

APPENDIX 4A : STRUCTURAL DESIGN REPORT
AND
FACADE DESIGN REPORT



TaylorThomsonWhitting

10 June 2010

091602

Bancor Developments
c/- FJMT
Level 5 MCA
140 George Street
Sydney NSW 2000

Attention: Simon Barr

**STRUCTURAL REPORT
6-16 ATCHISON STREET, ST LEONARDS**

Dear Simon,

Structuring re building is very simple with a central core and prestressed flat plate floors. In the basement banded slabs are used. Some of the column offset and this is done by the use of transfer columns. At the podium it was architectural intent to have no columns at the ends of the podium. This was achieved using cantilevering beams over the recreational area and hanging the podium slabs from the beam.

The excavation is mainly in rock temporary shoring in the street will be used to maximise the car park area.

The permanent shoring wall will be a reinforced concrete wall.

The foundation will be pad footings in rock.

We have reviewed the architectural plans and have prepared structural sketches to ensure that the architectural design can be structurally designed to meet the relevant article standard.

Yours faithfully,

TAYLOR THOMSON WHITTING (NSW) PTY LTD

**RICHARD GREEN
Director**

P:\2009\0916\091602\Letters\100610 Structural Report for 6-16 Atchison Street St Leonards BC_REV 1.doc

Structural

Civil

Traffic

Facade

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Document Issue Transmittal

Page: 1 of 1

Date: 25/05/2010

Project: 6-16 Atchison Street, St Leonards, Residential

Job No.: 091602

Issue No.: 1

Reason for Issue: Costing

Sent Via: Uploaded to Web

Distribution	Attention
FJMT Architects (Francis-Jones Morehen Thorp), Sydney Level 5 MCA 140 George Street SYDNEY NSW 2000 Australia	Simon Barr PDF

Drawing No.	Title	Issue
S0010	Wall Elevations Sheet 1	P1
S0011	Wall Elevations Sheet 2	P1
S0012	Wall Elevations Sheet 3	P1
S0013	Wall Details	P1
S0020	Column Schedule Sheet 1	P1
S0021	Column Schedule Sheet 2	P1
S0100	Basement 5 Outline Plan	P1
S0150	Basement 2-4 Outline Plan	P1
S0200	Basement 1 Outline Plan	P1
S0201	Basement 1 Loading Dock Outline Plan	P1
S0300	Basement Mezzanine Outline Plan	P1
S0400	Lower Ground Level Outline Plan	P1
S0500	Upper Ground Level Outline Plan	P1
S0600	Typical Mixed Use Level 2 Outline Plan	P1
S0601	Pool & Deck Outline Part Plan	P1
S0700	Typical Mixed Use Level 3 Outline Plan	P1
S0800	Level 4 Outline Plan	P1
S0900	Level 5 Outline Plan	P1
S1000	Level 6 Outline Plan	P1
S1100	Level 7-11 Outline Plan	P1
S1200	Level 12-18 Outline Plan	P1
S1300	Level 19-26 Outline Plan	P1
S1400	Level 27-33 Outline Plan	P1
S1500	Roof Outline Plan	P1

SENT BY: TAYLOR C



Facade



TaylorThomsonWhitting

6-16 Atchison Street St Leonards, NSW Facade Report

for FJMT Architects

Status of document: For Consent Authorities Approval

16 June 2010

TTW Job No: 091602 F

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1.0 SUMMARY

This report summarises the proposed unitised curtain wall system to be incorporated into the New Facade above the podium level of this project.

The system has been designed to using proprietary curtain wall systems, which are readily available in Australia.

Depending on how this project is tendered there is the strong possibility contractors may use the alternate systems to suit their procurement needs. However this does not negate the fact the contractor will be required to provide a curtain wall to the project, which is equivalent in appearance, and performance as per that finally documented for the project.

2.0 CURTAIN WALL DESIGN PREMISE SUMMARY

1. General description: Structural glazed system with operable windows and horizontal sunshades as shown on the architectural elevations
2. Vision Glass: DGU 8 HS / 12 / 10.76 Neutral (low e coating on #2 surface).
3. Module: 3.05 m high (floor height) x 2100 m wide
4. Design Wind Load: Design to AS 1170 part 2, 2002
5. Deflection Limit: As per clause 2.9 of the attached brief
6. Stack/Sill above Floor: At Finish Floor Level
7. Special considerations: Built in operable windows into curtain wall panels

Above is the basic system currently developed for further discussion and development. Some possible alternates yet to be explored are:

1. Glass: Glass make up to be reviewed and approved by the acoustic consultant
2. Glass Thermal Properties: To be reviewed and approved by Mechanical and ESD consultants

All parties involved should review the above and comment on any possible errors or misunderstandings. Please bring any such discrepancies to the attention of this engineer for design resolution.

3.0 ACOUSTIC PERFORMANCE

The Current Glazing System uses a double glazed unit, 8 mm monolithic glass, 12 mm air space and 10.76 mm laminated glass. Laminated glass has been chosen for the inner layer of glass for safety. The nature of building is residential and vision glass is extending to the floor level, therefore, the occupancies safety should be considered in selection of glass.

This selection will also assist with the acoustic performance of the facade and will provide RW rating of 38 (Based on Saint Gobain product lab test data). The final acoustic requirement for the building is to be specified by the acoustic consultant. And the make of the double glazed unit can be modified to suit.

4.0 THERMAL PERFORMANCE

Currently the Facade Glazing is being considered with the following performance data:

Shading Co Efficient: Max0.45

Reflectance Internal: Max 13%

Reflectance External: Max 11%

Transmittance:

Visible Light: Min 70%

SHGC: Max 0.40

U Value: Max 2.5W/m2.K

5.0 CONSTRUCTION OF FACADE SYSTEM

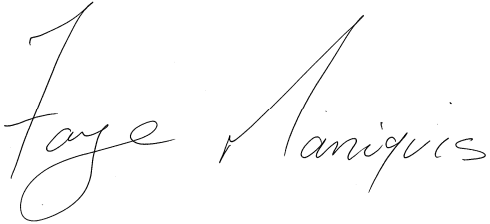
Pre fabricated self drained and pressure equalized panelised system has been selected for the construction of facade of this project. The selected system is proofed to be the safest system in terms of external building envelopes weatherproofing, durability and longevity. Ease of installation and safety during installation are also the features which make the unitised curtain wall the preferred facade system for this project.

The panelised system consists of a series of self supporting pre fabricated units anchored directly to the building structure. The design features of panelised curtain wall systems are in the panels themselves and in methods of articulating the joints between units. Elements such as sun shades and window openings in panelised systems must be structurally integral to the panelised unit.

Panels are designed to accommodate building and thermal movements and withstand any imposed loads.

Find attached (**Appendix A**) copies of proposed schematic design for the facade of this building and (**Appendix B**) a copy of preliminary Facade Brief, outlining the performance requirements for the facade of this project.

