

Thames Quarter

client - Watkin Jones

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This document includes:

Code	Section	Revision	Dated
H11	Curtain walling	Pr1	14 Sep 2018

H11 Curtain walling

To be read with Preliminaries/ General conditions.

TYPES OF CURTAIN WALLING

110 CURTAIN WALLING TO ENTRANCE

- Supporting structure: To span from ground floor slab to RHS steel support beam at level 2.
- Curtain walling system:
 - Manufacturer: Sapa Building Systems.
 - Product reference: Elegance 52 ST.
 - Type: Stick system, drained and ventilated .
- Internal framing member:
 - Material: Aluminium.
 - Finish: Powder coating.
 - Colour/ texture: RAL grey colour to be confirmed gloss finish.
 - Minimum film thickness: system standard for high usage environments.
- External cover cap:
 - Material: Aluminium.
 - Finish: Powder coating.
 - Colour/ texture: RAL grey colour to be confirmed gloss finish.
 - Minimum film thickness: system standard for polluted environments.
- Glazing: Insulating glass units.
 - Inner pane: Thermally toughened glass.
 - Outer pane: Laminated glass.
- Glazing system: Gaskets, cover plate fixed.
- Panel/ facing type: Composite facings, mechanically fixed to secondary framing.
 - External material: Aluminium sheet.
 - External finish: Powder coating.
 - Internal material: Aluminium sheet.
 - Internal finish: Powder coating.
 - Core insulation: manufacturers standard to comply with specification.
- Accessories: Perimeter flashings.
- Incorporated components: None.
- Other requirements: - To provide support for canopy. PAS 24/ Secure by Design certified.

111 CURTAIN WALLING - OTHER GROUND FLOOR AREAS

- Supporting structure: Fitted within blockwork/ SFS framing. To span from ground floor slab to underside of concrete floor slab at level 1.
- Curtain walling system:
 - Manufacturer: Sapa Building Systems.
 - Product reference: Elegance 52 ST.
 - Type: Stick system, drained and ventilated .
- Internal framing member:
 - Material: Aluminium.
 - Finish: Powder coating.
 - Colour/ texture: RAL grey colour to be confirmed gloss finish.
 - Minimum film thickness: system standard for high usage environments.
- External cover cap:
 - Material: Aluminium.
 - Finish: Powder coating.
 - Colour/ texture: RAL grey colour to be confirmed gloss finish.
 - Minimum film thickness: system standard for polluted environments.
- Glazing: Insulating glass units.
 - Inner pane: Thermally toughened glass.
 - Outer pane: Laminated glass.
- Glazing system: Gaskets, cover plate fixed.
- Panel/ facing type: Composite facings, mechanically fixed to secondary framing.
 - External material: Aluminium sheet.
 - External finish: Powder coating.
 - Internal material: Aluminium sheet.
 - Internal finish: Powder coating.
 - Core insulation: manufacturers standard to comply with specification.
- Accessories: Perimeter flashings.
- Incorporated components: None.
- Other requirements: PAS 24/ Secure by Design certified.

- 112 CURTAIN WALLING TO LEVEL 10 & 11
- Supporting structure: To fit within SFS framing. Typically to span from concrete floor slab/ support to underside of roof slab.
 - Curtain walling system:
 - Manufacturer: Sapa Building Systems.
 - Product reference: Elegance 52 ST.
 - Type: Stick system, drained and ventilated .
 - Internal framing member:
 - Material: Aluminium.
 - Finish: Powder coating.
 - Colour/ texture: RAL grey colour to be confirmed gloss finish.
 - Minimum film thickness: system standard for high usage environments.
 - External cover cap:
 - Material: Aluminium.
 - Finish: Powder coating.
 - Colour/ texture: RAL grey colour to be confirmed gloss finish.
 - Minimum film thickness: system standard for polluted environments.
 - Glazing: Insulating glass units.
 - Inner pane: Thermally toughened glass.
 - Outer pane: Laminated glass.
 - Glazing system: Gaskets, cover plate fixed.
 - Panel/ facing type: Composite facings, mechanically fixed to secondary framing.
 - External material: Aluminium sheet.
 - External finish: Powder coating.
 - Internal material: Aluminium sheet.
 - Internal finish: Powder coating.
 - Core insulation: manufacturers standard to comply with specification.
 - Accessories: Perimeter flashings.
 - Incorporated components: None.
 - Other requirements: None.
- 130 SUN SCREENS / CANOPY TO ENTRANCE SCREEN
- Manufacturer: Contractors choice .
 - Product reference: purpose made .
 - Material: Aluminium sheet facing on aluminium framing .
 - Finish: Powder coating .
 - Colour/ texture: white colour to be confirmed .
 - Minimum film thickness: 60 micrometres .
 - Fixing: supported off curtain wall framing .
 - Other requirements: Integrated soffit lighting .
- 135 DOORS TO MAIN ENTRANCE
- Manufacturer: Geze .
 - Product reference: Slim Line NT drive with integrated all glass system .
 - Material: Aluminium framed glazing .
 - Finish: Powder coating .
 - Colour/ texture: to match curtain walling .
 - Minimum film thickness: 60 micrometres .
 - Fixing: to corner frame of curtain walling - confirm with both manufacturers .
 - Other requirements: access control .
- 150 MATERIALS SPECIFICATION
- Minimum BRE 'Green Guide to Specification' online rating: A.
 - Specification of glazing materials to be in accordance with guidance in CIRIA document 'Guidance on glazing at height'.

