

Architectural Specification Discharge of Planning Condition 8

VLON7.5

Virtus

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Ss_25_13_50_51

MWS-01 Masonry wall leaf systems type A

Systems

Ss_25_13_50_51 MWS-01 Masonry wall leaf systems type A

1. **Description:** External fire rated masonry single wall leaf system.
2. **System performance:**

[Ss_25_13_50/200 Accuracy of brick and block walling](#); [Ss_25_13_50/202 Design submittals for masonry systems](#); [Ss_25_13_50/204 Design supervision and checking for masonry systems](#); [Ss_25_13_50/206 Design working life of masonry systems](#); [Ss_25_13_50/235 Design of masonry walling](#); [Ss_25_13_50/240 Loading for mechanical and electrical services on masonry systems](#); [Ss_25_13_50/252 Design for fire performance of masonry structures](#); [Ss_25_13_50/290 Compliance with performance requirements for masonry systems](#); [Ss_25_13_50/238 Impact loads upon parapets and barriers for masonry systems](#)

3. **Masonry units:** [Pr_20_93_52_01 Aggregate concrete blocks 100mm](#)
4. **Mortar**
 - 4.1. **General applications:** [Pr_20_31_53_11 MWS systems Cement-gauged mortars above DPC](#)
 - 4.2. **Pointing :** [Pr_20_31_53_11 MWS systems Cement-gauged mortars above DPC](#)
 - 4.3. **Below dpc:** [Pr_20_31_53_11 MWS systems Cement-gauged mortars below DPC](#)
5. **Concrete fill:** Refer to drawings where required.
6. **Dpcs**
 - 6.1. **Dpcs – general applications:** Not required.
7. **Wall ties**
 - 7.1. **Wall ties – general applications:** Note: Wall ties to be selected and confirmed by the Structural Engineer following structural analysis of the proposed wall panel design.
[Pr_20_85_84_73 Shear wall ties Ancon SPV](#)
8. Wall ties - specific applications
 - 8.1. **Movement joints:** Note: blockwork to be tied back to primary structure both sides of movement joint within 225mm of the movement joint location. [Pr_35_90_53_86 Fire rated movement joints Emshield WFR CE](#);
[Pr_20_85_84_33 General-purpose slip ties Ancon PPS](#)
9. **Cappings and copings:** [Pr_25_93_54_03 Aluminium coping units](#)
10. **Samples required:** [Ss_25_13_50/305 Product samples blockwork](#)
11. **Execution:**

[Ss_25_13_50/600 Adverse weather](#); [Ss_25_13_50/601 Cleanliness](#); [Ss_25_13_50/604 Putlog scaffolding](#);
[Ss_25_13_50/605 Execution Standards for masonry structures](#); [Ss_25_13_50/610 Reference panels to establish quality of masonry work facing brickwork](#); [Ss_25_13_50/674 Masonry movement joints](#); [Ss_25_13_50/758 Levelling of separate leaves in brick and block walling](#); [Ss_25_13_50/757 Laying walling below ground level](#)
12. **System completion:** [Ss_25_13_50/895 Verification of performance](#)

System performance

Ss_25_13_50/200 Accuracy of brick and block walling

1. **Courses:** Level and true to line.
2. **Faces, angle and features:** Plumb
3. **Permissible deviations**
 - 3.1. **Position in plan of any point in relation to the specified building reference line and/ or point at the same level:** ± 10 mm.
 - 3.2. **Straightness in any 5 m length:** ± 5 mm.
 - 3.3. **Verticality up to 3 m high:** ± 10 mm.
 - 3.4. **Verticality up to 7 m high:** ± 14 mm.
 - 3.5. **Overall thickness of walls:** ± 10 mm.
 - 3.6. **Level of bed joints up to 5 m (brick masonry):** ± 11 mm.
 - 3.7. **Level of bed joints up to 5 m (block masonry):** ± 13 mm.

Ss_25_13_50/202 Design submittals for masonry systems

1. **Detailed design**
 - 1.1. **Requirement:** All masonry construction within the project.
 - 1.2. **Purpose:** To demonstrate compliance with performance requirements.
 - 1.3. **Design load information provided to the Contractor:** Refer to Structural Engineer's information.
 - 1.4. **Submittals:** Drawings – General arrangement drawings and typical joint details.
Calculations – Sample calculations demonstrating compliance with specification, typical calculations for the more heavily loaded elements.
Technical information – Reports/ certification demonstrating compliance with specification of proposed incorporated products and finishes.
Proposals – for connections to and support from other parts of the building structure and building components, for frequencies and methods of replacement for products and finishes with a design life less than the design working life of the building, for replacing damaged or failed products, preliminary method statements for fabrication and installation.
Quality plan – examples of standard documentation from which project quality plan will be provided to ensure the competence of the personnel/ subcontractor proposed for specialist work. Insert, e.g. *Provide details of the experience of personnel/ subcontractor proposed for the execution of this work.*
Builders' work – special provisions and special attendance by others. Confirm that full provision has been made in the tender price, fully schedule and provide a schedule of any items not covered by the tender price.
 - 1.5. **Information to be supplied by the product supplier:** Drawings, schedules, technical information, calculations and manufacturers' literature as appropriate.
 - 1.6. **Timing:** Submit before ordering products.
 - 1.7. **Format:** Drawings and specification in BIM compliant format.

Ss_25_13_50/204 Design supervision and checking for masonry systems

1. **Required level of design supervision:** To [BS EN 1990](#), DSL 2.
2. **Design supervision personnel:** May include designers/ design inspectors, checkers, etc. based on their competence, experience and internal organization.

Ss_25_13_50/206 Design working life of masonry systems

1. **Design working life category:** 60 years.

Ss_25_13_50/235 Design of masonry walling

1. **Standard:** To [BS EN 1996-1-1](#).

Ss_25_13_50/238 Impact loads upon parapets and barriers for masonry systems

1. **Standard:** In accordance with [BS 6180](#).
2. **Horizontal pedestrian loading**
 - 2.1. **Parapets and barriers:** Refer to Structural Engineer's information.
 - 2.2. **Height of application:** Refer to Structural Engineer's information.
3. **Information provided:** Select worst condition from computer printout provided by employer's engineer.
4. **Location of posts:** Refer to Structural Engineer's information.

Ss_25_13_50/240 Loading for mechanical and electrical services on masonry systems

1. **Standard:** In accordance with [BS EN 1991-3](#).
2. **Imposed loads**
 - 2.1. **Uniformly distributed loads (maximum):** Refer to Structural Engineer's information.
 - 2.2. **Defined loads:** Refer to Structural Engineer's information.
3. **Concentrated loads:** Refer to Structural Engineer's information.

Ss_25_13_50/252 Design for fire performance of masonry structures

1. **Standard:** In accordance with [BS EN 1365-1](#) and To [BS EN 1991-1-2](#), Annex F.
2. **Building purpose group:** In accordance with Building Regulations for use in England.
3. **Loadbearing capacity, integrity and insulation:** 60 mins minimum. (By the equivalent time of fire exposure to PD 6688-1-2, Annex B).
4. **Criteria:** Source of fire load - MEP equipment located between the walls.

Ss_25_13_50/290 Compliance with performance requirements for masonry systems

1. **Requirement:** Proof of compliance with specified performance.
2. **Method**
 - 2.1. **Previous test results:** For structural performance.
For fire performance.
For acoustic performance.
3. **Submittals**
 - 3.1. **Format:** Test results and certification.
 - 3.2. **Timing:** At detailed design stage.

Products

Pr_20_31_53_11 MWS systems Cement-gauged mortars above DPC

1. **Description:** Cement gauged mortar to be used above DPC level.
2. **Manufacturer:** Submit proposals.
3. **Standard:** To BS [EN 998-2](#). IS EN1996-1 -1 and SK 325.
4. **Mortar type:** Ready to use cement:lime:sand.
5. **Mix:** 1:1:6 (cement:lime:sand)4 N/mm² (mortar class 4).
6. **Admixture:** Styrene butadiene rubber (SBR).
7. **Colour:** Match masonry units.
8. **Reaction to fire classification:** Class A1.
9. **Additional requirements:** Durability: Freeze/ thaw resistance: Not to be left exposed.
10. **Execution:** [Pr 20 31 53/610 Testing fresh mortar cement content](#); [Pr 20 31 53/615 Height of lifts in brick and block walling using cement gauged mortar or hydraulic lime mortar](#); [Pr 20 31 53/605 Testing compressive strength of mortar](#)

Pr_20_31_53_11 MWS systems Cement-gauged mortars below DPC

1. **Description:** Cement gauged mortar to be used below DPC level.
2. **Manufacturer:** Submit proposals.
3. **Standard:** To BS [EN 998-2](#). BS EN 1996-1 -1 and SK 325.
4. **Mortar type:** Ready to use cement:lime:sand.
5. **Mix:** 1:3 (masonry cement:sand) 6 N/mm² (mortar class 6).
6. **Admixture:** Submit proposals for agreement.
7. **Colour:** Match masonry units.
8. **Reaction to fire classification:** Class A1.
9. **Additional requirements:** Durability: Freeze/ thaw resistance: Frost resistant. Durability: Freeze/ thaw resistance: Suitable for exposed external use below dpc.
10. **Execution:** [Pr 20 31 53/605 Testing compressive strength of mortar](#); [Pr 20 31 53/610 Testing fresh mortar cement content](#); [Pr 20 31 53/615 Height of lifts in brick and block walling using cement gauged mortar or hydraulic lime mortar](#)

Pr_20_85_84_33 General-purpose slip ties Ancon PPS

1. **Description:** General purpose slip ties at vertical movement joint locations fixed at 450mm centres vertically.
2. **Manufacturer:** [Leviat](#)
3. **Contact details**
 - 3.1. **Address:** President Way
President Park,
Sheffield
South Yorkshire
S4 7UR
 - 3.2. **Telephone:** +44 (0) 114 275 5224
 - 3.3. **Web:** www.leviat.com
 - 3.4. **Email:** info.uk@leviat.com

4. **Product reference:** [Ancon PPS Movement Tie - 2D Detail](#)
5. **Material:** Austenitic stainless steel.
6. **Length:** 225 mm.
7. **Type:** Ancon PPS wall tie.
8. **Execution:** [Pr_20_85_84/615 Installing slip ties for movement joints PPS ties](#)

Pr_20_85_84_73 Shear wall ties Ancon SPV

1. **Description:** Frame cramp ties with vertically slotted fixing hole fixed at 450mm centres vertically and horizontally.
2. **Manufacturer:** [Leviat](#)
3. **Contact details**
 - 3.1. **Address:** President Way
President Park,
Sheffield
South Yorkshire
S4 7UR
 - 3.2. **Telephone:** +44 (0) 114 275 5224
 - 3.3. **Web:** www.leviat.com
 - 3.4. **Email:** info.uk@leviat.com
4. **Product reference:** [Ancon SDB Frame Cramp - 2D Detail \(SPV Frame Cramp\)](#)
5. **Material:** Austenitic stainless steel.
6. **Length:** 100 mm.
7. **Type:** Frame cramp with 8 x 30 mm fixing slot.
8. **Accessories:** Ancon ISO-TW washers to isolate stainless steel from galvanized steel structure.
Rubber grommets to isolate stainless steel bolted fixings for stainless steel ties.
Ancon gauge tape to set out centres for fixings.

Pr_20_93_52_01 Aggregate concrete blocks 100mm

1. **Description:** Solid, close textured architectural concrete masonry blocks to form fire rated external single leaf wall.
2. **Manufacturer:** Submit proposals
3. **Standard:** To [BS EN 771-3](#).
4. **Block description:** Solid, close textured architectural concrete masonry block suitable for use externally on both sides.
5. **Appearance:** Manufacturer's standard.
6. **Configuration:** Group 1. Solid blocks. In accordance with [BS EN 1996-1-1](#).
7. **Compressive strength**
 - 7.1. **Mean value:** Minimum 10.4 N/mm².
 - 7.2. **Category:** I.
8. **Freeze/ thaw resistance:** Frost-resistant.
9. **Thermal conductivity:** Not required where external wall. 100mm blocks - 0.79W/mK at 3% moisture content.
10. **Recycled content:** 20% (minimum) to [BS EN ISO 14021](#).
11. **Work sizes (length x width x height):** 440 x 100 x 215 mm.

12. **Accessory and special shape types:** Matching coursing blocks where applicable.
13. **Tolerance category:** D2.
14. **Density**
 - 14.1. **Gross dry density:** 1850 kg/m³.
15. **Reaction to fire:** Class A1 to BS EN 13501-1.
16. **Execution:** [Pr 20_93_52/625 Blockwork appearance](#); [Pr 20_93_52/630 Blockwork bond](#); [Pr 20_93_52/635 Blockwork pointing](#); [Pr 20_93_52/655 Facing blockwork joints](#); [Pr 20_93_52/660 Fair faced blockwork](#); [Pr 20_93_52/690 Laying brick and block masonry units generally](#); [Pr 20_93_52/745 Toothed bond](#)

Pr_25_93_54_03 Aluminium coping units

1. **Description:** Aluminium coping units to top of masonry wall.
2. **Manufacturer:** [Dales Fabrications Ltd - Aluminium Eaves Products](#)
3. **Contact details**
 - 3.1. **Address:** Crompton Road Industrial Estate
Ilkeston
Derbyshire
DE7 4BG
 - 3.2. **Telephone:** +44 (0)115 9301521
 - 3.3. **Web:** www.dales-eaves.co.uk
 - 3.4. **Email:** techinfo@dales-eaves.co.uk
4. **Product reference:** [Meridian Coping \(Alloy 1050 \(Powder Coating or Mill Finish\)\)](#)
5. **Material:** BS EN 515, BS EN 573-3, BS EN 485-1 and BS EN 485-2.
6. **Finish:** Powder coating to BS EN 12206-1.
7. **Material thickness (minimum):** 2 mm.
8. **Fixings:** Secret fix. Stainless steel. As supplied by manufacturer.
9. **Colour:** To be confirmed from Standard RAL range.
10. **Accessories:** End caps.
11. **Profile:** Flat.
12. **Type:** Clip on coping.
13. **Dimensions:** Width: 160mm
Length: Manufacturer's standard.

Pr_35_90_53_86 Fire rated movement joints Emshield WFR CE

1. **Description:** Fire rated and water resistant vertical movement joint to masonry wall.
2. **Manufacturer:** [NCC – Emseal Movement Joints](#)
3. **Contact details**
 - 3.1. **Address:** Woodside, Ackhurst Road
Common Bank Industrial Estate
Chorley
Lancashire

United Kingdom
PR7 1NH

- 3.2. **Telephone:** +44 (0) 1257 266696
- 3.3. **Web:** www.EmsealServices.co.uk
- 3.4. **Email:** technical@emsealservices.co.uk
4. **Product reference:** [Fire Resistant Floor & Wall Movement Joints - Emshield DFR / WFR CE \(Emshield WFR CE\)](#)
5. **Joint width:** 12 mm.
6. **Edging**
 - 6.1. **Material:** Fire rated double sided silicone faced.
 - 6.2. **Colour:** Grey - closest match to blockwork.
7. **Insert**
 - 7.1. **Material:** Fire retardant impregnated foam.
 - 7.2. **Colour:** Grey.
8. **Reaction to fire:** Class B-S2, d0.
9. **Resistance to fire:** 1, 2, 3 and 4 hour.
10. **Movement:** 100% seismic movement (+/- 50% of nominal supplied size).
11. **Acoustic performance:** Rs.w (C; Ctr): ≥54 (-1, -3).
12. **Thermal Conductivity::** 0.0623 W/m.K.
13. **Water permeability:** No leakage up to 1200 Pa of pressure.
14. **Air permeability:** No leakage up to 1200 Pa of pressure.

Ss_25_13_50/305 Product samples blockwork

1. **Manufacturer:** Selected manufacturer.
2. **Submittals:** Representative of the range in variation of appearance. Minimum of 1 No. of each type of concrete block specified.
3. **Purpose:** For use as a reference sample.
4. **Labelling:** Clearly label all submitted samples.
5. **Timing:** Before ordering for project.

Ss_25_13_50/515 Custom made wall ties, restraints and supports SPD

1. **Manufacturer:** Ancon or equivalent approved.
2. **Product reference:** SPB or SPV.
3. **Tie type:** Frame cramp.
4. **Material:** Austenitic stainless steel - [BS EN 845-1](#) material/ coating reference 3.
5. **Sizes:** As required to suit cavities.
6. **Design embedment length (minimum):** 65mm.
7. **Movement:** Non tolerant.
8. **Additional requirements**
 - 8.1. **Mortar joint thickness (minimum):** 10mm.

- 8.2. **Resistance to water crossing cavity:** Resistant.
- 8.3. **Slope tolerance:** Tolerant.
- 9. **Execution:** [Pr 20 85 84/610 Fixing ties in masonry cavity walls PPS ties](#); [Pr 20 85 84/615 Installing slip ties for movement joints PPS ties](#)

Execution

Pr_20_31_53/605 Testing compressive strength of mortar

- 1. **Testing authority:** An approved laboratory.
- 2. **Test method:** To [BS EN 1015-11](#).
- 3. **Preliminary tests procedure**
 - 3.1. **Specimens**
 - 3.1.1. **Number:** 6.
 - 3.1.2. **Specimen type:** 40 x 40 x 160 mm prisms.
 - 3.1.3. **Preparation:** At least six weeks before walling commences.
 - 3.2. **Specimen testing:** Half of specimens at 7 days, remainder at 28 days.
 - 3.3. **Retarded mixes:** Extend curing periods to include retardation period.
 - 3.4. **Response to result:** If mean compressive strength at 28 days is not within the range given below repeat tests with more suitable sand or next higher mortar class.
- 4. **Site tests procedure**
 - 4.1. **Specimens**
 - 4.1.1. **Number:** Six per 150m² of walling or per storey, whichever the more frequent.
 - 4.1.2. **Specimen types:** As preliminary test, but prepared during construction.
 - 4.1.3. **Timing:** Half of specimens at 7 days remainder at 28 days.
 - 4.1.4. **Retarded mixes:** Extend curing periods to include retardation period.
- 5. **Required test mean compressive strength at 28 days (N/mm²)**
 - 5.1. **Walling type:** All masonry walling types.
 - 5.2. **Preliminary tests minimum (N/mm²):** Refer to Structural Engineer's information.
 - 5.3. **Preliminary tests maximum (N/mm²):** Refer to Structural Engineer's information.
 - 5.4. **Site tests minimum (N/mm²):** Refer to Structural Engineer's information.
 - 5.5. **Site tests maximum (N/mm²):** Refer to Structural Engineer's information.
- 6. **Results:** Submit.

