

GRC Rainscreen Cladding Package

Introductory note and performance criteria for tendering sub-contractors



B17-1796 Broadway Two Hotel

Renfield Street, Glasgow

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FOREWORD

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This report should be read along with the drawings and documents by Consarc Design Group as listed overleaf.

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-	CS	MK	MK	12.06.19

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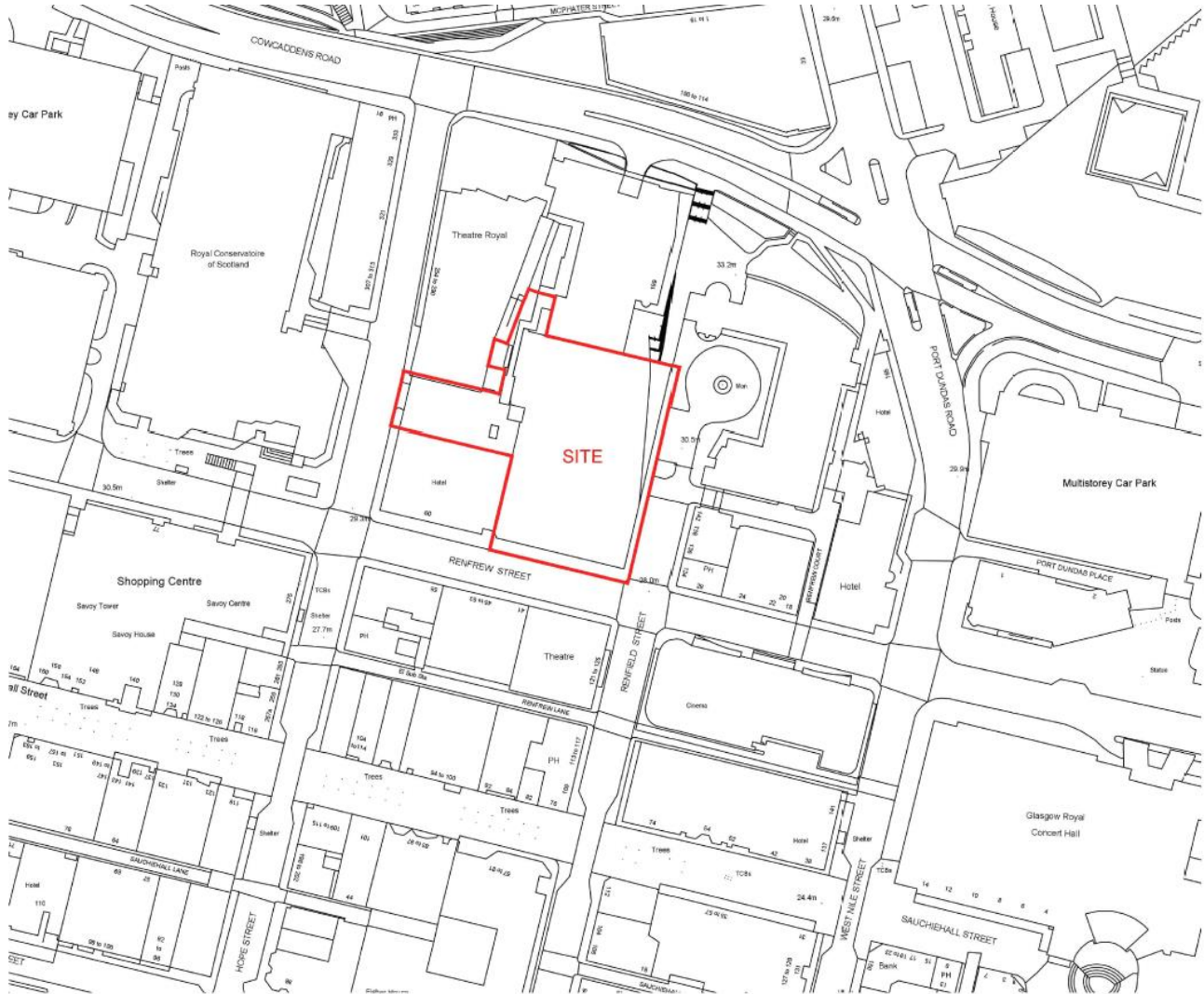
2.0 Drawings

3.0 Specification –GRC Rainscreen Cladding Façade

1.0 INTRODUCTION

The proposal is for a 300 bed, 12 storey hotel with roof level plant enclosure on Renfrew/Renfield Street, Glasgow.

