WDC - Approved Building Consent Document - BC2600060 - Pg 1 of 46 - 16/02/2026 - NZBTC

BUILDING CONSENT PLANS

PROPOSED DWELLING
FOR
MILLBROOK ESTATE PROPERTY DEVELOPMENTS
20 GROOM RISE, WAIPU

OBELLA Design

LOT 8

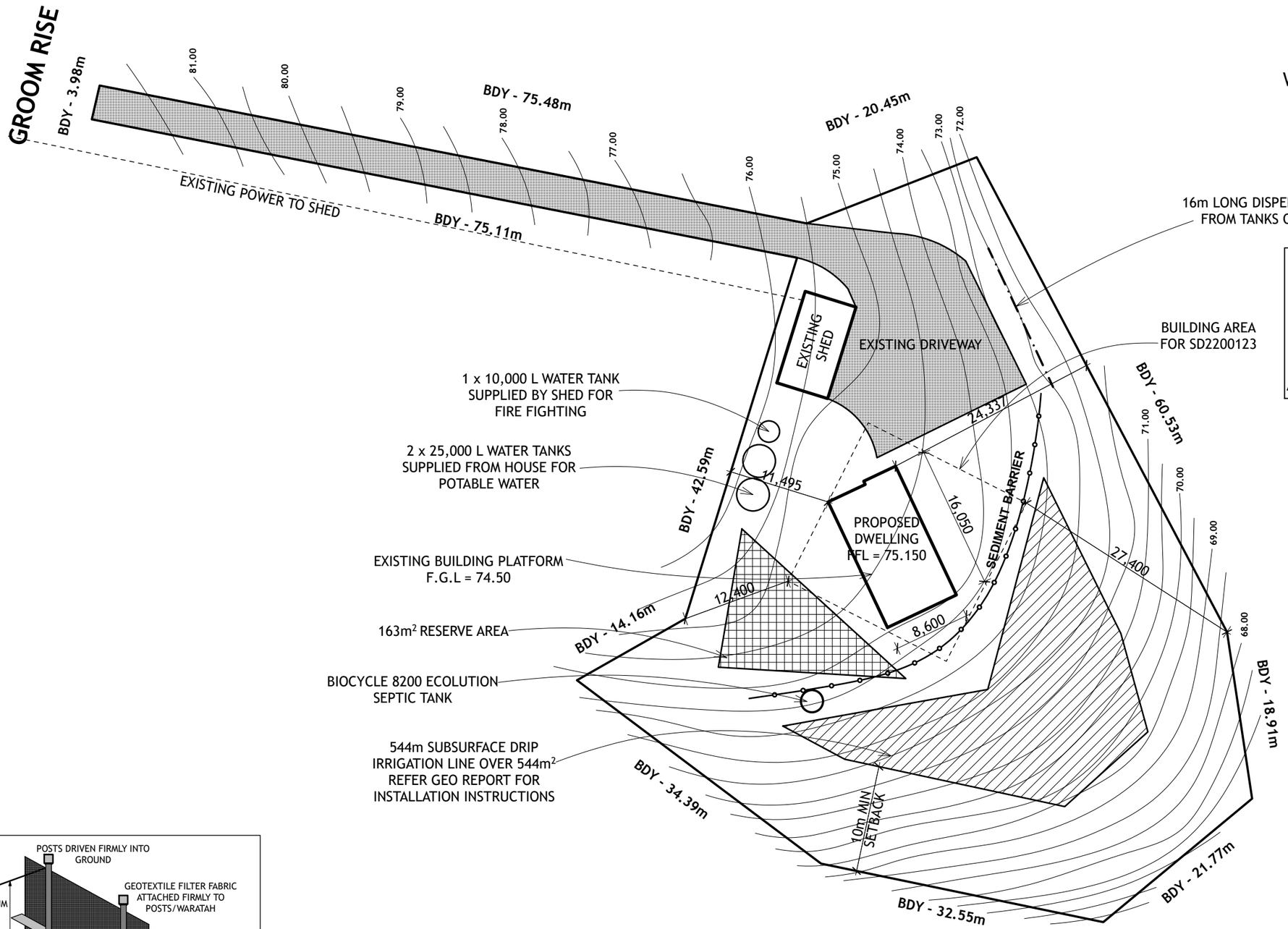
These plans accurately represent the requirements of the attached calculations prepared by us

for T L Watson Consulting Engineer Ltd

sub floor design only

Sheet Index		
Layout ID	**Layout Name**	**Published**
01	Title Page	☐
02	Site Plan	☐
03	Proposed Floor Plan	☐
04	Elevations	☐
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LEGAL DESC:
Lot 8
DP 606527
RT: 8706163
Area 4106m²

TOWN PLANNING

ZONE: Rural Production Zone

WIND ZONE:	Very High
EXPOSURE ZONE:	C
EARTHQUAKE ZONE:	1

BUILDING HEIGHT:

10.0m MAX. ALLOWED -COMPLIES

YARDS

FRONT YARD - 8m -COMPLIES
SIDE YARDS - 8m -COMPLIES
REAR YARD - 8m -COMPLIES

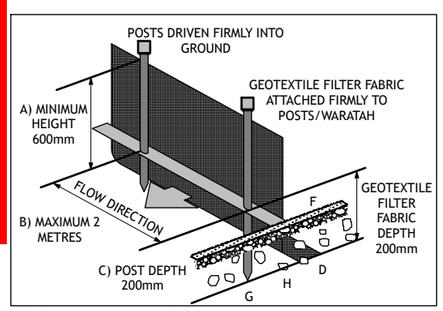
BUILDING COVERAGE:

MAXIMUM AREA ALLOWED 20%	(8305m²)	
PROPOSED FLOOR COVERAGE:	148.00m²	
EXISTING SHED COVERAGE:	64.80m²	
TOTAL FLOOR COVERAGE:	212.80m²	-COMPLIES

RESOURCE CONSENT REQ. FOR:

- N/A

CONTOURS TO NZVD2016



SILT FENCE DETAIL NTS

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LICENSED BUILDING PRACTITIONER BUILDING CONFIDENCE
BP132379

Client: MILLBROOK ESTATE PROPERTY DEVELOPMENTS

Site Address: **20 Groom Rise, Lot 8 Waipu**

Drawing Title: **Site Plan**

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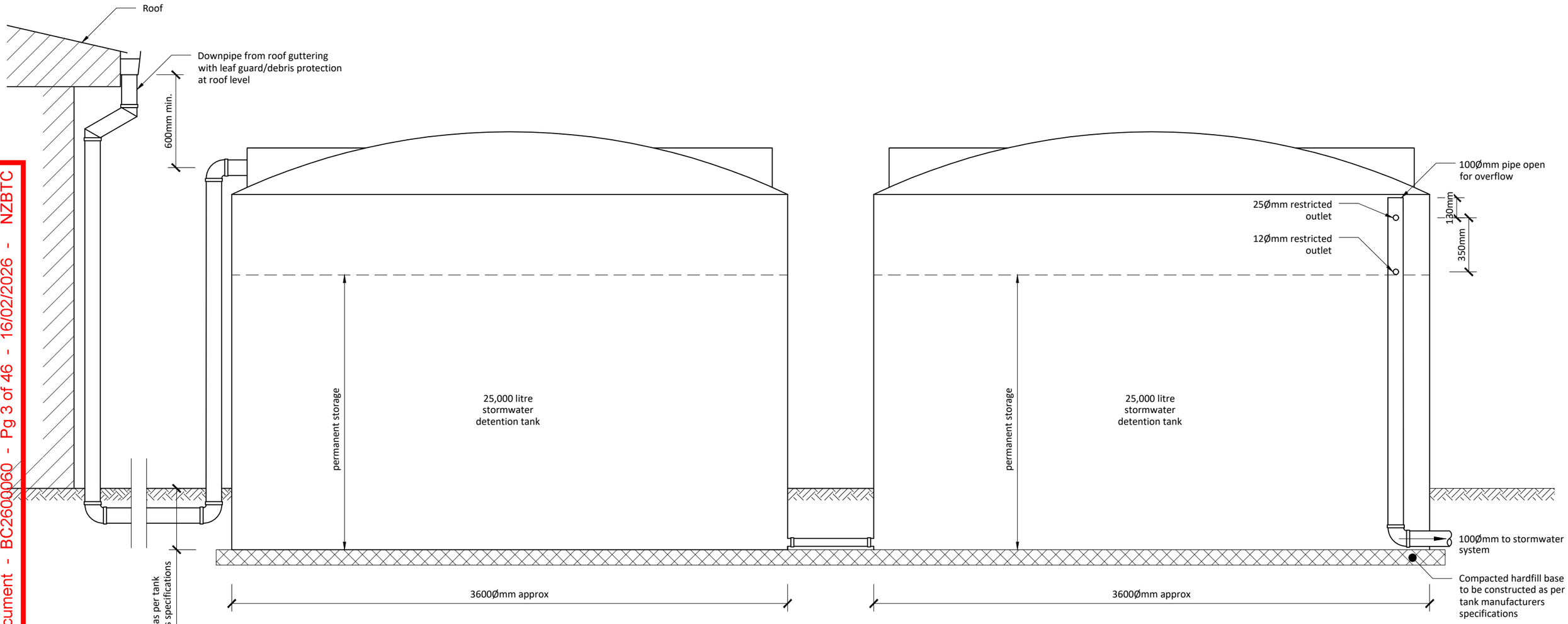
DATE	REV.	AMENDMENTS

Wind Zone	Earthquake Zone	Exposure Zone
Very High	One	C Non Sea Spray

Scale 1:500 @ A3 | Date 19/02/2026

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STORMWATER ATTENUATION 2/25,000L PLASTIC TANK DETAIL

1:25

NOTES:

- All services should be located on-site prior to commencement of works.
- All works to comply with all relevant local authority by-laws and council regulations where applicable.
- Contractors to confirm all dimensions on site prior to commencing any work.
- Do not scale off drawings.
- These drawings are to be read in conjunction with specifications - plans take precedence.
- If any part of these documents are unclear, please contact RSEng Ltd.
- This plan is copyright to RSEng Ltd and should not be reproduced without prior permission.
- Tank installation and footing to manufacturers instructions.
- All tank penetrations and pipe connections to manufacturers instructions.
- Leaf guard/debris protection to manufacturers instructions.

RS Eng Ltd
09 438 3273
office@RSEng.co.nz
2 Seaview Road,
Whangarei 0110

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PROPOSED DWELLING
STORMWATER ATTENUATION
2x PLASTIC TANK DETAIL

Client: WAYNE ALLEN
Location: 20 GROOM RISE WAIPU

Date	Rev	Notes
15/09/2025	A	Report Issue 1

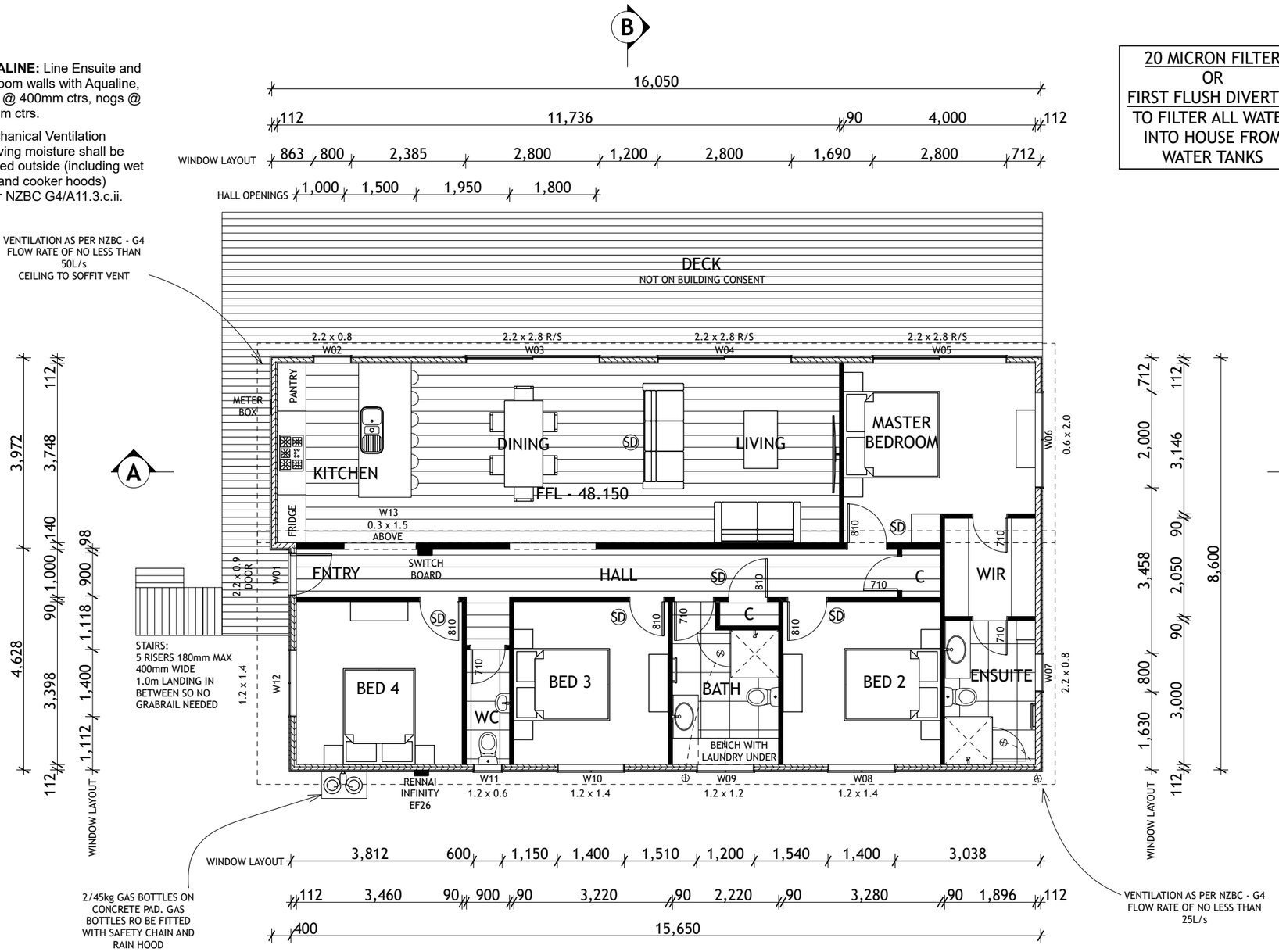
Drawn by: NW | Reviewed by: RB | Approved by: MJ

Scale: 1:25
Original: A3
Job No.: 19728
Rev No.: A
Sheet No.: C01

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AQUALINE: Line Ensuite and bathroom walls with Aqualine, studs @ 400mm ctrs, nogs @ 600mm ctrs.

- Mechanical Ventilation removing moisture shall be vented outside (including wet area and cooker hoods) refer NZBC G4/A11.3.c.ii.



PROPOSED FLOOR PLAN 1:100

EXISTING FLOOR AREA: 136.20m²

NON SEASPRAY ZONE:
All structural deck fixings require stainless steel fittings. Subfloor fixings less than 600mm above GL require stainless steel fixings where no base lining is installed

B

NOTES:
- 15 deg COLORSTEEL TRIMRIB ROOFING
- 2.4Mm STUD HEIGHT
- VERTICAL SHIPLAP WEATHERBOARD CLADDING
- VERY HIGH WIND ZONE
- DURABILITY ZONE C
- EARTHQUAKE ZONE ONE

WALL FRAMING:
TO NZS 3604:2011
EXTERIOR WALLS:
- SIP PANEL
INTERIOR LOAD BEARING WALL:
- 140x45 H1.2 KD
- STUDS AT 400 c/c
- 6 ROWS NOGS
INTERIOR WALLS:
- 90x45 H1.2 KD
- STUDS AT 600 c/c
- 3 ROWS NOGS

20 MICRON FILTER
OR
FIRST FLUSH DIVERTER
TO FILTER ALL WATER
INTO HOUSE FROM
WATER TANKS

DOMESTIC SMOKE ALARMS
TO BE INSTALLED IN ACCORDANCE WITH NZBC F7
SD
- SMOKE ALARMS SHALL BE PROVIDED WITH A HUSH FACILITY HAVING A MINIMUM DURATION OF 60 SECONDS.
- SMOKE ALARMS SHALL BE LISTED OR APPROVED BY A RECOGNIZED AUTHORITY AS COMPLYING WITH AT LEAST ONE OF: UL 217 CAN/ULC S531, AS 3786, BS 5446 PART 1.

TO BE INSTALLED IN ACCORDANCE WITH NZS4514:2021 AND LOCATED:
- ON OR NEAR THE CEILING.
- IN ALL BEDROOMS, LIVING SPACES, HALLS AND LANDINGS.
- WHERE THE KITCHEN IS SEPERATED FROM THE LIVING BY A DOOR THAT CAN BE CLOSED, AN ALARM THAT IS SUITABLE FOR A KITCHEN SHALL BE LOCATED IN THE KITCHEN.
- MULTI-LEVEL UNITS, MIN. 1 SMOKE ALARM PER LEVEL.
- WHERE MORE THAN ONE SMOKE ALARM IS NEEDED TO MEET THE REQUIREMENTS OF THIS STANDARD. THESE SMOKE ALARMS SHALL ALL BE INTERCONNECTED SO THAT WHEN ONE ACTIVATES, ALL THE SMOKE ALARM DEVICES IN THE HOUSEHOLD UNIT WILL SOUND.

ALL GLAZING TO COMPLY WITH F2/AS1 1.0 GLAZING
NZS 4223.1 2008, NZS 4223.2 2016, AND NZS 4332.3 2016.

WINDOW OPENINGS TO COMPLY WITH F4/AS1 2.0
OPENING WINDOWS (OPENINGS LESS THAN 1.0m WIDE
MIN. SILL HEIGHT TO BE 760mm OR RESTRICTOR STAY
REQUIRED WITH MAX. 100mm OPENING GAP)
ALL OPENING SASHES COMPLY WITHOUT RESTRICTOR STAYS

EXPOSURE ZONE C: Medium

Durability of all fixings to comply with NZBC B2/AS1 and NZS 3604 (2011) section 4.
CONCRETE to be 20 MPa minimum, with 50mm cover (75mm to ground) unless an alternative solution is advised by Engineer.
EXPOSED ie. Open to weather or < 600mm above ground level. Material is washed by direct or wind blown rain or subfloor > 7000mm² per m² ventilation. Use 304.
SHELTERED ie. Open to the air but not rain. Material is not washed by direct or wind blown rain, but may be subject to wind blown salts. (<700mm² per m² ventiliation and >600mmmm abover ground level) Use Hot-Dip Galvanised Steel.
CLOSED ie. Dry or internal spaces (Including Cosed Roof Spaces). Not exposed to rain, ground moisture or wind blown corrosive salts. Use standard Galv Steel for Nail Plates, Wire Dogs & Bolts and Mild Steel for other finxings products.

NOTES:

DOWNLIGHTS SHALL COMPLY WITH NZCEP54:2001

ALL HOSE TAPS TO BE FITTED WITH
VACUUM BREAK NON RETURN VALVES

OPENINGS IN BRACING UNITS:
SMALL OPENINGS (EG. POWER OUTLETS) OF 90x90mm OR LESS MAY BE PLACED NO CLOSER THAN 90mm TO THE EDGE OF THE BRACED ELEMENT. A BLOCK MAY BE NEEDED TO BE PROVIDED ALONGSIDE THE PERIMETER STUD (REFER ALSO GIB BRACING SPECS)

H1.2 Jambs to all External Doors and Windows. Expandable Foam Air Seals with Backing Rods to all External Doors and Windows.

All Windows require support bars.

Windows to be Double Glazed R0.36 unless noted otherwise in Window Schedule.