GENERAL REQUIREMENTS/ PREPARATORY WORK

- 210 DESIGN
- Curtain walling and associated features: Complete the detailed design. Submit before commencement of fabrication.
 - Related works: Coordinate in the detailed design.
- 215 DESIGN PROPOSALS
- Submission of alternative proposals: Preliminary design drawings indicate intent. Other reasonable proposals will be considered.
- 220 SPECIFICATION
- Compliance standards: BS EN 13830:2003 and The Centre for Window and Cladding Technology (CWCT) 'Standard for systemised building envelopes'.
 - Reference information: For the duration of the contract, keep available at the design office, workshop and on site copies of:
 - The CWCT 'Standard for systemised building envelopes'.
 - Publications invoked by the CWCT 'Standard for systemised building envelopes'.
- 230 INFORMATION TO BE PROVIDED DURING DETAILED DESIGN STAGE
- Submit the following curtain walling particulars:
 - A schedule of detailed drawings and dates for submission for comment.
 - A schedule of loads that will be transmitted from the curtain walling to the structure.
 - Proposed fixing anchor details relevant to structural design and construction.
 - A detailed testing programme in compliance with the Main Contract master programme.
 - A detailed fabrication and installation programme in compliance with the Main Contract master programme.
 - Proposals to support outstanding applications for Building Regulation consents or relaxations.
- 232 QUALITY PLAN
- Requirement: Submit during detailed design.
 - Content: In accordance with BS EN ISO 9001 and including the following:
 - Name of the quality manager.
 - Quality assessment procedures.
 - Inspection procedures to be adopted in checking the work.
 - Stages at which check lists will be used and samples of the lists.
 - List of work procedures on the correct use of materials or components, both off site and on site.
 - List of product information with latest revisions.
 - Subcontractors involved in the work.
 - Subcontractors' quality plans.
 - Storage, handling, transport and protection procedures.
 - Procedure for registering and reporting non compliances.
 - Maintenance procedures and calibration records.
 - Certification that completed work complies with specification.
 - 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
- Submit the following curtain walling particulars:
 - Detailed drawings to fully describe fabrication and installation.
 - Detailed calculations to prove compliance with design/ performance requirements.
 - Project specific fabrication, handling and installation method statements.
 - Certification for incorporated components manufactured by others confirming their suitability for proposed locations in the curtain walling.
 - Recommendations for spare parts for future repairs or replacements.
 - Recommendations for safe dismantling and recycling or disposal of products.
- 240 INFORMATION TO BE PROVIDED BEFORE COMMENCEMENT OF STRUCTURAL SEALANT/ BONDED GLAZING
- Submit structural bonding sealant manufacturer's project specific approval for:
 - Compatibility and adhesion of products and finishes.
 - Full details of structural sealant/ bonded glazing design.
 - Structural sealant dimensions.
 - Project specific sealant application method statement.
- 250 PRODUCT SAMPLES
- General: Before commencing detailed design, submit labelled samples of: corner of standard glazing panel with frame .
- 260 SAMPLES OF FIXINGS
- 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
- General: During detailed design, submit samples of: 600 x 600 mm mullion and transom intersection with fitted glazing units .
 - Obtain approval of appearance before proceeding.

