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A General Requirements

A.1 Materials Generally

All materials used in the Works shall be new and of the qualities and kinds specified herein and equal to approved samples. Deliveries shall be made sufficiently in advance to enable samples to be taken and tested if required. No materials shall be used until approved and all materials which are not approved or which are damaged, contaminated or have deteriorated in any way or which do not comply in any way with the requirements of this Specification shall be rejected and shall be immediately removed from the Site at the Contractor’s expense.

A.2 Alternatives to Proprietary Brands or Specified Standards

Where materials are specified to a particular standard or by their propriety names or where fittings are specified by catalogue numbers, or descriptions, the Contractor may offer alternative materials or fittings which are of equal or superior quality.

In the event of the tenderer allowing in his prices for using alternative standards of materials to those specified, his tender must be qualified by listing the various alternatives to be used. The successful tenderer must then subsequently submit samples of the alternative materials to the Engineer as soon as practicable after the award of the Contract, and must obtain his written approval before purchasing the particular materials.

Where alternative materials are not listed with the tender, the tenderer will be deemed to have allowed in his prices for the standard of materials specified.

A.3 Measuring and Testing Equipment

The Contractor shall provide on the Site the following equipment for carrying out measuring and control tests and maintain the same in full working order:

- (a) Straight edges 2 metres and 4 metres long for testing the accuracy of finished surfaces.
- (b) A glass graduated cylinder for use in the silt test for organic impurities in sand.
- (c) Slump test apparatus.
- (d) 150 mm Steel cube moulds with base plates and tamping rods to B.S. 1881.
- (e) Two 30 metre steel tapes.
- (f) One dumpy or quick set level and staff
- (g) Micrometer.

End of section.

A31 PROVISION, CONTENT AND USE OF DOCUMENTS

DEFINITIONS AND INTERPRETATIONS
110 DEFINITIONS: The meaning of terms, derived terms and synonyms used in the preliminaries/general conditions and specification is as defined below or in the appropriate British Standard or British Standard glossary.

120 CA means the person nominated in the Contract as Architect or Contract Administrator or his authorised representative.

120 CA means the person nominated in the Contract as Employer's Agent or his authorised representative.

130 IN WRITING: When required to advise, notify, inform, instruct, agree, confirm, obtain information, obtain approval or obtain instructions do so in writing.

140 APPROVAL (and words derived therefrom) means the approval in writing of the CA unless specified otherwise.

150 PRODUCTS means materials (including naturally occurring materials) and goods (including components, equipment and accessories) intended for permanent incorporation in the Works.

180 CROSS-REFERENCES TO THE SPECIFICATION:
- Where a numerical cross-reference to a specification section or clause is given on drawings or in any other document the Contractor must verify its accuracy by checking the remainder of the annotation or item description against the terminology used in the referred to section or clause.
- Where a numerical cross-reference is not given the relevant section(s) and clause(s) of the specification will apply, cross-reference thereto being by means of related terminology.
- Where a cross-reference for a particular type of work, feature, material or product is given, relevant clause(s) elsewhere in the referred to specification section dealing with general matters, ancillary products and workmanship also apply.
- The Contractor must, before proceeding, obtain clarification or instructions in relation to any discrepancy or ambiguity which he may discover.

200 EQUIVALENT PRODUCTS:
- Where the specification permits substitution of a product of different manufacture to that specified and such substitution is desired, before ordering the product notify the CA and, when requested, submit for verification documentary evidence that the alternative product is equivalent in respect of material, safety, reliability, function, compatibility with adjacent construction, availability of compatible accessories and, where relevant, appearance. Submit certified English translations of any foreign-language documents.
- Any proposal for use of an alternative product must also include proposals for substitution of compatible accessory products and variation of details as necessary, with evidence of equivalent durability, function and appearance of the construction as a whole. If such substitution is sanctioned, and before ordering products, provide revised drawings, specification and manufacturer’s guarantees as required by CA.

201 EQUIVALENT PRODUCTS: Wherever products are specified by proprietary name and the phrase 'or equivalent' is not included, it is to be deemed included.

210 BRITISH STANDARD PRODUCTS: Where any product is specified to comply with a British Standard for which there is no equivalent European Standard it may be substituted by a product complying with a grade or category within a national standard of another Member State of the European Community or an international standard recognised in the UK specifying equivalent requirements and assurances in respect of material, safety, reliability, function, compatibility with adjacent
construction, availability of compatible accessories and, where relevant, appearance. In advance of ordering notify the CA of all such substitutions and, when requested, submit for verification documentary evidence confirming that the products comply with the specified requirements. Any submitted foreign language documents must be accompanied by certified translations into English.

220 REFERENCES TO BSI DOCUMENTS are to the versions and amendments listed in the BSI Standards Catalogue.

230 MANUFACTURER AND REFERENCE: Where used in this combination:
- 'Manufacturer' means the firm under whose name the particular product is marketed.
- 'Reference' means the proprietary brand name and/or reference by which the particular product is identified.

270 SIZES: Unless otherwise stated:
- Products are specified by their co-ordinating sizes.
- Cross section dimensions of timber shown on drawings are nominal sizes before any required planing.

280 FIX ONLY means all labours in unloading, handling, storing and fixing in position, including use of all plant.

290 SUPPLY AND FIX: Unless stated otherwise all items given in the schedule of work and/or on the drawings are to be supplied and fixed complete.

DOCUMENTS PROVIDED ON BEHALF OF EMPLOYER.

440 DIMENSIONS: The accuracy of dimensions scaled from the drawings is not guaranteed. Obtain from the CA any dimensions required but not given in figures on the drawings nor calculable from figures on the drawings.

450 THE MEASURED QUANTITIES: For purposes of ordering products and constructing the Works:
- The accuracy and sufficiency of the measured quantities is not guaranteed.
- The specification and drawings shall take precedence over the measured quantities.

460 THE SPECIFICATION: All sections of the specification must be read in conjunction with Main Contract Preliminaries/General conditions.

DOCUMENTS PROVIDED BY CONTRACTOR/SUBCONTRACTORS/SUPPLIERS

510 CONTRACTOR'S DESIGN: DESIGN AND PRODUCTION INFORMATION:
- When preparing the master programme make reasonable allowance for completing design/production information, including submission for inspection by the CA, and any subsequent amendment(s), resubmission(s) and reinspection(s).
- During the Contract submit to CA the required number of copies of design/production information. The CA will note his comments on one copy, then return to the Contractor.
- Ensure that any necessary amendments are made without delay. Unless and until the CA confirms that resubmission is not required, submit copies of amended drawings etc. to CA, and ensure incorporation of necessary amendments all as before.
- If submitted design/production information differs from the Employer's Requirements, each such difference must be the subject of a request for substitution or Change, supported by all relevant information.
- Should any amendment required by the CA be considered to involve a Change which has not already been acknowledged as a Change by the CA, notify the CA without delay and in any case within 7 days, and do not proceed with ordering, fabrication, erection or installation until subsequently instructed. Claims for the extra cost of such work, if made after it has been carried out, may not be allowed.
- Complete final version of all design/production information and submit to the CA the number of copies required by him.

520 CONTRACTOR'S DESIGN PORTION: DESIGN AND PRODUCTION INFORMATION:
- When preparing the master programme make reasonable allowance for completing design/production information, including submission to the Planning Supervisor for comment, inspection by the CA, and any subsequent amendment(s), resubmission(s) and reinspection(s).
- During the Contract submit to CA the required number of copies of design/production information. The CA will note his comments on one copy, then return to the Contractor and this will be deemed to be a direction, notice or instruction under the Contract.
- Ensure that any necessary amendments are made without delay. Unless and until the CA confirms that resubmission is not required, submit copies of amended drawings etc. to CA, and ensure incorporation of necessary amendments all as before.
- If submitted design/production information differs from the Employer's Requirements, each such difference must be the subject of a request for substitution or Variation, supported by all relevant information.
- Should any amendment required by the CA be considered to involve a Variation which has not already been acknowledged as a Variation by the CA, notify the CA without delay and in any case within 7 days, and do not proceed with ordering, fabrication, erection or installation until subsequently instructed. Claims for the extra cost of such work, if made after it has been carried out, may not be allowed.
- Complete final version of all design/production information and submit to the CA the number of copies required by him.

530 PERFORMANCE SPECIFIED WORK: CONTRACTOR'S STATEMENT: Submit proposals for Performance Specified Work.

540 PERFORMANCE SPECIFIED WORK: CONTRACTOR'S PROPOSALS:
- When preparing the master programme make reasonable allowance for completing proposals for Performance Specified Work, including submission for inspection by the CA and any subsequent amendment(s), resubmission(s) and reinspection(s).
- Submit two copies of proposals to the CA when required. The CA will note his comments on one copy, then return to the Contractor and this will be deemed to be a direction notice or instruction under the Contract.
- Ensure that any necessary amendments are made without delay. Unless and until the CA confirms that resubmission is not required, submit copies of amended proposals to CA and ensure incorporation of necessary amendments all as before.
- If submitted proposals differ from the performance requirements or require changes at the interface with adjacent work, each such difference or change must be the subject of a request for substitution or Variation, supported by all relevant information.
- Should any amendment required by the CA be considered to involve a Variation which has not already been acknowledged as a Variation by the CA, notify the CA without delay and in any case within 7 days, and do not proceed with ordering, fabrication, erection or installation until subsequently instructed. Claims for the extra cost of such work, if made after it has been carried out, may not be allowed.
- Complete final version of proposals and submit two copies to the CA.

550 NOMINATED SUBCONTRACTORS/SUPPLIERS: DESIGN AND PRODUCTION INFORMATION:
- Nominated Subcontractors/Suppliers will be required to provide design/production information during the Contract:
- When preparing the master programme make reasonable allowance, based on the information in sections A51 or A52, for completing such design/production information, checking, including submission to the Planning Supervisor for comment, inspection by the CA, and any subsequent amendment(s), resubmission(s) and reinspection(s).
- Obtain all the information which the Subcontractors/Suppliers in question are required to provide in time to meet the programme and in accordance with NSC/T Part 2 where applicable. Thoroughly check, on the basis of the information available, that dimensions are correct, that account is taken of all related work, and that construction is practicable. Note any comments on one copy of the design/production information, then submit to CA with the required number of additional unmarked copies. Such checking will not relieve the CA or the Subcontractor(s)/Supplier(s) of their respective responsibilities for design, co-ordination and documentation.
- The CA will note his comments on one copy, then return to the Contractor. Inspection and any comments, made by the CA will not relieve the Subcontractor(s) and/or Supplier(s) of their responsibility for design and documentation.
- Ensure that any necessary amendments are made without delay. Unless and until the CA confirms that resubmission is not required, obtain copies of amended drawings, etc., check, resubmit to CA, and ensure incorporation of necessary amendments all as before.
- Obtain final version of the information and submit to the CA the number of copies required by him. On behalf of the CA distribute additional copies as appropriate to all affected Subcontractors and others, and keep at least one copy on site.

692 AS BUILT DRAWINGS AND INFORMATION must be provided to the CA not less than 4 weeks before the date for Completion.

710 TECHNICAL LITERATURE: The Contractor is to keep copies of the following on site, readily accessible for reference by all supervisory personnel:
- Manufacturers' current literature relating to all products to be used in the Works.
- Relevant BS Codes of Practice.
- Those parts of BS 8000 'Workmanship on building sites' which are invoked in the specification.

720 MAINTENANCE INSTRUCTIONS AND GUARANTEES:
Retain copies delivered with components and equipment (failing which, obtain), register with manufacturer as necessary and hand over to CA on or before Practical Completion.

850 ELECTRONIC DATA INTERCHANGE (EDI): Methodology and details to be agreed.

End of section.

**F10 BRICK/BLOCK WALLING**

To be read with Preliminaries/General conditions.

**TYPE(S) OF WALLING**

350 CONCRETE COMMON BLOCKWORK
  Manufacturer and reference: Contractor to submit for approval
  Minimum average compressive strength: 5.2 N/sq mm
Work size(s): 230mm, 150mm and 100mm thick. Height and length to manufacturers specification.
- Mortar: As section Z21.
  Mix: to manufacturer’s specification
- Bond: stretcher half bond generally, to be agreed on site.

WORKMANSHIP GENERALLY

410 RELATED WORK is specified in the following sections:
F30 Accessories/Sundry items for brick/block/stone walling.
F31 Precast concrete sills/lintels/copings/features.

420 SITE STORAGE: Store bricks/blocks in stable stacks clear of the ground and clearly identified by type, strength, grade, etc. Protect from adverse weather and keep clean and dry.

440 CONDITIONING OF CONCRETE BRICKS/BLOCKS:
- Do not use autoclaved concrete bricks(blocks when still warm from the manufacturing process.
- Do not use nonautoclaved concrete bricks/blocks until at least four weeks after casting.
- Do not wet concrete bricks or blocks before laying; use an approved water retaining admixture in the mortar to counteract suction.

460 MORTAR GROUPS: Where mortar is specified by group number, select any mortar in that group as set out below. Mix proportions are by volume. Use the same mortar throughout any one type of facing work.

<table>
<thead>
<tr>
<th>Mortar group</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cement:lime: sand</td>
<td>1:0-0.25:3</td>
<td>1:5:4-4.5</td>
<td>1:1:5-6</td>
<td>1:2:8-9</td>
</tr>
<tr>
<td>Cement:premixed lime &amp; sand (Proportion of lime to sand given in brackets)</td>
<td>1:3</td>
<td>1:4:4.5</td>
<td>1:5-6</td>
<td>1:8-9</td>
</tr>
<tr>
<td></td>
<td>(1:12)</td>
<td>(1:9)</td>
<td>(1:6)</td>
<td>(1:4.5)</td>
</tr>
<tr>
<td>Masonry cement: sand</td>
<td>-</td>
<td>1:3-4</td>
<td>1:5-6</td>
<td>1:7-8</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>1:2.5-3.5</td>
<td>1:4-5</td>
<td>1:5.5-6.5</td>
</tr>
</tbody>
</table>

480 TESTING - CEMENT CONTENT OF MORTAR:
- When instructed by CA, test mortar before use, to determine cement content.
- Carry out tests using the BREMORTEST method described in Building Research Establishment Information Paper 8/89, or other equivalent.
- A provisional sum for testing is included elsewhere.

500 LAYING GENERALLY:
- Lay bricks/blocks on a full bed of mortar; do not furrow. Fill all cross joints and collar joints; do not tip and tail.
- Build walls in stretching half lap bond when not specified otherwise.
- Plumb perpends of facework every third or fifth cross joint along a course and even out the joint widths in between.

510 OVERHAND LAYING must not be used without approval.

520 ACCURACY: Keep courses level and true to line. Accurately plumb all wall faces, angles and features. Unless otherwise specified, build brickwork/blockwork within the following permissible deviations:

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Permissible deviation (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position in plan of any point or specified fair face in relation to the nearest building grid line at the same level</td>
<td>+/-10</td>
</tr>
<tr>
<td>Length (unless otherwise defined by adjacent construction):</td>
<td></td>
</tr>
<tr>
<td>Up to 5 m</td>
<td>+/-15</td>
</tr>
<tr>
<td>5 to 10 m</td>
<td>+/-20</td>
</tr>
<tr>
<td>10 to 20 m</td>
<td>+/-25</td>
</tr>
<tr>
<td>Over 20 m</td>
<td>+/-30</td>
</tr>
<tr>
<td>Height:</td>
<td></td>
</tr>
<tr>
<td>Up to 3 m</td>
<td>+/-15</td>
</tr>
<tr>
<td>3 to 6 m</td>
<td>+/-20</td>
</tr>
<tr>
<td>Over 6 m</td>
<td>+/-25</td>
</tr>
<tr>
<td>Level of bed joints:</td>
<td></td>
</tr>
<tr>
<td>Up to 5 m long</td>
<td>+/-10</td>
</tr>
<tr>
<td>5 to 10 m long</td>
<td>+/-15</td>
</tr>
<tr>
<td>Over 10 m long</td>
<td>+/-25</td>
</tr>
<tr>
<td>Straightness in any 5 m length</td>
<td>+/-10</td>
</tr>
<tr>
<td>Vertically:</td>
<td></td>
</tr>
<tr>
<td>In any 3 m height</td>
<td>+/-10</td>
</tr>
<tr>
<td>In o/a height of building exceeding 6 m</td>
<td>+/-20</td>
</tr>
<tr>
<td>Thickness:</td>
<td></td>
</tr>
<tr>
<td>Overall thickness of walls or width of piers (subject to the following)</td>
<td>+/-15</td>
</tr>
<tr>
<td>Difference in thickness of a wall or width of a pier at any two points 3 m apart</td>
<td>+/-10</td>
</tr>
</tbody>
</table>

521 ACCURACY: Notwithstanding clause 520, comply with any critical dimensions given in Preliminaries clause A33/ or on the drawings.

535 HEIGHT OF LIFTS:
- Rack back when raising quoins and other advance work.
  Do not use tothing.
- Raise no portion of the work more than 1.2 m above another at any time.
- In facework, complete each lift in one period of operation.
- Do not carry up any one leaf more than 1.5 m in one day unless permitted by the CA.

545 LEVELLING OF SEPARATE LEAVES: Bring both leaves of cavity walls to the same level at:
- 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.

595 LINTEL BEARINGS: Carefully predetermine setting out to ensure that full length masonry units occur below lintel ends.

635 JOINTING: When not specified otherwise, finish joints neatly to the specified profile(s) as the work proceeds.

645 UNEXPOSED JOINTS: As the work proceeds, strike off joints that will not be exposed to view in the finished work.

655 JOINTS IN MASONRY TO BE PLASTERED OR RENDERED: Unless keyed units or metal lathing are used, rake out joints as work proceeds, to a depth of approximately 15 mm.

665 POINTING: Where specified, rake out joints to a depth of 12-15 mm as the work proceeds. Subsequently, remove loose debris from the joints using a dry brush, dampen the work, and neatly point to the specified profile in a continuous operation from the top of the wall downwards as the scaffolding is taken down.

