



H92 Rainscreen cladding

PROJECT NAME: Chalcot Estate

H92 RAINSCREEN CLADDING

Optima FC System

To be read with Preliminaries/General conditions.

(Help to complete individual sections is given in Guidance Notes to H92)

TYPE(S) OF RAINSCREEN CLADDING

Optima FC is a secret fix hook on rainscreen system.

Optima FC system to be fixed with vertical panels.

Standard joints are 20mm vertical and 20mm horizontal.

The panels are individually demountable.

The system can accommodate a multitude of materials and thicknesses (from 0.7mm to 4mm) may be used on one universal carrier.

Actual panel thickness 50mm

This drained and ventilated system has been independently tested for compliance with CWCT specification for rainscreen cladding.

Minimum drainage and ventilation zone to be 38mm from back of the panel.

System must comply with CWCT 'Standard for systemised building envelopes'

Test performed:

Watertightness – dynamic

Wind resistance – serviceability

Wind resistance – safety

Soft body impact

System components to be recyclable if solid aluminium.

120 RAINSCREEN CLADDING Metal – See Elevations

- Drawing reference(s): (as shown on Architects drawings)
- Primary support structure: as drawings
- Rainscreen cladding system: Optima FC Rainscreen System

Manufacturer and reference:

Sotech Limited

Unit 2, Whitehouse Business Park,

Peterlee,

Co. Durham,

SR8 2RU

Telephone: 0191 5872287

Fax: 0191 5180703

E-mail: technical@sotech-optima.co.uk

Rainscreen panel:

- Manufacturer: Sotech Limited
- Product Reference: Optima FC Rainscreen System, individually demountable, tray stiffened as necessary to meet performance criteria for deflection under wind load as clause 350.
- PVC anti rattle clips to be incorporated into pre-punched, snap in slots in panels.

Material –

Aluminium:

Polyester powder coating (PPC)

Product Characteristics-

- Thickness: 3.0mm Aluminium
 - Manufactured using CNC controlled machines and ISO9001 quality assured processes.
 - Finish/Colour – PPC Ral: 9002
 - Joint type: Baffle
 - Joint: Typical joint size 20mm x 20mm
- Secondary Support System:
 - Manufacturer – Sotech Limited
 - The structural wall brackets are manufactured from extruded aluminium with a hands free facility for fixing to the extruded carrier profile allowing adjustability in all planes, to required zone range (130mm-320mm) The carrier profile has panel retention hooks, mechanically fixed using CNC production guidelines before delivery to site. The support framing must allow for calculated expansion movement of the whole system vertically and horizontally.
 - Material: Extruded aluminium to BS1474 in 6063/T6 grade alloy;
 - Security Screw: Two small wafer head, self-tapping stainless steel screws per panel.
 - Backing wall: As clause 130 (by others)
 - Breather membrane: As section 785
 - Thermal insulation: As clause 775
 - Accessories: All necessary flashings, copings bullnose, drainage channel etc the material, finish and colour to be agreed with the architect and to be manufactured by Sotech Ltd., the Rainscreen manufacturer, see above for contact details.
 - Other requirements consult:
Sotech Limited
2 Traynor Way
Whitehouse Business Park
Peterlee
Co. Durham
SR8 2RU
Tel: 0191 5872287
 - Other requirements: (Insert any panel properties not included above or in referenced drawings).
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- Vapour control layer to be bonded to roof & floor membranes and flashings to openings to achieve the required air tightness levels.
- Rainscreen Cladding installation to include all products, fixings, closer pieces, sealants and interface components necessary to complete the fabrication and installation and provide watertight and airtight enclosure (including vapour barrier, thermal insulation, movements joints and air seals at all junctions with other elements.
- Cavity Fire barriers as Clause 490

GENERAL REQUIREMENTS/PREPARATORY WORK

210 DESIGN

- Complete the detailed design of the rainscreen cladding and associated features shown on the preliminary design drawings to meet the requirements of this specification
- Co-ordinate detailed design with that for all related works.

220 SPECIFICATION:

- Comply with the latest edition of the Centre for Window and Cladding Technology (CWCT) 'Standard for walls with ventilated rainscreen' and 'Standard for testing of ventilated rainscreen' unless specified otherwise in this section.
- Keep a copy of the CWCT 'Standard for walls with ventilated rainscreen' and 'Standard for testing of ventilated rainscreen' together with other CWCT publications invoked by these documents, at the design office, workshop and on site, readily accessible for reference at all times during the course of the works.

