

Greig & Stephenson Architects Limited

Kirklees Council

Huddersfield Market Regeneration Project

NBS - Huddersfield Market

HMH-GSA-XX-XX-T-A-1541

16-01-2025

Curtain walling

Regeneration of Huddersfield Market and surrounding
public realm

Contents

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Rev	Date	Comments	WTN	CHK
P01	16/01/26	S4 – For Tender	CL	TA

H11 Curtain walling

Tendering

10 Information to be provided with tender

1. Submit the following curtain walling particulars
 - 1.1. **Evidence of compliance:** All curtain walling to be CE marked to BS EN 13830. Submit Declaration of Performance (DoP). CE marking and Declaration of Performance (DoP) requirements for structural sealant glazing to be submitted on the basis of a manufacturer's European Technical assessment (ETA) prepared in accordance with EOTA technical guide ETAG 002 (Parts 1, 2 and 3).
 - 1.2. Typical plan, section and elevation drawings at suitable scales.
 - 1.3. Typical detailed drawings at large scales, including Full size head, cill mullion profiles for all variations. See drawings HMH-GSA-MH-XX-D-A-8300-8307 .
 - 1.4. Technical information and certification demonstrating compliance with specification of proposed incorporated products and finishes, including Insulating glass units, doors and ironmongery, actuators and powered automated openers..
 - 1.5. Certification, reports and calculations demonstrating compliance with specification of proposed curtain walling.
 - 1.6. Proposals for connections to and support from the building structure and building components.
 - 1.7. Proposals for amendments to primary supporting structure and for secondary supporting structure additional to that shown on preliminary design drawings.
 - 1.8. Schedule of builder's work, special provisions and special attendance by others.
 - 1.9. Examples of standard documentation from which project quality plan will be prepared.
 - 1.10. Preliminary fabrication and installation method statements and programme.
 - 1.11. Schedule of products and finishes with a design life expectancy less than that specified in clause 440, with proposals for frequencies and methods of replacement.
 - 1.12. Proposals for replacing damaged or failed products.
 - 1.13. Areas of non-compliance with the specification.

Types of curtain walling

110 Stick curtain walling systems

1. Curtain walling system
 - 1.1. Manufacturer: [Technal](#)
 - 1.1.1. Contact details
 - 1.1.1.1. Address: Hydro Building Systems UK Ltd
Severn Drive
Tewkesbury
Gloucestershire
GL20 8SF
 - 1.1.1.2. Telephone: [+44 \(0\)1684 853 500](tel:+44(0)1684853500)
 - 1.1.1.3. Web: <https://www.technal.com/en-uk/commercial>
 - 1.1.1.4. Email: info.uk@hydro.com
 - 1.1.2. Product reference: [Aluminium Curtain Wall - TENTAL 50 \(Tental 50 TT Feature cap \)](#) or equivalent approved.

- 1.2. **System performance:** Tested in accordance with the requirements of EN 13830 and all components Specification of glazing materials to be in accordance with guidance in CIRIA document 'Guidance on glazing at height'.
- 1.3. **Framing**
 - 1.3.1. **Material:** All aluminium frames and other sections to be extruded to EN 12020, EN 573-3, EN 515 and EN 775 -1 to 9 from aluminium alloy specification 6060 T66 comprising a minimum of 75% recycled end-of-life aluminium (post-consumer scrap) and a GWP (A1-A3) of no greater than 1.9 kg of CO₂e/kg of aluminium. Provide EcoPlatform third party published EPD conforming to ISO14025 and EN15804+A2 to confirm the above.

All aluminium billets and extrusions to be sourced from cast house and extrusion plants certified by Aluminium Stewardship Initiative (ASI) for Performance Standard and Chain of Custody Standard
 - 1.3.2. **Frame members:** Hydro CIRCAL® aluminium alloy 6060 T66 sections, extruded to EN 12020, EN 573-3, EN 515 and EN 775-1 to 9.
 - 1.3.3. **Frame accessories:** Horizontal and vertical caps.
- 1.4. **Cladding units**
 - 1.4.1. **Glass units:** Insulated glass units (IGUs).
 - 1.4.2. **Panels and facings**
 - 1.4.2.1. **Material:** Opaque infill, spandrel panels and louvres to be tested and classified to Class A2-s1, d0 or A1 according to BS EN 13501-1:2007+A1:2009 for reaction to fire.
 - 1.4.2.2. **Thermal insulation:** not required.
 - 1.4.3. **Perimeter seals:** EPDM membranes, ≤ 250 mm width. In place of EPDM, use sealing membrane as H11/780A
- 1.5. **Glazing:** Glazing spec to designed by specialist and provided in tender return to suit performance criteria;
For tender pricing purposes allowance for the following by Calumen: 31.52mm hermetically sealed double 90% Argon filled cavity glazed units in accordance with Building Regulations including Document L and BS6180
 - 1.5.1. **Glazing Type:** Outer Ply: 6 mm Tempered with Planitherm Ultra N II
Cavity: 16 mm Argon 90%
Inner Ply : 9.52 mm Annealed & PVB laminated (2x4 mm plies + 1.52 mm PVB)
 - 1.5.2. **Glazing Notes:** Glazing to be hermetically sealed insulated glazed units, in accordance with Building Regulations. Composition of units to be confirmed (To BS EN356: 2000 P1A where required for PAS24 compliance)

Where self-cleaning coating is applied to the external pane, use non-silicone lubricated gasket. Specialist Contractor to supply confirmation from glass supplier of gasket compatibility.

All glass and glazing shall conform to:
BS EN12600: 2002. Glass in building. Pendulum test. Impact test method and classification for flat glass.
BS EN 1279. Glass in Buildings. Insulating Glass Units.
Part 1:2004 Generalities, dimensional tolerances and rules for the system description
Part 2:2002 Long term test method and requirements for moisture penetration
Part 3:2002 Long term test method and requirements for gas leakage rate and for gas concentration tolerances.
Part 4:2002 Methods of test for the physical attributes of edge seals
Part 5:2005+A2:2010 Evaluation of conformity
Part 6:2002 Factory production control and periodic tests.

Manifestation design as per design drawings.

Recommendations of the Glass and Glazing Federation must be adhered to.

A glazing thermal safety check be carried out by the glass or sealed unit supplier/manufacturer.

