

## 019-034 BBIC

**H43**

### METAL COMPOSITE PANEL CLADDING

October 2019  
**Rev A (14.10.2019)**



EDGE



**H43 METAL COMPOSITE PANEL CLADDING/COVERING**  
**To be read with Preliminaries/General Conditions.**

**NOTE:** WHILST MANUFACTURERS ARE IDENTIFIED WITHIN THIS SPECIFICATION, THIS IS FOR DATUM PURPOSES ONLY. OTHER SYSTEMS WITH EQUAL PERFORMANCE WILL BE CONSIDERED SHOULD THE CONTRACTOR PREFER TO PROPOSE THESE.

**100 NOVATED DESIGN TEAM REVIEW PERIODS FOR SUB-CONTRACT DRAWINGS**

***Allow 10 working days for initial review.***  
***Allow 10 working days for each subsequent review***

**105 DETAIL DESIGN/INSTALLATION DRAWINGS AND CALCULATIONS.**

**Sub-Contractor is to prepare design/installation drawings of the complete external Composite Metal Cladding system, to the areas indicated on the Architectural drawings. The Sub-Contractor is to be responsible for the design of the complete system, including all necessary fixing brackets and where required, secondary steelwork should the design necessitate additional steelwork over and above that of the primary steelwork and/or the existing support steel of the existing single skin cladding of the connecting industrial unit. Once revealed the subcontractor is to assess the suitability of the existing cladding rail system, and existing primary structure to determine whether it can be utilised to support the new cladding system. Should this be possible the subcontractor is to take full responsibility of the performance of the system and supports. The Subcontractor is to undertake site measurements to satisfy themselves that their design is tailored to suit all inherent insitu constraints prior to manufacture.**

**The relevant SUB-CONTRACTOR(S) are to prepare design installation drawings of the complete wall covering/cladding system, including all upstands, interfaces with adjoining materials and weathering details to all penetrations. This includes interfaces between the cladding system and both existing and/or new building fabric.**

**Drawings/Calculations are to be submitted to the ARCHITECT & CA for comment prior to manufacture.**

The relevant SUB-CONTRACTOR(S) are to be responsible for the design, supply and fix of the complete cladding system(s), including all upstands, closures etc weathering and airtightness details at the junctions with all other materials to provide a weathertight assembly.

Any details indicated on the Architects drawings are design intent only and are to be finalised by the cladding SUB-CONTRACTOR(S) as part of their design responsibility. The entire insulated cladding system(s), including any upstands, closures etc is to be insulated to maintain the thermal performance of the wall and to eliminate any cold bridging.

The relevant SUB-CONTRACTOR(S) will be required to liaise closely with the curtain walling, window, door, insulated plasterboard lining and M&E sub-contractors to ensure all interfaces are resolved satisfactorily. The completed cladding system(s) are to be weathertight under all conditions and are to accord with air leakage standards as set out in Part L2A of the Building Regulations 2013 with 2016 amendments.

The relevant SUB-CONTRACTOR(S) will be required to produce condensation risk

calculations for the completed system(s). In addition to the wall cladding/covering, the calculations are to take into account any lining or insulation layers located below the substrate, including the drylining layer, refer to the criteria set out in clause H34.

**The design of the weather tight envelope should include for all necessary flashings/seals/cills required to provide a weather tight assembly where the cladding abuts adjacent materials, whether new or existing.**

**Firesafe panels should be employed across compartment lines as defined on fire strategy drawings to ensure 60 mins fire separation is achieved.**

**The Sub-Contractor will be required to liaise with the Window Sub-Contractor in L10. The Cladding should not transfer an unacceptable deflection onto the windows as noted in L10.**

**The sub-contractor will be required to carryout a thermal safety check of the installation.**

**Drawings and calculations are to be submitted to the Architect and Structural Engineer prior to fabrication for comment.**

**The Sub-Contractor will be required to liaise with other the Sub-Contract designers responsible for design of building elements to which the curtain walling interfaces with such as Roofing, Curtain Walling, windows ceiling, plasterboard and metal stud partition sub-contractors as specified in K10, K40 & L10 etc of the NBS respectively. The Sub-Contractor will be required to produce a detailed Composite Cladding schedule.**

**The Cladding system is to be weather tight under all conditions and accord with air leakage standards set out in part L2A of the Building regulations 2013 with 2016 amendments and achieve a minimum U Value of  $0.26\text{Wm}^2\text{K}$ . Overall Air leakage of building should be a maximum of  $4\text{m}^3/(\text{h.m}^2)$  at 50Pa must be achieved to meet the M&E consultants building model requirements.**

