

NATIONAL BUILDING SPECIFICATION

FOR

Job No: **2148**

Project: **DWELLINGS AT DONARD STREET,
NEWCASTLE, COUNTY DOWN**

Status: **TENDER**

Date: **SEPTEMBER 2016**

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APPENDIX 1 - ISSUE HISTORY

Revision	Edit time/Date	Status/Revisions	Issue Date
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F10 BRICK/ BLOCK WALLING

To be read with Preliminaries/ General conditions.

TYPES OF WALLING

NOTE FOR ALL MASONRY CONSTRUCTION: ENSURE THAT THE PROPOSED BRICK MEETS THE STRUCTURAL ENGINEERS SPECIFICATION FOR THE MINIMUM COMPRESSIVE STRENGTH. FOLLOW THE ENGINEERS SPECIFICATION FOR MORTAR MIXES, IN ALL CASES USE THE SPECIFIED MORTAR MIX.

DURABILITY DESIGNATION

Facing bricks to comply with BS 3921-F (BS EN 771-1:2003-F2) - Frost Resistant and L- Low soluble salt content. Liability to efflorescence – Nil/Slight

110 CLAY FACING BRICKWORK TO EXTERNAL WALLS

- Bricks: To BS EN 771-1.
- Manufacturer: to be approved by sample
- Recycled content: 10%
- Special shapes: Solid brick for final header course for external site-works 215mm walls
- Mortar: As section Z21.
- Mix: Class III – to BS 5628
- Additional requirements: Premixed coloured mortar to be confirmed by employer or their delegate
- Bond: Stretcher
- Joints: pole
- Features: as drawings

Brick to be similar in appearance to 'Belfast Brick'. Examples of brickwork, which will be approved by the Employer, are indicated below. Deemed similarity and subsequent approval of the suggested brick by the appointed Contractor brick to the examples below will be at the discretion of the Employer. Brick sample panel of the Contractor's suggested brick to be erected on site. The Employer accepted brick to be used throughout the development.



Brick Example 1



Brick Example 2

355 CONCRETE COMMON BLOCKWORK TO EXTERNAL & INTERNAL WALLS

- Blocks: To BS EN 771-3.
 - Manufacturer: To be approved by sample
 - Product reference: Medium density concrete
 - Configuration: Solid
 - Compressive strength: (minimum) 7N/mm² to be as per S.E. specification
 - Freeze/ Thaw resistance: to BS 3921-F (BS EN 771-1:2003-F2)
 - Recycled content: 10%
 - Thermal properties: N/A
 - Work sizes (length x width x height): 440x100x215 or 440x140x215
 - Special shapes: N/A
 - Additional requirements: Flush joints
- Mortar: As section Z21.
- Mix: 4a (see clause 460)
- Bond: Stretcher

TESTING**410 COMPRESSIVE STRENGTH OF MORTAR FOR EACH WALLING TYPE**

- Testing authority: A UKAS accredited laboratory
- Test method: To BS 5628-1 Appendix A and BS 4551-1.
- Preliminary tests procedure: As follows:
 - Specimens:
 - Number of specimens: 6.
 - Type: Six 25 x 25 x 100 mm or 40 x 40 x 160 mm prisms or 70.7 mm or 100 mm cubes
 - Preparation: At least six weeks before walling commences.
 - Specimen testing: Half of specimens at 7 days. Remainder at 28 days.
 - Retarded mixes: Extend curing periods to include retardation period.
 - Response to result: If mean compressive strength at 28 days is not within the range given below repeat tests with more suitable sand or next higher designation of mortar.

- Site tests procedure: As follows.
 - Number of specimens: Six per 150m² of walling or per storey whichever the more frequent.
 - Specimen types: As preliminary test, but prepared during construction.
 - Specimen testing: Half of specimens at 7 days. Remainder at 28 days.
 - Retarded mixes: Extend curing periods to include retardation period.
- Required test mean compressive strength at 28 days (N/mm²): To be within the following range:

Walling type	Preliminary tests		Site tests	
	Min. N/mm ² (MPa)	Max. N/mm ² (MPa)	Min. N/mm ² (MPa)	Max. N/mm ² (MPa)
	_____	_____	_____	_____

- Results: Submit.

415 FRESH MORTAR CEMENT CONTENT

- Test method: BRE mortar test
- Test specimens: Test mortar for the following wall types: F10/ 355
- Results: Submit.

WORKMANSHIP GENERALLY

430 CONDITIONING OF CLAY AND CALCIUM SILICATE BRICKS

- Bricks delivered warm from manufacturing process: Do not use until cold.
- Absorbent bricks in warm weather: Wet to reduce suction. Do not soak.

440 CONDITIONING OF CONCRETE BRICKS/ BLOCKS

- Autoclaved concrete bricks/ blocks delivered warm from manufacturing process: Do not use.
- Age of nonautoclaved concrete bricks/ blocks: Do not use until at least four weeks old.
- Avoidance of suction in concrete bricks/ blocks: Do not wet.
 - Use of water retaining mortar admixture: Submit details.

460 MORTAR GROUPS

- Mix proportions: For a specified group select a mix design from the following:

Group	1	2	3	4
PC*:lime:sand with or without air entraining additive				
	1:0-0.25:3	1:0.5-4.5	1:1:5-6	1:2:8-9
Masonry cement:sand containing PC* and lime in approx ratio 1:1, and an air entraining additive				
	-	1:3	1:3.5-4	1:4.5
Masonry cement:sand containing PC* and inorganic materials other than lime and air entraining additive				
	-	1:2.5-3.5	1:4-5	1:5.5-6.5
PC*:sand and air entraining additive				
	1:3	1:3-4	1:5-6	1:7-8

PC* = Portland cement

- Batching: Mix proportions by volume.
- Mortar type: Continuous throughout any one type of masonry work.

500 LAYING GENERALLY

- Mortar joints: Fill vertical joints. Lay bricks, solid and cellular blocks on a full bed.
- Bond where not specified: Half lap stretcher.
- Vertical joints in facework: Even widths. Plumb at every fifth cross joint.

520 ACCURACY

- Courses: Level and true to line.
- Faces, angles and features: Plumb.
- Permissible deviations:
 - Position in plan of any point in relation to the specified building reference line and/ or point at the same level ± 10 mm.
 - Straightness in any 5 m length ± 5 mm.
 - Verticality up to 3 m height ± 10 mm.
 - Verticality up to 7 m height ± 14 mm.
 - Overall thickness of walls ± 10 mm.
 - Level of bed joints up to 5 m (brick masonry) ± 11 mm.
 - Level of bed joints up to 5 m (block masonry) ± 13 mm.

535 HEIGHT OF LIFTS IN WALLING USING CEMENT GAUGED OR HYDRAULIC LIME MORTAR

- Quoins and advance work: Rack back.
- Lift height (maximum): 1.2 m above any other part of work at any time.
- Daily lift height (maximum): 1.5 m for any one leaf.

540 HEIGHT OF LIFTS IN WALLING USING THIN JOINT MORTAR GLUE

- Quoins and advance work: Rack back.
- Lift height (maximum): 1.3 m above any other part of work at any time.

545 LEVELLING OF SEPARATE LEAVES

- Locations for equal levelling of cavity wall leaves: As follows:
- Every course containing vertical twist type ties or other rigid ties.
 - Every third tie course for double triangle/ butterfly ties.
- Courses in which lintels are to be bedded.

560 COURSING BRICKWORK

- Gauge: Four brick courses including bed joints to 300 mm.

561 COURSING BRICKWORK WITH EXISTING

- Gauge: Line up with existing brick courses.

580 LAYING FROGGED BRICKS

- Single frogged bricks: Frog uppermost.
- Double frogged bricks: Larger frog uppermost.
- Frog cavity: Fill with mortar.

585 LAYING CELLULAR BRICKS

- Orientation: Cavities downward.

595 LINTELS

- Bearing: Ensure full length masonry units occur immediately under lintel ends.

610 SUPPORT OF EXISTING WORK

- Joint above inserted lintel or masonry: Fully consolidated with semidry mortar to support existing structure.
- 615 BRICKWORK TO RECEIVE ASPHALT DPC
- Substrate: Mortar bed finished flush, smooth and level.
- 620 BLOCK BONDING NEW WALLS TO EXISTING
- Pocket requirements: Formed as follows:
 - Width: Full thickness of new wall.
 - Depth (minimum): 100 mm.
 - Vertical spacing:
 - Brick to brick: 4 courses high at 8 course centres.
 - Block to block: Every other course.
 - Pocket joints: Fully filled with mortar.
- 635 JOINTING
- Profile: Consistent in appearance.
- 645 ACCESSIBLE JOINTS NOT EXPOSED TO VIEW
- Jointing: Struck flush as work proceeds.
- 665 POINTING
- Joint preparation: Remove debris. Dampen surface.
 - Mortar: As section Z21.
 - Mix: Class III – to BS 5628
 - Additional requirements: Premixed coloured mortar to be confirmed by employer or their delegate
 - Bond: Stretcher
 - Joints: pole
 - Features: as drawings
- 671 FIRE STOPPING
- Avoidance of fire and smoked penetration: Fit tightly between cavity barriers and masonry. Leave no gaps.
- 690 ADVERSE WEATHER
- General: Do not use frozen materials or lay on frozen surfaces.
 - Air temperature requirements: Do not lay bricks/ blocks:
 - In cement gauged mortars when at or below 3°C and falling or unless it is at least 1°C and rising.
 - In hydraulic lime:sand mortars when at or below 5°C and falling or below 3°C and rising.
 - In thin joint mortar glue when outside the limits set by the mortar manufacturer.
 - Temperature of walling during curing: Above freezing until hardened.
 - Newly erected walling: Protect at all times from:
 - Rain and snow.
 - Drying out too rapidly in hot conditions and in drying winds.

ADDITIONAL REQUIREMENTS FOR FACEWORK

- 710 THE TERM FACEWORK
- Definition: Applicable in this specification to brick/ block walling finished fair.
 - Painted facework: The only requirement to be waived is that relating to colour.

730 BRICK/ CONCRETE BLOCK SAMPLES

- General: Before placing orders with suppliers submit for approval of appearance labelled samples of the following: _____
- Selection of samples: Representative of the range in variation of appearance.

740 FINISHED MASONRY WORK REFERENCE PANELS

- General: Before proceeding to construct the following walling types, construct panels as specified. Give notice when panels are dry.
- Walling type: F10/110
Location: to be agreed on site
Size: 1.5m x 1.5m
Other requirements: **Include 4 no finished work sample panels for selection by client of Facing brick & brick mortar and rendered blockwork to be built on site. Samples to be retained on site for comparison purposes and unless otherwise specified for forming part of the finished work, shall be removed when no longer required by the employer.**

750 COLOUR CONSISTENCY OF MASONRY UNITS

- Colour range: Submit proposals of methods taken to ensure that units are of consistent and even appearance within deliveries.
- Conformity: Check each delivery for consistency of appearance with previous deliveries and with approved reference panels; do not use if variation is excessive.
- Finished work: Free from patches, horizontal stripes and racking back marks.

760 APPEARANCE

- Brick/ block selection: Do not use units with damaged faces or arrises.
- Cut masonry units: Where cut faces or edges are exposed cut with table masonry saw.
- Quality control: Lay masonry units to match relevant reference panels.
 - Setting out: To produce satisfactory junctions and joints with built-in elements and components.
 - Coursing: Evenly spaced using gauge rods.
- Lifts: Complete in one operation.
- Methods of protecting facework: Submit proposals.

780 GROUND LEVEL

- Commencement of facework: Not less than 150 mm below finished level of adjoining ground or external works level.

790 PUTLOG SCAFFOLDING

- Use: Not permitted in facework.

800 TOOTHED BOND

- New and existing facework in same plane: Bond together at every course to achieve continuity.

830 CLEANLINESS

- Facework: Keep clean.
- Mortar on facework: Allow to dry before removing with stiff bristled brush.
- Removal of marks and stains: Rubbing not permitted.

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F30 ACCESSORIES/ SUNDRY ITEMS FOR BRICK/ BLOCK/ STONE WALLING

To be read with Preliminaries/ General conditions.

CAVITIES**110 CONCRETE FILL TO BASE OF CAVITY**

- Concrete generally: To BS EN 206-1 and BS 8500-2.
- Designated concrete: RC20
Workability: High.
- Extent: Maintain 75 mm between top of fill and external ground level and a minimum of 225 mm between top of fill and ground level dpc.
- Placement: Compact to eliminate voids.

120 CLEANLINESS

- Cavity base and faces, ties, insulation and exposed dpcs: Free from mortar and debris.

130 PERPEND JOINT WEEP HOLES

- Form: Open perpend joint.
- Locations: Through outer leaf immediately above base of cavity, at cavity trays, stepped dpcs and external openings. 75 mm above top of cavity fill at base of cavity.
- Provision: At not greater than 1000 mm centres and not less than two over each opening.

131 BED JOINT WEEP HOLES

- Form: Open 10 mm diameter hole.
- Locations: Through outer leaf immediately above base of cavity at cavity trays, stepped dpcs and external openings. 75 mm above top of cavity fill at base of cavity.
- Provision: At not greater than 1000 mm centres and not less than two over each opening.

132 PERPEND JOINT PLASTICS WEEP HOLES

- Manufacturer: To be approved by sample
- Locations: Through outer leaf immediately above base of cavity, at cavity trays, stepped dpcs and external openings. 75 mm above top of cavity fill at base of cavity. See detailed drawings
- Provision: To be at 450mm centres at high and low level

150 FULL FILL CAVITY INSULATION

- Insulation: CFC/HCFC free rigid Polyisocyanurate (PIR) core between low emissivity foil facings with engineered HIPS outer skin manufactured to BS EN 13165:2008.
- Product certification: BRE
- Manufacturer: To be approved by sample
- Face size (nominal length x width): 1200 x 450 mm.
- Edge profile Rebated all four edges.
- Thickness (nominal): 125 mm.
- Thermal conductivity: 0.021 W/mk.
- Additional requirements: To achieve an A+ rating under the BRE Green Guide.

- Placement: Continuous and free of mortar and debris.
- Installation: To be installed in accordance with instructions issued by manufacturer
- Additional items:
 - Riser panels at base of walls where required to facilitate the overlap of 150 mm between floor and wall insulation.
 - Top panels where required at top of wall to limit wastage.
 - Preformed corner panels to be used at both internal and external corners.
 - Service void panels to be used at periscopic floor vents, (F30.171) Locations.
 - Note, used cut 100 mm thick boards at locations of steel columns protruding cavities and tape joints with the 125mm boards as recommended by manufacturer,

**ALL INSULATION TO TO AVOID THE USE OF SUBSTANCES THAT HAVE A GWP
LESS THAN OR EQUAL TO 5 (manufacture or installation)**
U VALUE REQUIRED FOR EXTERNAL WALLS TO BE 0.16W/m2

160 AIR BRICKS IN EXTERNAL WALLING

- Standard: To BS 493, class 1.
- Manufacturer: to be approved by sample
- Apertures: Rectangular Louvre – to BS 493 class 1 and 2 to prevent the passage of a 9.5mm diameter steel ball
- Work sizes: 215 x 102.5 65mm – TBC by manufacturer
- Material/ colour: Thermoplastic / colour to be suitable for wall location - a choice of red/brown/white
- Placement: Built in with no gaps at joints.
Vents to be able to be clipped together to form larger vent as required for location.
For venting gas risers / extracts as per drawings
To include sleeve and stepped dpc

**171 VENTILATION DUCTS IN EXTERNAL WALLING from mechanical extract
location to be co-ordinated with employer or their delegate**

- Manufacturer: to be approved by sample
- Placement: Across cavity, sloping away from inner leaf. Full mortar joints to seal cavity.
- Protection from water penetration to inner leaf: Where barrier is not integral to duct, form stepped dpc cavity tray with stop ends above duct, extending 150 mm on each side.

180 CAVITY CLOSERS

- Manufacturer: Calcuim Silicate board by Thickness: 12 mm or equal and approved to achieve 60 minutes fire protection
 - Product reference: 60 minutes
- Bedded in cement mortar and with at least 50mm bearing on the outer leaf and 100mm bearing on the inner leaf. Mechanically fixed to inner leaf

214 CAVITY WALL TIES TO ALL EXTERNAL WALLS

- Standard: To BS EN 845-1.
- Type: Type 2 tie, to BS 5628-1: 2005.
- Manufacturer: To be approved by sample
- Material/ finish: Stainless steel grade 1.4301 (304).
- Sizes: To suit 125 mm cavity.
- Design embedment length (minimum): 50 mm.

- Additional requirements: The wall tie should be confirmed as compatible for use with specified cavity insulation and be installed so as not to compromise the performance of the insulation.

REINFORCING/ FIXING ACCESSORIES

228 FIXING TIES IN MASONRY CAVITY WALLS WITH FULL FILL CAVITY INSULATION

- Embedment in mortar beds (minimum): 50 mm.
- Placement: Sloping slightly downwards towards outer leaf, without bending. Drip centred in the cavity and pointing downwards.
- Spacing: Staggered in alternate courses.
 - Horizontal centres: As recommended by manufacturer, (max 900 mm).
 - Vertical centres: 450mm max to suit insulation boards.
- Provision of additional ties:
One row above DPC level to support lowest row of insulation batts.
 - Spacing: 600 mm horizontally.Two number ties within 225 mm of reveals of unbonded openings.
 - Spacing: 450 mm vertically.

FLEXIBLE DAMP PROOF COURSES/ CAVITY TRAYS

330 DAMP PROOF COURSE – ABOVE GROUND LEVEL

High performance polymeric DPC suitable for damp-proofing walls in brick, concrete in both solid and cavity constructions and block flooring to include preformed cloaks and accessories as required. To be BBA approved 1.25mm thick flexible polymeric material to be suitable for use horizontally and vertically, stepped and cavity tray situations.

- Manufacturer: Should be laid in accordance with manufacturers recommendations

345 SITE FORMED FLEXIBLE SHEET CAVITY TRAYS TO LINTELS AND CILLS

- Material: High performance polymeric DPC. To be BBA approved 1.25mm thick flexible polymeric material to be suitable for use horizontally and vertically, stepped and cavity tray situations.
- Manufacturer: Provide sample for approval
 - Product reference: Should be laid in accordance with manufacturers recommendations

360 GAS RESISTANT DPCS/ CAVITY TRAYS AT GROUND FLOOR LEVEL

- Manufacturer: High performance polymeric gas resistant DPC suitable for damp-proofing walls in brick, concrete in both solid and cavity constructions and block flooring to include preformed cloaks and accessories as required. To be BBA approved 1.25mm thick flexible polymeric material to be suitable for use horizontally and vertically and stepped situations.
- Product reference: Should be laid in accordance with manufacturers recommendations

390 SITE FORMED DPC/ CAVITY TRAY JUNCTIONS/ STOP ENDS

- Three dimensional changes in shape: Form to provide a free draining and watertight installation. Seal laps.
- Alternative use of preformed junction cloaks/ stop ends: Submit proposals.

INSTALLATION OF DPCS/ CAVITY TRAYS

415 HORIZONTAL DPCS

- Placement: In continuous lengths on full even bed of fresh mortar, with 100 mm laps at joints and full laps at angles.
- Width: At least full width of leaf unless otherwise specified. Edges of dpc not covered with mortar or projecting into cavity.
- Overlying construction: Immediately cover with full even bed of mortar to receive next masonry course.
- Overall finished joint thickness: As close to normal as practicable.

425 GROUND LEVEL DPCS

- Joint with damp proof membrane: Continuous and effectively sealed.

435 STEPPED DPCS IN EXTERNAL WALLS

- External walls on sloping ground: Install dpcs not less than 150 mm above adjoining finished ground level.

445 SILL DPCS

- Form and placement: In one piece and turned up at back when sill is in contact with inner leaf.

455 COPING/ CAPPING DPCS

- Placement: Bed in one operation to ensure maximum bond between masonry units, mortar and dpc.
- Dpcs crossing cavity: Provide rigid support to prevent sagging.

465 SEALING DPCS

- Overlaps and junctions: Seal with manufacturer's recommendation

475 SITE FORMED CAVITY TRAYS

- Requirements to prevent downward ingress of water:
 - Profiles: To match those shown on drawings. Firmly secured.
 - Joint treatment: Use unjointed wherever possible, otherwise lap at least 100 mm and seal to produce a free draining and watertight installation.
 - Horizontal cavity trays: Support using cavity closer.
 - Sloping cavity trays: Prevent sagging.
 - Cleanliness: Free from debris and mortar droppings.

485 CAVITY TRAYS OVER OPENINGS AND OTHER CAVITY BRIDGINGS

- Length: To extend not less than 150 mm beyond ends of lintels/ bridgings.

495 GAS RESISTANT DPCS/ CAVITY TRAYS

- Joint treatment: Use unjointed wherever possible, otherwise lap at least 150 mm and seal to form a gas and watertight installation.
- Joint with damp proof membrane: Overlap dpc/ cavity tray not less than 150 mm.

515 DPC/ CAVITY TRAY LEADING EDGE IN FACEWORK - FLUSH

- Treatment at face of masonry: Finish flush and clear of mortar at the following locations: at window/door head and jambs

- 535 DPC/ CAVITY TRAY LEADING EDGE IN FACEWORK - PROJECTING
- Treatment at face of masonry: Projecting 5 mm from face of wall at the following locations: at window/door cills
- 560 VERTICAL DPCS GENERALLY
- Form: In one piece wherever possible.
 - Joints: Upper part overlapping lower not less than 100 mm.
- 570 JAMB DPCS AT OPENINGS
- Joint with cavity tray/ lintel at head: Full underlap.
 - Joint with sill/ horizontal dpc at base: Full overlap.
 - Projection into cavity: Not less than 25 mm.
 - Relationship with frame: In full contact.
- 580 JAMB DPCS TO BUILT IN TIMBER FRAMES
- Fixing: Securely fastened to back of frame.
 - Fasteners: Galvanized clout nails or staples.

JOINTS

- 610 MOVEMENT JOINTS WITH SEALANT **to external blockwork/brickwork**
- Joint preparation and sealant application: As section Z22.
 - Filler: A cross-linked, closed cell, semi-rigid, non-absorbent polyethylene joint filler for forming or filling movement joints in concrete, brickwork and blockwork. The material must have a density of 60kg/m³ (to ISO845), a recovery of 98% after 50% compression (ASTM D3575) and a compressive strength of 0.15N/mm² (ASTM D3575). It must have a water absorption of less than 0.05% by volume when tested in accordance with ASTM D3575 and be resistant to weathering to Dtp Clause 1015 and chemical attack. The joint filler must have BS 6920 Water Byelaws Scheme approval for use in contact with potable water.
 - Thickness: To match design width of joint.
 - Manufacturer: To be confirmed by sample
 - Placement: Build in as work proceeds with no projections into cavities and to correct depth to receive sealant system.
 - Sealant: **as clause M20.653**
- 630 UNEXPOSED CONTRACTION JOINTS
- Formation: Close butt as work proceeds.
- 650 POINTING IN FLASHINGS
- Joint preparation: Free of debris and lightly wetted.
 - Pointing mortar: As for adjacent walling.
 - Placement: Fill joint and finish flush.
- 655 POINTING IN ASPHALT SKIRTINGS
- Joint preparation: Free of debris and lightly wetted.
 - Pointing mortar: 1:4 cement: sand incorporating a bonding agent.
 - Colour: Match adjacent work.
 - Placement: Fill joint and finish flush.
- 660 PINNING UP TO SOFFITS
- Top joint of loadbearing walls: Fill and consolidate with mortar.

670 TOPS OF NONLOADBEARING WALLS

- Restraints: Galvanised steel straps
- Fixing: Secure to soffit.
- Joint filler: Fill and consolidate with mortar.
- Placement: Full, no gaps.

PROPRIETARY SILLS/ LINTELS/ COPINGS/ DRESSINGS

720 SILLS **CONCRETE**

- Standard: To BS 5642-1.
- Material: precast concrete
- Manufacturer: to be approved
- Product reference: _
- Dimensions: As shown on drawings. 2 course - see detailed drawings
 - Cills in facing bricks walls to have stooped ends and non-stooped ends in rendered finished walls
- Finish: generally as specified under Fair faced components (F31)
Mould material lining GRP or similar to give smooth finish
Aggregate 10mm stone
Colour white portland cement sample to be provided for approval
- Mortar for bedding/ jointing: Cement gauged as section Z21.
 - Standard: group 2 resistant, BS 5628, part 3 table 15
 - Mix: 1:1:6
 - Additional requirements: cast in water bars as required
- Joints: Flush.
- Bedding one piece sills: Leave bed joints open except under end bearings and masonry mullions. On completion, point to match adjacent work.
NOTE: kits will not be permitted – sample required for quality checks by employer or their delegate

755 PREFABRICATED STEEL LINTELS

- Standard: To BS EN 845-2.
- Manufacturer: To be approved by sample
- Types: as head details
- Material/ finish: Galvanised steel
- Sizes: To manufacturers details
- Additional requirements: **ALL INSULATION TO AVOID THE USE OF SUBSTANCES THAT HAVE A GWP LESS THAN OR EQUAL TO 5 (manufacture or installation)**
- Placement: Bed on mortar used for adjacent work.
- Bearing length (minimum): as per manufacturers specification

MISCELLANEOUS ITEMS

840 OPENINGS FOR FRAMES

- Formation: Use accurate, rigid templates to required size.

850 WALL PLATES

- Placement: On full bed of mortar to correct horizontal level.

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F31 PRECAST CONCRETE SILLS/ LINTELS/ COPINGS/ FEATURES

To be read with Preliminaries/ General conditions.

TYPES OF COMPONENT

- 105 EXPOSED PRECAST EXTERNAL CONCRETE THRESHOLD**
- Concrete: Components manufacturer's 'proprietary' concrete.
 - Identity: Manufacturer's mix performance
 - Conformity: To BS 8500-2 and the recommendations of BS 8500-1 Annex A4 for the specified exposure class.
 - Evidence: Submit third party certification from a UKAS accredited laboratory.
 - Exposure class: XC3 and XC4
 - Strength class (cylinder/ cube): C32/40
 - Reinforced components: Submit proposals for type of reinforcement and cover.
 - Matching sample for finish to visible faces: As per requirements of CA
 - Other requirements: use air-entrained concrete mix
- 106 EXPOSED PRECAST EXTERNAL CONCRETE COPINGS TO WALLS / PILLAR CAPS**
- Concrete: Components manufacturer's 'proprietary' concrete.
 - Identity: Manufacturer's mix performance
 - Conformity: To BS 8500-2 and the recommendations of BS 8500-1 Annex A4 for the specified exposure class.
 - Evidence: Submit third party certification from a UKAS accredited laboratory.
 - Exposure class: XC3 and XC4
 - Strength class (cylinder/ cube): C32/40
 - Reinforced components: Submit proposals for type of reinforcement and cover.
 - Matching sample for finish to visible faces: As per requirements of CA
 - Other requirements: use air-entrained concrete mix
- 130 CONCEALED PRECAST LINTELS**
- Standard: To BS EN 845-2.
 - Verification of performance: Submit calculations or test certificates.
- 140 CONCEALED PRECAST LINTELS**
- Concrete: Designated to BS 8500-2: Minimum RC30.
 - Aggregate (maximum) size: 20 mm.
 - Configuration:
 - Clear span up to 900 mm:
 - Section: 140 mm deep x width of wall.
 - Bearing: 150 mm at both ends.
 - Reinforcement: One 12 mm carbon steel bar for each 105 mm of wall thickness.
 - Clear span 900 mm to 1800 mm:
 - Section: 215 mm deep x width of wall.
 - Bearing: 225 mm at both ends.
 - Reinforcement: One 16 mm carbon steel bar for each 105 mm of wall thickness.
 - Cover to reinforcement (nominal): 20 mm minimum.

GENERAL REQUIREMENTS**210 MOULDS**

- Permissible fabrication and operating tolerances: Length 0 to +6 mm, other dimensions ± 3 mm.

220 CONCRETE GENERALLY

- Specification: To BS 8500-2 and BS EN 206-1.
- Producer: Currently certified by a body accredited by UKAS to BS EN 45011 for product conformity certification of ready-mixed concrete.
- Chloride class of concrete:
- Excluding SRPC: C1 0.40.
- Using SRPC: C1 0.20.
- Reinforced and heat cured: C1 0.10.
- Prestressed: C1 0.10.
- Admixtures containing calcium chloride: Not allowed.

250 REINFORCEMENT

- Carbon steel reinforcement: As appropriate to BS 4449, BS 4482 and BS 4483.
- Cutting and bending: To BS 8666.
- Galvanized reinforcement: Galvanized to BS EN ISO 1461 after cutting. Chromate treated.
- Stainless steel reinforcement: To BS 6744.
- Designation: 1.4301.
- Cutting and bending: To BS 8666.
- Non structural reinforcement: Include to resist shrinkage and handling stresses.
- Bimetallic corrosion and staining: Prevent by appropriate selection and use of materials.
- Condition at time of placement: Clean, free of corrosive pitting, loose materials and substances that adversely affect reinforcement, concrete, or bond between the two.
- Fixing: Accurate and secure.
- Method: Wire tying, approved steel clips or tack welding if permitted.
- Concrete cover: Maintain free of all tying wire or clips.

255 QUALITY ASSURANCE OF REINFORCEMENT

Reinforcement to BS 4449, BS 4483, BS 6744: Obtain valid certificates of approval for product conformity issued by the UK Certification Authority for Reinforcing Steels.

260 CASTING AND CURING

- Placing of concrete: Thoroughly compact.
- Protection against drying out: Methods and duration to BS EN 13369 clause 4.2.1.3.
- Immature components: Avoid movement, vibration, overloading, physical shock, rapid cooling and thermal shock.
- Delivery to site: Not until at least 14 days after casting.

261 CUTTING

- Cutting of precast concrete components: Not permitted.

262 RECORDS

- Records for each type of component: Maintain details including:
- Unique identification number.
- Identification of the producer.
- Identification of the place of production.
- Correlation with records of mixes, including batch numbers.
- Date of each stage of manufacture.

- Dates and results of all tests, checks and inspections.
- Dimensions related to specified levels of accuracy.
- Specific location in the finished work.
- Weight of the unit.
- Damage and making good.
- Any other pertinent data, e.g. if unit is a production control unit.
- Availability of records for inspection: On request.

FAIR FACED COMPONENTS

310 CONTROL SAMPLES

- Required samples: After finalization of design, one each of the following components – Cill and coping
- Approval of appearance: Obtain before manufacture of remaining units.
- Identification and storage location: Clearly label and retain at factory for comparison with production units.

320 DETAILS OF SAMPLES

- Submittals after approval of appearance and before manufacture of production units:
- Aggregates: Confirm type, maximum size, grading and source.
- Conformity of designed concrete: Evidence of compliance for compressive strength class and limiting values of composition.

330 MIXES FOR VISIBLE FACED COMPONENTS

- Constituent materials and mix design for each finish type: To remain constant.
- Colour and appearance of each finish type: To remain constant.
- Aggregates: To BS EN 12620.
- Origin: Single source for each finish type, having sufficient quantity for whole contract.

341 CONDITIONS FOR SEPARATE FACING AND BACKING MIXES

- Difference in cement content: Not greater than 80 kg/m cu.
- Thickness of facing mix: 10 mm greater than maximum aggregate size, minimum 25 mm.
- Location of reinforcement: Minimum 20 mm away from the interface between mixes.
- Compaction of facing and backing mix: Carry out to create monolithic construction.

350 QUALITY OF FINISHES

- Appearance standard: As established by samples.

365 COVER ON EXPOSED AGGREGATE FACES

- Nominal cover: Exclusive of aggregate projection.

370 COVER ON VISIBLE FACES

- Spacers: Not permitted.
- Proposed method statement: Submit.

380 CONSISTENCY OF PRODUCTION METHODS

- Production methods: To remain consistent for each matching type of finish.
- Finish appearance: To remain within the range of variation indicated by the samples submitted.

- Changes to production methods: If variations are proposed for components of the same finish, submit evidence that there will be no difference in appearance.

390 INSPECTION

- Completed components: Give notice when ready to be inspected at factory.

INSTALLATION

420 LAYING

- Mortar for bedding and jointing: As section Z21.
- Mix: Class III – to BS 5628
- Packing: If required use slate.
- Bedding components: On full bed of mortar.
- Removal of marks, stains and extraneous mortar on visible faces: Rubbing not permitted.

430 SUPPORT OF EXISTING WORK OVER NEW LINTELS

- Joint above lintels: Fully fill and compact with semidry mortar.

440 ONE PIECE SILLS/ THRESHOLDS

- Bed joints: Leave clear of mortar except at end bearings and beneath masonry mullions.
- On completion: Point with mortar to match adjacent work.

APPENDIX 1 - ISSUE HISTORY

Revision	Edit time/Date	Status/Revisions	Issue Date
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G20 CARPENTRY/ TIMBER FRAMING/ FIRST FIXING

To be read with Preliminaries/ General conditions.

GENERAL**105 TIMBER PROCUREMENT**

- Timber (including timber for wood based products): Obtained from well managed forests/ plantations in accordance with:
- The laws governing forest management in the producer country or countries.
- International agreements such as the Convention on International Trade in Endangered Species of wild fauna and flora (CITES).
- Documentation: Provide either:
- Documentary evidence (which has been or can be independently verified) regarding the provenance of all timber supplied, or
- Evidence that suppliers have adopted and are implementing a formal environmental purchasing policy for timber and wood based products.

115 CONTRACTOR DESIGNED STRUCTURAL COMPONENTS

- Design standard: To BS 5268-2.
- Completion of design: Design and detail members and connections to satisfy loading requirements specified or otherwise calculable from the information given.
- Drawings:
- Content: Drawings must show:
Geometry of structure.
Wood species and grades/ strength classes.
Target/ Finished sizes of all timber sections.
Joints not detailed on Engineer's drawings, their locations, and evidence as to their structural adequacy.
- Submission: To Employers Delegate
Copies: 2
- Compliance with design standard: Demonstrate by calculation or by prototype load testing in accordance with BS 5268-2, Section 8.

150 STRENGTH GRADING OF TIMBER

- Grader: A company currently registered under a third party quality assurance scheme operated by a certification body approved by the UK Timber Grading Committee.

160 GRADING AND MARKING OF SOFTWOOD

- Timber of a target/ finished thickness less than 100 mm and not specified for wet exposure: Graded at an average moisture content not exceeding 20% with no reading being in excess of 24% and clearly marked as 'DRY' or 'KD' (kiln dried).
- Timber graded undried (green) and specified for installation at higher moisture contents: Clearly marked as 'WET' or 'GRN'.
- Structural timber members cut from large graded sections: Regraded to approval and marked accordingly.

PRODUCTS

- 210 **STRUCTURAL SOFTWOOD (GRADED DIRECT TO STRENGTH CLASS) FOR FRAMING**
- Grading standard: To BS 4978, BS EN 14081-1, or other national equivalent and so marked.
 - Strength class to BS EN 338: C24
 - Treatment: pressure impregnated with preservative as section Z12 and British Wood Preserving and Damp-proofing Association Commodity Specification C9
- 230 **STRUCTURAL SOFTWOOD (STRENGTH CLASS NOT SPECIFIED) FOR TRIMMING/BATTENING**
- Species and origin: Responsibly sourced and to comply with sustainable homes requirements
 - Grading standard: To the appropriate standard or rules for the specified grade and so marked.
 - Grade: To the appropriate standard or rules for the specified grade and so marked.
 - Treatment: pressure impregnated with preservative as section Z12 and British Wood Preserving and Damp-proofing Association Commodity Specification C9
- 270 **UNGRADED SOFTWOOD FOR INTERNAL NON STRUCTURAL USE**
- Quality of timber: Free from decay, insect attack (except pinhole borers) and with no knots wider than half the width of the section.
 - Surface finish: sawn generally
 - Treatment: pressure impregnated with preservative as section Z12 and British Wood Preserving and Damp-proofing Association Commodity Specification C9
- 310 **STRUCTURAL PLYWOOD complying to BS EN 13986 BS6566:8**
- Standard: To the relevant national standards and quality control procedures specified in BS 5268-2, and so marked.
 - Type: COFI EXTERIOR
 - Nominal thickness/ number of plies: 19mm
 - Finish: unsanded
 - Treatment: As section Z12 and British Wood Preserving and Damp-proofing Association Commodity Specification C9
- 311 **NONSTRUCTURAL PLYWOOD complying to BS EN 13986 BS6566:8**
- Standard: To an approved national standard.
 - Thickness: 9mm
 - Appearance class to BS EN 635: III OR IV
 - Bond quality to BS EN 314-2:
 - Finish: unsanded
 - Treatment: As section Z12 and British Wood Preserving and Damp-proofing Association Commodity Specification C9
- 350 **TRUSSED RAFTERS**
- Design and fabrication: To BS 5268-3 and BS EN 14250.
 - Manufacturer: A firm currently registered under a third party quality assurance scheme.
 - Truss system: Agreement Certified
 - Ancillary components to be supplied by the truss fabricator: as required to roof design see drawings
 - Treatment: Require treatment as Z12

WORKMANSHIP GENERALLY

- 401 CROSS SECTION DIMENSIONS OF STRUCTURAL SOFTWOOD AND HARDWOOD
- Dimensions: Dimensions in this specification and shown on drawings are target sizes as defined in BS EN 336.
 - Tolerances: The tolerance indicators (T1) and (T2) specify the maximum permitted deviations from target sizes as stated in BS EN 336, clause 4.3:
 - Tolerance class 1 (T1) for sawn surfaces.
 - Tolerance class 2 (T2) for further processed surfaces.
- 402 CROSS SECTION DIMENSIONS OF NONSTRUCTURAL SOFTWOOD
- Dimensions: Dimensions in this specification and shown on drawings are finished sizes.
 - Maximum permitted deviations from finished sizes: As stated in BS EN 1313-1:
 - Clause 6 for sawn sections.
 - Clause NA.2 for further processed sections.
- 403 CROSS SECTION DIMENSIONS OF NONSTRUCTURAL HARDWOOD
- Dimensions: Dimensions in this specification and shown on drawings are finished sizes.
 - Maximum permitted deviations from finished sizes: As stated in BS EN 1313-2:
 - Clause 6 for sawn sections.
 - Clause NA.3 for further processed sections.
- 420 WARPING OF TIMBER
- Bow, spring, twist and cup: Not greater than the limits set down in BS 4978 or BS EN 14081-1 for softwood, or BS 5756 for hardwood.
- 430 SELECTION AND USE OF TIMBER
- Timber members damaged, crushed or split beyond the limits permitted by their grading: Do not use.
 - Notches and holes: Position in relation to knots or other defects such that the strength of members will not be reduced.
 - Scarf joints, finger joints and splice plates: Do not use without approval.
- 440 PROCESSING TREATED TIMBER
- Cutting and machining: Carry out as much as possible before treatment.
 - Extensively processed timber: Retreat timber sawn lengthways, thickened, planed, ploughed, etc.
 - Surfaces exposed by minor cutting/ drilling: Treat with two flood coats of a solution recommended by main treatment solution manufacturer.
- 450 MOISTURE CONTENT
- Moisture content of wood and wood based products at time of installation: Not more than:
 - Covered in generally unheated spaces: 24%.
 - Covered in generally heated spaces: 20%.
 - Internal in continuously heated spaces: 20%.

451 MOISTURE CONTENT TESTING

- Procedure: When instructed, test timber sections with an approved electrical moisture meter.
- Test sample: Test 5% but not less than 10 lengths of each cross-section in the centre of the length.
- Test results: 90% of values obtained to be within the specified range. Provide records of all tests.

470 COMPONENT TESTING

- Standard: To BS 5268-2, Section 8.
- Test results: Submit as soon as available.

480 TRUSSED RAFTER TESTING

- Standard: To BS EN 595.
- Number/Timing of tests: Submit proposals
- Purpose of testing: General quality control
- Test reports: Submit as soon as available.

510 PROTECTION

- Generally: Keep timber dry and do not overstress, distort or disfigure sections or components during transit, storage, lifting, erection or fixing.
- Timber and components: Store under cover, clear of the ground and with good ventilation. Support on regularly spaced, level bearers on a dry, firm base. Open pile to ensure free movement of air through the stack.
- Trussed rafters: Keep vertical during handling and storage.

520 EXPOSED END GRAIN

- Components: Seal exposed end grain of the following before delivery to site: cut timbers
- Sealer: clear end grain sealer

530 PAINTED FINISHES

- Structural timber to be painted: Primed as specified before delivery to site.

540 CLEAR FINISHES

- Structural timber to be clear finished: Keep clean and apply first coat of specified finish before delivery to site.

550 EXPOSED TIMBER

- Planed structural timber exposed to view in completed work: Prevent damage to and marking of surfaces and arrises.

JOINTING TIMBER**570 JOINTING/ FIXING GENERALLY**

- Generally: Where not specified precisely, select methods of jointing and fixing and types, sizes and spacings of fasteners in compliance with section Z20.

580 FRAMING ANCHORS

- Manufacturer: to employer or their delegate's approval
- Material/ finish: Stainless steel
- Fasteners: Galvanized or sherardized square twist nails.
- Size: Not less than size recommended by anchor manufacturer.

- Fixing: Secure using not less than the number of nails recommended by anchor manufacturer.
- 590 METAL PLATE FASTENERS/GUSSET
- Manufacturer: to employer or their delegate's approval
 - Product reference: submit proposals
- 630 BOLTED JOINTS
- Bolt spacings (minimum): To BS 5268-2, table 81.
 - Holes for bolts: Located accurately and drilled to diameters as close as practical to the nominal bolt diameter and not more than 2 mm larger.
 - Washers: Placed under bolt heads and nuts that would otherwise bear directly on timber. Use spring washers in locations which will be hidden or inaccessible in the completed building.
 - Bolt tightening: So that washers just bite the surface of the timber. Ensure that at least one complete thread protrudes from the nut.
 - Checking: At agreed regular intervals up to Completion. Tighten as necessary.
- 650 GLUED JOINTS
- Adhesive: to contractors design
 - Compatibility: Where relevant, obtain manufacturer's confirmation that adhesive is compatible with preservative/ fire retardant treatment.
 - Glued structural components: Fabricated to BS 6446 in clean, controlled workshop conditions.
- 670 ANTICORROSION FINISHES FOR FASTENERS
- Galvanizing: To BS 7371-6, with internal threads tapped and lightly oiled following treatment.
 - Sherardizing: To BS 7371-8, Class 1.
 - Zinc plating: To BS EN ISO 4042 and passivated.

ERECTION AND INSTALLATION

- 710 PROPOSALS FOR ERECTING STRUCTURAL TIMBER
- Proposals: Submit details of:
 - Method and sequence of erection.
 - Type of craneage.
 - Temporary guys and bracing proposed for use during erection.
- 715 BONDED ANCHORS Manufacturer: Contractor's choice.
- Product reference: Submit proposals.
- Size: M12.
- Material/ finish: Stainless steel.
- Spacing/ edge distance (minimum): Refer to manufacturer's details.
- Obtain instructions if specified spacing or edge distance cannot be achieved.
- Installation holes: Drilled to diameter and depth recommended by manufacturer.
- Clean and free from dust.
- Permeable sleeves: Use in conditions where otherwise loss of bonding agent would be unacceptably high.
- Installation/ tightening: To manufacturer's instructions.

740 PRE-ERECTION CHECKING

- Timing: Not less than 10 days before proposed erection start date.
- Checklist:
- Foundations and other structures to which timber structure will be attached: Check for accuracy of setting out.
- Holding down bolts: Check for position, protruding length, condition and slackness.
- Inaccuracies and defects: Report without delay.
- Erection: Obtain permission to commence.

750 MODIFICATIONS/ REPAIRS

- Defects due to detailing or fabrication errors: Report without delay.
- Methods of rectification: Obtain approval of proposals before starting modification or remedial work.
- Defective/ damaged components: Timber members/ components may be rejected if the nature and/ or number of defects would result in an excessive amount of site repair.

760 TEMPORARY BRACING

- Provision: As necessary to maintain structural timber components in position and to ensure complete stability during construction.