1.6. **System completion:** Submit EcoPlatform third party published EPD conforming to ISO 14025 and EN 15804+A2.

1.7. **Coating throughout :** INTERPON D1036 MATT

Polyester powder-coated in accordance with BS EN 12206-1: 2021. Minimum thickness: 60 microns.

Any special warranties or guarantees (such as marine or industrial / chlorine) to be issued directly by the powder supplier and agreed prior to material order.

All finishing to be undertaken by Hydro Building Systems prior to delivery to the manufacturer.

1.7.1. **Qualicoat Classification:** Class 1

1.7.2. **Resistance to Fire:** Classification: A2,s1,d0 with film thickness up to 120 µm (generic polyester D1036, D2525) according to EN13501-1

1.7.3. **Environment:** The polyester powder coated finish shall be applied using enhanced procedures as specified by the powder manufacturer for use in marine environments. The powder manufacturer and applicator shall provide a site specific warranty to the fabricator of agreed years subject to their specified fabrication, maintenance and cleaning procedures being adhered to and the guarantee being requested at the point of order. Enhanced powder applications and guarantees may incur additional lead times to standard.

1.8. **Colour:** Standard Technal finish from standard Technal range.
to be agreed with architect and client provide samples for approval
Jet Black RAL 9005
MARRONE GRIGIASTRO RAL 8019
Umbra Grey RAL 7022
Anthracite Grey RAL 7016 (Satin)

1.9. **Texture:** Matt.

1.10. **Watertightness:** R7 (600 Pa).

1.11. **Air permeability:** A4 (600 Pa).

1.12. **Resistance to wind load:** 2400 Pa (3600 Pa safety).

1.13. **Impact resistance:** E5/I5.

1.14. **Load:** 340 kg.

1.15. **Burglar resistance:** To EN 1627 RC2, RC3 and PAS 24.

1.16. **Aluminium curtain wall frame sections:** Recycled content: Minimum of 75% recycled end-of-life aluminium (post-consumer scrap). Embodied carbon: GWP (A1-A3) of no greater than 1.9 kg of CO₂e/kg of aluminium.

1.17. **Accessories:** Perimeter Seal

1.17.1. **Perimeter Pocket Filler:** Provide

1.17.2. **Perimeter Membrane Carrier:** 1.1.Techal TMZ20007

1.17.3. **Perimeter Membrane :** 1.1.In place of EPDM, use sealing membrane as H11/780A. Membranes to be no more than 250mm in width in accordance with CWCT / SFE "Technical Guidance for interpretation in relation to external walls and specified attachments of Relevant Buildings in England issue 2, July 2023"

1.18. **Opening Lights:** Refer to drawings and schedule for door arrangements. Windows to be provided as part of CW system. Tental top hung concealed opening lights.

- 1.18.1. **Opening Lights Actuators** : MICRO EVO CHAIN ACTUATOR. To each opening light to be linked to BMS Humidity and temperature sensors
- 1.19. **Doors**: Refer to drawings and schedule for door arrangements. Pivot Doors as per L20/480A in single and double dual action.
- 1.20. **Trims, cills and drips**: 2mm thick aluminium flashings and cills to be provided. Backing rod and secret fixing to e provided. PPC coating to match specification of main curtain walling. Refer to details. Cills to provide adequate drip to avoid water falling down surface of walling below.
Provide all other aluminium trims, flashings and cover pieces as per drawings for neat and sealed interface with substrate.
- 1.21. **Blast Mitigation Requirements**: Detailed design to be completed by contractor to demonstrate the blast mitigation recommendations are provided in line with NPSA betterment guidance for stick curtain wall systems.
- 1.21.1. **Mullions**: As a minimum the mullions shall have section properties equal to or greater than the following values. The values listed below are typical of a mullion measuring approximately 50 mm wide and 150 mm deep.
A = 12 cm² (cross-section area)
I_x = 400 cm⁴ (strong-axis second moment of area)
I_y = 40 cm⁴ (weak-axis second moment of area)
W_x = 43 cm³ (strong-axis elastic section modulus)
W_y = 17 cm³ (weak-axis elastic section modulus)
The mullion shall provide 14 mm or greater glass bite.
The mullion sections shall be extruded from aluminium grades EN-AW6060-T6 or EN-AW6060-T66, or stronger.
- 1.21.2. **Transoms**: As a minimum the transom shall have section properties equal to or greater than the following values. The values listed below are typical of a mullion measuring approximately 50 mm wide and 150 mm deep.
A = 12 cm² (cross-section area)
I_x = 295 cm⁴ (strong-axis second moment of area)
I_y = 40 cm⁴ (weak-axis second moment of area)
W_x = 36 cm³ (strong-axis elastic section modulus)
W_y = 17 cm³ (weak-axis elastic section modulus)
The transom shall provide 14 mm or greater glass bite
The transom sections shall be extruded from aluminium grades EN-AW6060-T6 or EN-AW6060-T66, or stronger.
- 1.21.3. **Spigot / Support Brackets**: The aluminium spigot profile should fit tightly inside the mullion section selected. As a minimum the spigot profile shall have section properties equal to
or greater than the following values:
A = 11 cm² (cross-section area)
W_x = 35 cm³ (strong-axis elastic section modulus)
The spigot profile shall have an insertion depth of at least 250 mm into the mullion.
The support bracket connection (i.e. a spigot connected to an endplate and fixings to the structure), which connects the mullion to the structure, shall be stronger than the capacity of the mullions. As a minimum requirement, the detailed design of the connection shall be undertaken for a design load equal to 1.5x the calculated support reaction when the mullions have reached their full plastic bending resistance under a uniformly distributed load (see Annex C for worked example).
As a minimum the detailed design of the connections shall be checked for vertical loads due to self-weight of the façade in combination with the horizontal reaction force. As a minimum, two separate load cases shall be considered.
1) Vertical loads due to self-weight + horizontal reaction acting in the positive (inward) direction.
2) Vertical loads due to self-weight + horizontal reaction acting in the positive (outward) direction.
It is the responsibility of the design engineer to check the connection for additional loads that may arise as part of the specific protect detail i.e. moments caused by

eccentric loads.

