019-034 BBIC

H11

CURTAIN WALLING
October 2019
Rev A (14.10.2019)

H11 CURTAIN WALLING

To be read with Preliminaries/General conditions.
Please also refer to the following SAS documents:

- U value report
- Clima guard glass details.

TYPE(S) OF CURTAIN WALLING

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

5 INFORMATION TO BE PROVIDED WITH TENDER

- Submit the following curtain walling particulars:
- Typical plan, section and elevation drawings at suitable scales.
- Typical detailed drawings at large scales, including
  • *All interfaces*
- Technical information and certification demonstrating compliance with specification of proposed incorporated products and finishes, including:
  • *Confirmation of adherence to design criteria set out in General Requirements and Preparatory work and H11/105.*
- Certification, reports and calculations demonstrating compliance with specification of proposed curtain walling.
- Proposals for connections to and support from the building structure and building components.
- Proposals for amendments to primary supporting structure and for secondary supporting structure additional to that shown on preliminary design drawings.
- Schedule of builder's work, special provisions and special attendance by others.
- Examples of standard documentation from which project quality plan will be prepared.
- Preliminary fabrication and installation method statements and programme.
- Schedule of products and finishes with a design life expectancy less than that specified in clause 330, with proposals for frequencies and methods of replacement.
- Proposals for replacing damaged or failed products.
- Areas of non-compliance with the specification.

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

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

100A SETTINGOUT AND CONSTRUCTION TOLERANCES.

For setting out and construction Tolerances see Structural Engineers specification.

142 DESIGN:

Sub-Contractor is to prepare design/installation drawings of the complete external Window system. The Sub-Contractor is to be responsible for the design of the complete window & integral door system, including all necessary fixing brackets and where required secondary steelwork should the design necessitate additional steelwork/structure over and above that indicated on the structural Engineers drawings.

The subcontractor is to assess the suitability of the primary & infill SFS structure (structural window openings) for support the new curtain walling. The subcontractor is to take full responsibility of the performance of the system and supports. The Subcontractor is to undertake site measurements to satisfy themselves that their design is tailored to suit all inherent in-situ constraints prior to manufacture.

- **The Design of the window system should allow for all building movement and include for deflection head detailing as necessary as generated by the Main building structural fabric. The Design should take into consideration the setting out and tolerances for the existing building.**
- **The design of the weather tight envelope should include for all necessary flashings / seals required to provide a weather tight assembly where the window system abuts adjacent materials.**
  THE WINDOW SUB–CONTRACTOR WILL BE REQUIRED TO ADVISE ON AND PROVIDE SUITABLE TRIMS & SEALANTS APPROPRIATE FOR USE WITHIN THE BUILDING TOLERANCES.
- **Drawings and calculations are to be submitted to the Architect and Structural Engineer prior to fabrication for comment**

103 SITE DIMENSIONS

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

105 DETAIL DESIGN/INSTALLATION DRAWINGS AND CALCULATIONS.

- **Complete the detailed design of the curtain walling systems and associated features shown on the preliminary design drawings to meet the requirements of this specification.**
- **The sub- contractor will be required to take all necessary site dimensions prior to fabrication.**
- **Coordinate detailed design with that for all related works.**
- **The Sub-Contractor is to prepare design installation drawings and calculations for issue to the design team.**
- **Glass configuration given in L10/330 is indicative and the subcontractor will be required to undertake all necessary calculations to determine the final composition to meet all current building regulations together with indigenous climatic conditions, including solar protection. The sub-Contractor will be required to ensure that the window system conforms to part L2A of the building regulations (2013 edition with 2016 amendments – min U' Value 1.6wm^{2}K to be achieved), the acoustic criteria as noted in L10/715 and all loadings. Glass thickness and configuration is to be determined by the sub-contractor.**
- **The completion of the design window system installation and associated assemblies shown on the design intention /general arrangement drawings will**

be carried out by a SAS Installing Dealer, including co-ordination with all other related works. The Sub-Contractor will be required to take all necessary site dimensions prior to fabrication.