Prepared by:
TAYLOR THOMSON WHITTING
(NSW) PTY LTD



FAYE MANIQUIS
Facade Manager

Authorised by:
TAYLOR THOMSON WHITTING
(NSW) PTY LTD

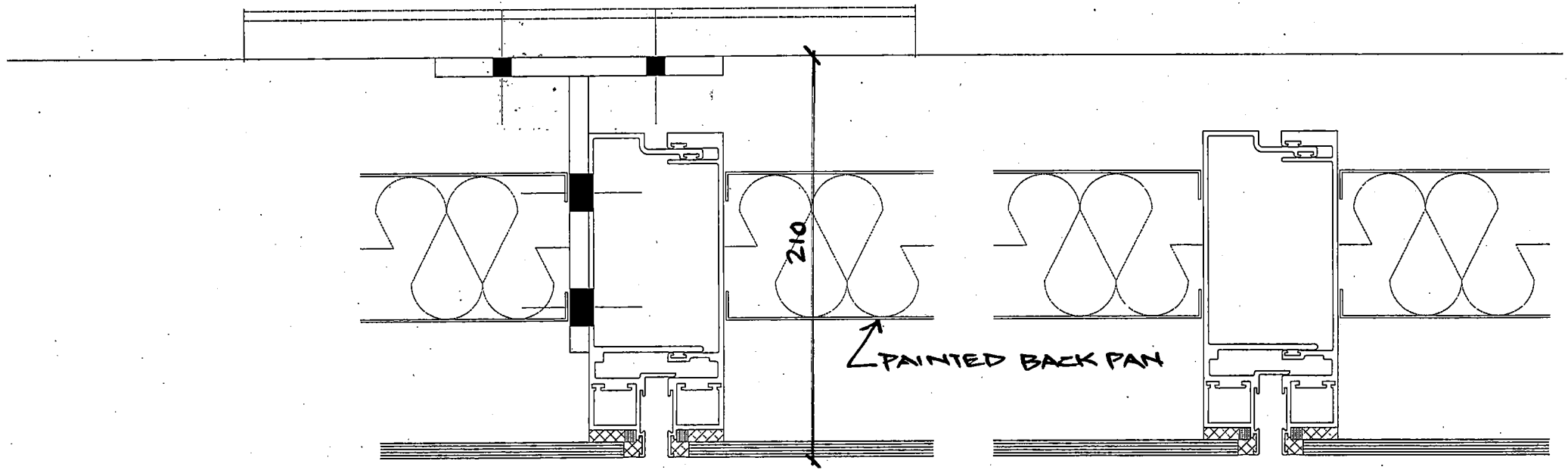


RICHARD GREEN
Director

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Appendix A

Proposed Facade Details



MULLIONS @ FLOOR
FIXING

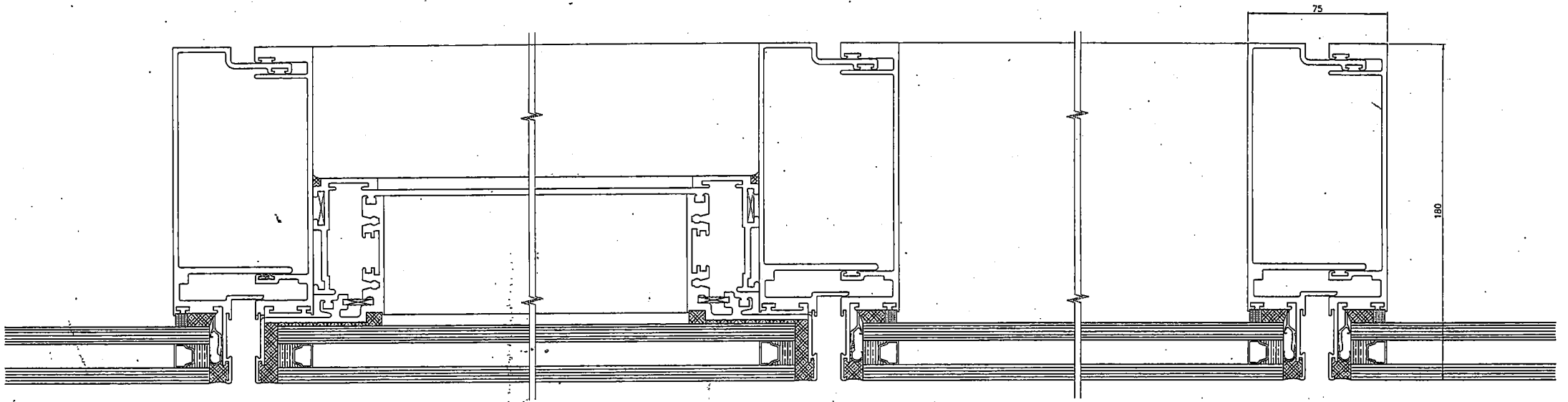
SPANDREL MULLIONS



TaylorThomsonWhitting

Structural Civil Traffic Facade
Sydney Melbourne Canberra Jakarta Singapore

Project G-16 Atchison St Job No 091602F Page No 1
 Subject SECTION THROUGH MULLIONS FM Date 9/6/10



MULLIONS @ OPERABLE
WINDOWS

FIXED GLAZING MULLIONS



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Project G-16 Atchison St. Job No 091602F Page No 2
 Subject SEC. THROUGH VISION MULLIONS FM Date 9/6/10



