1975 Commonwealth House
(1 New Oxford Street)

26/01/2016

Specification
Section L10: Issue For Construction

1975_SP004 Rev. C01 L10 Windows Glass Louvres

ORMS
1 Oliver's Yard

55-71 City Road

London EC1Y 1HQ

This issue releases 'For Construction' information for the following Specification clauses :

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L10 WINDOWS/ GLASS/ LOUVRES

To be read in conjunction with Section A and other related sections of the Specification, Preliminaries and Contract Conditions.

L10.100 COMPLIANCE AND SCOPE

COMPLIANCE

L10.101 General

a) Refer to and comply with clause A.302 describing the obligations of design responsibility applying to the works described within this Specification section.

b) Post Contract award the Contractor may obtain the services of a specialist Sub-Contractor to undertake and complete the Detailed Design on their behalf but this will not be undertaken by the novated/ appointed Architect.

c) Drawing Description References: Reference codes and accompanying descriptions are contained in the System Reference Sheet (SRS) and identify systems/ components/ products indicated on the Design Drawings.

SCOPE

L10.102 General

Refer to the Window Schedule.

Windows

L10.103 Type EWS-01 (A-H) Typical Punch Window

Fixed aluminium window sustem, fixed into openings including glass, gaskets, sealants, window furniture and all accessories to locations indicated on the Design Drawings.

a) New window sight lines to replicate existing Crittal window system as per planning conditions.

b) Manufacturer: Kawneer, or acceptable equivalent.

c) Product reference: Kawneer GT70S.

d) Projecting fin detail to window frame integral as part of the frame extrusion.

e) Configured as indicated on the Window Schedule and/ or Design Drawings.

f) Windows shall be in accordance with BS 4873.

g) Performance requirements:

  i) Thermal requirement: Minimum 1.5 W/m²K or better.

  ii) Wind load requirement: 1 kPa.

h) Framing:

  i) Aluminium frames.

  ii) Fixed lights only.

  iii) Extruded projecting fin to window frame and verticals, integral with window frame.

  iv) 3 No. Horizontal 25mm glazing bars welded to mullions at ends externally and bonded to glass:

    • Bonded only on the inside.

i) Glazing infill panel: Type GL-01 Glazing Panel.

j) Acoustic reduction: Refer to the Acoustic Report.

k) Aluminium cill configured as indicated on the Design Drawings, 3mm thick, fully welded end caps; powder coated to match window system.

l) The ironmongery/ accessories provided shall be as recommended by the system manufacturer to the approval of the client and Architect through sampling. Finish to be from metallic range.

m) Finish to all window elements including cills: Tiger Coatings Series 68 Drylac Powder Coating, finish and metallic colour to be confirmed.

L10.104 Type EWS-02A Strip Windows to Central Bay (Levels 1-6, New Oxford Street)

Fixed window system, double glazed fixed into openings including glass, gaskets, sealants, window furniture and all accessories to locations indicated on the Design Drawings.

a) Window system to form continuous window bay length with equally spaced mullions and with 2 No. 150mm diameter (or as per specific site conditions to match existing windows) curved single corner elements.

b) Window system and glass to curve as indicated on the Design Drawings, curved elements to match standard system in all parameters visual and performance.

c) Indicative manufacturer: Kawneer, or acceptable equivalent.

d) Product reference: Kawneer GT70S.

e) Configured as indicated on the Window Schedule and/ or Design Drawings.

f) Projecting fin detail to window frame integral as part of the frame extrusion.

g) Windows shall be in accordance with BS 4873.

h) Performance requirements:

i) Thermal requirement: Minimum 1.5 W/m²K or better.

ii) Wind load requirement: 1 kPa.

i) Framing:

i) Aluminium frames.

ii) Fixed lights only.

iii) 3 No. glazing bars welded at ends and bonded on the outside and bonded only on the inside, equally spaced as indicated on the Design Drawings.

j) Glazing infill panel: As indicated on the Design Drawings.

k) Acoustic reduction: Refer to the Acoustic Report.

l) The ironmongery/ accessories provided shall be as recommended by the system manufacturer to the approval of the client and Architect through sampling. Finish to be from metallic range.

m) Finish to all window elements: Tiger Coatings Series 68 Drylac Powder Coating, finish and metallic colour to be confirmed.

L10.105 Type EWS-02B Glazed Fins (Levels 1-5, New Oxford Street)

Bespoke glazed fin elements to feature cove bay to locations indicated on the Design Drawings.

a) Configured as flat or curved as indicated on the Window Schedule and/ or Design Drawings.

b) Glazed fins:

i) Indicative manufacturer/ supplier: Pyrolave Architecture, or acceptable equivalent.

ii) Product reference: Glazed Lava Stone.

iii) Size: Profile and indicative length of fins as indicated on the Design Drawings. Lengths in accordance with manufacturer's recommendations and test data, equally spaced along façade, to the acceptance of the Architect.

iv) Colour/ finish: 6 No 'Mock-ups' of colour variations of tile types A-G (a different colour to each tile).

v) Fixing: All fixings shall be concealed and in accordance with the manufacturer's recommendations.

c) Louvres:

i) Indicative manufacturer/ supplier: Renson Fabrications Ltd., or acceptable equivalent.

ii) Louvres with posts or 2mm powder coated aluminium with PIR insulation bonded to the back.

iii) Product reference: L.033V.

iv) Extruded aluminium sections.

v) Finish to all window elements including cills: Tiger Coatings Series 68 Drylac Powder Coating, finish and metallic colour to be confirmed.

- Free areas provided: Minimum 45%.
- 100% free area required: 0.35m² per AHU.
- Acoustic reduction: Refer to the Acoustic Report.

d) Secondary support angles and post to support stone fins/ hexagon mesh cassettes to suit service conditions.

e) Perforated external aluminium mesh concealing air intake louvres.

i) Manufacturer/ supplier: RMIG, or acceptable equivalent.

ii) Hexagonal perforated powder coated finished sheet to form cassettes to achieve 50% free area.

iii) Finish to all window elements including cills: Tiger Coatings Series 68 Drylac Powder Coating, finish and metallic colour to be confirmed.

iv) Sheet pattern type : H9T12.73 to be agreed with the Architect and client.

