

## Test Method:

**Note:** The client requested that the sample be tested to NZBC E2/VM1 which is intended for claddings that include a 20mm drained cavity. NZBC E2/VM1 is a derivative of ASNZS4284 which allows for glazed systems though it has different pass criteria. This sample has been subjected to the pressures and sequences from E2/VM1 however drilling 6mm holes in the glazing seals was not possible so the seal degradation test from ASNZS4284:2008 8.10 was substituted. There was no 'wet wall' test performed as there is no equivalent in ASNZS4284 or NZS4211.

The sample was exposed to the preconditioning test from NZBC E2/VM1 1.4.1 at 1515 Pa Positive and Negative for 1 minute each way.

Series 1: The Static water test 1.4.1 at 455 Pa and then cyclic water test 1.4.2 at 455 – 910 Pa were then undertaken.

Series 2: Pane 1 (upper right when viewed from the wet side of the sample) had 3 areas of the seal cut out,  $\frac{3}{4}$  up the sides on both jambs and in the middle of the sill see figures 3, 4 & 5. These were approximately 30mm long by 2-3mm wide by 30mm deep. The water tests from series 1 were repeated.

Series 3: On the inside of the same Pane 1 as above a 30mm long section of the inner seal was removed and the water tests were repeated. See Figure 6.

Series 4: On Pane 2 the inner seal only was removed in a similar manner as before and the tests from series 1 were repeated.

Tested by: s 9(2)(a)

Checked by: JLG



Figure 3 – Pane 1, Left Jamb Seal



Figure 4 – Pane 1, Right Jamb Seal



Figure 5 – Pane 1, Sill Seal



Figure 6 – Pane 1, Interior Glazing Seal

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Figure 7 – Panes 1 & 2, with Interior Seals removed, during testing

## Results:

TEST	SAMPLE CONDITION	OBSERVATION
Preconditioning		No visible damage or deformation.
Series 1	Pane 1 – No seal degradation	No water penetration
Series 2	Pane 1 – Outer seals degraded	No water penetration
Series 3	Pane 1 – Outer & inner seals degraded	Significant water penetration
Series 4	Pane 2 – Inner seal degraded	No water penetration

Tested by: s 9(2)(a)

Checked by: JLG

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# Jackson Clapperton & Partners Ltd

Consulting Engineers & Regd Surveyors

P.O. Box 71065, Rosebank Road, Auckland

Ph: (09) 8200-131 Fax: (09) 8200-133

Project: New Dwelling for Corban Walls  
at 6 Island Bay Road, Birkdale

Ref. No: 2003/004/H

Page No. W2

Date: 20/11/2017

Designed: MD

## (C) Check SHS Window Mullions on Southwestern Wall

(Worst case for 2.9m span)

50x50x5 SHS posts. Vertical span 2.9m max.

Loads	kN/m <sup>2</sup>	Trib. Width (m)	G (kN/m)		Qu (kN/m)
Roof	0.75	0.2	0.11	0.25	0.04
			Σ 0.11	kN/m	Σ 0.04 kN/m
					Point Load Qc = 1.00 kN

Max trib length per post = 3.2m

$$N^* = (1.2)(0.11)(3.2) + (1.5)(1.0) = 1.9 \text{ kN}$$

$$W_u = (1.2)(1.69)(3.2/2) = 3.24 \text{ kN/m}$$

$$W_s = (1.2)(1.14)(3.2/2) = 2.19 \text{ kN/m}$$

Check 50x50x5mm SHS posts

### Lateral bending.

$$M^* = \frac{wL^2}{8} = 3.41 \text{ kNm}$$

$$\therefore \phi M_n = (0.9)(0.35)(13.2) = 4.16 \text{ kNm} \quad \text{OK}$$

### SLS

$$E = 200 \text{ MPa} \quad I = 0.257 \times 10^6 \text{ mm}^4$$

$$W_s \Delta = \frac{5(wx10^3)L^4}{384EI} = 39.2 \text{ mm}$$

$$ST \Delta = 39.2 \text{ mm} > \text{Limit} = \frac{\text{span}}{200} = 15.0 \text{ mm} \quad \text{N/G}$$

### Try adding 50x60x6mm Al. Tee section

$$\text{Combined } I = 700 \times 10^6 \text{ mm}^4 = I = 0.700 \times 10^6 \text{ mm}^4$$

$$W_s \Delta = \frac{5(wx10^3)L^4}{384EI} = 14.4 \text{ mm}$$

$$ST \Delta = 14.4 \text{ mm} < \text{Limit} = \frac{\text{span}}{200} = 15.0 \text{ mm} \quad \text{OK}$$

$$\text{OR} \quad \text{Combined } I = 2.2 \times 10^6 \text{ mm}^4 = I = 2.2 \times 10^6 \text{ mm}^4$$

$$E = 69.6 \text{ MPa}$$

$$W_s \Delta = \frac{5(wx10^3)L^4}{384EI} = 13.2 \text{ mm}$$

$$ST \Delta = 13.2 \text{ mm} < \text{Limit} = \frac{\text{span}}{200} = 14.5 \text{ mm} \quad \text{OK}$$

Consider shear flow between the two sections:-

$$V^* w_u = (3.24)(2.9/2) = 4.70 \text{ kN}$$

$$\text{Steel/Al} \quad q = \tau b = \frac{VQ}{I} = \frac{(4.7)(7.6 \times 10^{-6})}{(7.0 \times 10^{-11})} = 51.0 \text{ kN/m}$$

$$\text{Al/Steel} \quad q = \tau b = \frac{VQ}{I} = \frac{(4.7)(2.26 \times 10^{-7})}{(2.2 \times 10^{-6})} = 48.3 \text{ kN/m}$$

Consider screw fixings between Aluminium Tee & 50x50 SHS.

$$q = 51 \text{ kN/m}$$

Try 8 gauge self tapping screws Ult. shear strength = 5.35 kN

$$\text{therefore } \phi Q_v = (0.8)(5.35) = 4.28 \text{ kN/screw}$$

$$\text{Therefore need } \frac{51}{4.28} = 12 \text{ 8 gauge screws per metre.}$$

If have a screw on each side of the T the spacing will be 150mm.

Consider using M6 socket screws G8.8

$$\phi V^*v = (0.8)V_f$$

$$\text{Where } V_f = 0.62f_{uf}k_r(n_n A_c + n_x A_o)$$

$$f_{uf} = 880 \text{ MPa (G8.8)}$$

$$\text{OR } f_{uf} = 400 \text{ MPa (G4.6)}$$

$$k_r = 1.0$$

$$n_n = 1.0$$

$$n_x = 0$$

$$A_c = 17.9 \text{ mm}^2$$

$$A_o = 28.2 \text{ mm}^2$$

$$\text{Therefore } V_f = (0.62)(880)(1.0)(1 \times 17.9) + (0 \times 28.8) = 9.8 \text{ kN Grade 8.8}$$

$$\& V_f = (0.62)(400)(1.0)(1 \times 17.9) + (0 \times 28.8) = 4.4 \text{ kN Grade 4.6}$$

$$\phi V^*v = (0.8)(9.8) = 7.8 \text{ kN If Grade 8.8}$$

$$\phi V^*v = (0.8)(4.4) = 3.6 \text{ kN If Grade 4.6}$$

$$\text{Therefore need } \frac{51}{7.8} = 7 \text{ 8 G8.8 M6 screws per metre. i.e. 250mm c/c}$$

Check bearing of M6 bolt on 5mm SHS wall.

$$\phi V^*v = (0.8)V_b$$

$$\text{Where } V_b = 1.4f_{yb}d_r t_p k_p \quad f_{yb} = 350 \text{ MPa SHS}$$

$$d_r = 5.3 \text{ mm}$$

$$t_p = 5 \text{ mm}$$

$$k_p = 1.0$$

$$\text{Therefore } V_b = 1.4(350)(5.3)(5)(1)/1000 = 13.0 \text{ kN OK}$$

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Consulting Engineers &amp; Regd Surveyors

P.O. Box 71065, Rosebank Road, Auckland

Ph: (09) 8200-131 Fax: (09) 8200-133

Project: New Dwelling for Corban Walls  
at 6 Island Bay Road, Birkdale

Ref. No: 2003/004/H Page No. W4

Date: 20/11/2017 Designed: MD

**(D) Check SHS Window Mullions for larger span on Northwestern Wall**

(Worst case for 3.7m span)

50x50x5 SHS posts. Vertical span 3.7m max.

Loads	kN/m <sup>2</sup>	Trib. Width (m)	G (kN/m)		Qu (kN/m)
Roof	0.75	1.5	1.13	0.25	0.38
			Σ 1.13	kN/m	Σ 0.38 kN/m
					Point Load Qc = 1.00 kN

Max trib length per post = 1.1m

$$N^* = (1.2)(1.13)(3.2) + (1.5)(1.0) = 5.6 \text{ kN}$$

$$W_u = (1.2)(1.69)(1.1) = 2.23 \text{ kN/m}$$

$$W_s = (1.2)(1.14)(1.1) = 1.50 \text{ kN/m}$$

Check 50x50x5mm SHS posts

Lateral bending.

$$M^* = \frac{wL^2}{8} = 3.82 \text{ kNm}$$

$$\therefore \phi M_n = (0.9)(0.35)(13.2) = 4.16 \text{ kNm} \quad \text{OK}$$

SLS

$$E = 200 \text{ MPa} \quad I = 0.257 \times 10^6 \text{ mm}^4$$

$$W_s \Delta = \frac{5(w \times 10^3)L^4}{384EI} = 27.0 \text{ mm}$$

$$ST \Delta = 27.0 \text{ mm} > \text{Limit} = \frac{\text{span}}{200} = 15.0 \text{ mm} \quad \text{N/G}$$

Try adding 100x50x6mm Al. Tee section

$$\text{Combined } I = 1.5 \times 10^6 \text{ mm}^4 = I = 1.500 \times 10^6 \text{ mm}^4$$

$$W_s \Delta = \frac{5(w \times 10^3)L^4}{384EI} = 12.2 \text{ mm}$$

$$ST \Delta = 12.2 \text{ mm} < \text{Limit} = \frac{\text{span}}{200} = 18.5 \text{ mm} \quad \text{OK}$$

Consider shear flow between the two sections:-

$$V^* w_u = (2.23)(3.7/2) = 4.13 \text{ kN}$$

$$\text{Steel/Al} \quad q = \tau b = \frac{VQ}{I} = \frac{(4.13)(13.7 \times 10^6)}{(1.5 \times 10^6)} = 42.9 \text{ kN/m}$$

Note that this is less than the shear flow between the 50x60x6 T section (on previous page) so use same connection details between the two sections.



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Ph: (09) 8200-131

Fax: (09) 8200-133

Project:

New Dwelling for Corban Walls

at 6 Island Bay Road, Birkdale

Ref. No:

2003/004/H

Page No.

W5

Date:

20/11/2017

Designed:

MD

**(E) Check Top & bottom fixing of SHS/T section mullions.**

i) 2.9m high mullions

$$V^* = (3.24)(2.9/2) = 4.7 \text{ kN} \quad \text{- governs}$$

ii) 3.7m high mullions

$$V^* = (2.23)(3.7/2) = 4.1 \text{ kN}$$

Drawings show 6mm baseplate with 3M10 bolts through the XLAM Floor.

Min. edge distance loaded across the grain =  $4da = (4)(10) = 40\text{mm}$  OK

$$\phi Q_n = (0.7)(1.0)(5.8)(3) = 12.18 \text{ kN} \quad \text{OK}$$

Check base fixing of mullions to concrete slab Drawings show 3/M6 x 70 Hilti HUS3-C6 fasteners

From Manufacturers. Min edge distance for splitting = 63mm. OK Nominal embedment = 55mm

Min spacing = 35mm OK

Mean ultimate Shear in uncracked concrete  $V_{ru,m} = 13.1\text{kN}$   
 & in cracked concrete  $V_{ru,m} = 13.1\text{kN}$

& Design resistance

Uncracked	$V_{ru,m} = 8.3\text{kN}$	
Cracked	$V_{ru,m} = 8.3\text{kN}$	Adopt as worst case

Therefore three fasteners =>  $V_{ru,m} = (3)(8.3) = 24.9 \text{ kN}$  OK

**(F) Check fixings of glazing jamb to XLAM walls**

From page W2

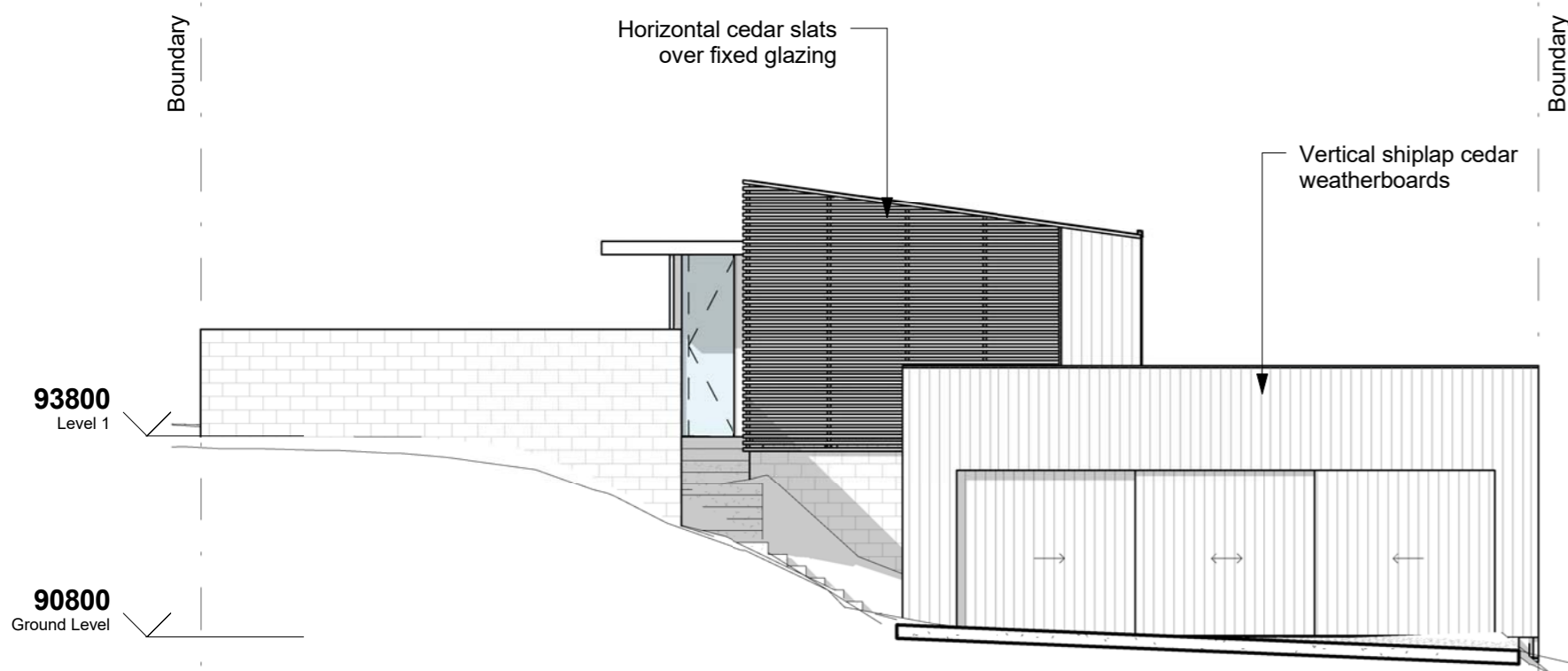
$$W_u = (1.2)(1.69)(3.2/2) = 3.24 \text{ kN/m}$$

Drawings show 60mm long x 12 gauge screws @ 600mm c/c.

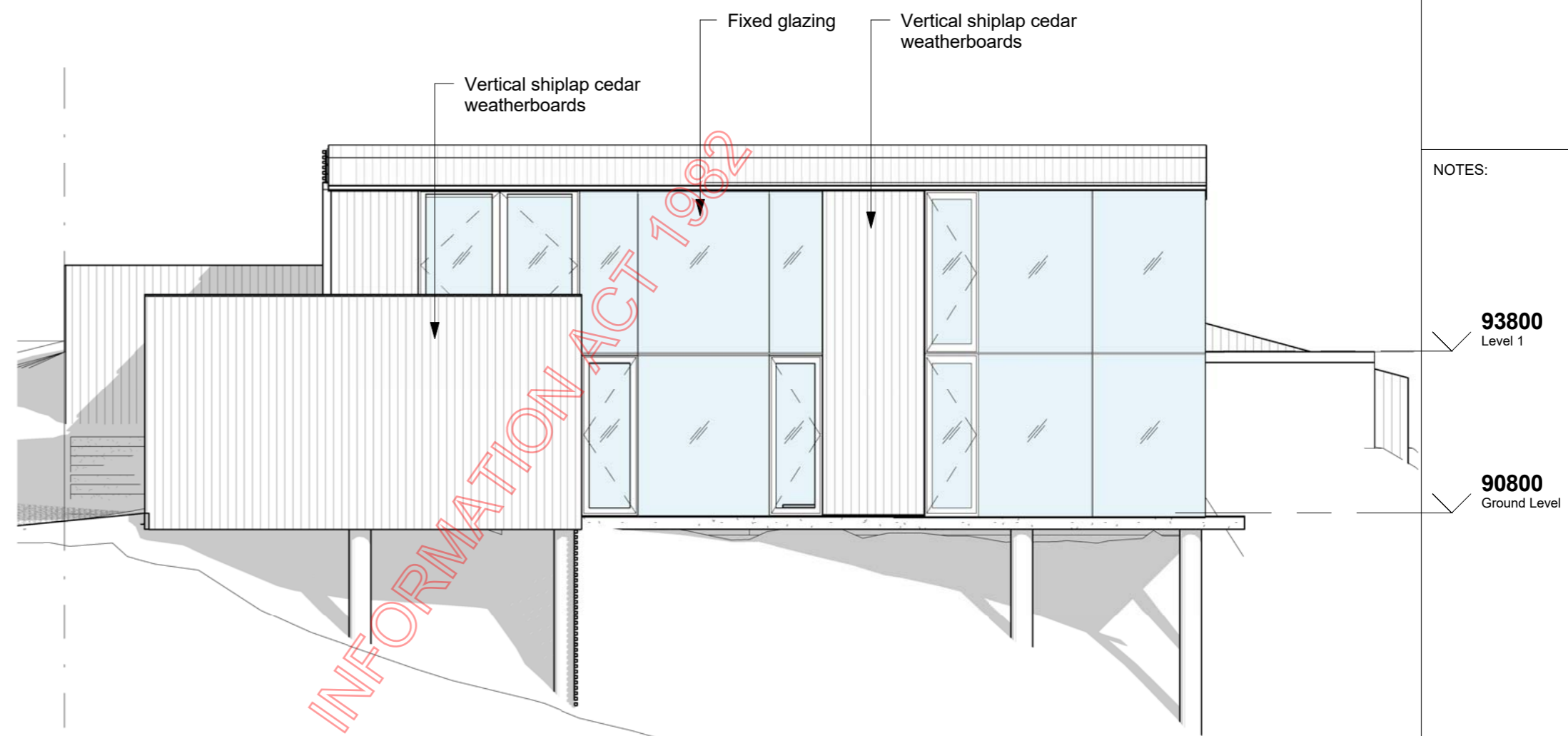
$$\phi Q_t = (0.7)(1.0)(70.8)(60)/1000 = 2.97 \text{ kN/screw}$$

$$= 4.96 \text{ kN/m} \quad \text{OK}$$

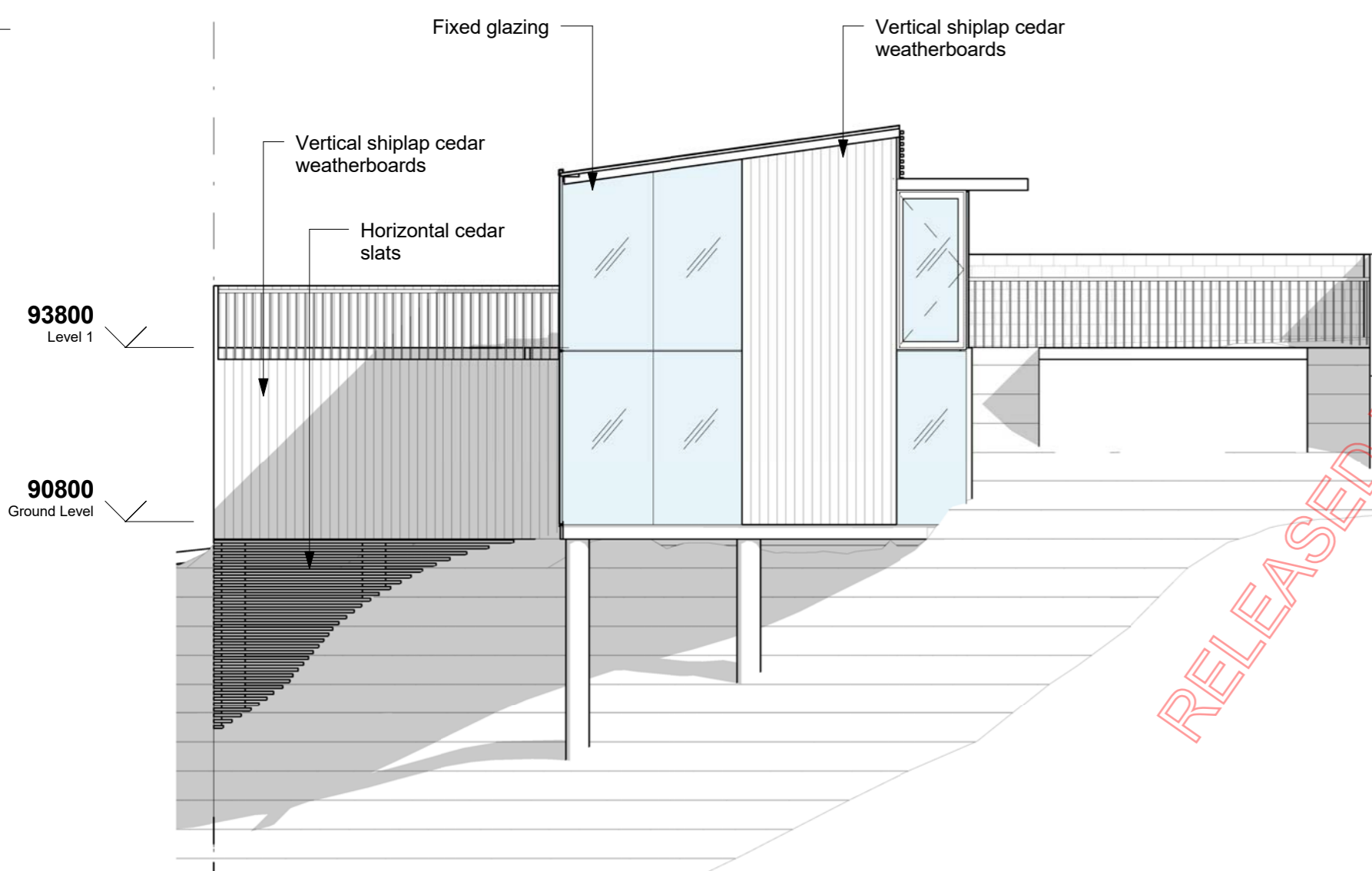
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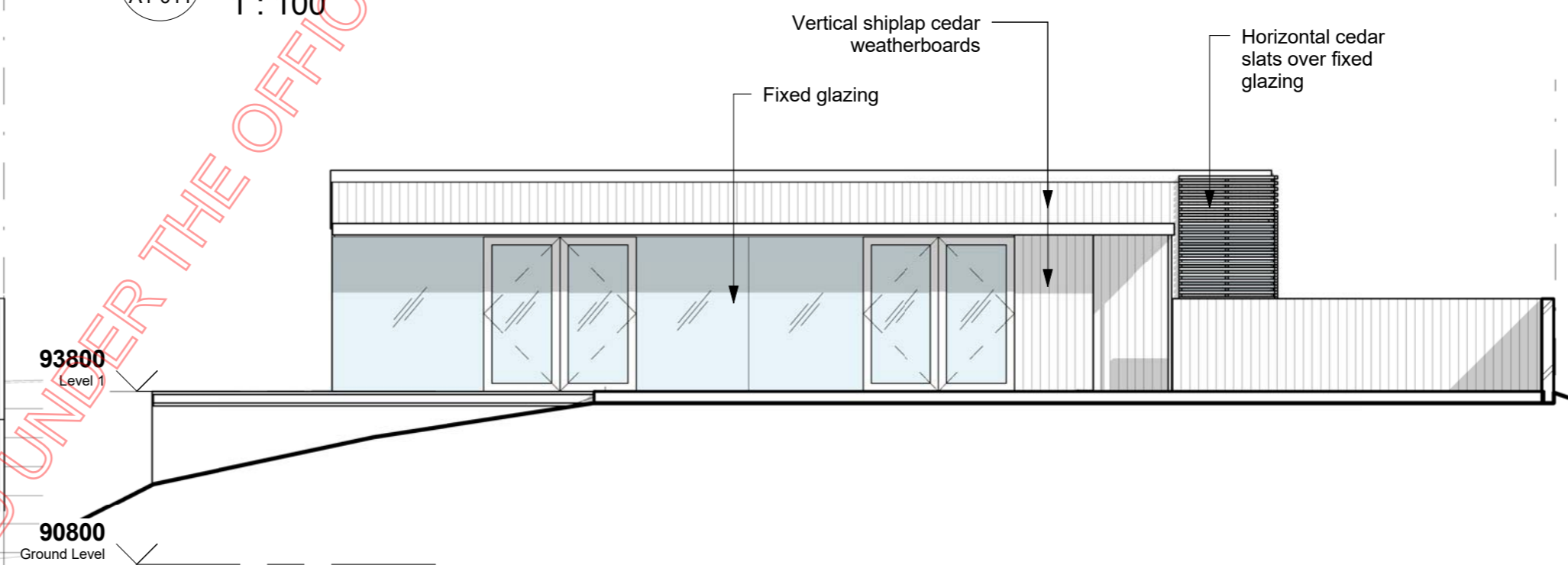
1 North West Elevation  
A1-011 1 : 100



2 South West Elevation  
A1-011 1 : 100



3 South East Elevation  
A1-011 1 : 100



4 North East Elevation  
A1-011 1 : 100

LOCAL AUTHORITY  
CONSULTANTS

NOTES:

93800  
Level 1

90800  
Ground Level

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504  
**ISLAND BAY ROAD HOUSE**

6 Island Bay Road, Beach Haven

SHEET:  
**Elevations**

SCALES @ A2: 1 : 100  
SCALES @ A4: Half A2 scale

REF:  
DRAWN/START DATE: Author

DRWG No: **A1-401** REVISION:

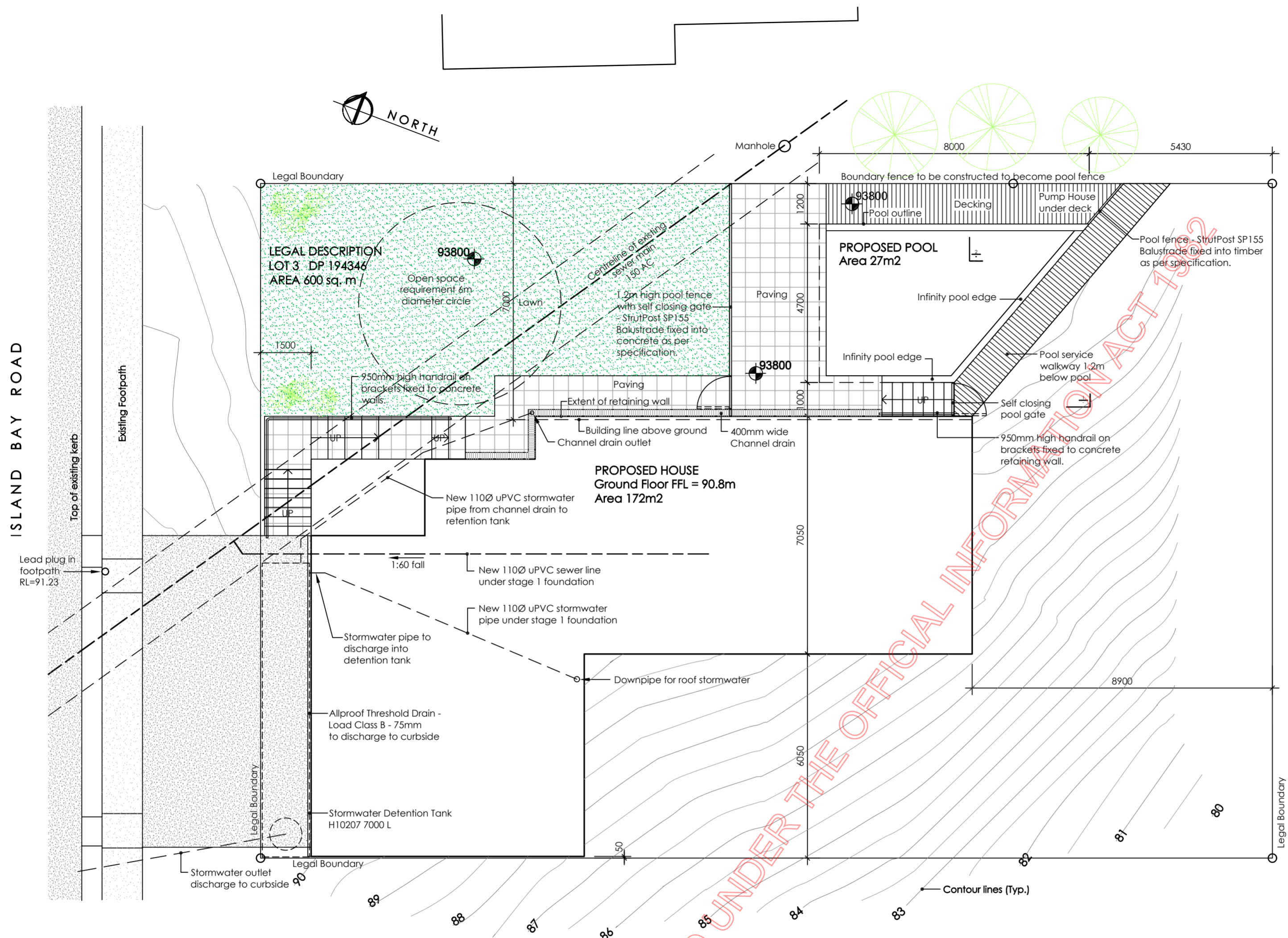
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07-Dec-17 5:42:09 PM

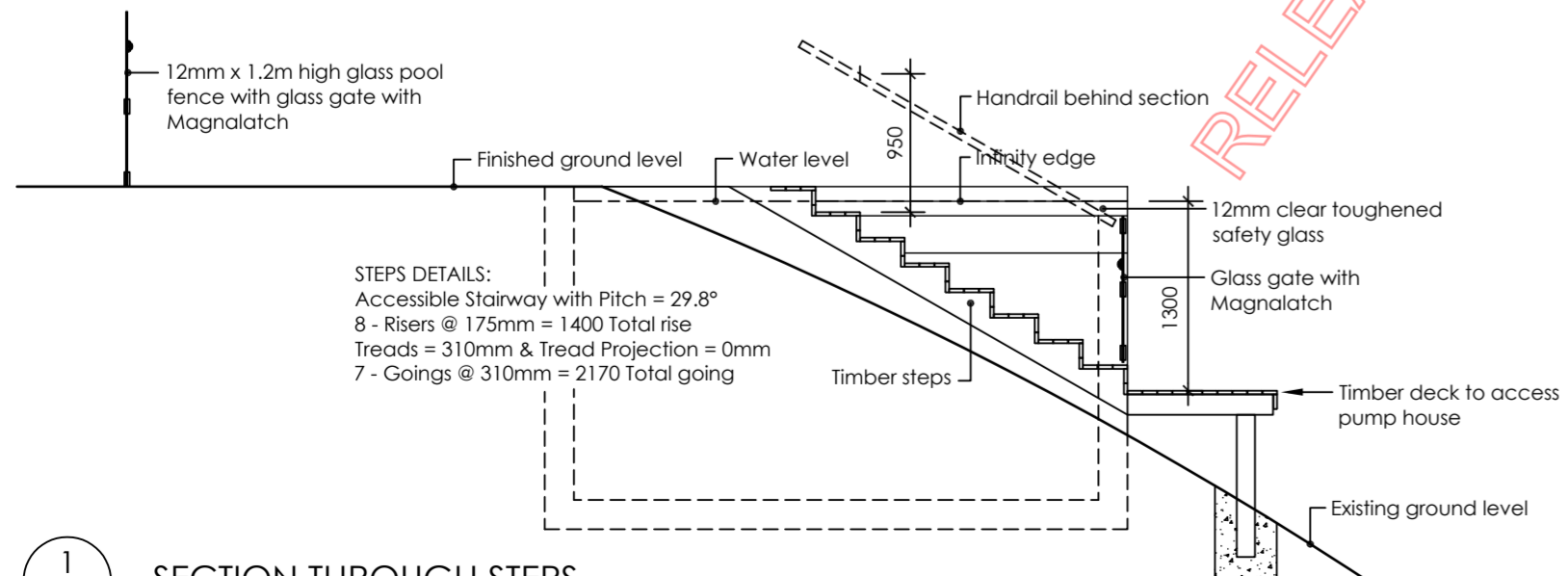
**BUILDING CONSENT**



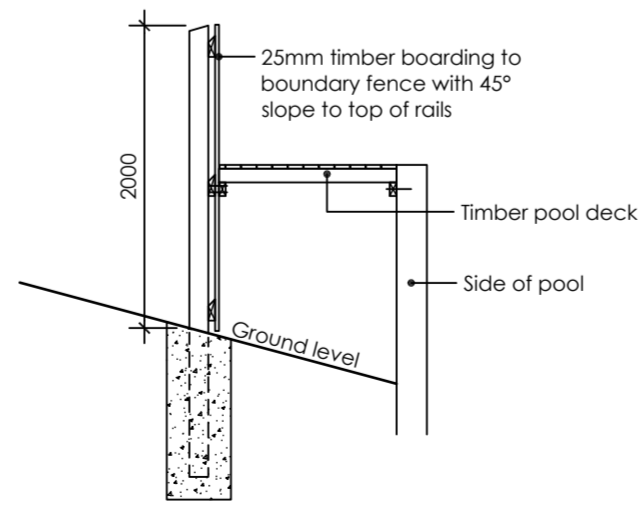


SITE PLAN scale 1:100 @ A2

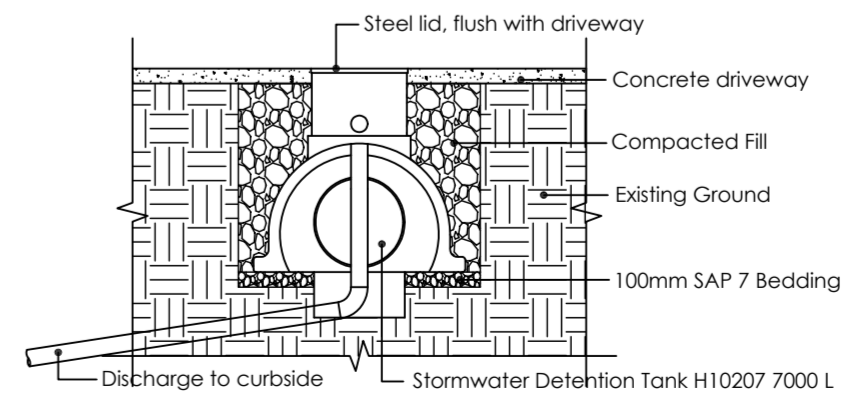
NOTE:  
 Refer to Architectural drawings for full site and building and details.  
 Refer to stage one consent drawings for full site and foundation details.



SECTION THROUGH STEPS SCALE 1:50 @ A2



POOL/BOUNDARY FENCE SCALE 1:50 @ A2



DETENTION TANK SECTION SCALE 1:50 @ A2

LOCAL AUTHORITY:  
 AUCKLAND CITY COUNCIL

CONSULTANT:  
 s 9(2)(a)  
 Jackson Clapperton & Partners Ltd  
 PO Box 71 065 Rosebank Road  
 ph (09) 8200131  
 cell

NOTES:

**POOL DECK NOTE:**  
 The deck around the pool is less than 1.5m from finished ground level and thus exempt from consent.

**ALL STEP/STAIR DETAILS:**  
 Main Private Stairway with Pitch = 35.8°  
 16 - Risers @ 187.5mm = 3000 Total rise  
 Treads = 285mm & Tread Projection = 25mm  
 15 - Goings @ 260mm = 3900 Total going

**HANDRAIL NOTE:**  
 The handrail to the stair shall be 950mm high and shall be in accordance with NZBC Clause D1 Access Routes.

**STAIR SLIP RESISTANCE NOTE:**  
 The stair is to have slip resistance on the treads in accordance with section 2.1 Slip Resistance on the treads in accordance with section 4.1.7 b) of the NZBC Clause D1 Access Routes.

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504  
**ISLAND BAY ROAD HOUSE**

6 Island Bay Road  
 Beach Haven  
 AUCKLAND

SHEET:  
**Site Plan & Floor Slab Plan**

SCALES @ A2:  
 SCALES @ A4: Half A2 scale

REF:  
 DRAWN/START DATE: Author

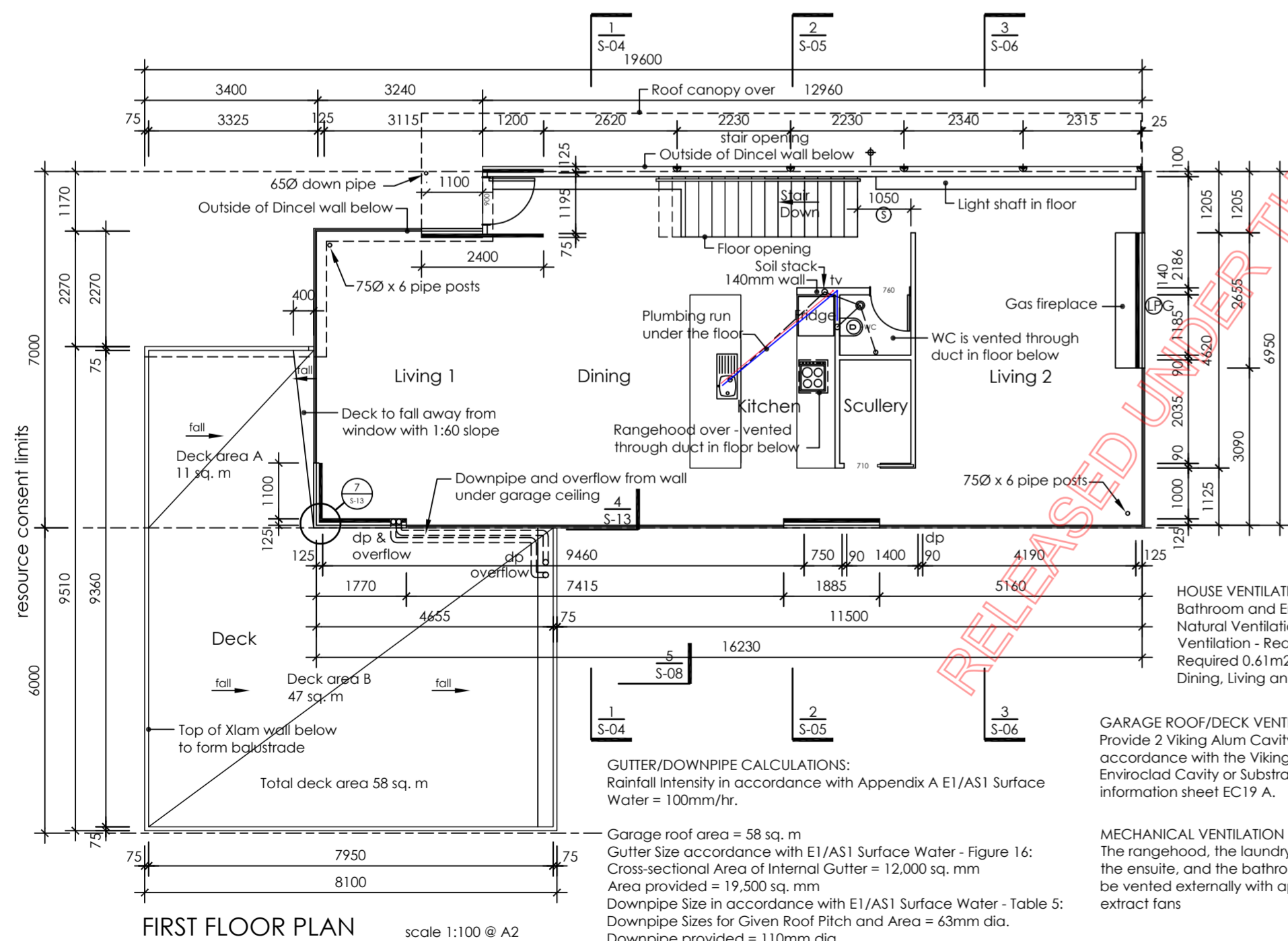
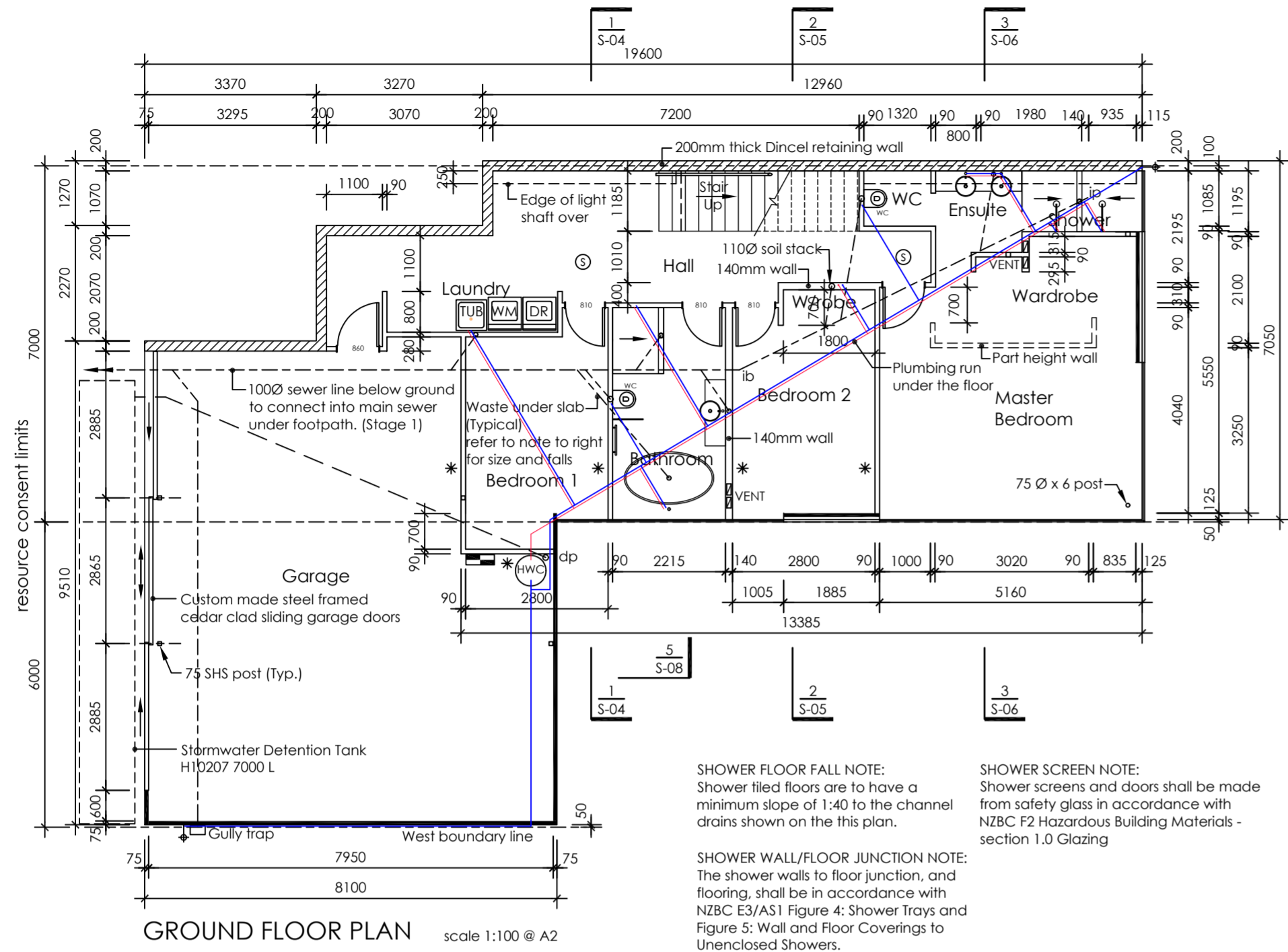
DRWG No: REVISION:

**S-01**

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- wall legend:**
- 200mm Dintel retaining wall
  - 90mm thick internal
  - 125mm thick exterior wall (75mm Xlam + 50mm insulation)
  - Windows to building exterior
  - Denotes wall that have 10mm + 13mm Gib board lining both sides of wall
- floor slab legend:**
- Downpipe - to size stated
  - Floor Waste Gully (FWG)
  - Terminal vent
  - inspection bend
  - inspection point
  - inspection join
  - air admittance valve
  - outdoor hose tap
  - 300L hot water cylinder
  - Ceiling mounted smoke alarm
  - Electric 'SMART' Meter Box
  - COLD water pipes
  - HOT water pipes
- PLUMBING NOTES:**  
Provide Backflow Prevention to all external Taps on the site. The backwash from the Pool Pump is required to discharge to Private Sewer line via the pipe shown on this plan.

- wall legend:**
- 90mm thick internal
  - 125mm thick exterior wall (75mm Xlam + 50mm insulation)
  - 75mm thick Xlam wall
  - 75mm thick Xlam balustrade
  - Windows to building exterior
  - 9kg LPG gas cylinder location

**general note:**

Before commencing any work on site, the main contractor and all subcontractors shall read and fully understand all relevant sections of the drawings and specifications, this includes reading all notes:

Do not scale dimensions off the drawings, if in doubt about any dimension ask the designer.

A copy of all product manuals noted on the drawings, or called up in the specifications shall be on site at all times during the construction of the building.

Only drawings marked "FOR CONSTRUCTION" shall be used for construction of the building.

**waste pipe notes:**

Wastes running under the floor slab are 110mm Ø and have already been laid in stage 1, all pipework above the floor shall be of the following sizes and be laid to the following minimum gradients.

Soil stack 110mm Ø at 1:60  
Waste from FWG 110mm Ø at 1:60  
WC 110mm Ø at 1:50  
Bath 40mm Ø at 1:40  
Showers 40mm Ø at 1:40  
Vanities 40mm Ø at 1:40  
Laundry tub 40mm Ø at 1:40  
Kitchen sink 40mm Ø at 1:40

**storm water drainage notes:**

All drainage shown on this plan is part of the stage 1 consent, has already been constructed and is in accordance with NZBC E1 "Surface Water" and NZBC G13 "Foul Water" and to the sizes as shown on the plan with 1:120 minimum fall.

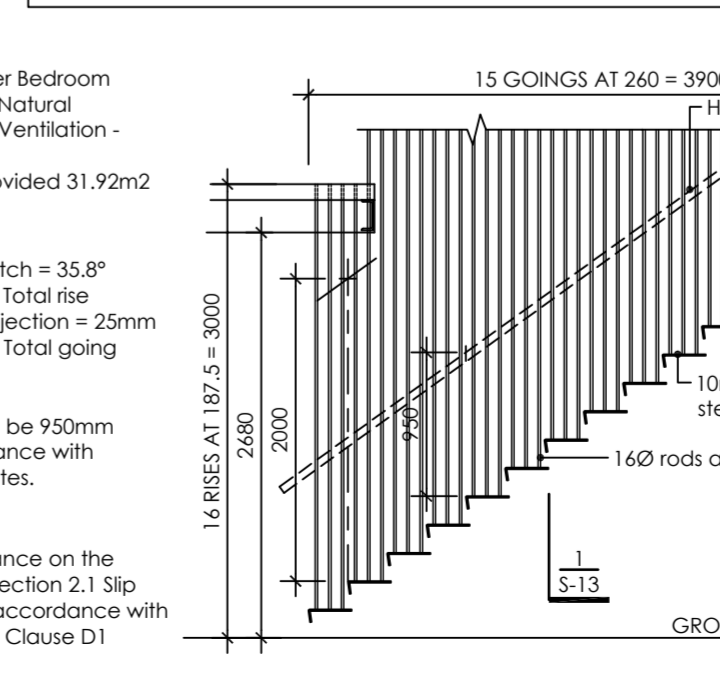
**waste pipe notes:**

Wastes running under the house and under the first floor to the soil stack, shall be of the following sizes, and be laid to the following minimum gradients.

WC - 100mm Ø at 1:50  
Shower - 40mm Ø at 1:40  
Bath - 40mm Ø at 1:40  
Vanity - 40mm Ø at 1:40  
Laundry tub - 40mm Ø at 1:40  
Kitchen sink - 40mm Ø at 1:40

**GENERAL CONSTRUCTION NOTES:**

- All work shall comply with the relevant clauses of the NZ building code, NZS 3604:2011 Timber Framed Buildings, NZS 3602:2003 Timber and Wood-based Products for use in Building, all other relevant NZ standards, all local authority regulations and other professionals producer statements.
- All work shall be carried out by Licensed Building Practitioners, in accordance with the best trade practices.
- All materials shall be new, the best of their respective kind, and shall be used in accordance with manufacturers details and specifications.
- Framing timbers shall be dry to 20% moisture content and finishing timbers dry to 12 - 15% moisture content.
- Structural timber shall be H1.2 treated SG 8 framing to the internal and H3.2 SG 8 where exposed to the weather. All studs/jack studs shall be at 600mm maximum crs. and all dwangs at 800mm maximum crs.
- Check all dimensions on site before beginning construction.
- These plans shall be read in conjunction with the plans and specifications prepared by all other professionals involved in the construction of this building.
- Only drawings that are APPROVED FOR CONSTRUCTION shall be used to construct the building.



**LOCAL AUTHORITY:**  
**AUCKLAND CITY COUNCIL**

**CONSULTANT:**  
**s 9(2)(a)**  
Jackson Clapperton & Partners Ltd  
PO Box 71 065 Rosebank Road  
ph (09) 8200131  
cell [redacted]

**insulation notes:**

The house is insulated as follows:  
**SLAB** - XPS 50mm R Value = 1.85 / EPS 200mm R Value = 5.56  
**TOTAL UNDERSLAB R VALUE = 7.41**  
**RETAINING WALL** - XPS 50mm R Value = 1.85 / EPS 200mm R Value = 5.56  
**TOTAL RETAINING WALL R VALUE = 7.41**  
**WALLS** - Xlam 90mm Panel R Value = 0.75 / PIR 50mm insulation / R Value = 2.65  
**TOTAL WALL R VALUE = 3.40**  
**GLAZING** - double glazed 18mm Argon filled, Low E, Laminated  
**TOTAL GLAZING R Value = 1.10**  
**CEILING** - Ceiling Insulation PIR R Value 3.89 / Double Earth Wool Skillion Batts R Value 6.4  
**TOTAL CEILING R VALUE = 10.29**

**coach screw fixing note:**

All M12 coach screws which fix into Xlam panels shall have a 8mm pre drilled pilot hole in the panel.  
All M10 coach screws which fix into Xlam panels shall have a 7mm pre drilled pilot hole in the panel.

For the following bolt and coach screw diameters use washer sizes as below unless noted otherwise on the drawings:

up to M8 - 25 x 25 x 1.5mm or 30Ø x 1.5mm  
up to M12 - 50 x 50 x 3mm or 60Ø x 3mm  
up to M20 - 65 x 65 x 5mm or 75Ø x 5mm  
up to M20 - 75 x 75 x 6mm or 85Ø x 6mm

**smoke alarm note:**  
Smoke alarms shall be Cavius 10yr Smoke Alarms

**exposed fixings note:**  
All exposed structural fixings shall be 316 stainless steel

**NOTES:**

**GENERAL NOTES:**  
All products listed below are to be used in the construction of the building, and supersede any other products which may be specified on these drawings.

Viking Enviroclad TPO Membrane  
PIR rigid insulation  
J Frame LVL framing  
James Hardie 6mm RAB Board  
Tekton breathable building wrap  
Marshall Innovations Super Stick building tape  
Dow Corning 795  
All exposed fixings 316 stainless steel  
All Aluminium joinery to be T6 6061  
Cedar vertical shiplap weatherboards  
Cavity battens V4 40x70mm Castellated

**REVISION HISTORY:**

s 9(2)(a)

**PROJECT:** No: 201504  
**ISLAND BAY ROAD HOUSE**  
6 Island Bay Road  
Beach Haven  
AUCKLAND

**SHEET:**  
**Dimensioned Floor Plans**

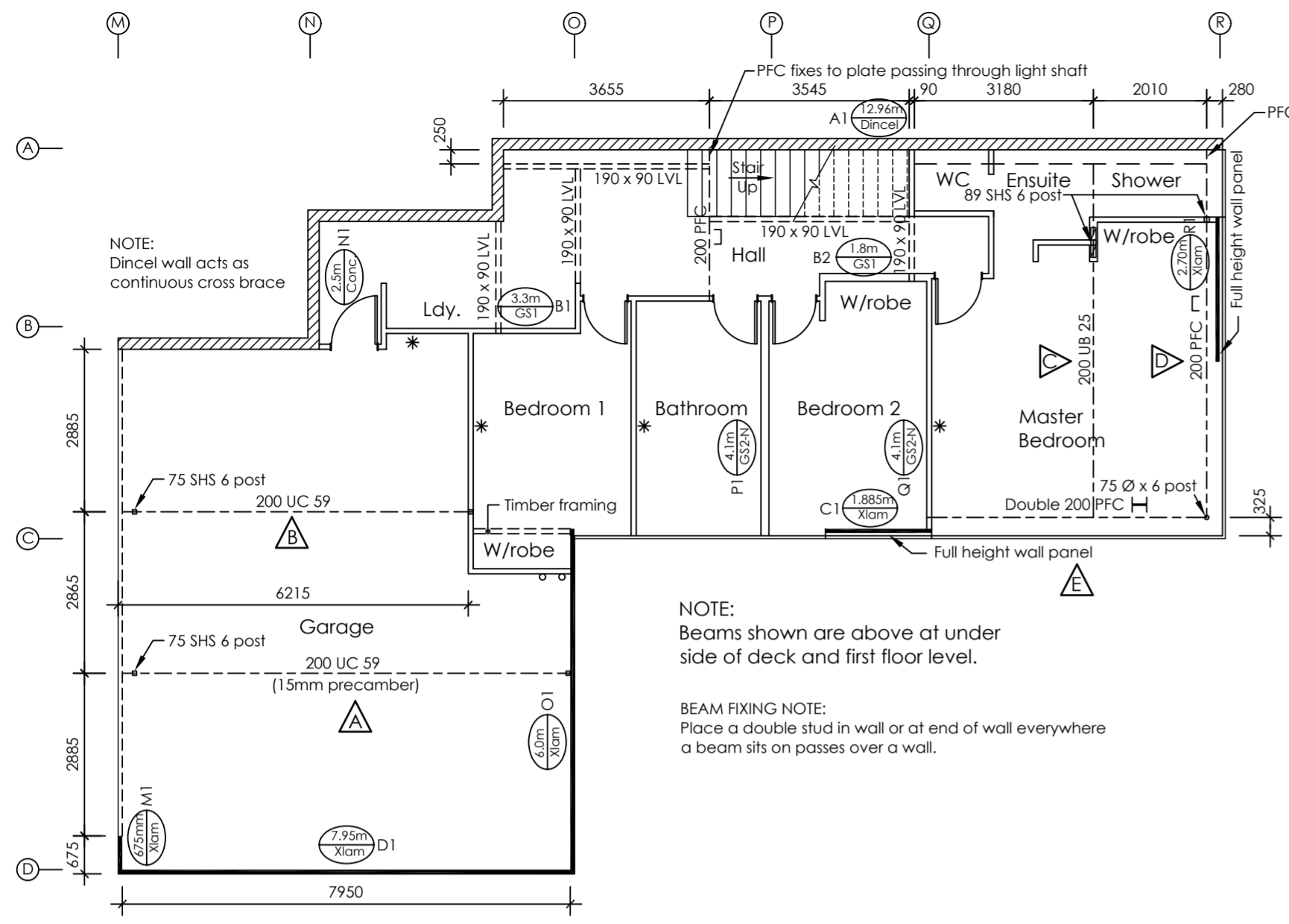
**SCALES @ A2:**  
**SCALES @ A4:** Half A2 scale

**REF:**  
**DRAWN/START DATE:** Author  
**DRWG No:** S-02  
**REVISION:**

DO NOT SCALE CONTRACTOR MUST VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK

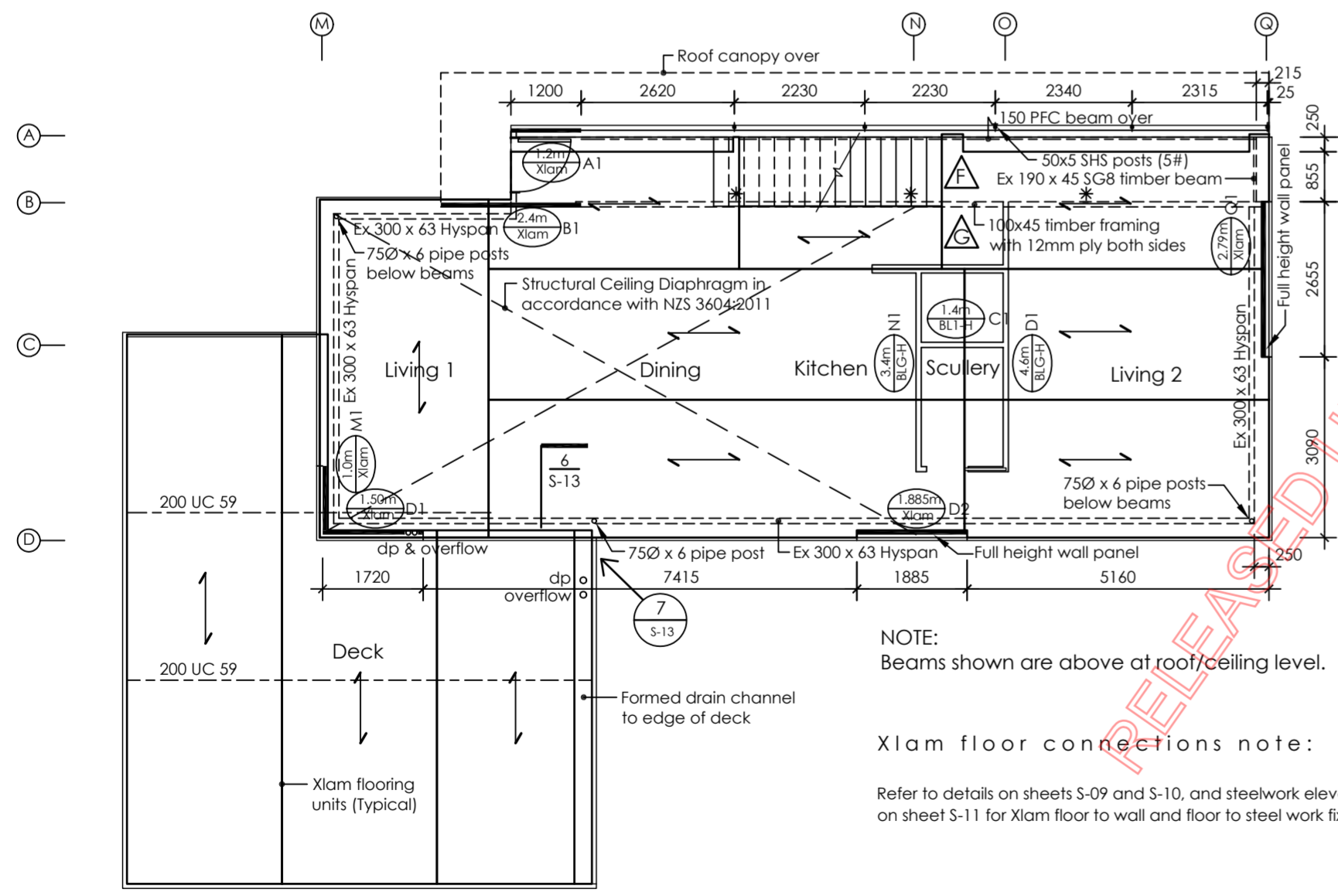
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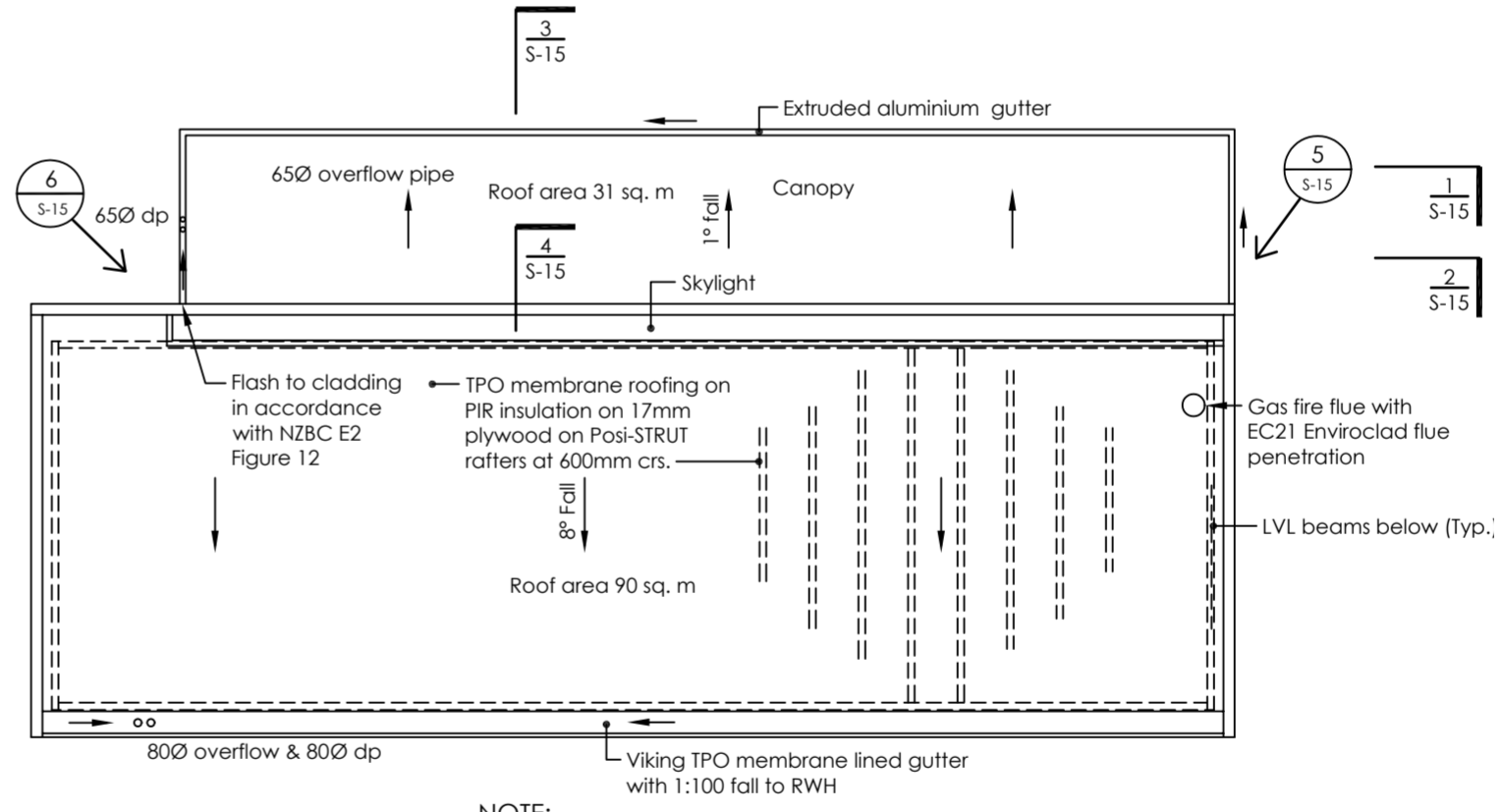
GROUND FLOOR BEAM & COLUMN LAYOUT PLAN INCLUDING BRACING scale 1:100 @ A2

- wall legend:**
- 200mm Dintel retaining wall
  - 125mm thick exterior wall (75mm Xlam + 50mm insulation)
  - 90mm thick internal wall with 90x45 studs at 600mm crs.
  - 140mm thick internal wall with 140x45 studs at 600mm crs.
  - 90mm thick internal wall with 90x90 studs at 400mm crs.
- symbol legend:**
- \* Special framing requirements for loadbearing wall - refer above
  - dp 110mm Ø PVC downpipe
  - Steel beam over to size stated
  - === Timber beam over to size stated
  - ↔ Span direction of Xlam floor units
  - △ Steelwork elevation - located on S11
  - Bracing wall - length and type
  - Bracing line



FIRST FLOOR XLAM SETOUT PLAN INCLUDING BRACING scale 1:100 @ A2

- wall legend:**
- 90mm thick internal
  - 125mm thick exterior wall (75mm Xlam + 50mm insulation)
  - 75mm thick Xlam wall
  - 75mm thick Xlam balustrade
  - Windows to building exterior
  - \* Denotes roof support plate above

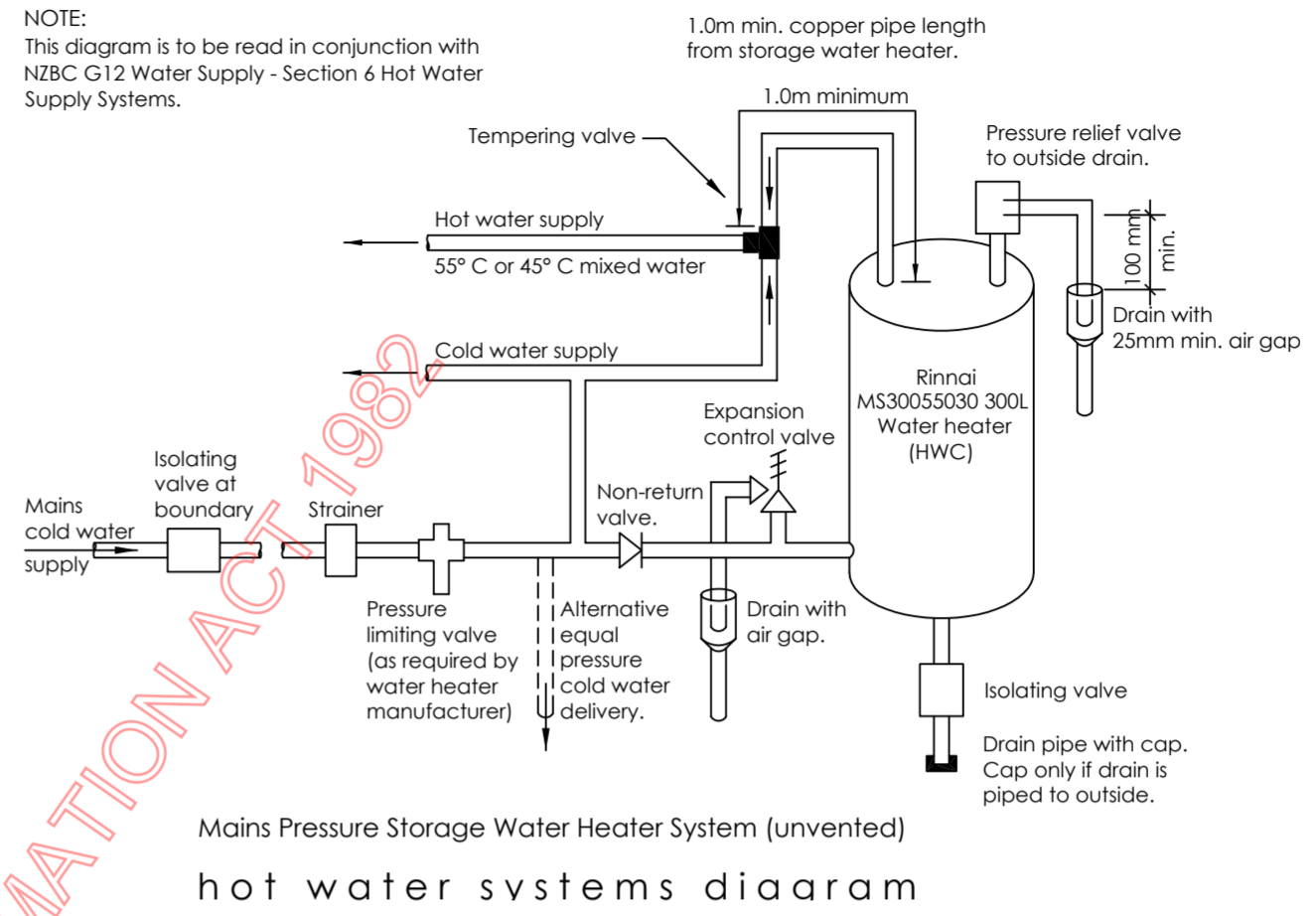


ROOF PLAN scale 1:100 @ A2

GUTTER/DOWNSPIPE CALCULATIONS:  
Rainfall Intensity in accordance with Appendix A E1/AS1 Surface Water = 100mm/hr.

