 10 seconds to indicate that alarm is in 'hush' mode and automatically reset in approximately 10 minutes;
- have the feature that on first power up the red and amber LEDs flash once and then after 2 minutes settling, the alarm operates normally;
- shall have a green LED indicator light that confirms the integrity of the mains power supply;
- have low and high level indicators - red LED indicator light shall flash every 2 seconds at 50ppm CO (sounder operate within 60-90 mins); flash twice every second at 100ppm CO (sounder operate within 10-40 mins); flash 4 times per second at 350ppm CO (sounder operate within 3 minutes);
- have a fault indicator - amber LED flash and horn beep every 40 seconds if a fault is detected;
- have a manual test/hush button - test button to test circuitry and horn. Pressing and releasing the test button when the unit is sensing CO shall silence the alarm for 4 minutes. It must only silence once until the gas clears. At 300ppm CO the unit shall not silence due to the increased danger;
- have a quick CO gas test to reduce the time for testing with CO from at least 4 - 5 minutes to less than 10 seconds;
- have a memory feature - pressing test button must record if CO has been detected during a period of absence: red LED off – no CO recorded; red LED flashes twice (every 40 seconds) – 50ppm CO recorded; red LED flashes 4 times (every 40 seconds) –100ppm; red LED flashes 8 times (every 40 seconds) - 300ppm CO recorded. Pressing the test button for 20 seconds must reset the memory;
- have a built in sounder to give a minimum output of 85dB(A) at 3 metres. The sound output shall be modulated - 3 rapid pulses followed by a 1½ second pause, repeated until reset. This easily differentiates it from a typical smoke alarm;

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- have an automatic reset facility of alarm test when button is released and after an alarm state when CO gas clears;
- have a tamper resistant cover, which cannot be removed from mounting plate without releasing catch with a small screwdriver. There shall be an optional locking screw that can be screwed into the side to prevent removal. The rechargeable cells must not be suitable for use with other products and must be soldered on to the circuit board;
- have an operating temperature range: -10°C to +40°C (14°F - 104°F). 15% to 95% relative humidity (non-condensing); and
- have a 5 year manufacturer's guarantee.

Client's current manufacturers/suppliers/products

004. 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]

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INJECTED DAMP PROOF COURSES AND FUNGUS/BEETLE ERADICATION

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INJECTED DAMP PROOF COURSES AND FUNGUS/BEETLE ERADICATION

GENERAL REQUIREMENTS

Generally

001. Chemical injection damp proof course Works and fungus/beetle eradication Works must be undertaken by a specialist Subcontractor approved by the Client's Representative.

002. Provide a warranty supported by an insurance policy in terms approved by the Client's Representative for chemical injection damp proof course system or fungus/beetle eradication. Provide the policy for each Property to the Client's Representation on completion of the Works to that Property.

003. Protection of Property: Avoid all unnecessary damage to the Property and its contents. Take particular care if the Property has bitumen or pitch floors and/or dampproof courses, since bitumen could be leached by the solvents present in some damp-proofing fluids.

004. Carpets, vinyl floors, furniture and decorations should be adequately protected from contact with the chemicals. Most of the fluids used can damage plant life and adequate precautions should be taken to prevent spillages in gardens.

005. Before any Work is commenced advise the occupier/owner of any adjoining property of the proposed Works. If possible, inspect and record the condition of the relevant walls in those properties.

WORKMANSHIP

Chemical injection damp proof course

006. Chemical injection damp-proof course systems are to be British Board of Agrément or equivalent certified and are to be either:

- Silane/Siloxane emulsions (A silicone micro-emulsion in concentrated form) with solution to be injected at pressure up to 350kPa for mortar injection and 500pKa for brickwork;
- Potassium methyl siliconate (An aqueous siliconate solution in concentrated form) applied by low pressure injection; or
- Ready to cream emulsion on a Silane/Siloxane base for masonry injection by means of a low pressure sprayer or cartridge gun.

007. Comply with the following:

- The horizontal spacing of injection holes must not exceed 150mm. This is to ensure that an overlap of saturated zones occurs thus forming a continuous damp proof barrier;
- All external walls such as yard or screen walls and not themselves having damp proof courses must be drilled and injected vertically not less than 1200mm high where they butt against main Property walls. Take care at steps between Properties of different floor levels when a proprietary silicate render tanking will be necessary;
- When the internal walls are being re-plastered after treatment, the bottom edge of the plaster must be no closer than 25mm from floor level, particularly when injection is associated with solid floors;
- Apply a floating coat of plaster 1:1:6 Cement/Lime/Sand which includes an additive to inhibit the re-occurrence of hygroscopic salts. Gypsum based absorbent lightweight plaster must not be used;
- Allow at least 2 days for the solvent to evaporate, and ventilate rooms to build up of inflammable vapour;
- After plastering use emulsion paints only. Do not decorate with wallpaper for at least 6 months after injection. The Property should be dried out between 6 and 12 months depending on the thickness of the wall; and
- Treat any timbers at risk from fungal decay or insect damage.