L10.106 Type EWS-02C Curved Window Strip (To Nose, Levels 1-6)

Fixed aluminium window system, double glazed fixed into openings including secondary bracketry, EPDMs, glass, gaskets, sealants, window furniture and all accessories to locations indicated on the Design Drawings.

a) Indicative manufacturer: Kawneer, or acceptable equivalent.

b) Product reference: Kawneer GT70S.

c) Configured as indicated on the Window Schedule and/ or Design Drawings.

d) Projecting fin detail to window frame integral as part of the frame extrusion.

e) Windows shall be in accordance with BS 4873.

f) Performance requirements:

  i) Thermal requirement: Minimum 1.5 W/m²K or better.

  ii) Wind load requirement: 1 kPa.

g) Framing:

  i) Aluminium frames.

  ii) Fixed vents only.

  iii) Horizontal glazing bars:

    - 3 No. glazing bars welded at ends and bonded on the outside and bonded only on the inside, equally spaced as indicated on the Design Drawings.
    - Internally bonded only.

h) Aluminium cill and jamb details as indicated on the Design Drawings, 3mm aluminium, powder coated to match window system.

i) Glazing infill panel: Type GL-02 Glazing Panel.

j) Acoustic reduction: Refer to the Acoustic Report.

k) Metal sleeve:

  i) Flat corrosion resistant 3mm aluminium sheet folded bonded to WPB backing board.

  ii) Fully factory welded corners with 100mm return leg as indicated on the Design Drawings.

  iii) Sleeved joints as indicated on the Design Drawings.

  iv) Finish: PPC to match window frames, metallic colour to the acceptance of the Architect.

  v) Concealed fixings.

  vi) Integrated luminaire, as indicated on the Design Drawings.

l) All fixings shall be concealed.

m) Finish to all window elements including cills: Tiger Coatings Series 68 Drylac Powder Coating, finish and metallic colour to be confirmed.

L10.107 Type EWS-03 (A-C & E) Punch Window (Levels 7 and 8)

Window system to 7th and 8th floor as Type EWS-01, but system varies in structural opening, size and breakdown, all inward vents where present, configured as indicated on the Design Drawings, except no glazing bars, windows with ceramic frit as indicated on the Design Drawings.

a) Glazing infill panel: Type GL-01 Glazing Panel.

L10.108 Type EWS-03 (D) Curved Punch Window (Level 7 Nose Only)

Window System as Type EWS-2C, but configured as indicated on the Design Drawings and comprising:

a) System broken down into three with a central curved open out door leaf.

b) Glazing infill panel: Type GL-01 Glazing Panel.

c) No glazing bars.

d) Refer to the Door Schedule.

L10.109 Type EWS-03 (F) Louvred Window System

Aluminium window system as Type EWS-101, but nominally sized and configured as indicated on the Design Drawings but with integrated louvre system, comprising:

a) Glazed in louvres:

  i) Glazing in louvre with 2mm powder coated insulated spandrel panel behind louvres, to receive cut-in duct work, refer to Services Engineer's Documentation.

  ii) Indicative manufacture/ supplier: Renson Fabrications Ltd., or acceptable equivalent.

  iii) Product reference: 414.

  iv) Extruded aluminium sections.

v) Finish: Powder coated to match window framing.

vi) Stainless steel 1.4301 insect screen.

- Free areas provided: Minimum 45%.
- 100% free area required: 0.35m² per AHU.
- Acoustic reduction: Refer to the Acoustic Report.

L10.110 Type EWS-04 (A-G) Mezzanine Window System

Aluminium fixed window system, double glazed fixed into openings including secondary bracketry, EPDMs, glass, gaskets, sealants, window furniture and all accessories to locations indicated on the Design Drawings.

a) Indicative manufacturer: Kawneer, or acceptable equivalent.

b) Product reference: Kawneer GT70S.

c) Configured as indicated on the Window Schedule and/ or Design Drawings.

d) Projecting fin detail to window frame integral as part of the frame extrusion.

e) Windows shall be in accordance with BS 4873.

f) Performance requirements:

i) Thermal requirement: Minimum 1.5 W/m²K or better.

ii) Wind load requirement: 1 kPa.

g) Framing:

i) Aluminium frames.

ii) Projecting fin detail to window frame, integral as part of frame extrusion.

h) Glazing infill panel: Type GL-03 Glazing Panel.

i) Acoustic reduction: Refer to the Acoustic Report.

j) Aluminium cill and jamb details as indicated on the Design Drawings, 3mm aluminium, powder coated to match window system.

k) All associated folded aluminium reveals, head and cill sections shall lap into system to form portal frame.

l) Fixed glass vent with louvre section above:

i) Glazing in louvre with 2mm powder coated insulated spandrel panel on rear face.

ii) Indicative manufacture/ supplier: Renson Fabrications Ltd., or acceptable equivalent.

iii) Product reference: 414.

iv) Extruded aluminium sections.

v) Finish: Powder coated to match window framing.

vi) Stainless steel 1.4301 insect screen.

- Free areas provided: Minimum 45%.
- 100% free area required: 0.35m² per AHU.
- Acoustic reduction: Refer to the Acoustic Report.

m) Metal sleeve:

i) Flat corrosion resistant 3mm aluminium sheet folded bonded to WPB backing board.

ii) Fully factory welded corners with 100mm return leg as indicated on the Design Drawings.

iii) Sleeved joints as indicated on the Design Drawings.

iv) Finish: PPC to match windows frame, metallic colour to the acceptance of the Architect.

v) Concealed fixings.

n) Finish to all window elements including cills: Tiger Coatings Series 68 Drylac Powder Coating, finish and metallic colour to be confirmed.

L10.111 Type EWS-05 (A-B) Window System (Office Main Entrance)

Aluminium window system as Type EWS-04, but configured as indicated on the Design Drawings, comprising:

a) Bespoke architectural features and framing configured as indicated on the Design Drawings.

b) Fixed glass vents and circular sliding door drum with metal roofing such as manufactured by Geze, or acceptable equivalent, refer to the Door Schedule.

c) Curved glass to align with curved glass drum.

d) Glazing infill panel: Type GL-03 Glazing Panel.

e) Decorative stepped metal reveal to jambs and head.

f) Finish: Powder coated (metallic finish), colour to the acceptance of the Architect.

g) Indicative manufacturer: Kawneer, or acceptable equivalent.

h) Product reference: Kawneer GT70S

i) Framing: Projecting fin detail to window frame, integral as part of frame extrusion.

j) Metal sleeve:

  i) Aluminium rectangular sections as indicated on the Design Drawings.

  ii) Fully factory welded corners with 100mm return leg as indicated on the Design Drawings.

  iii) Joints to be sleeved.

  iv) Finish: Tiger Coatings Series 68 Drylac Powder Coating, finish and metallic colour to be confirmed.

  v) Concealed fixings.

  vi) Factory cut-out to sleeve to accommodate intercom and video panel.

k) Integrated doorset as Type DRS-211 in Section L20 of the Specification to match the finish and profile of the window system.

l) Intercom and video call button, refer to the Services Engineer's Documentation.

L10.112 Type EWS-06 (A-H) Shopfront Window System

Aluminium window system as Type EWS-04, but configured as indicated on the Design Drawings, comprising:

a) Bespoke architectural features and framing configured as indicated on the Design Drawings.

b) Central flat section with glass sides with glass to glass joints, to form shop bay and glazed door, refer to the Door Schedule.

c) Insulated metal stall risers:

  i) Performance requirements:

    - 3mm thick aluminium, powder coated finish to match window frames, no visible fixings.
    - Thermal requirement: Minimum 1.5 W/m²K or better.
    - Wind load requirement: 1 kPa.

  ii) Height of stall risers varies, refer to Design Drawings for datum levels.

d) Glazing infill panel: Type GL-03a Glazing Panel.

e) Manufacturer: Kawneer, or acceptable equivalent.

f) Product reference: Kawneer GT70S.

g) Framing: Aluminium framing.

h) Finish to all window elements: Tiger Coatings Series 68 Drylac Powder Coating, finish and metallic colour to be confirmed.

i) Projecting fin detail to window frame, integral as part of frame extrusion.

j) Metal sleeve:

  i) Flat corrosion resistant 3mm aluminium sheet folded bonded to WPB backing board.

  ii) Fully factory welded corners with 100mm return leg.

  iii) Sleeved joints as indicated on the Design Drawings.

  iv) Finish: PPC to match windows frames, metallic colour to the acceptance of the Architect.

  v) Concealed fixings.