**The subcontractor is to take account of all necessary wind & dead loads within the design.**

#### 110 SITE DIMENSIONS

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

#### TYPE OF CLADDING SYSTEM

#### 121S METAL COMPOSITE PANEL WALL CLADDING

- Drawing reference(s): 019-034 Series in Plans, Sections & Elevations.
- Supports: Kingspan Structural Multibeam cold rolled rails.  
Bearing width: Min 60mm intermediate, Min 130mm vertical joint.
- Manufacturer and reference: Kingspan Limited, horizontally laid wall cladding system for standard internal & external non-corrosive, inland environments also Loss Prevention Certification Board certified to LPS 1181 Grade EXT-B.
- Test results:  
LPS1181: 2014: Part 1: Issue 1.2, series of fire growth tests for LPCB approval and is certified to LPS 1181 Grade EXT-B.  
Reaction to fire classification according to BS EN 13501-1:2007+A1:2009: B-s1,d0.
- Panels:  
Profile reference: KS600 FP – Insulated Wall Panel.  
External facings:

- Material: Metallic protected steel to BS EN 10346: 2015.
  - Thickness: 0.5 mm nominal.
  - Finish/Colour: To be selected from Kingspan Altaris Solid, Symphony or Kingspan Spectrum – ie: Metallic Silver from standard ranges but Blue **Paau** c100m100y30k25 to match BBIC branding references. Additionally area of metallic white cladding as indicated on elevations to be allowed for as well as metallic grey returns to feature boxed window frame returns to match aluminium windows.
- Internal facings:
- Material: Metallic protected steel to BS EN 10346: 2015.
  - Thickness: 0.4 mm nominal.
  - Finish/Colour: CleanSafe 15.
- Core insulation: HCFC, CFC, HFC free LPCB certificated QuadCore hybrid insulation core.  
Panel thickness: Min 80mm (England & Wales) – subject to subcontractor design calcs.
- Male/female panel joint sealant:
    - Factory applied weather seal set in rebate.
    - Kingspan AWP filler and non-setting gun-grade, PremSeal BR or similar, site applied at the end of each panel where flashings pass over the joint.
    - Bridging seal across panel joint in line with AWP filler and internal air seal to be non-setting gun-grade, PremSeal BR or similar.
  - Fasteners: As determined by clause 220A
- Number and location:
- For panels: As determined by clause 197A, but with each panel fixed to each support using not less than one fastener at panel ends and two fasteners at intermediate supports, located through tongue section, as recommended by cladding manufacturer.
  - For panel bearers: Fix each one using two fasteners.
  - For vertical top-hat fix to vertical support at 500mm centres.
- Vertical joints:

Type: Option A with recessed top-hat flashing and insert with 4mm diameter butyl rubber sealant, Class A, ref: NFRC TB36.

Finish/colour: Finish as external face of panels.

    - PIR insulation board with any gaps between board and panels, fill with Premier Sealants (01724 864100) Firefoam (class B1 rated) or similar, fire rated gun applied canister urethane insulation.
    - Vertical panel joint to have VJ2 EPDM 95mm x 10mm self adhesive air seal bubble gasket applied to vertical supporting steelwork and lapped over drip flashing
  - Thermal Transmittance (U Value) calculated using the method required by the Building Regulations Part L2A (England & Wales) and Building (Scotland) Regulations Section 6: 0.23 W/m<sup>2</sup>K, based on an aged thermal conductivity value of 0.018W/mK. .
  - Air leakage rate of 3m<sup>3</sup>/hr/m<sup>2</sup> at 50 Pa, based on the assumption that the full building envelope is constructed using Kingspan panels.
  - Other requirements:
    - Internal face of panel to be air sealed to perimeter supports / flashing using a SGV20, 20x9mm PVC foam tape (premier sealants) or similar.
  - Accessories:
    - Panel bearers located at panel ends and at maximum 1500mm intervals in-between, located in positions recommended by cladding manufacturer to support the bottom row of horizontally laid panels.
    - Any joints in the secondary steel frame and cleader angles, which are forming part of the building air seal line, must be sealed with a Film backed butyl tape/PremSeal SWRPIO or similar.