008. Neatly and fully fill holes which are exposed to view with 1:1:6 cement:lime:sand mortar. Match the mortar to the existing masonry in colour and texture. Inform the Client's Representative before starting the Works and obtain approval of the appearance of the first few holes before completing the remainder.

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009. Take effective measures to ventilate and dry out damp building fabric as soon as possible. Allow a minimum of 48 hours to ventilate spirit based formulations and as long as practicable for drying out the fabric. Obtain the approval of the Client's Representative to the methods to be used. Do not plaster the wall until the wall is free of any residual moisture (which may take 12 (twelve) months or more)

Cutting out Decayed or Infested Timber

010. Cut out the decayed or infested timber along the grain for one metre beyond the last visible sign of attack. Minimise any damage to sound building fabric and ensure adequate propping and shoring.

Repairs to timber internal door frames

011. Form the joint of the new and existing timber by a 45o - 60o splice. For the new timber, use redwood or equivalent from a source approved by the Client's Representative. Joint the new timber to the existing with galvanised screws or nails or plug and screw it to the wall. Ensure the new timber matches the profile of the existing timber.

Repairs to timber external door and window frames and the cills of timber window frames

012. Form the joint of the new and existing timber by a 45o - 60o splice. For the new timber use a preservative treated redwood or equivalent from a source approved by the Client's Representative. Dip all cut ends in similar preservative fluid before fixing them in position. Joint the new timber to the existing timber with galvanised screws or nails or plug and screw it to the wall. Ensure the new timber matches the profile of the existing timber.

Replacing structural members

013. Joint the new and existing timber by a half-lapped joint. The joint should have a length of at least twice the depth of the timber members; the new timbers should make-up the bottom section of the joint if timbers are horizontally placed. For the new timber, use a preservative treated whitewood or equivalent from a source approved by the Client's Representative. Existing timbers ends exposed by cutting/jointing must be treated with preservative. Joint the new timber to the existing with coach bolts. Ensure the new timber matches the profile of the existing timber.

Chemicals for treatment

014. Use only chemical formulations approved under the Health and Safety Executive (HSE) and listed on the HSE website under non-agricultural pesticides.

Dry rot, wet rot and insect infestation

~~015.~~ Treat dry rot, wet rot and insect infestation as advised in BRE Digest 299(Dry Rot) and BRE Digest 345 (wet Rot) and /or BRE Expert Collection 7 "Condensation and dampness", BRE Report 453 (Insect Damage) or equivalent approved by the Client's Representative.

016. Comply with the following basic principles:

- Prevent further entry of dampness into the building;
- Dry out to remove existing dampness; and
- Eradicate the fungus; and
- Repair the damage caused.

Disposal of defective timber

017. Dispose of defective timber immediately and safely to a tip approved by a waste regulation authority. Prevent contamination of other parts of the Property.

Sterilisation for Fungus Eradication

018. Completely sterilise the surface with approved fungicide by coarse spraying of fluid preparation or direct application by brush with heavy bodied preservative paste. Timber preservatives and biocides must be approved under environmental Law.

Sterilisation for beetle eradication

019. Completely sterilise the surface with approved fungicide/insecticide by coarse spraying/brush application of fluid preparation.

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Sterilisation for woodworm

020. Inject an insecticide approved by the Client's Representative into existing woodworm holes.

Irrigation

021. Irrigate walls with a fungicide approved by the Client's Representative. Bore holes in the wall as necessary for the introduction of the liquid.

Plaster to control dampness or after insertion of a new damp proof course or system

022. The re-plastering operation should be carried out once the wall is likely to be free of residual moisture following the injection of the damp-proof course.

023. Additives may be incorporated in the plaster undercoat to increase resistance to hygroscopic salt migration, provided they do not prevent the passage of moisture vapour. The new plaster work must not be a vapour barrier. Premixed gypsum plasters must not be used as undercoats.

024. The damp-proof course must not be bridged by plasters internally, or by renders externally. A gap of 25mm must be left at base of plaster on inside walls to prevent contact with solid floors.

025. Remove the old plaster to a position not less than 300mm above either the last detectable signs of dampness or the damp-proof course line itself. For chemical damp-proof courses, follow the recommendations of the damp-proof course installer regarding the use of:

- water-proofers or salt inhibitors in render mixes; and
- premixed "renovating" plasters, which must be British board of Agrément or equivalent certified for application to salt contaminated substrates.

026. Arrange for the Client's Representative to inspect and approve the brickwork background before starting any replastering.

027. Apply a plaster after the insertion of a new damp proof course or system consisting of three coats of cement sand backing and gypsum hemihydrate formulated finish with a total plaster thickness in accordance with Good Industry Practice as follows:

- the first coat comprising a cement sand (1:3) scratch coat with an additive approved by the Client's Representative;
- the second coat comprising cement sand (1:3) with no additive mixture, applied whilst the first coat is still green and then ruled to alignment and scratched to form a key; and
- the finishing coat comprising gypsum hemihydrate formulated finish.

