

Appendix A – Preliminary Specification

PRELIMINARY SPECIFICATION

TYPES OF ROOF GLAZING

MONO PITCH PRE-GLAZED PANEL ROOF LIGHTS

- a) **Scope of Work:** The scope of work will include the detailing, supply and installation of all components to the roof lights, including opening vents, fixings, flashings, gaskets and sealants to provide a fully operational and watertight assembly.
- b) **Drawing reference(s):** Please see Appendix B – MRC Harwell Plan and Section 001
- c) **Description:** 4no 8000mm x 2000mm Lean-to roof lights abutting / overlapping solid gables by others.
- d) **Support Structure:** Head, verge and cill structure, shaped or aligned to suit the pitch of the glazing, to be provided and fixed by appointed contractor.
- e) **Manufacturer and Reference:** Pre-fabricated, fully enclosing panel frame type VITRAL 'A74' by: VITRAL UK Ltd. 83 High Street, Linton, Cambridgeshire, CB21 4JT. Tel: 01223 499000. Fax: 01223 499001. Email: VITRAL-UK@VITRAL.CO.UK – or equal
approved
Installation to be carried out by a Trained Approved Specialist Contractor (TASC), details available from manufacturer.
- f) **Frame Material/Size:** 23 x 74mm aluminium alloy (6060TF) precision frame profiles bonded to polyurethane resin thermal break. The total width of the side framing between adjacent fixed and/or opening panels, including internal drainage channel, shall not exceed 50mm.
- g) **Finish:** Panel frames, cill covers, external cover caps, flashings and fixings shall be p.p.c. finish in a standard RAL colour. Gloss finish 77% +/- 7%. Internal finish to suit external.
- h) **Panel centres:** approx. 800mm
- i) **Pitch:** Approximately 25 degrees°.
- j) **Pane / infilling material(s):** Glazed panel frames to be fitted with hermetically double-sealed, double glazed units in controlled factory conditions, not on site. 6mm clear toughened glass outer pane, 18mm Argon filled cavity with TGI warm edge spacer, non-fragile laminated low-E float glass inner pane. Whole system inclusive of glazing to be tested in accordance to CWCT TN66/67 (impact test) achieving a minimum Class 2 rating. Glazed unit to provide a mid-pane U-value of 1.1 W/m²K and to achieve an average U-value across the entire roof glazing assembly of around 1.60 W/m²K. Toughened and laminated glass unit required to resist maintenance and impact loadings. Glass performance properties as noted below:
 - Light Transmittance (LT): 78 (0.78%)
 - Energy Transmittance(TET): 50 (0.50%)
 - Solar Factor (g-value): 0.61
- k) **Accessories/Fixings:** Installation to incorporate high density isolation material where connected to the steel supporting structure, along with ridge / head, verge / gable and cill cover flashings and all associated gaskets and sealants to ensure a water-tight detail.
- l) **Ventilation:** None. All fixed.

GENERAL REQUIREMENTS

DESIGN

- Detailed design of roof glazing system: Complete in accordance with the requirements of this specification and submit to the Contract Administrator (CA) before commencement of fabrication.
- Related works: Coordinate with supporting structure and interfaces in detailed design. The specialist sub-contractor will be required to prepare full and detailed fabrication and assembly drawings of their work, including: plans, sections, and full details of the joints and junctions within the glazing system and with the sub-structure.

DESIGN/PERFORMANCE REQUIREMENTS

REQUIREMENTS GENERALLY

- Extent of compliance: Entire roof glazing assembly, including flashings and junctions with adjacent parts of the building.
- Deflections and other movements: Make full allowance.

VERIFICATION OF PERFORMANCE

- Reports and calculations: Structural frame and glass calculations, laboratory testing of air tightness and water tightness, and hot box testing of thermal performance of frames to be submitted before commencement of roof glazing work.
- Air tightness method of test: To EN 1026 (2000)
- Air tightness classification: To EN 12207 – air permeability Class 4 at 600 Pa
- The thermal performance of the entire assembly should be proven by project specific calculation, based on hot box testing of the framing in accordance with EN12412-2:2003 and/or assessment in accordance with BS-EN ISO 10077-2:2004.