For mullions spanning multiple floors, consideration shall be given to the bending moments within the span and over intermediate supports, which will result in a different ultimate resistance of the mullion and therefore different support reactions. The mullion does not require a mechanical connection to the spigot i.e. a bolt through the spigot, when the recommended insertion depth is met.

The spigot and support brackets shall be extruded from aluminium grades ENAW6060-T6 or EN-AW6060-T66, or stronger.

- 1.21.4. **Splice Connection:** The splice connection shall be located away from the area that the maximum bending moment occurs. The designer shall ensure that yielding of the mullion profile will occur within the main span before occurring at the splice connection. This is typically achieved by locating the splice connection between 1/4 and 1/5 of the span height away from a support when the mullions are continuous over multiple floors. The splice sections shall have an insertion depth into each mullion of at least 300mm or two times the depth of the mullion profile, whichever is greater. As a minimum the splice sections shall have section properties equal to or greater than the following values:

$A = 11 \text{ cm}^2$ (cross-section area)

$W_x = 35 \text{ cm}^3$ (strong-axis elastic section modulus)

The splice sections shall be extruded

- 1.21.5. **Mullion - transom connections:** There are several tested and approved connections. Details of these connections are included in CPNIs CSE (Catalogue of Security Equipment).

The use of spring-loaded (button) cleats is not permitted.

If an alternative connection detail is required, the connection strength in the positive and negative horizontal direction shall be proven via testing in accordance with BS EN16758:2016. The connection strength shall be equal to or greater than the approved connections in the CSE.

- 1.21.6. **Thermal Break:** The thread of the pressure plate fixings must breach the sides of the isolator material and engage with the inner sides of the aluminium nose on the mullions and transoms.

- 1.21.7. **Pressure plate and fixings:** Non-metallic pressure plates (e.g. plastic) are not permitted.

Capacity of the pressure plates and pull-out capacity of the fixings that retain the glass panels shall be equal to, or greater than 35 kN/m.

Regardless of the fixing capacity, the spacing of the pressure plate fixings shall be no greater than 150 mm.

- 1.21.8. **Cover Cap:** Standard flat cover caps that do not project more than 25 mm from the external surface of the glass are considered suitable. Following the initial installation, the cover caps must be checked to ensure that they are correctly installed and fully engaged with the pressure plate.

- 1.21.9. **Cover Cap for mounting security screen to Market office:**
Vertical Line to allow screen mounting bracket fixed to side of cap as per drawing A-6931

140 Louvres

1. **Description:** To GS00.6 to BYRAM STREET
2. **Manufacturer:** Refer to MEP Specification for detailed requirements.

Gilberts
Clifton Rd, Blackpool, Lancashire FY4 4QT
United Kingdom

- 2.1. **Product reference:** WD-38 Frameless

3. Material: Aluminium
4. Finish: Powder-coating as per H11/110
 - 4.1. Colour/ texture: as per H11/110
 - 4.2. Minimum film thickness: 60 micrometres
5. Fixing: Secret fixed mechanical fixing
6. Other requirements: 50% Free Area

150 Materials specification

1. Minimum BRE 'Green Guide to Specification' online rating: Contractor's choice
2. Specification of glazing materials to be in accordance with guidance in CIRIA document 'Guidance on glazing at height'.
3. All aluminium frames and other sections to be extruded to EN 12020, EN 573-3, EN 515 and EN 775 -1 to 9 from aluminium alloy specification 6060 T66 comprising a minimum of 75% recycled end-of-life aluminium (post-consumer scrap) and a GWP (A1-A3) of no greater than 1.9 kg of CO₂e/kg of aluminium. Provide EcoPlatform third party published EPD conforming to ISO14025 and EN15804+A2 to confirm the above.
4. 1.All aluminium billets and extrusions to be sourced from cast house and extrusion plants certified by Aluminium Stewardship Initiative (ASI) for Performance Standard and Chain of Custody Standard.

General requirements/ preparatory work

210 Design

1. Curtain walling and associated features: Complete the detailed design. Submit before commencement of fabrication.
2. Related works: Coordinate in the detailed design.
3. Design Calculations: *Due to possible changes of design and usage after the compilation of this specification we recommend that the window fabricator/installer calculate framing requirements to comply with Approved Document K3 and BS6180 with regard to loading and barriers. Wind load calculations relating to framing and profile specifications have been carried out on a preliminary basis only using information available at the time, and a basic form of calculation to BS6399 Pt2 1995 or BS EN1991-1-4. The fabricator/installation contractor should provide detailed wind load calculations based on full and final information at the point of order, based on BS6399 Part 2 1997 or BS EN 1991-1-4.*

215 Design proposals

1. Submission of alternative proposals: General Arrangement and Detailed design drawings indicate intent. Other reasonable proposals will be considered.

220 Specification

1. Compliance standards: BS EN 13830 and The Centre for Window and Cladding Technology (CWCT) 'Standard for systemised building envelopes'.
2. Reference information: For the duration of the contract, keep available at the design office, workshop and on site copies of:
 - 2.1. The CWCT 'Standard for systemised building envelopes'.
 - 2.2. Publications invoked by the CWCT 'Standard for systemised building envelopes'.

230 Information to be provided during detailed design stage

1. Submit the following curtain walling particulars
 - 1.1. A schedule of detailed drawings and dates for submission for comment.

- 1.2. A schedule of loads that will be transmitted from the curtain walling to the structure.
- 1.3. Proposed fixing anchor details relevant to structural design and construction.
- 1.4. A detailed testing programme in compliance with the main contract master programme.
- 1.5. A detailed fabrication and installation programme in compliance with the main contract master programme.
- 1.6. Proposals to support outstanding applications for Building Regulation consents or relaxations.

232 Quality plan

1. Requirement: Submit during detailed design.
2. Content: In accordance with BS EN ISO 9001 and including the following:
 - 2.1. Name of the quality manager.
 - 2.2. Quality assessment procedures.
 - 2.3. Inspection procedures to be adopted in checking the work.
 - 2.4. Stages at which check lists will be used and samples of the lists.
 - 2.5. List of work procedures on the correct use of materials or components, both off site and on site.
 - 2.6. List of product information with latest revisions.
 - 2.7. Subcontractors involved in the work.
 - 2.8. Subcontractors' quality plans.
 - 2.9. Storage, handling, transport and protection procedures.
 - 2.10. Procedure for registering and reporting non compliances.
 - 2.11. Maintenance procedures and calibration records.
 - 2.12. Certification that completed work complies with specification.
 - 2.13. Check list register to ensure all items have been inspected and non compliances discharged.