DESIGN/ PERFORMANCE REQUIREMENTS

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

313 INTEGRITY

- Requirement: The curtain walling must resist wind loads, dead loads and design live loads, and accommodate deflections and movements without damage.
- Design wind pressure: Calculate in accordance with: BS EN 1991-1-4 and National Annex.
- Impact performance: High standard required for ground floor & level 10 elements were fronting onto accessible terraces.
 - Safety impact requirements: To CWCT TN 75, High risk .
 - Serviceability impact requirements: To CWCT TN 75, serviceability class 1.
 - External impact exposure: In accordance with CWCT TN 75: Ground floor = category A; Level 10 facing terraces = category B; Level 11 = category E.
 - Hard and soft body impact loads - curtain walling to BS EN 14019: class E5.
 - Hard and soft body impact loads - glass to BS EN 12600: 1 (A) 1.
 - Hard body impact tests - In accordance with CWCT Standard test methods for building envelopes and TN 76 (curtain wall).
 - Soft body impact tests: In accordance with CWCT Standard test methods for building envelopes and TN 76 (curtain wall)..
- Permanent imposed loads: Sun screen/ canopy as shown on drawings.
- Temporary imposed loads: Abseiling window cleaning.

320 DEFLECTION UNDER DEAD LOADS

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

325 DEFLECTION UNDER WIND LOAD

- Requirement: To CWCT 'Standard for systemised building envelopes' clause 3.5 2 and the following additional requirements: Normal to plane deflection not to exceed 10 mm for framing members .
- Additional stiffness to CWCT 'Standard for systemised building envelopes' clause 3.5 4.2: not allowed.

330 GENERAL MOVEMENT

- Requirement: Curtain walling must accommodate anticipated building movements as follows: refer Structural Engineers specification in relation to concrete frame .

332 APPEARANCE AND FIT

- Requirement: Design curtain walling system:
 - To ensure position and alignment of all parts and features as shown on preliminary design drawings.
 - To accommodate deviations in the primary support structure.
- Primary support structure: Before commencing installation of curtain walling system, carry out survey sufficient to verify that required accuracy of erection can be achieved.
 - Give notice: If the structure will not allow the required accuracy or security of erection.
 - Design tolerances: +/- 10mm horizontally & vertically.
- Curtain wall envelope zone tolerances:
 - Width: +/- 5mm .
 - Critical reference location: abutment at jamb & head.
- Maximum permitted component and installation tolerances: Panel tolerance ± 2 mm, installation tolerance ± 2 mm, overall = ± 4 mm.

- 335 THERMAL MOVEMENT - SERVICE TEMPERATURE RANGES
- Requirement: To CWCT 'Standard for systemised building envelopes' clause 2.7.2 amended and/ or with the addition of the following: allow for solar gain on exposed elevations.
- 340 AIR PERMEABILITY
- 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.
 - Permeability class to BS EN 12152: AE 750.
 - Peak test pressure: 600 Pa.
- 345 AIR PERMEABILITY EXFILTRATION
- Requirement: The maximum permissible air exfiltration rate through the curtain walling system must not exceed: $4 \text{ m}^3/(\text{h.m}^2)$ at a test pressure of 100 Pa.
- 350 WATER PENETRATION
- Watertightness class to BS EN 12154: RE 750.
 - Peak test pressure: 600 Pa.
 - Additional requirements: Underside of any transom not to be wetted at peak test pressure.
- 370 THERMAL PROPERTIES
- Method of calculating the thermal transmittance (U-value) of curtain walling/ each zone of curtain walling: Weighted U-value.
 - Average U-value of curtain walling: $1.6 \text{ W}/\text{m}^2\text{K}$.
 - Curtain wall zone interfaces: Co-ordinate to achieve required average U-value.
 - Method for assessing thermal transmittance (U-value) of assemblies: Method 2 - accurate method in accordance with CAB/CWCT publication 'The thermal assessment of window assemblies, curtain walling and non-traditional building envelopes'.
- 380 SOLAR AND LIGHT CONTROL
- Total solar energy transmission:
 - Maximum g-value - glazing only: 0.57.
 - Maximum effective g-value - glazing with shading devices: Not applicable.
 - Visible light transmission:
 - Minimum light transmission - glazing only: 80%.
 - Minimum effective light transmission - glazing with shading devices: 60%.
- 385 THERMAL STRESS IN GLAZING
- Glass panes/ units: Must have adequate resistance to thermal stress generated by orientation, shading, solar control and construction.
- 390 AVOIDANCE OF CONDENSATION
- 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:
 - Notional outdoor psychrometric conditions as BS 6229, table A1.
 - Notional indoor psychrometric conditions:
 - Temperature: 30°C .
 - Relative humidity: 60%.
 - Vapour pressure: 1.28 kPa .