Site Location Plan



2.0 DRAWINGS

This specification is to be read in conjunction with the following information:

Consarc Design Group Drawings:

DRAWING NO	DRAWING TITLE
GA-A-L100	Proposed Ground Floor Plan
GA-A-L101	Proposed First Floor Plan
GA-A-L102	Proposed Second Floor Plan
GA-A-L103	Proposed Third Floor Plan
GA-A-L104	Proposed Fourth Floor Plan
GA-A-L105	Proposed Fifth Floor Plan
GA-A-L106	Proposed First Floor Plan
GA-A-L110	Proposed Tenth Floor Plan
GA-A-L111	Proposed Eleventh Floor Plan
GA-A-L112	Proposed Twelfth Floor Plan
GA-A-L113	Proposed Thirteenth Floor Plan
GA-A-L701	Proposed Sample Panel
GA-A-L702	Façade Details
GA-A-L703	Façade Details
GA-A-L704	Façade Details
GA-A-L705	Façade Details
GA-A-L706	Façade Details
GA-A-L707	Façade Details
GA-A-L708	Façade Details
GA-A-L709	Façade Details
GA-A-L710	Façade Details
GA-A-L711	Façade Details
GA-A-L720	Renfrew Street Façade Detail Elevation
GA-A-L721	Renfield Street and West Courtyard Façade Detail Elevation
GA-A-L722	North Street Façade Detail Elevation
GA-A-L723	West Façade Detail Elevation
GA-A-L724	Fire Barrier Responsibility Matrix

And the following information provided by other design team consultants:

Adnitt Acoustics –

- Stage 3 Report

Caldwell Consulting –

- SBEM Model.

Jeremy Gardner Associates -

- Fire Report

Ian Black Consulting Drawings –

- Structural drawings illustrating locations of structure to fix façade finishes to so that the sub-contractor can allow for sufficient brackets/frame anchors to fix back to structural slabs/boots etc.
- Movement Report.

3.0 SPECIFICATION – GRC RAINSCREEN CLADDING FACADE

SCOPE OF WORK

The scope of work includes the design, supply fabrication and installation of Telling GRC Rainscreen cladding system complete with all necessary sub-structures, anchors, hardware, insulation, fire barriers, membranes, EPDMs and fittings to provide a total installation, fully in conformity with the requirements and intent of the drawings and specification herein.

Facade sub-contractors shall demonstrate compliance with BS8414-1, BS8414-2 and BR135 for the complete cladding systems and with Scottish Building Regulations. Any insulation products used in the system to achieve class A1 non-combustible rating when tested to EN 13501-1.

All copings and cills are to be supplied under the aluminium cladding and roofing sub-contract package.

Facade sub-contractor to undertake a full detailed design process for all elevations including sub structure design, details, calculations etc including the submission of information to the design team in good time for approval prior to the procurement of any of the façade materials.

All fixing and joint details shall be designed to provide for the expected thermal movements and structural movements including deflection/long term creep in accordance with structural engineer's specification and movement report and UK Standards and Building Regulations. The system shall be designed to withstand the design wind load based on the relevant UK Standards and Building Regulations for the prevailing local weather conditions and submitted to the structural engineer for approval prior to any other design works being undertaken.

The cladding shall be so fabricated and erected as to provide for all expansion and contraction of the components. Any temperature change due to climatic conditions shall not cause harmful buckling, opening of joints, undue stress on fastening and anchors, noise of any kind or other defects.

Facade sub-contractor to undertake a full and detailed survey of each façade prior to manufacture of any of the component parts of that façade.

Facade sub-contractor to allow for large size A3 samples for final colour selection and 1 large sample panel approx 1m x 2m with a minimum of 2 vertical and 2 horizontal joints and 1 full size beam detail as shown on architects drawing GA-A-L701 proposed sample panel for final design team and client signoff.

Facade sub-contractors must participate in a series of façade workshops with other sub-contractors to ensure a fully co-ordinated whole façade. Façade sub-contractors must comment on other façade sub-contractors proposals where they have an impact on their proposals/ system.