House roof area = 90 sq. m  
Gutter Size accordance with E1/AS1 Surface Water - Figure 15:  
Cross-sectional Area of Internal Gutter = 18,000 sq. mm  
Minimum area provided = 18,000 sq. mm  
Downpipe Size in accordance with E1/AS1 Surface Water - Table 5:  
Downpipe Sizes for Given Roof Pitch and Area = 100x50 mm (5000 sq. mm). Downpipe provided = 80mm dia. (5027 (sq. mm)

Canopy roof area = 31 sq. m  
Gutter Size in accordance with E1/AS1 Surface Water - Figure 15:  
Cross-sectional Area of External Gutter = 4000 sq. mm (the minimum allowed)  
Area provided at lowest point = 49,500 sq. mm  
Downpipe Size in accordance with E1/AS1 Surface Water - Table 5:  
Downpipe Sizes for Given Roof Pitch and Area = 63mm dia.  
Downpipe provided = 65mm dia.



Mains Pressure Storage Water Heater System (unvented) hot water systems diagram

LOCAL AUTHORITY:  
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CONSULTANT:  
**s 9(2)(a)**  
Jackson Clapperton & Partners Ltd  
PO Box 71 065 Rosebank Road  
ph (09) 8200131  
cell

NOTES:

REVISION HISTORY:

**s 9(2)(a)**

PROJECT: No: 201504  
**ISLAND BAY ROAD HOUSE**

6 Island Bay Road  
Beach Haven  
AUCKLAND

SHEET:  
**Structural Floor Plans**

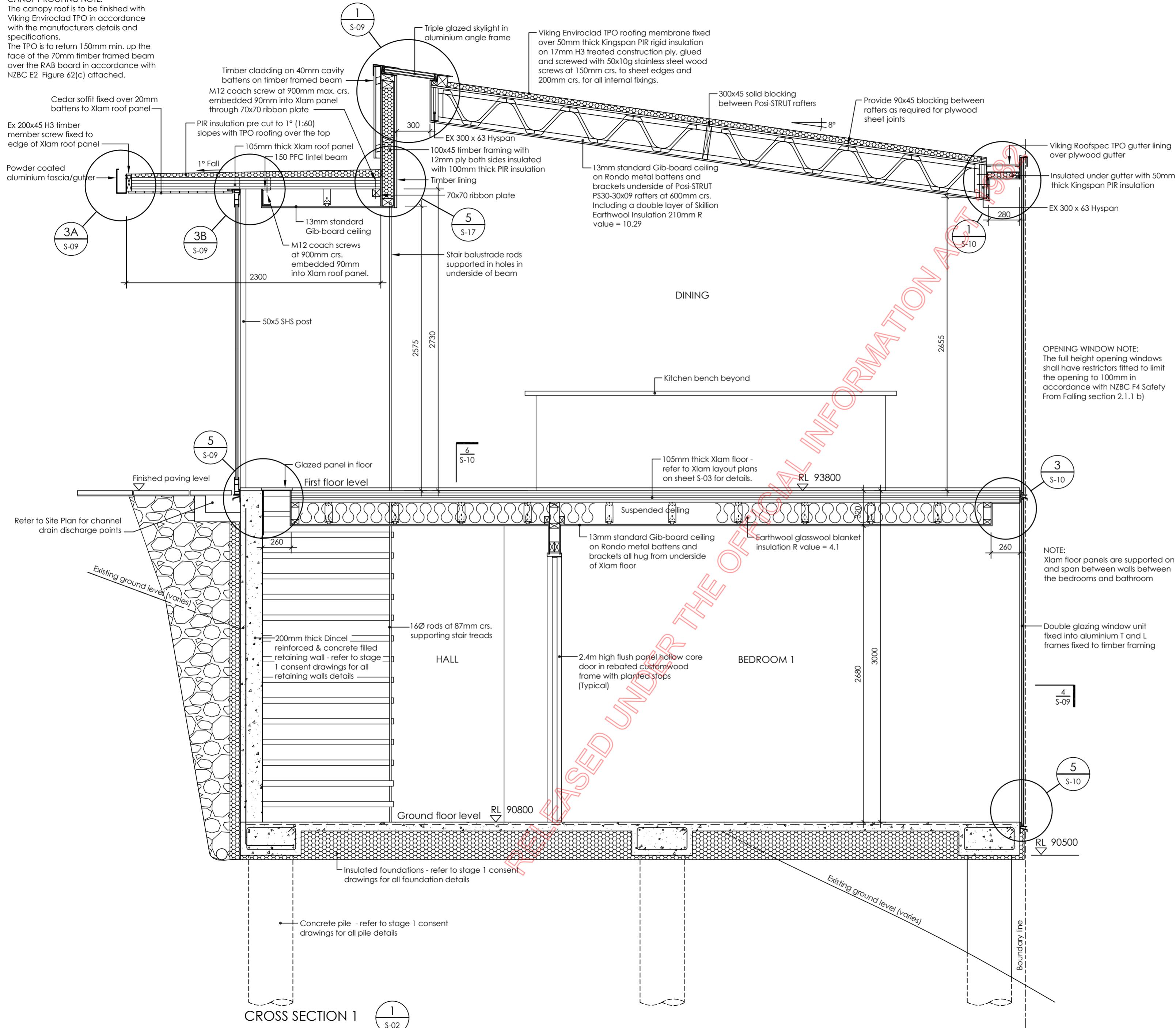
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SCALES @ A4: Half A2 scale

REF:  
DRAWN/START DATE: Author  
DRWG No: **S-03** REVISION: **F**

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**CANOPY ROOFING NOTE:**  
 The canopy roof is to be finished with Viking Enviroclad TPO in accordance with the manufacturers details and specifications.  
 The TPO is to return 150mm min. up the face of the 70mm timber framed beam over the RAB board in accordance with NZBC E2 Figure 62(c) attached.



CROSS SECTION 1

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NOTES:
REVISION HISTORY:
s 9(2)(a)
PROJECT: No: 201504 <b>ISLAND BAY ROAD HOUSE</b> 6 Island Bay Road Beach Haven AUCKLAND
SHEET: <b>House Cross Section 1</b>
SCALES @ A2: SCALES @ A4: Half A2 scale
REF: DRAWN/START DATE: Author
DRWG No: <b>S-04</b> REVISION:
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PROJECT: No: 201504  
**ISLAND BAY ROAD HOUSE**  
 6 Island Bay Road  
 Beach Haven  
 AUCKLAND

SHEET:  
**House Cross Section 2**

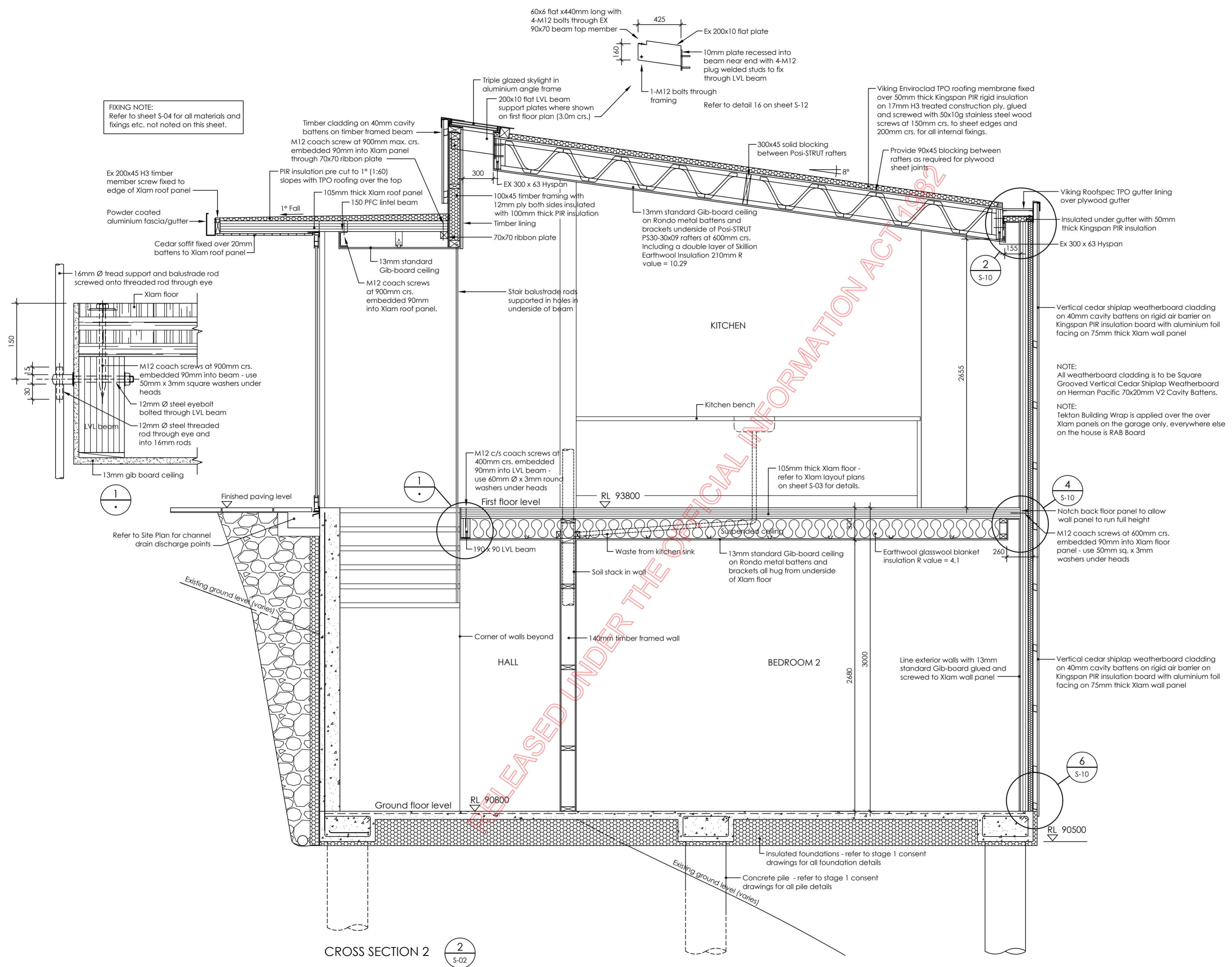
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REF:  
 DRAWN/START DATE: Author

DRWG No: **S-05** REVISION: **C**

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**CROSS SECTION 2**  
 2  
 S-02





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ph (09) 8200131  
cell

NOTES:

REVISION HISTORY:

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PROJECT: No: 201504  
**ISLAND BAY ROAD HOUSE**  
6 Island Bay Road  
Beach Haven  
AUCKLAND

SHEET:  
**Garage/House Cross Section**

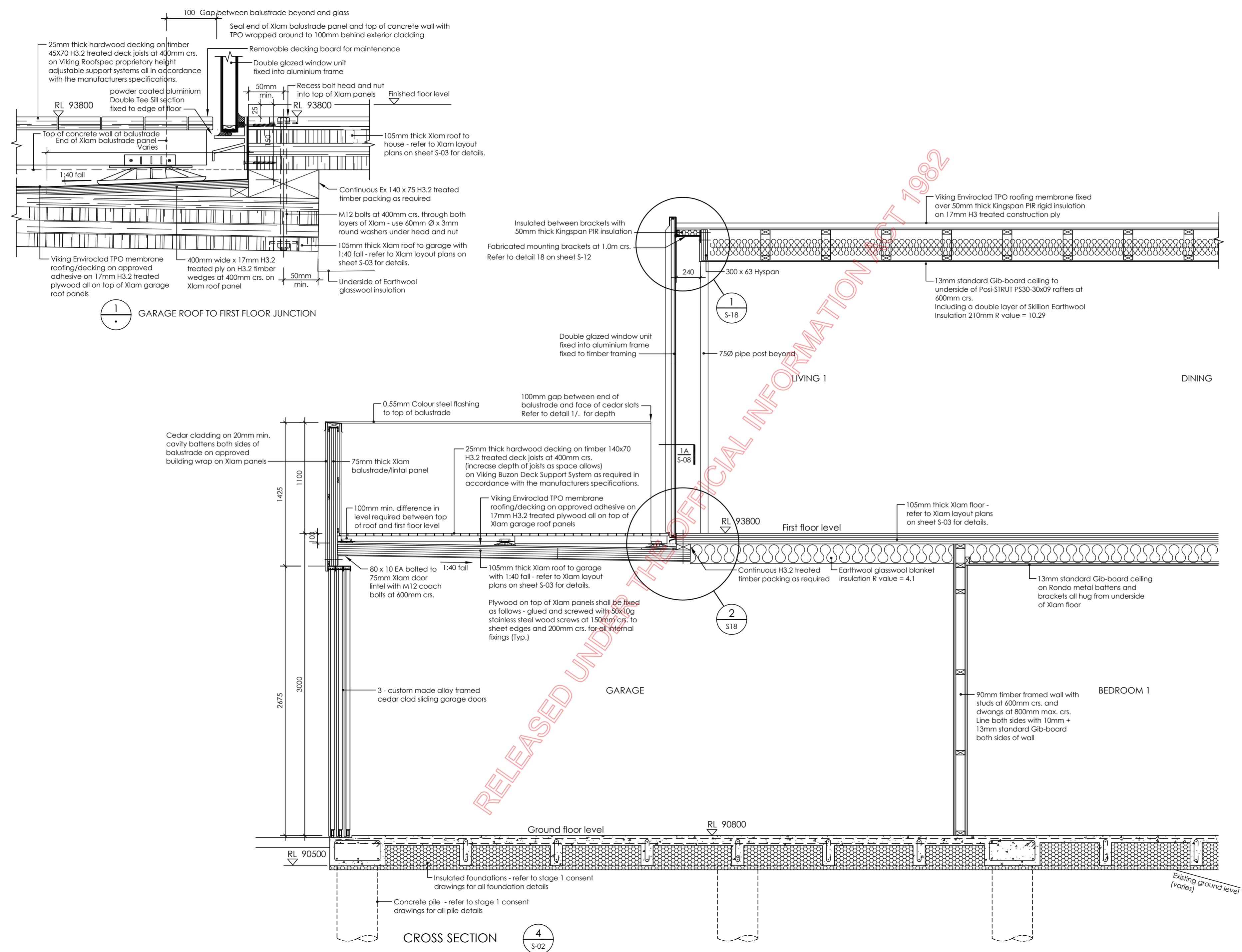
SCALES @ A2:  
SCALES @ A4: Half A2 scale

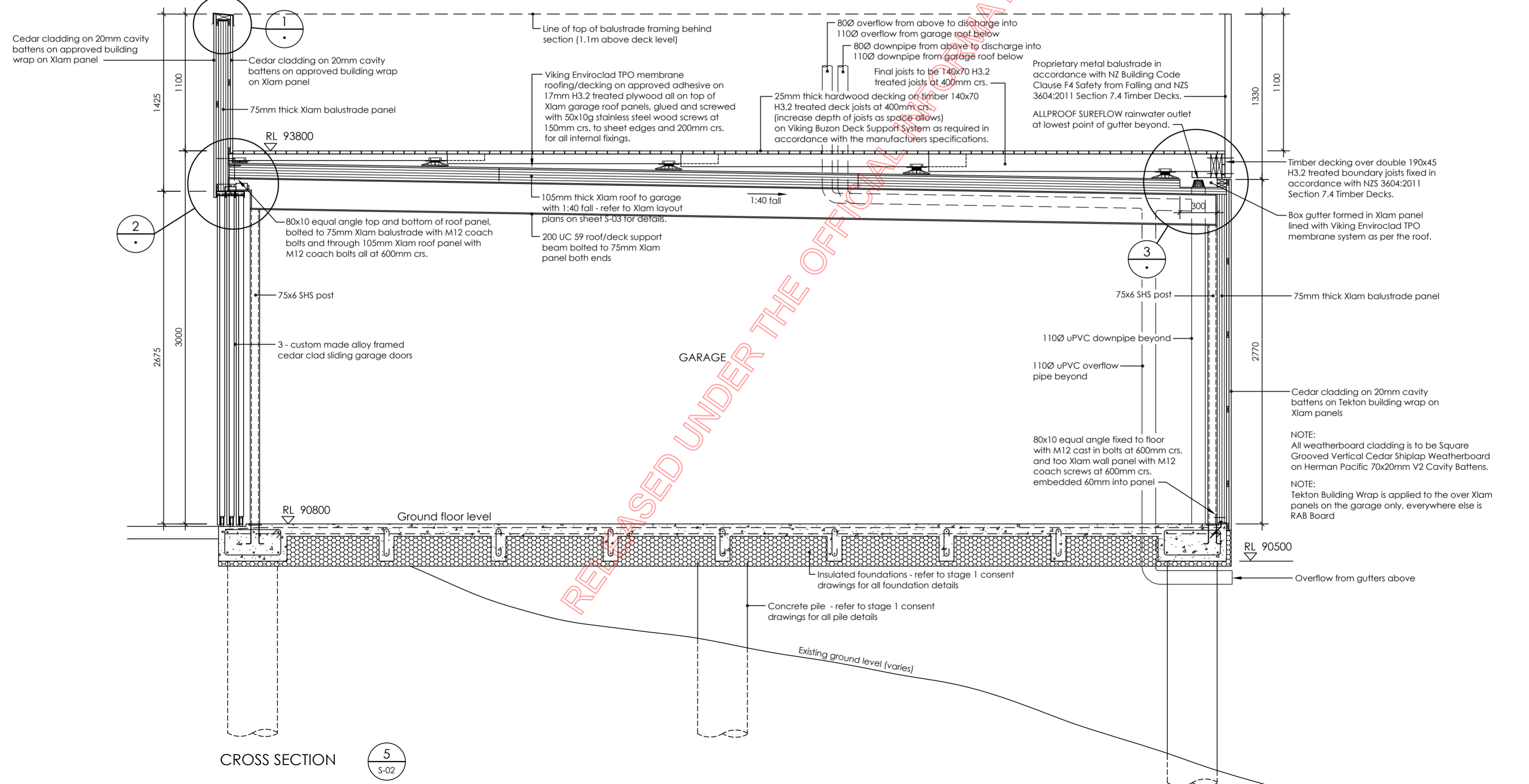
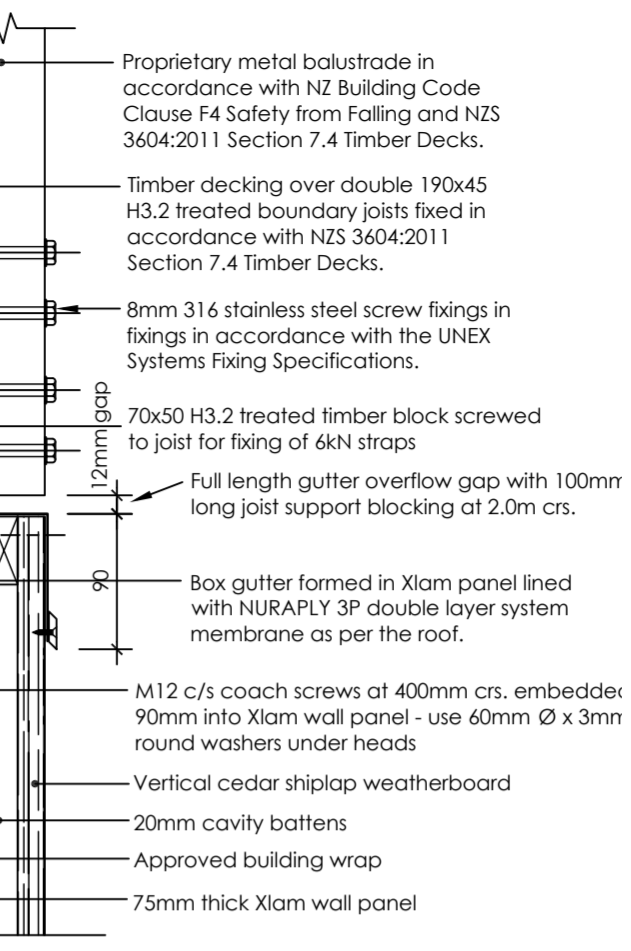
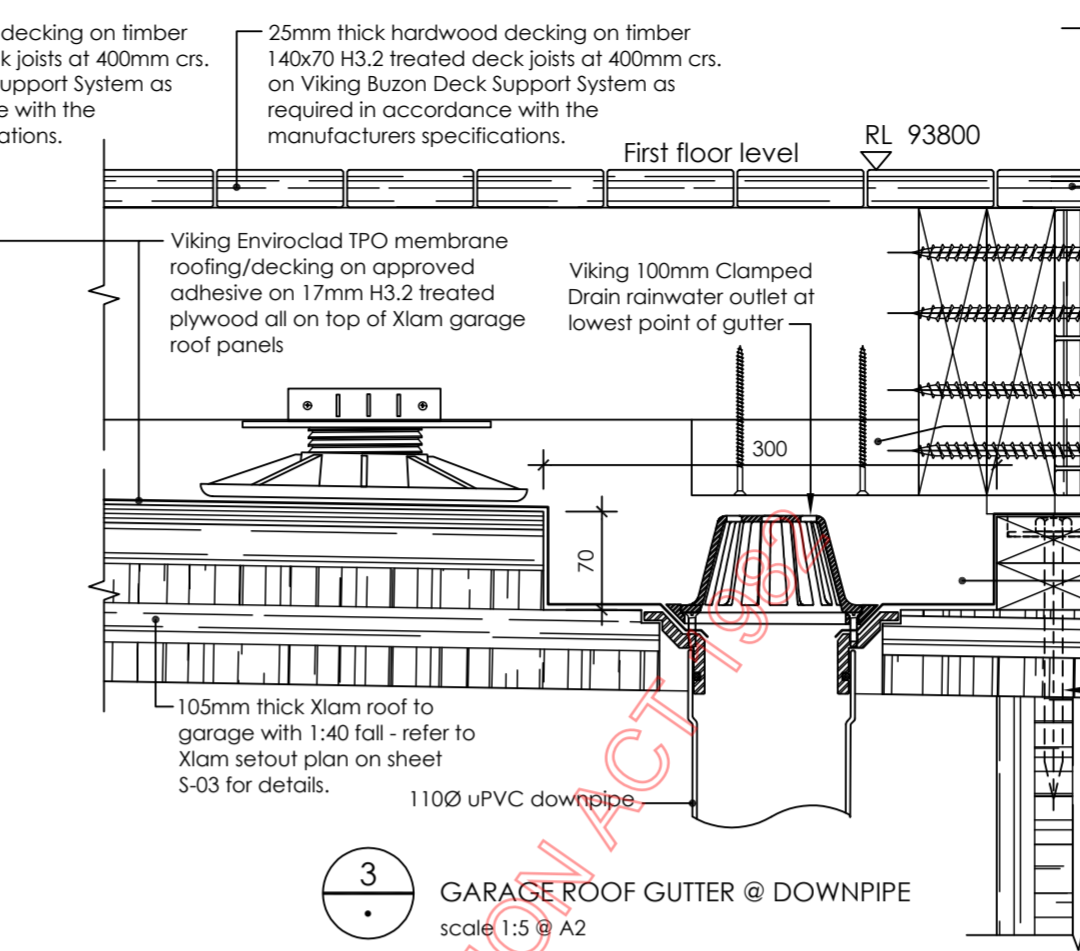
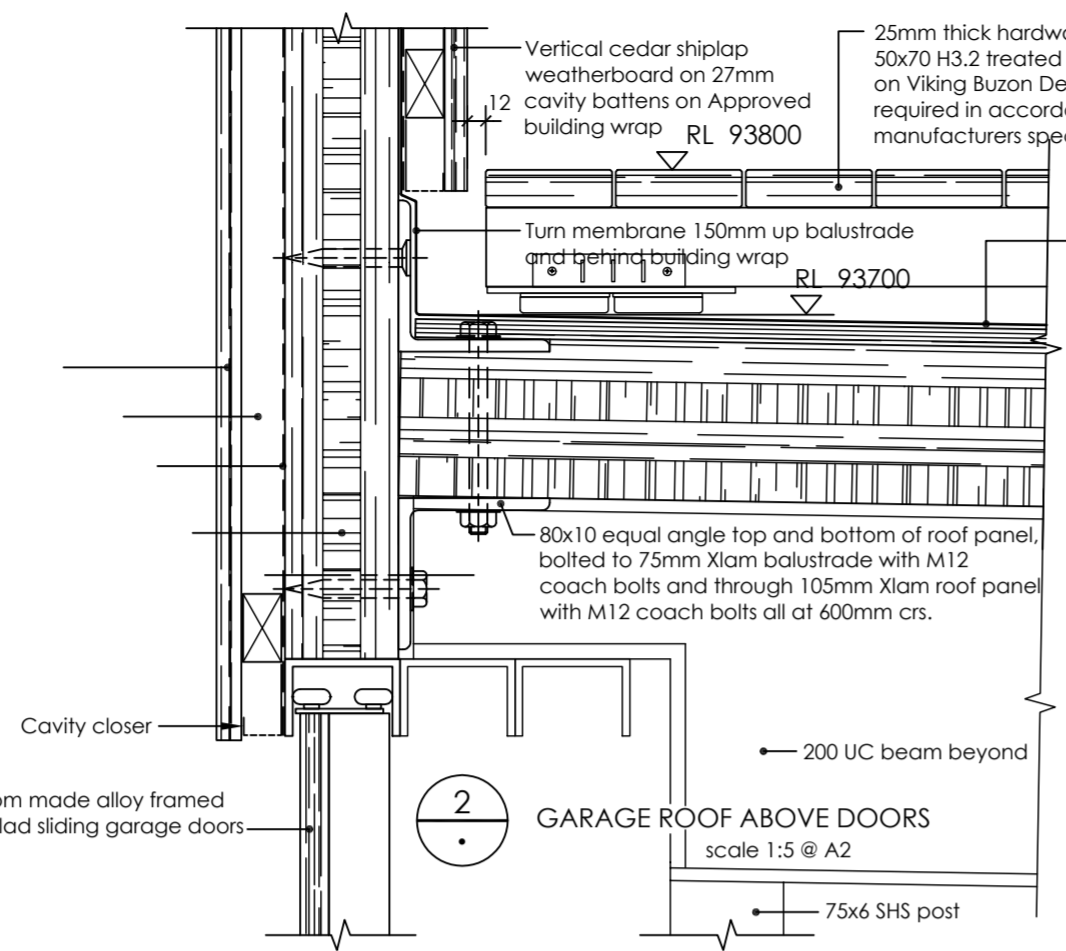
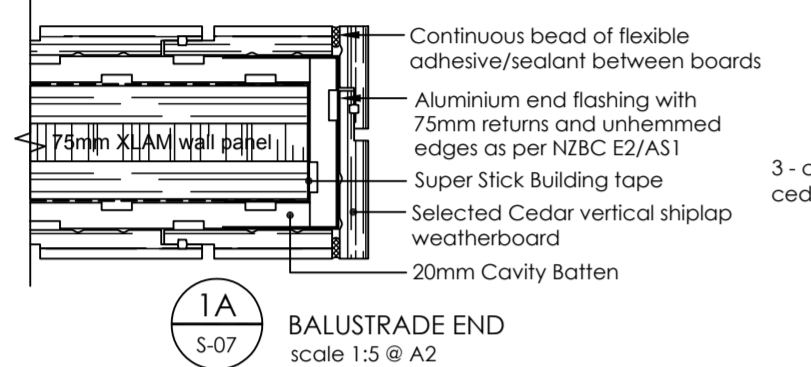
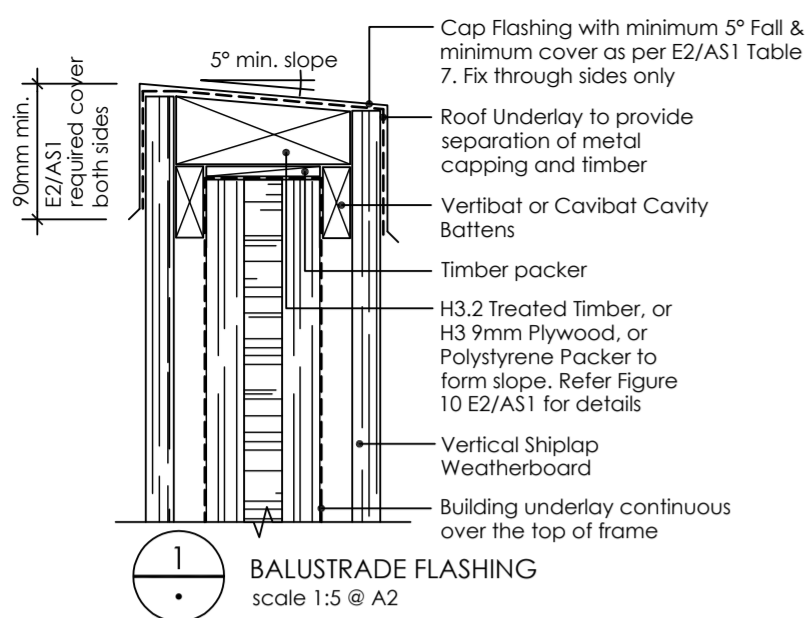
REF:  
DRAWN/START DATE: Author  
DRWG No: REVISION:

**S-07**

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ph (09) 8200131  
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NOTES:

REVISION HISTORY:

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PROJECT: No: 201504  
**ISLAND BAY ROAD HOUSE**  
6 Island Bay Road  
Beach Haven  
AUCKLAND

SHEET:  
**Garage Cross Section**

SCALES @ A2:  
SCALES @ A4: Half A2 scale

REF:  
DRAWN/START DATE: Author

DRWG No: **S-08** REVISION:

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NOTES:  
GENERAL NOTES:  
All products listed below are to be used in the construction of the building, and supersede any other products which may be specified on these drawings.  
Viking Enviroclad TPO Membrane  
PIR rigid insulation  
J Frame LVL framing  
James Hardie 6mm RAB Board  
Tekton breathable building wrap  
Marshall Innovations Super Stick building tape  
Dow Corning 795  
All exposed fixings 316 stainless steel  
All Aluminium joinery to be T6 6061  
Cedar vertical shiplap weatherboards  
Cavity battens V4 40x70mm Castellated

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PROJECT: No: 201504  
**ISLAND BAY ROAD HOUSE**

6 Island Bay Road  
Beach Haven  
AUCKLAND

SHEET:  
**DETAILS**

SCALES @ A2:  
SCALES @ A4: Half A2 scale

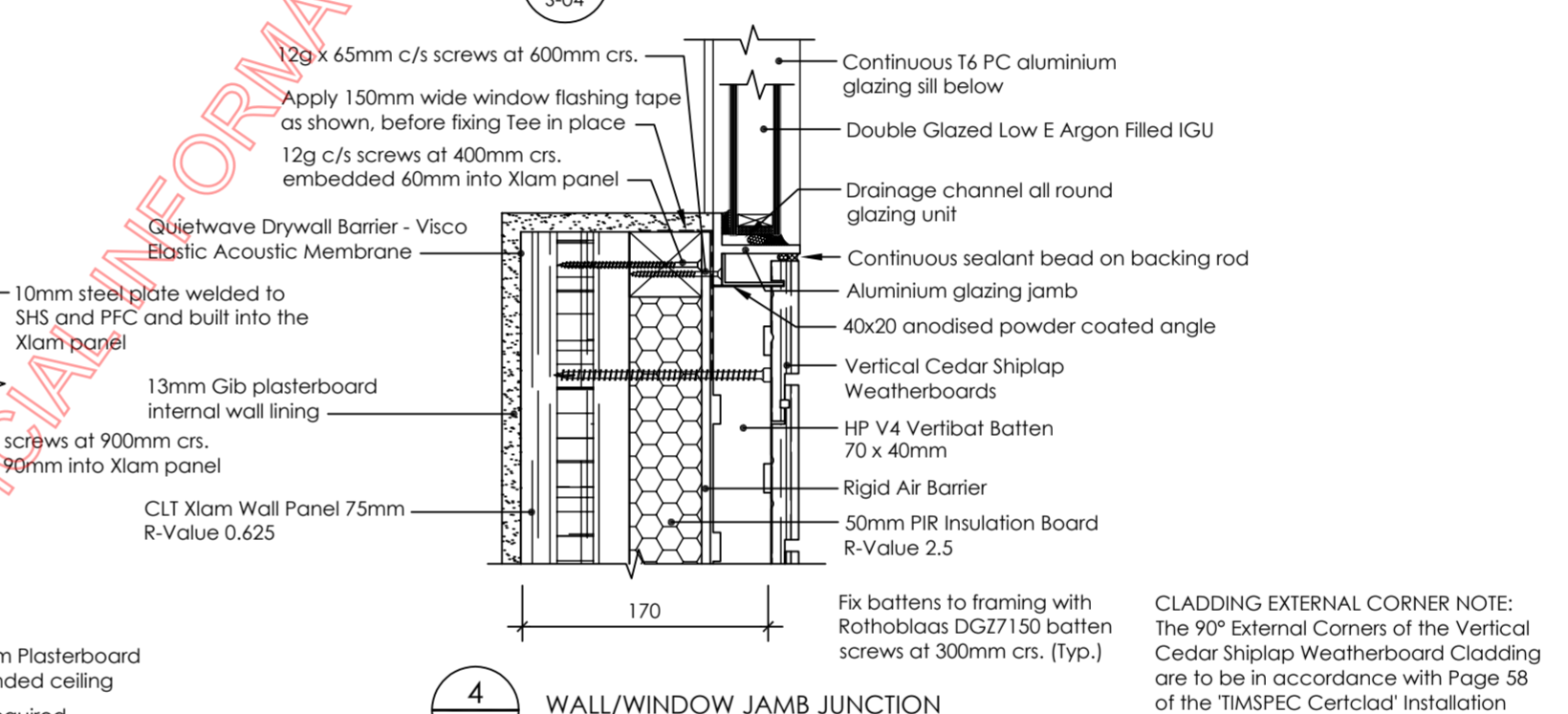
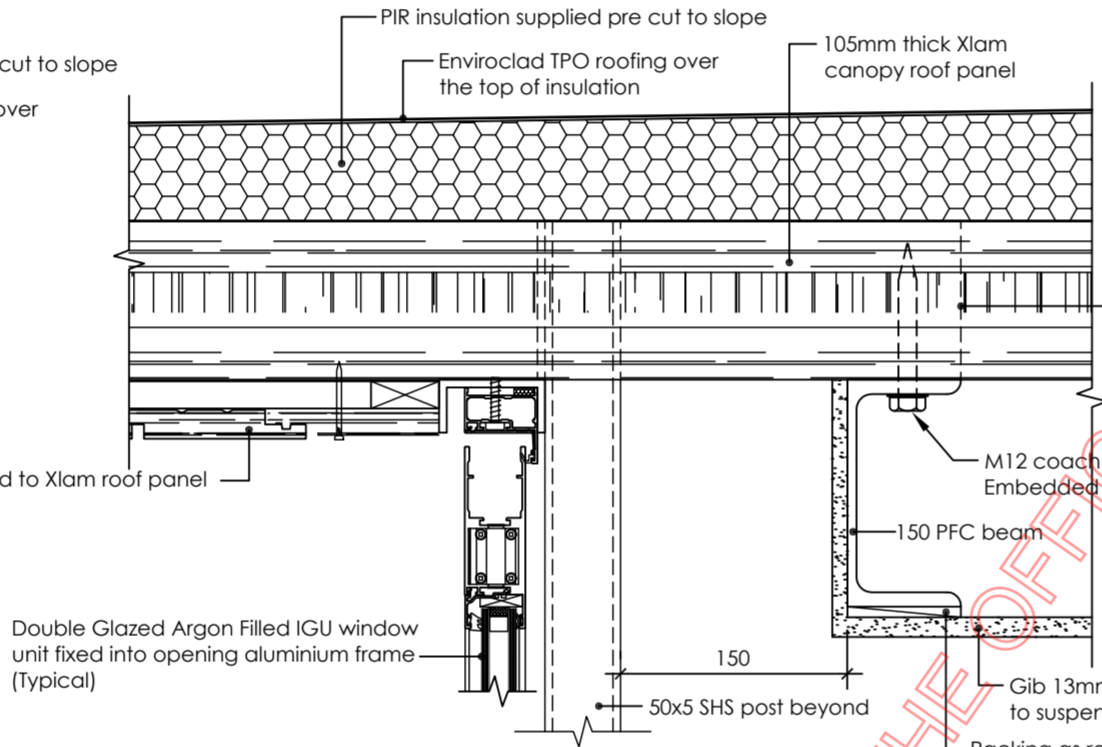
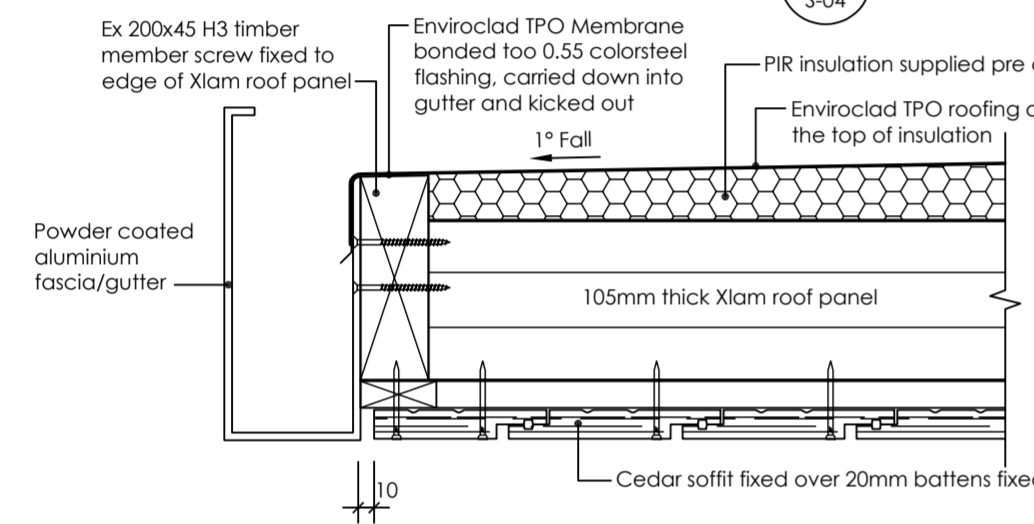
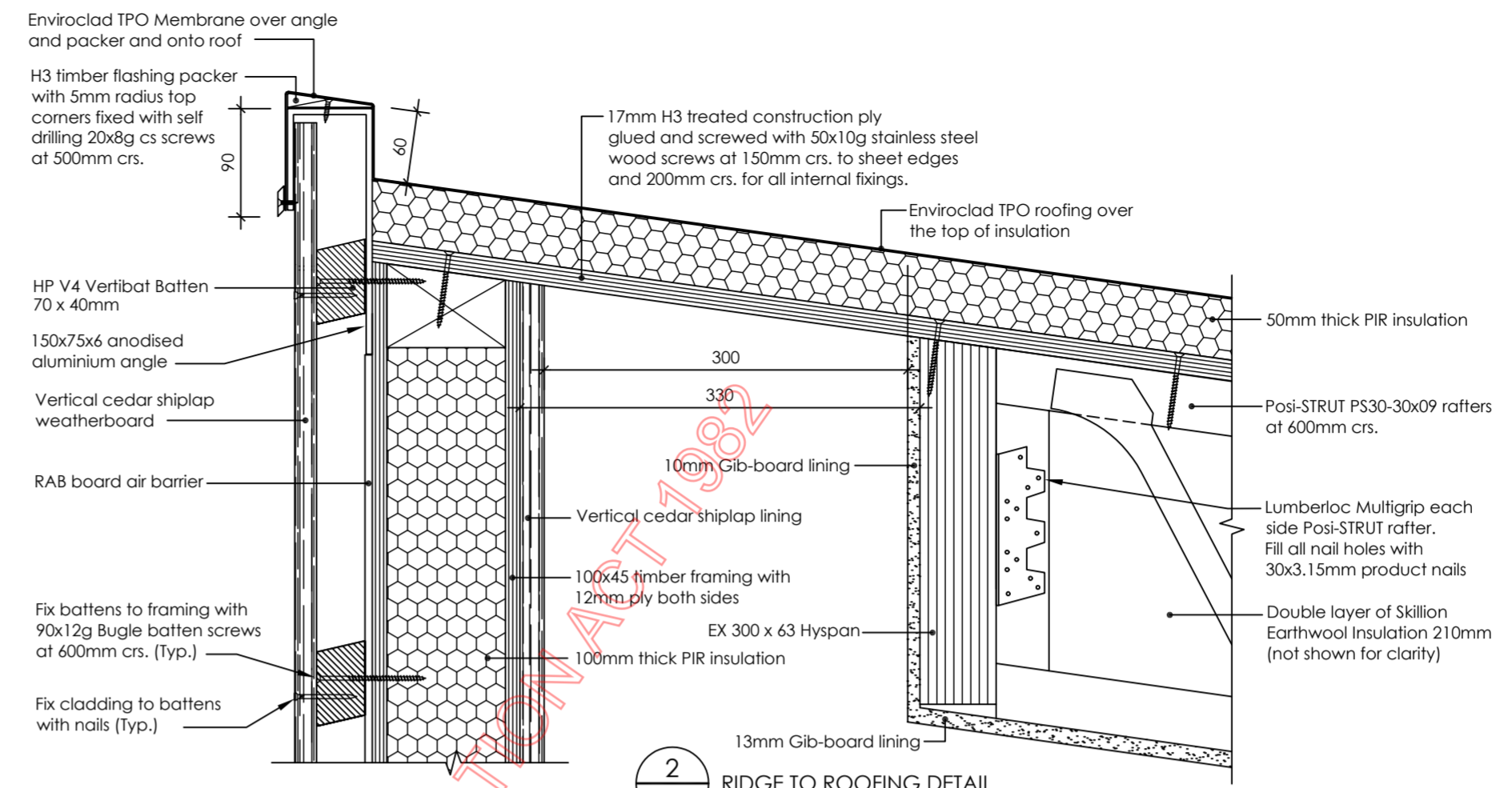
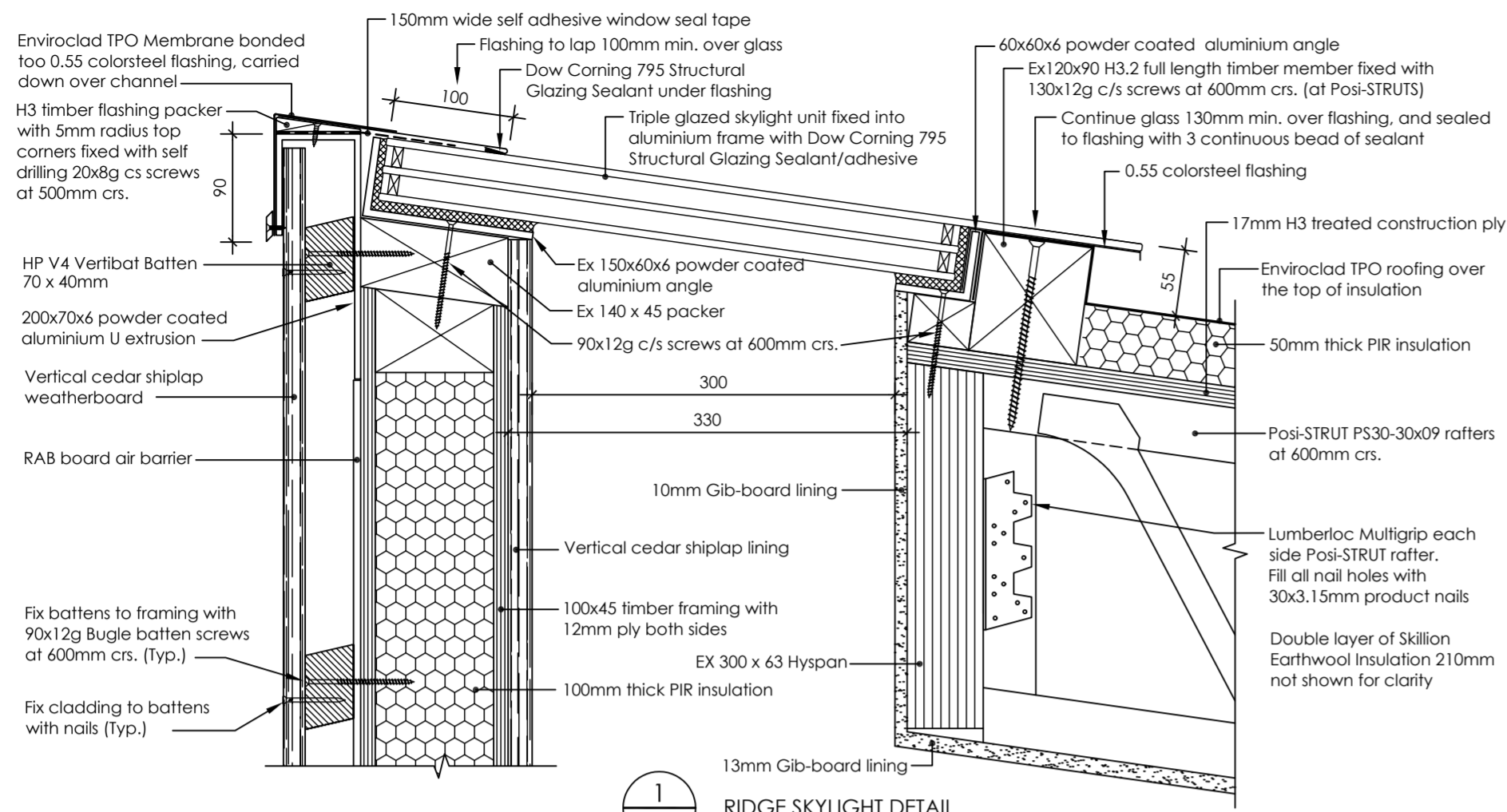
REF:  
DRAWN/START DATE: Author

DRWG No: REVISION:

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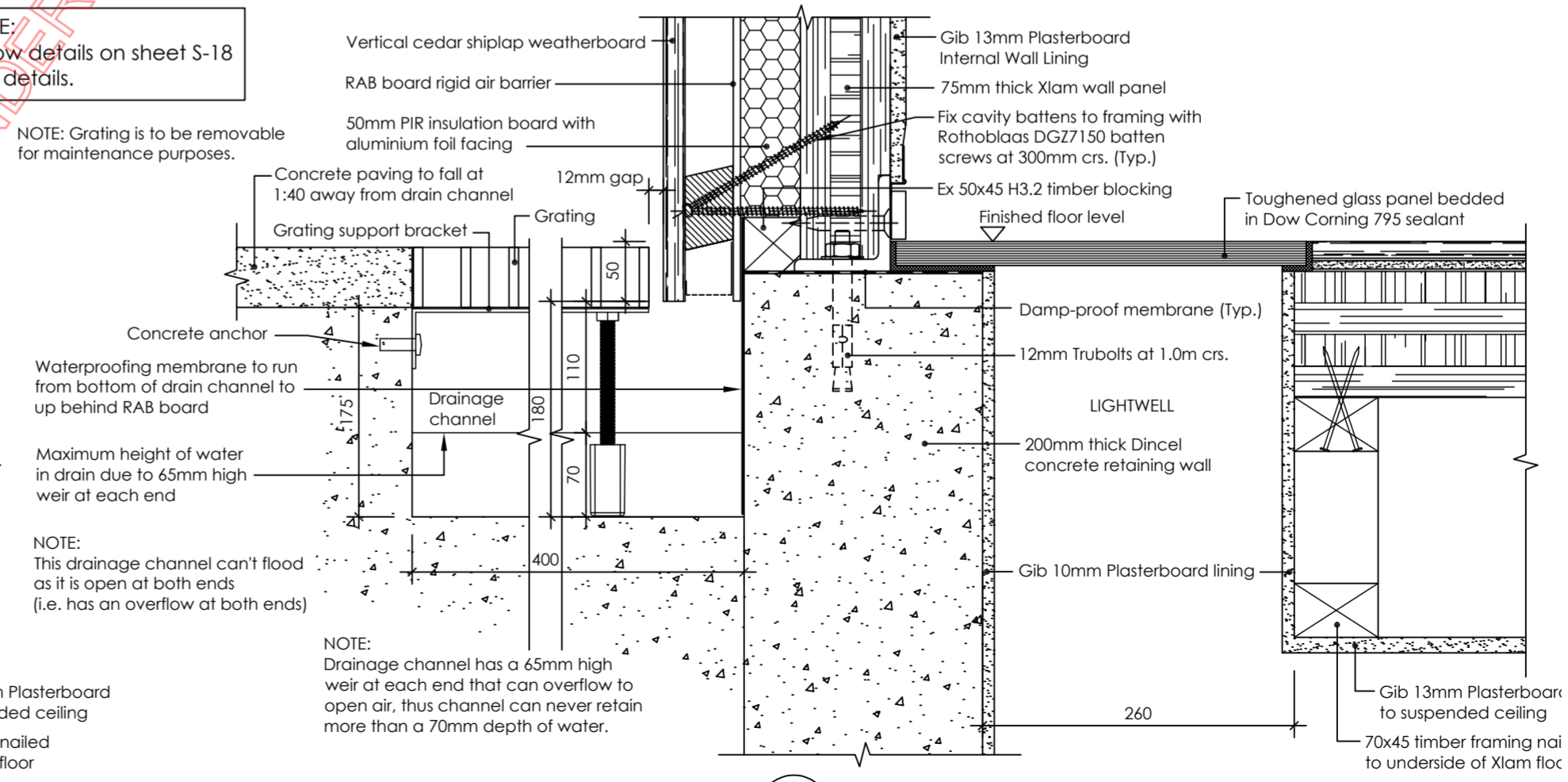
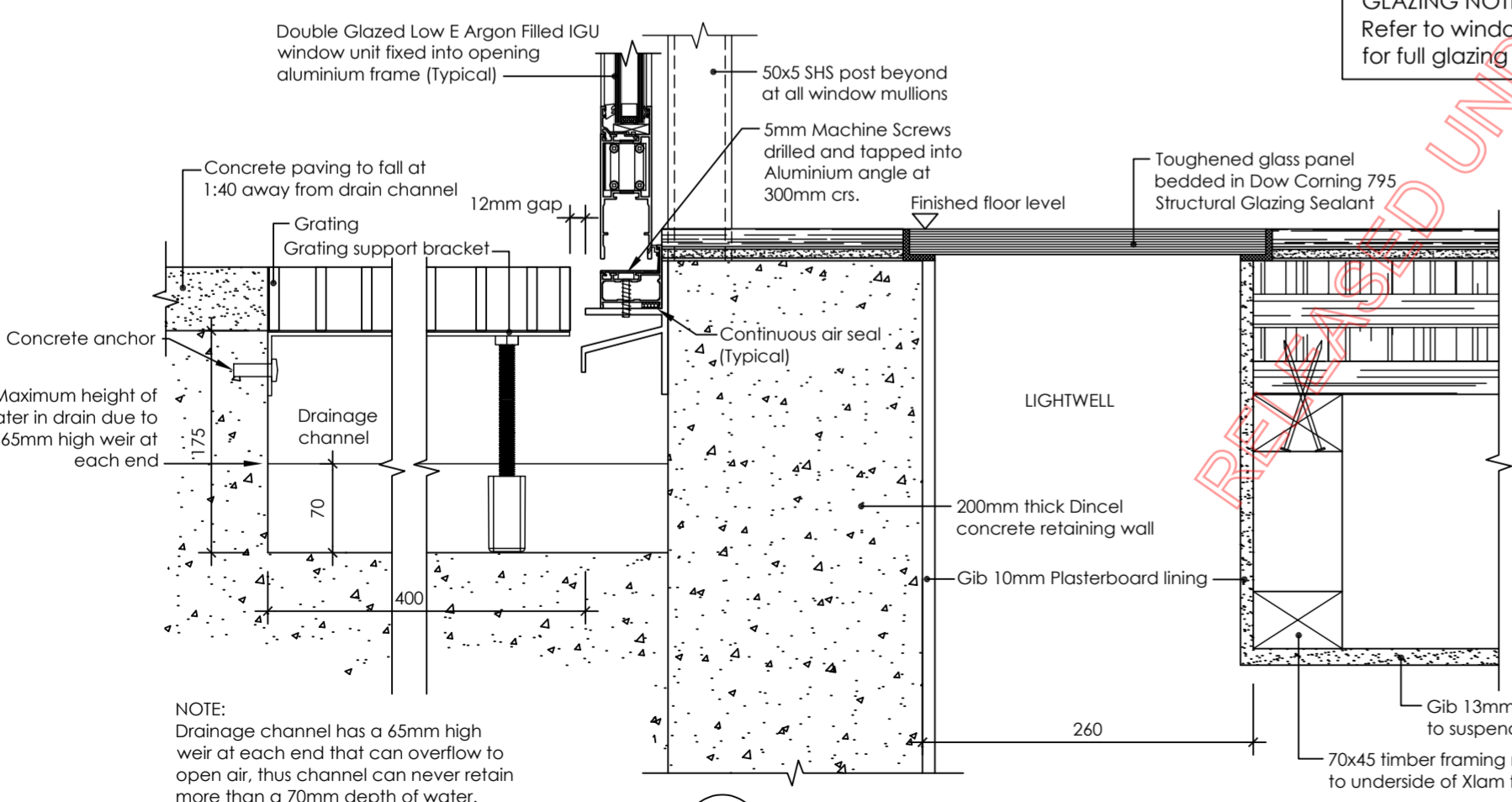
CLADDING EXTERNAL CORNER NOTE:  
The 90° External Corners of the Vertical Cedar Shiplap Weatherboard Cladding are to be in accordance with Page 58 of the 'TIMSPEC Certclad' Installation Manual 'External 90° Corner Details' 'Notched and Lapped'

GLAZING NOTE:  
Refer to window details on sheet S-18 for full glazing details.

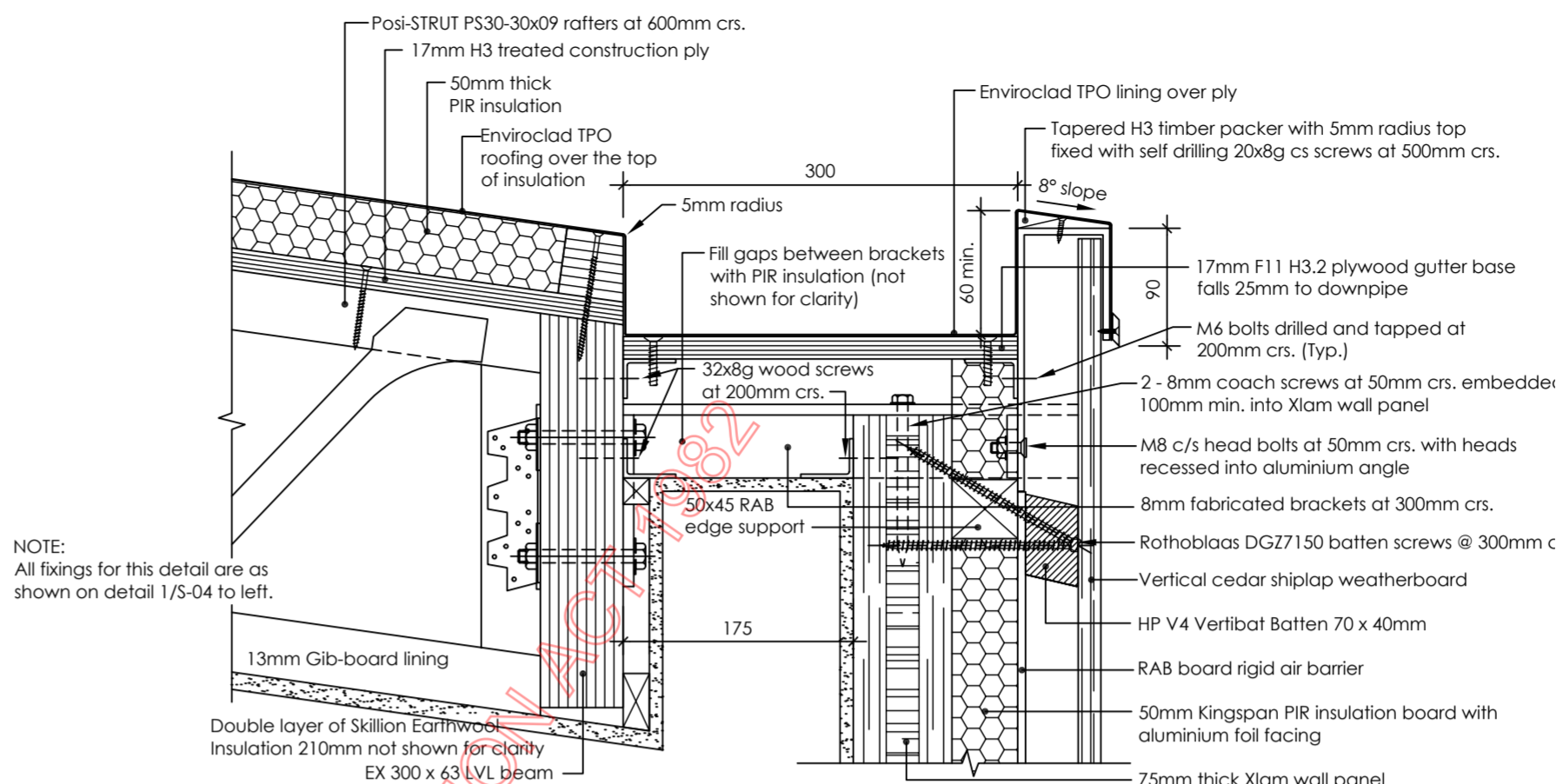
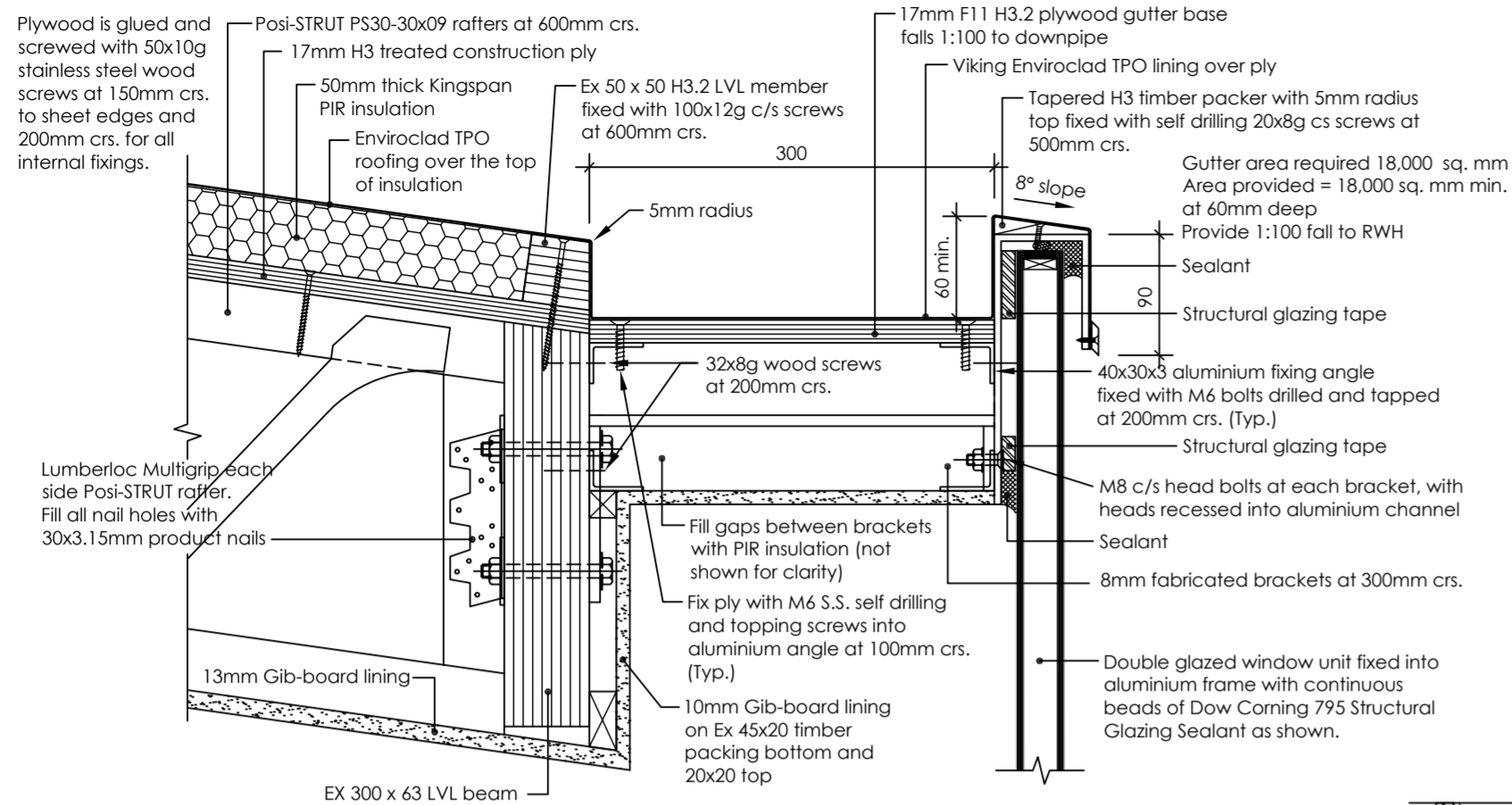
NOTE: Grating is to be removable for maintenance purposes.

NOTE: This drainage channel can't flood as it is open at both ends (i.e. has an overflow at both ends)

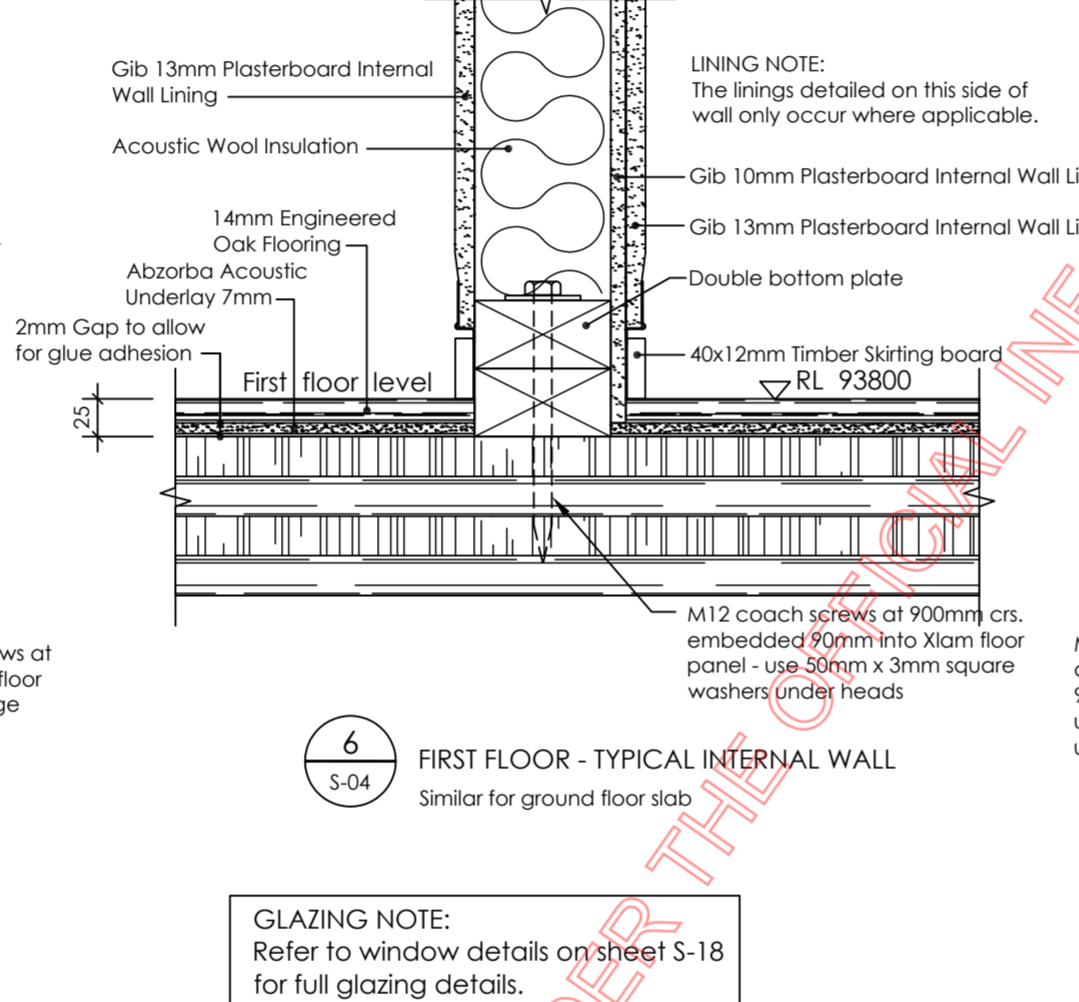
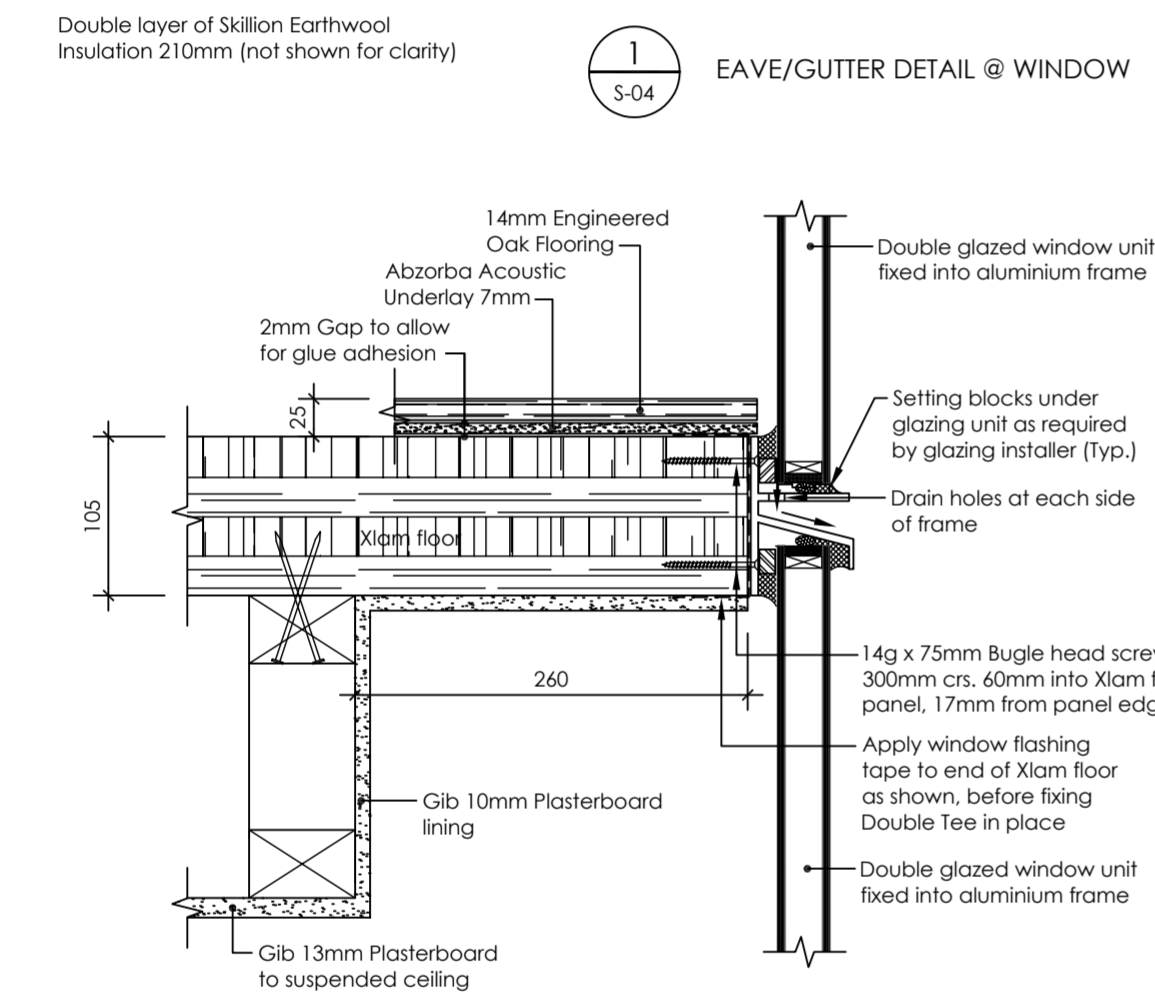
NOTE: Drainage channel has a 65mm high weir at each end that can overflow to open air, thus channel can never retain more than a 70mm depth of water.