Pr_20_31_53/610 Testing fresh mortar cement content

- 1. **Test method:** BREMORTEST in accordance with Building Research Establishment Information Paper 8/89.
- 2. **Mortar test specimens:** Mortars used in project.
- 3. **Results:** Submit.

Pr_20_31_53/615 Height of lifts in brick and block walling using cement gauged mortar or hydraulic lime mortar

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

Pr_20_85_84/610 Fixing ties in masonry cavity walls PPS ties

1. **Wall arrangement:** Tie to extend across movement joint in same leaf of engineering brickwork.
2. **Embedment in mortar beds (minimum):** 50 mm.
3. **Placement:** Sloping slightly downwards towards outer leaf, without bending. Centre drip in the cavity and pointing downwards.
4. **Spacing**
 - 4.1. **Pattern:** Aligned above tie below.
 - 4.2. **Horizontal centres:** Not applicable.
 - 4.3. **Vertical centres:** 225mm centres vertically.

Pr_20_85_84/615 Installing slip ties for movement joints PPS ties

1. **Debonding arrangement:** Polyethylene sheet wrapping to one half length of tie.
2. **Fixing centres:** Alternate courses.

Pr_20_93_52/625 Blockwork appearance

1. **Brick/ block selection:** Do not use units with damaged faces or arrises.
2. **Cut masonry units:** Where cut faces or edges are exposed, cut with table masonry saw.
3. **Quality control:** Lay masonry units to match relevant reference panels.
4. **Setting out:** To produce satisfactory junctions and joints with built-in features and components.
5. **Coursing:** Evenly spaced using gauge rods.
6. **Lifts:** Complete in one operation.

Pr_20_93_52/630 Blockwork bond

1. **Bond type:** Half lap stretcher.

Pr_20_93_52/635 Blockwork pointing

1. **Joint preparation:** Remove debris. Dampen surface.
2. **Profile:** Bucket handle.

Pr_20_93_52/655 Facing blockwork joints

1. **Profile:** Bucket handle.

Pr_20_93_52/660 Fair faced blockwork

1. **Definition of facework:** Applicable in this specification to block walling finished fair.
2. **Definition of painted facework:** The only requirement to be waived is that relating to colour.

Pr_20_93_52/690 Laying brick and block masonry units generally

1. **Mortar joints:** Lay units on a full bed. Fill vertical joints and voids.
2. **Thin mortar joints**
 - 2.1. **Generally:** Lay blocks on a full bed. Fill vertical joints.
 - 2.2. **Clay block vertical joints:** Interlock without mortar.
3. **Joint appearance:** Neat and consistent.
4. **Bond where not specified:** Half lap stretcher.
5. **Vertical joints in brick and concrete block facework:** Plumb at every fifth cross joint.
6. **Cleanliness**
 - 6.1. **Facework:** Keep clean.
 - 6.2. **Mortar on facework:** Removed.
 - 6.3. **Removal of marks and stains:** Rubbing and other abrasive or chemical cleaning methods not permitted.

Pr_20_93_52/745 Toothed bond

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

Ss_25_13_50/600 Adverse weather

1. **Freezing conditions:** Do not use frozen materials or lay on frozen surfaces.
2. **Air temperature**
 - 2.1. **Cement-gauged mortars:** Do not lay units at or below 3°C and falling or below 1°C and rising (unless mortar has a temperature of not less than 4°C when laid and walling is thoroughly protected).
 - 2.2. **Hydraulic lime:sand mortars:** Do not lay units at or below 5°C and falling or below 3°C and rising, or as manufacturer's/ supplier's recommendations.
3. **Temperature of masonry during curing:** Above freezing until mortar hardens/ has fully set.
4. **Newly erected walling**
 - 4.1. **Protect from precipitation:** At all times.
 - 4.2. **Protect from drying out too rapidly:** At all times in hot conditions and in drying winds.

Ss_25_13_50/601 Cleanliness

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

Ss_25_13_50/604 Putlog scaffolding

1. **Putlog scaffolding:** Not permitted in facework.

Ss_25_13_50/605 Execution Standards for masonry structures

1. **Standard:** To [BS EN 1996-2](#).

Ss_25_13_50/610 Reference panels to establish quality of masonry work facing brickwork

1. **Method:** Finished masonry work sample panels.
2. **Required samples**

- 2.1. **Types:** Facing clay brick masonry units, jointing and pointing mortar and profile.
- 2.2. **Frequency:** One panel for each type of masonry unit.
- 2.3. **Locations:** In an agreed location on site.
- 2.4. **Sizes:** 1.5m wide x 975mm high. (13 bricks high).
- 2.5. **Selection of masonry units:** Randomly to [BS EN 771-1](#).
- 2.6. **Bond:** Half lap stretcher.
- 2.7. **Features to be included:** Abutment edge with curtain walling junction.
- 2.8. **Timing:** Construct before commencement of walling. Obtain approval of appearance before proceeding.

Ss_25_13_50/674 **Masonry movement joints**

1. **Joint frequency:** 6m maximum.
2. **Joint width:** 12mm.
3. **Joint location:** Refer to drawings.

Ss_25_13_50/757 **Laying walling below ground level**

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

Ss_25_13_50/758 **Levelling of separate leaves in brick and block walling**

1. **Locations for equal levelling of cavity wall leaves:** Every course containing vertical twist type ties or other rigid ties, every third tie course for double triangle/ butterfly ties and courses in which lintels are to be bedded.

System completion

Ss_25_13_50/895 **Verification of performance**

1. **Requirement:** Check completed system and provide assurance of compliance with specified performance.
2. **Submittals**
 - 2.1. **Format:** Description of inspections, remedial works carried out and certification of compliance.
 - 2.2. **Timing:** At completion of installation.

Ω End of System

Ss_25_14_67_51

FEN-01 Metal mesh panel fencing systems type A

Systems

Ss_25_14_67_51 FEN-01 Metal mesh panel fencing systems type A

1. **Description:** Mesh panel screens with lockable gates to transformer enclosures. TX cages with doors. Reinstatement of existing perimeter fence line adjacent to ne gantry.
2. **System performance:** [Ss_25_14_63/201 Contractor design of fencing systems](#); [Ss_25_14_63/205 Design submittals type B](#); [Ss_25_14_63/215 Anti-intruder and security fencing performance](#); and [Ss_25_14_63/265 Visual performance](#).
3. **System manufacturer:** CLD Fencing Systems
www.cld-fencing.com
4. **Manufacturers reference:** Dulok-8 SR1 fencing.
5. **Standard:** To BS 1722-14.
6. **Category:** 2.
7. **Posts:** [Pr_20_76_64_12 Carbon steel posts](#).
8. **Post foundations:** Manufacturers standard post feet fixed to floor slab.
9. **Panels:** [Pr_25_71_50_19 Carbon steel mesh panels](#)
10. **Gates:** [Pr_30_59_34_14 Carbon steel mesh gates](#)
11. **System accessories:** Single hinged doors with security locks co-ordinated with the security consultants requirements.
12. **Samples required:** [Ss_25_14_63/310 Product samples type B](#).
13. **Execution:** [Ss_25_14_63/605 Alignment of fences](#); [Ss_25_14_63/607 Fencing work generally](#); and [Ss_25_14_67/772 Erecting open metal mesh panel general purpose fencing systems](#).
14. **System completion:** [Ss_25_14_63/830 Certificates for open mesh steel panel fencing systems type A](#) and [Ss_25_14_63/870 Inspection of fencing systems type A](#).

System performance

Ss_25_14_63/201 Contractor design of fencing systems

1. **Design scope:** The layout and design in accordance with the Architectural drawings.
2. **Detailed design**
 - 2.1. **Standards:** To the Eurocodes appropriate to the nature and location of the structure.
 - 2.2. **Deflections and other structural movements:** At serviceability limit state, these must be compatible with requirements of the pavement fabric, construction joints and weathertightness.
 - 2.3. **Design load criteria:** Refer to Structural Engineer's specification.

Ss_25_14_63/205 Design submittals type B

1. **Detailed design**
 - 1.1. **Requirement:** Complete the design within the constraints of the building and adjoining equipment.

- 1.2. **Purpose:** To demonstrate compliance with performance requirements.
For aesthetic evaluation.
- 1.3. **Submittals:** Typical plan, elevation and section drawings at suitable scales.
- 1.4. **Timing:** Before manufacture.
- 1.5. **Format:** Drawings and specification in BIM compliant format.

Ss_25_14_63/215 Anti-intruder and security fencing performance

1. **Standards:** Open mesh steel panel security fencing systems to [BS 1722-14](#) Category 2 and LPS 1175 Category A1 (Issue 8).

Ss_25_14_63/265 Visual performance

1. **Colour:** Submit proposals .
2. **Intervisibility:** To [BS 7818](#).
3. **Sight lines:** In accordance with [BS 6180](#).
4. **Transparency:** To [BS EN 1794-2](#).

Products

Pr_20_76_64_12 Carbon steel posts

1. **Manufacturer:** CLD Fencing Systems
www.cld-fencing.com
2. **Standards:** Manufacturer's standard .
3. **Posts**
 - 3.1. **Type:** Manufacturer's standard .
 - 3.2. **Size and profile:** 60mm x 40mm to 120mm x 60mm depending on height of panel.
 - 3.3. **Length:** 2400mm
4. **Post top:** Flat top.
5. **Post base:** Welded base plate to be bolted to concrete slab.
6. **Maximum post centres:** 2520mm centres.
7. **Finish as delivered**
 - 7.1. **Applied finish:** Powder coating to [BS EN 13438](#). Minimum 60 microns. Confirm compliance with corrosivity category C3 in accordance with Table 1 BS EN ISO 12944-2.
 - 7.2. **Colour:** To match fence panels.

Pr_25_71_50_19 Carbon steel mesh panels

1. **Description:** Carbon steel mesh panels.
2. **Manufacturer:** CLD fencing Systems.
3. **Product reference:** CLD Dulok S1 Double Wire Rigid Mesh Panel System.
4. **Standards:** To [BS 1722-14](#).
5. **Dimensions**
 - 5.1. **Width:** 2506mm.

- 5.2. **Height:** 2400mm.
6. **Frame**
 - 6.1. **Material:** Carbon steel.
 - 6.2. **Section:** Rectangular.
 - 6.3. **Finish as delivered**
 - 6.3.1. **Applied finish:** Powder coating to [BS EN 13438](#). Minimum 60 microns. Confirm compliance with corrosivity category C3 in accordance with Table 1 BS EN ISO 12944-2.
7. **Infill mesh**
 - 7.1. **Mesh size**
 - 7.1.1. **Security fencing systems:** 200 mm vertical x 50 mm horizontal x 6 mm vertical wire diameter x 8+8 mm horizontal wire diameter.
 - 7.2. **Finish as delivered**
 - 7.2.1. **Applied finish:** Powder coating to [BS EN 13438](#). Minimum 60 microns. Confirm compliance with corrosivity category C3 in accordance with Table 1 BS EN ISO 12944-2.
8. **Colour:** Refer to Finishes Schedule.
9. **Fixing:** 40mm x 5mm full length clamp bar. M8 x 40mm stainless steel pin hex dome-head security screws. Sheardrive™ if required instead of pin hex.
10. **Top edge projection:** 30mm.
11. **Panel installation:** Bottom of panel maximum 50mm above ground.

Pr_30_59_34_14 Carbon steel mesh gates

1. **Description:** Mesh access gates within mesh fencing system.
2. **Manufacturer:** CLD Fencing Systems.
3. **Product reference:** Lockmaster S1 Dulok 8 swing gates.
4. **Standard:** In accordance with [BS EN 12445](#) and [BS EN 12453](#).
5. **Dimensions**
 - 5.1. **Span:** Refer to drawings.
 - 5.2. **Height:** Refer to drawings.
6. **Posts:** Carbon steel. Minimum 80mm x 80mm.
7. **Gate leaves:** Carbon steel welded mesh.
 - 7.1. **Gate leaf frame:** 50x50x2mm vertical stiles SHS min/ 40x40x2mm horizontal rails SHS minimum.
 - 7.2. **Gate leaf mesh:** 200x50mm mesh 6mm verticals 2 x 8mm horizontals.
8. **Hardware**
 - 8.1. **Hinges:** Required.
 - 8.2. **Securing:** A slide-bar locking mechanism to be used in conjunction with a padlock required.
 - 8.3. **Operating:** Manual. No closers required.
9. **Finish as delivered**
 - 9.1. **Applied finish:** Powder coating to [BS EN 13438](#). Minimum 60 microns. Confirm compliance with corrosivity category C3 in accordance with Table 1 BS EN ISO 12944-2.

Ss_25_14_63/310 Product samples type B

1. **Supplied by:** CLD Fencing Systems.
2. **Submittals:** Samples of exposed profiles and finishes.
3. **Purpose:** For use as a reference sample.
4. **Labelling:** Clearly label all submitted samples. State full details of composition of mix.
5. **Timing:** Before ordering for project.

Execution

Ss_25_14_63/605 Alignment of fences

1. **Alignment of fences and barriers:** Straight lines or smoothly flowing curves, following profile of the ground.
2. **Tops of posts:** Follow ground profile.
3. **Verticality:** Plumb.
4. **Tolerances:** ±30 mm of prescribed alignment and, within any 10 m length, ±15 mm from the straight or required radius.
5. **Changes of direction:** Obtuse angles such that no angle is less than 130°.

Ss_25_14_63/607 Fencing work generally

1. **Metal fixings:** Protect from corrosion.
2. **In situ welding:** Not permitted.
3. **Treatment of minor damage to galvanized surfaces**
 - 3.1. **Repairs to areas of damage less than 40 mm²**
 - 3.1.1. **Method:** Submit proposals .
 - 3.1.2. **Zinc coating thickness (minimum):** Thickness of the original layer.
4. **Site applied finishes**
 - 4.1. **Timing:** Prepare surfaces and apply finishes as soon as possible after fixing.

Ss_25_14_67/772 Erecting open metal mesh panel general purpose fencing systems

1. **Standard:** To [BS 1722-14](#), category 1.
2. **Fence height**
 - 2.1. **Height to top of mesh:** 2400mm
 - 2.2. **Height to top line of barbed wire (maximum):** 150 mm from top of fence panel. 200 mm below the top of the extension arm.
3. **Rails**
 - 3.1. **Number:** Submit proposals .
 - 3.2. **Spacing:** Evenly spaced.
4. **Post centres (maximum):** 3000 mm.
5. **Bottom of fencing:** Manufacturer's standard . Raised above concrete slab level.
6. **Additional security:** Line of fence to be set out such that no angle is less than 130° at changes of direction.
7. **Fasteners and fittings :** Manufacturer's standard.

System completion

Ss_25_14_63/830 Certificates for open mesh steel panel fencing systems type A

1. **Standard** : To BS 1722-14.
2. **Certificates**
 - 2.1. **Fence manufacturer**
 - 2.1.1. **Statement of conformity:** Confirmation that fence and/ or gates are manufactured in accordance with client's instructions.
 - 2.1.2. **Format:** Contract or order number.
Date.
Purchaser's name and address.
Supplier's name and address.
 - 2.2. **Fence installer**
 - 2.2.1. **Statement of conformity:** Confirmation that materials and execution are in accordance with client's instructions.
 - 2.2.2. **Format:** Contract or order number.
Date.
Purchaser's name and address.
Supplier's name and address.

Ss_25_14_63/870 Inspection of fencing systems type A

1. **Timing:** On completion of the installation.
2. **Period of notice (minimum):** Three working days.

Ω End of System

Ss_25_20_14_54

EWS-01 Metal insulating sandwich panel cladding systems type C

Systems

Ss_25_20_14_54 EWS-01 Metal insulating sandwich panel cladding systems type C

1. **Description:** External Metal Faced Cladding Panels to Gantry Plant Rooms.
2. **System performance:** [Ss_25_20_14/205 Metal insulating sandwich panel cladding system design](#);
[Ss_25_20_14/210 Design submittals](#);
[Ss_25_20_14/215 Structural performance Type A](#); Fire performance in accordance with BS EN 13501
[Ss_25_20_14/255 Thermal performance](#);
[Ss_25_20_14/265 Avoidance of condensation](#);
[Ss_25_20_14/270 Water penetration](#);
[Ss_25_20_14/275 Durability](#);
and [Ss_25_20_14/290 Compliance with performance requirements](#). [Ss_25_20_14/225 Fire performance](#)
3. **System manufacturer:** Eurobond (or similar approved).
4. **Product reference:** Rockspan.
5. **Cladding panels**
 - 5.1. **Panel type:** [Pr_25_71_14_22 Carbon steel insulating sandwich panels type C](#).
 - 5.2. **Panel fasteners:** Stainless steel fasteners.
 - 5.3. **End and side laps:** Butt jointed with cover caps.
6. **Continuity thermal insulation:** Joints filled with Stone wool insulation.
7. **Panel joints**
 - 7.1. **Horizontal:** Interlocking.
 - 7.2. **Vertical:** [Pr_35_90_28_15 Cover caps](#).
8. **System accessories:** Vertical cap Joint with insulation insert, Fixings, vertical seals to back of joint, Flashings, Cills and Parapet Cappings.
9. **Samples required:** [Ss_25_20_14/305 Product samples](#).
10. **Execution:** [Ss_25_20_14/610 Preliminary cladding installation](#);
[Ss_25_20_14/625 Installing continuity thermal insulation for insulating sandwich panel wall cladding](#);
[Ss_25_20_14/645 Installing flashings and trims to insulating sandwich panel cladding](#);
and [Ss_25_20_14/650 Butt-jointed flashings and trims](#).
11. **System completion:** [Ss_25_20_14/895 Verification of performance](#).