L10.113 Type EWS-07 (A-B) 'Pop Out' Window System (Level 6, High Holborn)

'Framed' prefabricated window system including secondary bracketry, EPDMs, glass, gaskets, sealants, window furniture and all accessories to locations indicated on the Design Drawings.

a) Manufacturer: Schuco, or acceptable equivalent.

b) Reference: FW50+S Capless SSG.

c) Framing:

  i) Extruded aluminium profiles; thermally broken and separated, and with integral drainage slots/ channels.

ii) Framing shall be factory assembled into unit frames by means of mitred corners, mechanically jointed with cleats and the appropriate additional sealant.

iii) Joints with aluminium cover piece to rear.

iv) Externally, junctions between framing and interfacing systems shall be finished/ sealed using black coloured sealant.

v) All associated folded aluminium reveals, head and cill sections shall lap into system to form portal frame.

vi) Metal cladding as Type EWC-04A Metal Cladding in Section H31 of the Specification.

vii) Ceramic glass frit as indicated on the Design Drawings.

d) Performance requirements:

i) Thermal requirement: Minimum 1.5 W/m²K or better.

ii) Wind load requirement: 1 kPa.

e) Glazing infill panel: Type GL-01 Glazing Panel.

f) Visible gaskets shall be black.

g) Finish to all window elements: Tiger Coatings Series 68 Drylac Powder Coating, finish and metallic colour to be confirmed.

L10.114 Type EWS-08 (A-C) Punch Window (West Elevation)

Aluminium window system as Type EWS-101, but nominally sized and configured as indicated on the Design Drawings.

a) Glazing infill panel: Type GL-01 Glazing Panel.

L10.115 Type EWS-08 (D-E) Louvred Window (West Elevation)

Aluminium window system as Type EWS-101, but nominally sized and configured as indicated on the Design Drawings, but with integrated louvre system, comprising:

a) Glazed in louvres:

i) Glazing in louvre with 2mm powder coated insulated spandrel panel behind louvres, to receive cut-in duct work, refer to Services Engineer's Documentation

ii) Indicative manufacture/ supplier: Renson Fabrications Ltd., or acceptable equivalent.

iii) Product reference: 414.

iv) Extruded aluminium sections.

v) Finish: Powder coated to match window framing.

vi) Stainless steel 1.4301 insect screen.

- Free areas provided: Minimum 45%.
- .100% free area required: 0.35m² per AHU.
- Acoustic reduction: Refer to the Acoustic Report.

L10.116 Type EWS-10 (A-H) Window System (9th Floor)

Window/ curtain walling system, configured as indicated on the Design Drawings, comprising:

a) Manufacturer: Schuco, or acceptable equivalent.

b) Reference: FW50+SG (SSG to New Oxford Street only, capped to High Holborn & West elevations).

c) Framing:

i) Extruded aluminium profiles; thermally broken and separated, and with integral drainage slots/ channels.

ii) Framing shall be factory assembled into unit frames by means of mitred corners, mechanically jointed with cleats and the appropriate additional sealant.

iii) Joints with aluminium cover piece to rear.

iv) Externally, junctions between framing and interfacing systems shall be finished/ sealed using black coloured sealant.

v) All associated folded aluminium reveals, head and cill sections shall lap into system to form portal frame.

vi) Ceramic glass frit as indicated on the Design Drawings.

d) Integrated door system to match the finish and profile of the walling system.

e) Performance requirements:

i) Thermal requirement: Minimum 1.5 W/m²K or better.

ii) Wind load requirement: 1 kPa.

f) Glazing infill panel: Type GL-01 Glazing Panel.

g) Black fritting to glass edges.

h) Door typically with fixed vent.

i) Sizing of boxing in accordance with manufacturers recommendations.

j) The ironmongery/ accessories provided shall be as recommended by the system manufacturer.

k) Finish shall be powder coated, colour to be confirmed by the Architect and the client.

Glazing

L10.117 Type GL-01 Glazing Panel (Flat)

Glass shall be clear, flat double glazed, high performance, insulated, safety glass units meeting the following criteria:

a) Manufacturer/ supplier: Saint-Gobain, or acceptable equivalent.

b) Product reference: Contractor to confirm.

c) Colour/ finish: Clear.

d) Ceramic frit to glazing where indicated on the Design Drawings.

e) Thickness: Contractor to confirm.

i) Sound transmission loss: Refer to the Acoustic Report.

ii) Luminous factors:

- Transmittance: 60%.
- Outdoor reflectance: 16%.
- Indoor reflectance: 18%.

iii) Colour rendering:

- Ra : 91 Transmittance.
- Ra : 85 Outdoor reflectance.

iv) Energy factors:

- Transmittance: 31 %.
- Outdoor reflectance: 34%.
- Indoor reflectance: 34%.
- Absorptance A1: 34%.
- Absorptance A2: 2%.

v) Solar factors:

- G value: 0.35.
- Shading coefficient : 0.39.

vi) Thermal transmission: 1.0 W/(m².K) including integral spacer within double glazed unit to all applied glazing bar locations.

vii) Spacer bar:

- Integral spacer within DGU to all applied glazing bar locations.

L10.118 Type GL-02 Glazing Panel (Curved)

Glass shall be clear, curved double glazed, high performance, insulated, safety glass units meeting the following criteria:

a) Manufacturer/ supplier: Saint-Gobain, or acceptable equivalent.

b) Product reference: Contractor to confirm.

c) Colour/ finish: Clear.

d) Thickness: Contractor to confirm.

i) Sound transmission loss: Refer to the Acoustic Report.

ii) Luminous factors:

- Transmittance: 60%.
- Outdoor reflectance: 16%.
- Indoor reflectance: 18C%.

iii) Colour rendering:

- Ra : 91% Transmittance.
- Ra : 85% Outdoor reflectance.

iv) Energy factors:

- Transmittance: 31%.
- Outdoor reflectance: 34%.
- Indoor reflectance: 34%.
- Absorptance A1 : 34%.
- Absorptance A2: 2%.

v) Solar factors:

- G value: 0.35.
- Shading coefficient: 0.39.

vi) Thermal transmission: 1.0 W/(m².K) including integral spacer within double glazed unit to all applied glazing bar locations.

vii) Spacer bar:

- Integral spacer within DGU to all applied glazing bar locations.