- 410 SOUND TRANSMITTANCE
 - Minimum weighted sound reduction index (Rw) to BS EN ISO 717-1:
 - Between internal and external surfaces of curtain walling: 33.
 - Minimum weighted standardized level difference (DnTw) to BS EN ISO 717-1:
 - Between adjacent floors abutting curtain walling: not applicable.
 - Between adjacent rooms on same floor abutting curtain walling: not applicable.
- 420 FIRE RESISTANCE OF CURTAIN WALLING
 - Standard: To BS EN 13501-1.
 - Minimum periods and criteria: Class E 30 .
- 426 REACTION TO FIRE OF CURTAIN WALLING
 - Standard: To BS EN 13501-1.
 - Class: A1.
- 430 FIRE STOPPING
 - Locations: At junctions of curtain walling with compartment walls and floors.
 - Materials and methods of fixing: To ensure fire resistance not less than that specified for compartment walls and floors.
- 436 DOORS AND OTHER ACCESS FACILITIES
 - Performance criteria: To CWCT 'Standard for systemised building envelopes' Part 3.
 - Access facilities designated for use by disabled persons: low threshold for all cases.
 - Strength and durability: To CWCT 'Standard for systemised building envelopes' clause 4.3.3.
 - Forces and tests: To BS EN 12400 class 1A1.
 - Security:
 - Applicable doors: All on ground floor.
 - Security rating: To PAS 24-1 .
- 440 DURABILITY
 - Relevant agents or degradation mechanisms: Traffic fumes to ground floor; Railway fumes and driving rain to levels 10 & 11.
 - Design life of the curtain walling system: Not less than 50 years.
 - Secondary components: Submit details together with required maintenance regime, replacement periods and methods of replacement.
- 445 LIGHTNING PROTECTION SYSTEM
 - Curtain wall components used as part of lightning protection system: None.
- 450 SAFETY
 - Finished surfaces of curtain walling: Accessible internal and external areas must not:
 - Have irregularities capable of inflicting personal injury.
 - Release irritant or staining substances.
- 460 STRUCTURAL SEALANT/ BONDED GLAZING REQUIREMENTS
 - Structural sealant/ bonded glazing units: Installable, removable and replaceable without site application of structural bonding sealant.
 - Structural sealant/ bonded glazing design: Must limit design tensile stress of sealants to 138 kPa.

TESTING

- 510 COMPARISON (TYPE) TESTING
- Requirement: To CWCT 'Standard for systemised building envelopes', Part 8.
 - Test results and reports: Before commencement of curtain walling fabrication and installation, submit proof of compliance with this specification.
- 520 PROJECT TESTING (SITE)
- Test results and reports: Before installation of general areas of curtain walling, submit proof of compliance with this specification.
- 530 TESTING AUTHORITY
- Requirement: Project testing must be carried out by a United Kingdom Accreditation Service (UKAS) approved independent laboratory.
- 630 SITE SPRAY BAR TEST
- Requirement: To CWCT 'Standard for systemised building envelopes', 'Standard test methods for building envelopes' Section 10.
 - Area to be tested: submit proposals for agreement with Main Contractor & Building Inspector .
 - Pressure difference across curtain wall: As clause 345.
- 650 TEST Sound Attenuation.
- Requirement: Carry out in accordance with Noise assessment report to achieve SRI 33dB.
- 655 WIND LOAD FATIGUE TEST, SMALL SPECIMEN
- Requirement: To CWCT 'Standard for systemised building envelopes', 'Standard test methods for building envelopes' Section 14.
 - Test sequence: As CWCT 'Standard for systemised building envelopes' Table 8.1.
- 660 STRUCTURAL SEALANT/ BONDED GLAZING TESTS
- 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.
 - Testing: By sealant manufacturer to determine compatibility and adhesion of structural bonding sealant under specified design loadings.
 - 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
- Standard: To relevant parts of BS EN 515, BS EN 573, BS EN 755 and BS EN 12020.
 - Alloy, temper and thickness: Suitable for the application and specified finish.
 - Structural members: To BS EN 1999-1-1.
- 712 ALUMINIUM ALLOY SHEET
- Standards: To relevant parts of BS EN 485, BS EN 515 and BS EN 573.
 - Alloy, temper and thickness: Suitable for the application and specified finish.
- 715 CARBON STEEL FRAMING SECTIONS/ REINFORCEMENT
- Standards: To relevant parts of BS 7668, BS EN 10029, and BS EN 10210.
 - Thickness: Suitable for the application, and for galvanizing or other protective coating.