System performance

Ss_25_20_14/205 Metal insulating sandwich panel cladding system design

1. **Requirement:** Including doors integral to cladding system.
2. **Purpose:** To demonstrate compliance with performance and technical requirements.
3. **Standards:** In accordance with BS 5427.
4. **Appearance and fit:** Ensure that position and alignment of parts and features are as shown on preliminary design drawings. Accommodate all deviations in the primary support structure.

5. **Related works:** Coordinate in the detailed design.

Ss_25_20_14/210 Design submittals

1. **Submittals:** Typical plan, section and elevation drawings at suitable scales;
Typical detailed drawings at large scales;
Technical information and certification demonstrating compliance with specification of proposed incorporated products and finishes, including thermal insulation;
Certification, reports and calculations demonstrating compliance with specification of proposed cladding;
Proposals for connections to and support from the primary support structure; Proposals for primary support structure additional to that shown on preliminary design drawings; and Schedule of builder's work, special provisions and special attendance by others.
2. **Timing:** Submit during detailed design.
3. **Format:** In electronic format.

Ss_25_20_14/215 Structural performance Type A

1. **Loads:** Resist wind loads, dead loads and design live loads.
2. **Deflections and movements:** Accommodate without damage.
3. **General movement:** Anticipated building movements to be accommodated.
4. **Hard body impact loads**
 - 4.1. **Category:** Category C in accordance with [BS 5427](#), Table B.1.
5. **Soft body impact loads**
 - 5.1. **Category:** Category C in accordance with [BS 5427](#), Table B.1.
6. **Imposed loads**
 - 6.1. **Standard:** In accordance with [BS EN 1991-1-1](#) and [BS 5427](#).
 - 6.2. **Permanent imposed loads:** Contractor to calculate loads.
 - 6.3. **Temporary imposed loads:** Contractor to calculate loads.
 - 6.4. **Dead loads:** In accordance with [BS 5427](#).
 - 6.5. **Dead and imposed loads:** In accordance with [BS 5427](#).
 - 6.6. **Wind loads:** Permissible deflection in accordance with [BS 5427](#), L/100.

Ss_25_20_14/225 Fire performance

1. **Standard:** To [BS EN 14509](#).
2. **Fire resistance**
 - 2.1. **Complete wall assembly:** To [BS EN 13501-2](#), Class EI 60.
 - 2.2. **Direction:** 'O<>' – inside to outside and outside to inside.
3. **Reaction to fire**
 - 3.1. **Core:** To [BS EN 13501-1](#), Class A1.
 - 3.2. **Insulation:** To [BS EN 13501-1](#), Class A1.
 - 3.3. **External surfaces:** To [BS EN 13501-1](#), Class A2-s1,d0.
 - 3.4. **Internal surfaces:** To [BS EN 13501-1](#), Class A2-s1,d0.
4. **Testing and assessment reports:** Submit evidence of successful testing by a UKAS-accredited laboratory.

5. **Timing:** Before ordering for project.

Ss_25_20_14/255 Thermal performance

1. **Method for calculating the thermal transmittance of the cladding wall:** Weighted U-value.
2. **Thermal bridging:** Complete thermal design of the cladding system to avoid excessive thermal bridging.

Ss_25_20_14/265 Avoidance of condensation

1. Winter interstitial condensate
 - 1.1. **Calculated amount (maximum):** 0.35 kg/m².
 - 1.2. **Calculated annual net retention:** Nil.
2. **Condensation:** Reduce the risk of forming on interior building surfaces, framing members or any part of infill panels or facings under notional psychrometric conditions.
3. **Risk of condensation:** Determine in accordance with [BS 5250](#), Annex D and provide effective vapour control.
4. **Notional outdoor psychrometric conditions**
 - 4.1. **Notional outdoor psychrometric conditions:** As [BS 6229](#), Table A1.
5. **Surface condensation:** Determine surface condensation risk of cladding system using the method described in [BS EN ISO 13788](#). If necessary, revise thermal insulation to provide satisfactory temperature factor (f_{min}). Ensure that damage and nuisance from surface condensation does not occur.

Ss_25_20_14/270 Water penetration

1. **Water leakage requirements:** Under site exposure conditions, moisture must not penetrate onto internal surfaces, or into cavities not designed to be wetted.

Ss_25_20_14/275 Durability

1. **Relevant agents or degradation mechanisms:** Submit proposals .
2. **Primary components**
 - 2.1. **Components:** Cladding panels;
Flashings and trims;
and Supports fasteners.
 - 2.2. **Design life duration (minimum):** 30 years.
3. **Secondary components**
 - 3.1. **Components:** Joint gaskets.
 - 3.2. **Design life duration:** Submit details for each product together with required maintenance regime, replacement periods and methods of replacement.
4. **Electrolytic corrosion:** Prevent.
5. **Submittals:** Prior to completion of detailed design, submit required maintenance regime, replacement periods and methods of replacement.

Ss_25_20_14/290 Compliance with performance requirements

1. **Requirement:** Proof of compliance with specified performance.
2. **Method**

- 2.1. **Previous test results:** For structural performance.
For acoustic performance.
For thermal performance.
3. **Testing authority:** UKAS approved independent test agency.
4. **Submittals**
 - 4.1. **Format:** Test results and certification.
 - 4.2. **Timing:** At detailed design stage.

Products

Pr_25_71_14_22 Carbon steel insulating sandwich panels type C

1. **Description:** Fire rated composite steel faced cladding panels.
2. **Manufacturer:** Eurobond (or similar approved).
3. **Panel reference:** Rockspan.
4. **Standard:** To [BS EN 14509](#).
5. **Panels:** Manufacturer's standard .
6. **Panel construction**
 - 6.1. **Panel external face**
 - 6.1.1. **Material:** TA Steel Colorcoat HPS200 Ultra.
 - 6.1.2. **Grade:** Manufacturer's standard.
 - 6.1.3. **Profile:** Flat profile.
 - 6.2. **Panel internal face**
 - 6.2.1. **Material:** TATA Steel.
 - 6.2.2. **Grade:** Manufacturer's standard .
 - 6.2.3. **Profile:** Flat profile.
 - 6.3. **Core insulation:** Non combustible stone wool. Minimum 115 Kg/m³ density.
7. **Panel dimensions**
 - 7.1. **Length:** Refer to drawings.
 - 7.2. **Cover width:** 1000mm or 1200mm.
 - 7.3. **Thickness:** Minimum 100mm to achieve EI60.
8. **Joint type**
 - 8.1. **Side or vertical:** Secret fix vertical joint Option 1 with insert.
 - 8.2. **End or horizontal:** Interlocking.
9. **Curvature:** Manufacturer's standard.
10. **Taper:** Manufacturer's standard.
11. **Finish as delivered**
 - 11.1. **Outer skin**
 - 11.1.1. **Material:** TATA Steel.
 - 11.1.2. **Thickness:** 0.7mm.

11.1.3. **Colour:** Colour grey, subject to approved sample.

11.2. **Inner skin**

11.2.1. **Material:** TATA Steel.

11.2.2. **Thickness:** 0.5mm.

11.2.3. **Colour:** RAL to match existing.

12. **Integral accessories:** All necessary trims, flashings, gaskets, seals etc. required to complete the wall panel installation.

13. **Fire performance**

13.1. **Reaction to fire**

13.1.1. **Panel external face:** Non combustible. As defined in Building Regulations Approved Documents B2, section B4 Table 12.1 (England and Wales).

13.1.2. **Panel internal face:** Non combustible. As defined in Building Regulations Approved Documents B2, section B2 Table 6.1 (England and Wales).

13.2. **Fire resistance:** EI60.

Pr_35_90_28_15 **Cover caps**

1. **Manufacturer:** Eurobond (or similar approved).
2. **Product reference:** Top hat section, secret fix Option 1 with insert.
3. **Material:** Manufacturer's standard.
4. **Profile:** Manufacturer's standard.
5. **Purpose:** To conceal vertical joint and fixings.
6. **Size:** Manufacturer's standard.
7. **Finish:** To match cladding panel.
8. **Film thickness (minimum):** Manufacturer's standard.
9. **Colour:** To match cladding panel.
10. **Sheen:** To match cladding panel.
11. **Fixing:** Screw fixing.

Ss_25_20_14/305 **Product samples**

1. **Manufacturer:** Eurobond (or similar approved).
2. **Submittals:** Samples of all exposed finishes and profiles.
3. **Purpose:** For use as a reference sample.
4. **Labelling:** Clearly label all submitted samples.
5. **Timing:** Before ordering for project.

Execution

Ss_25_20_14/610 **Preliminary cladding installation**

1. **Purpose:** To serve as an installation reference panel.
2. **Installation:** Complete an area of cladding in an agreed location for inspection and agreement of appearance.
3. **Position:** Submit proposals .

4. **Sample area (minimum):** To indicate typical horizontal, vertical and movement joints, and finishes.
5. **Timing and approvals:** Construct and obtain approval of appearance before proceeding with installation of cladding. Retain undisturbed until completion of cladding installation.

Ss_25_20_14/625 **Installing continuity thermal insulation for insulating sandwich panel wall cladding**

1. **Requirement:** Secure and continuous with cladding insulation.

Ss_25_20_14/645 **Installing flashings and trims to insulating sandwich panel cladding**

1. **Flashing type:** Manufacturer's standard.
2. **Method of fixing**
 - 2.1. **Fixing locations:** Manufacturer's standard.
 - 2.2. **Fixing type:** Manufacturer's standard.
 - 2.3. **Fastener spacing:** In accordance with manufacturer's recommendations.
3. **Vertical and sloping flashings and trims:** Manufacturer's standard.
4. **Horizontal flashings and trims:** Manufacturer's standard.
5. **Special flashings and trims:** Manufacturer's standard.

Ss_25_20_14/650 **Butt-jointed flashings and trims**

1. **Requirement:** Manufacturer's standard.
2. **Butt joints:** Seal.

System completion

Ss_25_20_14/895 **Verification of performance**

1. **Requirement:** Check completed system and provide assurance of compliance with specified performance
2. **Submittals**
 - 2.1. **Format:** Confirmation in writing.
 - 2.2. **Timing:** At completion of installation.

Ω End of System

Ss_25_30_20_25

DRS-02 External Steel Doorset system type D

Systems

Ss_25_30_20_25 DRS-02 External Steel Doorset system type D

1. **Description:** External Steel Door Sets.
2. **System performance:** External 1 Hr Fire rated Steel Insulated secure Access Door Sets to gantry Plantrooms.
3. **System manufacturer:** Eurobond Doors or similar approved.
4. **Doorset**
 - 4.1. **Type:** [Pr_30_59_24_52 Metal doorsets type B](#).
 - 4.2. **Fasteners:** [Pr_20_29_14_32 Frame cramps type B](#).
 - 4.3. **Seals or inserts**
 - 4.3.1. **Frame:** Manufacturer's standard.
 - 4.3.2. **Door:** Manufacturer's standard.
5. **Thresholds**
 - 5.1. **Base:** Manufacturer's standard.
 - 5.2. **Weather or seal stripping:** Required.
6. **Hardware:** Refer to Architectural Ironmongery schedule.
7. **Breakout facility:** Not required.
8. **Filler between frame and reveal:** Manufacturer's standard detail to achieve the require performance.
9. **Trim:** All trims to match doors and frames.
10. **Samples required:** [Ss_25_30_20/305 Product samples type B](#).
11. **Execution:** [Ss_25_30_20/610 Preconstruction survey type A](#);
[Ss_25_30_20/625 Corrosion protection](#);
[Ss_25_30_20/645 Installing fire resisting and smoke control doorsets, door assemblies or doors type A](#);
[Ss_25_30_20/655 Fixing hardware type A](#);
[Ss_25_30_20/680 Frame sealant joints type A](#);
and [Ss_25_30_20/685 Timing of fixing of doorsets type A](#).
12. **System completion:** [Ss_25_30_20/895 Verification of performance type A](#) and [Ss_25_30_20/810 Documentation relating to doors, door assemblies and doorsets type C](#).
13. **System facility management:** [25-50-20/905 Fire door inspection and maintenance type A](#)

Products

Pr_20_29_14_32 Frame cramps type B

1. **Manufacturer:** Eurobond Doors
2. **Material:** Carbon steel.
3. **Finish:** Galvanized to [BS EN ISO 1461](#).
4. **Size:** Submit proposals .

Pr_30_59_24_52 Metal doorsets type B

1. **Manufacturer:** Eurobond Doors or similar approved.
2. **Standard:** External fire rated steel framed doorset to [BS 6510](#) and CE marked in accordance with [BS EN 14351-1](#) and [BS EN 16034](#).
3. **Third-party certification:** Third party accredited by UKAS External link approved/ recognized body.
4. **Configuration:** Double leaf, single action.
5. **Doorset size:** Refer to Architectural door schedule.
6. **Performance**
 - 6.1. **Fire resistance**
 - 6.1.1. **Integrity:** To [BS EN 13501-2](#), E 60 minutes.
 - 6.1.2. **Insulation:** To [BS EN 13501-2](#), I 60 minutes.
 - 6.1.3. **Radiation:** Manufacturer's standard .
 - 6.2. **Smoke leakage:** Manufacturer's standard .
 - 6.3. **Reaction to fire:** To [BS EN 13501-1](#), Class A2-s1, d0 or better.
 - 6.4. **Acoustic performance:** Sound reduction index Rw 32 dB minimum.
 - 6.5. **Strength and durability:** To [BS EN 1192](#), Class 3.
 - 6.6. **Thermal:** Manufacturer's standard .
 - 6.7. **Intruder resistance**
 - 6.7.1. **Minimum requirement:** In accordance with [BS 6375-3](#), Basic security.
 - 6.7.2. **Application:** Hinge side only.
 - 6.7.3. **Conformity:** Certification by accredited third party certification body. Type testing not permitted.
7. **Frame**
 - 7.1. **Material:** Steel.
 - 7.2. **Threshold:** Steel
 - 7.3. **Perimeter seals or inserts:** Manufacturer's standard .
 - 7.4. **Finish**
 - 7.4.1. **Coating:** Powder coating to [BS EN 13438](#).
 - 7.4.2. **Texture:** Matt.
 - 7.4.3. **Colour:** Colour grey, subjto match plantroom cladding.
 - 7.5. **Installation fasteners:** Galvanized carbon steel frame cramps.
 - 7.6. **Frame accessories:** Manufacturer's standard .
8. **Door leaf**
 - 8.1. **Thickness:** 44mm thick.
 - 8.2. **Core:** Dufaylite corrugated cardboard type D170 10
 - 8.3. **Panel details:** Manufacturer's standard .
 - 8.4. **Material:** Steel.
 - 8.5. **Lippings:** Manufacturer's standard .
 - 8.6. **Perimeter seals:** Manufacturer's standard .

8.7. Finish

8.7.1. **Coating:** Powder coating to [BS EN 13438](#).

8.7.2. **Texture:** Matt.

8.7.3. **External colour:** Colour grey, to match plantroom cladding.

8.7.4. **Internal colour:** Colour grey, to match plantroom cladding.

8.7.5. **Film thickness (minimum):** Manufacturer's standard .

8.8. **Door accessories:** Refer to door hardware specification and door schedule.

9. **Hardware:** Refer to door hardware specification and door schedule.

10. **Accessories:** Refer to door hardware specification and door schedule.

11. **Execution:** [Pr 30 59 23/630 Installing hardware](#).

Ss_25_30_20/305 Product samples type B

1. **Manufacturer:** Eurobond Doors.
2. **Submittals:** Samples of all profiles and finishes.
3. **Purpose:** For use as a reference sample.
4. **Labelling:** Clearly label all submitted samples.
5. **Timing:** Before ordering for project.

Execution

Pr_30_59_23/630 Installing hardware

1. **Standard:** In accordance with door, door assembly or doorset and hardware manufacturers' recommendations.
2. **Submissions:** Evidence of compliance with certification.

Ss_25_30_20/610 Preconstruction survey type A

1. **Procedure:** Before starting work on designated items, take the site dimensions, record them on shop drawings and use them to ensure accurate fabrication.
2. **Designated items:** Structural openings and access for installation.
3. **Primary support structure:** Survey sufficiently to verify that the required accuracy and security of erection can be achieved.
4. **Timing:** Before fabrication.

Ss_25_30_20/625 Corrosion protection

1. **Material:** Submit proposals in accordance with the manufacturer's recommendations.
2. **Surfaces to be protected:** All exposed surfaces.
3. **Timing of protective coating application:** Before fixing components.

Ss_25_30_20/645 Installing fire resisting and smoke control doorsets, door assemblies or doors type A

1. **Standard:** In accordance with [BS 8214](#).
2. **Installer:** A firm currently registered under a third party accredited fire door installer scheme.

3. **Installation:** In accordance with instructions supplied with the product conformity certificate, test report or engineering assessment.
4. **Gaps between frames and supporting construction:** Manufacturer's standard to meet fire requirements.
5. **Labelling:** To include manufacturer's name, fire rating and traceable serial number.

Ss_25_30_20/655 Fixing hardware type A

1. **Holes for components:** No larger than required for satisfactory fit and operation.
2. **Adjacent surfaces:** Do not damage.
3. **Integrity of the assembly, as established by testing:** Do not compromise.
4. **Cutting:** Cut accurately.
5. **Clearances (maximum):** Submit proposals to maintain the integrity of the doorset.
6. **Hinges**
 - 6.1. **Primary hinge positions:** Submit proposals in accordance with the Architectural drawings.
 - 6.2. **Third hinge position:** Submit proposals in accordance with the Architectural drawings.

Ss_25_30_20/680 Frame sealant joints type A

1. **Application:** Prepare joints. Form triangular fillets finished to a flat or slightly convex profile.

Ss_25_30_20/685 Timing of fixing of doorsets type A

1. **Timing:** After rooms served have been made weathertight and the work of wet trades locally is finished and dried out.