Project 6-16 Atchison st

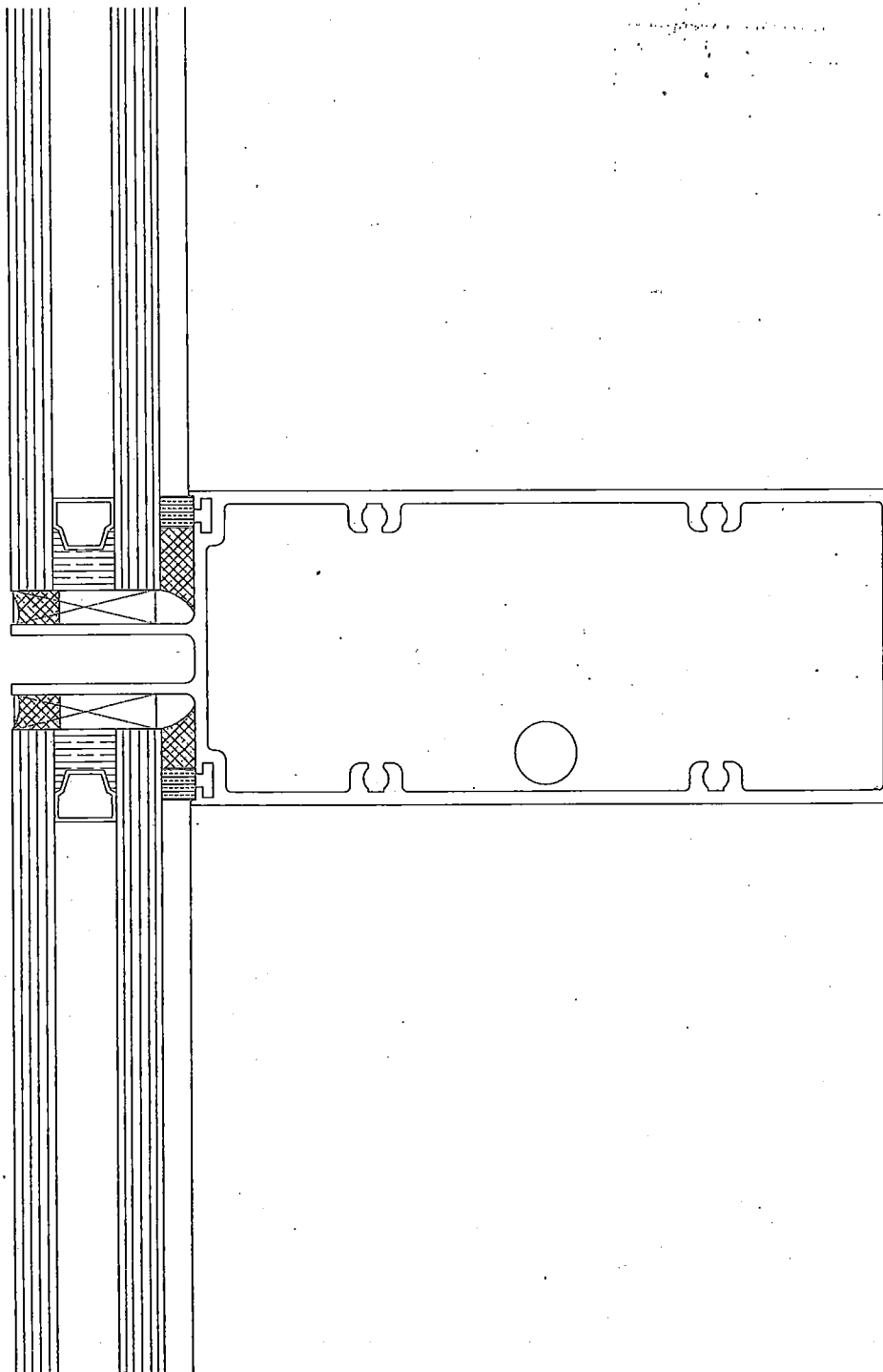
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Page No 3

Subject VISION TRANSOM

By FM

Date 9/06/10





Project G-16 Atehison st.