- **The SAS dealer will be the Curtain walling system sub-contractor.**
  The Sub-Contractor will be required to produce a detailed Curtain Walling schedule indicating all window types including the free area of opening windows and trickle vents. The Architects elevation drawings indicate opening windows to internal rooms, the sub-contractor will be required to ensure that the windows indicated provide suitable openable free area and trickle vents to the rooms they serve to accord with F1 Table 2 of the building regulations. The sub-contractor shall include for any additional opening lights that may be required to accord with the building regulation requirements.

110 CURTAIN WALLING: **GENERALLY.**

- Drawing reference(s): **Elevations, plans & sections drawing references**
  Curtain walling system: **SF52 Series with Vertical and Horizontal pressure plate and cover caps.**
- Manufacturer: **SENIOR ARCHITECTURAL SYSTEMS LTD**
  Eland Road,
  Denaby Main,
  Doncaster,
  DN12 4HA
  Tel: 01709 772600
  Contact: Michael Reynolds
  Email: michaelr@sasmail.co.uk; www.seniorarchitectural.co.uk

Product reference: SF52 fully capped zone drained pressure equalised dry glaze 50 mm Curtain wall.

- Type: Stick System with thermal isolator behind metal pressure plate
- Internal framing members:
  Ref- Ground Floor Doors & Side Screens: SF100mm deep Mullion & Transoms.
  Ref- North Elevation Stairwell & East Elevation: SF150mm deep Mullion & Transoms.

An ESTIMATED windload of 1349 Pascal's has been used based upon elevation drawings. mid-point tie backs to structure included for. If wind load, mullion/transom centres and overall height of the screens increase, then the ixx deflection calculations will need re-calculating accordingly. This will need to be confirmed by a structural engineer.

NOTE:- Where structural properties of mullions is in excess of those for the sizes listed, it will be necessary to insert a system specific reinforcing flat steel bar insert into the box element of the mullions.

With Metal Pressure plates to suit (Pressure plates to be confirmed to suit size of capping by Seniors Technical Manual)

- External cover cap: SCW002 extruded Capping's to Architects design to verticals & SCW055 to horizontals.
- Material: Extruded Aluminium Alloy 6063 T6 to BS EN 75 5 Pt 9 2008
- Finish: Polyester Powder Coat to BS 6496 1984/BS EN 12206-1 2004
  Colour/ texture: To be confirmed by architect (Ref - RAL TBC Matt), from Standard Colour Range – metallic grey.
  Minimum film thickness: 40 microns (60 microns in hazardous environments).

- Glazing details: Double or triple glazing options available, from 24 mm up to 50 mm thickness to maximise thermal and acoustic performance.
- **NOTE:-** where the installation is not to have caps, or if the caps are only to either of the mullions or transoms – then the maximum thickness of insulating glass units will be no more than 40 mm – eg if double glazed this would be 12.0 mm; 16.0 mm cavity; 12.0 mm units.
- Outer Pane:-6mm Climaguard A1.0 toughened
  Cavity:- 16mm argon gas filled cavity
  Inner Pane:-6.8mm clear laminated

  If the ground floor glazing is to comply with Secure By Design, then inner pane may have to be a minimum of 6.8 mm laminated.
  All glazing to comply to BS6262
  NOTE Glazing thicknesses shown are only as a guide, the glazing specialist will need to assess the pane size in-conjunction with the site wind loads, in order to determine the actual thicknesses required..
  Solar control glass is required to meet the following requirements:-

- **Accessories:**
- Incorporated components: Metal pressure plate, fixed to mullions & transoms at a maximum of 25mm from ends & at a maximum of 150 centres.
  Head and cill fixing bracketry in line with Architects requirements to suit cladding details and Seniors Architectural Technical manual.