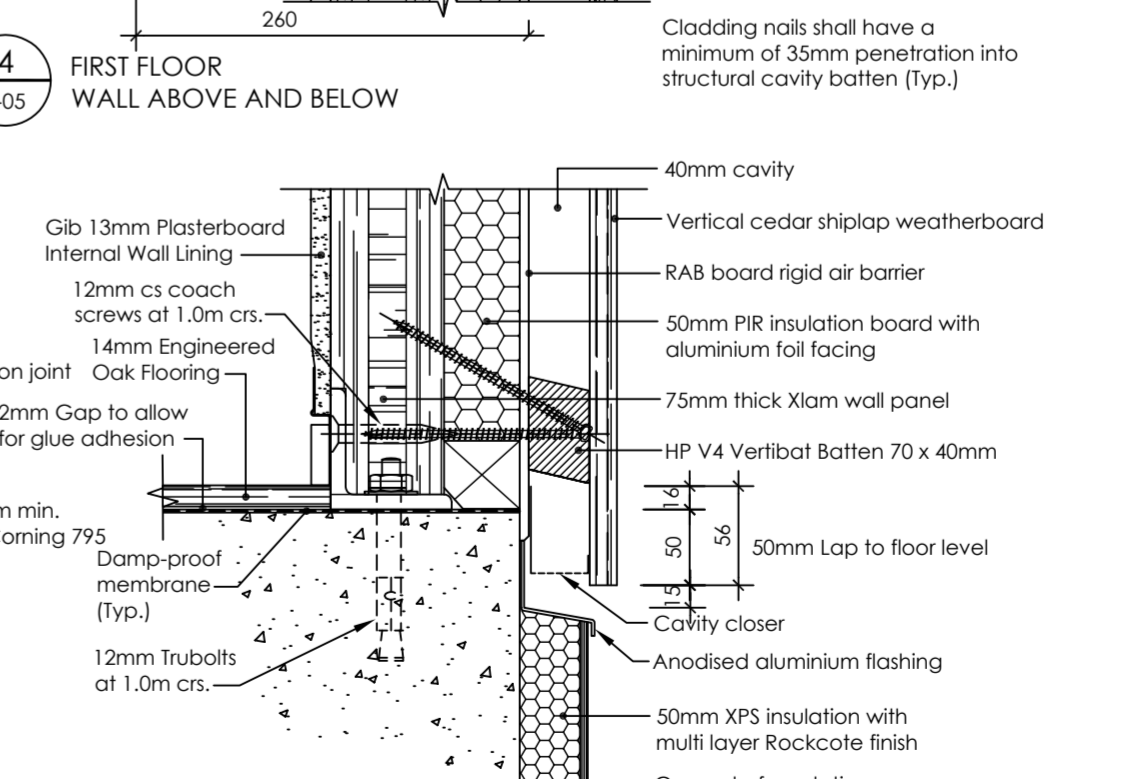
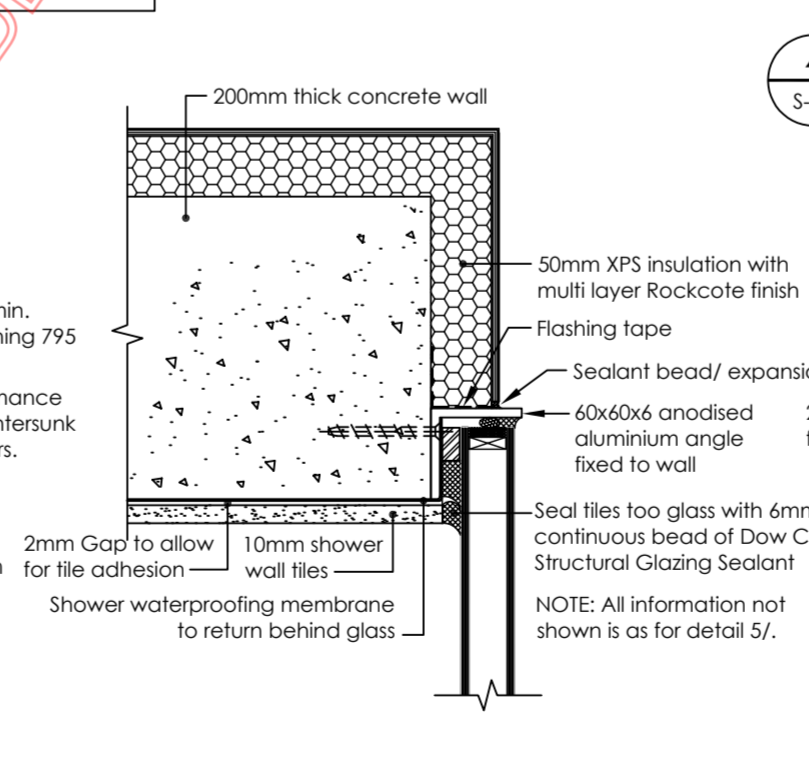
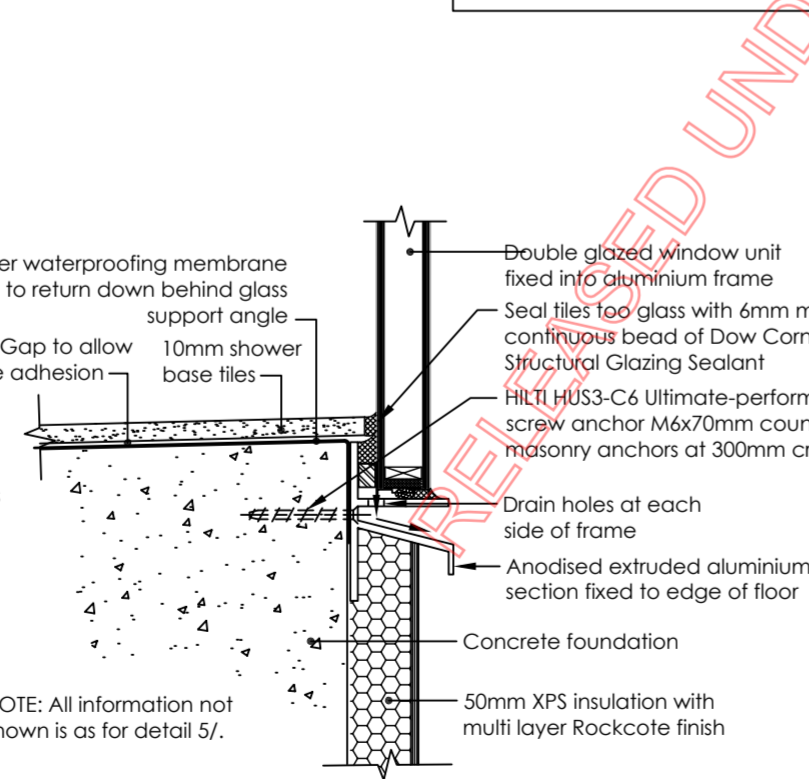
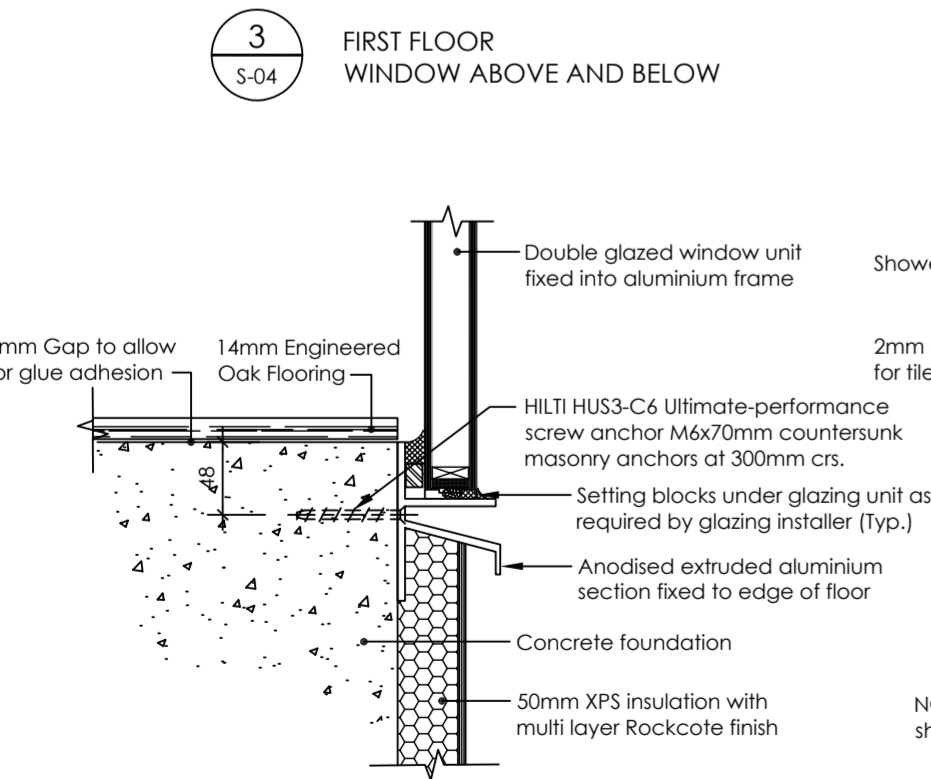
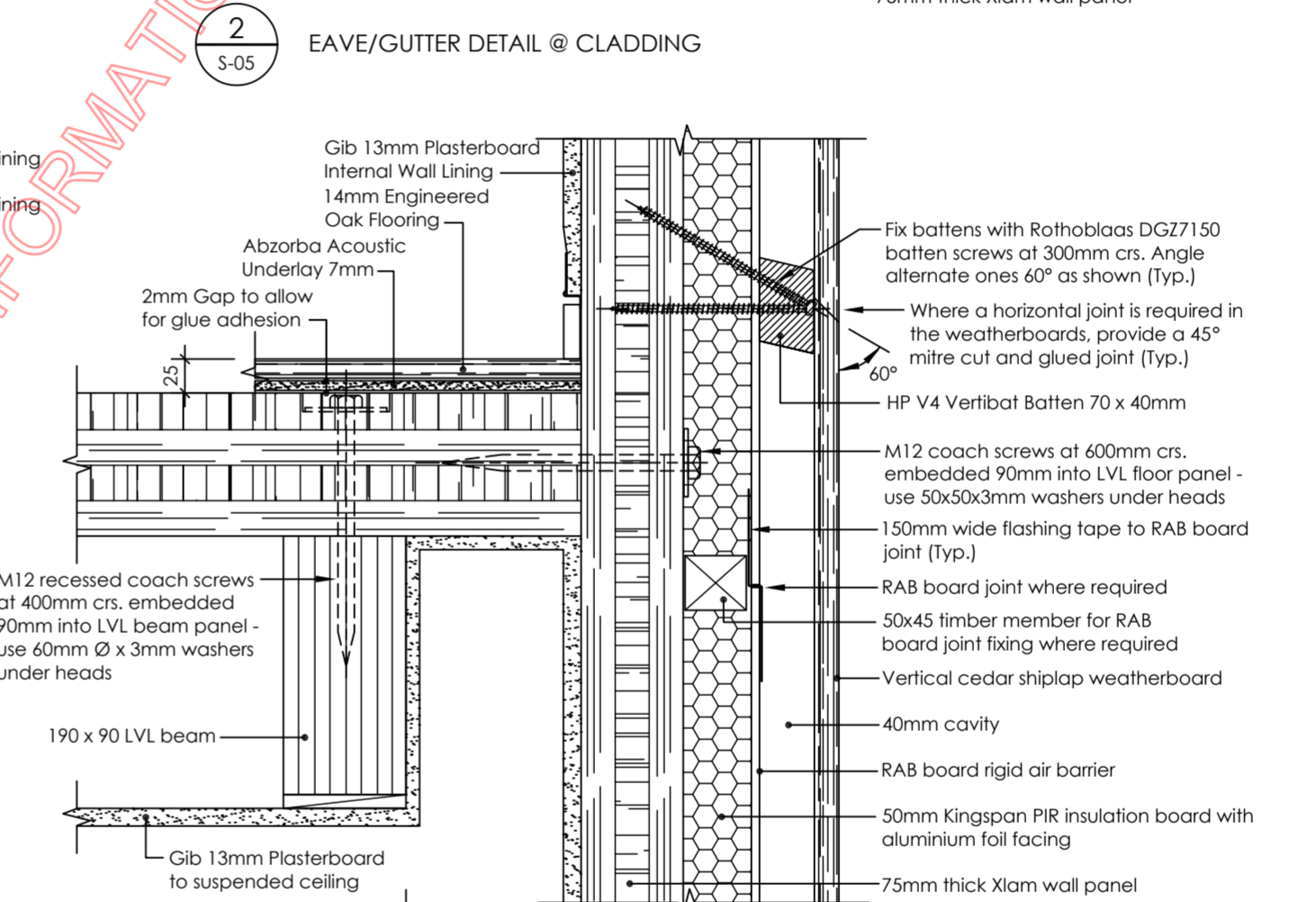




NOTE: All fixings for this detail are as shown on detail 1/S-04 to left.



GLAZING NOTE: Refer to window details on sheet S-18 for full glazing details.



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CONSULTANT:  
**s 9(2)(a)**  
Jackson Clapperton & Partners Ltd  
PO Box 71 065 Rosebank Road  
ph (09) 8200131  
cell

NOTES:

REVISION HISTORY:

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PROJECT: No: 201504  
**ISLAND BAY ROAD HOUSE**  
6 Island Bay Road  
Beach Haven  
AUCKLAND

SHEET:  
**DETAILS**

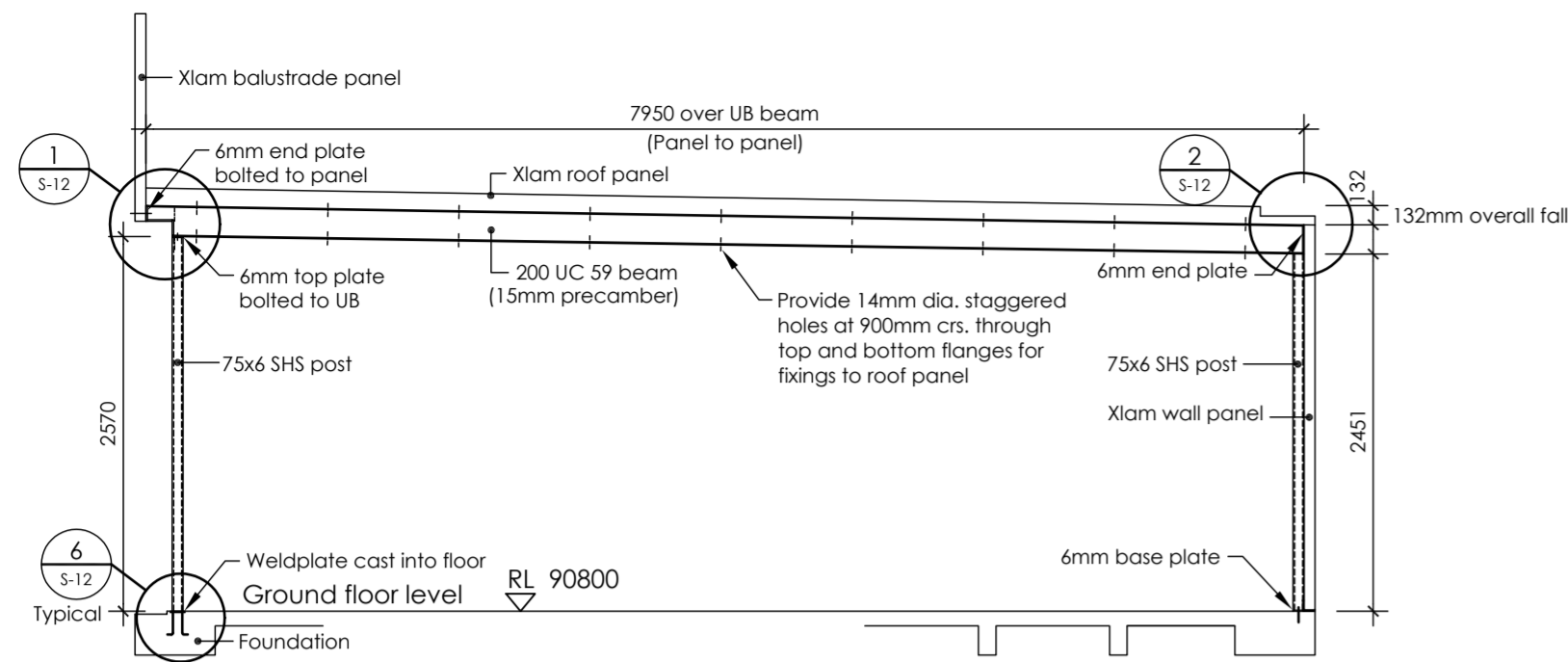
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SCALES @ A4: Half A2 scale

REF:  
DRAWN/START DATE: Author  
DRWG No: REVISION:

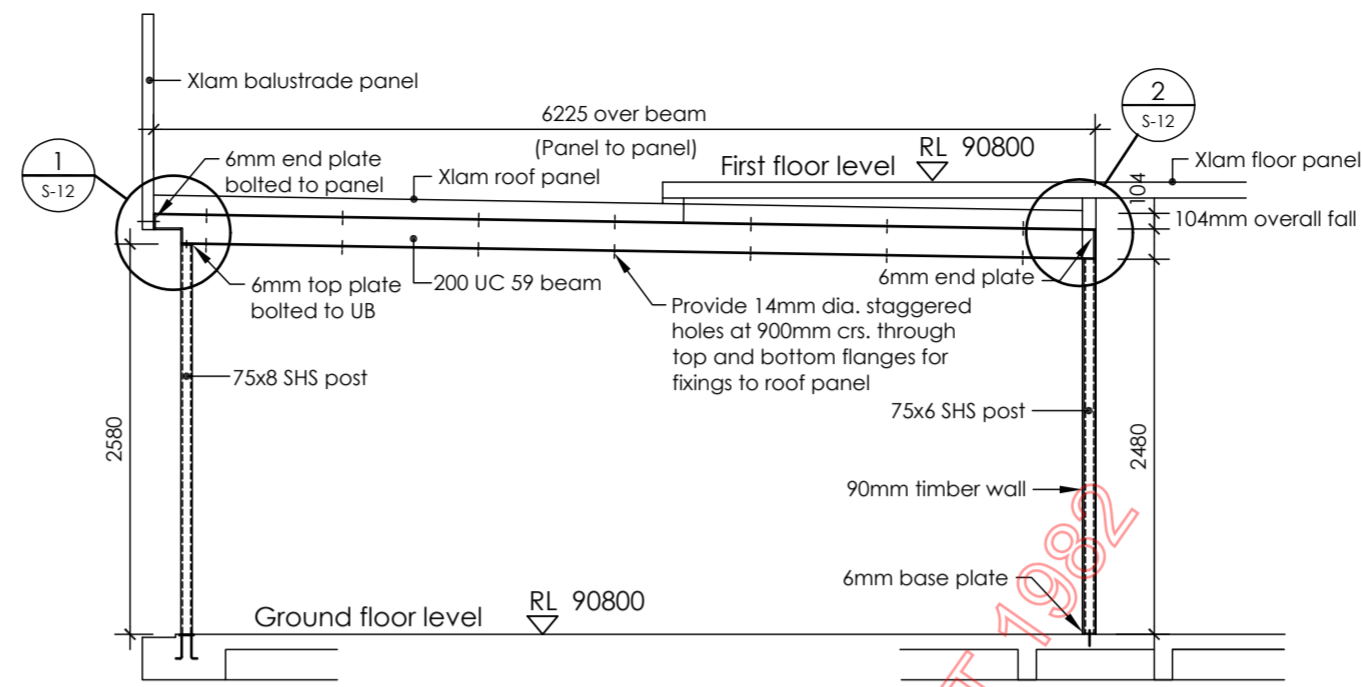
**S-10**

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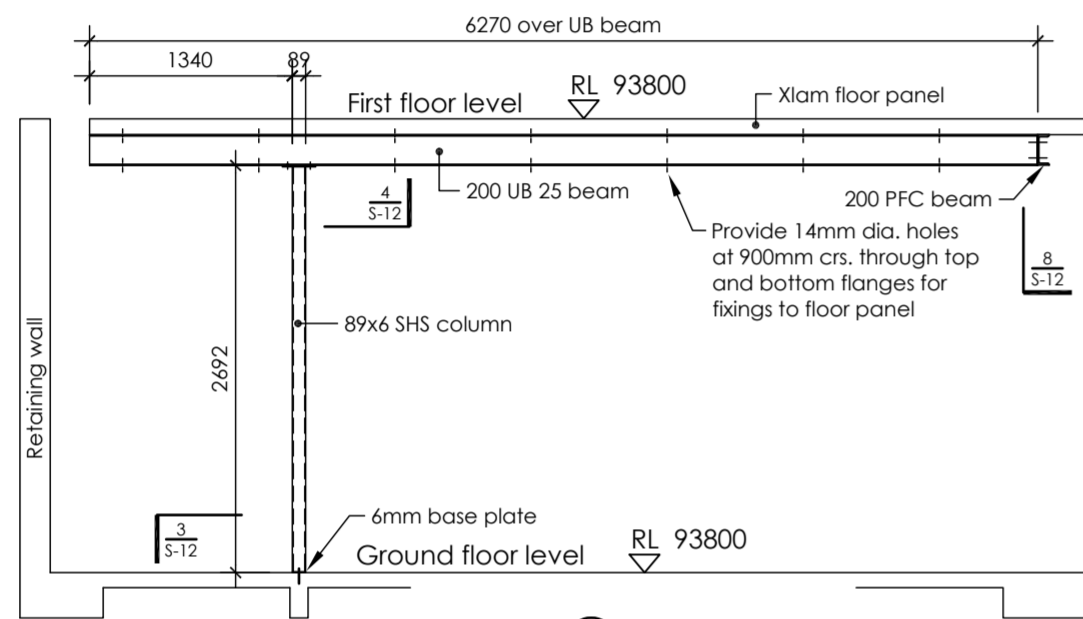
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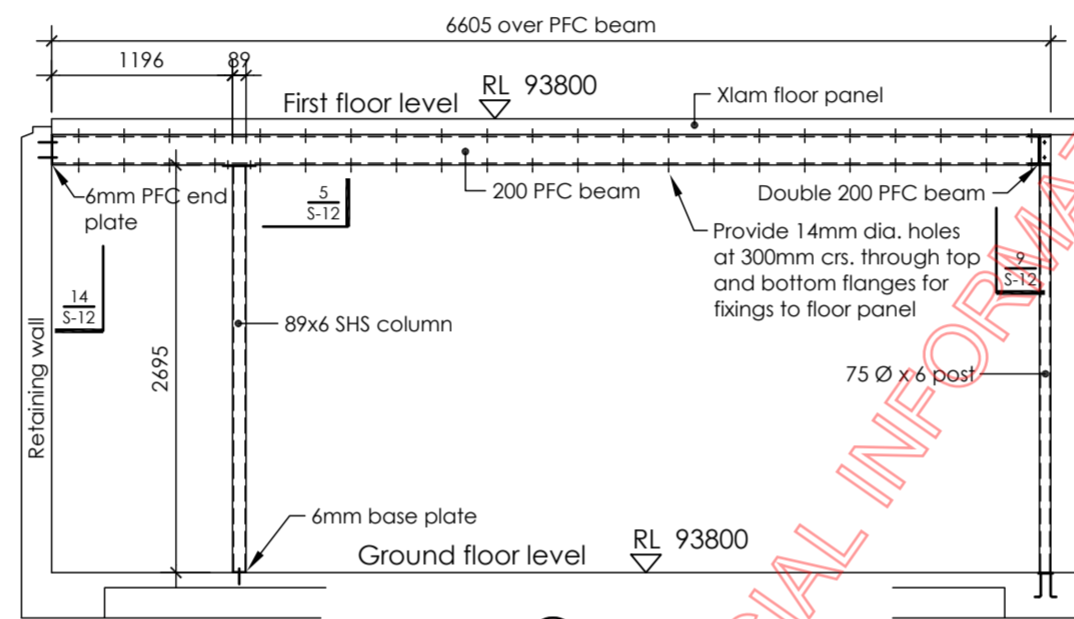
LONG GARAGE BEAM ELEVATION - (A) Scale 1:50 @ A2



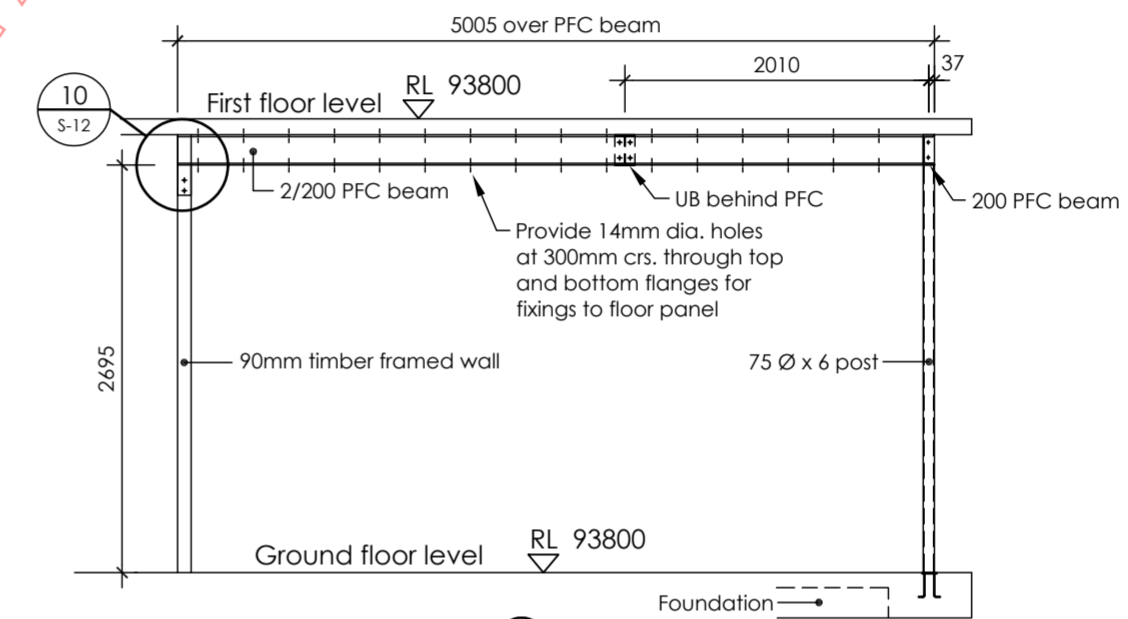
SHORT GARAGE BEAM ELEVATION - (B) Scale 1:50 @ A2



(C)

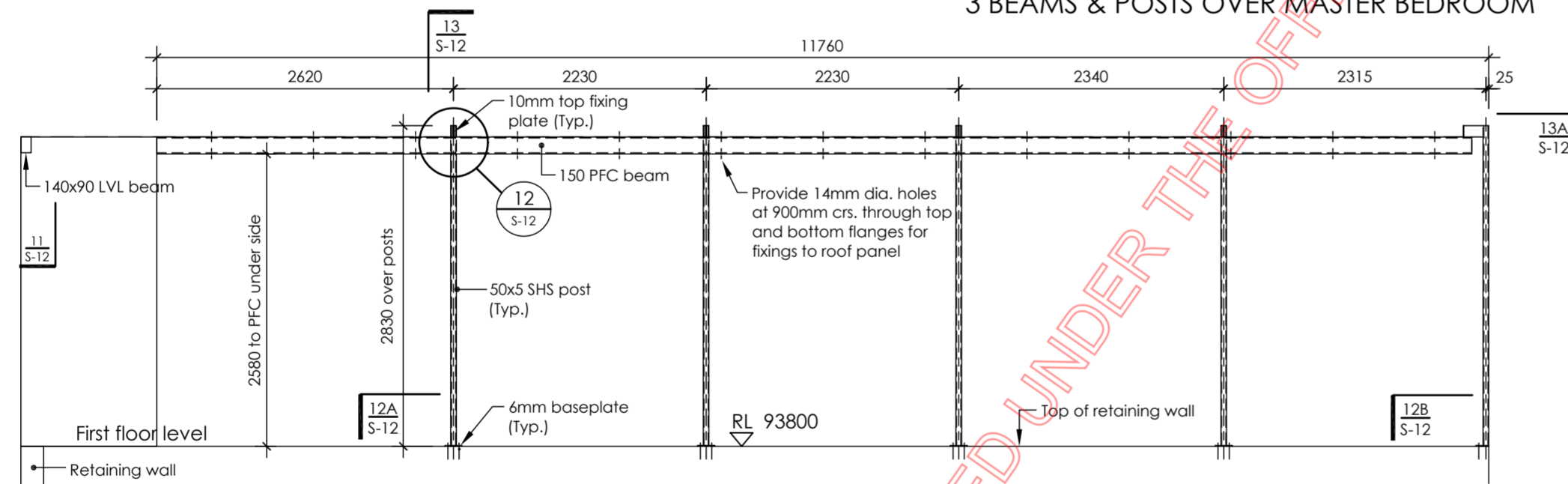


(D)

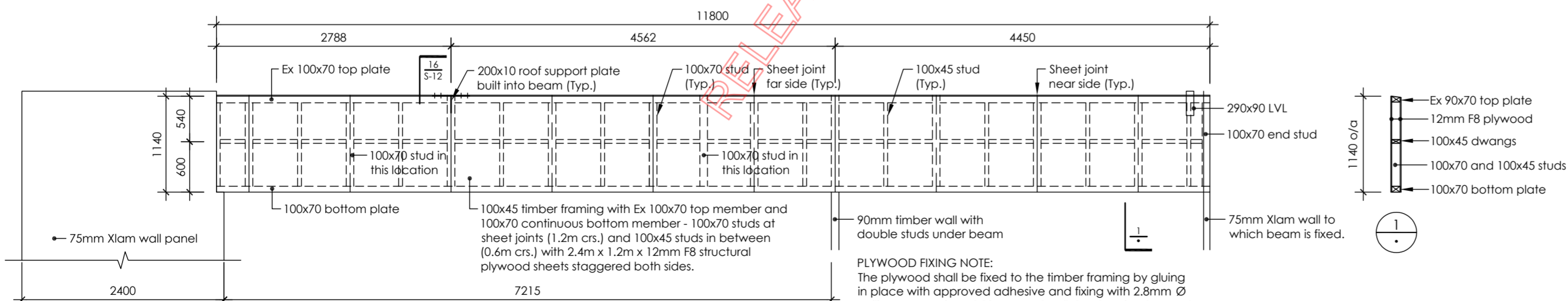


(E)

3 BEAMS & POSTS OVER MASTER BEDROOM Scale 1:50 @ A2



BEAM AND POSTS ABOVE RETAINING WALL - (F) Scale 1:50 @ A2



TIMBER BEAM ABOVE CANOPY - (G) Scale 1:50 @ A2

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s 9(2)(a)  
Jackson Clapperton & Partners Ltd  
PO Box 71 065 Rosebank Road  
ph (09) 8200131  
cell

NOTES:

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504  
ISLAND BAY ROAD  
HOUSE

6 Island Bay Road  
Beach Haven  
AUCKLAND

SHEET:  
STEELWORK  
ELEVATIONS

SCALES @ A2:  
SCALES @ A4: Half A2 scale

REF:

DRAWN/START DATE: Author

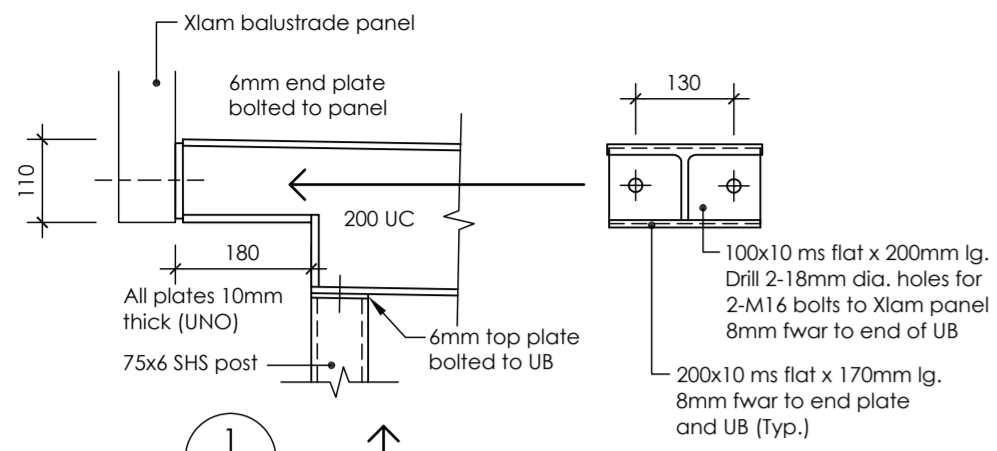
DRWG No: REVISION:

S-11

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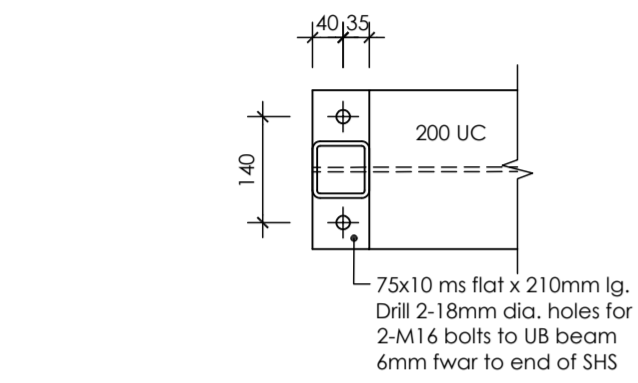
1 S-11

2 200 UC END DETAIL S-11

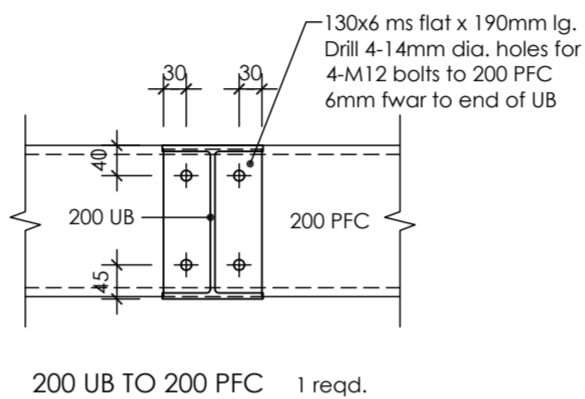
3 89 SHS BASEPLATE 2 reqd. S-11  
Applies also for top plate to 200 PFC 1 Reqd.

4 89 SHS TOP PLATE TO 200 UB 1 reqd. S-11

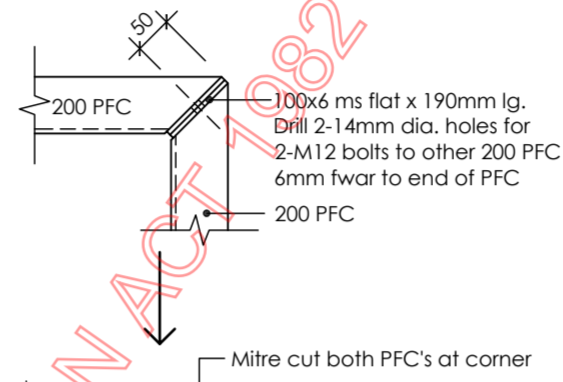
5 89 SHS TOP PLATE TO 200 PFC 1 reqd. S-11



6 TYPICAL CAST IN WELDPLATE 3 reqd. S-11

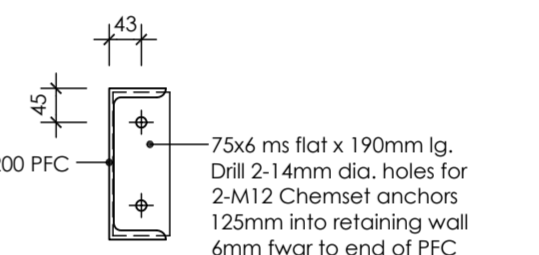


8 S-11

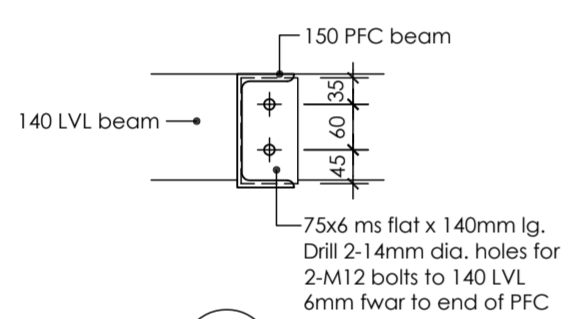


9 90° 200 PFC TO 200 PFC 1 reqd. S-11

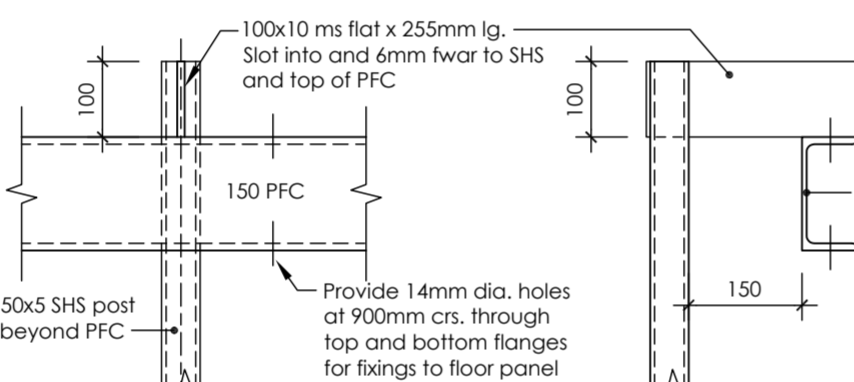
10 200 PFC TO TIMBER WALL 1 reqd. S-11



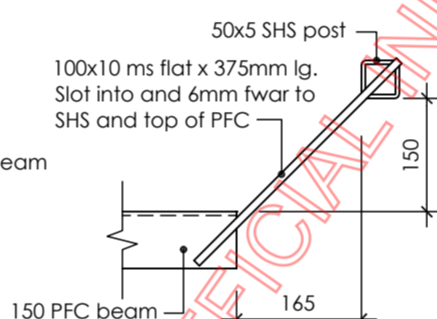
14 200 PFC TO RETAINING WALL 1 reqd. S-11



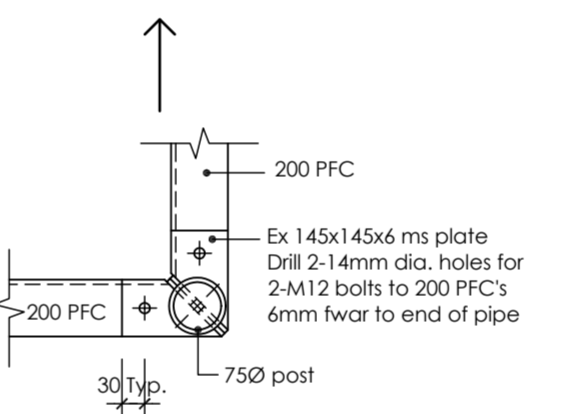
11 S-11



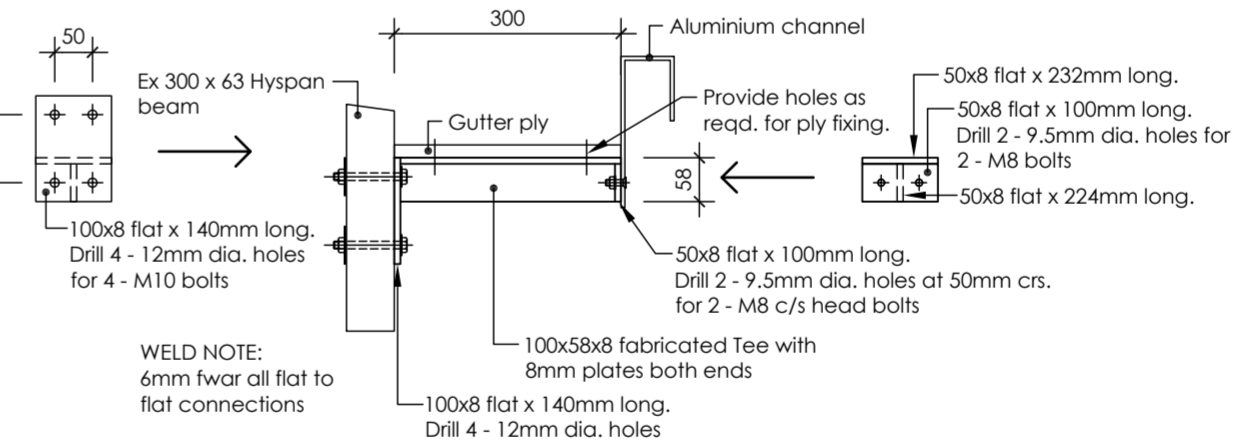
12 S-11



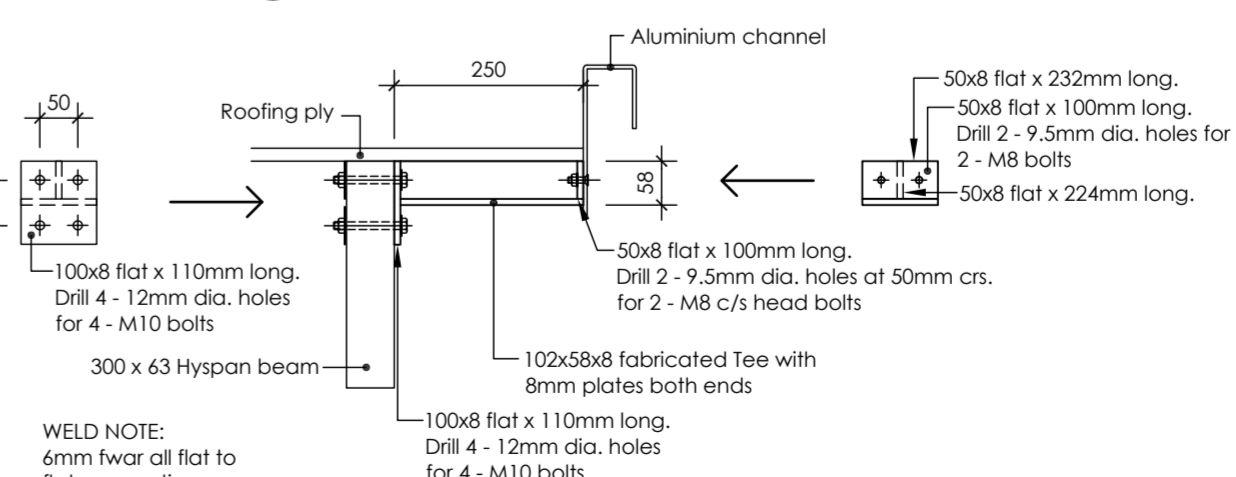
13A S-11



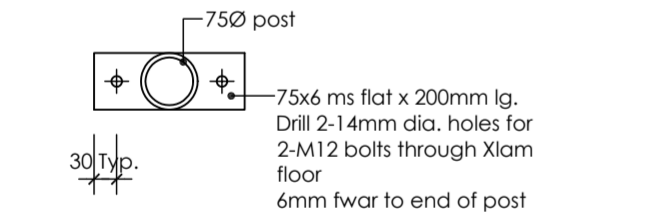
13B S-11



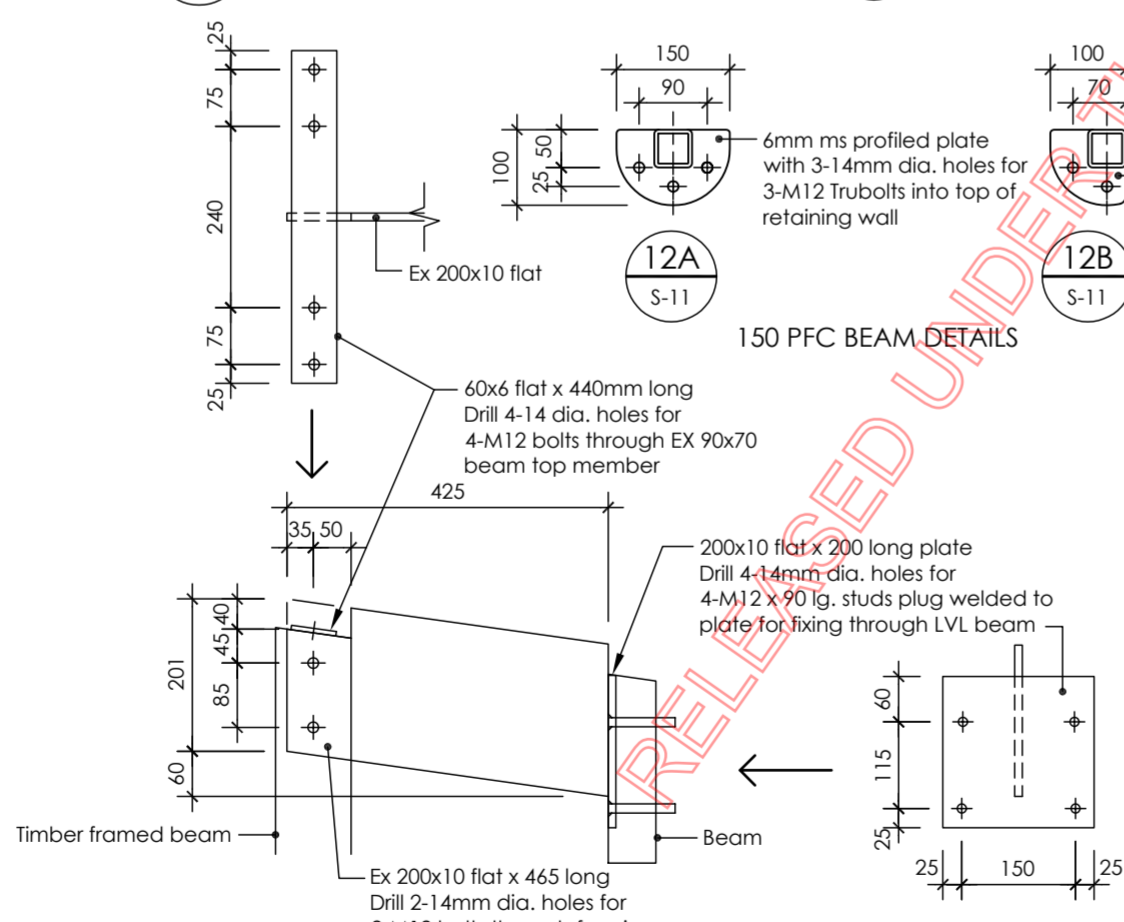
17 WINDOW SUPPORT BRACKET AT GUTTER S-04



18 WINDOW SUPPORT BRACKET AT ROOF ENDS S-07



15 76Ø POST BASE PLATE 5 Reqd. total S-11



16 ROOF LIGHT BEAM FIXING PLATE S-11

GENERAL NOTES:  
Members welded to plates and holes in plates that are not dimensioned, are generally in the centre or equally spaced.

STEELWORK DETAILS Scale 1:10 @ A2

LOCAL AUTHORITY:  
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CONSULTANT:  
s 9(2)(a)  
Jackson Clapperton & Partners Ltd  
PO Box 71 065 Rosebank Road  
ph (09) 8200131  
cell

NOTES:

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504  
ISLAND BAY ROAD HOUSE

6 Island Bay Road  
Beach Haven  
AUCKLAND

SHEET:  
STEELWORK DETAILS

SCALES @ A2:  
SCALES @ A4: Half A2 scale

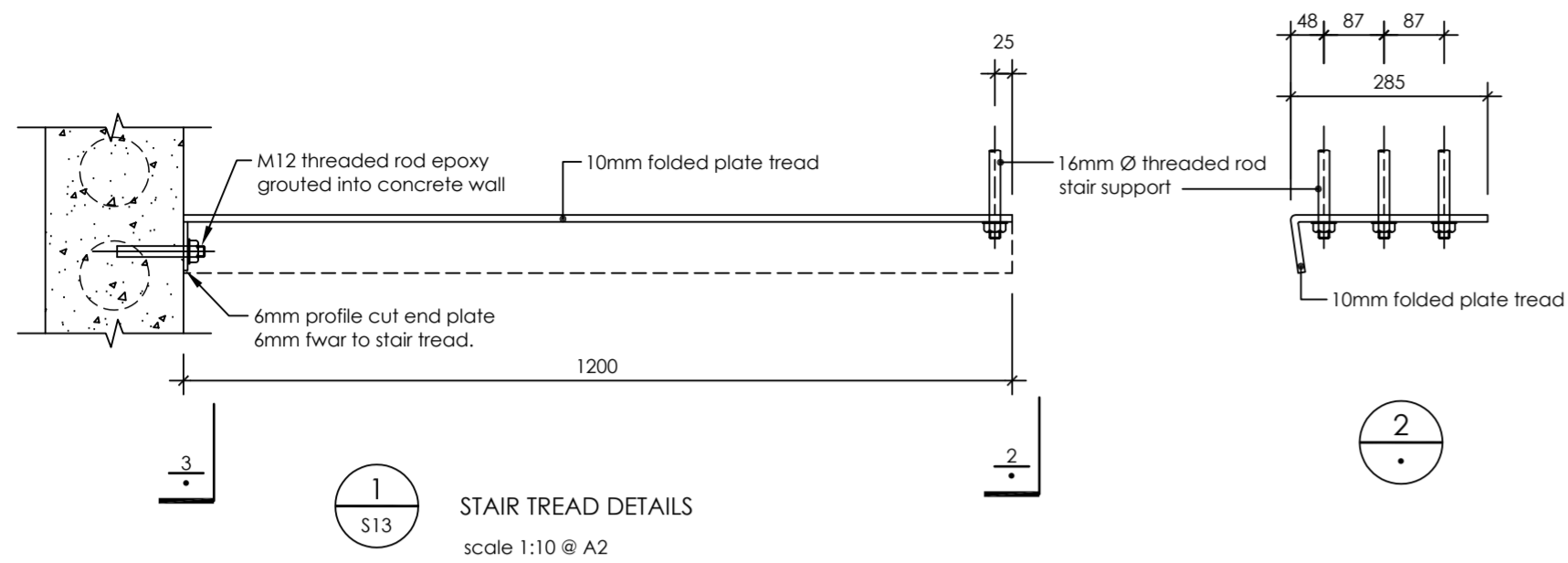
REF:  
DRAWN/START DATE: Author

DRWG No: REVISION:  
S-12

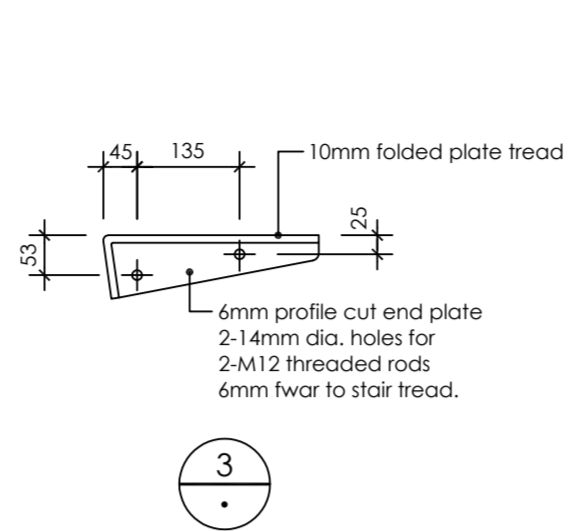
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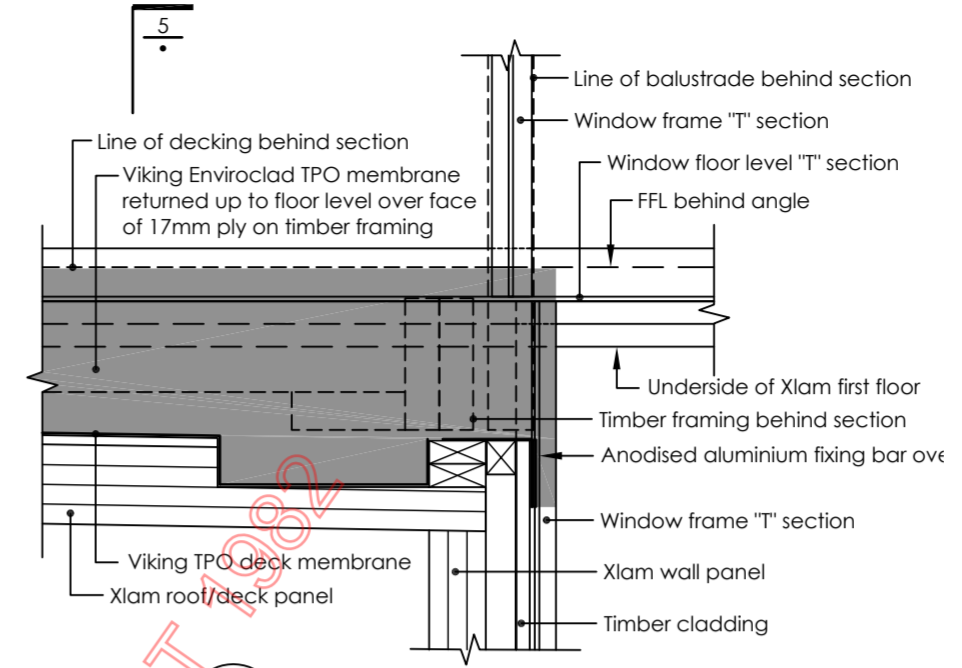




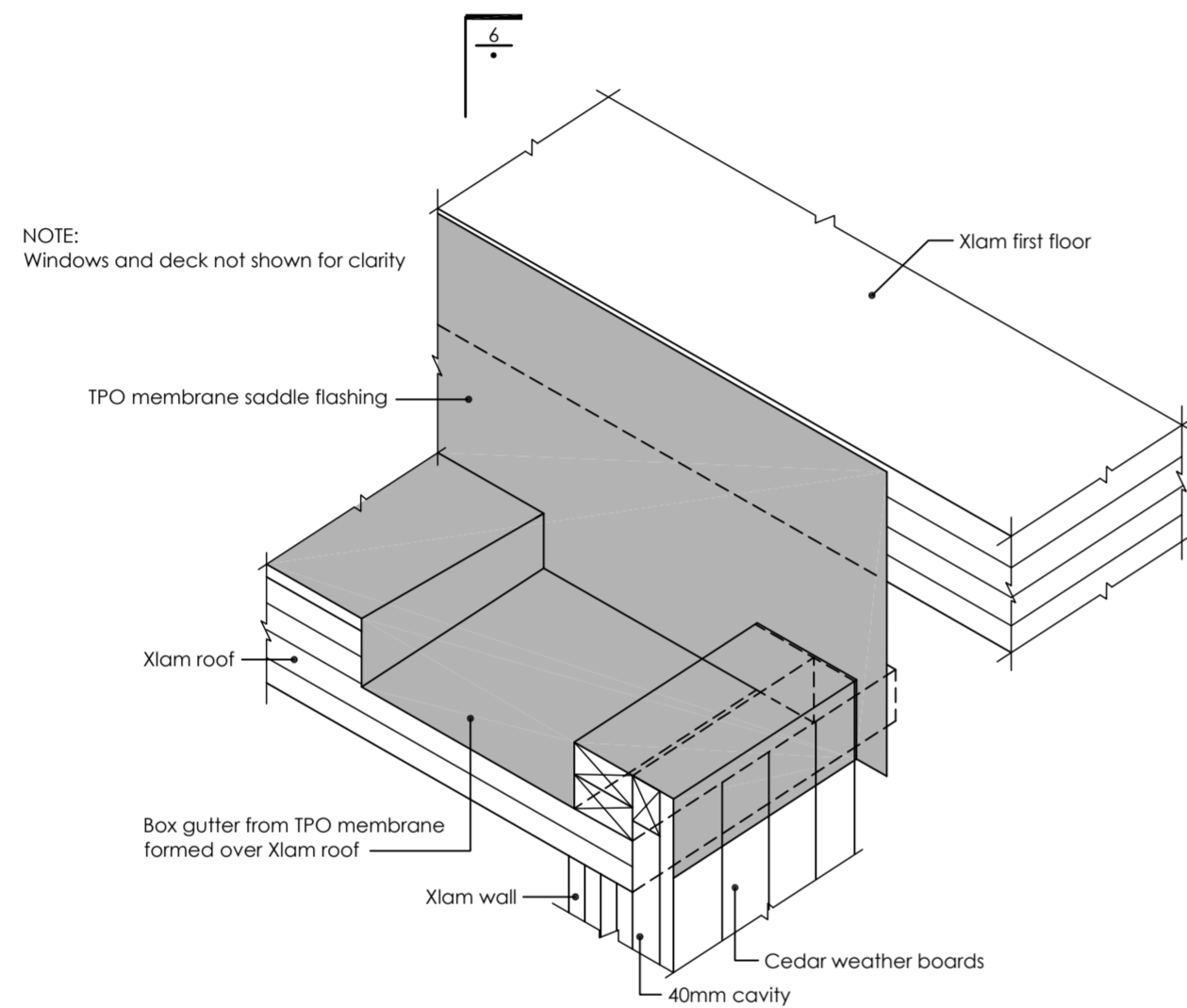
1  
S13 STAIR TREAD DETAILS  
scale 1:10 @ A2



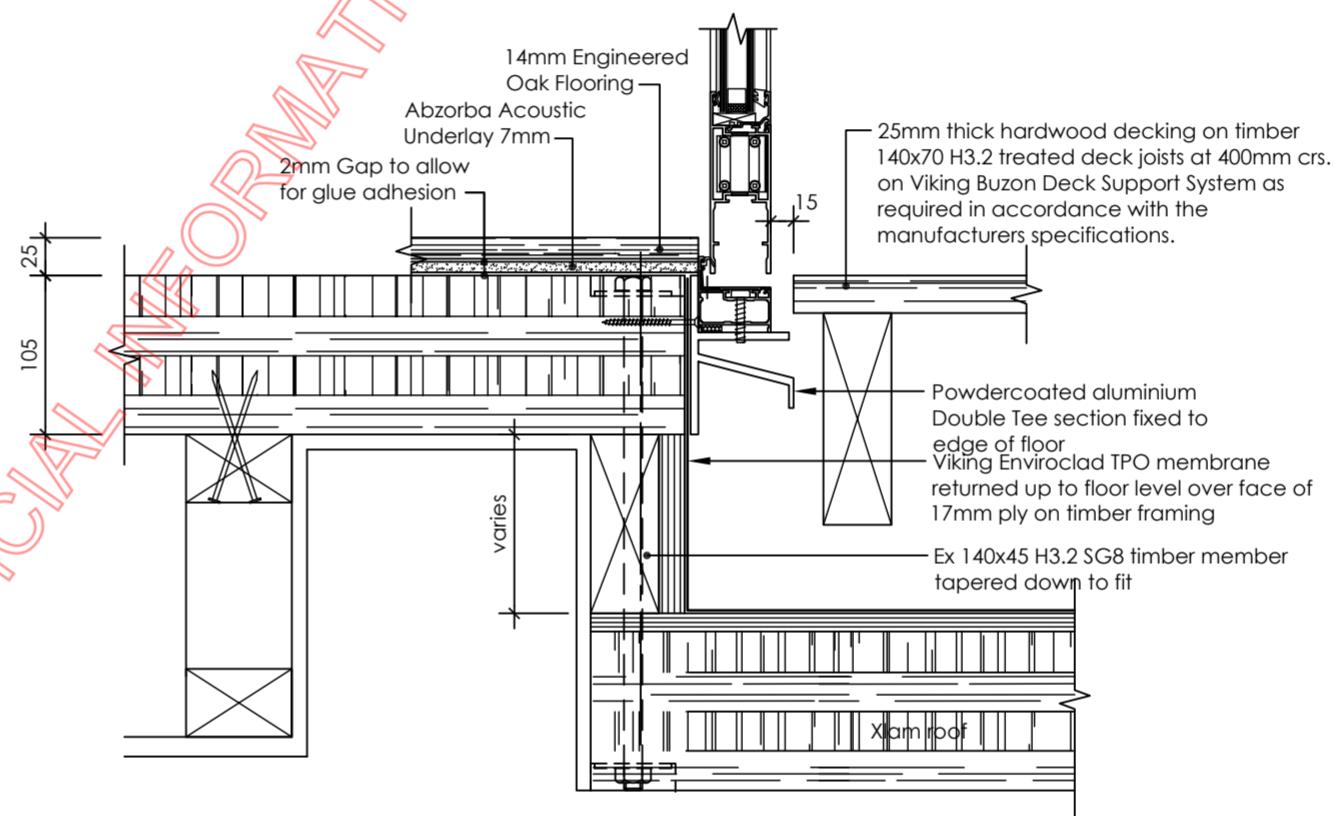
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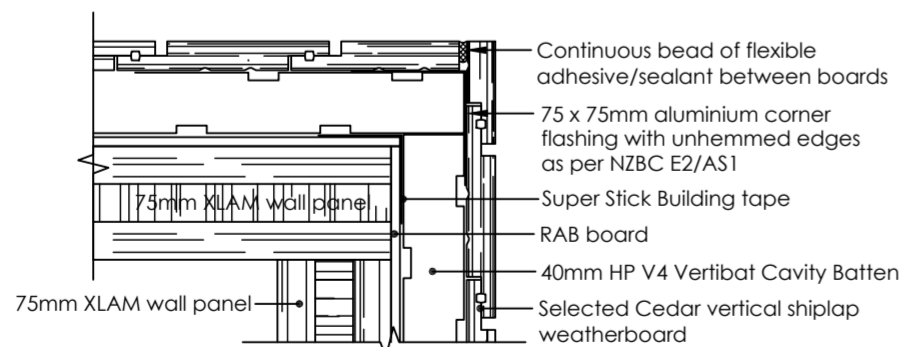
4  
S-02 DECK GUTTER END DETAIL  
scale 1:10 @ A2



5  
S-03 GUTTER END FLASHING DETAIL  
scale: NTS



6  
S-03 FIRST FLOOR DOOR AT DECK



7  
S-02 CLADDING EXTERNAL CORNER  
scale 1:5 @ A2  
Detail the same for Garage, except Garage has 20mm thick battens.

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s 9(2)(a)  
Jackson Clapperton & Partners Ltd  
PO Box 71 065 Rosebank Road  
ph (09) 8200131  
cell

NOTES:

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504  
ISLAND BAY ROAD  
HOUSE

6 Island Bay Road  
Beach Haven  
AUCKLAND

SHEET:  
MISC. DETAILS

SCALES @ A2:  
SCALES @ A4: Half A2 scale

REF:  
DRAWN/START DATE: Author

DRWG No: REVISION:

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s 9(2)(a)  
Jackson Clapperton & Partners Ltd  
PO Box 71 065 Rosebank Road  
ph (09) 8200131  
cell

NOTES:

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504  
**ISLAND BAY ROAD HOUSE**

6 Island Bay Road  
Beach Haven  
AUCKLAND

SHEET:  
**XLAM PANELS SIZES**

SCALES @ A2:  
SCALES @ A4: Half A2 scale

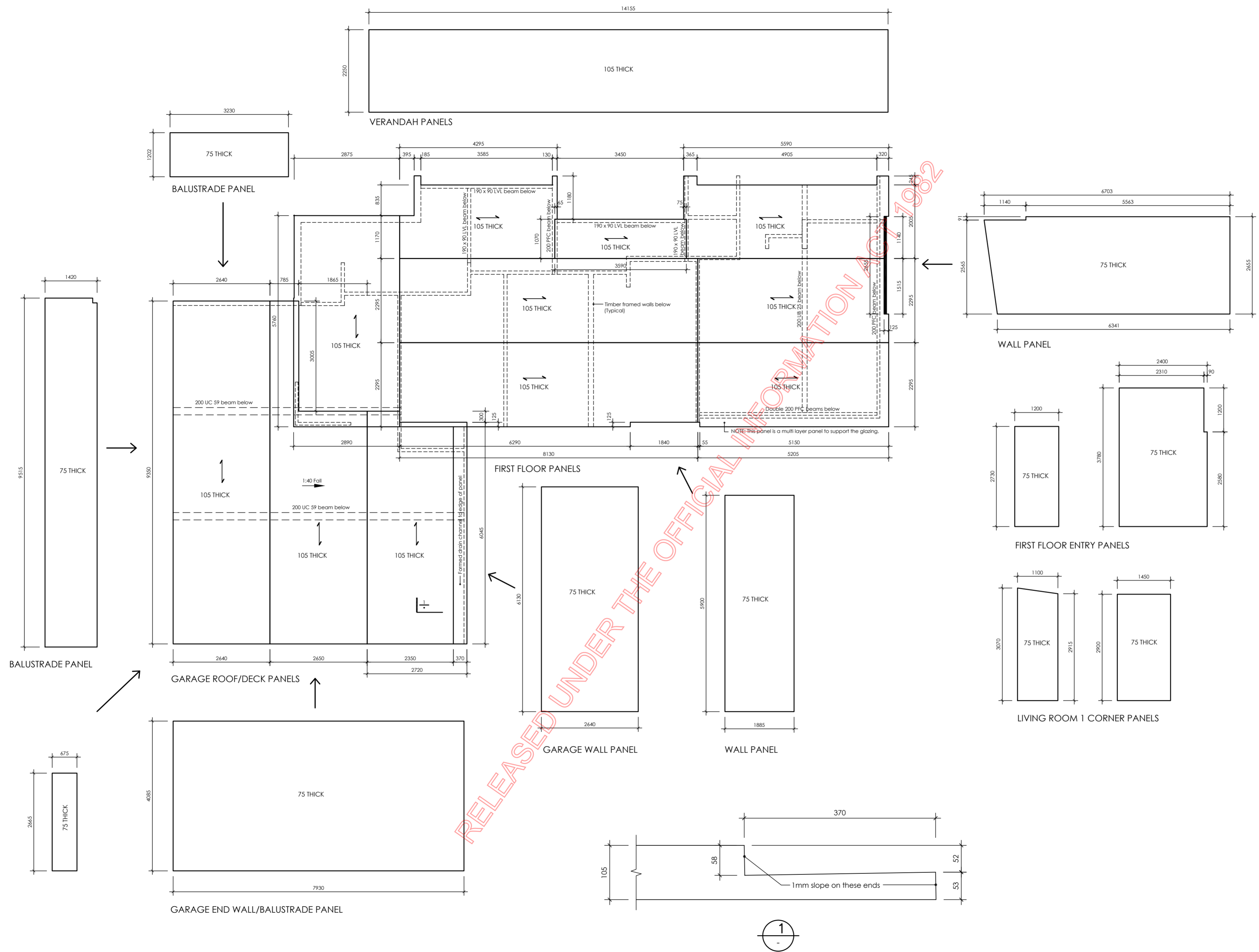
REF:  
DRAWN/START DATE: Author

DRWG No: REVISION:

**S-14**

DO NOT SCALE  
CONTRACTOR MUST VERIFY ALL DIMENSIONS ON  
SITE BEFORE COMMENCING WORK

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1

NOTES:

REVISION HISTORY:



PROJECT: No: 201504  
**ISLAND BAY ROAD HOUSE**  
6 Island Bay Road  
Beach Haven  
AUCKLAND

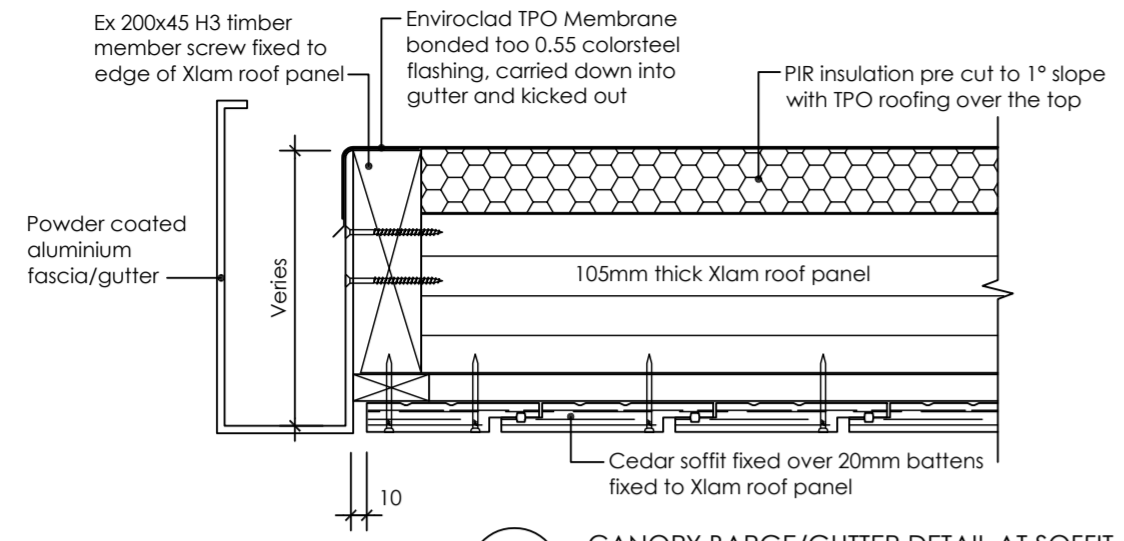
SHEET:  
**CANOPY DETAILS**

SCALES @ A2:  
SCALES @ A4: Half A2 scale

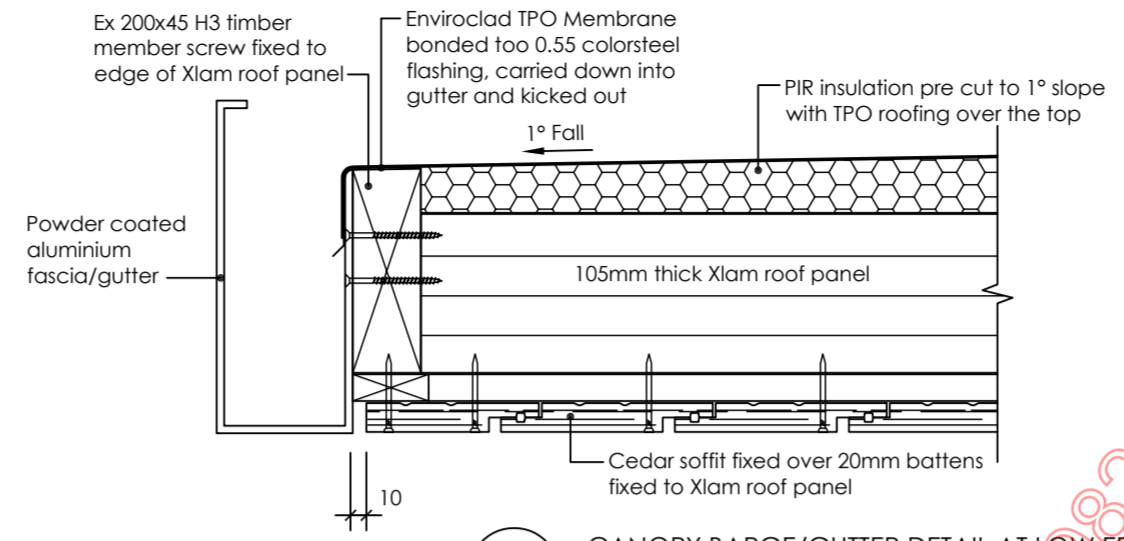
REF:  
DRAWN/START DATE: Author

DRWG No: REVISION:  
**S-15**

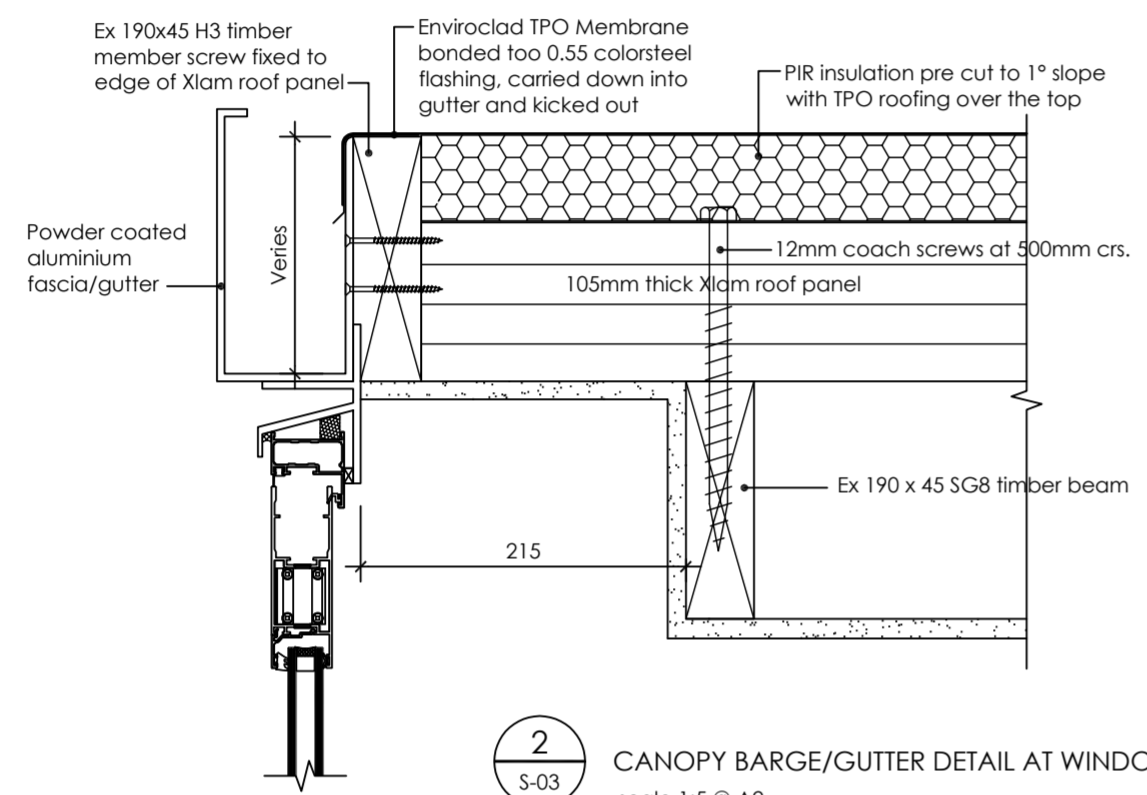
DO NOT SCALE  
CONTRACTOR MUST VERIFY ALL DIMENSIONS ON  
SITE BEFORE COMMENCING WORK