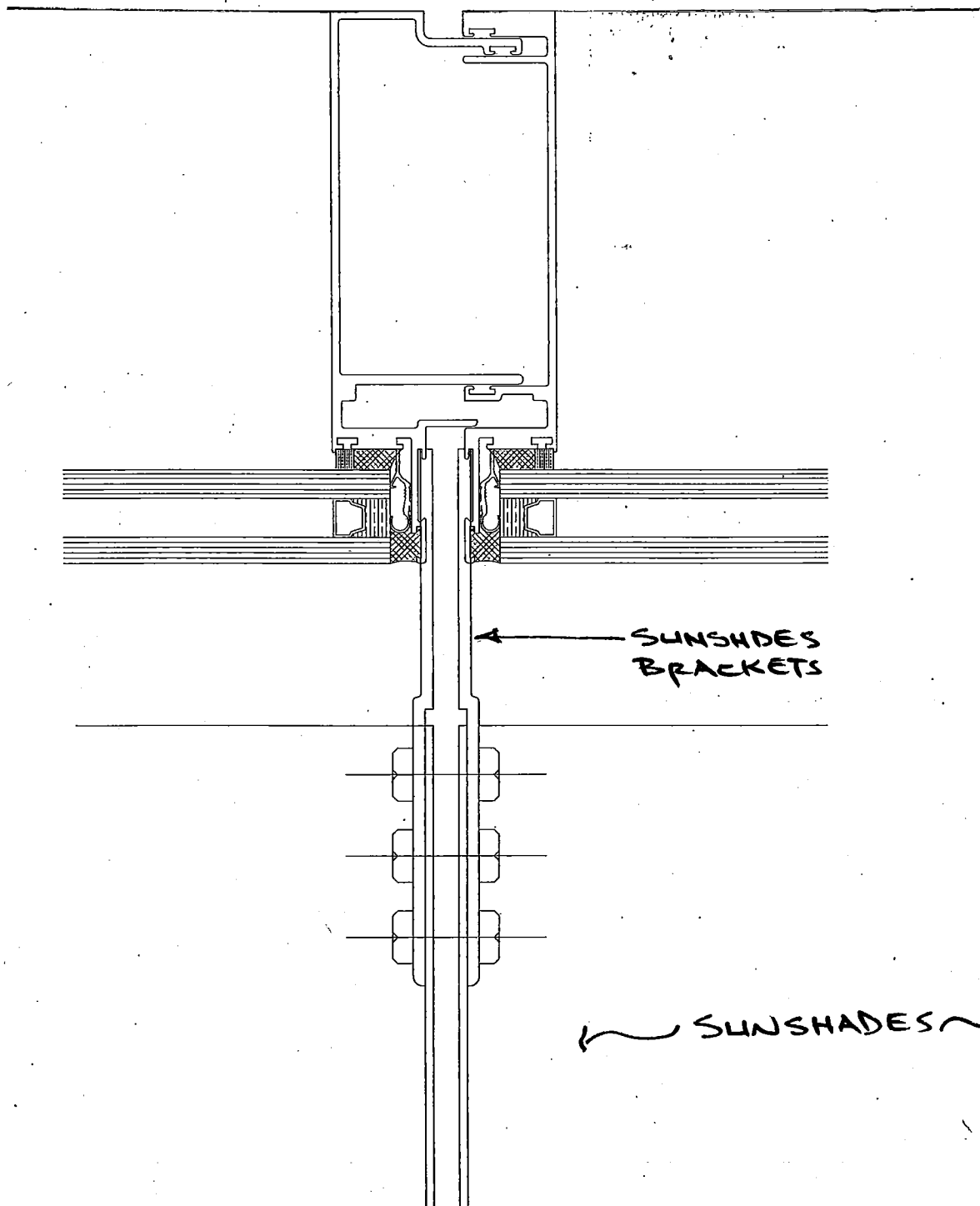
Job No 091602F

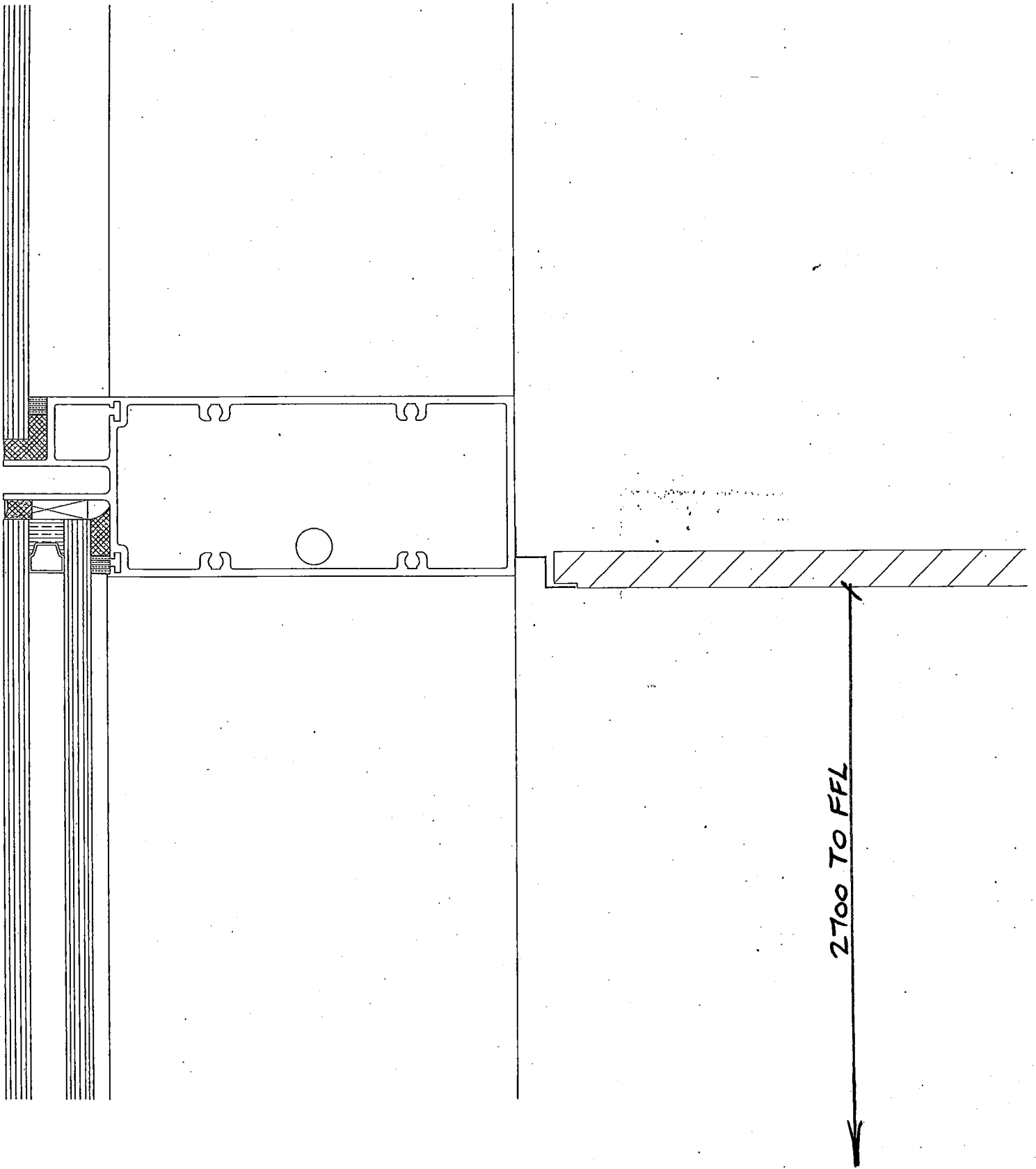
Page No 4

Subject MULLIONS @ SUNSHADE
BRACKETS

By FM

Date 9/06/10

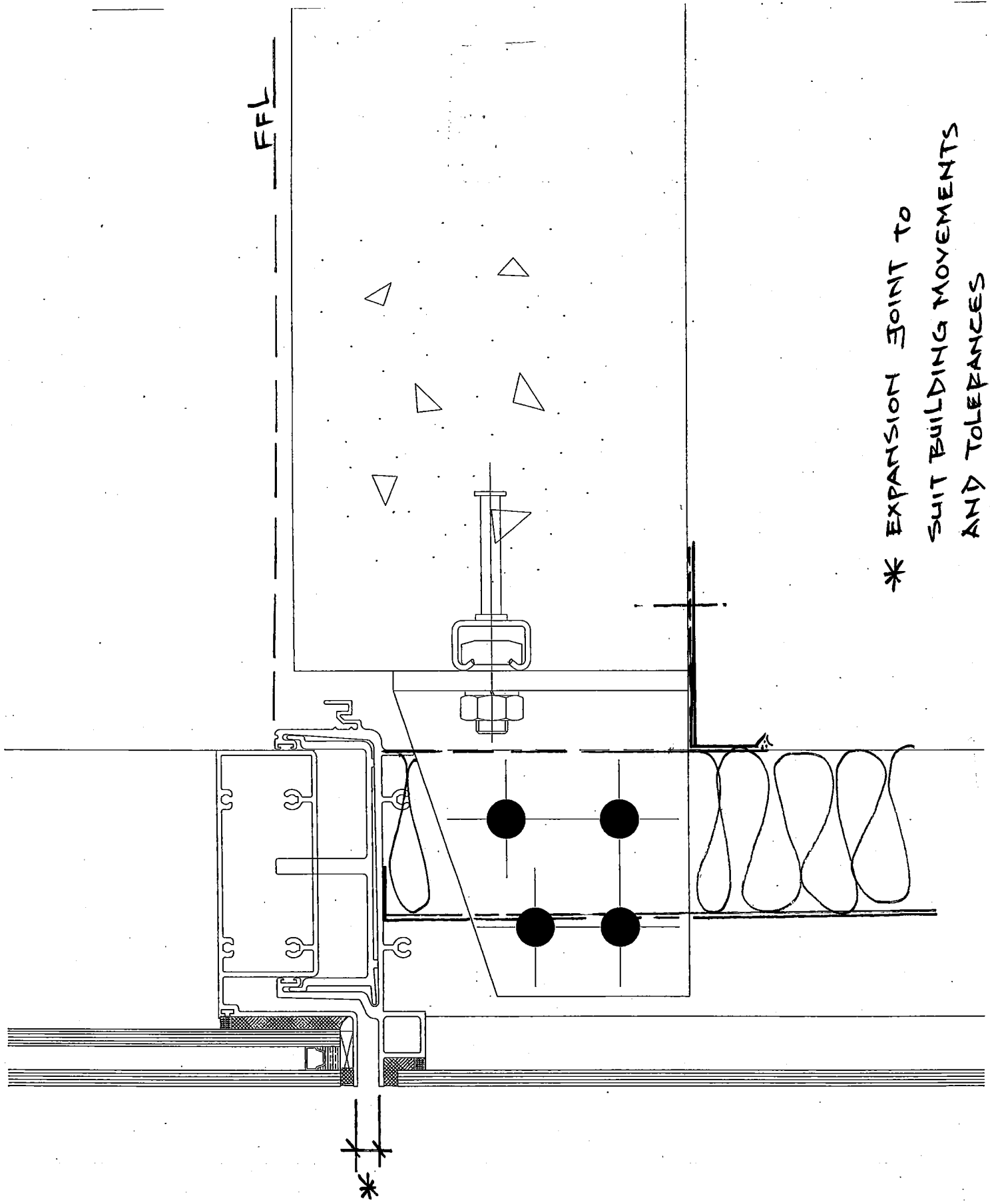






Project 6-16 Atchison st Job No 091602F Page No 6

Subject TRANSOMS @ STACK JOINT By FM Date 9/06/10



* EXPANSION JOINT TO
SUIT BUILDING MOVEMENTS