028. Alternatively, if the Client's Representative so approves, use a two coat lightweight aggregate plaster with a total plaster thickness of at least 13mm as follows:

- on normal backgrounds:
    - for the first coat: use a renovating plaster scratch coat containing a perlite lightweight aggregate and a waterproofing/salts inhibiting additive; and
    - for the second coat: use a finishing plaster coat containing fine lightweight aggregate; or
- on low suction backgrounds:
    - for the first coat: use a slurry keying aid as recommended by the plaster manufacturer; and
    - immediately follow it by a tight coat of renovating plaster and leave it for a minimum of 36 hours before applying the finishing plaster.

029. For normal two coat systems of a total of 13mm thickness, apply the floating coat in a single application, ruled to alignment and scratched to form a key. If the maximum thickness of the backing coat required exceeds 12mm use a scratch or dubbing out coat to bring out to a level surface. Ensure the coat does not exceed 11mm, is well scratched, and is allowed to dry before the application of the subsequent coat.

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Physically Inserted Damp Proof Courses to Existing Walls

030. Carefully cut joint of brickwork, blockwork or masonry to prevent structural damage, install a continuous damp proof course barrier to rising damp with polyethylene BS 6515 or equivalent weighting not less than 1.55kg per m^2 to full width of wall and finish, externally to finish flush with face of wall, internally to form a minimum 150mm lap with damp proof membrane.

031. Carefully cut joint of brickwork, blockwork or masonry to prevent structural damage, install a continuous damp proof course barrier to rising damp with bituminous felt to BS 6398 or equivalent weighting not less than 0.48kg per m^2 to full width of wall and finish, externally to finish flush with face of wall, internally to form a minimum 150mm lap with damp proof membrane.

Mastic asphalt tanking/damp proof membranes

032. Where these are horizontal, apply them as follows:

- base: existing concrete;
- preparation: laid to falls;
- separating layer: none;
- certification: asphalt kitemark or equivalent certified;
- thickness: at least 20mm; and
- finish: smooth floated.

033. Where these are vertical, apply them as follows:

- base: existing concrete or brickwork;
- preparation: key a vertical surface;
- certification: asphalt kitemark or equivalent certified;
- thickness: at least 20mm; and
- finish: smooth floated.

General technical requirements

034. Lay each horizontal coat in a single operation to provide a secure, free draining and completely watertight floor.

035. Unless otherwise specified by the Client's Representative, use ancillary products and accessories recommended by the asphalt manufacturer.

Primer

036. Use a primer recommended by the manufacturer of the material to be bonded. Apply by mopping, brushing or spraying to achieve an even and full cover of the surface. Allow to dry thoroughly before covering.

Bonding compound(s)

037. Unless specified otherwise by the Client's Representative, use oxidised bitumen of a grade recommended by the manufacturer of the material for the conditions and type of surface. Heat it and lay it at a temperature sufficient to ensure bonding over the whole surface. Do not overheat it.

Preparation of bases - renewing existing asphalt

038. Agree with the Client's Representative the extent of the area(s) to be renewed.

039. Remove, renew and waterproof each area on the same day, unless the Client's Representative Instructs otherwise.

040. Adequately protect existing and new area(s) of floors against damage during the Works. Where removal results in accidental damage to existing elements which are to remain, agree the proposed repair or replacement with the Client's Representative.

Keying to concrete

041. Clean off mould oil with detergent. Use Materials recommended for the purpose by the asphalt manufacturer. Either prime the surface with a proprietary bituminous emulsion or apply a proprietary keying mix of cement and slurry incorporating a bonding agent.

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Keying to brickwork/blockwork

042. Ensure that all joints are lightly recessed by brushing or other means. Prime the wall surface with a proprietary bitumen and rubber emulsion recommended by the mastic asphalt manufacturer.

Keying to metal

043. Apply a keying primer to all metal pipes, metal lathing, etc.

Asphalt/accessories - suitability of base

044. Before laying asphalt ensure that:

- the horizontal base is to even falls with no areas which will pond;
- the surfaces to be covered are firmly fixed, clean, dry, smooth, free from frost, contaminants, voids and protrusions; and
- all preliminary work including formation of upstands, kerbs, sumps, grooves, chases, expansion joints, etc., and fixing of battens, fillets, anchoring plugs/strips, flashings, outlets, pipe sleeves, ventilators, etc., is complete and satisfactory.

Application of asphalt

045. Ensure thorough mixing when remelting and do not heat to more than 2300C.

046. Do not use reheated asphalt.

047. Apply each coat to an even thickness using suitable gauges. Float to a smooth surface free from imperfections and crazing. Apply successive coats without delay and within the same working period.

048. Ensure there is complete fusion of the asphalt at all joints so as to give a continuous watertight membrane. Clean and heat the edges of previously laid coats by poulticing with hot asphalt. Remove and discard the poultice and cut away the edge to remove sand rubbed material before jointing. Lay new asphalt whilst the poulticed surface is still hot. Do not torch.