770 ADDITIONAL SUPPORTS

- Provision: Position and fix additional studs, noggings and/ or battens to support edges of sheet materials, and wall/ floor/ ceiling mounted appliances, fixtures, etc. shown on drawings.
- Material properties: Additional studs, noggings and battens to be of adequate size and have the same treatment, if any, as adjacent timber supports.

775 BEARINGS

- Timber surfaces which are to transmit loads: Finished to ensure close contact over the whole of the designed bearing area.
- Packings: Where provided, to cover the whole of the designed bearing area.
- Crushing strength: Not less than timber being supported.
- In external locations: Rot and corrosion proof.

780 WALL PLATES

- Position and alignment: To give the correct span and level for trusses, joists, etc.
- Bedding: Fully in fresh mortar.
- Joints: At corners and elsewhere where joints are unavoidable use nailed half lap joints. Do not use short lengths of timber.

784 JOISTS GENERALLY

- Centres: Equal, and not exceeding designed spacing.
- Bowed joists: Installed with positive camber.
- End joists: Positioned approximately 50 mm from masonry walls.

786 JOISTS ON HANGERS

- Hangers: Bedded directly on and hard against supporting construction. Do not use packs or bed on mortar.
- Joists: Cut to leave not more than 6 mm gap between ends of joists and back of hanger. Rebated to lie flush with underside of hangers.
- Fixing to hangers: A nail in every hole.

790 STANDARD JOIST HANGERS for ceiling joists where required

- Standard: To BS EN 845-1.

- Size and type: To suit joist, design load and crushing strength of supporting construction.
 - Material/ finish: stainless steel. Nails to be NLT 30 x 3.75mm galvanised or sherardized square twist unless recommended otherwise.
- 795 TRIMMING OPENINGS
- Trimmers and trimming joists: When not specified otherwise, not less than 25 mm wider than general joists.
- 800 TRUSSED RAFTER INSTALLATION
- Require drawings and calculations for Building Control – design to include for all bracing and infills
- Erection: To BS 5268-3, clause 9.3 and TRA site installation guide.
 - Trusses generally: Do not modify without approval.
 - Damaged trusses: Do not use.
 - Fixing: Truss clips and bottom chords of standard trusses and rafters of raised tie trusses bearing fully on wall plates.
 - Bottom chords of standard trusses: Do not fix to internal walls until roofing is complete and cisterns are installed and filled.
- 805 TRUSS CLIPS
- Material/ finish Fasteners: 32 x 3.5mm galvanised or sherardized square twist nails
- 810 PERMANENT BRACING OF TRUSSED RAFTERS to BS 5268-3 annex A
- Bracing and binders:
 - Size: Min 100 x 25mm – to be in accordance with truss designer recommendations
 - Method of fixing: To every rafter, strut or tie with not less than two fasteners.
 - Fasteners: 32 x 3.5mm galvanised round wire nails – to be in accordance with truss designer recommendations
 - Lap joints: Extended over and nailed to at least two truss members.
- 820 VERTICAL RESTRAINT STRAPS
- Manufacturer: Approved manufacturer
 - Material/ finish: Galvanised mild steel
 - Size:
 - Cross section: Not less than 30 x 5mm. 100mm cranked end
 - Length: 900mm long
 - Centres: Not more than 2m in accordance with building regs – to be confirmed by structural engineer
 - Fixing:
 - To timber members with not less than two 32 x 3.5mm galvanised or sherardized square twist nails
 - To masonry with not less than 4no screws evenly spaced, with at least one screw located within 150 mm of the bottom end of each strap.
- 830 LATERAL RESTRAINT STRAPS
- Manufacturer: Approved manufacturer
 - Material/ finish: Galvanised mild steel
 - Size: Not less than Not less than 30 x 5mm. 100mm cranked end
 - Fixing: To top of joists/ rafters/ ties at not more than 1.2 m centres and as shown on drawings.
 - Ensure that cranked end is in tight contact with cavity face of wall inner leaf and is not pointing upwards.
 - Straps spanning joists/ rafters/ ties running parallel to wall: Fix noggings and packs tightly beneath straps.

- Size of noggings and packs: Not less than three quarters of joist/ rafter/ tie depth and not less than 38 mm thick.
- Notching: Notch joists so that straps fit flush with surface. Do not notch rafters/ ties.
- Fasteners: Not less than 4 number 50 x 8 guage sherardized countersunk screws per strap, evenly spread.

840 STRUTTING TO FLOOR JOISTS

- Type: One of the following:
- Herringbone strutting: At least 38 x 38 mm softwood.
- Solid strutting: At least 38 mm thick softwood and at least three quarters of joist depth.
- Proprietary metal strutting: of approved type
- Fixing: Between joists as follows:
- Joist spans of 2.5 to 4.5 m: One row at centre span.
- Joist spans over 4.5 m: Two rows equally spaced.
- Strutting must not project beyond top and bottom edges of joists.
- Outer joists: Blocked solidly to perimeter walls.

850 INSPECTION GENERALLY

- Structural timber-work: Give reasonable notice before covering up.

860 BOLTED JOINT INSPECTION

- Timing: Inspect all accessible bolts at the end of the Defects Liability Period and tighten if necessary.

950 FASCIAS/ BARGES/ SOFFITS PVC-u

- Manufacturer: Agreement Certified
- Product reference: Agreement Certified
- Material: PVC-U
- Finish: to be agreed
- Colour: **BLACK**
- Nominal depth: see detail drawings
- Edge profile: to be approved
- Accessories: as required
- Support: treated timber and backing board supplied and site fitted by timber-frame manufacturer
- Provide additional support at joints.
- Fixings: as manufacturer's recommendations
- Installer: A contractor approved by the system manufacturer.

APPENDIX 1 - ISSUE HISTORY

Revision	Edit time/Date	Status/Revisions	Issue Date
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H41 GLASS FIBRE REINFORCED PLASTICS CLADDING/ FEATURES

To be read with Preliminaries/ General conditions.

TYPES OF CLADDING/ FEATURES

130 GRP PURPOSE MADE FEATURES ROOF CANOPIES

- Primary support structure: External wall
- GRP components:
- Manufacturer: Contractor's choice – contractor responsible for both detail design and construction
- Construction: Moulding direct fixed to supporting structure – see drawing for design intent
- Finish: Smooth gloss unless other agreed with the client or their representative
- Colour: Colour to be agreed with client or their representative from a full range of RAL colours or BS 4800 with a daylight fade index of 7 to BS 1006:B01:LFS7
- Fire rating:
 - Spread of flame (component external face): class 0
 - Spread of flame (component internal face): class 0
- Fixings and fasteners: As clause 205
- Joints: as clause 650
- Accessories/ Other requirements: as required

DESIGN/ PERFORMANCE REQUIREMENTS

205 CONTRACTOR'S DESIGN ROOF CANOPIES

- Design responsibility: Determine size and thickness of units and the type, size and spacing of fixings including support structure
- Structural and fire requirements:
- Generally: As section B50.
- Design: Complete the design in accordance with the designated code of practice to satisfy specified performance criteria.

215 THERMAL PERFORMANCE/ BRIDGING

- Requirement: Complete thermal design to avoid excessive thermal bridging.
- Assessment: To BRE IP 1/06.

220 WEATHER RESISTANCE

- Requirement: Weathertight, with full allowance made for deflections and other movements.

260 FIRE RATING CERTIFICATION

- Verification: Before commencing full manufacture, submit evidence based on laboratory testing.
- Testing authority: UKAS accredited

270 COLOUR FASTNESS/ APPEARANCE OF GRP

- Colour fastness of pigments: Not less than standard 6 when measured to BS 1006:B01C:LFS6.

- Evidence of compliance: Submit.

275 COLOUR FASTNESS/ APPEARANCE SAMPLES

- 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 unweathered 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 unweathered control samples.

320 DESIGN SAMPLES

- GRP samples: Before general manufacture obtain approval of appearance of fully tested compliant design samples of: Entrance canopy
- 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.

330 MOCK-UP

- Element: At an agreed stage during detailed design construct a mock-up of: A complete component and ancillaries
- Function: As installation reference panel
- Inspection: Obtain approval of appearance before proceeding. Retain mock-up in undisturbed condition until completion of GRP installation.

MANUFACTURE

410 QUALITY OF WORK

- 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.
- Fillers and admixtures: Submit proposals.
- 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.

440 MANUFACTURING ACCURACY

- Finished dimensions of completed units when erected:
- Ambient temperature: Measurements taken at 16-18°C.
- Maximum permissible deviations:

Overall dimension involved (m)	Up to 2	2-3	3-4.5	4.5-6
Width and height:	+0	+0	+0	+0
	-2 mm	-3 mm	-5 mm	-6 mm

Straightness of edges:
deviation from intended
line, any variation to be
evenly distributed with
no sudden bends or
irregularities. 3 mm 4 mm 5 mm 6 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 5 mm 6 mm

Twist: deviation of any
corner from the plane
containing the other
3 corners; dimension
involved is the
shorter side. 3 mm 5 mm 7 mm 8 mm

Flatness - deviation under a 1 m straight edge placed
anywhere on a flat panel surface: 3 mm

450 GEL COATS TO EXTERNAL SURFACES

- Mixing: Resins, pigments and fillers thoroughly mixed.
- Batching: All units of one colour from single batch of resin/ additive mix.
- Nominal overall thickness: 500 micrometres.
- Limits for single gel coating: No reading less than 400 micrometres nor more than 600 micrometres.
- Limits for double gel coating: Submit proposals for coat thickness limits based on resin manufacturer's recommendations.
- Gel coat with embedded surface tissue: Submit proposals for coat thickness limits based on resin manufacturer's recommendations.
- Checking wet film thickness: All units checked in accordance with BS EN ISO 2808, four readings per m sq per coat over external surface area.

460 LAMINATING

- Glass fibre content: Not less than 900 g/m sq of glass fibre, in not less than two layers to each GRP skin.
- Reinforcement distribution:
 - Random reinforcement: Distributed uniformly.
 - Non random reinforcement: Correctly positioned and aligned.
- Layering of woven fabric reinforcement: Layered with chopped strand mat on both sides.
- Resin:glass fibre ratio: Not less than 2:1, higher as appropriate, with glass fully wetted out by resin.
- Layer bonding: Good overall bond between gel coats and layers of laminate.
- Consolidation of GRP: Well consolidated and free from air voids.

470 BONDING OF CONSTITUENTS

- Resin layers: Good overall bond between gel coats and layers of laminate.

- Additional components: Core materials, ties, ribs, fixings and accessories fully bonded to GRP skins over full contact surface area.

480 FIXINGS AND FASTENERS

- Loadbearing fixing type: Contractor's design
- Restraint fixing type: Contractor's design
- Extent of adjustment: To accommodate support structure/ cladding fabrication/ installation tolerances and thermal movement of GRP.
- Method of fixing to primary support structure: To contractors design
- Avoidance of bimetallic corrosion: Select appropriate materials for fixings/ fasteners/ spacers/ washers.

490 SEALING OF UNITS

- Flow coat: Apply to all surfaces of finished units which are not gel coated.
- Cut edges and holes: Seal to avoid penetration of moisture into glass fibres.

500 CURING

- Initial curing period at 20°C: 24 hours.
- Distortion during curing: Prevent.

505 METAL POWDER FINISH

- Polishing: Remove an even film of resin to ensure natural patination of the whole exposed surface.

510 HARDNESS TESTING

- Standard: To BS 2782-10: Method 1001.
- Timing: After curing.
- Extent: One test for each 1 m sq of external surface area, not less than 2 tests per unit.
- Barcol hardness at ambient temperature: Not less than 30.

530 WEIGHT TESTING

- First unit of each type and size:
- Compliance: In accordance with design and specification.
- Weight: Record.
- Subsequent units:
- Acceptable weight: Unmodified subsequent units to be within 10% of weight of first unit.

570 PRODUCTION RECORDS

- Recorded information:
- Unique identification number.
- Full details of composition.
- Date of each stage of manufacture.
- Dates and results of tests, checks and inspections.
- Dimensions related to specified levels of accuracy.
- Specific location in the finished work.
- Other pertinent data, e.g. if the unit is a production control unit.
- Availability of records: For inspection on request.

580 RETENTION OF MOULDS AFTER PRODUCTION

- Purpose: Retain moulds and store in a reusable condition to allow manufacturing to recommence if required.
- Retention period: Destroy only with approval

INSTALLATION

605 PREPARATION

- Prefabrication: Complete products and attach fixings in workshop wherever possible.
- Identification: Mark or tag products. Do not mark surfaces visible in the complete installation.
- Electrolytic corrosion: Isolate dissimilar metals.

615 SUITABILITY OF STRUCTURE

- Contractor's survey:
- Scope: Geometric survey of supporting structure, checking line, level and fixing points.
- Coordinate: With surveys for adjacent cladding.
- Give notice: If structure will not allow required accuracy or security of erection.
- Setting out: Establish erection datum points, lines and levels for a complete elevation at a time unless otherwise agreed.

625 INSTALLATION OF INTERFACES

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

635 ACCURACY OF ERECTION OF GRP COMPONENTS

- Joint widths: Within joint lengths, including in-line continuations across transverse joints, as follows:
- Tolerance: Greatest width not to exceed least width by more than 10mm
- Variations: Evenly distribute, with no sudden changes.
- Offset in elevation: Between component edges across transverse joints not to exceed 10mm
- Offset in plan or section: Between flat faces of adjacent units across joints not to exceed 10mm
- Sealant joints width limitations: To recommendations of sealant manufacturer.
- Finished work: True to line and plane with satisfactory fit at junctions.

640 FINAL FIXING

- Torque figures: Tighten threaded fastenings to figures recommended by manufacturer. Do not overtighten restraint fixings intended to permit lateral movement.

645 METALWORK

- Material standards and fabrication: As section Z11.

650 SEALANT JOINTING SYSTEM

- Sealant: Silicone
- Class to BS EN ISO 11600: Contractor selection to suit anticipated moisture and thermal movement
- Colour: TBC with client or their representative
- Joint back up/ filler: Contractor selection to suit anticipated moisture and thermal movement
- Application: As section Z22.

- H41 Glass fibre reinforced plastics cladding/ features RPP Architectural Specification
(continued)
- 660 OPEN DRAINED JOINTS
- Rear seals: Airtight.
 - Baffles and flashings: Installed securely and accurately to function as intended.
- 680 CLEANING DOWN
- General: Return to site at completion or when instructed and thoroughly clean down the entire area of the GRP work. Cleaning agents for the purpose must be approved by the GRP manufacturer.

APPENDIX 1 - ISSUE HISTORY

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H60 PLAIN ROOF TILING

To be read with Preliminaries/General conditions.

TYPES OF TILING

120 CONCRETE ROOF TILING TO APARTMENTS / HOUSE TYPES

- Substrate: timber truss/rafter at 400 crs
- Pitch: as drawings
- Underlay:
to be high performance vapour permeable roofing underlay for use in cold and warm roof constructions. To have a water vapour transmission of $\leq 0.5\text{g/m}^2$ over 24 hours. Underlay to be BSA certified.
- Recycled content: Min. 10 % .
- Direction: Parallel to eaves.
- Head-lap (minimum): to manufacturers recommendations
- Battens:
- Size: 50 x 38mm vac-vac treated
- Counter Battens:
- Size: 50 x 38mm vac-vac treated
- Fixing: to BS5534
- Tiles: To BS EN 490, noninterlocking.
- Manufacturer: To be approved by sample
- Pattern: none
- Colour: Charcoal grey
- Size: 268 x 330mm flat tile
- Recycled content: 10%
- Head-lap (minimum): 65 mm.
- Fixing: clause 275

To eaves, verge, ridge,, hip, etc to be fixed. All other to be to BS 5534 also manufacturer's recommendations

Minimum as follows:

Eaves tile- nail all tiles with 2no 75mm long aluminium alloy clout nails. Also clip all tiles with patent aluminium eaves clips/using 60mm long aluminium nails

Verge tiles- mortar bedded verge (wet verge) nail all tiles with 2no nails each course and fix tiles. Every course with patent aluminium verge clips.

Top course- nail and clip as per eaves tiles

Perimeter tiles- also include tiles adjacent to hip, valleys, abutments, dormers, chimneys, etc. Above tiles should be nailed and clipped at every course as at verge tiles.

Remaining tiles- all remaining tiles to be nailed in an alternative diagonal pattern.

In extremely exposed locations above tiles should be clipped.

Ridge tiles- all should have mechanical fixing ie alloy screw nails with nylon washers. Fixings should be of a length to suit battens and their position.

- Other requirements: Lead should be treated to prevent staining and weeping

Include 4 no finished work sample panels for selection by client.

Samples to be retained on site for comparison purposes and unless otherwise specified for forming part of the finished work, shall be removed when no longer required by the employer.

TILING GENERALLY

210 BASIC WORKMANSHIP

- General: Fix tiling and accessories to make the whole sound and weathertight at earliest opportunity.
- Setting out: To true lines and regular appearance, with neat fit at edges, junctions and features.
- Fixings for tiling accessories: As recommended by tile or accessory manufacturer.
- Gutters and pipes: Keep free of debris. Clean out at completion.

240 UNDERLAY

- Laying: Maintain consistent tautness.
- Vertical laps (minimum): 100 mm wide, coinciding with supports and securely fixed.
- Fixing: Galvanized steel, copper or aluminium 20 x 3 mm extra large clout head nails.
- Eaves: Where exposed, underlay must be BS 8747 Annex B, type 5U, or equivalent UV durable type.
- Penetrations: Use proprietary underlay seals or cut underlay to give a watertight fit around pipes and components.
- Ventilation paths: Do not obstruct.

245 BATTENS/ COUNTERBATTENS – TREATED

- Timber: Sawn softwood.
- Standard: BS 5534, clause 4.12.1.
- Permissible characteristics and defects: Not to exceed limits in BS 5534, Annex C.
- Moisture content at time of fixing and covering (maximum): 22%.
- Preservative treatment: As section Z12 and Wood Protection Association Commodity Specification C8.
- Type: Organic solvent (OS) or equal to be approved by the employer or their delegate

259 COUNTERBATTENS ON RAFTERS/TRUSSES

- Fixing: Into rafters at not more than 300 mm centres.

265 BATTEN FIXING

- Setting out: Align parallel to ridge in straight horizontal lines to gauge of tiles. Align on adjacent areas.
- Batten length (minimum): Sufficient to span over three supports.
- Joints in length: Square cut. Butt centrally on supports. Joints must not occur more than once in any group of four battens on one support.
- Additional battens: Provide where unsupported laps in underlay occur between battens.
- Fixing: Each batten to each support. Splay fix at joints in length.

270 BATTENS FIXED TO MASONRY

- Setting out: In straight horizontal lines. Align on adjacent areas.
- Batten length (minimum): 3 m.
- Fixing centres (maximum): 400 mm.

272 TIMBER FOR TILING SUBSTRATE WORK

- Timber: Sawn softwood, free from wane, pitch pockets, decay and insect attack (ambrosia beetle excepted).
- Moisture content at time of fixing and covering (maximum): 22%.
- Preservative treatment: As section Z12 and Wood Protection Commodity Specification C8.

- Type: Organic solvent (OS) or equal to be approved by the employer or their delegate

275 TILE FIXING

- Setting out: Lay tiles to a half lap bond with joints slightly open. Align tails.
- Ends of courses: Use tile and a half tiles to maintain bond and to ensure that cut tiles are as large as possible.
- Top and bottom courses: Use eaves/ tops tiles to maintain gauge.
- Perimeter tiles:
- Verges, abutments and each side of valleys and hips: Twice nail end tile in every course.
- Eaves and top edges: Twice nail two courses of tiles or clip as appropriate.
- Fixings for tiles: Nails/ clips recommended by tile manufacturer.

280 LOCAL AND GENERAL FIXING AREAS

- Definitions:
- Local areas: Bands of tiling around all edges or obstructions of each plane of the roof. Calculate extent of each band in accordance with BS 5534, section 5.
- General areas: Remaining areas of roof tiling.

290 MORTAR BEDDING/ POINTING

- Mortar: As section Z21, 1:3 cement:sand, with plasticizing admixtures permitted.
- Bond strength providing resistance to uplift: To BS 5534.
- Weather: Do not use in wet or frosty conditions or when imminent.
- Preparation of tiles and accessories to be bedded: Wet and drain surface water before fixing.
- Appearance: Finish neatly as work proceeds and remove residue.

ROOF TILING EDGES/ JUNCTIONS/ FEATURES**305 GENERALLY**

- Fittings and accessories: As recommended by tile manufacturer, do not improvise.
- Exposed fittings and accessories: To match tile colour and finish.
- Cut tiles: Cut only where necessary, to give straight, clean edges.
- Flashings: Fix with or immediately after tiling. Form neatly.

325 FIRE SEPARATING WALLS

- Separating walls: Completely fill space between top of wall and underside of tiles with mineral wool quilt to provide fire stopping.
- Boxed eaves: Completely seal air paths in plane of separating wall with wire reinforced mineral wool, not less than 50 mm thick, fixed to rafters and carefully cut to shape to provide fire stopping.

355 VENTILATED EAVES WITH SEPARATED GRILLES/ TRAYS

- Fascia grilles:
- Manufacturer: To be approved by sample
- Over fascia vent to cold roofs 10,000mm²/m
- Over fascia vent to warm roofs 25,000mm²/m
- Both including gutter support spacer
- Ventilator trays:
- Manufacturer: To be approved by sample
- Roll to cold roofs 10,000mm²/m
- Roll to warm roofs 25,000mm²/m

- Fix to provide free passage of air over insulation.
- Underlay support: 12mm WBP ply fillet topped with 400mm DPC membrane underneath roofing felt along gutter eaves
- Continuous to prevent water retaining troughs.
- Gutter: Dress underlay or underlay support tray to form drip into gutter.
- Undercourse and first course tiles: Fix with tails projecting 50 mm over gutter or to centre of gutter, whichever dimension is the lesser.

435 PROPRIETARY DRY VERGES

- Underlay and tiling battens: Carry over full width of verge. Project underlay to turn down behind verge tiles.
- Product reference: Bespoke aluminium flat tile dry verge system to secure tiles on gable ends without the requirement for mortar or timber and internally jointed to provide seamless appearance. Range of colours to be provided for client's selection
- Projection beyond face of wall (maximum): TBC by sample profiles with client or their representative
- Fixing: Manufacturer's recommendation

615 METAL VALLEYS

- Underlay: Cut to rake. Dress over tilting fillets to lap onto metal valley. Do not lay under metal.
- Roof tiles: Cut adjacent tiles to fit neatly.
- Bedding: On mortar on fibre cement undercloaks laid loose each side of valleys.
- Valley width between tiles: _ .

660 SIDE ABUTMENTS

- Underlay: Turn up not less than 100 mm at abutments.
- Abutment tiles: Cut as necessary. Fix close to abutments.
- Soakers: Interleave with abutment tiles. Fix by turning down over head of abutment tiles.

675 TOP EDGE VENTILATED ABUTMENTS WHERE REQUIRED

- Underlay: Provide air gap at abutment as recommended by ventilator manufacturer.
- Abutment ventilator:
- Manufacturer: to be approved by sample
Product reference: Lead-vent top edge abutment with integral lead flashing to provide ventilation to the roofspace equivalent to 5000mm³/m in accordance with building regulations NI part K or BS 5250:2002/2005. Install continuously and fix in accordance with manufacturer's recommendations
- Fixing: As recommended by manufacturer.

670 TOP EDGE ABUTMENTS

- Underlay: Turn up not less than 100 mm at abutments.
- Top course tiles: Fix close to abutments.

690 ROOF WINDOWS

- Underlay: Turn up not less than 100 mm at window surrounds under integral flashings/ soakers.
- Roof tiles: Cut as necessary and fix closely all round.

700 DRY VENTILATED RIDGES

- Underlay: Provide air gap at apex.

- Dry ridge tiles:
 - Manufacturer: To be approved by sample
 - Product reference: angle ridge
 - Ridge terminals:
 - Manufacturer: To be approved by sample
- 800 CHANGE OF ROOF PITCH
- Tiling substrate work: Fix timber tilting fillet to support flashing and course of tiles above change of pitch.
 - Roof tiles: Fix courses above and below change of pitch and make weathertight with flashing.
- 840 VENTILATOR TILES
- Ventilator tiles: Through in-line
 - Manufacturer: To be approved by sample
 - Requirement: To ventilate cold roof where location deems standard ridge vent unsuitable
 - Positions: 2m centres unless otherwise required by manufacturer
- 850 ROOF SLOPE TERMINALS **FOR SVPS / EXTRACT VENTS / GAS RISERS / ETC**
- Ventilator tiles: Through in-line
 - Manufacturer: To be approved by sample
 - Connect to soil and vent pipes, extract ducts as M&E specification and over gas risers
To include a spigot for connection to ductwork/flexible ducting from extracts, etc
- 870 SUNDRY ACCESSORIES **EAVES SKIRT**
- Proprietary eaves skirt to be extruded in uv-stabilised 1.5mm PVC-U fitted over the proprietary over fascia ventilator installed to manufacturer's instructions

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H71 LEAD SHEET COVERINGS/ FLASHINGS

To be read with Preliminaries/ General conditions.

TYPES OF LEADWORK**230 VALLEY GUTTER LINING TO TILE ROOFS**

- Underlay: needle punched nonwoven polyester geotextile layer between 200 and 220g/m²
- Type of lead: Any
- Thickness: To BS EN 12588 or Agreement certificate – code 4 (BS 1178)
- Pretreatment: Patination oil
- Laying: Over and beyond tilting fillets.
- Lengths: Not more than 1500mm
- Cross joints: Lapped not less than 200mm
- Fixing: Welt edges. Nail top edge of each sheet. Dress bottom end neatly into eaves gutter.

250 WEATHERING TO ROOF CANOPIES

- Substrate:
- Underlay: needle punched nonwoven polyester geotextile layer between 200 and 220g/m²
- Type of lead: Any
- Thickness: To BS EN 12588 or Agreement certificate – code 4 (BS 1178)
- Joints: welts
- Spacing: not more than 1500mm
- Edge details: welted drip at front upstand at rear with tuck in
- Fixing: lead clips

320 COVER FLASHINGS : ROOF LEVELS AT INTERFACES FROM TILED ROOF TO FLAT ROOF

- Drawing reference(s): including but not restricted
- Lead: Code **5** in lengths not exceeding **1500** mm.
- End to end joints: Laps of not less than 100 mm.
- Cover: Overlap to upstand of not less than 75 mm.
- Fixing: As clause 720 lead wedges into bed joints.

420 COVER FLASHINGS

- Lead: Rolled
- Thickness: 1.75 or 1.80 mm (Code 4).
- Dimensions:
- Lengths: Not more than 1500mm
- End to end joints: Laps of not less than 100 mm.
- Cover: Overlap to upstand of not less than 75 mm.
- Fixing: As clause 715 and 770-790.

440 SOAKERS AND STEP FLASHINGS TO ROOF ABUTMENTS

- Lead soakers:
- Thickness: To BS EN 12588 or Agreement certificate – code 4 (BS 1178)
- Dimensions:
 - Length: Slate/ tile gauge + lap + 25 mm.
 - Upstand: Not less than 75 mm.
 - Underlay: Not less than 100 mm.

- Fixing: By roofer.
- Lead step flashings:
- Thickness: To BS EN 12588 or Agreement certificate – code 4 (BS 1178)
- Dimensions:
 - Lengths: Not more than 1500mm
 - End to end joints: Laps of not less than 100 mm.
 - Cover: Overlap to soaker upstands of not less than 65 mm.
- Fixing: Lead wedges at every course.

470 PROPRIETARY FLASHINGS TO SUN PIPES

- Thickness: To BS EN 12588 or Agreement certificate (BS 1178) as supplied by solar panel/sun pipe manufacturer and fitted by roofer

GENERAL REQUIREMENTS/ PREPARATORY WORK

510 WORKMANSHIP GENERALLY

- Standard: To BS 6915 and latest edition of 'Rolled lead sheet. The complete manual' published by the Lead Sheet Association.
- Fabrication and fixing: To provide a secure, free draining and completely weathertight installation.
- Operatives: Trained in the application of lead coverings/ flashings. Submit records of experience on request.
- Preforming: Measure, mark, cut and form lead prior to assembly wherever possible.
- Marking out: With pencil, chalk or crayon. Do not use scribes or other sharp instruments without approval.
- Bossing and forming: Straight and regular bends, leaving sheets free from ripples, kinks, buckling and cracks.
- Solder: Use only where specified.
- Sharp metal edges: Fold under or remove as work proceeds.
- Finished work: Fully supported, adequately fixed to resist wind uplift but also able to accommodate thermal movement without distortion or stress.
- Protection: Prevent staining, discolouration and damage by subsequent works.

515 LEADWELDING

- In situ leadwelding: Not permitted.

516 LEADWELDING

- In situ leadwelding: Is permitted, subject to completion of a 'hot work permit' form and compliance with its requirements.

520 LEAD SHEET

- Production method:
- Rolled, to BS EN 12588, or
- Machine cast, Agreement certified and to code thicknesses with a tolerance (by weight) of $\pm 5\%$, or
- Sand cast, from lead free from bitumen, solder, other impurities, inclusions, laminations, cracks, air, pinholes and blowholes; to code thicknesses but with a tolerance (by weight) of $\pm 10\%$.
- Identification: Labelled to show thickness/ code, weight and type.

555 LAYOUT

- Setting out of longitudinal and cross joints: Submit proposals.

560 CONTROL SAMPLES

- General: Complete areas of the finished work, and obtain approval of appearance before proceeding:

610 SUITABILITY OF SUBSTRATES

- Condition: Dry and free of dust, debris, grease and other deleterious matter.

620 PREPARATION OF EXISTING TIMBER SUBSTRATES

- Remedial work: Adjust boards to level and securely fix. Punch in protruding fasteners and plane or sand to achieve an even surface.
- Defective boards: Give notice.
- Moisture content: Not more than 22% at time of covering. Give notice if greater than 16%.

630 PLYWOOD UNDERLAY

- Standard: Manufactured to an approved national standard and to BS EN 636, section 7 (plywood for use in humid conditions).
- Sheet size: 2400 or 1200 x 1200 mm and 6 mm thick.
- Moisture content: Not more than 22% at time of covering. Give notice if greater than 16%.
- Laying: Cross joints staggered and a 0.5 to 1 mm gap between boards.
- Fixing: With 25 mm annular ringed shank copper or stainless steel nails, at 300 mm grid centres over the area of each sheet and at 150 mm centres along edges, set in 10 mm from perimeter edges.
- Nail heads: Set flush or just below the surface.

640 TIMBER FOR USE WITH LEADWORK

- Quality: Planed, free from wane, pitch pockets, decay and insect attack (ambrosia beetle excepted).
- Moisture content: Not more than 22% at time of fixing and covering. Give notice if greater than 16%.
- Preservative treatment: Organic solvent as section Z12 and Wood Protection Association Manual. Commodity Specification C8.

645 NEEDLE PUNCHED NONWOVEN POLYESTER GEOTEXTILE UNDERLAY

- Manufacturer: to be approved by sample
- Weight: as agreed with manufacturer

650 LAYING UNDERLAY

- Handling: Prevent tears and punctures.
- Laying: Butt or overlap jointed onto a dry substrate.
- Fixing edges: With copper or stainless steel staples or clout nails.
- Do not lay over roof edges but do turn up at abutments.
- Wood core rolls: Fixed over underlay.
- Protection: Keep dry and cover with lead at the earliest opportunity.

FIXING LEAD

705 HEAD FIXING LEAD SHEET

- Top edge: Secured with two rows of fixings, 25 mm and 50 mm from top edge of sheet, at 75 mm centres in each row, evenly spaced and staggered.
- Sheets less than 500 mm deep: May be secured with one row of fixings, 25 mm from top edge of sheet and evenly spaced at 50 mm centres.

710 FIXINGS

- Nails to timber substrates: Copper clout nails to BS 1202-2, or stainless steel (austenitic) clout nails to BS 1202-1.
- Shank type: Annular ringed, helical threaded or serrated.
- Shank diameter: Not less than 2.65 mm for light duty or 3.35 mm for heavy duty.
- Length: Not less than 20 mm or equal to substrate thickness.
- Screws to concrete or masonry substrates: Brass or stainless steel to BS 1210, tables 3 or 4.
- Diameter: Not less than 3.35 mm.
- Length: Not less than 19 mm.
- Washers and plastic plugs: Compatible with screws and lead.
- Screws to composite metal decks: Self tapping as recommended by the deck and lead manufacturer/ supplier for clips.

715 CLIPS

- Material:
- Lead clips: Cut from sheets of same thickness/ code as sheet being secured.
Temper: BS EN 1172, designation R220 in welts, seams and rolls, R240 elsewhere; dipped in solder if exposed to view.
- Stainless steel clips:
Thickness: 0.71mm
Grade: BS EN 10088, 1.4301(304) terne coated if exposed to view.
- Dimensions:
- Width: 50 mm where not continuous.
- Length: To suit detail.
- Fixing clips: Secure each to substrate with either two screw or three nail fixings not more than 50 mm from edge of lead sheet. Use additional fixings where lead downstands exceed 75 mm.
- Fixing lead sheet: Welt clips around edges and turn over 25 mm.

760 CONTINUOUS CLIPS

- Material:
- Lead continuous clips:
Thickness: As sheet
- Temper: BS EN 1172, designation R220 in welts, seams and rolls, R240 elsewhere.
- Stainless steel continuous clips:
Thickness: 0.71mm
Grade: BS EN 10088, 1.4301(304).
- Dimensions:
- Width: To suit detail.
- Fixing clips: Secure at 200mm maximum
- Fixing lead sheet: Welt edge around continuous clip and dress down.

765 CONTINUOUS CLIPS FOR CROSS JOINTS IN ROOFING

- Lead continuous clips: 50 mm wide, cut from sheets of same thickness/ code as sheet being secured.
- Fixing clips: Leadweld top edge of clips to underlap sheet, 50 mm from lower edge of overlap.
- Fixing lead sheet: Welt edge around continuous clip and dress down.

770 WEDGE FIXING INTO JOINTS/ CHASES

- Joint/ chase: Rake out to a depth of not less than 25 mm.
- Lead: Dress into joint/chase.
- Fixing: Lead wedges at not more than 450 mm centres, at every change of direction and with at least two for each piece of lead.
- Sealant: To BS EN ISO 11600
- Application: As section Z22.

780 WEDGE FIXING INTO DAMP PROOF COURSE JOINTS

- Joint: Rake/ cut out under damp proof course to a depth of not less than 25 mm.
- Lead: Dress lead into joint.
- Fixing: Lead wedges at not more than 450 mm centres, at every change of direction and with at least two for each piece of lead.
- Sealant: To BS EN ISO 11600
- Application: As section Z22.

790 SCREW FIXING INTO JOINTS/ CHASES

- Joint/ chase: Rake out to a depth of not less than 25 mm.
- Lead: Dress into joint/ chase and up back face.
- Fixing: Into back face with stainless steel screws and washers and plastics plugs at not more than 450 mm centres, at every change of direction, and with at least two fixings for each piece of lead.
- Sealant: To BS EN ISO 11600
- Application: As section Z22.

JOINTING LEAD**810 FORMING DETAILS**

- Method: Bossing or leadwelding except where bossing is specifically required.
- Leadwelded seams: Neatly and consistently formed.
- Seams: Do not undercut or reduce sheet thickness.
- Filler strips: Of the same composition as the sheets being joined.
- Butt joints: Formed to a thickness one third more than the sheets being joined.
- Lap joints: Formed with 25 mm laps and two loadings to the edge of the overlap.
- Bossing: Carried out without thinning, cutting or otherwise splitting the lead sheet.

970 PATINATION OIL

- Location: All visible exposed leadwork from street level and within building
- Application: Apply patination oil to all faces of leadwork prior to installation. As soon as practical, apply a smear coating to lead, evenly in one direction and in dry conditions.

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J40 FLEXIBLE SHEET TANKING/ DAMP PROOFING

To be read with Preliminaries/ General conditions.

110 HARDCORE BEDS

- Preparation: Blind with soft sand or pulverized fuel ash.
- Thickness (minimum): 225mm
- Finish on completion: Smooth, consolidated bed free of sharp projections.

115 VENTING HARDCORE BEDS

- Preparation: Blind with concrete to BS 8500-2.
- Concrete: Designated GEN 1 or Standardized Prescribed ST2.
- Thickness: 50 mm.
- Finish on completion: Smooth.

TYPES OF TANKING/ DAMP PROOFING**120 DAMP PROOF / TANKING MEMBRANE – FULLY BONDED ADHESIVE MEMBRANE TO BASE AND SIDES OF FOUNDATIONS WHICH WILL HAVE PERMANENT SHUTTERING.**

Manufacturer and Reference:

To be approved by sample - BBA Certified for basements Grades 2, 3 & 4 to BS8102: 1990.

A pre-applied, flexible, multi-layered composite sheet membrane comprising a thick white HDPE film, highly aggressive pressure sensitive adhesive and a weather resistant protective coating layer. The membrane provides a passive protection system that does not rely upon hydration processes or swell in contact with water. An intimate bond is formed to the poured in-situ structural concrete by means of a pressure sensitive adhesive preventing lateral water and moisture migration between the membrane and structure.

To be chemically resistant in all types of soil or water and protects the structure from salt and sulphate attack. To be tested to withstand a 70m head of water, has a zero permeance to moisture, does not activate prematurely due to wet conditions and is unaffected by ground settlement beneath slabs. The physical characteristics ensure that protection against Methane, CO₂ and Radon are in excess of the minimum requirements stated in BRE Reports 'Construction of new buildings on gas-contaminated land' (BR 212) and 'Radon: guidance on protective measures for new dwellings' (BR 211).

Substrate: Substrate must be regular and smooth with no gaps or voids greater than 12mm. A sound solid substrate should be created to eliminate movement during the concrete pour. Vertically the membrane can be applied to permanent formwork, rigid insulation the adjoining structure or as recommended by the manufacturer.

Thickness: 1.2mm ASTM D3767 Method A

Bonding: Fully bonds to the poured in-situ structural concrete by means of a pressure sensitive adhesive. Apply membrane with disposable plastic release liner uppermost. End laps should be staggered to avoid build up of layers. Plastic release liner to remain in position until overlap procedure is complete. Roll all laps to ensure good adhesion between sheets, in accordance with manufacturers recommendations.

Joints: Side and end laps to be a minimum of 75mm. Accurately position sheets to overlap previous sheet along indicated adhesive selvedge, ensure a continuous bond is achieved without creases and roll firmly. For roll ends, cut edges and for providing continuity of waterproofing at penetrations and detailing employ Tape LT. End laps to be staggered to avoid a build up of layers.

Sealing: Not required.

Ancillaries

Liquid Membrane - Two component elastomeric, cold applied liquid compound, which cures to form a tough seamless rubber-like waterproof layer. Liquid shall conform to irregular profiles and be suitable for detailing curved, irregular or stepped profiles, pile penetrations, internal corners, flashing around drains, gullies, pipe entries and edge sealing at terminations.

Tape shall have an highly aggressive, pressure sensitive adhesive layer for overbanding cut edges, roll ends, penetrations and detailing continuity.

Waterstops To be from the manufacturer's range of passive or active Waterstops for expansion joints and additional protection at construction joints providing single point responsibility

143 LOOSE LAID GAS RETARDANT DAMP PROOFING: TO GROUND FLOOR SLAB

- Substrate: Suspended precast concrete slabs
 - Manufacturer: To be approved by sample
 - Product reference: Radon membrane
 - Thickness/ Gauge: 300 micrometres
 - Joints:
 - Surfaces to be joined: Clean and dry beyond full width of joint.
 - Laps (minimum): end and side 150mm
 - Sealing: all laps must be sealed using manufacturer's double sided jointing tape and manufacturer's girth jointing tape
 - Accessories: at pipe penetrations seal using manufacturer's top hat units
- Detailing at corners to be manufacturer's internal and external corner pieces
To be protected from damage during construction until covered with insulation and screed

190 SELF-ADHESIVE BITUMEN DAMP PROOF MEMBRANE/TANKING: To vertical faces of substructure walls overlapping with DPM and DPCs as detailed drawings.

Manufacturer and Reference:

To be approved by sample - BBA Certified for basements Grades 2, 3 & 4 to BS8102: 1990.

A flexible preformed cold applied waterproof membrane combining a high performance cross-laminated, HDPE carrier film with a unique super-sticky self-adhesive rubber bitumen compound. BBA certified for protection of sub-structures in accordance with the relevant requirements of BS8102: 1990. Designed to be applied horizontally and vertically to protect critical sub-structures. The membrane is specially formulated to allow application to "green concrete" and able to be applied in damp or marginal weather conditions with the use of a moisture tolerant primer system.

Number of Layers:	One
Primer:	To manufacturer's recommendations
Thickness (Nominal)	1.5mm ASTM D3767 Method A

Laps: Minimum 50mm

Bonding: Apply sheets adhesive side down, smoothing out to exclude air. Roll laps to ensure good adhesion between sheets, in accordance with manufacturers recommendations.

Application Temperature -10° to +35°C

BBA Certified for basements Grades 2, 3 & 4 to BS8102: 1990.

Complies with Gas Resistance requirements of Building Regulations 1991, Clause C2

Ancillaries

Protection Board made from selected aggregates bound with bitumen, laminated between two rough asphaltic papers to form a strong protection board.

Tape for overbanding primed butt joints between protection boards.

Liquid Membrane. Two component elastomeric, cold applied liquid compound, which cures to form a tough seamless rubber-like waterproof layer. Liquid shall conform to irregular profiles and be suitable for detailing curved, irregular or stepped profiles, pile penetrations, internal corners, flashing round drains, gullies, pipe entries and edge sealing at terminations.

Waterstops To be from the manufacturer's recommendations range of passive or active Waterstops for expansion joints and additional protection at construction joints providing single point responsibility

Tape used where required to assist waterproofing continuity.

WORKMANSHIP

310 WORKMANSHIP GENERALLY

- Condition of substrate:
- Clean and even textured, free from voids and sharp protrusions.
- Moisture content: Compatible with damp proofing/ tanking.
- Air and surface temperature: Do not apply sheets if below minimum recommended by membrane manufacturer.
- Condition of membrane at completion:
- Neat, smooth and fully supported, dressed well into abutments and around intrusions.
- Completely impervious and continuous.
- Undamaged. Prevent puncturing during following work.
- Permanent overlying construction: Cover membrane as soon as possible.

320 INSPECTION

- Give notice: Before covering any part of membrane with overlying construction.

335 PRIMERS

- Product reference: To manufacturer's recommendations
- Coverage per coat (minimum): To manufacturer's recommendations
- Curing: Allow to dry thoroughly before covering.

345 COLD APPLIED BONDING COMPOUNDS

- Type and application: As recommended for the purpose by the membrane manufacturer.

350 ANGLES IN BONDED DAMP PROOFING/ TANKING

- Preformed rot proof fillet to internal angles:
 - Size (minimum): 50 x 50 mm, splay faced.
 - Bedding: Bitumen mastic or bonding compound.
 - Reinforcing strip to all angles:
 - Material: As damp proofing/ tanking.
 - Width (minimum): 300 mm.
 - Timing: Apply before main sheeting.
 - Dressing of main sheeting onto adjacent surfaces (minimum): 100 mm.
- 360 JUNCTIONS WITH PROJECTING DPCS/ CAVITY TRAYS
- Adjoining surfaces: Clean and dry.
 - Dpcs/ Cavity trays: Lap and fully bond/ seal with sheeting.
 - Laps (minimum): 100mm beyond wall surface or 150mm for gas retardant below floor level
 - Bonding/ Sealing: Mastic tape - To manufacturer's recommendations
- 365 JUNCTIONS WITH FLUSH DPCS/ CAVITY TRAYS
- Adjoining surfaces: Clean and dry.
 - Dpcs/ Cavity trays:
 - Expose edge where concealed.
 - Lap and fully bond/ seal sheeting to wall.
 - Dressing of sheeting beyond dpc/ cavity tray (minimum): 50 mm.
 - Bonding/ Sealing: To manufacturer's recommendations
- 370 PREFORMED COLLARS FOR PIPES, DUCTS, CABLES, ETC.
- Manufacturer: same as DPM/membrane
 - Sealing: To manufacturer's recommendations
 - Completed junctions: Impervious.
- 380 PROTECTION BOARDS FOR DAMP PROOFING/ TANKING
- Manufacturer: To be approved by architect and DPM/tanking manufacturer's recommendations
 - Application:
 - Membrane surface: Clean and free from contaminants.
 - Bonding: To manufacturer's recommendations
 - Board joints: To manufacturer's recommendations
 - Board contact with membrane: Secure and continuous.
 - Backfilling: To manufacturer's recommendations

APPENDIX 1 - ISSUE HISTORY

Revision	Edit time/Date	Status/Revisions	Issue Date
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J42 SINGLE LAYER POLYMERIC SHEET ROOF COVERINGS

To be read with Preliminaries/ General conditions.