System completion

Ss_25_30_20/810 Documentation relating to doors, door assemblies and doorsets type C

1. **Fire safety information:** Location of every fire door in the building, the fire door certificate relevant to the installed door, fire safety strategy, maintenance information for each component, frequency of inspection and maintenance depending on expected usage of the door.
2. **Fire performance evidence:** Provide third party certification of product conformity with the specified fire performance for each door or doorset supplied. Include identifier schedule or similar to allow individual doors to be located. Test evidence must be in the name of the door or doorset manufacturer.
3. **Smoke performance:** Provide third party certification of product conformity with the specified smoke performance for each door or doorset supplied. Include identifier schedule or similar to allow individual doors to be located. Test evidence must be in the name of the door or doorset manufacturer.
4. **Acoustic performance evidence:** Provide third party certification of product conformity for specified acoustic performance for sound attenuating door or doorset supplied.
5. **Submittals**
 - 5.1. **Manufacturer's operation and maintenance instructions for the following products:** Typically, the literature should provide the following information:
 - Product description.
 - Date of purchase.
 - Performance characteristics.
 - Application (suitability for use).
 - Method of operation and control.
 - Cleaning and maintenance requirements.

- 5.2. **Record layout drawings indicating:** General arrangement drawings showing the location of doors, shutters or hatches.
- 5.3. **Drawing and schedule format:** Electronic
- 5.4. **Number of copies:** One

Ss_25_30_20/895 Verification of performance type A

- 1. **Requirements:** Check completed system and provide assurance of compliance with specified performance.
- 2. **Submissions**
 - 2.1. **Format:** Electronic.
 - 2.2. **Timing:** At completion of installation.

System facility management

25-50-20/905 Fire door inspection and maintenance type A

- 1. **Requirements:** Submit proposals .
- 2. **Frequency of inspection:** Submit proposals .

Ω End of System

Ss_25_50_45_45

LWS-01 Louvre screen systems type A

Systems

Ss_25_50_45_45 LWS-01 Louvre screen systems type A

1. **Description:** Horizontal Louvred Screens to gantry.
2. **System performance:** [Ss_25_50_45/205 Compliance with performance requirements](#) and [Ss_25_50_45/220 Durability](#).
3. **System manufacturer:** Caice Ltd.
4. **Manufacturer refernce:** PLS 100 Louvre System.
5. **Screen framing:** [Pr_30_59_48_78 Screening and ventilation louvre support frames](#)
6. **Louvres**
 - 6.1. **Type:** [Pr_30_59_48_02 Aluminium louvre blades](#).
 - 6.2. **Operation:** Fixed.
7. **Blanking panels:** [Pr_25_71_42_08 Aluminium blanking panels](#)
8. **Installation fasteners:** Manufacturer's standard. Aluminium brackets and stainless steel fixings.
9. **System accessories:** [Pr_30_59_48_77 Screening and ventilation access doors Personnel doors](#). [Pr_30_59_48_77 Screening and ventilation access doors Access for services](#)
10. **Additional requirements:** Louvre blades shall be extruded to an aerodynamically efficient profile and clipped to concealed structural supporting mullions to allow for thermal expansion without distortion along their length.

Mullions shall be concealed at maximum 1000mm centres and their points of support along their length shall be in accordance with prevailing site wind pressures (as calculated and specified by a structural engineer) in accordance with the relevant Eurocode. Mullions will be manufactured from extruded profiles so that the associated supporting steelwork is kept to a minimum.
11. **Samples required:** [Ss_25_50_45/305 Product samples](#).
12. **Verification:** Required.
13. **Execution:** [Ss_25_50_45/620 Preconstruction survey](#);
[Ss_25_50_45/635 Fixing of aluminium frames](#);
and [Ss_25_50_45/655 Installation of louvre screens](#).
14. **System completion:** [Ss_25_50_45/810 Protection and cleaning](#) and [Ss_25_50_45/895 Verification of performance](#).

System performance

Ss_25_50_45/205 Compliance with performance requirements

1. **Requirement:** Proof of compliance with specified performance. Where applicable, louvre screens shall perform as required by any acoustic performance requirements in the Acoustic Consultants Report.
2. **Method**
 - 2.1. **Laboratory project testing :** Submit proposals .
 - 2.2. **Previous test results:** For durability.
 - 2.3. **Computer simulation testing:** Submit proposals .

3. **Submittals:** Typical plan, elevation and section drawings at suitable scale. Warranty criteria and limitations.
4. **Timing:** Before manufacture.
5. **Format:** Information in BIM format. Test results and certification.

Ss_25_50_45/220 Durability

1. **Design lifespan:** 25 years.
2. **Verification:** Test results and / or design calculations.

Products

Pr_25_71_42_08 Aluminium blanking panels

1. **Description:** Uninsulated blanking panels to lower 2100mm zone of louvre screens. Top of blanking panels to align with the top of the access doors in the louvre screens.
2. **Manufacturer:** Caice.
3. **Standards:** In accordance with [BS EN 485-1](#) and [BS EN 485-2](#). In accordance with [BS EN 14782](#).
4. **Alloy, temper and thickness:** Suitable for the application and finish.
5. **Size (height x width):** Refer to drawings.
6. **Panel finish:** Powder coating to [BS EN 12206-1](#). Minimum of 60 microns to all exposed surfaces.
7. **Colour:** To be confirmed.
8. **Reaction to fire**
 - 8.1. **Panel external face:** To [BS EN 13501-1](#), Class A2 or better.
 - 8.2. **Panel internal face:** To [BS EN 13501-1](#), Class A2 or better.
9. **Additional requirements:** Gap to be maintained between back of louvres and blanking panels to allow for rainwater drainage as louvres are inverted for screening purposes.

Pr_30_59_48_02 Aluminium louvre blades

1. **Manufacturer:** Caice Ltd.
2. **Profile:** PLS 100 Louvre System (Type A).
3. **Blade pitch and angle:** 100mm. 45 degrees.
4. **Performance:** Class D.
5. **Free area:** 55%.
6. **Classification:** Class A to BS EN ISO 13030:2001. (In standard configuration only).
7. **Orientation:** Blades inverted to act as screening louvres.
8. **No. of banks:** Single bank louvres.
9. **Material:** Extruded aluminium alloy perforated plain sheet, to [BS EN 755-1](#).
10. **Finish:** Powder coating to [BS EN 12206-1](#). Minimum of 60 microns to all exposed surfaces including mullions.
11. **Colour:** To be confirmed.
12. **Texture:** Matt.
13. **Mounting arrangement:** Clip fixing to mullions.

14. **Reaction to fire:** To [BS EN 13501-1](#), Class A2 or better.

Pr_30_59_48_77 Screening and ventilation access doors Access for services

1. **Description:** Fill point and SCR access panels within the louvre screen system.
2. **Manufacturer:** Caice Ltd.
3. **Size:** Refer to drawings.
4. **Format:** Multiple leaf, single action.
5. **Material:** Manufacturer's standard.
6. **Finish:** To match surrounding louvre screens.
7. **Colour:** To match surrounding louvre screens.
8. **Texture:** To match surrounding louvre screens.
9. **Reaction to fire:** To [BS EN 13501-1](#), Class A2 or better.

Pr_30_59_48_77 Screening and ventilation access doors Personnel doors

1. **Description:** Personnel access doors within the louvre screen system.
2. **Manufacturer:** Caice Ltd.
3. **Size:** Refer to drawings and door schedule.
4. **Format:** Single leaf, single action and double leaf, single action.
5. **Material:** Manufacturer's standard.
6. **Finish:** To match surrounding louver screens.
7. **Colour:** To match surrounding louver screens.
8. **Texture:** To match surrounding louver screens.
9. **Reaction to fire:** To [BS EN 13501-1](#), Class A2 or better.

Pr_30_59_48_78 Screening and ventilation louvre support frames

1. **Description:** Aluminium mullions to the rear of the louvres. Mullions shall be powder coated with minimum 60 microns to match the louvre blades.
2. **Manufacturer:** Submit proposals.
3. **Overall dimensions:** Refer to drawings.
4. **Components:** Refer to structural engineers drawings & specification.
5. **Materials:** Stainless steel or aluminium.
6. **Finish:** Powder coating to [BS EN 12206-1](#).
7. **Colour:** Refer to Finishes Schedule.
8. **Texture:** Matt.
9. **Fasteners:** Stainless steel bolts.
10. **Reaction to fire:** To EN 13501-1, Class A2 or better.
11. **Accessories:** Manufacturer's standard.

Ss_25_50_45/305 Product samples

1. **Manufacturer:** Caice Ltd.

2. **Submittals:** Samples of all profiles and finishes.
3. **Purpose:** To demonstrate compliance with performance requirements.
For aesthetic evaluation.
4. **Labelling:** Clearly label all submitted samples.
5. **Timing:** Before ordering for project.

Execution

Ss_25_50_45/620 Preconstruction survey

1. **Procedure:** Before starting work on designated items take site dimensions, record on shop drawings and use to ensure accurate fabrication.
2. **Primary support structure:** Carry out survey sufficient to verify that required accuracy and security of erection can be achieved.
3. **Timing:** Before fabrication.

Ss_25_50_45/635 Fixing of aluminium frames

1. **Spacing:** When not pre-drilled or specified otherwise, position fasteners not more than 250 mm from ends of each member, and at maximum 600 mm centres.

Ss_25_50_45/655 Installation of louvre screens

1. **Louvre alignment:** Horizontal.
2. **Louvre pitch:** Submit proposals .
3. **Mounting:** Fixed, individual louvre mounted on support mullions.
Louvres mounted inverted to provides screening of the plant when viewed from below.
4. **Arrangement:** Continual runs.
5. **Support arrangement:** Support mullions.
6. **Louvre fixings:** Manufacturer's standard.
7. **Site-applied finish:** Not required.

System completion

Ss_25_50_45/810 Protection and cleaning

1. **Cement and plaster-based spillage:** Remove whilst wet.
2. **Protection:** Prevent staining, scratching and other disfigurement.
3. **Completion:** Remove protective coverings. Thoroughly clean external and internal surfaces with appropriate agents.

Ss_25_50_45/895 Verification of performance

1. **Requirement:** Check completed system and provide assurance of compliance with specified performance.
2. **Method:** Third party certification.
3. **Submittals**
 - 3.1. **Format:** Description of inspections, remedial works carried out and certification of compliance.

3.2. **Timing:** At completion of installation.

Ω End of System

Ss_25_50_45_60

LVR-01 Panellized louvre systems type A

Systems

Ss_25_50_45_60 LVR-01 Panellized louvre systems type A

1. **Description:** Individual aluminium louvres to external walls with PPC finish to standard RAL colour.
2. **System performance:**

[Ss_25_50_45/215 Design of acoustic, screening and ventilation louvre systems](#)
[25-55-45/206 Thermal expansion](#); [Ss_25_20_14/215 Structural performance](#); [Ss_25_20_90/205 Design submittals Individual louvres \(CDP item\)](#)
[Ss_25_50_45/205 Compliance with performance requirements](#); [Ss_25_50_45/220 Durability](#)

3. **System manufacturer:** Caice Ltd.
4. **Manufacturer reference:** PLS 100 Louvre System.
5. **Screen framing:** [Pr_30_59_48_78 Screening and ventilation louvre support frames](#)
6. **Louvre panels**
 - 6.1. **Type:** [Pr_30_59_48_04 Aluminium louvre panel units to individual openings](#)
 - 6.2. **Operation:** Fixed.
7. **Installation fasteners:** Use types and sizes to suit unit installation conditions.
 1. Use tamper-resistant flat head screws for exposed fasteners unless otherwise indicated.
 2. For fastening aluminium, use aluminium or stainless-steel fasteners.
 3. For colour-finished louvres, use fasteners with heads that match colour of louvres.
8. **System accessories:** [Pr_30_59_57_08 Bird guard mesh](#); [Pr_35_90_30_11 Coated aluminium flashings proprietary](#); [Pr_20_85_03_63 Supports and fixings](#); [Pr_25_71_14_04 Aluminium insulating blanking panels](#); [Pr_30_59_57_40 Insect guard mesh](#); [Pr_30_31_76_77 Silicone construction joint sealants](#)
9. **Additional requirements:** Louvre blades shall be extruded to an aerodynamically efficient profile and clipped to concealed structural supporting mullions to allow for thermal expansion without distortion along their length.

Mullions shall be concealed at maximum 1000mm centres and their points of support along their length shall be in accordance with prevailing site wind pressures (as calculated and specified by a structural engineer) in accordance with the relevant Eurocode. Mullions will be manufactured from extruded profiles so that the associated supporting steelwork is kept to a minimum.

10. **Samples required:** [Ss_25_50_45/305 Product samples](#)
11. **Execution:** [Ss_25_50_45/615 Installation control samples](#)
[Ss_25_50_45/630 Corrosion protection](#)
[Ss_25_50_45/640 Fixing of steel frames](#)
[Ss_25_50_45/660 Fixing of components](#)
[Ss_25_50_45/665 Frame sealant joints](#); [Ss_25_50_45/620 Preconstruction survey](#); [Ss_25_50_45/655 Installation of louvre screens](#)
12. **System completion:**
[Ss_25_50_45/815 Documentation relating louvre systems](#); [Ss_25_50_45/895 Verification of performance louvre systems](#); [Ss_25_50_45/810 Protection and cleaning](#)

System performance

25-55-45/206 Thermal expansion

1. **Performance requirements:** Thermal expansion of the element should be taken into account based on the coefficient of linear thermal expansion of aluminium equal to $23 \times 10^{-6} \text{ m/m/}^\circ\text{C}$. A minimum gap of 1–2mm should be incorporated into the element jointing detail to accommodate thermal expansion of sections every approximately 1m length. (Calculation is based on a 50 °C maximum change in temperature).

Ss_25_20_14/215 Structural performance

1. **Loads:** Resist wind loads, dead loads and design live loads.
2. **Deflections and movements:** Accommodate without damage.
3. **General movement:** Anticipated building movements to be accommodated
4. **Integrity of cladding:** Structural performance.
 - 4.1. **General requirement:** Determine profiles, sizes and thicknesses of panels and sheets, the sizes, number and spacing of fixings, and incorporation of other accessories and fittings to ensure cladding system will resist factored dead, imposed and design live loads and accommodate deflections and thermal movements without damage, in accordance with Eurocodes.
 - 4.2. **Primary fasteners:** Not to be subjected to any bending movement.
 - 4.3. **Wind loads:** Calculate to Eurocode 1 (BS EN 1991 1-4), Standard method appropriate to location, exposure, height, building shape and size, taking account of existing and known future adjacent structures.
 - 4.4. **Imposed roof load (no access):** Calculate to Eurocode.
 - 4.5. **Impact loads:** Calculate to Eurocode.
5. **Attachment:** Structural performance.
 - 5.1. **General attachment:** Determine the number and location of cladding fasteners recommended by the cladding manufacturer to resist wind loads calculated in accordance with Eurocodes.
 - 5.2. **Loads:** Calculate wind loads on roof and wall cladding appropriate to location, exposure, height, building shape and size in accordance with Eurocodes.
 - 5.3. **External pressure coefficients (Cpe):** As determined by Eurocodes.
 - 5.4. **Internal pressure coefficients (Cpi):** As determined by Eurocodes.

Ss_25_20_90/205 Design submittals Individual louvres (CDP item)

1. **Detailed design**
 - 1.1. **Requirement:** The Contractor shall be responsible for the detailed design, fabrication and installation of the fixings, bracketry and sub-framing of this element in accordance with the design intent drawings and specification.

The Contractor shall be responsible for completing the coordination of this element in accordance with the interfacing elements and designer/manufacturers requirements based on the co-ordinated design intent information.

The design of this element shall be coordinated with all other interfacing systems and is to include (but not limited to):

Design of all fixings and adhesives of materials to meet design intent.

Prepare fabrication and detail design drawings and calculations.

Provide calculations generally including, but not limited to, wind uplift, wind deflections and air flow.

Design and detailing of all associated interfaces and accessories including flashings, seals, gaskets, fixings and backgrounds, etc. where applicable.

- 1.2. **Purpose:** To demonstrate compliance with performance requirements & for aesthetic evaluation.
- 1.3. **Submittals:** See below:
 - 1.3.1. **Product literature:** Include rated capacities, furnished specialties, accessories, details of construction relative to materials, dimensions of individual components, profiles, and finishes.

Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

Provide Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for each type of louvre and showing compliance with performance requirements specified, particularly with respect to water penetration and physical free area.
 - 1.3.2. **Calculations:** Design calculations to provide applied loads and demonstrate that the applied loads can be transferred through the support locations and fixings of the supports to the secondary and primary structure.

Include analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - 1.3.3. **Drawings:** Provide detailed fabrication and installation drawings. Include plans, elevations, sections, details, coordination of penetrations, attachments to and interfaces with other adjacent work. Show the following:
 1. Show weep paths, gaskets, flashing, sealant, fixings and other means of preventing water intrusion.
- 1.4. **Timing:** Before manufacture.
- 1.5. **Format:** Drawings and specification in BIM compliant and also in pdf format.

See [Ss_25_50_45/205 Compliance with performance requirements](#) in [Ss_25_50_45_45 LWS-01 Louvre screen systems type A](#)

Ss_25_50_45/215 Design of acoustic, screening and ventilation louvre systems

1. **Weather performance:** Storm-resistant.
2. **Inlet operation**
 - 2.1. **Water penetration class (minimum):** To EN 13030, class A.
 - 2.2. **Entry loss coefficient (minimum):** Refer to Mechanical Engineer's Specification.
 - 2.3. **Active face velocity:** Refer to Mechanical Engineer's Specification.
 - 2.4. **Free area:** Refer to Mechanical Engineer's Specification.
 - 2.5. **Pressure drop:** Refer to Mechanical Engineer's Specification.
3. **Discharge operation**
 - 3.1. **Discharge loss coefficient (minimum):** To EN 13030, Class 2. (MEP Engineer to confirm minimum discharge loss coefficient).
4. **Acoustic performance**
 - 4.1. **Test body:** UKAS(or equivalent)-accredited.
 - 4.2. **Calculated weighted sound reduction index (Rw):** To BS EN ISO 5135 where applicable.

