M3NHF Schedule of Rates

VERSION 8

Responsive Maintenance and Void Property Works Specification

Your challenges expertly solved in partnership

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SPECIFICATION OF WORKMANSHIP AND MATERIALS

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GENERAL

M3NHF SCHEDULE OF RATES – RESPONSIVE MAINTENANCE & VOID PROPERTY WORKS – SPECIFICATION – VERSION 8

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

Standards of workmanship and Materials

006 Carry out and complete all Works as required by this Contract including:
- in accordance with 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 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.

European and British Standards & Codes of Practice

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

011 References in this Specification of Workmanship and Materials to any 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.

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 Do not use any Prohibited Materials in carrying out the Works. Prohibited Materials are those materials which are generally accepted or (having regard to Good Industry Practice) are reasonably suspected of:

- being harmful in themselves;
- being harmful when used in a particular situation or in combination with other Materials;
- becoming harmful with the passage of time; or
- being damaged by or causing damage to the structure in which they are to be affixed.

019 Materials are to be regarded as harmful if, in the context of their use in the Works (whether alone or in combination with other materials) they:

- are prejudicial to health and safety;
- may pose a threat to the structural stability or the physical integrity of any Property; or
- could materially reduce the normal life expectancy of any part of the Property.

020 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.

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

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

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

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

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

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

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

025 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.

026 **[optional clause]** 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

Temporary Accommodation conforming to all applicable Standards.

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 (note: gas is the preferred option);
- 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).

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 1:12) to be provided for people with a disability to the satisfaction of the Client's Representative;
- Water supply; and
- Mains sewerage connection (where feasible).

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.

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].*

A chemical toilet compliant with all Standards for portable chemical closets may be used where no sewer connection is feasible.

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

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

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

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.

The facility is to be cleaned between each change of user.

The following notice not less than 200mm x 130mm with the heading printed in red is to be fixed 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

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

Access

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

Firestopping

029 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.

030 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.

EXTERNAL WORKS

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 to Applicable Standard, 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 Applicable Standard and laid in accordance with the applicable 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 Standards 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. All precast concrete edgings and kerbs are to be to applicable Standard.

Bond Coat

009 Bond coats should comply with the applicable Standards. The minimum target rate of spread to existing substrates should not be less than 0.3kg/m2 of residual binder. For application to newly laid substrates the minimum target rate of spread should not be less than 0.2kg/m2 of residual binder.

Asphalt Concrete

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

011 Binder to be petroleum bitumen conforming to Table 1 of the applicable Standard.

	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 – Basecourse Trafficked	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
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 applicable Standard and PD 6691 for Category B traffic and laid and compacted in accordance with the applicable Standard

	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 All aggregates used for bituminous surfacing materials shall be sound, clean, hard broken rock graded to and conforming to the applicable Standards. 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 Standards.

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 Standards and laid and compacted to the applicable Standard, amount of reclaimed asphalt to be 10% by mass of the total mixture.

017 Binder to be paving grade petroleum bitumen conforming to the applicable Standard.

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

Chippings

018 Pre-coated Chippings to comply with and applied in accordance with the applicable Standards.

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/m2 and rolled in

Thermostatic Road Marking

019 To be hot thermos-plastic road marking to applicable Standard 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 to the applicable Standards in either herringbone or stretcher bond.

021 Sand for bedding to be sharp sand or crushed rock fines, not more than 10%, retained on a 5mm BS sieve and evenly graded as Applicable Standard GF85)/4/(MP) 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 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.

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 applicable Standard to form half brick wall in cement mortar (1:3 30N/mm2) in stretcher bond, form 2 number holes each not exceeding 55mm nominal size diameter, and fix only surface box supplied by 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 Applicable Standard 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 name of Street lighting Authority and Year of Manufacture in 6mm high blue lettering along its entire length, no joints allowed
Street Lighting Cables in Carriageways or Parking Areas	160mm diameter PVC-u to Applicable Standard complete with flexible joints

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, the Provider will be required to 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, the Provider shall 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, the Provider must reinstate the surface to match the surrounding area and leave the area safe and level with the surrounding area.

040 Advance warning notices must be delivered by the Provider at his own expense 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. The Provider must 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. The Provider must carry out all rectification and reinstatement to the satisfaction of the Client's Representative.

043 Remove all arising's 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 the Provider must 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 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 section;
Non-folding stays; 3 or 4 no 2omm diameter aluminium tubes or 13mm x 13mm painted galvanised steel section;
Brackets: zinc die cast;
Centre Pole: galvanised hot finished welded hollow section made from steel to Applicable Standard, minimum 34mm diameter, minimum 1.7m length;
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;
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;
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 frame, and galvanised steel liner fixed with a security chain;
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 be comply with Applicable Standard and to be constructed from:
Galvanised tubular steel painted black with bands
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 Preparation of undisturbed topsoil is to be in accordance with 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 Applicable Standard: Loamy sand.

057 Imported low fertility topsoil for specific purpose - Low fertility. - soil textural class to Applicable Standard: 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;
- 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 current revision, obtained from a PAS 100 compliant facility.

Spreading Topsoil

060 Spreading topsoil is to be in accordance with 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.
- Depth after firming and settlement: No greater than 400 mm.

061 The finished levels of topsoil after settlement is to 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.
- Adjoining soil areas. Marry in.

062 Final cultivation od 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. –
    - Remove roots and large stones with any dimension exceeding 25mm.

063 Grading of topsoil:
- Contours: Smooth and flowing, with falls for adequate drainage.
- 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.

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;
- frequency: as necessary to ensure the establishment and continued thriving of all seeding/turfing;

Water restrictions:
- 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;
- visiting site during maintenance period;

Setting out:
- boundaries: mark clearly.
- 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.
Lawn areas: Existing topsoil, incorporated with compost.

Wildflower Seed Mixture for Wildflower Meadows:

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

Flowering Lawn Seed Mixture for Flowering Lawn

- Supplier: Emorsgate or other equal and approved. –
- 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.
- 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.
- 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.
- 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.
- Season: Grass seed generally: April to October.

Cleanliness

- Soil and arisings: Remove from hard surfaces.
- 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]

FENCING AND GATES

FENCING AND GATES

MATERIALS

Generally

001 Follow any timber sizes stated in the Schedule of Rates items, in preference to those stated in any applicable Standard or equivalent.

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" Section.

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 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 or from a FLEGT licensed or equivalent source. This shall comply with the EU timber Regulation (EUTR) and the UK Timber Procurement Policy (TPP).

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" Section.

Nails and screws

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

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 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 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.

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 to in accordance with the applicable Standards

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;
Bull-wire 3.15mm diameter (10SW) galvanised mild steel to 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;
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;
Bull-wire 3.15mm diameter (10SW) galvanised mild steel to 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;
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;
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;
Bull-wire 3.15mm diameter (10SW) galvanised mild steel to 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;
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;
Bull-wire 3.15mm diameter (10SW) galvanised mild steel to 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;
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;
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;
1000mm long x 72mm x 20mm splayed top board, fixed vertically at 144mm centres; (72mm spaces between all boards);

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;
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;
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);
Bull-wire 3.15mm diameter (10SW) galvanised mild steel to 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;
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;
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;
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.

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;
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.