L10.119 Type GL-03 Glazing Panel (Office Entrance)

Glass shall be clear, (flat and curved) double glazed, high performance, insulated, safety glass units meeting the following criteria:

a) Manufacturer/ supplier: Saint-Gobain, or acceptable equivalent.

b) Product reference: Contractor to confirm.

c) Colour/ finish: Clear.

d) Thickness: Contractor to confirm.

i) Sound transmission loss: Refer to the Acoustic Report.

ii) Luminous factors:

- Transmittance: 80%.
- Outdoor reflectance: 14%.
- Indoor reflectance: 14%.

iii) Colour rendering:

- Ra : 97 Transmittance.
- Ra : 97 Outdoor reflectance.

iv) Energy factors:

- Transmittance: 62%.
- Outdoor reflectance: 12%.
- Indoor reflectance: 12%.
- Absorptance A1 : 18%.
- Absorptance A2: 9%.

v) Solar factors:

- G value: 0.69.
- Shading coefficient : 0.80.

vi) Thermal transmission: 2.7 W/(m².K).

L10.120 Type GL-03a Glazing Panel (Ground Floor Shopfronts and Mezzanine Windows)

Glass shall be clear, flat, single glazed, high performance, laminated safety glass units meeting the following criteria:

a) Manufacturer/ supplier: Saint-Gobain, or acceptable equivalent.

b) Product reference: Contractor to confirm.

c) Colour/ finish: Clear.

d) Thickness: Contractor to confirm.

i) Sound transmission loss: In accordance with the Acoustic Report.

ii) Luminous factors:

- Transmittance: 80%.

- Outdoor reflectance: 14%.
- Indoor reflectance: 14C%.

iii) Colour rendering:

- Ra : 97 Transmittance.
- Ra : 97 Outdoor reflectance.

iv) Energy factors:

- Transmittance: 62%.
- Outdoor reflectance: 12%.
- Indoor reflectance: 12%.
- Absorptance A1 : 18%.
- Absorptance A2: 9%.

v) Solar factors:

- G value: 0.69.
- Shading coefficient : 0.80.

vi) Thermal transmission: 2.7 W/(m².K).

e) Horizontal line load : 0.74kN as part of glazing system.

L10.121 Type GL-04 Glazing Panel (Internal Atrium)

Glass shall be clear, (flat and curved) single glazed, high performance, laminated safety glass units meeting the following criteria:

a) Manufacturer/ supplier: Saint-Gobain, or acceptable equivalent.

b) Product reference: Contractor to confirm.

c) 9th floor Atrium glazing requires smoke sealed construction.

d) Colour/ finish: Clear.

e) Thickness: Contractor to confirm.

f) Thickness: Contractor to confirm.

i) Emissivity:

- Normal outdoor emissivity: 0.89.
- Normal indoor emissivity: 0.89.

ii) Luminous factors:

- Transmittance: 87%.
- Outdoor reflectance: 8%.
- Indoor reflectance: 8%.

iii) Colour rendering:

- Ra : 97 Transmittance.
- Ra : 97 Outdoor reflectance.

iv) Energy factors:

- Transmittance: 70%.
- Outdoor reflectance: 7%.
- Indoor reflectance: 7%.
- Absorptance A1 : 24%.

v) Solar factors:

- G value: 0.75.
- Shading coefficient : 0.86.
- Thermal transmission: 5.4 W/(m².K).

L10.122 Type GL-105 Glazing Panel (Roof Glazing)

Glass shall be clear, flat double glazed, high performance, insulated, fire rated, low iron safety glass units meeting the following criteria:

a) Manufacturer/ supplier: Saint-Gobain, or acceptable equivalent.

b) Product reference: Contractor to confirm.

c) Colour/ finish: Clear/ grey.

d) Thickness: Contractor to confirm.
- LT: 59%.
- G: 0.34.
- U: 1.0w/m2K.

i) Shall achieve 30 min Fire rating integrity only, in combination with VISS glazing system.

ii) Sound transmission loss: Refer to the Acoustic Report.

iii) Luminous factors:
- Transmittance: 31%.
- Outdoor reflectance: 20%.
- Indoor reflectance: 16%.

iv) Colour rendering:
- Ra : 92 Transmittance.
- Ra : 84 Outdoor reflectance.

v) Energy factors:
- Transmittance: 15%.
- Outdoor reflectance: 35%.
- Indoor reflectance: 20%.
- Absorptance A1: 34%.
- Absorptance A2: 15%.

vi) Solar factors:
- G value: 0.35.
- Shading coefficient: 0.39.

vii) Thermal transmission: 1.0 W/(m².K).

L10.123 Type GL-111 Glazing to the Top of the Brise Soleil System

Glass shall be clear, high performance, laminated safety glass units meeting the following criteria:

a) Colour/ Finish: Clear.

b) Thickness: Contractor to confirm.

Louvres

L10.124 Type EWS-701 Acoustic Rooftop Enclosure with Decorative Fins

Aluminium louvre plant enclosure system with decorative fins configured as indicated on the Design Drawings including bird mesh, cleats, weather seals and accessories.

a) Acoustic rating: Refer the the Acoustic Report.

b) Decorative glazed lava fins:

i) Profile and lengths as indicated on the Design Drawings.

ii) Suitable support framing.

iii) Manufacturer/ supplier: Pyrolave Architecture, or acceptable equivalent.

iv) Reference: Glazed Lavastone.

v) Finish and colour shall be to the acceptance of the Architect through sampling.

vi) Concealed fixing as recommended by the system manufacturer to suit service conditions

c) Perforated external aluminium mesh concealing air intake louvres.

i) Manufacturer/ supplier: RMIG, or acceptable equivalent.

ii) Hexagonal perforated powder coated finished sheet to form cassettes to achieve 50% free area.

iii) Finish: Tiger Coatings Series 68 Drylac Powder Coating, finish and metallic colour to be confirmed.

iv) Sheet pattern type : H9T12.73 to be agreed with the Architect and client.

d) Louvres:

i) Manufacturer: Trox, or acceptable equivalent

ii) Reference: Trox Type NL.

iii) The material shall consist of aluminium extrusion.

iv) The blades shall have a nominal pitch (generally 100mm), centres and width as indicated on the Design Drawings.

v) The louvre system shall include aluminium frame and flashings as indicated on the Design Drawings.

vi) Finish: Tiger Coatings Series 68 Drylac Powder Coating, finish and metallic colour to be confirmed.

e) Mild steel secondary/ support framing for fins and louvres to sub-Contractor design to achieve the Architect's design intent, all concealed fixings and hot dipped galvanised finish.

f) Special features/ details to sizes and profiles indicated on the Design Drawings.

g) System shall include matching integrated door set with suitable locking mechanism and concealed framing and hinges.

h) System shall include all support framing, fixings and all components necessary to complete the installation.