049. Stagger junctions of bays in successive coats by at least 150mm.

050. Pierce any blows and make good affected areas while the asphalt is still at a working temperature.

051. Form solid fillets in all internal angles, fully fused to the asphalt coating and at least 40mm wide on face and at an angle of approximately 45 degrees to the horizontal.

052. Maintain the full thickness of the asphalt around all external angles.

053. Turn the asphalt into splayed chase at the top edge of skirtings and vertical work. Finish the top surface with a splay to shed water away from the wall, maintaining full thickness.

054. Form watertight joints around all pipes, gullies and other penetrations.

055. Finish asphalt to a smooth flat surface, free from lipping, pitting, scars and other imperfections. Sand rub all horizontal surfaces while the asphalt is still warm, using clean, coarse sand from natural deposits, passing a 600 micron sieve and retained on a 210 micron sieve.

Redecoration

056. After complete drying out, brush off the efflorescence, allowing the Customer to proceed with normal wall papering etc. Do not apply impervious wall coatings until the walls are dry. This could take as long as twelve months, and certainly not less than six months from the installation of the damp-proof course.

057. Apply one coat of matt emulsion paint for the interim period.

058. After re-plastering, decoration should be restricted to matt emulsion and water based paints which are porous and allow the wall to breathe.

059. Delay any decoration with impermeable finishes such as gloss paint and vinyl paints or wallpapers for at least one year.

060. Do not use plaster from different manufacturers within the same application.

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PEST CONTROL

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PEST CONTROL

General Requirements

001. Provide a pest treatment service at all Properties and corporate and communal premises and land owned or managed by the Client for all pests comprising:

- Routine preventive treatment;
- Responsive treatment; and
- Out of Hours Emergency Works.

002. Decide on the methods, equipment and materials that should be used in a treatment with due regard to the health and safety of Staff, the Customer and their family, staff of the Client, the general public and any household pets.

003. Carry out the Works in accordance with:

- the Codes of Practice issued by the British Pest Control Association or such other Codes or guidance which in the opinion of the Client's Representative is of an equivalent or better standard;
- the Client's Environmental Policy (as appended to the Contract Details);
- the UK Rodenticide Stewardship Regime; and
- the Rat and Mouse Control Procedures Manual issued by the Chartered Institute of Environmental Health or equivalent.

004. Contact the relevant Public Health Team for the local authority area where the infested Property, corporate or communal facility or land is located, if the infestation present is of a size that the Provider believes it cannot be dealt with within the contracted number of visits, or there's harbourage on site that requires clearing in order to reduce the incidence of re-infestation.

005. Should be a member of the British Pest Control Association or the National Pest Control Technicians Association.

Operational Requirements

006. Notify the Client's Representative of all accidental occurrences involving persons, animals or property on the premises treated by the Provider.

007. All baits laid on the premises either from the treatment or previous treatments by other contractors shall be removed on completion of the treatment and disposed of in a safe manner in accordance with the Law.

008. Remove and dispose of any pest carcasses which result from the pest treatment in a safe and hygienic manner

009. Inform the Client's Representative of details of the chemicals to be employed, their toxic properties, and any antidotes and precautions that may be necessary to prevent damage or injury to persons, animals and property.

010. Supply the Customer or other occupier with a statement of the poison used on the Property or premises and the appropriate medical or veterinary treatment in an emergency.

011. Keep a record of all treatments carried out in enough detail as to indicate the extent of each infestation and the number and position of baits laid. Provide a monthly report the Client's Representative detailing the pests treated.

012. Provide the Client's Representative with quarterly and annual statistics as the numbers of Orders raised by pest, category, time of response and time to resolve the infestation.

013. Provide the Client with a qualified scientific advisory and identification service in relation to rodent control including expert evidence at court proceedings as and when required.

014. The Rates include for all visits required to continue the appropriate treatment until the Property is or premises are free from the reported pests.

015. Where infestation is found to originate from or extend to an adjoining Property owned and managed by the Client treat that Property accordingly as a variation to the original Order.

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016. Where infestation is found to originate from or extend to an adjoining property not owned or managed by the Client, give advice on treatment to the owner/occupier of that property, and report the findings to the Client's Representative.

Emergency or Urgent Treatment

017. Where an Order is issued for Emergency Works the Provider must give the Customer a triage call within 15 minutes of receipt of the Order and must attend the Property within 2 (two) hours of the Order.

018. Where an Order is issued for Urgent Works, the Provider must give the Customer a triage call within 15 minutes of receipt of the Order and must attend the Property within 4 (four) hours of the Order.

Permit to Work Certification

019. Comply with any permit to work system operated by the Client's Representative for working in confined spaces.

Access

020. Undertake a risk assessment before undertaking the Works. Provide a method statement for the means of access to the Client's Representative (for Emergency Works or Urgent Works provision of the copy to the Client's Representative may be after completion of the Works).

Staff

021. Train Staff in the use of pesticides and rodenticides for all types of pests, both vertebrate and invertebrate and provide certificates of training to the Client's Representative just before the Commencement Date and on each anniversary of that date.