671 FIRE STOPPING: Ensure a tight fit between brickwork and cavity barriers to prevent fire and smoke penetration.

680 HOLES, RECESSES AND CHASES IN BRICK/BLOCK WALLING: Comply with the relevant clause in section P31.

690 ADVERSE WEATHER:
- Protect newly erected walling against rain by covering when precipitation occurs, and at all times when the work is not proceeding.

End of section.

H31 METAL PROFILED/FLAT SHEET CLADDING/COVERING

To be read with Preliminaries/General conditions.

TYPE(S) OF CLADDING SYSTEM

120 METAL COVERING TO ROOFS
- Supports: Steel purlins as shown on structural drawings
  Bearing width: 40 mm
  Pitch: 14 deg
- Sheets: to BS EN 508-1
  Manufacturer and reference: Contractor to submit for CA approval
  Material: Steel to BS EN 10147, grade S22GD+Z275
  Finish/Colour: PVC(P) 200 micrometers inner and outer surfaces. White (RAL no to be confirmed).
  Sheet thickness: 24 gauge nominal
- Accessories: ridge pieces, cappings, flashings, trims, aprons, gutters, corner pieces, drips and necessary or as shown on drawings
- Sheet fasteners and spacers: to manufacturer’s recommendations
Number and location of fasteners: to manufacturer’s recommendations
- End, sealing and stitching laps: to manufacturer’s recommendations
- Special features: to manufacturer’s recommendations

130 METAL CLADDING TO WALLS
- Supports: Steel cladding rails as shown on structural drawings
  Bearing width: 40 mm
  Pitch: vertical sheeting
- Sheets: to BS EN 508-1
  Manufacturer and reference: Contractor to submit for CA approval
  Material: Steel to BS EN 10147, grade S22GD+Z275
  Finish/Colour: PVC(P) 200 micrometers inner and outer surfaces. Colour to be confirmed.
  Sheet thickness: 28 gauge nominal
- Accessories: ridge pieces, cappings, flashings, trims, aprons, gutters, corner pieces, drips and necessary or as shown on drawings
- Sheet fasteners and spacers: to manufacturer’s recommendations
- End, sealing and stitching laps: to manufacturer’s recommendations
- Special features: to manufacturer’s recommendations

GENERAL REQUIREMENTS

170 DESIGN:
- Complete the design of the cladding system in accordance with BS 5427:Part 1 and the requirements of this specification.
- Coordinate detailed design with that of all related works.
- Submit detailed design proposals to the CA before commencing any cladding fabrication work.

175 PRODUCT SAMPLES: Before commencing detailed design provide the CA with identified samples of roofing and cladding. Obtain approval before proceeding.

176 SAMPLES OF FASTENERS: When submitting detailed design, provide the CA with identified samples of each type of fastener.

DESIGN/PERFORMANCE REQUIREMENTS

180 GENERALLY: Requirements specified in this section, unless indicated otherwise, apply to the whole cladding system including incorporated flashings and abutments. Full allowance must be made for deflections and other forms of movement.

185 VERTIFICATION OF PERFORMANCE: Submit evidence and calculations demonstrating compliance of design with performance requirements before commencing fabrication of any part of the cladding. Reports, certificates and calculations must be based on approved laboratory testing or computer modelling.

196 INTEGRITY OF CLADDING:
- Determine profile(s), size(s) and thickness(es) of sheets, the size(s), number and spacing of fixings, configuration and location of spacer systems and incorporation of other accessories and fittings to ensure the cladding system will resist all dead, imposed and design live loads, and accommodate all deflections and thermal movements without damage in accordance with BS 5427:Part 1.
- Calculate wind loads on roof and wall cladding appropriate to location, exposure, roof height, building shape and size in accordance with BS 6399:Part 2 Standard Method and BS 5427:Part 1.
- Determine imposed roof load (no access) in accordance with BS 6399:Part 3 and BS 5427:Part 1.

198 WATER PENETRATION onto internal surfaces, or into cavities not designed to be wetted, must not occur under site exposure conditions.

**FIXING CLADDING**

210 STRUCTURE: Check that structure is in a suitable state to receive cladding before commencing fixing. Subcontractor must confirm acceptance to Main Contractor and CA.

215 STRUCTURE: Do not fix cladding until final coats of paint have been applied to outer surfaces of supporting structure.

217 PROTECTION:
- Store metal sheets and panels under cover to keep dry and prevent rust staining. Store on firm level bearers spaced at 900 mm maximum centres. Limit height of stacks to avoid distortion.
- Stack no higher than 1 m. Prevent mechanical damage and solar overheating.
- Adequately secure stored sheets/panels to prevent wind and mechanical damage.

219 FASTENINGS GENERALLY: Type(s), size(s), material(s) and finish(es) as specified, or in the absence of such specification, as recommended for the purpose by the cladding manufacturer.

221 FITTINGS AND ACCESSORIES GENERALLY:
- Cappings, closure pieces, flashings, trims, sills, gutters, fillers, spacers, tapes, sealants, fixings, etc., where not specified, to be types recommended by cladding manufacturer.

223 ISOLATING TAPE: A type recommended for the purpose by the cladding manufacturer. Apply to those surfaces of supports which would otherwise be in contact with cladding or accessories after fixing. Prevent electrolytic action throughout installation.

300 PROFILE FILLERS GENERALLY:
- Manufacturer and reference: Contractor to submit for CA approval.
  - Material: expanded polyethylene
  - Colour: black
  - Thickness: 50 mm
- Fixing: compression
- Locate where shown on drawings and wherever necessary to close off corrugation cavities from the inside and outside of the building. Ensure a tight fit and leave no gaps.
- Include where necessary, perforations sufficient to allow passive ventilation of internal cavities and condensation drainage. Perforations to be sized to prevent ingress of large insects and vermin.

305 FIRE RESISTING PROFILE FILLERS:
- Type(s) supplied by the cladding manufacturer accurately matching sheet profile.
- Fix in positions shown on drawing, leaving no gaps and using an adhesive recommended by the profile filler manufacturer.

410 FIXING SHEETS GENERALLY:
- Cut sheets and flashings to give clean true lines, with no distortion. Remove burrs and any lubricant.
- Cut openings in sheets for outlets, vent pipes, flues, etc. to the minimum size necessary. Reinforce edges of openings with trimming plates, angles and sections.
- Lay sheets with exposed joints of side laps away from prevailing wind unless shown otherwise on drawings.
- Ensure that ends of sheets, and end laps are fully supported with fixings at top of lap.
- Ensure that raking cut edges at hips and valleys are fully supported.
- Drill all holes and install fasteners perpendicular to the surface of the cladding. Position fasteners at regular intervals in straight lines, centred on support bearings.
- Locate fasteners centrally within holes that are oversized.
- Remove dust and any other foreign matter before finally fixing sheets into position.
- Protect sheets adequately during fixing and up to Practical Completion against mechanical damage and disfigurement. Rectify any defects as quickly as practicable to minimise damage and nuisance.
- Install fasteners to correct tightness using any special tools recommended by the fastener manufacturer. When used, screw guns must be fitted with depth sensitive devices and used at the correct speed.
- Check fastenings on completion and adjust as necessary to ensure that they are watertight and sheeting is secure but not buckled or distorted.
- Paint all cut edges to match face finish.

460 THERMAL MOVEMENT in roof and cladding sheeting to be accommodated by the use of expansion laps or to manufacturer’s recommendations.

470 STRUCTURAL MOVEMENT JOINTS: Leave space between sheets to coincide with structural movement joints. Fix weathertight movement joint cover to sheets on one side only.

480 FLASHINGS/TRIMS to be lapped at joints as follows, unless specified otherwise:
- Vertical and sloping flashings/trims: End laps to be the same as for adjacent sheeting.
- Horizontal flashings/trims: End laps to be 150 mm, sealed and where possible arranged with laps away from the prevailing wind.
- Where possible fix flashings/trims to structure in conjunction with adjacent sheeting. Otherwise fix securely to sheeting to manufacturers recommendations.

540 ABUTMENTS: Ensure a weathertight junction with flashings which must be correctly located and neatly dressed down.

550 SEALING LAPS ON EXTERNAL SHEETS:
- Sealant tape: If not specified elsewhere type(s) to be as recommended for the purpose by sheet manufacturer.
- Position sealant tape in straight, unbroken lines below fixing positions, parallel to edge of sheet. Place into corrugations or troughs. Do not allow to stretch or sag into position.
- Ensure continuity and effectiveness of seal, especially at corner of sheets. Do not overcompress.
- Seal end laps as specified elsewhere with a single or double line of sealant tape. Single line sealant tape to be located immediately below the line of fasteners. A second line, if specified to be slightly set back from the edge of the external sheet.
- Seal side laps, as specified elsewhere with a single or double line of sealant tape. Single line sealant tape to be located outside of the line of fasteners. A second line, if specified to be located on the other side of the fasteners.

560 WARNING NOTICES:
- Signs as described below to be fixed at points as agreed with CA.
- Manufacturer and reference: contractor to submit for CA approval.
Material: aluminium
- Description:
  Warning sign as BS 5378:Part 3 reference A.2.4 with supplementary text sign, lettering 'DANGER Fragile roof'.
  Mandatory sign as BS 5378:Part 3 reference A.3.1 with supplementary text sign, lettering 'Use crawling boards'.

End of section.

J       Waterproofing

J30    LIQUID APPLIED TANKING/ DAMP PROOFING

To be read with Preliminaries/General conditions.

TYPES OF TANKING OF DAMP PROOFING

110    COLD APPLIED TANKING
- Masterseal by BASF.
- Substrate: concrete screed
- Primer: Undiluted Primer G
- Coating: Trowelled waterproof flexible protective coating
- Manufacturer: BASF, Kigali.
- Product reference: Masterseal, detailed specification to CA approval one-part product with a material base of solvent-free, synthetic resin dispersion. It is a membrane-forming liquid applied tanking system which protects moisture sensitive substrates, providing a waterproof background for the fixing of ceramic tiles and mosaics.
- The system includes sealing tape for wall and floor junctions liable to excessive movement and gaskets for use where pipes and drains penetrate the coating. Provides protection even when cracks of 1.8mm occur in the background after application.

130    COLD APPLIED DAMP PROOFING;
- Masterseal by BASF
- Substrate: In situ concrete walls and bases
- Primer: Undiluted Primer
- Coating: Brush and then trowelled waterproof flexible protective coating
- Manufacturer: BASF
- Number of coats: Three, total 3mm. thick
- Coverage per coat (minimum): Refer to Manufacturer's recommendations.
- Reinforcement: Refer to Manufacturer's recommendations.
- Blinding: Not required.

EXECUTION

205A    SUITABILITY OF SUBSTRATE
- Preparation: Consult with BASF for recommendations and details.
- Substrates generally:
  - Smooth, even textured, clean, dry and frost free.
  - Within tolerances for level and surface regularity
  - Vertical and horizontal surfaces: Correctly prepared and free from irregularities.
  - Moisture content and stability of substrate: Must not impair integrity of finished tanking/ damp proofing.
- Preliminary work: Complete including:
- Chases.
- External angles.
- Formation of upstands and kerbs.
- Movement joints.
- Penetrations/Outlets.

207 PRIMERS
- Application: Uniform, continuous coverage.

End of section.

L Windows/Doors/Stairs

L20 Doors/shutters/hatches
Note: See Door Schedule for door types
To be read with Preliminaries/General conditions.

PRELIMINARY INFORMATION/REQUIREMENTS

110 EVIDENCE OF PERFORMANCE: Provide independently certified evidence that all specified variants of components comply with specified performance requirements.

115 FIRE RESISTING TIMBER DOORSETS: Provide evidence, in the form of a product conformity certificate, test report or engineering assessment, that each fire door/doorset supplied will comply with the specified requirements for fire resistance if tested in accordance with BS 476:Part 22. Such certification must cover door and frame materials, glass and glazing materials and installation, essential and ancillary ironmongery, hinges and seals.

120 FIRE RESISTING STEEL DOORS/SHUTTERS: Provide evidence of compliance with the Loss Prevention Council Rules for the construction and installation of firebreak doors and shutters.

150 SITE DIMENSIONS must be taken and recorded on shop drawings before commencing fabrication.

160 PROTOTYPES: Prepare one of each of the types and arrange for inspection by the CA before starting repetitive fabrication.

170 CONTROL SAMPLES: After finalisation of all details, prepare one of each of the types, as part of the quantity required for the project and obtain approval of appearance before proceeding with manufacture of the remaining quantity.

COMPONENTS

480 DOORS METAL DOORSETS:
- Drawing reference(s): refer to door schedules
- Manufacturer: Submit proposals.
- Product reference: TBC.
- Finish as delivered: Anodised to BS 3987 AA25, primed for painting on site
- Beading: Internal.
- Ironmongery: As ironmongery schedule.
- Fixing: To manufacturer’s recommendations.
520 SLIDING DOORS
- Manufacturer: Aluclad Rwanda or similar
- Door leaf material: Aluminum framed screen door.
- Arrangement: Top rolling with bottom guide trail.
- Thickness: Basic depth of vent profile 50 mm, basic depth of outer frame profile 100 mm.
- Color: White.
- Material: Aluminum
- Finish: Powder coating
- Glazing system: n/a
- Ironmongery: to CA approval
- Fixing: To manufacturer's recommendations

EXECUTION

710 PROTECTION OF COMPONENTS: Do not deliver to site components that cannot be installed immediately or placed in clean, dry, floored and covered storage. Stack on bearers, separated with spacers to prevent damage by and to projecting ironmongery, beads, etc.

720 MOISTURE CONTENT: During delivery, storage, fixing and thereafter to Practical Completion maintain conditions of temperature and humidity to suit specified moisture content(s) of timber components. When instructed by CA, test components with approved electrical moisture meter used in accordance with manufacturer's recommendations.

730 PRIMING/ SEALING: Wood surfaces inaccessible after installation: Primed or sealed as specified before fixing components.

740 CORROSION PROTECTION: Before fixing, apply two coats of bitumen solution to BS 6949 or an approved mastic impregnated tape, to surfaces of differing metals which will come into contact with one another.

750 DOORSETS: Do not fix until rooms are weathertight and the work of wet trades is finished and dried out.

760 BUILDING IN: will not be permitted except where specifically stated.

761 BUILDING IN: Components which are being built in must be braced and protected as necessary to prevent distortion and damage during erection of adjacent structure.

780 PREPARED OPENINGS: Ensure that dpcs are positioned correctly in relation to frames and prevent displacement during fixing operations.

800 LOOSE THRESHOLDS: Fix 150 mm from each end and at 600 mm maximum centres.

820 SEALANT JOINTS:
- Sealant manufacturer and reference: Adshead Radcliffe or equal and approved Arbo XL 1075
  Colour: to be agreed with CA
- Prepare joints and apply sealant as section Z22.

830 FIXING IRONMONGERY GENERALLY:
- Assemble and fix carefully and accurately using fasteners supplied by the ironmongery manufacturer, with matching finish and equivalent corrosion resistance.
- Holes for components to be no larger than the minimum required for satisfactory fit/operation.
- Protect ironmongery and adjacent surfaces as necessary to prevent damage.
- At completion, check, adjust and lubricate as necessary to ensure correct functioning of all moving parts.
840 FIXING IRONMONGERY TO FIRE RESISTING DOOR ASSEMBLIES:
- Fix all items in accordance with door leaf manufacturer's recommendations.
- Ensure that, when fixed, ironmongery does not compromise the integrity of the assembly as established by testing/assessment.
- Cut holes for through fixings and components accurately. Clearances must not be greater than 8 mm unless protected by intumescent paste or similar.
- Coat lock/latch cases for FD60 doors with intumescent paint or paste before fitting.

850 LOCATIONS OF HINGES:
- Where not specified otherwise, position hinges with centre lines 250 mm from top and bottom of door leaf.
- Position third hinge (where specified) at mid-leaf.
- Position hinges for fire resisting doors in accordance with door leaf manufacturer's recommendations.

End of section.

L30 Stairs/ ladders/ walkways/ handrails/ balustrades

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: Part A-F as appropriate.

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

COMPONENTS
EXTERNAL RAMP – guardrail
- Component material, grade and finish as delivered:
  Guarding: Mild steel with painted finish
  Handrails: painted mild steel, circular section
- Other requirements: refer to drawings

End of section

L40 General glazing
To be read with Preliminaries/ General conditions.

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 re-glazed in situ.

140 SAMPLES of each of the glazing types, not less than 150 mm square, to be submitted and approved before cutting panes.

150 WORKMANSHIP GENERALLY:
- Glazing generally: to BS 6262.
- The glazing must be wind and watertight under all conditions with full allowance made for deflections and other movements.
- Panes/sheets to be accurately sized, with clean, undisfigured surfaces and undamaged edges.
- Avoid contact between glazing panes/units and alkaline materials such as cement and lime.
- Keep materials dry until fixed. Keep insulating glass units and plastics glazing sheets protected from the sun and away from heat sources.
- Ensure that glass/plastics, surround materials, sealers primers and paints/clear finishes to be used together are compatible. Comply with glazing and sealant manufacturers’ recommendations.

151 PREPARATION: Ensure that preparation by others of surrounds, rebates, grooves and beads is complete. Clean surfaces before installing glazing.

152 PREPARATION: Clean surrounds, rebates, grooves and beads, and prepare as specified before installing glazing.

155 GLASS: Generally to BS 952 and the relevant part(s) of BS EN 572, free from scratches, bubbles, cracks, rippling, dimples and other defects.

180 BEAD FIXING WITH PINS: Space pins evenly at not more that 150 mm centres, and within 50 mm of each corner. Punch pins just below the timber surface.