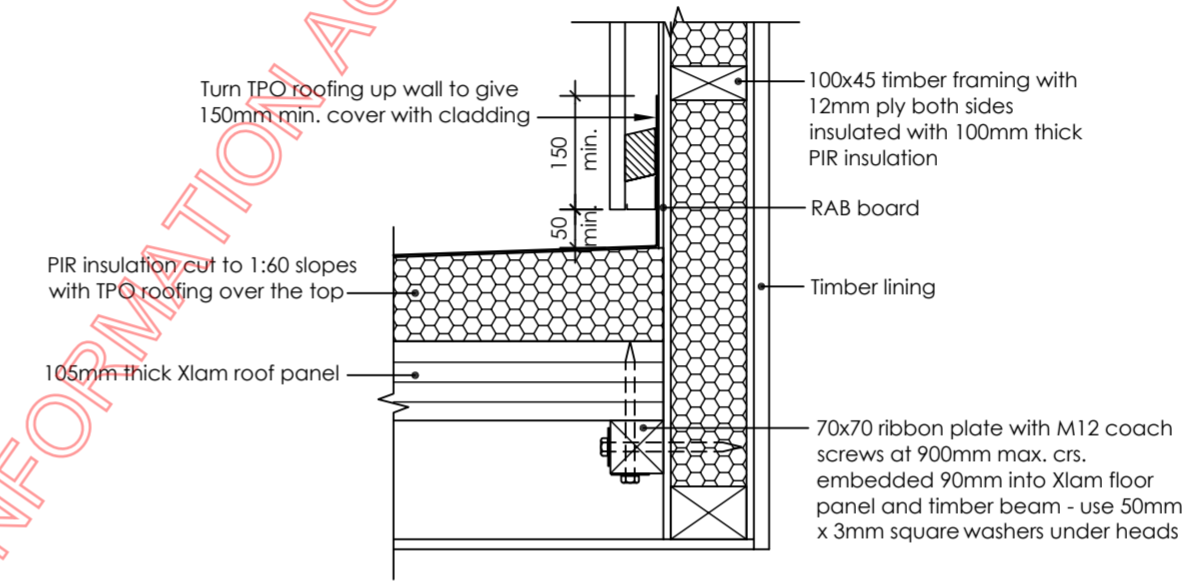
**1**  
S-03  
CANOPY BARGE/GUTTER DETAIL AT SOFFIT  
Applies at both ends of canopy  
scale 1:5 @ A2



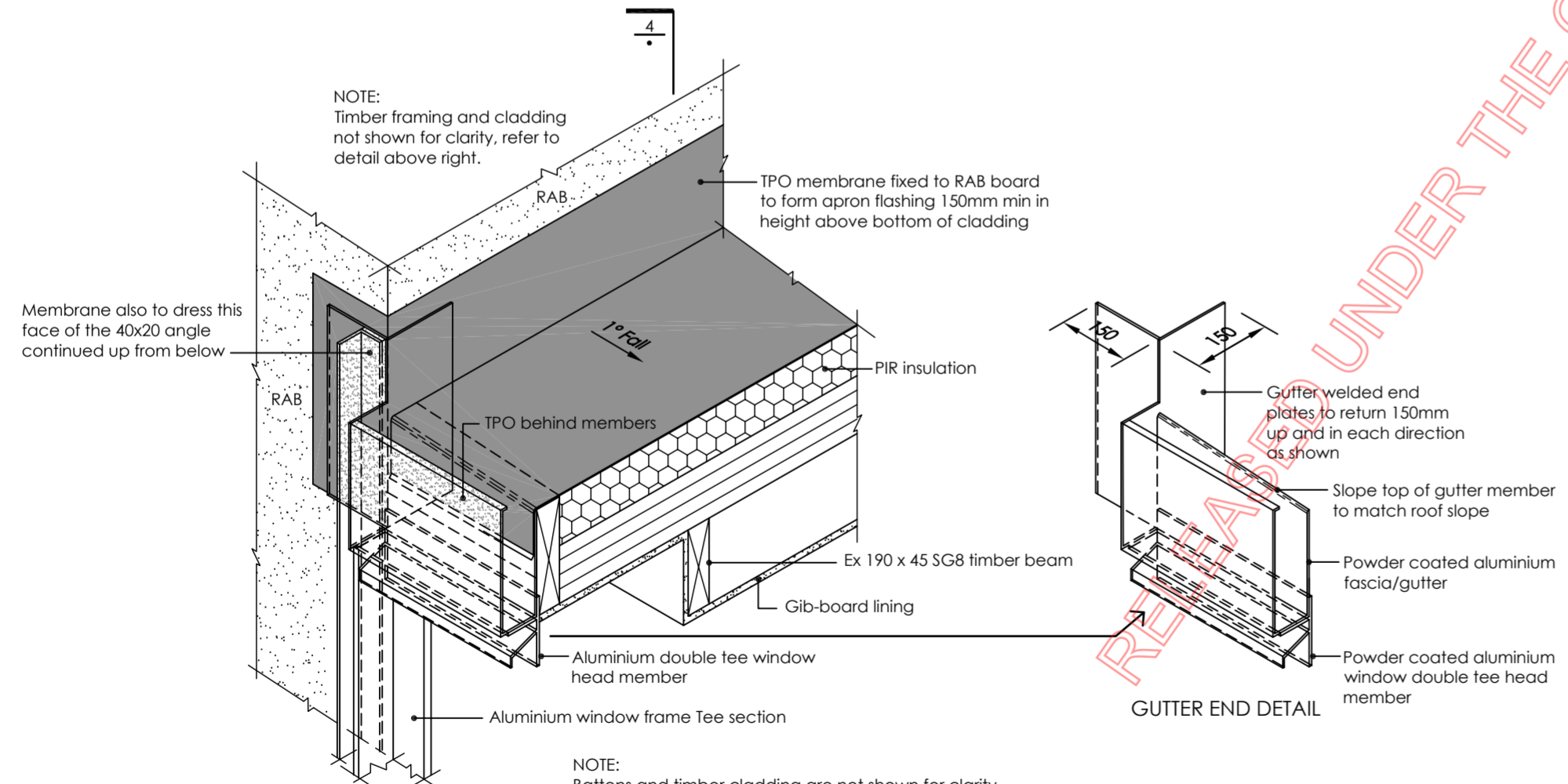
**3**  
S-03  
CANOPY BARGE/GUTTER DETAIL AT LOW EDGE  
Applies full length to long sided of canopy  
scale 1:5 @ A2



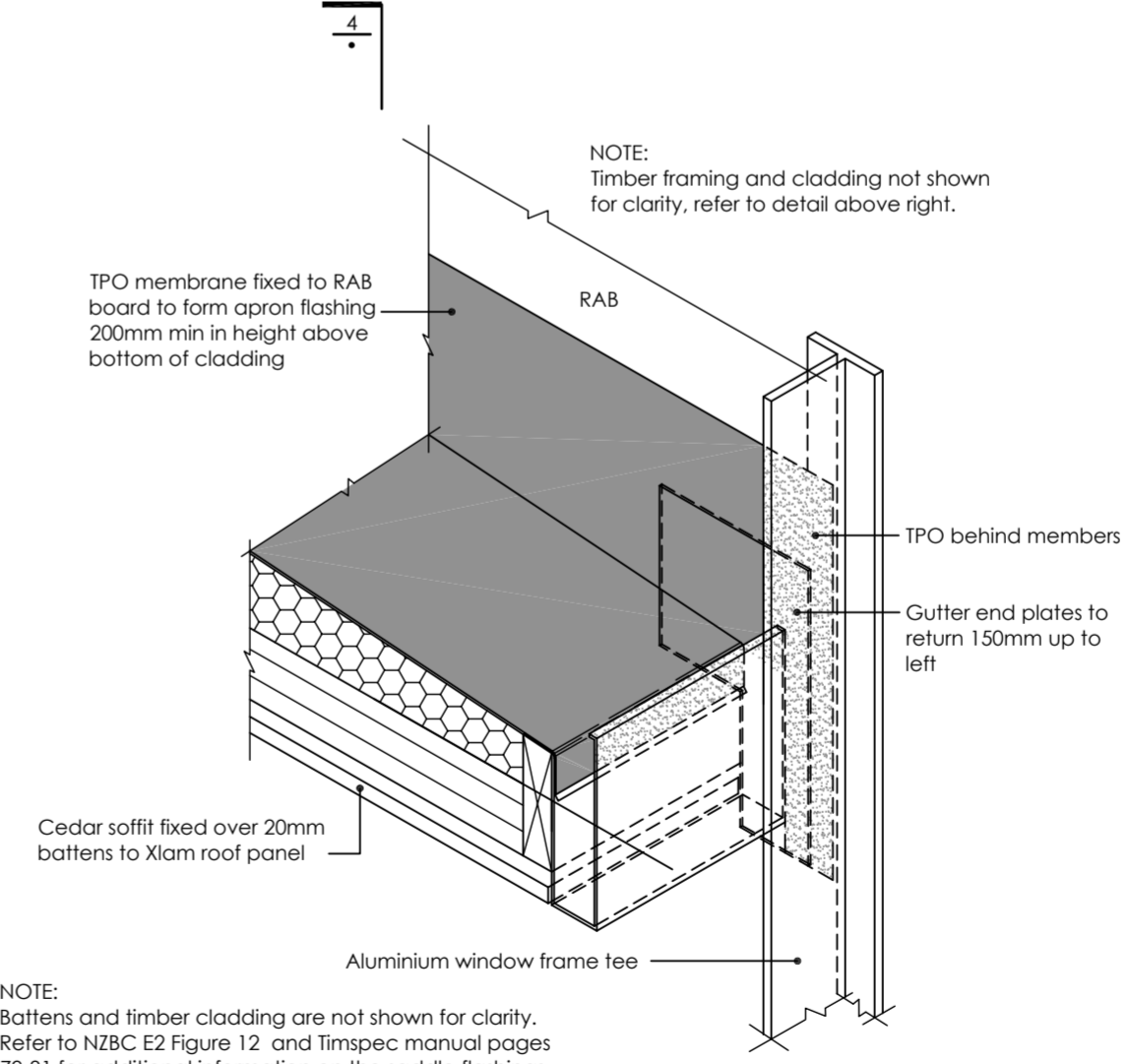
**2**  
S-03  
CANOPY BARGE/GUTTER DETAIL AT WINDOW  
scale 1:5 @ A2



**4**  
S-02  
CANOPY WALL JUNCTION DETAIL  
scale 1:10 @ A2



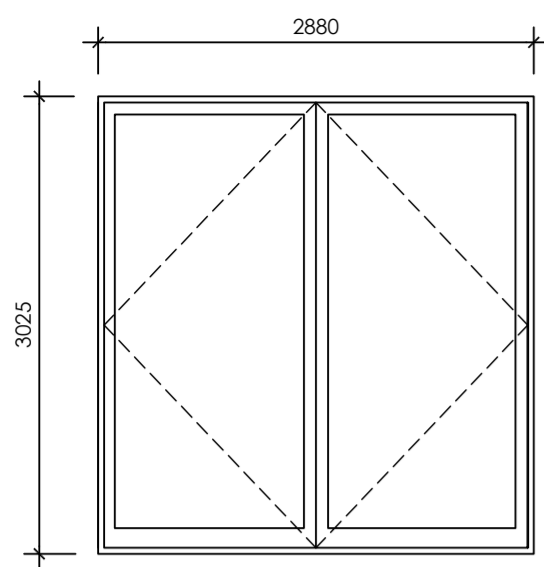
**5**  
S-03  
CANOPY BARGE SADDLE FLASHING DETAIL  
scale: NTS



**6**  
S-03  
CANOPY BARGE SADDLE FLASHING DETAIL  
scale: NTS

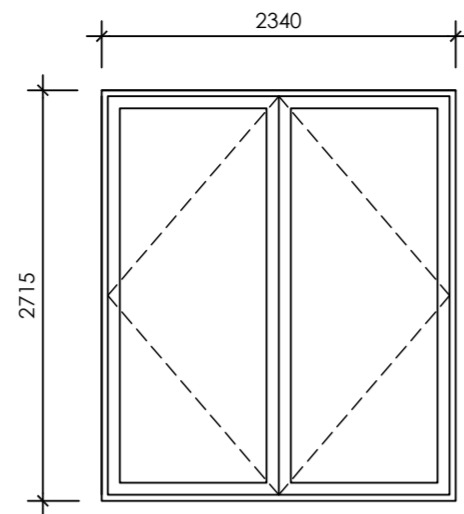
REMOVED UNDER THE OFFICIAL INFORMATION ACT 1982





DOOR 1 DESCRIPTION  
Aluminium framed double glazed double 1440 wide doors as shown.

D1 1 off  
door elevations Scale 1:50



DOOR 2 & 3 DESCRIPTION  
Aluminium framed double glazed 2700 wide sliding doors as shown.

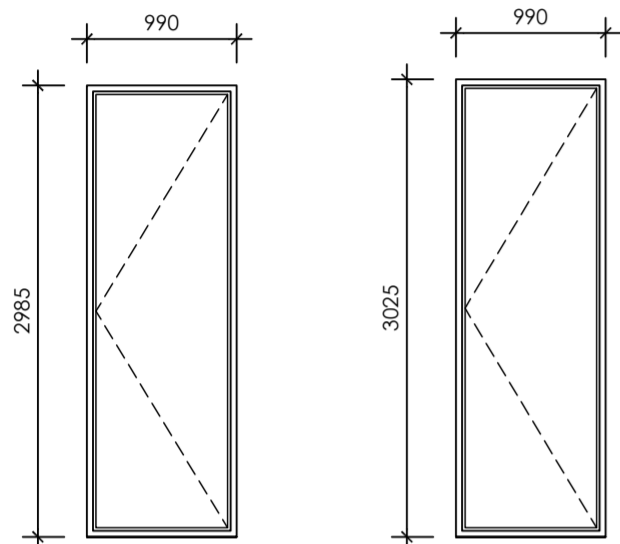
D2 & D3 1 off each

general notes:

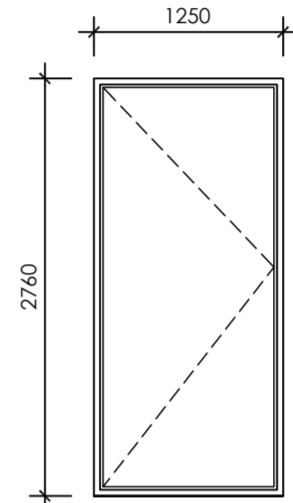
Refer to the floor plans and elevations for the door locations.  
"F" framed window dimensions shown are over the frame and "U" glazing unit dimensions shown are over the unit.  
All glazing units are low E double glazed glazing units.  
All windows and doors are elevated from the outside.  
All doors windows and glazing units are to be site measured before manufacture.  
All class is to be clear float glass.

glazing notes:

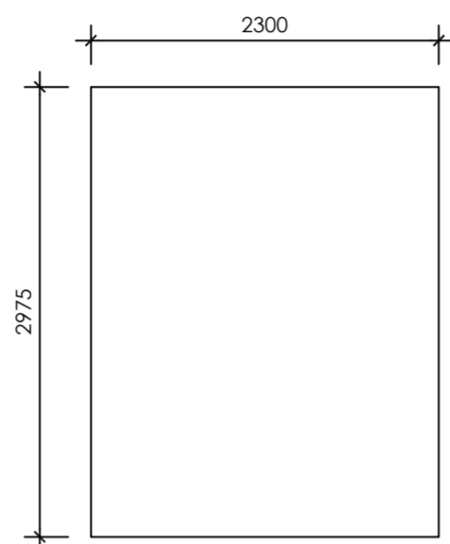
Safety glass is to be provided to all doors and windows as required by Building Code Clause F2 Hazardous Building Materials, and in accordance with NZS 4223: Part 3: 1999 Glazing in Buildings - Human Impact Safety Requirements All glazing to the dwelling to comply with NZS 4223 parts 1, 2 and 3



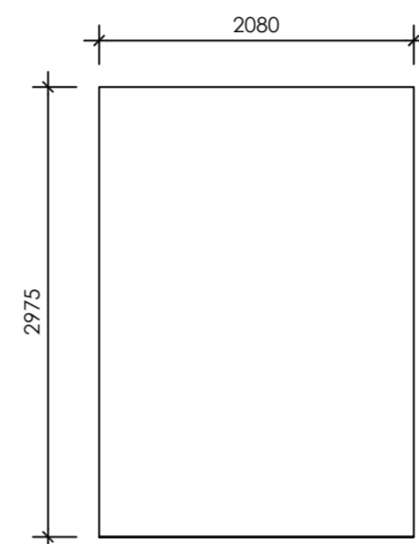
F1, F2 & F3 1 off each  
F4 1 off



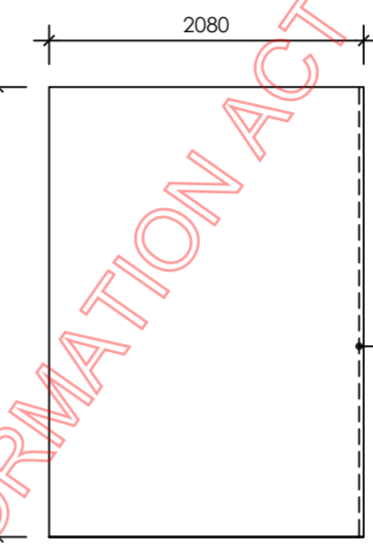
F5 1 off



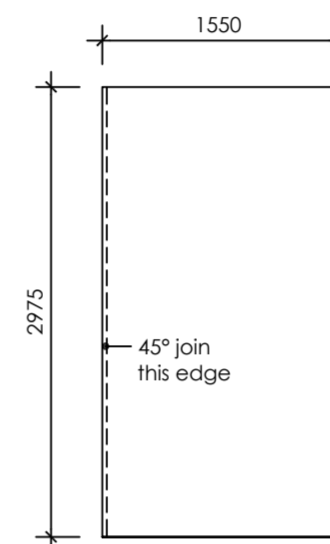
U1 1 off



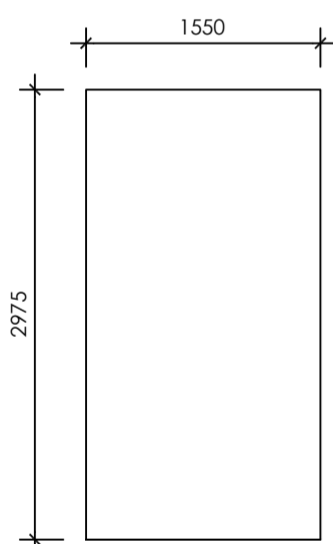
U2 1 off



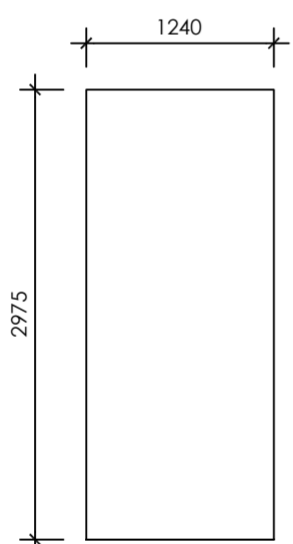
U3 1 off



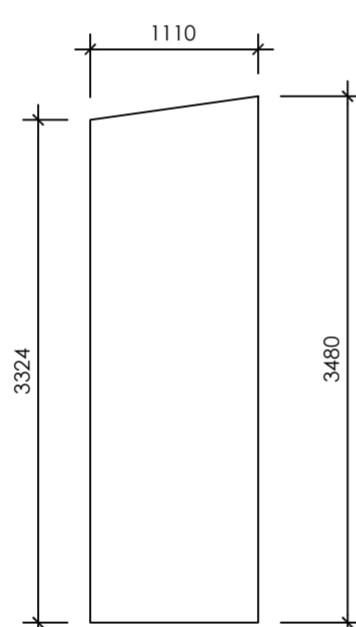
U4 1 off



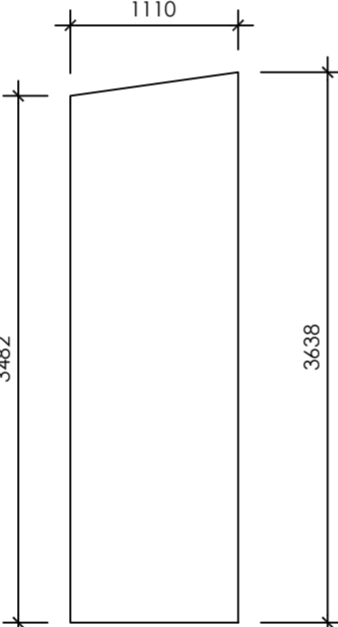
U5 1 off



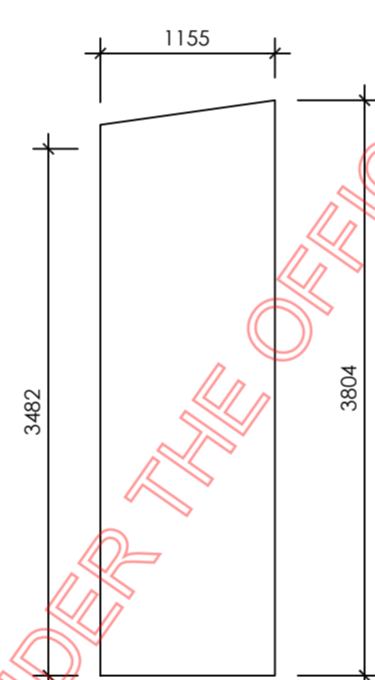
U6 1 off



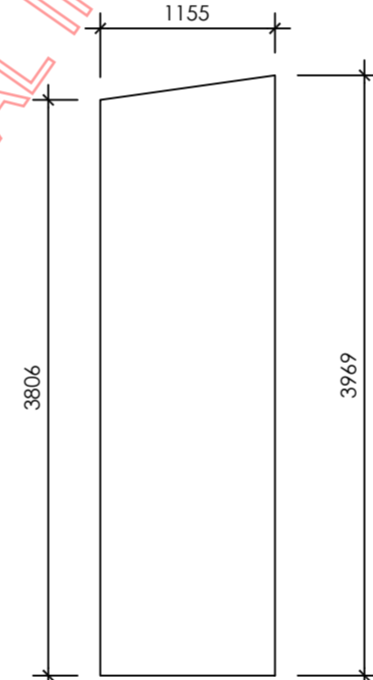
U7 1 off



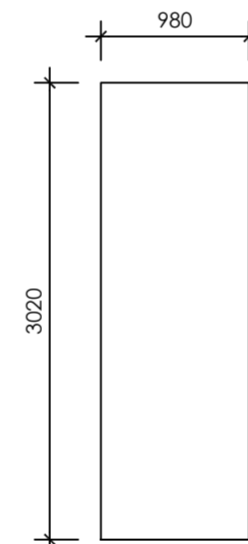
U8 1 off



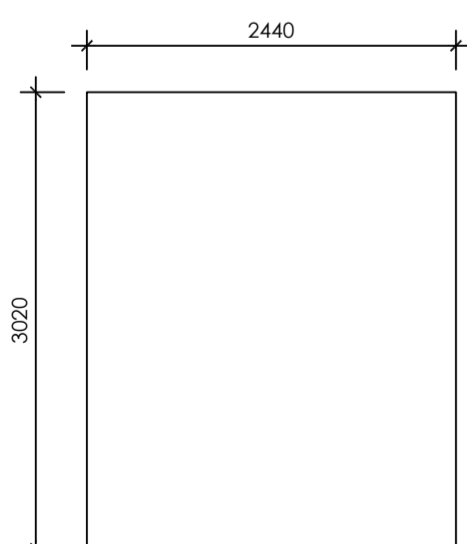
U9 1 off



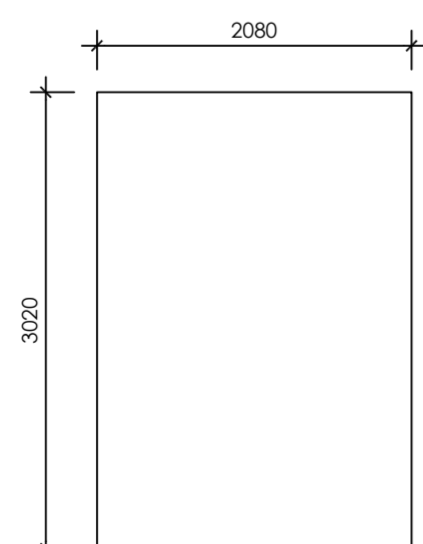
U10 1 off



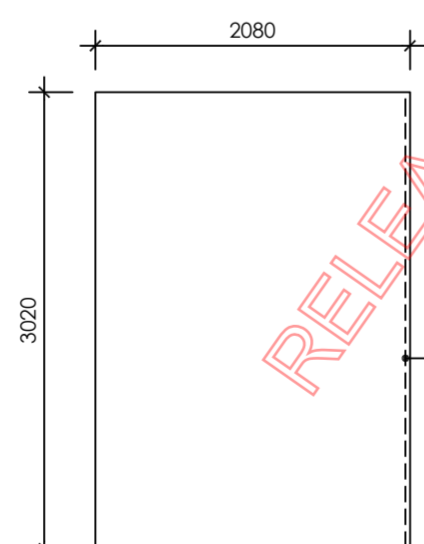
U11 & U13 1 off each



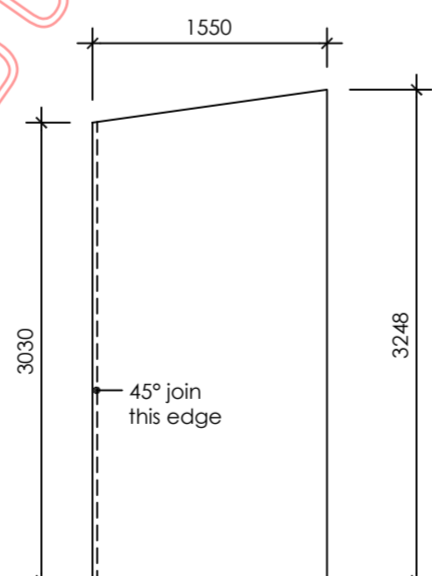
U12 1 off



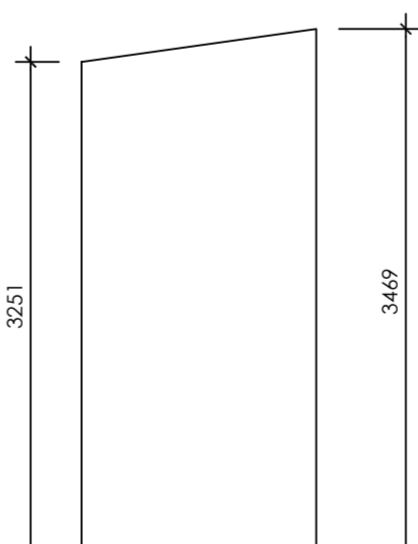
U14 1 off



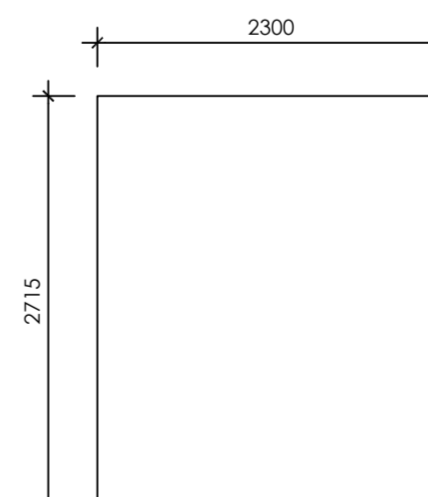
U15 1 off



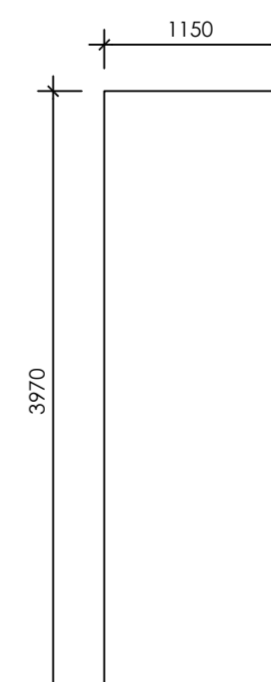
U16 1 off



U17 1 off



U18, U19 & U20 1 off each



U21 & U22 1 off each

window elevations Scale 1:50 @ A2

LOCAL AUTHORITY:  
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s 9(2)(a)  
Jackson Clapperton & Partners Ltd  
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cell

NOTES:

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504

ISLAND BAY ROAD HOUSE

6 Island Bay Road  
Beach Haven  
AUCKLAND

SHEET:  
DOOR AND WINDOW ELEVATIONS

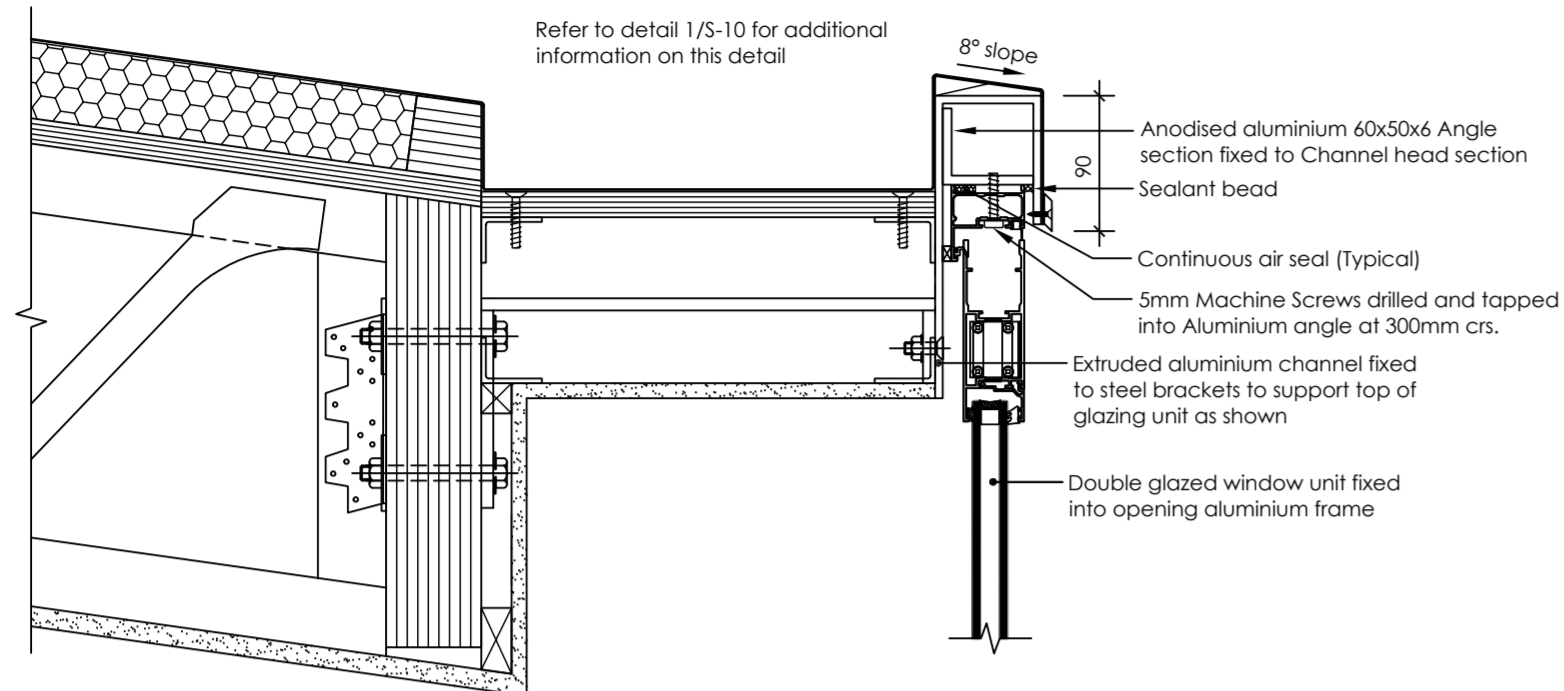
SCALES @ A2:  
SCALES @ A4: Half A2 scale

REF:  
DRAWN/START DATE: Author

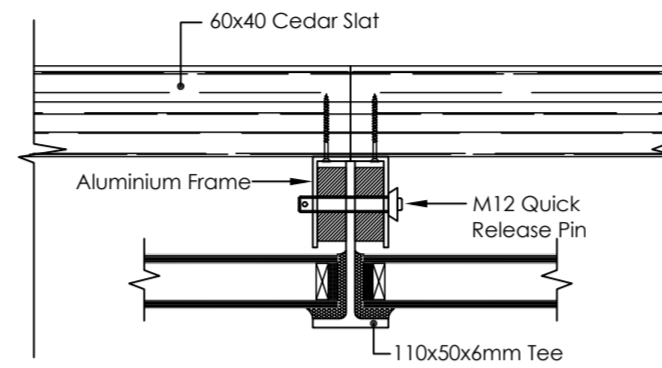
DRWG No: REVISION:  
S-16

DO NOT SCALE  
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SITE BEFORE COMMENCING WORK

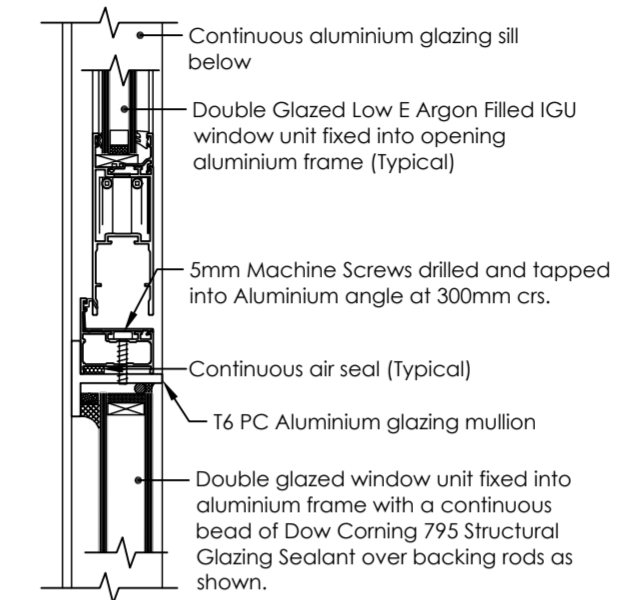
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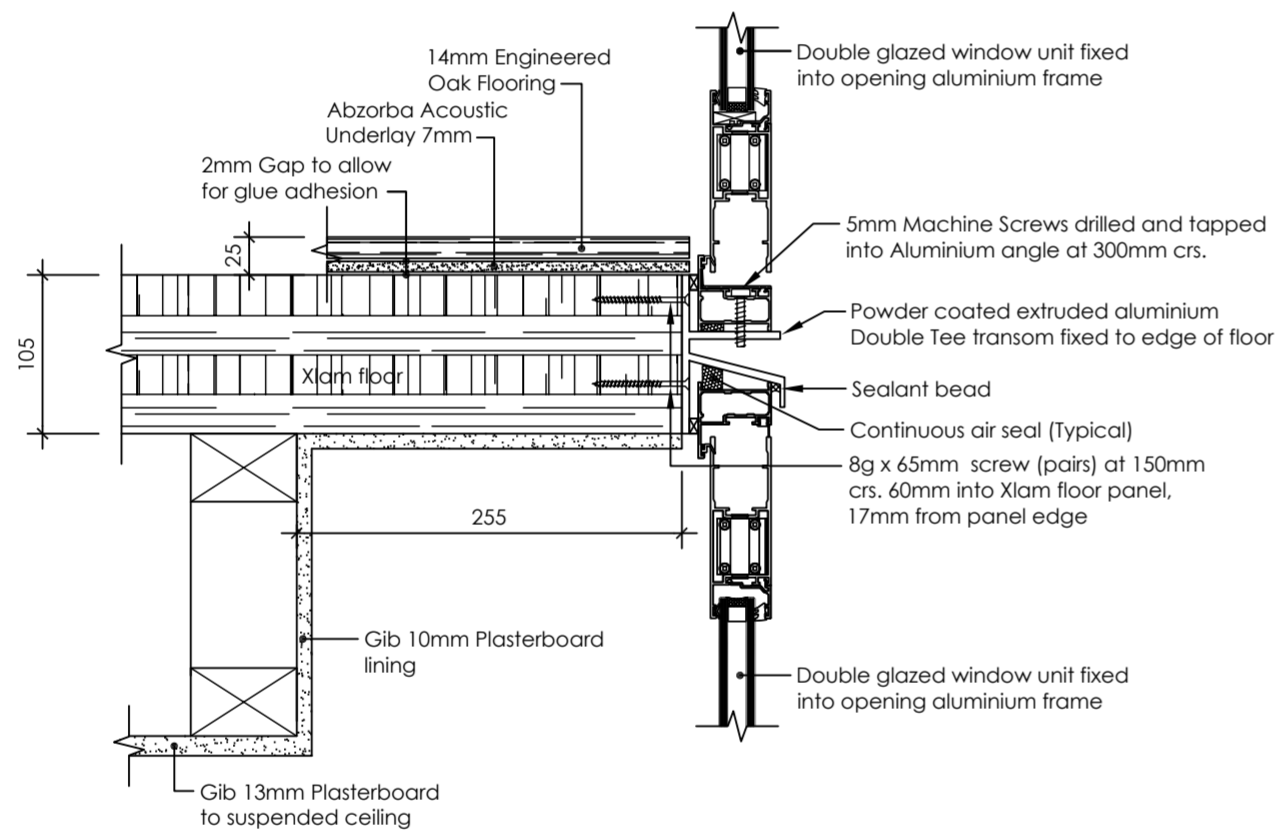
ROOF LEVEL  
EAVE/GUTTER DETAIL @ WINDOW



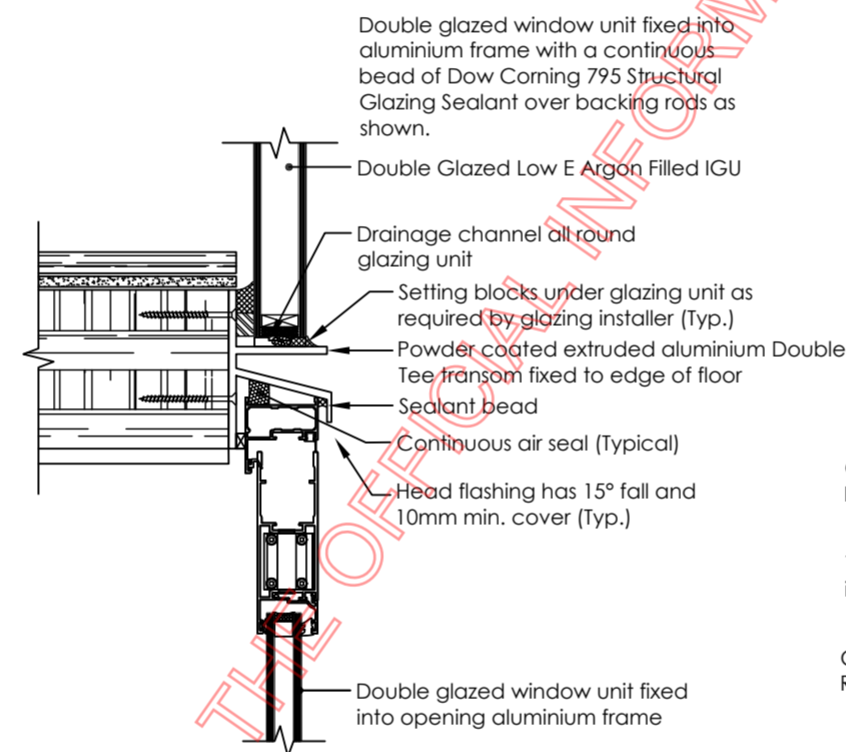
CEDAR SLAT - HORIZONTAL SECTION - FIXING DETAIL



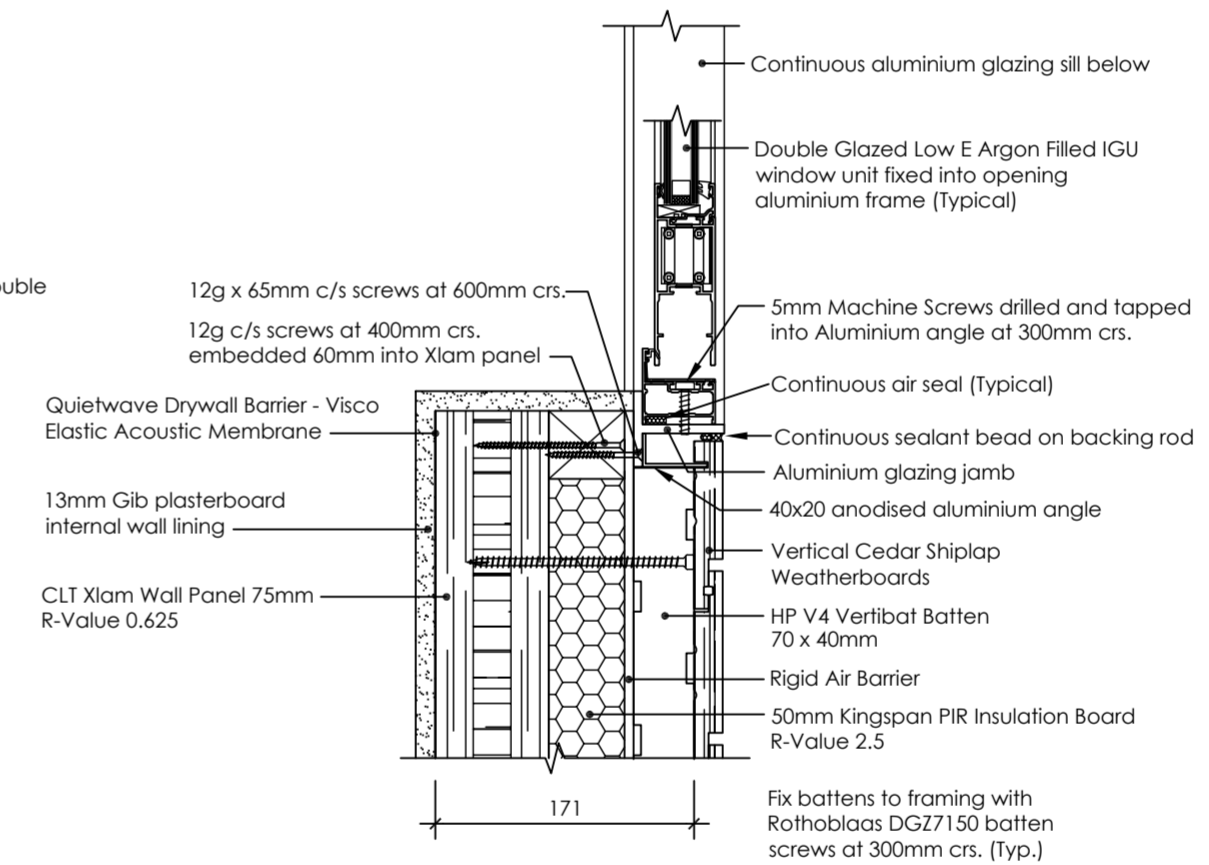
FIXED GLAZING/DOOR JAMB JUNCTION



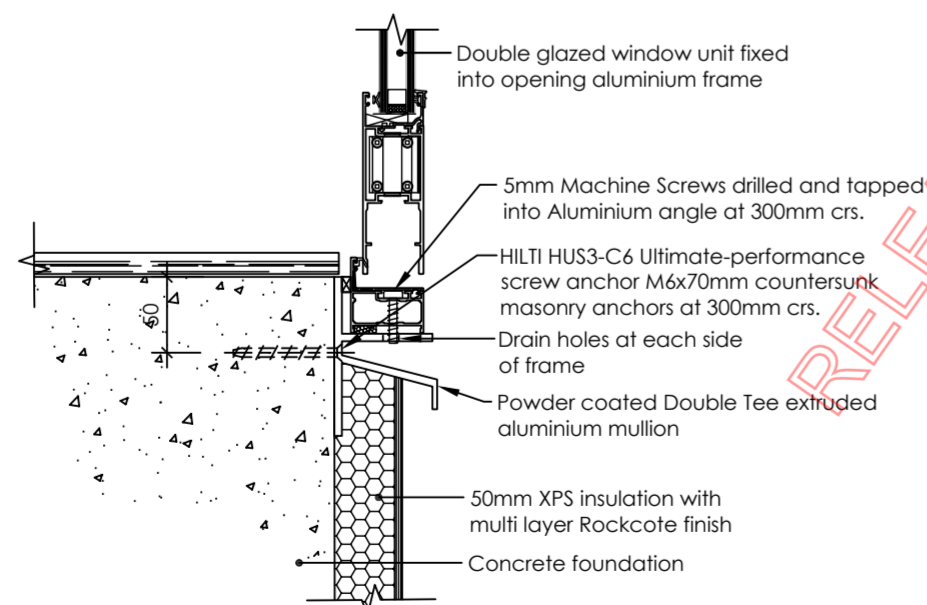
FIRST FLOOR  
WINDOW ABOVE AND BELOW



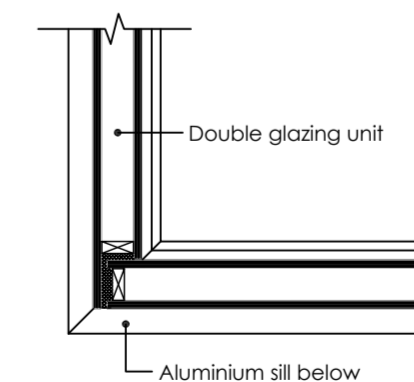
FIRST FLOOR  
FIXED WINDOW ABOVE AND OPENING WINDOW BELOW



WALL/WINDOW JAMB JUNCTION



TYPICAL OPENING WINDOW DETAILS Scale 1:5 @ A2



FIXED GLAZING CORNER DETAIL Scale 1:5 @ A2

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AUCKLAND CITY COUNCIL

CONSULTANT:  
s 9(2)(a)  
Jackson Clapperton & Partners Ltd  
PO Box 71 065 Rosebank Road  
ph (09) 8200131  
cell

NOTES:

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504

ISLAND BAY ROAD  
HOUSE

6 Island Bay Road  
Beach Haven  
AUCKLAND

SHEET:  
OPENING WINDOW  
DETAILS

SCALES @ A2:  
SCALES @ A4: Half A2 scale

REF:  
DRAWN/START DATE: Author

DRWG No: REVISION:

S-17

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REVISION HISTORY:

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PROJECT: No: 201504

**ISLAND BAY ROAD HOUSE**

6 Island Bay Road  
Beach Haven  
AUCKLAND

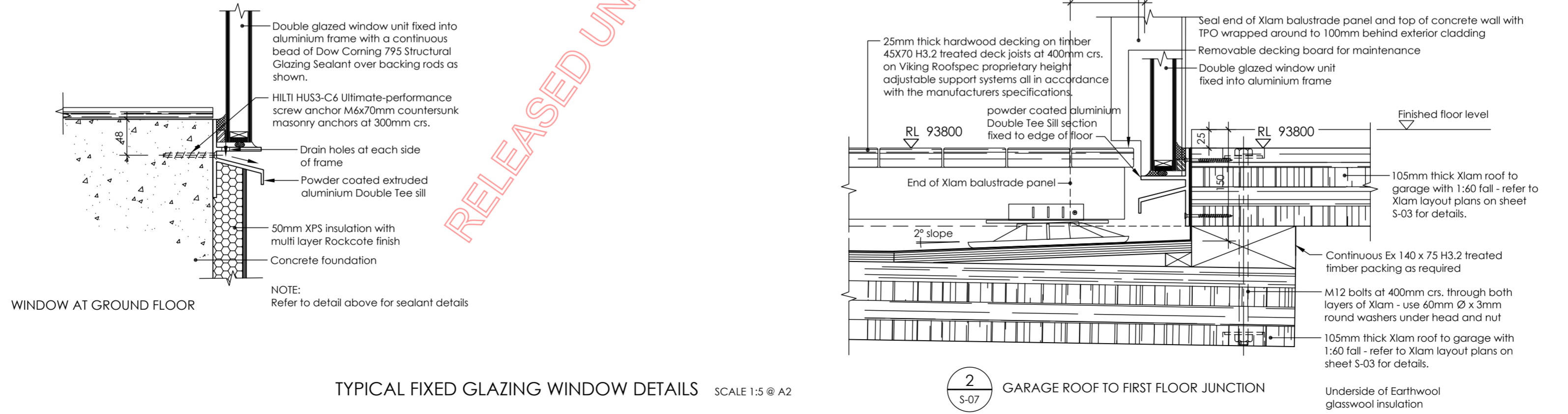
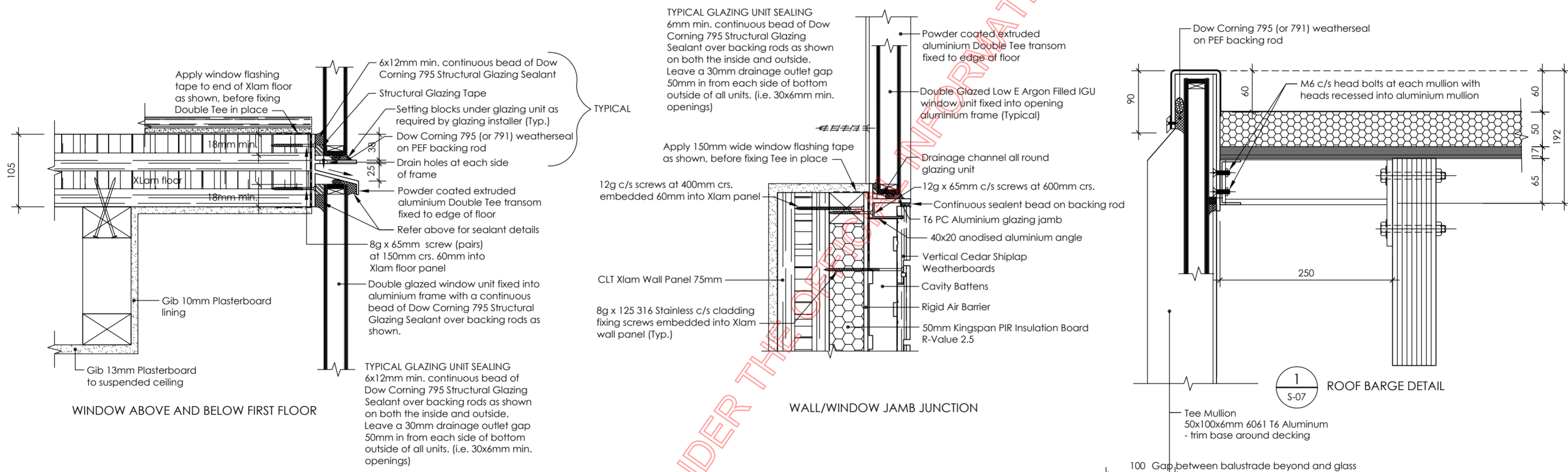
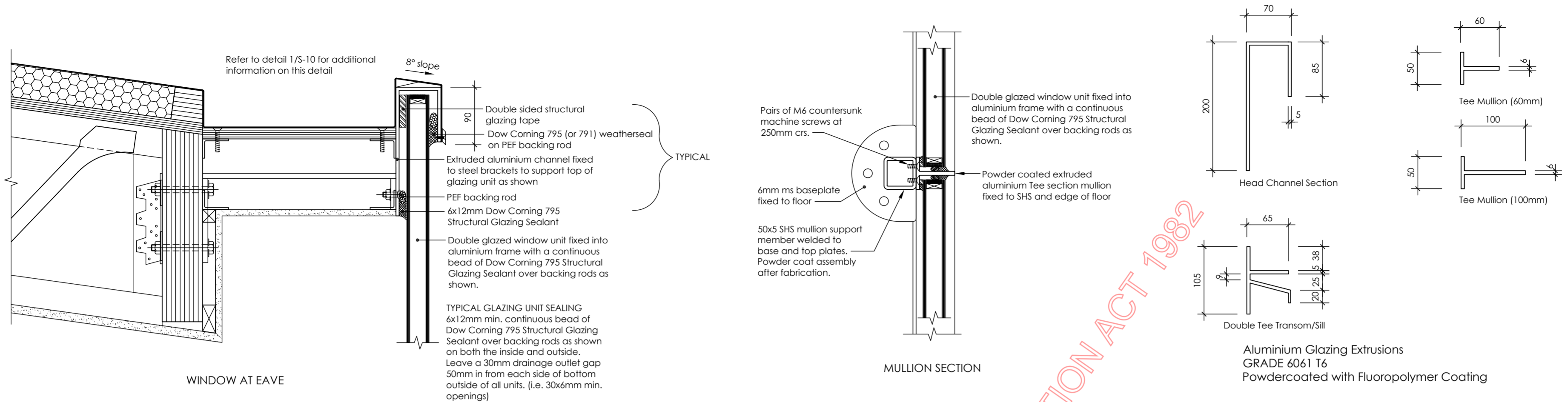
SHEET:  
**FIXED WINDOW DETAILS**

SCALES @ A2:  
SCALES @ A4: Half A2 scale

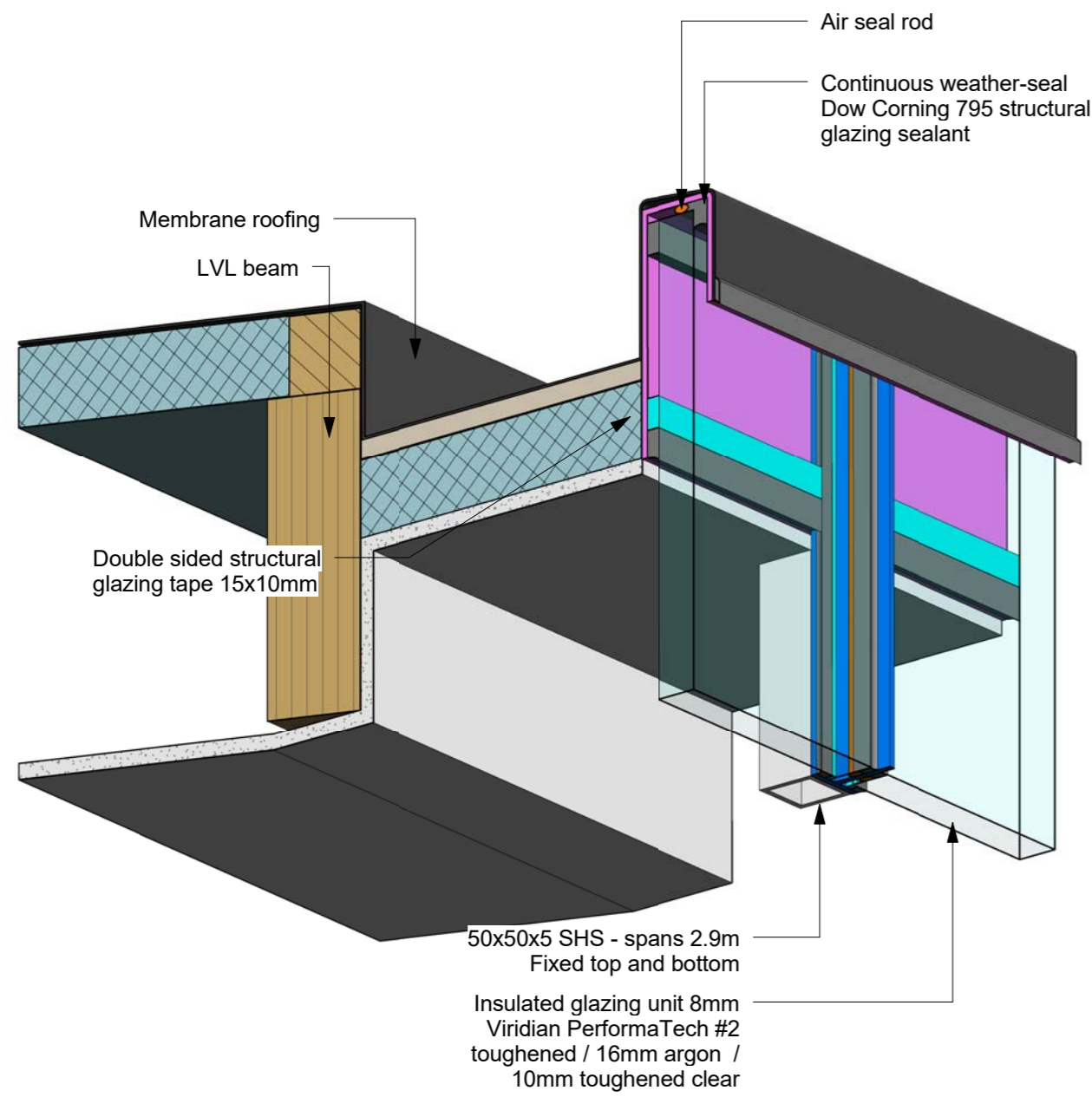
REF:  
DRAWN/START DATE: Author

DRWG No: REVISION:  
**S-18**

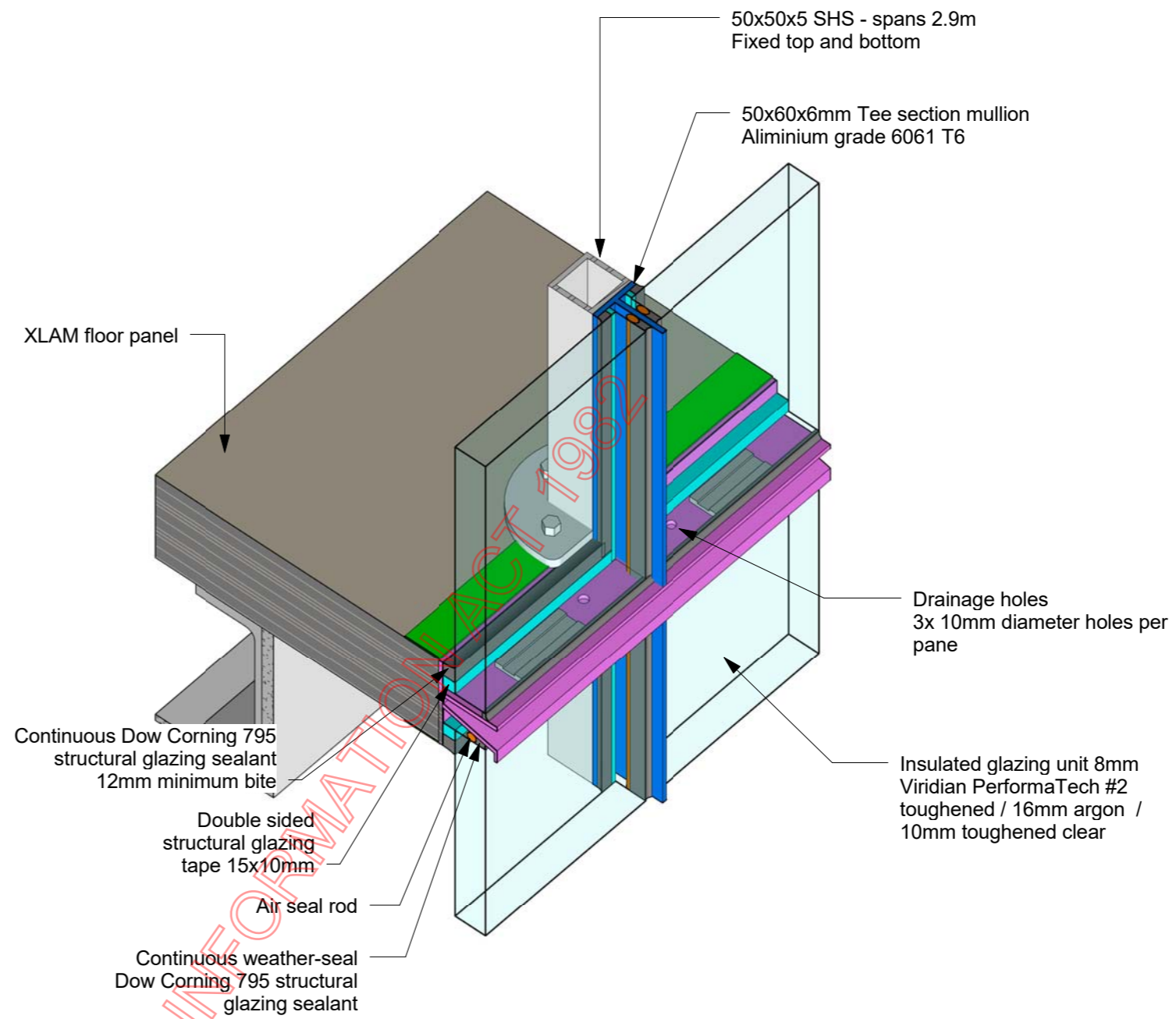
DO NOT SCALE  
CONTRACTOR MUST VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK



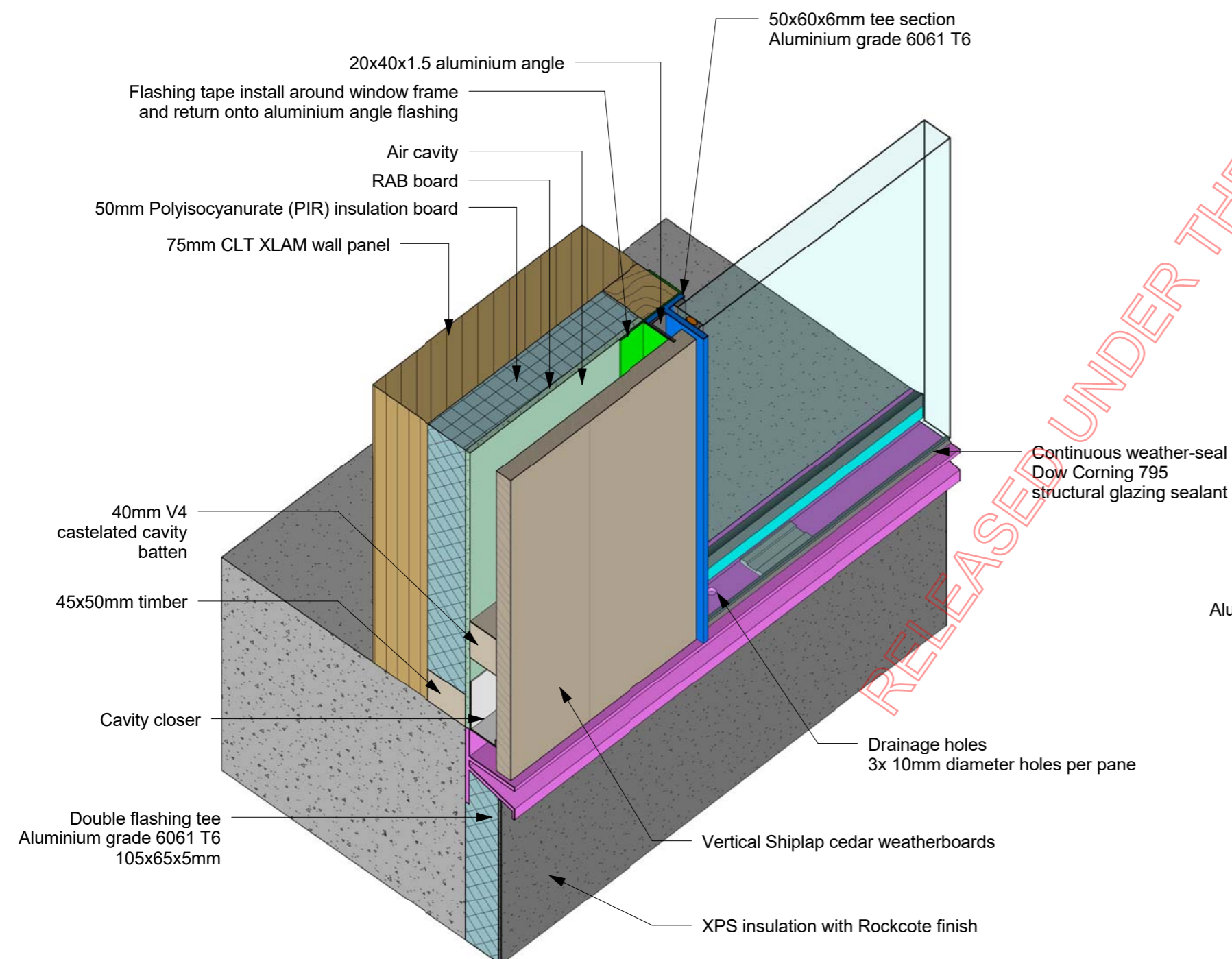




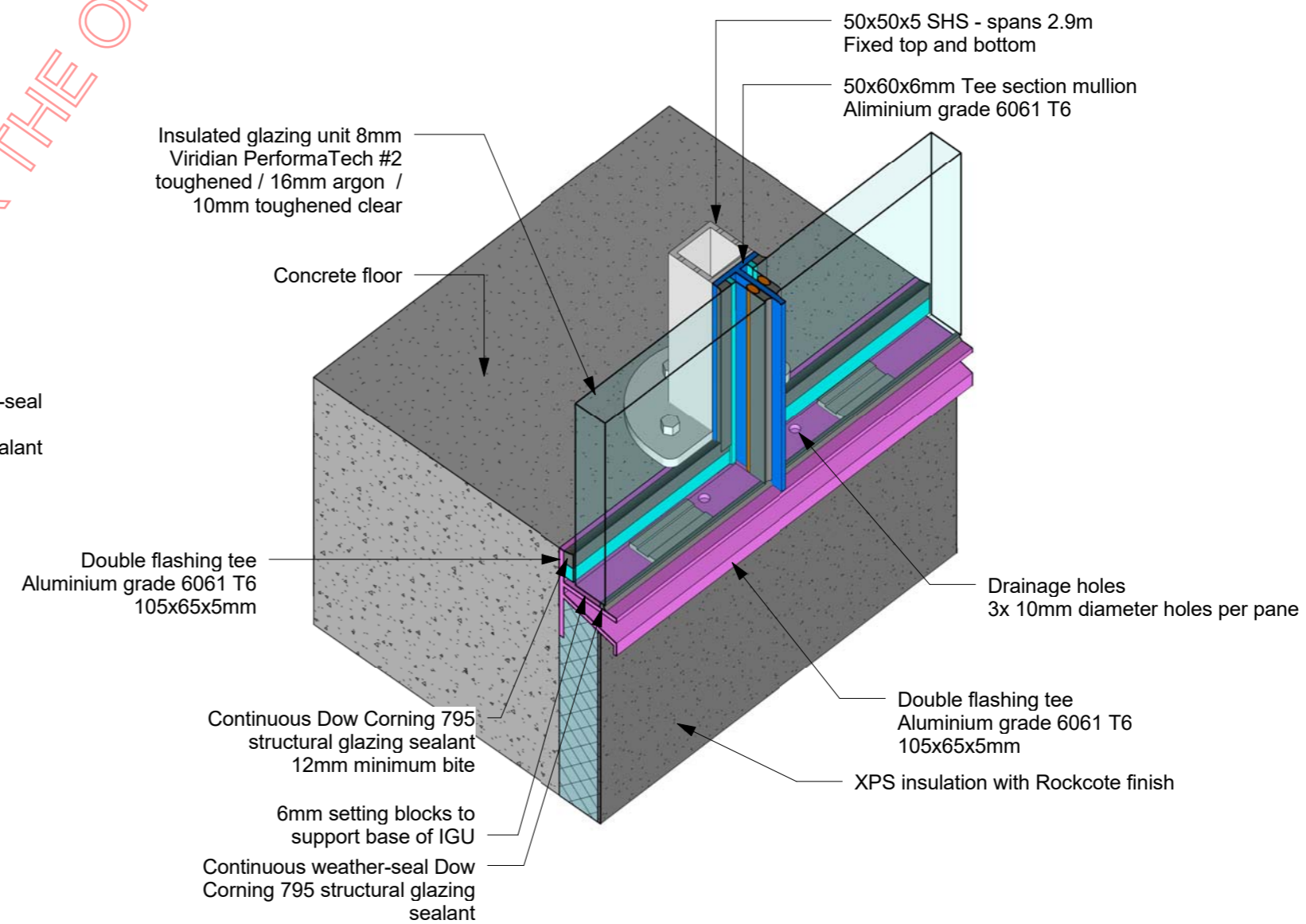
3  
Typical Glazing Head Isometric Detail