FINISHES

Refer to dwg nos. noted in section 2.0 for extent of finishes

System to be designed and installed by a specialist facade sub-contractor to meet building regulations and all relevant standards including but not limited to BS 8118-2, BS8200, DIN18516-1, BSEN13116, BR135 and BS8414-2.

FACADE BUILD-UPS:

GRC RAINSCREEN CLADDING SYSTEM

15-100mm thick Glassfibre Reinforced Concrete panel Grade 18P
Minimum 50mm air gap
A1 Non-combustible insulation to achieve a U-value of 0.18 W/m²K
Siderise compartment fire barriers and cavity barriers
Breathable membrane Class B1-S1, d0
12.5mm A1 non-combustible sheathing board
150mm A1 non-combustible insulation in Metsec studwork 150mm by others
1000-gauge polythene vapour control layer
2no. layers of 15mm fireline plasterboard

Concealed Support System consisting of structural wall brackets 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 to have panel retention hooks, mechanically fixed using CNC production guidelines before delivery to site. The support framing must allow for calculated expansion and structural movement of the whole system vertically and horizontally as defined in the document.

Installer to ensure the locations of all SFS studs are clearly identified prior to installation of breather membrane as pin hole searching for a stud location will not be permitted. All fixings for secondary support brackets are only permitted into SFS studs and not only into the sheathing board unless previously agreed with the SFS / sheathing board sub-contractor. Responsibility remains with the metal cladding sub-contractor to ensure all fixings are correctly located.

Prior to installation of breather membrane GRC cladding sub-contractor to ensure all joints in sheathing board have been filled by the relevant façade sub-contractor – when joints are unfilled these are to be pointed out to the main contractors for rectification prior to installation of the membrane.

All GRC panels to be secret fixed to support system – GRC cladding sub-contractor to ensure adequacy of secret fixed security screws, including fixing methodology, under all wind loading conditions ensuring resonance of panels does not compromise the integrity of the panel fixing.

Prior to installation of GRC cladding panels, GRC rainscreen cladding subcontractor, in conjunction with the main contractor to set out very detailed reference lines and offset lines to determine the exact position and alignment of each and every GRC panel.

INNER LEAF

Inner leaf is generally Metsec SFS Infill Walling system with 150mm wide channels (all accessories required are to be provided to provide a full finished system) by others.

GRC RAINSCREEN CLADDING SYSTEM

The proposed GRC cladding shall be divided into individual panels as indicated on architectural design intent drawings.

Panels are always taken from the same production batch, e.g. only one batch should be used to clad a complete building elevation.

All fixing and joint details shall be designed to provide for the expected thermal movements and structural movements in accordance with structural engineer's specification and Scottish Building Standards and British Standards. The system shall be designed to withstand the Design wind load based on the relevant

UK Standards and Building Regulations for the prevailing local weather conditions and submitted to the structural engineer for approval prior to any other design works being undertaken.

No cladding element shall sustain permanent deformation or failure under loading equivalent 1.5 times the design wind pressure - full details to be confirmed by the façade sub-contractor. Deflection of any aluminium frame shall not exceed 1/150 of the clear span.

10 INFORMATION TO BE PROVIDED WITH TENDER:

Submit the following cladding particulars:

- Typical plan, section and elevation drawings at suitable scales.
- Typical detailed drawings at large scales, including plans, sections and elevations at 1:20.
- Technical information and certification demonstrating compliance with specification of proposed incorporated products and finishes, including [CWCT compliance, manufacturing in accordance with relevant BS or equivalent European standards and the International Glass Fibre Reinforced Concrete Association Specification for the manufacture, Curing & Testing of Glassfibre Reinforced Concrete Products document published October 2017.] .
- Certification, reports and calculations demonstrating compliance with specification of proposed cladding.
- Proposals for connections to and support from the primary support structure.
- Proposals for primary support 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.
- Proposals for replacing damaged or failed products.
- Areas of non-compliance with specification.

120 GLASS FIBRE REINFORCED CONCRETE RAINSCREEN CLADDING:

Primary Support Structure: Concrete frame and SFS infill

Rainscreen cladding system:

- Distributor: Telling Architectural Limited, Unit 4E, Station Road, Four Ashes, Wolverhampton, WV10 7DB, (TEL: 01902 797700). www.telling.co.uk , info@telling.co.uk
- Installation: To be carried out by a contractor with the necessary experience, and expertise to install such systems provided by the distributor/manufacturers agent

- Type: GRC Rainscreen Façade System.