235 Information to be provided before commencement testing or fabrication of curtain walling

1. Submit the following curtain walling particulars
 - 1.1. Detailed drawings to fully describe fabrication and installation.
 - 1.2. Detailed calculations to prove compliance with design/ performance requirements.
 - 1.3. Project specific fabrication, handling and installation method statements.
2. Certification for incorporated components manufactured by others confirming their suitability for proposed locations in the curtain walling.
 - 2.1. Recommendations for spare parts for future repairs or replacements.
3. Recommendations for safe dismantling and recycling or disposal of products.

240 Information to be provided before commencement of structural sealant/ bonded glazing

1. Submit structural bonding sealant manufacturer's project specific approval for
 - 1.1. Compatibility and adhesion of products and finishes.
 - 1.2. Full details of structural sealant/ bonded glazing design.
 - 1.3. Structural sealant dimensions.
 - 1.4. Project specific sealant application method statement.

250 Product samples

1. General: Before commencing detailed design, submit labelled samples of: Louvre panels and decorative screen .

260 Samples of fixings

1. General: During detailed design, submit labelled samples of each type of fixing anchor, including casting-in restraints and shims, together with manufacturers' recommended torque figures.

270 Fabrication samples

1. General: During detailed design, submit samples of: Colour swatches of reasonable size to demonstrate appearance and following final Mullions and Transoms in agreed final colour .
 - 1.1. Obtain approval of appearance before proceeding.

Design/ performance requirements

305 CWCT 'Standard for systemised building envelopes'

1. General: Unless specified or agreed otherwise comply with:
 - 1.1. Part 2 - 'Loads, fixings and movement'.
 - 1.2. Part 3 - 'Air, water and wind resistance'.
 - 1.3. Part 4 - 'Operable components, additional elements and means of access'.
 - 1.4. Part 5 - 'Thermal, moisture and acoustic performance'.
 - 1.5. Part 6 - 'Fire performance'.
 - 1.6. Part 7 - 'Robustness, durability, tolerances and workmanship'.
2. Project performance requirements specified in this subsection: Read in conjunction with CWCT performance criteria.

311 Integrity

1. Requirement: The curtain walling must resist wind loads, dead loads and design live loads, and accommodate deflections and movements without damage.
2. Design wind pressure: Maximum calculated wind pressure but not less than 800 Pa
3. Impact performance: Hard and soft body impact loads - curtain walling to BS EN 14019: curtain walling frame and infill materials to BS EN 14019:2016 Class E5 / Class I5 and CWCT TN075.
 - 3.1. Safety impact requirements: To CWCT TN 75, negligible risk
 - 3.2. Serviceability impact requirements: CWCT TN 75, serviceability class 3
 - 3.3. External impact exposure: In accordance with CWCT TN 75: category A.
4. Permanent imposed loads: Signage and Lighting
5. Temporary imposed loads: Ladders

320 Deflection under dead loads

1. Requirement: Framing members parallel to the curtain walling plane must not:
 - 1.1. Reduce glass bite to less than 75% of design dimension.
 - 1.2. Reduce edge clearance to less than 3 mm between members and immediately adjacent glazing units, panel/ facing units or other fixed units.
 - 1.3. Reduce clearance to less than 2 mm between members and movable components such as doors and windows.

325 Deflection under wind load

1. Requirement: To CWCT 'Standard for systemised building envelopes' clause 3.5 2 and the following additional requirements: None.
2. Additional stiffness to CWCT 'Standard for systemised building envelopes' clause 3.5 4.2: Not allowed

330 General movement

1. Requirement: Curtain walling must accommodate anticipated building movements as follows:
Structural Steel deflection: As required by Structural Engineer Horizontal= 10mm Vertical = 8mm .

332 Appearance and fit

1. Requirement: Design curtain walling system:
 - 1.1. To ensure position and alignment of all parts and features as shown on preliminary design drawings.
 - 1.2. To accommodate deviations in the primary support structure.
2. Primary support structure: Before commencing installation of curtain walling system, carry out survey sufficient to verify that required accuracy of erection can be achieved.
 - 2.1. Give notice: If the structure will not allow the required accuracy or security of erection.
 - 2.2. Design tolerances: Where existing PFCs are present - Site measure and survey is required to every instance by Contractor. Opening sizes within the schedules are nominal for pricing purposes only. In these instances the installer is to show horizontal tolerances on shop drawings prior to fabrication.

New steelwork structural openings including the new horizontal members fixed to existing PFCs require steelwork fabrication tolerance + deflection allowance.

3. Curtain wall envelope zone tolerances
 - 3.1. Width: The curtain wall shall be designed to fit the *as-built* opening measured on site by the fabricator. Nominal structural openings are provided or pricing purposes. Maximum allowable tolerance to be +0 to +10 mm.

All New steelwork to be installed in accordance with tolerances with The National Structural Steelwork Specification by Contractor.

The Contractor shall design connections and brackets to accommodate this envelope. Finished line/level/plumb shall meet CWCT tolerances of ± 2 mm in any one storey height or structural bay and ± 5 mm overall. Contractor to carry out and submit a pre-manufacture site survey and shop drawings for approval prior to fabrication.

- 3.1.1. Critical reference location: -
4. Maximum permitted component and installation tolerances: Panel length ± 2 mm.
Panel width ± 1 mm.
Panel tolerance ± 2 mm, installation tolerance ± 2 mm, overall = ± 4 mm.

335 Thermal movement – service temperature ranges

1. Requirement: To CWCT 'Standard for systemised building envelopes' clause 2.7.2 amended and/or with the addition of the following: None.