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;
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 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;
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 applicable Standard;
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;
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;
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.
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;
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.
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;
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.
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)
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;

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;
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 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;
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;
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;
1525mm long x 50mm x50mm mild steel bar intermediate post welded to horizontal rails, posts at 1800mm centres;
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;
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;
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;
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;
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 8.30m3, 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;

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 8.30m3, 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;

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;

Steel Palisade Fencing

037 2400mm High Steel Palisade fencing constructed from:

Pales: Corrugated "D" section, 3mm thick galvanised steel, 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 rails, bolted with shear-nuts;
Posts: 102mm x 44mm x 7.4mm rolled steel joist (RSJ), Posts at 2.75m centres;
Fixings: Galvanised steel;

All to be hot dipped galvanised to applicable Standard;

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;

038 2000mm High Steel Palisade fencing constructed from:

Pales: Corrugated "D" section, 3mm thick galvanised steel, 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 rails, bolted with shear-nuts;
Posts: 102mm x 44mm x 7.4mm rolled steel joist (RSJ), Posts at 2.75m centres;
Fixings: Galvanised steel;

All to be hot dipped galvanised to applicable Standard;

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;

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.;
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;

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;

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.;
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;

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.;
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;

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);
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.;
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;

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
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;
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 manufacturer, 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;

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;
Drop bolt: with ground sockets on 315mm 70mm x10mm mild steel back plate welded to both gates;

All galvanised after manufacturer, 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;

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;
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;
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 manufacturer, 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;
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;
Stop: one leaf only, 200mm long x 50mm x 6mm;

All galvanised after manufacturer, 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 Clause 035 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;

Submit manufacturers and installer's certificates in accordance with the requirements of the applicable Standard;

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

Gate frame: 50mmx 50mm x 3mm polyester powder coated galvanised mild steel with mesh as Clause 035 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);
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;

Submit manufacturers and installer's certificates in accordance with the requirements of the applicable Standard;

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 Clause 035 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);
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;

Submit manufacturers and installer's certificates in accordance with the requirements of the applicable Standard;

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 Clause 035 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;

Submit manufacturers and installer's certificates in accordance with the requirements of the applicable Standard;

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

Gate frame, 50mm x 50mm x 3mm powder coated galvanised mild steel with mesh as Clause 035 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;
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;

Submit manufacturers and installer's certificates in accordance with the requirements of the applicable Standard;

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;
All to be hot dipped galvanised to applicable Standard;
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;

Submit manufacturers and installer's certificates in accordance with the requirements of the applicable Standard;

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;
All to be hot dipped galvanised to applicable Standard;
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 450mm x 450mm x 600mm deep, 75mm concrete base, backfilled with concrete to depth 100mm below finished ground level, remainder selected earth;

Submit manufacturers and installer's certificates in accordance with the requirements of the applicable Standard;

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;
All to be hot dipped galvanised to applicable Standard;
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;

Submit manufacturers and installer's certificates in accordance with the requirements of the applicable Standard;

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;
All to be hot dipped galvanised to applicable Standard;
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;

Submit manufacturers and installer's certificates in accordance with the requirements of the applicable Standard;

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;
All to be hot dipped galvanised to applicable Standard;
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;

Submit manufacturers and installer's certificates in accordance with the requirements of the applicable Standard;

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;
All to be hot dipped galvanised to applicable Standard;
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;

Submit manufacturers and installer's certificates in accordance with the requirements of the applicable Standard;

Client's current manufacturers/suppliers/products

059 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]

DRAINAGE

DRAINAGE

MATERIALS

Gullies

001 Ensure grating, sealing plates and other metal accessories used are cast iron.

002 Gullies are to be:

- Roddable trapped clay gullies are to be to 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;
- 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 applicable Standard, kite marked certified complete with cast iron gully grating and frame to appliacble Standard Class D400, kite marked certified, hinged at one end so that it cannot be removed from frame, and concrete bed and surround;
- 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 applicable Standard 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 applicable Standard 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 applicable Standard graded 20mm to 5mm for pipes up to 525mm diameter and 40mm to 5mm for pipes over 525mm diameter.
- Class S granular surround consisting of broken stone or gravel to applicable Standard graded 10mm to 5mm

Bricks for manholes etc.,

008 Ensure bricks for manholes are:

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

Manhole Ironwork

009 General purpose pattern galvanised malleable cast iron manhole step irons with 230mm long tails to 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 applicable Standard for precast concrete manholes.

011 Manhole ladders are to be installed to 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 applicable Standard.

013 Manhole safety chains are to be galvanised mild steel short link chain to 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 applicable Standard 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 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 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 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, and be to the requirements of the applicable Standards, 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 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 generally:

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 applicable Standard, kite marked certified, and bedded and pointed in cement mortar (1:3)

Precast concrete channels sections shall comply with 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 relevant applicable Standard for location, installed in accordance with the manufacturer's technical data sheet.

027 Plastic inspection chambers risers with sealing ring are to be 450mm diameter chamber with preformed channels to the applicable Standard 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 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 applicable Standard Class A15 for house drainage with no vehicular loading, galvanised steel 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 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 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 applicable Standard with flexible joints, kite marked certified;
- Clay pipes, bends and junctions for storm-water drainage are to be vitrified clay to applicable Standard with flexible joints, kite marked certified;
- Plastic pipes, bends and junctions for foul or storm drainage are to be PVC-u to applicable Standard with flexible joints, kite marked certified;
- Concrete pipes, bends and junctions are to be to 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 applicable Standard, maximum mesh width 10mm, channel to be bedded and haunched with concrete;
- Polypropylene "U" section linear channel 100mm x 75mm deep x 1000mm long and black plastic grating to applicableStandard 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 applicableh Standard and be BSI kite marked.

Septic Tanks

035 Septic Tanks to single dwellings 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 and BBA certified or equivalent, the design of the tank shall be such that sludge cannot be discharged through the outlet in any circumstances;
- Channel gratings are to be galvanised mild steel square mesh gratings and set in position;

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.

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.

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 clause 019 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 clause 019 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;
- 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. The Provider shall 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, they shall be remedied by the Provider at his own expense, and a further CCTV survey carried out at his own expense. When a final survey acceptable to the Client's Representative has been carried out. The Provider shall arrange for a copy of the video recording to be given 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;
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 The single dwelling septic tank units are to be installed strictly in accordance with the manufacturer's technical data sheet and the recommendations of the applicable Standard;

084 The tanks are to be handled with care and lifted 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 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 applicable Standards 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.

Testing

090 Test pipes and manholes generally 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:
1. 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;
2. Test steeply graded drains in stages in order not to exceed the maximum test pressure;
3. Allow a period of 1 hour for absorption;
4. Measure 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;
5. 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;
1. 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;
2. 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 requisite 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:
1. Test sewers for infiltration, the amount of infiltration shall not exceed 0.1litres per hour/100m/mm of pipe diameter;
2. 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 Authority if services are exposed by excavation or if land drainage work crosses the line of a service, follow the Utility Authorities instructions concerning work near services. Replace any marker tape or protective covers disturbed by excavation work in accordance with the Utility Authorities 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.

101 Perforated plastic pipes are to be twin walled PVC-u to 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 Clause 066 below, and blind with 40mm bed of sand to applicable Standard: Gf 85 0/1 (FP) fine aggregate,

102 Perforated concrete sub-base land drainage pipes are to be to 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 Clause 066 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:

Applicable Standard 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]

CONCRETE WORK

CONCRETE WORK

GENERAL

001 Constituent materials, composition of mixes, production of concrete, information to be provided to the Client's Representative, sampling, testing and compliance to be in accordance with applicable Standards.

READY-MIXED CONCRETE:

002 The ready-mixed concrete production plant is to be currently certified by a body accredited by UKAS to applicable Standards for product conformity certification of ready-mixed concrete.
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 Any declaration of non-conformity received from the concrete producer is to be notified immediately to the Client's Representative.