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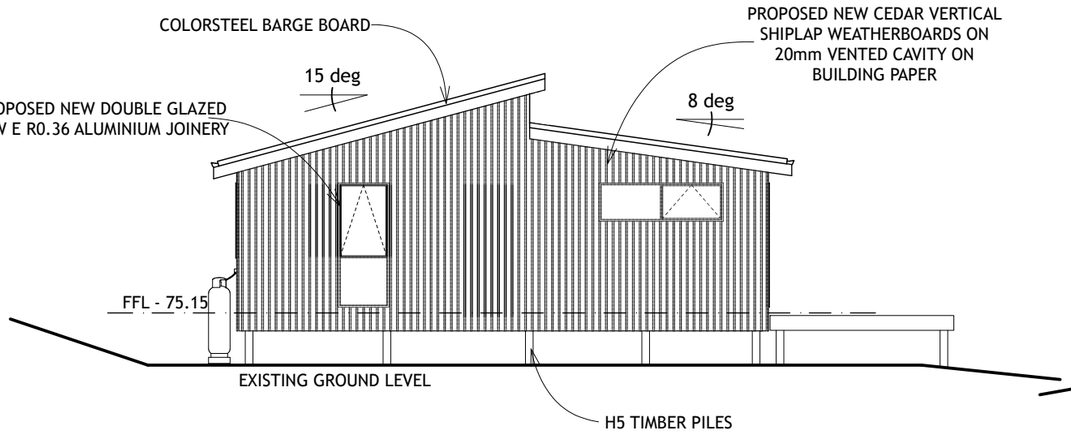
Client: MILLBROOK ESTATE PROPERTY DEVELOPMENTS
Site Address: **20 Groom Rise, Lot 8 Waipu**
Drawing Title: **Proposed Floor Plan**

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DATE	REV.	AMENDMENTS

Wind Zone: Very High | Earthquake Zone: One | Exposure Zone: C Non Sea Spray
Scale: 1:100 @ A3 | Date: 2/02/2026
Sheet: 03 of 28

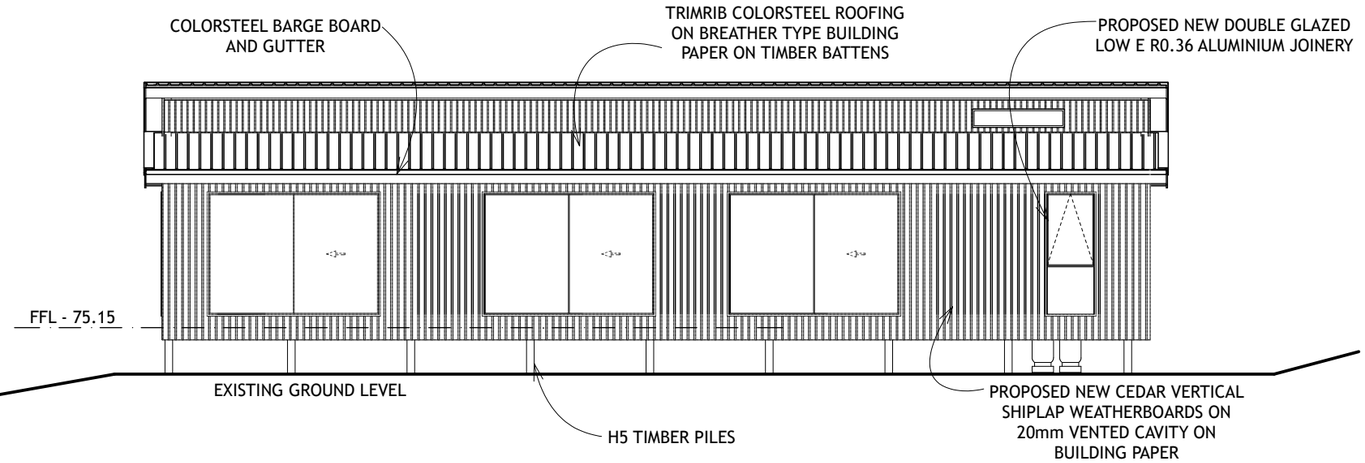
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ELEVATION ONE 1:100

BUILDING ENVELOPE RISK MATRIX		
North Elevation		
Risk Factor	**Risk Severity**	**Risk Score**
Wind zone (per NZS 3604)	Very high risk	2
Number of storeys	Low risk	0
Roof/wall intersection design	Low risk	0
Eaves width	Medium risk	1
Envelope complexity	Low risk	0
Deck design	Low	0
Total Risk Score:		**3**

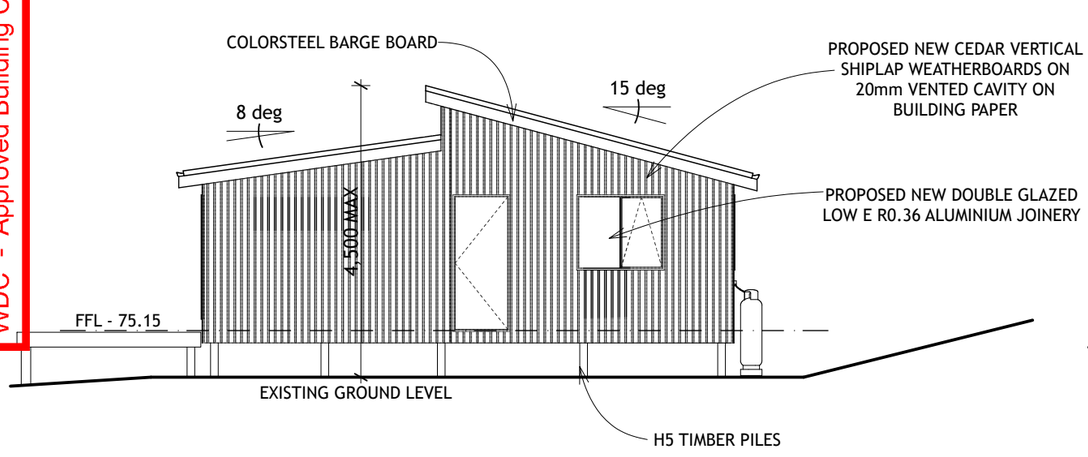
RISK MATRIX COVERS ALL ELEVATIONS
VERTICAL SHIPLAP WEATHERBOARD CLADDING ON VENTED CAVITY COMPLIES



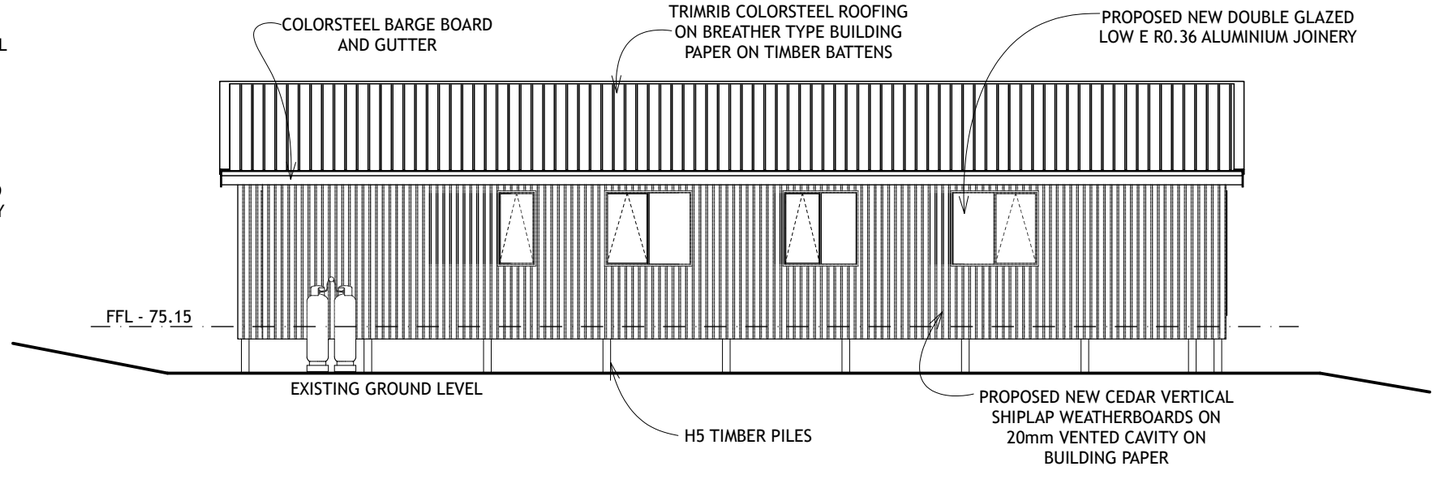
ELEVATION TWO 1:100

TIMBER TREATMENT SCHEDULE
SG8 Kiln Dried Pinus Radiata & JNL Frame

External Walls - Sip:	H1.2 Treated
Internal Walls - SG8:	H1.2 Treated
All Beams & Lintels - SG8:	H1.2 Treated
All Bottom Plates - SG8:	H1.2 Treated
Roof Panels - Sip:	H1.2 Treated
Other Roof Framing - SG8:	H1.2 Treated
Window & Door Reveals - SG8 :	H1.2 Treated
Valley Boards - SG8 :	H3.1 Treated
Purlins - SG8:	H1.2 Treated
Column Framing - SG8:	H1.2 Treated
Cavity Battens - SG8	H3.1 Treated
Ply Cladding	H3.1 Treated
90 x 90 Laminated Posts	H3.2 Treated



ELEVATION THREE 1:100



ELEVATION FOUR 1:100

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Site Address: **20 Groom Rise, Lot 8 Waipu**

Drawing Title: **Elevations**

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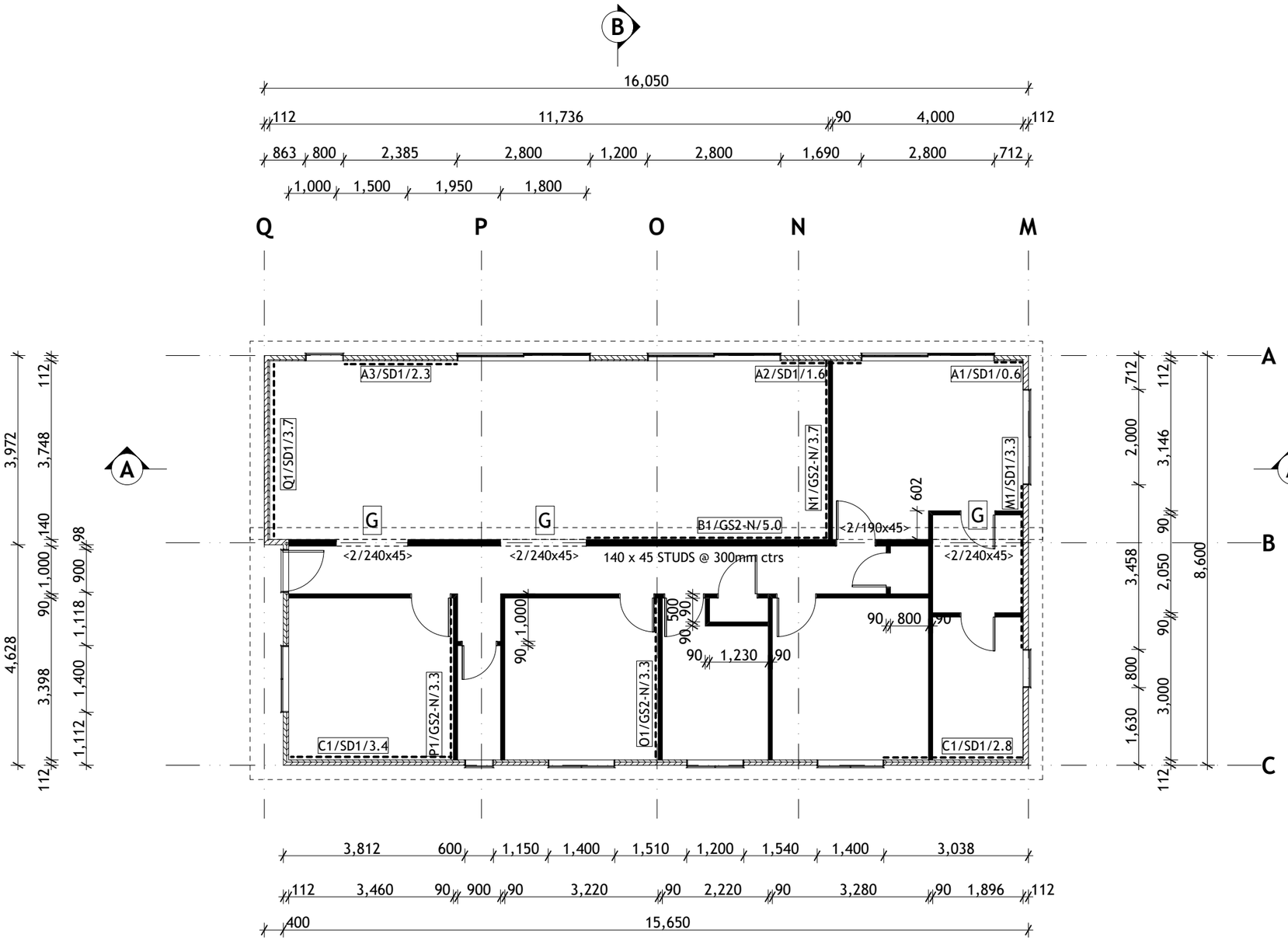
DATE	REV.	AMENDMENTS

Wind Zone	Earthquake Zone	Exposure Zone
Very High	One	C Non Sea Spray

Scale 1:100 @ A3 | Date 19/02/2026

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BRACING PLAN 1:100

VERY HIGH WIND ZONE

CONNECTIONS:
UNLESS NOTED OTHERWISE REFER SIP PANEL DETAILS FOR ALL FIXING DETAILS

INTERNAL WALL BOTTOM PLATE FIXING:
3x SHOT NAILS AT 600mm CENTERS AND 150mm FROM END

GIB EzyBrace System wall bracing elements- permitted openings in Bracing Elements
No penetrations are permitted within 90mm of the perimeter of any bracing element.
Small openings e.g. light/power switches of 90 x 90mm or less may be placed no closer than 90mm to the edge of the braced element. A block may need to be provided alongside the perimeter stud.

LINTELS:
UNLESS NOTED OTHERWISE ALL FRAMED LINTELS ARE TRIMMERS ONLY.
ALL SIPS LINTELS ARE PANEL LINTELS AS PER DETAILS.
UPLIFT FIXINGS ARE NOT REQUIRED

G = Refer Page 12 for Lintel Fixings

WALL FRAMING:
TO NZS 3604:2011
EXTERIOR WALLS:
- SIP PANEL
INTERIOR LOAD BEARING WALL:
- 140x45 H1.2 KD
- STUDS AT 300 c/c
- 6 ROWS NOGS
INTERIOR WALLS:
- 90x45 H1.2 KD
- STUDS AT 600 c/c
- 3 ROWS NOGS

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Client: MILLBROOK ESTATE PROPERTY DEVELOPMENTS
Site Address: **20 Groom Rise, Lot 8 Waipu**
Drawing Title: **Bracing Plan**

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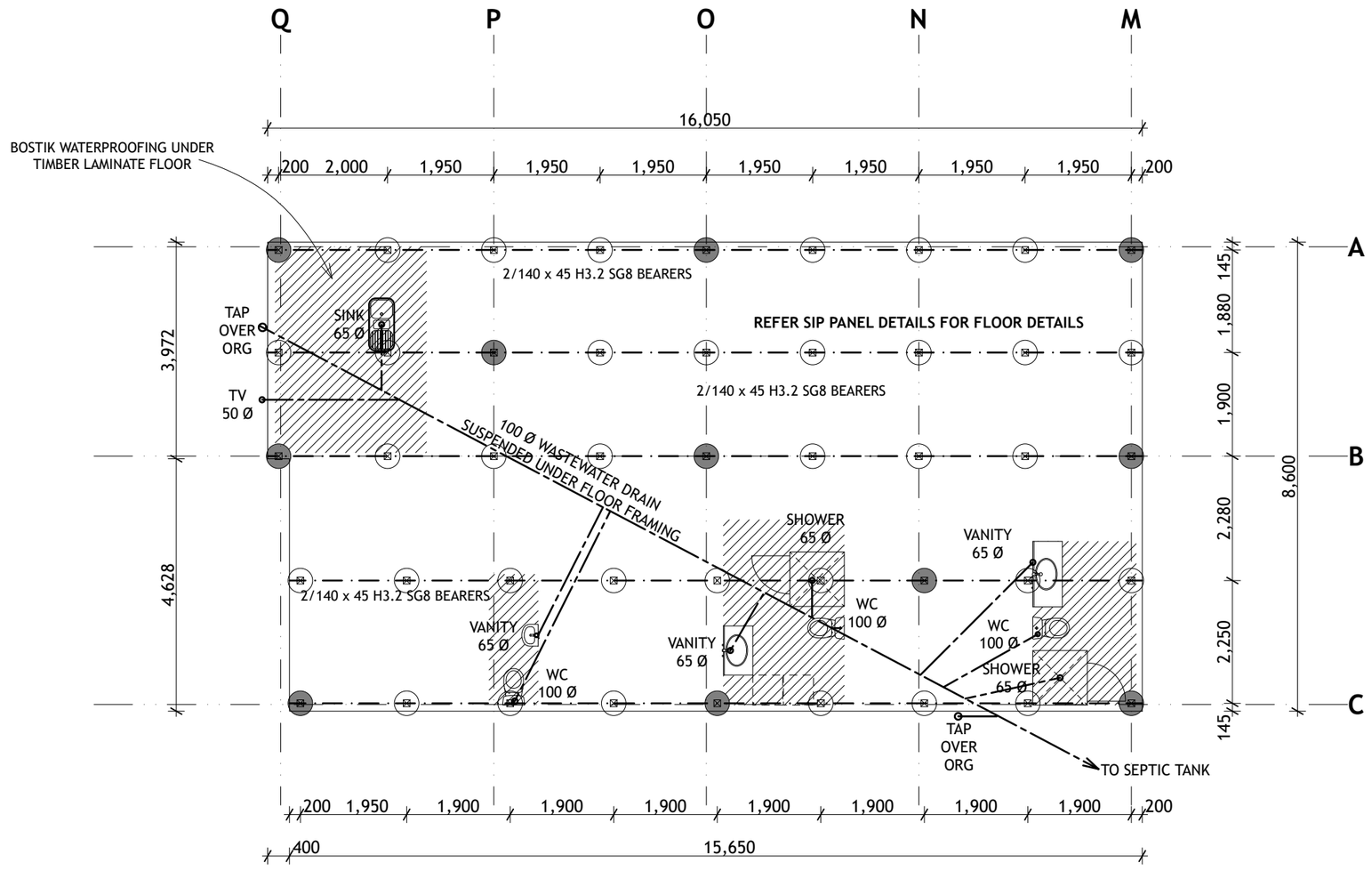
DATE	REV.	AMENDMENTS

Wind Zone	Earthquake Zone	Exposure Zone
Very High	One	C Non Sea Spray

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REFER PAGE 14 FOR CONNECTION DETAILS

REFER PAGE 15 FOR FOOTING DETAILS

FOUNDATION/DRAINAGE PLAN 1:100

PLUMBING TO AS/NZS 3500.2 2015

ALL STORMWATER DRAINAGE SHALL BE CONSTRUCTED IN ACCORDANCE WITH NZBC E1/AS1

ALL PLUMBING AND DRAINAGE PIPE SIZES AND FALLS SHALL COMPLY WITH AS/NZS 3500.2 2015, ALSO ACCEPTABLE SOLUTIONS, AUSTRALIAN PLUMBING STANDARDS

PLUMBING ROUTE, WASTE SIZES AND FIXTURE POSITIONS TO BE CONFIRMED BY PLUMBER PRIOR TO ANY SLAB/FOUNDATION WORK COMMENCING

PIPES TO SAN. FITTINGS
65 dia. PIPES (1 IN 40 MIN. FALL)
100 dia. MIN. PIPES (1 IN 60 MIN. FALL)

100 dia. STORMWATER PIPES (1 IN 120 MIN. FALL)

⊠ ORDINARY PILE: 150 ROUND H5 SET IN 500 dia x 0.9m DEEP CONCRETE FILLED 17.5MPa FOOTING. PILE TO BEARER TO SIP PANEL TO BE 6kN