340 Air permeability

1. Requirement: Permissible air leakage rates of $1.5 \text{ m}^3/\text{hr}/\text{m}^2$ for fixed lights and $2.0 \text{ m}^3/\text{hr}/\text{lin.m}$ for opening lights must not be exceeded when the curtain walling is subjected to the peak test pressure.
2. Permeability class to BS EN 12152: AE

- 2.1. Peak test pressure: 1500Pa Tentel 50 TT standard cap.
1200Pa Tentel 50 TT VL/HL

350 Water penetration

1. Watertightness class to BS EN 12154: RE
 - 1.1. Peak test pressure: 1200Pa Tentel 50 TT standard cap.
1200Pa Tentel 50 TT VL/HL
2. Additional requirements: Water Tightness to CWCT Test: Static water tightness : 600 Pa
Dynamic water tightness 600 Pa (test sequence B)

370 Thermal properties

1. Method of calculating the thermal transmittance (U-value) of curtain walling/ each zone of curtain walling: Weighted U-value.
2. Average U-value of curtain walling: 1.6W/m²K
3. Curtain wall zone interfaces: Co-ordinate to achieve required average U-value.
4. Method for assessing thermal transmittance (U-value) of assemblies: By calculation

380 Solar and light control

1. Note: Solar performance of glass to be confirmed with architect and following BCO approval prior to ordering. Calculations shown here are for pricing based on best information available at time of writing.
2. Total solar energy transmission
 - 2.1. Maximum g-value - glazing only: 0.58
 - 2.2. Maximum effective g-value - glazing with shading devices: Not applicable
3. Visible light transmission
 - 3.1. Minimum light transmission - glazing only: 80%
 - 3.2. Minimum effective light transmission - glazing with shading devices: Not applicable

385 Thermal stress in glazing

1. Glass panes/ units: Must have adequate resistance to thermal stress generated by orientation, shading, solar control and construction.

390 Avoidance of condensation

1. Requirement: Notional psychrometric conditions under which condensation must not form on building interior surfaces of framing members or any part of infill panels/ facings are:
 - 1.1. Notional outdoor psychrometric conditions as BS 5250.
 - 1.2. Notional indoor psychrometric conditions
 - 1.2.1. Temperature: 15°C
 - 1.2.2. Relative humidity: 35%
 - 1.2.3. Vapour pressure: 0.6 kPa

410 Sound transmittance

1. Minimum weighted sound reduction index (R_w) to BS EN ISO 717-1
 - 1.1. Between internal and external surfaces of curtain walling: 1.1.Up to 43 dB (C, Ctr; -1, -3) for Tentel 50 CPP SC

426 Reaction to fire of curtain walling

1. Standard: To BS EN 13501-1.

- 1.1. Class: B-s3, d2 or better

430 Fire stopping

1. Locations: At junctions of curtain walling with compartment or separating walls and floors.
2. Materials and methods of fixing: To ensure fire resistance not less than that specified for compartment or separating walls and floors when tested from both sides.

435 Opening lights (Windows)

1. Requirement : Refer to L10 for Window Type
2. Performance criteria: To CWCT 'Standard for systemised building envelopes', part 3
3. Security
 - 3.1. Applicable opening lights: All
 - 3.2. Security rating: To PAS 24
4. Opening lights restrictive catches to CWCT 'Standard for systemised building envelopes' clause 4.2.5: To all opening lights
5. Ventilation requirement: Approved Doc F
6. Windows to be cleaned from inside of the building: None
7. Fasteners: Concealed multipoint, operated by an internal handle.
8. Integral locks: Suited to pass same key

436 Doors and other access facilities

1. Requirement: Refer to L20 for Door Type
2. Performance criteria: To CWCT 'Standard for systemised building envelopes', part 3
3. Access facilities designated for use by disabled persons: As schedule
4. Strength and durability: To CWCT 'Standard for systemised building envelopes' clause 4.3.3.
 - 4.1. Forces and tests: No additional requirements
5. Security
 - 5.1. Applicable doors: All
 - 5.2. Security rating: To PAS 24-1

437 Louvres

1. Performance classification to BS EN 13030.
 - 1.1. Discharge operation: Outlet
 - 1.2. Water penetration class: B
 - 1.3. Discharge/ entry loss coefficient class: 2

440 Durability

1. Relevant agents or degradation mechanisms: U-V Exposure
Airborne pollutants (SOx, NOx from traffic, combustion).
Particulates (PM10/PM2.5, dust, grit) – abrasive and may clog louvre blades.
Urban grime (diesel residues, soot) – affects appearance and cleaning frequency.
Salt exposure (low-moderate) if within reach of gritted roads in winter (De-icing salts can accelerate corrosion).
2. Design life of the curtain walling system: Not less than 25 years
3. Secondary components: Submit details together with required maintenance regime, replacement periods and methods of replacement.

445 Lightning protection system

1. Curtain wall components used as part of lightning protection system: None

450 Safety

1. Finished surfaces of curtain walling: Accessible internal and external areas must not:
 - 1.1. Have irregularities capable of inflicting personal injury.
 - 1.2. Release irritant or staining substances.

460 Structural sealant/ bonded glazing requirements

1. Structural sealant/ bonded glazing units: Installable, removable and replaceable without site application of structural bonding sealant.
2. Structural sealant/ bonded glazing design: Must limit design tensile stress of sealants to 138 kPa.

Breem performance requirements - Not Used

Testing

510 Comparison (type) testing

1. Requirement: To CWCT 'Standard for systemised building envelopes', part 8.
2. Test results and reports: Before commencement of curtain walling fabrication and installation, submit proof of compliance with this specification.

515 Project testing (laboratory)

1. Test results and reports: Before commencement of curtain walling fabrication and installation, submit proof of compliance with this specification.

520 Project testing (site)

1. Test results and reports: Before installation of general areas of curtain walling, submit proof of compliance with this specification.

530 Testing authority

1. Requirement: Project testing must be carried out by a United Kingdom Accreditation Service (UKAS) approved independent laboratory.