MATERIALS

Cement

004 Use ordinary "Portland" cement in accordance with 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;
- 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;
- 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 4^0 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.

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

	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
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;
- 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 applicable Standard:,
- Substitution: In accordance with applicable Standard: table A.13. Submit for each substitution, stating reasons.
- Mixes: If standardised prescribed concretes are made on site, this must conform to applicable Standard.

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 applicable Standards.
- 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.
- 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.
  - 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, The Provider is to inform the Client's Representative without delay and submit:
- Confirmation of the validity of the test results, and/or
- Proposals for further tests to assess the strength of the concrete in the structure, as set out in the applicable Standard and/or
- Proposals for rectification.
- Obtain agreement with the Client's Representative of 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 of the Client's Representative for any alternative method.
- Surface to be clean and damp when fresh concrete is placed against it.

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 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.
- 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 applicable Standard, the variation in gap under a 3m straightedge 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.
- 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 Generally:
- 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.
  - Must not affect the satisfactory bond of subsequent construction and finishes.
- 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.

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.
- 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 4^0C. 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.
- 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 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.

040 Tie bars are to be:
- To applicable Standard, clean and free from oil, dirt, loose rust or scale;
- Fixed securely at the stated centres, and at the required depth, placed centrally on the joint.

041 Dowel bars are to be:
- To applicable Standard, 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;
- 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;
- Ensure sufficient space is left for sealant.

043 Sealant for joints is to be:
- Cold-applied sealants complying with applicable Standard.
- 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 applicable Standard.

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;
- 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 Clause 026;
- When the concrete is suitably stiff, tamp surface in one direction to give a uniform ribbed surface;
- 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 Clause 026.
- 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.
- 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. Allow for the cost of any such making good.

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 Clause 026.
- 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.
- 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 Clause 026.
- 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.
- 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 Clause 046.

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

Generally/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.
- Wind and snow loads.

060 Temporary Works including propping shall comply with Health and Safety Executive Information Sheet No 56 and the applicable Standard 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:
- 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;
- 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.
- 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.
- 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. Notwithstanding other clauses in this Specification and any checking by the Client's Representative, 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:

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 applicable Standard, be cut and bent to applicable Standard 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 applicable Standard Grade 250.

079 Deformed bar reinforcement is to be to applicable Standard grade 460.

080 Steel fabric reinforcement generally is to be to applicable Standard.

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.
- Grade 460 bars must not be bent or straightened without the approval of the Client's Representative.

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 applicable Standard. 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), or
- 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.

Precast Concrete - Large Units

Components

101 Precast concrete stairs shall comply with the applicable Standard.

102 Concrete generally: Constituent materials, composition of mixes, production of concrete, information to be provided, sampling, testing and compliance to be in accordance with applicable Standards.

103 The Chloride ion content of the constituents of each mix shall comply with the applicable Standard.

104 Reinforcement type:
- Plain bar reinforcement to be to applicable Standard Grade 250.
- Deformed bar reinforcement to be to applicable Standard, 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;
- 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.
- 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.
- 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.

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 applicable Standards. 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.
- Grout all joints between units with concrete Grade RC 25/30 as Clause 012 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.
- 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:
- The manufacturer shall make known the nominal sizes of his units. The following tolerances on the nominal dimensions are permitted;
  - Length +/- 9mm;
  - depth +/- 3mm;
  - width +/- 6mm.
- 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.
- Size: Not less than 30mm x 5mm cross-section; not less than 650mm long including each end cranked 100mm.
- 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 applicable Standard
- Type: Reinforced pre-stressed concrete T-Beam.
- Infill blocks: clause 123.

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
- Submit programme well in advance of construction.

131 Standard precast concrete infill blocks: (floor)
- Type: Solid block to applicable Standard.
- Size: 440 x 215 x 100 mm.
- Compressive strength (minimum) 3.5 N/mm²
- Transverse load capacity (minimum): 3.5 kN/m² measured on a 420 mm span.

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.

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;
- 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 applicable Standard 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.

- The Provider shall 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;
- The Provider shall 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. The Provider must submit his proposed methodology for the fixing of new reinforcement to the Client's Representative for approval; and
- The Provider shall 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;
- 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 his 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);
- 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.

Client's current manufacturers/suppliers/products

142 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]

BRICKWORK AND BLOCKWORK

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 applicable Standard and be manufactured by a firm with their capability assessed and registered with BSI or other quality certification body acceptable to the Client.

Lime

002 Use Class B hydrated lime, to applicable Standard

Sand

003 Sand for mortar is to be to applicable Standard FP or MP Category 3 unless specified otherwise. Sand for face-work mortar is be from one source, different loads to be mixed if necessary to ensure consistency of colour and texture'

Sand and aggregate Material Property Limits	applicable Standard Category for other aggregates and Sand	applicable 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 applicable Standard from a competent mortar manufacturer to the satisfaction of the Client, Ordinary portland cement is added on site by volume in accordance with the mix specification.

008 Coloured lime:sand:mortar, where required is to be made using a proprietary coloured ready-mixed lime:sand to applicable Standard; colour to be as specified or to match existing. Pigments used in lime:sand mortar are to conform to applicable Standard.

Ready to Use Retarded Mortars

009 Ready to use retarded mortars shall be in accordance with applicable Standard and Render/Plaster mixes to be in accordance with applicable Standard. The Client is provided with CE Marked performance information to Annex ZA before mixing commences.

(i) All mortar storage containers are kept in good condition.
(ii) Storage containers are thoroughly cleaned out between fills.
(iii) Storage containers are clearly marked with mortar mix designation i.e. building/plaster/render, date and time of delivery.
(iv) Under no circumstances may partially full storage containers be 'topped up' with fresh mortar.
(v) The mortar is properly protected from adverse weather conditions, prior to, during and after use.
(vi) On no account should the mortar be re-mixed in a mechanical mixer

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 applicable Standard, supplied and installed in compliance with a current British Agrément Board certificate or other Quality system approved by the Client. The quantities of agent to be used are to be strictly in accordance with the manufacturer's technical data sheet. The Provider is prohibited from using admixtures based on calcium chloride and ethylene glycol.

Bonding Agent

015 Bonding agent is to be Opaque white non-toxic externally plasticised PVA emulsion of high viscosity and manufactured to applicable Standard. The bonding agent is to be suitable for the exposure conditions and supplied and installed in compliance with a current British Agrément Board certificate or other Quality system approved by the Client.

Air Entraining Admixture

016 Air entraining admixture is to be to applicable Standard, supplied and installed in compliance with a current British Agrément Board certificate or other Quality system approved by the Client. 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 applicable Standard, supplied and installed in compliance with a current British Agrément Board certificate or other Quality system approved by the Client. 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 applicable Standard

Location	Bond	Mortar mix
Superstructure Brickwork above DPC	Stretcher	1:1:6 cement lime mortar
Superstructure Brickwork above DPC	English	1:1:6 cement lime mortar
Substructure Brickwork below DPC	Stretcher	2:1:6 cement lime mortar
Substructure Brickwork below DPC	English	2:1:6 cement lime mortar

019 Use concrete common bricks to applicable Standard, with an average compressive strength of 20N/mm2 with no brick from any 10 no tested having a strength less than 16N/mm sq.