⊠ ANCOR PILE: 150 ROUND H5 SET IN 500 dia x 0.9m DEEP CONCRETE FILLED 17.5MPa FOOTING. PILE TO BEARER TO SIP PANEL TO BE 12kN

E3/AS1 3.0 WATERSPLASH
WET ROOMS SHALL HAVE TILED FLOORING WHERE SHOWN, LAID WALL TO WALL OVER BOSTIK H777 WATERPROOFING MEMBRANE, (ON 6mm TILE AND SLATE UNDERLAY FOR TIMBER FLOOR STANDBOARD),
WITH SILICONE SEALANT AT TILE TO WALL JUNCTION. NO COVES REQUIRED.
VANITY TO WALL JOINS SHALL BE SILICONE SEALED.
WALLS SHALL BE FINISHED WITH AN IMPERVIOUS COATING THAT IS EASILY CLEANED.
WALL AND FLOOR COVERINGS TO SHOWERS IMPERVIOUS LININGS TO BE MIN. 1800 ABOVE SHOWER LEVEL OR MIN. 300 ABOVE FIXED SHOWER HEAD (WHICHEVER THE GREATER)

These plans accurately represent the requirements of the attached calculations prepared by us

for T L Watson Consulting Engineer Ltd

sub floor design only

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LICENSED BUILDING PRACTITIONER BUILDING CONFIDENCE
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Client: MILLBROOK ESTATE PROPERTY DEVELOPMENTS

Site Address: **20 Groom Rise, Lot 8 Waipu**

Drawing Title: **Foundation Plan**

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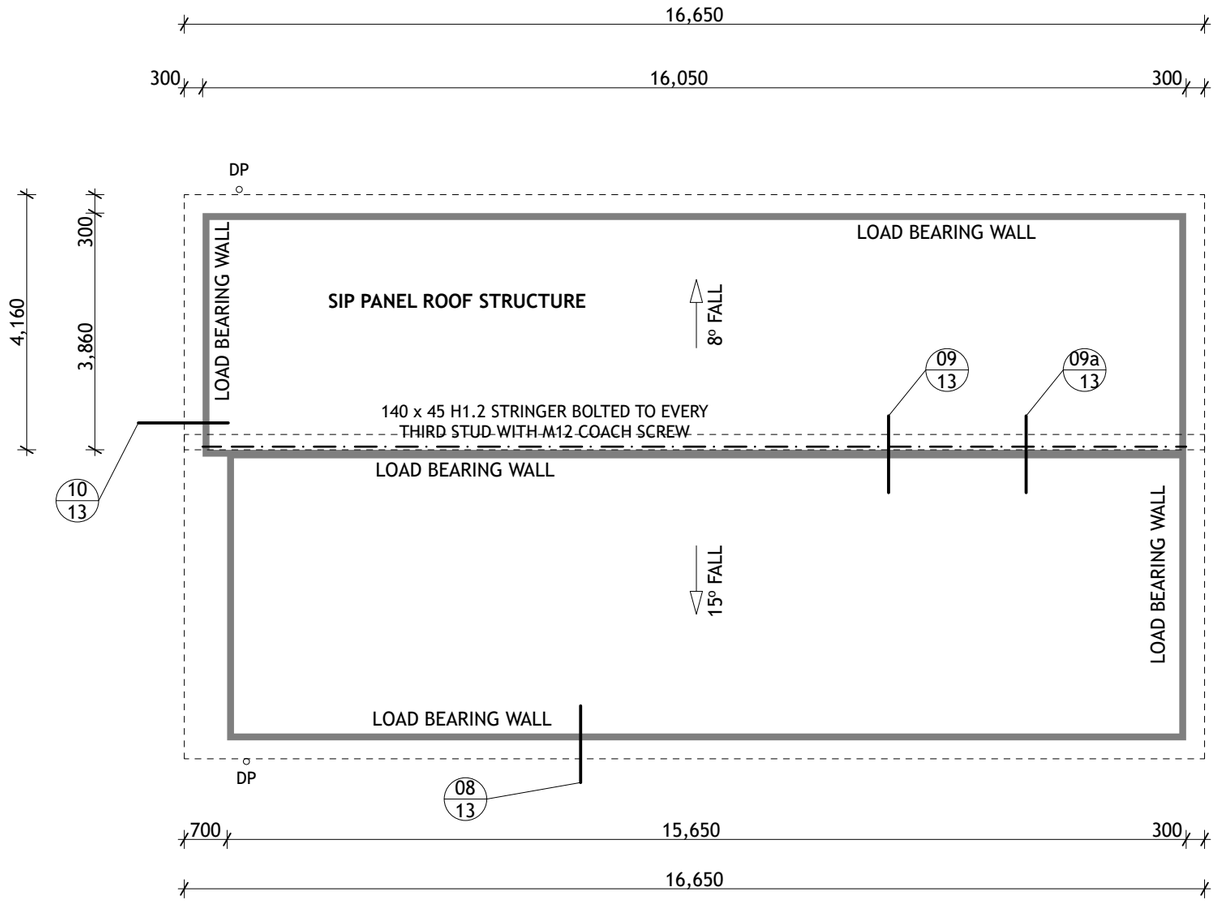
DATE	REV.	AMENDMENTS

Wind Zone	Earthquake Zone	Exposure Zone
Very High	One	C Non Sea Spray

Scale 1:100 @ A3 | Date 2/02/2026

Sheet 06 of 28

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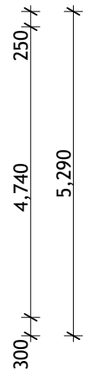
ROOF PLAN 1:100

NEW ROOF PLAN AREA:	157.4m² APPROX
ROOF PITCH:	8 deg & 15 deg
ROOF SHEATHING :	COLORSTEEL TRIMRIB ROOFING
ROOF GEOMETRY :	SPLIT MONO PITCH ROOF
DESIGN WIND SPEED :	VERY HIGH
EARTHQUAKE ZONE :	ONE
CORROSION ZONE:	C

ROOF BRACING REQ AS PER NZS3604:2011 TABLE 10.16

LIGHT ROOF
1 ROOF PLANE BRACE, ROOF SPACE BRACE OR HIP/VALLEY RAFTER PER 50m² OR PART THEREOF WITH MINIMUM 3 BRACES PER RIDGE BRACING PROVIDED BY SIP PANELS

No OF DOWNPIPES REQ AS PER NZBC ACCEPTABLE SOLUTION E1/AS1:
0-25 deg ROOF: 1x 74mm dia DP PER 85m² ROOF PLAN AREA SERVED,
2 x 74 dia REQUIRED, 2 x 80 dia PROVIDED

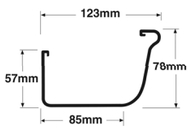


80mm Dia Colorsteel Downpipes

ROOF MEMBER FIXINGS:

REFER SIP PANEL DETAILS FOR SIP FIXING

PURLIN FIXINGS: ENGINEER DESIGN
70x45 H1.2 SG8 AT 900 c/c MAX
TYPE 17 14g SCREW FIXING@ 300crs.



Colorsteel Stormcloud Technical Details:
- Effective Cross Sectional Area: 5100mm2
- Flow Capacity: 70 litres/minute
- Material: Colorsteel
- Minimum Recommended Fall: 1:2000

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Client: MILLBROOK ESTATE PROPERTY DEVELOPMENTS

Site Address: **20 Groom Rise, Lot 8 Waipu**

Drawing Title: **Roof Plan**

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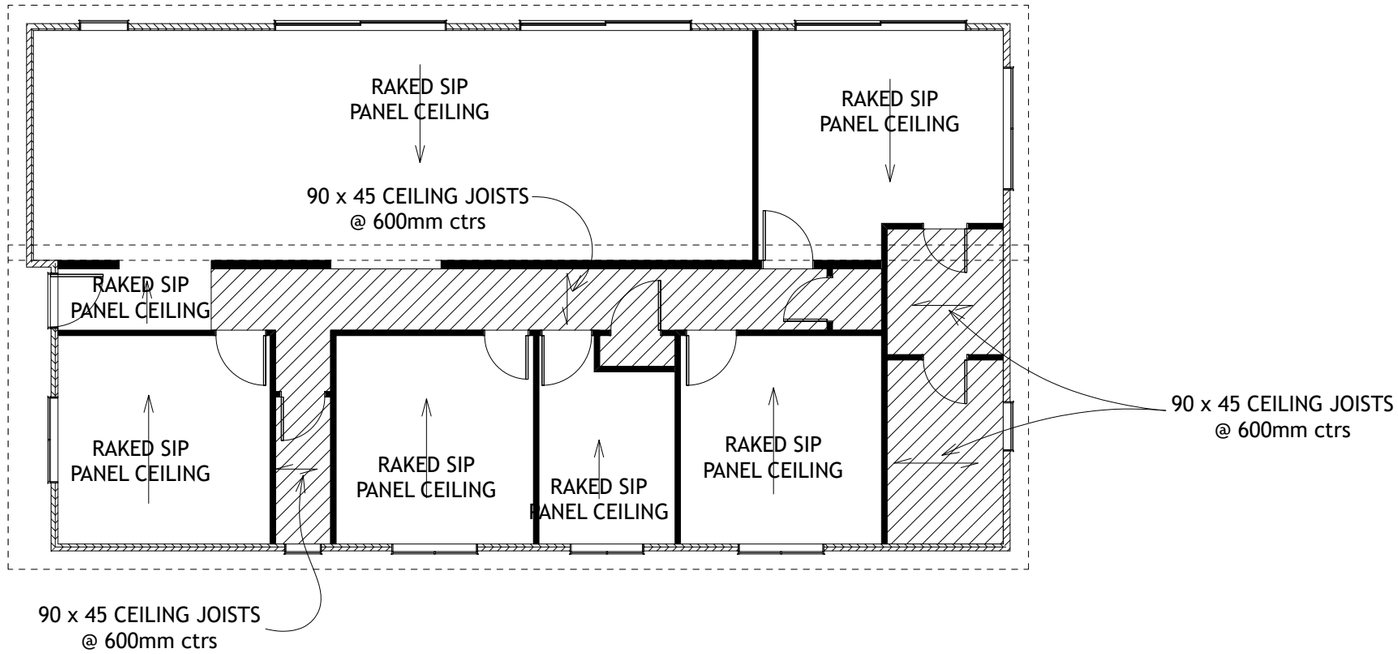
DATE	REV.	AMENDMENTS

Wind Zone	Earthquake Zone	Exposure Zone
Very High	One	C Non Sea Spray

Scale @ A3 | Date 2/02/2026

Sheet 07 of 28

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CEILING PLAN 1:100

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Client MILLBROOK ESTATE PROPERTY DEVELOPMENTS

Site Address **20 Groom Rise, Lot 8 Waipu**

Drawing Title **Ceiling Plan**

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DATE	REV.	AMENDMENTS

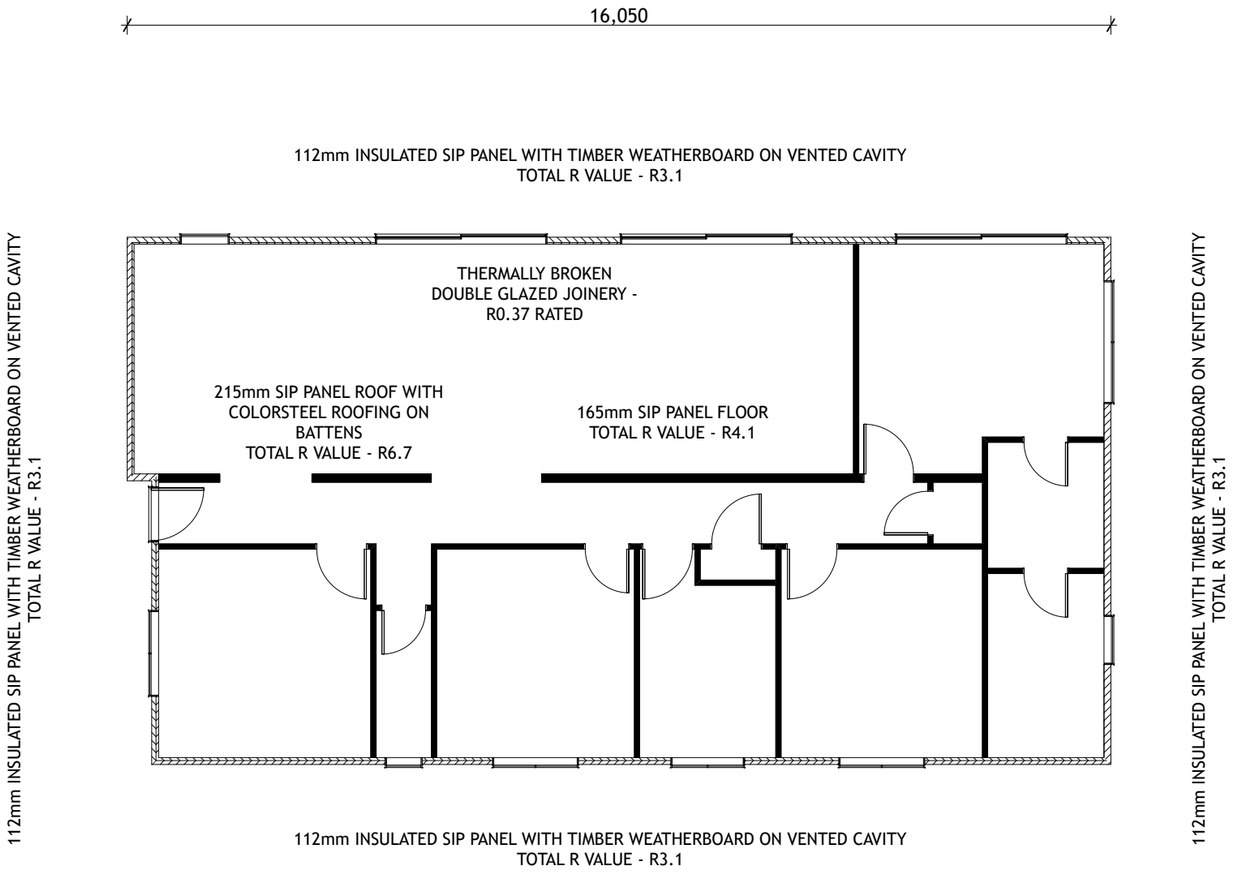
Wind Zone	Earthquake Zone	Exposure Zone
Very High	One	C Non Sea Spray

Scale @ A3

Date 2/02/2026

Sheet **08** of 28

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AS PER NZBC - CLAUSE H1, ENERGY EFFECIENCY, 6th EDITION & NZS 4218:2009, ENERGY EFFICIENCY.
SMALL BUILDING
CLIMATE ZONE 1
TOTAL GLAZING LESS THEN 30%

INSULATION PLAN 1:100

SIPS Direct

Finished panel properties

Core Thickness	Weight Kg/m²	R-Value	Total Thickness
93	16.2	3.18	115
143	17.4	4.79	165
193	18.6	6.38	215
243	19.8	8.10	265
293	21.0	9.74	315

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BP132379

Client: MILLBROOK ESTATE PROPERTY DEVELOPMENTS

Site Address: **20 Groom Rise, Lot 8 Waipu**

Drawing Title: **Insulation Plan**

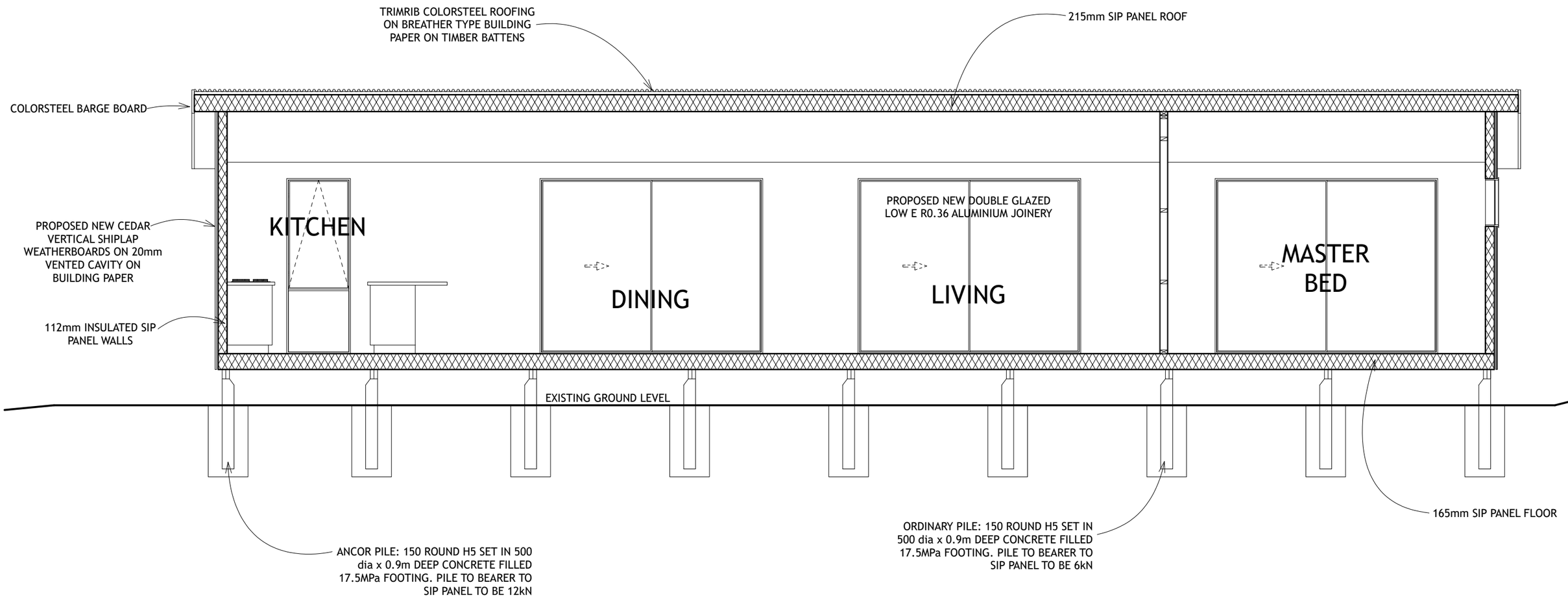
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DATE	REV.	AMENDMENTS