- Factory made pre-formed corners.
- Manufacturers guarantee:-
  - 40 year maintenance and inspection free external coating guarantee.  
Manufacturer's external coating guarantee to be available on project completion and be fully transferrable for future changes of building ownership.
  - 40 year thermal performance guarantee.
  - 40 year structural performance guarantee.
- Panels manufactured under the following standards:-
  - ISO 9001, Quality Management Systems.
  - ISO 14001, Environmental Management Systems.
  - ISO 18001, Occupational Health and Safety Management Systems.
  - ISO 50001, Energy Management Certificate
- Kingspan recommend that the appointed cladding sub-contractor attends the appropriate product installation training course at our offices in Holywell prior to commencing installation on site.

## GENERAL REQUIREMENTS

### 170 DESIGN

- Cladding: Complete detailed design of the cladding system and submit before commencement of fabrication.
  - Standard: To BS 5427-1.
- Related works: Coordinate in detailed design.

### 172 THERMAL PERFORMANCE/ BRIDGING

- Requirement: Complete thermal design of the cladding/ covering system to avoid excessive thermal bridging.
  - Standard: MCRMA Technical Paper 14 and BRE Information Paper 1/06.

### 175 PRODUCT SAMPLES

- General: Before commencing detailed design, submit labelled samples of the following:  
Cladding panel for LA Approval.

### 176 FASTENER SAMPLES

- General: During detailed design, submit labelled samples of each type of fastener.

### 185B PERFORMANCE COMPLIANCE

- Verification: The system has an approved environmental profile with a BRE Ecopoints score of 0.497 Cradle to Grave over 60 year study period.\*  
Panels can achieve an A+ rating in accordance with the Green Guide to Specification.
- Verifying authority: BRE Certification Ltd. Scheme Document SD 028.
- CE marked to BS EN 14509: 2013.  
\*Assessment pending

### 197A ATTACHMENT:

- Determine the number and location of cladding fasteners recommended by the cladding manufacturer to resist wind loads calculated in accordance with BS 6399:Part 2 Standard Method and BS 5427:Part 1.

- Calculate wind loads on roof and wall cladding appropriate to location, exposure, roof height, building shape and size in accordance with BS 6399:Part 2 Standard Method and BS 5427:Part 1.

Basic wind speed ( $V_b$ ): 22.5 m/s

Altitude factor ( $S_a$ ): 1.071

Direction factor ( $S_d$ ): 1

Seasonal factor ( $S_s$ ): 1

Probability factor ( $S_p$ ): 1

Terrain and building factor ( $S_b$ ): 1.5

External and internal size effect factors ( $C_a$ ): 1

External pressure coefficients ( $C_{pe}$ ): As determined from BS 6399:Part 2, clauses 2.4 and 2.5.

Internal pressure coefficients ( $C_{pi}$ ): As determined from BS 6399:Part 2, clause 2.6.

## 192 SOUND TRANSMITTANCE OF CLADDING/ COVERING SYSTEM

- Minimum weighted sound reduction index ( $R_w$ ) within 100 to 3150 Hz frequency range to BS 5821-3:
  - 100mm - 31Rw (db)
  - 125mm - 32Rw (db)
  - 150mm - 32Rw (db)
  - 175mm - 33Rw (db)
  - 200mm - 34Rw (db)
  - 240mm - 34Rw (db)
- Overall wall system to achieve minimum Db reduction to meet requirements of Acoustic Noise Test Report.

## 196A INTEGRITY OF CLADDING/ COVERING

- 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/ covering system will resist factored dead, imposed and design live loads, and accommodate deflections and thermal movements without damage, in accordance with BS 5427-1.
  - Primary fasteners: Not to be subjected to any bending moment.
  - Wind loads: Calculate to Eurocode 1 (EN1991.4) Standard Method and BS 5427-1 appropriate to location, exposure, height, building shape and size, taking account of existing and known future adjacent structures.
- In order for Eurobond to run span/load calculations for the panels in question we require the specific wind loads acting upon the cladding.

Normally, we would expect to see the loads split across 3 zones, these being Zone A (corners of the building), Zone B (just in from the corners) and Zone C (remainder of elevation).

Eurobond specifically require pressure & suction wind loads represented in kN/m<sup>2</sup>. If we are supplied with wind speeds we cannot run calculations based upon this information.

If these loads are not available, the appointed Structural Engineer would normally be actioned to raise these by the nominated Contractor or (if applicable) the Contractor will action the wind load analysis 'in house'.

If site specific wind loads are not available or can be calculated a site specific postcode is to be provided to allow indicative wind load values to be calculated through wind load modeller. All calculations must be reviewed by a Structural Engineer to ensure that the calculations conform to the site specific requirements.

#### **198 WATER PENETRATION**

- Requirement: Under site exposure conditions, moisture must not penetrate onto internal surfaces, or into cavities not designed to be wetted.