TYPES OF ROOF COVERING**110 SINGLE PLY ROOF COVERING AS DRAWINGS**

- Substrate: Insulation on plywood deck
 - Preparation: To manufacturers recommendations
 - Roof covering system: To be approved by employer or their delegate by sample
 - Lower protection layer (loose laid): To manufacturers recommendations
 - Vapour control layer: To manufacturers recommendations
 - Insulation: as clause J42-427 between joists
 - Separating layer (loose laid): To manufacturers recommendations
 - Waterproof membrane: as clause J42-400
 - Width: To Manufacturers recommendations
 - Thickness: 1.5mm thick
 - Colour: Anthracite
 - Upper protection layer (loose laid): To manufacturers recommendations
 - Surface protection: N/A
 - Accessories: Rainwater outlets shall be PU outlets with smooth flange to which is welded the roofing membrane. Metal profiles are required at all changes of plane to the roof and at all edges of the waterproofing and wherever indicated on the drawings. These profiles shall be formed by the licensed contractor to the required shape and length using press brake machinery from the 2m or 3m x 1m blanks supplied by main roofing membrane manufacturer.
- Metal profiles are to be fixed to the substrate, through one leg only by fasteners at maximum 225mm. Detailed fixing instructions in the Manufacturers Product information and Installation Guide must be adhered to.
- The 3mm gaps left between the running lengths of metal are waterproofed by welding 125mm wide butt strap material over them, with the light grey/anthracite side exposed as appropriate. These 3mm joints must first be covered by 25mm wide masking tape before the butt straps are welded over the joints.

PERFORMANCE**210 ROOF PERFORMANCE**

- Roof covering: Secure, free draining and weathertight.

220 AVOIDANCE OF INTERSTITIAL CONDENSATION: WARM AND INVERTED ROOFS

- Determine: Interstitial condensation risk of roof construction as recommended in BS 6229.
- Basic design data:
- Outdoor notional psychrometric conditions, winter:
 - Temperature: -5°C.
 - Relative humidity: 90%.
 - Vapour pressure: 0.36 kPa.
 - Duration: 60 days.
- Outdoor notional psychrometric conditions, summer:
 - Temperature: 18°C.

Relative humidity: 65%.

Vapour pressure: 1.34 kPa.

Duration: 60 days.

- Winter interstitial condensate (warm roof):
- Calculated amount (maximum): 0.35 kg/m sq.
- Calculated annual net retention: Nil.
- Vapour control layer: If necessary, provide a suitable membrane or sealed deck so that damage and nuisance from interstitial condensation do not occur.

225 AVOIDANCE OF INTERSTITIAL CONDENSATION: WARM AND INVERTED ROOFS

- Determine: Interstitial condensation risk of roof construction as recommended in BS 5250, annex D.
- Vapour control layer: If necessary, provide a suitable membrane so that damage and nuisance from interstitial condensation do not occur.

230 INSULATION

- Requirement: Determine type and thickness of insulation and integral or separate overlay to satisfy the following criteria:
- Thermal transmittance of the roof (maximum): **U value to be 0.17W/m2K**
- Compressive strength of insulation (minimum) at 10% compression: as clauses J42-427 and J42-430
- Finished surface: Suitably even, stable and robust to receive roof covering.
- Insulation compliance: To a relevant British Standard, or Agrément certified.

240 ATTACHMENT OF ROOFING MEMBRANE

- Requirement: Determine methods of attachment to resist wind loads. Provide for relative movement of materials and effects of vapour pressure. Do not reduce performance of vapour control layer.
- Wind loads: Calculate to BS 6399-2, Standard Method.
- Basic wind speed (Vb): 30 m/s
- Altitude factor (Sa): 1.07
- Direction factor (Sd): 1
- Seasonal factor (Ss): 1.
- Probability factor (Sp): 1.
- Terrain and building factor (Sb): 2.06
- Size effect factor (Ca): 1.
- External pressure coefficients (Cpe): Appropriate to building dimensions
- Internal pressure coefficients (Cpi): Appropriate to building dimensions and building envelope

PRODUCTS

320 PRIMER

- Type: To manufacturers recommendations
- Manufacturer: To manufacturers recommendations

325 ADHESIVE

- Type: To manufacturers recommendations
- Manufacturer: To manufacturers recommendations

330 TIMBER TRIMS, ETC

- Quality: Planed. Free from wane, pitch pockets, decay and insect attack except ambrosia beetle damage.
- Moisture content at time of covering (maximum): 22%.

340 PREFORMED SLEEVES

- Type: 0.6 mm galvanised steel with 0.8 mm homogenous membrane laminated to it.
- Manufacturer: to match main roof membrane
- Colour: To match main roof colour
- Size: refer to details

345 PERIMETER TRIMS

- Type: 0.6 mm galvanised steel with 0.8 mm homogenous membrane laminated to it.
- Manufacturer: To manufacturers recommendations
- Colour: To match main roof colour
- Size: To manufacturers recommendations

355 MECHANICAL FASTENERS, WASHERS, PRESSURE PLATES, ETC

- Type: To manufacturers recommendations
- Manufacturer: To manufacturers recommendations

380 PROTECTION LAYER

- Type: To manufacturers recommendations
- Manufacturer: To manufacturers recommendations
- Grade: To manufacturers recommendations

383 SEPARATING LAYER

- Type: To manufacturers recommendations
- Manufacturer: To manufacturers recommendations
- Grade: To manufacturers recommendations

395 VAPOUR CONTROL LAYER

- Type: As manufacturer's recommendations
- Manufacturer: To be approved by sample
- Thickness: Vapour barrier (530 MNs/g)
 - To have resistance to tearing (nail shank) to EN 12310-1
 - Tensile strength to EN 12311-2
- Vapour resistance: 250 MN s/g

400 WATERPROOF MEMBRANE

- Type: homogenous plasticized PVC. This shall be laid as an exposed, mechanically fixed membrane. All end and side laps to be a minimum of 50mm and solvent or hot air welded. The edge is to be secured with PVC sealing mastic.
- Manufacturer: to be approved by employer or their delegate by sample
- Thickness: 1.5mm thick
- Colour: Anthracite
- Guarantee: 20 years

427 PHENOLIC FOAM (PF) ROOF INSULATION FIXED BETWEEN S/W ROOFING JOISTS

- Standard: To BS EN 13166.
Zero Ozone Depletion (ODP) rigid insulation core with an aged **thermal conductivity/ λ -value of 0.020 W/mK (insulant thicknesses $\geq$ 45mm) & 0.021W/mK (insulant thicknesses 25-44mm), achieving Class 0 fire rating on both core & facings, producing <5% smoke obscuration when tested to BS 5111-1: 1974, highly resistant to the transmission of water vapour (>100 MN.s/g) and air movement**
- Manufacturer: To be approved by employer by sample
- Grade: with a compressive strength typically in excess of 125 kPa at 10% compression when tested to BS EN 826: 1996 (Thermal insulating products for building applications. Determination of compression behaviour).
- Edges: TBC by manufacturer
- Thickness: 150mm
- Facing: autohesively bonded low emissivity composite foil facings on both sides
- Boards supported between roofing joists with S/W battens

450 STANDING SEAM PROFILES

- Manufacturer/ Supplier: As roof membrane.
- Product reference: to be approved by sample
- Profile: Rectangular – tba by client or their representative
- Colour: as roof membrane
- End treatment: open ends to be capped as manufacturer's recommendations

480 PIPE COLLARS

- Manufacturer: As roof manufacturer
- Size: as required

EXECUTION GENERALLY**510 ADVERSE WEATHER**

- General: Do not lay membrane at temperatures below 5°C or in wet or damp conditions unless effective temporary cover is provided over working area.
- Unfinished areas of roof: Keep dry and protect edges of laid membrane from wind action.

520 INCOMPLETE WORK

- End of working day: Provide temporary seal to prevent water infiltration.
- On resumption of work: Cut away tail of membrane from completed area and remove from roof.

530 APPLYING PRIMERS

- Coverage per coat (minimum): To manufacturers recommendations
- Surface coverage: Even and full.
- Coats: Fully bonded. Allow volatiles to dry off thoroughly between coats.

550 CONTROL SAMPLES

- Type of covering: Flat roof
- Sample area (minimum): 1m²
- Approval of appearance: Obtain before proceeding with remaining work.

SUBSTRATES/ VAPOUR CONTROL LAYERS/ WARM DECK ROOF INSULATION

610 SUITABILITY OF SUBSTRATES

- Surfaces to be covered: Secure, clean, dry, smooth, free from frost, contaminants, voids and protrusions.
- Preliminary work: Complete, including:
 - Grading to correct falls.
 - Formation of upstands, kerbs, box gutters, sumps, grooves, chases and expansion joints.
- Fixing of battens, fillets and anchoring plugs/ strips.
- Moisture content and stability of substrate: Must not impair integrity of roof.

670 LAYING VAPOUR CONTROL LAYER

- Laying: To manufacturers recommendations
- Side and head laps: To manufacturers recommendations
- Upstands, kerbs and other penetrations: Enclose edges of insulation. Fully seal at abutment by bonding or taping.

680 LAYING WARM DECK ROOF INSULATION

- Setting out:
 - Long edges: Fully supported
 - End edges: Adequately supported.
- Joints: Butted together.
- End joints: Staggered.
- Attachment: In accordance with insulation board manufacturer's recommendations.
- Mechanical fixing: In accordance with insulation board manufacturer's recommendations.
- Completion: Boards must be in good condition, well fitting and secure.

WATERPROOF MEMBRANES/ ACCESSORIES

710 MECHANICAL FIXING OF WATERPROOF MEMBRANE

- Setting out: As required by disc pattern.
- Laying: Loose, do not wrinkle or stretch.
- Installing fasteners:
 - Use manufacturer's/ supplier's recommended methods and equipment.
 - Insertion: Correct and consistent.
- Washers/ Pressure plates/ Bars:
 - Distance from fixed edge (minimum): 10 mm.
- Fixing: Flush with membrane.
- Sheet overlaps: Extend beyond washers/ pressure plates by minimum To manufacturers recommendations
- Surface condition at completion: Fully sealed, smooth, weatherproof and free draining.

730 WELDED JOINTING OF WATERPROOF MEMBRANE

- Side and end joints:
 - Laps (minimum): To manufacturers recommendations
- Preparation: Clean and dry surfaces beyond full width of joint.
- Sealing: Weld together.

- Seam sealant: To manufacturers recommendations
 - Condition at completion: Fully sealed, smooth, weatherproof and free draining.
- 760 PERIMETER OF MEMBRANE
- General: Secure membrane at roof edge conditions, changes of plane, curb flashings, upstands to roof lights, etc. with mechanical fasteners.
- 765 PERIMETER DETAILS FOR THERMOPLASTIC MEMBRANES
- Upstands, edge trims, drips, kerbs, etc: Secure preformed metal sections to roof structure with mechanical fasteners.
 - Roof membrane: Dress over perimeter profile. Overlap beyond fasteners by minimum To manufacturers recommendations
 - Sealing: Weld together.
- 770 PERIMETER DETAILS FOR THERMOPLASTIC MEMBRANES
- Upstands, edge trims, drips, kerbs, etc: Form flashings from waterproof membrane material.
 - Roof membrane: Terminate in horizontal plane immediately adjacent to change in direction and secure with mechanical fasteners.
 - Flashings: Dress over perimeter profile. Overlap horizontal roof membrane beyond perimeter securement by minimum To manufacturers recommendations
 - Sealing: To manufacturers recommendations
- 775 PERIMETER DETAILS FOR ELASTOMERIC MEMBRANES
- Upstands, edge trims, drips, kerbs, etc: Preformed from waterproof membrane material.
 - Reinforcing strip: Lay at edge of horizontal roof plane.
 - Securing: Mechanically fasten.
 - Roof membrane: Dress over perimeter profiles.
 - Sealing: Bond to substrate and to secured perimeter reinforcing strip.
- 780 ROOF PENETRATIONS THROUGH THERMOPLASTIC MEMBRANES
- Roof membrane: Cut around penetrations and secure to deck.
 - Flanged sleeve:
 - Type: To manufacturers recommendations
 - Installation: Dress over and around penetration.
 - Roof membrane overlap to flange (minimum): 50 mm beyond fasteners.
 - Sealing: Weld flange to roof membrane.
 - Protection to top edge of sleeve: Flashing or weathering cravat.
- 785 ROOF PENETRATIONS THROUGH ELASTOMERIC MEMBRANES
- Roof membrane: Cut around penetrations.
 - Flanged sleeve:
 - Type: To manufacturers recommendations
 - Installation: Dress over and around penetration.
 - Sealing: Flush to roof membrane.
 - Roof membrane overlap to flange (minimum): 75 mm beyond fasteners.
 - Sealing: To manufacturers recommendations

COMPLETION

- 910 INSPECTION
- Interim and final roof inspections: Submit reports.

920 ELECTRONIC ROOF INTEGRITY TEST

- Testing authority: Independent specialist company TBC
- Timing of test: To be agreed
- Condition of roof prior to testing:
- Waterproof membrane complete to a stage where integrity can be tested.
- Surface: Clean.
- Test results and warranty: Submit on completion of testing.

940 COMPLETION

- Roof areas: Clean.
- Outlets: Clear.
- Work necessary to provide a weathertight finish: Complete.
- Storage of materials on finished surface: Not permitted.
- Completed membrane: Do not damage. Protect from traffic and adjacent or high level working.

APPENDIX 1 - ISSUE HISTORY

Revision	Edit time/Date	Status/Revisions	Issue Date
-	10.12.2012	QS ISSUE	10.12.2012

K10 PLASTERBOARD DRY LININGS/ PARTITIONS/ CEILINGS

To be read with Preliminaries/ General conditions.

TYPES OF DRY LINING

205 LINING ON TIMBER INTERNAL STUD PARTITIONS

- Background: S/W studs at 400 crs
- Metal resilient (acoustic) bars:
- Linings: 1 x 12.5mm Gypsum wallboard
- Fixing: 25mm drywall screw
- Finishing: Skim coat plaster as clause 680
- Primer/ Sealer: primer to receive paint finish
- Accessories: Angle/edge bead/Stops as required
- Other requirements: sealant for sealing air paths as per detailed drawings

245 CEILING LINING ON TIMBER CEILING JOISTS

- Background: S/W joists at 400 crs
- Metal resilient (acoustic) bars:
- Linings: 1 x 12.5mm Gypsum wallboard
- Fixings: 25mm drywall screw
- Finishing: Skim coat plaster as clause 680
- Primer/ Sealer: primer to receive paint finish
- Accessories: Angle/edge bead/Stops as required
- Other requirements: sealant for sealing air paths as per detailed drawings

GENERAL/ PREPARATION

305 COMPLIANCE WITH PERFORMANCE REQUIREMENTS

- Testing/ Assessment: Submit UKAS accredited laboratory reports for the following: Plasterboard
- Materials, components and details: As used in testing/ assessment reports. If discrepancies arise, give notice.

335 ADDITIONAL SUPPORTS

- Framing: Accurately position and securely fix to give full support to:
- Partition heads running parallel with, but offset from main structural supports.
- Fixtures, fittings and service outlets. Mark framing positions clearly and accurately on linings.
- Board edges and lining perimeters, as recommended by board manufacturer to suit type and performance of lining.

375 NEW WET LAID BASES

- Dpcs: Install under full width of partitions/ freestanding wall linings.
- Material: Bituminous sheet or plastics.

COMPONENTS

401 GYPSUM PLASTERBOARD

- Type: BS EN 520 type A - 2
- Core density (minimum): 650 kg/m cu.
- Recycled content: 60% to BS EN ISO 14021
- Exposed surface and edge profiles: tapered edge - proprietary bead to receive the specified finish to corners

403 GYPSUM PLASTERBOARD (MOISTURE RESISTANT) **TO TOILETS AND BATHROOMS**

- Type: BS EN 520 type H1 $\leq$ 5%
- Core: Moisture resistant.
- Density (minimum): 710 kg/m cu.
- Paper facings: Moisture resistant.
- Recycled content: 84% to BS En ISO 14021
- Exposed surface and edge profiles: tapered edge - proprietary bead to receive the specified finish to corners

405 GYPSUM PLASTERBOARD (CLASS C SOUND ABSORBER) **TO STAIRWELLS AND LOBBIES IN APARTMENTS**

- Type: Vogl 12/25Q (Quadrat) with 30mm glass wool insulation over
- Exposed surface and edge profiles: tapered edge - proprietary bead to receive the specified finish to corners

430 ACCESS PANELS

- Type: To be approved by sample
- Sizes: 600 x 600mm unless otherwise required by location
- Frame: Bead for tape and jointing
- Panel: Plasterboard infill
- Lock: Tamper proof and operated by castellated key

INSTALLATION

435 DRY LININGS GENERALLY

- General: Use fixing, jointing, sealing and finishing materials, components and installation methods recommended by board manufacturer.
- Cutting plasterboards: Neatly and accurately without damaging core or tearing paper facing.
- Cut edges: Minimize and position at internal angles wherever possible. Mask with bound edges of adjacent boards at external corners.
- Fixings boards: Securely and firmly to suitably prepared and accurately levelled backgrounds.
- Finishing: Neatly to give flush, smooth, flat surfaces free from bowing and abrupt changes of level.

445 CEILINGS

- Sequence: Fix boards to ceilings before installing dry lined walls and partitions.
- Orientation of boards: Fix with bound edges at right angles to supports and with ends staggered in adjacent rows.
- Two layer boarding: Stagger joints between layers.

465 STAGGERED STUD PARTITIONS

- Horizontal frame members (noggin, bearers, etc.) and boards: Fix between alternate studs and not touching adjacent offset studs.

485 SUSPENDED CEILING GRIDS

- Setting out: Accurately aligned and level.
- Grid members and hangers: Centres to suit specified linings and imposed loads.
- Additional grid members: Provide bracing and stiffening at upstands, partition heads, access hatches, etc.
- Fixing: Securely at perimeters, grid joints, top and bottom hanger fixings.

505 INSTALLING MINERAL WOOL INSULATION

- Fitting insulation: Closely butted joints and no gaps. Use fasteners to prevent slumping or displacement.
- Services:
 - Electrical cables overlaid by insulation: Sized accordingly.
 - Ceilings: Cut insulation around electrical fittings, etc.

510 SEALING GAPS AND AIR PATHS

- Location of sealant: To perimeter abutments and around openings.
- Pressurized shafts and ducts: At board-to-board and board-to-metal frame junctions.
- Application: To clean, dry and dust free surfaces as a continuous bead with no gaps.
- Gaps greater than 6 mm between floor and underside of plasterboard: After sealing, fill with jointing compound.

530 CAVITY FIRE BARRIERS WITHIN PARTITIONS/ WALL LININGS

- Metal framed systems:
 - Material: Wire reinforced mineral wool to achieve 60 minute fire resistance
 - Installation: Form accurately and fix securely with no gaps to provide a complete barrier to smoke and flame locations as per drawings but not more than 20m in any direction (class 0)
- Adhesive fixed wall lining systems:
 - Material: Adhesive compound.
 - Installation: Form in a continuous line with no gaps to provide a complete barrier to smoke and flame.

545 CAVITY FIRE BARRIERS WITHIN SUSPENDED CEILINGS

- Type: Wire reinforced mineral wool
- Fire resistance: BS 476-20, 30 minutes integrity and insulation
- Ceiling void subdivision: Fix barriers locations as per drawings but not more than 20m in any direction (class 0)
- Fixing at perimeters and joints: Secure, stable and continuous with no gaps, to provide a complete barrier to smoke and flame.
- Service penetrations: Cut and pack to maintain barrier integrity. Sleeve flexible materials. Adequately support services passing through barrier.
- Ceiling systems for fire protection: Do not impair fire resisting performance of ceiling system.

555 FIRE STOPPING AT PERIMETERS OF DRY LINING SYSTEMS

- Material: Tightly packed mineral wool or intumescent mastic/ sealant.

- Application: To perimeter abutments to provide a complete barrier to smoke and flame.
- 560 JOINTS BETWEEN BOARDS
- Tapered edged plasterboards:
 - Bound edges: Lightly butted.
 - Cut/ unbound edges: 3 mm gap.
 - Square edged plasterboards: 3 mm gap.
 - Square edged fibre reinforced gypsum boards: 5 mm gap.
- 565 VERTICAL JOINTS
- Joints: Centre on studs.
 - Partitions: Stagger joints on opposite sides of studs.
 - Two layer boarding: Stagger joints between layers.
- 570 HORIZONTAL JOINTS
- Surfaces exposed to view: Horizontal joints not permitted. Seek instructions where height of partition/ lining exceeds maximum available length of board.
 - Two layer boarding: Stagger joints between layers by at least 600 mm.
 - Edges of boards: Support using additional framing.
 - Two layer boarding: Support edges of outer layer.
- 575 PLANK PLASTERBOARD
- First layer in two layer boarding: Square edged with long edges at right angles to studs. Fully supported edges on first layer, etc include for noggins, etc – ie; no unsupported joints
- 580 INSULATION BACKED PLASTERBOARD
- General: Do not damage or cut away insulation to accommodate services.
 - Installation at corners: Carefully cut back insulation or plasterboard as appropriate along edges of boards to give a continuous plasterboard face, with no gaps in insulation.
- 590 FIXING PLASTERBOARD TO METAL FRAMING/ FURRINGS
- Partitions/ Wall linings: Fix securely and firmly at the following centres (maximum):
 - Single layer boarding: To all framing at 300 mm centres. Reduce to 200 mm centres at external angles.
 - Multi-layer boarding: Face layer at 300 mm centres, and previous layers around perimeters at 300 mm centres.
 - Ceilings: 230 mm. Reduce to 150 mm at board ends and at lining perimeters.
 - Position of screws from edges of boards (minimum): 10 mm.
 - Screw heads: Set in a depression. Do not break paper or gypsum core.
- 592 FIXING INSULATION BACKED PLASTERBOARD TO METAL FURRINGS
- Fixing to furrings: In addition to screw fixings apply continuous beads of adhesive sealant to furrings.
- 595 DEFLECTION HEADS
- Fixing boards: Do not fix to head channels.
- 610 FIXING PLASTERBOARD TO TIMBER
- Fixing to timber: Securely at the following centres (maximum):
 - Nails: 150 mm.
 - Screws to partitions/ wall linings: 300 mm. Reduce to 200 mm at external angles.

- Screws to ceilings: 230 mm.
- Position of nails/ screws from edges of boards (minimum):
- Bound edges: 10 mm.
- Cut/ unbound edges: 13 mm.
- Position of nails/ screws from edges of timber supports (minimum): 6 mm.

620 FIXING PLASTERBOARD WITH ADHESIVE DABS

- Setting out boards: Accurately aligned and plumb.
 - Fixing to substrates: Securely using adhesive dabs.
 - Adhesive dab spacings for each board:
 - Horizontally: One row along top edge and one continuous dab along bottom edge.
 - Vertically: One row along each edge and thereafter at intermediate spacings to suit size of board:
- | Thickness (mm) | Width (mm) | Dab centres (mm) |
|----------------|------------|------------------|
| 9.5 | 1200 | 400 |
| 9.5/12.5 | 900 | 450 |
| 12.5 | 1200 | 600 |
- Adhesive dab dimensions (width x length): At least 50–75 mm x 250 mm.
 - Position of dabs from edges/ ends of boards (minimum): 25 mm.

625 FIXING INSULATION BACKED PLASTERBOARD WITH ADHESIVE DABS

- Fixing to substrates: In addition to adhesive dab fixings, secure boards with nailable plugs in locations recommended by board manufacturer.

630 FIXING INSULATION BACKED PLASTERBOARD WITH ADHESIVE SPOTS

- Setting out boards: Accurately aligned and plumb.
- Fixing to substrates: Securely using adhesive spots and mechanical fastenings.
- Adhesive spot spacings to each board: Four vertical rows, at 400 mm centres in each row.
- Adhesive spot diameters (minimum): 25 mm.
- Mechanical fasteners: Nailable plugs in locations recommended by board manufacturer.

FINISHING

650 LEVEL OF DRY LINING ACROSS JOINTS

- Sudden irregularities: Not permitted.
- Joint deviations: Measure from faces of adjacent boards using methods and straightedges (450 mm long with feet/ pads) to BS 8212, clause 3.3.5.
- Tapered edge joints:
 - Permissible deviation (maximum) across joints when measured with feet resting on boards: 3 mm.
- External angles:
 - Permissible deviation (maximum) for both faces: 4 mm.
- Internal angles:
 - Permissible deviation (maximum) for both faces: 5 mm.

670 SEAMLESS JOINTING TO PLASTERBOARDS

- Cut edges of boards: Lightly sand to remove paper burrs.
- Filling and taping: Fill joints, gaps and internal angles with jointing compound and cover with continuous lengths of paper tape, fully bedded.
- Protection of edges/ corners: Reinforce external angles, stop ends, etc. with specified edge/ angle bead.

- Finishing: Apply jointing compound. Feather out each application beyond previous application to give a flush, smooth, seamless surface.
 - Nail/ screw depressions: Fill with jointing compound to give a flush surface.
 - Minor imperfections: Remove by light sanding.
- 680 SKIM COAT PLASTER FINISH
- Plaster type: As recommended by board manufacturer
 - Thickness: 2-3 mm.
 - Joints: Fill and tape except where coincident with metal beads.
 - Finish: Tight, matt, smooth surface with no hollows, abrupt changes of level or trowel marks.
- 692 RIGID BEADS/ STOPS
- Internal: To BS EN 13658-1.
 - External: To BS EN 13658-2.
- 695 INSTALLING BEADS/ STOPS
- Cutting: Neatly using mitres at return angles.
 - Fixing: Securely using longest possible lengths, plumb, square and true to line and level, ensuring full contact of wings with substrate.
 - Finishing: After joint compounds/ plasters have been applied, remove surplus material while still wet from surfaces of beads exposed to view.
- 725 REPAIRS TO EXISTING PLASTERBOARD
- Filling small areas with broken cores: Cut away paper facing, remove loose core material and fill with jointing compound.
 - Finish: Flush, smooth surface suitable for redecoration.
 - Large patch repairs: Cut out damaged area and form neat hole with rectangular sides. Replace with matching plasterboard.
 - Fixing: Use methods to suit type of dry lining, ensuring full support to all edges of existing and new plasterboard.
 - Finishing: Fill joints, tape and apply jointing compound to give a flush, smooth surface suitable for redecoration.

APPENDIX 1 - ISSUE HISTORY

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K11 RIGID SHEET FLOORING/ SHEATHING/ DECKING/ SARKING/ LININGS/ CASINGS

To be read with Preliminaries/ General conditions.

TYPES OF FLOORING/ SHEATHING/ DECKING/ SARKING/ LINING/ CASING**315 PLYWOOD FLOORING TO UPPER FLOOR CONSTRUCTION**

- Substrate: S/W joists centres to Structural eng. Spec.
- Additional supports: as clause K11/930
- Flooring: Plywood manufactured to the relevant standards and quality control procedures specified in BS 5268-2, and so marked.
- Type: 3
- Grade: flooring
- Nominal thickness/ number of plies: 21mm
- Edges: Tongued and grooved all edges.
- Other requirements: WBP
- Setting out: Long edges running across joists. End joints central over joists and staggered.
- Fixing to joists:
- Fasteners: Screws
- Fixing centres (maximum):
 - Around floor perimeter and along short edges of each board: 150 mm.
 - Along intermediate supports: 300 mm.
- Fixing distance from edges: 25 mm from long edges and minimum 10 mm from short edges.
- Joint treatment: PVA adhesive
- Expansion provision:
- Clear expansion gap around perimeter of floor area and upstands: in accordance with BS 8201
- Intermediate expansion/ movement joints: As recommended by flooring manufacturer.

815 PLYWOOD GROUNDING TO STUD WALLS

As required with agreed with employer or their delegate

In addition to hotpress and first floor bathroom only where future grab rails may be required under lifetime homes

- Substrate: 50x38mm S/W battens side fixed into main studs
- Additional supports: as clause K11/930
- Plywood: Manufactured to an approved national standard.
- Thickness: 19mm
- Other requirements: WBP
- Fixing to supports:
- Fasteners: Screws
- Fixing centres (maximum):
 - Around board edges: 150 mm.
 - Along intermediate supports: 300 mm.
- Fixing distance from edges (minimum): 10 mm.

890 **BOARD SUBSTRATE TO ALL WALL TILING TO STUD WALLS – PLYWOOD SUBSTRATE WILL NOT BE ACCEPTED**

- Substrate: Timber frame studs
- Board: bonded waterproof structural substrate board – to be even impact resistant and rigid. Must be waterproof and temperature resistant & vapour retardant. Board to be extruded hard foam with reinforcement layer both faces, finished with a fleece webbing to both faces
- Manufacturer/ Supplier: to be approved by sample
- Thickness: 12.5mm – face to finish flush with gypsum dry-lining board
- Edges: square
- Other requirements: Class 0
- Setting out: Long edges running: Consult manufacturer for advice on installing and fixing proprietary board
- Gap between adjacent boards: Consult manufacturer for advice on installing and fixing proprietary board

WORKMANSHIP

910 **INSTALLATION GENERALLY**

- Timing: Building to be weathertight before fixing boards internally.
- Moisture content of timber supports (maximum): 18%.
- Joints between boards: Accurately aligned, of constant width and parallel to perimeter edges.
- Methods of fixing, and fasteners: As section Z20 where not specified otherwise.

930 **ADDITIONAL SUPPORTS**

- Additional studs, noggings/ dwangs (Scot) and battens:
- Provision: In accordance with board manufacturer's recommendations and as follows:
 - Tongue and groove jointed rigid board areas: To all unsupported perimeter edges.
 - Butt jointed rigid board areas: To all unsupported edges.
- Size: Not less than 50 mm wide and of adequate thickness.
- Quality of timber: As for adjacent timber supports.
- Treatment (where required): As for adjacent timber supports.

940 **BOARD MOISTURE CONTENT AND CONDITIONING**

- Moisture content of boards at time of fixing: Appropriate to end use.
- Conditioning regime: Submit proposals.

950 **MOISTURE CONTENT TESTING**

- Test regime and equipment: Submit proposals.
- Test results: Submit record of tests and results.

960 **FIXING GENERALLY**

- Boards/ Sheets: Fixed securely to each support without distortion and true to line and level.
- Fasteners: Evenly spaced in straight lines and, unless otherwise recommended by board manufacturer, in pairs across joints.
- Distance from edge of board/ sheet: Sufficient to prevent damage.
- Surplus adhesive: Removed as the work proceeds.

980 **OPEN JOINTS**

- Perimeter joints, expansion joints and joints between boards: Free from plaster, mortar droppings and other debris.
- Temporary wedges and packings: Removed on completion of board fixing.

990 ACCESS PANELS

- Size and position: Agree before boards are fixed.
- Additional noggings/ dwangs (Scot), battens, etc: Provide and fix as necessary.

APPENDIX 1 - ISSUE HISTORY

Revision	Edit time/Date	Status/Revisions	Issue Date
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L10 WINDOWS/ ROOFLIGHTS/ SCREENS/ LOUVRES

To be read with Preliminaries/ General conditions.

GENERAL**110 EVIDENCE OF PERFORMANCE**

- Certification: Provide independently certified evidence that all incorporated components comply with specified performance requirements.

115 TIMBER PROCUREMENT

- Timber (including timber for wood based products): Obtained from well managed forests and/ or plantations in accordance with:
 - The laws governing forest management in the producer country or countries.
 - International agreements such as the Convention on International Trade in Endangered Species of wild fauna and flora (CITES).
- Documentation: Provide either:
 - Documentary evidence (which has been or can be independently verified) regarding the provenance of all timber supplied.
 - Evidence that suppliers have adopted and are implementing a formal environmental purchasing policy for timber and wood based products.

ALL TIMBER TO BE CERTIFIED FSC OR PEFC**120 SITE DIMENSIONS**

- Procedure: Before starting work on designated items take site dimensions, record on shop drawings and use to ensure accurate fabrication.

140 CONTROL SAMPLES

- Procedure:
 - Finalise component details.
 - Fabricate one of each of the following designated items as part of the quantity required for the project.
 - Obtain approval of appearance and quality before proceeding with manufacturer of the remaining quantity.
- Designated items: **Include 3 no finished window samples including restrictors, handles, etc for selection by client.**
Samples to be retained on site for comparison purposes and unless otherwise specified for forming part of the finished work, shall be removed when no longer required by the employer.

PRODUCTS**205 WINDOW MATERIALS SPECIFICATION**

- Minimum BRE 'Green Guide to Specification Online' rating to clause L10-260: A+

350 PVC-U WINDOWS BFRC 'A' RATED DOUBLE GLAZED

A 10 year guarantee in respect of all windows must be provided at handover for frames and glass

- Manufacturer & Ref : to be approved by sample as clause 140
- Standard: Agrément certified.
Manufactured to BS 7413 **'Secure by Design' Certification required**
- Colour/ Texture: WOODGRAIN - to be approved by sample

- Exposure category to BS 6375-1/ Design wind load
Glazing details:
Secure by design specification, with an average “U” value of 1.4 w/m²k (G Value = 0.5)
BFRC ‘A’ rating – Double Glazed as clause L40/370

General:

The system shall be fabricated to be secure by design as in BS7950.

All PVC window frames and sashes to be fabricated in accordance with manufacturers technical specifications.

Nominal 70mm uPVC profile robust construction.

All windows to be internally beaded.

Tilt and turn windows not acceptable.

The system must operate a Quality Management system fully complying with BS 5750: Part 2, ISO 9001/9002.

The system supplier shall produce windows that hold a currently valid certificate approved by Macdata, BBA or BSI.

Windows to be fully supplied with appropriate drainage slots within all frames and shall be routed in accordance with manufacturers’ recommendations.

All sash sizes must comply with the maximum permissible dimension as specified by manufacturer.

Windows to be fully welded and screw fixed through to reinforcement with stainless steel fixings as specified.

Sills and frame extensions to be factory fitted.

All windows removed from site must be recycled with a route of recycling being clearly shown.

Colour fastness in profile to have 35 years guarantee.

Windows and glazed units must have a 10 year guarantee

Heat welded mitred corners and joints are required at all window member junctions, opening sashes are to be weathered on both sides with welded neoprene gasket seals, factory glazing with hermetically factory sealed glazing units.

EXCESSIVE USE OF SILICONE IN CONSTRUCTION OR INSTALLATION IS NOT PERMITTED.

Reinforcement:

Reinforcement to be galvanised steel rectangular hollow section (RHS) with a minimum wall thickness of 1.5mm.

Mechanical alteration of reinforcement not permissible unless

Stainless steel Grade 304 or 316.

Reinforcement Placement with all sashes /outer frames /mullions /transoms shall be fully reinforced to ensure the structural integrity of the frame using galvanised steel and comply with BS EN 10143:1993 and BS 7590 Secure by design, Fixed into chamber walls.

Reinforcement to be continuous across “T” joints in outer frame elements and vertically continuous across ‘T’ and ‘+’ joints in mullions.

In all cases, reinforcement shall and must be designed, supplied and inserted into the hollow chamber in one continuous length and be pre-routed where required to accept locking mechanisms and keepers.

The fixing centres shall be as recommended by manufacturer.

Climatic Performance:

Climatic performance tested and assessed in accordance with BS EN 12211:2000 and BS EN 1027: 2000.

Drainage: Pressure equalisation and drainage holes ascertained in accordance with climatic performance tests and to be CONCEALED.

All windows and their installation are to provide a severe exposure rating and adhere with the following test pressure performance criteria.

BFRC 'A' rating – Double Glazed

Wind Resistance : 2400 p.a.

Air Permeability : 300p.a.

Water Tightness: 300p.a.

Ironmongery/ Accessories:

All to comply with secure by design, BS7950

All ironmongery to be approved to lifetime homes – handle opening height to be 1200mm above FFL in each habitable room – see criteria 15

All ironmongery to be approved.

Handles – Push button operated depress button “Push button release,

Hinges - to be approved.

Locking Mechanism- to be approved,

Restrictors- to be approved.

All screws to be austenitic stainless steel, internal locking components and friction hinges shall be stainless steel.

Locking points to incorporate night vent position.

- All ground floor windows irrespective of size will each have two fixed integrated restrictor hinges of maximum length within each opening - limited opening to 100mm.

- First and second floor fire escape windows to have easy clean hinges fitted, as before, hinges to have maximum length within opening

-All handles to be locking type with the exception of fire escape windows. Handles to be spag type.

-First and second floor window panes must be capable of being cleaned from inside the home, this function is catered for by use of proprietary 'easy clean' hinges. The use of 'easy clean' hinges must not interfere with building control regulations.

-The top edge of the 'easy clean' hinge will have a dual function, the hinge must have an integrated restrictor limiting the opening to 100mm and an easy clean facility.

-The bottom edge of the hinge will have the easy clean facility only.

-All windows will open outwards only. Tilt and turn windows are not acceptable.

-First and second floor bathroom and landing windows (non fire escape) require a pair of integrated restrictor hinges fitted.

This arrangement must be discussed and agreed with the local building control officer for approval on this specification of locking devices.

Fixing: as clause 783

Windows installation to include s/w battens and dpc fixing to timber frame.

EXCESSIVE USE OF SILICONE DURING INSTALLATION WILL NOT BE PERMITTED.

Trickle ventilation:

Provide a minimum ventilation opening of 1/20th of the floor area to habitable rooms, kitchen, utility and sanitary accommodation. Provide trickle ventilation to habitable rooms having a total area of not less than 8000mm²

480 ROOF WINDOWS

A 10 year guarantee in respect of all windows must be provided at handover for frames and glass

- Manufacturer: to be approved by sample by employer or their delegate
 - Glazing details: Factory fitted Double glazed clear float glass to provide an average U value of 1.4 w/m²k and a G value of 0.5
 - Centre-Pivot window sizes unless alternative requested by client or their representative
 - Beading: Factory fitted to manufacturer's recommendations
 - Flashings: By window manufacturer to suit roofing as H60-120
 - Accessories: N/A
 - Fixing: as manufacturer's recommendations
- Material / Finish:
 Frame: White varnished polyurethane with wooden core
 Sash: - Grey aluminium
 Lining Kit: Site manufactured by the contractor

495 DAYLIGHT PIPE

- Manufacturer: to be approved by sample
- Components:
 - roof dome:** injection moulded, impact-resistant, polycarbonate with uv protective characteristics. classified as tp(a) material, 3.2mm thick, with visible light transmission minimum 92%. Prismatic pattern moulded into dome to capture low angle sunlight.
 - pipe:** fabricated from aluminium sheet meeting the requirements of astm b 209, alloy and temper required by the manufacturer to suit forming operations and finish requirements, 0.4mm thick.
 - interior finish:** high reflectance finish on exposed reflective surface; visible spectrum (400 nm to 760 nm) greater than 99%; total solar spectrum (400 nm to 2500 nm) less than 93%.
 - colour:** a* and b* (defined by cie l*a*b colour model) shall not exceed plus 2 or be less than minus 2 as determined in accordance to astm e 308.
 - Diameter: 160mm diameter - tbc by manufacturer
 - Length: to suit roof make up – see sections
- Bends: not to exceed 30 degrees
- Roof terminal: Roof dome
- Ceiling terminal: ceiling diffuser - to be approved by sample
- Accessories: install as per manufacturer's recommendations
- Fixing: install as per manufacturer's recommendations - wrap pipe in insulation through attic void

651 METAL SCREEN TO GAS RISER

- Manufacturer: **To be approved by sample**
- Product reference: **Aluminium perforated sheet. Square holes/ square pitch, with perimeter squeeze frame.**
- Material: **Aluminium.**
- Hole size: **6.3mm**
- Open area: **44%**
- Sheet size: **Width of chase x 900mm high**
- Finish as delivered: **Powder coated to BS 6496 to Standard RAL Colour matt. TBC**
- Accessories/ Other requirements: **Stainless steel Insect mesh**

- Fixing: **Aluminium fixing bracket fixed back to masonry reveal. See clause 781. Countersunk alloy key fixings for fixing sheet in frame to angle brackets to allow removal of panels for maintenance.**

EXECUTION

710 PROTECTION OF COMPONENTS

- General: Do not deliver to site components that cannot be installed immediately or placed in clean, dry floored and covered storage.
- Stored components: Stack vertical or near vertical on level bearers, separated with spacers to prevent damage by and to projecting ironmongery, beads, etc.

730 PRIMING/ SEALING

- Wood surfaces inaccessible after installation: Prime or seal as specified before fixing components.

740 CORROSION PROTECTION

- Protective coating: Two coats of bitumen solution to BS 6949 or an approved mastic impregnated tape.
- Timing of application: Before fixing components.

750 BUILDING IN

- General: Not permitted unless indicated on drawings.
- Brace and protect components to prevent distortion and damage during construction of adjacent structure.

765 WINDOW INSTALLATION GENERALLY

- Installation: Into prepared openings.
- Gap between frame edge and surrounding construction:
- Minimum: as recommended by window manufacturer
- Maximum: as recommended by window manufacturer
- Distortion: Install windows without twist or diagonal racking.

770 DAMP PROOF COURSES IN PREPARED OPENINGS

- Location: Ensure correct positioning in relation to window frames. Do not displace during fixing operations.

780 FIXING OF WOOD FRAMES

- Standard: As section Z20.
- Fasteners: as recommended by window manufacturer
- Spacing: When not predrilled or specified otherwise, position fasteners not more than 150 mm from ends of each jamb, adjacent to each hanging point of opening lights, and at maximum 450 mm centres.

810 SEALANT JOINTS

- Sealant:
- Manufacturer: to be approved by employer or their delegate
- Colour: to be approved by employer or their delegate
- Application: As section Z22 to prepared joints. Finish triangular fillets to a flat or slightly convex profile.

820 IRONMONGERY

- Fixing: Assemble and fix carefully and accurately using fasteners with matching finish supplied by ironmongery manufacturer. Do not damage ironmongery and adjacent surfaces.
- Checking/ Adjusting/ Lubricating: Carry out at completion and ensure correct functioning.

APPENDIX 1 - ISSUE HISTORY

Revision	Edit time/Date	Status/Revisions	Issue Date
A	10-12-12	Tender Clarification	10-12-12

L20 DOORS/ SHUTTERS/ HATCHES

To be read with Preliminaries/ General conditions.

GENERAL**110 EVIDENCE OF PERFORMANCE**

- Certification: Provide independently certified evidence that all incorporated components comply with specified performance requirements.

112 TIMBER PROCUREMENT

- Timber (including timber for wood based products): Obtained from well managed forests and/ or plantations in accordance with:
 - The laws governing forest management in the producer country or countries.
 - International agreements such as the Convention on International Trade in Endangered Species of wild fauna and flora (CITES).
- Documentation: Provide either:
 - Documentary evidence (which has been or can be independently verified) regarding the provenance of all timber supplied.
 - Evidence that suppliers have adopted and are implementing a formal environmental purchasing policy for timber and wood based products.

ALL TIMBER TO BE CERTIFIED FSC OR PEFC**115 FIRE RESISTING DOORS/ DOORSETS/ ASSEMBLIES**

- Evidence of fire performance: Provide certified evidence, in the form of a product conformity certificate, directly relevant fire test report or engineering assessment, that each door/ doorset/ assembly supplied will comply with the specified requirements for fire resistance if tested to BS 476-22, BS EN 1634-1 or BS EN 1634-3. Such certification must cover door and frame materials, glass and glazing materials and their installation, essential and ancillary ironmongery, hinges and seals.