540 Test specimen

1. Arrangement and overall dimensions: Mullions and Transoms on a typical external screen.
2. Features: none

550 Test sequence – standard laboratory tests

1. Requirement: To CWCT 'Standard for systemised building envelopes', Standard sequence A, clause 8.12.1, and as follows:
2. Air permeability (infiltration): To CWCT clause 8.6.
 - 2.1. Peak test pressure: As clause 340. 600Pa
 - 2.2. Method of identifying areas of concentrated air leakage: Back of hand
3. Air permeability (exfiltration): To CWCT clause 8.6.
 - 3.1. Peak test pressure: As clause 340.600Pa
 - 3.2. Allowable exfiltration rates: As clause 345.
 - 3.3. Method of identifying areas of concentrated air leakage: Back of hand

4. Water penetration resistance - static: To CWCT clause 8.7.1.
 - 4.1. Peak test pressure: As clause 350. 600Pa
5. Wind resistance - serviceability: To CWCT clause 8.8.
 - 5.1. Peak test pressure: Equal to design wind pressure specified in clause 2400Pa.
 - 5.2. Position of displacement measuring devices: suggest location for agreement
 - 5.3. Allowable elastic and residual deformation: 1/500 of the span, measured between points of attachment to the building, one hour after the loading has been removed.
6. Air permeability (infiltration): Repeat as above.
7. Air permeability (exfiltration): Repeat as above.
8. Water penetration resistance - static: Repeat as above.
9. Hose test: To CWCT clause 8.16.2.
 - 9.1. Joints to be tested: Sample representative of types
10. Wind resistance - safety: To CWCT clause 8.8.
 - 10.1. Peak test pressure: Equal to 1.5 times design wind pressure specified in clause 3600Pa.
 - 10.2. Position of displacement measuring devices: suggest location for agreement
 - 10.3. Allowable residual deformation: 1/500 of the span, measured between points of attachment to the building, one hour after the loading has been removed.
11. Impact - safety: I5/E5 To CWCT clause 8.10
12. Dismantle inspect and record.

555 Test sequence – standard laboratory tests

1. Requirement: To CWCT 'Standard for systemised building envelopes', Standard sequence B, clause 8.12.2, and as follows:
2. Air permeability (infiltration): To CWCT clause 8.6.
 - 2.1. Peak test pressure: As clause 340. 600Pa
 - 2.2. Method of identifying areas of concentrated air leakage: Back of hand
3. Air permeability (exfiltration): To CWCT clause 8.6.
 - 3.1. Peak test pressure: As clause 340. 600Pa
 - 3.2. Allowable exfiltration rates: As clause 345.
 - 3.3. Method of identifying areas of concentrated air leakage: Back of hand
4. Water penetration resistance - static: To CWCT clause 8.7.1.
 - 4.1. Peak test pressure: As clause 350. 600Pa
5. Wind resistance - serviceability: To CWCT clause 8.8.
 - 5.1. Peak test pressure: Equal to design wind pressure specified in clause 2400Pa.
 - 5.2. Allowable elastic and residual deformation: 1/500 of the span, measured between points of attachment to the building, one hour after the loading has been removed
6. Air permeability (infiltration): Repeat as above.
7. Air permeability (exfiltration): Repeat as above.
8. Water penetration resistance - static: Repeat as above.
9. Water penetration resistance - dynamic: To CWCT clause 8.7.2.
 - 9.1. Test method: Dynamic fan
 - 9.2. Test pressure: As clause 350.
10. Hose test: To CWCT clause 8.16.2.
 - 10.1. Joints to be tested: Sample representative of types
11. Wind resistance - safety: To CWCT clause 8.8.

- 11.1. Peak test pressure: Equal to 1.5 times design wind pressure specified in clause 3600Pa.
- 11.2. Allowable residual deformation: 1/500 of the span, measured between points of attachment to the building, one hour after the loading has been removed
12. Impact - safety: I5/E5 To CWCT clause 8.10
13. Dismantle inspect and record.

635 Site hose test

1. Requirement: To CWCT 'Standard for systemised building envelopes' Section 8.16.2, 'Standard test methods for building envelopes' Section 9.
 - 1.1. Joints to be tested: -

660 Structural sealant/ bonded glazing tests

1. Product samples: Provide the structural bonding sealant manufacturer with framing profiles, glass, gaskets, assembly/ weathering sealants and other curtain walling products that are proposed for contact with structural bonding sealant.
2. Testing: By sealant manufacturer to determine compatibility and adhesion of structural bonding sealant under specified design loadings.
3. Modification of product to enable compliance with test criteria: Details must be recorded in the sealant manufacturer's project specific approval.

Products

710 Aluminium alloy framing sections

1. Standard: To relevant parts of BS EN 515, BS EN 573, BS EN 755 and BS EN 12020.
2. Alloy, temper and thickness: Suitable for the application and specified finish. Aluminium alloy to BS EN 755-9: 2016, Specification EN-AW-6060 T66. Tolerances in accordance with EN12020-2: 2017
3. Structural members: To BS EN 1999-1-1.

712 Aluminium alloy sheet

1. Standards: To relevant parts of BS EN 485, BS EN 515 and BS EN 573.
2. Alloy, temper and thickness: Suitable for the application and specified finish.

715 Carbon steel framing sections/ Reinforcement

1. Standards: To relevant parts of BS 7668, BS EN 10029, and BS EN 10210.
2. Thickness: Suitable for the application, and for galvanizing or other protective coating.

717 Carbon steel sheet

1. Standards: To relevant parts of BS 1449-1, BS EN 10048, BS EN 10051, BS EN 10111, BS EN 10131, BS EN 10132, BS EN 10139, BS EN 10140, BS EN 10149, BS EN 10209 and BS EN 10268.
2. Grade and thickness: Suitable for the application, and for galvanizing or other protective coating.

720 Stainless steel sheet

1. Standards: To relevant parts of BS EN 10029, BS EN 10048, BS EN 10051, BS EN 10095 and BS EN ISO 9445.
2. Grade: To BS EN 10088-2, austenitic 1.4301 (304) generally, 1.4401 (316) when used externally or in severely corrosive environments.
3. Thickness: Suitable for the application.

730 Mechanical fixings

1. **Stainless steel:** To BS EN ISO 3506, grade A2 generally, grade A4 when used in severely corrosive environments.
2. **Carbon steel:** To BS 4190 and suitable for galvanizing or other protective coating.
3. **Aluminium brackets, rivets and shear pins:** To relevant parts of BS EN 755.

732 Adhesives

1. **General:** Not degradable by moisture or water vapour, or exposure to UV light.

735 Fixing anchors

1. **Type and use:** Reviewed and approved by fixing manufacturers. Submit confirmatory information on request.
2. **Dimensions:** Not less than recommended by their manufacturers.
3. **Adjustment capability:** Sufficient in three dimensions to accommodate building structure and curtain walling fabrication/ installation tolerances.