- **Other requirements:**
- Manifestations incorporating the BBIC logo in accordance with Part M & Part K of the Building Regulations.
- Flashings:
- EPDM to all Curtain walling screens as per Architects details – Tremco Illbruck or similar approved
  All in conformance to the CWCT Standard for Systemised Building Envelopes Part 3
  Air permeability 600 pa A4 Classification
  Water tightness 600 pa R7
  Wind Resistance 2400 pa
  And DD ENV 13050 Water tightness – Dynamic (Fan) Test.
  When tested in accordance with EN 13830: 2003 the following results where achieved:-
  Air permeability 600 pa
  Water tightness 600 pa
  Wind resistance 2400 pa

GENERAL REQUIREMENTS/PREPARATORY WORK

210 DESIGN:

- **Complete the detailed design of the curtain walling and associated features shown on the preliminary design drawings to meet the requirements of this specification.**
- **Coordinate detailed design with that for all related works.**
- **The Sub-Contractor is to prepare design, installation drawings and calculations for issue to the design team.**
- **Glass configuration given in H11/110 is for guidance purposes only. The Sub-Contractor will be required to ensure that the Curtain walling conforms to part L2A of the building regulations (2013 edition with 2016 amendments), the**

acoustic criteria as noted in H11/410 and all loadings. Glass thickness and configuration is to be determined by the sub- contractor.

- **The completion of the design 1202 Dry-glaze curtain wall facade installation and associated assemblies shown on the design intention /general arrangement drawings will be carried out by a SAS Installing Dealer, including co-ordination with all other related works.**
- **The SAS dealer will be the curtain walling sub-contractor.**
- **The sub-contractor will be required to take all necessary site dimensions prior to fabrication.**
- **The Architects elevation drawings indicate opening windows to internal rooms, the sub-contractor will be required to ensure that the opening lights indicated provide suitable openable free area and trickle vents to the rooms they serve to accord with F1 Table 2 of the building regulations & latest CIBSE guidance. The sub-contractor shall include for any additional opening lights that may be required to accord with the building regulation requirements.**

215 DESIGN PROPOSALS

- Alternative proposals: Preliminary design drawings indicate intent. Other reasonable proposals will be considered.

220 SPECIFICATION

- Compliance standard: Senior Architectural Systems technical manual,
- Reference information: For the duration of the contract, keep a copy of the technical manual at the design office, workshop and on site.

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.
- A quality plan in compliance with CWCT ‘Guide to good practice for facades’, Section 6.
- Proposals to support outstanding applications for Building Regulation consents or relaxations.

235 INFORMATION TO BE PROVIDED BEFORE COMMENCEMENT OF 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.

250 PRODUCT SAMPLES

- General: Before commencing detailed design, submit labelled samples of: Curtain walling section.

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.

DESIGN/ PERFORMANCE REQUIREMENTS

305 STANDARD FOR CURTAIN WALLING'
- General: Comply with Section 2 of S.A.S Technical manual - Performance Criteria unless specified or agreed otherwise.
- Project performance requirements specified in this subsection: Read in conjunction with S.A.S Technical manual performance criteria.

311 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 to BS 6399-2.

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.

330 GENERAL MOVEMENT
- Requirement: Curtain walling must accommodate anticipated building movements as follows: to Structural Engineers requirements.

340 AIR PERMEABILITY
- Permissible air leakage rates of 1.5 cu m/hr/sq. m for fixed curtain wall must not be exceeded when the curtain walling is subjected to a peak positive pressure test pressure of 600 Pascal's.

350 WATER PENETRATION
- Water Penetration onto internal surfaces or cavities not designed to be wetted must not occur when the curtain wall is subjected to a peak positive pressure of 600 Pascal's.

370 THERMAL PROPERTIES
- The average thermal transmittance (U-value) of the curtain walling, calculated using the elemental area method, must be not more than **1.6 W/m^{2}K. All in accordance with part L2 of the building regulations April 2013 with 2018 amendments**

380 SOLAR AND LIGHT CONTROL.
As Appendix A

385 THERMAL STRESS IN GLAZING
- Glass panes/ units: Must have adequate resistance to thermal stress generated by orientation, shading, solar control and construction. This is to be checked by glazing sub-contractor.

410 ACOUSTIC PROPERTIES: The following minimum sound reduction Index (Rw) in dB will be required to be achieved.

On completion of the installation the Sub - Contractor will be required to carry out site testing to demonstrate that the acoustic performance of Windows is achieved to the satisfaction of current statutory requirements.