Approval of Pesticides and Rodenticides

022. Submit details of all pesticides and rodenticides to be used including the trade name and chemical formulation of the proposed pesticides and rodenticides to the Client's Representative for approval following pre-inspection before undertaking the Works.

023. Do not use any pesticides and rodenticides other than those approved by the Client's Representative.

Investigations

024. In cases of alleged poisoning from pest treatments undertake a full investigation and co-operate with any investigations carried out by others. Provide an initial report to the Client's Representative on and remedial action to be taken and a final report to the Client's Representative detailing all findings and actions taken.

Surveys

025. Undertake an investigative survey Ordered by the Client's Representative for any type of pest at any Property and/or land owned or managed or proposed to be owned or managed by the Client.

026. Upon completion of the investigative survey, immediately provide a written report of the findings and recommendations for appropriate treatment to the Client's Representative. The Order will state whether this is to be paid for as a Technical Inspection or at Daywork Rates.

Pest Treatment – Rats and Mice

027. On receipt of an Order, visit the Property, investigate the nature and extent of the rat and mice pest infestation and commence a suitable treatment.

028. Keep a record of the treatment undertaken, including the number and position of bait stations, traps and any other items used in the treatment.

029. Arrange with the Customer or occupier of the Property a convenient time and date (which shall not be more than 10 (ten) calendar days from the date of the initial visit) to return to make a subsequent visit to monitor the progress of the treatment, renew baits as necessary, vary the treatment if considered necessary and to take any other steps to complete the treatment as speedily as possible and in a manner which is consistent with Good Industry Practice and safety considerations.

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030. On the initial visit give a written notice to the Customer recording the treatment undertaken and essential safety information. Give a further notice on each subsequent visit with updated information and advice. The design and wording of each such notice must be approved by the Client's Representative.

031. Continue visit the Property until the treatment has been satisfactorily concluded. Following the second visit (including the initial visit) if the treatment has not been satisfactorily concluded, report to the Client's Representative on the conduct of the treatment, discuss with the Client's Representative any difficulties that have arisen and submit proposals for the future conduct of the treatment.

032. Comply with any Instruction from the Client's Representative on any future treatment for the rat and mice infestation at no extra cost to the Client.

033. Payment shall be made by the Client for the Works only on the successful completion of the treatment.

Pest Treatment - Fleas, Bedbugs and Cockroaches

034. On receipt of an Order, visit the Property, investigate the nature and extent of the fleas, bedbugs and cockroach pest infestation and commence a suitable treatment.

035. Keep a record of the treatment undertaken, including the type of pest, Materials used, the location and extent of infestation and any other items used in the treatment.

036. On the initial visit give a written notice to the Customer recording details of the treatment undertaken and essential safety information. The design and wording of such a notice must be approved by the Client's Representative.

037. Complete the treatment for fleas, bedbugs and/or cockroaches in one visit. If a subsequent visit is required, submit a written report to the Client's Representative on the case, and recommend any further measures needed to conclude the treatment satisfactorily.

038. Comply with any Instruction from the Client's Representative on any future treatment at no extra cost to the Client.

039. Payment will be made for the Works only on the successful completion of the treatment.

Pest Treatment – Wasps and Hornets

040. On receipt of an Order, visit the Property, investigate the nature and extent of the wasp or hornet pest infestation and commence a suitable treatment.

041. Keep a record of the treatment undertaken, including the type of pest, Materials used, the location and extent of infestation and any other items used in the treatment.

042. On the initial visit give a written notice to the Customer recording details of the treatment undertaken and essential safety information. The design and wording of such a notice must be approved by the Client's Representative.

043. Complete the treatment for wasps and hornets in one visit. If a subsequent visit is required, submit a written report to the Client's Representative on the case, and recommend any further measures needed to conclude the treatment satisfactorily.

044. Comply with any Instruction from the Client's Representative on any future treatment at no extra cost to the Client.

045. Payment will be made for the Works only on the successful completion of the treatment.

Pest Treatment - Beetles, Ants, Psocids and Flies

046. On receipt of an Order, visit the Property, investigate the nature and extent of the beetles, ants, psocids and flies pest infestation and commence a suitable treatment a suitable regime of treatment.

047. Keep a record of the treatment undertaken, including the type of pest, Materials used, the location and extent of infestation and any other items used in the treatment.

048. On the initial visit give a written notice to the Customer recording details of the treatment undertaken and essential safety information. The design and wording of such a notice must be approved by the Client's Representative.

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049. Complete the treatment in one visit. If a subsequent visit is required, submit a written report to the Client's Representative on the case, and recommend any further measures needed to conclude the treatment satisfactorily.

050. Comply with any Instruction from the Client's Representative on any future treatment at no extra cost to the Client.

051. Payment will be made for the Works only on the successful completion of the treatment.

Pest Treatment - Pigeons

052. As directed in the Order pigeon proofing areas used by pigeons for perching or roosting by using barriers, spikes, nets and wire, shock strips, audible scarers and / or optical gels.