See [Ss_25_50_45/220 Durability](#) in [Ss_25_50_45_45 LWS-01 Louvre screen systems type A](#)

Products

Pr_20_85_03_63 Supports and fixings

1. **Description:** To be an integral part of louvre manufacturer's system. Refer to main clause above.
2. **Manufacturer:** Louvre supplier.

Pr_25_71_14_04 Aluminium insulating blanking panels

1. **Description:** Insulated aluminium faced blanking panels to louvred areas where required.
2. **Manufacturer:** Same as louvre manufacturer.
3. **Standard:** To [EN 14509](#).
4. **Panels:** Factory-assembled insulating sandwich panels.
5. **Panel construction**
 - 5.1. **Panel external face**
 - 5.1.1. **Material:** Aluminium.
 - 5.1.2. **Thickness:** 2mm minimum.
 - 5.2. **Panel internal face**
 - 5.2.1. **Material:** Aluminium.
 - 5.2.2. **Thickness:** 2mm minimum.
 - 5.3. **Core insulation:** Thickness: 50mm
Insulating Core: Rigid, glass-fibre-board insulation.
6. **Panel dimensions**
 - 6.1. **Length:** Refer to drawings.
 - 6.2. **Cover width:** Refer to drawings.
 - 6.3. **Thickness:** Approximately 55mm.
7. **Joint type**
 - 7.1. **Side or vertical:** Edge Treatment: Trim perimeter edges of blanking panels with louvre manufacturer's standard extruded-aluminium-channel frames, not less than 2mm nominal thickness or channel frames, with corners mitred and with same finish as panels.
Seal perimeter joints between panel faces and louvre frames with gaskets or sealant.
 - 7.2. **End or horizontal:** Edge Treatment: Trim perimeter edges of blanking panels with louvre manufacturer's standard extruded-aluminium-channel frames, not less than 2mm nominal thickness or channel frames, with corners mitred and with same finish as panels.
Seal perimeter joints between panel faces and louvre frames with gaskets or sealant.
8. **Finish as delivered**
 - 8.1. **Outer skin**
 - 8.1.1. **Material:** Powder coating to [BS EN 12206-1](#).
 - 8.1.2. **Thickness:** Qualicoat Standard Class 2 minimum.
 - 8.1.3. **Colour:** To match louvre blade colour.
 - 8.2. **Inner skin**
 - 8.2.1. **Material:** Powder coating to [BS EN 12206-1](#).

8.2.2. **Thickness:** Qualicoat Standard Class 2 minimum.

8.2.3. **Colour:** To match louvre blade colour.

9. **Integral accessories:** All necessary fixings required to complete the installation.

10. **Fire performance**

10.1. **Reaction to fire**

10.1.1. **Core:** To [BS EN 13501-1](#), Class A1.

10.1.2. **Panel external face:** To EN 13501-1, Class A2 or better.

10.1.3. **Panel internal face:** To EN 13501-1, Class A2 or better.

Pr_30_31_76_77 Silicone construction joint sealants

1. **Description:** Sealant to external face of movement joints in masonry. To be used in conjunction with a backing filler strip.

2. **Manufacturer:** [Carlisle Construction Materials Limited](#)

3. **Contact details**

3.1. **Address:** Lancaster House
Concorde Way
Millennium Business Park
Mansfield
Nottinghamshire
United Kingdom
NG19 7DW

3.2. **Telephone:** +44 (0)1623 627285

3.3. **Web:** www.ccm-europe.com

3.4. **Email:** info.uk@ccm-europe.com

4. **Product reference:** [Arbosil 1090](#)

5. **Colour:** Submit proposals. (Grey for concrete blockwork to concrete blockwork joints).

6. **Additional requirements:** Surfaces to receive sealant to be primed with Arbo Primer 2650.

7. **Execution:** [Pr 30 31 76/610 Suitability of joints for sealant application](#); [Pr 30 31 76/620 Joint preparation for sealant application](#); [Pr 30 31 76/630 Applying joint sealants](#)

Pr_30_59_48_04 Aluminium louvre panel units to individual openings

1. **Description:** Inset louvres within builder's work / structural opening.

2. **Manufacturer:** Caice Ltd.

3. **Location.:** Louvre panels to individual openings on facade.

4. **Product reference:** PLS 100 with bird mesh or insect mesh. (MEP Engineer to advise on requirement depending on whether intake or exhaust).

5. **Size (l x w x d):** Refer to drawings.

6. **Material:** Extruded aluminium alloy frame and louvre blades, to EN 755-1.

7. **Finish:** Powder coating to [BS EN 12206-1](#).
To be to Qualicoat Class 2 standard minimum.

8. **Colour:** Refer to Finishes Schedule.

9. **Texture:** To match metal wall panels.

10. **Construction:** Factory assemble louvres to minimize field splicing and assembly.
Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.
Provide sub sills made of same material as louvres or extended sills for recessed louvres. Refer to architectural drawings and details.
Frame Type: Channel unless otherwise indicated in architectural drawings.
Include supports, anchorages, and accessories required for complete assembly.
11. **Air intake and exhaust performance**
 - 11.1. **Application:** Intake and Exhaust.
 - 11.2. **Air volume:** Refer to MEP Engineer's information.
 - 11.3. **Face velocity:** Refer to MEP Engineer's information.
 - 11.4. **Core velocity (maximum):** Refer to MEP Engineer's information.
12. **Calculated weighted sound reduction index (Rw)**
 - 12.1. **Standard:** To EN ISO 5135.
13. **Weather performance**
 - 13.1. **Water penetration class (minimum):** To EN 13030, class A.
 - 13.2. **Discharge loss coefficient (minimum):** To EN 13030, Class 2. (MEP Engineer to confirm minimum discharge loss coefficient).
14. **Fire performance**
 - 14.1. **Reaction to fire :** To EN 13501-1, Class A2 or better.
15. **Louvre configuration**
 - 15.1. **Number of banks:** One.
 - 15.2. **Blade orientation:** Horizontal.
 - 15.3. **Blade angle:** Fixed.
16. **Accessories:** [Pr 30 59 57 08 Bird guard mesh](#); [Pr 30 59 57 40 Insect guard mesh](#)

See [Pr 30 59 48 78 Screening and ventilation louvre support frames](#) in [Ss 25 50 45 45 LWS-01 Louvre screen systems type A](#)

Pr_30_59_57_08 Bird guard mesh

1. **Description:** Stainless steel bird guard mesh to rear of louvres.
2. **Manufacturer:** Same as louvre manufacturer.
3. **Material:** Stainless steel to [BS EN 10088-1](#), grade 1.4401. (316)
4. **Finish:** Self finished.
5. **Location:** Interior face of louvres.
6. **Configuration:** 12mm square mesh.

Pr_30_59_57_40 Insect guard mesh

1. **Description:** Stainless steel insect guard mesh to rear of louvres.
2. **Manufacturer:** Same as louvre manufacturer.
3. **Material:** Stainless steel to [BS EN 10088-1](#), grade 1.4401. (316)
4. **Finish:** Self finished.

5. **Location:** Interior face of louvres.
6. **Configuration:** 3.5mm square mesh.

Pr_35_90_30_11 Coated aluminium flashings proprietary

1. **Description:** To be an integral part of louvre manufacturer's system. Refer to main clause above.
2. **Manufacturer:** Louvre supplier.

See [Ss_25_50_45/305 Product samples](#) in [Ss_25_50_45_45 LWS-01 Louvre screen systems type A](#)

Execution

Pr_30_31_76/610 Suitability of joints for sealant application

1. **Joint dimensions:** Within limits specified for the sealant.
2. **Substrate quality:** Surfaces regular, undamaged and stable.
3. **Joints not fit to receive sealant:** Submit proposals for rectification.

Pr_30_31_76/620 Joint preparation for sealant application

1. **Surfaces to which sealant must adhere:** Remove temporary coatings, tapes, loosely adhering material, dust, oil, grease, surface water and contaminants that may affect bond.
2. **Cleaning:** Use materials and methods recommended by sealant manufacturer.
3. **Vulnerable surfaces adjacent to joints:** Mask vulnerable surfaces.
Do not stain or smear with primer or sealant.

Pr_30_31_76/630 Applying joint sealants

1. **Substrate:** Dry and dust/detritus free. Unaffected by frost, ice or snow. As recommended by sealant manufacturer.
2. **Environmental conditions:** Do not dry or raise temperature of joints by heating.
3. **Sealant application:** Completely and neatly fill joints. Provide firm adhesion to substrates.
4. **Sealant profiles**
 - 4.1. **Butt and lap joints:** Slightly concave.
 - 4.2. **Fillet joints:** As recommended by sealant manufacturer.
5. **Protection:** Do not contaminate or damage finished joints.

Ss_25_50_45/615 Installation control samples

1. **Samples:** Panelised louvre screen system.
2. **Purpose:** For aesthetic evaluation, for performance evaluation & for use as an installation reference sample.
3. **Siting:** Refer to drawings.
4. **Scale:** Submit proposals .
5. **Features to be included:** Critical junctions, representative components and assemblies.
6. **Timing:** Construct during preliminary installation in an approved location. Obtain approval of appearance before proceeding.

See [Ss_25_50_45/620 Preconstruction survey](#) in [Ss_25_50_45_45 LWS-01 Louvre screen systems type A](#)

Ss_25_50_45/630 Corrosion protection

1. **Material:** Submit proposals .
2. **Surfaces to be protected:** Protect unpainted galvanized and nonferrous-metal surfaces that are in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or non-metallic flashing.
3. **Application of protective material:** Before fixing components.

Ss_25_50_45/640 Fixing of steel frames

1. **Spacing:** When not predrilled or specified otherwise, position fasteners not less than 50 mm and not more than 190 mm from ends of each member and at maximum 900 mm centres.

See [Ss_25_50_45/655 Installation of louvre screens](#) in [Ss_25_50_45_45 LWS-01 Louvre screen systems type A](#)

Ss_25_50_45/660 Fixing of components

1. **Holes for through fixings and components:** No larger than required for satisfactory fit and operation.
2. **Fixing:** Assemble and fix carefully and accurately.
3. **Adjacent surfaces:** Do not damage hardware and adjacent surfaces.

Ss_25_50_45/665 Frame sealant joints

1. **Application:** Prepare joints. Use appropriate backing strip for deep joints. For joints formed by surfaces at 90 to each other, form triangular fillets finished to a flat or slightly convex profile.

System completion

See [Ss_25_50_45/810 Protection and cleaning](#) in [Ss_25_50_45_45 LWS-01 Louvre screen systems type A](#)

Ss_25_50_45/815 Documentation relating louvre systems

1. **Operation and maintenance instructions**
 - 1.1. **Scope:** All products used throughout this system
 - 1.2. **Requirements:** Product information for components and materials including manufacturers literature, COSHH data sheets and recommendations for cleaning maintenance and repair. The terms and conditions of any guarantee. Method statement for means of access for maintenance and for use of any permanent equipment. Method statement covering the procedures for replacement of parts that have a design life less than the design life of the system. Recommendations for routine maintenance and cleaning, including suitable cleaning agents and lubrication/ adjustments to working parts
2. **Dismantling:** Submit recommendations for safe dismantling and reuse, recycling or disposal of system and products.
3. **Record layout drawings indicating:** General arrangement drawings showing the location and type of louvre screens and units, and any actuators or controls
4. **Drawing format:** Drawings and specification in BIM compliant & pdf format
5. **Number of copies:** Two.

Ss_25_50_45/895 Verification of performance louvre systems

1. **Requirement:** The Contractor shall be responsible for checking the completed system, testing the completed system and issuance of the appropriate certification to provide assurance of compliance with specified performance.

2. **Submittals**

- 2.1. **Format:** Description of inspections, remedial works carried out and certification of compliance.
- 2.2. **Timing:** At completion of installation.

Ω End of System

Ss_25_60_05_05

BAL-01 Balustrade and guarding systems type B

Systems

Ss_25_60_05_05 BAL-01 Balustrade and guarding systems type B

1. **Description:** Galvanised steel Balustrades & Guardings.
2. **System performance:** [Ss_25_60_05/205 Design submittals](#);
[Ss_25_60_05/210 Design of balustrade and handrail systems generally](#);
[Ss_25_60_05/220 Structural performance of handrails, balustrade and guarding systems](#)
and [Ss_25_60_05/290 Compliance with performance requirements](#).
3. **System manufacturer:** Submit proposals.
4. **Uprights:** [Pr_20_76_52_16 Carbon steel hot-finished hollow sections](#)
5. **Rails**
 - 5.1. **Handrails:** [Pr_20_76_52_16 Carbon steel hot-finished hollow sections](#)
 - 5.2. **Mid rails:** [Pr_20_76_52_16 Carbon steel hot-finished hollow sections](#)
 - 5.3. **Base rails:** [Pr_20_76_52_16 Carbon steel hot-finished hollow sections](#)
6. **Fixing to parent structure:** Galvanised Steel fixings: see Structural Engineers spec.
7. **Samples required:** [Ss_25_60_05/305 Product samples](#).
8. **Execution:** [Ss_25_60_05/650 Corrosion protection of dissimilar materials in handrail, balustrade and guarding systems](#);
[Ss_25_60_05/630 Fabrication of balustrade and handrail systems generally](#);
[Ss_25_60_05/640 Installation of handrail, balustrade and guarding systems generally](#);
and [Ss_25_60_05/610 Preconstruction survey](#).
9. **System completion:** [Ss_25_60_05/810 Inspection of handrail, balustrade and guarding systems](#) and [Ss_25_60_05/895 Verification of performance](#).

System performance

Ss_25_60_05/205 Design submittals

1. **Purpose:** To demonstrate compliance with performance requirements.
For aesthetic evaluation.
2. **Submittals:** Fully dimensioned general arrangement drawings, plans, elevations and sections. Mounting and fixing details. Details of finishes systems and colours. Shipping sections. Technical information, calculations and manufacturers' literature.
3. **Timing:** Before manufacture.
4. **Format:** Drawings and specification in BIM compliant format.

Ss_25_60_05/210 Design of balustrade and handrail systems generally

1. **Detailed design:** Complete the design to meet structural and safety requirements of [BS 6180](#) and in accordance with [BS 8300-2](#).
2. **Regulations:** The balustrading design is to be fully compliant with Part K of the UK Building Regulations, the current version at the time of tendering for the works.

Ss_25_60_05/220 Structural performance of handrails, balustrade and guarding systems

1. **Structure and associated features:** Complete the detailed design in accordance with [BS 8300-2](#).
2. **Horizontal uniformly distributed line loads on balustrade or handrail (maximum):** 0.74 kN/m.

Ss_25_60_05/290 Compliance with performance requirements

1. **Requirement:** Proof of compliance with specified performance.
2. **Method:** Submit evidence of compliance with [BS 8300-2](#).
3. **Testing authority:** The United Kingdom Accreditation Service (UKAS).
4. **Submittals**
 - 4.1. **Format:** Test results and certification.
 - 4.2. **Timing:** At detailed design stage.

Products

Pr_20_76_52_16 Carbon steel hot-finished hollow sections

1. **Description:** Galvanised steel CHS sections for stair handrail and balustrading.
2. **Supplied by:** Submit proposals.
3. **Standard:** To [BS EN 10210-1](#).
4. **Grade:** Refer to Structural Engineer's specification.
5. **Grade options for steel to be galvanized:** To [BS EN 10210-1](#), options 1.1 and 1.4.
6. **Corrosion protection**
 - 6.1. **Galvanizing**
 - 6.1.1. **Standard:** Hot-dip galvanized to [BS EN ISO 1461](#).
 - 6.1.2. **Coating thickness (minimum):** To provide service life of minimum 25 years in accordance with Corrosion Category 3 in accordance with table 1 [BS EN ISO 12944-2](#).
7. **Specific Requirements:** All connections between CHS sections to be galvanised steel, hot-dip galvanized to [BS EN ISO 1461](#).
8. **Dimensions and dimensional tolerances:** To [BS EN 10210-2](#).
9. **Size:** Approx 48.3mm diameter. TBC by Contractor.

Ss_25_60_05/305 Product samples

1. **Manufacturer:** Submit proposals .
2. **Samples required**
 - 2.1. **Product samples**
 - 2.1.1. **Supplied by:** Selected manufacturer.
 - 2.1.2. **Submittals:** Samples of all proposed profiles and finishes.
 - 2.1.3. **Purpose:** For use as a reference sample.
 - 2.1.4. **Labelling:** Clearly label all submitted samples.
 - 2.1.5. **Timing:** Before ordering for project.

Execution

Ss_25_60_05/610 Preconstruction survey

1. **Procedure:** Before starting work on designated items take site dimensions, record on shop drawings and use to ensure accurate fabrication.
2. **Primary support structure:** Carry out survey sufficient to verify that required accuracy and security of erection can be achieved.
3. **Timing:** Before fabrication.

Ss_25_60_05/630 Fabrication of balustrade and handrail systems generally

1. **Design:** Complete the detailed design and obtain approval before fabrication.
2. **Frameworks:** Assemble and brace, including temporary members required for installation.
3. **Contact between dissimilar metals:** Avoid.
4. **Fixings:** Fully bolt together. Tighten bolts.
5. **Temporary support:** Do not subject members to non-design loadings.

Ss_25_60_05/640 Installation of handrail, balustrade and guarding systems generally

1. **Standard:** In accordance with [BS 6180](#).

Ss_25_60_05/650 Corrosion protection of dissimilar materials in handrail, balustrade and guarding systems

1. **Components:** Isolate using washers, sleeves or other suitable means to separate materials to avoid corrosion and or staining.

System completion

Ss_25_60_05/810 Inspection of handrail, balustrade and guarding systems

1. **Timing:** Two weeks prior to date when principal contractor expects work to be practically complete.
2. **Period of notice (minimum):** Three working days.

Ss_25_60_05/895 Verification of performance

1. **Requirement:** Check completed system and provide assurance of compliance with specified performance.
2. **Submittals**
 - 2.1. **Format:** Description of inspections, remedial works carried out and certification of compliance.
 - 2.2. **Timing:** At completion of installation.