AND TOLERANCES



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Project 6-16 Atchison st

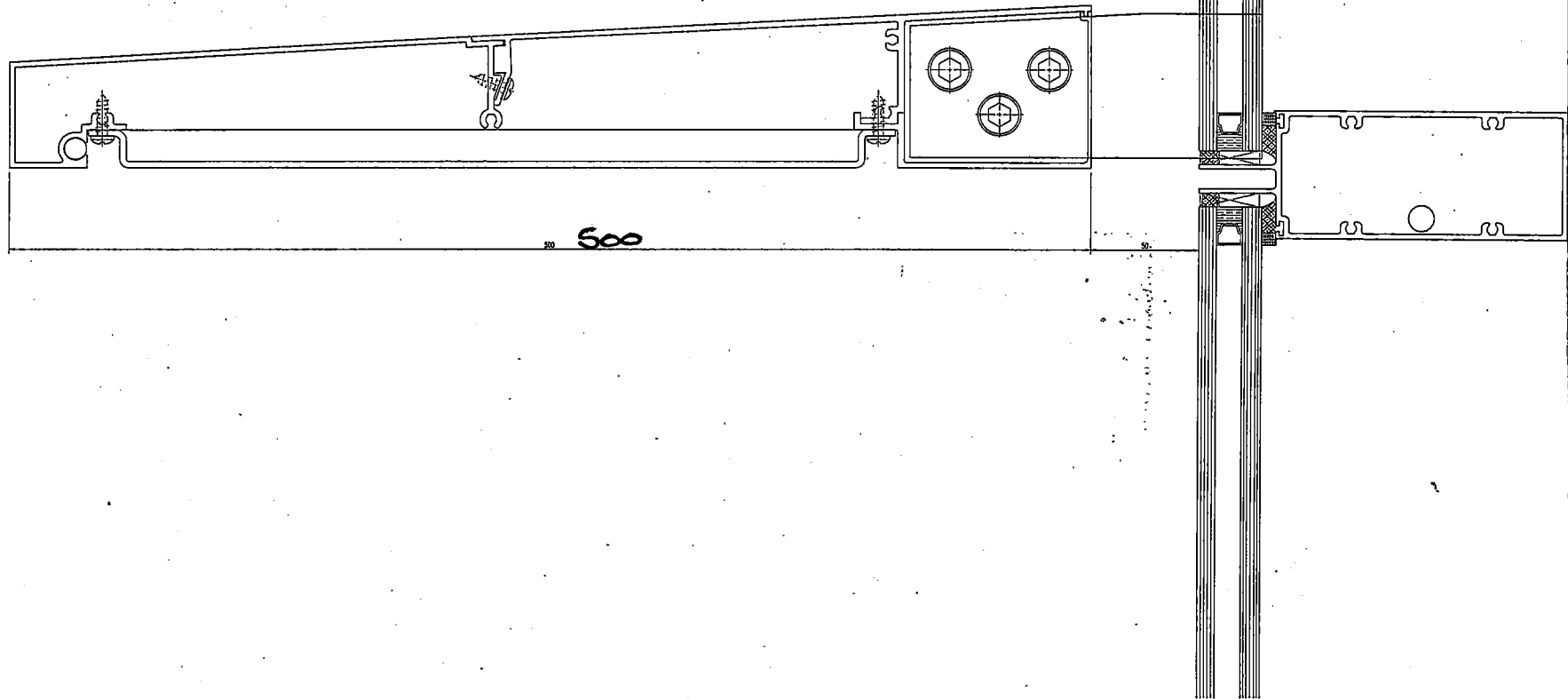
Job No 091602 F

Page No 7

Subject TRANSOM @ SUN HOODS

By FM

Date 9/06/10



500



Project 6-16 Atchison st.

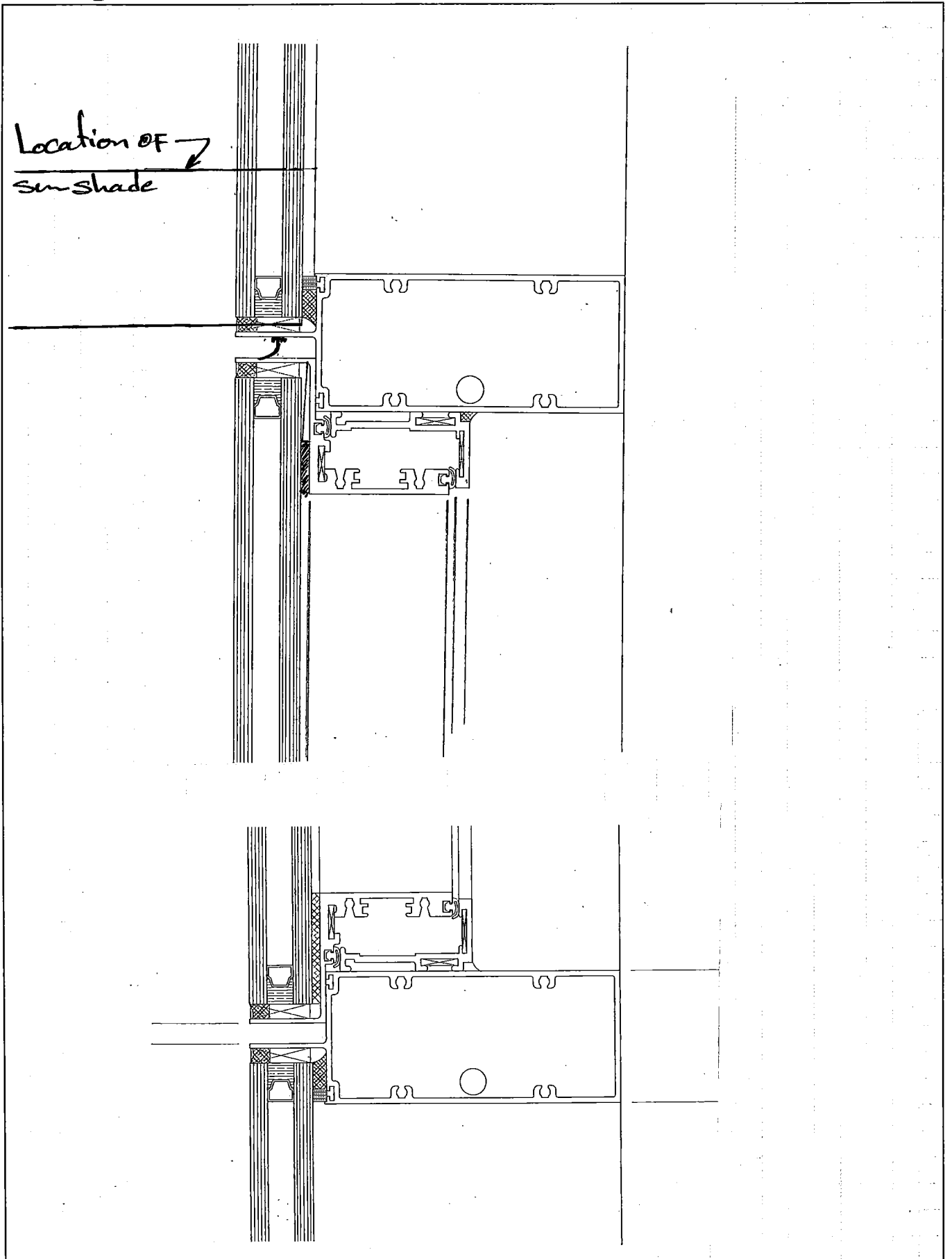
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Page No 8