737 Glass generally

1. **Standards:** To BS 952 and relevant parts of:
 - 1.1. BS EN 572 for basic soda lime silicate glass.
 - 1.2. BS EN 1096 for coated glass.
 - 1.3. BS EN 1748 for borosilicate glass.
 - 1.4. BS EN 1863 for heat-strengthened soda lime silicate glass.
 - 1.5. BS EN 12150 for thermally toughened soda lime silicate glass.
 - 1.6. BS EN 13024 for thermally toughened borosilicate glass.
 - 1.7. BS EN ISO 12543 for laminated glass.
2. **Selection of glass type and thickness** in accordance with recommendations of CIRIA publication 'Guidance on glazing at height'.
3. **Glass quality:** Clean and free from obvious scratches, bubbles, cracks, ripples, dimples and other defects.
4. **Glass edges:** Generally undamaged. Shells and chips not more than 2 mm deep and extending not more than 5 mm across the surface are acceptable if ground out.

739 Dimensional tolerances on glass

1. **Description:** ALL
2. **Measurement of tolerances:** Before any thermal toughening/ heat-strengthening.
3. **Pane dimensions less than 1500 mm**
 - 3.1. For 3 to 6 mm-thick glass: ± 1.0 mm.
 - 3.2. For 8 to 12 mm-thick glass: ± 1.5 mm.
 - 3.3. For 15 mm-thick glass: ± 2.0 mm.
 - 3.4. For 19 mm and 25 mm-thick glass: ± 2.5 mm.
4. **Pane dimensions more than 1500 mm**
 - 4.1. For 3 to 6 mm-thick glass: ± 1.5 mm.
 - 4.2. For 8 to 12 mm-thick glass: ± 2.0 mm.
 - 4.3. For 15 mm-thick glass: ± 2.5 mm.
 - 4.4. For 19 mm and 25 mm-thick glass: ± 3.0 mm.
5. **Pane squareness:** Not more than 4 mm difference in diagonal measurements.

741 Distortional tolerances on glass

1. Description: All
2. Measurement of tolerances: After any thermal toughening/ heat-strengthening.
3. Maximum bow: 0.2% of pane dimension.
4. Maximum roller wave
 - 4.1. For 3 to 5 mm-thick glass: 0.5 mm.
 - 4.2. For 6 to 10 mm-thick glass: 0.3 mm.
 - 4.3. For 12 mm and thicker glass: 0.15 mm.
5. Maximum edge dip
 - 5.1. For 3 to 5 mm-thick glass: 0.8 mm.
 - 5.2. For 6 to 10 mm-thick glass: 0.5 mm.
 - 5.3. For 12 mm and thicker glass: 0.25 mm.

742 Heat-soaked thermally toughened glass

1. Standard: To BS EN 14179.
 - 1.1. Holding period: 2 hours
2. Locations of heat-soaked glass: All tempered glass

745 Insulating glass units

1. Standard and labels for hermetically sealed units: To BS EN 1279.
2. Label: Each pane.
3. Colour of aluminium perimeter spacers: Black
4. Perimeter taping: Not to be used.
5. Perimeter seals
 - 5.1. Resistant to UV light degradation on exposed edges.
 - 5.2. Compatible with structural, assembly and weather sealants.

747 Glass edge condition for structural sealant/ bonded glazing

1. Bonded, unframed outer edges: Flat ground with a small arris suitable for open jointing or for weatherseal jointing.

760 Gaskets

1. Material
 - 1.1. Noncellular rubber to BS 4255-1.
 - 1.2. Cellular rubber to ASTM-C509-06.
2. Continuity: Outer gaskets of single front sealed curtain walling systems and inner gaskets of drained and ventilated or pressure equalized curtain walling systems must be formed in a complete frame with sealed joints. Vulcanized rubber gaskets must have factory moulded corner joints.
3. Durability: Resistant to oxidation, ozone and UV degradation.

765 Weatherstripping of opening units

1. Material
 - 1.1. Noncellular rubber to BS 4255-1.
 - 1.2. Cellular rubber to ASTM-C509-06.
 - 1.3. Polypropylene woven pile, silicone treated.

2. **Attachment:** Fixed in undercut grooves in framing sections using preformed corners, with any joints in the length.

770 General sealants

1. **Selection:** In accordance with BS 6213 from:
 - 1.1. Silicone.
 - 1.2. One part polysulfide.
 - 1.3. Two parts polysulfide.
 - 1.4. One or two parts polyurethane.
2. **Classification and requirements:** To BS EN ISO 11600.
3. **Reaction to contact products and finishes:** Stable and compatible.

772 Curtain walling joint assembly sealants

1. **Material:** One part, low modulus silicone to BS EN ISO 11600, type F or G. Neutral curing where in contact with or close proximity to other products that may be adversely affected by acetoxy curing.
2. **Manufacturer:** Refer to the Tentall 50/60 Design and Fabrication manuals
 - 2.1. **Product reference:** Refer to the Tentall 50/60 Design and Fabrication manuals

775 Bonding sealants for structural sealant/ bonded glazing

1. **Material:** Silicone, neutral curing, designed and manufactured for bonding of structural sealant/ bonded glazing. Compatible with contact and close proximity products and finishes.
2. **Manufacturer:** Refer to the Tentall 50/60 Design and Fabrication manuals
 - 2.1. **Product reference:** Refer to the Tentall 50/60 Design and Fabrication manuals

777 Weathersealing for structural sealant/ bonded glazing

1. **Material:** Silicone, one or two parts, neutral curing. Designed and manufactured for weathersealing of structural sealant/ bonded glazing. Compatible with contact and close proximity products and finishes.
2. **Manufacturer:** Refer to the Tentall 50/60 Design and Fabrication manuals
 - 2.1. **Product reference:** Refer to the Tentall 50/60 Design and Fabrication manuals
3. **Colour:** Black

780A Plastics sheets Seal to all Curtain walling and interface with structure

1. **Manufacturer:** [OBEX Protection Ltd](#)
 - 1.1. **Contact details**
 - 1.1.1. **Address:** Unit 5
St Modwen Park
Norton Road
Worcester
Worcestershire
United Kingdom
WR5 2QR
 - 1.1.2. **Telephone:** [+44 \(0\)1905 337800](tel:+44(0)1905337800)
 - 1.1.3. **Web:** <https://obexglobal.com/uk>
 - 1.1.4. **Email:** Sales-UK@obexglobal.com
 - 1.2. **Product reference:** [OBEX CORTEX 0500FR Class B ISM \(Interface Sealing Membrane\)](#)
[Including OBEX CORTEX 0771FR Class B Paste Adhesive](#)