1  
Typical Glazing Isometric Detail



2  
Typical Glazing to Wall Panel Isometric Detail



4  
Typical Glazing Sill Isometric Detail

LOCAL AUTHORITY

CONSULTANTS

NOTES:

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504

ISLAND BAY ROAD HOUSE

6 Island Bay Road, Beach Haven

SHEET: Typical Glazing Details

SCALES @ A2:  
SCALES @ A4: Half A2 scale

REF:  
DRAWN/START DATE: Author

DRWG No: A4-202 REVISION:

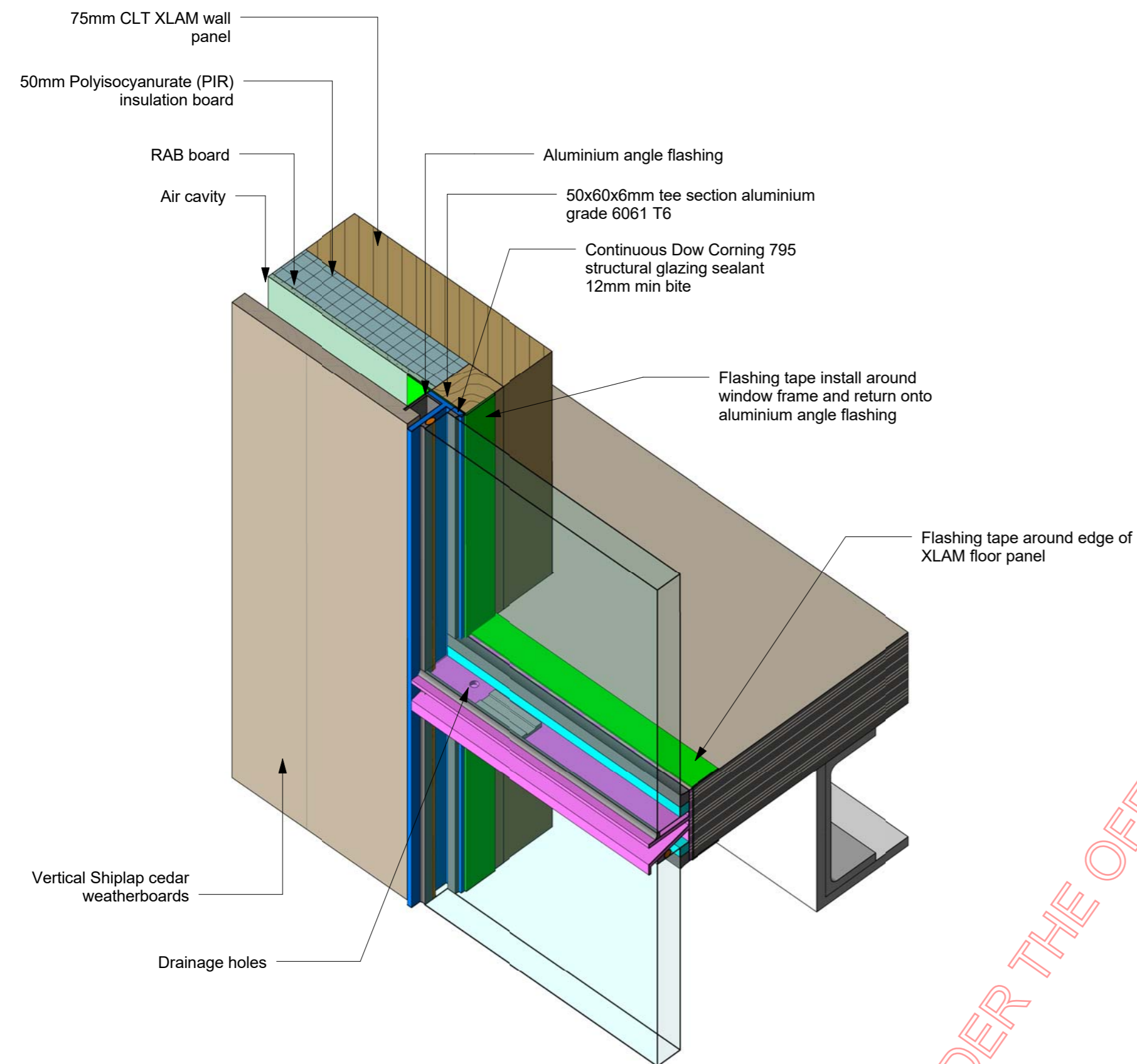
DO NOT SCALE  
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07-Dec-17 5:42:14 PM

BUILDING CONSENT





1 Typical Glazing to Wall Panel  
Isometric Detail at Midfloor

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LOCAL AUTHORITY

CONSULTANTS

NOTES:

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504

ISLAND BAY ROAD  
HOUSE

6 Island Bay Road, Beach  
Haven

SHEET:

Typical Glazing Details -  
Sheet 2

SCALES @ A2:

SCALES @ A4: Half A2 scale

REF:

DRAWN/START DATE: Author

DRWG No:

A4-203

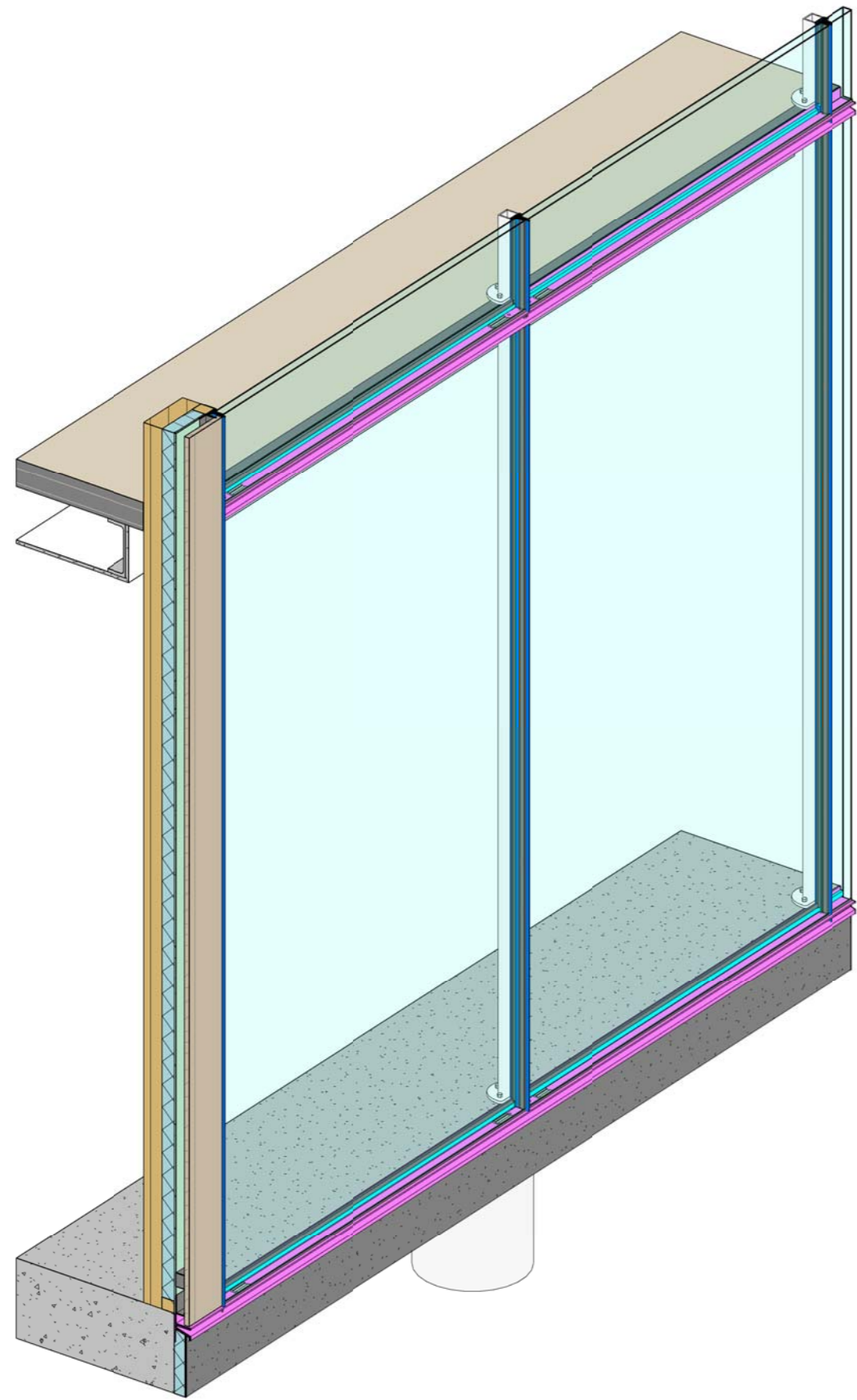
REVISION:

DO NOT SCALE  
CONTRACTOR MUST VERIFY ALL DIMENSIONS ON  
SITE BEFORE COMMENCING WORK

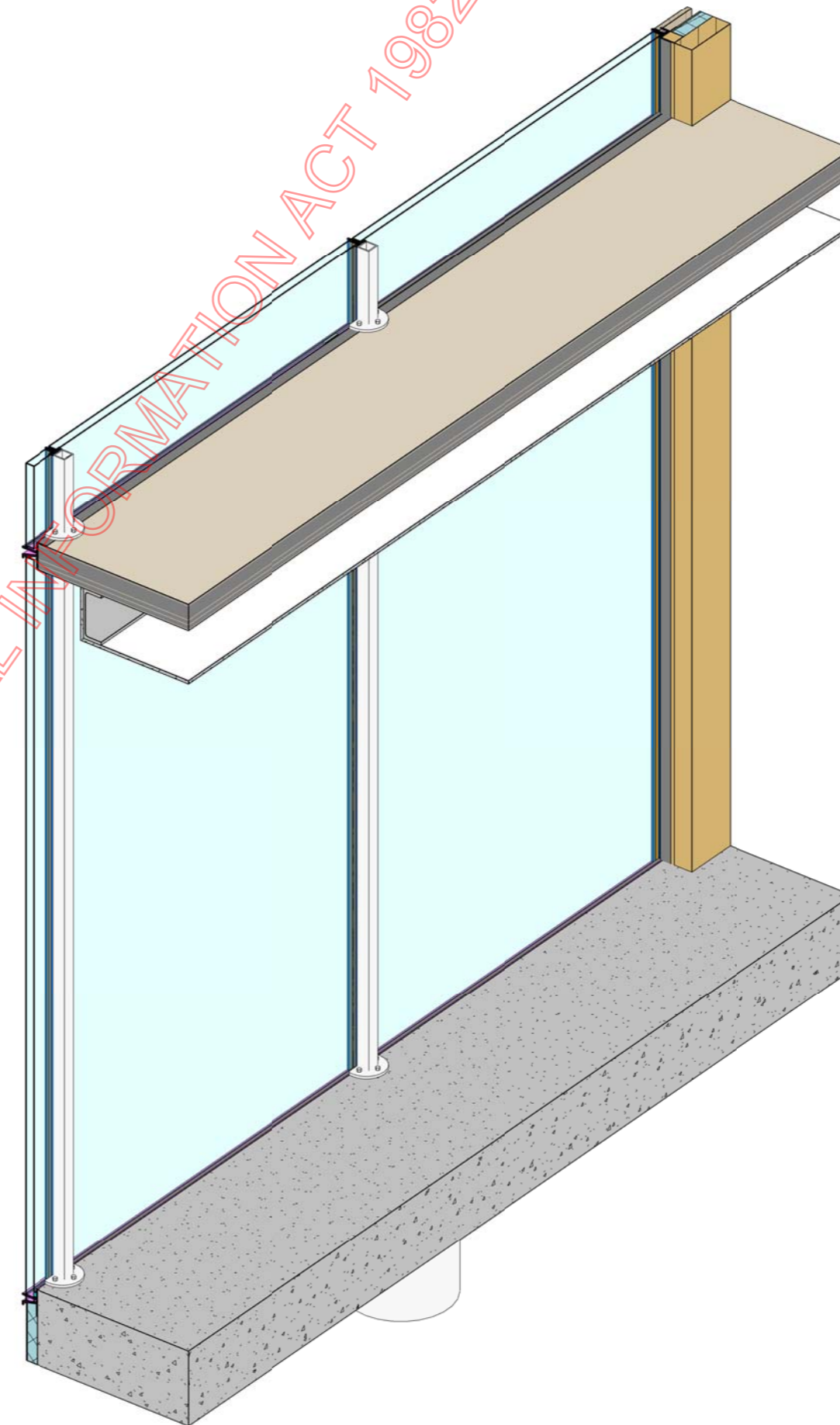
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07-Dec-17 5:42:18 PM

BUILDING CONSENT



1 Typical Glazing Panels - 3D



2 Typical Glazing Panels - 3D Interior

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NOTES:

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PROJECT: No: 201504  
**ISLAND BAY ROAD HOUSE**

6 Island Bay Road, Beach Haven

SHEET:  
**Typical Glazing Details - Sheet 3**

SCALES @ A2:  
 SCALES @ A4: Half A2 scale

REF:  
 DRAWN/START DATE: Author

DRWG No: **A4-204** REVISION:

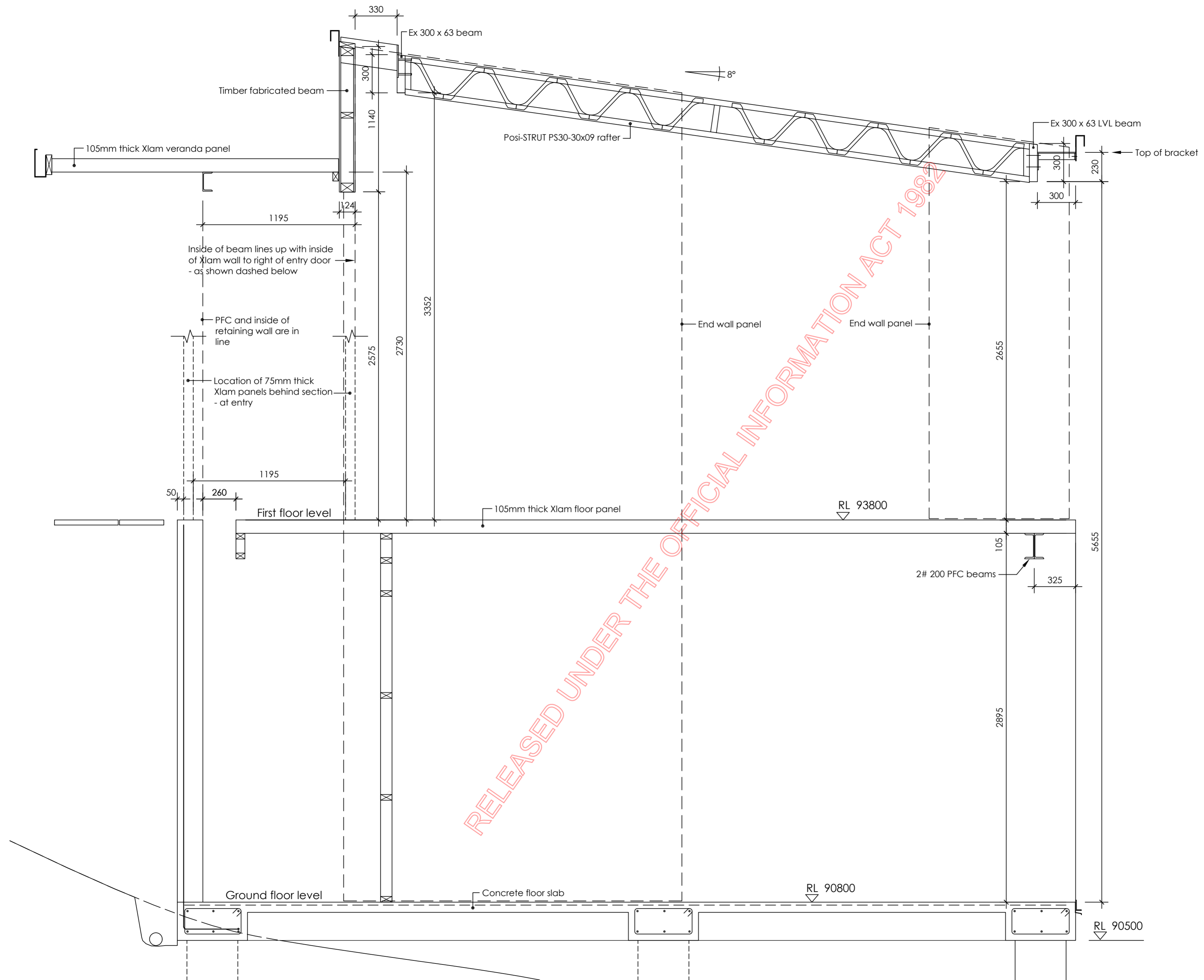
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**BUILDING CONSENT**





LOCAL AUTHORITY:  
**AUCKLAND CITY COUNCIL**

CONSULTANT:  
**s 9(2)(a)**  
 Jackson Clapperton & Partners Ltd  
 PO Box 71 065 Rosebank Road  
 ph (09) 8200131  
 cell [REDACTED]

NOTES:

REVISION HISTORY:

**s 9(2)(a)**

PROJECT: No: 201504  
**ISLAND BAY ROAD HOUSE**  
 6 Island Bay Road  
 Beach Haven  
 AUCKLAND

SHEET:  
**SETOUT DRAWING**

SCALES @ A2:  
 SCALES @ A4: Half A2 scale

REF:  
 DRAWN/START DATE: Author

DRWG No: **S-19** REVISION:

DO NOT SCALE  
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## Island Bay Road House Maintenance Schedule

<b>ADDRESS</b>	6 Island Bay Road, Beach Haven, Auckland 0626
<b>OWNERS</b>	Alex and Corban Walls
<b>MONTHLY</b>	CHANNEL DRAINS: Remove grates and preform visual inspection of stormwater channel drains. Remove any debris, (silt and leaves etc) collected in the drains and ensure proper water flow to storm water
<b>MONTHLY</b>	RETENTION TANK: Remove and clean stormwater retention tank catch basket. This may need to be actioned more regularly depending on the season particularly in Autumn
<b>6 MONTHLY</b>	ROOF GUTTERS: Check for - debris, leaves, branches, silt etc, evidence of water ingress, water ponding, membrane deterioration. Clear and remove any debris collected in the gutter, around outlet and overflows. Ensure both the upper level gutter and garage roof gutted are thoroughly inspected and cleaned. If a leak is suspected contact a Viking Roofspec technical representative to inspect and advise
<b>6 MONTHLY</b>	ROOFING AND DECKING MEMBRANE; (to be preformed in conjunction with gutter inspection). Check for - evidence of water ingress, water ponding, decking membrane deterioration, moss/lichen growth, dirt/salts, roof tearing at fixing points, gaps or cracks around roof penetrations. Ensure that the main roof, canopy roof and garage roof are thoroughly inspected and cleaned. If a leak is suspected contact a Viking Roofspec technical representative to inspect and advise.
<b>12 MONTHLY</b>	FIXED GLAZING: Check for - deterioration or imperfections, cracked/damaged silicon, cracked/ broken glass. Clean windows and thoroughly inspect all junctions and seals. If a leak is suspected contact a Dow Corning technical representative to inspect and advise.



**12 MONTHLY**

DOORS AND WINDOWS: Check for - deterioration or imperfections, cracked/damaged glass. Clean windows and thoroughly inspect all junctions and seals. Lubricate door and window locks, hinges, and mechanisms.

**12 MONTHLY**

WEATHERBOARD CLADDING: Check for - dirt/salts/staining, cracked/ flaking/chalking coatings, moss/lichen, corrosion of flashings, corroded or missing fixings, split/cupped/rotten weatherboards. Wash, re-coat, repair or replace as necessary. Thoroughly wash with brush and soapy water (DO NOT water blast)

**12 MONTHLY**

DECKING: Check for - dirt/salts/staining, moss/lichen, corroded or missing fixings, timber rot/splintering, split/cupped/rotten boards, loose balustrades/posts. Wash, re-coat, repair or replace as necessary. Thoroughly wash with brush and soapy water (DO NOT water blast)

**12 MONTHLY**

FLUE: Check for - build up of soot, corrosion of flue/cowl/fixings, loose fixings. Clean and remedy as necessary

**12 MONTHLY**

TREES AND PLANTING: Check for - Overgrowth, dangerous trees or branches the could injure or come in contact with the building. Have qualified arborist remove only what is necessary

**24 MONTHLY**

RE-STAIN WEATHERBOARD CLADDING: After thoroughly washing with brush and soapy water (DO NOT water blast) , allow to dry, apply a single coating of stain to the weatherboard cladding as per product recommendation. Ensure all channel drain grates are removed prior to coating.

**NOTE**

This schedule should be considered fluid and as a guideline only. If unforeseen issues arise that are outside the scope of this document they should be remedied as soon as possible.

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# Producer statement design (PS1)

TO BE COMPLETED BY THE DESIGN PROFESSIONAL WHO HAS BEEN ENGAGED TO PROVIDE A PS1

Author name:  Author number:

Author company:

Building consent N°:

Site address:

Legal description:

Engaged by:  (Owner)

To provide design services in respect of: (describe work)  
 part  all

NZBC clauses: (circle as applicable)

B1	B2	C1	C2	C3	C4	C5	C6	D1	D2	E1	E2	E3
✓	✓											
F1	F2	F3	F4	F5	F6	F7	F8	G1	G2	G3	G4	G5
	✓		✓									
G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	H1		

NB: all statements must include B2

The design has been prepared in accordance with:

Documents issued by the Ministry of Business Innovation & Employment

Alternative solution (attach schedule if required)

The proposed building work covered by this producer statement design is described on the drawings referenced below, together with the specifications and other documents set out in the schedule attached to this statement:

Drawing title:  Drawing numbers:

The producer statement is subject to:

(i) Site verification of the following design assumptions:

(ii) All proprietary products meeting their performance specification requirements

I believe on reasonable grounds that the proposed building work, will comply with the relevant provisions of the Building Code if constructed in accordance with the drawings, specifications and other documents provided or listed with this statement.

I understand that Auckland Council is reliant on this producer statement for the purposes of establishing compliance with the relevant provisions of the Building Act 2004, Building Regulations and Building Code. I confirm that I hold a current policy of professional indemnity insurance to the value required by Auckland Council.




Construction monitoring is:  Not required  Required (if required please list below)

De-glazing and evaluation of silicone adhesion of at least two glass units for evaluation by Viridian Glass and Dow Corning agent.

(Agreement must be attached)

Signed by:



Date:

15-12-17

Address:

2 Mana Pace, Wiri, Auckland

Postcode: 2014

Phone:

Fax:

Mobile:

s 9(2)(a)

Email:

s 9

## COMMENTS

### Assumptions:

1. Very high wind zone
2. Three drain holes with minimum diameter of 10 mm, or slots 20 mm x 5 mm, must be provided under each insulating glass unit in accordance with NZS 4666. Glazing is undertaken strictly in accordance with NZS 4666.
4. Compatibility of glass and all other substrates in contact with sealants are approved by Dow Corning before commencement of work.
5. At least two insulating glass units are de-glazed from the windows and evaluated by Dow Corning agent to ensure satisfactory adhesion between sealant and frame.
6. Insulating glass units are made up of Viridian 8 mm toughened safety Performatech glass + 16 mm argon cavity + 10 mm clear toughened safety glass inner pane.
7. Glazing is carried out in a clean environment
8. This PS1 does not cover the design and E2 requirements of the window frames and flashings.
10. Dow Corning 795 for sealing glass to tiles in wet areas is permitted as outlined in Dow Corning product specification.

### Important notes:

- Producer statements are accepted solely at Auckland Council's discretion; please refer to the Producer Statement Policy which can be found on Council's website for further details <http://www.aucklandcouncil.govt.nz/EN/ratesbuildingproperty/consents/Consent%20documents/ac2301producerstatementpolicy.pdf>

Design Input

Instructions

Occupancies

AR=1-1.25

AR=1.25-1.5

AR=1.5-1.75

AR=1.75-2

AR=2-2.5

AR=2.5-3

AR=3-5

**VERTICAL IGU SUPPORTED ALONG 4 EDGES: NZS 4223.4:2008**

14/12/2017

**DESIGN INPUT**

ULS wind pressure (kPa)

1.76

SLS wind pressure (kPa)

1.25

**IGU make-up**

**Outer pane**

**Inner pane**

Monolithic

Monolithic

Toughened

Toughened

	Outer pane Monolithic Toughened	Inner pane Monolithic Toughened
Glass thickness selected (mm)	<b>8</b>	<b>10</b>
Load share - ultimate	0.73	1.47
Load share - serviceability	0.52	1.04
Long side of panel (mm)	3020	
Short side of panel (mm)	2440	
AR	1.24	

**MINIMUM GLASS THICKNESS REQUIRED FOR STRENGTH**



Nominal thickness (interlayer excluded)	<b>4</b>	<b>5</b>
---	----------	----------

**Glass selected has adequate strength**

**CHECK DEFLECTION OF GLASS SELECTED**

Glass thickness selected	<b>8</b>	<b>10</b>
Minimum thickness	7.7	9.7
Slenderness factor	316.9	251.6
Slenderness factor from Figure 35 of NZS 4223.4	721.2	481.6
<b>Deflection ≤ Span / 60</b>	<b>OK</b>	<b>OK</b>
Estimated deflection mm		23
IGUMA recommended deflection limit (1.5 times airspace)		24
Thickness check if safety glass is required by NZS 4223.3:2016	<b>OK</b>	<b>OK</b>

**Deflection complies (deflection > 20mm may be visually disturbing)**

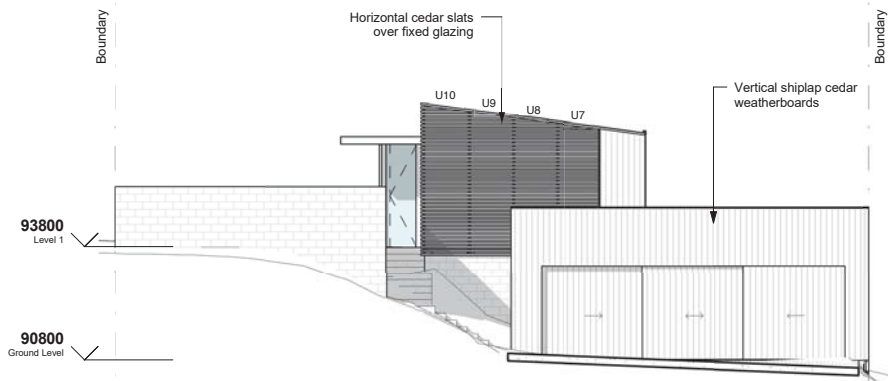
**IF GLAZING IS WITHIN 800MM OF FLOOR LEVEL AND SAFEGUARDS A FALL OF 1 M OR MORE. THE INNER PANE MUST BE A SAFETY GLASS TO TABLE 7 OF NZS 4223.3:2016**

Minimum glass thickness for inner pane. Occupancy type	Monolithic	Laminated
	Toughened	Annealed
A	10	12

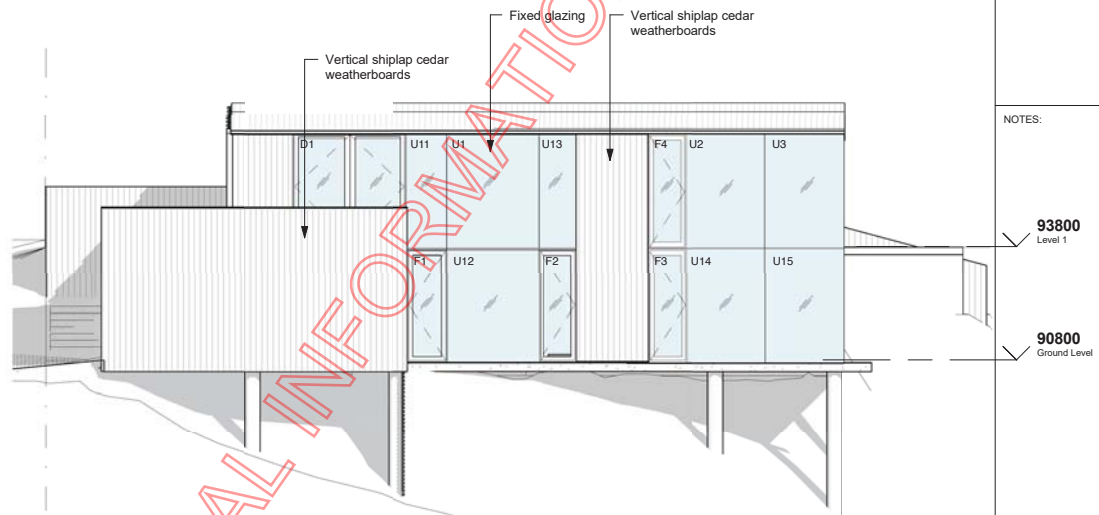
B, E & C3	10	12
C1/C2, D & C5	10	12

RELEASED UNDER THE OFFICIAL INFORMATION ACT

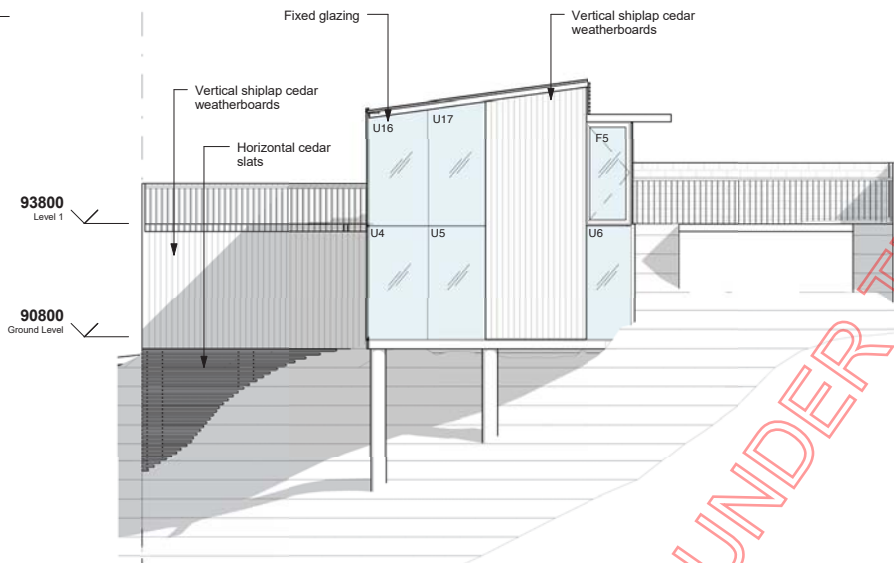




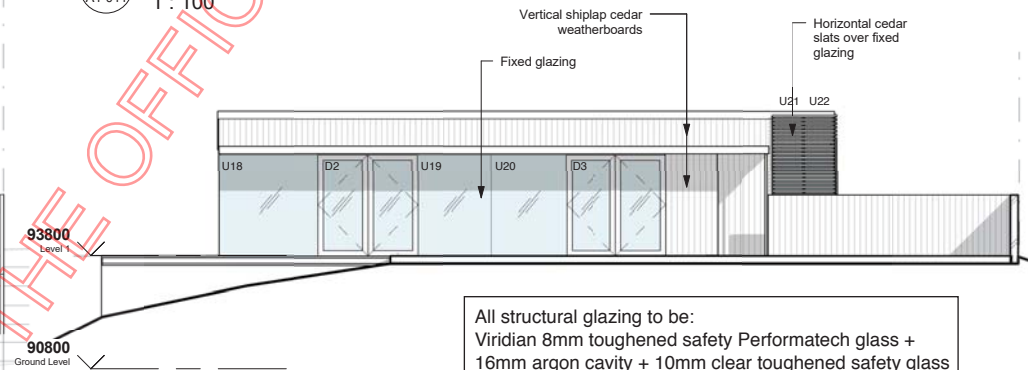
1 North West Elevation  
A1-011 1 : 100



2 South West Elevation  
A1-011 1 : 100



3 South East Elevation  
A1-011 1 : 100



4 North East Elevation  
A1-011 1 : 100

All structural glazing to be:  
Viridian 8mm toughened safety Performatech glass +  
16mm argon cavity + 10mm clear toughened safety glass

LOCAL AUTHORITY  
CONSULTANTS

NOTES:

93800 Level 1  
90800 Ground Level

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504  
**ISLAND BAY ROAD HOUSE**

6 Island Bay Road, Beach Haven

SHEET:  
**Elevations**

SCALES @ A2: 1 : 100  
SCALES @ A4: Half A2 scale

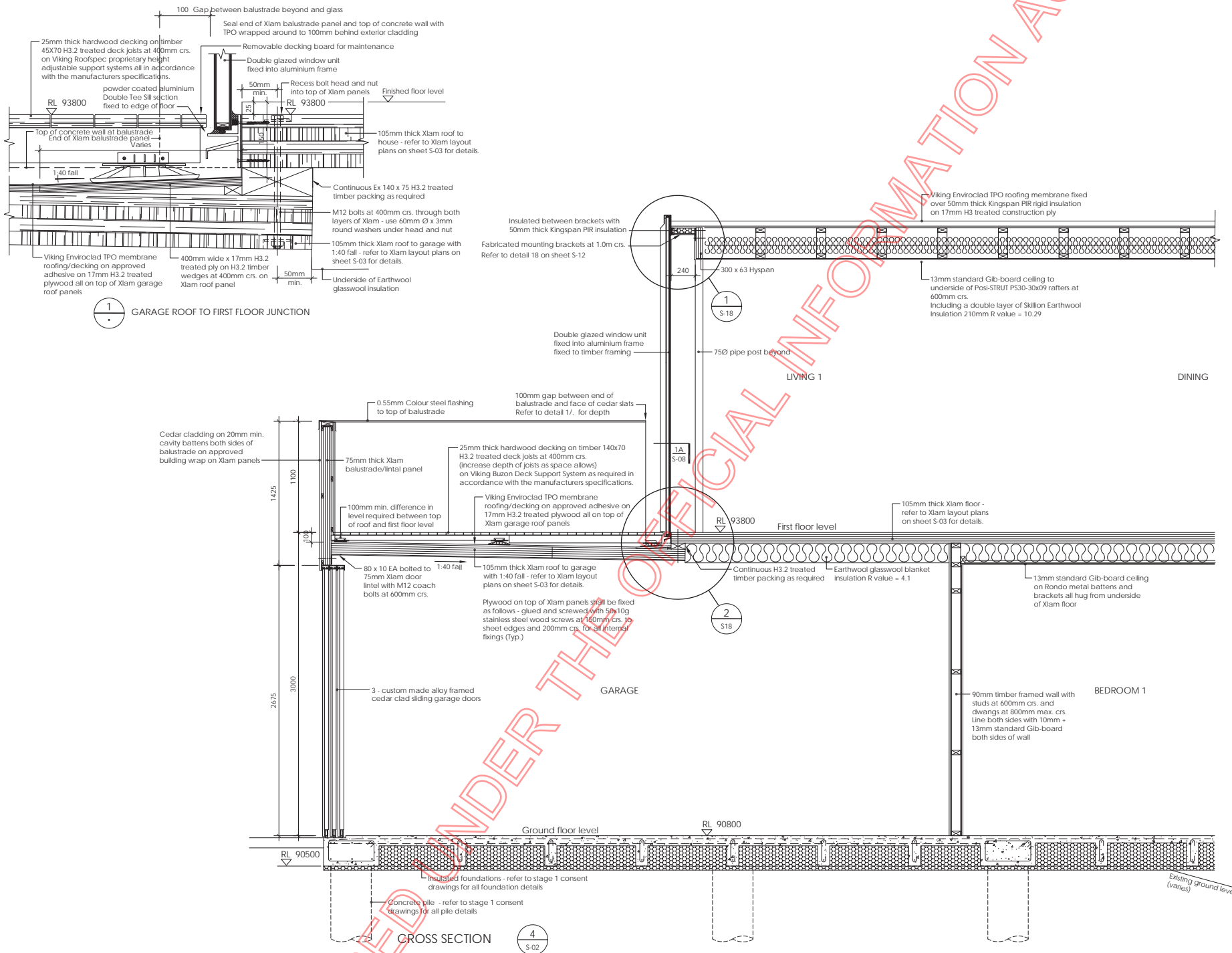
REF:  
DRAWN/START DATE: Author  
DRWG No: REVISION:  
**A1-401**

DO NOT SCALE  
CONTRACTOR MUST VERIFY ALL DIMENSIONS ON  
SITE BEFORE COMMENCING WORK

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07-Dec-17 5:42:09 PM

**BUILDING CONSENT**



LOCAL AUTHORITY:  
AUCKLAND CITY COUNCIL

CONSULTANT:  
s 9(2)(a)  
S. J. Robertson & Partners Ltd  
PO Box 71 065 Rosebank Road  
ph (09) 8200131  
cell

NOTES:

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504  
**ISLAND BAY ROAD HOUSE**  
6 Island Bay Road  
Beach Haven  
AUCKLAND

SHEET:  
**Garage/House Cross Section**

SCALES @ A2:  
SCALES @ A4: Half A2 scale

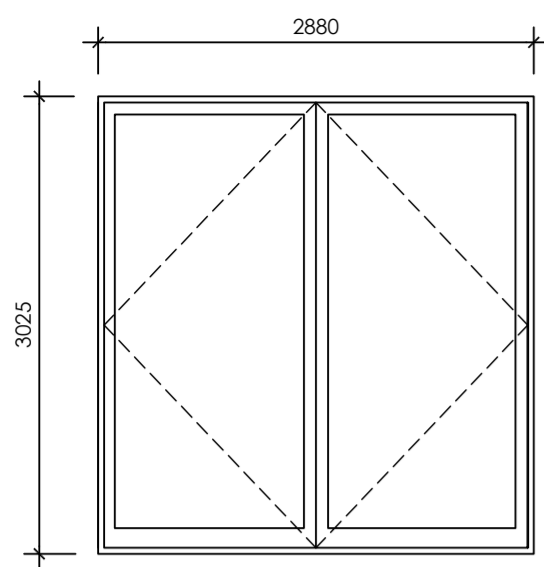
REF:  
DRAWN/START DATE: **Author**

DRWG No: **S-07** REVISION:

DO NOT SCALE  
CONTRACTOR MUST VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK

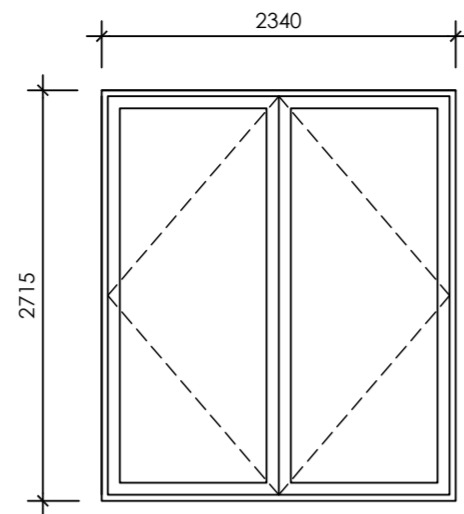
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DOOR 1 DESCRIPTION  
Aluminium framed double glazed double 1440 wide doors as shown.

D1 1 off  
door elevations Scale 1:50



DOOR 2 & 3 DESCRIPTION  
Aluminium framed double glazed 2700 wide sliding doors as shown.

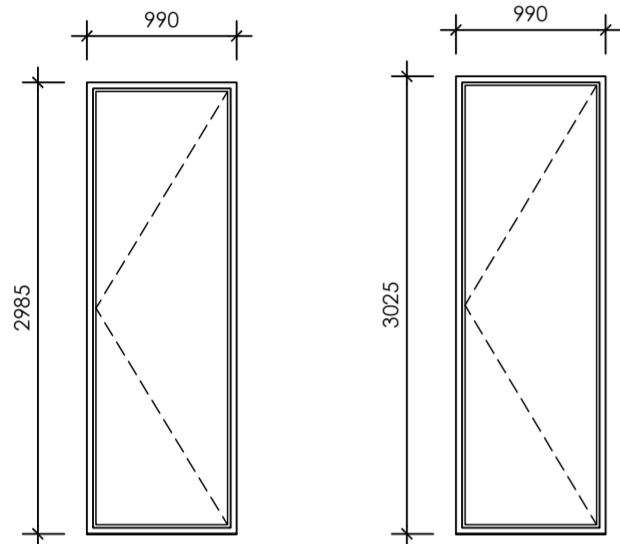
D2 & D3 1 off each

general notes:

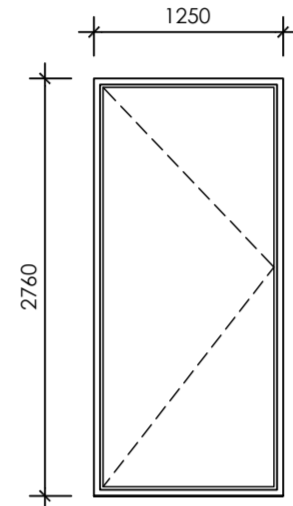
Refer to the floor plans and elevations for the door locations.  
"F" framed window dimensions shown are over the frame and "U" glazing unit dimensions shown are over the unit.  
All glazing units are low E double glazed glazing units.  
All windows and doors are elevated from the outside.  
All doors windows and glazing units are to be site measured before manufacture.  
All class is to be clear float glass.

glazing notes:

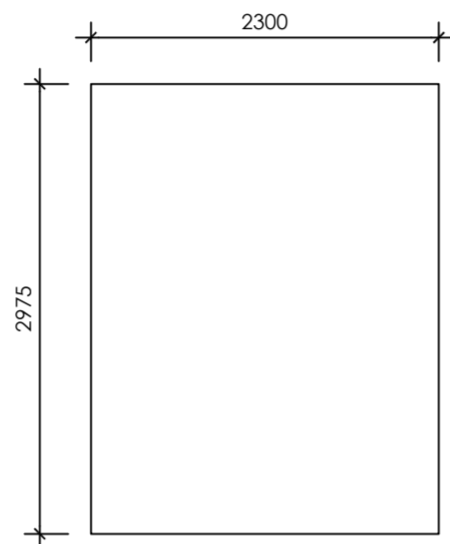
Safety glass is to be provided to all doors and windows as required by Building Code Clause F2 Hazardous Building Materials, and in accordance with NZS 4223: Part 3: 1999 Glazing in Buildings - Human Impact Safety Requirements All glazing to the dwelling to comply with NZS 4223 parts 1, 2 and 3



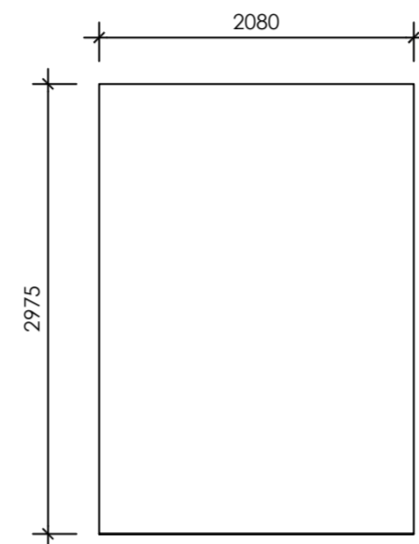
F1, F2 & F3 1 off each  
F4 1 off



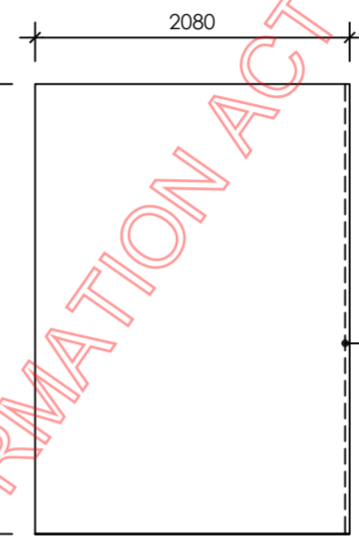
F5 1 off



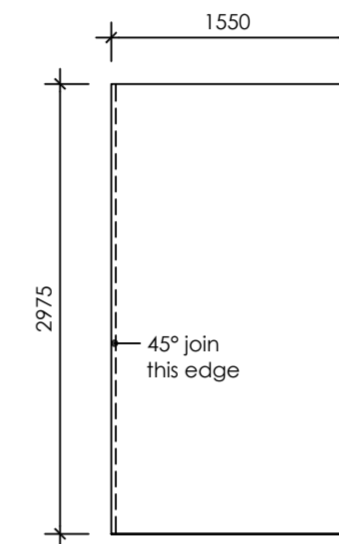
U1 1 off



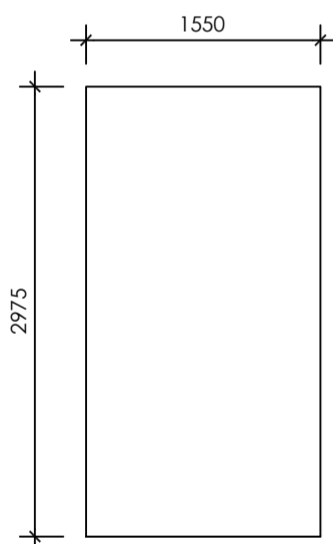
U2 1 off



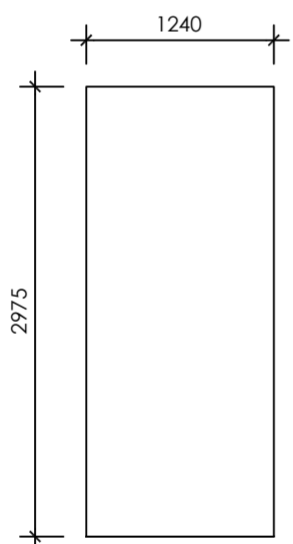
U3 1 off



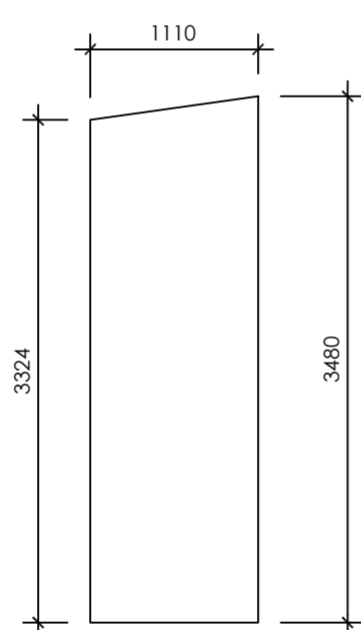
U4 1 off



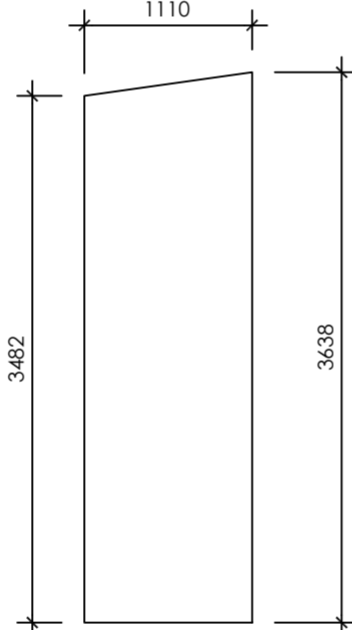
U5 1 off



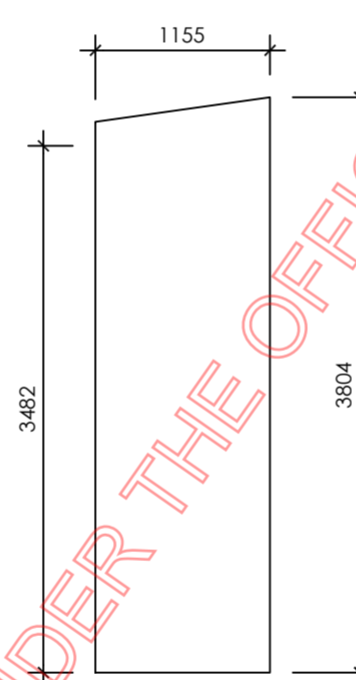
U6 1 off



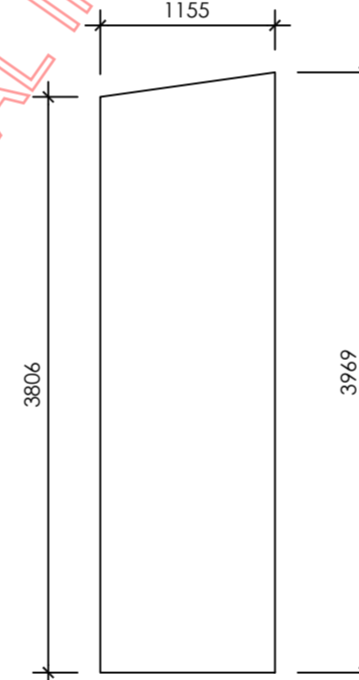
U7 1 off



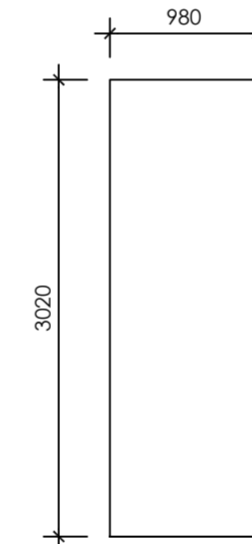
U8 1 off



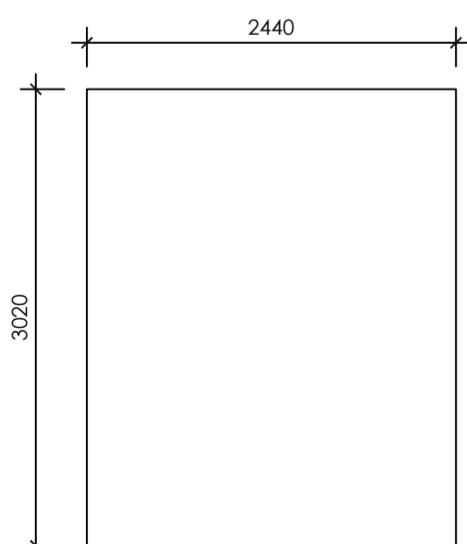
U9 1 off



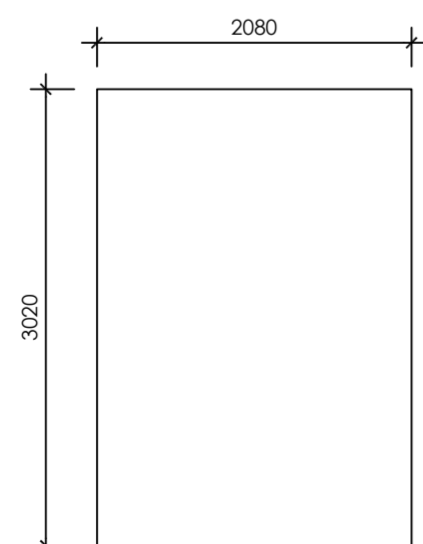
U10 1 off



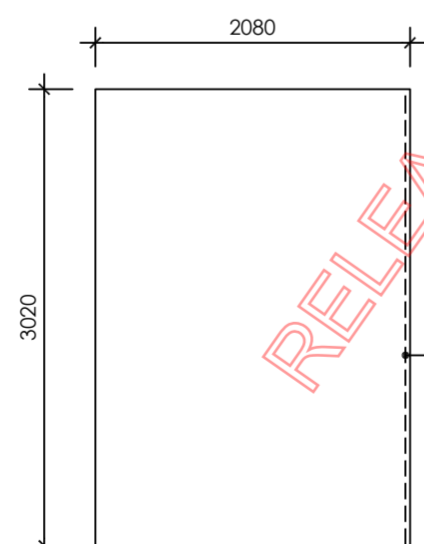
U11 & U13 1 off each



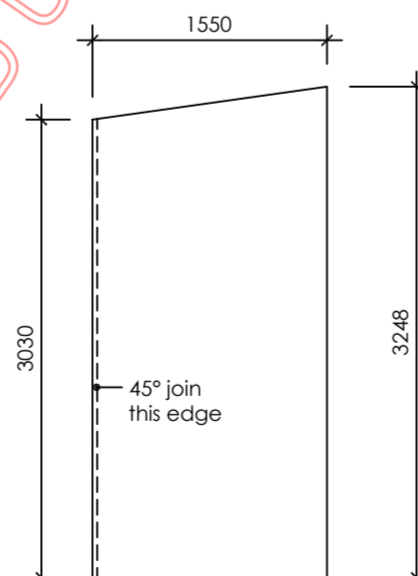
U12 1 off



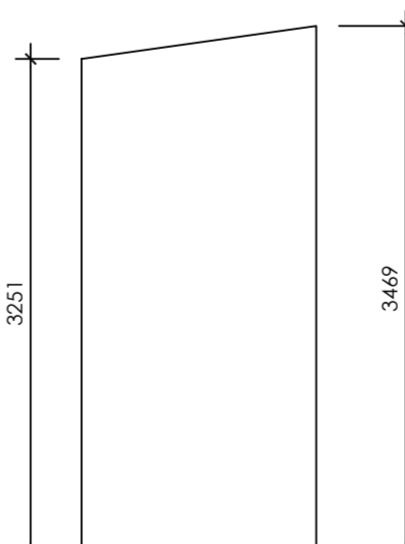
U14 1 off



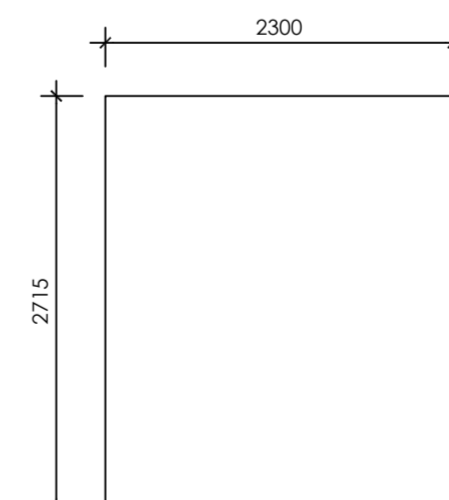
U15 1 off



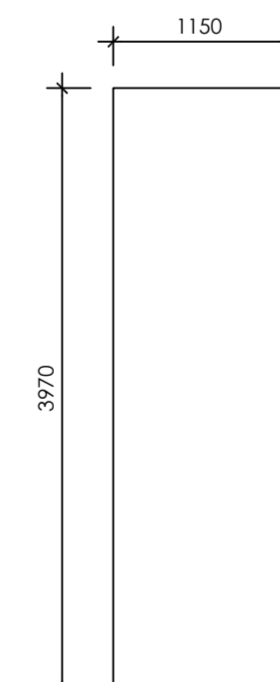
U16 1 off



U17 1 off



U18, U19 & U20 1 off each



U21 & U22 1 off each

window elevations Scale 1:50 @ A2

LOCAL AUTHORITY:  
AUCKLAND CITY COUNCIL

CONSULTANT:  
s 9(2)(a)  
Jackson Clapperton & Partners Ltd  
PO Box 71 065 Rosebank Road  
ph (09) 8200131  
cell

NOTES:

REVISION HISTORY:



PROJECT: No: 201504

ISLAND BAY ROAD HOUSE

6 Island Bay Road  
Beach Haven  
AUCKLAND

SHEET:  
DOOR AND WINDOW ELEVATIONS

SCALES @ A2:  
SCALES @ A4: Half A2 scale

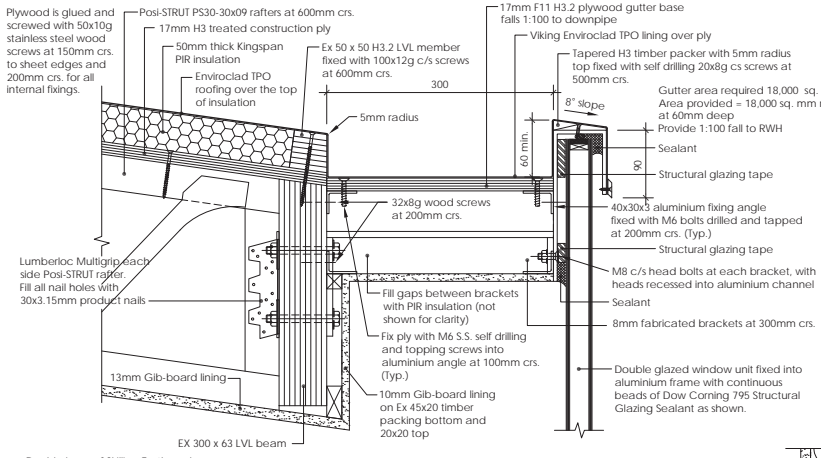
REF:  
DRAWN/START DATE: Author

DRWG No: REVISION:

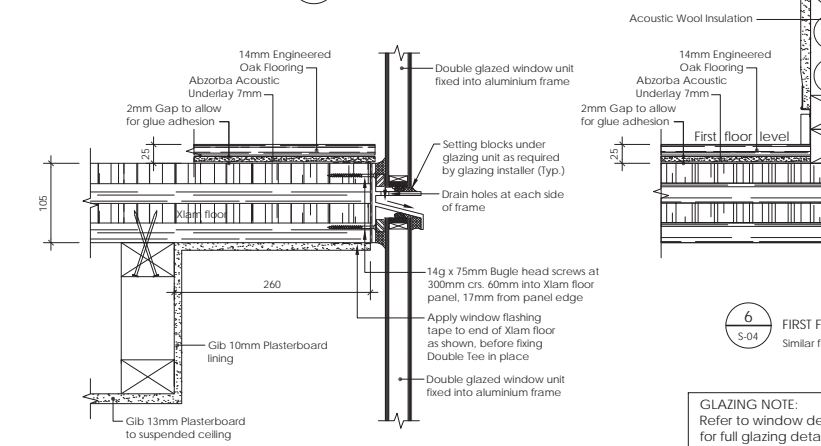
S-16

DO NOT SCALE  
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SITE BEFORE COMMENCING WORK

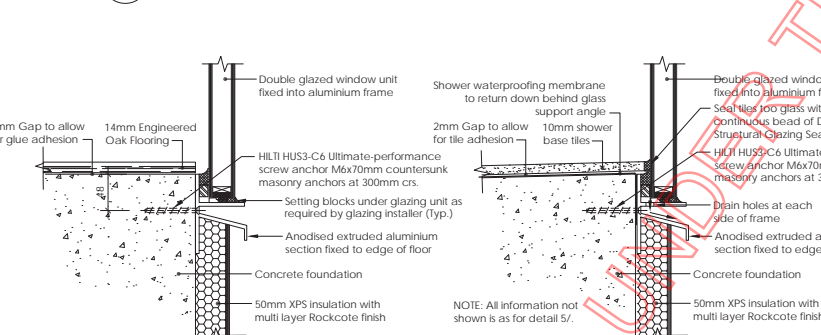
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Double layer of Skillion Earthwool  
Insulation 210mm (not shown for clarity)



Double layer of Skillion Earthwool  
Insulation 210mm (not shown for clarity)

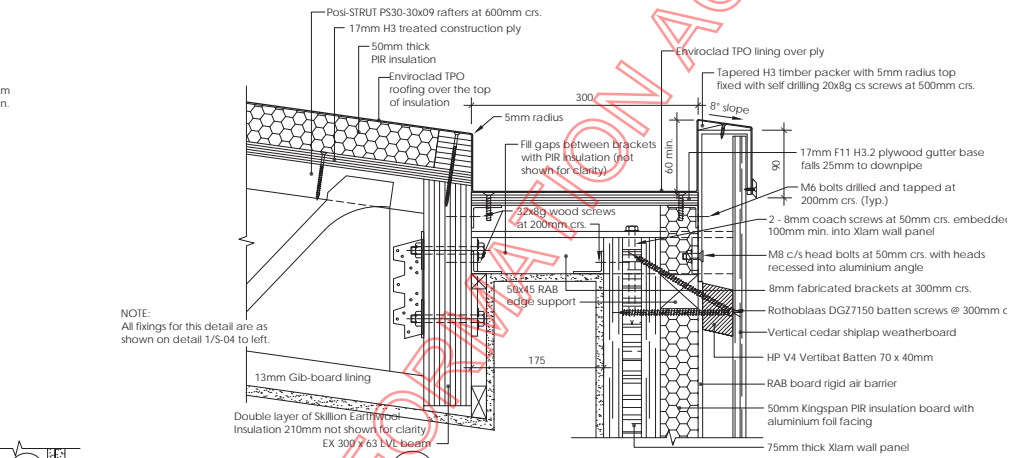


GLAZING NOTE:  
Refer to window details on sheet S-18  
for full glazing details.

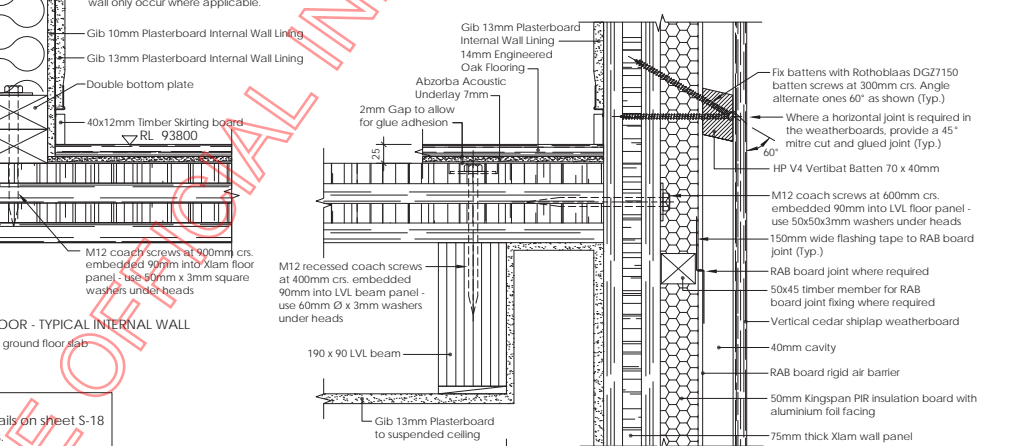
GLAZING NOTE:  
Refer to window details on sheet S-18  
for full glazing details.

GLAZING NOTE:  
Refer to window details on sheet S-18  
for full glazing details.

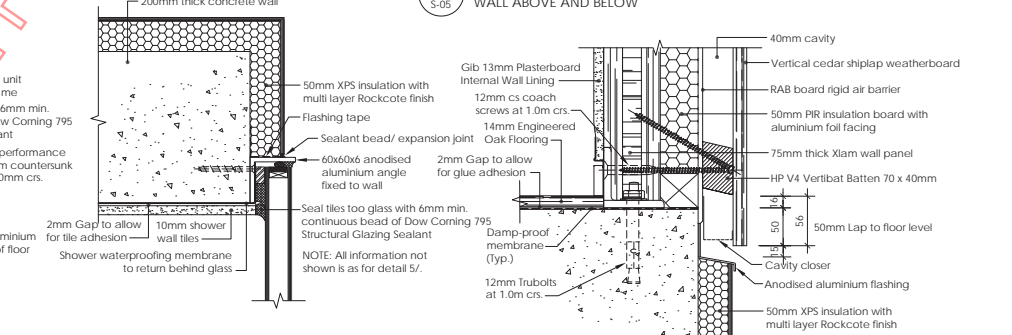
GLAZING NOTE:  
Refer to window details on sheet S-18  
for full glazing details.



