

AFL Architects

NMGH -MULTI STOREY CAR PARK

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Tender Issue

P2

01-02-2022

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Status B, With Comments (S3-DO NOT CONSTRUCT TO)

H11

Curtain walling

Clauses

001 Revision

1. P1 - First Issue
2. P2 - Added 110B
- 3.

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 13830:2003. 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 built-up.
 - 1.4. Technical information and certification demonstrating compliance with specification of proposed incorporated products and finishes, including
 - 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

110A Curtain wall system

1. Manufacturer: Kawneer UK Ltd.
 - 1.1. Web: www.kawneer.co.uk.
 - 1.2. Email: kawneerAST@arconic.com.
 - 1.3. Product reference: AA®100 Aluminium 50 mm Stick Curtain Wall System
2. Type: Vertically capped/ horizontally silicone-glazed/ rubberized pressure plate
3. Size: Refer to curtain walling detail
4. Glazing/ infill thickness:
 - 4.1. 6.2mm Laminated outer pane, including glazed doors.

- 4.2. 16mm black spacer Argon filled cavity
- 4.3. 6mm toughened inner pane
5. Glazing U-value: to achieve G 0.32, and U value whole window 1.6 W/m²K, pane value 1.0 W/m²K
6. Drainage: Mullion or Zone
7. Finish: Permacover polyester powder-coated to BS 6495
8. Colour:
 - 8.1. Internal: 7016 antracite grey
 - 8.2. External: 7016 antracite grey
9. Film thickness: TBC
10. Manifestation: Bespoke applied graphic manifestation to all panes, two levels per pane.
11. Ironmongery: Allow
12. Door System AA 720 Series Door Systems – allowance for panic hardware and access control
13. Colour:
 - 13.1. Internal: [7016 antracite grey].
 - 13.2. External: [7016 antracite grey].

110B Curtain wall system

1. Manufacturer: Kawneer UK Ltd.
 - 1.1. Web: www.kawneer.co.uk.
 - 1.2. Email: kawneerAST@arconic.com.
 - 1.3. Product reference: AA® 100 FR (EI 60/60)
2. Type: Stick system Pressure equalised Zone drained
3. Internal framing member: To be confirmed by Kawneer Approved Dealer
4. Size: Refer to curtain walling detail
5. Glazing/ infill thickness:
 - 5.1. 40 Microns unless in a marine environment
 - External cover cap: Standard 16mm and 20mm face caps
6. Colour: Kawneer Permacover (colour and finish TBC by Architect)
7. Material: Aluminium
8. Finish: Powder coating
9. Glazing: to comply with Test Report CF 811-A (refer to product manual/test report for glazing options).
 - Glazing Units: Contraflam 60-3 Climaplus.
 - Glazing system: Gaskets as clause 760 including a 'batman' gasket fitted into the nose of the member. with steel reinforcement 272884 at 250mm centres. Intumescent gaskets are to be used throughout.

150 Materials specification

1. Minimum BRE 'Green Guide to Specification' online rating: Submit proposals
2. Specification of glazing materials to be in accordance with guidance in CIRIA document 'Guidance on glazing at height'.

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.

215 Design proposals

1. **Submission of alternative proposals:** Preliminary design drawings indicate intent. Other reasonable proposals will be considered.

220 Specification

1. **Compliance standards:** BS EN 13830:2003 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.
- 1.4. Certification for incorporated components manufactured by others confirming their suitability for proposed locations in the curtain walling.
- 1.5. Recommendations for spare parts for future repairs or replacements.
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: glazing panel and frame approximately 2 sqm .

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.

280 Mock-Up

1. General: Construct during detailed design work in an approved location. Obtain approval of appearance before proceeding. Retain undisturbed until completion of curtain walling installation.
2. Extent: To be confirmed
3. Purpose: To serve as an installation reference panel

Design/ performance requirements

305 CWCT 'Standard for systemised building envelopes'

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

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.

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 6229, Table A1.
 - 1.2. Notional indoor psychrometric conditions
 - 1.2.1. Temperature: 20°C
 - 1.2.2. Relative humidity: 40%
 - 1.2.3. Vapour pressure: 0.93 kPa

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.

437 Louvres

1. Performance classification to BS EN 13030.
 - 1.1. **Discharge operation:** Outlet
 - 1.2. **Water penetration class:** To be confirmed
 - 1.3. **Discharge/ entry loss coefficient class:** To be confirmed

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.

Breeam performance requirements

480 View out

1. Glazed areas/ opening sizes and position: Designed to meet BREEAM 'View out' criteria for relevant building type.
2. Submit design plan and elevation drawings showing the following
 - 2.1. All BREEAM defined 'relevant areas' dependant on building type and room depths.
 - 2.2. Actual or notional workstation/ desk layouts.
 - 2.3. Glazed areas/ open areas.
3. Submit site plan showing: Building location and proximity to external obstructions.

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.

655 Wind load fatigue test, small specimen

1. Requirement: To CWCT 'Standard for systemised building envelopes', 'Standard test methods for building envelopes' Section 14.
 - 1.1. Test sequence: As CWCT 'Standard for systemised building envelopes' Table 8.1

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.
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:**
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.

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 part polysulfide.
 - 1.4. One or two part polyurethane.
2. **Classification and requirements:** To BS EN ISO 11600.

3. Reaction to contact products and finishes: Stable and compatible.

780 Thermal insulation

1. Material: Mineral wool boards
 - 1.1. Recycled content: Submit proposals
 - 1.2. Properties: Durable, rot and vermin proof and not degradable by moisture or water vapour.
2. Fixing: Attached to or supported within the curtain walling so as not to bulge, sag, delaminate or detach during installation or in situ during the life of the curtain walling.

785 Air and vapour control layer

1. Acceptable materials
 - 1.1. Aluminium alloy.
 - 1.2. Carbon steel, galvanized or protective coated.
 - 1.3. Stainless steel.
 - 1.4. Reinforced membranes: Foil, plastics or rubbers, protected both sides by rigid facings/linings.
2. Location: Warm side of thermal insulation.
3. Integrity: Continuous, free from gaps and sealed at joints.

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.

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.

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.

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:** Permitted, subject to completion of and compliance with a 'hot work permit' form

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:** 2 copies

Ω End of Section

Status B, With Comments (S3-DO NOT CONSTRUCT TO)



Specification created using NBS Chorus