181 BEAD FIXING WITH SCREWS: Space screws evenly at not more that 225 mm centres, and within 75 mm of each corner.

TYPES OF GLAZING

210 PUTTY FRONTED SINGLE GLAZING
- Drawing reference(s): refer to door and window schedules
- Pane material: 6mm clear float glass. Laminated safety glass where required by codes.
- Surround: galvanized steel Sealer: paint primer
- Type of putty: metal casement
- Apply sufficient putty to produce not less than 1.5 mm finished thickness of back bedding after inserting glazing.
- Locate glazing centrally in surround using setting and location blocks, and secure with glazing sprigs/cleats/clips at 300 mm centres.
- Apply front putty and finish to a neat triangular profile stopping 2 mm short of sight line. Lightly brush surface to seal putty to glass and leave smooth with no brush marks.
- Seal putty as soon as sufficiently hard but not within 7 days of glazing. Within 28 days apply either:
  - The full final finish, suitably protected until completion and cleaned down and made good as necessary, or
  - Two coats of primer applied locally to the compound, to be followed nearer Practical Completion with the full specified finish.
- Keep opening lights in closed position until putty has set sufficiently to prevent displacement of glazing.

End of section.

M Surface finishes
M10 CEMENT: SAND/ CONCRETE SCREEDS/TOPPINGS

To be read with Preliminaries/General conditions.

TYPES OF SCREED/TOPPING

110 CEMENT:SAND SCREEED
- Base: reinforced concrete slab
- Construction: Bonded as clause 260. Nominal thickness: 70mm including finishes. Minimum thickness: 50mm.
- Mix:
  Cement: Portland to BS 12 or Portland blastfurnace to BS 146, class 42.5.
  Sand: To BS 882, grading limit M, but with not more than 10% passing sieve size 150 micrometres.
  Proportions: 1:3-4½
  Admixture: Water reducing to BS 5075: Part 1, dosage to manufacturer’s recommendations.
- Other requirements: control joint locations and details to be agreed with CA.
- Finish: suitable to receive finishes as specified on drawings
- Soundness: Test to BS 8204:Part 1, Appendix B.

GENERALLY/PREPARATION

210 SUITABILITY OF BASES: Before starting work ensure that:
- Bases are such as to permit specified levels and flatness/regularity of finished surfaces, bearing in mind the permissible minimum and maximum thicknesses of the screed/topping.
- Bases are sound and free from significant cracks and gaps.
- Bases are clean and free from plaster, dirt, dust and oil.
- Concrete slabs to receive fully or partially bonded construction have been allowed to dry out by exposure to the air for not less than 6 weeks.

220 PROPRIETARY SCREEDS/TOPPINGS: Where any screed/topping is described as ‘proprietary’, all materials, mix proportions, mixing methods, minimum/maximum thicknesses and workmanship must be in accordance with the recommendations of the stated manufacturer even though that manufacturer may not supply all of the required materials.

230 CONTROL SAMPLE: Lay an area of screed in advance of the remainder, in an approved location and to an agreed size. Obtain approval of appearance from CA before proceeding.

240 ROOF SCREEDS: Before laying screed cut small neat holes through roof slab at low points to effectively drain surplus water. Locations and method of cutting to be approved. When screed has drained completely, fill and seal holes to approval.

251 CONDUITS which are to be cast into or under screeds:
- Overlay with 500 mm wide strip of steel fabric to BS 4483, reference D49, or Welded mesh manufactured in rolls from mild steel wire not less than 1.5 mm diameter to BS 1052, mesh size 50 x 50 mm.
- Place the reinforcement at mid depth between the top of the conduit and the screed surface.

255 PIPE DUCTS/TRUNKING: Before laying screed, ensure that preformed access ducts are securely fixed to the base and accurately levelled in relation to the finished floor surface.
260 FULLY BONDED CONSTRUCTION:
  - Shortly before laying screed/topping completely remove mortar matrix from surface
to expose coarse aggregate over entire area of hardened base using abrasive
blasting or, for in situ slabs only, pneumatic scabbling. Remove all dust and debris
and wash clean.
  - Keep surface well wetted for several hours before laying screed/topping. Remove
free water then brush in a slurry bonding coat of creamy consistency.
  - As an alternative to wetting and slurring, prepare, prime as necessary and apply a
bonding agent to manufacturer's recommendations.
  - Lay screed/topping while slurry or bonding agent is still wet to ensure a good bond.

BATCHING/MIXING/LAYING

310 BATCHING: Proportions of mixes made with dense aggregates are specified by weight
and, where practicable, should be batched by weight. Volume batching will be
permitted on the basis of the previously established weight:volume relationship(s) of
the particular materials and using accurate gauge boxes. Allow for bulking of damp
sand.

330 MIXING:
  - Do not use admixtures containing calcium chloride.
  - Water content of mixes to be the minimum necessary to achieve full compaction, low
  enough to prevent excessive water being brought to the surface during compaction.
  - Mix materials thoroughly to a uniform consistence. Mixes other than no-fines must be
  mixed in a suitable forced action mechanical mixer. Do not use a free fall type (drum)
  mixer.
  - Use while sufficiently plastic for full compaction.
  - Use ready-mixed retarded screed mortar within the working time and site
  temperatures recommended by the manufacturer. Do not retemper.

340 ADVERSE WEATHER:
  - In hot weather reduce the time between operations or use other measures to prevent
  premature setting or drying out.

350 JOINTS IN SCREEDS: Unless otherwise specified:
  - Cast screeds continuously, as far as possible without defined joints, using 'wet
  screeds' between strips or bays. Obtain approval for positions of bay joints.
  - Form day joints with a vertical edge.

351 JOINTS IN SCREEDS:
  - Ensure that all joints are coordinated with movement joints required for the floor
  finish and/or the structural base.

370 LEVELS OF FLOOR SCREEDS/TOPPINGS: Permissible deviation in level of surface of
screeds (allowing for thickness of coverings) and toppings from datum: +/- 5mm.

380 FLATNESS/REGULARITY OF FLOOR SCREEDS: Sudden irregularities are not
permitted. When measured with a slip gauge to BS 8204:Part 1, Figure 3 or
equivalent, the variation in gap under a straightedge (with feet) placed anywhere on
the surface to be not more than the following:
  - Screeds to receive toppings or beds 15-30 mm thick: 10 mm under a 3 m
    straightedge
  - Screeds to receive mastic asphalt flooring/underlays:
    5 mm under a 3 m straightedge
  - Screeds to receive sheet or tile finishes bedded in adhesive:
    5 mm under a 3 m straightedge
2 mm under a 1 m straightedge

390 FLATNESS/REGULARITY OF ROOF SCREEDS:
- Sudden irregularities not permitted. Variation in gap under a 2 m straightedge (with feet) placed anywhere on the surface to be not more than 6 mm.
- Ensure that falls are sufficiently even to prevent ponding.

400 COMPACTION OF SCREEDS: Compact proprietary screeds using methods recommended by the manufacturer. Compact other screeds as follows:
- Compact screed layer(s) thoroughly by mechanical means (e.g. plate vibrator) or, where this is not practicable, by hand using a handrammer or weighted roller.
- Lay screeds over 50 mm thick in two layers of approximately equal thickness. Roughen the surface of the compacted lower layer and immediately lay the upper layer.

420 STAIR SCREEDS/TOPPINGS:
- Construction: Bonded as clause 260 to treads, risers and landings.
- Form risers with fine finish formwork.
- Make good surfaces of toppings with cement:fine aggregate and a wood float, and when hardened rub to remove laitance.

425 CRACK CONTROL REINFORCEMENT:
- Type: wire mesh to BS 4483.
- Place between the two layers of screed, lap edges not less than 100 mm and tie securely with steel wire. Ensure continuity through daywork joints.
- Where necessary arrange reinforcement to avoid a four layer build up at corners.

430 COVED IN SITU SKIRTINGS:
- Background: concrete blockwork
- Form construction joint at base.
- Apply recommended bonding agent and render skirting while still wet to ensure a good bond.
- Thickness: Not more than 10 mm for any one coat. Allow each coat to set before applying subsequent coats.
  Cove radius: 30 mm.
- Render to give true lines and a fine finish with an even consistent appearance.

455 SEALANT MOVEMENT JOINTS WITH METAL EDGINGS
- Edging material: galvanized mild steel angle.
  Size: to suit finish depth
  Fixing: Bed in 1:3 cement:sand centred over joint in base and to exact finished level of floor. Fix securely to base.
- Joint width: nominal 10mm, to be agreed with CA
- Sealant: submit for approval
  Colour: to be agreed with CA
- Prepare joints and apply sealant as section Z22.

475 STRIP MOVEMENT JOINTS
- Manufacturer and reference: from Schluter range or equal and approved
- Set joints securely into screed/topping to exact finished level of floor. Ensure that joints extend through to the base.

FINISHING/CURING

510 TIMING: Carry out all finishing operations at optimum times in relation to the setting and hardening of the material. Do not wet surfaces to assist surface working. Do not sprinkle cement onto surface.
520 WOOD FLOATED FINISH: Use a wood float to give an even slightly coarse texture with no ridges or steps.

530 SMOOTH FLOATED FINISH: Use a hand float, skip float or power float to give an even surface with no ridges or steps.

540 TROWELLED FINISH TO RECEIVE APPLIED FLOOR FINISHES:
- Float to an even surface with no ridges or steps.
- Hand or power trowel to give a uniform smooth but not polished surface free from trowel marks and other blemishes, and suitable to receive the specified flooring material.
- If, because of inadequate finishing or protection, the surface of the screed is not suitable to receive the specified flooring material, it must be made good by application of a smoothing compound by and to the satisfaction of the flooring subcontractor. Allow for the cost of any such making good.

550 TROWELLED FINISH FOR WEARING SURFACES:
- Float to an even surface with no ridge or steps.
- As soon as the surface is sufficiently hard, steel trowel by hand or machine. Retrowel at least twice at intervals until a hard closed finish is obtained and there is little or no effect from further trowelling.
- Finished surfaces must be uniform, smooth and free from trowel marks and other blemishes.

570 NONSLIP TROWELLED FINISH FOR WEARING SURFACES:
- Float to an even surface with no ridges or steps.
- As soon as the surface is sufficiently hard, steel trowel by hand or machine. Retrowel at least twice at intervals until a hard closed finish is obtained and there is little or no effect from further trowelling.
- Finished surfaces must be uniform, smooth and free from trowel marks and other blemishes.
- Apply silicon carbide or aluminium oxide, graded between BS 410 sieves 1.7 mm and 500 micrometres, sprinkling evenly at the rate of 1 kg/sq m. Trowel into the surface while the concrete is still plastic.

600 POWER GROUND FINISH FOR WEARING SURFACES:
- Float to an even surface with no ridges or steps.
- When concrete is sufficiently hard for sand particles not to be torn from the surface, power grind to remove 1-2 mm from surface to give an even glass-paper texture, free from blemishes and trowel marks.
- Remove all dust and wash down. Replace waterproof sheeting without delay to complete the specified curing.

650 CURING: Unless otherwise specified:
- Immediately after laying, protect surface from wind, draughts and strong sunlight.
- As soon as screed/topping has set, closely cover with polyethylene sheeting and keep in position for not less than 7 days.

660 PROTECTION: Adequately protect screeds/toppings from damage and contamination by subsequent building operations.

670 ROOF SCREEDS: Cover screeds during wet weather and arrange building programme to ensure that they are as dry as practicable when weathertight coverings are laid.

End of section.
M20 Plastered/ Rendered/ Roughcast coatings

To be read with Preliminaries/ General conditions.

TYPES OF COATING

110 CEMENT:LIME:SAND RENDER:
- Background: blockwork and concrete
- Preparation: as Clause 511 and CA direction
- Basecoats:
  - Cement: Portland
  - Lime:sand mix: Ready-mixed to BS 4721 using sand to BS 1199, type A.
  - Admixture(s): as directed by CA if required
  - Mix proportions: as Clause 433
  - Thickness (excluding dubbing out): 8 – 12mm and 6 – 10mm
- Final coat:
  - Cement: Portland
  - Lime:sand mix: Ready-mixed to BS 4721 using sand to BS 1199, type A.
  - Mix proportions: as Clause 433
- Accessories: galvanized mild steel or PVCu beading. Submit details for approval
- Total nominal thickness: 20 – 25mm
- Refer to Mortar industry Association Guide to Best Practice for External rendering www.euromix.com

210 LIGHTWEIGHT GYPSUM PLASTER
- Preparation: Bonding agent.
- Undercoats: To BS EN 13279-1.
  - Product reference: Contractor’s choice.
  - Thickness (excluding dubbing out and keys): Two coat 13 mm overall.
  - Final coat: Finish plaster to BS EN 13279-1, class B.
- Product reference: Contractor’s choice.
  - Thickness: 2-3 mm.
  - Finish: Smooth.
- Accessories: Beads and stops.

GENERAL REQUIREMENT FOR WORKMANSHIP

413 SAMPLES: Provide samples of products as directed by CA. Obtain approval before starting work.

418 CONTROL SAMPLE(S): Complete sample areas, being part of the finished work, in approved locations as agreed with CA, and obtain approval of appearance before proceeding.

423 UNIFORMITY OF COLOUR AND TEXTURE: Once samples of coatings have been approved do not change type or proportion of constituent materials. Ensure that supplies of materials are sufficient to give consistent and uniform colour and texture. Obtain each material from one source and mix different loads if necessary.

438 CEMENT: As specified in the type of coating clause(s).
- Where Portland cement is specified Portland blastfurnace cement or Portland pulverizedfuel ash cement may be used as an alternative.
- Where Portland cement, Portland blastfurnace cement, Portland pulverized-fuel ash cement or Sulfate-resisting Portland cement is specified use Class 42.5 or 52.5 material as defined by the appropriate British Standard.
- All cements must comply with the appropriate British Standard and be licensed under the BSI Kitemark scheme for cement.
441 SITE PREPARED LIME:SAND FOR CEMENT GAUGED MORTARS: When pigment is not required, lime:sand may be prepared on site in lieu of ready-mixed material, using sand as specified in the type of coating clause(s), by:
- Thoroughly mixing lime putty, ready prepared to BS 890, with sand, or
- Thoroughly mixing hydrated lime powder to BS 890 with sand, first in the dry state and then with water. Keep for at least 16 hours before use and prevent from drying out.
- Mix materials thoroughly to a uniform consistency and appearance using suitable mechanical or manual means or, for proprietary mixes, as recommended by the manufacturer. - Do not overmix gypsum plasters or cement gauged mixes containing air entraining admixtures.

444 READY-MIXED CEMENT GAUGED MORTARS may be retarded provided they are to BS 4721, used within the working time and site temperatures recommended by the manufacturer and not remixed on site.

449 ADMIXTURES:
- Do not use unless specified or approved.
- Do not use admixtures of any type with proprietary mixes. - Do not use calcium chloride or any admixtures containing calcium chloride.

453 MIXING: - Measure materials accurately by volume using clean gauge boxes. Proportions of specified mortar mixes are for damp sand. Adjust proportions if dry sand is used.

458 CONTAMINATION: Do not allow contamination of one type of material by another, or by any set material.

461 INITIAL SET: Do not use mixes after initial set has taken place. Do not retemper or reconstitute mixes, unless permitted by the manufacturer of proprietary mixes.

466 SCAFFOLDING: Use independent scaffolding to avoid putlog holes and other breaks in coatings.

469 CLEANLINESS: Protect thoroughly all existing work and approaches using suitable boards, sheets, etc. Clean off all droppings on to finished work immediately.

481 READY PREPARED LIME PUTTY:
- Use lime putty slaked directly from CL 90 (high calcium) quicklime to BS 890, using an excess of water and matured in pits/containers that allow excess water to drain away.
- Density of matured lime putty: 1.3 to 1.4 kg/litre.
- Maturity of lime putty before use: Not less than 90 days after slaking.
- Prevent lime putty from drying out and protect from frost.

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.

511 PREPARATION GENERALLY:
- Remove efflorescence, dust and other loose material by thoroughly dry brushing.
- Remove all traces of paint, grease, dirt and other materials incompatible with coating by scrubbing with water containing detergent and washing off with plenty of clean water. Allow to dry before applying coatings unless specified otherwise.

538 STIPPLE KEY
- Materials:
  - Cement: To BS EN 197-1 and CE marked.
  - Sand: Clean, coarse.
  - Admixture: SBR bonding agent, Agrément certified.
- 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: Apply evenly to substrate to achieve effective bond of plaster/ render coat. Protect adjacent surfaces.

556 MOVING DEFECTIVE EXISTING RENDER
- Render for removal: Detached, hollow, soft, friable, badly cracked, affected by efflorescence or otherwise damaged.
- Removing defective render: Cut out to regular rectangular areas with straight edges. Horizontal and vertical edges: Square cut or slightly undercut. Bottom edges to external render: Do not undercut.
- Render with imitation joints: Cut back to joint lines.
- Cracks:
  - Fine hairline cracking/ crazing: Leave.
  - Other cracks: Cut out to a width of 75 mm (minimum).
- Dust and loose material: Remove from exposed substrates and edges.

556 MOVING DEFECTIVE EXISTING PLASTER
- Plaster for removal: Detached, soft, friable, badly cracked, affected by efflorescence or otherwise damaged.
- Hollow, detached areas: Obtain instructions.
- Stained plaster: Remove.
- Removing defective plaster: Cut back to a square, sound edge.
- Faults in background (structural deficiencies, damp, etc.): Submit proposals.
- Cracks:
  - Fine hairline cracking/ crazing: Leave.
  - Other cracks: Obtain instructions.
- Dust and loose material: Remove from exposed substrates and edges.

BACKINGS/ BEADS/ JOINTS

610 BACKINGS:
- Plasterboard: 12.5mm to BS 1230:Part 1, nail fixed, with grey paper face exposed.
- Ensure that perimeter and unbound or cut edges of boards are fully supported by additional nogginings in accordance with the board manufacturers recommendations for the type and thickness of board.
- Ensure that nogginings, bearers, etc. to support fixtures, fittings and services are accurately positioned and securely fixed.
- With the exception of wallboards fixed with bound edges vertical, arrange boards with bound edges at right angles to supports and end joints staggered between rows. Gap between boards to be not more than 3 mm.
- Working from the centre of each board, fix securely to all supports at not more than 150 mm centres. Position fixings not less than 10 mm from bound edges, 13 mm from cut/unbound edges and not less than 6 mm from edge of the timber support. Set heads flush; do not break paper or gypsum core.
- Fixings: Galvanized clout nails with minimum diameter of 2-5 mm (shank) and 7 mm (head). Length not less than 3 times the thickness of board being fixed.