Rainscreen panel:

- Manufacturer: Telling Architectural Limited, Unit 4E, Station Road, Four Ashes, Wolverhampton, WV10 7DB, (TEL: 01902 797700). www.telling.co.uk , info@telling.co.uk

Product reference: Norscreen™ M4

- Material: Glassfibre Reinforced Concrete panel Grade 18P and secondary support framing system.
- Thickness: Nominal 15-100mm – To be determined by performance requirements.
- Finish/Colour: To meet Architects/Clients design.
- Fasteners: Norscreen™ M4, Stainless Steel support brackets, Grade 304, with separation membrane/tape.
- Vertical joint type: Sealed joints
- Air gap: Minimum 50mm in accordance with the requirements of the CWCT if ventilated and 20mm if sealed.

Secondary support/framing system:

- Mechanically fixed – Aluminium Top Hat and T splines, or bracketry system mechanically fixed to loadbearing substrate of either concrete or steel framing system. Configuration and gauge dependant on under construction type, and design. Aluminium brackets must be thermally separated from contact with concrete substrates.
- Manufacturer: As designed, approved and supplied by Telling Architectural Limited, Unit 4E, Station Road, Four Ashes, Wolverhampton, WV10 7DB. www.telling.co.uk , info@telling.co.uk
- Material: Aluminium
- Fasteners: To be determined by Telling Architectural Limited, and dependant on secondary support system/background utilised.

GENERAL REQUIREMENTS/PREPARATORY WORK:

210 DESIGN:

Rainscreen cladding system and associated features: Complete detailed design in accordance with this specification and the preliminary design drawings and submit before commencement of fabrication.
Related works: Coordinate in detailed design.

220 SPECIFICATION:

Compliance standards: The Centre for Window and Cladding Technology (CWCT) 'Standard for systemised building envelopes'.

230 INFORMATION TO BE PROVIDED DURING DETAILED DESIGN:

Submit the following cladding particulars:

- A schedule of detailed drawings and dates for submission for comment.
- A schedule of loads that will be transmitted from the rainscreen cladding to the structure.
- Proposed fixing details and systems relevant to the structural design and construction with methods of adjustment and tolerances.

- A schedule of fabrication tolerances/ size tolerances.
- 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.

310 STANDARD FOR WALLS WITH VENTILATED RAINSCREENS':

General: Performance Criteria unless specified or agreed otherwise.

Project performance requirements specified in this subsection: Read in conjunction with CWCT "Standard for systemised building envelopes".

340 INTEGRITY: (Rainscreen Cladding Contractor Design)

Requirement: The rainscreen cladding 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](#)

350 DEFLECTION UNDER WIND LOAD:

Requirement: For listed components, at positive and negative applications of the design wind pressure, normal deflections are not to exceed: [\[L/360\]](#) .

Additional stiffness to CWCT "Standard for systemised building envelopes" clause 3.5.4.2

360 WIND RESISTANCE - CYCLIC LOADING:

Requirement: No reduction in the integrity of the rainscreen cladding must occur when subjected to the test sequence given in CWCT "Standard for systemised building envelopes", clause 8.14.6.

Test method: As clause 665.

-Effective wind pressure: after the maximum effective wind pressure has been applied for 10,000 cycles.

370 APPEARANCE AND FIT:

Requirement: Design rainscreen wall:

- 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 rainscreen cladding 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.

Maximum permitted component and installation tolerances: Façade panels to be within $\pm 3.0\text{mm}$ of specified length, and height.

All components shall be installed level, true to line with uniform joints and reveals. Maximum deviation for vertical member: 3mm maximum over 5.2m and 5mm maximum over 11.0m. Maximum deviation for horizontal members: 3mm maximum over 8.5m

420 WATER PENETRATION:

Watertightness class to BS EN 12154

450 VAPOUR CONTROL LAYER:

Interstitial condensation risk of rainscreen wall: Determine using the method described in BS 5250 Annex D. If necessary, provide a suitable vapour control layer to ensure that damage and nuisance from interstitial condensation does not occur.

460 SOUND TRANSMITTANCE:

Minimum sound reduction indices (Rw) to Acoustic Consultants Specification

480 FIRE RESISTANCE

Minimum periods and criteria: To BS 476-21.

