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- System Description: A site assembled roof system with a profiled metal lining sheet, bar and bracket spacer system, insulation and profiled metal outer sheet.

- Alterations: Any alterations required to this specification must be presented for

approval and subsequent re-issue of the specification

- Fire Classification: Class 0 surface spread of flame as described in approved document B

- Combustibility: AA rated when tested to BS 476-3:2004

- Non-fragility: Class B non-fragile when tested to ACR [M] 001:2014

- U Value: 0.18 W/m²K

- Cladding Material: TataLG

- Structure Tolerance: To be in accordance with SCI publication P346

**H31 METAL PROFILED/ FLAT SHEET CLADDING/ COVERING**

 To be read with Preliminaries/ General Conditions.

 **TYPES OF CLADDING/ COVERING SYSTEM**

H31/120 METAL CLADDING:

 SIG Design & Technology twin skin roof construction.

 - Drawing reference(s):

 - Manufacturer: SIG Design & Technology

 Long Meadow Industrial Estate,

 Cullompton, Devon. EX15 1BT

 Tel: 01884 839302

- Product reference: URP1000/32

- Support structure: Purlins at 1800mm (max) centres.

- Bearing width: 40 mm (minimum).

 - Minimum pitch: 4° minimum

 - External sheets: Trapezoidal profiled metal sheet.

- Material: Tata LG

- Thickness: 0.7 mm (nominal)

- Cover Width: 1000 mm

- Length: 11.200 m (maximum)

- Colour: TBC

- Non fragility: Class B non-fragile when tested to ACR [M] 001:2014.

- Accessories: See later sections

- Primary cladding sheet fasteners:

Fastener: Colour headed carbon steel, self-drilling fasteners with

Ø19 mm sealing washers.

Fastener location: Fix through profile trough.

Fastener pattern: End lap - Fix through every trough (5 fixings).

Intermediate - Fix through alternate troughs (3 fixings).

Eaves - Fix through 4 troughs (4 fixings).

- End laps size (minimum): 150 mm.

- Sealing laps: End laps external sheets: to be fully sealed in accordance with clause

 550.

 Side laps external sheets: to be fully sealed in accordance with clause

 550.

- Stitching laps:

End Laps: Colour headed carbon steel, self-drilling fasteners with Ø19 mm sealing washers.

Side Laps: Fix sheets with colour headed carbon steel, self-drilling fasteners with Ø16 mm sealing washers, stitched at 450 mm centres.

- Spacers system:TechBar spacer system.
Supplier: SIG Design & Technology

 Description: 40 x 40mm support rail in 1.25mm galvanised steel with a 1.5 x 280mm brackets with and integral thermal/sealing pad - fitted typically at 1.000m centres (subject to wind/imposed loads).

- Spacer to purlin: Carbon steel, self-drilling fasteners with Ø16 mm sealing washers 2 x per bracket.

H31/130 CE MARKING:

- SIG Design & Technology profiles are CE Marked to BSEN 14782:2006 - Self-supporting metal sheet for roofing, external cladding and internal lining.

H31/150 ROOFLIGHTS:

- Manufacturer: Hambleside Danelaw Ltd, Long March, Daventry NN11 4NR

Tel: 01327 701920 Fax: 01327 701929

- Supports: *As specified*

- System type: Zenon PRO GRP Rooflights for triple-skin built-up cladding system incorporating a 4mm polycarbonate core panel.

- Material: GRP to BS EN 1013-1:2012 + A1:2014 (UK annex)

- External sheet: Zenon Pro 18 - CE18/1.8kg/m²

- Profile: To match cladding profile.

- Length: To suit application.

- Cover width: 1000mm.

- Nominal thickness: 1.01mm.

- Finish/colour: Natural Translucent UV stabilised resins and weather film (tinted and opaque sheets available)

- Thermal insulation: 4mm twin wall polycarbonate core panel

- Liner: Zenon Pro 30 - CE30 Liner - 3.0kg/m²

- Profile: To match cladding profile.

- Length: To suit application.

- Cover width: 1000mm.

- Nominal thickness: 1.54mm.