150 SITE DIMENSIONS

- Procedure: Before starting work on designated items take site dimensions, record on shop drawings and use to ensure accurate fabrication.
- Designated items: _____ .

170 CONTROL SAMPLES

- Procedure:
 - Finalize component details.
 - Fabricate one of each of the following designated items as part of the quantity required for the project.
 - Obtain approval of appearance and quality before proceeding with manufacture of the remaining quantity.
- Designated items: **Include 3 no finished internal and external door sample including handles, etc for selection by client.**
Samples to be retained on site for comparison purposes and unless otherwise specified for forming part of the finished work, shall be removed when no longer required by the employer.

PRODUCTS

230 WOOD FLUSH DOORS **INTERNAL NON-FIRE RATED DOORS**

- Manufacturer: To be approved by sample
- Product reference: Ash or white oak veneer to be 44mm thick and carry a FD30 certification (for robustness). The core is solid laminated timber with hardwood “T” section lippings on the long edges to match the veneer. The top and bottom edges are also to be over veneered. The doors to be supplied with a closed pore clear satin lacquer finish.
- Facings: Ash or white oak veneer – to be approved by sample
- Thickness: 44mm
- Lippings: Hardwood ‘T’ section lipping to all edges
- Preservative treatment: as per manufacturers recommendations
- Finish as delivered: Closed pore clear satin lacquer finish
- Other requirements: Ironmongery as per ironmongery schedule

231 WOOD FLUSH DOORS **INTERNAL 30 MINUTE FIRE RATED DOORS**

- Manufacturer: To be approved by sample
 - Product reference: Ash or white oak veneer to be 44mm thickness and carry a FD30 certification. The core is solid laminated timber with hardwood “T” section lippings on the long edges to match the veneer. The top and bottom edges are also over veneered. The doors to be supplied with a closed pore clear satin lacquer finish.
 - Facings: Ash or white oak veneer – to be approved by sample
 - Thickness: 44mm
 - Lippings: Hardwood ‘T’ section lipping to all edges
 - Preservative treatment: as per manufacturers recommendations
 - Finish as delivered: sanded for site painting/varnish
 - Other requirements: Ironmongery as per ironmongery schedule including door closers
- Fire and smoke seals to be included as required in door schedule

232 WOOD FLUSH DOORS **INTERNAL 60 MINUTE FIRE RATED DOORS**

- Manufacturer: To be approved by sample
 - Product reference: Ash or white oak veneer to be 54mm thickness and carry a FD30 certification. The core is solid laminated timber with hardwood “T” section lippings on the long edges to match the veneer. The top and bottom edges are also over veneered. The doors to be supplied with a closed pore clear satin lacquer finish.
 - Facings: Ash or white oak veneer – to be approved by sample
 - Thickness: 54mm
 - Lippings: Hardwood ‘T’ section lipping to all edges
 - Preservative treatment: as per manufacturers recommendations
 - Finish as delivered: sanded for site painting/varnish
 - Other requirements: Ironmongery as per ironmongery schedule including door closers
- Fire and smoke seals to be included as required in door schedule

330 WOOD DOOR FRAMES **TO ALL INTERNAL DOORS**

- Materials: Generally to BS EN 942.
- Species: Softwood as table NA1
- Appearance class: J40 and J50
- Assembly:
- Adhesive: WBP
- Joinery workmanship: As section Z12.

- Preservative treatment: BWPDA Commodity specification C5
- Moisture content on delivery: 9-13%
- Finish as delivered: sanded for site painting/varnish
- Perimeter seals: intumescent seals as required in door schedule to doors
- Fixing: Plugged and screwed to Z20

410 SOLID WOOD DOORSETS TO EXTERNAL REAR DOORS – see door schedule for elevations

All to be certified Secure by Design

U value of 1.4 w/m2k

- Manufacturer: To be approved by sample
- Door leaf: Hardwood
- Finish as delivered: factory finished with micro porous water based stain/ paint colour to be agreed
- Frame and architraves:
- Wood species: hardwood
- Finish as delivered: factory finished with micro porous water based stain/ paint colour to be agreed
- Preservative treatment: Required
- Glazing/ Infill details: Double glazed Low E argon filled with an average U value of 1.4 w/m2k (g factor of 0.5)
Glazing to be obscure unless agreed otherwise – range of glazing to be provided for selection by client or their representative.
- Manifestation: n/a
- Beading: All to comply with secure by design, BS7950
- Ironmongery:
All to comply with secure by design, BS7950 to be included incorporating 5 point locking system, door viewer, etc for secure by design - finish to be agreed with employer or their delegate
- Perimeter seals: Trapper bar with easily interchangeable seals for maintenance 15mm maximum – sample to be provided for approval
- Other requirements: Double glazed side screens as door schedule to front door
- Fixing: to manufacturer recommendations

480 DOORSETS TO EXTERNAL FRONT DOORS – see door schedule for elevations

All to be certified Secure by Design

- Manufacturer: To be approved by sample
- Product reference: Grained finish to doors – to be approved by employer or their delegate – style to match elevations and schedules
Construction to be a GRP encased bonded core of rigid HFC polyurethane foam contained within an internal perimeter frame. The thermal break must not be affected by the fitting of hinges, door handles, or a sleeved letter plate.
The door must have an unglazed U value performance of 1.4 W/m2k
- Door leaf: GRP composite
- Finish as delivered: factory finished woodgrain finish – to be approved by sample by employer or their delegate
- Frame and architraves: uPVC woodgrain finish – to be approved by sample by employer or their delegate
 - Finish as delivered: factory finished
- Glazing details: Double glazed - as clause L40/371
- Ironmongery: to be included incorporating 5 point locking system, door viewer, etc for secure by design - finish to be agreed with employer or their delegate
- Perimeter seals: Trapper bar with easily interchangeable seals for maintenance 15mm maximum – sample to be provided for approval

- Other requirements: Double glazed side screens as door schedule as L40/370
 - Fixing: to manufacturer recommendations
- ALL INSULATION TO AVOID THE USE OF SUBSTANCES THAT HAVE A GWP LESS THAN OR EQUAL TO 5 (manufacture or installation)**

630 HATCHES TO LOFT

- Manufacturer: To be approved by sample
- Product reference: Hinge down trap (Rigid insulation board U value 0.25)
- Including access pole and one lockable security bolt
- Including loft ladder as L30/421

ALL INSULATION TO AVOID THE USE OF SUBSTANCES THAT HAVE A GWP LESS THAN OR EQUAL TO 5 (manufacture or installation)

EXECUTION**710 PROTECTION OF COMPONENTS**

- General: Do not deliver to site components that cannot be installed immediately or placed in clean, dry, floored and covered storage.
- Stored components: Stacked on level bearers, separated with spacers to prevent damage by and to projecting ironmongery, beads, etc.

730 PRIMING/ SEALING

- Wood surfaces inaccessible after installation: Primed or sealed as specified before fixing components.

740 CORROSION PROTECTION

- Surfaces to be protected: _____ .
- Protective coating: Two coats of bitumen solution to BS 6949 or an approved mastic impregnated tape.
- Timing of application: Before fixing components.

750 FIXING DOORSETS

- Timing: After associated rooms have been made weathertight and the work of wet trades is finished and dried out.

760 BUILDING IN

- General: Not permitted unless indicated on drawings.

770 DAMP PROOF COURSES ASSOCIATED WITH BUILT IN WOOD FRAMES

- Method of fixing: To backs of frames using galvanized clout nails.

780 DAMP PROOF COURSES IN PREPARED OPENINGS

- Location: Correctly positioned in relation to door frames. Do not displace during fixing operations.

790 FIXING OF WOOD FRAMES

- Spacing of fixings (frames not predrilled): Maximum 150 mm from ends of each jamb and at 600 mm maximum centres.

800 FIXING OF LOOSE THRESHOLDS

- Spacing of fixings: Maximum 150 mm from each end and at 600 mm maximum centres.

809 FIRE RESISTING/ SMOKE CONTROL DOORS/ DOORSETS

- Installation: By a firm currently registered under a third party accredited fire door installer scheme in accordance with instructions supplied with the product conformity certificate, test report or engineering assessment.
- 810 FIRE RESISTING/ SMOKE CONTROL DOORS/ DOORSETS
- Gaps between frames and supporting construction: Filled as necessary in accordance with requirements for certification and/ or door/ doorset manufacturer's instructions.
- 820 SEALANT JOINTS
- Sealant:
 - Manufacturer: To be approved by sample
 - Colour: To be agreed by employer or their delegate
 - Application: As section Z22 to prepared joints. Triangular fillets finished to a flat or slightly convex profile.
- 830 FIXING IRONMONGERY GENERALLY
- Fasteners: Supplied by ironmongery manufacturer.
 - Finish/ Corrosion resistance: To match ironmongery.
 - Holes for components: No larger than required for satisfactory fit/ operation.
 - Adjacent surfaces: Undamaged.
 - Moving parts: Adjusted, lubricated and functioning correctly at completion.
- 840 FIXING IRONMONGERY TO FIRE RESISTING DOOR ASSEMBLIES
- General: All items fixed in accordance with door leaf manufacturer's recommendations ensuring that integrity of the assembly, as established by testing, is not compromised.
 - Holes for through fixings and components: Accurately cut.
 - Clearances: Not more than 8 mm unless protected by intumescent paste or similar.
 - Lock/ Latch cases for fire doors requiring > 60 minutes integrity performance: Coated with intumescent paint or paste before installation.
- 850 LOCATION OF HINGES
- Primary hinges: Where not specified otherwise, positioned with centre lines 250 mm from top and bottom of door leaf.
 - Third hinge: Where specified, positioned
 - Hinges for fire resisting doors: Positioned in accordance with door leaf manufacturer's recommendations.
- 860 INSTALLATION OF EMERGENCY EXIT DEVICES
- Standard: Unless specified otherwise, install panic bolts/ latches in accordance with BS EN 1125.

APPENDIX 1 - ISSUE HISTORY

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L30 STAIRS/ LADDERS/ WALKWAYS/ HANDRAILS/ BALUSTRADES

To be read with Preliminaries/ General conditions.

PRELIMINARY INFORMATION/ REQUIREMENTS**110 DESIGN**

- Design standard: The following items have been designed to BS 5395 where applicable: Stairs, balustrades and handrails
- Completion of design: Finalize details to meet structural and safety requirements of BS 5395.
- Type of activity/ occupancy category to BS 6399-1: A Domestic and residential activities

Galvanised Steel Handrails, uprights and fixings to be contractor designed for the approval of the Architect and Structural Engineer including fixing

Galvanising generally to be to BS EN ISO 1461

Structural Performance Specification: All components shall be designed to resist Horizontal Loads for Parapets, barriers and balustrades to BS 6399: Part 1: 1996 Table 4. Section C3 (ix) Horizontal Uniformly distributed line load: 0.74kN/m; Uniformly distributed load applied to the infill: 1.0kN/m²; Point Load applied to part of the infill: 0.5kN. In addition the structural elements shall be designed to resist a wind loading of 1.5kN/m² applied to the infill.

115 TIMBER PROCUREMENT

- Timber (including timber for wood based products): Obtained from well managed forests and/ or plantations in accordance with:
 - The laws governing forest management in the producer country or countries.
 - International agreements such as the Convention on International Trade in Endangered Species of wild fauna and flora (CITES).
- Documentation: Provide either:
 - Documentary evidence (which has been or can be independently verified) regarding the provenance of all timber supplied.
 - Evidence that suppliers have adopted and are implementing a formal environmental purchasing policy for timber and wood based products.

ALL TIMBER TO BE CERTIFIED FSC OR PEFC**130 SITE DIMENSIONS**

- Procedure: Before starting work on designated items take site dimensions, record on shop drawings and use to ensure accurate fabrication.
- Designated items: all staircases

COMPONENTS**230 INTERNAL WOOD STAIRS**

- Components: **samples to be provided of all components**
- Treads: 25mm S/W with bull nose edge
- Risers: 12mm WBP plywood
- Strings: redwood

- Newels: 100 x 100mm turned redwood & 120 x 120 x 25mm newel cap
- Guarding: 41mm turned redwood balusters
- Handrails: 50x59mm hardwood
- Timber: Generally to BS EN 942.
- Appearance class:
 - J30 generally, J10 for newels and newel caps, balusters & handrails
- Moisture content at time of installation: As recommended by BS EN 942
- Adhesive: Contractor's choice
- Finish as delivered: Sanded for site painting/varnish
- Workmanship: To section Z10.
- Other requirements: **NO MDF ALLOWED**
 - To include landings and structural support required.
 - To be protected from damage during construction
 - Headroom to be 2m for full length and width of stairs and landings.
 - Handrail to be between 900-1000mm above pitch line and give firm support.
 - Guarding to not allow a 100mm sphere to pass through any gap.
 - Underside of stairs to be fire protected with 2 no layers of plasterboard staggered joints bonded and skimmed.**

421 LOFT LADDERS

- Manufacturer: To be approved by sample
- Standard: To BS EN 14975.
- Accessories: To be fitted with loft access door L20/630

550 PURPOSE MADE BALUSTRADES **SEE DRAWINGS FOR DESIGN INTENT**

- Component material, grade and finish as delivered:
- Guarding: 15mm MS rounds at max 100mm crs
50 x 10mm MS flats top and bottom
- Handrails: 50mm MS CHS
- Workmanship:
- Joinery: N/A
- Metalwork: as clause Z11
- Other requirements: specialist sub-contractor design – sub-contractor to provide fabrication drawings prior to manufacture. To comply to building regulations regarding 100mm dia sphere
- Fixing: by specialist sub-contractor as clause Z20

INSTALLATION

610 MOISTURE CONTENT

- Temperature and humidity: Monitor and control internal conditions to achieve specified moisture content in wood components at time of installation.

620 PRIMING/ SEALING/ PAINTING

- Surfaces inaccessible after assembly/installation: Before fixing components, apply full protective/decorative treatment/coating system.

630 CORROSION PROTECTION OF DISSIMILAR MATERIALS

- Components/ substrates/ fasteners of dissimilar materials: Isolate using washers/ sleeves or other suitable means to separate materials to avoid corrosion and/ or staining.

640 INSTALLATION GENERALLY

- Fasteners and methods of fixing: To section Z20.

- Structural members: Do not modify, cut, notch or make holes in structural members, except as indicated on drawings.
- Temporary support: Do not use stairs, walkways or balustrades as temporary support or strutting for other work.

APPENDIX 1 - ISSUE HISTORY

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L40 GENERAL GLAZING

To be read with Preliminaries/ General conditions.

GENERAL REQUIREMENTS

- 111 PREGLAZING of components will be permitted, but:
- Precautions to be taken to prevent displacement of glazing or compound. Submit details and obtain approval.
 - Panes with any displaced glazing or compound or with defective seals to be reglazed in situ.
- 140 MATERIAL SAMPLES
- Representative samples of designated materials: Submit before cutting panes.
 - Sample size (minimum): to be agreed with the employer or their delegate
 - Designated materials: Spandrel panels
- 150 WORKMANSHIP GENERALLY
- Glazing generally: To BS 6262.
 - Integrity: Glazing must be wind and watertight under all conditions with full allowance made for deflections and other movements.
 - Dimensional tolerances: Panes/ sheets to be within ± 2 mm of specified dimensions.
 - Materials:
 - Compatibility: Glass/ plastics, surround materials, sealers, primers and paints/ clear finishes to be used together to be compatible. Avoid contact between glazing panes/ units and alkaline materials such as cement and lime.
 - Protection: Keep materials dry until fixed. Protect insulating glass units and plastics glazing sheets from the sun and other heat sources.
- 152 PREPARATION
- Surrounds, rebates, grooves and beads: Clean and prepare before installing glazing.
- 155 GLASS GENERALLY
- Standards: To BS 952 and relevant parts of:
 - BS EN 572 for basic soda lime silicate glass.
 - BS EN 1096 for coated glass.
 - BS EN 1748-1-1 for borosilicate glass.
 - BS EN 1748-2-1 for ceramic glass.
 - BS EN 1863 for heat strengthened soda lime silicate glass.
 - BS EN 12150 for thermally toughened soda lime silicate safety glass.
 - BS EN 12337 for chemically strengthened soda lime silicate glass.
 - BS EN 13024 for thermally toughened borosilicate safety glass.
 - BS EN ISO 12543 for laminated glass and laminated safety glass.
 - Panes/ sheets: Clean and free from obvious scratches, bubbles, cracks, rippling, dimples and other defects.
 - Edges: Generally undamaged. Shells and chips not more than 2 mm deep and extending not more than 5 mm across the surface are acceptable if ground out.
- 160 LINEAR PATTERNED/ WIRED GLASS
- Alignment: Vertical/ Horizontal as appropriate, and pattern matched across adjacent panes in close proximity.

- 165 HEAT SOAKING OF THERMALLY TOUGHENED GLASS
- Standard: To BS EN 14179.
 - Mean glass temperature: 290° ±10°C.
 - Certified evidence of treatment: Submit.
- 175 EDGE TAPES TO INSULATING UNITS: Report to CA any damage to edge tapes. Obtain approval of proposed method of repair.
- 180 BEAD FIXING WITH PINS
- Pin spacing: Regular at maximum 150 mm centres, and within 50 mm of each corner.
 - Exposed pin heads: Punched just below wood surface.
- 181 BEAD FIXING WITH SCREWS
- Screw spacing: Regular at maximum 225 mm centres, and within 75 mm of each corner.
- 190 GLASS TO GLASS JOINTING
- Sealant: Silicone.
 - Standard: To BS EN ISO 11600.
 - Colour: Black
 - Fire resistance rating: refer to schedule
 - Joints:
 - Width: Consistent and suitable to receive sealant.
 - Gap between panes: Completely filled, leaving no voids or bubbles.
 - Surplus sealant: Removed to leave a clean, neatly finished weathertight joint.

TYPES OF GLAZING

- 370 BEAD FIXED INSULATING **24MM DOUBLE GLAZED UNITS TO WINDOWS**
- Pane material: Insulating glass units to BS EN 1279 and kitemarked
 - **Inner pane:** 6mm Insulating glass inner pane (toughened when within 800mm of f.f.l.) with thermal one coating gas filled cavity
 - **Outer pane:** 6mm Insulating glass outer pane (toughened when within 800mm of f.f.l.)
 - Perimeter taping: Do not use.
 - Surround/ bead: H/W frame and beads
 - Preparation: As per suppliers recommendations
 - Bead location: inside
 - Bead fixing: As per suppliers recommendations
 - Glazing system: _____ .
 - Glazing installation:
 - Insulating unit: Located centrally in surround using setting and location blocks.
 - Gaskets and beads: Installed as recommended by frame manufacturer.
 - Gasket fit at corners: Tight, without gaps.
 - Drainage and ventilation holes: Unobstructed.
- 371 BEAD FIXED INSULATING GLASS UNITS **TO EXTERNAL DOOR**
- Pane material: Insulating glass units to BS EN 1279 and kite-marked
 - Inner pane: 6mm insulating glass inner pane (toughened when within 800mm of f.f.l.)
 - Outer pane: 6mm glass outer pane (toughened when within 800mm of f.f.l.)
 - Perimeter taping: Do not use.
 - Surround/ bead: H/W door

- Preparation: As per suppliers recommendations
- Bead location: inside
- Bead fixing: As per suppliers recommendations
- Glazing installation:
- Insulating unit: Located centrally in surround using setting and location blocks.
- Gaskets and beads: Installed as recommended by frame manufacturer.
- Gasket fit at corners: Tight, without gaps.
- Drainage and ventilation holes: Unobstructed.

APPENDIX 1 - ISSUE HISTORY

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M10 CEMENT BASED LEVELLING/ WEARING SCREEDS

To be read with Preliminaries/ General conditions.

TYPES OF SCREED**130 PROPRIETARY QUICK DRYING LEVELLING SCREEDS**

- Substrate: Insulation M10/290 on concrete floor to structural engineers design
- Screed manufacturer: to be approved
- Screed construction: Floating as clause 290 or 295.
 - Reinforcement for crack control: As Clause 392.
- Thickness:
 - Nominal: 100mm
 - Minimum: manufacturer's recommendations
- Mix:
 - Cement: Standards as clause 302.
 - Coarse aggregate single size: Not required. (For screed thickness in excess of 75mm, a proportion of the sand is replaced by coarse aggregate, 5 mm (or 6 mm) single size).
- Proportions: To manufacturer's recommendations.
- In situ crushing resistance (ISCR) category: A/B. (3/4mm maximum indentation).
- Mass of test weight: 4 kg.
- Flatness/ Surface regularity: Maximum permissible deviation: SR2 generally
- Finish: Trowelled as clause 540
- To receive: Floor finish as schedule – latex where vinyl is to be laid
- Other requirements: Where thin finishes require a smoothing compound, smooth with proprietary underlayment.
- Acoustic Insulation: Provide 12mm sound deadening foam (manufacturer to be approved by sample) to:
 - u'side of screeds on first & second floors, returned up at perimeter to skirting.
 - perimeter of screeds on Ground Floor.

GENERALLY/ PREPARATION**205 DESIGN LIFE OF SCREEDS**

- Subject to reasonable wear and tear.
- Condition of use: Subject to correct loading and traffic usage throughout duration.

210 SUITABILITY OF SUBSTRATES

- General:
 - Suitable for specified levels and flatness/ regularity of finished surfaces. Consider permissible minimum and maximum thicknesses of screeds.
 - Sound and free from significant cracks and gaps.
- Concrete strength: To BS 8204-1, Table 2.
- Cleanliness: Remove plaster, debris and dirt.
- Moisture content: To suit screed type. New concrete slabs to receive fully or partially bonded construction must be dried out by exposure to the air for minimum six weeks.

215 SURFACE HARDNESS OF SUBSTRATES TO RECEIVE POLYMER MODIFIED WEARING SCREEDS

- General: Substrates must restrain stresses that occur during setting and hardening of wearing screeds.
- Test for surface hardness: To BS EN 12504-2 using a rebound hammer with compliance values selected from the following:

Screed thickness	Rebound hammer value
15 mm or less	Greater than 25
Greater than 15 mm	Greater than 30

- Report: Submit details of areas where substrate surface hardness does not comply with these values.

220 PROPRIETARY LEVELLING/ WEARING SCREEDS

- General: Materials, mix proportions, mixing methods, minimum/maximum thicknesses and workmanship must be in accordance with recommendations of screed manufacturer.
- Standard: To BS 8204-3.

230 CONTROL SAMPLES

- General: Complete areas of finished work and obtain approval of appearance before proceeding.

250 CONDUITS UNDER FLOATING SCREEDS

- Haunching: Before laying insulation for floating screeds, haunch up in 1:4 cement:sand on both sides of conduits.

251 CONDUITS CAST INTO OR UNDER SCREEDS

- Reinforcement: Overlay with reinforcement selected from:
- 500 mm wide strip of steel fabric to BS 4483, reference D49, or
- Welded mesh manufactured in rolls from mild steel wire minimum 1.5 mm diameter to BS 1052, mesh size 50 x 50 mm.
- Placing reinforcement: Mid depth between top of conduit and the screed surface.
- Screed cover over conduit (minimum): 25 mm.

255 PIPE DUCTS/ TRUNKING

- Preformed access ducts: Before laying screed, fix securely to substrate and level accurately in relation to finished floor surface.

275 CEMENT SLURRY BONDING

- Application: Shortly before laying screed, thoroughly wash clean the surface and keep well wetted for several hours. Remove free water then brush in cement slurry bonding coat of creamy consistency.
- Screeding: While slurry is still wet.

290 FLOATING CONSTRUCTION

- Insulation: CFC/HCFC free rigid insulation to Standard: BS EN ISO 9001:2000
ALL INSULATION TO AVOID THE USE OF SUBSTANCES THAT HAVE A GWP LESS THAN OR EQUAL TO 5 (manufacture or installation)

- **175mm thick insulation to house types to achieve a thermal resistance of 0.022W/m.K (U VALUE THROUGH FLOOR REQUIRED 0.1 W/m2K)**
- Installation: Lay with tight butt joints. Continue up at perimeter abutments for full depth of screed to be 25mm thick
- Separating layer:
- Type: Vapour barrier (530 MNs/g)
- Installation: Lay over insulation and turn up at perimeter abutments. Lap 100 mm at joints. See detailed drawings

BATCHING/ MIXING

302 CEMENTS

- Cement types: In accordance with BS 8204-1, clause 5.1.3.

305 AGGREGATES

- Sand: To BS EN 13139.
 - Grading limits: In accordance with BS 8204-1, Table B.1.
- Coarse aggregates for fine concrete levelling screeds:
 - Standard: To BS EN 12620.
 - Designation: 4/10.
- Lightweight aggregates: To BS 8204-1, Annex A.

307 ADMIXTURES

- Standard: In accordance with BS 8204-1, Table 1.
- Calcium chloride: Do not use in admixtures.

310 BATCHING WITH DENSE AGGREGATES

- Mix proportions: Specified by weight.
- Batching: Select from:
 - Batch by weight.
 - Batch by volume: Permitted on the basis of previously established weight:volume relationships of the particular materials. Use accurate gauge boxes. Allow for bulking of damp sand.

311 BATCHING WITH LIGHTWEIGHT AGGREGATES

- Standard: To BS 8204-1, Annex A.
- Mix proportions: Specified by volume.
- Batching: Use accurate gauge boxes.

330 MIXING

- Water content: Minimum necessary to achieve full compaction, low enough to prevent excessive water being brought to surface during compaction.
- Mixing: Mix materials thoroughly to uniform consistency. Mixes other than no-fines must be mixed in a suitable forced action mechanical mixer. Do not use a free fall drum type mixer.
- Consistency: Use while sufficiently plastic for full compaction.
- Ready-mixed retarded screed mortar: Use within working time and site temperatures recommended by manufacturer. Do not retemper.

335 IN SITU CRUSHING RESISTANCE (ISCR)

- Standards and category: To BS 8204-1, table 4.
 - Testing of bonded and unbonded screeds: To Annex D.

- Testing of floating levelling screeds: To Annex E.

340 ADVERSE WEATHER

- Screeds surface temperature: Maintain above 5°C for a minimum of four days after laying.
- Hot weather: Prevent premature setting or drying out.

LAYING

345 LEVEL OF SCREED SURFACES

- Permissible deviation: (allowing for thickness of coverings) $\pm 10\text{mm}$ from datum (allow for thickness of coverings)

355 FLATNESS/ SURFACE REGULARITY OF FLOOR SCREEDS

- Standard: To BS 8204-1, Table 5.
- Test: To BS 8204-1, Annex C.
- Sudden irregularities: Not permitted.

375 COMPACTION OF SCREEDS

- General: Compact thoroughly over entire area.
- Screeds over 50 mm thick: Lay in two layers of approximately equal thickness. Roughen surface of compacted lower layer then immediately lay upper layer.

382 STAIR SCREEDS

- Construction: Fully bonded to treads, risers and landings.
- Risers: Form using fine finish formwork.
- Wearing screed surfaces: Make good with compatible cement:sand mix. Wood float. When hardened remove laitance.

392 GENERAL REINFORCEMENT

- Steel fabric: To BS 4483.
- Type: As per structural engineers design, specification and recommendation
- Installation: In accordance with BS 8204-1.

405 JOINTS IN LEVELLING SCREEDS GENERALLY

- Laying screeds: Lay continuously using 'wet screeds' between strips or bays. Minimize defined joints.
- Daywork joints: Form with vertical edge.

435 FORMED JOINTS IN WEARING SCREEDS

- Temporary forms: Square edged with a steel top surface and in good condition.
- Placing screed: Compact thoroughly at edges to give level, closely abutted joints with no lipping.

476 METAL SECTION MOVEMENT JOINTS

- Manufacturer: to be approved by sample and manufacturer's literature
- Colour of insert: TBA
- Bedding: 1:3 cement:sand.
- Installation: Centre over joint in substrate. Set to exact finished level of floor.
- Secure fixing to substrate: Floor slab

FINISHING/ CURING

510 FINISHING GENERALLY

- Timing: Carry out all finishing operations at optimum times in relation to setting and hardening of screed material.
- Prohibited treatments to screed surfaces:
 - Wetting to assist surface working.
 - Sprinkling cement.

540 TROWELLED FINISH TO LEVELLING SCREEDS

- Floating: To an even texture with no ridges or steps.
- Trowelling: To a uniform, smooth but not polished surface, free from trowel marks and other blemishes, and suitable to receive specified flooring material.

650 CURING

- General: Prevent premature drying. Immediately after laying, protect surface from wind, draughts and strong sunlight. As soon as screed has set sufficiently, closely cover with polyethylene sheeting.
- Drying after curing: Allow screeds to dry gradually. Do not subject screeds to artificial drying conditions that will cause cracking or other shrinkage related problems.

APPENDIX 1 - ISSUE HISTORY

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A	10-12-12	Tender Clarification	10-12-12

M20 PLASTERED/ RENDERED/ ROUGHCAST COATING

To be read with Preliminaries/ General conditions.

TYPES OF COATING**110 PROPRIETARY RENDER TO EXTERNAL RENDERED WALLS**

- **Location:** – Refer to elevations.
- **Background:** Concrete Blockwork - Aerated, constructed in accordance with BS 8000 – 3: 2001 & BS 5268 – 1, 2 & 3: 2005.

Preparation: Existing substrate should be clean, dry, load bearing and free of loose coatings, dirt, algae, fungus or deleterious materials etc. Make good as necessary.

Pre-treatment:

Micro: penetrating siloxane based primer, diluted 1:10 by volume with water applied by brush, roller or spray to friable, sanding or highly absorbent surfaces.

Existing substrate should be clean, dry and free of loose coatings or dirt etc. Make good as necessary.

Pre-treatment – if required:

Fungal – a fungicidal wash used where algae or fungus are present.

Micro – a deep penetrating siloxane based primer, which forms a water-repellent layer in the substrate and reduces the absorbency of porous surfaces and aids surface consolidation.

Contact – an acrylic based adhesion intermediary for siliconised bricks, ceramic tiles or other low absorbency backgrounds.

A polymer resin based isolating primer for isolation of lignin based stains.

A polymer resin based isolating primer for isolation of lignin based stains, supplied with added quartz sand for improved keying of subsequent coats.

Levelling Coat:

LP lightweight polymer modified cement / lime render - applied in sufficient thickness to achieve a straight and level surface. Minimum thickness 4mm. Thickness greater than 12mm to be a multi-coat application. Lightly finish using a wood or sponge float to remove trowel marks.

Reinforcing coat:

Cement-free, fibre-reinforced acrylic reinforcing coat. Thickness to be such to ensure the reinforcing mesh is fully embedded and a level surface is provided. (Minimum 3mm).

Reinforcement:

Glass Fibre Reinforcing Mesh with symmetrical interlaced glass fibre made from twisted multi-end strands, styrene butadiene coated to provide a high resistance to alkali attack and is manufactured so as to prevent laminar movement and deformation.

Priming Coat: Not applicable.

Render / Finish: Cement free render

Thickness: 1.5mm

Texture: – Stippled

Colour: Colour class C3

Accessories:

PVC Bellcast beads

PVC Stop beads

PVC Mesh Angle beads

Armour Angle

Drip Edge Bead

Movement joint Bead PVCu. **NOTE horizontal joints to be the hidden type.**

Alternative: Proprietary Stainless Steel Beads

Consult with MANUFACTURER for recommendations and details.

140 CEMENT:SAND RENDER TO RECEIVE TILING

- Background: Concrete block F10/351
- Preparation: Adhesive slurry
- Render coat(s):

Cement: Masonry cement to BS 5224, class MC 12.5 (with air entraining agent) or, subject to approval, Portland cement plus an air entraining admixture to BS 4887:Pt 1.

Sand: To BS 1199, type A.

Additional admixture(s): As per manufacturers recommendations

Mix proportions (masonry cement:sand): BS5262 and BS5492

Thickness (excluding dubbing out): 19mm in 2 coats

Finish: Lightly combed

- Accessories: Angle beads

200 GYPSUM PLASTER ON CEMENT GAUGED UNDERCOATS **TO INTERNAL WALLS**

- Substrate: Concrete blockwork as F10-355
- Preparation: Adhesive slurry
- Undercoats:
 - Mix: Cement: Masonry cement to BS 5224, class MC 12.5 (with air entraining agent) or, subject to approval, Portland cement plus an air entraining admixture to BS 4887:Pt 1.
 - Sand: To BS 1199, type A.
- Thickness (excluding dubbing out and keys): 16mm
- Final coat: Gypsum plaster to BS EN 13279-1, class B. thickness: 2-3mm
- Manufacturer: Contractor's choice
- Finish: Final coat gypsum plaster, smooth finish.
- Accessories: corner angle beads as clause 636

GENERAL

413 SAMPLES

- General: Provide representative samples of the following: M20-165

418 CONTROL SAMPLES

- Complete sample areas, being part of the finished work, in locations as follows: To be agreed with employer or their delegate

421 SCAFFOLDING

- General: Prevent putlog holes and other breaks in coatings.

MATERIALS AND MAKING OF MORTAR

430 READY-TO-USE CEMENT GAUGED MORTARS

- Time and temperature limitations: Use within limits prescribed by mortar manufacturer.
- Retempering: Restore workability with water only within prescribed time limits.

438 CEMENTS FOR MORTARS

- Cement: To BS EN 197-1 and CE marked.
- Types: Portland cement, CEM I.
Portland slag cement, CEM II.
Portland fly ash cement, CEM II.
- Strength class: 32.5, 42.5 or 52.5.
- White cement: To BS EN 197-1 and CE marked.
- Type: Portland cement, CEM I.
- Strength class: 52.5.
- Sulfate resisting Portland cement: To BS 4027 and Kitemarked.
- Strength class: 42.5.

- Masonry cement: To BS EN 998-1 and Kitemarked.
- 440 SAND FOR CEMENT GAUGED MORTARS
- Standard: To BS EN 13139.
 - Grading: 0/2 or 0/4 (CP or MP); category 2 fines.
 - Colour and texture: Consistent. Obtain from one source.
- 445 PIGMENT FOR COLOURED MORTARS
- Standard: To BS EN 12878.
- 449 ADMIXTURES FOR CEMENT GAUGED MORTARS
- Suitable admixtures: Select from:
 - Air entraining (plasticizing) admixtures: To BS EN 934-2 and compatible with other mortar constituents.
 - Other admixtures: Submit proposals.
 - Prohibited admixtures: Calcium chloride and any admixture containing calcium chloride.
- 495 MIXING
- Render mortars (site-made):
 - Batching: By volume. Use clean and accurate gauge boxes or buckets.
 - Mix proportions: Based on damp sand. Adjust for dry sand.
 - Lime:sand: Mix thoroughly. Allow to stand, without drying out, for at least 16 hours before using.
 - Mixes: Of uniform consistence and free from lumps. Do not retemper or reconstitute mixes.
 - Contamination: Prevent intermixing with other materials.
- 497 COLD WEATHER
- General: Do not use frozen materials or apply coatings on frozen or frost bound substrates.
 - External work: Avoid when air temperature is at or below 5°C and falling or below 3°C and rising. Maintain temperature of work above freezing until coatings have fully hardened.
 - Internal work: Take precautions to enable internal coating work to proceed without detriment when air temperature is below 3°C.

PREPARING SUBSTRATES

- 510 SUITABILITY OF SUBSTRATES
- Soundness: Free from loose areas and significant cracks and gaps.
 - Cutting, chasing, making good, fixing of conduits and services outlets and the like: Completed.
 - Tolerances: Permitting specified flatness/ regularity of finished coatings.
 - Cleanliness: Free from dirt, dust, efflorescence and mould, and other contaminants incompatible with coatings.
- 527 RAKING OUT FOR KEY
- Joints in existing masonry: Rake out to a depth of 13 mm (minimum).
 - Dust and debris: Remove from joints.
- 531 ROUGHENING FOR KEY
- Substrates: Roughen thoroughly and evenly.
 - Depth of surface removal: Minimum necessary to provide an effective key.

536 SPLATTERDASH KEY

- Materials:
 - Cement: To BS EN 197-1 and CE marked.
 - Sand: Clean, coarse.
 - Admixture: _____.
- Mix proportions (cement:sand): 1:1.5–2.
- Consistency: Thick slurry, well stirred.
- Application: Throw onto dampened background and leave rough.
- Thickness: 3–5 mm.
- Curing: Controlled to achieve a firm bond to substrate.

538 STIPPLE KEY

- Materials:
 - Cement: To BS EN 197-1 and CE marked.
 - Sand: Clean, coarse.
 - Admixture: To manufacturers specification
- Mix proportions (cement:sand): 1:1.5-2.
- Consistency: Thick slurry, well stirred.
- Application: Brushed and stippled to form deep, close textured key.
- Curing: Controlled to achieve a firm bond to substrate.

541 BONDING AGENT APPLICATION

- General: Apply evenly to substrate to achieve effective bond of plaster/ render coat. Protect adjacent surfaces.

BACKINGS/ BEADS/ JOINTS**600 ADDITIONAL FRAMING SUPPORTS FOR BACKINGS**

- Framing: Accurately position and securely fix to give full support to fixtures, fittings and service outlets.
- Support to board edges and perimeters: As recommended by board manufacturer to suit type and performance of board.

634 BEADS/ STOPS GENERALLY

- Manufacturer: To be approved by sample
- Material: as recommended by manufacturer

636 BEADS/ STOPS FOR EXTERNAL USE TO ALL CORNERS AND VERTICAL AND HORIZONTAL JOINTS

- Material: as recommended by manufacturer - to be approved by sample

640 BEADS/ STOPS GENERALLY

- Location: External angles and stop ends, except where specified otherwise.
- Corners: Neat mitres at return angles.
- Fixing: Secure, using longest possible lengths, plumb, square and true to line and level, ensuring full contact of wings with substrate.
 - Beads/ stops for external render: Fix mechanically.
- Finishing: After coatings have been applied remove surplus material, while still wet, from surfaces of beads/ stops exposed to view.

646 CRACK CONTROL AT JUNCTIONS BETWEEN DISSIMILAR SOLID SUBSTRATES

- Locations: Where defined movement joints are not required. Where dissimilar solid substrate materials are in same plane and rigidly bonded or tied together.
- Crack control materials:
 - Isolating layer: Building paper to BS 1521.
 - Metal lathing: as recommended by manufacturer - to be approved by sample
- Installation: Fix metal lathing over isolating layer. Stagger fixings along both edges of lathing.
- Width of installation over single junctions:
 - Isolating layer: 150 mm.
 - Lathing: 300 mm.
- Width of installation across face of dissimilar substrate material (column, beam, etc. with face width not greater than 450 mm):
 - Isolating layer: 25 mm (minimum) beyond junctions with adjacent substrate.
 - Lathing: 100 mm (minimum) beyond edges of isolating layer.

650 MOVEMENT JOINTS

- Manufacturer: manufacturer to be approved by sample
- Installation: Centred over joint in substrate.
 - Fixing: to floor slab

653 SEALANT MOVEMENT JOINTS WITH STOP BEAD EDGINGS TO ALL EXTERNAL MOVEMENT JOINTS

- Stop beads: as clause 636
- Installation: Centred over joint in substrate. **Movement joint filler as F30/610**
 - Joint width: 10mm
 - Fixing: as manufactures recommendations
- Sealant: Low-modulus silicone-based to BS 5889, Type A. Colour TBA with employer or their delegate
 - Manufacturer: manufacturer to be approved by sample
 - Preparation and application: As section Z22.

EXTERNAL RENDERING**810 APPLICATION GENERALLY**

- Application of coatings: Firmly and in one continuous operation between angles and joints. Achieve good adhesion.
- Appearance of finished surfaces: Even and consistent. Free from rippling, hollows, ridges, cracks and crazing.
 - Accuracy: Finish to a true plane, to correct line and level, with angles and corners to a right angle unless specified otherwise, and with walls and reveals plumb and square.
- Drying: Prevent excessively rapid or localized drying out.

820 DUBBING OUT RENDERING

- General: Correct substrate inaccuracies.
- Thickness of any one coat (maximum): 16 mm.
 - Total thickness (maximum): 20 mm, otherwise obtain instructions.
- Mix: As undercoat.
- Application: Achieve firm bond. Allow each coat to set sufficiently before the next is applied. Comb surface of each coat.

840 UNDERCOATS GENERALLY

- General: Rule to an even surface. Comb to provide a key for the next coat. Do not penetrate the coat.

- Undercoats on metal lathing: Work well into interstices to obtain maximum key.
- 856 FINAL COAT – PLAIN FLOATED FINISH
- Finish: Even, open texture free from laitance.
- 861 FINAL COAT – SCRAPED FINISH
- Finish: Scraped to expose aggregate and achieve an even texture.
- 880 CURING AND DRYING
- General: Prevent premature setting and uneven drying of each coat.
 - Curing coatings: Keep each coat damp by covering with polyethylene sheet and/ or spraying with water.
 - Final coat: Hang sheeting clear of the final coat.
 - Drying: Allow each coat to dry thoroughly, with drying shrinkage substantially complete before applying next coat.
 - Protection: Protect from frost and rain.

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M40 STONE/ CONCRETE/ QUARRY/ CERAMIC TILING/ MOSAIC

To be read with Preliminaries/ General conditions.

TYPES OF TILING/ MOSAIC**110 TILING TO WALLS KITCHEN SPLASHBACKS**

- Tiles: Ceramic tiles to BS1281
 - Manufacturer/ Supplier: to be approved by sample panel
 - Colour: White
 - Finish: glazed
 - Size: 150 x 150mm
 - Thickness: 8mm
 - Background/ Base: 6mm
 - Preparation: as manufacturers recommendation
 - Intermediate substrate: not required
 - Bedding: BS 5385-1 table 4
 - Reinforcement: as clause 578 if required
 - Adhesive: Waterproof adhesive
 - Joint width: as spacer lugs
 - Grout: proprietary as clause 875
 - Type/ classification: as BS EN 13888
 - Movement joints: N/A
 - Accessories: tile edge trims with a single round edge
- Tiling is to extend to include **entire** fridge and cooker wall spaces between skirting and general height of wall tiling (fridge space) and underside of extract unit (cooker space)

111 TILING TO WALLS TO BATHROOMS AND WC/SHOWER ROOMS WALLS and SPLASHBACKS

- Tiles: Ceramic tiles to BS1281
 - Manufacturer/ Supplier: to be approved by sample panel
 - Colour: White or equal and approved.
 - Finish: glazed
 - Size: 150 x 150mm (3 walls above bath fully tiled and 2 rows high above whb)
OR 200 x 150mm (3 walls above bath fully tiled and 1 row over whb)
 as agreed with employer or their delegate
 - Thickness: 6mm
 - Background/ Base: 6mm
 - Preparation: as manufacturers recommendation
 - Intermediate substrate: not required
 - Bedding: BS 5385-1 table 4
 - Reinforcement: as clause 578 if required
 - Adhesive: waterproof adhesive
 - Joint width: as spacer lugs
 - Grout: proprietary as clause 875
 - Type/ classification: as BS EN 13888
 - Movement joints: N/A
 - Accessories: contrasting tile edge trims with a single round edge
- Where shower is over bath tile all three walls at bath up to ceiling.
 Where shower space is separate tile 3 no rows around bath
 Provide bath seal between top of bath and tiles – sample to be provided for approval

Tile trim to be installed at top edge of coved skirting to full room area to shower room

112 TILING TO COMMUNAL ENTRANCE LOBBYS AT GROUND FLOOR

- Tiles: Ceramic tiles to BS1281
- Manufacturer/ Supplier: to be approved by sample panel
- Colour: BEIGE or equal and approved.
- Finish: glazed
- Size: 300 x 300mm WITH TILED SKIRTING TO MATCH
as agreed with employer or their delegate
- Thickness: 12mm
- Background/ Base: 6mm
- Preparation: as manufacturers recommendation
- Intermediate substrate: not required
- Bedding: BS 5385-1 table 4
- Reinforcement: as clause 578 if required
- Adhesive: waterproof adhesive
- Joint width: as spacer lugs
- Grout: proprietary as clause 875
- Type/ classification: as BS EN 13888
- Movement joints: AS PER BS and manufacturers' recommendations
- Accessories: proprietary ss movement joints

GENERAL

210 SUITABILITY OF BACKGROUNDS/ BASES

- Background/ base tolerances: To permit specified flatness/ regularity of finished surfaces given the permissible minimum and maximum thickness of bedding.
- New background drying times (minimum):
- Concrete walls: 6 weeks.
- Brick/ block walls: 6 weeks.
- Rendering: 2 weeks.
- Gypsum plaster: 4 weeks.
- New base drying times (minimum):
- Concrete slabs: 6 weeks.
- Cement:sand screeds: 3 weeks.