730 MECHANICAL FIXINGS

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

732 ADHESIVES

- General: Not degradable by moisture or water vapour.

735 FIXING ANCHORS

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

737 GLASS GENERALLY

- Standards: To BS 952 and relevant parts of:
 - BS EN 572 for basic soda lime silicate glass.
 - BS EN 1096 for coated glass.
 - BS EN 1748 for borosilicate glass.
 - BS EN 1863 for heat strengthened soda lime silicate glass.
 - BS EN 12150 for thermally toughened soda lime silicate glass.
 - BS EN 13024 for thermally toughened borosilicate glass.
 - BS EN ISO 12543 for laminated glass.
- Selection of glass type and thickness in accordance with recommendations of CIRIA publication 'Guidance on glazing at height'.
- Glass quality: Clean and free from obvious scratches, bubbles, cracks, rippings, dimples and other defects.
- 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 -

- Measurement of tolerances: Before any thermal toughening/ heat strengthening.
- Pane dimensions less than 1500 mm:
 - For 3 to 6 mm thick glass: ± 1.0 mm.
 - For 8 to 12 mm thick glass: ± 1.5 mm.
 - For 15 mm thick glass: ± 2.0 mm.
 - For 19 mm and 25 mm thick glass: ± 2.5 mm.
- Pane dimensions more than 1500 mm:
 - For 3 to 6 mm thick glass: ± 1.5 mm.
 - For 8 to 12 mm thick glass: ± 2.0 mm.
 - For 15 mm thick glass: ± 2.5 mm.
 - For 19 mm and 25 mm thick glass: ± 3.0 mm.
- Pane squareness: Not more than 4 mm difference in diagonal measurements.

- 741 DISTORTIONAL TOLERANCES ON GLASS -
- Measurement of tolerances: After any thermal toughening/ heat strengthening.
 - Maximum bow: 0.2% of pane dimension.
 - Maximum roller wave:
 - For 3 to 5 mm thick glass: 0.5 mm.
 - For 6 to 10 mm thick glass: 0.3 mm.
 - For 12 mm and thicker glass: 0.15 mm.
 - Maximum edge dip:
 - For 3 to 5 mm thick glass: 0.8 mm.
 - For 6 to 10 mm thick glass: 0.5 mm.
 - For 12 mm and thicker glass: 0.25 mm.
- 742 HEAT SOAKED THERMALLY TOUGHENED GLASS
- Standard: To BS EN 14179.
 - Holding period: 2 hours.
 - Locations of heat soaked glass: All ground floor areas & level 10.
- 745 INSULATING GLASS UNITS
- Standard and labels for hermetically sealed units: To BS EN 1279.
 - Label: Each pane.
 - Colour of aluminium perimeter spacers: Natural.
 - Perimeter taping: Not to be used.
 - Perimeter seals:
 - Resistant to UV light degradation on exposed edges.
 - Compatible with structural, assembly and weather sealants.
- 747 GLASS EDGE CONDITION FOR STRUCTURAL SEALANT/ BONDED GLAZING
- Bonded, unframed outer edges: Flat ground with a small arris suitable for open jointing or for weatherseal jointing.
- 750 INFILL PANELS/ FACINGS
- Tolerances:
 - Deviation in size (maximum): ± 1 mm.
 - Deviation in flatness from plane per 2 m length (maximum): ± 1 mm.
 - Rigidity: Adequate to comply with design/ performance requirements.
- 760 GASKETS
- Material:
 - Noncellular rubber to BS 4255-1.
 - Cellular rubber to ASTM-C509-06.
 - 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.
 - Durability: Resistant to oxidation, ozone and UV degradation.
- 770 GENERAL SEALANTS
- Selection: In accordance with BS 6213 from:
 - Silicone.
 - One part polysulfide.
 - Two part polysulfide.
 - One or two part polyurethane.
 - Classification and requirements: To BS EN ISO 11600.
 - Reaction to contact products and finishes: Stable and compatible.