Subject operable window head & sill

By FM

Date 19/4/10



Appendix B

Facade Brief



Facade



TaylorThomsonWhitting

Consent Authorities Approval Issue

FACADE PERFORMANCE BRIEF

Bancor

6-16 Atchison Street, St Leonards

for FJMT Architects

16 June 2010

TTW Job No: 091602F

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SYDNEY

CANBERRA

MELBOURNE

QEC 22375

Quality
ISO 9001

SAI GLOBAL

JOB NUMBER
BANCOR
ATCHISON STREET, ST LEONARDS
FACADE PERFORMANCE BRIEF

DOCUMENT REGISTER

PREPARED BY	APPROVED BY	STATUS	ISSUE	DATE
Engineer	Director	Status	Issue	Date
Faye Maniquis	Richard Green	Draft	Draft	28/05/2010
Faye Maniquis	Richard Green	Consent Authorities Approval	Issue	16/06/2010

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1. SCOPE AND DESCRIPTION OF FAÇADE SYSTEMS

1.1 Scope of Works

This is a performance brief for the façade works on Bancor, Atchison Street project which are to be undertaken on a design and construct (D&C) basis.

The Architectural drawings and this document indicate the design intent and establish the required geometry of the visible components, together with the minimum acceptable standard to which the facade must be designed, fabricated, installed and tested.

These are to be read together in conjunction with the other Contract documents.

As performance based documents full details of the proposed systems are not provided. The Façade Contractor shall be responsible for the design, procurement, fabrication, installation, testing and certification of the facade systems including its interfacing with the structure and other façade elements.

Any discrepancies or contradictions in the Documents shall be brought to the attention of Brookfield Multiplex by the Contractor for clarification during the tender period.

1.2 Contracts Documentation

Read in conjunction with other documents and in particular:

- The contracts and contracts preliminaries
- Architectural drawings
- The façade and architectural specification
- The structural engineering drawings
- The mechanical, electrical and hydraulic engineering drawings and specification
- The base building design brief
- The Acoustic engineering glazing specification
- The fire engineering glazing specification
- The ESD consultants requirements

1.3 System Descriptions

TYPE CW-1	<ul style="list-style-type: none"> Refer to Architectural drawings
Location	<ul style="list-style-type: none"> All 4 elevations of the tower
General System configuration	<ul style="list-style-type: none"> Unitised curtain wall panels comprising a panel system with a typical module of 2100mm wide x 3050mm high, spanning floor to floor. Refer to the architectural drawings for the non-typical panels Approx mullion size 165mm x 75mm with integrated blind guides in the extrusions Vision area: Vision glass from FFL to Ceiling level (2700mm) Spandrel area: Shadow box arrangement in front of slab Vertical and horizontal joints are silicone glazed Sliding windows integrated into unitized system. Locations as per architectural elevations
Vision Construction	<ul style="list-style-type: none"> Double glazed Low E high performance glass Colour: Neutral Glass make up: 8mm H/S with Low E + 12 air + 10.76mm clear annealed. This make up is structurally adequate, but both layers may need to be laminated for acoustic purposes.
Spandrel Construction	<ul style="list-style-type: none"> 6mm thick heat strengthened glass in a shadow box, with painted composite sheet + 50mm insulation + 1.6mm galvabond sheet air seal
Finishes	<ul style="list-style-type: none"> Internal surfaces of the framing members are to be powder coat equal Duratec External surfaces including sun-hoods and the feature blades are to be PVDF or PVF2 Sun-hoods will consist of two colours, black powder coat on upper surface and silver on the lower surface.
External Features	<ul style="list-style-type: none"> Modularized horizontal extruded or fabricated aluminium sun hoods of 500mm Deep x 50mm Wide, supported by mullions via brackets. Refer to architectural drawings for the geometry of the sun hoods.

TYPE PG-1	<ul style="list-style-type: none"> Refer to architectural
Location	<ul style="list-style-type: none"> Podium levels, South Wing, Level A
General System configuration	<ul style="list-style-type: none"> Frameless glazing with flat link fittings, supported by steel mullions which are clad with timber panels similar to Prodema Steel mullions are designed by the structural engineer and supplied by steel contractor.
Glass	<ul style="list-style-type: none"> High performance coated clear glass. Thickness TBC on later date. However, for this pricing purposes it can be based on 16mm Toughened glass
External features	<ul style="list-style-type: none"> Not applicable
Internal components	<ul style="list-style-type: none"> Steel vertical elements independent of glazing designed by the structural engineer and supplied by steel contractor. These elements are clad with timber similar to Perdema. Refer to architectural drawings for quantities and arrangements

Type AL1	<ul style="list-style-type: none"> Refer to architectural drawings
Location	<ul style="list-style-type: none"> Plant rooms
General configuration	<ul style="list-style-type: none"> Panelised aluminium louvers with 55% air intake capacity (TBC by mechanical engineers) and stainless steel mesh.
Finish	<ul style="list-style-type: none"> TBC

Type GF	<ul style="list-style-type: none"> Refer to architectural drawings
Location	<ul style="list-style-type: none"> Ground Floor Glazing
General configuration	<ul style="list-style-type: none"> Frameless glass with Glass fins of cable truss
Glass	<ul style="list-style-type: none"> High performance coated clear glass. Thickness TBC on later date. However, for this pricing purposes it can be based on 16mm Toughened glass

2. Design Performance Requirements

The design shall comply in all respects with the current edition of the Building Code of Australia and all relevant Australian Standards

Façade systems shall be designed to meet and accommodate the following performance criteria. Where there is no Australian Standard, comply with the current edition of British Standards, ASTM for testing and AAMA for manufacturing components.

The contractor is to comply with all rules and regulations of government and regulation bodies including Occupational Health and Safety Legislations.

Façade systems shall be designed to meet and accommodate the following performance criteria:

	Performance Parameter	Minimum Requirements	Notes
2.1	Design Life	<ul style="list-style-type: none"> Structural design – 50 years (to include all framing, brackets & fixings) Serviceability design – 25 years (life to first significant maintenance) 	
2.2	Wind Loads	<ul style="list-style-type: none"> Design to AS1170 part 2, 2002 Design for 50 year return 	
2.3	Dead Load	<ul style="list-style-type: none"> Design to AS1170.0 and 1170.1 	
2.4	Earthquake Load	<ul style="list-style-type: none"> Design to AS 1170.4 	
2.5	Maintenance Load	<ul style="list-style-type: none"> Design all horizontal surfaces to withstand 1.1KN Glass and glazing to withstand point load of 0.5KN applied perpendicular to the glazing Allow for 1.1KN BMU lanyard loads on each restrain pin on any direction 	
2.6	Live Loads	<ul style="list-style-type: none"> Generally design to AS1170.1 	
2.7	Balustrade Loads	<ul style="list-style-type: none"> Design to AS1170.1 row C3 of Table 3.3 	
2.8	Awning/Canopy Loadings	<ul style="list-style-type: none"> Design to AS1170.1 section 3.5 Wind loads as per AS1170.2 Appendix D 	
2.9	Deflection limits	<ul style="list-style-type: none"> Aluminium framing – Span/290 Max 20mm Aluminium panels- Span/110 Glass- Span/90 Max 20mm 	Serviceability limit state design pressure deflection limits