Location	Bond	Mortar mix
Superstructure Brickwork above DPC	Stretcher	1:1:6 cement lime mortar
Superstructure Brickwork above DPC	English	1:1:6 cement lime mortar
Substructure Brickwork below DPC	Stretcher	2:1:6 cement lime mortar
Substructure Brickwork below DPC	English	2:1:6 cement lime mortar
Substructure Brickwork below DPC	Honeycombed	2:1:6 cement lime mortar

020 Use concrete common bricks to applicable Standard, with an average compressive strength of 30N/mm2 with no brick from any 10 no tested having a strength less than 24N/mm sq.

Location	Bond	Mortar mix
Manholes	Stretcher	1:3 cement sand
Manholes	English	1:3 cement sand

Facing and Engineering bricks

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 applicable Standard generally made to fill the cavity, with conductivity less than 0.038W/mK, complete with a current BBA certificate or equivalent current quality system approved by the Client's Representative.

025 Expanded grey polystyrene injection moulding full fill board cavity wall insulation to applicable Standard 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 current quality system approved by the Client's Representative.

026 Composite, full-fill. Cavity wall insulation board, with polyisocyanurate foam to applicable Standard 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 current quality system approved by the Client's Representative.

027 Foil faced polyurethane/polyisocyanurate (PUR/PIR) foam partial fill cavity insulation board to applicable Standard, 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 current quality system approved by the Client's Representative.

028 Foil faced phenolic foam partial fill cavity insulation board to applicable Standard, thermal conductivity less than 0.023 W/mK, compressive strength more than 120pKa at 10% compression, complete with a current BBA certificate or equivalent current quality system approved by the Client's Representative.

029 Closed cell polystyrene board wall insulation (for use below ground level) to applicable Standard, thermal conductivity less than 0.038W/mK, compressive strength more than 300pKa at 10% compression, complete with a current BBA certificate or equivalent current quality system approved by the Client's Representative. Boards fixed underground to resist uplift or displacement with flooding.

030 Closed cell foam glass board wall insulation (for use below ground level) to applicable Standard, thermal conductivity less than 0.038W/mK, Compressive strength more than 300pKa at 10% compression, complete with a current BBA certificate or equivalent current quality system approved by the Client's Representative. Boards fixed underground to resist uplift or displacement with flooding.

Installation Generally

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. Include for 300mm girth DPM as requires 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 applicable Standard:
- low modulus and mould resistant; or
- 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;
- Joints are to be to applicable Standard

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 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;
- 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.

Wall ties

049 Wall ties are to be stainless steel 225mm to suit cavity and built in as work proceeds;
- Type; to applicable Standard
- Material: Austenitic stainless steel conforming to applicable Standard grade 1.4301 (304)

050 Wall ties are to be stainless steel 225mm to suit cavity and with suitable fixings for any partial fill boards and built in as work proceeds;
- Type: to applicable Standard
- Material: Austenitic stainless steel conforming to applicable Standard grade 1.4301 (304)

051 Wall ties are to be stainless steel 275mm to suit 150mm cavity and with tie mounted insulation retaining clips as recommended by insulation manufacturer and built in as work proceeds;
- Type: to applicable Standard
- Material: Austenitic stainless steel conforming to applicable Standard grade 1.4301 (304) Product to have BBA certification or equivalent.

052 Wall ties are to be stainless steel 275mm to suit 150mm cavity and built in as work proceeds;
- Type: to applicable Standard
- Material: Austenitic stainless steel conforming to applicable Standard grade 1.4301 (304) Product to have BBA certification or equivalent.

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 applicable Standard;
- Material: Plastic/steel;
- Supplied and installed in compliance with a BBA certificate or equivalent quality assurance system approved by the Client's Representative.

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;
- 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 ties to timber frames are to conform to applicable Standard.
- Material: austenitic stainless steel conforming to applicable Standard;
- Fixing: Fix securely to timber studs with 50mm x 11 gauge stainless steel annular shank nails, bed not less than 50mm into bed joint of brick cladding sloping towards the exterior, ties evenly spaced at not more than 800mm centres horizontally, staggered in alternate courses and at 450mm centres vertically, and with suitable fixings for any partial fill insulation boards, provide additional ties within 150mm of sides of openings, at not more than 225mm centres vertically.

057 Spiral stainless steel ties for timber frames are to be austenitic stainless steel conforming to applicable Standard and installed in accordance with the manufacturer's technical data sheet and the Client's requirements.

058 Brick extension ties are to conform to applicable Standard
- Material: 22 gauge austenitic stainless steel conforming to applicable Standard;
- Fixing: Fixing screws to be 50mm austenitic stainless steel with washers, 155mm austenitic stainless steel, Plugs to be 8mm high density polyamide;
- Sealing: Sealing strip to be neoprene resin-impregnated micro-cellular polythene, self-adhesive 10mm x 20mm x 2.4mm;

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 applicable Standard, bedded and flaunched in cement mortar (1:3) incorporating a waterproofing agent and a bonding agent mixed in accordance with the manufacturer's technical data sheet.

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 applicable Standard, bedded and flaunched in cement mortar (1:3) incorporating a waterproofing agent and a bonding agent mixed in accordance with the manufacturer's technical data sheet.

064 Galvanised steel anti-draught terminals as Instructed and approved by the Client's Representative are to be bedded and flaunched in cement mortar (1:3) incorporating a waterproofing agent and a bonding agent mixed in accordance with the manufacturer's technical data sheet.

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 Capping's Lintels Door Thresholds
Designated Concrete	RC 25/30
Reinforcement	applicable Standard
Aggregate Size	20mm
Coarse recycled concrete aggregates (RCA)	Permitted
Chloride Class	C1.0.4
Finish Requirements	Fair face on exposed surfaces

Components	Window Sills,
Designated Concrete	RC 25/30
Reinforcement	applicable Standard
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 to applicable Standard 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; 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; 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;
- bonded together with austenitic stainless steel 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.

080 Close cavities of cavity walls with proprietary insulated cavity closers as Clauses 115 to 119, 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 5^0 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.

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 should be provided stating the exact address of the Property covered by the guarantee.

099 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 CWI system, including remedial works, materials and installation.
4. Have Trustmark accreditation 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 and the Provider must 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.

103 Evidence must be provided that the CWI installation contractor has PAS 2030 certification and Trustmark accreditation.

104 A pre-design survey of the dwelling 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, 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 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 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, 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, satisfy or exceed the minimum standards in the Building Regulations.

109 The insulation system designer should:

- Calculate U-values in accordance with:
  - applicable Standard
  - 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, in accordance with the following applicable 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.
  - 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.

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 equal and approved by the Client's Representative. The inspection body must satisfy the requirements of PAS 2030, be independent of any system installer or designer and hold UKAS accreditation to either ISO 17065 or ISO 17020 'Type A'.

111 The inspection should include an external visual assessment of the elevations, and an internal visual inspection of the dwelling.

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).
- 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 dwellings 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)
- 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 Work, the Provider must produce a Property specific report on their findings to include confirmation of the following:

1. Address, postcode and Client's UPRN of the Property being inspected.
2. The location of boroscope holes, each with a unique reference number, presented on sketch elevations or photographs.
3. Date stamped photographs from boroscope tests with images of similar quality to the benchmark digital images.
4. 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.
5. 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.
6. 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.
7. The presence of insulation and its type, e.g., mineral or glass wool (fibre), bonded bead, loose bead, Urea Formaldehyde foam, or insulation board.
8. Condition of insulation, including whether the cavity is filled to the correct density in accordance with the system designer specification.