Wind Zone: Very High | Earthquake Zone: One | Exposure Zone: C Non Sea Spray

Scale: @ A3 | Date: 2/02/2026

Sheet: 09 of 28



CROSS SECTION A-A 1:50

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LICENSED BUILDING PRACTITIONER BUILDING CONFIDENCE
BP132379

Client: MILLBROOK ESTATE PROPERTY DEVELOPMENTS

Site Address: **20 Groom Rise, Lot 8 Waipu**

Drawing Title: **Section A-A**

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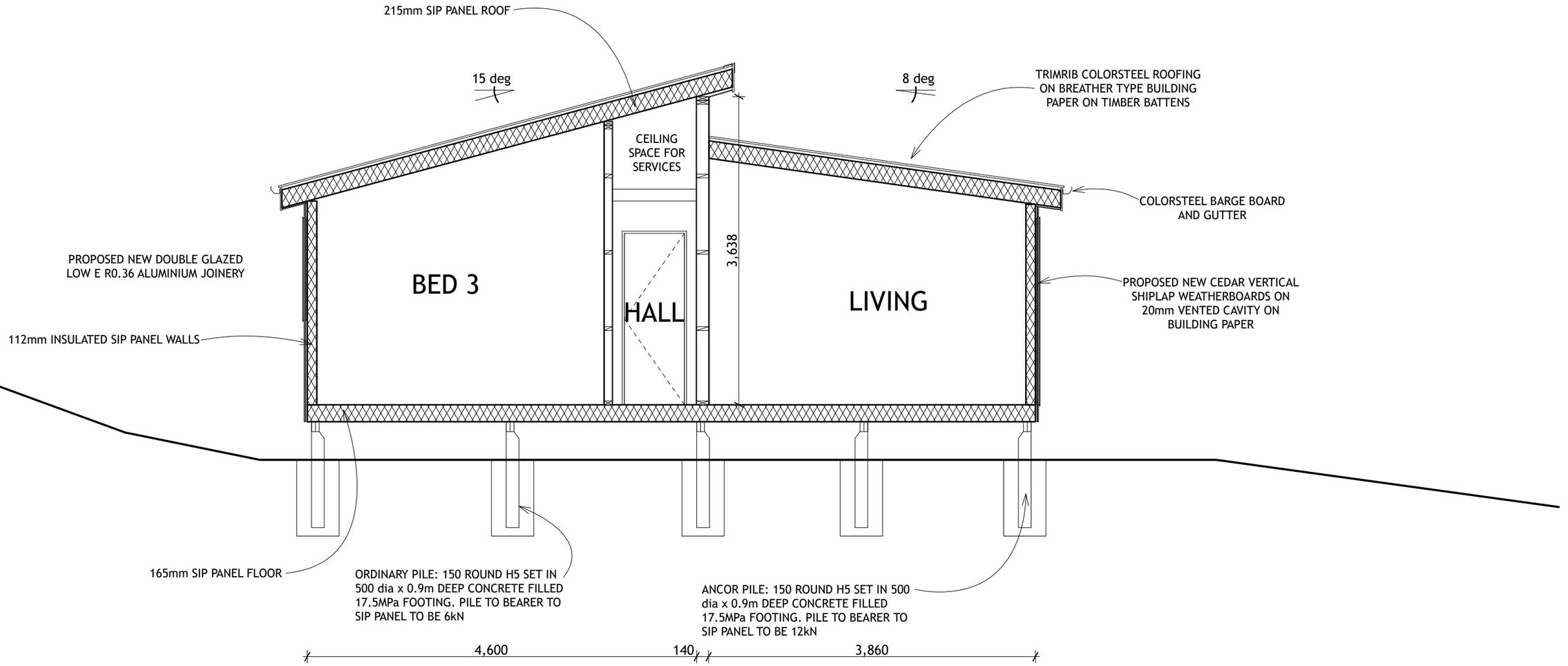
DATE	REV.	AMENDMENTS

Wind Zone	Earthquake Zone	Exposure Zone
Very High	One	C Non Sea Spray

Scale 1:50 @ A3 | Date 2/02/2026

Sheet 10 of 28

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CROSS SECTION B-B 1:50

These plans accurately represent the requirements of the attached calculations prepared by us

for I L Watson Consulting Engineer Ltd

sub floor design only

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Drawing Title: **Section B-B**

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DATE	REV.	AMENDMENTS

Wind Zone	Earthquake Zone	Exposure Zone
Very High	One	C Non Sea Spray

Scale 1:50 @ A3

Date 2/02/2026

Sheet 11 of 28

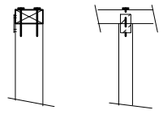
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LINTEL FIXINGS

REFER ALSO LUMBERLOK WALL FIXING CHART
LINTEL FIXING SCHEDULE

FOR FIXING OF JACK STUDS TO LINTEL AND TOP PLATE, REFER TO 'STUD TO TOP PLATE FIXING SCHEDULE'

M12 PROPRIETARY CONCRETE FIXING BOLT WITH 50x50x3mm SQUARE WASHER



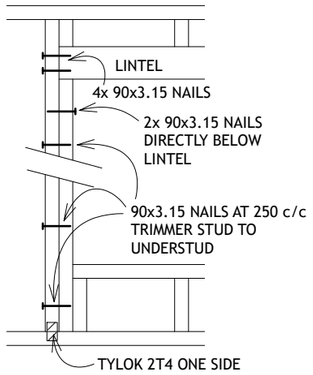
FIXING TYPE B (4.7 kN)

LOADED DIMENSION TO 3.5m
2/90x3.15 PLAIN STEEL WIRE NAILS DRIVEN VERTICALLY INTO STUD,
PLUS
6kN STUD ANCHOR

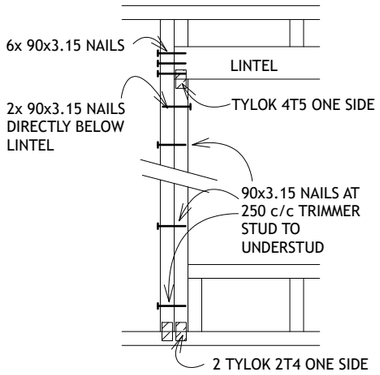
TOP PLATE FIXINGS

REFER ALSO LUMBERLOK WALL FIXING CHART
STUD TO TOP PLATE FIXING SCHEDULE

FIXING TYPE E (1.4 kN)

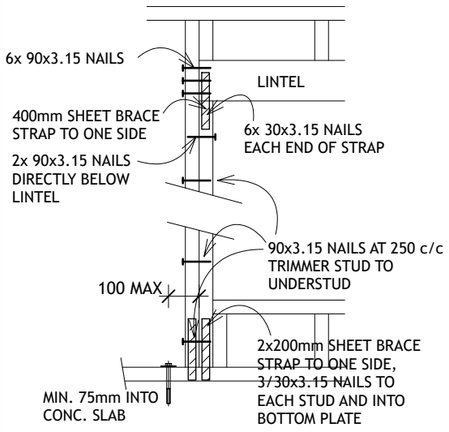


FIXING TYPE F (4.0 kN)



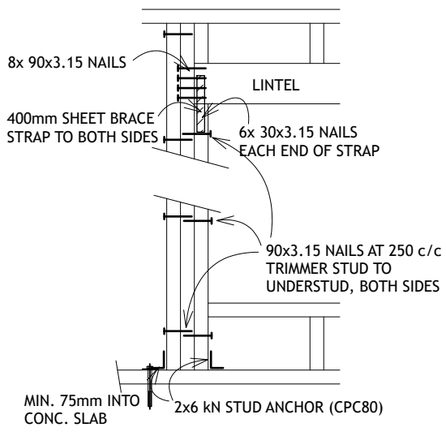
FIXING TYPE G (7.5 kN)

ANY COMBINATION OF TOP/BOTTOM FIXINGS



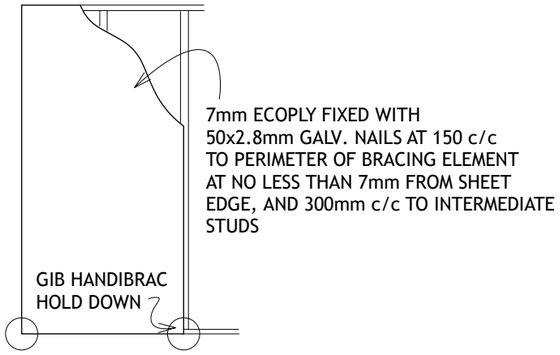
FIXING TYPE H (13.5 kN)

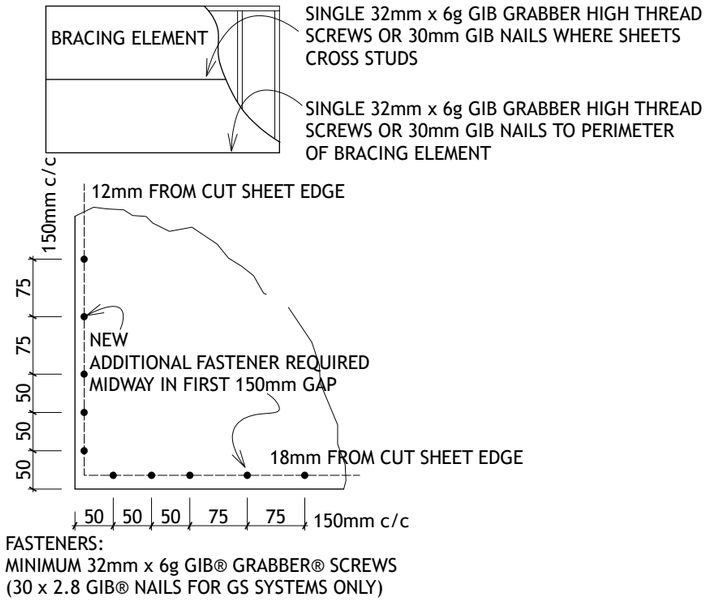
ANY COMBINATION OF TOP/BOTTOM FIXINGS



01 05 Lintel Fixing Details

Scale 1:20

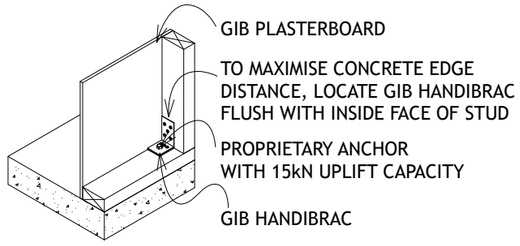




FASTENERS:
MINIMUM 32mm x 6g GIB® GRABBER® SCREWS
(30 x 2.8 GIB® NAILS FOR GS SYSTEMS ONLY)

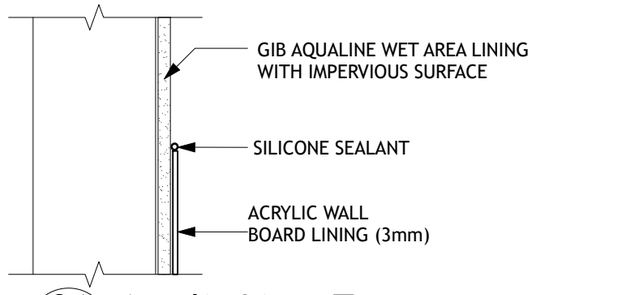
02 05 GIB Bracing Fixing Detail

REFER ALSO GIB BRACING SPECIFICATIONS



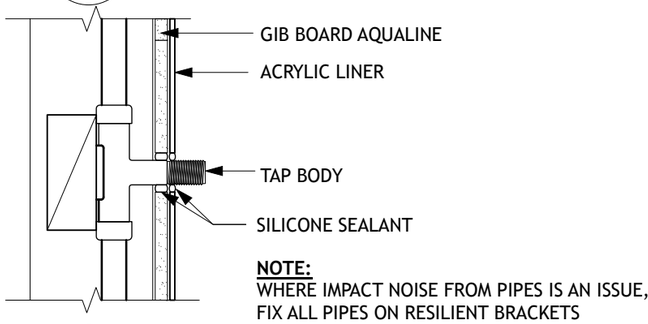
03 05 GIB Handibrac Detail

REFER ALSO GIB BRACING SPECIFICATIONS



04 Acrylic Liner Top

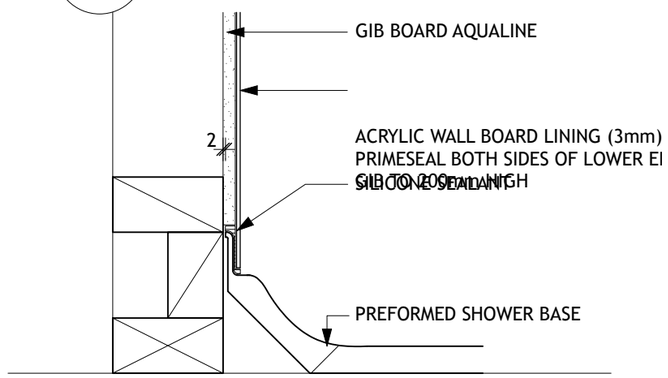
Scale 1:5



NOTE:
WHERE IMPACT NOISE FROM PIPES IS AN ISSUE, FIX ALL PIPES ON RESILIENT BRACKETS

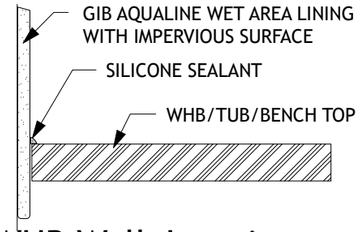
05 Acrylic Penetration

Scale 1:5



06 Acrylic Shower Base Detail

Scale 1:5



07 WHB Wall Junction

Scale 1:5

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LICENSED BUILDING PRACTITIONER BUILDING CONFIDENCE
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Client: MILLBROOK ESTATE PROPERTY DEVELOPMENTS
Site Address: **20 Groom Rise, Lot 8 Waipu**

Drawing Title: **Internal Details**

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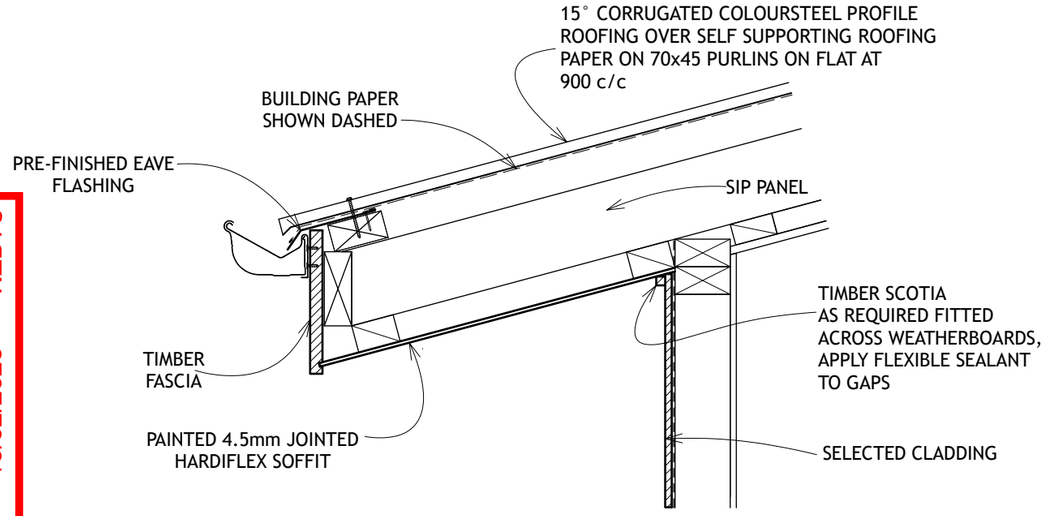
DATE	REV.	AMENDMENTS

Wind Zone	Earthquake Zone	Exposure Zone
Very High	One	C Non Sea Spray

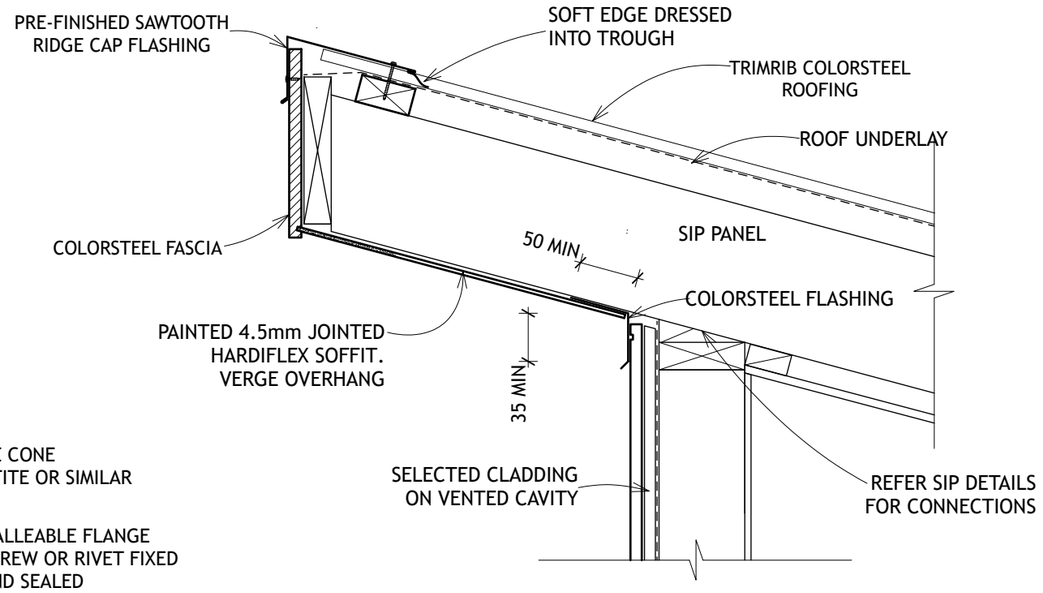
Scale 1:5 @ A3 | Date 2/02/2026

Sheet 12 of 28

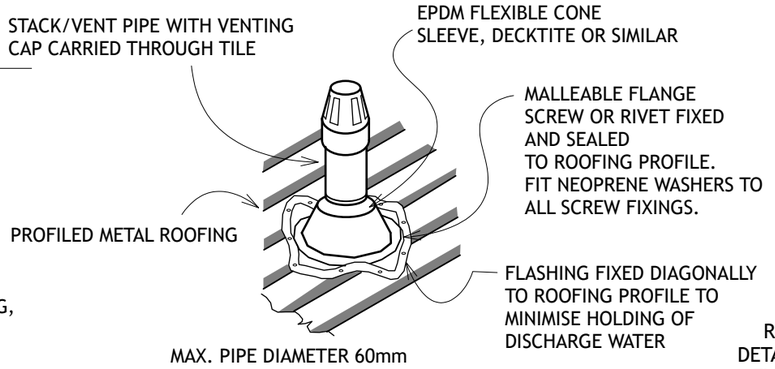
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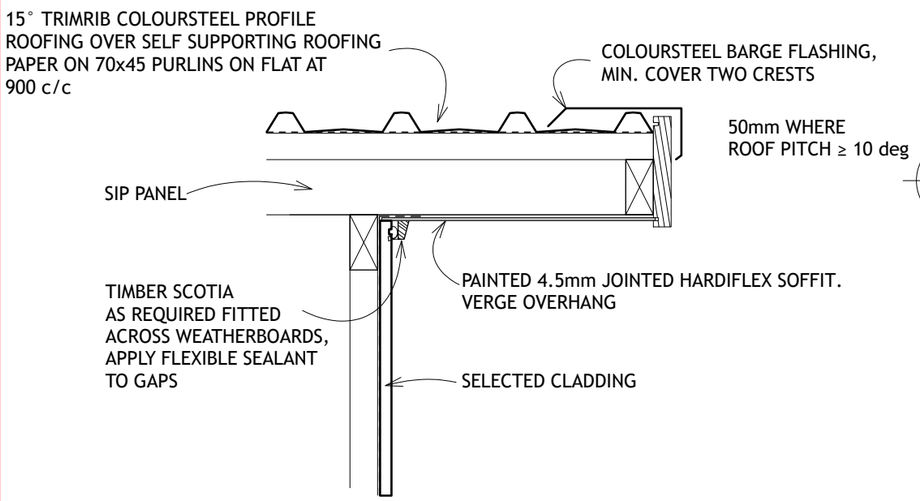
08/07 Eave Overhang Detail
Scale 1:10



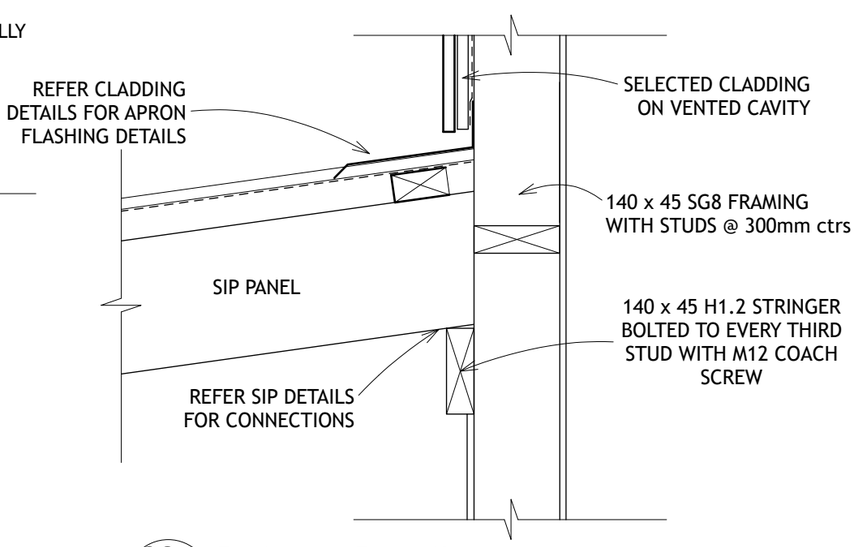
09/07 Barge Detail
Scale 1:10



10a/07 Pipe Penetration Detail
Scale 1:10



10/07 Typical Verge Detail
Scale 1:10



09a/07 Stringer Detail
Scale 1:10

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Client: MILLBROOK ESTATE PROPERTY DEVELOPMENTS
Site Address: **20 Groom Rise, Lot 8 Waipu**
Drawing Title: **Roofing Details**