215 FALLS IN THE BASES

- General: Give notice if falls are inadequate.

250 SAMPLES

- General: Submit representative samples of the following:
- **Provide 9 sample panels for client approval prior to ordering**
- **Samples to be retained on site for comparison purposes and unless otherwise specified for forming part of the finished work, shall be removed when no longer required by the employer.**
- **Contractor to produce colour range for client's approval – client will choose 3no. colours for use in scheme – tile edge trims to be supplied to match colour choice, client to approve tile trims prior to works commencing.**
- **Contractor to provide 1no area (for example 1 no kitchen) of tiling for clerk of works inspection and approval to general tiling being undertaken. Where**

quality of tiling is deemed unacceptable then that section of works to be redone to CoW's satisfaction.

260 CONTROL SAMPLES

- General: Complete sample areas, being part of finished work, in locations as follows: Apartment kitchen

PREPARATION

370 NEW IN SITU CONCRETE

- Backgrounds/ bases to be tiled: Remove mould oil, surface retarders and other materials incompatible with bedding.

380 NEW PLASTER

- Plaster: Dry, solidly bedded, free from dust and friable matter.
- Plaster primer: Apply if recommended by adhesive manufacturer.

390 PLASTERBOARD BACKGROUNDS

- Boards: Dry, securely fixed and rigid with no protruding fixings and face to receive decorative finish exposed.

420 RAKING OUT FOR KEY

- Soft joints in existing masonry: Rake out to a depth of 13 mm (minimum).

451 PREPARING CONCRETE BASES FOR UNBONDED BEDDING

- Separating layer: as M10/290
- Lap at joints: 100 mm.

460 SMOOTHING UNDERLAYMENT

- Type: Recommended by adhesive manufacturer.
- Condition: Allow to dry before tiling.

FIXING

510 FIXING GENERALLY

- Colour/ shade: Unintended variations within tiles for use in each area/ room are not permitted.
- Variegated tiles: Mix thoroughly.
- Adhesive: Compatible with background/ base. Prime if recommended by adhesive manufacturer.
- Cut tiles: Neat and accurate.
- Fixing: Provide adhesion over entire background/ base and tile backs.
- Final appearance: Before bedding material sets, make adjustments necessary to give true, regular appearance to tiles and joints when viewed under final lighting conditions.
- Surplus bedding material: Clean from joints and face of tiles without disturbing tiles.

530 SETTING OUT

- Joints: True to line, continuous and without steps.
- Joints on walls: Horizontal, vertical and aligned round corners.

- Joints in floors: Parallel to the main axis of the space or specified features.
- Cut tiles: Minimize number, maximize size and locate unobtrusively.
- Joints in adjoining floors and walls: Align.
- Joints in adjoining floors and skirtings: Align.
- Movement joints: Where locations are not indicated, submit proposals.

550 FLATNESS/ REGULARITY OF TILING

- Sudden irregularities: Not permitted.
- Deviation of surface: Measure from underside of a 2 m straightedge placed anywhere on surface. The straightedge should not be obstructed by the tiles and no gap should be greater than 3 mm.

560 LEVEL OF TILING ACROSS JOINTS

- Deviation (maximum) between tile surfaces either side of any type of joint:
- 1 mm for joints less than 6 mm wide.
- 2 mm for joints 6 mm or greater in width.

570 MORTAR BEDDING

- Bedding mix:
- Cement: Portland to BS EN 197-1 type CEM I/42.5.
- Sand for walls: To BS 1199, type A.
- Sand for floors: To BS EN 13139.
- Grading designation: 0/4 (MP) category 1 fines and between 20%-66% passing a 0.5 sieve.
- Batching: Select from:
 - Batch by weight.
 - Batch by volume: Permitted on the basis of previously established weight:volume relationships of the particular materials. Use accurate gauge boxes. Allow for bulking of damp sand.
- Mixing: Mix materials thoroughly to uniform consistence. Use a suitable forced action mechanical mixer. Do not use a free fall type mixer.
- Application: At normal temperatures use within two hours. Do not use after initial set. Do not retemper.

580 POROUS TILES

- Tiles to be bedded in cement:sand: Soak in clean water for at least 30 minutes. Fix as soon as surface water has drained.

650 THIN BED ADHESIVE - RIBBED (WALLS)

- Application: Apply 3 mm floated coat of adhesive to dry background in areas of approximately 1 m². Trowel to ribbed profile.
- Tiling: Press tiles firmly onto float coat.

651 THIN BED ADHESIVE - SOLID (WALLS)

- Application: Apply floated coat of adhesive to dry background in areas of about 1 m². Comb surface.
- Tiling: Apply thin even coat of adhesive to backs of dry tiles. Press tiles firmly onto float coat.
- Finished adhesive thickness (maximum): 3 mm.

690 CEMENT:SAND BEDDING (WALLS)

- Preparation: Dampen background.
- Application: Apply floated coat: 1:3-4 cement:sand mortar bedding.
 - Thickness (maximum): 10 mm.
 - Finish: Equivalent to wood float. Before tiling allow to stiffen slightly.

- Tiling: Without delay, apply 2 mm thick coat of 1:2 cement:fine sand mortar to backs of tiles, filling keys. Press tiles firmly onto float coat. Tap firmly into position.
- 710 THICK BED ADHESIVE - SOLID (FLOORS)
- Application: Apply floated coat of adhesive to dry base and comb surface.
 - Tiling: Apply coat of adhesive to backs of tiles filling depressions or keys. Press tiles firmly into position.
 - Finished adhesive thickness: Within range recommended by manufacturer.
- 720 CEMENT:SAND BEDDING (FLOORS)
- Mortar bedding mix: 1:3-4 cement:sand.
 - Consistency: Stiff plastic.
 - Laying: Lay suitably small working areas of screeded bed. Compact thoroughly to level.
 - Finished bed thickness: 15-25 mm.
 - Tiling: Within two hours and before bedding sets, evenly coat backs of tiles with adhesive. Press tiles firmly into position.
 - Finished adhesive thickness: Within range recommended by manufacturer.
- 730 SEMIDRY CEMENT:SAND BEDDING (FLOORS)
- Mortar bedding mix: 1:3.5-4 cement:sand.
 - Water content: A film of water must not form on surface of bed when fully compacted.
 - Preparation: Dampen base.
 - Laying: Lay suitably small working areas of screeded bed. Compact thoroughly to level.
 - Tiling: Within two hours and before bedding sets, evenly coat backs of tiles with a neat cement slurry. Beat tiles firmly into position.
- 740 CEMENT:LIME SAND BEDDING (FLOORS)
- Mortar bedding mix: 1:1: cement:lime:sand.
 - Cement: Portland to BS EN 197-1, type CEM I/42.5
 - Lime:sand (coarse stuff): Ready-mixed to BS EN 998-2.
 - Sand: To BS EN 13139.
 - Grading designation: 0/4 (MP) category 1 fines and between 20%-66% passing a 0.5 sieve.
 - Consistency: Stiff plastic. A film of water must not form on surface of bed when fully compacted.
 - Preparation: Dampen base.
 - Laying: Lay and compact bed to level.
 - Tiling: Tamp tiles firmly into position.

MOVEMENT JOINTS/ GROUTING/ COMPLETION

- 805 SEALANT MOVEMENT JOINTS WITH METAL EDGINGS
- Edging material: Stainless steel
 - Bedding: Bed in 1:3 cement:sand.
 - Installation: Centre over joints in base. Set to exact finished level of floor.
 - Preparation and application: As section Z22.
- 815 SEALANT MOVEMENT JOINTS **FOR BATHROOM AREAS**
- Joints: Extend through tiles and bedding to base/ background. Centre over joints in base/ background.
 - Width: to be agreed
 - Sealant: 2 part polysulphide

- Colour: to be agreed
 - Preparation and application: As section Z22.
- 825 STRIP MOVEMENT JOINTS
- Manufacturer: To be approved by sample
 - Colour: to be agreed
 - Joint width: 6-12mm
 - Fixing to base: to manufacturer's recommendations
 - Joints: Extend through tiles and bedding to base.
- 855 CEMENT:SAND GROUTING MIX
- Grout mix:
 - Cement: white portland
 - Sand:
 - Joint widths of 6 mm or greater: To BS 1199, table 1, Type B.
 - Joint widths of 3-6 mm: To BS 5385-5, table 2.
 - Proportions (cement:sand): 1:1 (<3mm) 1:2 (>3mm)
 - Pigment: to be agreed
 - Mixing: Mix thoroughly. Use the minimum of clean water needed for workability.
- 875 GROUTING
- Sequence: Grout when bed/ adhesive has set sufficient to prevent disturbance of tiles.
 - Joints: 6 mm deep (or depth of tile if less). Free from dust and debris.
 - Grouting: Fill joints completely, tool to profile, clean off surface. Leave free from blemishes.
 - Profile: to be agreed with employer or their delegate
 - Polishing: When grout is hard, polish tiling with a dry cloth.
- 885 COLOURED GROUT
- Staining of tiles: Not permitted
 - Evaluating risk of staining: Apply grout to a few tiles in a small trial area. If discoloration occurs apply a protective sealer to tiles and repeat trial.
- 910 PROTECTION GENERALLY: Adequately protect and keep clean all completed areas. Clean off any droppings immediately.

APPENDIX 1 - ISSUE HISTORY

Revision	Edit time/Date	Status/Revisions	Issue Date
A	27/11/12	QS Issue	27/11/12

M50 RUBBER/ PLASTICS/ CORK/ LINO/ CARPET TILING/ SHEETING

To be read with Preliminaries/ General conditions.

TYPES OF COVERING**150 SHEETING SLIP RESISTANT VINYL**

Vinyl to shower rooms to be suitable for wet room installation – full welded joints fixed using an epoxy adhesive floor to be R10 rated for bare foot traffic under wet conditions.

- Location: To bathrooms, WC/shower rooms and kitchens
- Base: Self levelling/smoothed compound as clause M50-460 to be included to entire screed to solid floors and T&G plywood to timber floors below sheeting
- Preparation: As recommended by the adhesive manufacturer
- Flooring roll: PVC with particle based enhanced slip resistance to BS EN 13845
- Manufacturer: To be approved by sample
BS EN 685 class: domestic general
Recycled content: BS EN ISO 14021 clause 7.8
- Width: 2m, 3m, 4m (to EN 426)
- Thickness: 3mm (to EN 428)
- Colour/ pattern: to be approved
- Adhesive (and primer if recommended by manufacturer): as clause 640
- Seam welding: hot welding with complimentary coloured weld
- Accessories: edge trim as clause 740
- Finishing: as clause 820
- Other requirements: All installation of materials in accordance with manufacturers recommendations.

GENERAL REQUIREMENTS**210 WORKMANSHIP GENERALLY**

- Base condition after preparation: Rigid, dry, sound, smooth and free from grease, dirt and other contaminants.
- Finished coverings: Accurately fitted, tightly jointed, securely bonded, smooth and free from air bubbles, rippling, adhesive marks and stains.

220 SAMPLES

- Covering samples: Before placing orders, submit representative sample of each type. **6 no different colours will be used subject to the client's approval.**

250 LAYOUT – ROLL MATERIALS

- Setting out of seams: Agree setting out for sheeting types M50/ 150

251 LAYOUT – SEAMS IN ROLL MATERIALS

- Setting out: Minimize occurrences of seams and cross seams.
- Cross seams: Not permitted in following locations: N/A

330 COMMENCEMENT

- Required condition of works prior to laying materials:
- Building is weathertight and well dried out.
- Wet trades have finished work.
- Paintwork is finished and dry.

- Conflicting overhead work is complete.
- Floor service outlets, duct covers and other fixtures around which materials are to be cut are fixed.
- Notification: Submit not less than 48 hours before commencing laying.

340 CONDITIONING

- Prior to laying: Condition materials by unpacking and separating in spaces where they are to be laid. Maintain resilient flooring rolls in an upright position. Unroll carpet and keep flat on a supporting surface.
- Conditioning time and temperature (minimum): As recommended by manufacturer with time extended by a factor of two for materials stored or transported at a temperature of less than 10°C immediately prior to laying.

350 ENVIRONMENT

- Temperature and humidity: Before, during and after laying, maintain approximately at levels which will prevail after building is occupied.
- Ventilation: Before during and after laying, maintain adequate provision.

360 FLOORS WITH UNDERFLOOR HEATING

- Commencement of laying: Not before a period of 48 hours after heating has been turned off.
- Post laying start up of heating system: Slowly return heating to its operative temperature not less than 48 hours after completing laying.

PREPARING BASES

410 NEW BASES

- Suitability of bases and conditions within any area:
- Commencement of laying of coverings will be taken as acceptance of suitability.

430 NEW WET LAID BASES

- Base drying aids: Not used for at least four days prior to moisture content testing.
- Base moisture content test: Carry out in accordance with BS 5325, Annex A or BS 8203, Annex A.
- Locations for readings: In all corners, along edges, and at various points over area being tested.
- Commencement of laying coverings: Not until all readings show 75% relative humidity or less.

440 SUBSTRATES TO RECEIVE THIN COVERINGS

- Trowelled finishes: Uniform, smooth surface free from trowel marks and other blemishes. Abrade suitably to receive specified floor covering material.

460 SMOOTHING/ LEVELLING UNDERLAYMENT COMPOUND

- Type: Latex cement
 - Manufacturer: to be approved
- To be included to entire screed to solid floors and T&G plywood to timber floors below sheeting**

520 TIMBER BOARDING/ STRIP FLOORING

- Substrate: Boards/ strips securely fixed and acceptably level with no protruding fasteners. Plane, sand or apply smoothing underlayment compound to give a smooth, even surface.

LAYING COVERINGS

610 SETTING OUT TILES

- Method: Set out from centre of area/ room so that, wherever possible:
- Tiles along opposite edges are of equal size.
- Edge tiles are more than 50% of full tile width.

620 COLOUR CONSISTENCY

- Finished work in any one area/ room: Free from banding or patchiness.

640 ADHESIVE FIXING GENERALLY

- Adhesive type: As specified, as recommended by covering/ underlay manufacturer, or as approved.
- Primer: Type and usage as recommended by adhesive manufacturer.
- Application: As necessary to achieve good bond.
- Finished surface: Free from trowel ridges, high spots caused by particles on the substrate, and other irregularities.

650 SEAMS

- Patterns: Matched.
- Joints: Tight without gaps.

670 BORDERS/ AND FEATURE STRIPS IN SHEET MATERIAL

- Curl: Not acceptable.
- Corners: Mitre joints.

680 SEAM WELDING COVERINGS

- Commencement: At least 24 hours after laying, or after adhesive has set.
- Joints: Neat, smooth, strongly bonded, flush with finished surface.

720 DOORWAYS

- Joint location: On centre line of door leaf.

740 EDGINGS AND COVER STRIPS TO DOOR THRESHOLDS

- Manufacturer: to be approved by sample
- Material/ finish: Aluminium
- Fixing: Secure with edge of covering gripped. Use matching fasteners where exposed to view.

770 SKIRTINGS **COVERED - TO ENTRANCE LEVEL SHOWER ROOMS**

- Types: Coved Vinyl skirting using proprietary cove former behind brought up 100mm on all edges and corners to full floor area
- Manufacturer: to be approved by sample
- Fixing: Secure with top edge straight and parallel with floor.
- Corners: Mitre joints.

Tiled trim to be installed at top edge of coved skirting to full of room see M40-111

780 TRAFFICKING AFTER LAYING

- Covering types: All sheet flooring
- Traffic free period: as per adhesive manufacturer's recommendations

COMPLETION

820 **FINISHING TO FLOORING**

- Cleaning operations:
- Wash floor with water containing neutral (pH 6–9) detergent. If necessary, lightly scrub heavily soiled areas.
- Rinse with clean water, removing surplus to prevent damage to adhesive. Allow to dry.
- Emulsion polish: Two coats of a type recommended by covering manufacturer.

880 **WASTE**

- Spare covering material: Retain suitable material for patching.
On completion submit pieces for selection. Hand over selected pieces to Employer.

APPENDIX 1 - ISSUE HISTORY

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M60 PAINTING/ CLEAR FINISHING

To be read with Preliminaries/ General conditions.

COATING SYSTEMS**135 GLOSS PAINT TO ALL INTERNAL WOODWORK**

- Manufacturer: to be approved by sample
- Product reference: Satinwood
- Surfaces: Internal uncoated wood
- Preparation: as clause 400
- Initial coats: thinned coat of satinwood
- Number of coats: 1
- Finishing coats: satinwood
- Number of coats: 3

160 DECORATIVE WOODSTAIN/ VARNISH/ PRESERVATIVE WHERE CLIENT REQUESTS IN LIEU OF CLAUSE M60-135

- Manufacturer: to be approved by sample
- Product reference: Colour to be agreed with employer or their delegate
- Surfaces: uncoated hardwood
- Preparation: as clause 400
- Initial coats: clear gloss varnish, vinyl matt thinned with white spirit.
- Number of coats: 1
- Finishing coats: clear satin varnish, matt vinyl, unthinned, rub down lightly between coats along the grain.
- Number of coats: 3

161 DECORATIVE WOODSTAIN/ VARNISH/ PRESERVATIVE TO ALL EXTERNAL WOODWORK

- Manufacturer: to be approved by sample
- Product reference: wood stain
- Surfaces: external uncoated softwood
- Preparation: as clause 400
- Initial coats: woodstain
- Number of coats: 1
- Finishing coats: woodstain
- Number of coats: 1

180 FLOOR COATING TO SEAL ALL AREAS OF FLOOR SCREED WITHOUT FLOOR FINISHES

- Manufacturer: to be approved by sample
- Product reference: PVA
- Surfaces: Internal uncoated screed as per M10/130
- Preparation: as clause 400
- Finishing coats: PVA thinned to form sealer as manufacturers recommendations
- Number of coats: 2

GENERAL**210 COATING MATERIALS**

- Selected manufacturers: Submit names before commencement of coating work.

215 HANDLING AND STORAGE

- Coating materials: Deliver in sealed containers, labelled clearly with brand name, type of material and manufacturer's batch number.
- Materials from more than one batch: Store separately. Allocate to distinct parts or areas of the work.

220 COMPATIBILITY

- Coating materials selected by contractor:
- Recommended by their manufacturers for the particular surface and conditions of exposure.
- Compatible with each other.
- Compatible with and not inhibiting performance of preservative/ fire retardant pretreatments.

280 PROTECTION

- 'Wet paint' signs and barriers: Provide where necessary to protect other operatives and general public, and to prevent damage to freshly applied coatings.

300 CONTROL SAMPLES

Include 20 no finished work samples of painted plasterboard cuttings 500 x 500mm for selection and approval by client

Samples to be retained on site for comparison purposes and unless otherwise specified for forming part of the finished work, shall be removed when no longer required by the employer.

- Sample areas of finished work: Carry out, including preparation, as follows:
Types of coating Nature of sample
Allow Colour choice
- Approval of appearance: Obtain before commencement of general coating work.

321 INSPECTION OF WORK STAGES

- Programme for inspections: Submit as follows:
Types of coating Inspection at completion of
Allow Colour choice
- Inspection: Give prior notice when each stage is ready for inspection.

PREPARATION

400 PREPARATION GENERALLY

- Standard: In accordance with BS 6150.
- Suspected existing hazardous materials: Prepare risk assessments and method statements covering operations, disposal of waste, containment, and reoccupation, and obtain approval before commencing work.
- Preparation materials: Types recommended by their manufacturers and the coating manufacturer for the situation and surfaces being prepared.
- Substrates: Sufficiently dry in depth to suit coating.
- Efflorescence salts: Remove.
- Dirt, grease and oil: Remove. Give notice if contamination of surfaces/ substrates has occurred.
- Surface irregularities: Remove.
- Joints, cracks, holes and other depressions: Fill flush with surface, to provide smooth finish.
- Dust, particles and residues from preparation: Remove and dispose of safely.
- Water based stoppers and fillers:

- Apply before priming unless recommended otherwise by manufacturer.
 - If applied after priming: Patch prime.
 - Oil based stoppers and fillers: Apply after priming.
 - Doors, opening windows and other moving parts:
 - Ease, if necessary, before coating.
 - Prime resulting bare areas.
- 420 FIXTURES AND FITTINGS
- Removal: Before commencing work remove: Light fittings, smoke/heat detection systems (covers only) from wall and ceilings, socket face plates, radiators from walls
 - Replacement: Refurbish as necessary, refit when coating is dry.
- 425 IRONMONGERY
- Removal: Before commencing work remove ironmongery from surfaces to be coated.
 - Hinges: Do not remove hinges unless instructed to do so by employer or their delegate
 - Replacement: Refurbish as necessary; refit when coating is dry.
- 471 PREPRIMED WOOD
- Areas of defective primer: Take back to bare wood and reprime.
- 481 UNCOATED WOOD
- General: Provide smooth, even finish with arrises and moulding edges lightly rounded or eased.
 - Heads of fasteners: Countersink sufficient to hold stoppers/ fillers.
 - Resinous areas and knots: Apply two coats of knotting.
- 490 PREVIOUSLY COATED STEEL
- Defective paintwork: Remove to leave a firm edge and clean bright metal.
 - Sound paintwork: Provide key for subsequent coats.
 - Corrosion and loose scale: Take back to bare metal.
 - Residual rust: Treat with a proprietary removal solution.
 - Bare metal: Apply primer as soon as possible.
 - Remaining areas: Degrease.
- 500 PREPRIMED STEEL
- Areas of defective primer, corrosion and loose scale: Take back to bare metal. Reprime as soon as possible.
- 511 GALVANIZED, SHERARDIZED AND ELECTROPLATED STEEL
- White rust: Remove.
 - Pretreatment: Apply one of the following:
 - 'T wash'/ mordant solution to blacken whole surface.
 - Etching primer recommended by coating system manufacturer.
- 521 UNCOATED STEEL - MANUAL CLEANING
- Oil and grease: Remove.
 - Corrosion, loose scale, welding slag and spatter: Remove.
 - Residual rust: Treat with a proprietary removal solution.
 - Primer: Apply as soon as possible.
- 531 UNCOATED STEEL - BLAST CLEANING
- Oil and grease: Remove.

- Blast cleaning:
 - Atmospheric conditions: Dry.
 - Abrasive: Suitable type and size, free from fines, moisture and oil.
 - Surface finish: To BS EN ISO 8501-1, preparation grade _____ .
 - Primer: Apply as soon as possible and within four hours of blast cleaning.
- 541 UNCOATED ALUMINIUM/ COPPER/ LEAD
- Surface corrosion: Remove, and lightly key surface.
 - Pretreatment: Etching primer, if recommended by coating system manufacturer.
- 552 UNCOATED PVC-U
- Dirt and grease: Remove. Do not abrade surface.
- 560 UNCOATED CONCRETE
- Release agents: Remove.
- 570 UNCOATED MASONRY/ RENDERING
- Loose and flaking material: remove.
- 580 UNCOATED PLASTER
- Nibs, trowel marks and plaster splashes: Scrape off.
 - Overtrowelled 'polished' areas: Key lightly.
- 590 UNCOATED PLASTERBOARD
- Depressions around fixings: Fill with stopper/ filler.
- 601 UNCOATED PLASTERBOARD - TO RECEIVE TEXTURED COATING
- Joints: Fill, tape and feather out with materials recommended by textured coating manufacturer.
- 645 SEALING OF INTERNAL MOVEMENT JOINTS
- General: To junctions of walls and ceilings with architraves, skirtings and other trims.
 - Sealant: Water based acrylic.
 - Preparation and application: As section Z22.

APPLICATION

- 711 COATING GENERALLY
- Application: In accordance with BS 6150, clause 9.
 - Conditions: Maintain suitable temperature, humidity and air quality during application and drying.
 - Surfaces: Clean and dry at time of application.
 - Thinning and intermixing of coatings: Not permitted unless recommended by manufacturer.
 - Overpainting: Do not paint over intumescent strips or silicone mastics.
 - Priming coats:
 - Thickness: To suit surface porosity.
 - Application: As soon as possible on same day as preparation is completed.
 - Finish:
 - Even, smooth and of uniform colour.
 - Free from brush marks, sags, runs and other defects.
 - Cut in neatly.
 - Doors, opening windows and other moving parts: Ease before coating and between coats.

- 720 PRIMING JOINERY
- Preservative treated timber: Retreat cut surfaces with two flood coats of a suitable preservative before priming.
 - End grain: Coat liberally, allow to soak in, and recoat.
- 730 WORKSHOP COATING OF CONCEALED JOINERY SURFACES
- General: Apply coatings to all surfaces of components.
- 731 SITE COATING OF CONCEALED JOINERY SURFACES
- General: After priming, apply additional coatings to surfaces that will be concealed when fixed in place.
- 740 CONCEALED METAL SURFACES
- General: Apply additional coatings to surfaces that will be concealed when component is fixed in place.
- 751 STAINING WOOD
- Primer: Apply, if recommended by stain manufacturer.
 - Application: Apply in flowing coats and brush out excess stain to produce uniform appearance.
- 760 VARNISHING WOOD
- Brush well in and lay off avoiding aeration.
 - Subsequent coats: Rub down lightly along the grain between coats.
- 770 EXTERNAL DOORS
- Bottom edges: Prime and coat before hanging doors.
- 780 BEAD GLAZING TO COATED WOOD
- Before glazing: Apply first two coats to rebates and beads.
- 790 PUTTY GLAZING
- Setting: Allow putty to set for seven days.
 - Sealing:
 - Within a further 14 days, seal with an oil based primer.
 - Fully protect putty with coating system as soon as it is sufficiently hard.
 - Extend finishing coats on to glass up to sight line.
- 800 GLAZING
- Etched, sand blasted and ground glass: Treat or mask edges before coating to protect from contamination by oily constituents of coating materials.
- 810 WATER REPELLENT
- Application: Liberally flood surface, giving complete and even coverage.

APPENDIX 1 - ISSUE HISTORY

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N10 GENERAL FIXTURES/ FURNISHINGS/ EQUIPMENT

To be read with Preliminaries/ General conditions.

PRODUCTS**110 PURPOSE MADE CUPBOARD TO CONSUMER UNIT**

- Dimensions: approx 1.0 x 1.0 x 0.3m – all to be agreed prior to fabrication
 - Finishes: 15mm melamine carcass fitted with 2 moulded mdf veneer doors
 - Doors: double doors one bolt one lock, cylinder chrome lock, handles bolted through doors
 - Joinery workmanship: As section Z10.
 - Metalwork materials and workmanship: As section Z11.
 - Other requirements: fire lined internally.
- For floor mounted units top edge of unit to be 19mm plywood to have rounded edged beads and have rounded corners

111 PURPOSE MADE SHELF & HANGING RAIL TO WARDROBES

- Manufacturer: contractor's choice
- Timber: To BS EN 942.
 - Species: 19mm plywood shelf with 19 x 25mm H/W edging bead to front, glued and pinned. Shelf to have a suitably sized S/W bearer to all sides fixed to wall
 - Appearance class: J2 to H/W bead
 - Moisture content on delivery: 6-10%
- Wood based boards: Appearance class E surface to plywood sanded finish
- Metal: 30mm dia steel hanging rail complete width of robe, steel thickness to be suitable for clear span of rail. Rail to be supported at both ends and mid rail by proprietary brackets – all to be approved by sample by client or their representative
- Finishes: Shelving to be stained and varnished as M60-160 – colours to be approved by client or their representative from range of samples
- Joinery workmanship: As section Z10.
- Metalwork materials and workmanship: As section Z11.
- Other requirements: POSITION TO BE AGREED ON SITE

112 PURPOSE MADE SHELF TO STORES

- Manufacturer: contractor's choice
- Timber: To BS EN 942.
 - Species: 19mm plywood shelf with 19 x 25mm H/W edging bead to front, glued and pinned. Shelf to have a suitably sized S/W bearer to all sides fixed to wall
 - Appearance class: J2 to H/W bead
 - Moisture content on delivery: 6-10%
- Wood based boards: Appearance class E surface to plywood sanded finish
- Finishes: Shelving to be stained and varnished as M60-160 – colours to be approved by client or their representative from range of samples
- Joinery workmanship: As section Z10.
- Metalwork materials and workmanship: As section Z11.
- Other requirements: POSITION TO BE AGREED ON SITE

113 PURPOSE MADE SLATTED SHELVES TO HOTPRESS

- Manufacturer: contractor's choice
- Timber: To BS EN 942.
 - Species: 25 x 38mm S/W slats on 25 x 38mm S/W framing

Shelf to have a suitably sized S/W bearer to all sides fixed to wall

- Appearance class:
- Moisture content on delivery: 6-10%
- Wood based boards: sanded finish
- Finishes: Shelving to be stained and varnished as M60-160 – colours to be approved by client or their representative from range of samples
- Joinery workmanship: As section Z10.
- Metalwork materials and workmanship: As section Z11.
- Other requirements: PROVIDE 3 NUMBER SHELVES TO COMPLETE SIZE OF HOTPRESS – POSITION TO BE AGREED ON SITE

270 MIRRORS TO WCs and BATHROOMS

- Material: safety glass to BS 6206 class C
- Quality: Free from tarnishing, discoloration, scratches and other defects visible in the designed viewing conditions. Reflection undistorted.
- Size: 600 wide x 900mm high
- Backing: lacquer
- Edges: to be approved by sample
- Fixing: Screws suitable for wall with chromed dome top screw covers
- Installation: Accurately with sides vertical. Position in bathroom and WC to be confirmed on site

300 ENTRANCE MATTING TO APARTMENT ENTRANCE LOBBY – SEE PLANS

- Manufacturer: to be approved by sample
- Colour: to be approved by sample
- Size: 900 x 1200mm - to be confirmed on site with the employer or their delegate

350 MISCELLANEOUS FITTINGS

- Item: Wheelie bin BLACK
- Size/ Capacity: 240 litre
- Finish/ Colour: Black
- Other requirements: to be compatible for collection by local council vehicles

351 MISCELLANEOUS FITTINGS

- Item: Wheelie bin BLUE
- Size/ Capacity: 240 litre
- Finish/ Colour: Blue
- Other requirements: to be compatible for collection by local council vehicles

351 MISCELLANEOUS FITTINGS

- Item: Wheelie bin GREEN
- Size/ Capacity: 240 litre
- Finish/ Colour: Green
- Other requirements: to be compatible for collection by local council vehicles

360 MISCELLANEOUS FITTINGS

- Item: Compost bin
- Size/ Capacity: 330 litres
- Finish/ Colour: Black
- Fixing: As manufacturer recommendations
- Other requirements: _____ .

370 MISCELLANEOUS FITTINGS

- Item: 3 no.Bins Compatible with Local Council Collection Requirements
- Size/ Capacity: **240 litre**

- Finish/ Colour: Blue/Grey/Brown
- Fixing: to manufacturers recommendations
-

390 MISCELLANEOUS FITTINGS

- Item: Health and Safety notice to roofspace
- Manufacturer: Installer's choice
- Other requirements: Notice must be installed in roofspace adjacent to trap door warning users must only use the catwalk provided.

400 MISCELLANEOUS FITTINGS

- Item: Internally wall mounted letter boxes – 1 number for each apartment
- Size/ Capacity: 355x330x100 each approx – size to be confirmed by manufacturer and approved by employer or their delegate
- Finish/ Colour: PPC aluminium boxes and framing system - to be agreed by employer or their delegate
- Other requirements:

410 MISCELLANEOUS FITTINGS

- Medicine Cabinet 450 x 350 x 150 approx. size to be confirmed by manufacturer and sample approved by employer or their delegate
- Child proof lock
- Adjustable Internal shelf
- Finish/ Colour: Factory finish white
- Fixing: As manufacturer recommendations

EXECUTION

710 MOISTURE CONTENT OF WOOD AND WOOD BASED BOARDS

- Temperature and humidity: During delivery, storage, fixing and to handover maintain conditions to suit specified moisture contents of timber components.
- Testing: When instructed, test components with approved moisture meter to manufacturer's recommendations.

770 TRIMS

- Lengths: Wherever possible, unjointed between angles or ends of runs.
- Running joints: Where unavoidable, obtain approval of location and method of jointing.
- Angle joints: Mitred.

COMPLETION

910 GENERAL

- Doors and drawers: Accurately aligned, not binding. Adjusted to ensure smooth operation.
- Ironmongery: Checked, adjusted and lubricated to ensure correct functioning.

920 APPLIANCES

- Test: Ensure that all functions and features work correctly.
- Documentation: Submit guarantees, instruction manuals, etc.

APPENDIX 1 - ISSUE HISTORY

Revision	Edit time/Date	Status/Revisions	Issue Date
A	28-11-2012	Clauses 300, 400 & 410 added	28-11-2012

N11 DOMESTIC KITCHEN FITTINGS, FURNISHINGS AND EQUIPMENT

To be read with Preliminaries and General Conditions.

PRODUCTS

ALL TIMBER TO BE CERTIFIED FSC OR PEFC

- All furniture to be kite marked certified to BS 6222: Part 2: Level 'H' "Domestic kitchen equipment, Part 2 specification for strength requirements and methods of test for fitted kitchen unit
"Test Level 'G' is not acceptable, units to be marked accordingly (to comply with BSI requirements).
- All furniture to meet life assessment of 25 years.
 All kitchen carcasses to be 12mm thick unless stated otherwise
- Space must be left for a standard cooker and fridge freezer (minimum 600mm).
- Finished height to top of worktop is 900mm from finished floor.
- A 458mm space between worktop and high level units to allow for 3 no. 150mm tiles
- All melamine faced chipboard to be manufactured from BS EN 312 P5 Grade coreboard and all carcass edging to be lipped with 0.45mm PVC.
- All structural rails and muntins to be manufactured from high quality HARDWOOD complying with the requirements of BS 1186: 1986: Part 1: Grade 1 and supplied from ecologically managed forests. On double base units the rear muntin should be inset by 68mm to accommodate pipework.
- All structural carcasses joint to be achieved without screwing directly into or through chipboard. Standard knock down blocks are not acceptable.
- **ALL CARCASS COMPONENTS MUST BE REPLACEABLE WITH THE UNITS FIXED IN POSITION.**
- Backs should be inset on all base units and should not be grooved into the carcass. All backs to be removable from the front of the unit.
- All plinths to be removable and plinth cut out sealed.
- All shelves over 600mm long should be supported centrally and at both ends with a total of 6 fixing points. All shelves to be adjustable in height.
- Sink and base units must support all edges of the sink and worktop.
- Wall units over 600mm long are to have 6 wall fixing points.
- Metal corner gussets are to be zinc plated to BS 1706: 1990 and then white epoxy coated 2 no. are to be fitted in base units and 4 no. in wall units. All muntins to be fitted with anti-rotation peg.
- Carcasses are to be chipboard P5 Grade to BS EN 312 with melamine facing and to be white or cream depending on doors picked and should have melamine faced hardboard (3.2mm) backings to match.
- Sink unit carcass shall be constructed from 18mm W.B.P. plywood and fully laminated.
 Sink base unit should have a 100mm upstand to base and mid level shelf
- Wall units to be 750mm high, 300mm deep carcass. Doors, handles and hinges to be of the same construction as base units. Also to have one adjustable middle shelf.
- Toe spaces to be WBP plywood laminate, same colour as doors. Any exposed edges on underside of high level units are to be bonded with laminate same colour as carcasses. The toe spaces shall be continuous right round so that none of the chipboard carcasses components are in contact with the floor.

- Infill panels and exposed gable ends shall be made from 18mm W.B.P. plywood fully laminated with a white or cream inner leaf to match carcasses chosen. The external exposed leaf will have the same laminate as the doors chosen.
- Integral cooker extractor hoods and fans shall be provided.
- Ducting from lift up cooker extractor hoods must be disguised with matching cornice aprons. Ducting shall be the shallow white rectangular 50mm PVC box section.
- All manufacturers must be registered to BS EN IS 9002: 1994: Quality Assurance Standard.
- **ALL MANUFACTURERS TO SUPPLY A "CERTIFICATE OF CONFORMITY" WITH EACH DELIVERY IF REQUESTED TO DO SO. THIS IS A MANDATORY REQUIREMENT UNDER BS 5750: PART 2: 1987 REGISTRATION CERTIFICATE TO CONFORMITY AND MUST CONFIRM THAT THIS SPECIFICATION (QUOTING ISSUE LEVEL) IS BEING ADHERED TO.**
Large boiler cupboard doors to have 3 number hinges
Plywood grounding as clause K11.815 adjacent to all units
- Top and bottom edges of both drawers and doors to be bonded with coloured laminated same as door faces. Iron on PVC self adhesive tape lipping will not be acceptable.
- Client requires a choice of handles.
- All manufacturers must supply a Certificate of Conformity.
- Back to back aluminium joints should be installed so that the removable fridge section can accommodate a tall fridge if required.
- Wall unit to have a lockable door to top section of unit to be used as medicine cupboard – see kitchen layout

Include 12 no finished work samples of kitchen worktops, units and accessories for selection by client prior to ordering.

Samples to be retained on site for comparison purposes and unless otherwise specified for forming part of the finished work, shall be removed when no longer required by the employer.

310 FITTED BASE UNITS SEE DRAWINGS FOR LAYOUT

- Standard: To BS 6222 -2 and -3, and BS EN 14749.
- Structural performance: To BS 6222-2, grade H marked accordingly to BSI requirements – to be kite marked – level G not acceptable
- Dimensions: To BS EN 1116.
- Surface finishes: To BS 6222-3.
- Doors and drawer fronts:
All doors to be made from 18mm chipboard P5 grade to BS EN 312 bonded with colour laminate and balanced with white or cream inner leaf to match carcasses. Laminated doors to have double postformed edges from range as approved by sample.
Iron on PVC self adhesive tape lipping will not be acceptable.
Door and drawer handles to be 98mm 'D' type colours available: white, grey, brown or black, or wooden 'D' handle or shaped stainless steel.
All doors are to be hung with 190° hinges to be combined slide-on arm and screw fix type, all metal nickel plated with spring closing mechanism. To have 3 dimensional adjustment with relevant mounting plate
- Drawers to have metal sides with 15mm MFC base and back manufactured to BS EN 312 P5 Grade with slow closer mechanisms fitted.
Base and back to be lipped on all edges
Drawer fronts shall not be grooved for drawer base.

- Drawers to have a 15mm solid base run on metal gliders with nylon rollers in a drawer pack. Drawer fronts to be of same construction as doors. Drawer's carcass shall be securely fixed to the drawer front. Drawers will require an additional stop fitted inside carcass to prevent the drawer front from doing the stopping.
- Other requirements: Base units shall be raised up off floor with PVC adjustable feet with a toespace height of 150mm and recessed back 50mm. Corner unit doors must be fitted with one door end closer piece (double opening doors without a front corner post)
 - Side panels, plinths and shelves:
Toe spaces to be WBP plywood fully laminated on all faces and edges, front face to match colour of doors.
The toe spaces shall be continuous right round so that none of the chipboard carcasses components are in contact with the finished floor.
All plinths to be removable and plinth cut out sealed.
All shelves over 600mm long should be supported centrally and at both ends with a total of 6 fixing points.
All shelves to be adjustable in height.
 - Accessories: as required

320 FITTED WALL UNITS SEE DRAWINGS FOR LAYOUT

- Standard: To BS 6222 -2 and -3, and BS EN 14749.
- Structural performance: To BS 6222-2, grade H marked accordingly to BSI requirements – to be kite marked – **level G not acceptable**
- Dimensions: To BS EN 1116.
- Surface finishes: To BS 6222-3.
- Doors and drawer fronts:
All doors to be made from 18mm chipboard P5 grade to BS EN 312 bonded with colour laminate and balanced with white or cream inner leaf to match carcasses. Laminated doors to have double postformed edges from range as approved by sample.
Iron on PVC self adhesive tape lipping will not be acceptable.
Door and drawer handles to be 98mm 'D' type colours available: white, grey, brown or black, or wooden 'D' handle or shaped stainless steel.
All doors are to be hung with 190° hinges to be combined slide-on arm and screw fix type, all metal nickel plated with spring closing mechanism. To have 3 dimensional adjustment with relevant mounting plate
Matching pelmet light trim to be fitted on the front underside edge of the units.
- Other requirements: Any exposed edges on underside of high level units are to be bonded with laminate same colour as carcasses.
- Iron on PVC self adhesive tape lipping will not be acceptable.
Wall units to be 750mm high, 300mm deep carcass. Doors, handles and hinges to be of the same construction as base units.
Also to have one adjustable middle shelf.
Wall units over 600mm long are to have 6 wall fixing points.
- Side panels and shelves:
All shelves over 600mm long should be supported centrally and at both ends with a total of 6 fixing points.
All shelves to be adjustable in height.
- Accessories: as required

340 WORKTOPS SEE DRAWINGS FOR LAYOUT

- Product reference: To be approved from sample range
- Material: Worktops to be manufactured from 40mm improved moisture resistant chipboard complying with BS EN 312: Part 5 (1997) Type P5. Laminates to be of

- post forming grade to BS EN 348. A backing laminate is to be utilised incorporating polythene barrier. To have a fire rating of Class 0 to BS 457
 - Dimensions: finished width 600mm
 - Exposed edges: Worktops to be manufactured with a front post formed edge laminate seal which wraps under front edge by 50mm with high heat and moisture resistant adhesives.
 - Support: Sink and base units must support all edges of the sink and worktop.
 - Other requirements: finished height 900mm above finished floor level
Where worktops are jointed dog bone joints must be used
- 350 SINKS, TAPS, TRAPS AND WASTES **SEE DRAWINGS FOR LAYOUT**
Sink tops to be manufactured to BS 1244: Parts 1 and 2 and have life assessment of 25 years.
Sinks must be of a heavy gauge to eliminate distortion of the bowl or drainer or movement at taps bases to include integral support. Sample to be made available on site for employer or their delegate's inspection and approval (sign off) prior to general installation.
Inset sink top to be single drainer, single bowl complete with overflow, chain and plug and standard tap holes
Low flow water taps to be lever pillar mounted type for approval by client
Washing machines discharge must have its own separate standpipe and waste trap and must **not** be incorporated into the sink waste trap.

EXECUTION

- 610 MOISTURE CONTENT OF WOOD AND WOOD BASED BOARDS
- Control and monitoring:
 - Method statement: Submit.
- 620 INSTALLATION GENERALLY
- Fixings and adhesives: As section Z20.
 - Services: As services drawings and specification
- 630 INSTALLING UNITS AND WORKTOPS
- General: Well fitting, stable and secure.
- 640 INSTALLING APPLIANCES
- Connections: Provide to electric, gas, and hot and cold water services.
- 650 INSTALLING SINKS, TAPS AND WASTES
- Water supply: To BS 6700 and BS EN 806-2.
 - Taps:
 - Fixing: Secure, watertight seal with the appliance.
 - Positioning: Hot tap to left of cold tap as viewed by the user of the appliance.
 - Wastes:
 - Bedding: Waterproof jointing compound.
 - Fixing: With resilient washer between appliance and backnut.
- 660 SEALANT BEDDING AND POINTING
- Application: As section Z22.
 - Bedding: Bed sinks to top of worktops
 - Pointing: Joints between all worktops and walls
Joints between all plinths and floors

670 INSTALLING TRIMS AND MOULDINGS

- Lengths: Un-jointed between angles or ends of runs.
- Angle joints: Mitred.

COMPLETION

910 GENERAL

- Doors and drawers: Accurately aligned, not binding. Adjusted to ensure smooth operation.
- Ironmongery: Checked, adjusted and lubricated to ensure correct functioning.

920 APPLIANCE COMMISSIONING

- Appliance operation, functions and controls: Verify.
- Documentation: Submit guarantees, instruction manuals, etc.

APPENDIX 1 - ISSUE HISTORY

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N13 SANITARY APPLIANCES AND FITTINGS

To be read with Preliminaries/ General conditions.