2. Material: Manufacturer's standard.
3. Purpose: UV resistant, watertight, airtight and fire protection.
4. Standard: To BS EN 13984.
5. Third-party certification: British Board of Agrément (BBA) certificate 17/5396 Product Sheet 1.
6. Performance characteristics
 - 6.1. Tensile strength (minimum): 2200–2100 N/50 mm.
 - 6.2. Tear resistance: 230 N.
 - 6.3. Elongation to break: 25.73% (warp) and 29.48% (weft).
 - 6.4. Water vapour resistance (minimum): 59 MN·s/g.
 - 6.5. Fire performance: To EN 13501-1, B-s3, d0.
 - 6.6. UV stabilization: To BS EN 13984, 5000 hours.
7. Physical properties
 - 7.1. Colour: Black.
 - 7.2. Dimensions
 - 7.2.1. Thickness (minimum): 0.50 mm.
 - 7.2.2. Width (minimum): 50–1500 mm.
 - 7.2.3. Roll length (minimum): 20 m.
8. Integral accessories: Cortex 0771FR Class B Paste Adhesive. Cortex 0787FR Class B Primer.
9. Temperature resistance: To DIN EN 1876-1, -40°C to +70°C.
10. Environmental stress crack resistance: To DIN 53359A, 100 000 x.
11. UV resistance: 10+ years.
12. Layer thickness: Equivalent air layer thickness, to EN 1931: 12 m (Sd value).
13. Water vapour permeability: To EN 1931, 23 726 µ.

Finishes

810 Protective coating of carbon steel framing sections/ Reinforcement

1. Treatment: One of the following to all surfaces:
 - 1.1. Hot dip galvanized to BS EN ISO 1461.
 - 1.2. An appropriate equivalent coating to BS EN ISO 12944-5 or BS EN ISO 14713-1, -2 and -3.

820 Protective coating of carbon steel mechanical fixings

1. Treatment: One of the following to all surfaces:
 - 1.1. Hot dip galvanized to BS EN ISO 1461.
 - 1.2. Sherardized to BS 7371-8, Class 30 coating thickness and passivated.
 - 1.3. Zinc plated to BS EN ISO 2081, coating designation Fe//Zn//C for an iridescent (yellow passivate) chromate conversion coating or Fe//Zn//D for an opaque (olive green) chromate conversion coating.

830 Powder-coating

1. Requirement: As section Z31.

840 Anodizing

1. Requirement: As section Z33.

860 Treatment of timber cut on site

1. Requirement
 - 1.1. Cutting and machining: Carry out as much as possible before full treatment of raw materials.
 - 1.2. Minor cutting drilling: Treat exposed timber surfaces with two flood coats of a solution recommended by main treatment solution manufacturer.
 - 1.3. Extensive processing should not be allowed.

Fabrication and installation

910 Generally

1. Electrolytic corrosion: Prevent. Submit proposed methods.
2. Fixings: Concealed unless indicated on detailed drawings. Where exposed they must match material and finish of the products fixed.
3. Fabrication: Machine cut and drill products in the workshop wherever possible.
4. Identification of products: Mark or tag to facilitate identification during assembly, handling, storage and installation. Do not mark surfaces visible in the completed installation.

912 Metalwork

1. Requirement: As section Z11, unless specified otherwise in this section.

915 Glazing

1. Requirement: As section L40, unless specified otherwise in this section.
2. Directional patterned/ wired glass: Generally fix parallel to surround and align adjacent panes where seen together at close quarters.

917 Fixings/ Adhesives application

1. Requirement: As section Z20, unless specified otherwise in this section.

920 Sealant application

1. Requirement: As section Z22, unless specified otherwise in this section.

925 Structural sealant/ bonded glazing

1. Curing: Do not transport units until structural bonding sealant has adequately cured for the period stated in the project specific approval.

930 Assembly

1. General: Carry out as much assembly as possible in the workshop.
2. Joints (other than movement joints): Rigidly secured, reinforced where necessary and fixed with hairline abutments.
3. Displacement of components in assembled units: Submit proposals for reassembly on site.

935 Openable windows in naturally ventilated buildings

1. Location: Over 10 m from sources of external pollution

955 Fixing anchor installation

1. Site drilling or cutting into structure: Submit proposals for positions other than shown on detailed drawings.

2. Concrete supporting structure
 - 2.1. Cast-in inserts: Provide detailed locational information. Protect cavities in inserts from entry of concrete.
 - 2.2. Edge fixing distances: Not less than recommended by fixing anchor manufacturers.
3. Corrective fabrication: Minimize. Where necessary, submit proposals.

965 Preliminary curtain walling installation

1. Requirement: Complete an area for inspection and approval of appearance as follows: to be agreed prior to fabrication to match sequencing requirements.

970 Curtain walling installation

1. Securing to fixing anchors: Through holes formed during fabrication only.
2. Tightening mechanical fasteners: To manufacturer's recommended torque figures. Do not overtighten fasteners intended to permit differential movement.
3. Protective coverings: Remove only where necessary to facilitate installation and from surfaces that will be inaccessible on completion.

975 Welding

1. In situ welding: Not permitted.

978 Installing fire and smoke stops

1. Fire and smoke stops: To be located at all junctions between the curtain wall and compartment or separating walls and floors. To be installed strictly in accordance with manufacturers' guidelines and as recommended in CWCT Technical Note TN 98.
2. Installer qualification: To be a member of a UKAS-accredited installer scheme.

980 Interfaces

1. Flashings, closers, etc: Locate and form correctly to provide weathertight junctions with the curtain walling.

982 Ironmongery

1. Assembly and fixing: Accurately, using fasteners with matching finish supplied by ironmongery manufacturer.
2. Completion: Check, adjust and lubricate as necessary to ensure correct functioning.

985 Maintenance

1. Maintenance manual: Incorporate details within the Building Manual in accordance with CWCT 'Standard for systemised building envelopes' clause 7.6.1.
 - 1.1. Materials certification and test reports to be included: CoP and data sheets for ironmongery
- Ω End of Section



Specification created using NBS Chorus