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DATE	REV.	AMENDMENTS

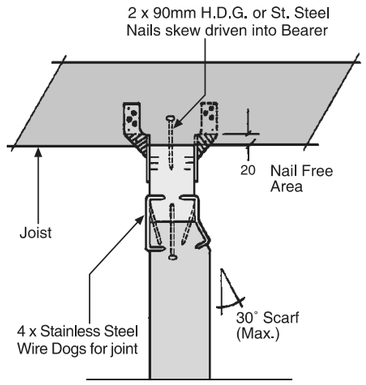
Wind Zone	Earthquake Zone	Exposure Zone
Very High	One	C Non Sea Spray

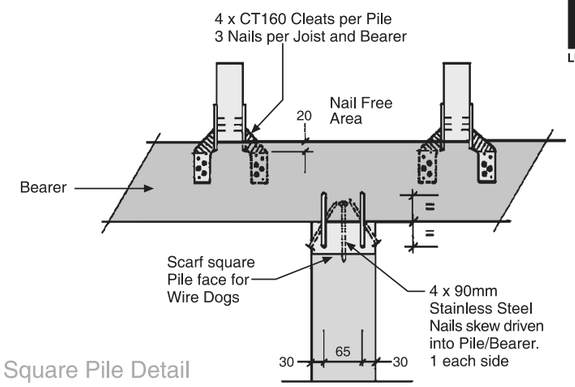
Scale @ A3 | Date 2/02/2026

Sheet 13 of 28

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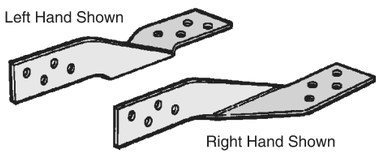
REFER TO SIP PANEL DETAILS FOR PANEL TO BEARER CONNECTION DETAIL

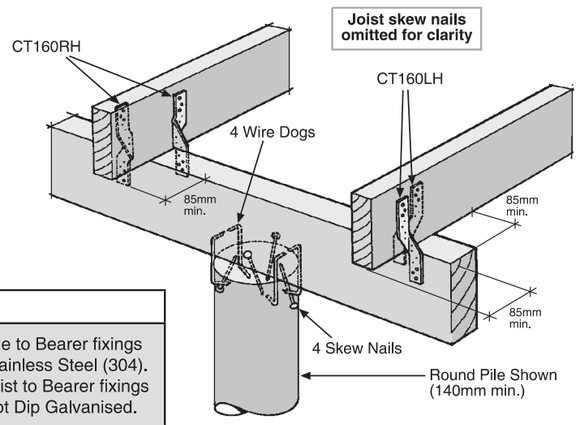




Square Pile Detail

LUMBERLOK®





6. FOUNDATION/SUBFLOOR

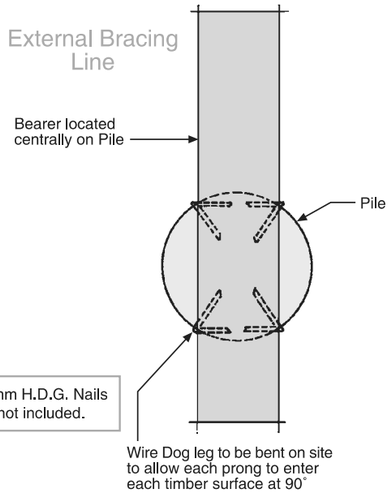
CORROSION HAZARD USE TABLE	
Standard Pack (6KN) - Zones B & C - If Joist to Bearer Fixings ABOVE 600mm from Ground level	Pile to Bearer fixings Stainless Steel (304). Joist to Bearer fixings Hot Dip Galvanised.
High Corrosion Pack (6KNH) - Zone D - All Fixings BELOW 600mm from Ground level	All items Stainless Steel (304).

6kN Joint Fixing Schedule

PILE TO BEARER
- Wire Dog Staples (4 per joint) Stainless Steel
- 4 x 90mm Skew Nails (1 per face) Stainless Steel

JOIST TO BEARER
- CT160 Cleats (4 per pile) 160mm long
- 3 Nails per Cleat into Joist
- 3 Nails per Cleat into Bearer
- 2 Skew Nails 90mm (1 per side)

NAILS
- 24 x 45mm x 3.55 dia. Spiral Nails (for Joist to Bearer fixings)
- 4 x 90mm x 4 dia. St. Steel Nails (6KN Pack only)
- 8 x 90mm x 4 dia. St. Steel Nails (6KNH Pack only)



6kN Pile Set Contents

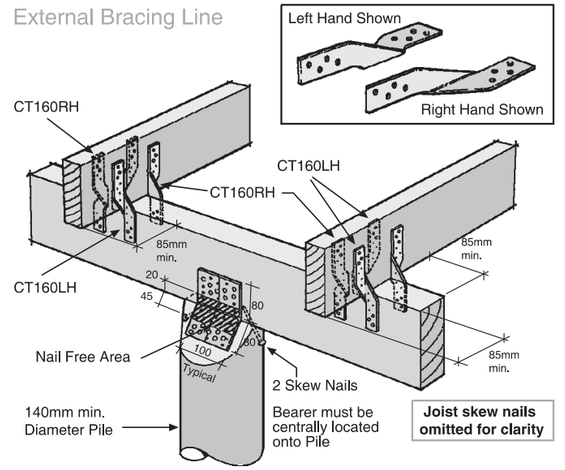
Each set represents 1 x 6kN Pile Fixing
(packed 10 sets per carton)
4 x Wire Dog Staples Stainless Steel
4 x CT160 Cleats
24 x 45mm x 3.55 dia. Spiral Nails
90mm St. Steel Nails to suit 4 - 6KN pack
8 - 6KNH pack

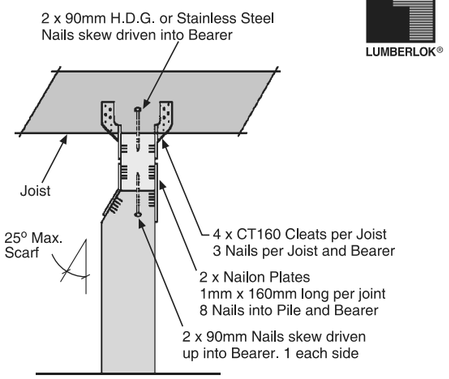
} Refer front page for Product Finish Options

11 06 6kN Footing Connection Detail

Scale 1:10

REFER TO SIP PANEL DETAILS FOR PANEL TO BEARER CONNECTION DETAIL



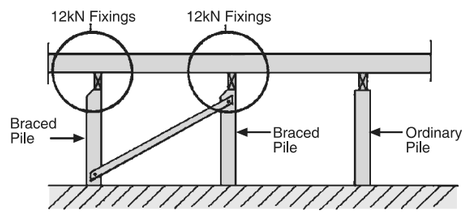


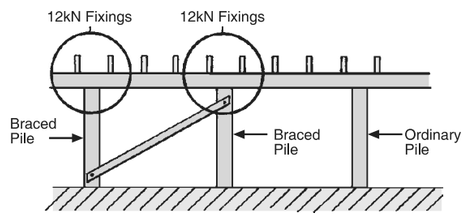
Square Pile

LUMBERLOK®

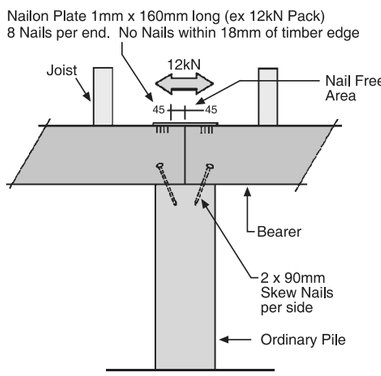
6. FOUNDATION/SUBFLOOR

CORROSION HAZARD USE TABLE	
Standard Pack (12KN) - Zones B & C - All Fixings ABOVE 600mm from Ground level	All items Hot Dip Galvanised.
High Corrosion Pack (12KNH) - Zone D - All Fixings BELOW 600mm from Ground level	All items Stainless Steel (304).





Sample Subfloor Elevations
12kN Fixing - Pile to Bearer
- Joists to Bearer



12kN Bearer Splice
Clause 6.12.7.2
NZS 3604:2011

12kN Joint Fixing Schedule

PILE TO BEARER
- Nailon Plate (2 per joint) 1mm x 100mm (Typical) x 160mm long
- 8 Nails per Plate into Pile
- 8 Nails per Plate into Bearer
- 2 Skew Nails 90mm (1 per face)

JOIST TO BEARER
- CT160 Cleats (4 per Joist) 160mm long
- 3 Nails per Cleat into Joist
- 3 Nails per Cleat into Bearer
- 2 Skew Nails 90mm (1 per side)

NAILS
- 80 x 45mm x 3.55 dia. Spiral Nails
- 6 x 90mm x 4 dia. St. Steel Nails (12KNH Pack only)

12kN Pile Set Contents

Each set represents 1 x 12kN Pile Fixing
(packed 4 sets per carton)
2 x Nailon Plates 160mm long
8 x CT160 Cleats
80 x 45mm x 3.55 dia. Spiral Nails
90mm x 4 dia. St. Steel Angular Groove 6 - 12KNH Pack

} Refer front page for Product Finish Options

12 06 12kN Footing Connection Detail

Scale 1:10

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Client: MILLBROOK ESTATE PROPERTY DEVELOPMENTS

Site Address: **20 Groom Rise, Lot 8 Waipu**

Drawing Title: **Foundation Details**

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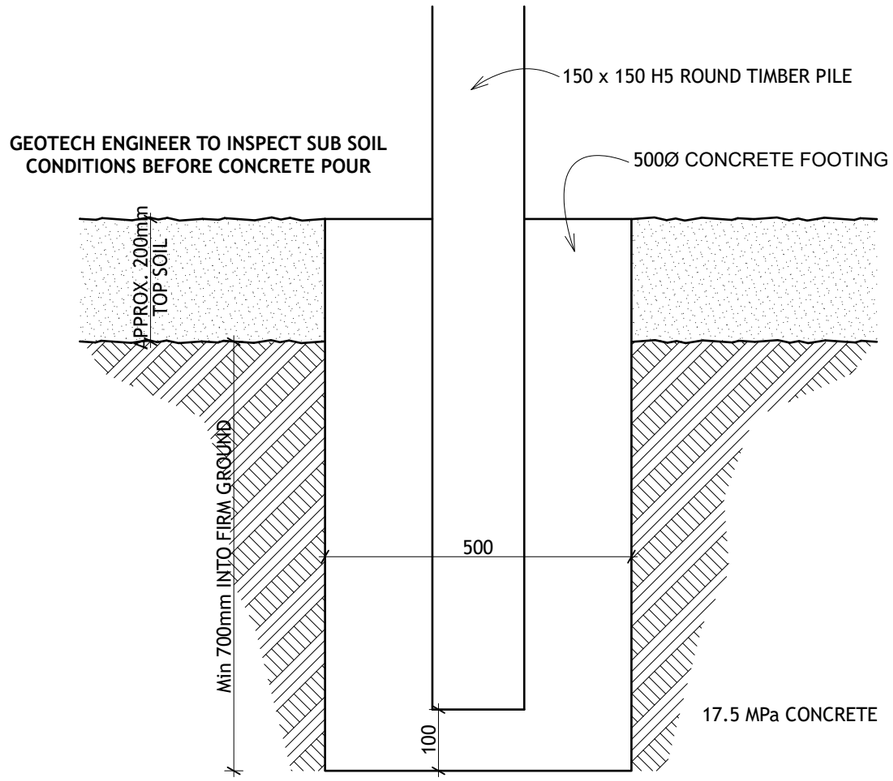
DATE	REV.	AMENDMENTS

Wind Zone	Earthquake Zone	Exposure Zone
Very High	One	C Non Sea Spray

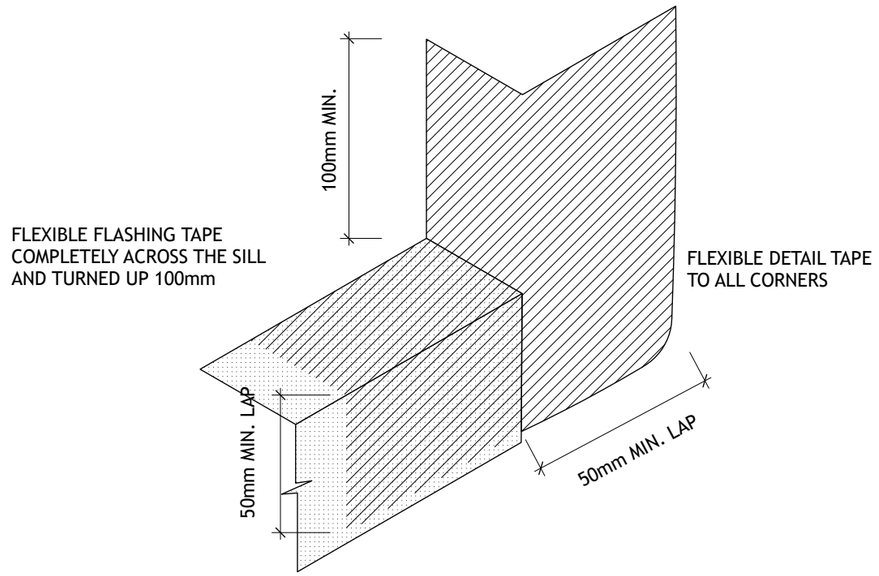
Scale 1:10 @ A3 | Date 2/02/2026

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13/06 Pile Footing Detail
Scale 1:10



14 Window Flashing Tape
Scale 1:5

These plans accurately represent the requirements of the attached calculations prepared by us

for T L Watson Consulting Engineer Ltd

sub floor design only

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LICENSED BUILDING PRACTITIONER BUILDING CONFIDENCE
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Site Address: **20 Groom Rise, Lot 8 Waipu**

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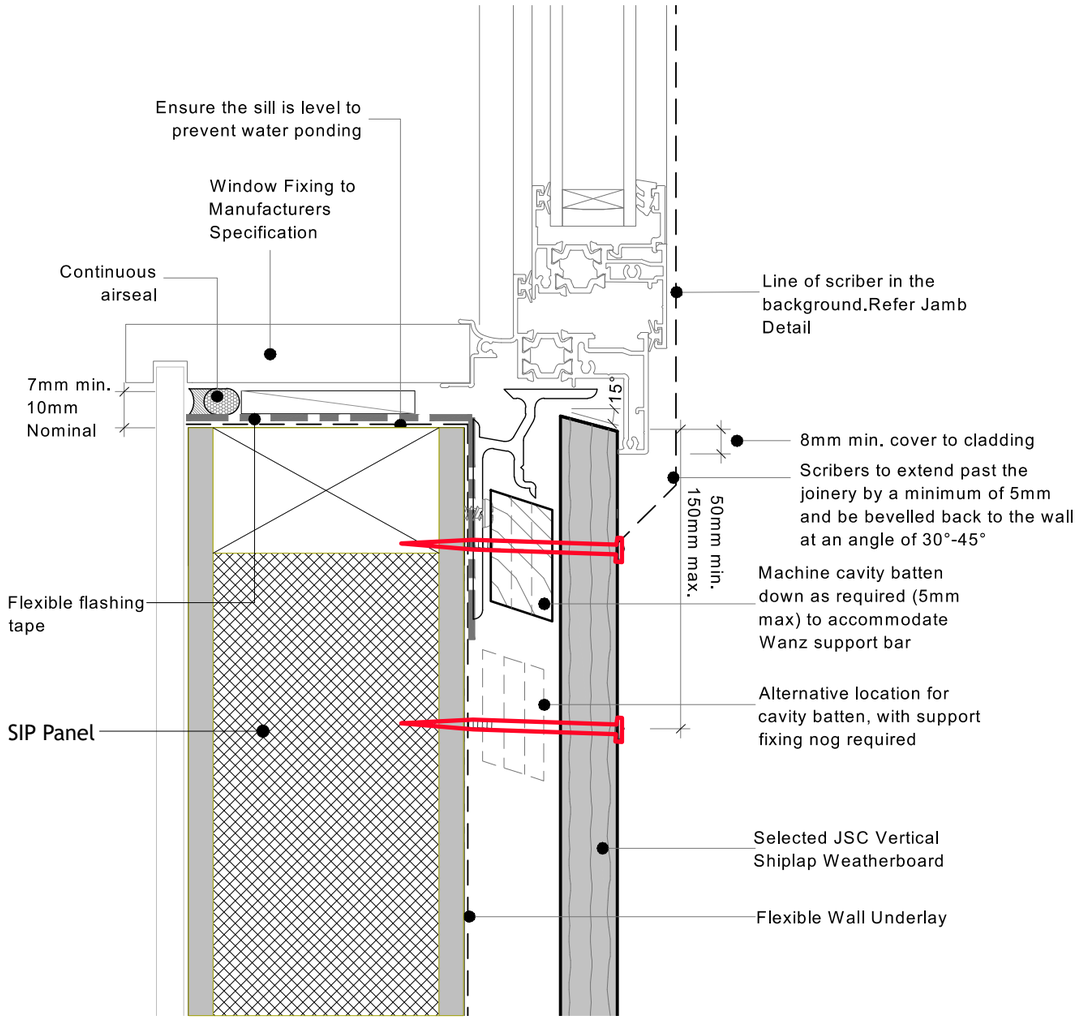
DATE	REV.	AMENDMENTS

Wind Zone	Earthquake Zone	Exposure Zone
Very High	One	C Non Sea Spray

Scale @ A3

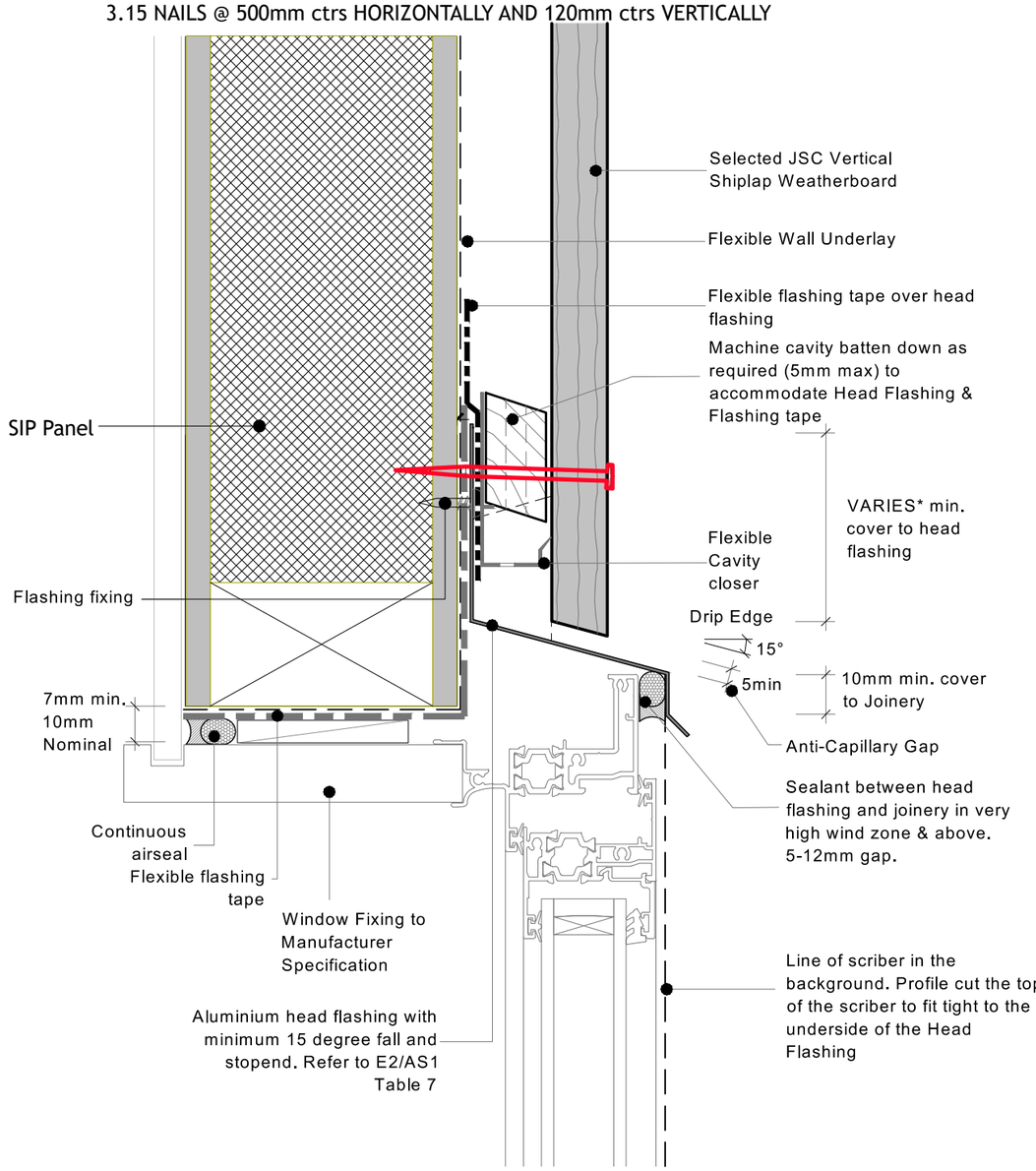
Date 2/02/2026

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CAVITY BATTENS AT MAX 480mm CENTERS
3.15 NAILS @ 500mm ctrs HORIZONTALLY AND 120mm ctrs VERTICALLY

15/04 Shiplap Weatherboard Sill Detail
Scale 1:2



NOTE:
- Ensure a minimum penetration of 30mm into the timber frame due to the presence of multiple elements, including cavity batten, flashing tape, cavity closure, and head flashing.
- To address the buildup of elements on the head detail, consider the use of a flexible cavity closer.