772 CURTAIN WALLING JOINT ASSEMBLY SEALANTS

- 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 acetoxycuring.
- Manufacturer: Submit proposals.
 - Product reference: as Sapa standard system.

775 BONDING SEALANTS FOR STRUCTURAL SEALANT/ BONDED GLAZING

- Material: Silicone, neutral curing, designed and manufactured for bonding of structural sealant/ bonded glazing. Compatible with contact and close proximity products and finishes.
- Manufacturer: Submit proposals.
 - Product reference: as Sapa standard - for external corner of Entrnace Glazing.

780 THERMAL INSULATION

- Material: Mineral wool boards.
 - Recycled content: Not applicable.
 - Properties: Durable, rot and vermin proof and not degradable by moisture or water vapour.
- 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 VAPOUR CONTROL LAYER

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

FINISHES

810 PROTECTIVE COATING OF CARBON STEEL FRAMING SECTIONS/ REINFORCEMENT

- Treatment: One of the following to all surfaces:
 - Hot dip galvanized to BS EN ISO 1461.
 - 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

- Treatment: One of the following to all surfaces:
 - Hot dip galvanized to BS EN ISO 1461.
 - Sherardized to BS 7371-8, class 30 coating thickness and passivated.
 - 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

- Requirement: As section Z31.

FABRICATION AND INSTALLATION

- 910 **GENERALLY**
 - Electrolytic corrosion: Prevent. Submit proposed methods.
 - Fixings: Concealed unless indicated on detailed drawings. Where exposed they must match material and finish of the products fixed.
 - Fabrication: Machine cut and drill products in the workshop wherever possible.
 - 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**
 - Requirement: As section Z11, unless specified otherwise in this section.
- 915 **GLAZING**
 - Requirement: As section L40, unless specified otherwise in this section.
 - Directional patterned/ wired glass: Generally fix parallel to surround and align adjacent panes where seen together at close quarters.
- 917 **FIXINGS/ ADHESIVES APPLICATION**
 - Requirement: As section Z20, unless specified otherwise in this section.
- 920 **SEALANT APPLICATION**
 - Requirement: As section Z22, unless specified otherwise in this section.
- 925 **STRUCTURAL SEALANT/ BONDED GLAZING**
 - Curing: Do not transport units until structural bonding sealant has adequately cured for the period stated in the project specific approval.
- 930 **ASSEMBLY**
 - General: Carry out as much assembly as possible in the workshop.
 - Joints (other than movement joints): Rigidly secured, reinforced where necessary and fixed with hairline abutments.
 - Displacement of components in assembled units: Submit proposals for reassembly on site.
- 955 **FIXING ANCHOR INSTALLATION**
 - Site drilling or cutting into structure: Submit proposals for positions other than shown on detailed drawings.
 - Concrete supporting structure:
 - Cast-in inserts: Provide detailed locational information. Protect cavities in inserts from entry of concrete.
 - Edge fixing distances: Not less than recommended by fixing anchor manufacturers.
 - Corrective fabrication: Minimize. Where necessary, submit proposals.
- 965 **PRELIMINARY CURTAIN WALLING INSTALLATION**
 - Requirement: Complete an area for inspection and approval of appearance as follows: agree with Main Contractor location of first element to be installed.
- 970 **CURTAIN WALLING INSTALLATION**
 - Securing to fixing anchors: Through holes formed during fabrication only.
 - Tightening mechanical fasteners: To manufacturer's recommended torque figures. Do not overtighten fasteners intended to permit differential movement.
 - Protective coverings: Remove only where necessary to facilitate installation and from surfaces that will be inaccessible on completion.

975 WELDING

- In situ welding: Not permitted..

980 INTERFACES

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

982 IRONMONGERY

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

985 MAINTENANCE

- Maintenance manual: Incorporate details within the Building Manual in accordance with CWCT 'Standard for systemised building envelopes' clause 7.6.1.
 - Materials certification and test reports to be included: refer Preliminaries.