053. For a heavy pigeon infestation, use control methods such as shooting, trapping or flying of predatory birds.

Pest Treatment – Use of Spring Traps

054. Use spring traps for species where toxic control measures are illegal or inappropriate. Ensure that all control measures are legal, humane and are carried out with sensitivity.

055. Use break back traps approved by Law for small vermin. Use spring traps for mole control where applicable in accordance with the Law. Break back traps should be used appropriately, in a humane manner and must be checked regularly.

056. Consult the manufacturer's technical data sheet regarding pest species and trap location before using spring traps. Where recommended by the manufacturer, set traps in an artificial or natural tunnel to prevent the access of non-target species. Make every effort to avoid trapping non target species. Ensure Staff setting traps can recognize the signs and evidence of pest activity.

057. Restrict the entrance of trap tunnels (with sticks, for example) to prevent the entry of non-target species. Firmly anchor the spring traps in the treatment area.

058. Check spring traps at least once a day, or more often where required by Law. Do not set spring traps in open or accessible areas where members of the public, animals and / or pets can gain easy access to them.

059. Ensure Staff always wear suitable Personal Protective Equipment when dealing with dead bodies and traps to prevent the transmission of rodent borne disease.

060. The capture and trapping of edible dormice (Glis glis) must be done under the terms of a Class License WML-CL02 from Natural England (http://www.naturalengland.org.uk/ourwork/regulation/wildlife/species/edibledormi ce.aspx).

Pest Treatment – Use of Live Capture Traps

061. The Provider must determine the appropriate treatment in accordance with the Law.

062. Live capture traps may be used to control some species that cannot be treated with toxic compounds. These must enable non-target species to be released.

063. Live capture cage traps should be large enough to accommodate the target species e.g. fox, muntjac deer, mink, black rat and grey squirrel. Cages should be inspected at least once every day. Non target species must be released unharmed as soon as possible.

064. The target species must be humanely dispatched at the most suitable opportunity and not released. The body should be responsibly disposed of.

065. Traps must not be set in a position where the captured animal will be exposed to extremes of temperature or the risk of flooding.

066. Take care to avoid attracting domestic animals into cage traps.

067. Where domestic cats can be shown to be feral (1st generation born wild) live capture trapping followed by humane dispatch is an appropriate control measure if the animals are posing a risk to health or to native species. Make every effort to determine first whether the cat is a pet by, for example, arranging for a vet to check for the presence of a microchip.

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Pest Treatment - Bees

068. Take every effort to avoid carrying out control treatments against any bees. Treat with a pesticide only as a last resort, to minimise the risk that foraging, non-target, honeybees come into contact with the treatment and carry away contaminated honey.

069. On receipt of an Order to treat a feral honeybee nest, assess the situation carefully., including whether people have been stung by honeybees from the nest, or are they at risk because of its location. If the nest is not causing any risk to public health, then carefully consider the alternatives before carrying out a treatment.

070. If the swarm has formed only recently, where possible leave it undisturbed and allow it to move on. This will usually occur within 48 hours. If the swarm is in a sensitive area and is easily accessible, attempt to collect and re- house it in a suitable hive. Where appropriate use a bait hive containing a pheromone lure to attract the queen.

071. If the swarm has recently taken up residence in a chimney (last 48 hours) seek to persuade it to move on using non-pesticidal smoke.

072. If a swarm has been resident for more than 48 hours or is in a void and it is not known how long it has been resident assume that the swarm is established and will not move on.

073. If the swarm has been in residence for more than 6 months) seek to persuade the Customer to live with the bees until the winter months. Take control action between January and mid-March, when the honey cells are capped and the stores are at their lowest. The numbers of bees at this time will also be at their lowest levels. This will reduce the quantity of pesticide required and will enable an efficient and clean removal of the contaminated comb and stores,

074. Following removal use a deodorising compound to discourage swarms from taking up residence the following year.

075. The Provider's decision to treat will depend on whether it is possible to close off the entrance(s) to the nest after treatment. It may be possible to use extension lances to get the insecticide to the nest, but it may require access equipment to close off entrances safely.

076. If treating with a non-residual insecticide, still block off any gaps so foragers from other managed hives do not find the unattended honeycomb and call their own hive into robbing mode.

077. If treatment is considered the best option, use the British Beekeepers Association's spray liaison scheme to liaise with local beekeepers before treating a nest. Members of the British Beekeepers Association can provide advice and can sometimes remove accessible feral honeybee colonies, avoiding the need to use pesticides.

078. If the entrance to a feral bee nest is high up on a building, potentially associated with the chimney, use appropriate means of access and use only Staff who are trained to work at height.

079. If the nest is associated with a chimney, assess whether the nest is inside the flue or the cavity surrounding the flue. If inside the flue, remove the combs before treatment, which may involve the partial demolition and rebuilding of the chimney.

080. Use only insecticides that are 'Approved for Use' by the Health and Safety Executive. Read the label in detail and follow all instructions.

081. Take every reasonable action to prevent foraging honeybees from gaining access to the treated nest, by removing the combs or blocking the nest entrances" irrespective of the insecticide used.