Double layer of Skillion Earthwool  
Insulation 210mm (not shown for clarity)



Double layer of Skillion Earthwool  
Insulation 210mm (not shown for clarity)



Double layer of Skillion Earthwool  
Insulation 210mm (not shown for clarity)

Double layer of Skillion Earthwool  
Insulation 210mm (not shown for clarity)

Double layer of Skillion Earthwool  
Insulation 210mm (not shown for clarity)

Double layer of Skillion Earthwool  
Insulation 210mm (not shown for clarity)

LOCAL AUTHORITY:  
AUCKLAND CITY COUNCIL

CONSULTANT:  
s 9(2)  
CONTRACTOR: s 9(2)(a)  
PO Box 71 065 Rosebank Road  
ph (09) 8200131  
cell

NOTES:

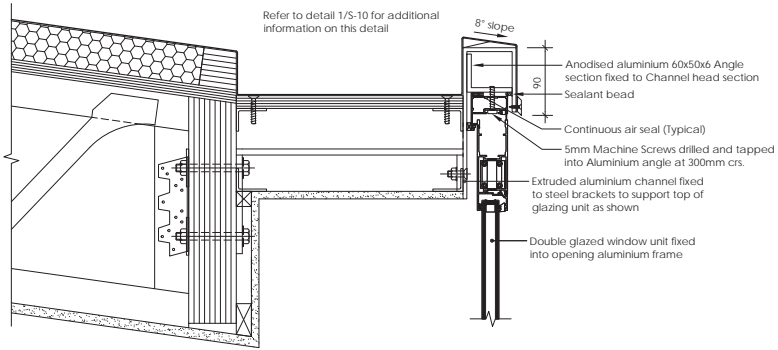
REVISION HISTORY:

PROJECT: No: 201504  
ISLAND BAY ROAD HOUSE

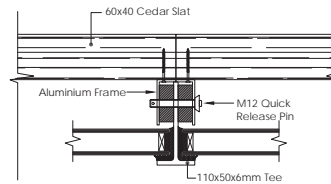
6 Island Bay Road  
Beach Haven  
AUCKLAND  
SHEET:  
DETAILS

SCALES @ A2:  
SCALES @ A4: Half A2 scale  
REF:  
DRAWN/START DATE: Author  
DRWG No: REVISION:

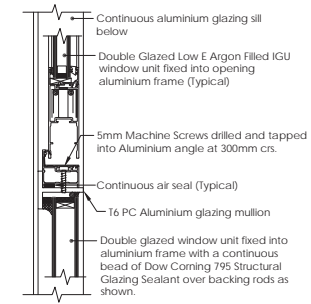
S-10  
DO NOT SCALE  
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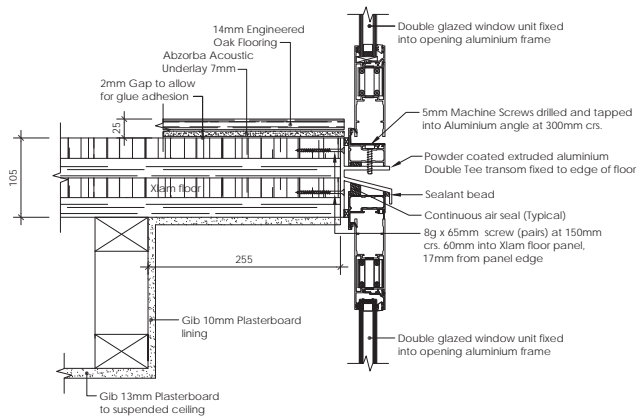
ROOF LEVEL  
EAVE/GUTTER DETAIL @ WINDOW



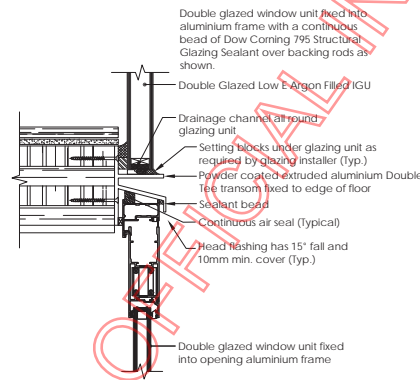
CEDAR SLAT - HORIZONTAL SECTION - FIXING DETAIL



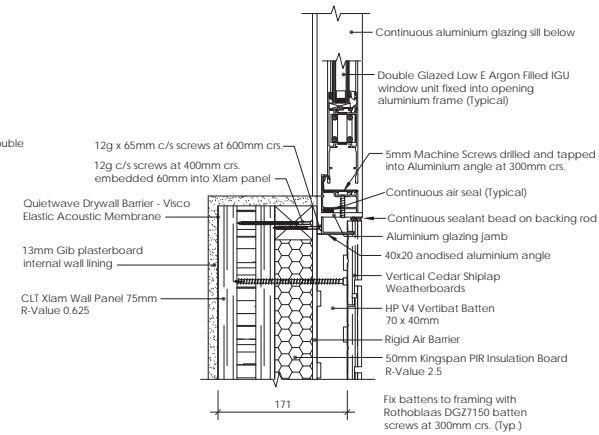
FIXED GLAZING/DOOR JAMB JUNCTION



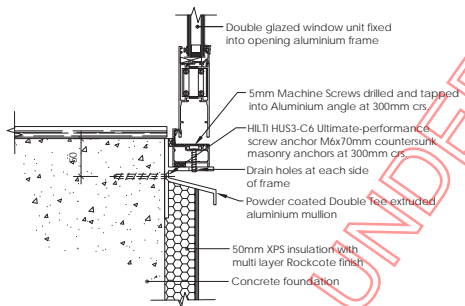
FIRST FLOOR  
WINDOW ABOVE AND BELOW



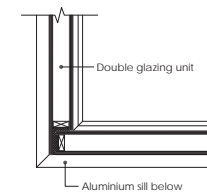
FIRST FLOOR  
FIXED WINDOW ABOVE AND OPENING WINDOW BELOW



WALL/WINDOW JAMB JUNCTION



TYPICAL OPENING WINDOW DETAILS Scale 1:5 @ A2



FIXED GLAZING CORNER DETAIL Scale 1:5 @ A2

GROUND FLOOR @ WINDOW

LOCAL AUTHORITY:  
AUCKLAND CITY COUNCIL

CONSULTANT:  
s 9(2)  
Skelton & Partners Ltd  
PO Box 71 065 Rosebank Road  
ph (09) 8200131  
cell

NOTES:

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504  
ISLAND BAY ROAD HOUSE

6 Island Bay Road  
Beach Haven  
AUCKLAND

SHEET:  
OPENING WINDOW DETAILS

SCALES @ A2:  
SCALES @ A4: Half A2 scale

REF:  
DRAWN/START DATE: Author

DRWG No: REVISION:

S-17

DO NOT SCALE  
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SITE BEFORE COMMENCING WORK

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NOTES:

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504

**ISLAND BAY ROAD HOUSE**

6 Island Bay Road  
Beach Haven  
AUCKLAND

**FIXED WINDOW DETAILS**

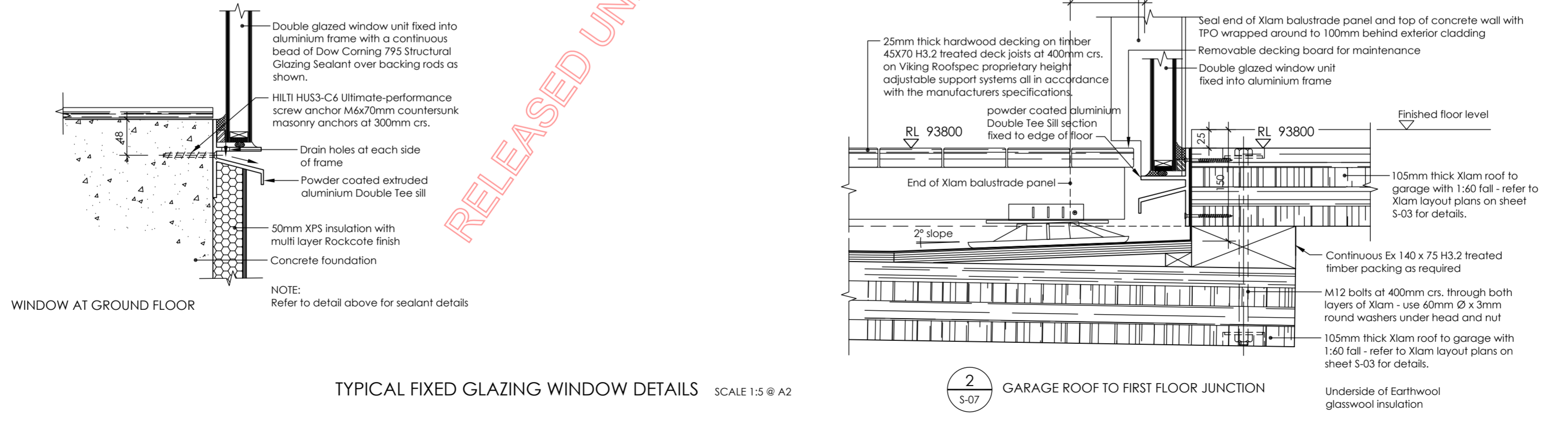
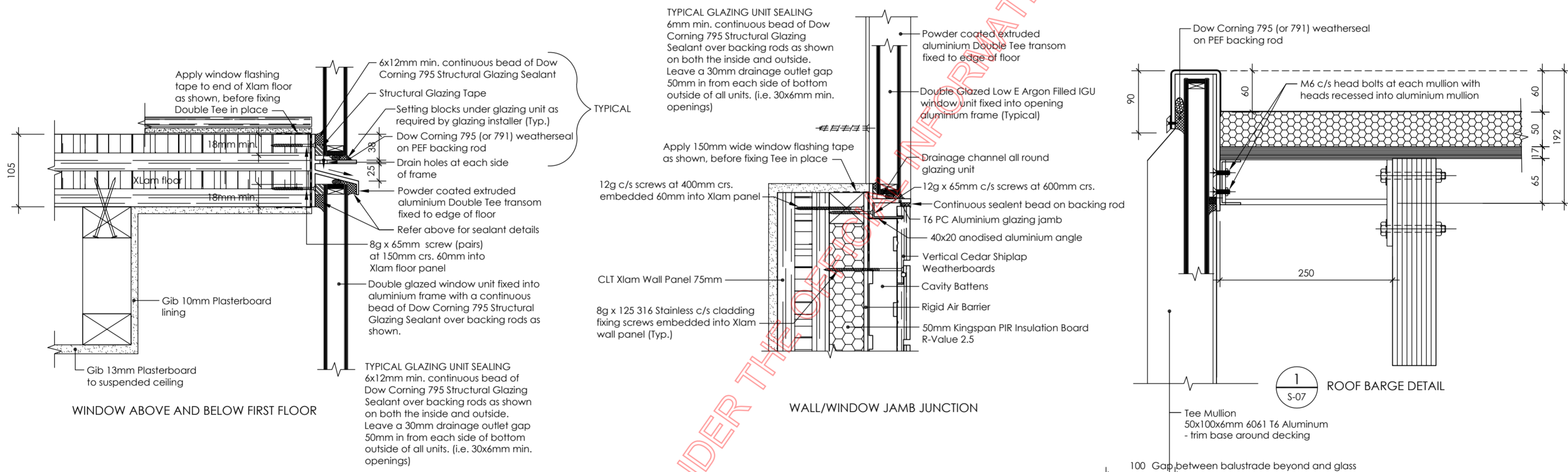
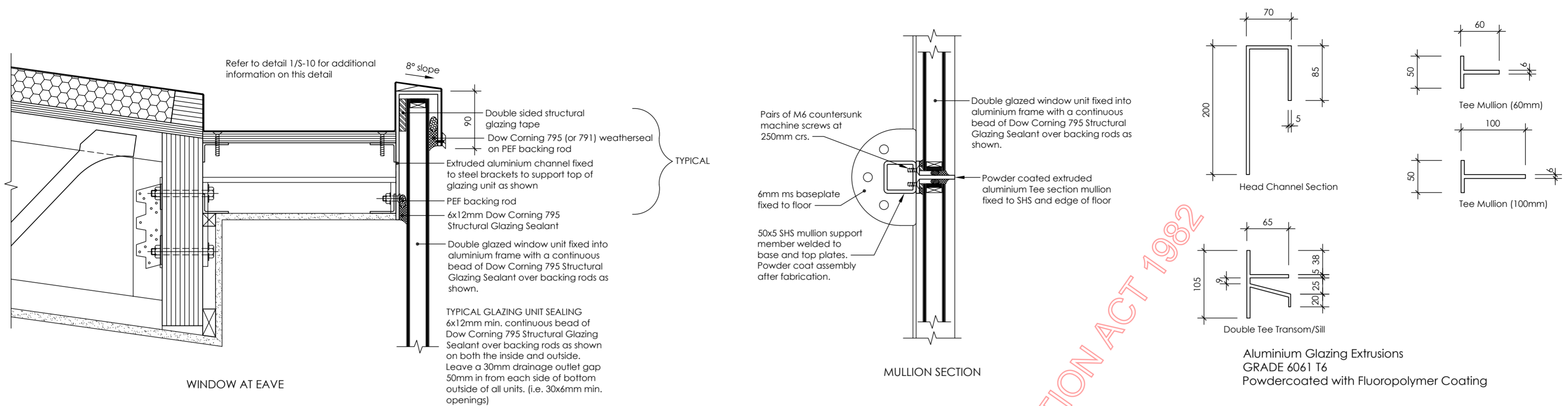
SCALES @ A2:  
SCALES @ A4: Half A2 scale

REF:  
DRAWN/START DATE: Author

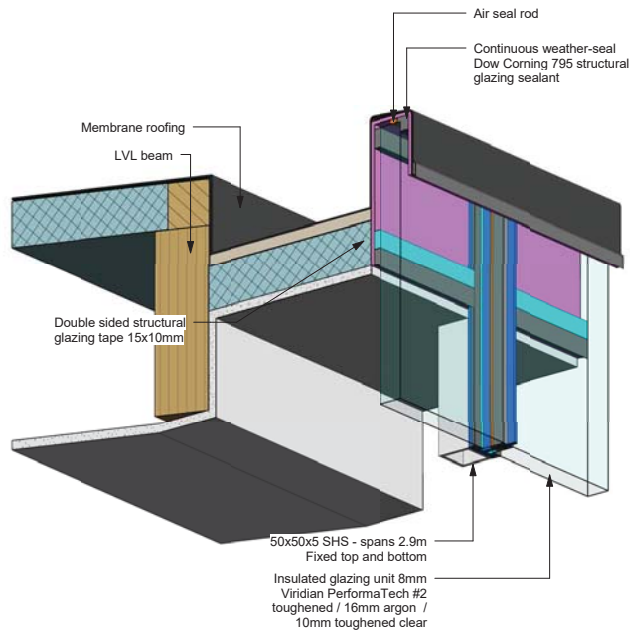
DRWG No: REVISION:

**S-18**

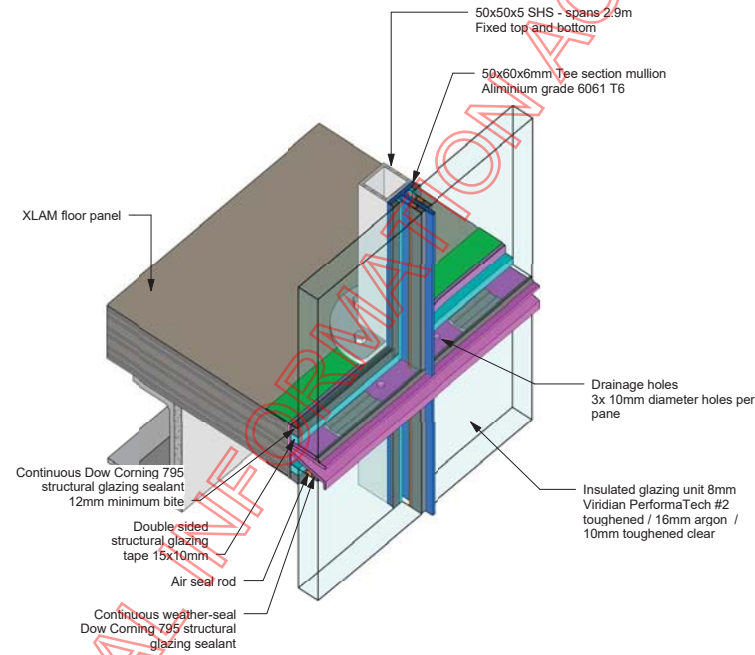
DO NOT SCALE  
CONTRACTOR MUST VERIFY ALL DIMENSIONS ON  
SITE BEFORE COMMENCING WORK



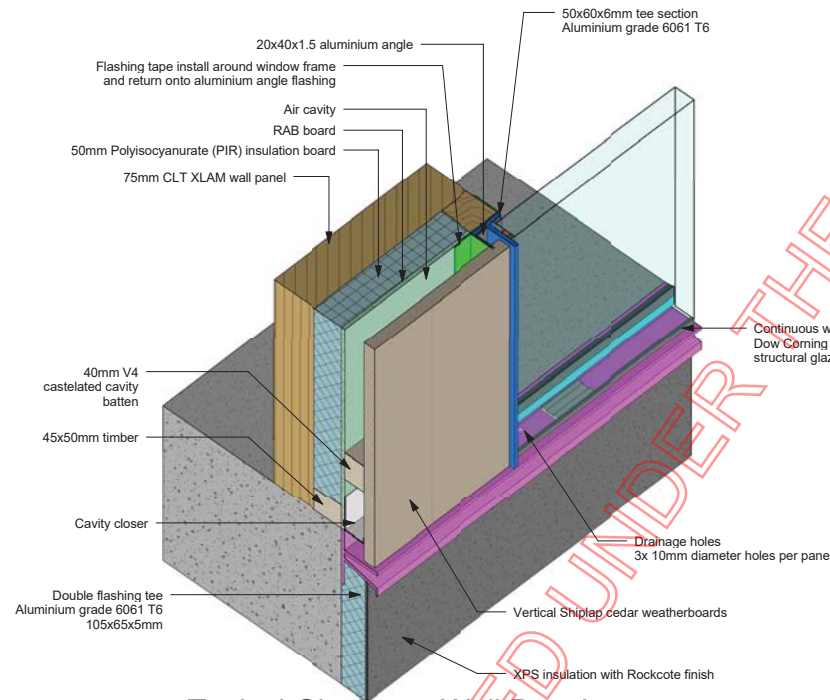
RELEASED UNDER THE OFFICIAL INFORMATION ACT 1982



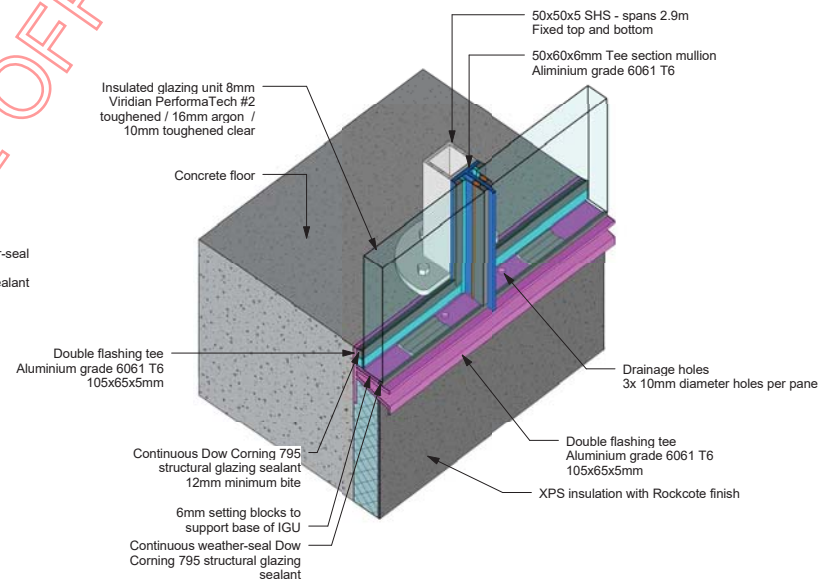
3 Typical Glazing Head Isometric Detail



1 Typical Glazing Isometric Detail



2 Typical Glazing to Wall Panel Isometric Detail



4 Typical Glazing Sill Isometric Detail

LOCAL AUTHORITY

CONSULTANTS

NOTES:

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504

ISLAND BAY ROAD HOUSE

6 Island Bay Road, Beach Haven

SHEET: Typical Glazing Details

SCALES @ A2: SCALES @ A4: Half A2 scale

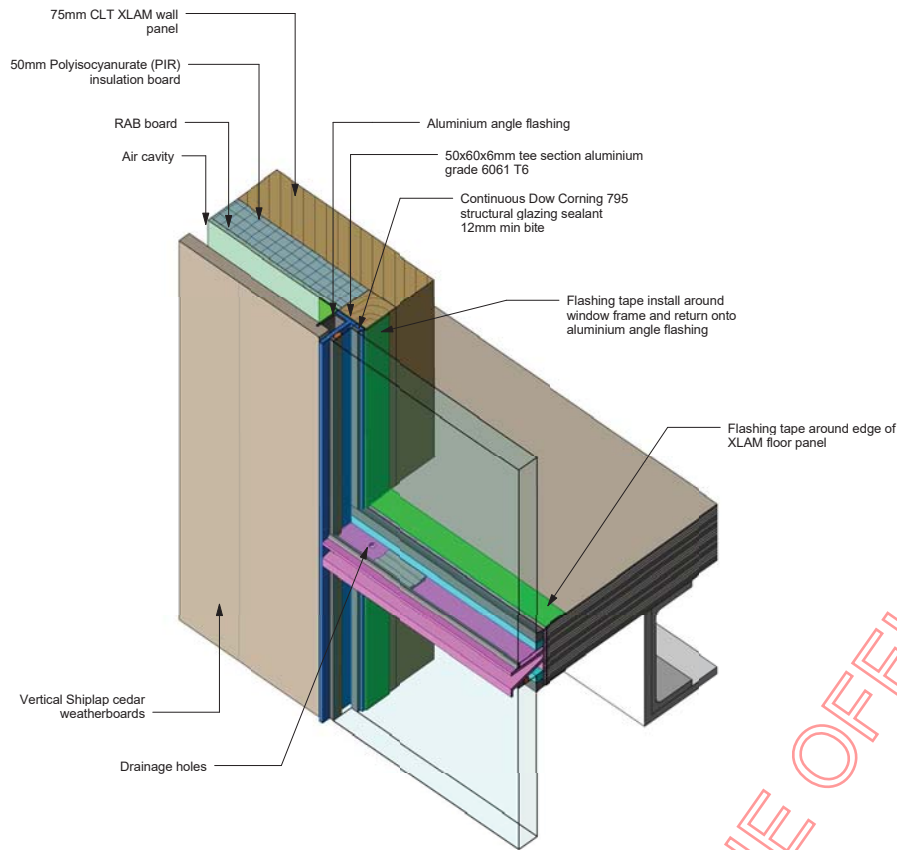
REF: DRAWN/START DATE: Author

DRWG No: A4-202 REVISION:

DO NOT SCALE CONTRACTOR MUST VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK

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BUILDING CONSENT



1 Typical Glazing to Wall Panel  
Isometric Detail at Midfloor

BASED UNDER THE OFFICIAL INFORMATION ACT

LOCAL AUTHORITY  
CONSULTANTS

NOTES:

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504  
ISLAND BAY ROAD  
HOUSE

6 Island Bay Road, Beach  
Haven

SHEET:  
Typical Glazing Details -  
Sheet 2

SCALES @ A2:  
SCALES @ A4: Half A2 scale

REF:  
DRAWN/START DATE: Author

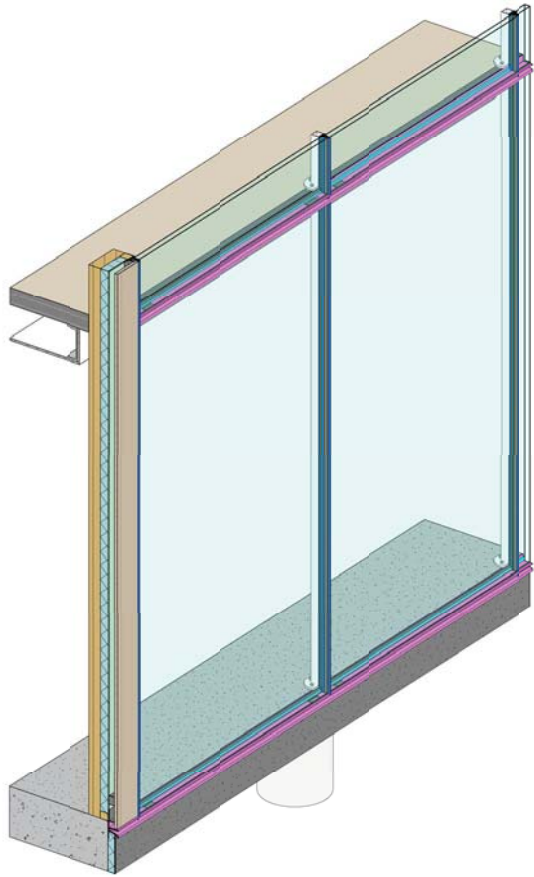
DRWG No: REVISION:  
A4-203

DO NOT SCALE  
CONTRACTOR MUST VERIFY ALL DIMENSIONS ON  
SITE BEFORE COMMENCING WORK

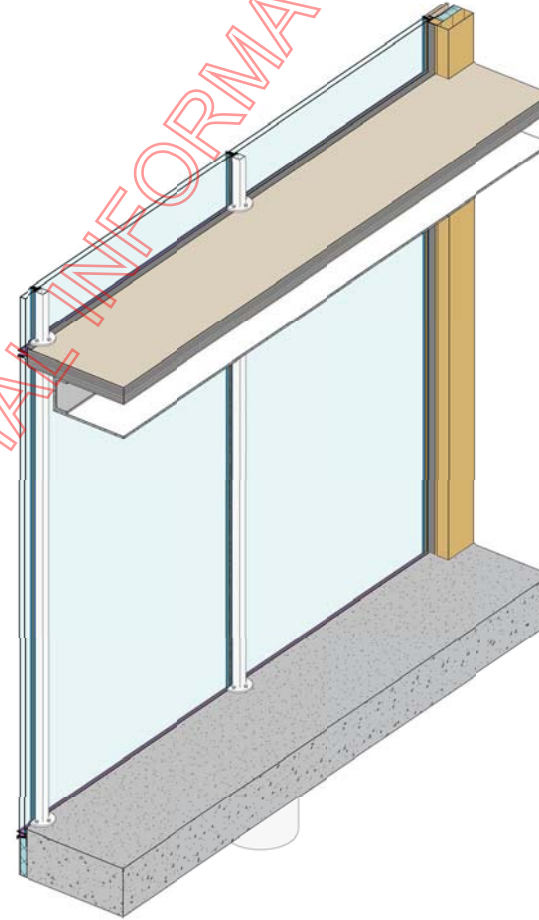
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07-Dec-17 5:42:18 PM

BUILDING CONSENT





1 Typical Glazing Panels - 3D



2 Typical Glazing Panels - 3D Interior

RELEASED UNDER THE OFFICIAL INFORMATION ACT

LOCAL AUTHORITY
CONSULTANTS
NOTES:
REVISION HISTORY:
s 9(2)(a)
PROJECT: No: 201504
<b>ISLAND BAY ROAD HOUSE</b>
6 Island Bay Road, Beach Haven
SHEET:
<b>Typical Glazing Details - Sheet 3</b>
SCALES @ A2:
SCALES @ A4: Half A2 scale
REF:
DRAWN/START DATE: Author
DRWG No: A4-204
REVISION:
DO NOT SCALE CONTRACTOR MUST VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK
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07-Dec-17 5:42:25 PM

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**From:** Malcolm McCluskey <Malcolm.McCluskey@aucklandcouncil.govt.nz>  
**Sent:** Thursday, 1 February 2018 9:32 a.m.  
**To:** Sue Brown  
**Cc:** s 9(2)(a) Determinations  
**Subject:** Draft determination for 6 Island Bay Road, Beach Haven, Auckland (Ref 2975)  
[UNCLASSIFIED]

Dear Ms Brown

My Instructing Officer has sent the comment below through to me, which MBIE may wish to consider before finalising the Determination:

Clause 5.1.3 (of draft determination) makes reference to the applicant having an E2/VM1 test on the joinery.

E2/VM1 is not a test of the joinery, but of the junction between the joinery and the cladding

# Verification Method

## 1.0 Cladding systems of buildings, including junctions with windows, doors and other penetrations

### 1.1 General

This Verification Method is for determining compliance with NZBC E2.3.2 of *cladding systems* and associated window and door junctions only, for *buildings* of importance Levels 1 or 2 as described in Table 1.1(a) of NZS 3604.

The tests in this Verification Method shall be undertaken in a test facility with IANZ or equivalent accreditation for testing the *weathertightness* of *claddings* to the procedures of AS/NZS 4284, and as used to establish the performance criteria detailed in Paragraph 1.4 Test Procedures.

#### COMMENT:

The *weathertightness* testing of AS/NZS 4284 is modified in this Verification Method for generic domestic-oriented *cladding* because the Standard was developed primarily for testing specific, non-absorptive facades and curtain wall systems on high-rise commercial *buildings*.

### 1.2 Scope

1.2.1 The scope of this Verification Method shall be restricted to *buildings* that:

- a) are in accordance with the scope of Paragraph 1.0 of E2/AS1, and within the *wind zones* covered by Section 5 of NZS 3604, and
- b) have *claddings* that include a drained and vented cavity of nominal 20 mm minimum depth with minimum ventilation opening of 1000 mm<sup>2</sup>/m at the foot, including any *claddings* that require a rigid *wall underlay* in accordance with Paragraph 9.1.7.2 of E2/AS1, and
- c) include window and door units that are manufactured to comply with the relevant requirements of NZS 4211, and



d) may include *buildings* based on (a), (b) and (c) above, but with specific engineering design frame elements of at least equivalent stiffness to the *framing* provisions defined in NZS 3604.

**1.2.2** This Verification Method may also be used for individual *buildings* that comply with (a) to (d) above, and that are designed for a specific wind pressure up to a maximum ultimate limit state (ULS) of 2500 Pa.

**COMMENT:**

While the test specimens used for this Verification Method may include window and door units, it is only the junctions of these elements with other *cladding* elements that are assessed in the test.

So as you will see the test in clause 1.1 it refers to the test is for junctions between the cladding and joinery NOT the joinery itself. It is the joinery in this determination that is in question.

Clause 1.2.1 (b) have claddings that include a drained and vented cavity of nominal 20mm .....The joinery does not have a drained and ventilated cavity. They are double glazed yes, but this is for thermal performance so the area between the two panes of glass are sealed NOT drained and ventilated.

Clause 1.2.1 (c) include windows and doors.... Manufactured to comply ...NZS4211. This is the joinery test. (I refer to it in my letter 4 Aug 18)

The comment is also relevant in this instance (Shaded in grey)

#### 1.4.4 Series 2 'Water Management Testing'

Paragraphs 1.4.2 and 1.4.3 shall be repeated, following the formation of 6 mm diameter holes through the *wetwall* as allowed in AS/NZS 4284 Clause 9.9 in at least 4 places, as noted below:

- a) Through the window/wall joint at 3/4 height of both window/door jambs,
- b) Immediately above the head *flashing*,
- c) Through the external sealing of the horizontal and vertical joints, and
- d) Above any other *wetwall* penetration detail.

The introduction of defects is intended to simulate the failure of the primary weather-defence/sealing. It must only penetrate to the plane of the back of the *wetwall* so the water management of the cavity can be assessed.

**1.4.4.1** Immediately upon the conclusion of the Water Management Tests (within 30 minutes) (Paragraph 1.4.4), the layers behind the *wetwall* that support air pressure (including sealing in the window trim cavity) shall be removed, and any evidence of non-compliance (as defined in Paragraph 1.4.5.3) noted.

Amend 5  
Aug 2011

### 1.4.5 Series 3 'Wetwall Test'

**1.4.5.1** Repeat Paragraph 1.4.3 with an air pressure of 50 Pa, applied across the *wetwall* only, for 15 minutes.

**1.4.5.2** Non-compliance shall be the presence of water (as defined in Paragraph 1.4.5.3) after carrying out the tests in Paragraphs 1.4.2 and 1.4.3, and the subsequent 'water management' tests (or evidence of any water) on the removed surfaces of the cavity.

**1.4.5.3** Water which is able to penetrate to the back of the *wetwall* through introduced defects and joints shall be controlled. It may contact battens and other cavity surfaces, but no water shall be transferred to the plane of the *wall underlay*, cavity air sealing or structural *framing* due to a design or systemic failure. Water that may arrive on the *underlay* due to an 'isolated blemish' may be disregarded. No water may drip through an air-space within the cavity where it is possible for water to impact on a surface in the cavity and splash onto the *wall underlay*. However, the spattering of water into the cavity through the introduced defects shall be ignored.

During the *Wetwall Test*, water is allowed to spatter up from the footer *flashing*, provided it is not held above any cavity obstruction.

The above clauses (from E2/VM1 1.4.4, 1.4.4.1 and 1.4.5.3) cannot be undertaken on the joinery.

**Malcolm McCluskey | Senior Solicitor**  
**Civil Litigation, Legal Services**  
DDI 09 890 2967 | EXT (46) 2967 | Mob s 9(2)(a)  
Auckland Council, Level 11, 135 Albert Street, Auckland  
Private Bag 92300, Victoria St West, Auckland  
Visit our website: [www.aucklandcouncil.govt.nz](http://www.aucklandcouncil.govt.nz)



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---

**From:** Corban Walls s 9(2)(a)  
**Sent:** Thursday, 8 February 2018 5:49 p.m.  
**To:** Determinations  
**Cc:** Malcolm McCluskey  
**Subject:** Re: Draft determination for 6 Island Bay Road, Beach Haven, Auckland (Ref 2975)  
[UNCLASSIFIED]  
**Attachments:** SC654E0078417112412020.pdf; SKMBT\_C451 17080413400.pdf  
**Categories:** sent to Emma

Hi Emma,

Thanks for your email update!

In reference to the communication from Malcolm McCluskey and specifically the letter from Robert Woodger dated 4th August 2017; (attached)  
*'The aluminium joinery, which we have discussed, and I have subsequently discussed with my manager, remains a concern. Other than the AAMA field test for weather-tightness, nothing else has been provided to demonstrate compliance. As explained, when using E2/AS1 for guidance, NZS4211:2008 (specification for the performance of windows) is the testing standard referenced. Again this is not to say this is the only standard that can be used, however having said that, it is important to understand the NZS4211 test is not just for weather-tightness but includes other tests. Council need more information to be satisfied compliance will be achieved'*.

In this statement Robert Woodger clearly states that NZS4211 is not the only standard that can be used to demonstrate compliance of the proposed fixed glazing. The email from Malcolm McCluskey dated 1st February 2018 seems to contradict this statement referring to NZS4211 as the appropriate standard for the glazing. **Furthermore and more importantly** Malcolm McCluskey accepted the draft determination by way of letter on the 24th November 2017 (attached) so does this not excluded Auckland Council from further discussion? How can they accept the determination draft and then argue it?

As you can see from the documentation I've provided that I've spent a lot of time, money, and resource ensuring I undertook the correct testing and engineering as advised in the draft determination. Personally I find it ridiculous when considering all the unnecessary delays caused by Auckland Council that they've had the audacity to question the Draft Determination, especially given the ambiguity of their questioning throughout the assessment of our Building Consent application over the past 15 months. I find the incompetence and lack of internal communication within Auckland Council appalling and it has caused my family a lot of stress and significant financial loss. I just want to move on from this experience and complete the build of our family home.

I look forward to hearing from you.

Kind regards, Corban

s 9(2)(a)

Corban Walls  
s 9(2)(a)

s 9(2)(a)

On 8/02/2018, at 4:04 PM, Determinations <[determinations@mbie.govt.nz](mailto:determinations@mbie.govt.nz)> wrote:

Hi Corban,

Thank you for your email.

The documentation you provided is currently being reviewed. We are aiming for the final determination to be out by the end of this month and we'll keep you updated of its progress should there be any delays.

Please contact us if you have any further questions.

Kind regards,

**Emma van den Eykel**

ADVISOR DETERMINATIONS

Determinations | Housing and Tenancy Services | Market Services

Ministry of Business, Innovation & Employment

Hīkina Whakatutuki – Lifting to make successful

[Emma.vandeneysel@mbie.govt.nz](mailto:Emma.vandeneysel@mbie.govt.nz) | Telephone +64 4 901 8618

15 Stout St, PO Box 1473, Wellington 6140

<image002.jpg>

Please note: all correspondence relating to this determination should be addressed to [determinxxxxx@xxxx.xxt.nz](mailto:determinxxxxx@xxxx.xxt.nz) and copied to all parties involved

---

**From:** Corban Walls s 9(2)(a) ]

**Sent:** Thursday, 8 February 2018 11:44 a.m.

**To:** Ginny Carter

**Cc:** [Malcolm.McCluskey@aucklandcouncil.govt.nz](mailto:Malcolm.McCluskey@aucklandcouncil.govt.nz); Determinations; Sue Brown

**Subject:** Re: Draft determination for 6 Island Bay Road, Beach Haven, Auckland (Ref 2975)

[UNCLASSIFIED]

Hi Ginny,

I just thought I'd touch base with you to see how things are progressing with the determination for our fixed glazing?

Thanks, Corban

<image003.jpg>

Corban Walls

s 9(2)(a)

On 1/02/2018, at 5:22 PM, Corban Walls s 9(2)(a) wrote:

Hi Ginny,

In response to the draft determination I have provided and undertaken the following:

Following instruction from the Determination Draft I've had the fixed glazed cladding system tested accordingly, and undertaken the following testing in accordance with AS/NZS 4284 and E2/VM1. The structure has been checked by a structural engineer as being sufficient for this specific situation.

The testing concluded that there were no leaks in the glazing or aluminium framing. (see attached test report for details). The fixed glazing relies on two barriers of sealant to maintain watertightness, the primary weather seal and also the structural glazing sealant bead. The testing showed that even in the case of severe deterioration of the primary weather seal (holes were cut into the seal during testing) that there were still no leaks as the structural glazing sealant bead acted as a secondary defence against the ingress of water. The Dow Corning 795 sealant comes with a 20 year warranty on this specific project.

Preconditioning Test: (PASSED)

Apply a preconditioning loading to the external face of the test sample for a period of 1 minute of positive pressure, followed by a period of 1 minute of negative pressure (suction) at 1515 Pa.

Series 1: Static Water Penetration (PASSED)

Test pressure 455 Pa Duration 15 minutes

Series 1: Cyclic Water Penetration (PASSED)

Test pressure 455-910 Pa Duration 5 minutes

Series 2: Water Management Tests Static Water Penetration (PASSED) Test pressure 455 Pa Duration 15 minutes

We couldn't practically drill 6mm holes in the primary weather seal as it would've broken the glass so we cut 30x3mm holes in the seals to simulate seal degradation. A 6mm diameter hole has an area of 28mm<sup>2</sup> where as a 30x3mm rectangular hole has an area of 90mm<sup>2</sup>, over three times the required size.

Series 2: Water Management Tests Cyclic Water Penetration (PASSED) Test pressure 455-910 Pa Duration 5 minutes

Series 3: Wetwall Test Static Water Penetration (NOT POSSIBLE)

Test pressure 50 Pa Duration 15 minutes

As the glass cladding is comprised of fully sealed glass panels there is no wall underlay to remove to make this portion of the test possible. With a window system, any leaks will be evident as opposed to a cladding system on timber



framing, which can cause structural damage without any visible signs until it's well advanced.

#### Onsite Testing:

I also propose that a condition of this design is to undertake an AAMA 501.2 onsite water tightness testing after installation but before wall linings are installed to prove the system performance in this specific application. The onsite test is a quality assurance test to check everything has been installed correctly.

- Added a head flashing above all the glazing panels that have a fall of 15° and a minimum cover of 10mm to align with the Acceptable solutions of E2/AS1 and to add a 'mitigating feature'.
- Have amended the multitude of errors and inconsistencies across the consent drawings to clearly demonstrate the specific structural glazing adhesive and how it should be used.
- Provided accurate drawings showing the exact size of all the glazing members.
- Provided B1 calculations and a producer statement for the structure supporting the glazing including loading and fixing of the sill.
- Designed a maintenance schedule for the building to ensure it is maintained consistently and correctly
- Verified the design by undertaking E2/VM1 testing at FACADE LAB, an IAONZ Accredited facility.

#### Responses:

4.3.9 Compatibility testing is performed on material samples of the actual 'run' of material being used for this specific project. The test is undertaken to test the adhesion performance of the structural glazing sealant to the coating on the aluminium extrusion. To perform this test on any other material would be deemed pointless. This is industry standard practice for structural glazing.

4.3.10 I've since received design approval from Dow Corning and have had the PS1 updated to reflect this.

4.3.11 I've received confirmation from Dow Corning that the 795 Structural Glazing Sealant is suitable for use in wet areas and for use with the granite and stone tiles. I have highlighted these points within the Dow Corning 795 Product Specification. I have also clarified that the portion of 795 Sealant used to structurally hold the glass in place is distinctly different from the 795 sealant used to seal the tile even though they are the same product they serve different purposes in this application.

Please find attached documentation.

I look forward to hearing from you.

Thanks, Corban

<sp\_signature.jpg>

Corban Walls  
s 9(2)(a)

<20171212155029.pdf>  
<ENG Island Bay Road Glazing signed.pdf>  
<Glazing Eng Calcs.pdf>  
<Island Bay Road - Full Final Set 13-12-17.pdf>  
<PS1 - 6 Island Bay Rd Rev A.pdf>  
<FLL Custom Test 1721 Special Projects.pdf>  
<Island Bay Road House Maintenance Schedule.pdf>

On 17/01/2018, at 11:32 AM, Ginny Carter  
<[Ginny.Carter@mbie.govt.nz](mailto:Ginny.Carter@mbie.govt.nz)> wrote:

Dear All

The draft determination was sent to you on 10 November 2017, as attached. We asked for the response sheet to be completed and returned by the 24 November 2017. To date, we do not appear to have received a response from you.

We appreciate you may have overlooked the earlier request, so I have enclosed a response sheet and extended the due date to 2 February 2018. Please respond before this date.

If you cannot make this deadline, please contact the Determinations team on 0800 242 243 or [determinations@mbie.govt.nz](mailto:determinations@mbie.govt.nz).

Yours sincerely

**Ginny Carter**

ADMINISTRATOR, DETERMINATIONS

Housing & Tenancy Services, Market Services  
Ministry of Business, Innovation & Employment  
*Hikina Whakatutuki - Lifting to Make Successful*

[xxxxx.xxxxxx@xxxx.xxxx.xx](mailto:xxxxx.xxxxxx@xxxx.xxxx.xx) |  
15 Stout Street, Wellington 6011

<image001.jpg>

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<20180117 F1 response form .docx><Mail Attachment.eml>

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---

**From:** Corban Walls s 9(2)(a)  
**Sent:** Tuesday, 13 February 2018 2:10 p.m.  
**To:** Malcolm McCluskey  
**Cc:** Determinations  
**Subject:** Re: Draft determination for 6 Island Bay Road, Beach Haven, Auckland (Ref 2975) [UNCLASSIFIED]  
**Attachments:** 6 Island Bay Road - Building Consent Processing Delays.pdf; Comparison of performance criteria.pdf  
**Categories:** sent to Emma

Hi Emma,

To follow the recent comments from Malcolm McCluskey. I believe that if Auckland Council had've been clear about what they required from the beginning then this would've never had to go through the determination process. The irony is, that if you apply logic, Auckland Council's position actually supports my case. I have previously familiarised myself with NZS4211 and it doesn't take long to realise that not only is NZS4211 the incorrect standard for the proposed glazing but in suggesting that 4211 is the correct standard actually supports my argument further, as E2/VM1 has a much higher threshold than the NZS4211 testing standard so the relevant criteria under NZS4211 have been met or exceeded under the E2/VM1 testing undertaken.

The determination required a VM1 test which I have provided in good faith. I have now compared the VM1 and engineering calcs to NZS4211 and the testing met or exceeded the relevant performance criteria of NZS 4211:2008. Please find attached comparison chart.

Extracts from NZS4211:

*'This Standard [NZS4211] excludes building facades and curtain walls, and does not provide a test for the weather-tightness of the installation details at the window perimeter or the interface between the window and the surrounding facade elements in an external wall. It does not ensure that the framing system is fit for purpose for glazing insulating glass units and other processed glass products.'*

*1.1 SCOPE. This standard [NSZ4211] specifically excludes (g) Building Facades (including curtain walls)*

Also please find attached the time-line of the consenting process so you can further understand my frustration with consenting process.

Kind regards,

Corban

s 9(2)(a)

Corban Walls  
s 9(2)(a)

On 9/02/2018, at 8:31 AM, Malcolm McCluskey  
<[Malcolm.xxxxxxxxxx@xxxxxxxxxxxxxxxxxxxx.xxxx](mailto:Malcolm.xxxxxxxxxx@xxxxxxxxxxxxxxxxxxxx.xxxx)> wrote:

Dear Determinations Team

Council did accept the Draft. However it has reviewed the position and is now querying an aspect of the Draft as it is entitled to do. Parties can always adjust their position at any time during the Determination process, which is why a Draft may not be relied upon.

**Malcolm McCluskey | Senior Solicitor**  
**Civil Litigation, Legal Services**  
DDI 09 890 2967 | EXT (46) 2967 | Mob s 9(2)(a)  
Auckland Council, Level 11, 135 Albert Street, Auckland  
Private Bag 92300, Victoria St West, Auckland  
Visit our website: [www.aucklandcouncil.govt.nz](http://www.aucklandcouncil.govt.nz)

---

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**Sent:** Thursday, 8 February 2018 5:49 p.m.  
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I look forward to hearing from you.

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<image001.jpg>

Corban Walls  
s 9(2)(a)

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**Emma van den Eykel**

ADVISOR DETERMINATIONS

Determinations | Housing and Tenancy Services | Market Services

Ministry of Business, Innovation & Employment

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[Emma.vandeneysel@mbie.govt.nz](mailto:Emma.vandeneysel@mbie.govt.nz) | Telephone +64 4 901 8618

15 Stout St, PO Box 1473, Wellington 6140

<image002.jpg>

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**Cc:** [Malcolm.McCluskey@aucklandcouncil.govt.nz](mailto:Malcolm.McCluskey@aucklandcouncil.govt.nz); Determinations; Sue Brown



**Subject:** Re: Draft determination for 6 Island Bay Road, Beach Haven, Auckland  
(Ref 2975) [UNCLASSIFIED]


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<image003.jpg>

Corban Walls  
s 9(2)(a)



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I look forward to hearing from you.

Thanks, Corban

<sp\_signature.jpg>

Corban Walls  
s 9(2)(a)



<20171212155029.pdf>  
<ENG Island Bay Road Glazing signed.pdf>  
<Glazing Eng Calcs.pdf>  
<Island Bay Road - Full Final Set 13-12-17.pdf>  
<PS1 - 6 Island Bay Rd Rev A.pdf>  
<FLL Custom Test 1721 Special Projects.pdf>  
<Island Bay Road House Maintenance Schedule.pdf>

On 17/01/2018, at 11:32 AM, Ginny Carter  
<[Ginny.Carter@mbie.govt.nz](mailto:Ginny.Carter@mbie.govt.nz)> wrote:

Dear All

The draft determination was sent to you on 10 November 2017, as attached. We asked for the



response sheet to be completed and returned by the 24 November 2017. To date, we do not appear to have received a response from you.

We appreciate you may have overlooked the earlier request, so I have enclosed a response sheet and extended the due date to 2 February 2018. Please respond before this date.

If you cannot make this deadline, please contact the Determinations team on 0800 242 243 or [determinations@mbie.govt.nz](mailto:determinations@mbie.govt.nz).

Yours sincerely

**Ginny Carter**

ADMINISTRATOR, DETERMINATIONS

Housing & Tenancy Services, Market Services  
Ministry of Business, Innovation & Employment  
*Hikina Whakatutuki - Lifting to Make Successful*

[xxxxx.xxxxxx@xxxx.xxxx.xx](mailto:xxxxx.xxxxxx@xxxx.xxxx.xx)  
15 Stout Street, Wellington 6011

<image001.jpg>

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<20180117 F1 response form .docx><Mail Attachment.eml>

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13th February 2018

## 6 Island Bay Road - Building Consent Processing Delays

The original building consent had been sitting at council for a total of 254 days (160 working days) when it was supposed to be processed in 20 working days, obviously this is excluding the days I had received RFI's and was working on providing new information. It's been processed by five different processors all with differing point of views and opinions in regards to the glazing. I have been given subjective and misleading information and not once have I received a concise or accurate answer as to what testing should be undertaken, until the I received the Draft Determination that is. It's beyond belief that Auckland Council can drag this out for over 15 months with such ambiguity only to oppose the first logical authoritative opinion on what standard the glazing falls under.

A Brief Timeline:

26th October 2016 Stage 2 Building Consent Application submission.

**RESPONSE TIME: 44 days**

7th December 2016 Received email from Winston Lam stating that he hadn't yet started processing the consent application

**RESPONSE TIME: 7 days**

14th December 2016 - Received RFI #1 Letter from Winston Lam

20th December 2016 - Provided answers to all RFI #1 questions from Winston Lam and requested a meeting as soon as possible as he clearly didn't understand the design. (Winston as on leave from 23rd Dec-9th Jan)

**RESPONSE TIME: 3 days**

23rd December 2016 - Received RFI #2 Letter from Winston Lam

11th January 2017 - Provided answers to most of the RFI #2 questions from Winston Lam and requested a meeting as soon as possible to discuss some of the questions that couldn't be answered to councils satisfaction.

19th January 2017 - Meet with Winston Lam, Tony Hay and Richard Kaggwa. Conclusion, the concerns with the building design is focussed around the custom window joinery with Tony told me I need to have the joinery tested to make sure it's watertight and meets the E2 requirements. Tony said they welcome new innovative designs as they help progress the building industry. He also suggested I get recommendation from a facade engineer. I spoke with Ron Hanley from Lautrec and given that E2 was the only concern he suggested I have John Downer perform a AAMA 501 water tightness test. Over the following weeks I proceeded to construct a test wall with windows installed. We performed the test and it passed with flying colours. The required test pressure is 30PSI, beyond the we tested if to 55PSI and the window still performed as it should.

21st April 2017 - As requested I provided relevant information including test results for the AAMA 501 water tightness test performed on the window joinery and a producer statement from Viridian for the glazing.

**RESPONSE TIME: 7 days**

28th April 2017 - Received RFI #3 Letter from Winston Lam.



2nd May 2017 - Provided answers to most of the RFI #3 questions from Winston Lam

**RESPONSE TIME: 10 days**

12th May 2017 - I followed up with Winston Lam regarding progress of the consent. Graeme Stokes (BC Team Leader) informed me that the application had been passed on to the Central Specialist Team.

**RESPONSE TIME: 7 days**

19th May - Received RFI #4 from Iskra Trenceva and also a request to have a meeting to discuss the design in person. I supplied most of the information as requested the same day and made points for discussion for our meeting with the remaining questions. We also booked a meeting for the 26th May.

26th May 2017 - Met with Iskra Trenceva and Robert Woodger. We discussed some of their concerns with the design, largely the window joinery and some other minor issues. Iskra Trenceva requested time to go over the design in more detail.

30th May 2017 - I emailed Iskra Trenceva notes from our meeting which would aid her in processing the consent.

28th June 2017 - I emailed Iskra Trenceva requesting an update on progress with the consent.

**RESPONSE TIME: 31 days**

29th June 2017 - Robert Woodger replied to my email me informing me the Iskra Trenceva was away on annual leave.

**RESPONSE TIME: 14 days**

12th July 2017 - I followed up with Robert Woodger to see how things were progressing. I also asked if he had spoken to John Downer regarding the watertightness testing of the joinery as this is something he wanted to discuss with John.

**RESPONSE TIME: 2 days**

14th July 2017 - I received an email response from Robert Woodger informing me that he had spoken with John Downer and that he had familiarised himself with the project as Iskra Trenceva was on annual leave. He asked what other tests had been undertaken. There has not been any other type of testing done as this was not even mentioned by Auckland Council until now. The only concern until now was E2 which has been proven in the AAMA water tightness test.

16th July 2017 - I requested another meeting with Robert Woodger.

**RESPONSE TIME: 2 days**

18th July 2017 - Robert Woodger emailed me suggesting we meet 20th or 21st

21st July 2017 - I met with Robert Woodger and discussed the fixed glazing. He requested I provide more information but wasn't clear on what he needed to prove compliance.

RESPONSE TIME: 10 days

31st July 2017 - Iskra Trencveva emailed me and informed me that she had returned from annual leave and requested that I re-send her the information so she can catch up with progress.

RESPONSE TIME: 4 days

4th August - I received RFI #5 from Robert Woodger and also threatening that my consent would be cancelled in 28 days if I failed to provide the information. I replied asking how was it possible to only allow me 28 days when was taking weeks himself to spend to my emails. I proceeded to work on the RFI's.

9th August 2017 - Provided answers to most of the RFI #5 questions from Robert Woodger

10th August 2017 - I provided Robert Woodger a clear and concise list of the information, testing and producer statements regarding the window joinery as this seems to be the final remaining concern with the design.

RESPONSE TIME: 11 days

21st August 2017 - I received RFI #6 from Robert Woodger. Robert informed me that he would be on annual for the next three months and that from here on in I would need to work with Mark Murray. I returned the requested information that same day. Most of it had already been provided prior.

22nd August 2017 - Out of frustration with delays (as I've had little communication from council) I applied for a determination for the custom window joinery.

30th August 2017 - I emailed Mark Murray expressing my concern with delays and the possibility of my consent being cancelled even though I had provided the requested information.

4th September 2017 - I phoned Mark Murray as I had not received any communications from him since he'd taken over from Robert Woodger. Mark emailed me later that day letting me know he had yet to review the information. I replied with a clear and concise list of the final three issues that needed resolving.

15th September 2017 - I emailed Mark Murray to see how things were progressing.

18th September 2017 - I emailed Mark Murray again to see how things were progressing.

RESPONSE TIME: 30 days (21st August - 20th September)

20th September 2017 - I received a phone call from David Gillott. He apologised profusely for the delays and expressed his concern with the lack of action from Auckland Council. He said it was unfortunate that the people assigned to assess the consent application had both taken long leave of absents. We arranged a meeting on the phone which was confirm by email.

27th September 2017 - I meet with David Gillott and Mark Murray. We discussed the design and some minor changed that nullify some concerns. We made the design changes as I felt this would be the quickest way to get over a couple of the minor issues. They requested time to fully review the project, they recommended that I put the Determination on hold as they didn't see that there were any issues with the design and said that from this point this consent was top priority over anything else.

28th September 2017 - I emailed David Gillott and Mark Murray a concise list of the last remaining items and some additional info as requested in our meeting

29th September 2017 - I delivered hardcopies of the updated design to David Gillott and followed up with an email.

4th October 2017 - I emailed David Gillott asking how things were progressing. David replied letting me know that they would conclude their assessment on the 6th October.

9th October 2017 - I emailed both David Gillott and Mark Murray asking for an update as I did not hear from them on the 6th.

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13th October 2017 - I received a response from David Gillott requesting a meeting which we scheduled for the 24th October.

**RESPONSE TIME: 26 days (29th September - 24th October)**

24th October 2017 - I meet with David Gillott and Mark Murray. David suggest that I now put in a determination for the entire design. I was not impressed as we've gone from having only three final items to resolve to Auckland Council wanting me to get a determination for the entire design. I told David I was NOT going to do this as I've had five people review the design and that we're at the tail end of the consenting process and that I was not willing to start the process again with another organisation. David mentioned he was going on annual leave so Mark Murray was taking over the process from here on in. Mark requested I resend some details to expedite the process which I did later that day.

At this point I had provided all the information that Auckland Council had asked and I feel I have been baited and misinformed throughout the entire process. I have been proactive in my communication and responses to their 'requests for more information'. They only delay from my end was the time to design, construct and testing of the window joinery.

The Building Consent processing is incredibly subjective as I've received differing and sometime contrary information from different assessors.

10th November 2017 - I met with David Gillott and Mark Murray and they refused the consent.

13th December 2017 - I resubmitted the Building Consent Application along the obvious design and changes and verification of the fixed glazing. At this point Mark Murray was leaving Auckland Council and David Gillott had changed roles, so the processing of the consent went back to Robert Woodger.

And the process continues...

The resubmitted consent has been sitting at council for a total of 62 days now (44 working days) when it was supposed to be processed in 20 working days.

Regards, Corban Walls



Comparison of documentation to date against the performance criteria of NZS 4211:2008

NZS 4211:2008 Performance Criteria:	Relevant documentation for fixed glazing details
<p><b>Section 6 - Serviceability deflection</b>                      Test to appropriate Wind Zone SLS for span/200 max deflection.</p>	<p>Ref <i>Structural Engineer calculations</i> for all members as standard, non-proprietary extrusions, calculated to a span/200 limit.</p>
<p><b>Section 7 - Operation of opening sashes</b></p>	<p>Not applicable - No opening sashes</p>
<p><b>Section 8 - Air Infiltration</b>                      Air-conditioned rating requires <math>\leq 1.6</math> L/s per m<sup>2</sup> window area.                      Non air-conditioned rating requires <math>\leq 8</math> L/s per m<sup>2</sup> window area.</p>	<p>This hasn't been tested however the limit of 8 L/s per m<sup>2</sup> is an easy threshold for opening windows. A fully sealed unit with wet seal on the face with foam seal backers should have a theoretical air leakage near zero - reference: units are fully sealed like an aquarium = zero air leakage</p>
<p><b>Section 9 - Water penetration</b>                      Maintain 30% of SLS pressure for 15 minutes for Very High wind zone this is 375 Pa</p> <p>Note: No requirement for introducing defects.</p>	<p>Ref <i>FLL 17-21</i>:                      15 minutes 455 Pa Static Water Penetration and then 5 minutes 455 - 910 Pa Cyclic, this sequence is then repeated after the introduction of defects for the water management series. This sample was then tested for a third time with removal of the backing seals.</p>
<p><b>Section 10 - Ultimate strength</b>                      20 Seconds at <math>\pm</math>ULS pressure:                      Very High wind zone <math>\pm</math>1760 Pa</p>	<p>Ref <i>FLL Report 17-21</i>                      VM1 Preconditioning 1 minute <math>\pm</math>1515 Pa during test</p> <p>20 seconds <math>\pm</math>2130 Pa post-test</p> <p>Ref <i>Structural Engineer calculations</i> for the same.</p>
<p><b>Section 11 - Torsional strength of sashes</b></p>	<p>Not applicable - No opening sashes</p>

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# BUILDING CONSENT APPLICATION – ADDITIONAL SUBMISSIONS REVIEW

Address of Property

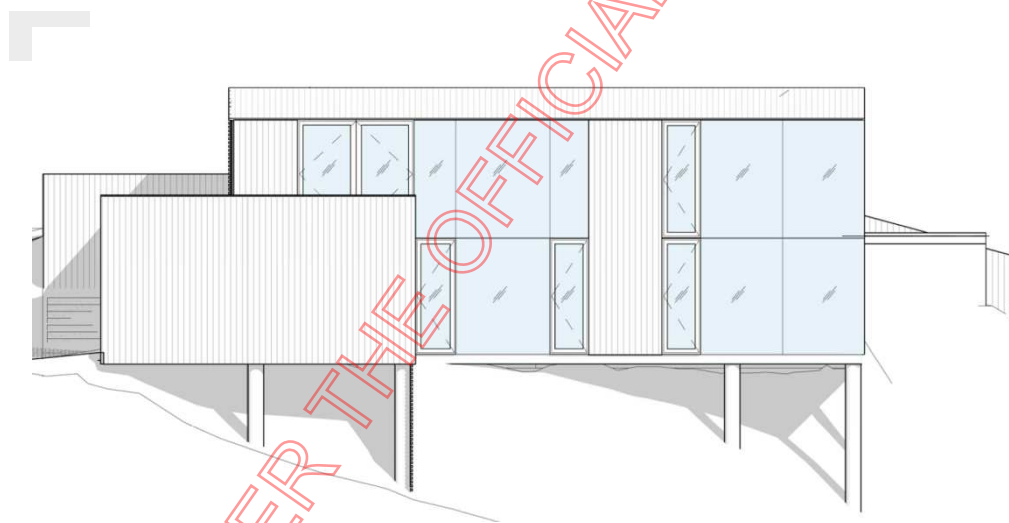
6 Island Bay Road  
Beach Haven, Auckland

MIBE Determination Reference number

2975

Date of Report

20 March 2018



Summary of matters to be determined
Compliance of custom fixed window joinery with NZBC clauses B1, B2 and E2

Name of Assessor preparing report: s 9(2)(a)

## CONTENTS

1	SUMMARY.....	3
2	APPLICATION DETAILS .....	4
3	INTRODUCTION.....	5
4	GENERAL DESCRIPTION OF THE BUILDING.....	6
5	REVIEW OF REVISED SUBMISSIONS .....	8
6	OUTCOME.....	17

### APPENDIX A Submissions

Weathertightness testing report

PS1 – Structural engineer

PS1 – Glass supplier

emails from applicant and Auckland Council

### APPENDIX B Review of structural calculations by MBIE consulting engineer

## 1 SUMMARY

- The Ministry issued a draft determination for this application 9th November 2017. This report considers submissions made by the applicant after that date including revised drawings, producer statements covering the structural and weathertight performance of the glazing, and a report on further weathertightness tests carried out on a sample of the glazing.
- The question for this report is whether or not the proposals for the fixed glass, as amended and supported by the submissions answer the issues raised at section 4 of the draft determination and provide reasonable evidence that the windows will comply with clauses B1, B2 and E2 of the NZBC.

- The conclusions reached are:

Prerequisites – Compatibility tests and a review of the structural silicone glazing details required by the silicone manufacturer should be carried out and results submitted prior to consent being issued.

Testing – The additional tests, although carried out to a regime intended for window junctions rather than windows themselves, provides incomplete evidence of reasonable performance of the sample. However, the sample was considerably smaller than the window sizes proposed and not therefore full representative. On-site testing is proposed and if it is enhanced to include pressure testing then, if successful, would provide adequate evidence of performance.

Structure – The review of structural calculations by the Ministry's consulting engineer (at Appendix B) finds that additional calculations are required, the edge distance of some fixings needs to be increased, and other issues.

Drawings – Amendments are required to clarify issues including:

- i. all mullions are to have 50x5 SHS sections behind them,
- ii. framing junction details where vertical and horizontal members meet,
- iii. Specification – It would be advisable that a specification should be prepared or notes added to the existing drawings
- iv. other issues raised at paragraphs 5.2, 5.3, 5.6 & 5.12



## 2 APPLICATION DETAILS

<b>Property Address</b>	6 Island Bay Road, Beach Haven, Auckland
<b>Owner's name(s)</b>	Mr C Walls
<b>Territorial Authority</b>	Auckland Council
<b>Date of Commissioning of Report</b>	5 March 2018
<b>Date of Completion of Report</b>	20 March 2018
<b>Assessor's Name, Address and Contact Details</b>	s 9(2)(a) [REDACTED] Dibley Associates Ltd 5 George Street, RD2 Warkworth Auckland.
<b>Site visit(s)</b>	None

### Abbreviations used in this report:

BC	Building Consent	NW	North West etc.
BRANZ	Building Research Association of New Zealand	NZBC	New Zealand Building Code
Council	Auckland Council	NZS	New Zealand Standard
LVL	Laminated veneer lumber	PS1	Producer Statement - design
		SHS	Square hollow section
		TPO	Thermoplastic polyolefin

### 3 INTRODUCTION

- 3.1 This is an independent report prepared for the Ministry of Business, Innovation & Employment by an Assessor contracted by the Chief Executive of the Ministry to provide specific information as part of the Determination process specified in the Building Act 2004 section 187.
- 3.2 On completion, this report is to be provided to the Official who requested the report on behalf of the Ministry. Drafts or copies of the report are not to be provided to any other person except as directed by the Ministry.
- 3.3 The investigation for this report was carried out to provide information required by the Ministry. It is based on the following:
- Review of the building consent and other documents provided
- 3.4 The documents referred to in the preparation of this report are:
- Revised drawings and documents provided.
  - Relevant Industry standards
- 3.5 The report is provided for the use of the Ministry only. No other party should rely on its findings and no liability to any third parties is accepted.

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## 4 GENERAL DESCRIPTION OF THE BUILDING

4.1 **Site Location and orientation** The site is in a suburban area of Beach Haven approximately 600m north east of the Auckland Harbour.

### 4.2 Site specific issues

- Contour: Site slope: over 3m across the footprint of the building
- Wind zone: NZS 3604 Very High<sup>1</sup> or Specific Engineering Design<sup>2</sup>
- Corrosion zone: NZS 3604 Zone C (Medium – inland coastal with medium risk of wind blow sea-spray salt deposits)

### 4.3 Size and Physical Characteristics

Storeys: 2 storey.

Construction type: Concrete pile and retaining wall foundations with suspended concrete beam and slab floor at ground level, cross-laminated timber external walls and light timber framed internal walls above.

Cladding types: Vertical cedar shiplap weatherboards.

Joinery: Aluminium framed including custom built fixed windows.

Roof: TPO membrane at a nominal slope of 8° on fabricated steel & timber rafter.

Decks: The roof of the garage forms a deck at the upper level

Timber treatment: Unknown.

### 4.4 Weathertightness risk to E2/AS1

The risk scores to E2/AS1 range from 14 -19.

### 4.5 Proposed variations to consent documents

It is assumed here that the revised submissions and new amended drawings where necessary will be submitted to the council for approval.

<sup>1</sup> NZS 3604 Table 5.1 – Region: A, Roughness: Open, Exposure: Exposed, Topo T3

<sup>2</sup> Zone identified on Auckland Council's gis viewer.

#### 4.6 **Site fixed silicone structural glazing**

The proposal is for 4 sided silicone structural glazing, which relies entirely on the silicone to glue heavy glass units onto the building. The usual method for this is to attach glass units to rigid subframes with silicone in a factory, and then mechanically fix the subframes to the building frame on site, and create a seal between subframes. This enables the critical operation of application of the structural sealant to be carried out in a clean and controlled environment. One of New Zealand's largest glass suppliers notes: "*In projects where 3 and 4 sided structural glazing is proposed the glazing must be done in the factory (not on site) under controlled conditions*<sup>3</sup>". In order to arrive at an opinion that onsite glazing as proposed is likely to comply with the NZBC, specific and onerous QA procedures are required to ensure a clean and controlled environment during glazing. These are not clearly specified on the application documents.

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<sup>3</sup> Metro Catalogue 6th Edition para 14.10



## 5 REVIEW OF REVISED SUBMISSIONS

- 5.1 This review is limited to proposals for the fixed silicone structurally glazed units and their installation. The review does not consider the openable framed windows and doors.

### REVISED DRAWINGS –“Island Bay Road Full final set 13-12-17”

- 5.2 The owner advised the following changes not yet shown in the revised proposal by phone:

- a) all mullions are to have a 50x5 SHS (square hollow section – steel) behind them whereas the structural steel elevation drawing S 11 shows them only for the single storey North East elevation. This will require new variation of the mullion section on drawing S18, justified by calculation, for the connections into the top and bottom of the cross laminated timber floor,
- b) that it is intended to use either Dow Corning 795 or Dow Corning 121 (a similar 2 pack silicone product) for the structural silicone joints. This will be decided at site on the day. The DC 121 option is covered by the glass suppliers PS1, but the drawings only refer to Dow Corning 795,
- c) Structural Glazing Tape is to be used on 4 sides of the double glazed units whereas backing rods are noted on the Mullion Section on drawing S18

and email 1st February:

- d) that a condition of this design is to undertake an AAMA 501.2 onsite water-tightness testing after installation but before wall linings are installed to prove the system performance in this specific application.

- 5.3 Drawing review – drawings relevant to structural silicone fixed glazing only

Drwg #

- S 02 – see comments regarding specification at para 5.7
- S 10 – detail 1. Specification for Structural Glazing Tape required
- 
- S 10 – detail 3. minimum edge distance should be 21mm not 17mm as noted (see Engineer’s review at Appendix A)
- S 11 – add other elevations where 50x5 SHS are to be fixed behind mullions or new drawing to show them.

- S 12 – add new fixing for new SHSs where they will be fixed to top and bottom of xLam floor panels
- S 18 – All applicable details:
  - i. Specification for Structural Glazing Tape required because there are tapes on the market less than 6mm thick which would not be suitable.
  - ii. All references to Dow Corning 795 should be to Dow Corning 795 or 121 if that is intended as an option
  - iii. references to the structural silicone being applied over backing rod should be amended to over Structural Glazing Tape
  - iv. No details are shown for the connection or sealing of vertical elements of the aluminium frame to the horizontal.

### **Tolerance**

5.4 Drawings S10,11,12 18 show the aluminium window framing fixed to the xLam floor, steel framing and concrete floor with no provision for adjustment to accommodate for building tolerances. The applicant advised me by phone that the concrete slab edge has been surveyed with laser equipment and found to be straight, and that the xLam walls will be accurately cut with CNC cutting machines and he expects the support elements to be fixed to with 2mm. In my experience accuracy of this order may be achieved in a workshop but not on building sites. If it is not, the various outcomes could be:

- trimming the xLam floor/wall edges where proud, which might be done using an appropriate plane, or
- to shim the window frames off the supporting members which could require further structural calculations to justify maximum shimming, or
- fixing of the glass with a twist, or an increase or reduction in the thickness of the structural silicone joint. Joints thinner than the specified 6mm or any other thickness required by Dow, and could lead to a risk of failure. The drawings or specification should indicate how better than normal building tolerances are to be achieved.

### **Joint design**

5.5 An issue with joint design is illustrated at the last page of the structural review (see Appendix B). The flange width of the mid floor extrusion is 22.5mm. If a minimum 12mm structural silicone bite (depth of joint adhered to glass) ,and a minimum 6mm weather seal is applied, the available width for the Structural

Glazing Tape is 4.5mm. Suitable tapes appear to be 10.5mm wide or more, and it is not clear that a 4.5mm wide tape would provide sufficient fixing for the glass while the structural silicone is curing.

### Specification

- 5.6 The proposal lacks a project specification, relying instead on general notes requiring construction to be carried out in accordance with manufacturer's instructions, and "plans and specification prepared by all other professionals involved in construction of the building". The application of the structural silicone glazing involves several critical processes including a review of the joint design and materials by Dow Corning, preparation including near to zero tolerance erection of the supporting structure, cleaning and environmental control during application, protection during curing, removal of sample panels to test the correct application, and on site weather tightness. It seems to me that this would best be compiled into a single specification document so that all parties to the structural glazing can clearly see both the design and processes intended without having to follow a series of references to the various documents.

### WEATHERTIGHTNESS TEST Facadelab test report 17-21 27 & 28th November 2017

- 5.7 It was intended that this 2nd test of a prototype sample window be carried under E2/VM1 1.4.1, 1.4.2 & 1.4.3. However this raises two issues:
- a) E2/VM1 procedures were not all followed. Departures include: Facadelab are not IANZ accredited or equivalent as required at E2/VM1 paragraph 1.1; the procedures of AS/NZS 4284 which are required to be followed at 1.1 were not all followed (eg the report did not include a full description of the sample, rate of water applied etc.) and the sample size was 710mm x 970mm high whereas a minimum sample size of 2.4 x 2.4 is required at paragraph 1.3.
  - b) E2/VM1 is a Verification Method for determining compliance of cladding systems and associated window and door junctions only. Whereas the issue which Auckland Council were concerned with was performance of the windows themselves. Auckland Council referred to this issue in their email to the Ministry 1/2/18 and noted: "It is the joinery in this determination that is in question".

- 5.8 Nevertheless, the tests were similar to AS/NZS 4284 and AS/NZS 4211, the related standard for windows, and the following paragraphs consider whether the information provided by the report is sufficient as evidence of performance of the windows as an alternative solution.
- 5.9 I telephoned the test laboratory Facadelab who provided additional information as follows:
- a) the sample was delivered to them and installed in their pressure chamber. The cladding junctions were not tested because the purpose of the test was to evaluate the glazing itself, and because the weather boards were “tacked on” rather than being fixed as they would be on site.
  - b) water was applied to the sample during the test using 6 nozzles with a distribution as indicated at NZS4211 figure B1. Hence the whole of the sample and junctions were wetted, but because it was not a requirement to test the junctions, the wrap and flashings were not removed, as they would have to have been to examine for signs of leakage if the junction were under test (see E2/VM1 1.4.4.1). The rate of application of water was not metered or recorded.
- 5.10 The following table provides comparison of the requirements of NZS 4211 for windows, which if followed, would be deemed to comply with NZBC clause E2 (ref E2/AS1 para 9.1.10) with what was done. I have used wind pressures appropriate to an NZS 3604 Very High Wind zone which I derived using NZS 3604 table 5.2. The site is designated Specific Engineering Design on Auckland Council’s GIS viewer, but they have not on enquiry been able to advise me how they arrived at this zoning.



	NS 4211				Comment
	ISSUE	MIN STANDARD	TEST LEVEL		
5.2	Sample size	the test sample window (is) to be representative in both size and shape of the largest standard window assembly			The largest standard window size is 2975mm x 2300mm, others are up to 3970mm high The test was carried out on a prototype panel 710mm x 970mm high. A larger window would be subject to greater deflection, and the sealant to greater stress and sample tested did not replicate these conditions.
6	Serviceability deflection	span/200	+/- 1250 Pa		Not tested, and the small sample would not have provided a relevant result. MBIE's structural engineer reports the calculated deflection is < 1/200.(see appendix A)
7	Operation of opening sashes				N/A to fixed windows
8	Air infiltration	8L/s/m <sup>2</sup> ; 2L/s/m	150 Pa		Not tested and not an NZBC clause E2 issue.
9	Water penetration	No uncontrolled water penetration or controlled water does not drain away	375 Pa		Tests should be carried out to AS 4420.5 – see following rows.
	<b>Water penetration test carried out</b>	<b>Facadelab test</b>		<b>AS4420.5</b>	
	<b>Test</b>	Based on E2/VM1			
	<b>precondition</b>	1515 Pa 1 minute each way positive and negative		5 minutes zero pressure 0.05L/m <sup>2</sup>	The rate of water application was not recorded.
	<b>Series 1 - Static</b>	static 455 Pa		15 minutes at pressure 375Pa (per NZS4211 para 9.2)	The pass under this test exceeds the performance required at NZS 4211 para 9 for this sample
	<b>Series 1 - Cyclical</b>	cyclical 455-910 Pa			ditto
	<b>Series 2 – series 1 repeated following removal of 30mm sections of external</b>	Series 1 tests repeated		ditto	ditto

	seal from panel 1				
	<b>Series 3</b> series 1 repeated following removal of sections of internal seal from panel 1	Series 1 tests repeated		Test not required	This test is not required by NZS 4211. The removal of part of the internal seals does not represent a likely in service scenario and the significant water penetration noted does not seem to me to relevant to the standard required by NZBC clause E2.
	<b>Series 4</b> series 1 repeated following removal of sections of internal seal from panel 2	Series 1 tests repeated		as Series 1	as Series 1
10	Ultimate strength		1760 Pa		Not tested – and it appears an additional structural calculation is required.
11	Torsional strength of sashes				N/A to fixed windows

**TABLE 1 – COMPARISON OF NZS 4211 REQUIREMENTS WITH TEST**

5.11 My conclusion is that although the tests, in conjunction with the engineers calculation of deflection, appear to indicate that the sample conforms to the standards of NZS 4211 and therefore NZBC clause E2:

- a) the sample was too small to represent the larger windows,
- b) the rate at which water was sprayed onto the windows was not recorded.