640 BEADS/STOPS GENERALLY:
- Provide beads/stops at all external angles and stop ends except where specified otherwise.
- Cut neatly, form mitres at return angles and remove sharp edges, swarf and other potentially dangerous projections.
- Fix securely, using the longest possible lengths, plumb, square and true to line and level, ensuring full contact of wings with background. Use mechanical fixings for external beads/stops.
- After coatings have been applied, remove coating material while still wet from surfaces of beads/stops which are to be exposed to view.

648 DISSIMILAR SOLID BACKGROUNDS FOR PLASTERING/RENDERING: Where coating is to be continued without break across joints between dissimilar solid backgrounds which are in the same plane and rigidly bonded or tied together, cover joints with a 150 mm wide strip of building paper to BS 1521 and overlay with 300 mm wide expanded galvanized mild steel lathing. Orientate lathing in accordance with manufacturer's recommendations and fix securely at 300 mm staggered centres along both edges.

655 CONDUITS bedded in undercoat to be covered with 100 mm wide joint tape bedded in finishing coat mix, pressed flat and trowelled in. Do not lap ends of tape.

659 PLASTERBOARD JOINTS: Fill and tape (scrim) joints between boards (except where coincident with a metal bead). Bed tape centrally over joints using same plaster as following coat. Do not lap ends. Press well in, trowel flat and smooth and allow to set but not dry out before applying coating.

662 JOINTS BETWEEN BOARDS AND SOLID BACKGROUNDS that are both to be plastered: Fill and tape (scrim) unless specified otherwise.

673 SERVICE CHASES: Cover with galvanized steel mesh strip fixed securely at 300 mm staggered centres along both edges.

PLASTERING

710 APPLICATION GENERALLY:
- Apply each coating firmly to achieve good adhesion and in one continuous operation between angles and joints.
- All coatings to be not less than the thickness specified, firmly bonded, of even and consistent appearance, free from rippling, hollows, ridges, cracks and crazing.
- Finish surfaces to a true plane, to correct line and level, with all angles and corners to a right angle unless specified otherwise, and with walls and reveals plumb and square.
- Prevent excessively rapid or localised drying out.

715 ACCURACY of plaster 13 mm thick or more: The variation in gap under 1.8 m straight edge (with feet) placed anywhere on the surface to be not more than 3 mm.

720 DUBBING OUT: If necessary to correct background inaccuracies, dub out in thicknesses of not more than 10 mm in same mix as first coat. Allow each coat to set sufficiently before the next is applied. Cross scratch surface of each dubbing out coat.

721 DUBBING OUT will not be permitted on smooth dense concrete surfaces except as recommended by the plaster manufacturer.

726 METAL MESH LATHING: Work undercoat well into interstices to obtain maximum key.
731 UNDERCOATS GENERALLY: Apply firmly, rule to an even surface and cross scratch each coat to provide a key for the next coat.

734 CEMENT GAUGED UNDERCOATS: Allow to dry out thoroughly, but not too rapidly, to ensure that drying shrinkage is substantially complete before applying next coat.

737 GYPSUM/LIGHTWEIGHT PLASTERS: Apply final coat as soon as undercoat has set, is firmly bonded to background and has developed reasonable suction.

742 THIN COAT PLASTER: Before applying single coat plaster of less than 2 mm thickness, prepare surface by filling holes, scratches and voids with finishing plaster.

767 DISSIMILAR BACKGROUNDS: Where tape (scrim) or lathing or beads are not specified, cut through plaster with a fine blade in a neat, straight line at junctions of:
- Plastered rigid sheet and plastered solid backgrounds
- Dissimilar solid backgrounds.

777 SMOOTH FINISH: Trowel or float to produce a tight, matt, smooth surface with no hollows, abrupt changes of level or trowel marks. Do not use water brush and avoid excessive trowelling and over polishing.

778 WOOD FLOAT FINISH: Finish with a dry wood float as soon as wet sheen has disappeared from surface to give an even overall texture.

**RENDERING**

810 APPLICATION GENERALLY:
- Apply each coating firmly to achieve good adhesion and in one continuous operation between angles and joints.
- All coatings to be not less than the thickness specified, firmly bonded, of even and consistent appearance, free from rippling, hollows and ridges.
- Finish surfaces to a true plane, to correct line and level, with all angles and corners to a right angle unless specified otherwise, and with walls and reveals plumb and square.
- Prevent excessively rapid or localised drying out.

815 ACCURACY of rendering to receive tiles fixed with adhesive. The variation in gap under a 1.8 m straight edge (with feet) placed anywhere on the surface to be not more than 3 mm.

820 DUBBING OUT:
- If necessary to correct background inaccuracies dub out in thicknesses of not more than 13 mm in same mix as undercoat. Total thickness of dubbing must not exceed 25 mm unless approved otherwise.
- In areas where thickness of dubbing will exceed 20 mm, first apply an approved keying/bonding treatment.
- Comb surface of each dubbing out coat. Allow each coat to set but not dry before the next is applied.

830 ANCHORED MESH REINFORCEMENT: The first undercoat must be applied through and round the mesh to fully bond with the solid background.

840 UNDERCOATS GENERALLY:
- Apply first undercoat or dubbing out coat by throwing from a trowel.
- Allow to stiffen and comb to provide a key for the next coat. Comb to produce evenly spaced wavy horizontal lines, approximately 20 mm apart and 5 mm deep. Do not penetrate through the coat.
- Brush down each undercoat to remove dust and loose particles and dampen to control suction before applying next coat.
856 FINAL COAT - PLAIN FLOATED FINISH: Finish with wood or other suitably faced float to give an even, open texture. Do not apply water while working up. Do not draw excessive laitance to surface (either by overworking or by use of steel trowel).

880 DRYING:
- Work in the shade and out of drying winds whenever possible.
- Keep each undercoat and final coat damp for the first 3-4 days by covering with polyethylene sheet and/or spraying with water. Hang sheeting clear of the final coat where it is the final finish. Thereafter prevent from drying out too rapidly.
- Allow each coat to dry out thoroughly to ensure that drying shrinkage is substantially complete before applying next coat.

890 PROTECTION: Adequately protect newly applied external coatings against rain for the first 48 hours using polyethylene sheet hung clear of the face, or other approved method.

End of section.

M40 Stone/ concrete/ quarry/ ceramic tiling/ mosaic
To be read with Preliminaries/ General conditions.

TYPES OF TILING/ MOSAIC

110 TILING TO FLOORS
- Drawing reference(s): refer to drawing 1.02.
- Tiles: Unglazed ceramic tile ref IM 4315 (beige) and 4621 (light green) from Tile Centre Ltd or similar.
  Size and thickness: 300 x 300 x 10mm thick
  Colour: beige and light green.
  Finish: Matt.
- Background/Base: sand/cement screed on concrete slab.
- Preparation: to manufacturers recommendations
- Bedding: to manufacturers recommendations
- Adhesive: to manufacturers recommendations
- Joint width: 3mm.
- Grout: beige
  Type/ classification: CG1.
  Admixture: None
- Movement joints: as screed
- Accessories: from tile manufacturers range

120 TILING TO WALLS
- Drawing reference(s): refer to Bathroom drawings 3.03, 3.04, 3.05.
- Tiles: Glazed ceramic tile ref 3001 (white) from Tile Centre Ltd or similar.
  Size and thickness: 100 x 100 x 4mm thick
- Background/Base: sand/cement render on blockwork
- Preparation: to manufacturers recommendations
- Bedding: to manufacturers recommendations
- Adhesive: to manufacturers recommendations
- Joint width: 2mm.
- Grout: to manufacturers recommendations
- Movement joints: as shown on drawings or agreed with CA
- Accessories: from tile manufacturers range

GENERAL
210 SUITABILITY OF BACKGROUNDS/ BASES: Before starting work ensure that backgrounds/bases:
- Are such as to permit specified flatness/regularity of finished surfaces, bearing in mind the permissible minimum and maximum thicknesses of the bedding material.
- Have been allowed to dry out by exposure to the air for not less than the following:
  - Concrete slabs: 6 weeks.
  - Concrete walls: 6 weeks.
  - Brick/block walls: 6 weeks.
  - Cement:sand screeds: 3 weeks.
  - Rendering: 2 weeks.
  - Gypsum plaster: 4 week

215 FALLS IN THE BASE: Before starting work, check that where required, falls have been provided in the base. Inform the CA if the falls are inadequate. Do not attempt to provide falls by increasing or decreasing the specified thickness of the bedding material.

250 SAMPLES: Before placing orders submit representative samples of all types for approval by the CA. Ensure that delivered materials match samples.

260 CONTROL SAMPLE(S): Complete sample areas, being part of the finished work in approved locations and obtain approval of appearance from the CA before proceeding.

PREPARATION

310 EXISTING BACKGROUNDS/BASES GENERALLY
- Efflorescence, laitance, dirt and other loose material: Remove.
- Deposits of oil, grease and other materials incompatible with the bedding: Remove.
- Tile, paint and other nonporous surfaces: Clean.
- Wet backgrounds: Dry before tiling.

320 EXISTING CONCRETE/SCREEDS
- Loose or hollow portions: Cut out.
- Making good: yes.

330 EXISTING PLASTER
- Defective areas: Remove plaster that is loose, soft, friable, badly cracked or affected by efflorescence. Cut back to straight horizontal and vertical edges.
- Making good: Use plaster or non-shrinking filler.

350 EXISTING TILES
- Loose or hollow sounding tiles: Remove.
- Making good: yes.

360 EXISTING PAINT
- Paint with unsatisfactory adhesion: Remove so as not to impair bedding adhesion.

380 NEW PLASTER: Ensure plaster is dry, solidly bedded, free from dust and friable matter. Apply plaster primer if recommended by the adhesive manufacturer and allow drying before tiling.

390 PLASTERBOARD BACKGROUNDS: Ensure that sheets are dry, securely fixed and rigid with no protruding fixings and the face intended to receive the decorative finish is exposed

438 PREPARING CONCRETE BASES FOR FULLY BONDED BEDDING:
- Completely remove mortar matrix from surface to expose coarse aggregate over entire area of hardened base (including any associated minor areas such as skirtings, treads and risers) using a pneumatic scabbler or abrasive blasting. Remove all dust and debris and wash clean.
- Keep surface well wetted for several hours before laying bedding. Remove free water then brush in a slurry bonding coat of creamy consistency. Slurry: sand/cement to tiling suppliers recommendations.
- As an alternative to wetting and slurring, prepare, prime as necessary and apply a bonding agent. Bonding agent: to tiling suppliers recommendations.
- Lay screeded bed while slurry or bonding agent is still wet to ensure a good bond.

460 SMOOTHING UNDERLAYMENT:
- A type recommended by the adhesive manufacturer.
- Apply to the base and allow drying before fixing tiles.

FIXING

510 FIXING GENERALLY
- Check that there are no unintended colour/shade variations within the tiles for use in each area/room. Thoroughly mix variegated tiles.
- Check that adhesive is compatible with background/base. Use a primer where recommended by the adhesive manufacturer.
- Cut tiles neatly and accurately.
- Unless specified otherwise fix tiles so that there is adhesion over the whole of the background/base and tile backs.
- Before bedding material sets make adjustments necessary to give true, regular appearance to tiles and joints when viewed under final lighting conditions.
- Clean surplus bedding material from joints and face of tiles without disturbing tiles.

520 ADVERSE WEATHER:
- Comply with manufacturers’ recommendations for minimum/maximum temperatures when using proprietary adhesives.
- Take adequate precautions to protect work from inclement weather and premature drying out.

530 SETTING OUT
- Joints to be true to line, continuous and without steps.
- Joints on walls to be truly horizontal, vertical and in alignment round corners.
- Joints in floors to be parallel to the main axis of the space or specified features.
- Cut tiles/slabs to be kept to the minimum, as large as possible and in unobtrusive locations.
- Joints in walls and floors to be in alignment.
- Where positions of movement joints are not specified they are to be agreed with the CA.
- Where setting out is not specified, it is to be agreed with the CA.
- Before laying tiles obtain approval of setting out.
- Setting out of floor tiles: Drawing reference: 1.02

540 LEVEL OF FLOOR TILING: Permissible deviation in level from datum to be +/- 2 mm.

550 FLATNESS/REGULARITY OF TILING: Sudden irregularities not permitted. When checked with a 2 m straight edge with 3 mm feet at each end, placed anywhere on the surface, the straightedge should not be obstructed by the tiles and no gap should be greater than 6 mm.

560 LEVEL OF TILING ACROSS JOINTS: Maximum deviation between tile or slab surfaces either side of a joint, including movement joints to be: 1mm for joints less than 6 mm wide. 2mm for joints 6 mm or greater in width.

570 MORTAR FOR BEDDING: Unless specified otherwise:
- Cement: Portland cement to BS 12, class 42.5.
- Sand for walls: To BS 1199, Table 1.
Sand for floors: To BS 882, grading limit M, but with not more than 10% passing a 150 micrometre sieve and not more than 3% passing a 75 micrometre sieve. Where fine sand is specified, grading limit F applies.

- Batch proportions of mixes by weight or by using accurate gauge boxes on the basis of previously established weight: volume relationship(s). Allow for bulking of damp sand.
- Mix materials thoroughly to a uniform consistence in a suitable forced action mechanical mixer. Do not use a free fall type (tilting drum) mixer. Use the minimum amount of water necessary to give required workability.
- Use mortar within two hours of mixing at normal temperatures. Do not use after the initial set has taken place and do not retemper.

578 CRACK CONTROL REINFORCEMENT:
- Type: to BS 4483.
- Place centrally in depth of bed, lap edges not less than 100 mm and tie together with steel wire.

580 POROUS TILES: If to be bedded in cement:sand, soak in clean water for at least 30 minutes, and fix as soon as surface water has drained.

590 COVED TILE SKIRTINGS: Bed solid to wall before laying floor tiles. Ensure joints in skirtings match and align with joints in floor tiling.

600 SIT-ON TILE SKIRTINGS: Bed solid to wall after laying floor tiles. Ensure joints in skirtings match and align with joints in floor tiling.

651 THIN BED ADHESIVE - SOLID (WALLS): Apply floated coat of adhesive to dry background in areas of approximately 1 sq m and comb the surface with the recommended solid bed trowel. Apply thin even coat of adhesive to backs of dry tiles. Press tiles onto bedding with twisting/sliding action to give finished bed thickness of not more than 3 mm.

670 THICK BED ADHESIVE - SOLID (WALLS): Apply floated coat of adhesive to dry background and comb the surface with the recommended solid bed trowel. Fill any keys and apply thin even coat of adhesive over the entire back of each tile. Press tiles onto bedding with twisting/sliding action to give finished bed thickness within the range recommended by the manufacturer.

690 CEMENT:SAND (WALLS):
- Dampen background and apply float coat of 1:3-4 cement: sand mortar as clause 570 to an even thickness of not more than 10 mm. Finish with a wood float and allow to stiffen slightly before applying tiles.
- Without delay, and using 1:2 cement:fine sand mortar, fill any keys and apply 2 mm thick coat to the entire back of each tile. Press tiles onto float coat and tap firmly into position.

710 THICK BED ADHESIVE - SOLID (FLOORS): Apply floated coat of adhesive to dry base and comb the surface with the recommended solid bed trowel. Apply adhesive to backs of tiles as necessary to fill any depressions or keys. Press tiles firmly into position to give finished bed thickness within the range recommended by the manufacturer.

720 CEMENT:SAND BED (FLOORS):
- Mortar for bed: 1:3-4 cement:sand as clause 570 and of a stiff plastic consistency.
- Lay suitably small working areas of screeded bed and thoroughly compact to level with a finished thickness not less than 15 mm, not more than 25 mm.
- Within two hours and before bedding sets, evenly coat the entire back of each tile with the specified adhesive. Press tiles firmly into position to give a finished adhesive thickness within the range recommended by the manufacturer.
780 CHECKING TILE ADHESION: As work proceeds and before the bedding has set, carefully remove random tiles to verify that there is the specified adhesion. Remove the initial adhesive, butter the removed tiles with fresh adhesive and refix.

MOVEMENT JOINTS/GROUTING/COMPLETION

805 SEALANT MOVEMENT JOINTS WITH METAL EDGINGS
- Edging material: stainless steel angle.
  Size: to be agreed with CA.
  Fixing: Bed in 1:3 cement:sand to exact finished level of floor. Fix securely to base with fixings to be agreed with CA
  Ensure that joints coincide with any movement joints in the base.
- Joint width: to be agreed with CA
- Sealant: contractor to submit details for approval  Colour: to be confirmed  - Prepare joints and apply sealant as section Z22.

815 SEALANT MOVEMENT JOINTS
- Ensure that joints extend through tiles and bedding to substrate and that they coincide with any movement joints in the substrate.
- Joint width: to be agreed with CA
- Sealant: contractor to submit details for approval
  Colour: to be confirmed
- Prepare joints and apply sealant as section Z22.

835 METAL SECTION MOVEMENT JOINTS
- Manufacturer and reference: To be selected from Schluter range or equal and approved by CA.
  Insert colour: to be confirmed
- Fixing: Bed in 1:3 cement:sand centred over joint in base and to exact finished level of floor. Fix securely to base to manufacturers recommendations.

875 GROUTING:
- Grout tiles as soon as possible after bedding have set sufficiently to prevent disturbance of tiles.
- Ensure that joints are 6 mm deep (or the depth of the tile if less), and are free from dust and debris.
- Fill joints completely, tool to an approved profile, clean off surface and leave free from blemishes.
- Polish wall tiling with a dry cloth when joints are hard.

885 COLOURED GROUT: Check the potential risk of staining by applying the grout to a few tiles in a small trial area. If discolouration occurs apply a protective sealer to the tiles and repeat the trial.

910 PROTECTION GENERALLY: Adequately protect and keep clean all completed areas. Clean off any droppings immediately.

911 PROTECTION IN WET AREAS: Tiles/slabs to be kept dry and not brought into service for at least three weeks after grouting/jointing.