*JSC recommends no hooks or hems. Therefore, the flashing upstand dimensions must be increased by 25 mm in accordance with E2/AS1, Section 4.5.1

16/04 Shiplap Weatherboard Head Detail
Scale 1:2

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Client: MILLBROOK ESTATE PROPERTY DEVELOPMENTS
Site Address: **20 Groom Rise, Lot 8 Waipu**

Drawing Title: **Shiplap Weatherboard Details**

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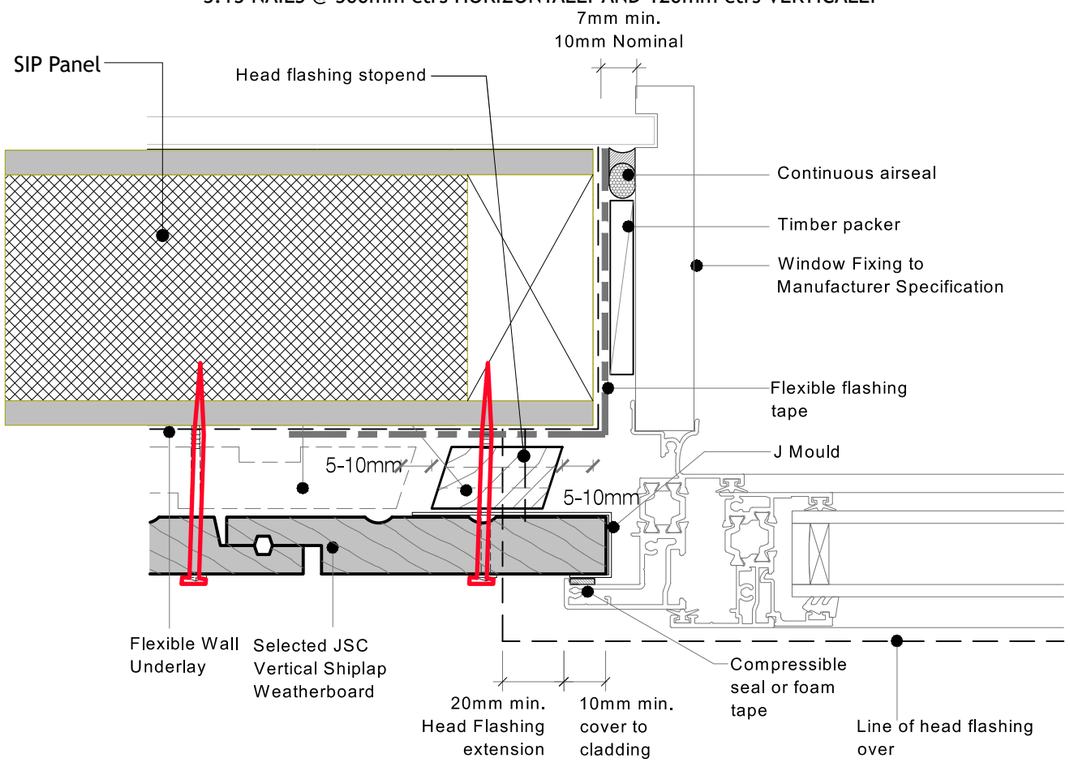
DATE	REV.	AMENDMENTS

Wind Zone	Earthquake Zone	Exposure Zone
Very High	One	C Non Sea Spray

Scale 1:2 @ A3 | Date 10/02/2026

WDC - Approved Building Consent Document - BC2600060 - Pg 18 of 46 - 16/02/2026 - NZBTC

CAVITY BATTENS AT MAX 480mm CENTERS
3.15 NAILS @ 500mm ctrs HORIZONTALLY AND 120mm ctrs VERTICALLY



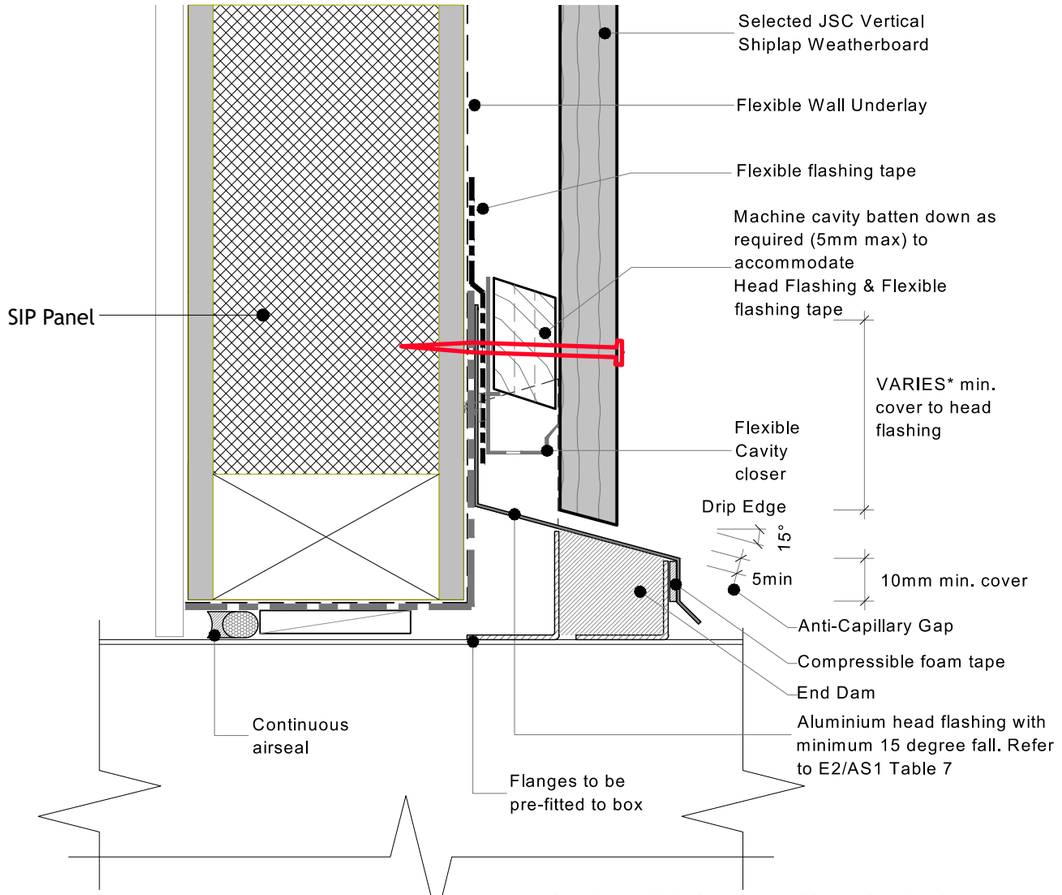


Cut and fold J Mould

J Mould to extend past sill cavity batten

NOTE : No Scriber Option :
The Aluminium Joinery must sit hard against the back of the joinery flange and the timber weatherboards with a seal or foam tape in between.

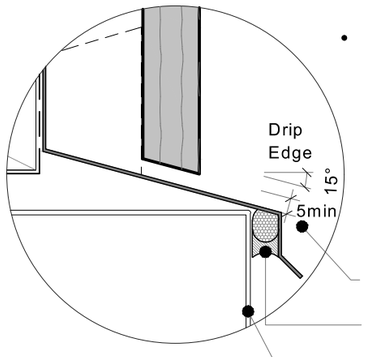
17/04 Shiplap Weatherboard Jamb Detail
Scale 1:2

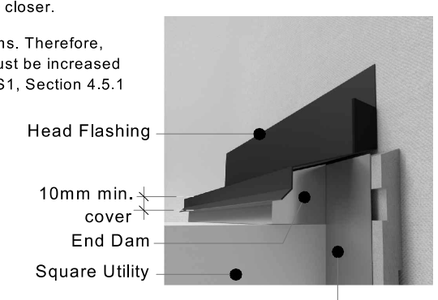


CAVITY BATTENS AT MAX 480mm CENTERS
NOTE: 3.15 NAILS @ 500mm ctrs HORIZONTALLY AND 120mm ctrs VERTICALLY

- Ensure a minimum penetration of 30mm into the timber frame due to the presence of multiple elements, including cavity batten, flashing tape, cavity closure, and head flashing.
- To address the buildup of elements on the head detail, consider the use of a flexible cavity closer.

*JSC recommends no hooks or hems. Therefore, the flashing upstand dimensions must be increased by 25 mm in accordance with E2/AS1, Section 4.5.1





18/04 Shiplap Weatherboard Meter Box Detail
Scale 1:2

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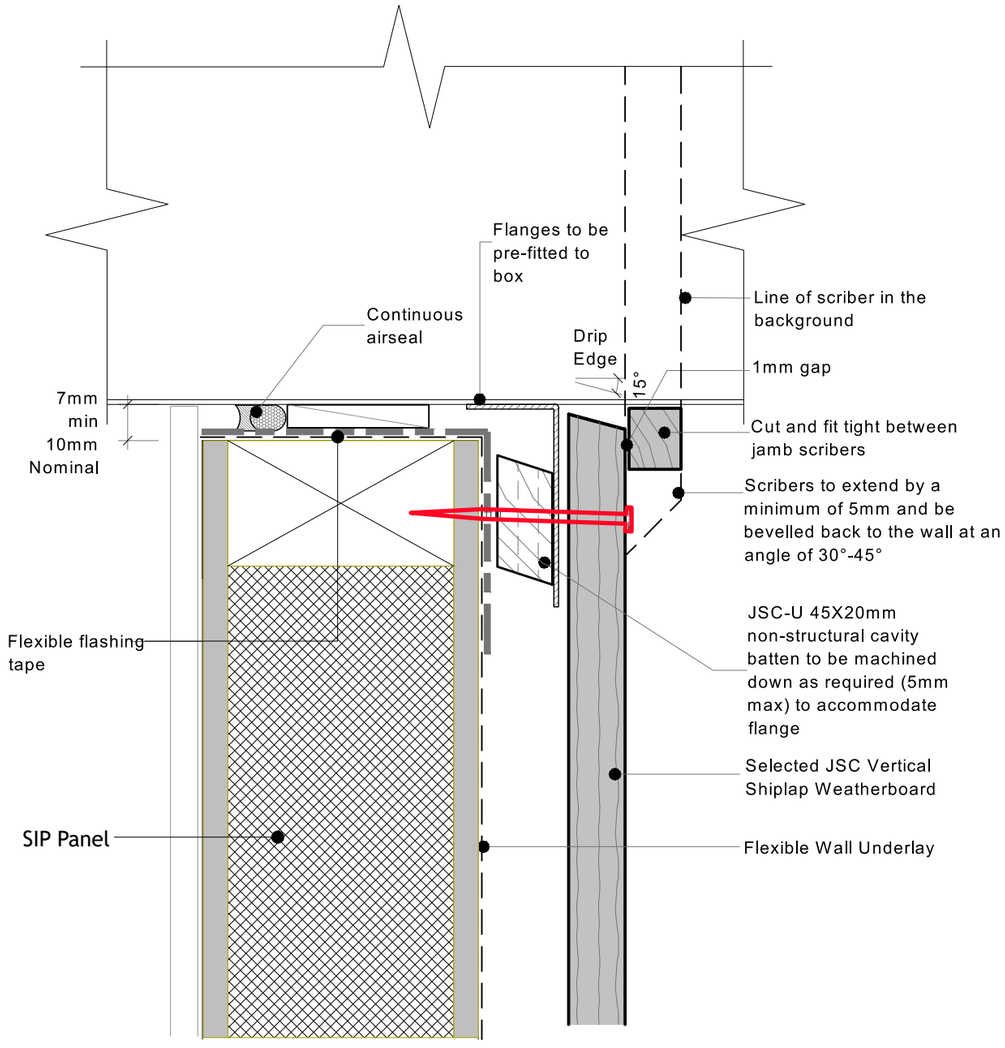
Drawing Title: **Shiplap Weatherboard Details**

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DATE	REV.	AMENDMENTS

Wind Zone: Very High | Earthquake Zone: One | Exposure Zone: C Non Sea Spray
Scale: 1:2 @ A3 | Date: 10/02/2026
Sheet: 17 of 28

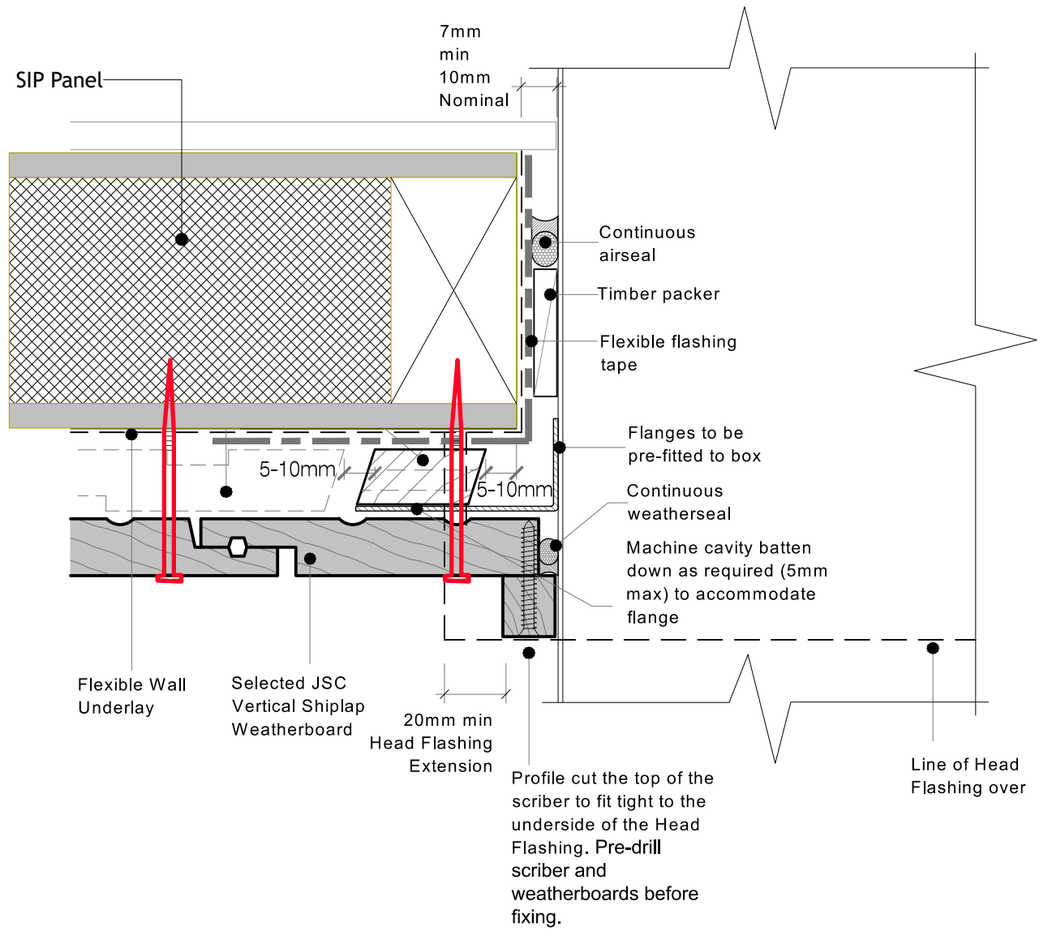
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CAVITY BATTENS AT MAX 480mm CENTERS
3.15 NAILS @ 500mm ctrs HORIZONTALLY AND 120mm ctrs VERTICALLY

19/04 Shiplap Weatherboard Meter Box Detail

Scale 1:2



CAVITY BATTENS AT MAX 480mm CENTERS
3.15 NAILS @ 500mm ctrs HORIZONTALLY AND 120mm ctrs VERTICALLY

20/04 Shiplap Weatherboard Meter Box Detail

Scale 1:2

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Site Address: **20 Groom Rise, Lot 8 Waipu**