PRODUCTS**429 CLOTHES HOOKS 6 NUMBER TO BE INSTALLED ON S/W RAIL (P20-110) IN CLOAKS CUPBOARD**

- Manufacturer: To be approved by sample – flat hat and coat hook approx 175 x 20mm
- Material: Aluminium
- Finish/ Colour: SAA

462 TOILET PAPER HOLDERS TO ALL WCs

- Manufacturer: To be approved by sample – ‘L’ shape holder approx 90mm projection from wall with 6 x 50mm rose
- Material/ finish: Steel
- Finish/ Colour: Stainless steel

EXECUTION**610 INSTALLATION GENERALLY**

- Assembly and fixing: Surfaces designed to falls to drain as intended.
- Fasteners: Nonferrous or stainless steel.
- Supply and discharge pipework: Fix before appliances.
- Fixing: Fix appliances securely to structure. Do not support on pipework.
- Jointing and bedding compounds: Recommended by manufacturers of appliances, accessories and pipes being jointed or bedded.
- Appliances: Do not use. Do not stand on appliances.
- On completion: Components and accessories working correctly with no leaks.
- Labels and stickers: Remove.

613 COMPATIBILITY OF COMPONENTS

- General: Each sanitary assembly must consist of functionally compatible components, preferably obtained from a single manufacturer.

620 NOGGINGS AND BEARERS

- Noggings, bearers, etc. to support sanitary appliances and fittings: Position accurately. Fix securely.

630 TILED BACKGROUNDS OTHER THAN SPLASHBACKS

- Timing: Complete before fixing appliances.
- Fixing appliances: Do not overstress tiles.

APPENDIX 1 - ISSUE HISTORY

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P10 SUNDRY INSULATION/ PROOFING WORK

To be read with Preliminaries/ General conditions.

ALL INSULATION TO AVOID THE USE OF SUBSTANCES THAT HAVE A GWP LESS THAN OR EQUAL TO 5 (manufacture or installation)

140 INSULATION FITTED BETWEEN RAFTERS TO WARM ROOFS

- Material: CFC/HCFC free rigid insulation
- Standard: BS EN 13166
- Manufacturer: To be approved by sample
- Recycled content: As BS EN ISO 14021 clause 7.8
- Thickness: **140mm compressible insulation to achieve 0.023 W/m.K**
Over all U value of P10/140 and P10/145 to achieve 0.1 W/m2K
- Installation requirements:
 - Joints: Butted, no gaps.
 - Fasteners: Used where necessary to retain insulation and/ or prevent slumping.
 - Air space above insulation: Not restricted.
 - Eaves ventilation: Unobstructed.

145 INSULATION FITTED ACROSS TOP OF RAFTERS/TRUSSES TO WARM ROOFS

- Material: CFC/HCFC free rigid phenolic insulation
- Standard: BS EN ISO 9001:2000
- Manufacturer: To be approved by sample
- Recycled content: As BS EN ISO 14021 clause 7.8
- Thickness: **90mm to achieve 0.023 W/m.K**
Over all U value of P10/140 and P10/145 to achieve 0.1 W/m2K
- Installation requirements: in accordance with manufacturers instructions
 - Joints: Butted, no gaps.
 - Fasteners: Used where necessary to retain insulation and/ or prevent slumping.
 - Air space above insulation: Not restricted.
 - Eaves ventilation: Unobstructed.

310 VAPOUR CONTROL LAYER FIXED TO TIMBER STUDS/ JOISTS/ FRAMING

- Manufacturer: To be approved by sample
 - Product reference: Triple ply construction with polywoven core and solid corrosion resistant aluminium layer with a **hemispherical emissivity of 0.05**.
Water vapour resistance (MNs/g) to EN 1931 **>589**
Vapour control layer to be fitted into wall in accordance with BS5250:2002 recommendations and manufacture's instructions.
- Moisture content of timber at time of fixing (maximum): 20%.
- Installation requirements:
 - Setting out: Joints minimized.
 - Method of fixing: Staples at 250 mm centres maximum along all supports.
Membrane not sagging.
 - Joints: At supports only, lapped 150 mm minimum.
 - Openings: Membrane fixed to reveals.
 - Joints and edges: Sealed with double sided tape with vapour resistivity not less than the vapour control layer.
- Penetrations: Sealed.

410 FLEXIBLE CAVITY BARRIERS TO TOP OF PARTY WALLS

- Manufacturer: to be approved by sample

- Material: wired mineral wool mats/rolls
 - Fire resistance rating: to BS EN 1363
 - Installation requirements:
 - Fixing: Secure at perimeters and joints with no gaps, to provide a complete barrier to smoke and flame between underside of roofing tile/membrane and structure
- 432 **CAVITY BARRIERS TO BLOCKWORK CAVITY WALLS - MINERAL WOOL SLAB FITTED HORIZONTALLY – for locations see sections and details**
- Manufacturer: to be approved
 - Fire resistance rating: BS 476-20, 60/60 integrity/ insulation
 - Thickness: as shown on drawings
 - Installation requirements: Continuous, with minimum joints fitted horizontally at floor slabs between fire compartments
 - Fasteners: Fixings are to be manufacturers fixing brackets fixed in accordance with manufacturers details.
 - Other requirements: A cavity tray is to be installed during the construction of the outer leaf. Slabs to be cut to suit the width of as-built cavity and securely fitted. All joints are to be tightly butted.
- 433 **CAVITY BARRIERS TO BLOCKWORK CAVITY WALLS - MINERAL WOOL SLAB FITTED VERTICALLY – for locations see plans and details**
- Manufacturer: to be approved
 - Fire resistance rating: BS 476-20, 60/60 integrity/ insulation
 - Thickness: as shown on drawings
 - Installation requirements: Continuous, with minimum joints At all fire compartment wall junctions and in voids so the maximum unobstructed dimension in any direction is 20 meters maximum
 - Fasteners: Fixings are to be manufacturers fixing brackets fixed in accordance with manufacturers details.
 - Other requirements: A vertical DPC is to be installed during the construction of the outer leaf. Slabs to be cut to suit the width of as-built cavity and securely fitted. All joints are to be tightly butted.

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P12 FIRE STOPPING SYSTEMS

To be read with Preliminaries/ General conditions.

GENERAL

- 130 **FIRE STOPPING SYSTEM TO INDIVIDUAL SERVICES PENETRATIONS THROUGH WALLS AND FLOORS**
- Fire resistance: as clause 240
 - Penetration seal: pipe collars and wraps clause 270, 375 and 380 as required and approved
 - Size: in accordance with manufacture's recommendations.
- 140 **FIRE STOPPING SYSTEM TO MULTIPLE SERVICES PENETRATIONS THROUGH WALLS AND FLOORS**
- Fire resistance: as clause 240
 - Bulkhead barrier:
 - Material: foam as clause 335, mastic as clause 345 and pillows as clause 360 as required and approved
- 150 **LOOSE FIRE STOPPING AS REQUIRED**
- Fire resistance: as clause 240
 - Penetration seal: Intumescent pillows as clause 345
 - Size: to manufacture's instructions
- 160 **LINEAR GAP SEALING FOR GAPS IN FIRE RESISTING WALLS ALSO INTEGRAL WITH COMPONENTS**
- Fire resistance: as clause 240
 - Sealant as clause 395

SYSTEM PERFORMANCE

- 210 **DESIGN**
- Design: Complete the design of the fire stopping system.
 - Proposals: Submit drawings, technical information, calculations and manufacturers' literature.
- 240 **FIRE PERFORMANCE**
- Resistance to fire: BS 476-7 and -22, 30 minutes integrity and insulation
 - Reaction to fire: In accordance with building regulations class 0
 - Smoke resistance:
 - Air leakage rate (maximum): 0.4

PRODUCTS

- 305 **PRODUCT CERTIFICATION**
- Certification: For products specified generically, submit evidence of compliance with the specification.
 - Acceptable evidence: Agreement Certification

- 310 BOARDS - CALCIUM SILICATE FIBRE REINFORCED
- Manufacturer: to be approved
- 335 INTUMESCENT FOAM
- Manufacturer: to be approved
 - flame retardant open cellular foam, fire rated to achieve Class 0 when tested to BS476 Part 20. Expandable graphite based intumescent is factory laminated onto both sides of the foam, forming a compressible fire resistant joint filler which is resistant to moisture attack. A minimum compression of 15% per thickness of material is recommended to ensure a rigid friction fit or as advised in accordance with manufacturer recommendations
- 338 INTUMESCENT MASTIC
- Manufacturer: to be approved
- 345 INTUMESCENT PILLOWS
- Manufacturer: To be approved
 - Composition: Sealed polyethylene bags containing graphite and vermiculite granules treated with fire activated chemicals.
 - Integral reinforced eyelets: Required.
 - Linking cable: Non-corrosive cotton-coated wire.
 - Length: to manufacture's instructions
- 360 MINERAL WOOL RIGID BATTS
- Standard: To BS EN 13162.
 - Manufacturer: To be approved
- 370 PIPE COLLAR - CONCEALED INTUMESCENT
- Manufacturer: To be approved
- 375 PIPE COLLAR - INSULATED WRAP
- Manufacturer: To be approved
- 380 PIPE COLLAR - SURFACE MOUNTED INTUMESCENT
- Manufacturer: To be approved
- 395 SEALANT - ONE-PART FIRE RESISTING ACRYLIC
- Manufacturer: To be approved
 - Intumescent Sealant water based acrylic 20mm thick installed continuously with polythene backing strips (35kg/m³) to both sides of walls as per manufacture's recommendations

EXECUTION

- 620 WORKMANSHIP GENERALLY
- Gaps: Seal gaps between building elements and services, to provide fire resistance and resist the passage of smoke.
 - Adjacent surfaces: Prevent overrun of sealant or mortar on to finished surfaces.
- 640 INSTALLING BOARDING
- Multiple board layers: Stagger joints between layers.

660 APPLYING INTUMESCENT FOAM

- New joints: Remove builder's debris, mortar droppings, grease, and other contaminants.
- Old joints: Clean and remove existing sealant from each joint.
- Priming: Lightly moisten substrate with water.
- Application: Fill joint to approximately half its depth, and allow foam to expand to face of joint.

670 APPLYING INTUMESCENT MORTAR

- Sequence: Install mortar after services are permanently installed.
- Loose dust and combustible materials: Remove from the opening.
- Shuttering: Install suitable shuttering panels to the faces of the opening.
- Temperature: Do not apply mortar when it could be damaged by frost.
- Powder:water ratio:to manufacturers recommendations
- Mortar cure: Do not disturb mortar before final set has taken place.
- Shuttering: Remove after mortar has cured.

680 INSTALLING INTUMESCENT PILLOWS

- Number of pillows (per m sq of opening): to manufacture's instructions
- Orientation of bags: to manufacture's instructions

690 APPLYING INTUMESCENT PUTTY

- Sequence: Install putty after services are permanently installed.
- Loose dust and combustible materials: Remove from the opening.

710 INSTALLING MINERAL WOOL BATTS

- Installing batts: Fit tight into void between the penetrating services and the surrounding construction to form a solid bulkhead.
 - Brackets: to manufacture's instructions
 - Bracket fixing: to manufacture's instructions
- Face of batts: Flush with the surface of wall, floor or soffit.
- Joints between batts: to manufacture's instructions
- Gaps between services and bulkhead: Seal with fire resisting sealant.

730 FIXING PIPE COLLARS

- Collar fixing: to manufacture's instructions
- Gap around collar: to manufacture's instructions
- Length of wraps: to manufacture's instructions

740 INSERTING SEALANT BACKING MATERIAL

- Preparation: Removed debris from service penetration.
- Installation: as per manufacturers instructions

745 APPLYING SEALANTS GENERALLY

- Application: As section Z22.

750 APPLYING CAPPING SEALANT

- Temperature: Do not apply water based sealants when they could be damaged by frost.

COMPLETION

910 CLEANING

- Masking tapes: Remove.
- Cleaning: Clean off splashes and droppings. Wipe down finishes.

920 INSPECTION

- Notice for inspection (minimum): 2 days

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P20 UNFRAMED ISOLATED TRIMS/ SKIRTINGS/ SUNDRY ITEMS

To be read with Preliminaries/ General conditions.

110 SOFTWOOD SKIRTINGS, ARCHITRAVES, COAT RAIL AND CURTAIN BATTENS

- Quality of wood and fixing: To BS 1186-3.
 - Species: Redwood
 - Class: 2 and 3
- Moisture content at time of fixing: 8-12%
- Preservative treatment: WPA commodity specification C5 service life 30 years
- Fire rating: class 0
- Profile: see detailed drawings
- Finished size:
 - 94 x 19mm once chamfered skirting;
 - 64 x 19mm once chamfered architrave;
 - 125 x 19mm twice rounded coat rail to Cloaks cupboard – rail must be screwed to wall, not nailed.
 - 64 x 19mm twice rounded curtain batten extending 200mm beyond each side of the opening – battens must be screwed to wall, not nailed.
- Finish as delivered: painted finish as M60/135
- Fixing: clause Z20
- **MDF will not be acceptable**

120 HARDWOOD CILL BOARDS

- Quality of wood and fixing: To BS 1186-3.
 - Species: Contractor's choice
 - Class: 2 and 3
- Moisture content at time of fixing: 8-12%
- Preservative treatment: WPA commodity specification C5 service life 30 years
- Fire rating: class 0
- Profile: see detailed drawings
- Finished size:
 - 25 x 179mm bullnosed cill board edges to extend 25mm (TBA with employer or their delegate) to be plugged and screwed
- Finish as delivered: stained finish as M60/160
- Fixing: clause Z20
- **MDF will not be acceptable**

ALL TIMBER TO BE CERTIFIED FSC OR PEFC

EXECUTION**510 INSTALLATION GENERALLY**

- Joinery workmanship: As section Z10.
- Metal workmanship: As section Z11.
- Methods of fixing and fasteners: As section Z20 where not specified.
- Straight runs: To be in one piece or in long lengths with as few joints as possible.
- Running joints: Location and method of forming to be agreed where not detailed.
- Joints at angles: Mitred
- Position and level: To be agreed where not detailed.

APPENDIX 1 - ISSUE HISTORY

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Q28 TOPSOIL AND GROWING MEDIA

To be read with Preliminaries/ General conditions.

120 SITE INVESTIGATION

- Report: See Glovers' Site Investigation Report

200 GRADING SUBSOIL

- General: Grade to smooth flowing contours to achieve specified finished levels of topsoil.
- Areas of thicker topsoil: Excavate locally.

250 SUBSOIL SURFACE PREPARATION

- General: Excavate and/ or place fill to required profiles and levels, as section D20.
- Loosening:
 - Light and non cohesive subsoils: When ground conditions are reasonably dry, loosen thoroughly to a depth of 300 mm.
 - Stiff clay and cohesive subsoils: When ground conditions are reasonably dry, loosen thoroughly to a depth of 450 mm.
 - Rock and chalk subgrades: Lightly scarify to promote free drainage.
- Stones: Immediately before spreading topsoil, remove stones larger than 75mm.
- Remove to approved dump.

260 INSPECTING FORMATIONS

- Give notice: Before spreading topsoil for planting & seeding.
- Notice period of 14 days.

310 PREPARATION OF UNDISTURBED TOPSOIL

- Standard: In accordance with BS 4428.
 - Grading and cultivation as required.
- Hard ground: Break up thoroughly.
- Clearing: Remove visible roots and large stones with a diameter greater than 75mm.
- Areas covered with turf or thick sward: Plough or dig over to full depth of topsoil.
- Fallow period (minimum) of 3 months.
 - Weed control: At appropriate times as required.

330 SURPLUS TOPSOIL TO BE RETAINED

- Generally: Spread and level on site:
 - Locations as necessary.
 - Protected areas: Do not raise soil level within root spread of trees that are to be retained.

340 IMPORTED TOPSOIL TO BS 3882

- Quantity: Provide as necessary to make up any deficiency of topsoil existing on site and to complete the work.
- Standard: To BS 3882.
- Classification: approved.
- Source: approved.
- Submit: Declaration of analysis in accordance with BS 3882, Annex E.
- Additional analyses if required.

341 IMPORTED TOPSOIL FROM A SPECIFIED SOURCE

- Quantity: Provide as necessary to make up any deficiency of topsoil existing on site and to complete the work.
- Source: approved.

355 COMPOST

- Standard: In accordance with PAS 100.
- Supplier: approved.
 - Product reference: spent mushroom compost or similar approved.
- Type: Sanitized and stabilized compost.
- 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: None.
- Composting Association certification: required
- Submit: Declaration of analysis.

395 PEAT

- Peat or products containing peat: Do not use.

650 NOTICE OF IMPORTING TOPSOIL

- Give notice: Before stripping topsoil for transfer to site.
 - Notice period of 14 days.

660 SAMPLE LOAD OF IMPORTED TOPSOIL

- General: Deliver to site a sample load of not less than 5 m³.
- Give notice: Allow inspection before making further deliveries to site. Retain for comparison with subsequent loads.
 - Notice period of 14 days

670 CONTAMINATION

- General: Do not use topsoil contaminated with subsoil, rubbish or other materials that are:
 - Corrosive, explosive or flammable.
 - Hazardous to human or animal life.
 - Detrimental to healthy plant growth.
- Subsoil: In areas to receive topsoil, do not use subsoil contaminated with the above materials.
- Give notice: If any evidence or symptoms of soil contamination are discovered on the site, or in topsoil to be imported.

680 TOPSOIL STORAGE HEAPS

- Location – on site
- Height (maximum) – 2.0m
- Width (maximum) – 10.0 x 10.0m
- Protection:
 - Do not place any other material on top of storage heaps.
 - Do not allow construction plant to pass over storage heaps.

- Prevent compaction and contamination, by fencing and covering as appropriate.

690 HANDLING TOPSOIL

- Aggressive weeds: Give notice and obtain instructions before moving topsoil.
- Plant: Select and use plant to minimize disturbance, trafficking and compaction.
- Contamination: Do not mix topsoil with:
 - Subsoil, stone, hardcore, rubbish or material from demolition work.
 - Other grades of topsoil.
- Multiple handling: Keep to a minimum. Use or stockpile topsoil immediately after stripping.
- Wet conditions: Handle topsoil in the driest condition possible. Do not handle during or after heavy rainfall.

700 SPREADING TOPSOIL

- Temporary roads/ surfacing: Remove before spreading topsoil.
- Layers:
 - Depth (maximum): 150 mm.
 - Gently firm each layer before spreading the next.
- Depths after firming and settlement (minimum) – 150mm.
- Crumb structure: Do not compact topsoil. Preserve a friable texture of separate visible crumbs wherever possible.

710 LOOSE TIPPING OF TOPSOIL

- General: Do not firm, consolidate or compact topsoil when laying. Tip and grade to approximate levels in one operation with minimum of trafficking by plant.

720 SPORTSFIELDS

- Grading: To even levels and within the following permitted deviations:
 - From levels or gradients shown on drawings: ± 75 mm.
 - From line between boning rods 30 m apart: ± 25 mm.

910 FINISHED LEVELS OF TOPSOIL AFTER SETTLEMENT

- Above adjoining paving or kerbs – 30mm.
- Below dpc of adjoining buildings: Not less than 30mm.
- Shrub areas: Higher than adjoining grass areas by 50 – 75mm.
- Within root spread of existing trees: Unchanged.
- Adjoining soil areas: Marry in.
- Thickness of turf or mulch: Included.

920 DOCUMENTATION

- Timing: Submit at handover.
- Contents:
 - Full description of all soil components.
 - Record of source for all soil components.
 - Analyst's report for each test carried out.
 - Record drawings showing the location and depth of all soils by type and grade.
 - Supplier's declaration of compliance with BS 3882.

APPENDIX 1 - ISSUE HISTORY

Revision	Edit time/Date	Status/Revisions	Issue Date
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Q30 SEEDING/ TURFING

To be read with Preliminaries/ General conditions.

GENERAL INFORMATION/ REQUIREMENTS**115 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.

120 CLIMATIC CONDITIONS

- General: Carry out the work while soil and weather conditions are suitable.

145 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.

146 WATERING

- Quantity: Wet full depth of topsoil.
- Application: Even and without displacing seed, seedlings or soil.
- Frequency – as required.

150 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.

160 NOTICE

- Give notice before:
 - Setting out.
 - Applying herbicide.
 - Applying fertilizer.
 - Preparing seed bed.
 - Seeding or turfing.
 - Visiting site during maintenance period.
- Period of notice: 14 – 30 days.

170 SETTING OUT

- Boundaries: Mark clearly.
- Delineation: In straight lines or smoothly flowing curves as shown on drawings.

PREPARATION**205 PREPARATION MATERIALS**

- General: Free from toxins, pathogens or other extraneous substances harmful to plant, animal or human life.
- Certification of source, analysis, suitability for purpose and absence of harmful substances: Submit.

- Certified materials: approved
 - Give notice: before ordering or using.
- 210 HERBICIDE
- Type: Suitable for suppressing perennial weeds.
 - Timing: Allow fallow period before cultivation.
 - Duration - 6 weeks.
- 231 PEAT
- Peat or products containing peat: Do not use.
- 250 CULTIVATION
- Compacted topsoil: Break up to full depth.
 - Soil Conditioner/ Fertilizer: Fully incorporate into topsoil to a depth of 50mm.
 - Tilth: Reduce topsoil to a tilth suitable for blade grading.
 - Depth: 30mm.
 - Particle size (maximum): 10 – 20mm.
 - Material brought to the surface: Remove stones and clay balls larger than 50 mm in any dimension, roots, tufts of grass, rubbish and debris.
- 260 GRADING
- Topsoil condition: Reasonably dry and workable.
 - Contours: Smooth and flowing, with falls for adequate drainage.
 - Hollows and ridges: Not permitted.
 - Finished levels after settlement: 25 mm above adjoining paving, kerbs, manholes etc.
 - Blade grading: May be used to adjust topsoil levels provided depth of topsoil is nowhere less than 100mm.
 - Give notice: If required levels cannot be achieved by movement of existing soil.
- 270 FERTILIZER
- Types: Apply both:
 - Superphosphate with a minimum of 18% water soluble phosphoric acid.
 - A sulphate of ammonia with a minimum of 20% nitrogen.
 - Application: Before final cultivation and three to five days before seeding/ turfing.
 - Coverage: Spread evenly, each type at 70 g/m², in transverse directions.
- 275 FERTILIZER
- Type: N6/P9/K6
 - Manufacturer: approved
 - Product reference: approved
 - Application: Before final cultivation and three to five days before seeding/ turfing.
 - Rate: Spread evenly at 50g/m²
- 280 FINAL CULTIVATION
- Timing: After grading and fertilizing.
 - Seed bed: Reduce to fine, firm tilth with good crumb structure.
 - Depth: 25 mm.
 - Surface preparation: Rake to a true, even surface, friable and lightly firmed but not over compacted.
 - Remove surface stones/ earth clods exceeding:
 - General areas: 50mm.
 - Fine lawn areas: 10 mm.
 - Adjacent levels: Extend cultivation into existing adjacent grassed areas sufficient to ensure full marrying in of levels.

TURFING – TO ALL GRASS AREAS (NO SEEDING ALLOWED)
TURF TO BE LAID 4 WEEKS PRIOR TO HANDOVER REGARDLESS OF TIME OF YEAR

- 400 CULTIVATED TURF
- Supplier: to be approved
- 405 CULTIVATED TURF
- Supplier: Turfgrass Growers Association (TGA) member, to TGA quality standards.
 - Seed mixture: approved.
 - Properties of soil used for turf production: approved
- 410 TURF TO BS 3969
- Standard: To BS 3969, free from undesirable grasses and weeds.
 - Grade: as approved.
 - Source: Submit proposals.
 - Herbicide treatment: Apply not less than four weeks and not more than three months before lifting.
- 420 DELIVERY AND STORAGE
- Timing: Lay turf with minimum possible delay after lifting. If delay occurs, lay turf out on topsoil and keep moist.
 - Frosty weather or waterlogged ground: Do not lift turf.
 - Delivery: Arrange to avoid need for excessive stacking.
 - Stacking height (maximum): 1 m.
 - Dried out or deteriorated turf: Do not use.
- 423 INSPECTION OF TURF
- Give notice: Before lifting turf of 7 days.
- 427 WEED SUPPRESSION MEMBRANE
- Manufacturer: to be approved.
 - Product reference: approved.
 - Laps: Minimum 100 mm side and end laps.
 - Laying sequence: After final cultivation and immediately before turfing.
 - Anchoring: Sufficient topsoil or sand spread evenly over membrane to prevent wind uplift.
- 428 COMPOST DRESSING FOR TURF
- Type: Sanitized and stabilized compost.
 - Supplier: approved.
 - Product reference: approved.
 - Standard: To PAS 100.
 - 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 content (minimum): 25%.
 - Carbon:Nitrogen ratio (maximum): 20:1.
 - Texture: Friable.
 - Objectionable odour: None.
 - Composting Association certification: required
 - Declaration of analysis: Submit.

- Timing: Apply prior to cultivation.

430 TURFING GENERALLY

- Time of year: as required.
- Timing of laying:
 - Spring and summer: Within 18 hours of delivery.
 - Autumn and winter: Within 24 hours of delivery.
- Weather conditions: Do not lay turf when persistent cold or drying winds are likely to occur or soil is frost bound, waterlogged or excessively dry.
- Working access: Planks laid on previously laid turf. Do not walk on prepared bed or newly laid turf.
- Jointing: Laid with broken joints, well butted up. Do not stretch turf.
- Edges: Whole turfs, trimmed to a true line.
- Adjusting levels: Remove high spots and fill hollows with fine soil.
- Consolidating: Lightly and evenly firm as laying proceeds to ensure full contact with substrate. Do not use rollers.
- Dressing, brushed well in to completely fill all joints.
- Watering: Thoroughly water completed turf immediately after laying. Check that water has penetrated into the soil below.

445 TURF NETTING

- Turf configuration: Diagonal or horizontal.
- Turf netting: approved.
- Fixings for netting: to be approved.
 - Frequency of fixings: as required.
- Removal of mesh and fixings: as required.

450 TRIMMING TURF

- Newly planted tree pits: Neatly cut away around individual trees.

PROTECTING/ CUTTING**510 PROTECTIVE FENCING**

- Fencing type: Chestnut paling to BS 1722 Part 4
- Height: 1.10m
- Erection: On completion of seeding/ turfing.
- Removal: when necessary

530 FIRST CUT OF GRASSED AREAS

- Timing: When grass is reasonably dry.
 - Height of initial growth: 35mm.
- Preparation:
 - Debris and litter: Remove.
 - Stones and earth clods larger than 25 mm in any dimension: Remove.
- Height of first cut: 35mm.

550 AREAS NOT TO BE CUT

- Do not cut:

590 CLEANLINESS

- Soil and arisings: Remove from hard surfaces.
- General: Leave the works in a clean, tidy condition at Completion and after any maintenance operations.

MAINTENANCE

605 MAINTENANCE

- Duration: Carry out the following operations from completion of seeding/ turfing until handover.

610 FAILURES OF SEEDING/ TURFING

- Defective materials or workmanship: Areas that have failed to thrive.
 - Exclusions: Theft or malicious damage.
- Method of making good: Recultivation and reseeded/ returfing.
- Timing of making good: as required.

620 MAINTAINING

- Maximum height of growth at any time: 65mm.
- Preparation: Before each cut remove all litter and debris.
- Cutting: As and when necessary to a height of 35mm.
 - Arisings: Remove
- Bulb planting areas: Do not cut until bulb foliage has died down.
- Trimming: All edges.
 - Arisings: Remove.
- Weed control: Substantially free of broad leaved weeds.
 - Method: Application of a suitable selective herbicide.
- Stones brought to the surface: Remove regularly.
 - Size: Exceeding 25 mm in any dimension.
- Areas of settlement: Make good.
- Watering: as required.

650 MAINTAINING GRASSED AREAS WITH PERENNIAL WILD FLOWERS

- Preparation: Before each cut remove all litter and debris.
- Height and frequency of cut in first growing season:
 - Time of first cut: September – October.
 - Height of first cut: 150mm.
 - Frequency of subsequent cutting (minimum): 1/year.
- Height and frequency of cut in second growing season:
 - Time of cut: September – October.
 - Height of cut: 150mm.
- Trimming: All edges.
 - Arisings: Remove.
- Watering: as required.

680 MAINTENANCE FERTILIZER

- March application: 15:10:10 Spring turf fertilizer at 35 g/m².
- September application: 5:10:10 Autumn turf fertilizer at 50 g/m².

685 MAINTENANCE FERTILIZER

- March application:
 - Manufacturer: approved
 - Application rate: as per manufacturers recommendations
- September application:
 - Manufacturer: approved
 - Application rate: as per manufacturers recommendations

APPENDIX 1 - ISSUE HISTORY

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Q31 EXTERNAL PLANTING

To be read with Preliminaries/ General conditions.

GENERAL INFORMATION/ REQUIREMENTS**112 SITE CLEARANCE GENERALLY**

- General: Remove rubbish, concrete, metal, glass, decayed vegetation and contaminated topsoil.
- Stones: Remove those with any dimension exceeding 50mm.
- Contamination: Remove material containing toxins, pathogens or other extraneous substances harmful to plant, animal or human life.
- Vegetation: Cut back and remove any dead or dying material as necessary
- Large roots: Grub up and dispose of without undue disturbance of soil and adjacent areas.
- Additional requirements: as necessary

118 SOIL CONDITIONS

- Soil for cultivating and planting: Moist, friable and (excepting aquatic/ marginal planting) not waterlogged.
- Frozen or snow covered soil: Give notice before planting. Provide additional root protection. Prevent planting pit sides and bases and backfill materials from freezing.

120 CLIMATIC CONDITIONS

- General: Carry out the work while soil and weather conditions are suitable.
- Strong winds: Do not plant.

125 TIMES OF YEAR FOR PLANTING

- Deciduous trees and shrubs: Late October to late March.
- Conifers and evergreens: September/ October or April/ May.
- Herbaceous plants (including marginal): September/ October or March/ April.
- Container grown plants: At any time if ground and weather conditions are favourable.
 - Watering and weed control: Provide as necessary.
- Dried bulbs, corms and tubers: September/ October.
- Colchicum (crocus): July/ August.
- Green bulbs: After flowering in spring.
- Wildflower plugs: Late August to mid November or March/ April.
- Aquatic plants: May/ June or September/ October.

130 MECHANICAL TOOLS

- Restrictions: Do not use within 100 mm of tree and plant stems.

145 WATERING

- Quantity: Wet full depth of topsoil.
- Application: Even and without damaging or displacing plants or soil.
- Frequency: As necessary to ensure establishment and continued thriving of planting.

146 WATERING

- Quantity: Wet full depth of topsoil.
- Application: Even and without damaging or displacing plants or soil.
- Frequency: as required.

150 WATER RESTRICTIONS

- General: If water supply is or is likely to be restricted by emergency legislation, do not carry out planting until instructed. If planting has been carried out, obtain instructions on watering.

160 NOTICE

- Give notice before:
 - Setting out.
 - Applying herbicide.
 - Applying fertilizer.
 - Delivery of plants/ trees.
 - Planting shrubs.
 - Planting trees into previously dug pits.
 - Watering.
 - Visiting site during maintenance period.
- Period of notice: 14 – 30 days.

165 PREPARATION, PLANTING AND MULCHING MATERIALS

- General: Free from toxins, pathogens or other extraneous substances harmful to plant, animal or human life.
- Certification of source, analysis, suitability for purpose and absence of harmful substances: Submit.
 - Certified materials
 - Give notice before ordering or using.

200 PLANTS/ TREES – GENERAL

- Condition: Materially undamaged, sturdy, healthy and vigorous.
- Appearance: Of good shape and without elongated shoots.
- Hardiness: Grown in a suitable environment and hardened off.
- Health: Free from pests, diseases, discoloration, weeds and physiological disorders.
- Budded or grafted plants: Bottom worked.
- Root system and condition: Balanced with branch system.
 - Standard: approved
- Species: True to name.
- Origin/ Provenance: approved.
 - Definition: Origin and Provenance have the meaning given in the National Plant Specification.

215 PLANTS/ TREES – SPECIFICATION CRITERIA

- Name, forms, dimensions, provenance and other criteria: As scheduled and defined in the National Plant Specification.

216 PLANTS/ TREES – SPECIFICATION CRITERIA

- Name, forms, dimensions and other criteria: To the relevant part of BS 3936.

225 BULBS/ CORMS/ TUBERS

- Condition: Firm, entire, not dried out or shrivelled.
- Health: Free from pests, diseases and fungus.
- Handling: Remove from packaging immediately.
- Storage: Permitted only when necessary.
 - Location: Well ventilated, dark, covered, rodent proof container, away from exhausts and fruit.
 - Duration: Minimum period.

- Temperature: 18–21°C.

235 CONTAINER GROWN PLANTS/ TREES

- Growing medium: With adequate nutrients for plants to thrive until permanently planted.
- Plants: Centred in containers, firmed and well watered.
- Root growth: Substantially filling containers, but not root bound, and in a condition conducive to successful transplanting.
- Hardiness: Grown in the open for at least two months before being supplied.
- Containers: With holes adequate for drainage when placed on any substrate commonly used under irrigation systems.

245 LABELLING AND INFORMATION

- General: Provide each plant/ tree or group of plants/ trees of a single species or cultivar with supplier's labelling for delivery to site, showing:
 - Full botanical name.
 - Total number.
 - Number of bundles.
 - Part bundles.
 - Supplier's name.
 - Employer's name and project reference.
 - Plant specification, in accordance with scheduled National Plant Specification categories.
- Additional information: Submit on request:

246 LABELLING AND INFORMATION

- Standard: To BS 3936.

260 PLANT/ TREE SUBSTITUTION

- Plants/ trees unobtainable or known to be likely to be unobtainable at time of ordering: Submit alternatives, stating:
 - Price.
 - Difference from specified plants/ trees.
- Approval: Obtain before making any substitution.

265 PLANT HANDLING, STORAGE TRANSPORT AND PLANTING

- Standard: To HTA 'Handling and establishing landscape plants'.
- Frost: Protect plants from frost.
- Handling: Handle plants with care. Protect from mechanical damage and do not subject to shock, e.g. by dropping from a vehicle.
- Plant packaging: approved
- Packaging of bulk quantities: approved.
- Planting: Upright or well balanced with best side to front.

280 TREATMENT OF TREE WOUNDS

- Cutting: Keep wounds as small as possible.
 - Cut cleanly back to sound wood using sharp, clean tools.
 - Leave branch collars. Do not cut flush with stem or trunk.
 - Set cuts so that water will not collect on cut area.
- Fungicide/ Sealant: Do not apply unless instructed.

285 PROTECTION OF EXISTING GRASS

- General: Protect areas affected by planting operations using boards/ tarpaulins.
- Excavated or imported material: Do not place directly on grass.

- Duration: Minimum period.

290 SURPLUS MATERIAL

- Subsoil, stones, debris, wrapping material, canes, ties, temporary labelling, rubbish, prunings and other arisings: Remove.

PREPARATION OF PLANTING BEDS/ PLANTING MATERIALS**300 HERBICIDE**

- Locations: as per plan
- Type: Suitable for suppressing perennial weeds.
- Timing: Allow fallow period before cultivation.
- Duration (minimum): 6 weeks.

305 WEED CONTROL

- Locations: as per plan.
- General: Prevent weeds from seeding and perennial weeds from becoming established.

335 GENERAL FERTILIZER

- Locations: as required.
- Manufacturer: approved.
- Product reference: N6/P9/K6
- Application: Spread evenly.
- Timing: Immediately before cultivation.
- Rate: 50g/m²

341 PEAT

- Peat or products containing peat: Do not use.

357 SOIL AMELIORANT/ CONDITIONER

- Locations: as required, based on plan
- Type: spent mushroom compost or similar approved.
- Reference/ Description/ Grading: approved.
- Application: Spread evenly.
- Timing: Apply prior to cultivation.
- Rate: 50L/m²

375 CULTIVATION

- Compacted topsoil: Break up to full depth.
- Cultivation: Loosen, aerate and break up soil into particles of 2–8 mm.
 - Depth: 200mm.
 - Timing: Within a few days before planting.
 - Weather and ground conditions: Suitably dry.
- Surface: Leave regular and even.
- Levels: as required.
- Undesirable material brought to the surface: Remove visible weeds, roots and large stones with any dimension exceeding 50mm.
- Soil within root spread of trees and shrubs to be retained: Do not dig or cultivate.

385 MULCH MATTING/ GEOTEXTILE FABRIC

- Manufacturer: approved.
- Product reference: approved membrane
- Type: approved, 60g/m².

- Recycled content: 20%
- Timing: Lay before planting.
- Watering: Water soil thoroughly before laying.
- Laying: In close contact with soil surface. Lap or butt joints as recommended by manufacturer, with no gaps.
- Planting: Cut neat slits or flaps. Refit closely around plant stems.
- Overlay: 100mm.

PLANTING SHRUBS/ HERBACEOUS PLANTS/ BULBS

400 RANDOM PLANT LAYOUT

- Spacing: as per plan/schedule
- Density: as per plan/schedule

401 REGULAR PLANT LAYOUT

- Spacing: as per plan/schedule
- Density: as per plan/schedule

435 CLIMBING PLANTS USED AS GROUND COVER

- Planting:
 - Canes or other supports: Remove.
 - Arrangement: Spread stems.
- Fixing: Pinned to ground to ensure good contact.

445 PLANTING BULBS/ CORMS/ TUBERS

- Depth: Top of bulb/ corm/ tuber at a depth of approximately twice its height, base in contact with bottom of hole.
- Backfilling: Finely broken soil. Lightly firm to existing ground level.
- Naturalized planting in existing grassed areas:
 - Scattering: Random. Plant bulbs/ corms/ tubers where they fall.
 - Planting: Neatly remove a plug of turf and replace after planting.

470 FORMAL HEDGES

- Shrubs for hedges: Consistent in species, cultivar and clone to ensure a uniform hedge.
- Planting: In trenches large enough to take full spread of roots. Set out plants evenly.

471 NATURALIZED HEDGES

- Planting: In trenches large enough to take full spread of roots. Set out plants evenly.

472 FENCING SUPPORT FOR NEW HEDGES

- Type: Timber post and general pattern wire mesh.
- Standard: To BS 1722-2.
- Height: 600 mm.
- Timing: Before planting hedge.
- Support: Lightly secure hedge plants to fence wires at appropriate intervals.

480 AFTER PLANTING

- Watering: Immediately after planting, thoroughly and without damaging or displacing plants or soil.
- Firming: Lightly firm soil around plants and fork and/ or rake soil, without damaging roots, to a fine tilth with gentle cambers and no hollows.

485 MULCHING PLANTING BEDS

- Material: spent mushroom compost or similar approved.
 - Purity: Free of pests, disease, fungus and weeds.
 - Recycled content:
- Preparation: Clear all weeds. Water soil thoroughly.
- Coverage: evenly spread
- Finished level of mulch: 50mm.

PLANTING TREES**505 TREE PITS**

- Sizes: at least 300mm wider than rootball
- Sloping ground: Maintain horizontal bases and vertical sides with no less than minimum depth throughout.
- Pit bottoms: With slightly raised centre. Break up to a depth of 100mm

510 TREE PIT ROOT BARRIERS

- Locations: as in agreement with architect
- Manufacturer: approved
 - Product reference: approved
- Depth of top of root barrier below finished soil level: as per manufacturer's instructions
- Installation: With sides vertical.

512 TREE PIT ACCESSORIES

- Locations: as in agreement with architect
- Manufacturer: approved.
 - Product reference: approved.
- Type: approved.

515 TREE PIT DRAINAGE

- Depth of excavation: Increase from specified size to allow for aggregate layer, with base slightly falling to outlet.
- Aggregate layer: Clean gravel or broken stone, with no fines, graded 40 to 20 mm.
 - Depth: 100mm
- Drainage pipes:
 - Type: perforated plastic
 - Diameter: 100mm
 - Position: Lay around perimeter of pit within aggregate layer.
- Geotextile filter:
 - Manufacturer: approved
 - Product reference: approved
 - Position: Lay over aggregate before installing tree or backfill.
- Completed pits: Test for free drainage before planting.

525 ADVANCED NURSERY STOCK TREES

- Standard: Prepare roots and transplant to BS 3969-5:1685
- Support: Paltipus underground system
- Protection: approved and recommended as per manufacturer's instructions.

535 STAKING GENERALLY

- Stakes: Softwood, peeled chestnut, larch or oak, straight, free from projections and large or edge knots and with pointed lower end.
 - Preservative treatment: approved.
 - Nails: To BS 1202-1, galvanized, minimum 25 mm long and with 10 mm diameter heads.
 - Stake size (minimum): 75mm
- 545 LONG SINGLE STAKING FOR STANDARD TREES
- Staking: Position stake close to tree on windward side and drive vertically at least 300 mm into bottom of pit before planting.
 - Backfilling: Consolidate material around stake.
 - Height of stakes: Cut off just below lowest branch of tree.
 - Ties: approved and be of reinforced rubber.
For trees up to 10-12cm girth, tree ties shall be 2 no. 25mm wide, 500mm long rubber straps with 2 no rubber spacers.
For trees of 12-14 & 14-16cm girth tree ties shall be 3 no. 38mm wide, 500mm long rubber straps with 3 no. rubber spacers.
 - Tying: Secure tree firmly but not rigidly to stake with at least two ties. Use three ties if necessary to prevent tree touching stake.
 - Position: Top tie within 25 mm of top of stake and lower tie approximately halfway down.
- 555 SHORT SINGLE STAKING FOR FEATHERED TREES
- Staking: Position stake close to tree on windward side and drive vertically at least 300 mm into bottom of pit before planting.
 - Backfilling: Consolidate material around stake.
 - Height of stakes: Cut to approximately 600 mm above ground level.
 - Ties: 2 no. 25mm wide, 500mm long rubber straps with 2 no rubber spacers.
 - Tying: Secure tree firmly but not rigidly to stake with strap & spacer within 25 mm of top of stake.
- 565 LONG DOUBLE STAKING FOR EXTRA HEAVY STANDARD TREES
- Staking: Drive stakes vertically at least 300 mm into bottom of pit on either side of tree position before planting.
 - Backfilling: Consolidate material around stakes.
 - Height of stakes: Cut off just below lowest branch of tree.
 - Cross bar: 100 x 38mm treated timber
 - Firmly fix on windward side of tree and as close as possible to stem.
 - Ties: 3 no. 38mm wide, 500mm long rubber straps with 3 no. rubber spacers.
 - Tying: Secure tree firmly but not rigidly to cross bar.
- 586 TREE BACKFILLING MATERIAL
- Composition: Previously prepared mixture of topsoil excavated from pit and additional topsoil as required.
 - Ameliorant/ Conditioner: spent mushroom compost or similar approved
 - Application rate: 20% of backfilling material
 - Fertilizer: 100gm 'Osmacote' (15:10:12) slow release fertiliser applied around base of tree at planting time and 80gm 'Osmacote' (18:11:10) top dressing slow release fertiliser applied around base of tree in late Spring/early Summer.
- 590 MULCHING TREES
- Material: spent mushroom compost or similar approved

- Purity: Free of pests, disease, fungus and weeds.
- Recycled content: 25%
- Preparation: Clear all weeds. Water soil thoroughly.
- Coverage: evenly spread
- Finished level of mulch: 50mm

WOODLAND/ MATRIX/ BUFFER ZONE PLANTING

600 WOODLAND WORK GENERALLY

- Services: Check for below and above ground services, including land drainage, in the vicinity. Give notice if they may be affected and obtain instructions before proceeding.
- Safety: Comply with Arboriculture and Forestry Advisory Group Safety leaflets.

605 EXISTING VEGETATION/ WEED CLEARANCE

- Surface vegetation clearance: as required
- Arisings: Remove.

615 EXISTING TREES

- Existing trees: retain/remove as agreed

617 REMOVING TREES AND HEDGES

- Identification: Clearly mark trees and hedges to be removed.
- Work near retained trees: Where canopies overlap, take down trees carefully in small sections to avoid damage to adjacent trees that are to be retained.
- Arisings: Remove.
- Tree stumps: ground out and treated with approved product

625 CULTIVATION

- General:
- Consolidation:
- Soil within root spread of trees to be retained: Do not plough or cultivate.