082. To reduce the risk of bees from other colonies gaining access to the treated nest whilst ensuring that all bees from the problem colony are controlled, where appropriate carry out the treatment just before dusk and close the nest entrances as soon as possible (i.e. first thing the next day).

083. Treat the treated honeycombs as 'controlled waste' and disposed of via a licensed waste carrier as 'Non-Hazardous Waste'. Use EWC Code 20.01.99 on the Waste Transfer Note, as for dead mice, rats, insects and pigeons. Dispose of the contaminated honeycombs by incineration so bee colonies cannot access contaminated honeycombs at a landfill tip.

084. Assess other biocides to decide whether a hazard classification of the treated materials is appropriate.

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ENERGY PERFORMANCE CERTIFICATES

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SPECIFICATION FOR ENERGY PERFORMANCE CERTIFICATES

001. Provide an Energy Performance Certificate ("EPC") when requested by the Client's Representative including:

- on the completion of any Works affecting the EPC score, such as:
  - Works to upgrade energy systems;
  - Renewal of windows and/or external door(s);
  - Internal or external wall insulation;
  - Roof space insulation upgrade; or
  - Floor insulation upgrade;
- on the recording of details of energy appliances controls and fuels
- whilst the Provider is at the Property to carry out Works that are not energy related and agrees to provide an EPC following those Works;
- On a special Order to inspect the Property and prepare an EPC prior to commencing Works; and
- Before letting or sale of an occupied or unoccupied Property, in which case access is to be arranged by the Client.

002. EPCs must be produced by suitably qualified Domestic Energy Assessors ("DEAs") accredited with National Energy Services (NES) Ltd. The Client's Representative will nominate one accreditation scheme for the Provider to use in producing all EPCs for the Client.

003. The Client may require the Provider's DEAs to attend extra training to ensure the correct recording of Property survey data. The training and venues will be provided by the Client.

004. The Provider is to retain a copy of all EPCs produced.

005. If any EPC is defective the Provider shall provide a replacement through either the DEA or their Accreditation Scheme provider.

006. Ensure the digital data entered into the EPC software is in NES/Elmhurst (or other equivalent approved by the Client's Representative) and complies with any guidelines produced by the accreditation authority.

007. Retain pdf versions of all EPCs produced for 10 years, suitably indexed, and also returned to the Client at the end of the Contract.

008. Upload the data collected onto the Client's IT System at least monthly, ensuring the Client's Unique Property Reference Number and any other data specified by the Client's Representative is correctly entered onto each digital EPC record.

009. Provide the Client's Representative with the Retrieval Reference Number, Positive Right to Rent Notice and address of every Property for which an EPC is produced by email on the same day as production of the EPC.

010. Provide EPCs for Void Properties within 5 (five) Business Days of a Property becoming void.

011. Provide an EPC for all other Works within 1 (one) Business Day of the Provider's pre-commencement survey, and an provide and updated EPC within 5 (five) Business Days of the completion of the Works.

012. Do not use multiple EPC production techniques for EPCs for heating systems, boilers and controls unless evidence is available from other EPCs for a Scheme.

013. When using multiple EPC production techniques (e.g. sampling and multiple certification or the common values approach), note this on the digital records on the Client's IT System and ensure quality assurance audits are carried out.

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AIRTIGHTNESS

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AIRTIGHTNESS

General

001 Where airtightness measures are required the Provider has overall responsibility for the continuity of the air tightness layer and should appoint one team member to oversee the execution of all airtightness details to maintain quality control. Specific care should be taken by the Provider to oversee and check the work of Subcontractors, who should be well briefed on the importance of the airtightness barrier.

002 All Staff should be encouraged to report breaches in the airtightness barrier without apportioning blame or fearing blame themselves. Under no circumstances should a breach of the barrier be covered up, but must be repaired at the earliest opportunity. The Provider should also inform the Client's Representative of any previously unidentified breaches of continuity. Should any aspect of the airtightness requirement appear unclear, the Provider should seek guidance from the Client's Representative.

003 The airtightness measures should be executed by trained and competent Staff.

004 Only tapes designed specifically for airtightness purposes and for bonding to the particular substrates and finishes are to be used. Expanding foam and mineral wool will not be accepted as part of the airtightness layer at any location.