	Performance Parameter	Minimum Requirements	Notes
2.10	Water penetration	<ul style="list-style-type: none"> Design to meet AS 4284 requirements 	For commercial building
2.11	Air infiltration limits	<ul style="list-style-type: none"> 0.5 L/M²/S at +/- 150 Pa 	
2.12	Building Movement	<ul style="list-style-type: none"> Vertical floor to floor differential deflection Horizontal differential movement Column shortening Building sway H/500 <p>Refer to the structural engineers report</p>	
2.13	Thermal Movement	<ul style="list-style-type: none"> Ambient temperature range 0C to 50C Surface temperature range in direct sun light 0C to 80C Internal surfaces in direct sun light 0C to 40C 	
2.14	Smoke flashing	<ul style="list-style-type: none"> Smoke separation is required between floors in accordance with Building Code of Australia 	
2.15	Acoustic	<ul style="list-style-type: none"> Refer to the Acoustic Consultants report. Acoustic insulation and flashing may be Required in the gap between the slab and curtain wall panels All single glass may be needed to be laminated 	
2.16	System Design	<ul style="list-style-type: none"> Fully pressure equalised panelised system Factory assembled and factory glazed 	
2.17	Glass replacement	<ul style="list-style-type: none"> Glazing system shall allow for glass replacement without damaging other components. Framing system to allow vision glass replacement from inside the buildig 	
2.18	Glass Properties	<ul style="list-style-type: none"> Limited information on the required glass at this stage. However, for preliminary pricing purposes glass can be based o 	
2.19	Thermal conductivity	<ul style="list-style-type: none"> Minimum performance through solid areas U=0.5 W/m²K Minimum performance through tower vision glass U= 1.8 W/m²K (TBC) Minimum performance through Lobby glazing U= 4 W/m²K (TBC) 	

	Performance Parameter	Minimum Requirements	Notes
2.20	Structural Tolerances	<ul style="list-style-type: none"> • Slab edge position (in/Out) +/- 25mm • Slab level +/-10mm • Column 	
2.21	Fabrication Tolerances	<ul style="list-style-type: none"> • Cutting tolerances +/- 1mm • Assembly tolerances +/-1 mm • Dimension of overall panel +/- 2mm 	
2.22	Installation tolerances	<ul style="list-style-type: none"> • Cast-in inserts +/- 2mm from slab edge, +/- 5mm from slab surface, +/- 30mm of grid position • Panel erection tolerances +/- 3mm in plan and height relative to adjacent panel • Overall façade plane +/- 5mm from nominal plane position 	
2.23	VOC requirements	<ul style="list-style-type: none"> • VOCs are to be in accordance with the Australian Environmental Labelling Association Inc. 	
2.24	Structural Silicone	<ul style="list-style-type: none"> • The system design shall allow for future capture bead, where 4 sided structural silicone is used 	
2.25	Lightening Protection	<ul style="list-style-type: none"> • All elements shall be earthed directly to the structure in accordance with AS 1768. Provide bonding of the framework to the rest of the lighting protection system. 	

3. Material and Components Requirements

	Material	Minimum Requirements	Notes
3.1	Glass	<ul style="list-style-type: none"> Standards AS 1288-2006 Flatness AS 2208-1996 Vision Quality AS 4667. Glass shall be consistent with approved samples Orient glass roller waves horizontal Toughened glass heat soaked to EN-14179-1 Visible edges arrissed Glass performance refer to clause 4 Glass manufacturer to submit glass properties for approval 	
3.2	Glass spacer	<ul style="list-style-type: none"> Colour: Black 	
3.3	Back pans in Shadow boxes	<ul style="list-style-type: none"> Composite aluminium sheet with PVF2 finish Standard range of colours Colour TBA 	
3.4	Aluminium Extrusions	<ul style="list-style-type: none"> Alloy 6063-T5, 6063-T6 or similar for framing. Suitable alloy for anodising to be used if P/C option not approved by the Architect Alloy 6060-T6 for structural elements and brackets 	
3.5	Aluminium panels	<ul style="list-style-type: none"> Composite panels to be equivalent to Alpolic or Alucobond Aluminium sheet: Grade 5005 or similar. Grade and alloy to be suitable for anodising if panels are to be anodised 	
3.6	Thermal Insulation	<ul style="list-style-type: none"> Zero ozone depleting substances (ODP) in composition and manufacture Inert, durable, rot and vermin proof Factory applied reinforced aluminium foil back Minimum thermal conductivity 0.0275W/m-K 	To comply with the ESD consultants façade optimisation report
3.7	Acoustic Insulation	<ul style="list-style-type: none"> Min 40kg/m³ mineral wool, 75mm thick 	Acoustic insulation is required where there is a possibility of outside noise travelling to inside residential space

	Material	Minimum Requirements	Notes
3.8	Aluminium Louvres	<ul style="list-style-type: none"> • Extruded aluminium louvers to comply with the minimum free air requirements of the mechanical specification • Colour to be selected from standard range • External finish to be PVF2 or approved powder coat to meet the warranty requirements • Stainless steel bird mesh with maximum 12mm openings to be used where louvers are active • 3mm powder coated aluminium sheets to be used to block off where louvers are not active 	
3.9	Structural steel sub frames	<ul style="list-style-type: none"> • Grade 250 mild steel minimum • unexposed: Galvanised finish minimum 100 micron thickness • Exposed architectural: Class 2 ½ sand blasts to meet AS1627.4 + inorganic Zinc rich primer + Epoxy paint. • External, non-exposed: Hot Dip Galvanised 	To Comply with the architectural specification A-SP0114 Steel finishes
3.10	Glazing Setting Blocks	<ul style="list-style-type: none"> • Heat cured silicone rubber • Shore Hardness:80-90 durometer • Length and position as per AS 1288-2006 	
3.11	Structural Silicone	<ul style="list-style-type: none"> • Equal to Dow Corning 795 or 983 • Colour: Black • Install in accordance with manufacturer's recommendation • Obtain manufacturers endorsement of all proposed details • VOC requirements: Maximum 100 grams of VOC per Litre 	UV stable
3.12	Double sided tape	<ul style="list-style-type: none"> • Equal Unisil 2000 Series 	
3.13	Gasket	<ul style="list-style-type: none"> • Neoprene or Santoprene • Colour: Black • Shore A hardness • Gaskets in contact with Silicone sealant to be silicone rubber 	UV stable