Drawing Title: **Shiplap Weatherboard Details**

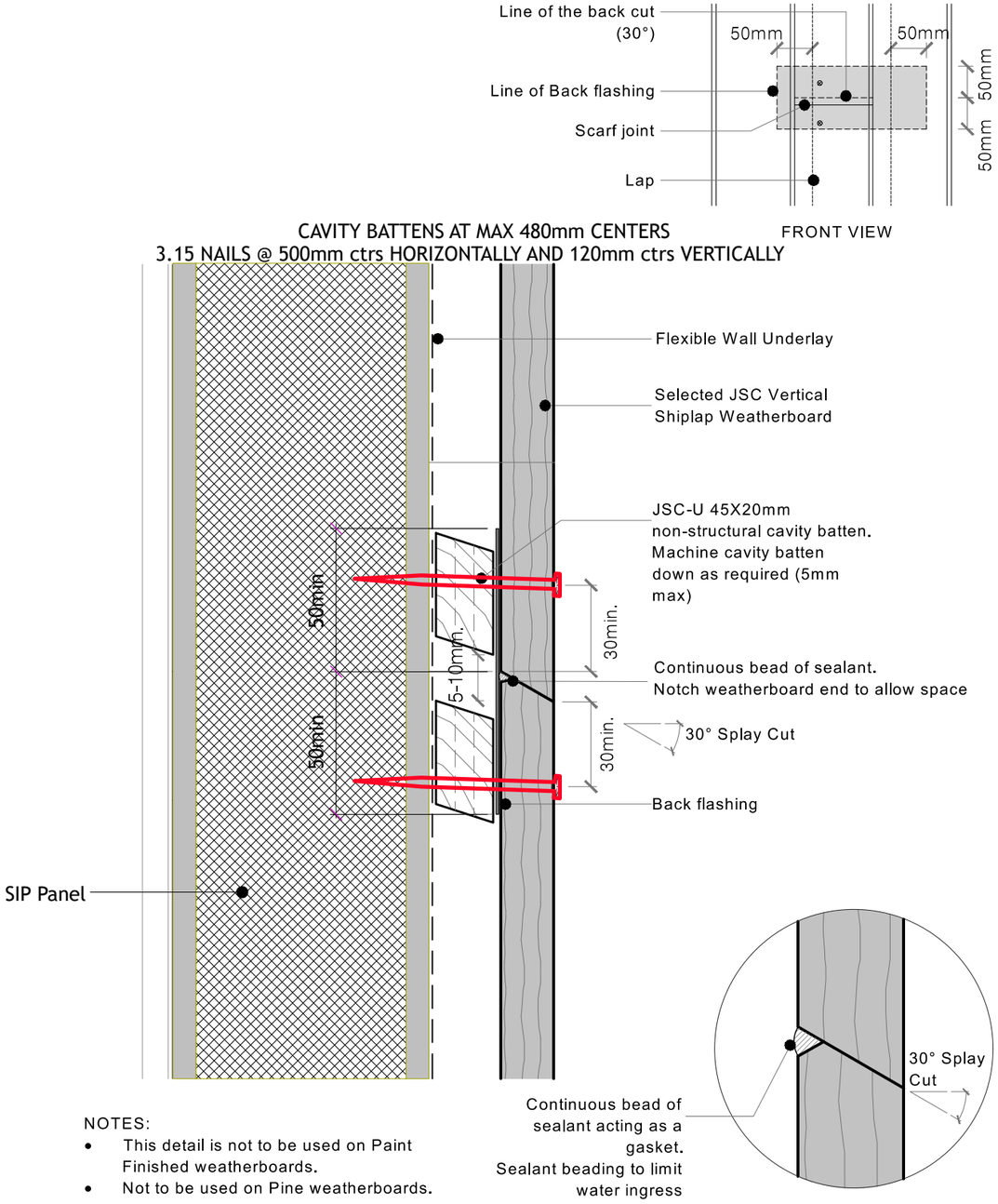
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DATE	REV.	AMENDMENTS

Wind Zone	Earthquake Zone	Exposure Zone
Very High	One	C Non Sea Spray

Scale 1:2 @ A3 | Date 10/02/2026

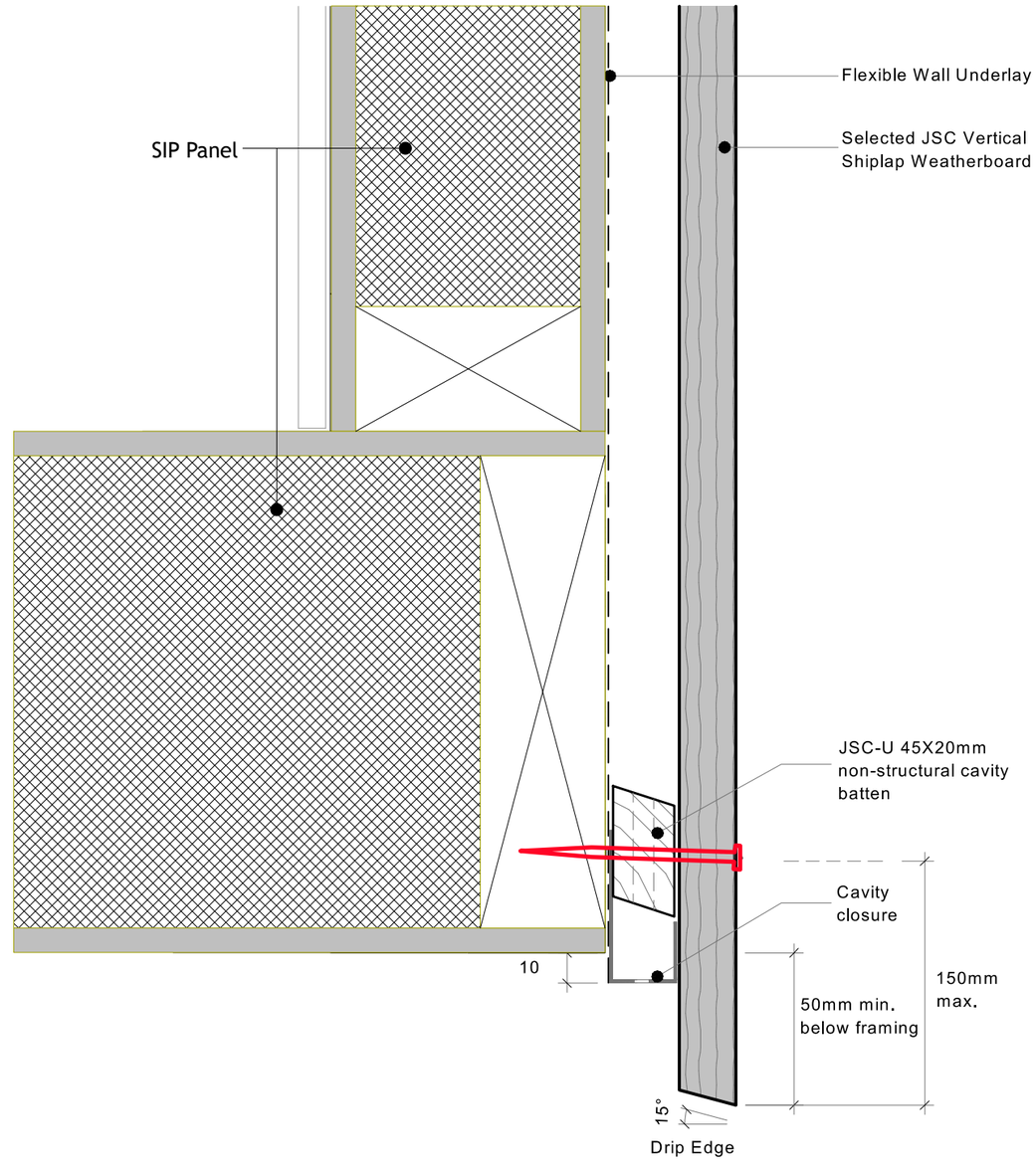
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NOTES:

- This detail is not to be used on Paint Finished weatherboards.
- Not to be used on Pine weatherboards.

21/04 Shiplap Weatherboard Junction Detail
Scale 1:2



CAVITY BATTENS AT MAX 480mm CENTERS
3.15 NAILS @ 500mm ctrs HORIZONTALLY AND 120mm ctrs VERTICALLY

22/04 Shiplap Weatherboard Base Detail
Scale 1:2

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Drawing Title: Shiplap Weatherboard Details

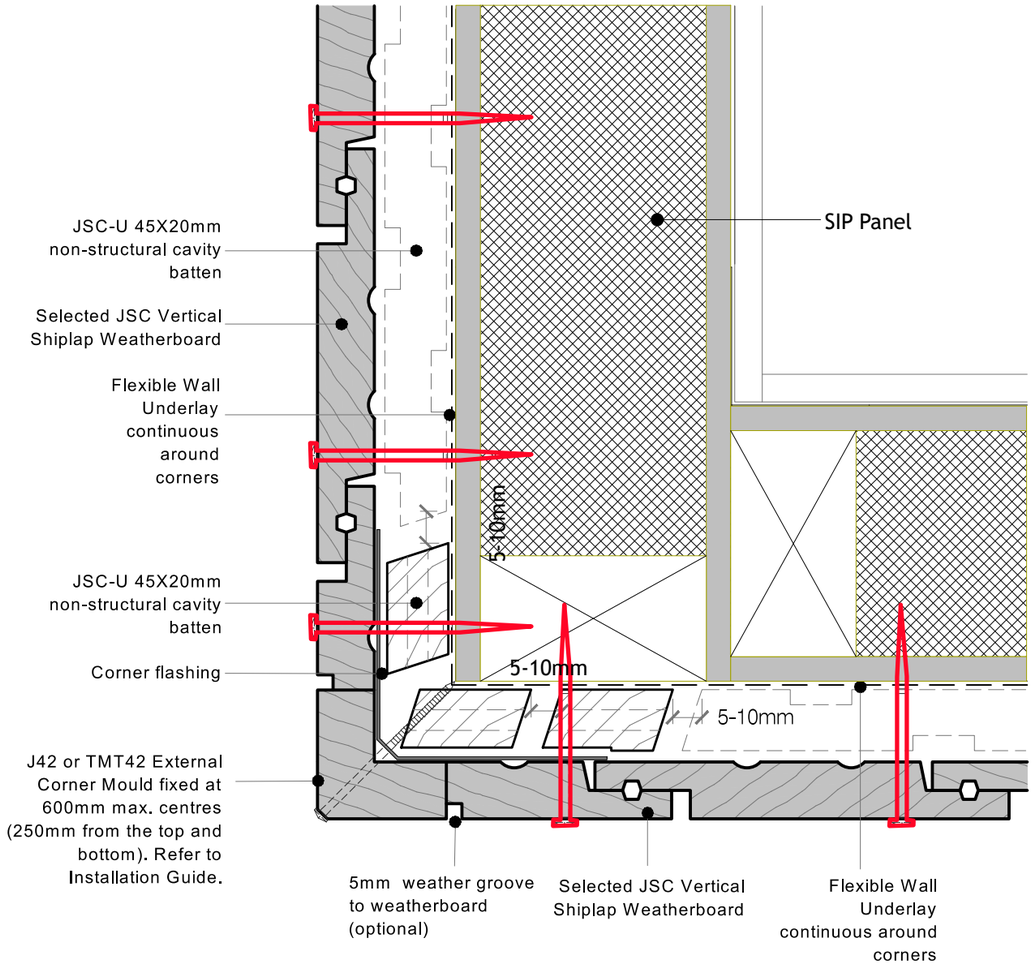
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DATE	REV.	AMENDMENTS

Wind Zone	Earthquake Zone	Exposure Zone
Very High	One	C Non Sea Spray

Scale 1:2 @ A3 | Date 10/02/2026

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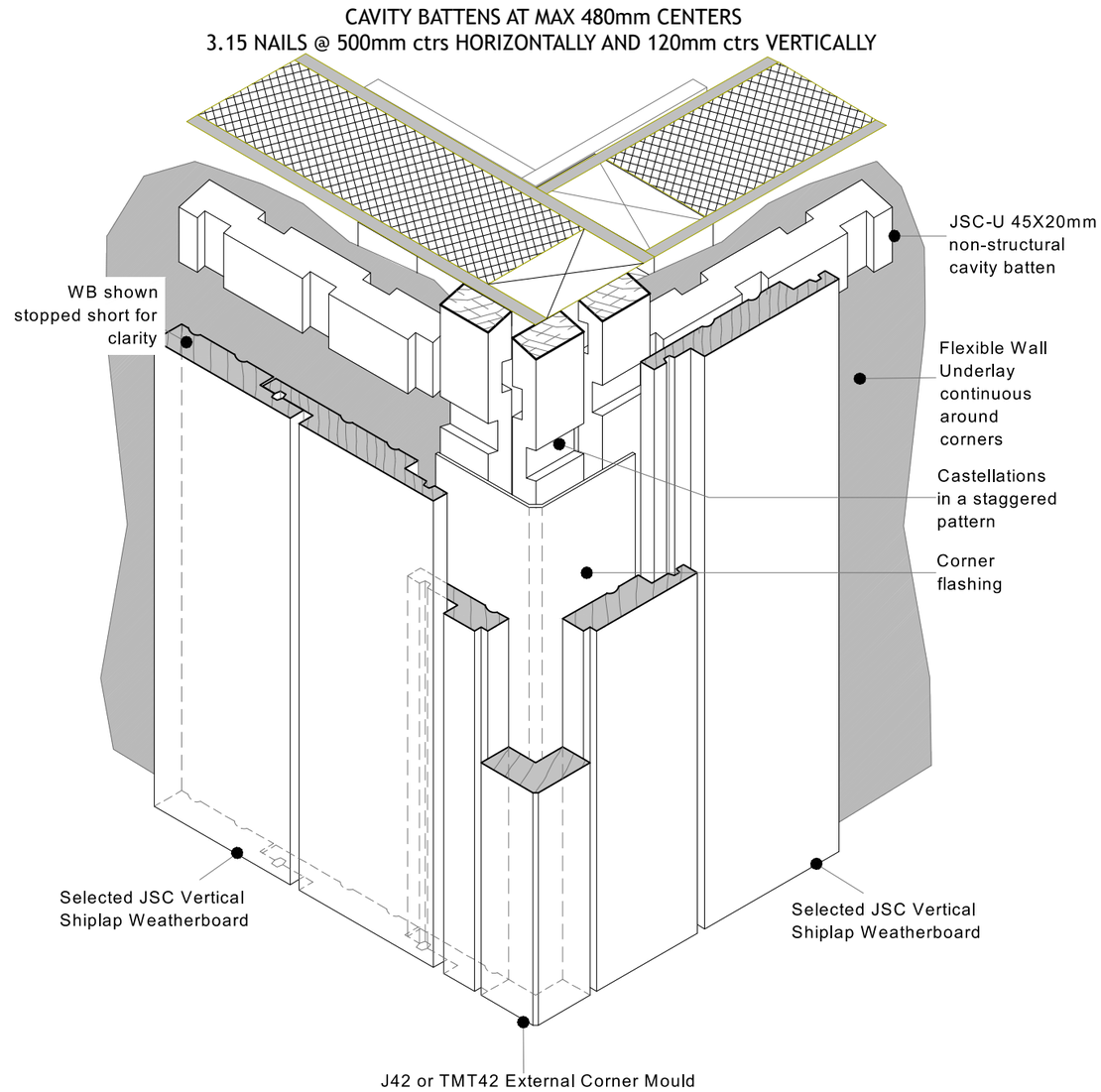
CAVITY BATTENS AT MAX 480mm CENTERS
3.15 NAILS @ 500mm ctrs HORIZONTALLY AND 120mm ctrs VERTICALLY

NOTES:

- Machine cavity battens down as required (5mm max) to accommodate corner flashing.
- Cut horizontal and vertical cavity battens on a 20-30°angle, sloping away from the framing.
- For Very High (VH) and Extra High (EH) wind zones, a solid batten (non-castellated) is required down one side of a significant external corner (change in elevation) to provide pressure isolation between elevations.
- JSC recommends this detail to be used for paint finished weatherboards.
- This detail is not recommended for Pine weatherboards.

23/04 Shiplap Weatherboard External Corner Detail

Scale 1:2



DETAIL NOTE :

- For Very High (VH) and Extra High (EH) wind zones (as defined NZS 3604), a solid batten (non castellated) is required down one side of a significant external corner (change in elevation) to provide pressure isolation between elevations.
- JSC recommends this detail to be used for paint finished weatherboards.

24/04 Shiplap Weatherboard External Corner Detail

Scale 1:2

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Drawing Title: **Shiplap Weatherboard Details**

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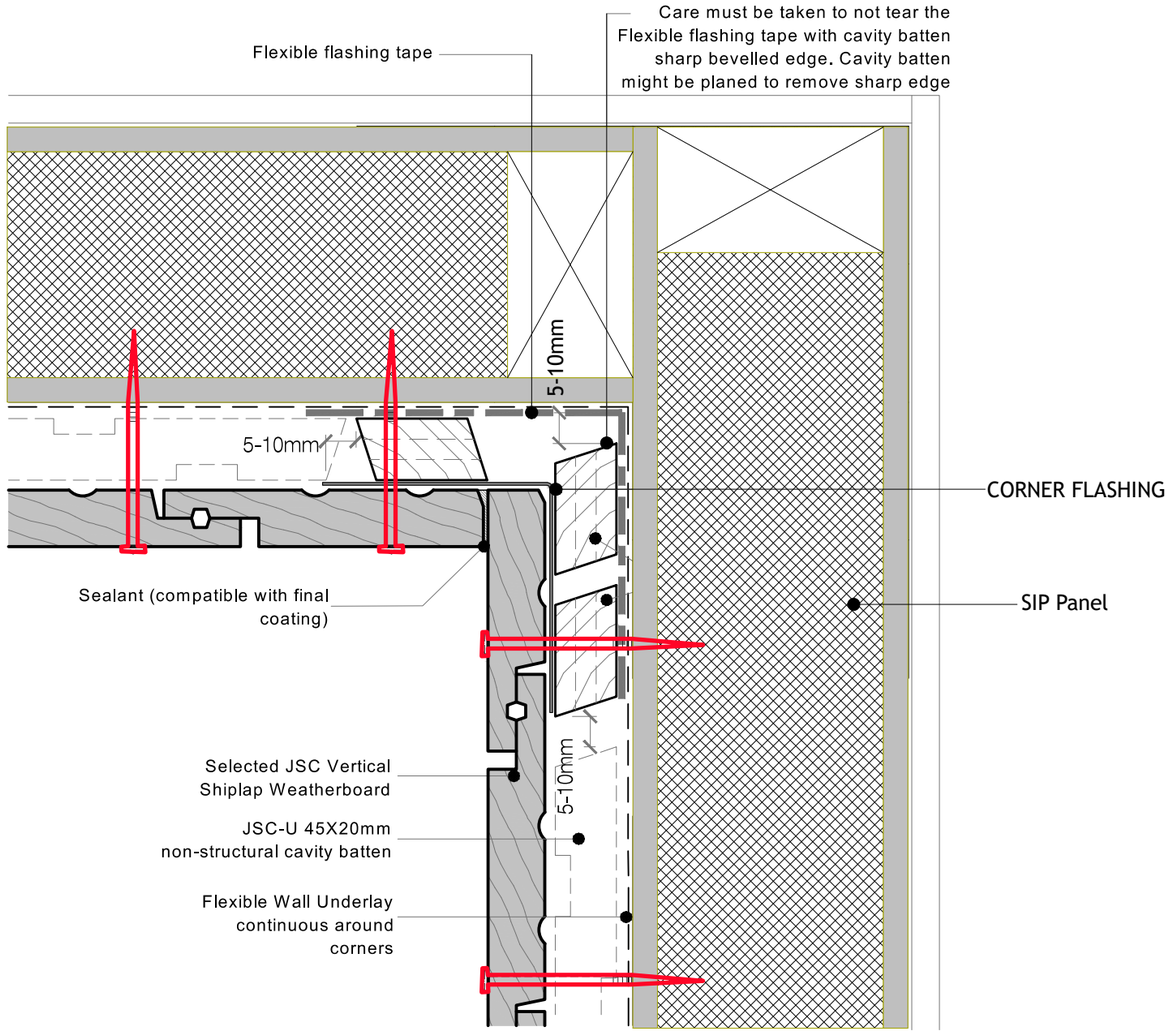
DATE	REV.	AMENDMENTS

Wind Zone	Earthquake Zone	Exposure Zone
Very High	One	C Non Sea Spray

Scale 1:2 @ A3 | Date 10/02/2026

Sheet 20 of 28

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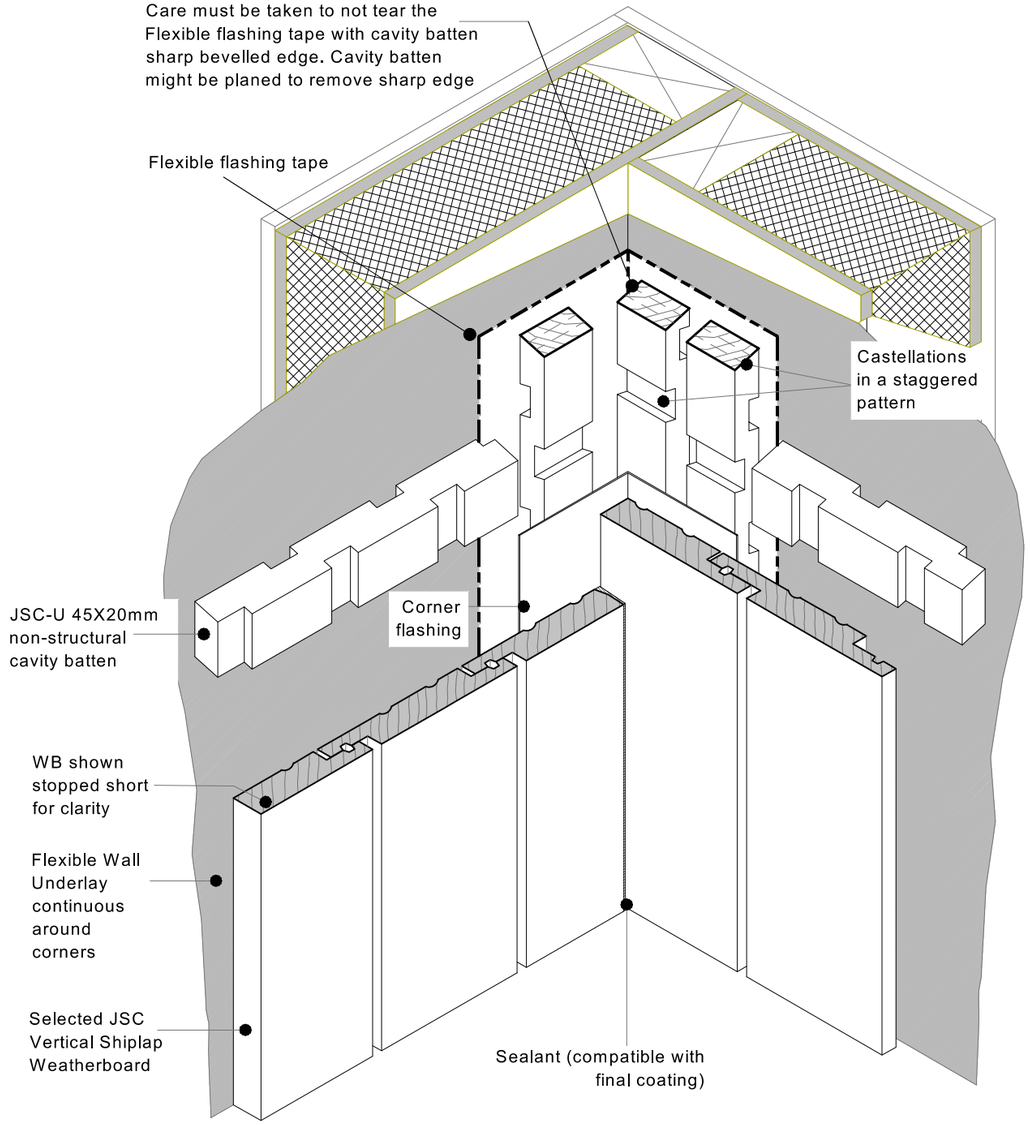


CAVITY BATTENS AT MAX 480mm CENTERS
3.15 NAILS @ 500mm ctrs HORIZONTALLY AND 120mm ctrs VERTICALLY

N O T E S:

- Machine cavity battens down as required (5mm max) to accommodate corner flashing.
- Cut horizontal and vertical cavity battens on a 20-30°angle, sloping away from the framing.
- Flexible flashing tape is recommended due to movement that may occur in corners but it is not required by E2/AS1.