L10.125 Type EWS-702 Acoustic Rooftop Plant Enclosure (to Entrance Corridor from Lift)

Aluminium louvre plant system configured as indicated on the Design Drawings including bird mesh, cleats, weather seals and accessories.

a) Acoustic rating: Refer to the Acoustic Report.

b) Perforated external mild steel mesh concealing air intake louvres.

i) Manufacturer/ supplier: RMIG, or acceptable equivalent.

ii) Hexagonal perforated powder coated finished sheet to form cassettes to achieve 50% free area.

iii) Finish shall be powder coated or painted, colour to be confirmed by the Architect.

iv) Sheet pattern type : H9T12.73 to be agreed with the Architect and client.

c) Louvres:

i) Manufacturer: Trox, or acceptable equivalent.

ii) Reference: Trox Type NL.

iii) The material shall consist of aluminium extrusion.

iv) The blades shall have a nominal pitch (generally 100mm), centres and width as indicated on the Design Drawings.

v) The louvre system shall include aluminium frame and flashings as indicated on the Design Drawings.

vi) Finish: Powder coated, colour to be confirmed by the Architect and client.

d) Mild steel secondary/ support framing.

e) System shall include matching integrated door set with suitable locking mechanism.

f) System shall include all support framing, fixings and all components necessary to complete the installation.

L10.126 Type EWS-703 Insulated Louvre Screen

Steel louvre system with insulation behind, configured as indicated on the Design Drawings.

a) Acoustic rating: Not applicable.

b) Steel louvre system:

i) Manufacturer: Sunray, or acceptable equivalent.

ii) System shall be UKPN approved and achieve a minimum 240 minute fire rating.

iii) Frame: Non-flanged option.

iv) Air flow: Refer to the Services Engineer's Documentation.

v) Louvres: Demountable stackable louvre panels with interlocking system.

vi) Anti-vermin mesh.

vii) The blades shall have a nominal pitch (generally 50mm), centres and blade thickness 2.5mm.

viii) The louvre system shall include steel frame and flashings as indicated on the Design Drawings.

ix) Finish: Powder coated, colour to be confirmed by the Architect and client.

c) Insulated panel:

i) Insulated rear aluminium panel, powder coated finish to be confirmed. Refer to Type INS-101 in Section P10 of the Specification.

ii) Panel shall achieve a 0.28 W/m2.K thermal performance.

iii) Cut-outs in panel for ventilation, refer to the Services Engineer's Documentation.

iv) Louvres to substation do not require insulation.

d) Double height metal sleeve as Type EWC-05 in Section H31 of the Specification, configured as indicated on the Design Drawings.

e) System shall include matching integrated door set with suitable locking mechanism, refer to Type DRS-312 Refuse/ Cyclist Doorsets in Section L20 of the Specification.

f) Insulated internal plasterboard lining finish as indicated on the Design Drawings.

g) Special features/ details to sizes and profiles indicated on the Design Drawings.

h) Finish: Tiger Coatings Series 29 Drylac Powder Coating, Finish and Metallic Colour to be confirmed.

i) Mild steel secondary/ support framing.

j) System shall include all support framing, fixings and all components necessary to complete the installation.

L10.127 Type EWS-704 Plant Louvres (To Service Yards)

Stell louvre plant system configured as indicated on the Design Drawings including bird mesh, cleats, weather seals and accessories.

a) Acoustic rating: Not applicable.

b) Louvres:

i) Manufacturer: Sunray, or acceptable equivalent.

ii) System shall be UKPN approved and achieve a minimum 240 minute fire rating.

iii) Frame: Non-flanged option.

iv) Air flow: Refer to the Services Engineer's Documentation.

v) Louvres: Demountable stackable louvre panels with interlocking system.

vi) Anti-vermin mesh.

vii) The blades shall have a nominal pitch (generally 50mm), centres and blade thickness 2.5mm.

viii) The louvre system shall include steel frame and flashings as indicated on the Design Drawings.

ix) Finish: Powder coated, colour to be confirmed by the Architect and client.

c) Double height metal sleeve as Type EWC-05 in Section H31 of the Specification, configured as indicated on the Design Drawings.

d) Louvred door, refer to Type DRS-205 in Section L20 of the Specification.

e) Mild steel secondary/ support framing.

f) System shall include all support framing, fixings and all components necessary to complete the installation.

g) All ironmongery and locking mechanism to suit UKPN requirements and set-out shall be agreed with the Architect.

L10.128 Type EWS-705 Acoustic Rooftop Plant Enclosure (Around the Atrium rooflight)

Aluminium louvre plant system configured as indicated on the Design Drawings including bird mesh, cleats, weather seals and accessories.

a) Acoustic rating: Refer to the Acoustic Report.

b) Louvres:

i) Manufacturer: Trox, or acceptable equivalent

ii) Reference: Trox Type NL.

iii) The material shall consist of aluminium extrusion.

iv) The blades shall have a nominal pitch (generally 100mm), centres and width as indicated on the Design Drawings.

v) The louvre system shall include aluminium frame and flashings as indicated on the Design Drawings.

vi) Finish: Powder coated, colour to be confirmed by the Architect and client.

c) Mild steel secondary/ support framing.

d) System shall include matching integrated door set with suitable locking mechanism.

e) System shall include all support framing, fixings and all components necessary to complete the installation.

f) Other requirements:

i) Insulated extract duct connected to rear of louvre for return air from Atrium.

ii) Where duct is not present, the rear of the louvre to be insulated with INS-101 & galvanized sheet to ensure thermal and weather line

L10.129 Type EWS-715 Micro Louvres (To Return Air in the Reception)

Proprietary metal louvre system, nominally sized and configured as indicated on the Design Drawings.

a) Manufacturer: Waterloo, or acceptable equivalent.

b) Reference: GA-RF Recessed frame louvre 38mm pitch.

c) Material: Aluminium.

d) Finish: Anodised frame to the match adjacent framing of Type LIN-201.

e) All framing shall be completely concealed.

f) All fixings shall be concealed.

L10.130 Type EWS-718 Brise Soleil

Besoke brise soleil system configured and nominally sized as indicated on the Design Drawings, comprising:

a) Louvre blades:

i) Material: Aluminium.

ii) Size: 8mm thick x 150mm high.

iii) Finish/ colour: powder coated, colour to be confirmed.

iv) Blades sandwiched between 12mm thick aluminium spigot fixing bracket (bracket fixed back structure).

b) Male to female counter sunk fixings holding fins to spigot bracket at either end as indicated on the Design Drawings.

c) Glass panelling, refer to Type GL-11, fixed to above brise soleil blades via 10mm diameter aluminium rods with pig face clamp fixings.

d) Aluminium gutter along both edges of glass falling back to plant room, powder coated finish, colour to be confirmed.

L10.131 Type EWS-719 Metal Plant Screen (To Top of South Stair Core)

Brise soleil system configured and nominally sized as indicated on the Design Drawings, comprising:

a) Manufacturer: Neaco, or acceptable equivalent.

b) Reference : ‘BRISE SOLEIL’ range.

c) Material: Aluminium.

d) Finish: Powder coated, colour to be confirmed.

e) All secondary steel framework to be mild steel galvanised finish to subcontractor design fixed back to RC deck and perimeter walls.

f) Waterproof collar detail to base of posts to be co-ordinated with nominated sub-Contractor.

g) Panels to be hinged to allow access to services and abseiling access points.

h) Panels to have ‘lock open’ function. Nominal panel sizes as indicated on the Design Drawings.