	Material	Minimum Requirements	Notes
3.14	Weather Seal	<ul style="list-style-type: none"> • Dow Corning 791P or equal • Colour: Black • Non staining and compatible with substrates • VOC requirements: Maximum 250grams of VOC per Litre 	To be compatible with the membrane system and adjoining finishes
3.15	Fasteners, nuts/bolts & S/Steel components	<ul style="list-style-type: none"> • Exposed fasteners Stainless steel Grade 316 • Non exposed fasteners Stainless steel Grade 304 	
3.16	Masonry anchors	<ul style="list-style-type: none"> • Externally used expansion bolts or chemical anchors: Stainless steel Grade 316 	
3.17	Paint	<ul style="list-style-type: none"> • Internal aluminium surfaces : Powder coat Duratec or equal to comply with AAMA 2603 • External PVF2 or equal to comply with AAMA 2605.2 • Colour from standard range 	
3.18	Anodising	<ul style="list-style-type: none"> • Anodising to be carried out in accordance with the requirements of AS 1231-2000 and reference documents listed in this standard. The coating thickness for the external elements to be AA25 and for the internal elements AA20 	
3.19	Isolators	<ul style="list-style-type: none"> • Dissimilar materials are to be separated by isolator tapes. • Isolator tapes to be compatible with material which it is in contact with 	
3.20	Backing Rod	<ul style="list-style-type: none"> • Compatible with the sealants • Semi open or closed cell foam 	
3.21	Packers	<ul style="list-style-type: none"> • Nylon up to maximum of 10mm • Metal packers for more than 10mm 	
3.22	Trims & covers	<ul style="list-style-type: none"> • Aluminium sheet grade 5005 • Minimum thickness 3mm for visible flashings and 1.6mm every where else • Thickness of back pans to be justified by calculations 	

4. Glass Performance Requirements

Glass thickness shown is indicative thickness. The exact required glass thicknesses are to be calculated by the Facade contractor.

Glass Type	Indicative Glass Composition	VLT	Reflectivity Out	Solar Transmit	SHGC	SC	U Value (W/m2K)	Bench Mark Product
GL-1 Curtain wall Vision	DGU compromising: Min 8mm H/S clear Low E outer lite + 12mm air gap +min 10.76mm clear annealed inner lite	Min 68%	Max 12%	Max 13%	Max 0.45 %	Max 0.44	Max 2.5	-CSG 8CED12 on clear + 12air+10.76 clear
GL-2 Curtain wall Spandrel	Min 6mm H/S glass to match the vision glass visually	-	Max 12%	-	-	-	-	
GL3 Podium glass	16mm clear high performance Tough glass (TBC)							-Viridin -CSG With Sunergy or Panabil G coating (TBC)

5. Testing & Verifications

	Item	Minimum Requirements	Notes
5.1	Structural Silicone	<ul style="list-style-type: none"> Adhesion and cohesion factory tests as per manufacturer's recommendations Submit QA/QC documentation Submit test results Supplier's written acceptance of design, engineering and application including their test results 	
5.2	On site water test	<ul style="list-style-type: none"> In accordance with AAMA 501.2 field water test Allow for 4 tests Location to be selected by the façade consultant 	
5.3	Performance Test	<ul style="list-style-type: none"> In accordance with AS/NZ 4284 latest edition The mock up specimen to be 2 storey in height, 3 panel wide plus one internal and one external corner The final configuration to be selected by the Architect and the Façade Consultant Test to be carried out by a NATA certified testing officer Testing regime to include BMU restrain pin test In case of test failure the contractor shall determine and rectify the cause and re test. Modifications to the test specimen shall be fully documented and included in the test report. 	
5.4	Previously tested systems	<ul style="list-style-type: none"> Submit test reports prepared by NATA approved authorities for consideration Previously tested sample and design parameters should not significantly differ from requirements of this project 	
5.5	Extrusion test	<ul style="list-style-type: none"> General visual inspection of in-coming goods Check against die drawings for the shape, size, thickness Test on alloy and hardness Mating of interlocking sections 	
5.6	Aluminium Finishes	<ul style="list-style-type: none"> Film adhesion and thickness to be tested as per paint supplier's recommendations Visual inspection and colour check against approved samples Test results are to be submitted as a part of QA/QC documentations 	

	Item	Minimum Requirements	Notes
5.7	Anodise Coating	<ul style="list-style-type: none">• Visual inspection and colour check against approved samples in accordance with AS1231-2000 section 5.• Coating thickness in accordance with AS1231-2000 section 7• Abrasion resistance in accordance with AS 1231-2000 section 9• Corrosion resistance in accordance with AS 1231-2000 section 10 and rating shall be at least 8• In case of any disputes tests recommended by AS1231-2000 shall be carried out	
5.8	Masonry and Chemical anchors	<ul style="list-style-type: none">• Expansion type anchors: Minimum 2.5%• Chemical anchors < 100 Minimum 10%• Chemical anchors >100 Minimum 2.5%	

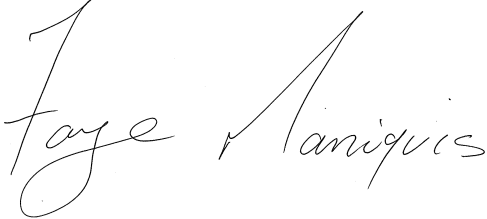
6. Warranties

Contractor to submit a written warranty stating that all design and work performed and all materials, items, systems and parts supplied by or on behalf of the Contractor in relation to his Scope of Works on this project are in accordance with qualities, standards, tests and requirements set out in the specification and Australian Standards and maintain the installation completely water and air tight for a period not less than 10 years from the latest date when a notice of Practical Completion is issued under the Head Contract.

Submit the following product warranties with the façade warranty:

	Items	Minimum Requirements	Notes
6.1	Double Glazed Glass	<ul style="list-style-type: none"> Minimum 10 Years warranty from glass manufacturer 	Warranty to include but not limited to the visual aspects, degradation of coating, spontaneous fracture, Thermal fracture, failure of DGU seal
6.2	Spandrel glass	<ul style="list-style-type: none"> Minimum 10 Years warranty from glass manufacturer 	Warranty to include but not limited to the visual aspects, spontaneous fracture, Thermal fracture,
6.3	Aluminium finishes	<ul style="list-style-type: none"> Minimum 15 years warranty from paint applicator and paint supplier 	Warranty to include colour retention and film integrity
6.4	Shadow box spandrel	<ul style="list-style-type: none"> Minimum 10 years warranty from composite panel manufacturer and glazing contractor 	Warranty to include paint de-lamination, panel distortion and panel de-lamination
6.5	Structural Sealant	<ul style="list-style-type: none"> Minimum 10 years warranty from sealant supplier 	Warranty to include adhesion and cohesion and staining of adjacent surfaces
6.6	Anodised extrusions	<ul style="list-style-type: none"> Minimum 15 years warranty from anodiser 	Warranty in accordance with AS... requirements
6.7	Weather seal	<ul style="list-style-type: none"> Minimum 10 years warranty from sealant supplier 	Warranty to include adhesion and cohesion and staining of adjacent surfaces
6.8	Hardware	<ul style="list-style-type: none"> Minimum 1 year for moving elements and 2 years for the others 	Warranties are to be supplied by the hardware company and the glazing contractor
6.9	Miscellaneous items	<ul style="list-style-type: none"> Minimum 10 years 	This includes but not limited to the insulation, back pans, bird meshes, gaskets etc...

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