The applicant proposes site water testing of all the windows (see appendix A pdf p 26), and if this is done instead under pressure (there is a firm on the North Shore which offers this service) that would provide adequate evidence of performance.

#### **PS1 – ENGINEER**

5.12 The applicants engineers calculations were checked independently by Chris Howell and Associates (copy of their review at Appendix B). The outcome is that various additional calculations and alterations are called for, including

- a) drawings to be amended to clarify that 50x5 SHS posts will be fitted behind all mullions,
- b) new fixings details and calculations for them are require where SHS posts are to be fixed to the bottom and top of the Xlam floor;
- c) increasing edge fixing distances where noted,
- d) alteration to the mullion design to allow sufficient width for both the glazing tape and silicone joint specified.

This is necessary to enable an opinion of compliance with NZBC clause B1.

#### **PS1 – GLASS SUPPLIER**

5.13 The PS1 provided by the glass supplier includes the following assumptions:

<b>Veridian Assumption</b>	<b>Comment</b>
1. Extra high wind zone	This exceeds Very High zone calculated using NZS 3604 table 5.1.
2. Three drain holes with a minimum diameter of 10 mm, or slots 20 mm x 5 mm, must be provided under each insulating glass unit in accordance with NZS 4666. Glazing is undertaken strictly in accordance with NZS 4666.	The drawings indicate two drain holes.
3. Typical mullion and transom details are approved by Dow Corning before commencement of work. The sealant bite size and glue line must be dimensioned.	Dow Corning approval should be provided before Building Consent is issued, otherwise the bite and glue line sizes shown on the revised proposal

		drawings could be incorrect.
4.	Glass and all other substrates in contact with sealants are tested for adhesion and compatibility, and approved by Dow Corning before commencement of work.	This approval should also be obtained before building consent is issued, so that any special provisions, requirements for primers etc are identified.
5.	At least two insulating glass units are deglazed from the windows and evaluated by Dow Corning agent to ensure satisfactory adhesion between sealant and frame.	This might be incorporated by a condition of the building consent.
6.	Insulating glass units is made up of Viridian E1 mm toughened safety Performatech glass + 16 mm argon cavity + 10 mm clear toughened safety glass.	It should be noted which of the glass types is to be fitted to the interior and which to the exterior.
7.	Cleaning of glass and frame is carried out strictly in accordance with Dow Corning instructions.	This should appear in the documents where it is likely to be seen by the glazier.
8.	Glazing is carried out in a dust free environment	This should appear in the documents where it is likely to be seen by the glazier.
9.	This PS1 does not cover the design of the window frames.	The engineers PS1 covers frames.
10.	In respect of E2, this PS1 only covers the design of the glazing, but not window frames or flashings.	No comment

**TABLE 2 – GLASS SUPPLIER ASSUMPTIONS**



- 5.14 The PS1 also includes the following limitations. The review and approval by Dow have not yet be carried out, and since there is at least the possibility that process could result in changes to such things as the dimension of the structural silicone joint, it should be done and results submitted to the council before a consent being issued.

<b>Limitations</b>	
	This product is neither tested nor represented as suitable for medical or pharmaceutical uses.
	DOWSIL 795 Structural Glazing Sealant should not be used for structural applications without the prior written approval of the Construction Industry Technical Services Department. Each project should be specifically and separately approved by Dow.
	Project specific approval involves the following prerequisites:
	<ul style="list-style-type: none"> <li>• Joint dimensioning and print reviews.</li> <li>• Successful laboratory adhesion and compatibility testing to all building components.</li> <li>• Observance of professional sealant application and workmanship standards.</li> <li>• Users should always consult the Technical Services Department for adhesion recommendation.</li> </ul>
	Dow shall not be held liable for any possible claims arising from structural glazing use of DOWSIL 795 Structural Glazing Sealant for projects which have not been specifically approved by Dow.
	For projects which have been approved, Dow will issue a structural adhesion warranty on a case by case basis at the user's request. It is the user's exclusive responsibility to ensure project compliance with local building regulations.

**FIGURE 1 – GLASS SUPPLIER LIMITATIONS**

- 5.15 I note that the author of the PS1, Greg Yim has represented WANZ on NZS committee, and it appears his opinion may be relied upon. The review by Dow remains outstanding.

**6 OUTCOME**

- 5.1 Amendments and further documentation are required to cover the issues raised at paragraphs 5.2, 5.3, 5.6 & 5.12 and enable an opinion on reasonable grounds that the design of glazing will comply with the requirements of the NZBC at clauses B1, B2 and E2. Installation will then have to be carried out in accordance with the various requirements of the documents and the manufacturer, which would best be compiled in a specification including a QA plan for the glazing.
- 5.2 I note that normal maintenance is required to ensure the ongoing performance for building elements.

END

A handwritten signature in black ink, consisting of several loops and a long tail stroke.

20 March 2018

s 9(2)(a) BA. DipArch MBA ARB(UK) MNZIA  
Dibley Associates Ltd.

## APPENDIX A

Facadelab Weathertightness testing report

PS1 – Structural engineer

PS1 – Glass supplier

emails from applicant and Auckland Council

RELEASED UNDER THE OFFICIAL INFORMATION ACT 1982

**Report No. 17-21**

## Testing of Sample Window: 6 Island Bay Road Project

**Client:** Corban Walls

**Project:** 6 Island Bay Road

**Specifier:** s 9(2)(a)

**Test date:** 27 & 28 November 2017

**People present** s 9(2)(a) Managing Director, FaçadeLab  
Corban Walls, Specifier

**Test facility:** FaçadeLab Limited  
320 Rosedale Rd  
Albany  
Auckland

**Note:** This test was performed on the glazing seals of the sample provided to E2/VM1 parts 1.4.1, 1.4.2 and 1.4.3 with the sequence repeated after removal of parts of the external glazing seals and then inner glazing seal as per ASNZS4284:2008 part 8.10 Seal Degradation test.

Tested by: s 9(2)(a)

Checked by: JLG



## Contents

Figures:.....	2
Description:.....	3
Test Method:.....	6
Results:.....	8

## Figures:

- Figure 1 – View of wet side of sample panel
- Figure 2 – Close view of wet side of sample panel
- Figure 3 – Pane 1, Left Jamb Seal
- Figure 4 – Pane 1, Right Jamb Seal
- Figure 5 – Pane 1, Sill Seal
- Figure 6 – Pane 1, Interior Glazing Seal
- Figure 7 – Panes 1 & 2, with Interior Seals removed during testing



Figure 1: View of wet side of sample panel

Tested by: s 9(2)(a)

Checked by: JLG

## Description:

The sample was provided and installed as pictured, it comprised of 4 window panes in a frame approx. 710mm wide by 970mm high. For the purposes of the test only the window was tested, not the cladding junctions at the head, sill or jambs although these areas were exposed during the test. For the purposes of this test Pane 1 is identified as the top right pane of glass when viewed from the wet side of the sample. Pane 2 is the top left.



Figure 2: Close up view of wet side of sample panel

The test window comprised of aluminum frames with four double glazed panels.

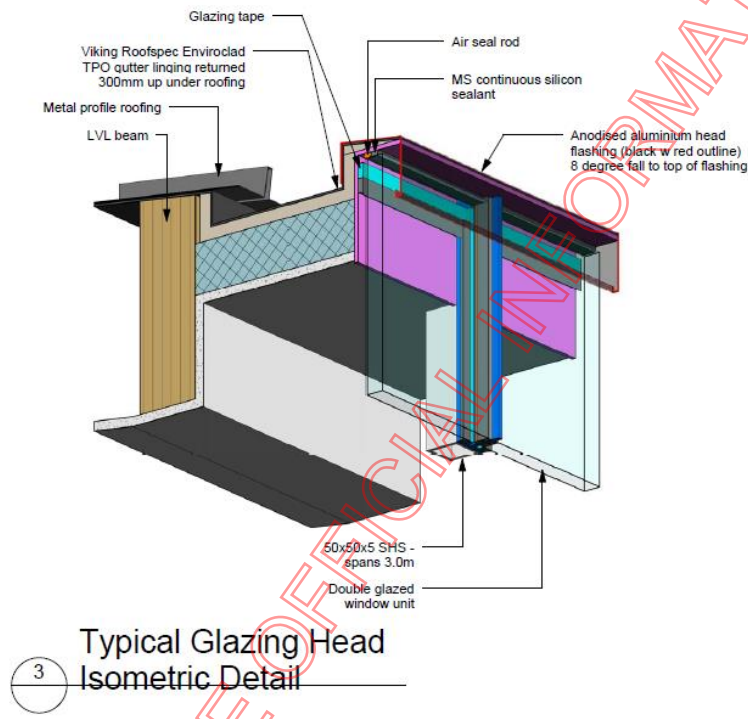
Tested by: s 9(2)(a)

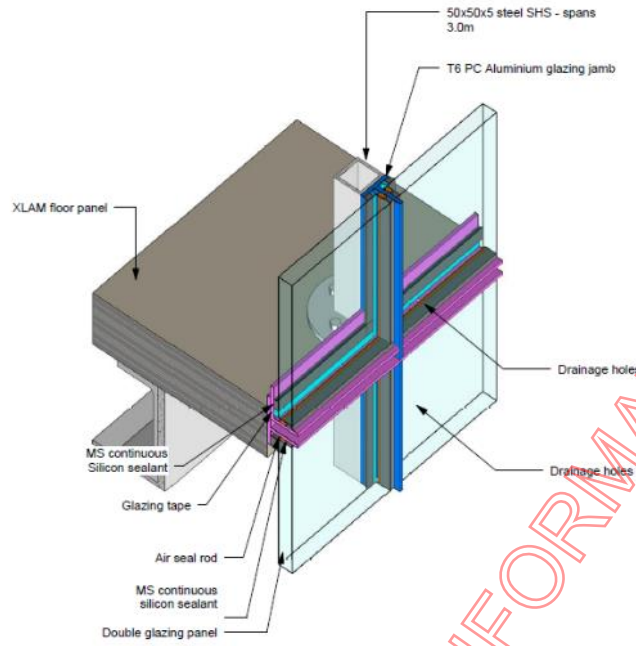
Checked by: JLG

Materials list provided by the client:

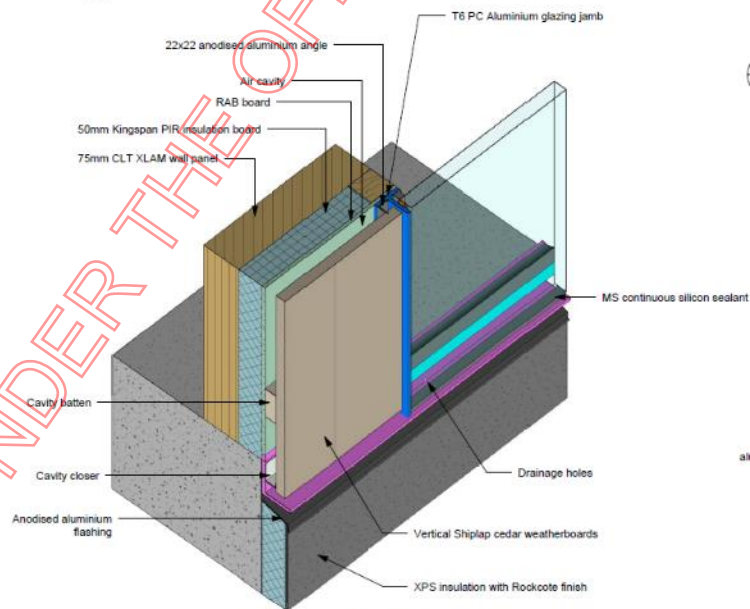
- 50x50x5mm Tee Mullions
- 100x50x5mm Double Tee Transom (at mid floor)
- 50x50x5mm Angle Head Frame with 90mm head flashing
- IGU's 5x12x5 fixed with 10x6mm structural glazing tape and 10x6mm bite Dow Corning 795 structural glazing sealant bead with Dow Corning 795 primary weather seal

Details from full scale drawing follows:



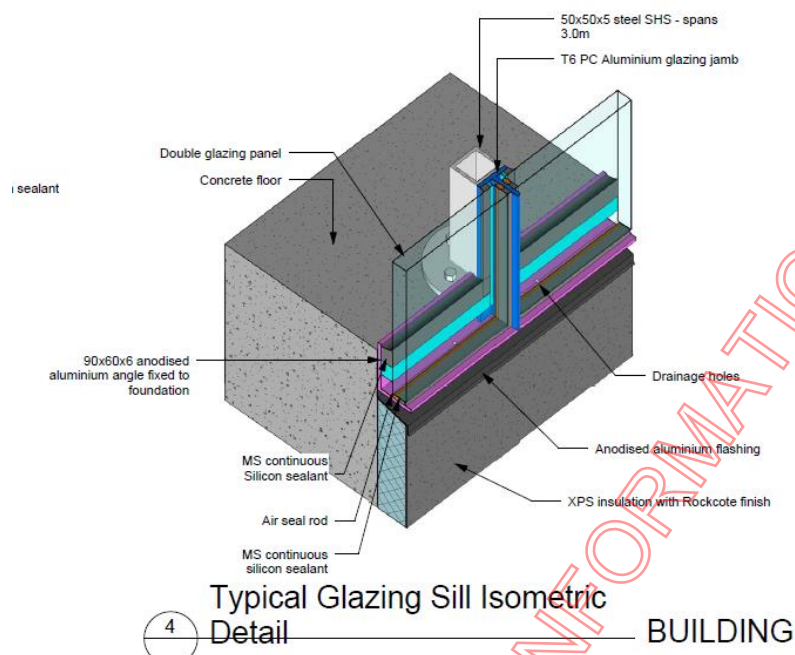


1 Typical Glazing Isometric Detail



2 Typical Glazing to Wall Panel Isometric Detail





## Test Method:

**Note:** The client requested that the sample be tested to NZBC E2/VM1 which is intended for claddings that include a 20mm drained cavity. NZBC E2/VM1 is a derivative of ASNZS4284 which allows for glazed systems though it has different pass criteria. This sample has been subjected to the pressures and sequences from E2/VM1 however drilling 6mm holes in the glazing seals was not possible so the seal degradation test from ASNZS4284:2008 8.10 was substituted. There was no 'wet wall' test performed as there is no equivalent in ASNZS4284 or NZS4211.

The sample was exposed to the preconditioning test from NZBC E2/VM1 1.4.1 at 1515 Pa Positive and Negative for 1 minute each way.

Series 1: The Static water test 1.4.1 at 455 Pa and then cyclic water test 1.4.2 at 455 – 910 Pa were then undertaken.

Series 2: Pane 1 (upper right when viewed from the wet side of the sample) had 3 areas of the seal cut out,  $\frac{3}{4}$  up the sides on both jambs and in the middle of the sill see figures 3, 4 & 5. These were approximately 30mm long by 2-3mm wide by 30mm deep. The water tests from series 1 were repeated.

Series 3: On the inside of the same Pane 1 as above a 30mm long section of the inner seal was removed and the water tests were repeated. See Figure 6.

Series 4: On Pane 2 the inner seal only was removed in a similar manner as before and the tests from series 1 were repeated.

Tested by: s 9(2)(a)

Checked by: JLG



Figure 3 – Pane 1, Left Jamb Seal



Figure 4 – Pane 1, Right Jamb Seal



Figure 5 – Pane 1, Sill Seal



Figure 6 – Pane 1, Interior Glazing Seal

Tested by: s 9(2)(a)

Checked by: JLG



Figure 7 – Panes 1 & 2, with Interior Seals removed, during testing

## Results:

TEST	SAMPLE CONDITION	OBSERVATION
Preconditioning		No visible damage or deformation.
Series 1	Pane 1 – No seal degradation	No water penetration
Series 2	Pane 1 – Outer seals degraded	No water penetration
Series 3	Pane 1 – Outer & inner seals degraded	Significant water penetration
Series 4	Pane 2 – Inner seal degraded	No water penetration

Tested by: s 9(2)(a)

Checked by: JLG





Building Code Clause(s).....B1 & B2\*

PRODUCER STATEMENT – PS1 – DESIGN

(Guidance notes on the use of this form are printed on page 2)

Our Ref:- 2003/004/H

ISSUED BY:.....Jackson Clapperton & Partners Ltd..... (Design Firm)

TO:.....Alexandra & Corban Walls..... (Owner/Developer)

TO BE SUPPLIED TO:.....Auckland Council..... (Building Consent Authority)

IN RESPECT OF:.....Window Fixings & Supports New Dwelling (Stage 2)..... (Description of Building Work)

AT:.....6 Island Bay Road, Birkdale, Auckland, 0626..... (Address)

.....LOT 3 DP 194346 SO.....

We have been engaged by the owner/developer referred to above to provide structural engineering design services in respect of the requirements of (Extent of Engagement)

Clause(s) .....B1 & B2\*.....(\* only those elements covered by our design).....of the Building Code for All or Part only (as specified below), of the proposed building work.

- 1. Window mullions, fixings, window frame fixings.

The design carried out by us has been prepared in accordance with:

- [X] Compliance Documents issued by the Ministry of Business, Innovation & Employment.....B1/VM1, B1/AS1.....or (verification method / acceptable solution)
[ ] Alternative solution as per the attached schedule.....

The proposed building work covered by this producer statement is described on the drawings titled .....

.....Island Bay Road House.....and numbered .....Ref 201504 sheets A1-401, S-18, A4-202 to 204 together with the specification, and other documents set out in the schedule attached to this statement.

On behalf of the Design Firm, and subject to:

- (i) Site verification of the following design assumptions: Loads to AS/NZS1170
(ii) All proprietary products meeting their performance specification requirements;

I believe on reasonable grounds that a) the building, if constructed in accordance with the drawings, specifications, and other documents provided or listed in the attached schedule, will comply with the relevant provisions of the Building Code and that b), the persons who have undertaken the design have the necessary competency to do so. I also recommend the following level of construction monitoring/observation:

[ ] CM1 [X] CM2 [ ] CM3 [ ] CM4 [ ] CM5 (Engineering Categories) Or [ ] as per agreement with owner/developer (Architectural)

I, .....s 9(2)(a)..... am: (Name of Design Professional) (Approved Author no. 1037)

[ ] CPEng .....7518.....#

[ ] Reg Arch ..... #

I am a Member of : [X] IPENZ [ ] NZIA and hold the following qualifications:.....BE, MIPENZ, CPEng..... The Design Firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than \$200,000\*.

The Design Firm is a member of ACENZ: [X]

SIGNED BY .....s 9(2)(a)..... ON BEHALF OF Jackson Clapperton & Partners Ltd..... (Design Firm)

Date.....12/12/2017..... (signature).....

Note: This statement shall only be relied upon by the Building Consent Authority named above. Liability under this statement accrues to the Design Firm only. The total maximum amount of damages payable arising from this statement and all other statements provided to the Building Consent Authority in relation to this building work, whether in contract, tort or otherwise (including negligence), is limited to the sum of \$200,000\*.

This form is to accompany Form 2 of the Building (Forms) Regulations 2004 for the application of a Building Consent.

THIS FORM AND ITS CONDITIONS ARE COPYRIGHT TO ACENZ, IPENZ AND NZIA



# Producer statement design (PS1)

**TO BE COMPLETED BY THE DESIGN PROFESSIONAL WHO HAS BEEN ENGAGED TO PROVIDE A PS1**

Author name:  Author number:

Author company:

Building consent N°:

Site address:

Legal description:

Engaged by:  (Owner)

To provide design services in respect of:  part  all  (describe work)

NZBC clauses: (circle as applicable)

B1	B2	C1	C2	C3	C4	C5	C6	D1	D2	E1	E2	E3
✓	✓											
F1	F2	F3	F4	F5	F6	F7	F8	G1	G2	G3	G4	G5
	✓		✓									
G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	H1		

NB: all statements must include B2

The design has been prepared in accordance with:

Documents issued by the Ministry of Business Innovation & Employment  (verification method / acceptable solution)

Alternative solution (attach schedule if required)

The proposed building work covered by this producer statement design is described on the drawings referenced below, together with the specifications and other documents set out in the schedule attached to this statement:

Drawing title:  Drawing numbers:

The producer statement is subject to:

(i) Site verification of the following design assumptions:

(ii) All proprietary products meeting their performance specification requirements

I believe on reasonable grounds that the proposed building work, will comply with the relevant provisions of the Building Code if constructed in accordance with the drawings, specifications and other documents provided or listed with this statement.


I understand that Auckland Council is reliant on this producer statement for the purposes of establishing compliance with the relevant provisions of the Building Act 2004, Building Regulations and Building Code. I confirm that I hold a current policy of professional indemnity insurance to the value required by Auckland Council.

Construction monitoring is:  Not required  Required (if required please list below)

De-glazing and evaluation of silicone adhesion of at least two glass units for evaluation by Viridian Glass and Dow Corning agent.

(Agreement must be attached)

Signed by:



Date:

15-12-17

Address:

2 Mana Pace, Wiri, Auckland

Postcode: 2014

Phone:

Fax:

Mobile:

s 9(2)(a)

Email:

s 9

## COMMENTS

### Assumptions:

1. Very high wind zone
2. Three drain holes with minimum diameter of 10 mm, or slots 20 mm x 5 mm, must be provided under each insulating glass unit in accordance with NZS 4666. Glazing is undertaken strictly in accordance with NZS 4666.
4. Compatibility of glass and all other substrates in contact with sealants are approved by Dow Corning before commencement of work.
5. At least two insulating glass units are de-glazed from the windows and evaluated by Dow Corning agent to ensure satisfactory adhesion between sealant and frame.
6. Insulating glass units are made up of Viridian 8 mm toughened safety Performatech glass + 16 mm argon cavity + 10 mm clear toughened safety glass inner pane.
7. Glazing is carried out in a clean environment
8. This PS1 does not cover the design and E2 requirements of the window frames and flashings.
10. Dow Corning 795 for sealing glass to tiles in wet areas is permitted as outlined in Dow Corning product specification.

### Important notes:

- Producer statements are accepted solely at Auckland Council's discretion; please refer to the Producer Statement Policy which can be found on Council's website for further details <http://www.aucklandcouncil.govt.nz/EN/ratesbuildingproperty/consents/Consent%20documents/ac2301producerstatementpolicy.pdf>

Design Input

Instructions

Occupancies

AR=1-1.25

AR=1.25-1.5

AR=1.5-1.75

AR=1.75-2

AR=2-2.5

AR=2.5-3

AR=3-5

**VERTICAL IGU SUPPORTED ALONG 4 EDGES: NZS 4223.4:2008**

14/12/2017

**DESIGN INPUT**

ULS wind pressure (kPa)

1.76

SLS wind pressure (kPa)

1.25

**IGU make-up**

**Outer pane**

**Inner pane**

Monolithic

Monolithic

Toughened

Toughened

	Outer pane Monolithic Toughened	Inner pane Monolithic Toughened
Glass thickness selected (mm)	<b>8</b>	<b>10</b>
Load share - ultimate	0.73	1.47
Load share - serviceability	0.52	1.04
Long side of panel (mm)	3020	
Short side of panel (mm)	2440	
AR	1.24	

**MINIMUM GLASS THICKNESS REQUIRED FOR STRENGTH**

Nominal thickness (interlayer excluded)	<b>4</b>	<b>5</b>
---	----------	----------

**Glass selected has adequate strength**

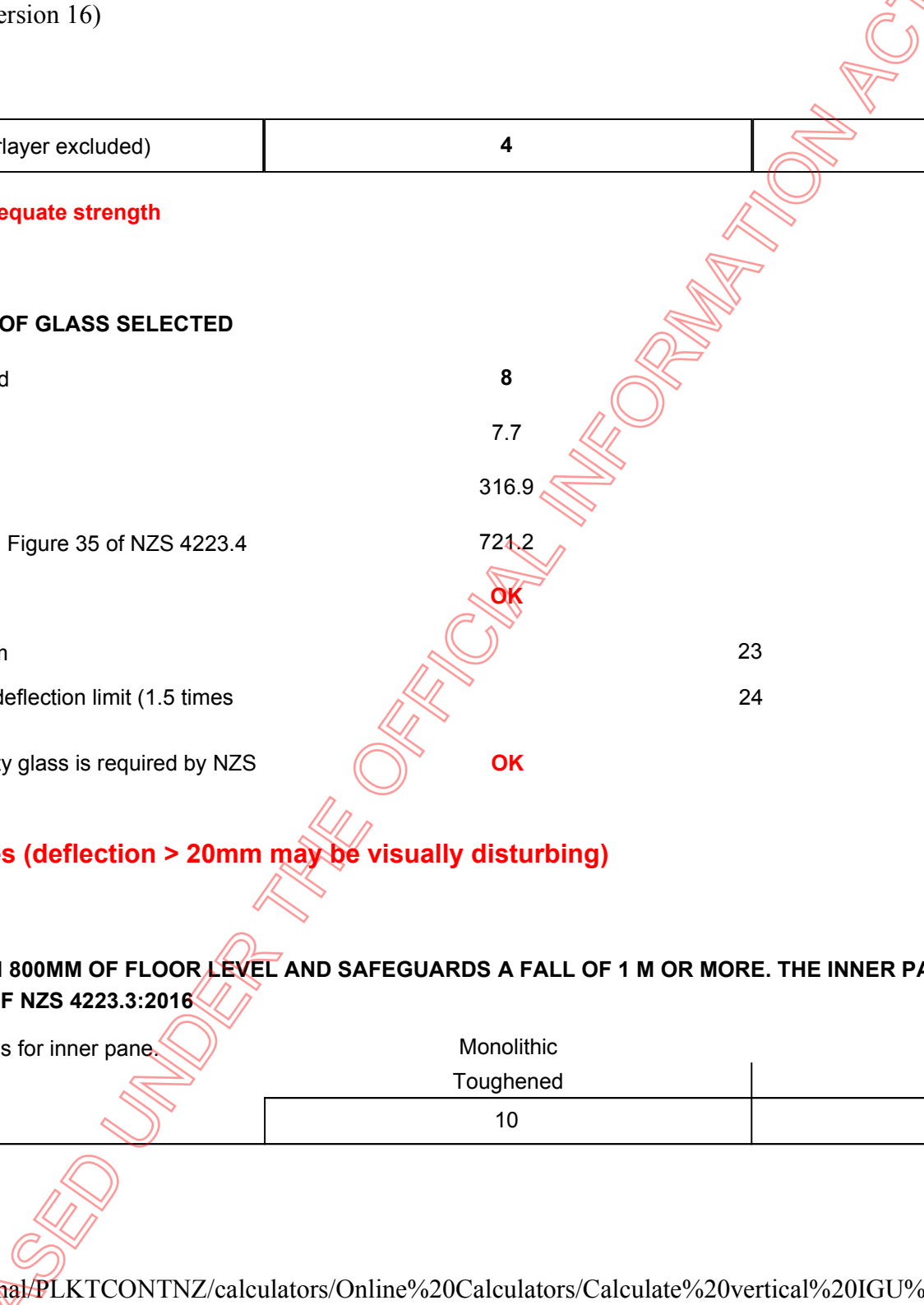
**CHECK DEFLECTION OF GLASS SELECTED**

Glass thickness selected	<b>8</b>	<b>10</b>
Minimum thickness	7.7	9.7
Slenderness factor	316.9	251.6
Slenderness factor from Figure 35 of NZS 4223.4	721.2	481.6
<b>Deflection ≤ Span / 60</b>	<b>OK</b>	<b>OK</b>
Estimated deflection mm		23
IGUMA recommended deflection limit (1.5 times airspace)		24
Thickness check if safety glass is required by NZS 4223.3:2016	<b>OK</b>	<b>OK</b>

**Deflection complies (deflection > 20mm may be visually disturbing)**

**IF GLAZING IS WITHIN 800MM OF FLOOR LEVEL AND SAFEGUARDS A FALL OF 1 M OR MORE. THE INNER PANE MUST BE A SAFETY GLASS TO TABLE 7 OF NZS 4223.3:2016**

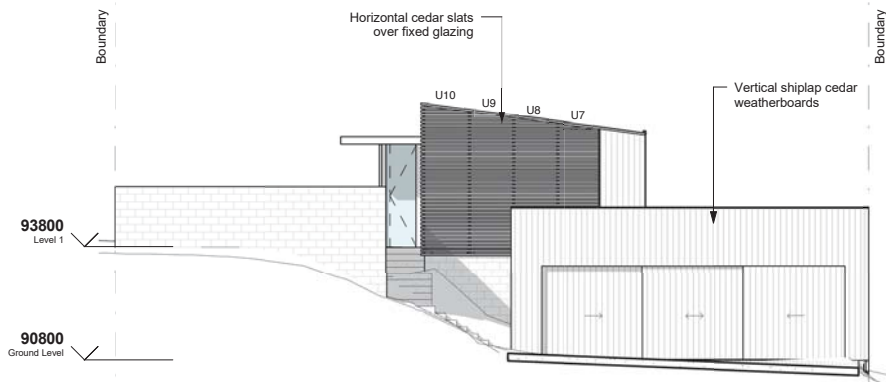
Minimum glass thickness for inner pane. Occupancy type	Monolithic Toughened	Laminated Annealed
	A	10



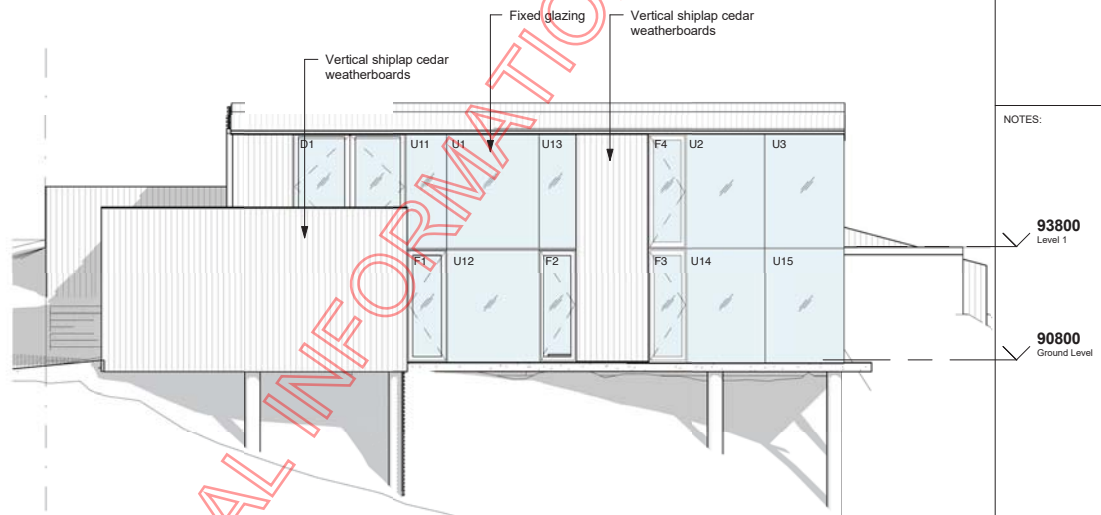


B, E & C3	10	12
C1/C2, D & C5	10	12

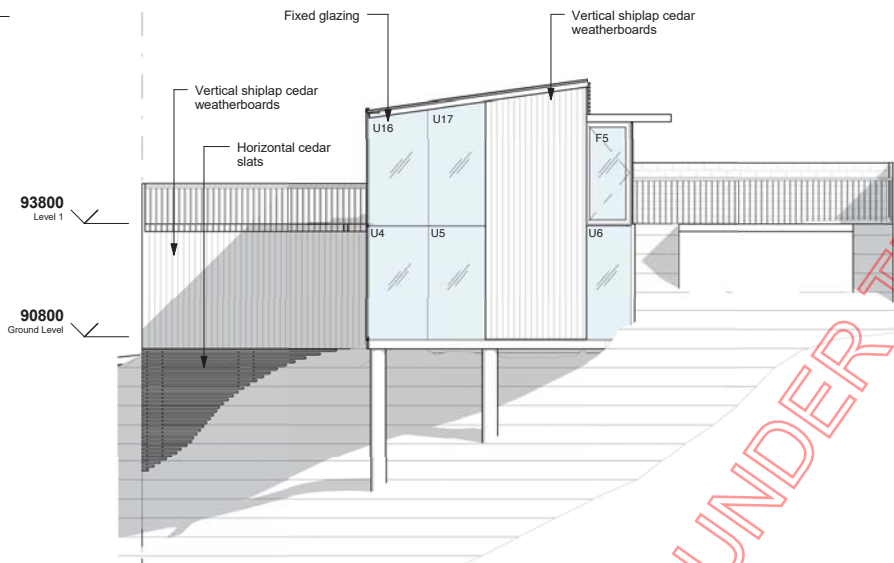
RELEASED UNDER THE OFFICIAL INFORMATION ACT



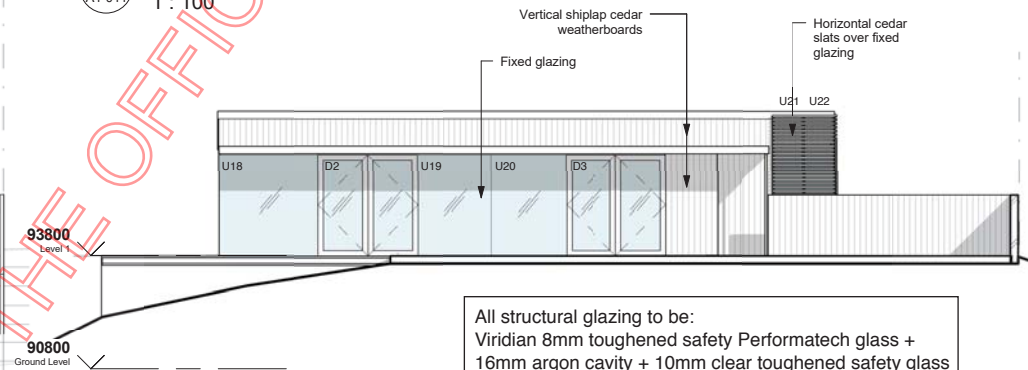
1 North West Elevation  
A1-011 1 : 100



2 South West Elevation  
A1-011 1 : 100



3 South East Elevation  
A1-011 1 : 100



4 North East Elevation  
A1-011 1 : 100

All structural glazing to be:  
Viridian 8mm toughened safety Performatech glass +  
16mm argon cavity + 10mm clear toughened safety glass

LOCAL AUTHORITY  
CONSULTANTS

NOTES:

93800 Level 1  
90800 Ground Level

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504  
ISLAND BAY ROAD HOUSE

6 Island Bay Road, Beach Haven

SHEET:  
Elevations

SCALES @ A2: 1 : 100  
SCALES @ A4: Half A2 scale

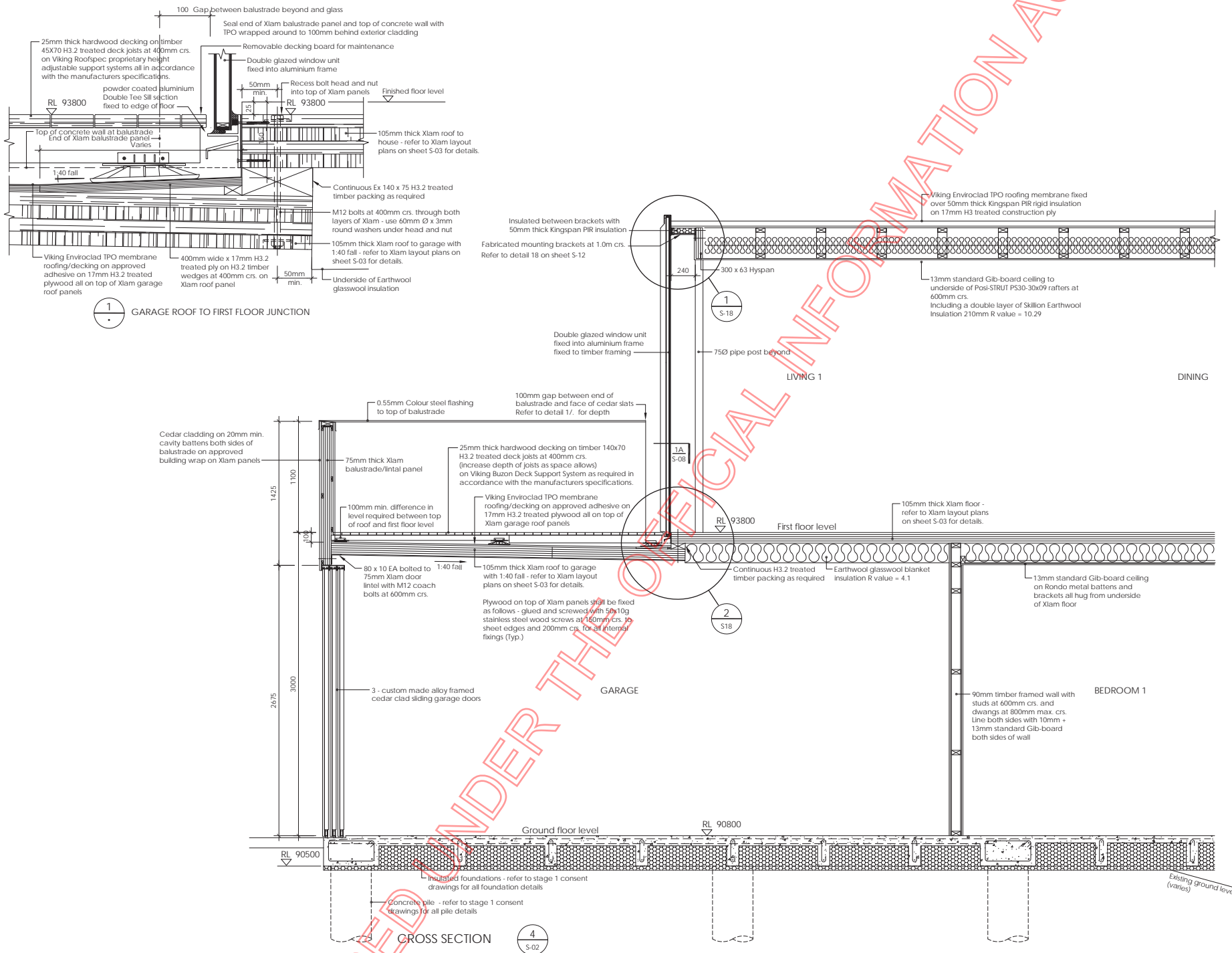
REF:  
DRAWN/START DATE: Author  
DRWG No: REVISION:  
A1-401

DO NOT SCALE  
CONTRACTOR MUST VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK

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07-Dec-17 5:42:09 PM

BUILDING CONSENT



LOCAL AUTHORITY:  
AUCKLAND CITY COUNCIL

CONSULTANT:  
s 9(2)(a)  
S. J. Robertson & Partners Ltd  
PO Box 71 065 Rosebank Road  
ph (09) 8200131  
cell

NOTES:

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504  
ISLAND BAY ROAD HOUSE  
6 Island Bay Road  
Beach Haven  
AUCKLAND

SHEET:  
Garage/House Cross Section

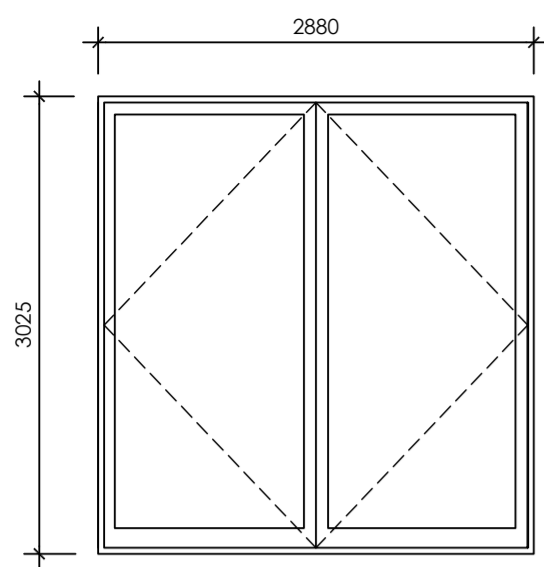
SCALES @ A2:  
SCALES @ A4: Half A2 scale

REF:  
DRAWN/START DATE: Author

DRWG No: S-07  
REVISION:

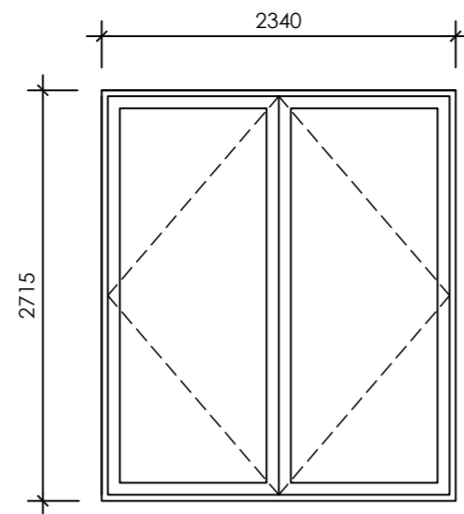
DO NOT SCALE  
CONTRACTOR MUST VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK

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**DOOR 1 DESCRIPTION**  
Aluminium framed double glazed double 1440 wide doors as shown.

D1 1 off  
door elevations Scale 1:50



**DOOR 2 & 3 DESCRIPTION**  
Aluminium framed double glazed 2700 wide sliding doors as shown.

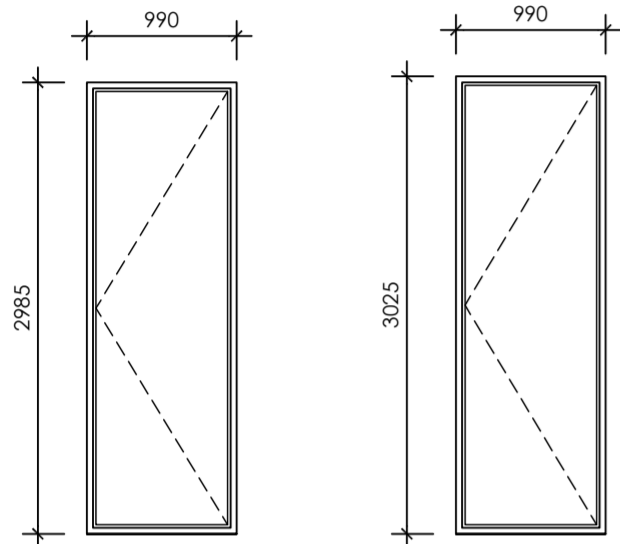
D2 & D3 1 off each

**general notes:**

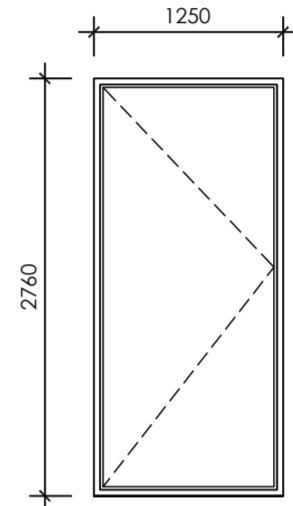
Refer to the floor plans and elevations for the door locations.  
"F" framed window dimensions shown are over the frame and "U" glazing unit dimensions shown are over the unit.  
All glazing units are low E double glazed glazing units.  
All windows and doors are elevated from the outside.  
All doors windows and glazing units are to be site measured before manufacture.  
All class is to be clear float glass.

**glazing notes:**

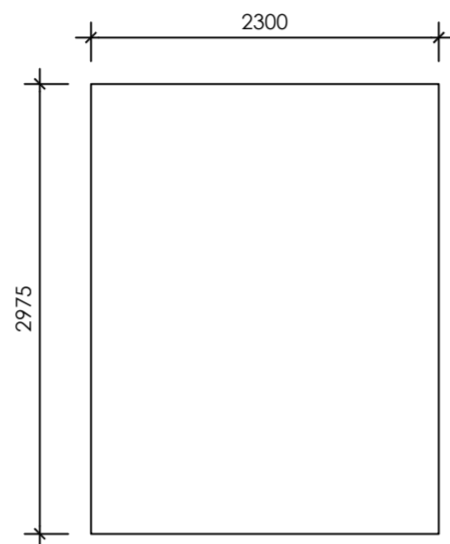
Safety glass is to be provided to all doors and windows as required by Building Code Clause F2 Hazardous Building Materials, and in accordance with NZS 4223: Part 3: 1999 Glazing in Buildings - Human Impact Safety Requirements All glazing to the dwelling to comply with NZS 4223 parts 1, 2 and 3



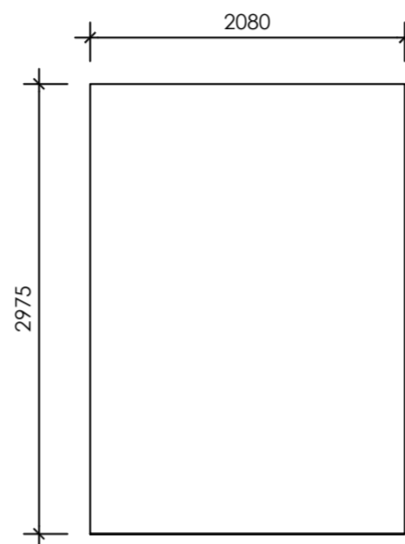
F1, F2 & F3 1 off each  
F4 1 off



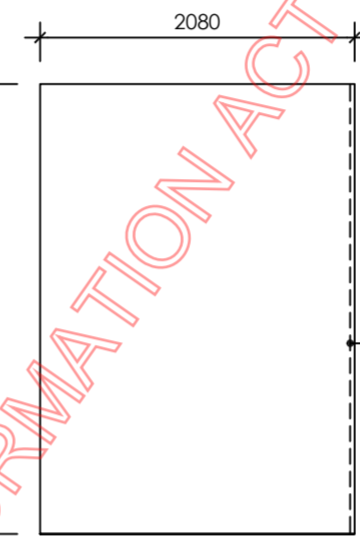
F5 1 off



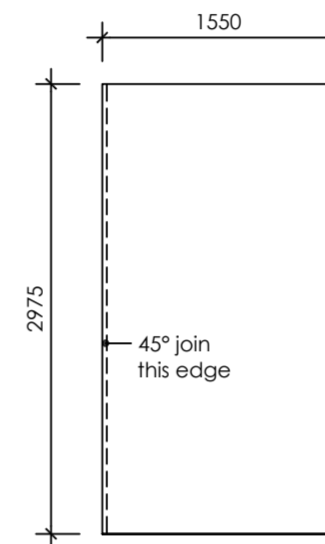
U1 1 off



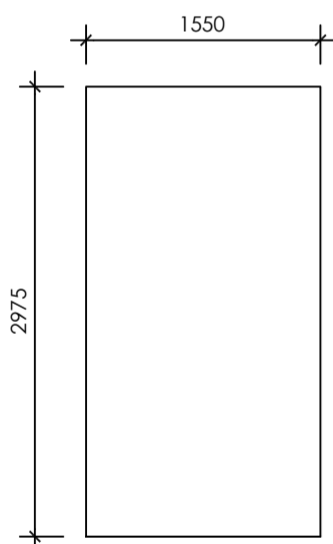
U2 1 off



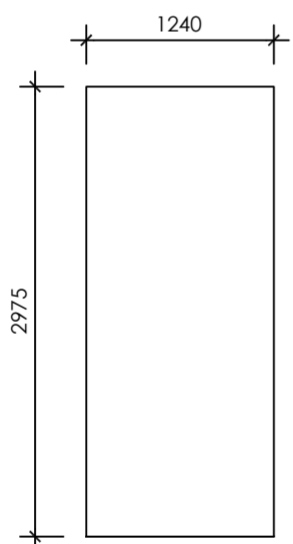
U3 1 off



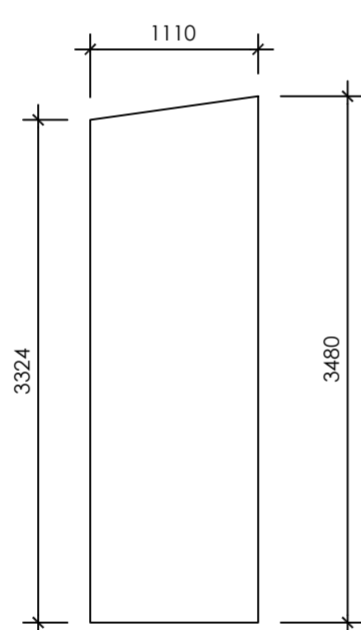
U4 1 off



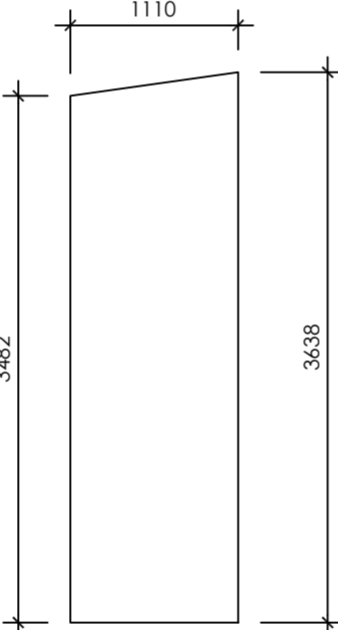
U5 1 off



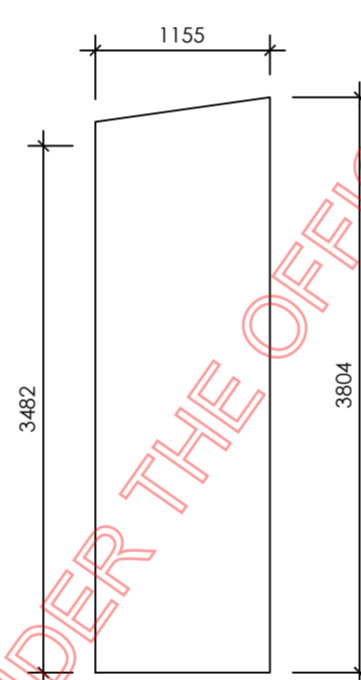
U6 1 off



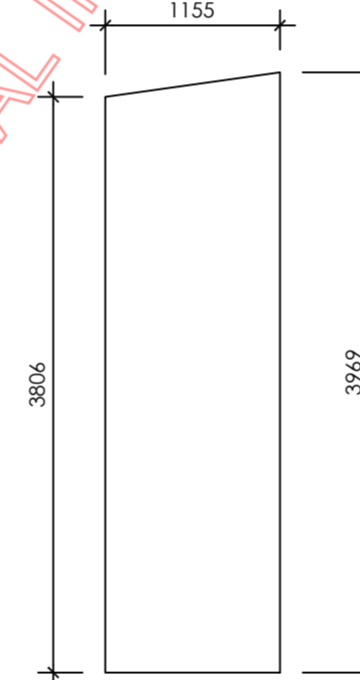
U7 1 off



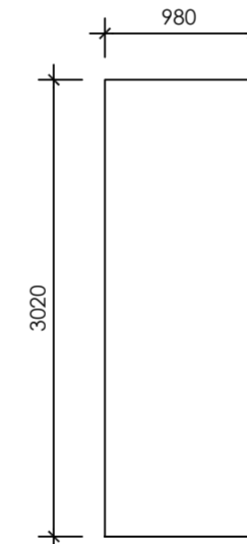
U8 1 off



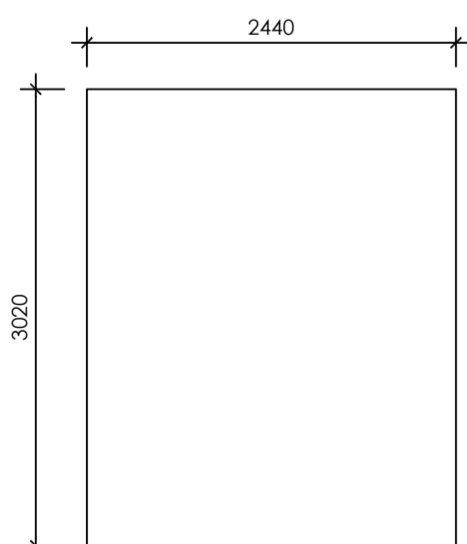
U9 1 off



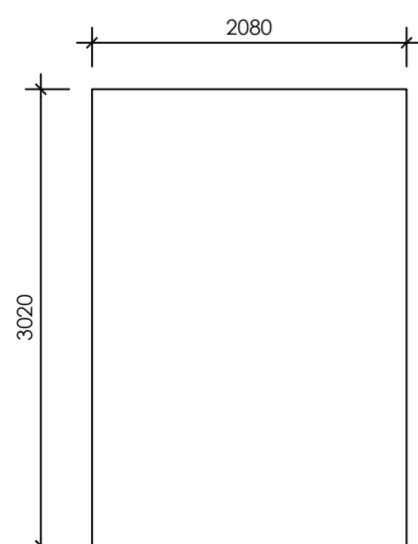
U10 1 off



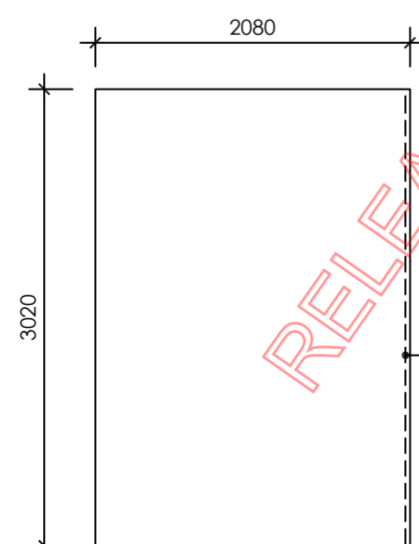
U11 & U13 1 off each



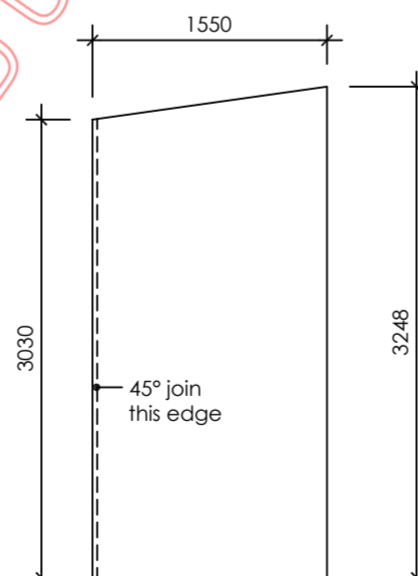
U12 1 off



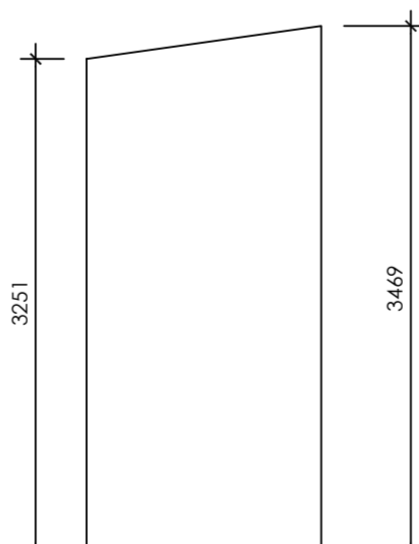
U14 1 off



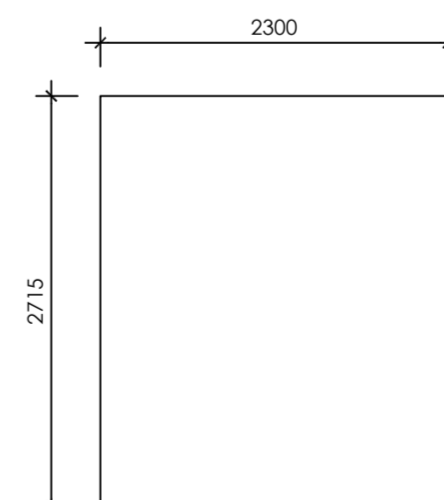
U15 1 off



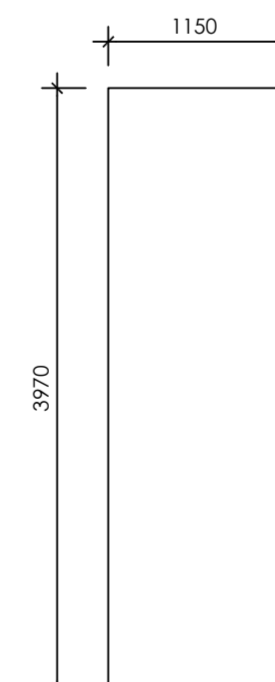
U16 1 off



U17 1 off



U18, U19 & U20 1 off each



U21 & U22 1 off each

window elevations Scale 1:50 @ A2

LOCAL AUTHORITY:  
AUCKLAND CITY COUNCIL

CONSULTANT:  
s 9(2)(a)  
Jackson Clapperton & Partners Ltd  
PO Box 71 065 Rosebank Road  
ph (09) 8200131  
cell

NOTES:

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504

ISLAND BAY ROAD HOUSE

6 Island Bay Road  
Beach Haven  
AUCKLAND

SHEET:  
DOOR AND WINDOW ELEVATIONS

SCALES @ A2:  
SCALES @ A4: Half A2 scale

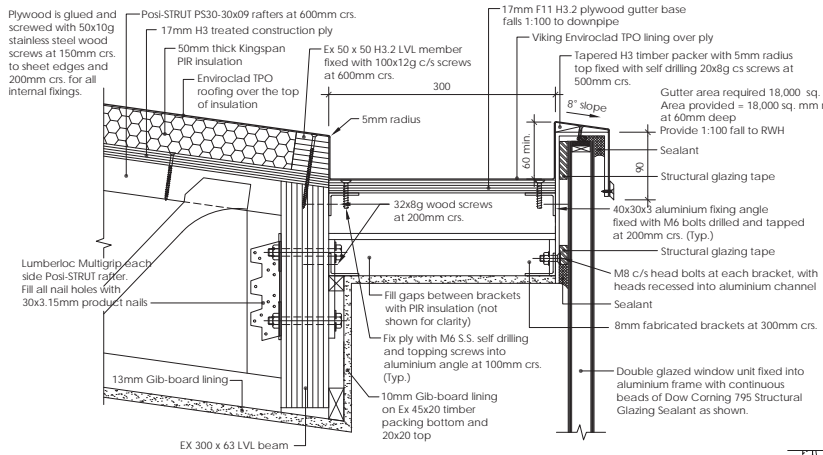
REF:  
DRAWN/START DATE: Author

DRWG No: REVISION:  
S-16

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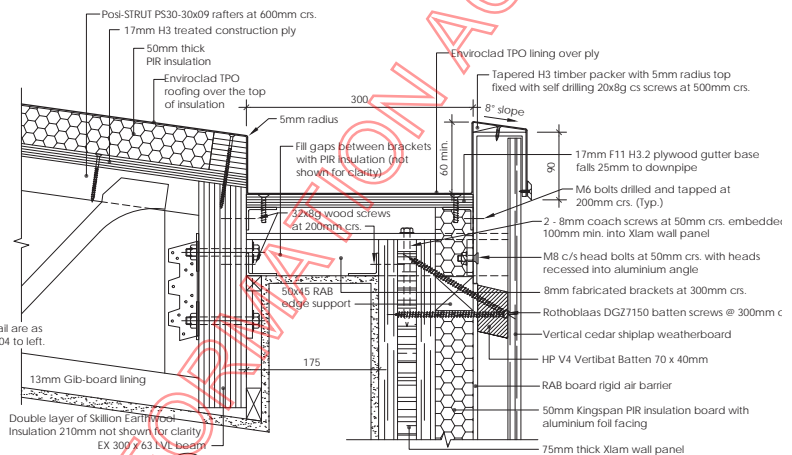
COPYRIGHT © s 9(2)(a)





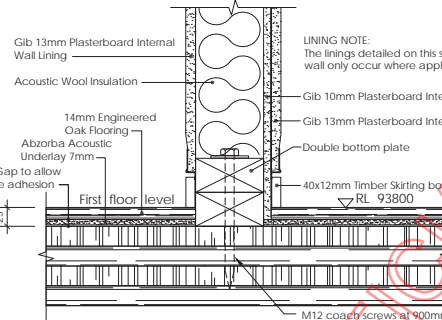
Double layer of Skillion Earthwool Insulation 210mm (not shown for clarity)

**1 S-04 EAVE/GUTTER DETAIL @ WINDOW**



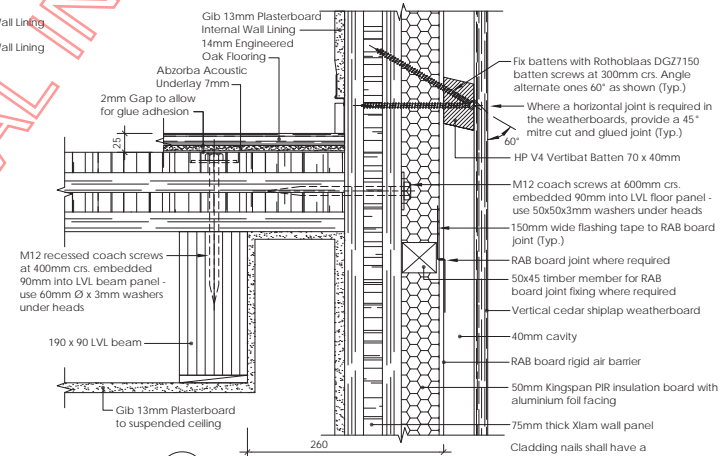
NOTE: All fixings for this detail are as shown on detail 1/S-04 to left.

**2 S-05 EAVE/GUTTER DETAIL @ CLADDING**

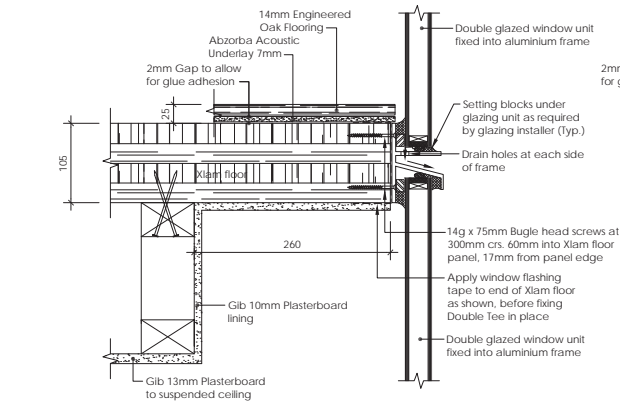


**6 S-04 FIRST FLOOR - TYPICAL INTERNAL WALL**

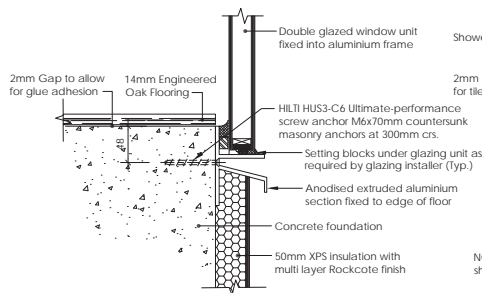
GLAZING NOTE: Refer to window details on sheet S-18 for full glazing details.