9. The original injection drill pattern in relation to whether or not it conformed to the system designer specification for the type of insulation.
10. The U-value of the existing construction.
11. The presence of an adequate DPC.
12. The suitability of the cavity to receive CWI in relation to the property location and exposure, in accordance with applicable Standard and BRE Report 262.
    i. Any evidence of voids or other problems caused by insulation failure.
13. 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
14. Locations and severity of any mould, condensation, water penetration or other obvious defects evident internally.
15. Locations and severity of any mould, condensation, water penetration or other obvious defects evident externally.
16. The presence of openable ventilators and adequate mechanical ventilation in relation to condensation/mould.
17. Adequate existing ventilation for any fuel burning appliances located within the property.
18. Any ventilation openings that would require remedial works to ensure they are not compromised during extraction or injection of insulation.
19. The location of flues to ensure they are not compromised during extraction or injection of insulation.
20. Injection drill holes were adequately filled upon completion of the original installation.
21. 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.
22. Any evidence of ingress of CWI materials in roof space/at services.
23. Relevant feedback from the Customer.
24. Any other information considered relevant e.g. absence of cavity barriers, etc.
25. Conclusions and any recommendations for remedial action to improve or replace insulation if considered appropriate.
26. 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 currently registered with the BBA Cavity Cleaning Company Scheme, or other UKAS accredited body equal and 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 Cleaning company must inform the Client's Representative of any remedial Works that are required, following the independently verified cavity inspection.

121 Cleaning company must include for the removal of 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 Mineral fibre of a type currently certified by BBA, or other UKAS accredited certification body equal and approved by the Client's Representative, as suitable for the purpose and exposure. Only to be used to top up existing mineral fibre insulation, 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.

123 Expanded polystyrene beads/granules with grey/metallic additive, bonded by adhesive, and currently certified by the BBA or other UKAS accredited certification body equal and approved by the Client's Representative as suitable for the purpose and exposure. 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 and carry out the installation in accordance with the:

- surveillance scheme;
- the BBA certificate;
- the certificate holder's instructions;
- 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, preferably 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 Check regularly during installation for leakages of insulation and seal immediately.

127 Check and confirm, following completion of the works, and at the end of each day if the work spans more than one day, 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, phenol's or halogen's, applied as a mortar to the following thicknesses.

Fire Resistance	Minimum Depth of Filling Material
One Hour	50mm
Four Hour	100mm

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.

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 his 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 applicable Standard, compressed fitted between timber members and fixed with large galvanised nails, cut to profile; or
- Non-combustible mineral wool with density ne 80kg/m^3 to applicable Standard, compressed fitted between timber members and fixed with large galvanised nails, cut to profile; or
- Non-combustible mineral wool with integral galvanised wire mesh with density ne 80kg/m^3 to applicable Standard, compressed fitted between timber members and fixed with large galvanised nails, cut to profile; or
- Asbestos free mineral fibre reinforced board, moisture resistant to applicable Standard, bedded in mortar to match walling;

142 Fire-stopping to loft access hatch door shall be asbestos free mineral fibre reinforced board, moisture resistant to applicable Standard.

143 Joint sealants are to be intumescent fire resistant mastic to applicable Standard installed in accordance with the manufacturer's technical data sheet;

144 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

145 Cut out corroded metal ties carefully, causing least possible disturbance to surrounding masonry and remove any associated rust debris.

146 Remedial wall ties shall be manufactured from austenitic stainless steel and be capable of meeting the test criteria for Type 2 wall ties.

Physically Inserted DPC'S to Existing Walls

147 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.

148 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.

149 Physically inserted damp-proof course system material is extend the full width of wall and finish and to be either:

- Polyethylene to applicable Standard, weight not less than 1.55kg/m2; or
- Bituminous Felt to applicable Standard, weight not less than 0.46kg/m2

Insulated Cavity Closers and Insulation to Jambs

150 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 applicable Standard;
- 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.

151 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 applicable Standard;
- Installed in compliance with current BBA certificate or equivalent quality system acceptable to the Client's Representative;
- Accessories: Manufacturer supplied compatible Polypropylene or PVC-u wall ties built in in accordance with the Manufacturer's technical data sheet.

152 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 applicable Standard.
- Installed in compliance with current BBA certificate or equivalent quality system acceptable to the Client's Representative;
- 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;
- Cavity closer to provide minimum 30 minutes fire resistance in terms of integrity and 15 minutes in terms of insulation when tested to applicable Standard;
- Installed in compliance with current 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 applicable Standard;
- Installed in compliance with current 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]

ROOFING

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 be not less than that of the samples of the agreed standard. Materials shall be stored in a manner which will prevent damage and the introduction of deleterious matter.

004 Carry out tests on 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

007 Ensure mechanically fixed dry ridge and dry verge Works are compatible with the existing dry ridge and dry verge installation and existing roof coverings.

008 Ridges are to be designed and fitted in accordance with the applicable Standard 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.

009 Hips are to be designed and fitted in accordance with the applicable Standard 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.

010 Valleys are to be designed and fitted in accordance with the applicable Standard and the manufacturer's technical data sheet from neatly and accurately cut tiles to give a valley width of 125mm.

011 Dry cloaked verge systems are to be designed and fitted in accordance with the applicable Standard 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.

012 Ensure wet ridge and wet verge Works are compatible with the existing wet ridge and wet verge installation and existing roof coverings.

Underlay

013 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.

014 As specified by roof designer, underlay to be either:

- Reinforced felt, in repairs only, to the applicable Standards; 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
  - Certification: British Agreément Board (BBA) or equivalent; or
- 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).
  - Water Tightness: W1 to the applicable Standard

015 Follow the applicable Standard Code of Practice for slating and tiling for guidance on the appropriate detailing of roofing components and installing underlay.

016 On timber structures use only inodorous sheathing felt or proprietary underlay as specified by the manufacturer as underlay for copper, lead and zinc roofing in a accordance with the applicable Standard.

Battens

017 For the tile battens use good quality deal, reasonably free from knots, clean and with no waney edges and in accordance with applicable Standard impregnated with an appropriate wood preservative before delivery to the Property, as specified under the 'Carpentry and Joinery' Section. Tile battens and counter battens to comply with applicable Standard.

018 Fix battens with staggered joints and square butt jointing. These are to span at least 3 supports.

Wood rolls

019 For wood rolls for copper, zinc or aluminium roofing use wrot seasoned timber to a tapered profile shown in Code of Practice 143:5, 143:12 and 143:15. Use common rolls approximately 45 x 40mm overall unless otherwise Instructed by the Client's Representative.

020 For wood rolls for lead roofing, use wrot seasoned timber to the smooth rounded profile shown in the applicable Standard. Use common rolls approximately 45 x 45mm with a 25mm wide flat base unless otherwise Instructed by the Client's Representative.

Mortar

021 Use cement mortar (1:3) for bedding and pointing as described in the "Brickwork and Blockwork" Section, but slightly tinted in colour and specially mixed for the purpose.

Nails

022 Use galvanised steel clout nails for underlay and battens in compliance with the applicable Standard. 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 silicon bronze nails to the applicable Standard or other nails approved by the Client's Representative.

023 Use copper jagged or ring shank nails, at least 20mm long with large flat heads for lead roofing.

Clips

024 Where roofing slates or tiles are described as fixing with clips, use lead or copper 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 clips to the applicable Standard for slates.

Steel hook bolts and nuts and roofing screws

025 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.

026 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.

Plywood decking for flat roofs

027 Ensure plywood sheets are be for structural use to the applicable Standard or equivalent material with Class 3 Bonding (external conditions) to the applicable Standard, durability Class H and to comply to a standard and quality approved by the Client's Representative. Sheets to be fixed at 150mm centres to supports with 50mm x 3mm annular ring shank nails.