235 INFORMATION TO BE PROVIDED BEFORE COMMENCEMENT OF RAINSCREEN CLADDING WORK: Submit to the CA before testing or fabrication the following rainscreen cladding particulars:

- Detailed drawings to fully describe fabrication and installation.
- Detailed calculations to prove compliance with all design/performance requirements.
- Project specific fabrication, handling and installation method statements.
- Certification for all incorporated components manufactured by others confirming their suitability for all locations in the rainscreen cladding.
- Recommendations for spare parts for future repairs or replacements.
- Recommendations for safe dismantling and recycling or disposal of all products.

DESIGN/PERFORMANCE REQUIREMENTS

310 GENERALLY:

- Comply with CWCT as 'Standard for walls with ventilated rainscreen', Section 2 - performance criteria unless specified or agreed otherwise.
- Project performance requirements specified in this subsection are to be read in conjunction with CWCT performance criteria.

330 INTEGRITY OF VENTILATED RAINSCREEN CLAD WALLS: Determine size(s) and thickness of panels, the size(s), number and spacing of fixings, configuration and location of secondary support systems and incorporation of other accessories and fittings to ensure the cladding system, primary support structure and other elements forming the rainscreen wall will resist all factored dead, imposed and design live loads, and accommodate all deflections and movements without damage.

- Calculate wind loads on rainscreen walls appropriate to location, exposure, height, building shape, and size in accordance with BS 6399-2 standard method, taking full account of existing and known future adjacent structures.

Basic wind speed (V_b): _____ m/s.

Altitude factor (S_a): _____

Direction factor (S_d): _____

Seasonal factor (S_s): 1.

Probability factor (S_p): 1.

Terrain and building factor (S_b): _____

External and internal size effect factors (C_a): 1.

External pressure coefficients (C_{pe}): As determined from BS 6399-2, clauses 2.4 and 2.5.

Internal pressure coefficients (C_{pi}): As determined from BS 6399-2, clause 2.6.

Dominant opening: _____

- Impact load(s) in accordance with BS 8200:

Location and category _____

- Temporary imposed loads: _____

(Use this clause where the parameters determining wind loads are critical)

- 350 DEFLECTION UNDER WIND LOAD: At positive and negative applications of the design wind pressure the maximum normal deflection for the listed components must not exceed:

Individual rainscreen panels – L90 of the span measured between the points of attachment of the panel – this being defined as the perimeter folded edges of the panel. The panel face (or pan) is to be designed to accept repeated deflection without damage based upon the mechanical properties of the panel material.

Framing members – L/200 of the span of the member measured between points of attachment to the building, or 20mm, whichever is the lesser

- 370 APPEARANCE AND FIT:

- Design rainscreen wall:
 - To ensure position and alignment of all parts and features as shown on the referenced drawings listed in type(s) of rainscreen cladding clause(s).
 - To accommodate deviations in the primary support structure.
- Maximum permitted component and installation tolerances:
 1. Permitted deviation of overall panel width +3.0mm -3.0mm
 2. Permitted deviation in panel length

For panels up to 2400mm	+3.0mm	-3.0mm
For panels over 2400mm	+3.0mm	-3.0mm
 3. Maximum permitted deviation in length of two opposite sides of panel +3.0mm -3.0mm
 4. Squareness of panels:

When the longest of two adjacent sides of the panel is taken as the base line, the deviation of the shorter side measured from a perpendicular to the baseline at any point along the baseline not to exceed +3.0mm -3.0mm
 5. Flatness:

Deviation under a 1.0m straight edge placed anywhere on a flat surface not to exceed 3.0mm
 6. Alignment of joints between adjacent panels: deviation of panel corner from protected lines of edges of adjacent

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- panels not to exceed 3.0mm
7. Alignment of faces to adjacent panels:
Deviation of panel edge under a 1.0m straight edge placed across adjacent panel not to exceed 3.0mm
- 380 GENERAL MOVEMENT: The rainscreen cladding must accommodate anticipated building movements as follows: (To be inserted by Client's Engineer)
- 390 AIR PERMEABILITY GENERALLY: The average air leakage rate through the listed wall(s) at a differential pressure of 50 pascals must not exceed:
(Typically 10m³/hr/m²)
- 440 CONDENSATION: The psychrometric conditions under which condensation must not form within or on the interior surface of the rainscreen wall or any surface of the wall that is on the warm side of any insulation are:
- Outdoor notional psychrometric conditions as BS 6229, table 6:

	Winter	Summer
Temperature	-5°C	18°C
Relative humidity	90%	65%
Vapour pressure	0.361 kPa	1.341 kPa
Duration	60 days	60 days
 - Indoor notional psychrometric conditions:
Temperature: _____ °C
Relative humidity: _____ %
Vapour pressure: _____ kPa.
(Data available in BS 6229, table 7)
 - Calculated amount of winter interstitial condensate must not exceed _____ kg/m².
Calculated annual net retention must not exceed 5% of winter condensate.
- 450 VAPOUR CONTROL LAYER: Determine the interstitial condensation risk of the rainscreen wall using the method described in BS 5250 Appendix D. If necessary, provide a suitable vapour control layer to ensure that damage and nuisance from interstitial condensation does not occur.
- 480 FIRE RESISTANCE OF BACKING WALL: To BS 476- 21 and not less than _____
- 485 INTERNAL SURFACE SPREAD OF FLAME OF BACKING WALL: To BS 476-7, Class _____
- 490 CAVITY FIRE BARRIERS: To BS 476-20 and must resist the passage of flame and smoke for not less than _____

TESTING

The Centre for Window and Cladding Technology have developed “The Standard for Testing of Ventilated Rainscreen” and “Test Methods for Ventilated Rainscreen” Sotech have commissioned and passed the following tests which are required by these standards for rainscreen systems –

- Dynamic water pressure test - weather tightness and water penetration
- Wind loading – Serviceability (positive and negative)
- Wind loading – Safety (load applied as serviceability test x 1.5 for safety factor)

- Wind resistance – Cyclic loading as test regime defined in “Standard for Walls with Ventilated Rainscreen” section 2.8.2 and BRE digest 346 part 7 (load applied as wind loading, serviceability test level)
- Soft body impact test.

Other tests which may be required are -

595 AIR PERMEABILITY TESTS – AIR BARRIER

- To CWCT “Standard for testing of ventilated rainscreen”, clause 3.3 and 3.3.1
- Peak test pressure: (Insert)
- Allowable leakage rates: As clause 390

620 WINDLOADING TEST – LARGE SPECIMEN – AIR BARRIER

- To CWCT ‘Standard for testing of ventilated rainscreen’, clause 3.5.1
- Test pressure: (Insert)
- Loading directions: (Insert)
- Allowable elastic deformation: (Insert)
- Allowable residual deformation: (Insert)

661 IMPACT TEST:

- To CWCT ‘Standard for testing of ventilated rainscreen’, clause 3.12.1 and BS 8200.
- Wall category: (Insert)
(This test regarded as compulsory by CWCT for ground floor treatments)

PRODUCTS

710 ALUMINIUM ALLOY FRAMING SECTIONS:

- To BS 1474, alloy 6063 and suitable for the specified finish.
- Structural members to comply with BS 8118.

712 ALUMINIUM ALLOY SHEET: To BS EN 485, BS EN 515 and BS EN 573 in an alloy, temper and thickness suitable for the application and specified finish.

715 MILD STEEL FRAMING SECTIONS/ REINFORCEMENT: To the relevant parts of BS 7668, BS EN 10029, BS EN 10113, BS EN 10137, BS EN 10155 and BS EN 10210, in a thickness suitable for the application, and for galvanizing or other protective coating.

717 MILD STEEL SHEET: To the relevant parts of BS 1449-1, BS EN 10048, BS EN 10051, BS EN 10111, BS EN 10131, BS EN 10139, BS EN 10140, BS EN 10149, BS EN 10209, and BS EN 10268 in a grade and thickness suitable for the application, and suitable for galvanizing or other protective coating.

720 STAINLESS STEEL SHEET: To the relevant parts of BS EN 10029, BS EN 10048, BS EN 10051, BS EN 10095, BS EN 10258, BS EN 10259 and BS EN 10088-2, austenitic, grade 1.4301 (304) generally, grade 1.4401 (316) when used externally or in severely corrosive environments, and in a thickness suitable for the application.

730 MECHANICAL FIXINGS:

- Stainless steel to BS EN ISO 3506 grade A2 generally, grade A4 when used in severely corrosive environments, or
- Mild steel to BS 4190 and suitable for galvanizing or other protective coating, or
- Aluminium complying with BS 1474 and BS EN 755.

- 732 ADHESIVES must not be degradable by moisture or water vapour.
- 735 FIXINGS AND FASTENERS must be:
- Of dimensions not less than recommended by their manufacturers.
 - Capable of adequate three dimensional adjustment to accommodate primary support structure and rainscreen cladding fabrication/installation tolerances.
- 760 GASKETS:
- Non-cellular rubber to BS 4255-1
 - Cellular rubber to ASTM-C509.
 - Resistant to oxidation, ozone and UV degradation.
- 770 GENERAL SEALANTS: Must be stable and compatible with all contact products and finishes and be selected in accordance with BS 6213 from:
Silicone to BS 5889
One part poly-sulphide to BS 5215
Two part poly-sulphide to BS 4254
One or two-part polyurethane.
- 775 THERMAL INSULATION:
- Material: (insert choice of material)
Manufacturer and reference: (insert)
Thickness: (insert ____ mm). (Exact thickness determined by thermal analysis of complete wall build up)
 - Keep dry during installation.
 - Installation method: (insert)
- 785 BREATHER MEMBRANE:
- Material: Spun bond polypropylene membrane
 - Lay membrane over insulation as work proceeds ensuring continuity.
 - Overlap joints not less than 150 mm and seal with tape recommended by the membrane manufacturer, to prevent water reaching the insulation.
 - Fully seal at penetrations using taping methods recommended by the membrane manufacturer.
 - Before covering check for tears and punctures. Carefully repair using a patch of breather membrane with 150 mm laps sealed with tape.
 - Ensure that bottom edges overlap flashings, sills, etc. to allow free drainage to the exterior.