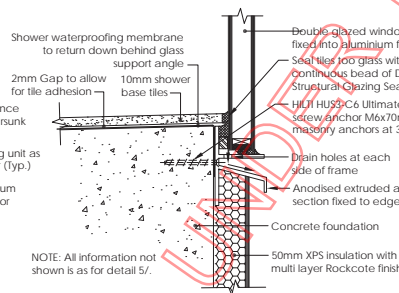
**4 S-05 FIRST FLOOR WALL ABOVE AND BELOW**



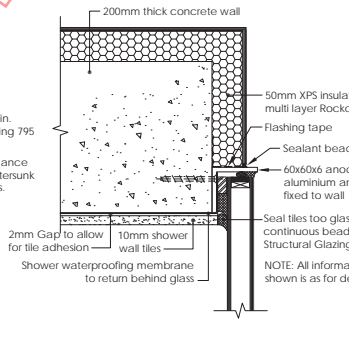
**3 S-04 FIRST FLOOR WINDOW ABOVE AND BELOW**



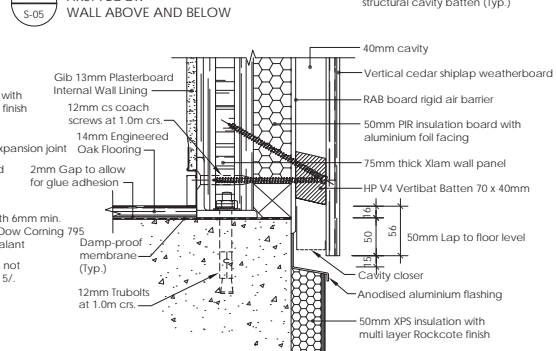
**5 S-04 GROUND FLOOR @ WINDOW**



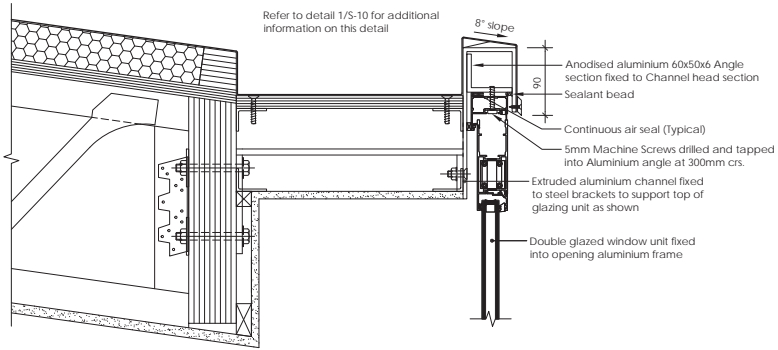
**5a S-04 GROUND FLOOR @ SHOWER WINDOW**



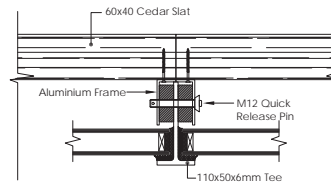
**5b S-04 WINDOW TO CONCRETE WALL - SECTION**



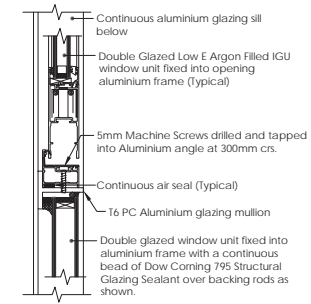
**6 S-05 GROUND FLOOR @ WALL**



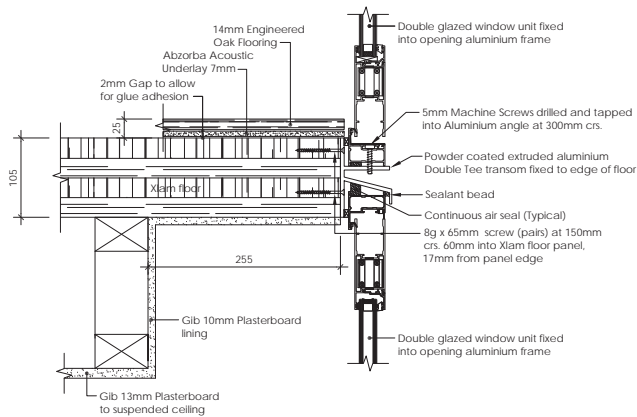
ROOF LEVEL  
EAVE/GUTTER DETAIL @ WINDOW



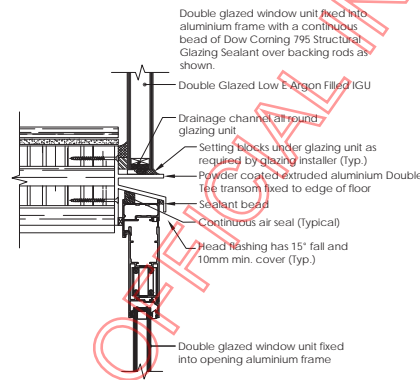
CEDAR SLAT - HORIZONTAL SECTION - FIXING DETAIL



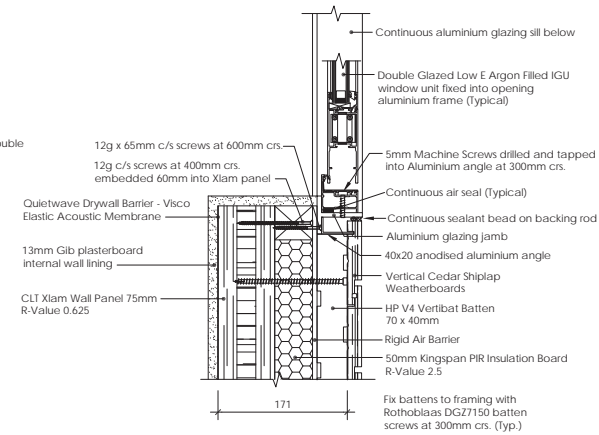
FIXED GLAZING/DOOR JAMB JUNCTION



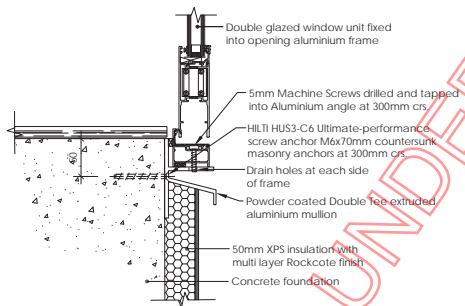
FIRST FLOOR  
WINDOW ABOVE AND BELOW



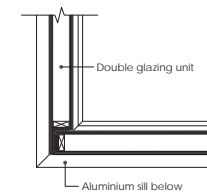
FIRST FLOOR  
FIXED WINDOW ABOVE AND OPENING WINDOW BELOW



WALL/WINDOW JAMB JUNCTION



TYPICAL OPENING WINDOW DETAILS Scale 1:5 @ A2



FIXED GLAZING CORNER DETAIL Scale 1:5 @ A2

GROUND FLOOR @ WINDOW

LOCAL AUTHORITY:  
AUCKLAND CITY COUNCIL

CONSULTANT:  
s 9(2)(a)  
s 9(2)(a) & Partners Ltd  
PO Box 71 065 Rosebank Road  
ph (09) 8200131  
cell

NOTES:

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504  
ISLAND BAY ROAD HOUSE

6 Island Bay Road  
Beach Haven  
AUCKLAND

SHEET:  
OPENING WINDOW DETAILS

SCALES @ A2:  
SCALES @ A4: Half A2 scale

REF:

DRAWN/START DATE: Author

DRWG No: REVISION:

S-17

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NOTES:

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504

**ISLAND BAY ROAD HOUSE**

6 Island Bay Road  
Beach Haven  
AUCKLAND

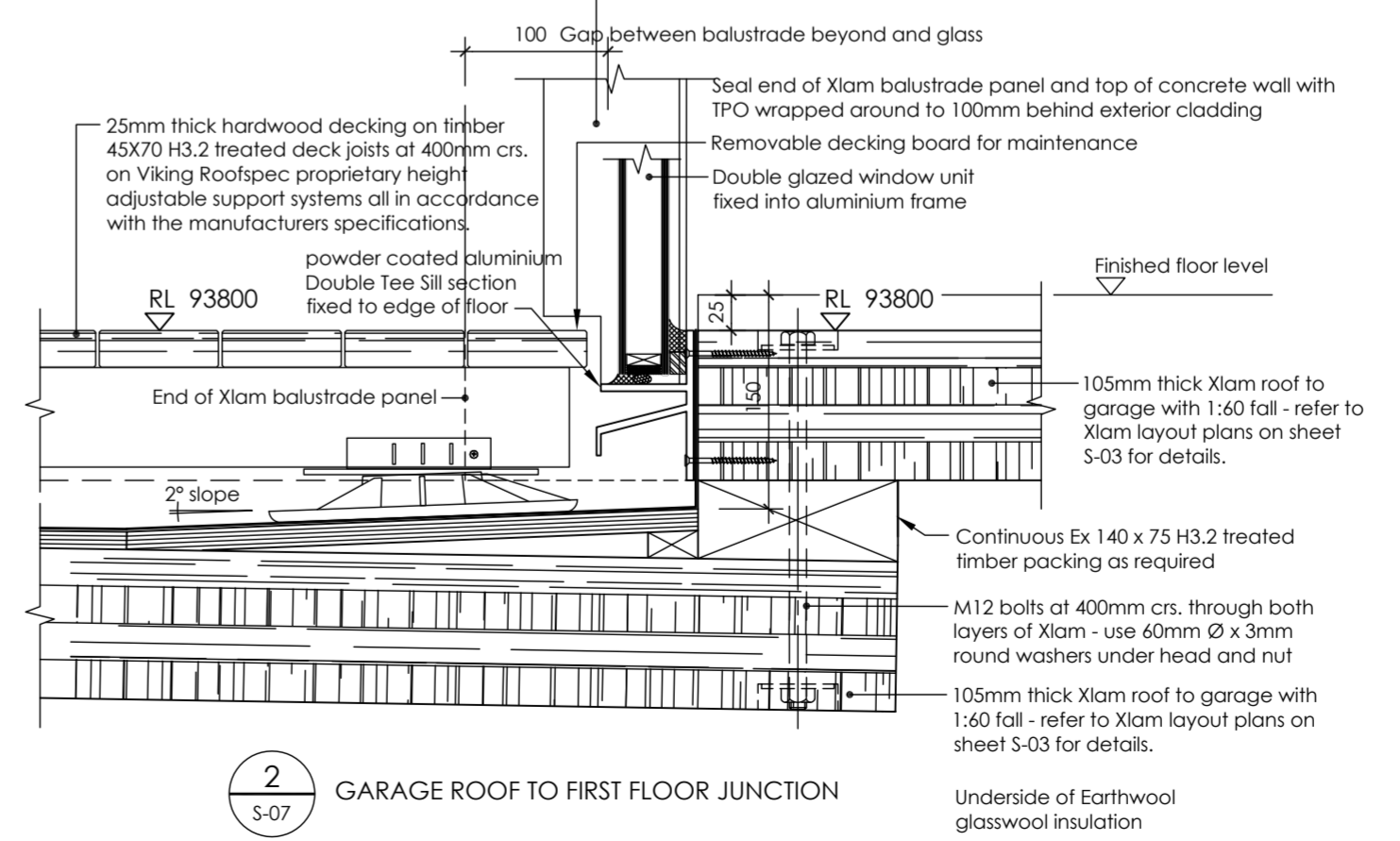
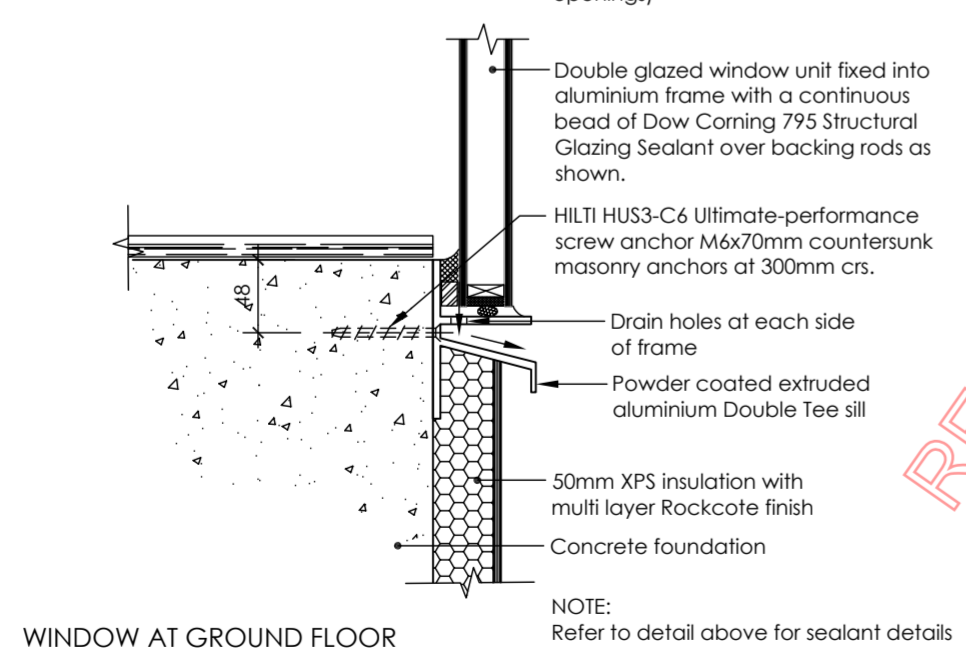
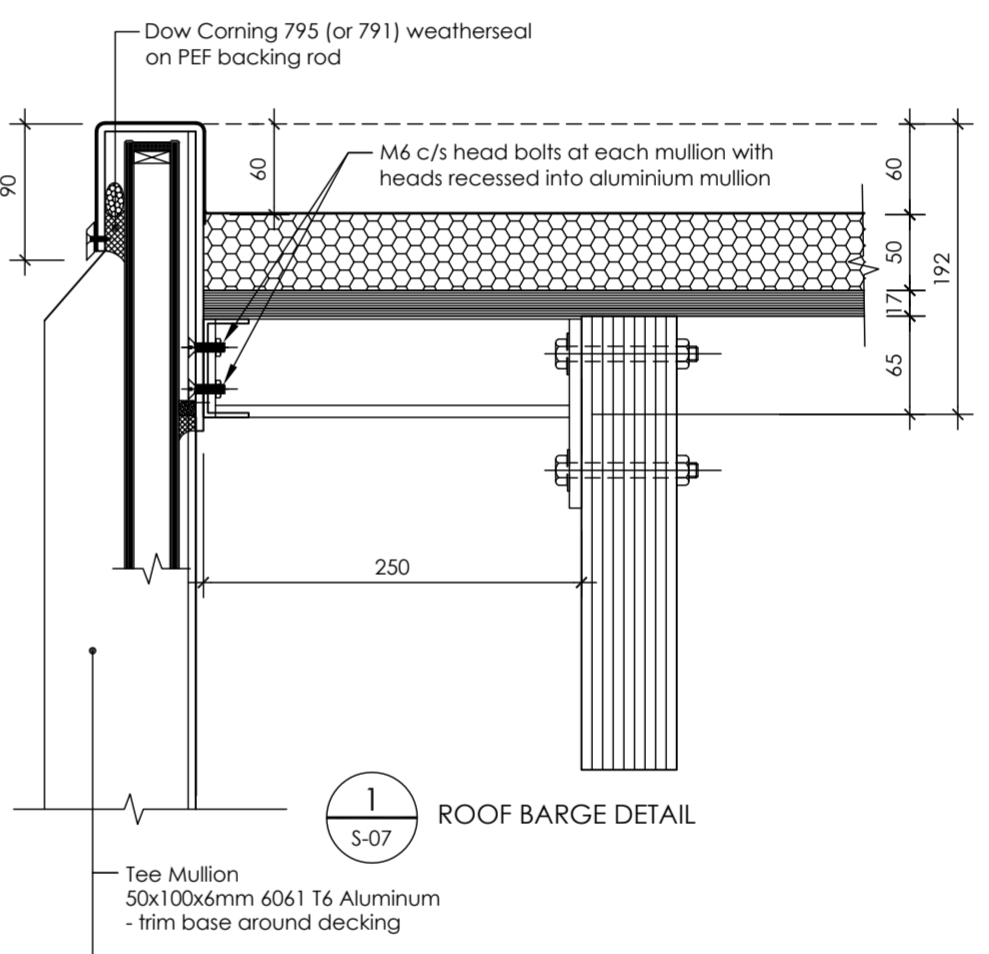
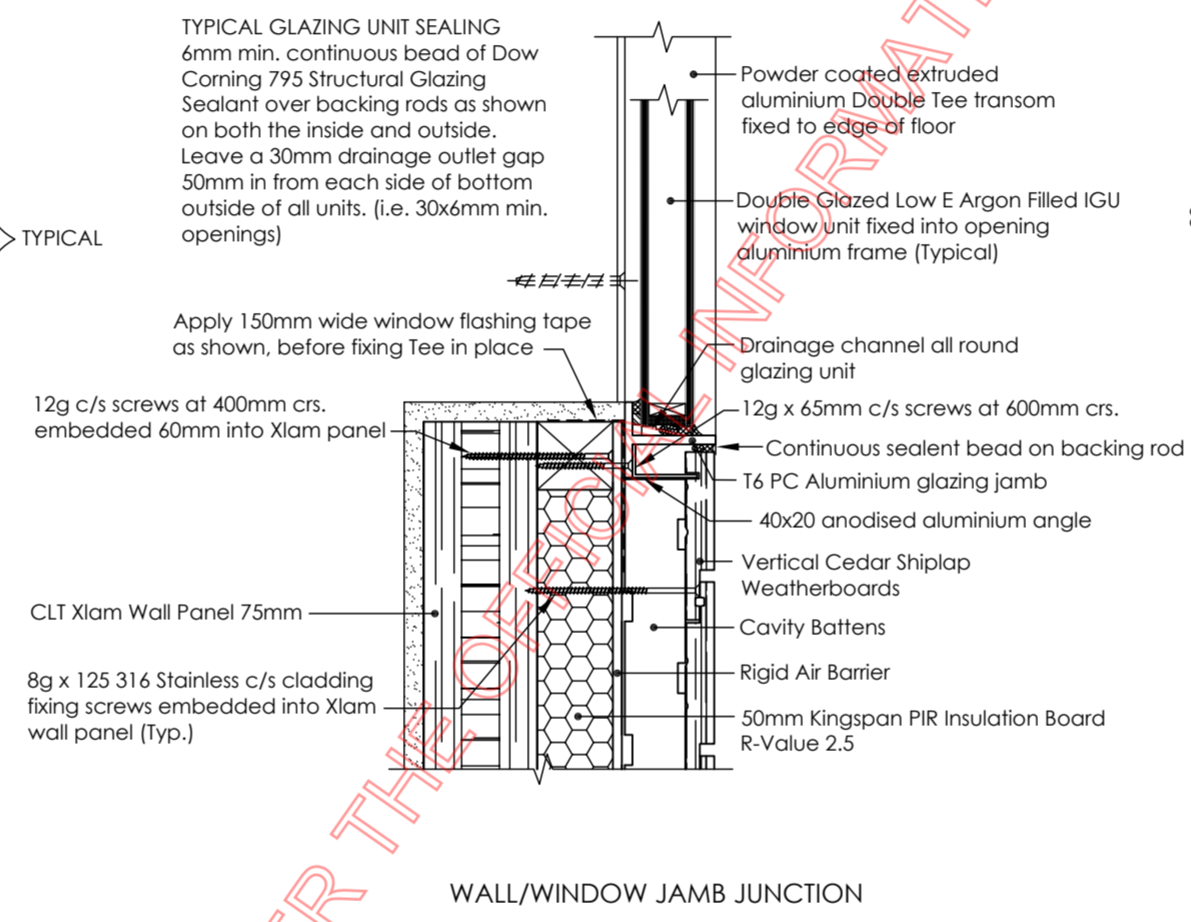
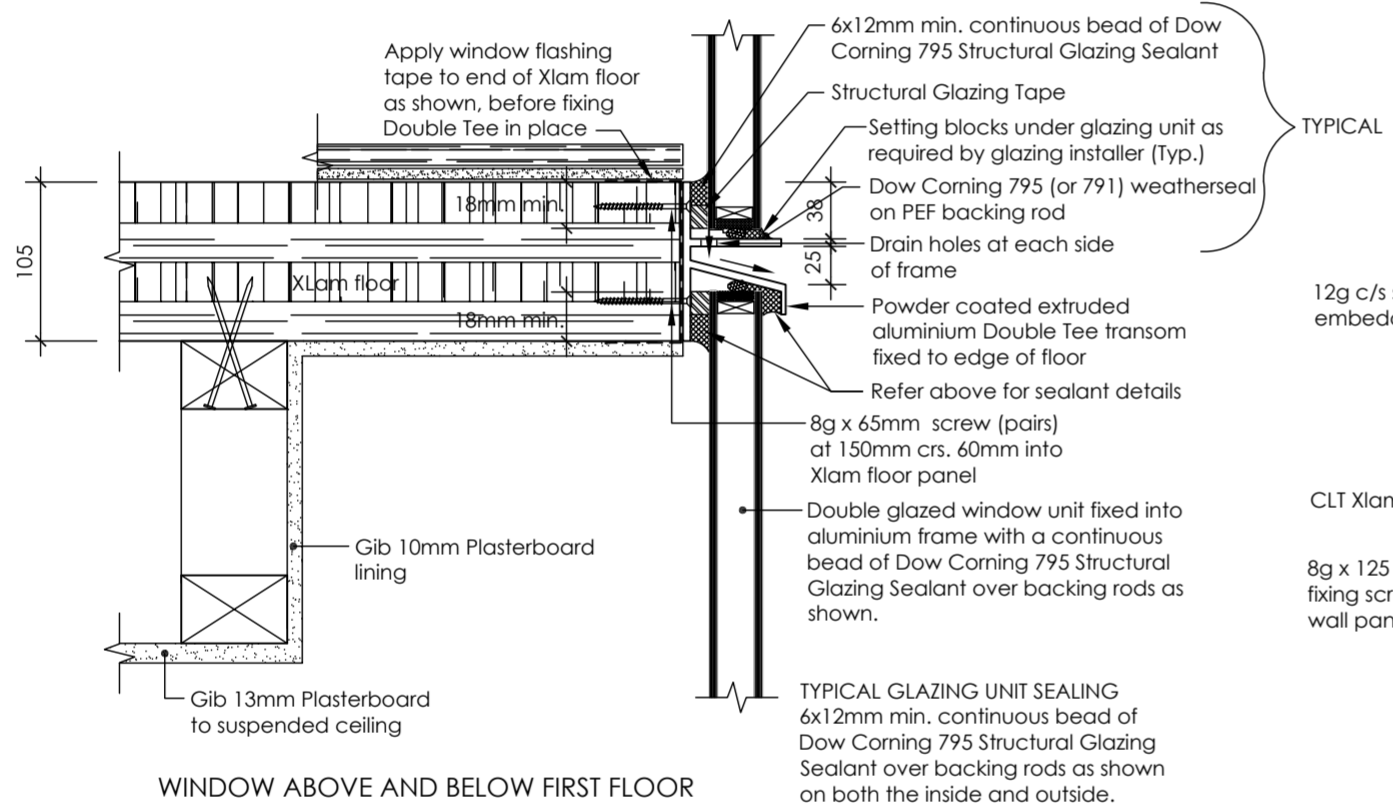
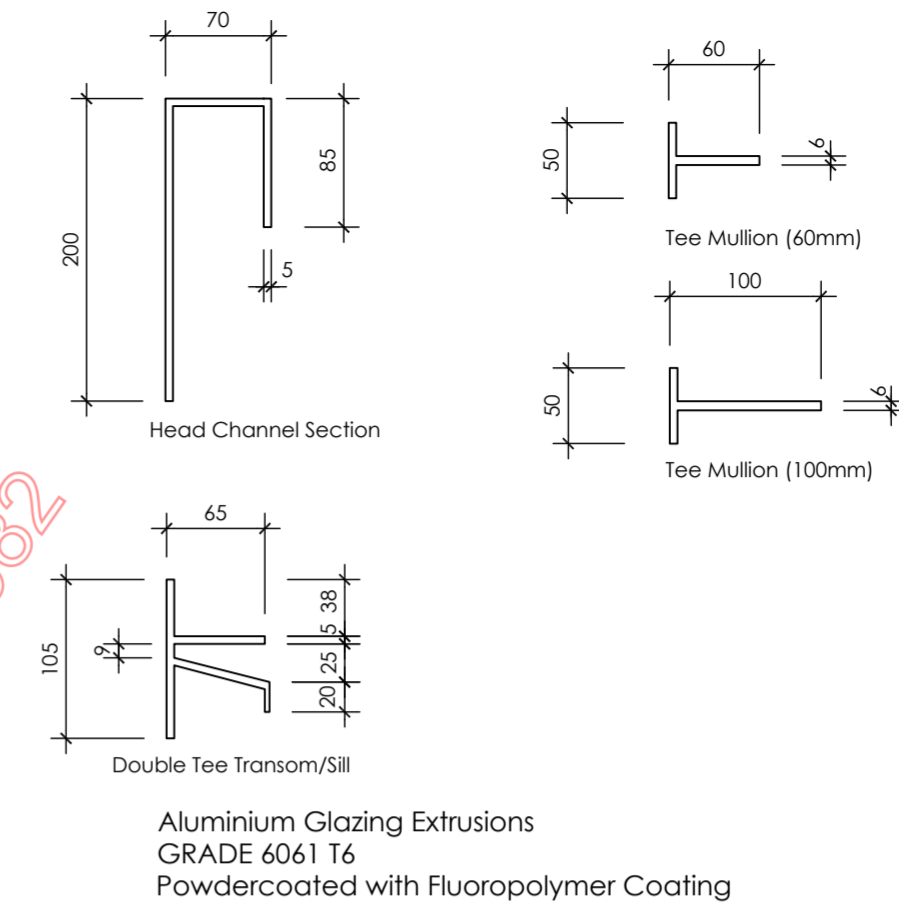
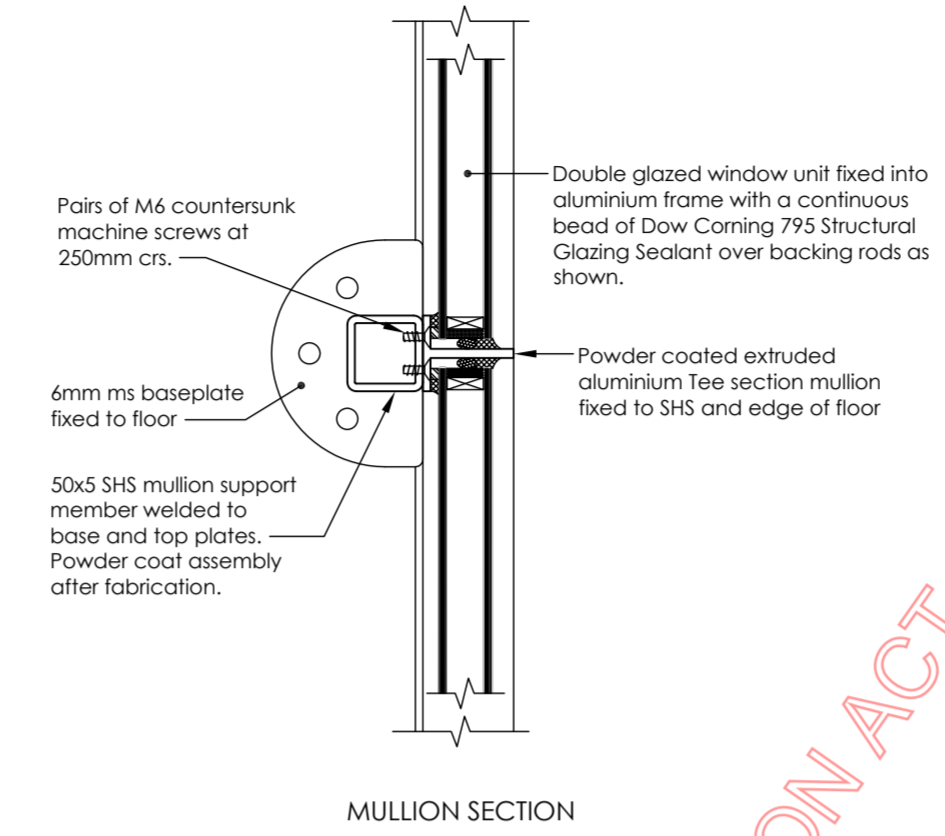
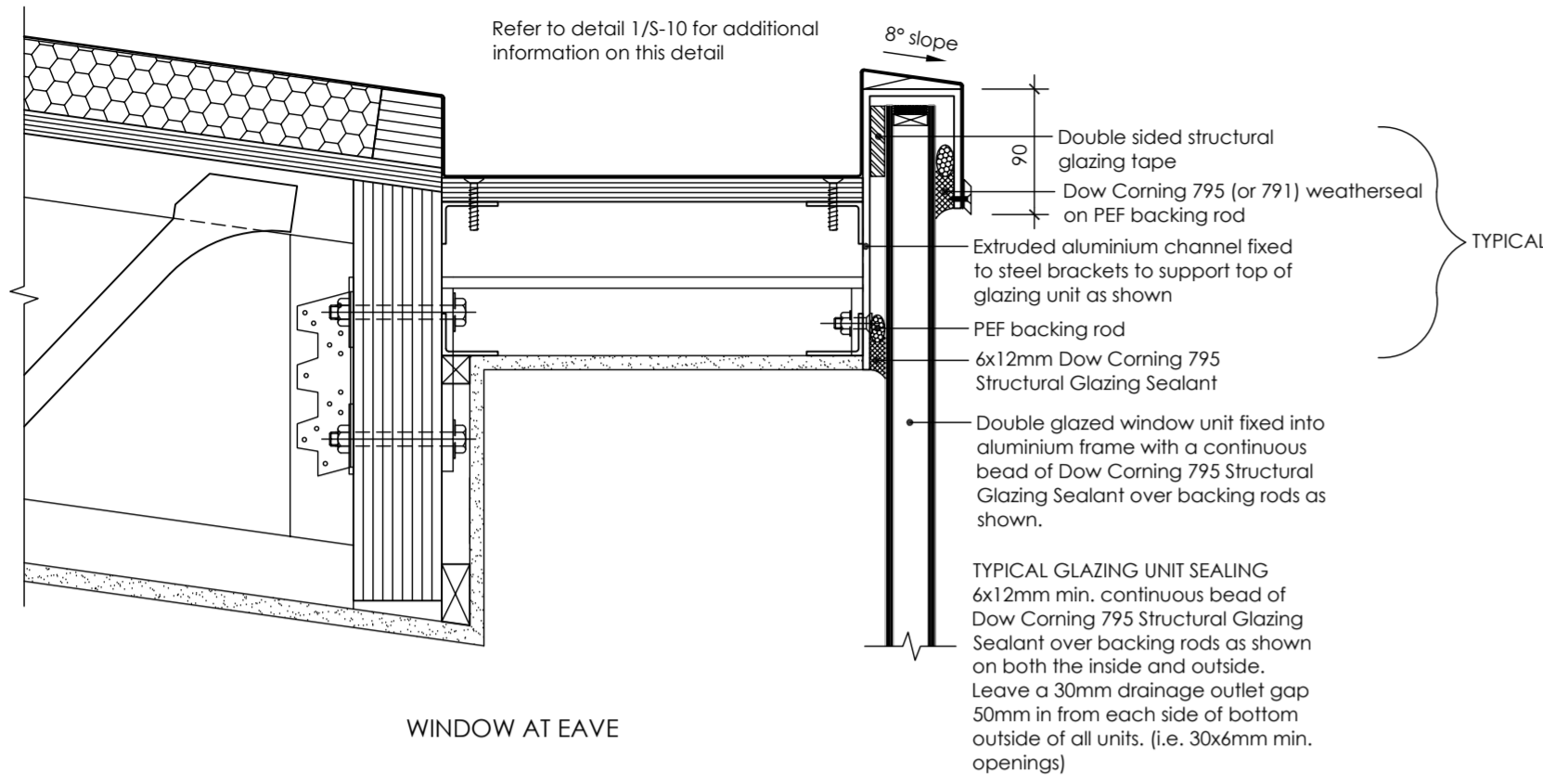
SHEET:  
**FIXED WINDOW DETAILS**

SCALES @ A2:  
SCALES @ A4: Half A2 scale

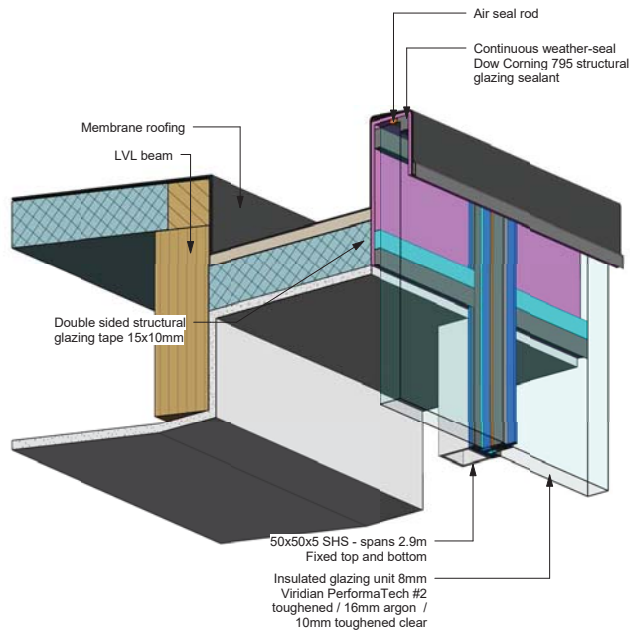
REF:  
DRAWN/START DATE: Author

DRWG No: REVISION:  
**S-18**

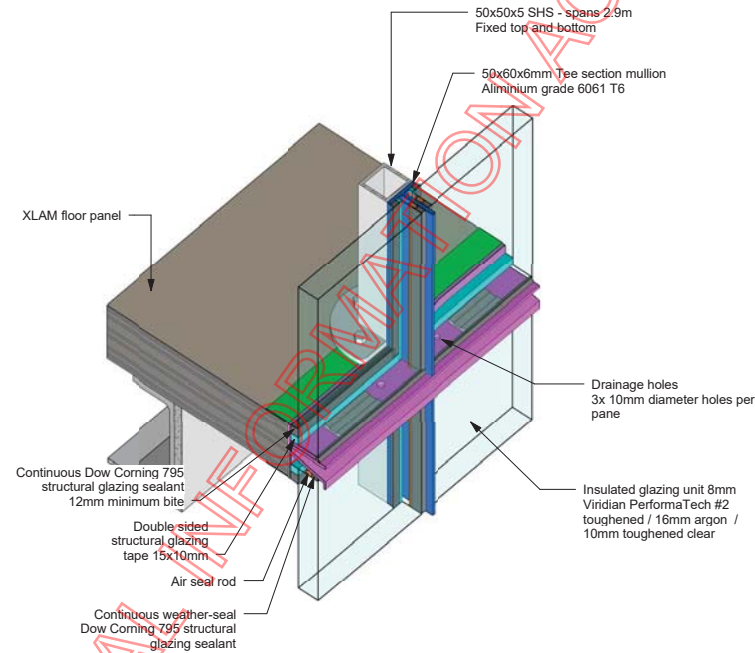
DO NOT SCALE  
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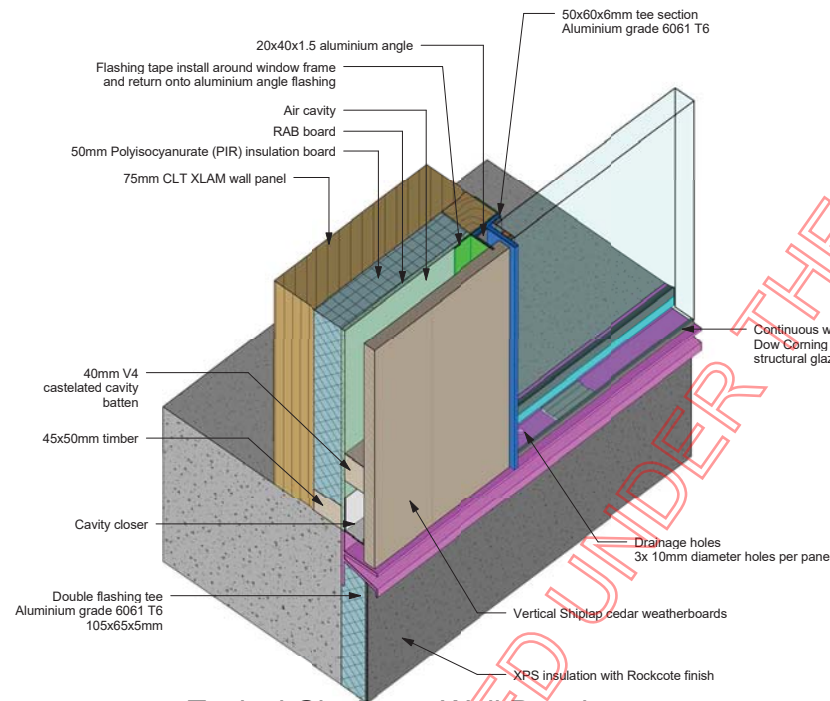




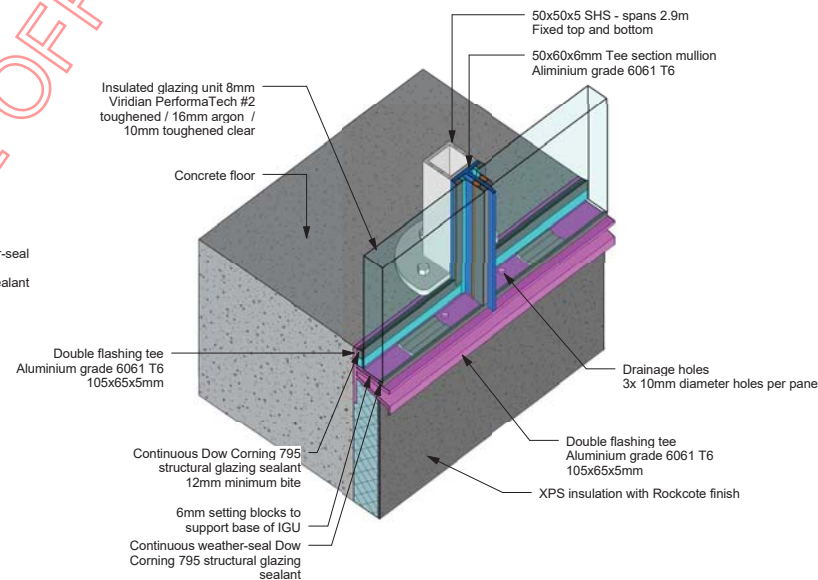
3 Typical Glazing Head Isometric Detail



1 Typical Glazing Isometric Detail



2 Typical Glazing to Wall Panel Isometric Detail



4 Typical Glazing Sill Isometric Detail

LOCAL AUTHORITY

CONSULTANTS

NOTES:

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504

ISLAND BAY ROAD HOUSE

6 Island Bay Road, Beach Haven

SHEET: Typical Glazing Details

SCALES @ A2: SCALES @ A4: Half A2 scale

REF: DRAWN/START DATE: Author

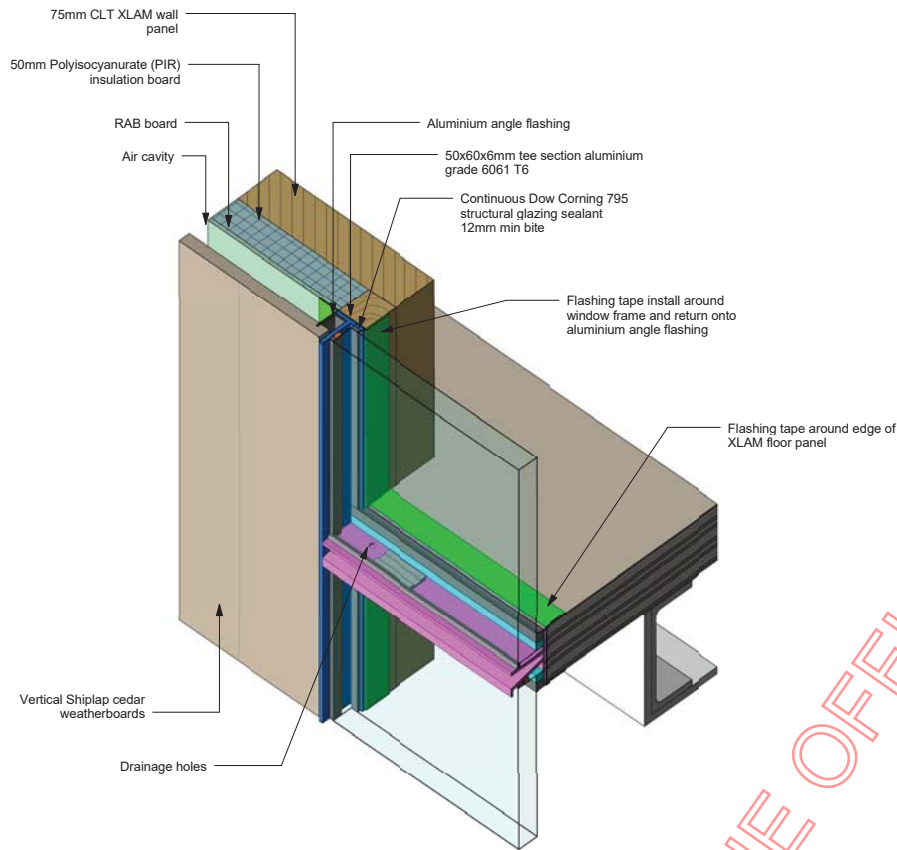
DRWG No: A4-202 REVISION:

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BUILDING CONSENT





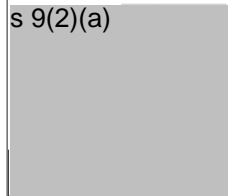
1 Typical Glazing to Wall Panel  
Isometric Detail at Midfloor

BASED UNDER THE OFFICIAL INFORMATION ACT

LOCAL AUTHORITY  
CONSULTANTS

NOTES:

REVISION HISTORY:



PROJECT: No: 201504  
**ISLAND BAY ROAD HOUSE**

6 Island Bay Road, Beach Haven

SHEET:  
**Typical Glazing Details - Sheet 2**

SCALES @ A2:  
SCALES @ A4: Half A2 scale

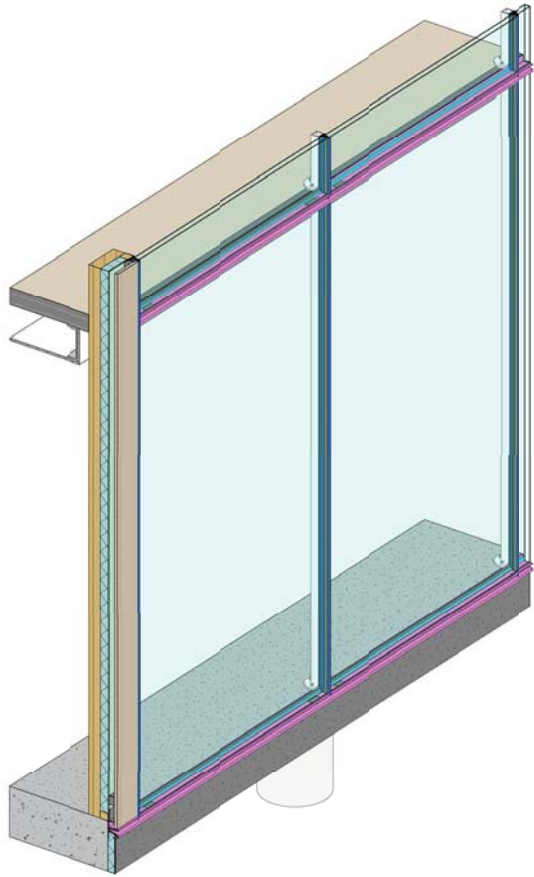
REF:  
DRAWN/START DATE: Author

DRWG No: A4-203 REVISION:

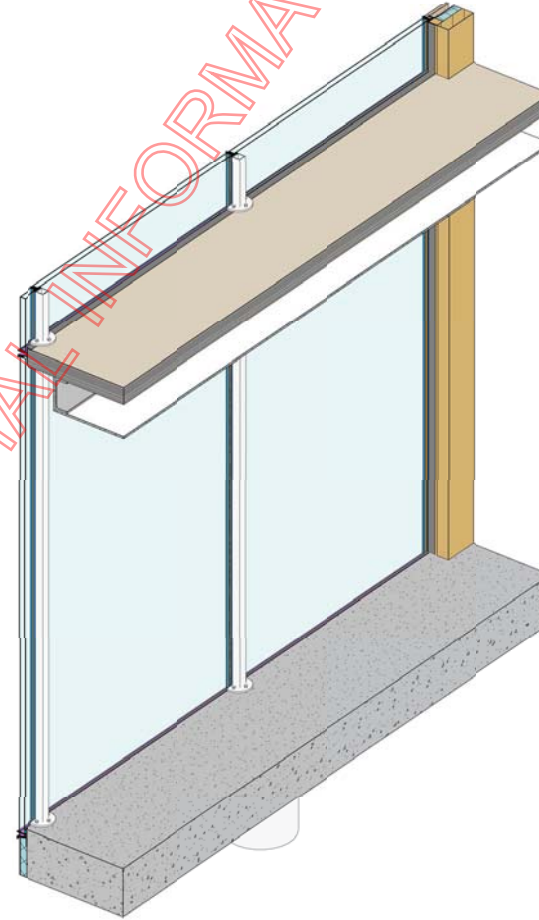
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07-Dec-17 5:42:18 PM

BUILDING CONSENT



1 Typical Glazing Panels - 3D



2 Typical Glazing Panels - 3D Interior

RELEASED UNDER THE OFFICIAL INFORMATION ACT

LOCAL AUTHORITY

CONSULTANTS

NOTES:

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504  
**ISLAND BAY ROAD HOUSE**

6 Island Bay Road, Beach Haven

SHEET:  
**Typical Glazing Details - Sheet 3**

SCALES @ A2:  
 SCALES @ A4: Half A2 scale

REF:  
 DRAWN/START DATE: Author

DRWG No: REVISION:  
**A4-204**

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 07-Dec-17 5:42:25 PM

**BUILDING CONSENT**

**From:** Corban Walls s 9(2)(a) ]

**Sent:** Thursday, 1 February 2018 5:23 p.m.

**To:** Ginny Carter

**Cc:** [Malcolm.McCluskey@aucklandcouncil.govt.nz](mailto:Malcolm.McCluskey@aucklandcouncil.govt.nz); Determinations; Sue Brown

**Subject:** Re: Draft determination for 6 Island Bay Road, Beach Haven, Auckland (Ref 2975)

[UNCLASSIFIED]

Hi Ginny,

In response to the draft determination I have provided and undertaken the following:

Following instruction from the Determination Draft I've had the fixed glazed cladding system tested accordingly, and undertaken the following testing in accordance with AS/NZS 4284 and E2/VM1. The structure has been checked by a structural engineer as being sufficient for this specific situation.

The testing concluded that there were no leaks in the glazing or aluminium framing. (see attached test report for details). The fixed glazing relies on two barriers of sealant to maintain watertightness, the primary weather seal and also the structural glazing sealant bead. The testing showed that even in the case of severe deterioration of the primary weather seal (holes were cut into the seal during testing) that there were still no leaks as the structural glazing sealant bead acted as a secondary defence against the ingress of water. The Dow Corning 795 sealant comes with a 20 year warranty on this specific project.

Preconditioning Test: (PASSED)

Apply a preconditioning loading to the external face of the test sample for a period of 1 minute of positive pressure, followed by a period of 1 minute of negative pressure (suction) at 1515 Pa.

Series 1: Static Water Penetration (PASSED)

Test pressure 455 Pa Duration 15 minutes

Series 1: Cyclic Water Penetration (PASSED)

Test pressure 455–910 Pa Duration 5 minutes

Series 2: Water Management Tests Static Water Penetration (PASSED) Test pressure 455 Pa Duration 15 minutes

We couldn't practically drill 6mm holes in the primary weather seal as it would've broken the glass so we cut 30x3mm holes in the seals to simulate seal degradation. A 6mm diameter hole has an area of 28mm<sup>2</sup> where as a 30x3mm rectangular hole has an area of 90mm<sup>2</sup>, over three times the required size.

Series 2: Water Management Tests Cyclic Water Penetration (PASSED) Test pressure 455–910 Pa Duration 5 minutes

Series 3: Wetwall Test Static Water Penetration (NOT POSSIBLE)

Test pressure 50 Pa Duration 15 minutes

As the glass cladding is comprised of fully sealed glass panels there is no wall underlay to remove to make this portion of the test possible. With a window system, any leaks will be evident as opposed

to a cladding system on timber framing, which can cause structural damage without any visible signs until it's well advanced.

Onsite Testing:

I also propose that a condition of this design is to undertake an AAMA 501.2 onsite water tightness testing after installation but before wall linings are installed to prove the system performance in this specific application. The onsite test is a quality assurance test to check everything has been installed correctly.

- Added a head flashing above all the glazing panels that have a fall of 15° and a minimum cover of 10mm to align with the Acceptable solutions of E2/AS1 and to add a 'mitigating feature'.
- Have amended the multitude of errors and inconsistencies across the consent drawings to clearly demonstrate the specific structural glazing adhesive and how it should be used.
- Provided accurate drawings showing the exact size of all the glazing members.
- Provided B1 calculations and a producer statement for the structure supporting the glazing including loading and fixing of the sill.
- Designed a maintenance schedule for the building to ensure it is maintained consistently and correctly
- Verified the design by undertaking E2/VM1 testing at FACADE LAB, an IAONZ Accredited facility.

Responses:

4.3.9 Compatibility testing is performed on material samples of the actual 'run' of material being used for this specific project. The test is undertaken to test the adhesion performance of the structural glazing sealant to the coating on the aluminium extrusion. To perform this test on any other material would be deemed pointless. This is industry standard practice for structural glazing.

4.3.10 I've since received design approval from Dow Corning and have had the PS1 updated to reflect this.

4.3.11 I've received confirmation from Dow Corning that the 795 Structural Glazing Sealant is suitable for use in wet areas and for use with the granite and stone tiles. I have highlighted these points within the Dow Corning 795 Product Specification. I have also clarified that the portion of 795 Sealant used to structurally hold the glass in place is distinctly different from the 795 sealant used to seal the tile even though they are the same product they serve different purposes in this application.


Please find attached documentation.

I look forward to hearing from you.

Thanks, Corban

**Corban Walls**

s 9(2)(a)





**From:** Malcolm McCluskey [<mailto:Malcolm.McCluskey@aucklandcouncil.govt.nz>]

**Sent:** Thursday, 1 February 2018 9:32 a.m.

**To:** Sue Brown

**Cc:** s 9(2)(a) ; Determinations

**Subject:** Draft determination for 6 Island Bay Road, Beach Haven, Auckland (Ref 2975)

[UNCLASSIFIED]

Dear Ms Brown

My Instructing Officer has sent the comment below through to me, which MBIE may wish to consider before finalising the Determination:

Clause 5.1.3 (of draft determination) makes reference to the applicant having an E2/VM1 test on the joinery.

E2/VM1 is not a test of the joinery, but of the junction between the joinery and the cladding

RELEASED UNDER THE OFFICIAL INFORMATION ACT 1982

# Verification Method

## 1.0 Cladding systems of buildings, including junctions with windows, doors and other penetrations

### 1.1 General

This Verification Method is for determining compliance with NZBC E2.3.2 of *cladding systems* and associated window and door junctions only, for *buildings* of importance Levels 1 or 2 as described in Table 1.1(a) of NZS 3604.

The tests in this Verification Method shall be undertaken in a test facility with IANZ or equivalent accreditation for testing the *weathertightness of claddings* to the procedures of AS/NZS 4284, and as used to establish the performance criteria detailed in Paragraph 1.4 Test Procedures.

#### COMMENT:

The *weathertightness* testing of AS/NZS 4284 is modified in this Verification Method for generic domestic-oriented *cladding* because the Standard was developed primarily for testing specific, non-absorptive facades and curtain wall systems on high-rise commercial *buildings*.

### 1.2 Scope

1.2.1 The scope of this Verification Method shall be restricted to *buildings* that:

- a) are in accordance with the scope of Paragraph 1.0 of E2/AS1, and within the *wind zones* covered by Section 5 of NZS 3604, and
- b) have *claddings* that include a drained and vented cavity of nominal 20 mm minimum depth with minimum ventilation opening of 1000 mm<sup>2</sup>/m at the foot, including any *claddings* that require a rigid *wall underlay* in accordance with Paragraph 9.1.7.2 of E2/AS1, and
- c) include window and door units that are manufactured to comply with the relevant requirements of NZS 4211, and

d) may include *buildings* based on (a), (b) and (c) above, but with specific engineering design frame elements of at least equivalent stiffness to the *framing* provisions defined in NZS 3604.

1.2.2 This Verification Method may also be used for individual *buildings* that comply with (a) to (d) above, and that are designed for a specific wind pressure up to a maximum ultimate limit state (ULS) of 2500 Pa.

#### COMMENT:

While the test specimens used for this Verification Method may include window and door units, it is only the junctions of these elements with other *cladding* elements that are assessed in the test.

So as you will see the test in clause 1.1 it refers to the test is for junctions between the cladding and joinery NOT the joinery itself. It is the joinery in this determination that is in question.

Clause 1.2.1 (b) have claddings that include a drained and vented cavity of nominal 20mm .....The joinery does not have a drained and ventilated cavity. They are double glazed yes, but this is for thermal performance so the area between the two panes of glass are sealed NOT drained and ventilated.

Clause 1.2.1 (c) include windows and doors.... Manufactured to comply ...NZS4211. This is the joinery test. (I refer to it in my letter 4 Aug 18)

The comment is also relevant in this instance (Shaded in grey)

#### 1.4.4 Series 2 'Water Management Testing'

Paragraphs 1.4.2 and 1.4.3 shall be repeated, following the formation of 6 mm diameter holes through the *wetwall* as allowed in AS/NZS 4284 Clause 9.9 in at least 4 places, as noted below:

- a) Through the window/wall joint at 3/4 height of both window/door jambs,
- b) Immediately above the head *flashing*,
- c) Through the external sealing of the horizontal and vertical joints, and
- d) Above any other *wetwall* penetration detail.

The introduction of defects is intended to simulate the failure of the primary weather-defence/sealing. It must only penetrate to the plane of the back of the *wetwall* so the water management of the cavity can be assessed.

**1.4.4.1** Immediately upon the conclusion of the Water Management Tests (within 30 minutes) (Paragraph 1.4.4), the layers behind the *wetwall* that support air pressure (including sealing in the window trim cavity) shall be removed, and any evidence of non-compliance (as defined in Paragraph 1.4.5.3) noted.

Amend 5  
Aug 2011

15  
11

#### 1.4.5 Series 3 'Wetwall Test'

**1.4.5.1** Repeat Paragraph 1.4.3 with an air pressure of 50 Pa, applied across the *wetwall* only, for 15 minutes.

**1.4.5.2** Non-compliance shall be the presence of water (as defined in Paragraph 1.4.5.3) after carrying out the tests in Paragraphs 1.4.2 and 1.4.3, and the subsequent 'water management' tests (or evidence of any water) on the removed surfaces of the cavity.

**1.4.5.3** Water which is able to penetrate to the back of the *wetwall* through introduced defects and joints shall be controlled. It may contact battens and other cavity surfaces, but no water shall be transferred to the plane of the *wall underlay*, cavity air sealing or structural *framing* due to a design or systemic failure. Water that may arrive on the *underlay* due to an 'isolated blemish' may be disregarded. No water may drip through an air-space within the cavity where it is possible for water to impact on a surface in the cavity and splash onto the *wall underlay*. However, the spattering of water into the cavity through the introduced defects shall be ignored.

During the *Wetwall* Test, water is allowed to spatter up from the footer *flashing*, provided it is not held above any cavity obstruction.

The above clauses (from E2/VM1 1.4.4, 1.4.4.1 and 1.4.5.3) cannot be undertaken on the joinery.

**Malcolm McCluskey | Senior Solicitor**

**Civil Litigation, Legal Services**

DDI 09 890 2967 | EXT (46) 2967 | Mobs 9(2)(a)

Auckland Council, Level 11, 135 Albert Street, Auckland

Private Bag 92300, Victoria St West, Auckland

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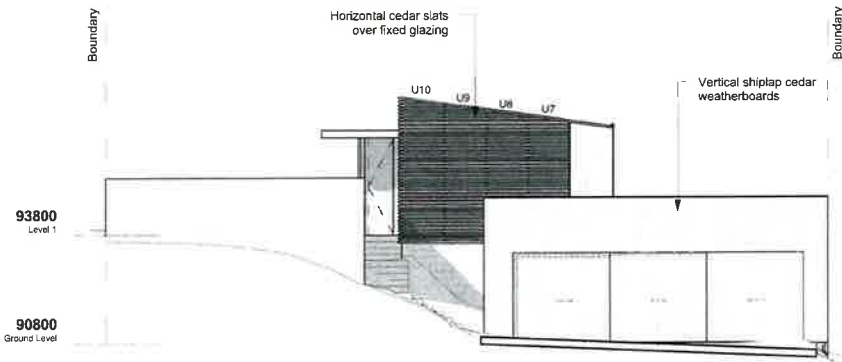
## APPENDIX B

Review of structural calculations by MBIE consulting engineer Chris Howell & Associates

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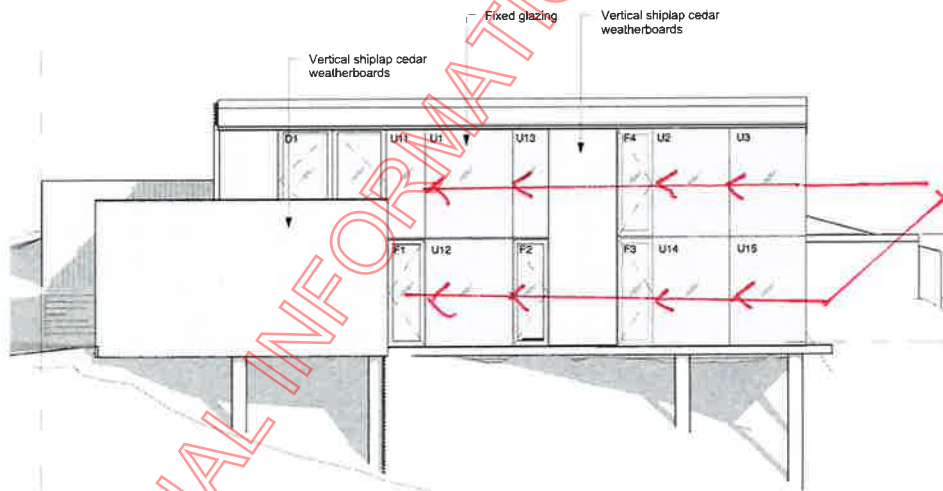






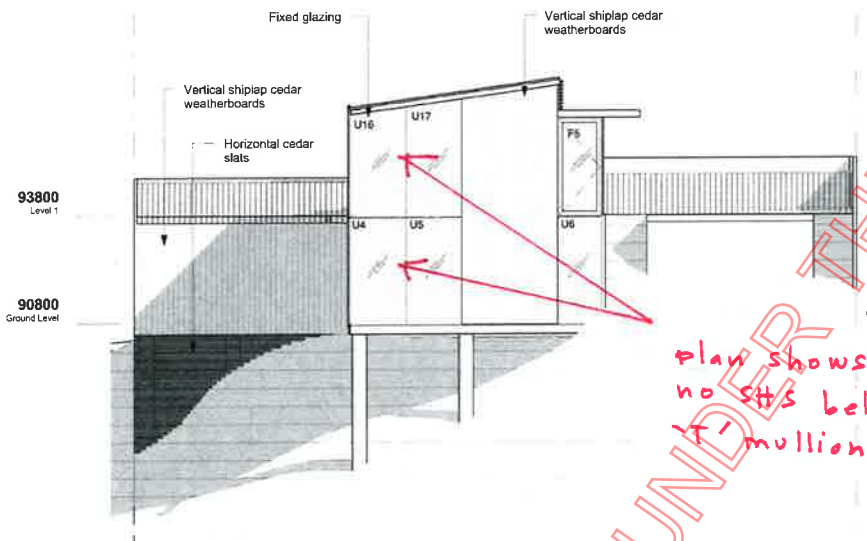
1 North West Elevation

A1-011 1 : 100



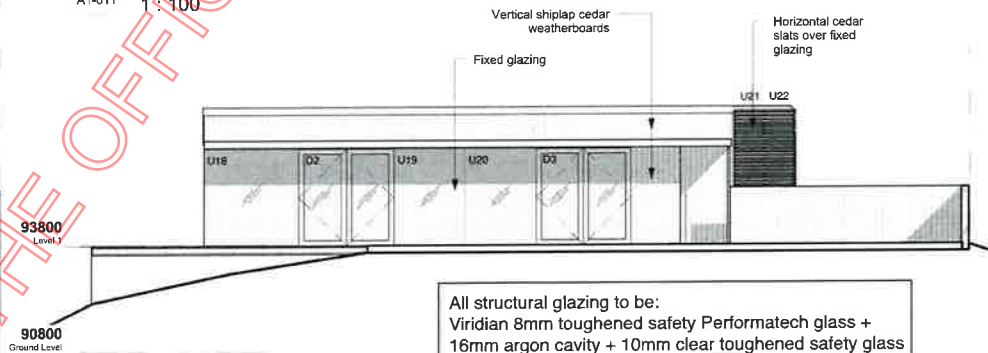
2 South West Elevation

A1-011 1 : 100



3 South East Elevation

A1-011 1 : 100



4 North East Elevation

A1-011 1 : 100

All structural glazing to be:  
Viridian 8mm toughened safety Performatech glass +  
16mm argon cavity + 10mm clear toughened safety glass

plan shows  
no STS behind  
T / mullion,

LOCAL AUTHORITY  
CONSULTANTS

NOTES  
plan shows  
no STS behind  
T / mullion

REVISION HISTORY:

s 9(2)(a)

PROJECT: No: 201504  
ISLAND BAY ROAD  
HOUSE

6 Island Bay Road, Beach  
Haven  
SHEET:  
Elevations

SCALES @ A2: 1 : 100  
SCALES @ A4: Half A2 scale

REF:  
DRAWN/START DATE: Author  
DRWG No: A1-401 REVISION:

DO NOT SCALE  
CONTRACTOR MUST VERIFY ALL DIMENSIONS ON  
SITE BEFORE COMMENCING WORK

COPYRIGHT: 6/2/2015

07-Dec-17 5:42:09 PM

From Auckland Geomap  
wind zone = SPECIFIC DESIGN

<b>Jackson Clapperton &amp; Partners Ltd</b> Consulting Engineers & Regd Surveyors P.O. Box 71065, Rosebank Road, Auckland Ph: (09) 8200-131 Fax: (09) 8200-133	Project:	New Dwelling for Corban Walls at 6 Island Bay Road, Birkdale	
	Ref. No:	2003/004/H	Page No. W1
	Date:	20/11/2017	Designed: MD

**(A) Check Sill fixings to Xlam Floor**

Worst case for lateral loading is at top floor level. Glazing to span 3.0m between floors and approx. the same to roof level.

1. no specific design of wind attached.  
2. wind pressure from Viridian  
 $q_v = 1.76 \text{ kPa}$   
 $q_s = 1.25 \text{ kPa}$

$W_u = (1.2)(1.69)(6/2) = 6.08 \text{ kN/m}$

$W_s = (1.2)(1.14)(6/2) = 4.10 \text{ kN/m}$

Note: verify wind pressure used.

Details shown on drawings are two sets of 14 gauge x 75mm long screws at 300mm c/c.

XLAM floor panels consist of 105mm thick flooring. This is made up of 3/35mm thick timber planks, laminated together.

Consider the side wall where the XLAM floor runs parallel to the window sills. Hence screw into the top & bottom layer of laminated plank. (What is the minimum edge distance of screws?)

Try 8 gauge screws	Max. $\phi Q_{withd.} = (0.7)(1.0)(2.38) =$	1.67 kN/screw
		- governs
Or	Max. $\phi Q_{withd.} = (0.7)(1.0)(52.6)(50/1000) =$	1.84 kN/screw

Hence if have pairs of screws (i.e. one for top of lower windows and 1 for bottom of upper) @ 200mm c/c then

shear check? consider end grain reduction factor.  
Max.  $\phi Q_{withd.} = \frac{1.67}{0.20} \times 2 = 16.66 \text{ kN/m} \gg 6.08 \text{ OK}$

from NZS 3603, Edge distance is 5 x screw dia for  $\phi 5 (4.20 \text{ mm})$   
Edge distance = 21 mm

**(B) Check Sill fixings to Conc. Floor**

$W_u = (1.2)(1.69)(3/2) = 3.04 \text{ kN/m}$

$W_s = (1.2)(1.14)(3/2) = 2.05 \text{ kN/m}$

Drawings show 2/M6 x 70 Hilti HUS3-C6 fasteners @ 300mm c/c.

From Manufacturers. Min edge distance = 35mm. OK Nominal embedment = 55mm

Min spacing = 35mm

Mean ultimate Tension in uncracked concrete  $N_{r,u,m} = 11.9 \text{ kN}$   
& in cracked concrete  $N_{r,u,m} = 8.0 \text{ kN}$

& Design resistance  
Uncracked  $N_{r,u,m} = 5.0 \text{ kN}$   
Cracked  $N_{r,u,m} = 3.3 \text{ kN}$  Adopt as worst case

Therefore two fasteners @ 300mm c/c =>  $N_{r,u,m} = (2)(3.3)/0.3 = 22.0 \text{ kN/m}$  OK

Fixings are also subjected to shear due to wt. of glass.

Note  
no calculation check of sill brackets.

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Consulting Engineers & Regd Surveyors  
 P.O. Box 71065, Rosebank Road, Auckland  
 Ph: (09) 8200-131 Fax: (09) 8200-133

Project:	New Dwelling for Corban Walls at 6 Island Bay Road, Birkdale	
Ref. No:	2003/004/H	Page No. W2
Date:	20/11/2017	Designed: MD

## (C) Check SHS Window Mullions on Southwestern Wall

(Worst case for 2.9m span)

50x50x5 SHS posts. Vertical span 2.9m max.

Loads	kN/m <sup>2</sup>	Trib. Width (m)	G (kN/m)		Qu (kN/m)
Roof	0.75	0.2	0.11	0.25	0.04
			Σ 0.11	kN/m	Σ 0.04 kN/m
					Point Load Qc = 1.00 kN

Max trib length per post = 3.2m

$$N^* = (1.2)(0.11)(3.2) + (1.5)(1.0) = 1.9 \text{ kN}$$

$$W_u = (1.2)(1.69)(3.2/2) = 3.24 \text{ kN/m}$$

$$W_s = (1.2)(1.14)(3.2/2) = 2.19 \text{ kN/m}$$

Check 50x50x5mm SHS posts

*(not all mullion have SHS post behind). Refer 3/5-06 of arch drawing.*

Lateral bending.

$$M^* = \frac{wL^2}{8} = 3.41 \text{ kNm}$$

$$\therefore \phi M_n = (0.9)(0.35)(13.2) = 4.16 \text{ kNm} \quad \text{OK}$$

SLS

$$E = 200 \text{ MPa} \quad I = 0.257 \times 10^6 \text{ mm}^4$$

$$W_s \Delta = \frac{5(wx10^3)L^4}{384EI} = 39.2 \text{ mm}$$

$$ST \Delta = 39.2 \text{ mm} > \text{Limit} = \frac{\text{span}}{200} = 15.0 \text{ mm} \quad \text{N/G}$$

Try adding 50x60x6mm Al. Tee section

$$\text{Combined } I = 700 \times 10^6 \text{ mm}^4 = I = 0.700 \times 10^6 \text{ mm}^4$$

$$W_s \Delta = \frac{5(wx10^3)L^4}{384EI} = 14.4 \text{ mm}$$

$$ST \Delta = 14.4 \text{ mm} < \text{Limit} = \frac{\text{span}}{200} = 15.0 \text{ mm} \quad \text{OK}$$

OR

$$\text{Combined } I = 2.2 \times 10^6 \text{ mm}^4 = I = 2.2 \times 10^6 \text{ mm}^4$$

$$E = 69.6 \text{ MPa}$$

$$W_s \Delta = \frac{5(wx10^3)L^4}{384EI} = 13.2 \text{ mm}$$

$$ST \Delta = 13.2 \text{ mm} < \text{Limit} = \frac{\text{span}}{200} = 14.5 \text{ mm} \quad \text{OK}$$

Consider shear flow between the two sections:-

$$V^* w_u = (3.24)(2.9/2) = 4.70 \text{ kN}$$

$$\text{Steel/Al} \quad q = \tau b = \frac{VQ}{I} = \frac{(4.7)(7.6 \times 10^{-6})}{(7.0 \times 10^{-11})} = 51.0 \text{ kN/m}$$

$$\text{Al/Steel} \quad q = \tau b = \frac{VQ}{I} = \frac{(4.7)(2.26 \times 10^{-7})}{(2.2 \times 10^{-6})} = 48.3 \text{ kN/m}$$



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P.O. Box 71065, Rosebank Road, Auckland

Ph: (09) 8200-131 Fax: (09) 8200-133

Project: New Dwelling for Corban Walls  
at 6 Island Bay Road, Birkdale

Ref. No: 2003/004/H

Page No. W3

Date: 20/11/2017

Designed: MD

Consider screw fixings between Aluminium Tee &amp; 50x50 SHS.

$$q = 51 \text{ kN/m}$$

Try 8 gauge self tapping screws Ult. shear strength = 5.35 kN

$$\text{therefore } \phi Q_v = (0.8)(5.35) = 4.28 \text{ kN/screw}$$

$$\text{Therefore need } \frac{51}{4.28} = 12 \text{ 8 gauge screws per metre.}$$

If have a screw on each side of the T the spacing will be 150mm.

Consider using M6 socket screws G8.8

$$\phi V^*v = (0.8)V_f$$

$$\text{Where } V_f = 0.62f_{ur}k_r(n_n A_c + n_x A_o)$$

$$f_{ur} = 880 \text{ MPa (G8.8)}$$

$$f_{ur} = 400 \text{ MPa (G4.6)}$$

$$k_r = 1.0$$

OR

$$n_n = 1.0$$

$$n_x = 0$$

$$A_c = 17.9 \text{ mm}^2$$

$$A_o = 28.2 \text{ mm}^2$$

$$\text{Therefore } V_f = (0.62)(880)(1.0)(1 \times 17.9 + 0 \times 28.8) = 9.8 \text{ kN Grade 8.8}$$

$$\& V_f = (0.62)(400)(1.0)(1 \times 17.9 + 0 \times 28.8) = 4.4 \text{ kN Grade 4.6}$$

$$\phi V^*v = (0.8)(9.8) = 7.8 \text{ kN If Grade 8.8}$$

$$\phi V^*v = (0.8)(4.4) = 3.6 \text{ kN If Grade 4.6}$$

$$\text{Therefore need } \frac{51}{7.8} = 7 \text{ 8 G8.8 M6 screws per metre. i.e. } 250\text{mm c/c}$$

Check bearing of M6 bolt on 5mm SHS wall.

$$\phi V^*v = (0.8)V_b$$

$$\text{Where } V_b = 1.4f_{yb}d_r t_p k_p$$

$$f_{yb} = 350 \text{ MPa SHS}$$

$$d_r = 5.3 \text{ mm}$$

$$t_p = 5 \text{ mm}$$

$$k_p = 1.0$$

$$\text{Therefore } V_b = 1.4(350)(5.3)(5)(1)/1000 = 13.0 \text{ kN OK}$$

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P.O. Box 71065, Rosebank Road, Auckland

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Project: New Dwelling for Corban Walls  
at 6 Island Bay Road, Birkdale

Ref. No: 2003/004/H Page No. W4

Date: 20/11/2017 Designed: MD

## (D) Check SHS Window Mullions for larger span on Northwestern Wall

(Worst case for 3.7m span)

50x50x5 SHS posts. Vertical span 3.7m max.

Loads	kN/m <sup>2</sup>	Trib. Width (m)	G (kN/m)		Qu (kN/m)
Roof	0.75	1.5	1.13	0.25	0.38
			Σ 1.13	kN/m	Σ 0.38 kN/m
					Point Load Qc = 1.00 kN

Max trib length per post = 1.1m

$$N^* = (1.2)(1.13)(3.2) + (1.5)(1.0) = 5.6 \text{ kN}$$

$$W_u = (1.2)(1.69)(1.1) = 2.23 \text{ kN/m}$$

$$W_s = (1.2)(1.14)(1.1) = 1.50 \text{ kN/m}$$

Check 50x50x5mm SHS posts

### Lateral bending.

$$M^* = \frac{wL^2}{8} = 3.82 \text{ kNm}$$

$$\therefore \phi Mn = (0.9)(0.35)(13.2) = 4.16 \text{ kNm} \quad \text{OK}$$

### SLS

$$E = 200 \text{ MPa} \quad I = 0.257 \times 10^6 \text{ mm}^4$$

$$W_s \Delta = \frac{5(wx10^3)L^4}{384EI} = 27.0 \text{ mm}$$

$$ST \Delta = 27.0 \text{ mm} > \text{Limit} = \frac{\text{span}}{200} = 15.0 \text{ mm} \quad \text{N/G}$$

### Try adding 100x50x6mm Al. Tee section

$$\text{Combined } I = 1.5 \times 10^6 \text{ mm}^4 = I = 1.500 \times 10^6 \text{ mm}^4$$

$$W_s \Delta = \frac{5(wx10^3)L^4}{384EI} = 12.2 \text{ mm}$$

$$ST \Delta = 12.2 \text{ mm} < \text{Limit} = \frac{\text{span}}{200} = 18.5 \text{ mm} \quad \text{OK}$$

Consider shear flow between the two sections:-

$$V^* w_u = (2.23)(3.7/2) = 4.13 \text{ kN}$$

$$\text{Steel/Al} \quad q = \tau b = \frac{VQ}{I} = \frac{(4.13)(13.7 \times 10^{-6})}{(1.5 \times 10^{-6})} = 42.9 \text{ kN/m}$$

Note that this is less than the shear flow between the 50x60x6 T section (on previous page) so use same connection details between the two sections.

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Ph: (09) 8200-131 Fax: (09) 8200-133

Project: New Dwelling for Corban Walls  
at 6 Island Bay Road, Birkdale

Ref. No: 2003/004/H

Page No. W5

Date: 20/11/2017

Designed: MD

**(E) Check Top & bottom fixing of SHS/T section mullions.**

i) 2.9m high mullions

$$V^* = (3.24)(2.9/2) = 4.7 \text{ kN}$$

- governs

ii) 3.7m high mullions

$$V^* = (2.23)(3.7/2) = 4.1 \text{ kN}$$

Drawings show 6mm baseplate with 3M10 bolts through the XLAM Floor.

Min. edge distance loaded across the grain =  $4da = (4)(10) = 40\text{mm}$ 

OK

$$\phi Q_n = (0.7)(1.0)(5.8)(3) = 12.18 \text{ kN}$$

OK

Check base fixing of mullions to concrete slab

Drawings show 3/M6 x 70 Hilti HUS3-C6 fasteners

From Manufacturers. Min edge distance for splitting = 63mm. OK

Nominal embedment = 55mm

Min spacing = 35mm

OK

Mean ultimate Shear in uncracked concrete  $V_{ru,m} = 13.1\text{kN}$   
& in cracked concrete  $V_{ru,m} = 13.1\text{kN}$ 

&amp; Design resistance

Uncracked  $V_{ru,m} = 8.3\text{kN}$ Cracked  $V_{ru,m} = 8.3\text{kN}$ 

Adopt as worst case

Therefore three fasteners =&gt;

$$V_{ru,m} = (3)(8.3) =$$

24.9 kN  
OK**(F) Check fixings of glazing jamb to XLAM walls**

From page W2

$$W_u = (1.2)(1.69)(3.2/2) = 3.24 \text{ kN/m}$$

Drawings show 60mm long x 12 gauge screws @ 600mm c/c.

$$\phi Q_t = (0.7)(1.0)(70.8)(60)/1000 = 2.97 \text{ kN/screw}$$
  
$$= 4.96 \text{ kN/m}$$

OK

note: no calculation of structural bite  
to determine the length of sealant.  
drawing says 12mm.