005 Particular attention should be paid to the following main areas of concern:

- Around window and door openings
- External wall to ceiling junctions
- Junctions of internal walls with external walls
- Junctions of internal walls with the ceiling
- Services and wiring penetrations
- Joints in poured concrete floors

Airtightness Membrane / Vapour Control Layer

006 Airtight membranes/Vapour control layers shall be:

Material:

- Polyethylene membrane with polypropylene fibres for permanently airtight building envelopes, to applicable Standard.
- BBA Certified or equivalent approved 3rd party accreditation.
- Dimensions: To applicable Standard
- Mass: = 110 g/m² to applicable Standard
- Thickness: = 0.40 mm
- Diffusion equivalent air layer thickness sd: = 5 m to Applicable Standard Nail tear-out resistance: = 200 N lengthwise and crosswise
- Tensile strength: Lengthwise: = 200 N/50 mm, Crosswise: = 180 N/50 mm
- Elongation: Lengthwise: = 50 %, Crosswise: = 50%
- Durability: To applicable Standard
- Airtightness: To applicable Standard.
- Resistance to water penetration: W1 to applicable Standard
- Fire Classification: Class E to applicable Standard
- Temperature resistance: -40° - 80° C

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Installation requirements:

- By competent, trained Staff, as recommended by manufacturer, suitable for construction type in accordance with applicable Standard.
- Setting out: Joints minimized.
- Method of fixing: Double sided tape as recommended, avoiding the use of staples.
- Joints: At supports only, lapped 100 mm minimum and sealed with tape.
- Openings: Membrane taped to reveals.
- Joints and edges: Sealed with tape.
- Penetrations: appropriately sealed as manufacturer's technical data sheet.

Warranty: Minimum of 5 years for complete air tight system.

Airtightness Tape

007 For taping around window and door openings, at corners and 1st floor joists/wall junction.

Material:
- Spun bonded, polyethylene, single-sided acrylic adhesive tape, pre-folded, suitable for use on masonry and for plastering over.
- BBA Certified or equivalent approved 3rd party accreditation.
- Manufacturer: same as that of airtightness membrane.
- Diffusion equivalent air layer thickness sd: = 5 m to applicable Standard
- Tensile strength: Lengthwise: = 200 N/50 mm, Crosswise: = 120 N/50 mm
- Airtightness: To applicable Standard, not less than that of airtightness membrane.
- Resistance to aging: permanent, non-drying adhesive strength, flexible to withstand structural movement.
- Fire Classification: Class E to applicable Standard
- Temperature resistance: -40° - 80° C
- Adhesive: high strength, self-adhesive, splash-proof

Installation requirements:
- By competent, trained Staff, as recommended by manufacturer, suitable for construction type, in accordance with applicable Standards.

Warranty: Minimum of 5 years for complete airtight system.

Airtightness Measures where indicated by the Client:

008 All new window and door installations are to be sealed with airtightness tape.

009 All locations where services interrupt the airtight plane on 1st floor ceilings, external walls and ground floors are to be sealed to form a continuous airtight layer, using a suitable product for this application as recommended by the airtightness system manufacturer.

010 New tracking in the internal face of external blockwork walls to be sealed with a parge coat of plaster to maintain the continuity of the airtightness barrier.

011 Install a vapour control layer to underside of top floor ceiling joists, turned down minimum 100mm at junctions with walls. To facilitate this chip back wall plaster locally to external walls as necessary and make good to ensure continuity.

012 Existing internal plaster finish to party walls and external walls to be made airtight. Chip off and apply a plaster parge coat where necessary to ensure the integrity of the airtight barrier, paying particular attention to junctions and where internal walls meet external walls. Allow for skim finish to all affected walls.

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013 To intermediate floor, strip back skirting, floorboards and plasterboard ceiling to expose ends of timber joists where they enter the inner leaf of the cavity wall. Tape wall/joists junctions as recommended by tape manufacturer, replace floor, skirting and make good ceiling. Ensure gap between joists is sufficiently sealed with airtightness membrane or a plaster parge coat.

014 Lift existing ground floor covering and skirting boards around perimeter and tape external and party wall/floor junction. Chip back wall plaster locally to facilitate this as required, make good and fit new skirting boards.

015 Tape joint between any existing and new concrete floors.

Airtightness Pressure Tests

016 A minimum of 2 airtightness pressure tests shall be carried out and should the Provider require any further testing, to ensure they are able to achieve the required air tightness levels, they will do so at their own cost.

Test Standard:

017 The airtightness pressure test shall be carried out in accordance with the requirements detailed in the ATTMA Technical Standard L1, Measuring Air Permeability of Building envelopes, and applicable Standard for Thermal Performance of Buildings - Determination of air permeability of buildings - Fan pressurisation method.

Specialist Subcontractor:

018 The buildings airtightness test shall be carried out by a Specialist Subcontractor who is a member company of ATTMA (The Air Tightness Testing and Measurement Association) and shall also be UKAS Certified.

019 The pressurization test must be carried out by an institution or person independent of the Client and Provider. If the Client or Provider is suitably qualified to conduct the pressurization test themselves, it is only accepted if an independent suitably qualified witness signs the test results and thereby certifies the correctness of the data.

Air Permeability Standard:

020 Achieve the airtightness levels as specified by the Client or as required by Building Regulations, whichever is lowest.

Instrumentation:

021 The instrumentation used to carry out the building airtightness test shall be UKAS certified and have a valid calibration certificate.

022 The pressurization test should only be performed to the heated building envelope. It is recommended to perform the initial tests when the airtight plane is still easily accessible and corrections can be implemented.

023 It is recommended that the first air tightness test is carried out when the airtight layer is still accessible.

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Client's current manufacturers/suppliers/products

024 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]

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