635 NOTCH PLANTING IN UNCULTIVATED GROUND

- Notching: Make a vertical 'I', 'L', 'T' or 'H' notch.
- Depth: To accommodate full depth of roots.
- Planting: Plant tree, close notch with root collar at ground level and firm the soil.

665 SETTING OUT

- Distance between trees: as per plan
- Distance between rows: as per plan

680 SETTING OUT

- Planting density: as per plan

PROTECTING/ MAINTAINING/ MAKING GOOD DEFECTS

710 MAINTENANCE

- Duration: Carry out the operations in the following clauses from completion of planting until – as agreed
- Frequency of maintenance visits: as per maintenance document

720 FAILURES OF PLANTING

- Defects due to materials or workmanship not in accordance with the Contract: Plants/ trees/ shrubs that have failed to thrive.
 - Exclusions: Theft or malicious damage after completion.
 - Rectification: Replace with equivalent plants/ trees/ shrubs.
- Replacements: To match size of adjacent or nearby plants of same species or match original specification, whichever is the greater.
- Timing of making good: as required

730 PROTECTIVE FENCING

- Fencing type: Chestnut paling to BS 1722 Part 4
- Height: 1.10m
- Erection: On completion of planting.
- Removal: when necessary

740 CLEANLINESS

- Soil and arisings: Remove from hard surfaces and grassed areas.
- General: Leave the works in a clean tidy condition at completion and after any maintenance operations.

750 PLANTING MAINTENANCE GENERALLY

- Weed control: Maintain weed free area around each tree and shrub.
 - Diameter (minimum): The larger of 1 m or the surface of original planting pit.
 - Keep planting beds clear of weeds:
- Planted areas: Fork over beds as necessary to keep soil loose, with gentle cambers and no hollows. Take care not to reduce depth or effect of mulch.
- Precautions: Ensure that trees and shrubs are not damaged by use of mowers, nylon filament rotary cutters and similar powered tools.
- Staking: Check condition of stakes, ties, guys and guards.
 - Broken or missing items: Replace.
 - Rubbing: Prevent.
 - Ties: Adjust to accommodate growth.
 - Damage to bark: Cut back neatly with sharp knife. Prevent further damage.
 - Frequency of checks: quarterly
- Firming up: Gently firm loosened soil around trees/ shrubs. Straighten leaning trees/ shrubs.
- Trees: Spray crown when in leaf during warm weather.
 - Timing: After dusk.
- Watering: as required

755 PLANTING MAINTENANCE – FERTILIZER

- Time of year: March or April.
- Fertilizer: N17/P17/K17
 - Manufacturer: approved
 - Product reference: approved
- Application: Evenly spread, carefully incorporating below mulch materials.
- Application rate: 30g/m²

760 PLANTING MAINTENANCE – PRUNING

- General: Prune to promote healthy growth and natural shape.
 - Dead, dying, diseased wood and suckers: Remove.

- Timing: Winter
- Trees: Favour a single central leading shoot.
- Arisings: Remove.

770 WOODLAND PLANTING MAINTENANCE

- Watering: Only as necessary to prevent plants wilting.
- Loose plants: Refirm surrounding soil, without compacting.
- Weed control: Cut down and remove weeds prior to setting seed in a 1 m diameter area around each tree.
- Vegetation except trees and coppice shoots to be retained: Cut down within the plantation area.
 - Height (maximum): 900mm.
 - Arisings: Leave between rows.
- Mechanical, chemical or mulching methods of vegetation control: Submit proposals.
- Ditches and drains: Keep clear.
- Watering: as required

780 MAINTENANCE INSTRUCTIONS

- General: as agreed

APPENDIX 1 - ISSUE HISTORY

Revision	Edit time/Date	Status/Revisions	Issue Date
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Q35 LANDSCAPE MAINTENANCE

To be read with Preliminaries/ General conditions.

GENERALLY

- 110 NOTICE
- Give notice before:
 - Application of herbicide.
 - Application of fertilizer.
 - Watering.
 - Each site maintenance visit.
 - Period of notice: 14 – 30 days
- 130 REINSTATEMENT
- Damage or disturbance to soil structure, planting, grass, fencing, hard landscaping, structures or buildings: Reinstate to original condition.
- 140 CONTROL OF MAMMALIAN PESTS
- Specialist firms: approved
 - Method: approved
- 155 WATERING
- Supply: from an approved source – licence required
 - Quantity: as required, depending on specific plant needs
 - Application: Do not damage or loosen plants.
 - Compacted soil: Loosen or scoop out, to direct water to root zone.
 - Frequency: As necessary for the continued thriving of all planting.
- 160 WATER RESTRICTIONS
- General: If water supply is, or is likely to be, restricted by emergency legislation, submit proposals for an alternative suitable source of water. Obtain instructions before proceeding.
- 170 DISPOSAL OF ARISING
- General: Unless specified otherwise, dispose of arisings as follows:
 - Biodegradable arisings: to approved dump
 - Grass cuttings: to approved dump
 - Tree roots and stumps: to approved dump
 - Shrub and tree prunings: to approved dump
 - Litter and non-biodegradable arisings: to approved dump
- 180 CHIPPING OR SHREDDING
- General: Not permitted on site.
- 181 MECHANICAL EQUIPMENT
- General: Minimize. All equipment must be operated by CITB operatives
 - Prohibited equipment: to be agreed
 - Timing: as required
- 190 LITTER
- Extraneous rubbish not arising from the contract work: Collect and remove from site.

195 PROTECTION OF EXISTING GRASS

- General: Protect areas affected by maintenance operations using boards/tarpaulins. Do not place excavated or imported materials directly on grass.

197 CLEANLINESS

- Soil and arisings: Remove from hard surfaces.
- General: Leave the works in a clean, tidy condition at completion and after any maintenance operations.

GRASSED AREAS**210 MAINTENANCE OF GRASSED AREAS**

- General: Maintain turf in a manner appropriate to the intended use.
- Soil and grass:
 - Condition: Maintain a healthy vigorous sward, free from disease, fungal growth, discolouration, scorch or wilt.
 - Waterlogging and compaction: Prevent.
 - Damage: Repair trampling, abrasion or scalping.
- Ornamental lawns: Maintain reasonably free from moss, excessive thatch, weeds, frost heave, worm casts and mole hills.
 - Edges: Neat and well defined, in clean straight lines or smooth flowing curves.
- Litter and fallen leaves: Remove regularly to maintain a neat appearance.

211 MAINTENANCE OF GRASSED AREAS

- Standard: To BS 7370-3. Carry out maintenance appropriate to each category of turf, as follows:
 - Objectives: To BS 7370-3, table 6.
 - Programme: To BS 7370-3, clause 11.
 - Mowing methods: To BS 7370-3, table 3.

220 GRASS CUTTING GENERALLY

- Before mowing: Remove litter, rubbish and debris.
- Finish: Neat and even, without surface rutting, compaction or damage to grass.
- Edges: Leave neat and well defined. Neatly trim around obstructions.
- Adjoining hard areas: Sweep clear and remove arisings.
- Drought or wet conditions: Obtain instructions.

225 TREE STEMS

- Precautions: Do not use mowing machinery closer than 100 mm to tree stems. Use nylon filament rotary cutters and other hand held mechanical tools carefully to avoid damage to bark.

226 TREE STEMS

- Precautions: Do not allow nylon filament rotary cutters and other mechanical tools closer than 100 mm to the stem of any tree.
 - Operations close to stems: Complete using hand tools.

265 MOWING

New grass swards shall be given their first cut at least two days after rolling and leave not less than 35mm growth.

- *Close Mown Grass – Amenity Areas:*

- 15No cuts between March & October to a height of 25mm, with growth not exceeding 75mm
- To encourage low growing rosette and creeping species, 16No cuts between April & October to a height of 100mm, with growth not exceeding 200mm
- Spot treatment of invasive weeds

- Arisings: remove

- *Grass Understorey:*

- 14No cuts between April and October to a height of 100mm
- Growth not to exceed 250mm
- Spot treatment of invasive weeds

290 ROLLING

- Location: grass areas
- Timing: when new sward has reached a minimum height of 50mm
- Roller: light
- Operations: Consolidate turf and reduce frost heave.

309 EDGES TO SEEDED AREAS

- Location: Planting beds and around newly planted trees.
- Timing: After seeded areas are well established.
- Edges: Cut to clean straight lines or smooth curves. Draw back soil to permit edging.
- Arisings: Remove.

310 RE-FORMING GRASS EDGES

- Location: as necessary
- Edges: Draw back soil and re-form edges to clean straight lines or smooth flowing curves, sloping slightly back from vertical.

320 LEVELLING HOLLOWES AND BUMPS IN TURF

- Standard: To BS 7370-3, clauses 12.4 and 12.5.

345 CONTROL OF JAPANESE KNOTWEED

- Operations: Spot treat in June and September during suitable weather conditions and when plants are growing vigorously.
- Herbicide: Glyphosate
- Application: as required and per manufacturer's instructions
- Arisings: remove to approved dump

350 FERTILIZER – SPRING APPLICATION

- Type: N6/P9/K6

- Application rate: 50g/m²
- 380 REINSTATEMENT OF DAMAGED LAWNS
- Damaged turf: Remove to a depth of 75mm.
 - Preparation: Cultivate substrate to a fine tilth.
 - Reinstatement: Contractor's choice of returfing or topsoiling and reseeding:
 - Returfing: Quality and appearance to match existing.
 - Reseeding: Fill with fine topsoil to BS 3882 multi purpose class, free from stones, debris and weeds. Reseed with a seed mix to match existing grass in quality and appearance.
 - Protection and watering: Provide as necessary to promote successful germination and/ or establishment.
- 381 REINSTATEMENT OF WORN OR DAMAGED LAWNS
- Worn or damaged areas: Make good by returfing or reseeding:
 - Returfing standard: To BS 7370-3, Clause 12.2.
 - Reseeding standard: To BS 7370-3, Clause 12.6.
 - Turf or seed: To match existing in appearance and quality.
 - Protection and watering: Provide as necessary to promote successful germination and/ or establishment.

SHRUBS/ TREES/ HEDGES

- 500 ESTABLISHMENT OF NEW PLANTING
- Duration: Years 1 - 3
 - Weed control:
 - Method: Keep planting beds clear of weeds by approved methods.
 - Area: Maintain a weed free area around each tree and shrub, minimum diameter the larger of 1 m or the surface of the original planting pit.
 - Soil condition: Fork over beds to keep soil loose, with gentle cambers and no hollows. Do not reduce depth or effect of mulch.
 - Watering: as required
- 502 ESTABLISHMENT OF NEW PLANTING – FERTILISER
- 60gm 'Osmacote' (15:10:12) slow release fertiliser applied around base of shrub/climber at planting time and 30gm 'Osmacote' (18:11:10) top dressing slow release fertiliser applied around base of shrub in late Spring/early Summer.
- Spreading: Spread evenly. Carefully lift and replace any mulch materials.
- 525 TREE GUARDS
- Loose or defective guards: Adjust, refix or replace to original specification and to prevent chafing.
- 535 TREE GRILLES
- Operations: Lift grilles, remove weeds, adjust levels as necessary and lightly compact. Refit grilles, refill interstices and lightly compact to correct level.
 - Material for making up levels and refilling with fine grit
- 540 PRUNING GENERALLY

- Pruning: In accordance with good horticultural and arboricultural practice.
 - Removing branches: Do not damage or tear the stem or bark.
 - Wounds: Keep as small as possible and cut cleanly back to sound wood.
 - Cutting: Make cuts above and sloping away from an outward facing healthy bud, angled so that water will not collect on cut area.
 - Larger branches: Prune neither flush nor leaving a stub, but using the branch bark ridge or branch collar as a pruning guide.
 - Appearance: Thin, trim and shape each specimen appropriately to species, location, season, and stage of growth, leaving a well balanced natural appearance.
 - Tools: Use clean sharp secateurs, hand saws or other approved tools. Trim off ragged edges of bark or wood with a sharp knife.
 - Disease or infection: Give notice if detected.
 - Growth retardants, fungicide or pruning sealant: Do not use unless instructed.
- 545 PRUNING OF EXCESSIVE OVERHANG
- Timing: November - March
 - Operations: Remove growth encroaching onto grassed areas, paths, roads, signs, sightlines and road lighting luminaires.
 - Special requirements: as necessary
- 550 PRUNING OF EXCESSIVE HEIGHT
- Timing: November - March
 - Operations: Remove excessive height
- 555 PRUNING TREES AND SHRUBS
- Standard: To BS 7370-4.
 - Special requirements: as necessary
- 570 FORMATIVE PRUNING OF YOUNG TREES
- Standard: Type and timing of pruning operations to suit the plant species.
 - Time of year: Do not prune during the late winter/ early spring sap flow period.
 - Young trees up to 4 m high:
 - Crown prune by removing dead branches and reducing selected side branches by one third to preserve a well balanced head and ensure the development of a single strong leader.
 - Remove duplicated branches and potentially weak or tight forks. In each case cut back to live wood.
 - Whips or feathered trees: Do not prune.
 - Operatives: must be trained/licenced
- 575 PRUNING ORNAMENTAL SHRUBS
- General: Prune to encourage healthy and bushy growth and desirable ornamental features, e.g. flowers, fruit, autumn colour, stem colour.
 - Suckers: Remove by cutting back level with the source stem or root.
- 580 PRUNING FLOWERING SPECIES OF SHRUBS AND ROSES
- Time of year:
 - Winter flowering shrubs: Spring.
 - Shrubs flowering between March and July: Immediately after the flowering period.
 - Shrubs flowering between July and October: Back to old wood in winter.
 - Rose bushes: Early spring to encourage basal growths and a balanced, compact habit.

- 600 TRIMMING RAPIDLY ESTABLISHING HEDGES
- General: Allow to reach planned height as rapidly as possible.
 - Form: Trim back lateral branches moderately.
- 605 TRIMMING SLOWLY ESTABLISHING HEDGES
- Operations:
 - Timing: Cut back hard in June and September to encourage bushy growth down to ground level.
 - Form: Allow to reach planned dimensions only by gradual degrees, depending on growth rate and habit.
- 615 TRIMMING FIELD HEDGES
- Operations: Trim to specified height and profile using suitable mechanical cutters.
- 620 REMOVAL OF DEAD PLANT MATERIAL
- Operations: At the end of the growing season, check all shrubs and remove all dead foliage, dead wood, and broken or damaged branches and stems.
- 625 CLIMBING PLANTS
- Pruning: Remove excess growth, to ensure that signs, light fittings, doors and windows are kept clear at all times.
 - Insecure growth: Attach to supporting wires or structures
 - Supporting structures: Check and repair as necessary.
- 630 DEAD AND DISEASED PLANTS
- Removal: as required
 - Replacement: as necessary with suitable species
- 635 REINSTATEMENT OF SHRUB/ HERBACEOUS AREAS
- Dead and damaged plants: Remove.
 - Mulch/ matting materials:
 - Carefully move to one side and dig over the soil, leaving it fit for replanting.
 - Do not disturb roots of adjacent plants.
 - Replacement plants:
 - Use pits and plants: To original specification or to match the size of adjacent or nearby plants of the same species, whichever is the greater.
- 640 THINNING BY REMOVAL OF SURPLUS PLANTS
- Plants to be thinned: as required
 - Standard: BS 7370-4.
 - Timing: Winter
 - Roots:
 - Disturbance to adjacent plants: Minimise.
 - Soil: Refill holes with topsoil to leave an even graded surface.
 - Mulch: Maintain mulch as original specification.
 - Adjacent plants: Make good any minor damage immediately.
 - Plants for retention: Select plants with a strong healthy habit.
 - Mature planting density: depending on species

642 THINNING BY TRANSPLANTING SURPLUS PLANTS

- Plants to be thinned: depending on species
- Standard: BS 7370-4.
- Timing: Winter
- Roots:
 - Disturbance to adjacent plants: Minimise.
 - Soil: Refill holes with topsoil to leave an even graded surface.
 - Mulch: Maintain mulch as original specification.
 - Adjacent plants: Make good any minor damage immediately.
- Plants for retention: Select plants with a strong healthy habit.
- Mature planting density: depending on species

650 HAND WEEDING

- General: Remove weeds entirely, including roots.
- Disturbance: Remove the minimum quantity of soil, and disturb plants, bulbs and mulched surfaces as little as possible.
- Completion: Rake area to a neat, clean condition.
- Mulch: Reinststate to original depth.

655 WEED CUTTING BY HAND OR MACHINE

- Undesirable grass, brambles and herbaceous growth: Cut down cleanly to a maximum height of 100mm.
- Herbicides: Glyphosate

657 HERBICIDE TO KILL REGROWTH

- Type: Suitable foliar acting herbicide to kill regrowth.
- Timing: Allow recommended period for herbicide to take effect before clearing dead weeds.

665 WEED CONTROL WITH WINTER HERBICIDE

- Type: Suitable residual soil acting herbicide.
- Time of year: Unless otherwise agreed, complete before end of March.
- Timing: Allow recommended period for herbicide to take effect before clearing dead weeds.

670 WEED CONTROL WITH SUMMER HERBICIDE

- Type: Suitable foliar acting herbicide.
- Timing: Allow recommended period for herbicide to take effect before clearing dead weeds.

675 DIGGING OVER

- General: Dig over beds. Do not damage existing plants, bulbs and roots.
 - Depth of dig (minimum): 100mm

680 SOIL AERATION

- Compacted soil surfaces:
 - Prick up: To aerate the soil of root areas and break surface crust.
 - Size of lumps: Reduce to crumb and level off.
 - Damage: Do not damage plants and their roots.

685 SOIL LEVEL ADJUSTMENT

- Level of soil/ mulch at edges of beds: Reduce to 50 mm below adjacent grass or hard surface.

- Arisings (if any): Spread evenly over the bed.

690 MAINTENANCE OF LOOSE MULCH

- Thickness (minimum): 50mm
- Top up: 25mm
- Mulch spill on adjacent areas: Remove weeds and rubbish and return to planted area.
- Weeding: Remove weeds growing on or in mulch by appropriate approved method.

695 FERTILISING ESTABLISHED TREES AND SHRUBS

- Time of year: May
- Type of fertiliser: N17/P17/K17
- Application: Spread evenly.
- Rate: 30g/m²

710 WOODLAND PLANTING MAINTENANCE

- Watering: In exceptional circumstances to prevent plants dying.
- Loose plants: Refirm surrounding soil, without compacting.
- Vegetation: Except trees and coppice shoots to be retained, cut down to 600mm above ground level within the plantation area.
- Arisings: Leave between rows.
- Ditches and drains: Keep clear.

715 WOODLAND THINNING

- Mature planting density: 1 per 2 square metres
- Timing: Thin in stages - Winter

TREE WORK**810 TREE WORK GENERALLY**

- Identification: Before starting work agree which trees, shrubs and hedges are to be removed or pruned.
- Protection: as recommended in BS 3998
- Standards: To BS 3998 and Health Safety Executive (HSE) 'Forestry and arboriculture safety leaflets'.
- Removing branches: Cut as Arboricultural Association Leaflet 'Mature tree management'. Cut vertical branches similarly, with no more slope on the cut surface than is necessary to shed rainwater.
- Appearance: Leave trees with a well balanced natural appearance.
- Chain saw work: Operatives must hold a Certificate of Competence.
- Tree work: To be carried out by an approved member of the Arboricultural Association.

815 ADDITIONAL WORK

- Defective, diseased, unsafe or weak parts of trees additional to those scheduled for attention: Give notice if detected.

820 PREVENTION OF WOUND BLEEDING

- Standard: To BS 3998, clause 8.

825 PREVENTION OF DISEASE TRANSMISSION

- Standard: To BS 3998, clause 9 and Appendix B.

830 CLEANING OUT AND DEADWOODING

- Remove:
 - Dead, dying, or diseased wood, broken branches and stubs.
 - Fungal growths and fruiting bodies.
 - Rubbish, wind blown or accumulated in branch forks.
 - Wires, clamps, boards and metal objects, if removable without causing further damage and not part of a support structure that is to be retained.
 - Other unwanted objects, e.g. tree houses, swings.

835 CUTTING AND PRUNING GENERALLY

- Tools: Appropriate, well maintained and sharp.
- Final pruning cuts:
 - Chainsaws: Do not use on branches of less than 50 mm diameter.
 - Hand saws: Form a smooth cut surface.
 - Anvil type secateurs: Do not use.
- Removing branches: Do not damage or tear the stem.
- Wounds: Keep as small as possible, cut cleanly back to sound wood leaving a smooth surface, and angled so that water will not collect on the cut area.
- Cutting: Cut at a fork or at the main stem to avoid stumps wherever possible.
- Large branches:
 - Remove in small sections and lower to ground with ropes and slings.
- Dead branches and stubs: When removing, do not cut into live wood.
- Unsafe branches: Remove epicormic shoots and potentially weak forks that could fail in adverse weather conditions.
- Disease or fungus: Give notice if detected. Do not apply fungicide or sealant unless instructed.

840 CROWN REDUCTION/ SHAPING

- General: Cut back selectively to lateral or sublateral buds or branches to retain flowing branch lines without leaving stumps.
- Operations: Winter

845 CROWN LIFTING

- Clearances: Remove branch systems to give clearance.
 - Height: as required
- Removing branches: Remove whole branches back to the stem, or cut lower portions of branches back to lateral or sublateral buds or branches. Do not leave stumps.

850 CROWN THINNING

- Removing branches: Remove inward growing, crossing, rubbing, dead and damaged branches.
- Thinning: Selectively remove secondary and small live branch growth evenly throughout the crown.
 - Quantity: as required
- Branches: Cut back to lateral or sublateral buds or branches without leaving stumps.
- Appearance: Leave a uniform and well balanced structure of branches and foliage.

855 CUTTING TREE ROOTS

- Excavating: Use hand tools only.
- Protected area: Do not cut roots within an area which is the larger of:
 - The branch spread of the tree.
 - An area with a radius of half the tree's height, measured from the trunk.
- Outside protected area: Give notice of roots exceeding 50 mm in diameter. Do not cut without approval.
- Cutting:
 - Cutting: Make clean smooth cuts with a hand saw.
 - Wounds: Minimize. Avoid ragged edges.
 - Finishing: Pare cut surfaces smooth with a sharp knife.
- Backfilling:
 - Protection: Cover cut roots with clean sharp sand.
 - Material: Backfill with original topsoil.

860 REMOVING TREES, SHRUBS AND HEDGES

- Standards: To BS 3998, Appendix A and Health Safety Executive (HSE)/ Arboricultural and Forestry Advisory Group Safety Leaflets.
- Existing services: Check for below and above ground services. Give notice if they may be affected.
- Shrubs and smaller trees: Cut down and grub up roots.
- Tree stumps:
 - Removal: to approved dump
 - Removal by winching: Give notice. Do not use other trees as supports or anchors.
- Protection: as required
- Work near retained trees: Where tree canopies overlap and in confined spaces generally, take down trees carefully in small sections to avoid damage to adjacent trees that are to be retained.
- Filling holes:
 - Material: Use as-dug material and/ or imported soil as required.
 - Finishing: Consolidate and grade to marry in with surrounding ground level.

865 BARK DAMAGE

- Wounds:
 - Do not attempt to stop sap bleeding.
 - Bark: Remove ragged edges using a sharp knife.
 - Wood: Remove splintered wood from deep wounds.
 - Size: Keep wounds as small as possible.
 - Liquid or flux oozing from apparently healthy bark: Give notice.

870 CAVITIES IN TREES

- Investigation: Remove rubbish and rotten wood. Probe the cavity to find the extent of any decay, and give notice.
- Water filled cavities: Do not drain.
- Sound wood inside cavities: Do not remove.
- Cavity openings: treat with approved method

HARD LANDSCAPE AREAS/ FENCING

910 HARD SURFACES AND GRAVEL AREAS

- Herbicide: Apply a suitable foliar acting or residual herbicide. Allow recommended period for herbicide to take effect before clearing arisings.
- Hard surfaces: Remove litter, leaves and other debris.
- Surface gutters and channels: Remove mud, silt and debris.
- Drainage gullies: Empty traps and flush clean.
- Gravel areas: Rake over. Remove weeds, litter, leaves and debris, and level off.
- Repairs to flexible bituminous pavings: In accordance with the original paving specification or BS 7370-2, clause 4.12.
- Stain removal: In accordance with BS 7370-2, table 4.

APPENDIX 1 - ISSUE HISTORY

Revision	Edit time/Date	Status/Revisions	Issue Date
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Q40 FENCING

To be read with Preliminaries/ General conditions.

FENCING SYSTEMS**310 CLOSE BOARDED FENCING**

- Standard: To BS 1722-5, type SWC 120 & 180
- Height: 144mm wide boards – height varies 1200 (above wall) and 1800mm – for heights see site boundary drawings
- Wood: softwood
 - Treatment: As section Z12 and British Wood Preserving and Damp-proofing Association Commodity Specification C3
- Boards/ rails: softwood feather edge boards and arris rails
- Posts: 150 x 150mm **concrete** with min 4no reinforcing bars
- Centres of posts (maximum): 2.4m to BS 1722-5
- Method of setting posts: To BS 1722
- Accessories: no gravel board.
- Conformity: Submit manufacturer's and installer's certificates, to BS 1722-5.
All securing bolts and nuts to be embedded in timber
Ideally bolts should be appropriately sized so that there is no projection but where this is not possible cut all projecting bolts and paint exposed cuts with cold galvanising touch-up paint

410 PURPOSE MADE METAL RAILINGS

DWG REF: 2148-012

- Standard: To BS 1722- except as varied on drawings and below.
Galvanised Steel rails, uprights and fixings as per drawings to be sub-contractor designed for the approval of the employer or their delegate including fixing
- Height: See drawings for details
- Materials: steel flats sizes as drawings
 - Treatment: Hot dipped galvanising generally to be to BS EN ISO 1461
- Method of setting posts: Fixings to walls below to structural engineers details and specification. Where railing has no wall below fixing to be as per contractors design
- Accessories: to include a concrete mowing strip at back of footpath if railing extends to ground level (without wall)

GATES, POSTS AND STILES**550 WOOD GATE ADJACENT TO CLOSE BOARDED FENCING**

- Standard: To BS 5709.
- Wood: softwood 1.8m high to match fence clause Q40.310
- Treatment: As section Z12 and British Wood Preserving and Damp-proofing Association Commodity Specification C3.
 - Type: Copper Azole (CuAz)
- Adhesive: Synthetic resin to BS EN 301, type 1.
- Workmanship: As section Z10.

- Fittings: 3 number 300mm galvanised strap hinges, auto-gate latch stop, 1 suffock gate latch, 1 cabin hook and 1 barrel bolt
- Method of fixing: **Concrete** posts as main fence unless gate is adjacent to dwelling in which case gate frame should be fixed to external face of cavity wall
- Accessories:
All securing bolts and nuts to be embedded in timber
Ideally bolts should be appropriately sized so that there is no projection but where this is not possible cut all projecting bolts and paint exposed cuts with cold galvanising touch-up paint

EXECUTION

710 INSTALLATION GENERALLY

- Set out and erect:
 - Alignment: Straight lines or smoothly flowing curves.
 - Tops of posts: Following profile of the ground.
 - Setting posts: Rigid, plumb and to specified depth, or greater where necessary to ensure adequate support.
 - Fixings: All components securely fixed.

715 COMPETENCE

- Operatives: Contractors must employ competent operatives.
- Qualifications: Submit certification of training.

720 SETTING POSTS IN CONCRETE

- Standard: To BS 8500-2.
- Mix: Designated concrete not less than GEN1 or Standard prescribed concrete not less than ST2.
- Alternative mix for small quantities: 50 kg Portland cement to 150 kg fine aggregate to 250 kg 20 mm nominal maximum size coarse aggregate, medium workability.
- Admixtures: Do not use.
- Holes: Excavate neatly and with vertical sides.
- Filling: Position post/ strut and fill hole with concrete to not less than the specified depth, well rammed as filling proceeds and consolidated.
- Backfilling of holes not completely filled with concrete: Excavated material, well rammed and consolidated.

730 EXPOSED CONCRETE FOUNDATIONS

- Filling: Compact until air bubbles cease to appear on the upper surface.
- Finishing: Weathered to shed water and trowelled smooth.

740 SETTING POSTS IN EARTH

- Holes: Excavated neatly, with vertical sides and as small as practicable to allow refilling.
- Filling: Position posts/ struts and replace excavated material, well rammed as filling proceeds.

750 DRIVEN POSTS

- Damage to heads: Minimize.
- Repair: Neatly finish post tops after installation.

760 NAILED WOOD RAILS

- Length (minimum): Two bays, with joints in adjacent rails staggered.
- Fixing: Nail each length of rail to each post with two 100 mm galvanized nails.
- Rails with split ends: Replace.

766 ARRIS RAILS

- Fixing:
 - Rail end section: Shaped to adequately fill the post mortice or recess.
 - Recessed posts: Rails bolted to each post.
 - Top rails: Fixed at both ends using screws
- Rails with split ends: Replace.

770 SITE CUTTING OF WOOD

- General: Kept to a minimum.
- Below or near ground level: Cutting prohibited.
- Treatment of surfaces exposed by minor cutting and drilling: Two flood coats of solution recommended for the purpose by main treatment solution manufacturer.

780 DAMAGE TO GALVANIZED SURFACES

- Treatment of minor damage (including on fasteners and fittings): Low melting point zinc alloy repair rods or powders made for this purpose, or at least two coats of zinc-rich paint to BS 4652.
- Thickness: Apply sufficient material to provide a zinc coating at least equal in thickness to the original layer.

790 SITE PAINTING

- Timing: Prepare surfaces and apply finishes as soon as possible after fixing.

COMPLETION**910 CLEANING**

- General: Leave the works in a clean, tidy condition.
- Surfaces: Clean immediately before handover.

920 FIXINGS

- All components: Tighten.
- Timing: Before handover.

930 GATES

- Hinges, latches and closers: Adjust to provide smooth operation. Lubricate where necessary.
- Timing: Before handover.

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Q50 SITE/ STREET FURNITURE/ EQUIPMENT

To be read with Preliminaries/ General conditions.

GATES, BARRIERS AND PARKING CONTROLS

120 STEEL GATE TO FRONT GARDENS

- Standard: To BS 4092-1.
 - Materials and workmanship: As section Z11.
 - Jointing: Welded.
 - Finish as delivered: Hot dip galvanised to BS EN ISO 1461 after fabrication
 - Fittings and accessories: hinges, Lockable gate latch and gate stop all hot dip galvanised to BS EN ISO 1461 after fabrication
 - Method of setting posts: To be fixed to external wall
- REFER TO DWGS FOR ADDITIONAL DETAIL INCLUDING 2148-012

SITE AND STREET FURNITURE

330 ROTARY CLOTHES DRIER

- Manufacturer: to be approved by sample
- Size: minimum length of 6+ for all 3+ bedroom dwellings
 - Arms: 4
- Method of fixing: Ground spike as per manufacturers recommendations. Spike to be concreted in – location indicated on site plan

INSTALLATION

510 CONCRETE FOUNDATIONS GENERALLY

- Standard: To BS 8500-2.
- Mix: Designated concrete not less than GEN 1 or standard prescribed concrete not less than ST2.
- Admixtures: Do not use.
- Foundation holes: Neat vertical sides.
- Depth of foundations, bedding, haunching: Appropriate to provide adequate support and to receive overlying soft landscape or paving finishes.

515 SETTING COMPONENTS IN CONCRETE

- Holes: to suit diameter of pole
- Components: Accurately positioned and securely supported.
- Concrete fill: Fully compacted as filling proceeds.
- Concrete foundations exposed to view: Compacted until air bubbles cease to appear on the upper surface, then weathered to shed water and trowelled smooth.
- Temporary component support: Maintain undisturbed for minimum 48 hours.

520 SETTING IN EARTH

- Holes: As small as practicable.
- Components being fixed: Accurately positioned and securely supported.
- Buried depth (minimum): as per manufacturers recommendations

- Earth refill: Well rammed as filling proceeds.
- 540 BUILDING IN TO MASONRY WALLS
 - Components being built in: Accurately positioned and securely supported. Set in mortar and pointed neatly to match adjacent walling.
 - Temporary support: Maintain for 48 hours (minimum) and prevent disturbance.
- 550 DAMAGE TO GALVANIZED SURFACES
 - Minor damage in areas up to 40 mm² (including on fixings and fittings): Make good.
 - Material: Low melting point zinc alloy repair rods or powders made for this purpose or at least two coats of zinc-rich paint to BS 4652.
 - Thickness: Sufficient to provide a zinc coating at least equal to the original layer.
- 560 SITE PAINTING
 - Timing: Prepare surfaces and apply finishes as soon as possible after fixing.

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R10 RAINWATER DRAINAGE SYSTEMS

To be read with Preliminaries/ General conditions.

GENERAL**110 GRAVITY RAINWATER DRAINAGE SYSTEM**

- Rainwater outlets: N/A
- Gutters: uPVC half round profile – colour to be confirmed by client
- Pipework: uPVC square profile – colour to be confirmed by client
- Below ground drainage: as section R12
- Disposal: to storm sewer as section R12
- Controls: N/A
- Accessories: as per detailed sections below

SYSTEM PERFORMANCE**210 DESIGN**

- Design: Complete the design of the rainwater drainage system.
- Standard: To BS EN 12056-3, clauses 3–7 and National Annexes.
- Proposals: Submit drawings, technical information, calculations and manufacturers' literature.

221 COLLECTION AND DISTRIBUTION OF RAINWATER

- General: Complete, and without leakage or noise nuisance.

230 DESIGN PARAMETERS – GENERAL

- Roof and gutter construction and finish: As detailed sections below
- Design rate of rainfall: As BS EN 12056-3, National Annex NB.2.
 - Category: 1
- Design life of building: minimum 60 years
- Available capacity of existing below ground drainage (maximum): refer to engineer's specification

PRODUCTS**350 PVC-U GUTTERS**

- Standard: To the relevant parts of BS EN 607 and BS EN 1462, Kitemark certified.
- Manufacturer: to be agreed by sample
- Recycled content: None
- Profile: half round
- Nominal size: to be agreed once manufacturer confirmed – flow rate calcs designed to building regs and BS EN 12056-3
- Colour: self coloured client or their representative to select colour for full range of colours
- Brackets: uPVC
 - Fixings: as per manufacturer's recommendations
 - Size: as per manufacturer's recommendations
- Accessories: All corners, offsets, junctions, shoes, stop ends, etc as required.

360 SEALANT FOR GUTTERS

- Type: as manufacturer's recommendations

365 PROPRIETARY RAINWATER CHANNEL TO THRESHOLDS AND DRIVEWAYS

- Manufacturer: to be approved by sample
 - Product reference: Load class B125
- Type of grate/ Fittings: heel guard grating
- Outlet: Type and direction to suit pipework with suitable adaptors and connections.
- Accessories: _____ .

366 PROPRIETARY RAINWATER OUTLETS TO CANOPIES / FLAT ROOFS

- Manufacturer: to be approved by sample
- Roof construction: Sub contractor designed GRP canopy or single layer polymeric sheet flat roof covering
 - Roof insulation thickness: See detailed drawings for details
- Type of grate/ Fittings: Domed grating
- Outlet: Type and direction to suit pipework with suitable adaptors and connections.
- Accessories: as required

420 PVC-U PIPEWORK – EXTERNAL

- Standard: To BS EN 12200-1, Kitemark certified.
- Manufacturer: to be agreed by sample
- Recycled content: None
- Section: square
- Nominal size: to be agreed once manufacturer confirmed – flow rate calcs designed to building regs and BS EN 12056-3
- Colour: self coloured client or their representative to select colour for full range of colours
- Brackets: uPVC
 - Fixings: as per manufacturer's recommendations
 - Size: as per manufacturer's recommendations
- Accessories: All corners, offsets, junctions, shoes, stop ends, etc as required.

EXECUTION**600 PREPARATION**

- Work to be completed before commencing work specified in this section:
 - Below ground drainage. Alternatively, make temporary arrangements for dispersal of rainwater without damage or disfigurement of the building fabric and surroundings.
 - Painting of surfaces which will be concealed or inaccessible.

605 INSTALLATION GENERALLY

- Electrolytic corrosion: Avoid contact between dissimilar metals where corrosion may occur.
- Plastics and galvanized steel pipes: Do not bend.
- Allowance for thermal and building movement: Provide and maintain clearance as fixing and jointing proceeds.
- Protection:
 - Fit purpose made temporary caps to prevent ingress of debris.
 - Fit access covers, cleaning eyes and blanking plates as the work proceeds.

610 FIXING AND JOINTING GUTTERS

- Brackets: Securely fixed.
 - Fixings: screws
Fixing centres: as per manufacturers recommendations
 - Additional brackets: Where necessary to maintain support and stability, provide at joints in gutters and near angles and outlets.
 - Roofing underlay: Dressed into gutter.
- 615 SETTING OUT EAVES GUTTERS – TO FALLS
- Setting out: To true line and even gradient to prevent ponding or backfall. Position high points of gutters as close as practical to the roof and low points not more than 50 mm below the roof.
 - Outlets: Align with connections to below ground drainage.
- 630 INSTALLING RAINWATER OUTLETS
- Fixing: Secure. Fix before connecting pipework.
 - Junctions between outlets and pipework: Accommodate movement in structure and pipework.
- 635 FIXING PIPEWORK
- Pipework: Fix securely, plumb and/ or true to line.
 - Branches and low gradient sections: Fix with uniform and adequate falls to drain efficiently.
 - Externally socketed pipes and fittings: Fix with sockets facing upstream.
 - Additional supports: Provide as necessary to support junctions and changes in direction.
 - Provide a loadbearing support at least at every storey level.
 - Tighten fixings as work proceeds so that every storey is self supporting.
 - Wedge joints in unsealed metal pipes to prevent rattling.
 - Wall and floor penetrations: Isolate pipework from structure.
 - Pipe sleeves: As section P31.
 - Masking plates: Fix at penetrations if visible in the finished work.
 - Expansion joint pipe sockets: Fix rigidly to buildings. Elsewhere, provide brackets and fixings that allow pipes to slide.
- 640 FIXING VERTICAL PIPEWORK
- Bracket fixings: screws and wall plugs
 - Distance between bracket fixing centres (maximum): as per manufacturers recommendations
- 645 FIXING LOW GRADIENT PIPEWORK
- Bracket fixings: screws
 - Distance between bracket fixing centres (maximum): as per manufacturers recommendations
- 650 JOINTING PIPEWORK AND GUTTERS
- General: Joint with materials and fittings that will make effective and durable connections.
 - Jointing differing pipework and gutter systems: Use adaptors intended for the purpose.
 - Cut ends of pipes and gutters: Clean and square. Remove burrs and swarf. Chamfer pipe ends before inserting into ring seal sockets.
 - Jointing or mating surfaces: Clean and, where necessary, lubricate immediately before assembly.
 - Junctions: Form with fittings intended for the purpose.

- Jointing material: Strike off flush. Do not allow it to project into bore of pipes and fittings.
 - Surplus flux, solvent jointing materials and cement: Remove.
- 665 INSTALLING PREFABRICATED GALVANIZED STEEL PIPEWORK
- Installation: Do not cut pipes to length or otherwise damage coatings.
- 675 CUTTING COATED PIPEWORK AND GUTTERS
- Cutting: Recoat bare metal.
- 680 FIXING INSULATION TO INTERNAL PIPELINES AND GUTTERS
- Fixing: Secure and neat. Provide continuity at supports and leave no gaps. Fix split pipe insulation with the split on 'blind' side of pipeline.
 - Method: _____.
 - Timing: Do not fit insulation until completion of pipe airtightness or leakage testing.
- 685 IDENTIFICATION OF INTERNAL RAINWATER PIPEWORK
- Markings: To BS 1710.
 - Type: Permanent; integral or painted pipe colour, self-adhesive bands or identification clips.
 - Locations: Junctions, both sides of slabs, bulkheads and wall penetrations.
- 690 ELECTRICAL CONTINUITY – PIPEWORK
- Joints in metal pipes with flexible couplings: Clips (or suitable standard pipe couplings) supplied for earth bonding by pipework manufacturer to ensure electrical continuity.
- 695 ELECTRICAL CONTINUITY – GUTTERS
- Joints in metal gutters: Purpose made links supplied by the gutter manufacturer to ensure electrical continuity.
- 700 ACCESS FOR TESTING AND MAINTENANCE
- General: Install pipework and gutters with adequate clearance to permit testing, cleaning and maintenance, including painting where necessary.
 - Access fittings and rodding eyes: Position so that they are not obstructed.

COMPLETION

- 900 TESTING GENERALLY
- Dates for testing: Give notice.
 - Period of notice (minimum): 2 days
 - Preparation:
 - Pipework: Complete, securely fixed, free from defects, obstruction and debris before testing.
 - Testing:
 - Supply clean water, assistance and apparatus.
 - Do not use smoke to trace leaks.
 - Records: Submit a record of tests.
- 905 INTERNAL PIPEWORK TEST – ENGLAND, WALES, IRELAND AND NORTHERN IRELAND
- Preparation: Temporarily seal open ends of pipework with plugs.
 - Test apparatus: Connect a 'U' tube water gauge and air pump to pipework via a plug.

- Testing: Pump air into pipework until gauge registers 38 mm.
- Required performance:
 - Allow a period for temperature stabilization, after which the pressure of 38 mm is to be maintained without loss for at least 3 minutes.

910 GUTTER TEST

- Preparation: Temporarily block all outlets.
- Testing: Fill gutters to overflow level and after 5 minutes closely inspect for leakage.

915 MAINTENANCE INSTRUCTIONS

- General: At completion, submit printed instructions recommending procedures for maintenance of the rainwater installation, including full details of recommended inspection, cleaning and repair procedures.

920 IMMEDIATELY BEFORE HANDOVER

- Construction rubbish, debris, swarf, temporary caps and fine dust which may enter the rainwater system: Remove. Do not sweep or flush into the rainwater system.
- Access covers, rodding eyes, outlet gratings and the like: Secure complete with fixings.

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R11 ABOVE GROUND FOUL DRAINAGE SYSTEMS

To be read with Preliminaries/ General conditions.

GENERAL**115 ABOVE GROUND FOUL DRAINAGE SYSTEM**

- Sanitary and floor drainage outlets: Floor drain

SYSTEM PERFORMANCE**210 DESIGN**

- Design: Complete the design of the above ground foul drainage system.
- Standards: To BS EN 12056-1 and BS EN 12056-2, and in accordance with BS EN 12056-2 National Annexes NA-NG.
- System type to BS EN 12056-2: System III.
- Proposals: Submit drawings, technical information, calculations and manufacturers' literature.

220 COLLECTION AND DISTRIBUTION OF FOUL WATER

- General: Quick, quiet and complete, self-cleansing in normal use, without blockage, crossflow, backfall, leakage, odours, noise nuisance or risk to health.
- Pressure fluctuations in pipework (maximum): ± 38 mm water gauge.
- Water seal retained in traps (minimum): 25 mm.

PRODUCTS**315 FLOOR DRAINS TO SHOWER ROOM**

- Manufacturer: to be approved by sample
 - Floor finish: vinyl sheet M50-150
 - Body type: to be confirmed by sample
 - Material: Plastic (ABS)
 - Grating/ cover:
 - Type: Grating (peripheral slot)
 - Material: Nickel Bronze or stainless steel – to be confirmed by sample
 - Outlet: Type and direction to suit pipework.
 - Accessories: To include removable dip tube, removable bucket
- To include:
- Load rating L15
- Clamping collar to provide water-tight seal between flooring material and gulley even when the grating is removed.
- Water seal to be formed by a bucket and dip tube, the water seal depth to be 50mm to comply with plumbing codes of practice in UK
- Flow rate to be in excess of 40L/min min BS EN274
- Accessible removable grating/cover/trap to enable easy access from above for maintenance purposes.
- Bucket to be removable filter bucket to eliminate blockages and intercepts jewellery, etc.
- 110mm dia spigot outlet for solvent-weld or ring-seal connection to PVC pipework (50mm reducer to be supplied loose if required)

The gulley must be supported and installed in accordance with the instructions from the manufacturer.