FINISHES

- 810 PROTECTIVE COATING OF MILD STEEL FRAMING SECTIONS/REINFORCEMENT: All surfaces must be:
- Hot dip galvanized to BS EN ISO 1461, or
 - Treated with an appropriate equivalent coating to BS 5493, BS EN ISO 12944 and BS EN ISO 14713.
- 820 PROTECTIVE COATING OF MILD STEEL MECHANICAL FIXINGS: All surfaces must be:
- Hot dip galvanized to BS EN ISO 1461, or
 - Sherardized to BS 4921, class 1 coating thickness and passivated, or
 - Zinc plated to BS 1706, coating classification Fe/Zn 12 and chromate conversion class 2C or 2D.

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830 All finishes applied in accordance with relevant UK standard requirements.

FABRICATION AND INSTALLATION

910 **GENERALLY:**

- Fabricate and install rainscreen cladding in accordance with this specification and the final detailed drawings.
- Fabricators and installers must employ competent rainscreen cladding operatives. Records of their experience are to be provided to the CA on request.
- Select and align all products to ensure uniformity of appearance.
- Joints must only occur at positions indicated on final detailed drawings.
- Isolate dissimilar metals to prevent electrolytic corrosion.
- Machine cut and drill all products in the workshop wherever possible.
- Mark or tag all products to facilitate identification during assembly, handling, storage and installation. Do not mark surfaces visible in the complete installation.

912 **METALWORK:** As section Z11, unless specified otherwise in this section.

922 **FIXINGS/ADHESIVES APPLICATION:** As section Z20, unless specified otherwise in this section.

925 **SEALANT APPLICATION:** As section Z22, unless specified otherwise in this section.

930 **ASSEMBLY:**

- Carry out as much assembly as possible in the workshop.
- Joints, other than movement joints and designed open joints, must be rigidly secured, reinforced where necessary and fixed with hairline abutments.
- Take precautions to prevent displacement of components in assembled units. Obtain approval for any reassembly on site.

935 **INSPECTION:**

- All fabrications and assembled units must be carefully inspected for match with approved samples and for compliance with this specification and the final detailed drawings before dispatch to site.
- Give adequate notice of inspection arrangements to enable the CA and/or other affected parties to be present.

940 **PROTECTION:**

- All fabrications and assembled units must be protected against damage, corrosion and disfigurement during handling, installation and subsequent site operations.
- Protective coverings must be applied before dispatch to site and must not be detrimental to rainscreen cladding products, finishes or installation procedures.

945 **HANDLING AND STORAGE:**

- Do not deliver to site any rainscreen cladding products and units, which cannot be installed immediately or unloaded into a suitable well protected storage area.
- Store products and units on level bearers clear of the ground and separate with resilient spacers.

950 **SUITABILITY OF STRUCTURE:**

- Not less than _____ weeks before commencement of rainscreen cladding installation carry out a geometric survey of the supporting structure, checking line, level and fixing points. Report immediately to the CA if structure will not allow the required accuracy or security of erection.

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- Coordinate geometric survey for rainscreen cladding with any other survey(s) for adjacent cladding.
 - Set out erection datum points, lines and levels for a complete elevation at a time unless otherwise agreed with the CA.
- 960 PRELIMINARY RAINSCREEN CLADDING INSTALLATION: Complete a preliminary area of rainscreen cladding as set out below for inspection and approval of appearance by the CA.
- 970 RAINSCREEN CLADDING INSTALLATION:
- Set out straight, parallel and truly aligned.
 - Tighten all mechanical fixings to manufacturers' recommended torque figures. Do not over tighten fixings intended to permit differential movement.
 - Remove protective coverings only where necessary to facilitate installation and from surfaces which will be inaccessible on completion.
- 975 IN SITU WELDING is not permitted.
- 980 INTERFACES: Ensure that flashings, closers, etc. (specified in another section) are located correctly and neatly overlap the rainscreen cladding to form a weather-tight junction.
- 985 DAMAGE:
- Do not repair rainscreen cladding 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 rainscreen cladding areas. Cleaning agents for the purpose must be approved by the rainscreen cladding manufacturer and incorporated products manufacturers.
- 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.