Woodwool slab decking for flat roofs

028 Where appropriate, reinforce woodwool slabs to comply with the applicable Standard with pressed steel channels. Use galvanised steel large flat headed nails as fixings for the slabs of a length to suit the application of galvanised steel clips to the applicable Standard 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

029 Ensure chipboard conforms to the applicable Standard 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 screws to a standard and quality and of an appropriate size and gauge approved by the Client's Representative.

Lead

030 Use best milled Code 4 lead for lead roof coverings in accordance with the applicable Standard, flashings, soakers, rainwater chutes, valley gutter linings, hips, ridges and the like, 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.

031 Clips for leadwork are to be 50mm wide and of a length to suit Client's details and to be formed from either:
- Lead cut from sheets of the same code as the sheet being secured; or
- Copper cut from 0.7mm thick sheet to applicable Standard, temper grade ¼ H, dipped in solder, if exposed to view; or
- Stainless steel, cut from 28 gauge sheet to the applicable Standards, terne coated if exposed to view

Self adhesive flashings

032 Use self adhesive flashings in strict accordance with manufacturer's recommendations and only with the approval of the Client's Representative.

033 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

034 Use as rubbing sand clean natural coarse sand passing a 600mm micron test sieve.

035 For chippings use hard light coloured non-absorbent natural stone graded 6 to 10mm.

036 Use white solar reflective paint.

037 Ensure asphalt roofing subject to traffic is to the applicable Standard Type R988 undercoat with finishing coat to a standard and quality approved by the Client's Representative.

038 Use glass fibre tissue for the isolating membrane for roofing subject to traffic.

High performance felt roofing

039 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.

High performance "torch on" felt roofing

040 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.

041 One layer torch on mineral felt roofing is to be to the applicable Standard Class S3PS

042 Two layer torch on felt roofing is to consist of an intermediate layer of torch on felt roofing to applicable Standard Class S2PS, and a top layer of torch on felt roofing to the applicable Standard Class S2PS.

043 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.

Bitumen primer

044 For felt roofing, use cut back bitumen primer with a maximum volatile solvent 60% by weight and Redwood No. 2 viscosity at 21^0 Centigrade 25 sec maximum.

Bitumen compounds

045 For felt roofing, use a bitumen bonding compound having a penetration of 20/30 at 25^0C and a softening point (R & B) of $80/100^0$ 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 zinc roofing is a black coating solution to the applicable Standard.

WORKMANSHIP

Roof tiling

046 Lay roof tiling in accordance with the applicable Standards and in even courses to suit the existing gauging and laps. Secure tiles with the appropriate patent clips and/or nails.

047 Underlay to be laid and fixed with extra-large head nails parallel to eaves, cut neatly and accurately around pipes etc.,

048 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 nails 65mm long x 3.35mm.

049 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.

050 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.

051 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.

052 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 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.

053 Ridges spanning a party wall are to have a fire-stop formed by filling the ridge void with a suitable non-combustible material.

054 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.

055 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, product to have BBA certification or equivalent. Tile to provide 20,000mm^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.

056 Ridge ventilators are to be a proprietary concrete ridge ventilator tile to provide ventilation to the applicable Standard, 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.

057 Form eaves with a double course of tiles.

058 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

059 Close joint natural slate roofing with horizontal and alternate vertical joints ranging through perfectly straight.

060 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.

061 Form eaves with double course of slates.

062 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.

063 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

064 Where appropriate, incorporate end and side lap sealing strips in fibre cement sheet roofing to the applicable Standard.

Galvanised steel

065 Lay galvanised corrugated sheeting in accordance with Code of Practice 143 section 4 and 10 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

066 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

067 Secure the sheets to steel with galvanised steel hook bolts and nuts, and to timber with galvanised steel roofing screws. Do not drill steelwork.

Holing sheets

068 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

069 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.

Insulation

070 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

071 Clear all debris resulting from roof Works from all gutters.

Leadwork

072 Ensure sheet lead Works are undertaken by skilled leadworkers in accordance with Lead Development Association recommendations and in accordance with the applicable Standard. Do not use solder without the approval of the Client's Representative. Undertake close and open nailing with copper nails at 25mm and 75mm centres respectively. Do not use lead pieces larger than 3.00m in length or 2.20m2 in area.

073 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.

074 Ensure laps to finishings are no less than 100mm.

075 Form welted joints with a 50mm overlap, 25mm underlap and copper or stainless steel clips at no more than 450mm centres, welt overlap and clips around underlay, loosely turn over and lightly dress down.

076 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.

077 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.

078 Form roll joints without splash-lap over wood core rolls, dress under-cloak three quarters over core roll, fix copper or stainless steel 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.

079 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

080 For flashings use milled sheet lead to comply with and be in accordance with the applicable Standards.

081 Dress lead flashings to the appropriate profiles without reducing the thickness of the lead sheet.

082 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

083 Lay asphalt roofing generally in accordance with the applicable Standard and the recommendations and publications of the Mastic Asphalt Council. Lay underlay loose and with 50mm laps.

084 Lay asphalt roofing in two coats with 150mm laps. Properly bond it to the edges of existing sound sphalt 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.

Felt roofing

085 Roofing felt to comply with the applicable Standard 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.

086 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.

087 Partially or fully bond the first layer of felt to the base with oxidised bonding compound to the applicable Standard Bitumen and bituminous binders Framework for specification of oxidised bitumen. Grade as recommended by the felt manufacturer, and heated in thermostatically controlled kettles, to a temperature not exceeding 215^0 Centigrade, but sufficient to provide a 200^0 Centigrade laying temperature.

088 Effect any partial bonding system by spot, strip or frame bonding the first felt layer with hot bonding compound.

089 Fully bond the perimeter of the roof for a width of 450mm, leaving 150mm wide ventilation channels at appropriate centres.

090 Effect a fully bonded system by applying a continuous even coating of hot bonding compound to the base at the rate of 1.5kg/m2. 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.

091 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 skirting's and make good as for new work;
- Renew damaged insulation;
- Remove waterproof coverings from existing skirting's and re-cover as specified.

092 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/m2, on completion remove loose chippings.

093 Use cut back bitumen or a suitable cold applied bitumen based adhesive to applicable Standard as a dressing compound for chippings applied at the rate of $1.5kg/m^2$.

Torch on felt roofing

094 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 <u>plain</u> finish (not mineral surface) by applying heat from above.

095 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/m2, on completion remove loose chippings.

096 Use cut back bitumen or a suitable cold applied bitumen based adhesive to the applicable Standard as a dressing compound for chippings applied at the rate of $1.5kg/m^2$.

Asphalt coverings to balconies and walkways

097 Lay asphalt to balconies and walkways in accordance with the applicable Standard and the recommendations and publications of the Mastic Asphalt Council. Lay underlay loose and with 50mm laps.

098 Use a glass fibre tissue isolating membrane approved by the Client's Representative.

099 Use bitumen coated 'plain expanded' steel lathing of a minimum 26 swg and a minimum 10 mm short way of mesh.

100 Use a high bond primer as approved by the Client's Representative.

101 Use oxidised bitumen suitable for applying hot as bitumen based bonding compound for bonding vapour barriers and for general bonding purposes.

102 Use clean natural coarse sand passing a 60 micron test sieve for rubbing sand.

103 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.

104 Use cut back bitumen or a suitable cold applied bitumen based adhesive to the applicable Standard as a dressing compound for chippings supplied at a rate of 1.5kg/ m^2.