Include connection to pipework to mechanical engineer's specifications

EXECUTION

601 INSTALLATION GENERALLY

- Standard: To BS EN 12056-5.
- Components: From the same manufacturer for each type of pipework.
- Electrolytic corrosion: Avoid contact between dissimilar metals where corrosion may occur.
- Plastics and galvanized steel pipes: Do not bend.
- Allowance for thermal and building movement: Provide and maintain clearance as fixing and jointing proceeds.
- Concealed or inaccessible surfaces: Decorate before starting work specified in this section.
- Protection:
 - Purpose made temporary caps: Fit to prevent ingress of debris.
 - Access covers, cleaning eyes and blanking plates: Fit as the work proceeds.

605 PIPE ROUTES

- General: The shortest practical, with as few bends as possible.
- Bends in wet portion of soil stacks: Not permitted.
- Routes not shown on drawings: Submit proposals before commencing work.

610 FIXING PIPEWORK

- Pipework: Fix securely plumb and/ or true to line. Fix discharge stack pipes at or close below socket collar or coupling.
- Branches and low gradient sections: Fix with uniform and adequate falls to drain efficiently.
- Externally socketed pipes and fittings: Fix with sockets facing upstream.
- Additional supports: Provide as necessary to support junctions and changes in direction.
- Vertical pipes: Provide a load bearing support not less than every storey level. Tighten fixings as work proceeds so that every storey is self supporting.
- Wall and floor penetrations: Isolate pipework from structure, e.g. with pipe sleeves.
 - Masking plates: Fix at penetrations if visible in the finished work.
- Expansion joint sockets: Fix rigidly to the building.
- Fixings: Allow the pipe to slide.

615 FIXING VERTICAL PIPEWORK

- Bracket fixings: screws
- Distance between bracket fixing centres (maximum): as per manufacturers recommendations

620 FIXING LOW GRADIENT PIPEWORK

- Bracket fixings: screws
- Distance between bracket fixing centres (maximum): as per manufacturers recommendations

630 JOINTING PIPEWORK – GENERALLY

- General: Joint with materials, fittings and techniques that will make effective and durable connections.
- Jointing differing pipework systems: With adaptors intended for the purpose.

- Cut ends of pipes: Clean and square. Remove burrs and swarf. Chamfer pipe ends before inserting into ring seal sockets.
 - Jointing or mating surfaces: Clean and, where necessary, lubricate immediately before assembly.
 - Junctions: Form with fittings intended for the purpose.
 - Jointing material: Do not allow it to project into bore of pipes and fittings.
 - Surplus flux, solvent jointing materials and cement: Remove from joints.
- 675 COATED PIPES
- Cutting: Recoat bare metal.
- 680 ELECTRICAL CONTINUITY
- Joints in metal pipes with flexible couplings: Make with clips (or suitable standard pipe couplings) supplied for earth bonding by pipework manufacturer to ensure electrical continuity.
- 685 IDENTIFICATION OF INTERNAL FOUL DRAINAGE PIPEWORK
- Markings: To BS 1710.
 - Type: Integral lettering on pipe wall, self-adhesive bands or identification clips.
 - Locations: At 500 mm centres, junctions and both sides of slabs, valves, appliances, bulkheads and wall penetrations.
- 690 IDENTIFICATION OF INTERNAL GREY WATER DRAINAGE PIPEWORK
- Grey water: As defined in BS EN 12056-1, clause 3.1.
 - Markings: To BS 1710:
 - Type: Integral lettering on pipe wall, self-adhesive bands or identification clips.
 - Locations: At 500 mm centres, junctions, and both sides of slabs, valves, appliances, bulkheads and wall penetrations.
- 695 DISCHARGE AND VENTILATING STACKS
- Terminations: Perforated cover or cage that does not restrict airflow.
 - Material: uPVC
- 700 INSTALLING AIR ADMITTANCE VALVES
- Position: Vertical, above flood level of highest appliance served and clear of insulation materials (other than the manufacturer's insulating cover).
 - Connection to discharge stack: Allow removal for rodding, e.g. ring seal.
 - Roof spaces and other unheated locations: Fit manufacturer's insulating cover.
- 703 FIXING INSULATION TO INTERNAL PIPELINES
- Fixing: Secure and neat. Provide continuity at supports and leave no gaps. Fix split pipe insulation with the split on 'blind' side of pipeline.
 - Timing: Do not fit insulation until completion of pipe airtightness or leakage testing.
- 705 ACCESS FOR TESTING AND MAINTENANCE
- General: Install pipework with adequate clearance to permit testing, cleaning and maintenance, including painting where necessary.
 - Access fittings and rodding eyes: Position to avoid obstruction.

COMPLETION

- 900 TESTING GENERALLY
- Dates for testing: Give notice.
 - Period of notice (minimum): 4 weeks .

- Preparation:
 - Pipework: Securely fixed and free from obstruction and debris.
 - Traps: Filled with clean water.
 - Testing:
 - Supply clean water, assistance and apparatus.
 - Do not use smoke to trace leaks.
 - Records: Submit a record of tests.
- 905 PIPEWORK AIRTIGHTNESS TEST
- Preparation:
 - Open ends of pipework: Temporarily seal using plugs.
 - Test apparatus: Connect a 'U' tube water gauge and air pump to pipework via a plug or through trap of an appliance.
 - Testing: Pump air into pipework until gauge registers 38 mm.
 - Required performance: Pressure of 38 mm is to be maintained without loss for at least three minutes.
- 910 SIPHONAGE AND BACK PRESSURE TESTS
- Method:
 - WC pans: Test by flushing.
 - Other appliances: Test by filling to overflow level, then removing the plug.
 - Number of tests: Test each appliance three times. Recharge traps before each test.
 - Self siphonage testing: Test each appliance individually.
 - Induced siphonage and back pressure testing: Test by discharging the following numbers of appliances simultaneously on each stack:
 - WCs: 2.
 - Washbasins: 2 .
 - Sinks: 2 .
 - Selection of appliances: Submit proposals.
- 915 PREHANDOVER CHECKS
- Temporary caps: Remove.
 - Permanent blanking caps, access covers, rodding eyes, floor gratings and the like: Secure complete with fixings.
- 920 SUBMITTALS
- Manufacturer's instructions for grease traps: Handover at completion.

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Z10 PURPOSE MADE JOINERY

To be read with Preliminaries/ General conditions.

110 FABRICATION

- Standard: To BS 1186-2.
- Sections: Accurate in profile and length, and free from twist and bowing. Formed out of solid unless shown otherwise.
 - Machined surfaces: Smooth and free from tearing, wooliness, chip bruising and other machining defects.
- Joints: Tight and close fitting.
- Assembled components: Rigid. Free from distortion.
- Screws: Provide pilot holes.
 - Screws of 8 gauge (4 mm diameter) or more and screws into hardwood: Provide clearance holes.
 - Countersink screws: Heads sunk at least 2 mm below surfaces visible in completed work.
- Adhesives: Compatible with wood preservatives applied and end uses of timber.

120 CROSS SECTION DIMENSIONS OF TIMBER

- General: Dimensions on drawings are finished sizes.
- Maximum permitted deviations from finished sizes:
 - Softwood sections: To BS EN 1313-1:-
 - Clause 6 for sawn sections.
 - Clause NA.2 for further processed sections.
 - Hardwood sections: To BS EN 1313-2:-
 - Clause 6 for sawn sections.
 - Clause NA.3 for further processed sections.

130 PRESERVATIVE TREATED WOOD

- Cutting and machining: Completed as far as possible before treatment.
- Extensively processed timber: Retreat timber sawn lengthways, thickened, planed, ploughed, etc.
- Surfaces exposed by minor cutting and/ or drilling: Treat as recommended by main treatment solution manufacturer.

140 MOISTURE CONTENT

- Wood and wood based products: Maintained within range specified for the component during manufacture and storage.

210 LAMINATED PLASTICS VENEERED BOARDS/ PANELS

- Fabrication: To British Laminated Plastics Fabricators Association Ltd (BLF) fabricating standards.
- Balancing veneer: From decorative veneer manufacturer and of similar composition. Applied to reverse side of core material.
- Finished components: Free from defects, including bow, twist, scratches, chipping, cracks, pimpling, indentations, glue marks, staining and variations in colour and pattern.
- Joints visible in completed work: Tight butted, true and flush.

220 WOOD VENEERED BOARDS/ PANELS

- Core material and veneers: Conditioned before bonding.
- Setting out: Veneer features and grain pattern aligned regularly and symmetrically unless instructed otherwise.
- Balancing veneer: Applied to reverse side of core material.

- Moisture and temperature movement characteristics: As facing veneer.
- Veneer edges: Tight butted and flush, with no gaps.
- Tolerance of veneer thickness (maximum): ± 0.5 mm.
- Finished components: Free from defects, including bow, twist, scratches, chipping, splits, blebs, indentations, glue marks and staining.
- Surface finish: Fine, smooth, free from sanding marks.

250 FINISHING

- Surfaces: Smooth, even and suitable to receive finishes.
 - Arrises: Eased unless shown otherwise on drawings.
- End grain in external components: Sealed with primer or sealer as section M60 and allowed to dry before assembly.

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Z11 PURPOSE MADE METALWORK

To be read with Preliminaries/ General conditions.

PRODUCTS**310 MATERIALS GENERALLY**

- Grades of metals, section dimensions and properties: To appropriate British Standards. When not specified, select grades and sections appropriate for the purpose.
- Prefinished metal: May be used if methods of fabrication do not damage or alter appearance of finish, and finish is adequately protected.
- Fasteners: To appropriate British Standards and, unless specified otherwise, of same metal as component being fastened, with matching coating or finish.

320 STEEL LONG AND FLAT PRODUCTS

- Hot rolled structural steels (excluding structural hollow sections and tubes): To BS EN 10025-1.
- Fine grain steels, including special steels: To BS EN 10025-3 and -4.
- Steels with improved atmospheric corrosion resistance: To BS EN 10025-5.

330 STEEL PLATE, SHEET AND STRIP

- Plates and wide flats, high yield strength steel: To BS EN 10025-6.

340 HOT ROLLED STEEL PLATE, SHEET AND STRIP

- Flat products, high yield strength for cold forming: To BS EN 10149-1, -2 and -3.
- Carbon steel sheet and strip for cold forming: To BS EN 10111.
- Narrow strip, formable steel and steel for general engineering purposes: To BS 1449-1.8 and BS 1449-1.14.

350 COLD ROLLED STEEL PLATE, SHEET AND STRIP

- Steel sections: To BS EN 10162.
- Flat products, high yield strength micro-alloyed steels for cold forming: To BS EN 10268.
- Carbon steel flat products for cold forming: To BS EN 10130 and BS EN 10131.
- Uncoated carbon steel narrow strip for cold forming: To BS EN 10139 and BS EN 10140.
- Narrow strip steel for general engineering purposes: To BS EN 10132-1, -2, and -3.
- Carbon steel flat products for vitreous enamelling: To BS EN 10209.

360 COATED STEEL FLAT PRODUCTS

- Hot dip zinc coated carbon steel sheet and strip for cold forming: To BS EN 10327 and BS EN 10143.
- Hot dip zinc coated structural steel sheet and strip: To BS EN 10143 and BS EN 10326.
- Hot dip zinc-aluminium (za) coated sheet and strip: To BS EN 10326 and 10327.
- Hot dip aluminium-zinc (az) coated sheet and strip: To BS EN 10327.
- Organic coated flat products: To BS EN 10169-1.

370 STEEL STRUCTURAL HOLLOW SECTIONS (SHS)

- Non alloy and fine grain steels, hot finished: To BS EN 10210-1 and -2.
- Non-alloy and fine grain steels, cold formed welded: To BS EN 10219-2.
- Weather resistant steels, hot finished: To BS 7668.

380 OTHER STEEL SECTIONS

- Equal flange tees: To BS EN 10055.
- Equal and unequal angles: To BS EN 10056-1 and -2.
- Wire, carbon steel for general engineering purposes: To BS 1052.
- Wire and wire products, general: To BS EN 10218-2.
- Tubes:
 - Seamless circular: To BS EN 10297-1.
 - Seamless cold drawn: To BS EN 10305-1.
 - Welded and cold sized square and rectangular: To BS EN 10305-5.
 - Welded circular: To BS EN 10296-1.
 - Welded cold drawn: To BS EN 10305-2.
 - Welded cold sized: To BS EN 10305-3.

400 STAINLESS STEEL PRODUCTS

- Chemical composition and physical properties: To BS EN 10088-1.
- Sheet, strip and plate: To BS EN 10088-2.
- Semi-finished products bars, rods and sections: To BS EN 10088-3.
- Wire: To BS EN 10088-3.
- Tubes:
 - Welded circular: To BS EN 10296-2.
 - Seamless circular: To BS EN 10297-2.

410 ALUMINIUM ALLOY PRODUCTS

- Designations:
 - Designation system, chemical composition and forms: To BS EN 573-1, -2, -3 and -5.
 - Temper designations: To BS EN 515.
- Sheet, strip and plate: To BS EN 485-1 to -4.
- Cold drawn rods, bars and tubes: To BS EN 754-1 and -2.
- Extruded rods, bars, tubes and profiles: To BS EN 755-1 and -2.
- Drawn wire: To BS EN 1301-1, -2 and -3.
- Rivet, bolt and screw stock: To BS 1473.
- Structural sections: To BS 1161.

420 COPPER ALLOY PRODUCTS

- Sheet, strip, plate and circles for general purposes: To BS EN 1652.
- Sheet and strip for building purposes: To BS EN 1172.
- Rods: To BS EN 12163.
- Profiles and rectangular bars: To BS EN 12167.
- Wire: To BS EN 12166.
- Tubes: To BS EN 12449.

FABRICATION**515 FABRICATION GENERALLY**

- Contact between dissimilar metals in components: Avoid.
- Finished components: Rigid and free from distortion, cracks, burrs and sharp arrises.
 - Moving parts: Free moving without binding.
- Corner junctions of identical sections: Mitre.

520 COLD FORMED WORK

- Profiles: Accurate, with straight arrises.

525 ADHESIVE BONDING

- Preparation of surfaces of metals to receive adhesives:
 - Degrease.
 - Abrade mechanically or chemically etch.
 - Prime: To suit adhesive.
- Adhesive bond: Form under pressure.

527 WELDING

- Welding procedures:
 - Preparation:
 - Joint preparation: Clean thoroughly.
 - Surfaces of materials that will be self-finished and visible in the completed work: protect from weld splatter.
 - Jointing:
 - Joints: Fully bond parent and filler metal throughout with no inclusions, holes, porosity or cracks.
 - Strength requirements: Welds to achieve design loads.
 - 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.
 - Lap joints: Minimum 5 x metal thickness or 25 mm, which ever is greater.
 - Weld terminations: Clean and sound.

530 STAINLESS STEEL FABRICATION

- Guillotining or punching: Do not use for metal thicknesses greater than 10 mm.
- Thermal cutting:
 - Carbonation in the heat affected zone: Remove, after cutting.
- Bending:
 - Plates or bars: Cold bending radius not less than material thickness.
 - Tubes: Cold bending radius not less than 2 x tube diameter.
- Welding: In addition to general welding requirements:
 - Protect adjacent surfaces from weld spatter.
 - Pickle all welds before post fabrication treatments.
- Protection: Provide protection to fabricated components during transit and on site.

555 BRAZING

- Standard: To BS EN 14324.
- Testing:
 - Destructive testing: To BS EN 12797.
 - Nondestructive testing: To BS EN 12799.

610 TESTING

- Welding records and test results: Submit 2 copies.

FINISHING**710 FINISHING WELDED AND BRAZED JOINTS VISIBLE IN COMPLETE WORK**

- Standard: To BS EN ISO 8501-3.
- Butt joints: Smooth, and flush with adjacent surfaces.
- Fillet joints: Neat.
- Grinding: Grind smooth where indicated on drawings.

745 PREPARATION FOR APPLICATION OF COATINGS

- General: Complete fabrication, and drill fixing holes before applying coatings.
 - Paint, grease, flux, rust, burrs and sharp arrises: Remove.
- 750 LIQUID ORGANIC COATING FOR ALUMINIUM ALLOY COMPONENTS
- Standard: To BS 4842.
- 760 ZINC AND CADMIUM PLATING OF IRON AND STEEL SURFACES
- Zinc plating: To BS EN 12329.
 - Cadmium plating: To BS EN 12330.
- 770 CHROMIUM PLATING
- Standard: To BS EN 12540.
- 780 GALVANIZING
- Standard: To BS EN ISO 1461.
 - Preparation:
 - Vent and drain holes: Provide in accordance with BS EN ISO 14713. Seal after sections have been drained and cooled.
 - Components subjected to cold working stresses: Heat treat to relieve stresses before galvanizing.
 - Welding slag: Remove.
 - Component cleaning: To BS EN ISO 8501-1.
- 790 VITREOUS ENAMELLING
- Standard: To BS EN 14431.
 - Substrate metal: Carbon steel or cast iron.

COMPLETION

- 910 DOCUMENTATION
- Submit:
 - Manufacturer's maintenance instructions.
 - Guarantees, warranties, test certificates, record schedules and log books.
- 920 COMPLETION
- Protection: Remove.
 - Cleaning and maintenance: Carry out in accordance with procedures detailed in fabricators' guarantees.

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Z12 PRESERVATIVE/ FIRE RETARDANT TREATMENT

To be read with Preliminaries/ General conditions.

110 TREATMENT APPLICATION

- Timing: After cutting and machining timber, and before assembling components.
- Processor: Licensed by manufacturer of specified treatment solution.
- Certification: For each batch of timber provide a certificate of assurance that treatment has been carried out as specified.

120 COMMODITY SPECIFICATIONS

- Standard: Current edition of the British Wood Preserving and Damp-proofing Association (BWPDA) Manual.

130 PRESERVATIVE TREATMENT SOLUTION STRENGTHS/ TREATMENT CYCLES

- General: Select to achieve specified service life and to suit treatability of specified wood species.

140 COPPER-ORGANIC PRESERVATIVE TREATMENT

- Solution:
 - Manufacturer: to be approved
 - Application: High pressure impregnation.
- Moisture content of wood at time of treatment: Not more than 28%. After treatment, allow timber to dry before using.

150 COPPER CHROMIUM BASED PRESERVATIVE TREATMENT

- Solution:
 - Manufacturer: to be approved
 - Application: High pressure impregnation.
- Moisture content of wood at time of treatment: Not more than 28%. After treatment, allow timber to dry for at least 14 days before using.

160 ORGANIC SOLVENT PRESERVATIVE TREATMENT

- Solution:
 - Manufacturer: to be approved
 - Application: Double vacuum + low pressure impregnation, or immersion.
- Moisture content of wood at time of treatment: As specified for the timber/ component at time of fixing. After treatment, timber to be surface dry before use.

165 WATER BASED MICROEMULSION PRESERVATIVE TREATMENT

- Solution:
 - Manufacturer: to be approved
 - Application: Double vacuum + low pressure impregnation.
- Moisture content of wood at time of treatment: As specified for the timber/ component at time of fixing. After treatment, timber to be surface dry before use.

167 BORON COMPOUND PRESERVATIVE TREATMENT

- Solution:
 - Manufacturer: to be approved
 - Application: High pressure impregnation.
- Moisture content of wood at time of treatment: Not more than 28%. After treatment, allow timber to dry before using.

170 CREOSOTE PRESERVATIVE TREATMENT

- Solution:
 - Manufacturer: to be approved
 - Application: High pressure impregnation, or immersion.
- Moisture content of wood at time of treatment: Not more than 28%. After treatment, allow timber to dry before using.

Z12/210 FIRE RETARDANT TREATMENT

- Manufacturer: to be approved
 - Application: Vacuum + pressure impregnation.
- Moisture content of wood at time of treatment: As specified for the timber/ component at time of fixing. After treatment, timber to be redried slowly at temperatures not exceeding 65°C to minimize distortion and degradation.

Z12/220 LEACH RESISTANT FIRE RETARDANT TREATMENT

- Manufacturer: to be approved
- Application: Vacuum + pressure impregnation.
- Moisture content of wood at time of treatment: As specified for the timber/ component at time of fixing.

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Z20 FIXINGS AND ADHESIVES

To be read with Preliminaries/ General conditions.

PRODUCTS**310 FASTENERS GENERALLY**

- Materials: To have:
 - Bimetallic corrosion resistance appropriate to items being fixed.
 - Atmospheric corrosion resistance appropriate to fixing location.
- Appearance: Submit samples on request.

320 PACKINGS

- Materials: Noncompressible, corrosion proof.
- Area of packings: Sufficient to transfer loads.

330 NAILED TIMBER FASTENERS

- Nails:
 - Steel: To BS 1202-1 or BS EN 10230-1.
 - Copper: To BS EN 1202-2.
 - Aluminium: To BS 1202-3.

340 MASONRY FIXINGS

- Light duty: Plugs and screws.
- Heavy duty: Expansion anchors or chemical anchors.

350 PLUGS

- Type: Proprietary types to suit substrate, loads to be supported and conditions expected in use.

360 ANCHORS

- Types:
 - Expansion: For use in substrate strong enough to resist forces generated by expansion of anchor.
 - Adhesive or chemical:
 - For use in substrate where expansion of anchor would fracture substrate.
 - For use in irregular substrate where expansion anchors cannot transfer load on anchor.
 - Cavity: For use where the anchor is retained by toggles of the plug locking onto the inside face of the cavity.

370 WOOD SCREWS

- Type:
 - Wood screws (traditional pattern).
 - Standard: To BS 1210.
 - Wood screws.
 - Pattern: Parallel, fully threaded shank or twin thread types.
- Washers and screw cups: Where required are to be of same material as screw.

380 MISCELLANEOUS SCREWS

- Type: To suit the fixing requirement of the components and substrate.
 - Pattern: Self-tapping, metallic drive screws, or power driven screws.
- Washers and screw cups: Where required to be of same material as screw.

390 ADHESIVES GENERALLY

- Standards:
 - Hot-setting phenolic and aminoplastic: To BS 1203.
 - Thremosetting wood adhesives: To BS EN 12765.
 - Polyvinyl acetate thermoplastic adhesive: To BS 4071.

410 POWDER ACTUATED FIXING SYSTEMS

- Types of fastener, accessories and consumables: As recommended by tool manufacturer.

EXECUTION**610 FIXING GENERALLY**

- Integrity of supported components: Select types, sizes, quantities and spacings of fixings, fasteners and packings to retain supported components without distortion or loss of support.
- Components, substrates, fixings and fasteners of dissimilar metals: Isolate with washers/ sleeves to avoid bimetallic corrosion.
- Appearance: Fixings to be in straight lines at regular centres.

620 FIXING THROUGH FINISHES

- Penetration of fasteners and plugs into substrate: To achieve a secure fixing.

630 FIXING PACKINGS

- Function: To take up tolerances and prevent distortion of materials and components.
- Limits: Do not use packings beyond thicknesses recommended by fixings and fasteners manufacturer.
- Locations: Not within zones to be filled with sealant.

640 FIXING CRAMPS

- Cramp positions: Maximum 150 mm from each end of frame sections and at 600 mm maximum centres.
- Fasteners: Fix cramps to frames with screws of same material as cramps.
- Fixings in masonry work: Fully bed in mortar.

650 NAILED TIMBER FIXING

- Penetration: Drive fully in without splitting or crushing timber.
- Surfaces visible in completed work: Punch nail heads below wrot surfaces.
- Nailed timber joints: Two nails per joint (minimum), opposed skew driven.

660 SCREW FIXING

- Finished level of countersunk screw heads:
 - Exposed: Flush with timber surface.
 - Concealed (holes filled or stopped): Sink minimum 2 mm below surface.

670 PELLETED COUNTERSUNK SCREW FIXING

- Finished level of countersunk screw heads: Minimum 6 mm below timber surface.
- Pellets: Cut from matching timber, match grain and glue in to full depth of hole.
- Finished level of pellets: Flush with surface.

680 PLUGGED COUNTERSUNK SCREW FIXING

- Finished level of countersunk screw heads: Minimum 6 mm below timber surface.

- Plugs: Glue in to full depth of hole.
- Finished level of plugs: Projecting above surface.

690 USING POWDER ACTUATED FIXING SYSTEMS

- Powder actuated fixing tools: To BS 4078-2 and Kitemark certified.
- Operatives: Trained and certified as competent by tool manufacturer.

700 APPLYING ADHESIVES

- Surfaces: Clean. Adjust regularity and texture to suit bonding and gap filling characteristics of adhesive.
- Support and clamping during setting: Provide as necessary. Do not mark surfaces of or distort components being fixed.
- Finished adhesive joints: Fully bonded. Free of surplus adhesive.

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Z21 MORTARS

To be read with Preliminaries/ General conditions.

CEMENT GAUGED MORTARS

- 110 CEMENT GAUGED MORTAR MIXES
- Specification: Proportions and additional requirements for mortar materials are specified elsewhere.
- 120 SAND FOR SITE MADE CEMENT GAUGED MASONRY MORTARS
- Standard: To BS EN 13139.
 - Grading: 0/2 (FP or MP).
 - Fines content where the proportion of sand in a mortar mix is specified as a range (e.g. 1:1: 5–6):
 - Lower proportion of sand: Use category 3 fines.
 - Higher proportion of sand: Use category 2 fines.
 - Sand for facework mortar: Maintain consistent colour and texture. Obtain from one source.
- 131 READY-MIXED LIME:SAND FOR CEMENT GAUGED MASONRY MORTARS
- Standard: To BS EN 998-2.
 - Lime: Nonhydraulic to BS EN 459-1.
 - Type: CL 90S.
 - Pigments for coloured mortars: To BS EN 12878.
- 135 SITE MADE LIME:SAND FOR CEMENT GAUGED MASONRY MORTARS
- Permitted use: Where a special colour is not required and in lieu of factory made ready-mixed material.
 - Lime: Nonhydraulic to BS EN 459-1.
 - Type: CL 90S.
 - Mixing: Thoroughly mix lime with sand, in the dry state. Add water and mix again. Allow to stand, without drying out, for at least 16 hours before using.
- 160 CEMENTS FOR MORTARS
- Cement: To BS EN 197-1 and CE marked.
 - Types:
 - Portland cement, CEM I.
 - Portland limestone cement, CEM II/A-L or CEM II/A-LL.
 - Portland slag cement, CEM II/B-S.
 - Portland fly ash cement, CEM II/B-V.
 - Strength class: 32.5, 42.5 or 52.5.
 - White cement: To BS EN 197-1 and CE marked.
 - Type: Portland cement, CEM I.
 - Strength class: 52.5.
 - Sulfate resisting Portland cement:
 - Types:
 - To BS 4027 and Kitemarked.
 - To BS EN 197-1 fly ash cement, CEM II/B-V and CE marked.
 - Strength class: 32.5, 42.5 or 52.5.
 - Masonry cement: To BS EN 413-1 and CE marked.
 - Class: MC 12.5.
- 180 ADMIXTURES FOR SITE MADE CEMENT GAUGED MORTARS
- Air entraining (plasticizing) admixtures: To BS EN 934-3 and compatible with other mortar constituents.

- Other admixtures: Submit proposals.
- Prohibited admixtures: Calcium chloride, ethylene glycol and any admixture containing calcium chloride.

190 RETARDED READY TO USE CEMENT GAUGED MORTAR

- Standard: To BS EN 998-2.
- Lime for cement:lime:sand mortars: Nonhydraulic to BS EN 459-1.
 - Type: CL 90S.
- Pigments for coloured mortars: To BS EN 12878.
- Time and temperature limitations: Use within limits prescribed by mortar manufacturer.
- Retempering: Restore workability with water only within prescribed time limits.

200 STORAGE OF CEMENT GAUGED MORTAR MATERIALS

- Sands and aggregates: Keep different types/ grades in separate stockpiles on hard, clean, free-draining bases.
- Factory made ready-mixed lime:sand/ ready to use retarded mortars: Keep in covered containers to prevent drying out or wetting.
- Bagged cement/ hydrated lime: Store off the ground in dry conditions.

210 MAKING CEMENT GAUGED MORTARS

- Batching: By volume. Use clean and accurate gauge boxes or buckets.
 - Mix proportions: Based on dry sand. Allow for bulking of damp sand.
- Mixing: Mix materials thoroughly to uniform consistency, free from lumps.
 - Mortars containing air entraining admixtures: Mix mechanically. Do not overmix.
- Working time (maximum): Two hours at normal temperatures.
- Contamination: Prevent intermixing with other materials.

LIME:SAND MORTARS**310 LIME:SAND MORTAR MIXES**

- Specification: Proportions and additional requirements for mortar materials are specified elsewhere.

320 SAND FOR LIME:SAND MASONRY MORTARS

- Type: Sharp, well graded.
 - Quality, sampling and testing: To BS EN 13139.
 - Grading/ Source: As specified elsewhere in relevant mortar mix items.

330 READY PREPARED LIME PUTTY

- Type: Slaked directly from CL 90 quicklime to BS 890, using an excess of water.
 - Maturation: In pits/ containers that allow excess water to drain away.
 - Density of matured lime putty: 1.3–1.4 kg/litre.
- Maturation period before use (minimum): 24 hours

340 POZZOLANIC ADDITIVES FOR NONHYDRAULIC LIME:SAND MORTARS

- Mixing: Mix thoroughly into mortar during knocking up.

345 ADMIXTURES FOR HYDRAULIC LIME:SAND MORTARS

- Air entraining (plasticizing) admixtures: To BS EN 934-3 and compatible with other mortar constituents.
- Prohibited admixtures: Calcium chloride, ethylene glycol and any admixture containing calcium chloride.

350 STORAGE OF LIME:SAND MORTAR MATERIALS

- Sands and aggregates: Keep different types/ grades in separate stockpiles on hard, clean, free-draining bases.
- Ready prepared nonhydraulic lime putty: Prevent drying out and protect from frost.
- Nonhydraulic lime:sand mortar: Store on clean bases or in clean containers that allow free drainage. Prevent drying out or wetting and protect from frost.
- Bagged hydrated hydraulic lime: Store off the ground in dry conditions.

360 MAKING LIME:SAND MORTARS GENERALLY

- Batching: By volume. Use clean and accurate gauge boxes or buckets.
- Mixing: Mix materials thoroughly to uniform consistency, free from lumps.
- Contamination: Prevent intermixing with other materials, including cement.

370 SITE PREPARED NONHYDRAULIC LIME:SAND MORTARS

- Mixing: Mix materials thoroughly by compressing, beating and chopping. Do not add water.
- Equipment: Roller pan mixer or submit proposals.

380 READY TO USE NONHYDRAULIC LIME:SAND MORTARS

- Manufacturer: to be approved
- Lime putty slaked directly from quicklime to BS EN 459-1 and mixed thoroughly with sand.
- Quicklime to BS EN 459-1 slaked directly with sand.

390 KNOCKING UP NONHYDRAULIC LIME:SAND MORTARS

- Knocking up before and during use: Achieve and maintain a workable consistency by compressing, beating and chopping. Do not add water.
- Equipment: Roller pan mixer or submit proposals.

400 MAKING HYDRAULIC LIME:SAND MORTARS

- Mixing hydrated hydraulic lime:sand: Follow the lime manufacturer's recommendations for each stage of the mix.
- Water quantity: Only sufficient to produce a workable mix.
- Working time: Within limits recommended by the hydraulic lime manufacturer

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Z22 SEALANTS

To be read with Preliminaries/ General conditions.

PRODUCTS**310 JOINTS refer to relevant section**

- Primer, backing strip, bond breaker: Types recommended by sealant manufacturer.

EXECUTION**610 SUITABILITY OF JOINTS**

- Presealing checks:
 - Joint dimensions: Within limits specified for the sealant.
 - Substrate quality: Surfaces regular, undamaged and stable.

620 PREPARING JOINTS

- Surfaces to which sealant must adhere:
 - Remove temporary coatings, tapes, loosely adhering material, dust, oil, grease, surface water and contaminants that may affect bond.
 - Clean using materials and methods recommended by sealant manufacturer.
- Vulnerable surfaces adjacent to joints: Mask to prevent staining or smearing with primer or sealant.
- Backing strip and/ or bond breaker installation: Insert into joint to correct depth, without stretching or twisting, leaving no gaps.
- Protection: Keep joints clean and protect from damage until sealant is applied.

630 APPLYING SEALANTS

- Substrate: Dry (unless recommended otherwise) and unaffected by frost, ice or snow.
- Environmental conditions: Do not dry or raise temperature of joints by heating.
- Sealant application: Fill joints completely and neatly, ensuring firm adhesion to substrates.
- Sealant profiles:
 - Butt and lap joints: Slightly concave.
 - Fillet joints: Flat or slightly convex.
- Protection: Protect finished joints from contamination or damage until sealant has cured.

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Z31 POWDER COATINGS

To be read with Preliminaries/ General conditions.

120 POWDER COATING MATERIALS

- Manufacturer: to be approved
- Selected manufacturer: Submit details before commencement of powder coating including:
 - Name and contact details.
 - Details of accreditation schemes.
 - Technical data of product including current Agrément certificates.

210 WORKING PROCEDURES

- Comply with the follow following standards.
 - Aluminium components: To BS 6496 or BS EN 12206-1.
 - Steel components: To BS EN 13438.
 - Safety standards: To British Coatings Federation 'Code of safe practice – Application of thermosetting powder coatings by electrostatic spraying'.

220 POWDER COATING APPLICATORS

- Applicator requirements:
 - Approved by powder coating manufacturer.
 - Currently certified to BS EN ISO 9001.
 - Comply with quality procedures, guarantee conditions, standards and tests required by powder coating manufacturer.
 - Applicator to use only one plant.
- Selected applicator: Submit details before commencement of powder coating including:
 - Name and contact details.
 - Details of accreditation schemes.

225 GUARANTEES

- Powder coating manufacturer and applicator guarantees:
 - Submit sample copies before commencement of powder coating.
 - Submit signed project specific copies on completion of work.

230 CONTROL SAMPLES

- Sequence: Prior to ordering materials for the works, obtain approval of appearance for:
 - Powder coated samples: Of various grades and forms of background metal to be used, showing any colour, texture and gloss variation.
 - Fabrication samples: Showing joint assembly, how powder coating is affected and how any cut metal edges are finished and protected.
- Samples to include the following information:
 - Product reference.
 - Colour.
 - Reference number.
 - Name.
 - Gloss level.

235 INDEPENDENT INSPECTION AT PLANT

- Requirement: Contractors/ suppliers of the following designated components must commission an approved Independent Inspection Authority to carry out acceptance

inspections to confirm that powder coating application complies with this specification.

- Designated components: _____.
- Acceptance inspections: Carry out for each variation of colour and finish of each component work package at applicator's plant prior to any fabrication of units, in accordance with the following:
 - Where three or more production runs are required for application of coatings, not less than three acceptance inspections must be carried out in accordance with BS 6001-1, general inspection level 2, with an acceptance quality limit of 1%.
 - Where less than three production runs are required for application of coatings, one acceptance inspection must be carried out in accordance with BS 6001-2, with a limiting quality of 5% where the probability of acceptance is 10%.
- Components failing inspection: Reprocess or replace and reinspect.
- Inspection reports: Independent Inspection Authority must submit copies.

240 QUALITY ASSURANCE SYSTEM

- Requirement: Powder and coating application to the following designated components is to be tested and approved in accordance with the Qualicoat system.

250 COMPONENT DESIGN

- Condition of components to be powder coated:
 - To comply with relevant recommendations of BS 4479-1, -3, and -4.
 - Of suitable size to fit plant capacity.
 - Of suitable thickness to withstand oven curing.

310 PRETREATMENT OF ALUMINIUM COMPONENTS

- Condition of components to be pretreated:
 - Free from corrosion and damage.
 - All welding and jointing completed and finish off as specified.
 - Free from impurities including soil, grease, oil.
 - Suitable for and compatible with the pretreatment process.
- Conversion coating requirements:
 - Chromate system: To BS 6496 or BS EN 12206-1.
 - Chromate-free system: To BS EN 12206-1. Submit details before using.
- Rinsing requirements: Use demineralized water. Drain and dry.

320 PRETREATMENT OF STEEL COMPONENTS

- Condition of components to be pretreated:
 - Free from corrosion and damage.
 - All welding and jointing completed and finish off as specified.
 - Free from impurities including soil, grease, oil.
 - Suitable for and compatible with the pretreatment process.
- Conversion coating requirements: To BS EN 13438.
- Rinsing requirements: Use demineralized water. Drain and dry.

430 EXTENT OF POWDER COATINGS

- Application: To visible component surfaces, and concealed surfaces requiring protection. Coated surfaces will be deemed 'significant surfaces' for relevant BS 6496 or BS EN 13438 performance requirements.

435 APPLICATION OF POWDER COATINGS

- Surfaces to receive powder coatings: Free from dust or powder deposits.
- Powder colours: Obtain from one batch of one manufacturer.
- Commencement of powder coating: To be continuous from pretreatment.
- Jig points: Not visible on coated components.

- Curing: Controlled to attain metal temperatures and hold periods recommended by powder coating manufacturer.
- Stripping and recoating of components: Only acceptable by prior agreement of powder coating manufacturer. Stripping, pretreatment and powder coating are to be in accordance with manufacturer's requirements.
- Overcoating of components: Not acceptable.

440 PERFORMANCE AND APPEARANCE OF POWDER COATINGS

- For aluminium components:
 - Standard: To BS 6496 or BS EN 12206-1.
- For steel components:
 - Standard: To BS EN 13438.
- Visual inspection after powder coating: Significant surface viewing distances to be as specified in the relevant Standard, unless specified otherwise.
- Colour and gloss levels: To conform with approved samples.

450 ALUMINIUM ALLOY FABRICATIONS

- Units may be assembled:
 - Before powder coating.
 - From components powder coated after cutting to size.
 - Where approved, from components powder coated before cutting to size.
- Exposure of uncoated background metal: Not acceptable.
- Assembly sealants: Compatible with powder coatings. Obtain approval of colour if sealants are visible after fabrication.

460 STEEL FABRICATIONS

- Unit assembly: Wherever practical, before powder coating.
- Exposure of uncoated background metal: Not acceptable.
- Assembly sealants: Compatible with powder coatings. Obtain approval of colour if sealants are visible after fabrication.

470 FIXINGS

- Exposed metal fixings: Powder coat together with components, or coat with matching repair paint system applied in accordance with the powder coating manufacturer's recommendations.

480 DAMAGED COMPONENTS – REPAIR/ REPLACEMENT

- Before delivery to site: Check all components for damage to powder coatings. Replace damaged components.
- Site damage: Submit proposals for repair or replacement.

510 PROTECTION

- Powder coated surfaces of components: Protect from damage during handling and installation, or by subsequent site operations.
- Protective coverings: Must be:
 - Resistant to weather conditions.
 - Partially removable to suit building in and access to fixing points.
- Protective tapes in contact with powder coatings: Must be:
 - Low tack, self adhesive and light in colour.
 - Applied and removed in accordance with tape and powder coating manufacturers' recommendations. Do not use solvents to remove residues as these are detrimental to the coating.
- Inspection of protection: Carry out monthly. Promptly repair any deterioration or deficiency.

535 DOCUMENTATION

- Submit the following information for each batch of powder coated components:
 - Supplier.
 - Trade name.
 - Colour.
 - Type of powder.
 - Method of application.
 - Batch and reference number.
 - Statutory requirements.
 - Test certificates.
 - Maintenance instructions.

540 COMPLETION

- Protection: Remove.
- Cleaning and maintenance of powder coatings: Carry out in accordance with procedures detailed in powder coating manufacturer and applicator guarantees.

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Z33 ANODIZING

To be read with Preliminaries/ General conditions.

110 ANODIC COATING

- Selected anodizer: Submit details before commencement of anodizing, including:
 - Name and contact details.
 - Details of accreditation schemes.
 - Technical data of product including current Agrément certificates.

210 WORKING PROCEDURES

- Standard: To BS 3987 for anodic coatings on wrought aluminium.

220 ANODIZER REQUIREMENTS

- Processing:
 - Approved: By the Aluminium Finishing Association.
 - Certified: To BS EN ISO 9001.
 - Anodizing plant: Each anodizer to use only one plant.

230 GUARANTEES

- Anodizer guarantees: Submit sample copies before commencement of anodizing.
- Project specific guarantees: Submit signed copies on completion of work.
- Guarantees to cover:
 - Life expectancy.
 - Colour: Opacity and consistency.
 - Texture: Gloss, satin or matt.
 - Quality of coating.

240 CONTROL SAMPLES

- Sequence: Prior to ordering materials for the works, obtain approval of appearance for Anodic coated samples: Showing colour and texture variation.
- Fabrication samples: Showing joint assembly, how anodic coating is affected and how cut metal edges are finished and protected.

250 INDEPENDENT INSPECTION AT PLANT

- Requirement: Contractors/ suppliers of the following designated components must commission an approved Independent Inspection Authority to carry out acceptance inspections to confirm that anodic coating application complies with this specification.
- Acceptance inspections: Carry out for each variation of colour and finish of each component work package at anodizer's plant prior to any fabrication of units, in accordance with the following:
 - Where three or more production runs are required for application of coatings, not less than three acceptance inspections must be carried out in accordance with BS 6001-1, general inspection level 2, with an acceptance quality limit of 1%.
 - Where less than three production runs are required for application of coatings, one acceptance inspection must be carried out in accordance with BS 6001-2, with a limiting quality of 5% where the probability of acceptance is 10%.
- Components failing inspection: Reprocess or replace and reinspect.
- Inspection reports: Independent Inspection Authority must submit copies.

255 QUALITY ASSURANCE SYSTEM

- Requirement: Powder and coating application to the following designated components is to be tested and approved in accordance with the Qualanod system.

270 COMPONENT DESIGN

- Condition of components to be anodized:
 - To comply with relevant recommendations of BS 4479-1 and -5.
 - Of suitable size to fit plant capacity.

310 PRETREATMENT

- Condition of components to be anodized:
 - Free from corrosion and damage.
 - Suitable for and compatible with the pretreatment and anodizing process.
- Process: In accordance with the specification requirements for the finish.

410 EXTENT OF ANODIC COATINGS

- Application: To visible component surfaces, and concealed surfaces requiring protection. Coated surfaces will be deemed 'significant surfaces' for relevant BS 3987 performance requirements.

420 APPLICATION OF ANODIC COATINGS

- Surfaces to receive anodic coatings: Clean.
- Commencement of anodic coating: To be continuous from pretreatment.
- Jig points: To be agreed. Not on visible areas of anodic coated components.
- Use of touch-up paint: Not acceptable.

430 PERFORMANCE AND APPEARANCE OF ANODIC COATINGS

- Standard: To BS 3987.
- Visual inspection after anodizing: Significant surfaces to be free from visible coating/ defects when viewed from a distance of not less than 5 m for external and 3 m for internal applications.

440 FABRICATION

- Units may be assembled:
 - Before anodizing, providing sufficient drainage holes are included in components to fully drain components.
 - From components anodized after cutting to size.
 - Where approved, from components anodized before cutting to size.
 - Exposure of uncoated background metal: Not acceptable.
 - Assembly sealants: Compatible with anodic coatings. Obtain approval of colour if sealants are visible after fabrication.

450 DAMAGED COMPONENTS – REPAIR/ REPLACEMENT

- Before delivery to site: Check all components for damage to anodic coatings. Replace damaged components.
- Site damage: Submit proposals for repair or replacement.

510 PROTECTION

- Anodic coated surfaces of components: Protect from damage during handling and installation, or by subsequent site operations.
- Protective coverings: Must be:
 - Resistant to weather conditions.
 - Partially removable to suit building in and access to fixing points.
- Protective tapes in contact with anodizing to be:
 - Low tack, self adhesive and light in colour.
 - Applied and removed in accordance with tape and anodizers recommendations.
- Inspection of protection: Carry out weekly. Promptly repair any deterioration or deficiency.

530 DOCUMENTATION

- Submit the following information for each batch of anodic coated components:
 - Supplier.
 - Trade name.
 - Colour (if required).
 - Batch and reference number.
 - Statutory requirements.

540 COMPLETION

- Protection: Remove.
- Cleaning and maintenance of anodic coatings: Carry out in accordance with procedures detailed in anodizer's guarantees.

APPENDIX 1 - ISSUE HISTORY

Revision	Edit time/Date	Status/Revisions	Issue Date
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