INTEGRITY

- Requirement: Determine size(s) and spacing(s) of the panels, thickness of glazing/infilling, types and locations of fixings and other structural requirements in accordance with relevant parts of BS 5516-2 to ensure that roof glazing will resist wind loads, dead loads and design live loads, and accommodate all deflections and thermal movements without damage
- Wind loads: Calculate to BS 6399-2.
- Snow load: Determine from BS 6399-3.
- Permanent imposed loads: 0
- Temporary imposed loads: 0

SURFACE SPREAD OF FLAME

- Standard: To BS 476-7.
 - Internal: Class 1
 - External: Class 1

WATER PENETRATION OF ROOF GLAZING

- Method of test: To EN 1027 (2000) – Method A.
- Water tightness classification: To EN 12208 Class E1200 = watertight at 1200 Pascals.

HEAT CONSERVATION

- Average thermal transmittance (U-value) across the complete glazing installation (glass & framing) must be not more than 1.60 W/m²K.

CONDENSATION

- Requirement: Condensation must not form on internal surfaces of framing members or glazing/ infilling in the following conditions:
 - External air temperature: -5°C.
 - Internal air temperature: +20°C.
 - Internal relative humidity (maximum): 40%.

THERMAL SAFETY

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

FABRICATION AND INSTALLATION

WORKMANSHIP GENERALLY

- Fixings: Concealed unless otherwise indicated on detailed drawings.
 - General requirements: NBS specification section Z20.
 - Material: Compatible with building component and substrate.
 - Metals: Isolate dissimilar metals to avoid electrolytic corrosion.
- Allowance for thermal and building movement: Where appropriate.
 - Movement joints: Do not bridge.
- Fabrication: Prefabricate glazed panels and machine cut and drill installation profiles in the workshop wherever possible.
- Installation: Submit proposals before cutting and drilling into structure in positions other than shown on detailed design drawings.

GLASS

- Standards and product labels: To BS 952 and the relevant parts of:
 - BS EN 572 for basic soda lime silicate glass.
 - BS EN 1096 for coated 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.
- Pane dimensions: Within ± 2 mm of nominal size.
- Glass quality: Clean and free from obvious scratches, bubbles, cracks, rippling, 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 surface are acceptable if ground out.

HEAT SOAKING OF THERMALLY TOUGHENED GLASS

- Requirement: Heat soak thermally toughened glass to reduce incidence of glass failure due to nickel sulfide inclusions.
- Heat soaking regime: To achieve a mean glass temperature of $290 \pm 10^\circ\text{C}$ for not less than 4.

- Locations: All toughened glass in all areas of roof glazing.

INSULATING GLASS UNITS

- Standard and labels for hermetically sealed units: To BS 5713 or BS EN 1279 and Kitemark certified.
- Label: Each pane.
- Colour of TPS perimeter spacers: Black.
- Perimeter seals: Resistant to UV light degradation on exposed edges.
- Perimeter taping: Not to be used.
- Assembly and weather sealants: Compatible with perimeter seals.

INFILLING

- Sheets: Accurately sized with undisfigured and undamaged edges and surfaces.
- Adequately rigid to comply with all design/performance requirements.

SUITABILITY OF STRUCTURE

- Contractor's survey:
 - Programme: Carry out not less than two weeks before commencement of glazing installation.
 - Scope: Geometric survey of supporting structure, checking line, level and fixing points. Structure unsuitable to receive glazing: Give notice.

PROTECTION AND FINAL CLEANING

- Cement and plaster-based spillage: Remove whilst wet.
- Staining, scratching and other disfigurement of glazing: Prevent during installation and by following trades.
- Completion: At agreed time, remove protective coverings and thoroughly clean external and internal surfaces with mild detergent solutions approved by VITRAL UK Limited – **or equal approved.**