105 Use a reputable proprietary brand of solar reflective paint approved by the Client's Representative.

106 For aluminium edging, use a proprietary section profiled to suit asphalt manufactured from aluminium.

107 Asphalt concrete to be laid and compacted in accordance with the applicable Standard.

108 Hot rolled asphalt is to be transported, laid, compacted and tested to the applicable Standard.

Inverted Roof Insulation

109 Inverted roof insulation is to be 200mm thick extruded polystyrene board to the applicable Standard, 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 broken bond pattern, cut cleanly to fit closely around projections, upstands, rainwater outlets etc., lay surface protection.

Single layer plastic roof covering

110 PVC-u single layer membrane to the applicable Standard, 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.

111 Warm deck roof designed in accordance with the applicable Standard and to comprise foil faced polyurethane /PIR foam insulation board to applicable Standard, 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.

112 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

113 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.

114 Butyl rubber based membrane (Polyisobutylene) 0.75mm thick (fabricated in factory to cover the complete roof) laid on one layer of applicable 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.

115 Eaves are to be finished with PVC coated metal "standard" edge trim and "GutterZ" 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.

116 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.

117 EPDM (Rubber Poymer) 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 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.

118 Fully bond the roofing membrane at intersections between roofs and walls with butyl adhesive applied to the wall. Lead flashings are to be fitted to prevent the ingress of rain, the roofing membrane is to be fully bonded to the wall surface under the lead flashing.

Metal Tile Roofing

119 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 applicable Standard battens fixed to each support with round galvanised steel 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 Standards, laid with minimum 150mm horizontal and vertical laps and fixed with galvanised steel 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

- All to be in accordance with Code of Practice for Lightweight Metal Roofing.

Metal Profiled /Flat Sheet Claddings

120 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 applicable Standard lapped and carried into gutter is to be installed under corrugated sheeting.

121 Ridge to be galvanised sheet 22mm gauge to comply with the applicable Standard, ridge capping to be formed from equal angle pieces with 200mm sides formed to fit securely on top of galvanised roofing sheet.

Plastic profiled Sheet Claddings

122 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 Standards;
- Extruded Cellular Unplasticised (PVC-Ue) Profiles:
- Standard length: 5m
- Cover width: maximum 100mm
- Nominal thickness; 6mm
- Fire resistant to Class 1Y to applicable Standard;
- Weight: Not less than 0.50kg metre;
- 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 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;
- 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 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;

123 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 applicable Standards, All fixings to be non-ferrous
- Fixing supports to ETAG001 and ETAG 029
- Fire resistant to Class 1Y to applicable Standards;
- Weight: Not less than 0.50kg metre;
- Density: Not less than 500kg/m^3;
- Appearance: Self -coloured smooth semi-matt or glass finish;

124 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 applicable Standard.

125 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 Standards. All testing must be in accordance with current applicable Standards.

- 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;

- 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.

126 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 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 applicable Standard;
- Fire Resistance: Satisfy the requirements of the applicable Standards particularly Class 1 spread of flame;
- Colour Fastness: in accordance with the applicable Standard;
- Water Absorption: Less than 1% when tested in accordance with the applicable Standard
- Appearance: Self-coloured smooth gloss finish;
- Method of fixing: As specified by manufacturer
- 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

127 PVC-Ue Fascia or Barge Board

As Clause 126 but minimum thickness 16mm

128 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 Standards 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 applicable Standard;

- Fire Resistance: Satisfy the requirements of the applicable Standard particularly Class 1 spread of flame;
- Colour Fastness: in accordance with the applicable Standard;
- Water Absorption: Less than 1% when tested in accordance with the applicable Standard;
- Appearance: Self-coloured smooth gloss finish;
- Method of fixing: As specified by manufacturer
- Jointing trims: matching colour, single piece PVC-Ue trims as manufacturer's details and fixed in accordance with manufacturer's technical data sheet

129 PVC-Ue Pre-vented Soffit Boards shall comprise;
As Clause 128 but with flat solid board pre-vented depending on application;

130 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.

131 Eaves Ventilators generally are to provide a continuous air gap of either 10mm or 25mm to the applicable Standard 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; or
- Proprietary over fascia ventilation system: fixed to top of fascia board; or
- Proprietary over fascia ventilation system; with polypropylene felt support, and fixing to top of fascia and rafters; or
- 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;
- 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.

132 Proprietary rafter tray ventilation system: to have BBA certification or equivalent and to provide ventilation to the applicable Standard, 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 fly screened ventilation system: to have BBA certification or equivalent and to provide ventilation to the applicable Standard, 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.

134 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, 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

135 GRP Flat roof specification will comprise the following activities:-

1. 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.
2. Additional timber firring pieces are to be fitted to existing joists to give a fall to the new deck.
3. The roof is 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.
4. Purpose made, pre-moulded, edging trims, wall fillets, gully mouldings are to supplied as necessary and installed in position.
5. Glass-fibre mat of 4oz / sg.m density is supplied and laid over the whole roof area. The glass-fibre mat is then impregnated with polyester resin onto the new deck to form a seamless GRP membrane.
6. Once curing time has elapsed, usually between 1- 4 hours depending on ambient temperature, a polyester resin gel coat in a chosen colour will be applied to the whole roof area.
7. Where a flat roof meets brick walls, a chase is to be cut into a chosen coarse approximately 1.5" deep. A glassfibre and resin flashing will be tailor made to fit into the chase. The chase is then to be re-pointed with conventional sand / cement mortar.
8. 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

136 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/dwelling;
  - Finish: Standard smooth matt finish;
  - 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.

137 Thermal Performance/Bridging Requirement: Complete thermal design to avoid excessive thermal bridging. Assessed to BRE Information Paper 1/06.

138 Weather Resistance Requirement: Weathertight, with full allowance made for deflections and other movements.

139 Colour Fastness/Appearance of GRP, Colour fastness of pigments: Not less than standard 6 when measured to the applicable Standard B01C:LFS6, The Provider is to submit evidence of compliance.

140 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.
  - 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.
  - Action: Submit with new un-weathered control samples.

141 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.
  - Action: Obtain approval of appearance before proceeding. Retain as production control sample.

Manufacture of GRP Canopies

142 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.
  - Prohibited blemishes: Including, but not limited to, wrinkling, spotting, striations, fibre patterning, fish eyes, blisters, crazing, cracking, dry patches and uneven or inconsistent colour.

143 Manufacturing Accuracy to conform to:
- Finished dimensions of completed units when erected:
  - Ambient temperature: Measurements taken at 16-18°C.
  - 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

144 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.
- Setting out: Establish erection datum points, lines and levels.

145 Installation of Interfaces
- General: Locate flashings, closers etc. correctly with neat overlaps to form weathertight junctions.

NFRC Competent Person Scheme for roofing

146 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) to facilitate the self-certification of residential, industrial and commercial work that falls under the auspices of the Building Regulations 2010 Approved Document L1B (as amended 2010, 2011, 2013, 2016 and 2018).

147 The Provider or the approved subcontractor 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, these include but are not limited to:

- Slating and tiling and all other pitched works;
- Felt, single ply and GRP;
- Fully supported lead, copper, zinc and standing seam aluminium;
- Liquid applied waterproofing;
- Mastic asphalt;
- Reinforce bitumen membranes;
- Sheeting;
- Rooflights (inserted between rafters)

Client's current manufacturers/suppliers/products

148 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]

METALWORK

METALWORK

MATERIALS

Generally

001 Grades of metals, section dimensions and properties are to be to the appropriate applicable Standards. When not specified, select grades and sections are to be appropriate for the purpose.