- Finish/colour: Natural Translucent UV stabilised (tinted and opaque sheets available)

- U Value: 1.7 W/m2K

- Light transmission: 53%

- Solar transmission: 55% total (g-value)

- Fire properties: External Fire Exposure to BS 476-3; S.AB or S.AA

 Liner: Surface Spread of Flame to BS 476-7; Class 3 or Class 1 (or Class 0 to BS 476-6)

- Safety: Non-fragile Class B in accordance with ACR(M)001:2014 (Fifth Edition) when new. Expected period of non-fragility will be up to 25 years and safe for inadvertent foot traffic. The period of non-fragility is subject to all other elements of the roof assembly maintaining their integrity, performance and conformity for the same period of time.

- CE marking: Manufactured and CE marked in accordance with BS EN 1013:2012 + A1:2014 (UK annex).

- Service life: Service life guarantee 25 years.

- Environmental: Total embodied carbon 25.08 KgCO2e/m2 (typical KgCO2e/m2 for 32mm/32mm deep profiled rooflight sheets).

- Accessories: Profile fillers and flashings (by others).

- BBA certification: BBA Certificate No. 03/3996

- Primary sheet fasteners: Austenitic Stainless steel, Ø5.5mm with minimum 29mm self-sealing washer with a poppy red cap. A minimum of 5 fixings per purlin positioned as evenly as possible across the profile of the sheet and central to each trough.

- Side lap stitching: Austenitic Stainless steel 6.3mm tapered side lap stitch fastener (GRP over metal) with minimum Ø16mm self-sealing washer with a poppy red cap fixed at 400mm centres maximum. Expanding metal grommet type fasteners with minimum Ø16mm d self-sealing washer and a poppy red cap should be used when lapping metal over GRP or GRP to GRP. Please refer to HDL installation guidelines.

- End lap size: 150mm with the fixings at the centre of the lap.

- Sealing laps: Seal end laps with Sealant strips 6x5mm, Ø6mm or Ø8mm bead butyl type strip sealant. Two strips to be positioned approximately 10 to 15mm either side of fixing and a further strip positioned 15mm from the outer end lap.

Alternatively the sealing strip on the line of fixings can be a single 18x4mm or 22x5mm U section butyl type strip sealant with a 6x5mm, Ø6mm, Ø8mm bead or neutral cure silicon sealant placed 15mm from the end of the sheet.

Seal side laps with a continuous 6x5mm butyl type strip installed on the crown of the underlapping panel. Please refer to HDL installation guidelines

H31/170 DESIGN:

- Complete the design of the roofing /cladding / fascia / rain water goods in accordance with BS5427:Part1 / BSEN 12056 and the requirements of this specification.

- Coordinate detailed designs for all related works.

- Submit detailed design proposals to the CA before commencing and manufacturing or installation work.

H31/172 THERMAL BRIDGING:

- Complete the thermal design of the cladding system to avoid excessive thermal bridging:

H31/187 DEFLECTION OF METAL CLADDING:

- Maximum permitted roof cladding deflection under distributed loads:

 Imposed load: Span/200

 Wind load: Span/90

198 WATER PENETRATION:

- Water Penetration onto internal surfaces, or into cavities not designed to be wetted, must not occur under site exposure conditions.

210 STRUCTURE:

- Check that structure is suitable to receive cladding before commencing fixing. The subcontractor must confirm acceptance to Main Contractor and C A.

211 STRUCTURE TOLERANCES:

- Tolerances of the support structure to be as per cladding manufacturer's recommendations.

215 PAINTING STRUCTURE:

- All outer surfaces of the support structure are to be painted / treated before the commencing the installation of the cladding.

217 MATERIAL STORAGE:

- Store sheets and materials under cover to prevent staining on the sheets and keep the components dry.

- Store sheets on firm lever bearers spaced at 900mm maximum centres, limit the stack height to prevent distortion.

- All stored materials should be adequately secured to prevent wind and mechanical damage.

- Storing should be all in accordance with the sheet and panel manufacturer’s recommendations

219 FASTENERS GENERALLY:

- Type(s), size(s), material(s) and finish(es) as specified, or in the absence of such specification, as recommended by the cladding manufacturer.

 - Supplier: SIG Design & Technology

 Long Meadow Industrial Estate,

 Cullompton, Devon. EX15 1BT

 Tel: 01884 839302

221 FITTINGS AND ACCESSORIES GENERALLY:

- Cappings, closure pieces, flashings, trims, gutters, fillers, spacers, tapes, sealants, fixings, etc. where not specified, to be types recommended by the cladding manufacturer.

223 ISOLATION TAPE:

- Isolating tape: Type recommended by cladding/ covering manufacturer.