Covers/ Housings (In Abeyance)

L10.132 Type EWS-721 VRF Covers

Bespoke aluminium wall hung VRF housing units to nominal dimensions, configured as indicated on the Design Drawings.

a) 3mm thick with 5mm wide vertical slots at centres indicated on the Design Drawings.

b) Top panel interfacing with Aluminium metal grill as per Services Engineer's Documentation, colour of grille PPC colour as per facing. 2mm curved sleeve with top and bottom flanges (all fixings concealed) for VRF pipe cover, PPC finish.

c) Finish: Power coated RAL colour - metallic range, to the acceptance of the Architect through sampling.

L10.133 Type EWS-722 VRF Covers

Bespoke aluminium floor mounted VRF housing units to nominal dimensions, configured as indicated on the Design Drawings.

a) 3mm thick with 5mm wide vertical slots at centres indicated on the Design Drawings.

b) Top panel interfacing with Aluminium metal grill as per Services Engineer's Documentation, colour of grille PPC colour as per facing. 2mm curved sleeve with top and bottom flanges (all fixings concealed) for VRF pipe cover, PPC finish.

c) Finish: Power coated RAL colour - metallic range, to the acceptance of the Architect through sampling.

L10.200 QUALITY AND WORKMANSHIP

SUBMITTALS

L10.201 Tender Response

a) Provide tender submittals in accordance with the requirements of Section A of the Specification.

b) Submit a design response with the Tender proposal, to include all profiles of typical conditions, with dimensions.

c) The Tender design response shall include:

i) Samples where specified.

ii) List of Tests included.

iii) QA/QC programme.

iv) List of proposed Working Drawings.

v) Summary of deviations from the Specification.

vi) Outline technical specifications reflecting proposed materials/systems.

vii) A list of proposed suppliers and sub-contractors intended to be used.

L10.202 Pre-contract Samples

The following pre-contract samples shall be provided:

a) Samples of framing and sill members minimum 300mm long.

b) Glass samples of each type 300mm x 300mm minimum size.

c) Typical operating handle.

d) Typical 'trickle' ventilator.

L10.203 Post Contract Samples

The following post contract samples shall be provided:

a) Samples of framing and sill members minimum 300mm long in the proposed colour and finish.

b) Glass samples of each proposed type 500mm x 500mm minimum size.

c) Typical ironmongery components in the proposed materials and finishes to include operating handle, hinge and locking device.

L10.204 Mock-ups

The following mock-ups shall be provided:

a) An arrangement of components and systems forming a visual and conceptual model of the works including interfaces with adjacent components and structure of all system types either in-situ or off site to be agreed with the client/ Contractor and the Architect.

L10.205 Prototypes

The following prototypes shall be provided:

a) A section of the works comprising not less than first structural bay in the proposed materials and finishes of each type and any adjacent interfaces.

L10.206 Benchmarks

The following quality benchmarks shall be provided in locations to be agreed with the Architect:

a) The first fully installed and completed part of the works.

TESTING

L10.207 Test Requirements

Include for testing by an accredited independent testing specialist or provide independently certified test data to demonstrate compliance with the Specification.

L10.208 Testing Requirements for Windows

a) Where required, carry out project specific tests and provide certification to demonstrate that the windows have been tested to meet the following:

i) Air permeability: To BS EN 1026 up to a pressure of 600Pa to meet the minimum performance criteria specified.

ii) Watertightness: To BS EN 1027 up to a pressure of 600Pa to meet the minimum performance criteria specified.

iii) Wind resistance: To BS EN 12211. Samples tested shall have been subjected to at least 5 cycles of positive pressure to satisfy maximum gust conditions and to meet the performance requirements as specified. The procedure shall then have been repeated with negative pressure. The results shall meet with the maximum deflection values as specified.

iv) Acoustic testing data, fire testing data, solar data and other testing results to satisfy the performance requirements specified herein as required.

v) Acceptance testing for all finishes as specified.

vi) Site hose testing as specified.

b) If the testing data submitted is not deemed to be satisfactory by the Architect, laboratory tests shall be carried out to satisfy the requirements of the Specification to be agreed with the Architect.

c) Test certificates do not relieve the Contractor of his responsibilities regarding the performance and service life requirements of the works.

L10.209 Site Hose Testing

a) A Site water hose test shall be carried out in accordance with the recommendations of the CWCT Standard for Systemised Building Envelopes.

b) Remedial work and re-testing:

i) Wherever leakage has occurred, joints shall be made watertight to satisfy the requirements of the Specification.

ii) After all necessary remedial work has been completed and the required curing time, if any, has elapsed, all repaired joints shall be re-tested following the same procedure as before. Should leakage still be found, further remedial measures shall be taken and testing shall be repeated until all joints in the designated area are found to be satisfactory.

c) Extent of testing: A minimum of 5% by length of all critical joints shall be tested at locations to be agreed with the Architect.

L10.210 Acoustic Testing

Acoustic testing shall be carried out in accordance with BS EN ISO 10140.

ARCHITECTURAL AND FUNCTIONAL REQUIREMENTS

Not applicable.

MATERIALS AND COMPONENTS

L10.211 Frames

a) Frames shall be manufactured from extruded aluminium. Working Drawings shall show the final extrusion design while strictly maintaining the Architect's visual requirements.

b) All corners shall be jointed and sufficiently flush, flat and true to comply with the specified tolerances.

c) Frames shall be fully gasketed to form the air and moisture barrier. No on-site gasketing shall be permitted.

d) Frames shall be factory-glazed, delivered and installed in one piece.

e) All framing shall utilise the minimum cross section necessary to maintain rigidity and performance.

f) Framing shall include a glazing chamber separated by two seals, one outside the glazing chamber, the other at the back. The glazing chamber shall be drained to the outside, this system shall comprise:

i) An outer seal designed to prevent water ingress into glazing or other chambers to substantially inhibit water penetration and to prevent heavy wetting of the back seal. Designs having full width gasket seals shall incorporate capillarity breaks to prevent the ingress and entrapment of water between surfaces in continuous contact.

ii) A back seal. This seal shall act as an air seal to minimise air permeability up to limits as specified. If subjected to light wetting in localised patches it shall prevent the ingress of this water to the inside face of the works (Note: Designs relying upon single stage seals shall not be used).

iii) State, in the Contractor's Proposals, the spacings of drainage outlets and demonstrate the adequacy and suitability of such spacings.

L10.212 Glazing

a) Select all glazing materials and systems to comply with the performance requirements.

b) Glazing material thickness, type and make-up in the various locations shall be the Contractor's responsibility.

c) Safety manifestation: Refer to the Design Drawings.

d) All glazing shall be in accordance with Section Z25 of the Specification.