Ω End of System

Ss_30_40_55_54

MRC-01 Metal insulating sandwich panel roof systems

Systems

Ss_30_40_55_54 MRC-01 Metal insulating sandwich panel roof systems

1. **Description:** Profiled Composite Metal Faced Roof Panels to Roof of gantry Plantrooms.
2. **System performance:** [Ss_30_40_55/205 Metal insulating sandwich panel roofing system design](#);
[Ss_30_40_55/210 Design submittals](#);
[Ss_30_40_55/215 Structural performance](#);
Fire performance to BS EN 13501;
[Ss_30_40_55/250 Avoidance of condensation](#);
[Ss_30_40_55/255 Water penetration](#);
[Ss_30_40_55/260 Durability](#);
and [Ss_30_40_55/290 Compliance with performance requirements](#). [Ss_30_40_55/225 Fire performance](#)
[Ss_30_40_55/270 Safety of roof panels](#)
3. **System manufacturer:** Eurobond (or similar approved).
4. **Roof pitch (degrees):** 5 Degrees minimum (post deflection).
5. **System description:** Metal insulating sandwich panel roof system shall be provided as the roof panel system to plantroom roofs, as indicated on the architectural drawings.
The final joint locations of the panels and associated elements (such as cover caps, etc) shall be agreed with the architect.
This cladding type comprises of a proprietary trapezoidal profiled metal insulated sandwich system, sealed to proprietary butyl rubber sealant tape and strips, which in turn is supported off a proprietary cold formed galvanised steel support system. The galvanised steel support system is connected back to the primary/secondary structure, as indicated on the architectural drawings.
The system(s) shall incorporate proprietary fixings, closer panels, gutters, etc. to be reviewed and agreed in accordance with the system supplier as detailed in Design submittals.
All interfaces are to be detailed in such that the continuity of the building weathering, thermal and vapour lines is maintained. This system includes all of the flashings, seals, straps, membranes, closures, liners, etc. to complete the entire cladding installation.
The façade contractor shall take account of all envisaged movements and shall ensure that the cladding system can accommodate the anticipated primary structure's movements, cladding deflections and thermal expansion without compromising the performance of the system (weathertightness, airtightness/vapour continuity, etc).
6. **Roofing panels**
 - 6.1. **Panel type:** [Pr_25_71_14_22 Carbon steel insulating sandwich panels type B](#).
 - 6.2. **Panel fasteners:** [Pr_20_29_76_76 Self-drilling screws type A](#).
 - 6.3. **End and side laps:** End laps minimum 150mm.
No end lap roof runs in single panels less than 6.5 metres long.
Side joint manufacturer's standard tilt and clip in.
 - 6.4. **Side laps sealing:** One row of partially cross linked 6x5mm butyl rubber sealant.
 - 6.5. **End laps sealing:** Two rows of partially cross linked 6x5mm butyl rubber sealant.
 - 6.6. **Side lap stitching fasteners:** 450mm centres as per MCRMA guidelines.
 - 6.7. **End lap stitching fasteners:** One per crown, 30mm up from edge.
 - 6.8. **Special features:** Profiled closure flashings required at cut edge above gutter.

7. Panel joints

7.1. **Horizontal:** Manufacturer's standard.

8. Fascia

8.1. **Material:** Carbon steel sheet.

8.2. **Support:** Manufacturer's Standard.

8.3. **Fasteners:** Manufacturer's Standard.

8.4. **Jointing:** Manufacturer's Standard.

9. Soffit

9.1. **Material:** Carbon steel sheet.

9.2. **Support:** Manufacturer's Standard.

9.3. **Fasteners:** Manufacturer's Standard.

9.4. **Jointing:** Manufacturer's Standard.

10. Gutters

10.1. **Gutter types:** Refer to RWG-01 Ss_50_30_02_28 External gravity rainwater drainage systems.

11. **Samples required:** [Ss 30 40 55/305 Product samples](#).

12. **System accessories:** [Pr 35 90 87 42 Isolating tapes](#)
[Pr 35 90 87 85 Synthetic closed cell foam rubber profile fillers](#)
[Pr 35 90 87 09 Butyl rubber sealant tapes composite panels](#)
[Pr 35 90 30 11 Carbon steel flashings Eurobond Roofspan](#)

13. **Execution:** [Ss 30 40 55/610 Preliminary roof cladding installation](#)
[Ss 30 40 55/670 Insulating sandwich panel abutments](#); [Ss 30 40 55/685 Installing gutters for metal insulating sandwich panel roof systems](#).
[Ss 30 40 55/645 Locating fasteners for factory assembled insulating rooflights](#)
[Ss 30 40 55/660 Installing flashings and trims to insulating sandwich panel cladding](#)
[Ss 30 40 55/675 Sealing panel laps](#)
[Ss 30 40 55/690 Fixing roof safety signs](#)

14. **System completion:** [Ss 30 40 55/895 Verification of performance](#).

System performance

Ss_30_40_55/205 Metal insulating sandwich panel roofing system design

1. **Requirement:** Complete the design of the roof covering system, including the roof panels, joints, fasteners and fixings, accessories and flashings at interfaces and penetrations.
2. **Purpose:** To demonstrate compliance with performance and technical requirements.
3. **Standard:** In accordance with [BS EN 14509](#) and [BS 5427](#).
4. **Appearance and fit:** Ensure that position and alignment of parts and features are as shown on preliminary design drawings. Accommodate all deviations in the primary support structure.
5. **Related works:** Coordinate in the detailed design.

Ss_30_40_55/210 Design submittals

1. **Submittals:** Typical plan, section and elevation drawings at suitable scales;
Technical information and certification demonstrating compliance with specification of proposed incorporated products

and finishes, including thermal insulation;
and Certification, reports and calculations demonstrating compliance with specification of proposed roofing.

2. **Timing:** Before starting detailed design.
3. **Format:** Drawings and specification in BIM compliant format.

Ss_30_40_55/215 Structural performance

1. **Loads:** Resist wind loads, dead loads and design live loads.
2. **Deflections and movements:** Accommodate without damage.
3. **General movement:** Anticipated building movements to be accommodated.
4. **Imposed loads**
 - 4.1. **Permanent imposed loads:** None.
 - 4.2. **Temporary imposed loads:** Roofs should be capable of withstanding being walked upon without damage or failure.

Ss_30_40_55/225 Fire performance

1. **Standard:** To [BS EN 14509](#).
2. **External fire exposure:** To [BS EN 13501-5](#), Class BROOF(t4).
3. **Fire resistance**
 - 3.1. **Complete roof assembly:** To [BS EN 13501-2](#), Class REI 60.
 - 3.2. **Firestops:** To [BS EN 13501-2](#), Class E60.
4. **Testing and assessment reports:** Submit evidence of successful testing by a UKAS accredited laboratory.
5. **Timing of submittal:** During detailed design.

Ss_30_40_55/250 Avoidance of condensation

1. Winter interstitial condensate
 - 1.1. **Calculated amount (maximum):** 0.35 kg/m².
 - 1.2. **Calculated annual net retention:** Nil.
2. **Condensation:** Reduce the risk of forming on interior building surfaces and on framing members, or within or between any part of infill panels or facings under notional psychrometric conditions.
3. **Risk of interstitial condensation in roof construction:** Determine in accordance with [BS 5250](#), Annex D and provide effective vapour control.
4. **Notional outdoor psychrometric conditions**
 - 4.1. **Notional outdoor psychrometric conditions:** As [BS 6229](#), Table A1.
5. **Surface condensation:** Determine surface condensation risk of roofing system using the method described in [BS EN ISO 13788](#). If necessary, revise thermal insulation to provide satisfactory temperature factor (f_{min}). Ensure that damage and nuisance from surface condensation does not occur.

Ss_30_40_55/255 Water penetration

1. **Water leakage requirements:** Under site exposure conditions, moisture must not penetrate onto internal surfaces, or into cavities not designed to be wetted.

Ss_30_40_55/260 Durability

1. **Relevant agents or degradation mechanisms:** Roofing panels;
Roofing panel fasteners;
Continuity thermal insulation;
Flashings and trims;
Gutters;
and Supports fasteners.
2. **Primary components**
 - 2.1. **Components:** Roofing panels, Roofing panel fasteners, Continuity thermal insulation, Flashings and trims, Gutters and Supports fasteners.
 - 2.2. **Design life duration (minimum):** 30 years.
3. **Secondary components**
 - 3.1. **Components:** Joint gaskets and Joint sealant.
 - 3.2. **Design life duration:** Submit details for each product together with required maintenance regime, replacement periods and methods of replacement.
4. **Electrolytic corrosion:** Prevent.
5. **Submittals:** Prior to completion of detailed design, submit required maintenance regime, replacement periods and methods of replacement.

Ss_30_40_55/270 Safety of roof panels

1. **Walkability:** The roof is to be walkable.

Ss_30_40_55/290 Compliance with performance requirements

1. **Requirement:** Proof of compliance with specified performance.
2. **Method**
 - 2.1. **Previous test results:** For structural performance.
For acoustic performance.
For impact resistance.
3. **Testing authority:** UKAS approved independent testing agency
4. **Submittals**
 - 4.1. **Format:** Test results and certification.
 - 4.2. **Timing:** At detailed design stage.

Products

Pr_20_29_76_76 Self-drilling screws type A

1. **Description:** Self drilling panel fasteners for insulated steel roof panel cladding.
2. **Manufacturer:** Eurobond Roofspan or similar approved.
3. **Standard:** To [BS EN ISO 1479](#).
4. **Material:** Grade 316 Austenitic stainless steel.
5. **Finish:** Manufacturer's standard .

6. **Head type:** Bi-hex head with EPDM elastomer faced storm washer to be integrated with fixings to avoid water ingress through punctures.
7. **Accessories:** Plastics caps.
8. **Size**
 - 8.1. **Diameter:** 5.5 mm.
 - 8.2. **Length:** Manufacturer's standard .
9. **Washers:** Manufacturer's standard .
10. **Number and location of fasteners:** Minimum of one fastener per crown, per fixing location, dependent upon wind loading.
11. **Execution:** [Pr_20_29_76/620 Fixing with screws](#)

Pr_25_71_14_22 Carbon steel insulating sandwich panels type B

1. **Description:** Fire rated stone wool composite roof panel with trapezoidal metal outer sheet and metal liner.
2. **Manufacturer:** Eurobond (or equivalent agreed).
3. **Panel reference:** Roofspan.
4. **Standard:** To [BS EN 14509](#).
5. **Panels:** Factory-assembled modular insulating sandwich panels.
6. **Panel construction**
 - 6.1. **Panel external face**
 - 6.1.1. **Material:** Tata Steel Galvalloy hot-dip zinc coated steel.
 - 6.1.2. **Grade:** Substrate must be ZA275 Galvalloy hot-dip zinc coated steel to BS EN 10326.
 - 6.1.3. **Profile:** 37mm trapezoidal.
 - 6.1.4. **Thickness:** Metal thickness to be a nominal 0.7mm (including zinc).
 - 6.2. **Panel internal face**
 - 6.2.1. **Material:** Tata Steel Galvalloy hot-dip zinc coated steel.
 - 6.2.2. **Grade:** Substrate must be ZA275 Galvalloy hot-dip zinc coated steel to BS EN 10326.
 - 6.2.3. **Profile:** Flat profile.
 - 6.2.4. **Thickness:** Metal thickness to be a nominal 0.7mm (including zinc).
 - 6.3. **Core insulation:** Manufacturer's standard .
7. **Panel dimensions**
 - 7.1. **Length:** Manufacturer's standard .
 - 7.2. **Cover width:** Manufacturer's standard .
 - 7.3. **Thickness:** 80mm. (Not including 37mm trapezoidal profile).
8. **Joint type**
 - 8.1. **Side or vertical:** Interlocking.
 - 8.2. **End or horizontal:** 150mm as set out by MCRMA.
9. **Finish as delivered**

- 9.1. **Outer skin**
 - 9.1.1. **Material:** TATA Steel.
 - 9.1.2. **Thickness:** 0.7mm.
 - 9.1.3. **Colour:** Colour grey, subject to approved sample.
- 9.2. **Inner skin**
 - 9.2.1. **Material:** TATA Steel.
 - 9.2.2. **Thickness:** 0.5mm.
 - 9.2.3. **Colour:** RAL to match existing.
- 10. **Integral accessories:** [Pr_35_90_30_11 Carbon steel flashings Eurobond Roofspan](#)
- 11. **Fire performance**
 - 11.1. **Reaction to fire**
 - 11.1.1. **Panel external face:** Non combustible. As defined in Building Regulations Approved Documents B2, section B4 Table 12.1 (England and Wales).
 - 11.1.2. **Panel internal face:** Non combustible. As defined in Building Regulations Approved Documents B2, section B2 Table 6.1 (England and Wales).
 - 11.2. **Fire resistance:** EI60.

Pr_35_90_30_11 Carbon steel flashings Eurobond Roofspan

- 1. **Description:** Proprietary flashings to insulated roof panel system.
- 2. **Manufacturer:** Eurobond Ltd. (or similar approved).
- 3. **Standard:** To EN 10169, EN 10346 ; EN 12588 ; EN 1172, EN 988 & EN 10088-2.
- 4. **Material:** Colour coated (to match panels) galvanized carbon steel.
- 5. **Item:** Refer to drawings.
- 6. **Size**
 - 6.1. **Thickness (minimum):** 1.65 mm generally. 3.0mm, where could be deformed by proximity of person to flashing.
 - 6.2. **Width:** Submit proposals.
- 7. **Fixing:** Lapped joints, or Butt joints with minimum 100 mm wide concealed butt straps.
- 8. **Thermal movement:** Joints and fixings must incorporate measures to avoid warping or damage from thermal movement, and maintain the weather resistance of the connection.
- 9. **Colour:** Refer to Finishes Schedule.

Pr_35_90_87_09 Butyl rubber sealant tapes composite panels

- 1. **Description:** Butyl rubber sealant tapes.
- 2. **Manufacturer:** Eurobond Ltd. (or similar approved).
- 3. **Core**
 - 3.1. **Material:** Cross-linked butyl rubber.
 - 3.2. **Type:** Manufacturer's standard .
- 4. **Bond:** Single-sided butyl adhesive.
- 5. **Size:** To suit application.

6. **Colour:** Manufacturer's standard .

Pr_35_90_87_42 Isolating tapes

1. **Manufacturer:** Kingspan
2. **Material:** Manufacturer's standard .
3. **Size:** Manufacturer's standard .
4. **Execution:** In accordance with Manufacturer's recommendations.

Pr_35_90_87_85 Synthetic closed cell foam rubber profile fillers

1. **Manufacturer:** Eurobond Roofspan or similar approved
2. **Material:** Expanded EPDM closed cell foam rubber.
3. **Profile:** Manufacturer's standard .
4. **Thickness:** Manufacturer's standard .
5. **Colour:** Manufacturer's standard .
6. **Fixing method:** Manufacturer's standard .
7. **Execution:** In accordance with Manufacturer's recommendations.

Ss_30_40_55/305 Product samples

1. **Manufacturer:** Kingspan
2. **Submittals:** Samples of all exposed finishes and fixings.
3. **Purpose:** For use as a reference sample.
4. **Labelling:** Clearly label all submitted samples.
5. **Timing:** Before ordering for project.

Execution

Pr_20_29_76/620 Fixing with screws

1. **Clearance holes:** Required.
2. **Fastener spacing:** To Contractor Design.
3. **Finished level of screw heads**
 - 3.1. **Exposed:** In accordance with instructions of the panel manufacturer to be fixed.
 - 3.2. **Concealed (holes filled or stopped):** Sink minimum 2 mm below surface.

Ss_30_40_55/610 Preliminary roof cladding installation

1. **Purpose:** To serve as an installation reference panel.
2. **Installation:** Complete an area of roofing in an agreed location for inspection and agreement of appearance.
3. **Position:** Submit proposals .
4. **Sample area (minimum):** Submit proposals .
5. **Features:** Typical joints and junctions.
6. **Timing and approvals:** Construct and obtain approval of appearance before proceeding with installation of roofing. Retain undisturbed until completion of roofing installation.

Ss_30_40_55/645 Locating fasteners for factory assembled insulating rooflights

1. **Fastener locations:** As recommended by the manufacturer and structural engineer.

Ss_30_40_55/660 Installing flashings and trims to insulating sandwich panel cladding

1. **Flashing type:** [Pr 35 90 30 11 Carbon steel flashings Eurobond Roofspan](#)

Ss_30_40_55/670 Insulating sandwich panel abutments

1. **Junctions with flashings:** In accordance with Manufacturer's recommendations.

Ss_30_40_55/675 Sealing panel laps

1. **Position of tape:** Below fixing positions in straight unbroken lines, parallel to and slightly back from edge of panel/ sheet and to manufacturers recommendations.
2. **Seal quality:** Effective, continuous and not over compressed.
3. **End lap sealant tape positions**
 - 3.1. **Single line tape:** Immediately below line of fasteners and to manufacturers recommendations.
 - 3.2. **Second line tape (where specified):** Slightly set back from the edge of external sheet and to manufacturers recommendations.
4. **Side lap sealant tape positions**
 - 4.1. **Second line tape (where specified):** Outside line of fasteners and to manufacturers recommendations.

Ss_30_40_55/685 Installing gutters for metal insulating sandwich panel roof systems

1. **Insulation:** Beneath full extent of gutter.
2. **Jointing:** As recommended by manufacturer.
3. **Fixing**
 - 3.1. **Method:** Support straps.
 - 3.2. **Centres (maximum):** 1500 mm.
4. **Fixing and support spacing:** Manufacturer's standard.

Ss_30_40_55/690 Fixing roof safety signs

1. **Positioning:** To fully comply with local regulations.
2. **Sign:** To EN ISO 7010.

System completion

Ss_30_40_55/895 Verification of performance

1. **Requirement:** Check completed system and provide assurance of compliance with specified performance.
2. **Submittals**
 - 2.1. **Format:** Description of inspections, remedial works carried out and certification of compliance.
 - 2.2. **Timing:** At completion of installation.