002 Prefinished metal products may be used if methods of fabrication do not damage or alter appearance of the finish, and the finish is adequately protected.

003 Fasteners and fixings are to be to the appropriate applicable Standards and, unless specified otherwise, of 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 applicable Standard.

006 Fine grain steels, including special steels are to be to applicable Standard.

007 Steels with improved atmospheric corrosion resistance are to be to applicable Standard.

008 High yield strength steel plate and wide flats are to be to applicable Standard.

Galvanised coatings

009 Apply galvanised coatings to applicable Standard.

010 Powder Coatings unless specified otherwise, comply with all relevant requirements and recommendations of applicable Standard for aluminium alloy backgrounds; applicable Standard for galvanized steel backgrounds; applicable Coatings Federation: Code of safe practice - Application of powder coatings by electrostatic spraying.

Garage door repairs

011 Ensure fittings and furniture for metal 'up and over' garage doors generally 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" section.

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.

Fabrication

016 Ensure compliance with any stated design and performance requirements. Ensure sections and dimensions are in accordance with relevant applicable Standards. 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 applicable Standard.

022 Stainless steel is to be welded to applicable Standard using double butt welds, backing bars, jigging and other methods to remove distortion.

023 Aluminium alloys are to be welded to applicable Standard.

024 Brazing is to be to applicable Standard 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:
- Method and standard: Metal arc welding to applicable Standards;
- Welding Procedure Specification (WPS): Not required.

027 Preparation:
- Joint preparation: Clean thoroughly.
- Surfaces of materials that will be self-finished and visible in the completed work: protect from weld splatter.

028 Jointing:
- Joints: Fully bond 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;
- Weld terminations: Clean and sound.

Finishing:

029 Welded and Brazed Joints visible in Complete Work:
- Standard: To applicable Standard. - Preparation grade:P1.
- Butt joints: Smooth, and flush with adjacent surfaces.
- 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.
- Paint, grease, flux, rust, burrs and sharp arrises: Remove

Balustrades

031 Isolated balustrades shall be mild steel hot dipped after manufacture to applicable Standard, all welding /fabrication of components shall be complete prior to galvanising, bolted site connections only will be accepted, no site welding is permitted, damaged sections of galvanising and exposed bare metal shall be liberally painted with 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 applicable Standard, all welding /fabrication of components shall be complete prior to galvanising, bolted site connections only will be accepted, no site welding is permitted, damaged sections of galvanising and exposed bare metal shall be liberally painted with proprietary cold galvanising paint, handrails are to be continuous and smooth to avoid key clamp style fixings;

Mesh Infill to Handrails

033 Proprietary mild steel to applicable Standard galvanised diamond pattern mesh netting fixed to existing galvanised steel 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, bolted site connections only will be accepted, no site welding is permitted, damaged sections of galvanising and exposed bare metal shall be liberally painted with proprietary cold galvanising paint;

034 Proprietary mild steel to applicable Standard galvanised diamond pattern mesh netting fixed to new galvanised steel 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, bolted site connections only will be accepted, no site welding is permitted, damaged sections of galvanising and exposed bare metal shall be liberally painted with proprietary cold galvanising paint;

Vertical Railings to Galvanised Tubular Handrails

035 Mild steel to applicable Standard 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, bolted site connections only will be accepted, no site welding is permitted, damaged sections of galvanising and exposed bare metal shall be liberally painted with proprietary cold galvanising paint;

Isolated Wall Mounted External Handrails

036 48.3mm diameter circular hollow section mild steel to applicable Standard hot dipped galvanised after manufacture isolated wall mounted external handrails galvanised after fabrication, all welding /fabrication of components shall be complete prior to galvanising, bolted site connections only will be accepted, no site welding is permitted, damaged sections of galvanising and exposed bare metal shall be liberally painted with proprietary cold galvanising paint;

PVC-u Handrail Cover

037 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 Methods of fixing and fastenings to be as specified using fixing and jointing methods and types, sizes, quantities and spacing of fastenings which are suitable having regard to:
- Do not modify, cut, notch or make holes in structural members except as shown on any applicable drawings or as approved.
- All welding/fabrication of components shall be complete prior to galvanising.
- Do not site wild connections. Bolted site connections only will be accepted.
- Damaged sections of galvanising and exposed bare metal shall be liberally painted with proprietary cold galvanising paint.

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.
Conditions expected in use.

Completion

039 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.

040 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

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

Product	Brand name	Manufacturer's details

[complete table as appropriate]

SCAFFOLDING AND MEANS OF ACCESS

M3NHF SCHEDULE OF RATES – RESPONSIVE MAINTENANCE & VOID PROPERTY WORKS – SPECIFICATION – VERSION 8

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 the Provider must:
- consult the highways authority as to 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 Clause 05 applies, the Provider must provide evidence to the Client's Representative that the permissions referred to in that Paragraph have been obtained and, where applicable, the notifications under Clause 06 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, the Provider must:
- 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:
- Work at Height Regulations 2005 (as amended);
- Applicable Standard; and
- either:
  - NASC Technical Guidance TG20 for tube and fitting scaffolds; or
  - the manufacturer's guidance for system scaffolds.

011 For all scaffolds:
- approved materials in good condition must be used;
- 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; and
- toe boards and guard rails must be fitted to working or access platforms and to stairs where people working on them could fall 2 metres or more;
- Materials must not be thrown, tipped or allowed to fall off the scaffolds or working platforms;
- when partially erected or partly dismantled a notice saying "Do not use" must be displayed on the scaffold; and
- the scaffold must be made unclimbable at all times when not in use for undertaking the Works.

012 Scaffold requiring protection from lightning strike in accordance with the applicable Standards 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
  - 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. The Provider must 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, the Provider must 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.

018 The Rates for scaffolding are deemed to additionally include as appropriate for the following:

.1 Basing out, preparing and levelling of ground, provision of additional support, base plates, spreaders and the like as necessary.

.2 Protection of the structure fabric, finishings, roof coverings and the like.

.3 Provision of all requisite tubes and fittings of every description, delivery, handling and removal.

.4 Erecting, supporting, maintaining, adapting and dismantling as required.

.5 Bridging across structures and all other obstructions where necessary.

.6 Removal, temporary storage/resiting, protection and subsequent reinstatement as required of all TV, radio and telecommunication aerials, satellite dishes and the like.

.7 Fans, gantries, hoardings, sheeting and double boarding of working platforms to afford protection around/over entrances, paths, rights of way and other forms of access or thoroughfare unless specifically instructed by the Client's Representative.

.8 Working platforms to towers and chimney scaffolding.

.9 Toe boards, guard-rails, handrails, safe ladder access, ladders, warning signs, taping and the like.

.10 Ancillary plant and equipment such as tower feet/wheels, out-riggers, cross bracing, gin wheels, ropes and the like.

.11 Lighting and/or alarming where deemed necessary or appropriate and/or as specifically directed by the Client's Representative.

.12 Protection against lighting strike.

.13 Fixed handholds and physical ties to the structure where necessary, subsequent removal and making good.

.14 Provision of certified structural design calculations and erection certificates to the Client Representative where required under the Contract.

.15 Reinstatement of ground and making good any damaged surfacing and/or paving's if necessary.

.16 Compliance with all Regulatory Requirements including provision of all associated licences, permits and the like and the payment of all related fees and charges.

.17 Additional lifts of scaffolding, working platforms, handrails, ladders, other access provisions and the like necessitated by structure/roof design, for example changes in roof pitches at mansards and anything similar.