L10.213 Aluminium

a) Aluminium sheeting to be of thickness to suit performance criteria. Unless specified otherwise, aluminium sheeting shall be a minimum of 3mm thick and satisfy the requirements of BS EN 485, BS EN 515 and BS EN 573: Parts 1-3.

b) Refer to Section Z11 of the Specification.

L10.214 Mild Steel

a) All mild steelwork shall comply with BS EN 1993, unless stated otherwise.

b) Refer to Sections Z11 and Z30 of the Specification.

L10.215 Sealants

Refer to Section Z22 of the Specification.

L10.216 Gaskets

a) Gaskets shall be made of either Ethylene Propylene material (EPDM/ EP) or of Silicone. The colour of all gaskets shall be black.

b) All visible room side glazing gaskets shall have factory-formed corners. All other gaskets shall have overlapping joints with appropriate sealant in between. It is a condition that the internal sealant of the entire envelope system has a continuous vapour and air seal. This also includes all interfacing connections.

L10.217 Support System

Provide a support system, as necessary, having due regard for any requirements in excess of framing indicated on the Structural Engineer's drawings and also any requirements indicated on the Design Drawings. The support system shall comply with the Structural Engineer's steelwork specification, including protective coatings. All Secondary steel shall be unseen, unless indicated otherwise on the Design Drawings.

L10.218 Fixings

a) Fixing components shall comply with all statutory requirements (and be to the acceptance of the District Surveyor/ Building Control Officer/Structural Engineer) both as to strength and type and shall be designed to carry all dead, live and wind loading under due consideration of any applicable thermal movements. Select suitable components and fixings in accordance with the following:

   i) External grade stainless steel fixings only shall be used Pyrolave elements.

   ii) Any sheet mild steel, cleats, angles, fixing brackets, etc. used in the fixing assemblies shall comply with BS 7668, BS EN 10029, BS EN 10210 and BS EN 10025: Parts 1-4 and 6 and rolled sections shall be used wherever practicable or appropriate. Steel sections used shall be hot-dip galvanised to the requirements of BS EN ISO 1461 after all cutting, drilling of holes and welding has been completed.

   iii) Stainless steel fixing components for the works shall comprise components of high grade austenitic stainless steel exterior quality to BS EN 10088, BS EN 10084, BS EN 10087, BS EN 10095, BS EN 10048, BS EN 10051, BS EN 10250: Part 4 and BS EN ISO 9445: Parts 1 and 2.

   iv) All non-visible supporting aluminium sub-constructions shall be corrosion protected. Mill finished aluminium shall not be used. Aluminium sub-constructions shall be separated from concrete by bitumen paint or similar acceptable method. Austenitic stainless steel to BS EN 10088 may be used in lieu of aluminium for any supporting sub-constructions.

   v) Fixing bolts, nuts, screws, washers, etc. shall be manufactured from austenitic stainless steel complying with BS EN ISO 3506: Parts 1 and 2. All screw fixings and attachments shall be secured against vibrating loose.

b) Refer to Section Z20 of the Specification.

Fabrication

L10.219 Tolerances for Manufacture

a) Assembly: The physical fitting together of any assembly of sub-elements shall be properly allowed for in the Detailed Design of the corresponding sub-elements.

b) The following tolerances apply to each individual component:

   i) Length/Width: Maximum allowed deviation is the lesser of 1.5mm up to 3000mm and 3.0mm above 3000mm of design dimension.

ii) Thickness/Depth (extrusion tolerances nominally): Maximum allowed deviation is ±0.5mm.

L10.220 Tolerances for Component Assembly

a) Assembly: The physical fitting together of any assembly of sub-elements shall be properly allowed for in the Detailed Design of the corresponding sub-elements.

b) Comply with the following tolerances during assembly of components:

i) Level of horizontal members: ±1mm from datum in 1500mm non-cumulative.

ii) Plumb of vertical members: ±1mm to the vertical in any 1500mm, non-cumulative.

iii) Squareness: Any diagonal length across the panel shall not deviate by more than the lesser of ±3mm or ±0.075% of design dimension.

iv) Bow: The centre section of the element shall not bow by more than the lesser of 3mm or 0.075% of the length of the element measured from a straight line between the ends of the element.

v) Straightness: Any surface or edge shall not deviate by more than +1.5mm from a 2m straightedge placed against it in a direction parallel to the long axis of the element.

vi) Flatness: Any surface shall not deviate by more than +1.5mm from a 2m straightedge placed against it in any direction.

vii) Twist: No section of the element may be twisted by more than 1° from the section at either end of the element.

c) All finished metal surfaces shall be flat and free from undulations and irregularities.

i) Twist: ±1.5mm - there shall be no warping of frame.

ii) Line of panel: ±2mm overall difference between adjacent standards.

d) Tolerances shall not be cumulative.

L10.221 Lightning Protection

a) Bonding to metal components shall be provided in accordance with BS 7430 and BS EN 62305: Parts 1-4, to ensure continuity between adjacent sections, both vertically and horizontally over the whole façade. Bonding between sections shall have a minimum cross section of 50mm².

b) Bonding to structural steelwork shall be carried out at intervals as indicated on the Design Drawings. The first level of bonding to the structural steelwork shall be at the highest floor level of each part of the building.

c) Provide studs/bolts for subsequent connection.

d) All straps/connections shall be concealed.

e) No straps shall be fixed along copings.

PERFORMANCE

L10.222 General

Comply with the general performance of Section A and the following specific performance requirements.

Structural

L10.223 General

When calculating loads the worst combinations shall be considered, taking account of the fact that the pressure coefficients at various locations may determine more than one design criterion.

L10.224 Deflections

The maximum in-plane deflection of any main framing member due to dead and live loads shall not exceed 1/500 of the span or 3mm, whichever is the lesser.

L10.225 Wind Loads

The works shall be designed to withstand without permanent deformation, the effects of wind loads. The works shall not depart from fixings under the design wind loads.

L10.226 Inertial Loads

The works shall be capable of accommodating inertial loads arising due to the acceleration/ deceleration of moving sections including opening lights, doors and vents of the building or enclosure. Consult the Architect regarding the motion requirements for such elements.

L10.227 Thermal Movement

a) All components shall be designed to resist thermal movement resulting from the maximum and minimum surface temperatures occurring. The design shall cater for all temporary and permanent conditions envisaged for the works.

b) The service temperature range for components of the works shall be taken as -25°C and +90° C.

c) Thermal movements shall not result in audible noise.

L10.228 Moisture Movement

The works shall withstand movement without permanent deformation or any reduction in the specified performance:

a) Due to changes in the moisture content of their components, resulting from variations in the moisture content of the air.

b) Due to the expansion of absorbed or retained moisture caused by freezing.

L10.229 Atmospheric Conditions

All works shall be fully capable of resisting the prevailing atmospheric conditions.

L10.230 Thermal Performance Requirements

a) Avoid cold bridging in any area of the system.

b) The maximum permitted thermal transmittance (U-value) for the various types shall be as follows:

i) Double glazed assembly, including frame: 1.9 W/m²K or better.

ii) Single glazed assembly, including frame: 2.8 W/m²K or better.

c) No cold bridging shall occur through the framing elements of the works. The average U-value shall comply with the above requirements.

d) Submit thermal calculations for the various components and the average thermal performance.