425 INTERNAL SURFACE SPREAD OF FLAME OF CURTAIN WALLING
- Standard: To BS 476-7.
- Class O.

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.

435A **DOORS- ALUMINIUM THERMAL (Refer to door schedule for ironmongery details)**

Manufacturer: Senior Architectural Systems Ltd
Product reference: SPW500/01 COMMERCIAL THERMAL DOOR by Senior Architectural Systems Ltd, Eland Road, Denaby Main, Doncaster, DN12 4HA
Tel: 01709 772600; Fax: 01709 772601;
email: michaelr@sasmail.co.uk; www.seniorarchitectural.co.uk

Aluminium alloy door profiles to conform to BS EN 755-9, alloy 6063 T5 or T6.All doors shall be fabricated from square cut components, mechanically jointed, from the S.A.S SPW500 Series range of profiles from aluminium alloy conforming to BS EN 755- alloy 6063 T5 or T6. Polyamide thermal barriers PA66 GF25.

Corners shall be reinforced with special aluminium cleats/brackets bolted together, along with torsion bars in the top and bottom rails for compressive strength. A Proprietary sealant to protect against water entry should be used on all metal to metal joints and cleat insertion points at assembly.

Doors are to be commercial quality with heavy duty pivot assembly and with concealed transomatic overhead closers with hold open device. (Light, Medium, Heavy, DDA duty TBC on door widths)

Standard lock door Stiles (SPW51415) shall be 71.5 x 47mm. Unless AXPR7085PAL Concealed Emergency Push Paddle/bar exit devices are to be used then (SPW52122) 110 x 47mm door stiles to be used

Standard Pivot stiles (SPW51011 AFT bulbous stile / SPW52828 AFT Jamb trim, shall be 97mm combined) so that, when the door is opened, the gap between the door jamb and stile does not exceed 4mm in any position). Unless AXPR7085AL Concealed Emergency Push Bars are to be used then SPW51015 AFT Panic Bar door stile / SPW52828 AFT Jamb trim to be used, maintaining the same 4mm gap)
Emergency exit doors to be as Fire Strategy. (Refer to schedule)

Top rails (SPW51213) shall be 119 x 46mm, Bottom rail (SPW51213) shall be 119 x 46mm. No Mid Rail

The door frame shall incorporate a double ramp threshold, with integral drainage ref SD501N in natural anodised finish, the door leaf to have double wool-pile to the stiles, top rail and bottom rail, in order to provide a degree of weather resistance.

• Finish as delivered: The finish is to be polyester powder coating, complying with the requirements of BS 6496: 1984, to a minimum thickness of 40 microns (60 microns in hazardous environments).This finish to be obtained using an 8 stage pre-treatment operation, prior to the application of the polyester
External : Polyester Powder coated to minimum 40 microns thickness (60 in hazardous areas).

- Finish: PPC RAL Metallic grey generally from manufacturers colour range (Architect to confirm). Main entrance doors to be blue to match BBIC's standard branding **Paua** c100m100y30k25.

• Glazing details: to be beaded to take 28 mm insulating glass units, to meet BS6262 and conform to BS6206, also to suit Part M and BS8300.
Glazing gaskets and seals to be extruded thermo-plastic rubber, and are to be and meet BS4255

All of the double glazing will be 28 mm thick, insulating glass overall to BS 5713, thermetically sealed and kitemark certified.

Thermal performance of all glazing, to be in accordance with Document L2 of the Building Regulations, for England & Wales 2016.
Acoustic performance as per Guardian Glass data sheets and to statutory regulations as a minimum.
Barrier protection requirements of 0.74K/N all as per Architects details and Guardian Glass data sheets provided.

Ironmongery:
AXPR7085 Emergency Exit push bars (AL) / Push Paddles (PAL) where required to Fire exit areas.
Other requirements:

440 DESIGN LIFE OF CURTAIN WALLING
- Duration (minimum): 40 years
- Maintenance: Submit a schedule for maintenance and for replacement of secondary components.

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.