920 PROTECTION OF FLOORS: Keep completed floors clear of traffic for at least four days and permit only light traffic for the next 10 days.

End of section.

M60 Painting/ clear finishing
To be read with Preliminaries/ General conditions.
COATING SYSTEMS

110 PAINT TO:
STEEL DOOR AND WINDOW FRAMES, CASEMENTS, BEADS, STEEL DOOR FACINGS, STRUCTURAL STEELWORK, STEEL BALUSTRADE.
- Manufacturer: Sadolin Paints (EA) Ltd
- Reference: Supergloss Enamel
- Surface(s): External primed mild steel, refer to drawings
- Preparation: As Clause 400 and to manufacturers recommendations
- Initial and finishing coats: two undercoats and one coat alkyd gloss to manufacturers recommendations. Colour to be confirmed

111 PAINT TO:
INTERNAL PLASTER
- Manufacturer: Sadolin Paints (EA) Ltd
- Reference: Vinyl Matt Emulsion
- Surface(s): Walls
- Preparation: As Clause 400 and to manufacturers recommendations
- Initial and finishing coats: two undercoats and one top coat to manufacturers recommendations. Colour to be confirmed

EXTERNAL RENDER
- Manufacturer: Sadolin Paints (EA) Ltd
- Reference: Weather Guard
- Surface(s): Exterior Walls
- Preparation: As Clause 400 and to manufacturers recommendations
- Initial and finishing coats: two undercoats and one top coat to manufacturers recommendations. Colour to be confirmed

GENERAL

210 COATING MATERIALS
- Manufacturer: Obtain materials from any of the following: Sadolin, Crown or Dulux Paints.
- Selected manufacturers: Submit names before commencement of any coating work.

220 COMPATIBILITY:
- Check that all materials to be used are recommended by their manufacturers for the particular surface and conditions of exposure, and that they are compatible with each other.
- Where surfaces have been treated with preservatives or fire retardants, check with treatment manufacturer that coating materials are compatible with the treatment and do not inhibit its performance.
- Inform the CA of any discrepancy in specification of coatings and obtain instructions before proceeding with application.

215 HANDLING AND STORAGE
- Coating materials must be delivered in sealed containers, each clearly labelled with the brand name, type of material and manufacturer's batch number.
- Wherever possible materials must be from one manufacturing batch. Inform the CA if materials from more than one batch are to be used, store separately and allocate to distinct parts or areas of the work.
- Store materials in accordance with manufacturer's recommendations. Use in order of delivery and before expiry of any shelf life date

230 ANCILLARY SURFACES: The descriptions of areas to be coated given in schedules, etc. are of necessity simplified. All ancillary exposed surfaces and features are to be coated
to match similar or adjacent materials or areas except where a fair faced natural finish is required or items are completely prefinished. In cases of doubt obtain instructions before proceeding.

270 OFF SITE WORK:
- All off site preparation and coating to be carried out under cover in a suitable environment with adequate lighting.
- Store all items, both before and after coating, in a clean, dry area protected from the weather and mechanical damage, properly stacked with spaces to permit air circulation and prevent sticking of surfaces.

280 PROTECTION:
- Adequately protect internal and external surfaces, fixtures and fittings which are not to be coated, by covering with dust sheets, masking or other suitable materials.
- Exhibit 'Wet paint' signs and provide barriers where necessary to protect other operatives and the general public, and to prevent damage to freshly applied coatings.

290 TESTING OF VISCOSITY, ETC: The CA may, with discretion, take samples of materials from each manufacturing batch as follows:
- Unopened containers, or samples from previously unopened containers, for submission to manufacturer for comparison with manufacturer's own retained samples from the same batch.
- Unopened containers, or samples from previously unopened containers, as a control sample for assessment of samples taken from painters' kettles.
- Samples from painters' kettles for submission with control sample to manufacturer and/or independent testing laboratory for comparative testing.

300 CONTROL SAMPLE(S): Prepare sample areas of the finished work, including preparation, in advance of the remainder as set out below. Obtain approval of appearance before proceeding.

310 SUPERVISED CONTROL SAMPLE(S): Prepare sample areas of the finished work, including preparation, in advance of the remainder as agreed with CA. Make arrangements with the CA for full time supervision of the application of each coat. Obtain approval of appearance before proceeding. Supervised control samples may, at the CA’s discretion, be used as the basis for comparative testing of dry film thickness of complete coating systems.

321 INSPECTION OF WORK: Inspection of the whole of the work at each of the stages may be made, at the discretion of the CA. Agree with the CA a programme which will facilitate such inspections and notify him when each part and stage of the work is ready for inspection. Do not proceed with subsequent stages of the work until authorised.

PREPARATION

400 PREPARATION GENERALLY
- To BS 6150, Section 4.
- Materials used in preparation must be types recommended by their manufacturers and the coating manufacturer for the situation and surfaces being prepared.
- Prevent or control exposure of operatives to dust, vapour and fumes exceeding occupational exposure standards set in the current Health and Safety Executive (HSE) document EH40.
- Substrates must be sufficiently dry in depth to suit the coating to be applied.
- Remove efflorescence salts from surfaces. Repeat removal if efflorescence recurs.
- Clean off dirt, grease and oil from surfaces. If contamination of surfaces/substrates has occurred, obtain instructions before proceeding.
- Smooth surface irregularities. Fill joints, cracks, holes and other depressions with stoppers/fillers worked well in and finished off flush with surface. Abrade to a smooth finish.
- Apply oil based stoppers/fillers after priming. Apply water based stoppers/fillers before priming unless recommended otherwise by manufacturer. Patch prime water based stoppers/fillers when applied after priming.
- Remove dust and particles from dry abrasive preparation of surfaces.
- Remove residues from wet preparation of surfaces by rinsing with clean water, wiping and allowing to dry.
- Ensure that doors, opening windows, etc, are ‘eased’ as necessary before coating. Prime any resulting bare areas.

420 FIXTURES: Before commencing work, remove fixtures and fittings as agreed with CA, set aside and replace on completion.

425 IRONMONGERY: Remove from surfaces to be coated and refix on completion. Do not remove hinges unless instructed to do so.

440 PREVIOUSLY COATED SURFACES GENERALLY
- Preparation: In accordance with BS 6150, clause 11.5.
- Contaminated or hazardous surfaces: Give notice of:
  Coatings suspected of containing lead.
- Substrates suspected of containing asbestos or other hazardous materials.
- Suspected existing hazardous materials: Prepare risk assessments and method statements covering operations, disposal of waste, containment and reoccupation, and obtain approval before commencing work.
- Significant rot, corrosion or other degradation of substrates.
- Removing coatings: Do not damage substrate and adjacent surfaces or adversely affect subsequent coatings.
  Loose, flaking or otherwise defective areas: Carefully remove to a firm edge.
  Alkali affected coatings: Completely remove.
- Retained coatings:
  Thoroughly clean to remove dirt, grease and contaminants.
  Gloss coated surfaces: Provide key.
- Partly removed coatings:
  Additional preparatory coats: Apply to restore original coating thicknesses.
  Junctions: Provide flush surface.
- Completely stripped surfaces: Prepare as for uncoated surfaces.

471 PREPRIMED TIMBER: Abrade chalking, powdery and other defective primer back to bare timber, remove dust and reprime resulting bare areas.

481 UNCOATED TIMBER:
- Abrade to a smooth, even finish with arises and moulding edges lightly rounded or eased.
- Ensure that heads of fasteners are countersunk sufficiently to hold stoppers/fillers.
- Apply two coats of knotting to resinous areas and knots and allow to dry.

490 PREVIOUSLY COATED STEEL:
- Abrade corrosion and loose scale back to bare metal.
- Treat any residual rust with a proprietary removal solution. Prime as soon as possible.

500 PREPRIMED STEEL: Areas of defective primer, corrosion and loose scale: Take back to bare metal. Reprime as soon as possible.
541 UNCOATED ALUMINIUM/COPPER/LEAD: Remove any surface corrosion/oxidization and lightly abrade with fine abrasive paper and white spirit. Apply pretreatment etching primer where recommended by the coating system manufacturer.

560 UNCOATED CONCRETE: Remove release agents with detergent/emulsion solutions. Ensure that major surface defects are repaired.

570 UNCOATED MASONRY/RENDERING: Remove loose and flaking material with a stiff brush.

580 UNCOATED PLASTER: Scrape off nibs, trowel marks and plaster splashes. Abrade lightly any over-trowelled 'polished' areas.

APPLICATION

700 UNSUITABLE CONDITIONS:
- Take all necessary precautions including restrictions on working hours, providing temporary protection and allowing extra drying time, to ensure that coatings are not adversely affected by climatic conditions during and after application.
- Prevent or control exposure of operatives to solvent vapour levels exceeding occupational exposure standards set in the current Health and Safety Executive (HSE) document EH40.
- Unless it is specifically permitted by the coating manufacturer, do not apply coatings:
  - To surfaces affected by moisture or airborne dust.
  - When the relative humidity is above 80%.
  - When heat is likely to cause blistering or wrinkling.

711 COATING GENERALLY:
- To BS 6150, Section 5.
- Do not use materials which show any bittiness or other defects when applied. Do not thin or intermix unless specified or recommended otherwise.
- Apply priming coats as soon as possible on the same day as preparation is completed. They must be of adequate thickness and suit surface porosity.
- Keep brushes and equipment in a clean condition. Dispose safely of cleaning and waste materials. Do not pour into sanitary appliances or drains.
- Subsequent coats of the same pigmented material must be of a different tint to ensure that each coat provides complete coverage.
- Apply coatings evenly to give a smooth finish of uniform colour, free from brush marks, sags, runs and other defects. Cut in neatly and cleanly. Do not splash or mark adjacent surfaces.
- Adequately protect drying and completed work from damage.

720 PRIMING JOINERY:
- Before priming preservative treated timber ensure that any cut surfaces have been retreated and that all preservatives are completely dry.
- Liberally coat all end grain, allow soaking in and then recoating.

730 CONCEALED JOINERY SURFACES: Where one or more additional coats are specified to be applied in the factory, they must be applied to all surfaces, including those which will be concealed when components are fixed in place.

751 STAINING TIMBER:
- Apply primer where recommended by the stain manufacturer.
- Apply stain in flowing coats. Brush out excess stain before set to produce uniform depth of colour.
760 VARNISHING: Thin first coat with white spirit in accordance with manufacturer's recommendations. Brush well in avoiding aeration and lay off. Apply further coats of varnish, rubbing down lightly between coats along the grain.

770 EXTERNAL DOORS: Prime and coat bottom edges before hanging.

N Furniture/Equipment

N13 Sanitary appliances and fittings

All as per Schedule

WORKMANSHP

610 INSTALLATION GENERALLY:
- Assemble and fix appliances and accessories so that surfaces designed to falls drain as intended.
- Use nonferrous or stainless steel fastenings unless specified otherwise.
- Wherever possible, fix supply and discharge pipework before appliances. Ensure that appliances are fixed securely to structure and are not supported by pipework.
- When not specified otherwise, use jointing and bedding compounds recommended by the manufacturers of the appliances, accessories and pipes being jointed or bedded.
- Prevent use of appliances for any purpose until Practical Completion. Do not stand on appliances.
- On completion, check for damage and defects and test for satisfactory operation. Replace damaged or defective components and accessories. Check for, and rectify leaks. Remove labels/stickers and clean appliances thoroughly.

613 COMPATIBILITY OF COMPONENTS: Unless specified otherwise, every sanitary assembly must consist of functionally compatible components obtained from a single manufacturer.

617 WATER BYELAWS SCHEME APPROVAL: All sanitary appliances, taps and water fittings must comply with local Water Byelaws or otherwise be tested and approved to the satisfaction of the water undertaker to whose supply they will be connected.

620 NOGGINGS/BEARERS: Ensure that noggings, bearers, etc. required to support sanitary appliances and fittings are accurately positioned and securely fixed.

630 TILED BACKGROUNDS (other than splashbacks): Ensure that:
- Tiling is complete before fixing appliances.
- Fixings do not overstress tiles.

650 WC PANS:
- Screw fix floor mounted pans and fit cover caps over screw heads. Unless specified otherwise, do not use mortar or other beddings.
- Ensure that seat and lid are stable when raised.

670 CISTERNS:
- Unless specified otherwise obtain cistern operating components from cistern manufacturer. Ensure that ball valve matches pressure of water supply.
- Fix at the height recommended by manufacturer unless otherwise specified or shown on drawings.
- Ensure that overflow pipe is fixed to falls, and located to give visible warning of discharge. Agree position with CA where not shown on drawings.

710 TAPS: Fix securely, making a watertight seal with the appliance. Place hot tap to left of cold tap as viewed by user of appliance.

720 WASTES/OVERFLOWS: Bed in waterproof jointing compound and fix with resilient washer between appliance and backnut.

750 SEALANT POINTING:
- Sealant: silicone based to BS 5889, Type B with fungicide.
  Manufacturer and reference: Adshead Ratcliffe or equal and approved
  Arbo Kitchen and Bathroom Sealant
  www.arbo.co.uk
  Colour: to be agreed with CA
- Application: As section Z22.

End of section.

P Building fabric sundries

P20 Unframed isolated trims/ skirtings/ sundry items
To be read with Preliminaries/General conditions

110 HARDWOOD SKIRTINGS, SILL BOARDS
- Quality of timber and fixing: To BS 1186:Part 3.
- Species: hardwood from a local sustainably managed source, details to be submitted for CA approval.
  Class: CSH and Class 1
  Moisture content at time of fixing: 9 to 13%
- Profile and finished size: square edged
- Finish as delivered: One coat clear matt finish as section M60
- Fixing: pinned or plugged, screwed and pelleted as directed by CA.

510 INSTALLATION GENERALLY:
- Joinery workmanship to be as section Z10 unless specified otherwise.
- Methods of fixing and fastenings to be as section Z20 unless specified otherwise.
- Straight runs to be formed in single lengths wherever possible. Location and method of forming running joints to be approved by the CA where not detailed.
- All joints at angles to be mitred unless specified otherwise.
- Moisture content of timber and wood based boards to be maintained during storage and installation within the range specified for the component.

End of section

P21 Door/ window ironmongery
To be read with Preliminaries/ General conditions.

As per door schedule.

PRE-TENDER

10 QUANTITIES AND LOCATIONS
- Quantities and locations of ironmongery are in the door and screen schedule.
- Fixing: As sections L10 and L20.

GENERAL

120 IRONMONGERY RANGE SELECTED BY CONTRACTOR
- Source: Single coordinated range.
- Notification: Submit details of selected range, manufacturer and/or supplier.
- Principal material/finish: Satin stainless steel, grade 1.4301 (304).
- Items unavailable within selected range: Submit proposals.

121 IRONMONGERY FROM SINGLE PROPRIETARY RANGE
- Manufacturer: Assa Abloy or similar approved.
- Product reference: Ovation series.
- Principal material/finish: Satin stainless steel, grade 1.4401 (316).
- Items unavailable within selected range: Submit proposals.

140 SAMPLES
- General: Before placing orders with suppliers submit labelled samples of the following: level furniture and locks.
- Conformity: Retain samples on site for the duration of the contract. Ensure conformity of ironmongery as delivered with labelled samples.

DOOR HANGING DEVICES

310 SINGLE AXIS DOOR HINGES all escape doors
- Standard: To BS EN 1935.
- Hinges to doors on escape routes and fire/smoke control doors: CE marked.
- Manufacturer: As clause 121.
- Product reference: Union.
- Type: Double washered butt.
- Size: 98 x 82 mm.
- Material/finish: Brass, grade 1.4401 (316).
- Hinge grade: As schedule.
- Other requirements: None.

DOOR SECURING DEVICES

515 DOOR LOCKS
- Standard: To BS EN 12209.
- Manufacturer: Union or similar approved.
  Product reference: L-2109-78.
- Type: Cylinder mortice lock.
- Backset: As schedule.
- Material/finish: Brass faceplate.
- Keying: In master keyed suite.

DOOR FURNITURE

610 LEVER HANDLES to outside covered terrace and bathroom door
- Standard: To BS EN 1906.
- Manufacturer: Assa Abloy or similar approved.
  Product reference: Sandpiper 6104-06SS.
  Style: As schedule.
  Size: As schedule.
- Material/finish: Brass, grade 1.4401 (316)As schedule.
- Mounting: Sprung rose with hidden screw fixing.
- Additional requirements: None.
641 PULL HANDLES outdoor covered terrace sliding door
- Manufacturer: Union or similar approved.
- Product reference: Sandpiper 5210 BBSS.
- Standard: To BS 8424.
- Shape: D handle.
- Diameter: 32 mm.
- Distance between centres: 350 mm.
- Material/ finish: Brass, grade 1.4401 (316).
- Mounting: Back to back.
- Additional requirements: None.

850 THRESHOLD WEATHERSTRIP:
Manufacturer and reference: contractor to submit details for approval.

End of section.

P31 Holes, chases, covers and supports for services
To be read with Preliminaries/General conditions.

Any service penetrations in the concrete beams will be shown on plan in the M&E drawings and made note of on the structural drawings. The location of the sleeve penetrations will not exceed 100mm in any location (unless specified on drawings) and the location is to be agreed and approved by the engineer prior to any casting to ensure the correct location has been chosen. Chasers are to be made in the blockwork only and not the concrete walls unless approved by the engineer. The chasers are to match the architects and M&E’s drawings and specifications

PRODUCTS
Refer to MEP drawings and specifications

EXECUTION

150 HOLES AND CHASES IN IN SITU CONCRETE to be cast in. Do not cut hardened concrete or drill holes larger than 10 mm diameter without permission.