Ω End of System

Ss_30_42_30_30

PTS-01 Floor coating systems type B

Systems

Ss_30_42_30_30 PTS-01 Floor coating systems type B

1. **Description:** A hard-wearing, single-pack, solvent-based floor paint.
2. **Preparation:** Ensure surfaces to be painted are sound, clean and dry (new surfaces particularly must be fully dry), and free from all defective or poorly adhering material, dirt, grease and wax
3. **Initial coats:** A thinned coat of [Pr 35 31 22 18 Concrete floor paints type A](#)
Thinning: Add up to 1 part white spirit to 10 parts of paint.
4. **Finishing coats:** [Pr 35 31 22 18 Concrete floor paints type A](#)
5. **Execution:** [Ss 40 90 60/700 Applying coating generally](#)
6. **System completion:** Brush or roller only. For Health & Safety reasons relating to all solvent-based paints, spray application is not recommended.
As with other solvent-based paints, do not apply in temperatures below 5°C (as recommended to British Standard BS 6150).

Products

Pr_35_31_22_18 Concrete floor paints type A

1. **Manufacturer:** Dulux Trade.
2. **Product reference:** Floorshield.
3. **Colour:** To Architect's drawings and schedules.

Execution

Ss_40_90_60/700 Applying coating generally

1. **Application:** In accordance with [BS 6150](#), clause 9.
2. **Environmental conditions :** Maintain suitable temperature, humidity and air quality during application and drying.
3. **Surfaces:** Clean and dry at time of application.
4. **Thinning and intermixing of coatings:** Only as recommended by manufacturer.
5. **Overpainting:** Do not paint over intumescent strips or silicone mastics.
6. **Initial coats**
 - 6.1. **Thickness:** To suit surface porosity.
 - 6.2. **Application:** As soon as possible on same day as preparation is completed.
7. **Finish:** Even, smooth and of uniform colour. Free from brush marks, sags, runs and other defects.
8. **Cutting in:** Cut in neatly.
9. **Doors, opening windows and other moving parts:** Ease before coating, and between coats.

Ω End of System

Ss_35_10_30_40

STS-01 Industrial stair systems type A

Systems

Ss_35_10_30_40 STS-01 Industrial stair systems type A

1. **Description:** External steel steps and landings with grated floor, and tubular railings/ balustrading.
2. **System performance:** [Ss_35_10_30/250 Design of industrial stair systems](#); [Ss_35_10_30/205 Design submittals](#); [20-85-45/206 Performance requirements Working platform, walkways and stairs gratings](#)
3. **System manufacturer:** Submit proposals .
4. **Frame**
 - 4.1. **Section:** Contractor's design .
 - 4.2. **Fixing to superstructure:** Fixed to structure.
5. **Strings:** Required.
6. **Treads**
 - 6.1. **Material:** [Pr_25_30_30_18 Carbon steel open bar metal gratings Elephant Gratings](#)
 - 6.2. **Nosing:** Integral within open bar metal grating tread.
7. **Landings**
 - 7.1. **Material:** [Pr_25_30_30_18 Carbon steel open bar metal gratings Elephant Gratings](#)
8. **Balustrade guarding system:** 25-25-10/110 Balustrade & guarding system type B.
9. **Handrail system:** 25-25-10/110 Balustrade & guarding system type B.
10. **Assembly connectors:** Galvanised steel bolts and clamping plates.
11. **Superstructure connectors:** Refer to Structural Engineer's specification.
12. **System accessories:** [Pr_25_30_30_14 Carbon steel Toe plates](#).
13. **Samples required:** [Ss_35_10_30/305 Product samples](#).
14. **Execution:** [Ss_35_10_30/610 Preconstruction survey](#) and [Ss_35_10_30/630 Installation of ladder and stair systems generally](#).
15. **System completion:** [Ss_35_10_30/810 Inspection of fixed ladders, working platforms, walkway and industrial stair systems](#).

System performance

20-85-45/206 Performance requirements Working platform, walkways and stairs gratings

1. **Delegated design:** Design gratings, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
All the CDP items shall be designed to Eurocodes and relevant National Annexes. To include EN 1090.
2. **Structural performance of gratings :** Provide gratings capable of withstanding the loading in accordance with the Structural Engineer's information and current Eurocodes including all relevant National Annexes.

The minimum loads to take into account for walkways and working platforms in accordance with EN 14122-2 are as follows:

- 2 kN/m² uniformly distributed load to account for the structure;
1,5 kN concentrated load applied in the most unfavourable position over an area of 200 mm × 200 mm of the floor.
3. **Serviceability performance:** When loaded with the design load, the deflection of the flooring shall not exceed 1/200th of the span or maximum 10mm.
When designing a walkway, the deflection under the dynamic loading shall also be taken into account.
Possible lateral movements of a platform in normal use shall not lead to loss of balance of the user of the platform or walkway.
The deflection level between the loaded and a neighbouring unloaded flooring shall not exceed 4 mm in height.
4. **Hazards generated by falling objects:** The risk assessment shall be carried out by the Contractor and the grating opening size determined on the following basis in accordance with EN 14122-2:
1. All open grating type floorings of working platforms, stairs or walkways shall only have such maximum openings that a ball with a diameter of 35 mm cannot fall through.
 2. All open grating type floorings above a place where people are working, as opposed to occasional passage, shall have such maximum openings that a ball with a diameter of 20 mm cannot fall through. Unless the same safety is guaranteed by other suitable means, the maximum lengths of the opening shall be 100 mm.
5. Gaps between flooring
- 5.1. **Flooring to flooring:** The gap between two adjacent sections of flooring shall be between 5-10mm.
- 5.2. **Flooring to adjacent construction:** Where gaps exist in the flooring, e.g. for the passage of pipes or other elements, or between the edge of a working platform or walkway and adjacent structures, the following requirements apply:
1. If gaps are >20 mm and ≤120 mm, a toe-plate with a height of at least 100 mm shall be fitted.
- If the gap is >120 mm, the following requirements apply:
1. If gaps are >120 mm and ≤180 mm, a toe-plate and a handrail (see ISO 14122-3) or an equivalent structure with a height of 1100mm shall be provided.
 2. If gaps are >180 mm, whole-body access is possible (see ISO 13857) and the working platform or walkway shall be fitted with a guard-rail according to ISO 14122-3:2016, Clause 7, to prevent access to the gap.
6. **Seismic performance:** Provide gratings capable of withstanding the effects of earthquake motions determined according to Eurocode requirements.
7. **Structural drawings:** Refer to Structural Engineer's information for additional metal grating locations and requirements.

Ss_35_10_30/205 Design submittals

1. **Submittals:** Should conflicts occur between this specification and any other Works requirements documents or any published standards, the most onerous specification requirement shall apply unless otherwise agreed with the employer's agent.
Design responsibility: The design information provided by the employer's agent, including the specification, defines particular aspects of the employer's requirements related to the system. This includes the performance criteria, minimum prescriptive requirements, the mandatory geometry of surfaces, the mandatory sub-division of those surfaces, details, interface details, principal materials and finishes.
The contractor shall be responsible for developing and completing the design in accordance with this specification and the Works requirements documents.
The contractor may propose alternatives for consideration by the employer's agent.
Any arrangements included within the design intent information shall not in any way relieve the contractor from his responsibility for the design and construction of the whole of the Works.

2. **Coordination:** Coordinate installation of anchorages for metal stairs, gratings, grating frames, ladders, platforms and supports. Furnish setting out drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
3. **Delegated design-submittal:** For stairs, gratings and floors, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
4. Submittals
 - 4.1. **Product data:** Product Data indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
 - 4.2. **Shop drawings:** Include plans, elevations, sections, details, and attachments.
5. **Additional information:** Assembly and bracing requirements, including temporary members required for installation.
6. **Timing:** Before starting detailed design.
7. **Format:** Drawings and specification in BIM-compliant & pdf format.

Ss_35_10_30/250 Design of industrial stair systems

1. **Design standard:** Complete the design to meet structural and safety requirements in accordance with [BS EN 1991-1-1](#) and [NA to BS EN 1991-1-1:2002](#).
2. **Category of stair :** To [NA to BS EN 1991-1-1:2002](#), Table NA.3. Refer to Structural Engineer's specification for confirmation of Sub Category.
3. **Proposals:** Submit technical information, calculations and manufacturers' literature, including requirements for the method by which the working platform and walkway system is to be fixed to the support.
4. **Format:** Straight with closed riser.

Products

Pr_25_30_30_14 Carbon steel Toe plates

1. **Description:** Galvanised steel toe plates to perimeter of stair flights / landings and walkways.
2. **Requirement:** Between the edges of grating / flooring and adjacent construction or opening edges, a toe plate is necessary if the distance between grating / flooring and element exceeds 20mm. Where required to satisfy BS EN ISO 14122-2, toe plate welded to grating at penetrations to form an upstand minimum 100mm above the grating / flooring FFL.
3. **Manufacturer:** Elefant gratings (or similar approved).
4. **Standard:** To BS [EN 10025-2](#).
5. **Certification:** Provide third-party certification by a United Kingdom Accreditation Service (UKAS)-approved independent laboratory.
6. **Designation:** S275JR.
7. **Finish:** Hot-dip galvanizing to BS [EN ISO 1461](#).
8. **Profile:** Flat plate.
9. **Size:** 100mm. Refer to drawings.
10. **Thickness:** Minimum 6mm. Refer to drawings.
11. **Anchors**

11.1. **Type of anchor:** Galvanised steel bolts or 'hollo' bolts where required.

Pr_25_30_30_18 Carbon steel open bar metal gratings Elefant Gratings

1. **Manufacturer:** Elefant Gratings Ltd (or similar approved).
2. **Product reference:** SP for walkway sections and SP-M for treads and landings to incorporate integral nosing.
3. **Standard:** To BS EN ISO 14122 pt 2:2016.
4. **Finish:** Hot dip galvanizing to BS EN ISO 1461.
5. **Size**
 - 5.1. **Length x width:** Refer to drawings.
 - 5.2. **Depth:** Depth of loading bar / control bar TBC by Contractor depending on span. Refer to 'deflection' below.
6. **Open hole size (maximum):** TBC by Contractor. refer to clause 20-85-45/206 Performance requirements Working platform, walkways and stairs gratings.
7. **Bar thickness:** Thickness of loading bar / control bar TBC by Contractor depending on span. Refer to 'deflection' below.
8. **Accessories:** Integrated non slip nosing 05/75 x 55 x 15m. Colour to be bright yellow. Integrated galvanised steel cranked riser plate to stair treads. Fixing holes to allow tread to be bolted to inside face of stair stringers.
9. **Frames and supports:** Frames and Supports for Metal Gratings: Fabricate from metal shapes, plates, and bars of welded construction to sizes, shapes, and profiles indicated and as necessary to receive gratings. Mitre and weld connections for perimeter angle frames. Cut, drill, and tap units to receive hardware and similar items. Unless otherwise indicated, fabricate from same basic metal as gratings. Galvanize steel frames and supports.
10. **Fixing type:** Unless otherwise indicated, space anchors 600mm o.c. and provide minimum anchor units in the form of steel straps 25mm wide by 6mm thick by 200mm long.
11. **Cut-outs:** Fabricate cutouts in grating sections for penetrations indicated. Arrange cutouts to permit grating removal without disturbing items penetrating gratings.
 1. Edge-band openings in grating that interrupt four or more bearing bars with bars of same size and material as bearing bars.
 2. Do not notch bearing bars at supports to maintain elevation.
12. **Fabrication:** Grating sections.
 - 12.1. **Shop assembly:** Fabricate grating sections in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
 - 12.2. **Quality:** Cut, drill, and punch material cleanly and accurately. Remove burrs and ease edges to a radius of approximately 0.8mm unless otherwise indicated. Remove sharp or rough areas on exposed surfaces. Form from materials of size, thickness, and shapes indicated, but not less than that needed to support indicated loads.
 - 12.3. **Connections:** Fit exposed connections accurately together to form hairline joints.
 - 12.4. **Welding:** Comply with standard recommendations and the following:
 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove welding flux immediately.
13. **Slip resistance value – water wet (minimum):** Minimum PTV of 40.
14. **Execution:** [Pr 25 96 30/630 Installing footway gratings](#)

Ss_35_10_30/305 Product samples

1. **Manufacturer:** Submit proposals .
2. **Submittals:** Samples of finishes.
3. **Purpose:** For use as a reference sample.
4. **Labelling:** Clearly label all submitted samples.
5. **Timing:** Before ordering for project.

Execution

Pr_25_30_86/605 Installation generally

1. **Setting of components:** Rigid, plumb and with sufficient structural support to prevent movement under expected loads.
2. **Fixings:** Securely fix components.

Pr_25_96_30/630 Installing footway gratings

1. **General requirements:** [Pr_25_30_86/605 Installation generally](#) .
2. **Field Measurements:** Verify actual locations of walls and other construction contiguous with gratings by field measurements before fabrication.
3. **Locations and layout:** Refer to drawings
4. **Setting of frames and gratings:** Level and flush with adjacent surfacing.
5. **Horizontal positioning of frames and gratings:** Install square with adjacent structure.
6. **Fastening to existing structure:** Provide anchorage devices and fasteners where necessary for securing gratings to in-place construction. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.
7. **Cutting, fitting & placement:** Perform cutting, drilling, and fitting required for installing gratings. Set units accurately in location, alignment, and elevation; measured from established lines and levels and free of rack. Provide temporary bracing or anchors in formwork for items that are to be built into concrete or masonry. Fit exposed connections accurately together to form hairline joints
8. **Touch-up painting:** Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with requirements for touching up shop-painted surfaces.
 1. Apply by brush or spray to provide a minimum 0.05mm dry film thickness.
 - B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with standards.
Refer to LEED Appendix C for all on-site painting LEED requirements.

Ss_35_10_30/610 Preconstruction survey

1. **Procedure:** Before starting work take site dimensions, record on shop drawings and use to ensure accurate fabrication.
2. **Primary support structure:** Carry out survey sufficient to verify that required accuracy and security of erection can be achieved.
3. **Timing:** Before fabrication.

Ss_35_10_30/630 Installation of ladder and stair systems generally

1. **Standard:** To [BS EN ISO 14122-3](#).

2. **Anchoring to supporting structure:** Coordinate location of holding down bolts and wall fixings related to fixed ladder, working platforms, walkways and industrial stairs with services fixing positions.
3. **Bimetallic reaction:** Avoid contact between dissimilar metals.
4. **Fixings:** Fully bolt together. Tighten bolts.
5. **Temporary support:** Do not subject members to non-design loadings.

System completion

Ss_35_10_30/810 Inspection of fixed ladders, working platforms, walkway and industrial stair systems

1. **Timing:** Two weeks prior to date when principal contractor expects work to be practically complete.
2. **Period of notice (minimum):** Three working days.

Ω End of System

Ss_35_10_30_95

WWS-01 Working platform and walkway systems

Systems

Ss_35_10_30_95 WWS-01 Working platform and walkway systems

1. **Description:** Metal grating platforms at gantry levels.
2. **System performance:** [Ss_35_10_30/205 Design submittals](#)
[Ss_35_10_30/240 Design of working platform and walkway systems](#); [Ss_35_10_30/230 Design of permanent means of access to machinery](#); [Ss_35_10_30/270 Durability of fixed ladder, working platform, walkway and industrial stair systems](#); [20-85-45/206 Performance requirements Working platform, walkways and stairs gratings](#)
3. **System manufacturer:** Submit proposals.
4. **Frame**
 - 4.1. **Section:** [Pr_20_76_51_12 Carbon steel beams, columns, channels and tees](#)
 - 4.2. **Fixing to superstructure:** Refer to Structural Engineer's drawings.
5. **Decking and flooring**
 - 5.1. **Material:**
[Pr_25_30_30_18 Carbon steel open bar metal gratings to external plant decks](#); [Pr_25_30_30_14 Carbon steel Toe plates](#)
6. **Toe plates:** [Pr_25_30_30_14 Carbon steel Toe plates](#)
7. **Balustrade guarding system:** Required.
8. **Handrail system:** Required.
9. **Assembly connectors:** Refer to structural engineers drawings.
10. **Superstructure connectors:** Install gratings to comply with recommendations of referenced metal bar grating standards that apply to grating types and bar sizes indicated, including installation clearances and standard anchoring details. Attach non-removable units to supporting members by welding where both materials are same; otherwise, fasten by bolting as indicated above.
Provide anchorage devices and fasteners where necessary for securing gratings to in-place construction. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors
11. **Width of walkways:** The minimum clear width of a walkway shall be ≥ 800 mm.
When the walkway is usually subject to passage or crossing of several persons simultaneously, the clear width shall be increased to at least 1000mm.

Due to the design of the machine, the environment, or the occasional use, e.g. less than 30 days per year and less than two hours per day, the clear width may be reduced from 800mm to 600mm.
12. **Headroom above walkways:** The minimum head-height over working platforms and walkways shall be 2100mm.

Where space is restricted adequate clearance shall be provided in the area around the head in accordance with Figure 1 in BS EN 14122-2.
If an obstacle (e.g. pipe) is crossing the walkway at the head-height, the minimum head-height may be reduced to 1900mm for a short length of walkway. Measures such as padding and warning signs shall be provided.
13. **Samples required:** [Ss_35_10_30/305 Product samples to walkway systems](#).

14. **Execution:** [Ss_35_10_30/670 Installing walkway systems](#); [Ss_35_10_30/640 Installing permanently fixed ladders, working platforms and walkways generally](#)
15. **System completion:** [Ss_35_10_30/820 Documentation for permanently fixed ladder, working platform, walkways and industrial stair systems](#)

System performance

See [20-85-45/206 Performance requirements Working platform, walkways and stairs gratings](#) in [Ss_35_10_30_40 STS-01 Industrial stair systems type A](#)

See [Ss_35_10_30/205 Design submittals](#) in [Ss_35_10_30_40 STS-01 Industrial stair systems type A](#)

Ss_35_10_30/230 Design of permanent means of access to machinery

1. **Design:** Complete the design of the permanent means of access to machinery.
2. **Standards**
 - 2.1. **Fixed means of access between two levels:** To [EN ISO 14122-1](#).
 - 2.2. **Working platforms and walkways:** To [EN ISO 14122-2](#).
 - 2.3. **Stairways, stepladders and guard-rails:** To [EN ISO 14122-3](#).
 - 2.4. **Fixed ladders:** To [EN ISO 14122-4](#).
3. **Proposals:** Submit technical information, calculations and manufacturers' literature.
4. **Drawings:** Submit design development and details.