- Location: To contact surfaces of supports and sheets of dissimilar metals.

H31/241 STEEL LINING TO ROOF CLADDING:

 SIG Design & Technology twin skin roof construction.

 - Manufacturer: SIG Design & Technology

- Product reference: URP1000/32

- Non Fragility: ACR[M]001 Class B, walkable when fully fixed and sealed.

 - Support structure: Purlins at 1800mm (max) centres.

- Bearing width: 60 mm (minimum).

 - Minimum pitch: 4° minimum

 - Internal sheets: Profiled metal lining panel

- Material: Galvatite, hot dip zinc coated steel EN 10346-S220GD+Z275 substrate, with Lining Enamel coating to interior.

- Thickness: 0.7 mm (nominal)

- Cover Width: 1000 mm

- Length: 11.200 m (maximum)

- Colour: BWLE

- Primary cladding sheet fasteners:

Fastener: carbon steel, self-drilling fasteners with Ø16mm sealing washers.

Fastener location: Fix through profile trough.

Fastener pattern: 5 fixings per sheet per support location - 50mm edge distance minimum.

- End laps size (minimum): 100 mm.

- Sealing laps: End laps external sheets: to be fully sealed in accordance with clause

 550.

 Side laps external sheets: to be fully sealed in accordance with clause

 550.

- Stitching laps:

End Laps: 5 fixings per sheet per support location - 50mm edge distance minimum.

Side Laps: Fix sheets with carbon steel, self-drilling fasteners with Ø16mm sealing washers, stitched at 450 mm centres.

H31/ H31/261 VAPOUR CONTROL:

- See Clause 554 where liner sheet acts as vapour membrane

H31/ H31/271 THERMAL INSULATION:

**-** Insulation quilt: To BS EN 13162:2001**,** BS 3958-5:1986, non-combustible to BS 476 Part 4 1970.

- U-value: 0.18 W/m²K

- Thickness: 280mm - compressed to 250mm

- Density: 12 - 27kg/m² (nominal)

- Thermal conductivity: λ0.040W/mK (CE marked 90/90 values)

- Install and secure as the work progresses, ensuring continuity under and around the spacer system.

- Lap insulation layers to ensure continuity of insulation over ridges, hips, verges leaving no gaps.

- Keep insulation dry and do not over compress. All wet / damaged insulation must be replaced before the roof is sealed up.

- Where ever possible ensure insulation continuity from roof to wall.

- Insulation to fill roof cavity with 10% compression.

H31/ H31/280 BREATHER MEMBRANE:

- Not required (except in high humidity buildings BS5250:2002)

281 SPACER SYSTEM:

- 1.5mm galvanised steel brackets, 280mm bracket height, 750mm spacing at ridge, eaves and verge, maximum 1m spacing generally. 1.25mm galvanised steel rail, interlocking end joints, bracket stability braces at 20m max spacing on brackets of 250mm and above, brackets secured with 2No. carbon steel ∅5.5mm fasteners with a ∅16mm bonded washer.

- TechBar bracket spacing subject to design information and confirmation by the project Engineer.

300 PROFILE FILLERS GENERALLY:

- Manufacturer: SIG Design & Technology

- Reference: URP1000/32

- Material: Closed cell, cross linked flexible polymers.

- Colour: Black / White

- Thickness: 25mm.

- Fixing: Compression fix between sheets and flashings / supports.

 Seal into place as appropriate.

Locate to close off corrugation cavities from the inside and outside of the building. Ensure a tight fit and leave no gaps. Include, where necessary, perforations sufficient to allow passive ventilation of internal cavities and condensation drainage. Perforations sized to prevent ingress of large insects and vermin.

3H31/ H31/305 FIRE RESISTANT PROFILE FILLERS:

- Types: To accurately match sheet profile.

- Fixing method: Adhesive recommended by profile filler manufacturer.

410 FIXING CLADDING GENERALLY:

- Cut sheets to give clean, true lines with no distortion and without damage to any protective coating. Remove burrs and any lubricant.

- Cut openings in sheets for outlets, vent pipes, flues, etc. to the minimum size necessary. Reinforce edges of openings with suitable steel support.

- Remove all drilling swarf, dust and any other foreign matter before placing any insulation.

- Protect sheets during fixing and up to practical completion against mechanical damage, and disfigurement. Rectify any defects as quickly as possible to minimise damage and nuisance.