#### **202 AVOIDANCE OF SURFACE CONDENSATION**

- Requirement: 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<sub>min</sub>). Ensure that damage and nuisance from surface condensation and does not occur.

#### **215 PAINTING STRUCTURE**

- Sequence: Paint outer surface of supporting structure before fixing cladding/ covering.

#### **220A FASTENERS:**

- Recommended manufacturer: to be confirmed by cladding sub-contractor.
- Panel fasteners: Self drilling, self tapping screws with bonded washers.  
Type(s), size(s) and drilling capacity: As recommended by fastener manufacturer to suit type and thickness of supports, and thickness of cladding panels.  
Screw material: Anti-corrosion coated carbon steel.  
Washer material: Non-ferrous.  
Washer size: 16 mm diameter.  
Heads: Hexagon head.
- Fasteners for vertical joint flashings/trims: As panel fasteners.
- Fasteners for panel bearers: As panel fasteners but with 15 mm diameter washers.
- Flashing fasteners: Stitching screws with bonded washers.  
Screw/washer material: As panel fasteners.  
Washer size: 14 mm diameter.  
Heads: With low profiled heads to match colour of the flashing.

#### **221 FITTINGS AND ACCESSORIES**

- Unspecified fittings and accessories: Recommended for the purpose by the cladding/ covering manufacturer.

#### **223 PREVENTION OF ELECTROLYTIC ACTION**

- Isolating tape: Type recommended by cladding/ covering manufacturer.
  - Location: To contact surfaces of supports and sheets of dissimilar metals.

#### **275 CONTINUITY THERMAL INSULATION**

- Material: Mineral wool
  - Manufacturer: Rockwool
  - Product reference: Contractor's choice

- Installation: Secure and continuous with cladding/ covering insulation.  
Bearing width: Min 60mm intermediate, Min 130mm vertical joint.

**310A PURPOSE MADE COLD FORMED METAL ACCESSORIES – EXTERNAL:**

- Drawing reference(s): As defined by Subcontractor – including coping
- Material/finish: As external face of cladding.  
Thickness: 0.63 mm  
Colour: To match external face of cladding.  
Workmanship as section Z11.
- Fixing: Stitch to external face of panels at 450 mm centres using secondary fasteners as specified for the cladding system.
- Sealing: Single line of 4mm diameter butyl rubber sealant, Class A, ref: NFRC TB36, site applied between flashing and panel.

**311A PURPOSE MADE COLD FORMED METAL ACCESSORIES – INTERNAL:**

- Drawing reference(s): As defined by Subcontractor
- Material/finish: As internal face of cladding.  
Thickness: 0.4 mm  
Colour: White.  
Workmanship as section Z11.
- Fixing: Stitch to internal face of panels at max. 450 mm centres using secondary fasteners as specified for the cladding system.
- Sealing: Single line of 6mm bead non-setting gun-grade, PremSeal CV or similar, site applied between flashing and panel.
- End laps to be air sealed with Film backed Butyl tape/PremSeal SWRPIO or similar, or gun grade sealant.

**580A INSULATED PANEL IDENTIFICATION & LABELLING**

- When the roofing and /or the wall cladding to this building is completed, a label identifying the composition of the insulated panels is to be fitted.
- This label illustrates the type of Insulated panels fitted, to assist Insurers, Fire Officers, Owners and Occupiers identify the envelope composition.
- It is a recommendation of the Kingspan Total Guarantee that the insulated panel identification label, which will have a specific project registration number, is installed in an agreed location. The project architect, cladding subcontractor or owner should locate or instruct the location of these labels in an appropriate and accessible location on the building.

**Additional Products for consideration**

- Kingspan Insulated Panels
- Kingspan Daylight System.
- Kingspan Safety System.
- Kingspan Insulated Membrane Lined Gutters.
- Kingspan External Highline Gutters and ancillary items
- Kingspan Specialist Fabrications.
- Kingspan Benchmark Façade Systems.
- Kingspan Energy Products.

- Kingspan Structural Products.
- Kingspan Controlled Environment Products.

**Service offered by Kingspan Envirocare Technical Services,**

- Fastener calculations in accordance with BS EN 1991-1-4:2005.
  - Roof drainage calculations in accordance with BS EN-12056:2000.
  - SBEM calculations for compliance with the Part L2 Building Regulations and Scottish Building Standards Section 6.
  - Thermal modelling analysis (Psi value & “f” factor) for project specific construction details.
- Project specific Kingspan construction detail checking service