TESTING

515 PROJECT TESTING (LABORATORY)
- Test results and reports: Before commencement of curtain walling fabrication and installation, submit proof of compliance with this specification.

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 8118-2.

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 MILD STEEL FRAMING SECTIONS/ REINFORCEMENT
- Standards: To relevant parts of BS 7668, BS EN 10029, BS EN 10113, BS EN 10137, BS EN 10155 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 3506-1 and - 2, grade A2 generally, grade A4 when used in severely corrosive environments.
- Mild 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
- 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.
- Glass quality: Clean and free from obvious scratches, bubbles, cracks, rippling's, dimples and other defects.
- Glass edges: Generally undamaged. Shells and chips not more than 2 mm deep and extending not more than 5mm across the surface are acceptable if ground out.

739 DIMENSIONAL TOLERANCES ON GLASS IN ALL CASES
- 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 and thicker 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 and thicker glass: ± 3.0 mm.
- Pane squareness : Not more than 4 mm difference in diagonal measurements.

741 DISTORTIONAL TOLERANCES ON GLASS IN ALL CASES
- 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 SOAKING OF THERMALLY TOUGHENED GLASS
- Requirement: To minimize the incidence of glass failure due to nickel sulphide nclusions in the following locations: High level windows.
- Heat soaking regime: To achieve a mean glass temperature of 290 ± 10°C for not less than manufacturer's recommendations.

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.

765 WEATHERSTRIPPING OF OPENING UNITS
- Material:
- Noncellular rubber to BS 4255-1.
- Polypropylene woven pile, silicone treated.
- Attachment: Fixed in undercut grooves in framing sections using preformed corners, with any joints in the length.

770 GENERAL SEALANTS
- Selection: In accordance with BS 6213 from:
- Silicone to BS 5889.
- One part polysulphide to BS 5215.
- Two part polysulphide to BS 4254.
- One or two part polyurethane.

772 CURTAIN WALLING JOINT ASSEMBLY SEALANTS
- Material: Silicone to BS 5889, type A or B, neutral curing where in contact with or close proximity to other products that may be adversely affected by acetoxy curing.
  Manufacturer/Product reference: To approval.
  The system shall be fabricated, assembled and sealed in accordance with Senior Architectural Systems recommendations.

780 THERMAL INSULATION
- Material: Rockwool cavity closers.
- 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: As clause 712.
- Mild steel: As clause 717, galvanized or protective coated.
- Stainless steel: As clause 720.
- 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 MILD 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 5493, BS EN ISO 12944 or BS EN ISO 14713.

820 PROTECTIVE COATING OF MILD STEEL MECHANICAL FIXINGS
- Treatment: One of the following to all surfaces:
- Hot dip galvanized to BS EN ISO 1461.
- Sherardized to BS 4921, class 1 coating thickness and passivated.
- Zinc plated to BS EN 12329, 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.

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.

950 SUITABILITY OF SUPPORTING STRUCTURE
- Pre-installation survey: Submit report if required accuracy or security of curtain walling installation cannot be achieved.

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: _to be agreed.

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 over tighten 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:

980 INTERFACES
- Flashings, closers, etc: Locate and form correctly to provide weather tight 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 DAMAGE:
- Do not repair curtain walling without approval. Such approval will not be given where products and units are badly damaged or where the proposed repair will impair performance or appearance.
- Repairs may require additional site testing at the discretion of the CA.
- Schedule repairs or record on drawings for inclusion in the maintenance manual.

990 CLEANING: At Practical Completion or when otherwise agreed with the CA, remove any protective coverings and thoroughly clean external and internal curtain walling areas. Cleaning agents for the purpose must be approved by the curtain walling manufacturer and incorporated products manufacturers.
The systems should be cleaned at prescribed intervals in full accordance with the details published by SAS, as issued by the installing Sub - Contractor.

995 MAINTENANCE: Prepare a maintenance manual in accordance with CWCT 'Guide to good practice for facades', Section 10. Unless otherwise instructed or agreed the manual must be completed and handed over to the CA at Practical Completion.
The systems shall be maintained in full accordance with the schedule and details published by SAS, as issued by the Sub - Contractor.