480 FLASHING & TRIM DETAILS:

- Manufacturer: SIG Design & Technology - Tel: 01884 839302

- Material and finish: To match finish and colour of roof, 0.7mm minimum gauge.

- Lap joint treatment: End joints to be lapped by 150mm and sealed, unless specified otherwise.

Where possible arrange with laps away from the prevailing wind.

Where butt joints are required, butt join and seal flashings / trims on 150mm wide butt straps made from sheet of the same material and finish.

- Method of fixing: Fix to cladding with sealed rivets or carbon steel, self -drilling fasteners with Ø16 mm sealing washers at 500mm minimum centres.

- Design: Maximum un-stiffened leg on flashing to be 250mm.

Visible free edges to be finished with a stiffened edge or welt.

500 GUIDED TYPE FALL ARREST SYSTEM:

- Ref: N25/210 Guided Type Fall Arrest System -

Latchways Constant Force Fall Protection System.

- Manufacturer: Latchways plc,

 Hopton Park,

 Devizes,

 Wiltshire,

 SN10 2JP

- System information: Anchorage device: Latchways Constant Force Post tested to BS EN 795: 2012, CEN TS 16415; 2013 and RC(M)002:2009

- Anchorage device: Latchways Constant Force® (65602-00)for mechanical attachment to the top skin of the profile using 16 Latchways stitching screws per post.

- Overall system length: *specify length of system/s.*

- System requirement: *specify what system is to be used for.*

- Interim support spacing: Between 6 and 10m - as designed by the Latchways approved installer.

- System access from: *specify where system to be accessed from and means of access.*

- System to be installed in accordance with BS 7883 by the system manufacturer or an installer approved by the system manufacturer and verified by the system manufacturer.

- On completion of the installation, system to be inspected and fully tested and a test certificate covering a period of 12 months to be issued. Notice showing date and period of validity of the test certificate to be attached to the system at each access point.

- Number, of complete set/s of Personal Protective Equipment PPE to be supplied with the system to be entered here…...

**For Latchways full system specifications please see the relevant NBS section - N25 PERMANENT ACCESS AND SAFETY EQUIPMENT**

554 WATER VAPOUR AND AIR SEALING AT LAPS AND PENETRATIONS IN METAL LININGS:

- Sealant Tape: Inside joint (suitable for end laps): 4mm diameter NFRC Class A butyl

strip sealant. Over joint (suitable for side laps, butt joints and sealing on to penetrations):

- Location: Position sealant in straight, unbroken lines. Place into troughs. Do

not allow to stretch or to sag into position.

Inside joint sealant to be placed below fixing positions, parallel to and slightly back from edge of sheet.

- Workmanship: NFRC Class A - do not over-compress.

The metal lining layer must be reasonably airtight so that the air permeability does not exceed 10M³/h/M² at an applied pressure of 50pa in accordance with the Building Regulations 2000, Approved Document L2a 2013.

Under laboratory testing sealed liner sheets can achieve an air leakage as low as 0.5 M³/h/M². A reasonable practical expectation for a finished system would be 3 - 5 M³/h/M².

- Filler Blocks: Provide filler blocks to close open flutes of lining panels, bed filler

blocks top and bottom in continuous strip sealant. Filler blocks to be closed cell, cross linked flexible polymers.

- Internal flashings: Provide internal flashings to ensure continuity and effectiveness of

seal, especially at corners of sheets such as at roof / wall junctions and at all penetrations of pipes, ducts, rooflights, etc.

Internal flashings supplied by SIG Design & Technology

H31/560 WARNING NOTICES:

 Signs as described below to be fixed at points indicated on drawings.

- Manufacturer and reference: \_\_\_\_\_\_\_\_\_

 Material: \_\_\_\_\_\_\_\_\_

- Warning sign as BS 5378: Part 3 reference A.2.4 with supplementary text sign, lettering 'DANGER Fragile roof'.

- Mandatory sign as BS 5378: Part 3 reference A.3.1 with supplementary text sign, lettering 'Use crawling boards’.

**Please Note:**

**The specification clauses above have been supplied by SIG Design & Technology for the purpose of Guidance, free of charge. They reflect the system requirements, Manufacturer’s Recommendations and current best practice at the time of writing. System performances are dependent on the content provided by SIG Design & Technology, Any changes are made the performances / requirements should be verified by SIG Design & Technology.**

**Alternative materials or systems may be possible and in such cases clarification should be sought with SIG Design & Technology and agreed before proceeding.**