160 HOLES AND CHASES IN PRECAST CONCRETE: Do not cut or drill precast concrete without permission.

170 HOLES IN STRUCTURAL STEELWORK: Do not cut or drill structural steelwork without permission.

185 HOLES, RECESSES AND CHASES IN MASONRY:
- Holes, recesses and chases to be in locations which will least affect the strength, stability and sound resistance of the construction, and to be of the smallest practicable size.
- Holes must not exceed 300 mm square.
- Do not cut chases in walls of hollow or cellular blocks without approval. In walls of other materials:
  - Vertical chases must be not deeper than one third of the single leaf thickness.
  - Horizontal or raking chases must be no longer than 1 m and not deeper than one sixth of the single leaf thickness.
- Do not set chases or recesses back to back; offset by a clear distance not less than the wall thickness. Where sockets, etc. are shown on drawings as nominally back to back, obtain instructions.
- Do not cut until mortar is fully set. Cut carefully and neatly, avoiding spalling, cracking or other damage to surrounding structure. Do not cut chases with mechanical or hand impact tools.

220 PREFORMED HOLES IN MASONRY: Submit proposals for bridging over holes for ducts, pipes, etc., which exceed 300mm in width.

230 NOTCHES AND HOLES IN STRUCTURAL TIMBER:
- To be avoided wherever possible and to be the minimum sizes needed to accommodate services.
- Do not position near knots or other defects in the same cross section which would significantly affect strength of timber.
- Notches and holes in the same joist to be at least 100 mm apart horizontally.
- Notches in joists to be at the top, located between 0.07 and 0.25 of span from support, not deeper than 0.125 x depth of joist and to be formed by sawing down to a drilled hole.
- Holes in joists to be on the neutral axis, with diameter not more than 0.25 x depth of joist spaced at centres not less than 3 x diameter of largest hole and located between 0.25 and 0.4 of span from support.
- Notches in roof rafters, struts and columns will not be permitted.
- Holes in struts and columns to be on the neutral axis, with diameters not exceeding 0.25 x minimum width of member, located between 0.25 and 0.4 of length from end and spaced at centres not less than 3 x diameter of largest hole.

310 PIPE SLEEVES
- Material: submit details for CA approval
- Sleeves to extend through full thickness of wall/floor and be accurately positioned to give a minimum clearance around service of 20 mm or diameter of service, whichever is the least.
- Sleeves, whether built in or installed in preformed holes, to be bedded solid.
- Seal annular space between service and sleeve with sealant to be approved by CA.
- Where exposed to view, finish bedding and sealing neatly to approval.
- Finish: Install sleeves flush with building finish. In areas where floors are washed down, install protruding 100 mm above floor finish.

340 SEALING AROUND SERVICES: Seal around all services where they pass through building fabric with mineral wool quilt and sealant (fire resistant where required). Completely fill the space, leaving no gaps and finish neatly.

370 ACCESS COVERS/GRATINGS
- Manufacturer and reference: submit details for approval.
  - Vertical positioning: level or marry in with surrounding surfaces.
  - Horizontal positioning: centre over openings and install square with joints in surrounding surfaces.

620 HOLES AND CHASES IN IN SITU CONCRETE
- Cast in: Holes larger than 10 mm diameter and chases.
- Cutting and drilling:
  - Permitted for holes no larger than 10 mm diameter.
  - Not permitted for holes larger than 10 mm diameter except as indicated on drawings.

End of section.

Q  Paving/Planting/Fencing/Site furniture

To be read with Preliminaries/General conditions.
Q21 IN SITU CONCRETE ROADS / PAVINGS / BASES

210 COMPLETE CORRELATED RECORDS must be maintained for each prescribed mix including:
- Information in accordance with BS 5328:Part 3, clauses 3.1 and 3.2.
- All sampling, site tests and identification numbers of all specimens tested in the laboratory.
- The location from which each sample is taken.

220 TESTING:
- Test prescribed mixes for types as directed by CA in accordance with BS 5328: Part 4.
- Rate of sampling: to be agreed with CA.
- Tests to be carried out by one NAMAS accredited laboratory. Submit name of selected laboratory as soon as possible and in any case before making trial mixes or concrete for use in the works.
- Submit test reports within one day of completion of each test. Keep a complete set of reports on site.

230 REINFORCEMENT QUALITY ASSURANCE: All steel reinforcement specified to BS 4449 or BS 4483 is to be obtained from firm(s) holding a valid certificate of approval issued under a product certification scheme obtained from a third party certification body with appropriate category 2 accreditation from the United Kingdom Accreditation Service (UKAS).

240 ACCEPTANCE OF SUB-BASE: Before starting work ensure that:
- The base is sound, free of debris, mud and soft spots, and suitably close textured.
- The levels and falls of the sub-base are as detailed, within the specified tolerances of ±20 mm (vehicular areas) and ±12 mm (pedestrian areas).
- Drainage outlets are within +0 to -10 mm of the required finished level.
- Kerbs and edgings are complete, adequately bedded and haunched and to the required levels.

250 LAYING MESH REINFORCEMENT:
- Lay in flat sheets, straight and out of winding, when placed in position.
- Lay with main reinforcement parallel to long axis of slab.
- Securely fix and support mesh in position during construction of the slab.
- Lap mesh sheets transversely by not less than 450 mm and longitudinally by not less than 300 mm.
- Terminate mesh within: 300 ±50 mm of slab edges and centre line of transverse joints 125 ±25 mm of centre line of longitudinal joints.
- Mesh may be placed in position on top of the first compacted layer of concrete, followed by the top layer of concrete, placed within two hours of the first layer.

260 STEEL FORMWORK:
- Use steel side forms, drilled as required for dowel bars, free from warping and kinks.
- Fix securely to required line, ±10 mm, and level, ±3 mm. Use locking plates where necessary to ensure rigidity and prevent movement during laying and compaction of concrete.
- Remove forms not less than six hours after completing compaction and treat exposed edges with approved waterproof compound.

265 TIMBER FORMWORK:
- 150 x 38 mm softwood board, drilled as required for dowel bars, fixed with galvanized nails to 50 x 50 x 450 mm long softwood pegs driven into the ground at 1200 mm centres.
- Preservative treatment: As section Z12 and British Wood Preserving and Damp-Proofing Association Commodity Specification C4.
  Type/Desired service life: CCA or creosote, 20 years.

LAYING CONCRETE

310 TRANSPORTING CONCRETE:
- When ready mixed concrete is transported in a truck mixer, water must be added under supervision either on site or at the central batching plant. Under no circumstances must water be added in transit.
- Avoid contamination, segregation, loss of ingredients, excessive evaporation and loss of workability. Cover concrete during heavy rain.
- Clean equipment immediately after use and whenever cement or aggregate is changed.
- Use suitable walkways and barrow runs for traffic over reinforcement and freshly placed concrete.

320 LAYING GENERALLY:
- At time of placing, ensure that surfaces on which concrete is to be placed are free from debris and standing water.
- Place as soon as practicable after mixing and while sufficiently plastic for full compaction. After discharge from the mixer do not add water or retemper mixes.
- Place in final position in one continuous operation up to construction joints.
- Ensure that temperature of concrete at point of delivery is not more than 30°C in hot weather and not less than 5°C in cold weather. Do not use frozen materials or place concrete against frozen or frost covered surfaces.
- Do not place concrete when the air temperature is below 3°C on a falling thermometer and do not resume placing until the rising air temperature has reached 3°C.
- Spread and strike off with surcharge sufficient to obtain required compacted thickness.
- Form neat junctions with and prevent damage to adjacent work. Keep clean all channels, kerbs, inspection covers, etc.

330 COMPACTING:
- Fully compact concrete to full depth (until air bubbles cease to appear on the surface) especially around reinforcement, cast-in accessories, into corners and at joints.
- Poker vibrators must not be used to make concrete flow into position and must not come into contact with fabric reinforcement.
- Rectify any irregularities at wet formed joint grooves by means of a vibrating float.
- Finish with an approved scraping straightedge immediately after completing compaction to produce a dense, even textured surface free from laitance or excessive water.
- Remove any excess concrete from top of groove formers.

340 MANHOLE COVER/GULLY GRATING FRAMES:
- Set frames in independent concrete slabs placed over, but slightly larger than, the exterior of the manhole shaft or gully pot and any concrete surround.
- Position joints in main slab so that manhole/gully slabs are adjacent to a main transverse joint, unless specified otherwise.
- Separate the independent slabs from main slabs with 25 mm thick joint filler board. Set board 20 mm below top of slab to form a sealing groove.
350 LEVELS:
- Lines and levels of finished surface to be smooth and even, with regular falls to prevent ponding.
- Finished surfaces to be within ±6 mm of required levels (+6 -0 mm adjacent to gullies and manholes).

360 SURFACE REGULARITY:
- Where appropriate in relation to the geometry of the surface, the variation in gap under a 3 m straightedge (with feet) placed anywhere on the surface to be not more than 5 mm.
- Sudden irregularities not permitted.

JOINTS

410 JOINTS GENERALLY:
- All joints to be accurately located, straight and well aligned.
- Construction joints made at the end of the working day to be formed as contraction joints.
- If modifications to any joint design or location are necessary on site, agree revisions with CA before proceeding.
- Do not allow concrete to enter any gaps or voids in the formwork or to render the movement joints ineffective.
- Do not allow concrete to impregnate or penetrate any materials used as compressible joint fillers.
- Do not place concrete simultaneously on both sides of movement joints.

420 TIE BARS:
- Plain round mild steel to BS 4449 grade 250, 12 mm diameter x 1000 mm long, and free from oil, dirt, loose rust and scale.
- Finish: Middle 400 mm to be thoroughly cleaned and coated with a corrosion resistant flexible polymeric coating.
- Place tie bars in longitudinal joints at 600 mm centres, centred on and perpendicular to line of joint. Position within the middle third of the slab depth and not less than depth specified in structural specifications below any top crack inducer joint groove.

430 DOWEL BARS:
- Plain, round, mild steel to BS 4449, grade 250 and free from oil, dirt, loose rust and scale. Bar dimensions: refer to structural specifications.
- Place dowel bars in movement joints at mid depth of the slab ±20 mm, centred on joint and at 300 mm centres. Bars to be parallel to longitudinal axis and top surface of the slab within a misalignment tolerance of ±3 mm per 300 mm length of dowel bar.
- Debonding of bars: Flexible plastics sleeve covering, not less than 0.6 mm thick.
- Provide 100 mm long plastics caps to bars in expansion joints for free bar movement. Before placing concrete, ensure there is a space between the end of the cap and the end of the dowel bar 10 mm greater than the thickness of the joint filler board.

440 LONGITUDINAL CONSTRUCTION JOINTS:
- To Concrete Society technical report 28. Longitudinal joints are those parallel to the main axis of the paving.
- Prior to concreting, set formwork and tie bars rigidly in position and support to prevent displacement. Maintain support until concrete has set.
- Repair damaged edges of initially cast slab prior to forming groove.
- Form groove, not less than 15 mm wide and 13 mm deep, by fixing preformed fillet against the top edge of the initially cast slab before concreting the adjacent slab.
- Round upper edges of slabs at joints to 5 mm radius using bullnose arris trowel without overworking concrete.
- Remove fillet when concrete on both sides of joint is fully cured.

450 CONTRACTION JOINTS WITH SAWN GROOVE:
- To Concrete Society technical report 28.
- Prior to concreting, set formwork and dowel bars rigidly in position and support to prevent displacement. Maintain support until concrete has set.
- Saw a groove not less than 3 mm wide, 3 mm deep per 10 mm depth of slab and not less than 50 mm deep. Cut as early as possible after the slab has been laid but without causing edges of groove to spall. Do not commence sawing whilst the temperature is falling.
- Enlarge upper portion of the joint by sawing a groove not less than 13 mm wide. Depth to be confirmed by Structural Engineer.

460 CONTRACTION JOINTS WITH WET FORMED GROOVE: To Concrete Society technical report 28.
- Prior to concreting, set formwork and dowel bars rigidly in position and support to prevent displacement. Maintain support until concrete has set.
- Bottom crack inducer: Refer to structural specification.
- Locate vertically below the top groove within a horizontal tolerance of ±10 mm and fix securely to sub-base to retain in position during construction.
- Form groove in the surface of the plastic concrete and insert a 20 mm thick temporary fillet. Depth to be confirmed by Structural Engineer.
- Recompact the displaced concrete without overworking it and round the edges of the groove to 5 mm radius, using bullnose arris trowel.
- Keep temporary fillet in position until concrete on both sides of joint is fully cured.

470 EXPANSION JOINTS:
- Prior to concreting, set joint filler board, sealing groove fillet and dowel bars rigidly in position and support to prevent displacement. Maintain support until concrete has set.
- Joint filler board: Refer to structural specification.
- Thickness: 25 mm.
- Joint filler board must extend from underside of sealing groove fillet to full depth of slab to provide complete separation of adjacent slabs.
- Accurately bore or punch holes in filler board to form a sliding fit for dowel bars.
- Round the upper edges of slabs at joints to 5 mm radius, using bullnose arris trowel, without overworking concrete.
- Keep sealing groove fillet in position until concrete on both sides of joint is fully cured.

SURFACE FINISH

510 SAMPLE AREA: Complete sample area of finish as directed by CA, size 12 m², in advance of the remainder and in an approved location. Obtain approval of CA before proceeding.

520 TAMPERED FINISH: Tamp surface with edge of a board or beam to give an even texture of parallel ribs.

530 BRUSHED FINISH:
- Brush surface in one direction at right angles to the longitudinal direction of the slab, with a stiff bristle or wire brush not less than 450 mm wide.
- Texture depth 1 mm with finished surface having an overall even texture.

540 SMOOTH FLOATED FINISH: After compaction allow the concrete to stiffen sufficiently to be properly worked. Finish with a skip float, hand float or power float to produce an even smooth surface with no ridges or steps.
550 POWER TROWEL FINISH:
- Float concrete to an even surface with no ridges or steps, then immediately commence curing.
- Successively power trowel at intervals, applying sufficient pressure to close the surface, to give a uniform smooth finish free from trowel marks and other blemishes.
- Resume specified curing without delay.

570 WASH AND BRUSH FINISH:
- Float concrete to an even surface with no ridges or steps, then immediately commence curing.
- When concrete is sufficiently hard to hold the coarse aggregate in place remove the surface mortar by brushing with a stiff bristle brush and water spray.
- Remove cement paste from concrete surface by flooding with clean water and applying a dilute solution of hydrochloric acid. Thoroughly rinse with water after the acid has ceased effervescing.
- Resume specified curing without delay.

580 POWER GROUND FINISH:
- Float concrete to an even surface with no ridges or steps, then immediately commence curing.
- When concrete is sufficiently hard for sand particles not to be torn from the surface, power grind to remove 1-2 mm from surface to give an even glass-paper texture, free from blemishes and trowel marks.
- Remove all dust and wash down. Resume specified curing without delay.

590 ABRASIVE BLASTED FINISH:
- At a carefully controlled time in relation to the strength of the concrete produce an even finish with an average depth of exposure to structural specifications.
- Stop off the blasting to straight masked lines, leaving regular margins.

CURING/PROTECTION/FINISHING

610 CURING:
- Immediately after completion of surface treatment prevent evaporation from the surface and exposed edges of the slab for a minimum period of seven days.
- Coverings for curing to be a suitable impervious sheet material, a resin based aluminized curing compound containing a fugitive dye and with an efficiency index of 90% when tested to BS 7542 or an approved sprayed plastics film.
- Curing compounds applied to surfaces that are to be decorated/stained must be removed by light grit blasting.
- Until the surface of fresh concrete is in a state suitable to receive sheets which are in direct contact or a sprayed curing compound as applicable, cover with waterproof sheeting held clear of the surface and well-sealed against draughts at edges and junctions.

640 HOT JOINT SEALING:
- Sealant: To BS 2499:Part 1, type to be agreed with CA. Provide a manufacturer’s certificate of compliance in accordance with annex B.
- Prepare joints and apply sealant in accordance with BS 2499:Part 2.

650 COLD JOINT SEALING:
- Sealant: To BS 5212:Part 1, type to be agreed with CA. Provide a manufacturer’s certificate of compliance in accordance with annex B.
- Prepare joints and apply sealant in accordance with BS 5212:Part 2.

660 PROTECTION: Prevent damage to concrete:
- From rain, indentation, physical damage, dirt, staining, rust marks and other disfiguration.
- From thermal shock and in cold weather from the entrapment of water in pockets, etc. and freezing expansion thereof.
- Do not use pavings as a building platform or for storing, mixing or preparing materials.

670 OPENING TO TRAFFIC: Light vehicles will be permitted on the pavement after 7 days and heavy vehicles after 28 days.

Q25 Slab / brick / sett / cobble pavings
To be read with Preliminaries/ General conditions.

GENERAL
GENERALLY

105 SAMPLES: Before placing orders submit for approval representative samples as directed by the CA. Ensure that delivered materials match samples.

115 CONTROL SAMPLE(S): Complete sample areas, being part of the finished work, in approved location(s) as directed by the CA and obtain approval of appearance before proceeding.

125 ADVERSE WEATHER:
- Protect stockpiled bedding sand to ensure it does not become saturated.
- Protect exposed areas of sand bedding and uncompacted areas of sand bedded paving from heavy rainfall.
- Remove and replace any sand bedding which becomes saturated before laying paving, or allow to dry before proceeding.
- If laying dry-sand jointed paving when conditions are damp, brush in as much jointing sand as possible and minimize site traffic over the paving. As soon as paving is dry, top up joints and complete the compaction.

135 ACCEPTANCE OF NEW SUB-BASES: Before starting work ensure that:
- The base is sound, clean and close-textured enough to prevent loss of bedding materials into it during compaction and use, free from movement under compaction plant and free from compaction ridges, cracks and loose material.
- The levels and falls of the base are as detailed, within the tolerance specified.
- Drainage outlets are within +0 to -10mm of the required finished level.

136 ACCEPTANCE OF PREPARED EXISTING BASES: Before starting work ensure that:
- Existing roadbases are sound, clean, free from rutting or major cracking and cleared of sharp stones and debris that may rupture geotextiles.
- Drainage perforations are adequately prepared to receive geotextiles.
- The surface of overlaid granular material, if any, is sound, clean, and close-textured enough to prevent loss of bedding materials into it during compaction and use.
- Levels and falls are as detailed and within +0 to -12 mm of the required finished level.
- Drainage outlets are within +0 to -10 mm of the required finished level.