L10.231 Glass Performance

General:

a) Independently certified test data shall be submitted in respect of solar and visible light performance confirming compliance with the Specification. Facilities shall be maintained to evaluate and report on expected solar performance under varying conditions of solar radiation and external/internal air velocity.

b) The works shall be designed to ensure that the glazing does not crack, distort or is damaged in any way through the differences of temperature on the surfaces of the glazing.

L10.232 Air Permeability/ Infiltration

a) The Detailed Design shall prevent airflow from the outside to the inside of the building through joints/junctions, etc. to avoid areas of concentrated airflow.

b) The works shall resist the passage of air such that its air leakage rates, if measured in accordance with BS EN 1026 shall not be exceeded in both the initial and repeat tests.

c) The works shall have a maximum air infiltration rate of:

i) 1.5 m³/hr/m² for fixed lights.

ii) 2.0 m³/hr/per metre length for opening lights/smoke vents.

d) Test to a pressure of minimum 600Pa or 0.25 x the design wind pressure when tested generally in accordance with BS EN 1026 and BS 6375: Part 1.

e) Air leakage shall be distributed and not concentrated at any one location.

f) Provide actual air leakage results from tests for acceptance by the Architect.

L10.233 Condensation

a) Condensation shall not form, either on internal or external surfaces of framing members, glazing, solid panels, or interstitially within the construction of infill panels forming a part of the works, such that it may lead to damage or staining.

b) Interstitial cavities within the construction, where condensation may occur, shall be adequately drained and ventilated to the outside, such that the formation of such condensation is not detrimental to the performance nor causes damage or staining of the works.

L10.234 Capillarity

The Detailed Design shall eliminate any possibility of water migration to the inside of the building due to capillarity.

L10.235 Weather and Water Penetration Resistance

a) The works shall be absolutely weatherproof and watertight, ensuring the prevention of water leakage onto the internal face of the works.

b) The works, including flashings and junctions with adjacent parts of the building, shall be fully weatherproof and watertight under all conditions with full allowance made for deflections and other movements.

c) The Detailed Design and construction of the works shall be such that all rigid or fixed joints shall remain rigid and accommodate all thermal, building structure or other movements and any applicable loads without compromising their watertightness. All movement joints shall also be designed and constructed to accommodate such loads or movements without compromising the glazing's watertightness.

L10.236 Local Factors

a) Visit the Site in order to become familiar with local requirements. Local microclimatic conditions shall be taken into account and grades of materials assessed as suitably durable for the location shall be selected.

b) An assessment of microclimatic conditions shall be made with due allowance for any factors likely to have an adverse effect upon materials intended for the Contract. More appropriate materials shall be substituted if adverse effects are predicted.

L10.237 Acoustic Performance Requirements

Refer to the Acoustic Report.

L10.238 Fire

All elements of the works shall be either non-combustible or not easily ignitable with low flame spread characteristics and shall not produce excessive quantities of smoke or toxic gases.

L10.239 Surface Spread of Flame

All materials used shall achieve a Class 0 classification when tested in accordance with BS 476: Parts 6 and 7 to comply with the requirements of the Fire Strategy Report.

L10.240 Specific Fire Performance Requirements

Refer to the Fire Strategy Report.

L10.241 Durability

The performance criteria shall be satisfied for the full design life of the works, as stated in the Specification, provided always that the maintenance has been carried out as specified.

L10.242 Strength

The operation and strength characteristics of windows shall be in accordance with BS 6375: Part 2 and BS EN 12046: Part 1.

L10.243 Impact and Abrasion Resistance

a) The works shall resist abrasion from agreed cleaning methods and maintenance systems without any noticeable change in surface appearance. Generally, surfaces shall be sufficiently hard (including glass coatings) to resist all reasonable impacts from hand-held objects in accordance with BS EN 356.

b) Impact tests shall be carried out on all works assemblies in accordance with the recommendations of BS 8200. Tests shall conform to category B requirements.

c) The extent of any damage determined through testing shall be recorded and, where possible, quantified. Samples shall be submitted to the Architect.

L10.244 Demountability

a) Elements of the works shall be individually and independently removable ensuring access for maintenance.

b) The removal of units shall not affect the performance or safety of any other part of these, or adjacent, works.

WORKMANSHIP

L10.245 General Requirements

a) The works shall be erected plumb (or at the angles prescribed) and true in proper alignment and relation to established lines and grids as shown on the Working Drawings. The erected system shall present true and accurate lines and flat planes. Deviations from lines, planes and verticality shall be limited to long wave formations of minimum wave length of 20m length with a rate of exchange not exceeding 1:1000, and a maximum amplitude of 3mm. All the above shall be measured from a laser reference line.

b) Joints between panels: The actual width of any joint shall not deviate from the nominal width by more than ±2mm or 10% of the joint width whichever is the lesser. Any variation shall be equally distributed with no sudden changes. The misalignment between joints shall not exceed 2mm.

c) Level: The works shall be within ±2mm of the specified level. The cumulative slope between the same locations on any panel shall not exceed 1 in 1000.

d) Plumbness: The works shall be erected such that no point on any panel is more than 3mm from its theoretical vertical/diagonal plane. The cumulative slope between the same locations on any panel shall not exceed 1 in 1000. The vertical plane shall be within ±2mm of the theoretical plane position.

e) A method statement detailing proposals to achieve the specified tolerances shall be submitted with the Tender. This shall demonstrate a clear understanding of the construction programme, the effects of the building structure and construction method and the fabrication method of the panels.

f) Sufficient analysis of the erection sequence shall be undertaken to ensure that the installation tolerances stated above shall be met to the acceptance of the Architect.

g) Dimensional Checking: Before work begins on Site the proposed method of dimensional setting-out and crosschecking with adjacent trades and elements to satisfy the accuracy requirements shall be submitted to the Architect. The checking of any setting-out or of any line or level by the Architect, or his representative, shall not in any way relieve the Contractor of his responsibility for the correctness thereof.

h) Alternative Tolerances: Alternative tolerances to those specified may be permitted at the Architect's discretion, provided they are agreed in advance of manufacture of components.

i) The Working Drawings shall provide for sufficient tolerance in manufacture of the works in order to accommodate manufacturing tolerances of interfacing elements.

j) The tolerances stated herein shall be adhered to. No revisions to the tolerances to cater for inadequate control shall be permitted.

k) Full details shall be submitted to the Architect for review of the proposed methods for achieving and constantly monitoring the fabrication tolerances during all stages of the work. Detailed records of the constant control and tolerances achieved shall be submitted to the Architect.

l) The works, when installed, shall not be subject to warping or twisting and shall be strictly rigid, firm, free from vibration, knocking, rattles, squeaks and other noises when subject to the worst combination of environmental conditions and wind loads.

m) All tolerances stated shall be measured and monitored at a mean temperature to be agreed with the Architect.

n) No rainwater ponding shall be permitted on any element of the works.

End of Section