The material has achieved a classification of A1 when tested in accordance with BS EN ISO: 1182: 2002 and BS EN ISO: 1716: 2002

495 DURABILITY:

Relevant agents or degradation mechanisms: anti-graffiti system to low level panels up to 3m above ground level

Design life of the rainscreen cladding system to be 25 years.

530 TESTING AUTHORITY:

Requirement: Project testing must be carried out by a United Kingdom Accreditation Service (UKAS) approved independent laboratory.

TESTING

The rainscreen cladding system shall have been tested by the Centre for Window and Cladding Technology who have developed "The Standard for Testing of Ventilated Rainscreen" and "Test Methods for Ventilated Rainscreen"

The following tests are required by these standards for the rainscreen cladding system –

- 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.

Impact test - to CWCT 'Standard for testing of ventilated rainscreen', clause 3.12.1 and BS 8200. Wall category: All rainscreen cladding locations

665 WINDLOAD FATIGUE TESTS, SMALL SPECIMEN:

Requirement: To CWCT 'Standard for systemised building envelopes', 'Standard test methods for building envelopes' Section 14.

- Effective wind pressure: As clause 360.

670 TESTING OF FIXINGS:

Requirement: To CWCT 'Standard for systemised building envelope', 'Standard test methods for building envelopes' Section 19 and in accordance with structural engineers project specific requirements?

672 SITE TESTING OF FIXINGS:

Requirement: To CWCT 'Standard for systemised building envelope', 'Standard test methods for building envelopes' Section 19.

680 SPRAY BAR TEST:

Requirement: To CWCT 'Standard for systemised building envelope', 'Standard test methods for building envelopes' Section 10.

685 SITE HOSE TEST:

Requirement: To CWCT 'Standard for systemised building envelopes', 'Standard test methods for building envelopes' Section 9.

PRODUCTS:

730 MECHANICAL FIXINGS - MATERIAL REQUIREMENTS:

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: To BS EN 755.

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.

985 DAMAGE:

Repairs: Do not repair cladding without approval.

- Approval: Will not be given where the proposed repair will impair performance or appearance.

Record of repairs: Prepare schedule or record on drawings for inclusion in the maintenance manual.

FABRICATION AND INSTALLATION

All cladding panels shall be factory fabricated and assembled in compliance with the manufacturer's Data Sheets and to the best standard of workmanship under experienced factory supervision and control.

All panels shall be cut and routed using equipment and tools recommended and approved by the panel manufacturer.

Each panel shall be marked on the reverse side for easy identification of size and location. Finished panels shall be stored and transported to site in vertical position, face-to-face back-to-back, with adequate protection to prevent scratches and dents.

Any component parts which are observed to be defective in any way, including warped, bowed, dented, abraded and broken members must not be installed. Member or parts which have been damaged during installation or thereafter before the time of final acceptance shall be removed and replaced.

FIRE BARRIERS

Refer to detailed elevations for extent of fire barriers and where each type is to be used. Fire barriers to be Siderise.

1. Compartment Fire Barrier (CFB) -120 minutes integrity / 120minute insulation fire barriers suitable for the facade system indicated to be located within the cavity void at all horizontal and vertical compartment wall abutments.
2. Cavity Barrier (CB) - 30 minute integrity / 15 minute insulation cavity barriers suitable for use with the facade system indicated to be provided in accordance with current Building Regulations to maximum limiting size of 20m in any direction and full perimeter of all openings.

All junctions in class A1 non-combustible sheathing board boards are to be treated with appropriate fire mastic and sealed/taped to prevent moisture ingress. All abutments of class A1 non-combustible sheathing

board boards, for example to slab edges, are to be sealed with intumescent mastic and sealed/taped to prevent moisture ingress.

All facade sub-contractors are to liaise together to ensure that fire barriers are continuous at junctions where there is a change in facade material.

CONDENSATION

The psychometric 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 as defined in BS 6229, table 6 for outdoor conditions and BS 6229, table 7 for indoor conditions.

AIR PERMEABILITY

Air permeability to be $5 \text{ m}^3/(\text{h.m}^2)$ at 50 Pa maximum.

Testing of air permeability to be undertaken and written confirmation of results provided to the satisfaction of building control.

U-VALUE

The proposed façade build-ups must achieve a minimum U-value of $0.18 \text{ W/m}^2\text{K}$.