137 ACCEPTANCE OF BASES FOR SAND BEDDED PAVINGS: In addition to other specified requirements ensure that edge restraints, raised manhole covers, drainage outlets and the like are complete, to the required levels, and adequately bedded and haunched in mortar that has reached sufficient strength and has a vertical face so that pavings do not 'ride up' when compacted.

138 DRAINAGE PERFORATIONS IN EXISTING BASES:
- Drill or break regular perforations through impervious layers of the existing road/paving and any additional build up. Do not weaken or excessively disturb the road/paving.
- Remove jagged or protruding edges and fill voids rammed down to form a flush smooth surface.

145 GEOTEXTILE SHEET EDGING STRIP:
- Manufacturer and reference: Contractor to submit for CA approval
- Lap and joint to manufacturer’s recommendations.
- Lay a strip of geotextile 1 m wide, immediately below the sand bedding layer, and abutting perimeters, other types of paving, edge restraints and other features which interrupt the sand bedding layer, such as drainage fittings, channels, manholes, kerbs and the like. Turn sheet up to form an upstand against all such features, of a height not less than the thickness of the sand bedding.

147 GEOTEXTILE PATCHES OVER DRAINAGE PERFORATIONS:
- Manufacturer and reference: Contractor to submit for CA approval
- Lay geotextile patches on the base, centred over each perforation.

155 GEOTEXTILE SHEET:
- Manufacturer and reference: Contractor to submit for CA approval
- Lap and joint to manufacturer’s recommendations.
- Lay immediately below the sand bedding layer. Fit neatly at edge restraints and around other features which interrupt the sand bedding layer, such as drainage fittings, channels, manholes, kerbs and the like, turning sheet up to form an upstand against all such features, of a height not less than the thickness of the sand bedding.

165 SETTING OUT of pavings and related features as shown on drawings.

170 LAYING PAVINGS:
- Cut paving units neatly and accurately with a masonry saw to give neat junctions with edgings and adjoining finishes.
- Lines and levels of finished surface to be smooth and even with regular falls to prevent ponding.
- Bed paving units firmly so that rocking does not occur or develop.
- Lay paving units upwards from the bottom of slopes where creep may occur.
- Finished paving to have an even overall appearance with even joint widths and free of mortar and sand stains.

175 LEVELS OF PAVING: Permissible deviation from specified levels to be ± 6 mm generally. Set paving 6-10 mm above gullies, 3-6 mm above surface drainage channels and 3 mm above kerbs to allow for settlement.

180 REGULARITY:
- Sudden irregularities not permitted.
- Where appropriate in relation to the geometry of the surface, the variation in gap under a 3 m straight edge placed anywhere on the surface to be not more than 10 mm.
- The difference in level between adjacent paving units to be not more than 2 mm.

190 PROTECTION:
- Keep paving clean and free from mortar droppings, oil and other materials likely to cause staining.
- Do not overload pavings with stacks of materials.
- Handle pavings with care to avoid damage to corners and arrises, and to previously laid paving.
- Pavings bedded on mortar must be kept free from pedestrian traffic for 4 days and vehicular traffic for 10 days after laying.
- Restrict access to paved areas as necessary to prevent damage from site traffic and plant.

235 CUTTING CONCRETE SLABS:
- Cut with a masonry saw or disc cutter only.
- When cutting a notch from the corner of a slab which exceeds 25% of the slab area, mitre cut the remaining shape from the internal corner of the notch to the opposite external corner.
- Diagonally cut slabs or portions of slabs to form a mitre at abrupt changes of level at the ends of ramped footpath crossings and the like.

245 SAND FOR BEDDING:
- Naturally occurring clean sharp sand from the quaternary geological series or sea dredged, graded as for laying course sand to BS 7533: Part 3, Annex D, Category II.
- Free from deleterious salts, contaminants and cement.
- Obtain from only one source and ensure that all sand supplied has consistent grading.
- Maintain at an even moisture content which will give maximum compaction. Sand squeezed in the hand should show no free water and bind together when pressure is released.

255 LAYING SLAB PAVINGS ON SAND BEDDING GENERALLY:
- Do not deliver bedding sand to the working area over uncompacted paving. Ensure that there is no disturbance to the bedding course by pedestrian or wheeled traffic.
- Do not leave areas of bedding exposed; proceed with laying paving immediately.
- Supply slabs to laying face over newly laid paving but stack at least 1 m back from laying face. Do not allow plant to traverse areas of uncompacted paving.
- Place slabs squarely with minimum disturbance to bedding.

300 FULL MORTAR BEDDING:
- Mortar: As Section Z21.
  Mix: 1:3-4 lime:sand, or 1:4-5 cement:sand.
  Consistency: as approved by CA.
  Sand: To BS 882, grading limit M or F.
- Spread and level mortar to give the specified average nominal thickness after bedding of slabs.
- Lay slabs on a full mortar bed and bed down to line and level with a maul.

315 MORTAR SPOT BEDDING:
- Mortar: As section Z21.
  Mix: 1:3-4 lime:sand, or 1:4-5 cement:sand.
  Sand: To BS 882, grading limit M or F.
- Spread five spots of wet mortar to give the specified average nominal thickness after bedding of slabs.
- Bed slabs down to line and level with a maul, ensuring full contact at all five spots.

325 DRY MORTAR JOINTS:
- Mortar mix: 1:3 cement:slightly damp sand to BS 882, grading limit M.
- When the paving is dry and rain is not expected, brush dry mortar into joints, ram firmly home with a smooth wooden lath, then repeat the operation until the joints are filled solid and flush. Brush off all residue without delay.
- Do not wet the paving: allow the joints to hydrate naturally. Immediately after filling joints, cover paving with polyethylene sheeting for three days to protect from rain.

335 MORTAR POINTED JOINTS:
- Mortar mix: as approved by CA, semidry cement:sand to BS 882, grading limit M.
- When the surface of the paving is dry and rain is not expected, carefully and thoroughly fill joints using a proper pointing tool and slotted masking shield. Tool to a bucket handle profile 2-3 mm below the slab surface. Clean any mortar from face of slabs before it sets.
- Immediately after completing joints, cover paving with polyethylene sheeting for not less than three days.
345 SAND FILLED JOINTS:
- Sand: To BS 882, grading limit to be agreed with CA.
- Brush into joints, knock down by beating the slabs with a vibrating plate compactor or maul, then repeat the operation until the joints are filled solid and flush.

End of section.

Q31 Planting

To be read with Preliminaries/General conditions.

GENERAL INFORMATION/REQUIREMENTS

110 TOPSOIL:
At the time of starting the sub-contract work, the areas to be planted will be covered by topsoil 500mm thick, provided and spread by the main contractor. Small planting beds located in general landscape areas may be excavated separately and at a later date than the general topsoiling operations.

112 SITE CLEARANCE:
- Remove rubbish, concrete, metal, glass, decayed vegetation, contaminated topsoil, and stones with largest dimension exceeding 75 mm.
- Contamination includes subsoil, rubble, fuel, lubricants or other substances injurious to plant growth.
- Grub up and dispose of large roots without undue disturbance of soil and adjacent areas.
- Apply a suitable non-residual herbicide to planting areas during course of works.

120 CLIMATIC CONDITIONS; Carry out the work while soil and weather conditions are suitable for the relevant operations. Do not plant during periods of frost or strong winds. Plant only during the following periods:
- Deciduous trees and shrubs: planting dates TBC
- Conifers and evergreens: planting dates TBC
- Container grown plants: At any time if ground and weather conditions are favourable. Ensure that adequate watering and weed control is provided.
- Dried bulbs, corms and tubers: planting dates TBC
- Colchicum (crocus): planting dates TBC
- Green bulbs: after flowering in spring; planting dates TBC
- Wildflower plugs: planting dates TBC.

144 WATERING:
- Obtain CA's approval before using a supply other than potable mains water.
- Ensure the full depth of topsoil is thoroughly wetted.
- Use a fine rose where appropriate to avoid damaging or loosening plants.

145 WATERING: Water as necessary to ensure the establishment and continued thriving of all planting.

150 DROUGHT CONDITIONS: If water supply is or is likely to be restricted by emergency legislation:
- Inform CA without delay and ascertain availability and additional cost of second quality water or other alternative source of supply.
- If planting has not been carried out, do not do so until instructed.
- If planting has been carried out, obtain instructions on watering.

160 NOTICE TO CA: Provide 10 days notice of the following operations, to give the CA the opportunity of being present:
  Setting out
  Application of herbicide
  Application of fertilizer
  Delivery of plants
  Planting of shrubs
  Planting of trees into previously dug pits
  Watering
  Each site visit during maintenance period.

200 TREES/PLANTS GENERALLY:
- Materially undamaged, sturdy, healthy, vigorous, of good shape and without elongated shoots.
- Grown in a suitable environment and hardened off.
- Free from pests, diseases, discoloration, weeds and physiological disorders.
- Budded or grafted plants to be bottom worked, unless otherwise specified or approved.
- With balanced root and branch systems, root system and condition in accordance with the relevant part of the National Plant Specification.
- True to name.
- Origin/Provenance: Ugandan grown or similar
  Origin and Provenance have the meaning given in the National Plant Specification.

215 TREES/PLANTS: Name, forms, dimensions and other criteria as scheduled and defined in the National Plant Specification.

225 BULBS/CORMS/TUBERS:
- Firm, entire, not dried out or shrivelled, visually free of pests, diseases and fungus.
- Remove from packaging immediately. If necessary, store for the minimum period of time in a well ventilated, dark, covered location at 18-21\(\text{deg}^\circ\)C, away from vehicle exhausts and fruit.

235 CONTAINER GROWN PLANTS:
- Supplied in a growing medium with adequate nutrients for the plant to thrive until permanently planted.
- Centred in the container, firmed and well watered.
- With root growth substantially filling the container, but not root bound, and in a condition conducive to successful transplanting.
- Grown in the open for at least two months before being supplied.
- Grown in containers with holes adequate for drainage when placed on any substrate commonly used under irrigation systems.

260 SUBSTITUTES: The tender must be based on plants which are available. If specified plants are unobtainable or known to be likely to be unobtainable at the time of ordering, submit alternatives with tender, stating price and how they differ from the specification. Such substitutions may not be acceptable and submission of further alternatives may be required. Obtain approval before making any substitution.

265 PLANT/TREE HANDLING STORAGE AND TRANSPORT:
- Comply with CPSE ‘Handling and establishing landscape plants’ (obtainable from the Horticultural Trades Association) Part I, Part II and Part III, paragraphs
1.3.3 to 1.3.6, 3.0, and 4.0.
- Protect plants/trees from frost.
- Handle plants/trees with care. Protect from mechanical damage and do not subject to shock, e.g. by dropping from a vehicle.
- Plant packaging: Black polyethylene bags
- Packaging of bulk quantities: Sealed bins.

270 PLANTING GENERALLY:
- Comply with CPSE 'Handling and establishing landscape plants' (obtainable from the Horticultural Trades Association) Part III, paragraphs 6.2 to 6.6.
- Plant upright or well balanced with best side to front.

280 TREATMENT OF TREE WOUNDS:
- Keep wounds as small as possible and cut cleanly back to sound wood using sharp, clean tools. Set cuts so that water will not collect on cut area.
- Do not apply fungicide or sealant unless instructed by the CA.

290 SURPLUS MATERIAL, including subsoil, stones, debris, wrapping material, canes, ties, temporary labelling and prunings to be removed from site.

PREPARATION OF PLANTING BEDS/PLANTING MATERIALS

305 WEED CONTROL FOR PLANTING BEDS
Prevent weeds from seeding and perennial weeds from becoming established, by treatment during course of works with proprietary herbicide.

335 GENERAL FERTILIZER:
- Manufacturer and reference: Bonemeal, Fishmeal, Hoof and horn.
- Apply evenly over planting beds at 70 g/sq m.

375 CULTIVATION:
- Break up any compacted topsoil to full depth.
- Within a few days before planting, but in suitably dry weather and ground conditions, cultivate top 500mm of all planting beds, using suitable plant to loosen, aerate and break up the soil into particles of 2-8 mm.
- Leave surface regular and even, with levels as required in section D20 and within 75mm of levels specified on drawings.
- Remove weeds, perennial weed roots and undesirable material brought to the surface including stones and clods larger than 50 mm in any dimension, roots, tufts of grass and foreign matter.
- Do not dig or cultivate within the root spread of trees and shrubs to be retained.

PLANTING SHRUBS/HERBACEOUS PLANTS/BULBS

405 SHRUB PLANTING PITS:
- Excavate not more than 5 days before planting and retain topsoil for re-use where specified.
- Break up bottoms of pits to a depth of 150mm
- Backfilling material: extracted topsoil

445 BULBS/CORMS/TUBERS:
- Plant so that the top of the bulb/corm/tuber is at a depth of approximately twice its height with base in contact with bottom of hole. Backfill with finely broken soil and lightly firm to existing ground level.
- When planting in existing grassed areas neatly remove a plug of turf and replace after planting. Scatter naturalized bulbs/corms/tubers at random over the allocated area and plant where they fall.
480 AFTER PLANTING:
- Water plants thoroughly immediately after planting, using a fine rose or sprinkler where necessary to avoid damaging plants.
- Lightly firm soil around plants and fork and/or rake soil, without damaging roots, to a fine tilth with approved gentle cambers and no hollows.

485 MULCHING PLANTING BEDS:
- Material: Chipped bark, free of pests, disease, fungus and weeds.
- Clear all weeds, water soil thoroughly, and mulch the whole surface of planting beds with bark at 1 cu m of material per 5 sq m.

PROTECTING/MAINTAINING/MAKING GOOD DEFECTS

710 MAINTENANCE:
- Make visits at approximately monthly intervals during the growing season and as necessary to fulfil the requirements of this specification.

720 FAILURES OF PLANTING:
- Excepting theft or malicious damage after practical completion, any trees/shrubs/plants that have failed to thrive, which are apparent during the period stated in clause 710, will be regarded as defects due to materials or workmanship not in accordance with the Contract. Unless otherwise instructed they must be replaced by approved equivalent trees/shrubs/plants.
- Replacements must match the size of adjacent or nearby plants of the same species or should match the original specification, whichever is the greater.

730 PROTECTIVE FENCING:
- Protect newly planted areas with chestnut palings.
- Maintain fencing until completion of works then remove and reinstate ground. Make good any damage to planting until area is accepted. The fencing will remain the property of the Contractor.

750 PLANTING MAINTENANCE GENERALLY:
- 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. Keep planting beds clear of weeds, by weeding Fork over beds as necessary to keep soil loose, with gentle cambers and no hollows, taking care not to reduce depth or effect of mulch.
- Ensure that trees and shrubs are not damaged by the use of mowers, nylon filament rotary cutters and similar powered tools.
- Every month check condition of stakes, ties, guys and guards. Replace broken or missing items. Adjust if necessary to allow for growth and prevent rubbing of bark. Cut back any damaged bark.
- Spray crown of trees when in leaf during warm weather. Carry out in the evening.

760 PLANTING MAINTENANCE - PRUNING: Prune at appropriate times, to remove dead or dying and diseased wood and suckers, to promote healthy growth and natural shape. Prune trees to favour a single central leading shoot, unless specified otherwise.

765 PLANTING MAINTENANCE WATERING: Water in accordance with clause(s) 144, 145 using a fine rose or sprinkler until full depth of topsoil is saturated.

790 FINAL MULCHING: At the end of the period stated in clause 710:
- Ensure that the soil is thoroughly moistened prior to remulching, applying water where necessary.
- Remulch the whole surface of planting beds as specified in clause 485 at 1 cu
m of material per 20 sq m.
- Remulch trees as specified in clause 590 at 1 cu m of materials per 20 sq m.

Q41 Barriers/ guardrails
To be read with Preliminaries/ General conditions.

TYPES OF BARRIERS/ GUARDRAILS

GUARDRAIL TO ACCESS RAMP/ STAIRS
• Standard: To US Standard, Section 1926.1052.
• Height above datum: 1100 mm or as otherwise noted on Architect's drawings.
• Design load: To BS 6399-1.
- Applied horizontally at: Design height.
• Surface finish: None.
- Colour/ Texture: N/A.
• Fixings: Refer to Engineer's and Architect's drawings.

140 STEEL BALUSTRADES; See architectural drawings and Section Z11.

R Disposal systems

R10 RAINWATER PIPEWORK/GUTTERS
To be read with Preliminaries/General conditions.

TYPE(S) OF PIPEWORK/GUTTER

210 GALVANISED STEEL OUTLETS:
- Pipes, fittings and accessories: To BS 2997.
- Manufacturer and reference: local Rwanda supplier.
- Shape: Round
- Type/Grade: Min thickness; 2mm
- Size(s): 150 mm diameter. normal
- Finish/Colour: galvanised
- Method of fixing: To manufacturers recommendations
- Overflows: 50mm round outlets as above, location ref roof section.
- Accessories: Leaf guards as required.

230 GALVANISED STEEL GUTTERS: ref: attached manufacturers details/specification
- Gutters and fittings: To BS 2997.
- Manufacturer and reference: Local Rwanda supplier or similar approved.
- Profile: Eaves gutter
- Type/Grade: aluminium alloy - 2mm gauge
- Size(s): 200 x 400 nominal
- Finish/Colour: galvanised
- Method of jointing: Site welded to manufacturers recommendations
- Method of fixing: Self tapping screws, bolt assemblies to manufacturers recommendations ref: section

370 RAINWATER OUTLETS
- Roof construction: waterproof membrane on screed to falls
- Manufacturer and reference: contractor to submit for approval
Type of grate: galvanized mild steel
Outlet: Type and direction to suit pipework with adaptors and connections recommended for the purpose by outlet manufacturer.
- Accessories: as required
- Method of fixing: to manufacturer’s recommendations

**INSTALLATION**

400 BEFORE COMMENCING WORK specified in this section, ensure that:
- Below ground drainage is ready to receive rainwater or that the discharge can be dispersed by approved means to prevent damage or disfigurement of the building fabric.
- Any specified painting of surfaces which will be concealed or inaccessible is completed.