Ss_35_10_30/240 Design of working platform and walkway systems

1. **Design standard:** Complete the design to meet structural and safety requirements in accordance with [EN 1991-1-1](#) and [NA to EN 1991-1-1:2002](#).
2. **Category of loaded area:** Heavy duty.

Ss_35_10_30/270 Durability of fixed ladder, working platform, walkway and industrial stair systems

1. **Requirements:** Refer to Basis of Design report.

Products

Pr_20_76_51_12 Carbon steel beams, columns, channels and tees

1. **Description:** Steel framework as required to comply with load and span requirements of walkway system decking to sub-contractor's design.
2. **Supplied by:** Submit proposals.
3. **Standard**
 - 3.1. **General delivery conditions:** To [BS EN 10025-1](#).
 - 3.2. **Specific delivery conditions:** To [BS EN 10025-5](#).
 - 3.3. **Grades and qualities:** Refer to structural engineers specification.
4. **Grade options for steel to be galvanized:** To [BS EN 10025-1](#), options 2 and 5.
5. **Corrosion protection**

- 5.1. **Galvanizing**
 - 5.1.1. **Standard:** Hot-dip galvanized to [BS EN ISO 1461](#).
 - 5.1.2. **Coating thickness (minimum):** Manufacturer's standard.
- 5.2. **Applied coatings:** Finish metal stairs after assembly.
Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
6. **Specific Requirements:** Fabricate stringers of steel plates or channels. Provide closures for exposed ends of channel stringers.
Construct platforms of steel plate or channel headers and miscellaneous framing members as needed to comply with performance requirements.
Weld stringers to headers; weld framing members to stringers, headers, and HHS tubes for support. Refer to Drawings.
7. **Dimensions:** As required for stair and walkway design. Refer to arch and structural drawings.
8. **Dimensional tolerances:** To [BS EN 10029](#).
9. **Size:** Refer to structural engineers drawings & specification.

See [Pr 25 30 30 14 Carbon steel Toe plates](#) in [Ss 35 10 30 40 STS-01 Industrial stair systems type A](#)

Pr_25_30_30_18 Carbon steel open bar metal gratings to external plant decks

1. **Description:** Galvanised steel open bar metal gratings.
2. **Manufacturer:** Elefant gratings (or similar approved).
3. **Product reference:** SP Type grating.
4. **Product description:** Anti-slip grating with load bearing bars and control bars.
5. **Standard:** BS EN ISO 14122 pt 2.
6. **Finish:** Hot-dip galvanizing to [BS EN ISO 1461](#).
7. **Surface:** Traffic Surface: Serrated.
8. **Size**
 - 8.1. **Length x width:** Refer to drawings.
 - 8.2. **Depth:** Depth of loading bar / control bar TBC by Contractor depending on span. Refer to 'deflection' below.
9. **Open hole size (maximum):** TBC by Contractor. refer to clause 20-85-45/206 Performance requirements Working platform, walkways and stairs gratings.
10. **Bar thickness:** Thickness of loading bar / control bar TBC by Contractor depending on span. Refer to 'deflection' below.
11. **Deflection:** Deflection limit span/200 or 10mm (whichever is the lesser), difference between a loaded and neighbouring unloaded floor shall not exceed 4mm vertically.
12. **Accessories:** Demountable clamp clip fixings.
[Pr 25 30 30 14 Carbon steel Toe plates](#)
13. **Fire rating:** Contractor is to ensure that chosen clamp clip system is not to compromise fire rating requirements
14. **Frames and supports:** Frames and Supports for Metal Gratings: Fabricate from metal shapes, plates, and bars of welded construction to sizes, shapes, and profiles indicated and as necessary to receive gratings. Miter and weld connections for perimeter angle frames. Cut, drill, and tap units to receive hardware and similar items. Unless otherwise indicated, fabricate from same basic metal as gratings. Galvanize steel frames and supports.
15. **Fixing type:** Unless otherwise indicated, space anchors 600mm o.c. and provide minimum anchor units in the form of steel straps 25mm wide by 6mm thick by 200mm long.
16. **Slip resistance value – water wet (minimum):** PTV of 40.

Ss_35_10_30/305 Product samples to walkway systems

1. **Manufacturer:** Selected manufacturer. Submit proposals.
2. **Submittals:** Treads, floorplates, platform, balustrade & handrail.
3. **Purpose:** For use as a reference sample.
4. **Labelling:** Clearly label all submitted samples.
5. **Timing:** Before ordering for project.

Execution

Ss_35_10_30/640 Installing permanently fixed ladders, working platforms and walkways generally

1. **Structural members:** Do not subject members to non-design loading. Do not modify, cut, notch or make unspecified holes.
2. **Frameworks**
 - 2.1. **Construction:** Assemble and brace, including temporary members required for installation.
 - 2.2. **Temporary support:** Do not use access systems as temporary support or strutting for other work.
3. **Contact between dissimilar metals:** Avoid.
4. **Bolted joints**
 - 4.1. **Bolts and washers:** Select quantities to retain supported components without distortion or loss of support.
 - 4.2. **Fixings:** Fully bolt together. Tighten bolts.
5. **Welded joints**
 - 5.1. **Standard:** To BS [EN ISO 15607](#)
 - 5.2. **Surfaces to be jointed:** Clean.
 - 5.3. **Tack welds:** Use only for temporary attachment.
 - 5.4. **Traces of flux residue, slag and weld spatter:** Remove.
 - 5.5. **Surface of welds:** Grind smooth.
 - 5.6. **Joints:** Fully bond with no holes or cracks.
6. **Finished components**
 - 6.1. **Distortion, cracks, burrs and sharp arrises :** Not permitted.
 - 6.2. **Corner junctions of identical sections:** Mitre.
 - 6.3. **Handrails:** Smooth and continuous, with no sharp edges.

Ss_35_10_30/670 Installing walkway systems

1. **Standard:** To BS [EN ISO 14122-2](#).

System completion

Ss_35_10_30/820 Documentation for permanently fixed ladder, working platform, walkways and industrial stair systems

1. **Number of copies:** Two.
2. **Submission:** Two weeks after request by Contract Administrator.

Ss_50_30_02_28

RWG-01 External gravity rainwater drainage systems

Systems

Ss_50_30_02_28 RWG-01 External gravity rainwater drainage systems

1. **Description:** Roof guttering and Rainwater down pipes to Gantry plantrooms.
2. **System performance:** [Ss_50_30_02/210 Design of gravity rainwater drainage system](#) and [Ss_50_30_02/290 Compliance with performance requirements](#).
3. **System manufacturer:** Submit proposals .
4. **Eaves gutters**
 - 4.1. **Gutters**
 - 4.1.1. **Gutter types:** [Pr_65_50_35_06 Aluminium eaves gutters](#).
 - 4.1.2. **Jointing:** Clip in with neoprene seals.
 - 4.1.3. **Electrical continuity:** Required.
 - 4.2. **Supports**
 - 4.2.1. **Brackets:** Eaves gutter brackets and clips.
 - 4.2.2. **Fixings:** Submit proposals .
5. **External rainwater pipework**
 - 5.1. **Rainwater downpipes**
 - 5.1.1. **Downpipe types:** [Pr_65_52_03_04 Aluminium rainwater pipes and fittings](#).
 - 5.1.2. **Jointing:** Submit proposals .
 - 5.2. **Supports**
 - 5.2.1. **Brackets and clips:** [Pr_20_85_09_01 Above-ground drainage pipe brackets](#).
 - 5.2.2. **Fixings:** Submit proposals .
6. **System accessories:** Eaves gutter leaf guards.
7. **Execution:** [Ss_50_30_02/642 Fixing and jointing pressed metal external gravity rainwater drainage pipework](#); [Ss_50_30_02/650 Fixing metal prefabricated rainwater drainage pipework assemblies](#); and [Ss_50_30_02/610 Installation of rainwater drainage generally](#).
8. **System completion:** [Ss_50_30_02/818 Rainwater drainage gutter test](#); [Ss_50_30_02/820 Rainwater drainage system maintenance instructions](#); [Ss_50_30_02/810 Testing rainwater drainage generally](#); and [Ss_50_30_02/890 Verification of performance](#).

System performance

Ss_50_30_02/210 Design of gravity rainwater drainage system

1. **Design:** Complete the design of the rainwater drainage system.
2. **Standards:** In accordance with England Building Regulations [Approved Document H3](#), section 1.
3. **Design parameters**
 - 3.1. **Roof and gutter construction and finish:** Grey subject to approved sample.

- 3.2. **Design life of building:** 30 years.
- 3.3. **Design rate category:** Category 3 to BS EN 12056-3, NB.2.1.
- 3.4. **Available capacity of existing below-ground drainage (maximum):** Refer to Services Consultant Specification.
4. **Requirements:** Submit proposals including detailed design drawings, technical information, calculations and manufacturers' literature.

Ss_50_30_02/290 Compliance with performance requirements

1. **Requirement:** Proof of compliance with specified performance.
2. **Method:** Confirm calculations for design to BS EN 12056-3.
3. **Testing authority:** The United Kingdom Accreditation Service (UKAS).
4. **Timing of submittals:** At detailed design stage.

Products

Pr_20_85_09_01 Above-ground drainage pipe brackets

1. **Manufacturer:** Submit proposals .
2. **Pipe location:** External.
3. **Arrangement:** Vertical.
4. **Form:** Stand off pipe clips.
5. **Material:** Submit proposals .
6. **Finish:** All exposed fixings to be colour coated to match gutters and wall cladding.
7. **Verification**
 - 7.1. **Submittals:** Declaration of Conformity.
UKCA Declaration of Performance.
Safety data sheet.
Test results, report and certification from an accredited testing facility.
Drawings, schedules, technical information, calculations, and manufacturer's literature.
Manufacturer's certification.
 - 7.2. **Timing:** Before completion of detailed design.

Pr_65_50_35_06 Aluminium eaves gutters

1. **Manufacturer:** Submit proposals .
2. **Form:** Extruded.
3. **Third-party product certification:** BBA Agrément certificate.
4. **Profile:** Box.
5. **Size (nominal width):** Refer to Services Consultant Specification.
6. **Thickness or gauge:** Submit proposals .
7. **Finish:** Powder coating to [BS EN 12206-1](#).
8. **Colour:** To match External Cladding.
9. **Film thickness (minimum):** Submit proposals .
10. **Integral accessories:** Preformed gutter angles, fixing brackets, support brackets and Stop ends.

11. **Execution:** [Ss_50_30_02/612 Setting out eaves gutters](#); [Pr_65_50_35/616 Fixing and jointing cast and extruded metal eaves gutters](#)

Pr_65_52_03_04 Aluminium rainwater pipes and fittings

1. **Manufacturer:** Submit proposals .
2. **Standard:** To [BS 8530](#).
3. **Third-party product certification:** BBA Agrément certificate.
4. **Form:** Extruded.
5. **Section:** Square.
6. **Size (nominal):** In accordance with Services Consultants Design.
7. **Minimum thickness or gauge:** Submit proposals .
8. **Finish and colour**
 - 8.1. **Finish:** Powder coating to [BS EN 12206-1](#).
 - 8.2. **Colour:** To match External Cladding.
 - 8.3. **Film thickness (minimum):** Submit proposals .
9. **Integral accessories:** Rainwater heads and Rainwater shoes.
10. **Execution:** [Pr_65_52_03/630 Fixing and jointing rainwater and above ground drainage pipes](#)
11. **Verification**
 - 11.1. **Submittals:** Declaration of Conformity.
UKCA Declaration of Performance.
Safety data sheet.
Test results, report and certification from an accredited testing facility.
Drawings, schedules, technical information, calculations, and manufacturer’s literature.
Manufacturer’s certification.
 - 11.2. **Timing:** Before completion of detailed design.

Execution

Pr_65_50_35/616 Fixing and jointing cast and extruded metal eaves gutters

1. **Fixing**
 - 1.1. **Supports**
 - 1.1.1. **Stability:** Fix securely.
 - 1.1.2. **Fixing centres (nominal):** Maximum 450mm centres.
 - 1.2. **Additional supports:** At joints in gutters, and near angles and outlets.
2. **Jointing**
 - 2.1. **Method:** Sealed and bolted clip jointing.
 - 2.2. **Jointing differing gutter systems:** Use adaptors intended for the purpose.
 - 2.3. **Cut ends of gutters:** Clean and square. Remove burrs and swarf.
 - 2.4. **Jointing or mating surfaces:** Clean and, where necessary, lubricate immediately before assembly.
 - 2.5. **Sealant:** 6 mm continuous bead each side of bolt position.

Pr_65_52_03/630 Fixing and jointing rainwater and above ground drainage pipes

1. **Fixing**
 - 1.1. **Supports**
 - 1.1.1. **Stability:** Fix securely.
 - 1.1.2. **Fixing centres (nominal):** Maximum 1.8m
 - 1.2. **Pipework**
 - 1.2.1. **Alignment:** Plumb and/ or true to line.
 - 1.2.2. **Externally socketed pipes and fittings:** Fix with socket ends forming inlet for each individual pipe.
2. **Jointing**
 - 2.1. **Jointing differing pipework systems:** Use adaptors intended for the purpose.
 - 2.2. **Cut ends of pipes:** Clean and square. Remove burrs and swarf. Chamfer ends of plastics pipes before inserting into ring seal sockets. Where metal pipes are to be used, recoat bare metal with appropriate primer and paint.
 - 2.3. **Jointing or mating surfaces:** Clean and, where necessary, use jointing lubricant immediately to allow safe and efficient jointing assembly.
 - 2.4. **Unsealed joints:** Wedge unsealed joints to cast pipes with timber or sheet lead cut-offs to centralize pipe joints and reduce rattling.
 - 2.5. **Expansion joint pipe sockets:** Fix rigidly to buildings. Elsewhere, provide brackets and fixings that allow pipes to slide.
 - 2.6. **Solvent-welded pipelines:** Install ring seal joints in all long runs of solvent-welded pipework, as movement joints.
3. **Spacing (maximum):** Maximum 1.8m
4. **Wall and floor penetrations:** Isolate pipework from structure.

Ss_50_30_02/610 Installation of rainwater drainage generally

1. **Collection and distribution of rainwater:** Complete, and without leakage or noise nuisance.
2. **Electrolytic corrosion:** Avoid contact between dissimilar metals where corrosion may occur.
3. **Plastics and galvanized steel pipes:** Do not bend. Plumb and/ or true to line.
4. **Allowance for thermal and building movement:** Provide and maintain clearance as fixing and jointing proceeds.
5. **Protection:** Fit purpose-made temporary caps to prevent ingress of debris. Fit access covers, cleaning eyes and blanking plates as the work proceeds.

Ss_50_30_02/612 Setting out eaves gutters

1. **Setting out:** Level and as close as practical to the roof.
To fall with true line and even gradient. Prevent ponding and backfall. Position high points of gutters as close as practical to the roof. Position low points not more than 50 mm below the roof.
2. **Outlets:** Align with connections to below-ground drainage.

Ss_50_30_02/642 Fixing and jointing pressed metal external gravity rainwater drainage pipework

1. **Fixing**
 - 1.1. **Supports**
 - 1.1.1. **Stability:** Fix securely.
 - 1.1.2. **Fixing centres (nominal):** 1.8 m.

- 1.2. **Pipework**
 - 1.2.1. **Alignment:** Plumb and/ or true to line.
 - 1.2.2. **Externally socketed pipes and fittings:** Fix with sockets facing upstream.
2. **Jointing**
 - 2.1. **Method:** Push fit.
 - 2.2. **Jointing differing pipework systems:** Use adaptors intended for the purpose.
 - 2.3. **Cut ends of pipes:** Clean and square. Remove burrs and swarf.
 - 2.4. **Jointing or mating surfaces:** Clean and, where necessary, lubricate immediately before assembly.

Ss_50_30_02/650 Fixing metal prefabricated rainwater drainage pipework assemblies

1. **Fixing**
 - 1.1. **Supports**
 - 1.1.1. **Stability:** Fix securely.
 - 1.1.2. **Fixing centres (nominal):** 1.8 m.
 - 1.2. **Pipework**
 - 1.2.1. **Alignment:** Plumb and/ or true to line.
 - 1.2.2. **Jointing differing pipework systems:** Use adaptors intended for the purpose.
2. **Wall and floor penetrations**
 - 2.1. **Requirement:** Isolate pipework from structure.
 - 2.2. **Masking plates:** Fix at penetrations if visible in the finished work.
3. **Protection to coated pipes:** Do not cut pipes to length or otherwise damage coatings.

System completion

Ss_50_30_02/810 Testing rainwater drainage generally

1. **Dates for testing:** Give notice.
2. **Period of notice (minimum):** Submit proposals .
3. **Pipework:** Complete, and fix securely. Make free from defects, obstruction and debris before testing.
4. **Testing**
 - 4.1. **Clean water:** Provide.
 - 4.2. **Testing apparatus:** Provide.
 - 4.3. **Smoke testing:** Do not use.

Ss_50_30_02/818 Rainwater drainage gutter test

1. **Preparation:** Temporarily block all outlets.
2. **Testing:** Fill gutters to overflow level and after 5 minutes closely inspect for leakage.
3. **Records of tests:** Submit.

Ss_50_30_02/820 Rainwater drainage system maintenance instructions

1. **Printed instructions:** Submit at completion.

2. **Contents:** Recommended procedures for maintenance of the rainwater installation, including full details of recommended inspection, cleaning and repair procedures.

Ss_50_30_02/890 Verification of performance

1. **Requirement:** Check completed system and provide assurance of compliance with specified performance.
2. **Submittals**
 - 2.1. **Format:** Description of inspections, remedial works carried out and certification of compliance.
 - 2.2. **Timing:** At completion of rainwater system work.

Ω End of System