410 INSTALLATION GENERALLY:
- Install pipework/gutters to ensure the complete discharge of rainwater from the building without leaking.
- Obtain all components for each type of pipework/guttering from the same manufacturer unless specified otherwise.
- Provide access fittings and rodding eyes as necessary in convenient locations to permit adequate cleaning and testing of pipework.
- Avoid contact between dissimilar metals and other materials which would result in electrolytic corrosion.
- Do not bend plastics or galvanized steel pipes.
- Adequately protect pipework/gutters from damage and distortion during construction.
- Fit purpose made temporary caps to prevent ingress of debris. Fit all access covers, cleaning eyes and blanking plates as the work proceeds.
- Where not specified otherwise use plated, sherardized, galvanized or nonferrous fastenings, suitable for the purpose and background, and compatible with the material being fixed.

420 FIXING GUTTERS:
- Set out to a true line and even gradient to ensure no 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.
- Position outlets to align with connections to below ground drainage, unless shown otherwise on drawings.
- Provide for thermal and building movement when fixing and jointing, and ensure that clearances are not reduced as fixing proceeds.
- Seal as specified to make watertight.
- Ensure that roofing underlay is dressed into gutter.

450 RAINWATER OUTLETS: Ensure that:
- Outlets are securely fixed before connecting pipework.
- Junctions between outlets and pipework can accommodate all movement in the structure and pipework.

460 FIXING PIPEWORK:
- Fix securely at specified centres plumb and/or true to line.
- Make changes in direction of pipe runs only where shown on drawings unless otherwise approved.
- Fix branches and low gradient sections with uniform and adequate falls to drain efficiently.
- Fix externally socketed pipes/fittings with sockets facing upstream.
- Provide additional supports as necessary to support junctions and changes in direction.
- Fix every length of pipe at or close below the socket collar or coupling.
- Provide a load bearing support for vertical pipes at not less than every storey level. Tighten fixings as the work proceeds so that every storey is self supporting and
undue weight is not imposed on fixings at the base of the pipe.
- Isolate from structure where passing through walls or floors and sleeve pipes as specified in Section P31.
- Provide for thermal and building movement when fixing and jointing, and ensure that clearances are not reduced as fixing proceeds.
- Fix expansion joint pipe sockets rigidly to the building and elsewhere use fixings that allow the pipe to slide.

465 JOINTING PIPEWORK/GUTTERS:
- Joint using materials, fittings and techniques which will make effective and durable connections.
- Joint differing pipework/gutter systems with adaptors recommended by manufacturer(s).
- Cut ends of pipes to be clean and square with burrs and swarf removed. Chamfer pipe ends before inserting into ring seal sockets.
- Ensure that jointing or mating surfaces are clean, and where necessary lubricated, immediately before assembly.
- Form junctions using fittings intended for the purpose ensuring that jointing material does not project into bore of pipes, fittings and appliances.
- Remove surplus flux/solvent/cement/sealant from joints.

520 MASKING PLATES: When required for compartmentation purposes
- Type: Sealmaster TCI pipe closer
  Material/Finish: galvanised steel sleeve
- Fixing: Surface mounted/built in as required, secured with 'Topcon' bolts to slab

560 INTERNAL PIPEWORK TEST:
- Temporarily seal open ends of pipework with plugs.
- Connect a U tube water gauge and air pump to the pipework via a plug.
- Pump air into pipework until gauge registers 38 mm.
- Allow a period for temperature stabilization, after which the pressure of 38 mm is to be maintained without loss for not less than 3 minutes.

570 GUTTER TEST: Block all outlets, fill gutters to overflow level and after 5 minutes closely inspect for leakage.

End of section.

Z Building fabric reference specification

Z10 Purpose made joinery
To be read with Preliminaries/General conditions.

110 FABRICATION GENERALLY:
- Fabricate joinery components to BS 1186: Part 2.
- Form sections out of the solid when not specified otherwise. Carefully machine timber to accurate lengths and profiles.
- After machining, sections to be free from twist and bowing, and surfaces to be smooth and free from tearing, wooliness, chip bruising and other machining defects.
- Assemble with tight, close fitting joints to produce rigid components free from distortion.
- All screws to have pilot holes. Screws of 8 gauge or more and all screws into hardwood to have clearance holes. Screw heads to be countersunk not less than 2 mm below timber surfaces that will be visible in completed work.
120 CROSS SECTION DIMENSIONS OF TIMBER:
- Dimensions on drawings are finished sizes.
- Maximum permitted deviations from finished sizes for softwood sections to be as stated in BS EN 1313:Part 1: Clause 6 for sawn sections Clause NA. 2 for further processed sections.
- Maximum permitted deviations from finished sizes for hardwood sections to be as stated in BS 5450:
  Clause 6.1 for sawn sections
  Clause 8.3 for further processed sections.

130 PRESERVATIVE TREATED TIMBER:
- Carry out as much cutting and machining as possible before treatment.
- Retreat all timber which is sawn along the length, ploughed, thicknessed, planed or otherwise extensively processed.
- Treat surfaces exposed by minor cutting and drilling with two flood coats of a solution recommended for the purpose by main treatment solution manufacturer.

140 MOISTURE CONTENT of timber and wood based boards to be maintained within the range specified for the component during manufacture and storage.

210 LAMINATED PLASTICS VENEERS:
- Apply sheets in accordance with ‘Recommendations for the fabrication of decorative laminated sheets’ published jointly by the British Plastics Federation and the British Laminated Plastics Fabricators’ Association.
- Condition sheets before bonding. When not otherwise specified, apply to the reverse side of flat boards a balancing veneer of similar construction to the decorative veneer and from the same manufacturer.
- Bond in presses whenever possible.
- Finished components to be free from defects, including bow, twist, scratches, chipping, cracks, pimpling, depressions, glue spill, staining, and defects in colour and pattern.
- All joints exposed to view in the finished work to be tight butted, true and flush. Chamfer edges at all external angles.

220 WOOD VENEERS:
- Condition core material and veneers before bonding. When not otherwise specified, apply to the reverse side of flat boards a balancing veneer with the same moisture and temperature movement characteristics as the facing veneer.
- Set out veneers so that features and pattern are aligned and in regular, uniform symmetry unless specified otherwise. Apply veneers with edges tight butted and flush, with no gaps or other open defects.
- Bond in presses whenever possible.
- Finished components to be free from defects, including bow, twist, scratches, chipping, pimpling, depressions, glue spill and staining.
- Sand to a fine, smooth finish free from sanding marks.

250 FINISHING AND PROTECTING:
- Sand all joinery to give smooth, flat surfaces suitable to receive specified finishes. Arisings to be eased unless specified otherwise.
- Before assembly, seal all end grains for external components with primer or sealer as specified in section M60 and allow to dry.
- Protect completed joinery against damage, dirt, moisture and other deleterious substances.

End of section.
To be read with Preliminaries/ General conditions.

110 MATERIALS GENERALLY:
- Grades of metals, section dimensions and properties to be to the appropriate British Standard. 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.
- Fastenings to be to the appropriate British Standard and, unless specified otherwise, to be of the same metal as the component, with matching coating or finish.

120 FABRICATION GENERALLY:
- Fabricate components carefully and accurately to ensure compliance with design and performance requirements.
- Do not permit contact between dissimilar metals in components which are to be fixed where moisture may be present or occur.
- Finished components to be rigid and free from distortion, cracks, burrs and sharp arises. Moving parts must move freely and without binding.
- Unless specified otherwise, mitre corner junctions of identical sections.

130 COLD FORMED WORK: Use brake presses or cold rolling to produce accurate profiles with straight arises.

140 ADHESIVE BONDING:
- Prepare surfaces of metals to receive adhesives by degreasing and abrading mechanically or chemically.
- Use adhesives to manufacturer's recommendations.
- Form bond under pressure.

150 THERMAL CUTTING OF STAINLESS STEEL: After cutting, grind off material which is liable to corrode.

170 WELDING/BRAZING GENERALLY:
- Thoroughly clean surfaces to be joined.
- Ensure accurate fit using clamps and jigs where practicable. Use tack welds only for temporary attachment.
- Make joints with parent and filler metal fully bonded throughout with no inclusions, holes, porosity or cracks.
- Prevent weld spatter falling on surfaces of materials which will be self-finished and visible in completed work.
- Remove all traces of flux residue, slag and weld spatter.

180 WELDING OF STEEL: Metal arc welding to BS 5135, or other methods subject to approval.

190 WELDING OF STAINLESS STEEL: TIG welding to BS 7475, or other methods subject to approval. Use double bevel butt welds, backing bars to remove heat, jigging, tack welds and any other measures necessary to minimise distortion. Remove slight distortion by light hammering, taking care not to damage surface finish.

200 WELDING OF ALUMINIUM ALLOYS: TIG welding to BS 3019: Part 1, or MIG welding to BS 3571:Part 1, or other methods subject to approval.

220 BRAZING: To BS 1723.

230 BRONZE WELDING: To BS 1724.

250 FINISHING WELDED/BRAZED JOINTS:
- Butt joints which will be visible in completed work to be smooth, flush with adjacent surfaces.
- Fillet joints which will be visible in completed work to be executed neatly. Grind smooth where specified.

310 APPLYING COATINGS:
- Apply after fabrication is complete and all fixing holes have been drilled, unless otherwise specified.
- Before applying coating remove all paint, grease, flux, rust, burrs and sharp arrises.
- Make good all defects which would show after application of coating and finish surfaces smooth.

320 LIQUID ORGANIC COATING FOR ALUMINIUM ALLOY COMPONENTS: To BS 4842.

340 CADMIUM/ZINC PLATING OF IRON AND STEEL SURFACES: To BS 1706.

350 CHROMIUM PLATING: To BS 1224.

360 GALVANIZING: To BS 729.

370 VITREOUS ENAMELLING OF STEEL SURFACES: To BS 3830.

380 ANODIZING: To BS 1615 unless specified otherwise. Provide a certificate of assurance that anodizing has been carried out as specified.

End of section.

Z20 Fixings/ adhesives

To be read with Preliminaries/ General conditions.

110 FIXING GENERALLY: Use fixing and jointing methods and types, sizes, quantities and spacings of fasteners which are suitable having regard to:
- Nature of and compatibility with product/material being fixed and fixed to,
- Recommendations of manufacturers of fasteners and manufacturers of components, products or materials being fixed and fixed to,
- Materials and loads to be supported,
- Conditions expected in use,
- Appearance, this being subject to approval.

120 FASTENERS for materials and components forming part of external construction to be corrosion resistant material, or have a corrosion resistant finish.

130 FASTENERS for materials and components:
- Forming part of external construction but not directly exposed to the weather to be of corrosion resistant material or have a corrosion resistant finish.
- Directly exposed to the weather to be of corrosion resistant material.

140 FIXING THROUGH FINISHES: Ensure that fasteners and plugs (if used) have ample penetration into the backing.

150 PACKINGS:
- Provide suitable, tight packings at fixing points to take up tolerances and prevent distortion. - Use noncompressible, rot proof, noncorrodible materials positioned adjacent to fixing points.
- Ensure that packings do not intrude into zones that are to be filled with sealant.
160 CRAMP FIXING:
- When not specified otherwise, position cramps not more than 150 mm from each end of frame sections and at 600 mm maximum centres.
- Secure cramps to frames with matching screws as masonry work proceeds, and fully bed in mortar.

170 NAILING:
- Nails: To BS 1202.
- In joints, use not less than two nails and opposed skew nailing unless specified otherwise.
- Drive nails fully in without splitting or crushing the material being fixed.
- Punch nail heads below surfaces that will be visible in the completed work.

180 MASONRY NAILS: Do not use without approval.

210 PLUGS:
- Proprietary types selected to suit the background, loads to be supported and conditions expected in use.
- Locate plugs accurately in correctly sized holes in accordance with manufacturer's recommendations.

220 SCREW FIXING:
- Screws: To BS 1210.
- All screws to have clearance holes. Screws of 8 gauge or more and all screws into hardwood to have pilot holes about half the diameter of the shank.
- Before using brass, aluminum or other soft metal wood screws precut the thread with a matching steel wood screw.
- Do not hammer screws unless specifically designed to be hammered.
- Drive countersunk heads flush with timber surface, or not less than 2 mm below it if they are to be stopped.
- Washers and screw cups, where specified, to be of the same material as the screw.

230 PELLETING: Countersink screw heads 6 mm below timber surface and glue in grain-matched pellets not less than 6 mm thick, cut from matching timber. Pellets to occupy the whole depth of the holes and be finished off flush with surface.

240 PLUGGING: Countersink screw heads 6 mm below timber surface and glue in plugs. Plugs to occupy the whole depth of the holes and project from the surface.

250 POWDER ACTUATED FIXING SYSTEMS:
- Do not use without approval.
- Tools to be to BS 4078: Part 2 and Kitemark certified, and used in accordance with BS 4078: Part 1. Operatives to be trained and certified as competent by tool manufacturer.
- Fasteners, accessories and consumables to be types recommended by the tool manufacturer.
- Ensure that operatives take full precautions against injury to themselves and others. Remove all unspent cartridges from the site when no longer required.
- Apply zinc rich primer to heads of fasteners used externally, in external walls or in other locations subject to dampness.
- Use top hat section plastics washers to isolate cartridge fired nails from stainless steel components fixed externally, in external walls or in other locations subject to dampness.

510 ADHESIVES:
- Adhesive types: As specified in the relevant section.
Surfaces to receive adhesive to be sound, unfrozen, free from dust, grease and any other contamination likely to affect bond. Where necessary, clean surfaces using methods and materials recommended by adhesive manufacturer.

- Adjust surface regularity and texture as necessary to suit bonding and gap filling characteristics of adhesive.
- Ensure that operatives observe manufacturer's and statutory requirements for storage and safe usage of adhesives.
- Do not use adhesives in unsuitable environmental conditions or beyond the storage period recommended by the manufacturer.
- Apply adhesives using recommended spreaders/applicators to ensure correct coverage. Bring surfaces together within recommended time period and apply pressure evenly over full area of contact to ensure full bonding.
- Remove surplus adhesive using methods and materials recommended by adhesive manufacturer and without damaging surfaces.

End of section.

Z21 Mortars
To be read with Preliminaries/ General conditions.

CEMENT GAUGED MORTARS

110 MIX PROPORTIONS FOR CEMENT GAUGED MORTARS and other particular requirements are specified elsewhere.

120 SAND FOR CEMENT GAUGED MORTARS:
- To BS 1200 unless specified otherwise.
- Sand for facework mortar to be from one source, different loads to be mixed if necessary to ensure consistency of colour and texture.
- When a range is specified (e.g. 1:1:5-6) use lower proportion of sand for Grade G sands and higher proportion for Grade S.

160 CEMENT FOR MORTAR: When not specified otherwise, to be Portland cement or Portland blastfurnace cement, to class 42.5 or 52.5, manufactured and supplied under the BSI Kitemark scheme for cement. All cements must comply with the appropriate British Standard or equal and approved standards.

170 RETARDED READY-MIXED CEMENT GAUGED MORTARS may be used provided they are:
- Of materials and proportions specified in this section and to BS 4721.

180 ADMIXTURES: Do not use in mortar unless specified or approved. Do not use calcium chloride or any admixtures containing calcium chloride. Admixtures, if specified, to be to BS 4887.

200 SITE STORAGE OF CEMENT GAUGED MORTAR MATERIALS:
- Store different sands and aggregates in different stockpiles on hard clean bases that allow free drainage.
- Store factory produced premixed lime:sand for mortar and ready-to-use retarded mortars in covered containers to prevent excessive drying out or wetting.
- Store bags of cement and hydrated lime in dry conditions, raised off the ground and not touching damp surfaces. Do not use cement or hydrated lime affected by damp.
- Avoid intermixing and contamination between stored materials and other building materials, debris or other deleterious matter.

210 MAKING CEMENT GAUGED MORTAR:
- Keep plant and banker boards clean at all times.
- Measure materials accurately by volume using clean gauge boxes or clean, undamaged buckets. Proportions of mixes are for dry sand; allow for bulking if sand is damp.
- Mix ingredients thoroughly to a consistence suitable for the work and free from lumps. Mix mortars containing air entraining admixtures by machine, but do not overmix.
- Use mortar within about two hours of mixing at normal temperatures. Use retarded mortar within the time and site temperatures recommended by the manufacturer. Mortar may be retempered to restore workability, but only within these time limits.

End of section.

**Z22 Sealants**
To be read with Preliminaries/General conditions.

110 SEALANT TYPES: As specified in the relevant section.

120 SUITABILITY OF JOINTS: Before commencing, check that:
- Joint dimensions are within limits specified for the sealant
- Surfaces are smooth and undamaged
- Preparatory work which must be done before assembly of the joint has been carried out  Inform CA if joints are not suitable to receive sealant and submit proposals for rectification

130 PREPARING JOINTS:
- Clean surfaces to which sealant must adhere using methods and materials recommended by sealant manufacturer.
- Remove all temporary coatings, tapes, loosely adhering material, dust, oil, grease and other contaminants which may affect bond.
- Keep joints clean and protect from damage until sealant is applied.
- Backing strip, bond breaker, primer: Types recommended for the purpose by sealant manufacturer.
- Insert backing strips and/or bond breaker tape into joint leaving no gaps.
- Cover adjacent surfaces with masking tape to prevent staining and protect surfaces which would be difficult to clean if smeared with primer or sealant.

160 APPLYING SEALANTS:
- Ensure that operatives observe manufacturers and statutory requirements for storage and safe usage of sealants.
- Use equipment and methods recommended by sealant manufacturer and apply within the recommended application life of primer and sealant, and the recommended air and substrate temperature ranges.
- Do not apply to damp surfaces (unless recommended otherwise), to surfaces affected by ice or snow or during inclement weather.
- Do not heat joints to dry them or raise the temperature.
- Fill joints completely; leaving no gaps, excluding all air and ensuring firm adhesion of sealant to required joint surfaces. Tool the sealant to a neat, slightly concave profile unless specified otherwise.
- Protect until cured.

End of section.

End.