25/04 Shiplap Weatherboard Internal Corner Detail
Scale 1:2



CAVITY BATTENS AT MAX 480mm CENTERS
3.15 NAILS @ 500mm ctrs HORIZONTALLY AND 120mm ctrs VERTICALLY

26/04 Shiplap Weatherboard Internal Corner Detail
Scale 1:2

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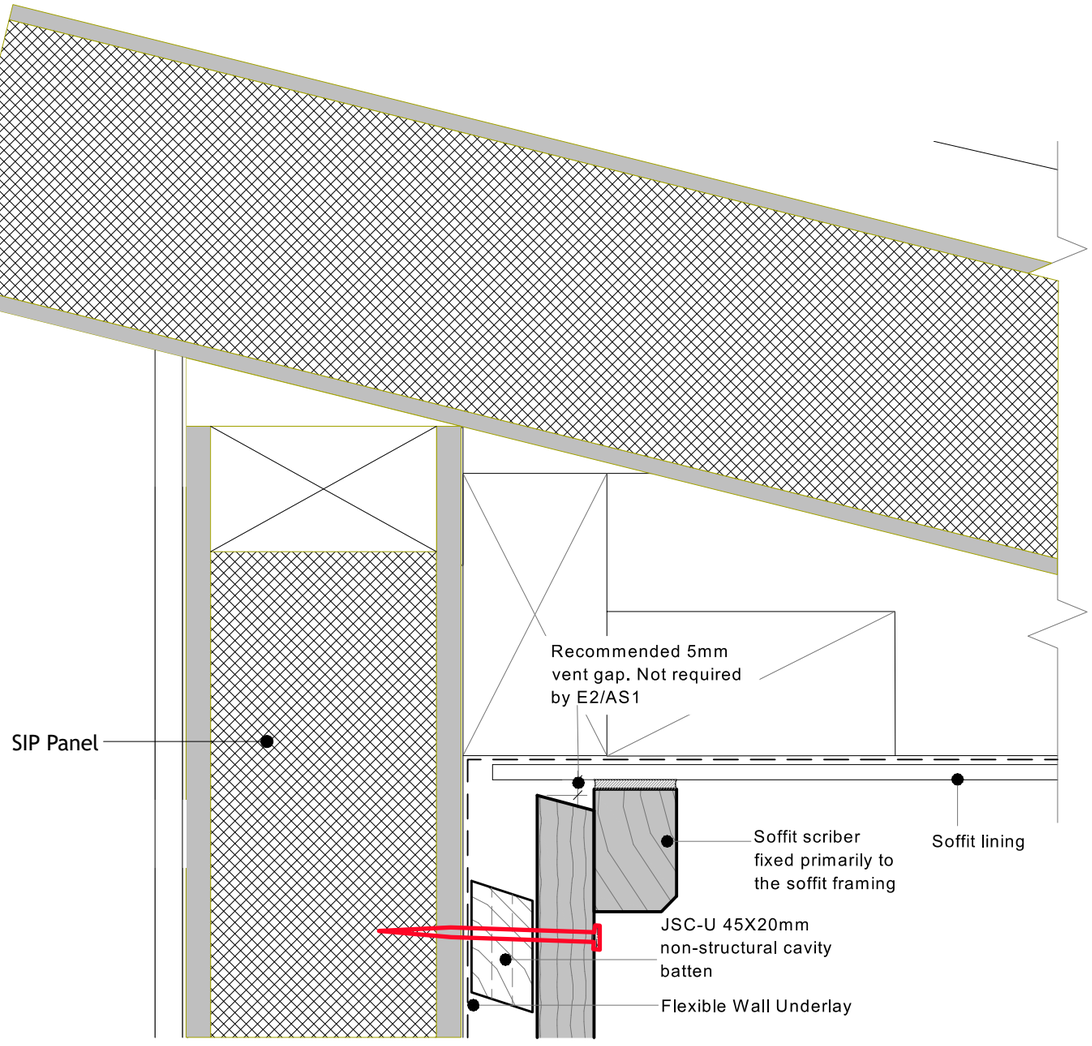
Client: MILLBROOK ESTATE PROPERTY DEVELOPMENTS
Site Address: **20 Groom Rise, Lot 8 Waipu**
Drawing Title: **Shiplap Weatherboard Details**

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Scale: 1:2 @ A3 | Date: 10/02/2026
Sheet: 21 of 28

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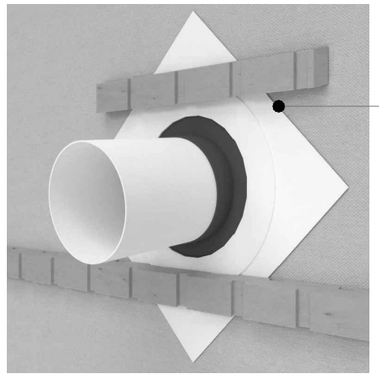


CAVITY BATTENS AT MAX 480mm CENTERS

3.15 NAILS @ 500mm ctrs HORIZONTALLY AND 120mm ctrs VERTICALLY

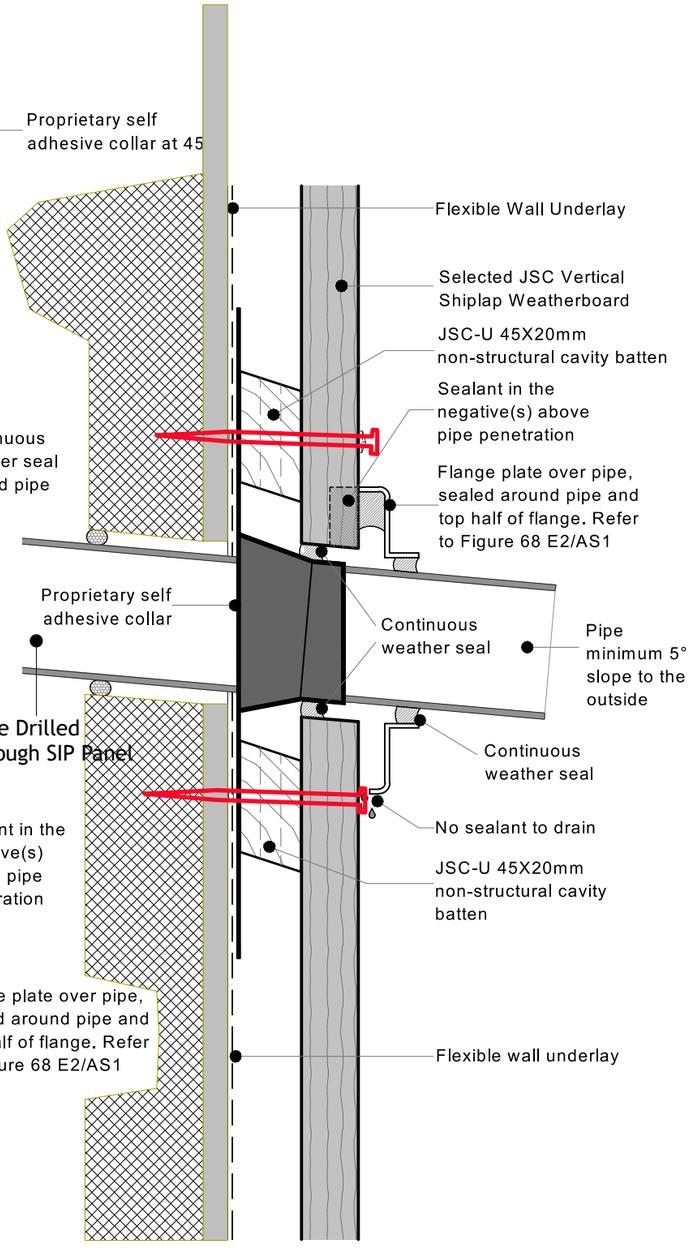
27/04 Shiplap Weatherboard Soffit Detail

Scale 1:2









CAVITY BATTENS AT MAX 480mm CENTERS

3.15 NAILS @ 500mm ctrs HORIZONTALLY AND 120mm ctrs VERTICALLY

28/04 Shiplap Weatherboard Pipe Penitration Detail

Scale 1:2

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DATE	REV.	AMENDMENTS

Wind Zone	Earthquake Zone	Exposure Zone
Very High	One	C Non Sea Spray

Scale 1:2 @ A3

Date 10/02/2026

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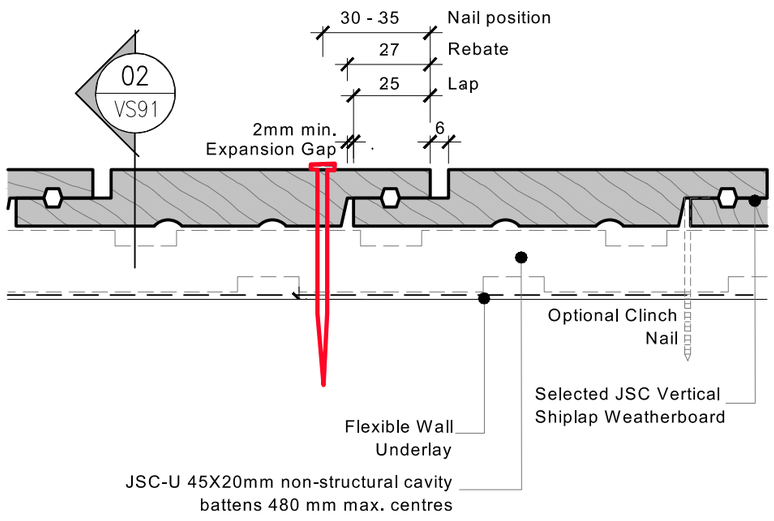
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Weatherboards:

- Single fix at each cavity batten with annular grooved nails (stainless steel 316 or silicon bronze) as per NZBC E2/AS1 Table 24
- Pre-drill holes approximately 1mm smaller than the nail gauge. Example: For a 75mm nail, use a 2.5mm drill
- Nail with slight (0-2°) upward slope
- Fixings to achieve a minimum of 30mm penetration into the framing
- Minimum 50mm from the ends of boards
- Use an accurate packer in the negative detail. Do not rely on clinch nails for spacing

Cavity battens:

- will be fixed by the cladding fixings, which will penetrate the wall framing. Battens only need temporary fixing until the cladding is fixed (E2/AS1 - Table 24)
- must always be installed sloping away from the framing
- must have a 5-10mm gap between them



CAVITY BATTENS AT MAX 480mm CENTERS
3.15 NAILS @ 500mm ctrs HORIZONTALLY AND 120mm ctrs VERTICALLY

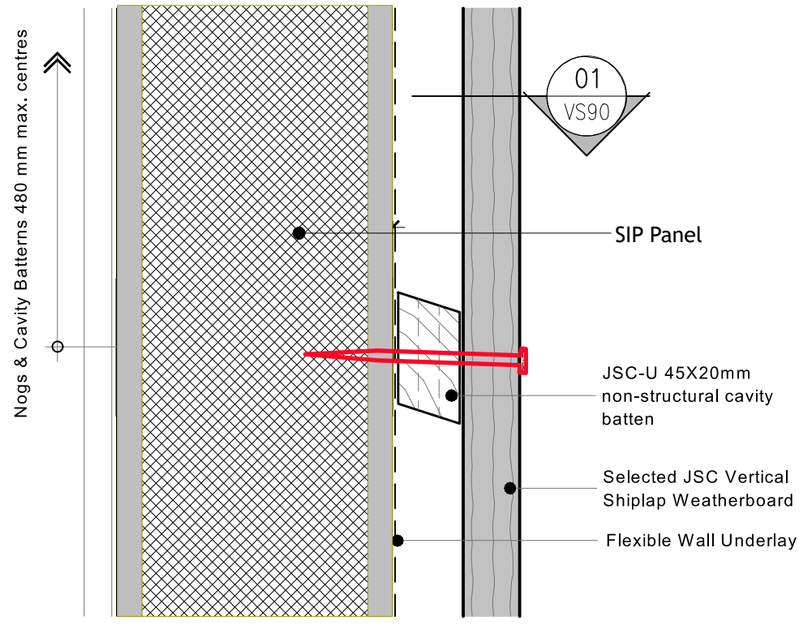
29/04 Shiplap Weatherboard Detail
Scale 1:2

Weatherboards:

- Single fix at each cavity batten with annular grooved nails (stainless steel 316 or silicon bronze) as per NZBC E2/AS1 Table 24
- Pre-drill holes approximately 1mm smaller than the nail gauge. Example: For a 75mm nail, use a 2.5mm drill
- Nail with slight (0-2°) upward slope
- Fixings to achieve a minimum of 30mm penetration into the framing
- Minimum 50mm from the ends of boards
- Use an accurate packer in the negative detail. Do not rely on clinch nails for spacing

Cavity battens:

- will be fixed by the cladding fixings, which will penetrate the wall framing. Battens only need temporary fixing until the cladding is fixed (E2/AS1 - Table 24)
- must always be installed sloping away from the framing
- must have a 5-10mm gap between them



CAVITY BATTENS AT MAX 480mm CENTERS
3.15 NAILS @ 500mm ctrs HORIZONTALLY AND 120mm ctrs VERTICALLY

30/04 Shiplap Weatherboard Fixing Detail
Scale 1:2

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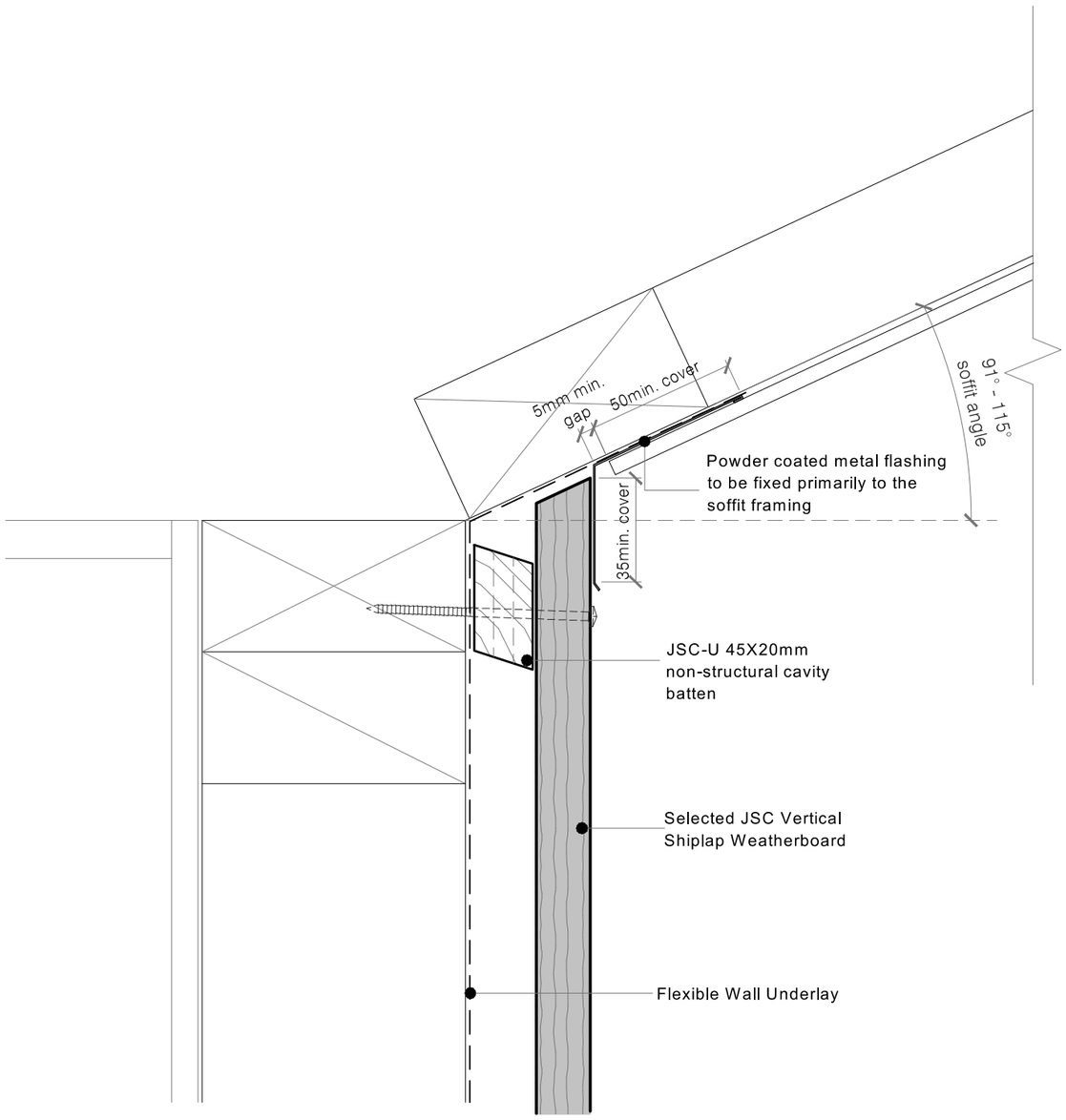
Client: MILLBROOK ESTATE PROPERTY DEVELOPMENTS
Site Address: **20 Groom Rise, Lot 8 Waipu**
Drawing Title: **Shiplap Weatherboard Details**

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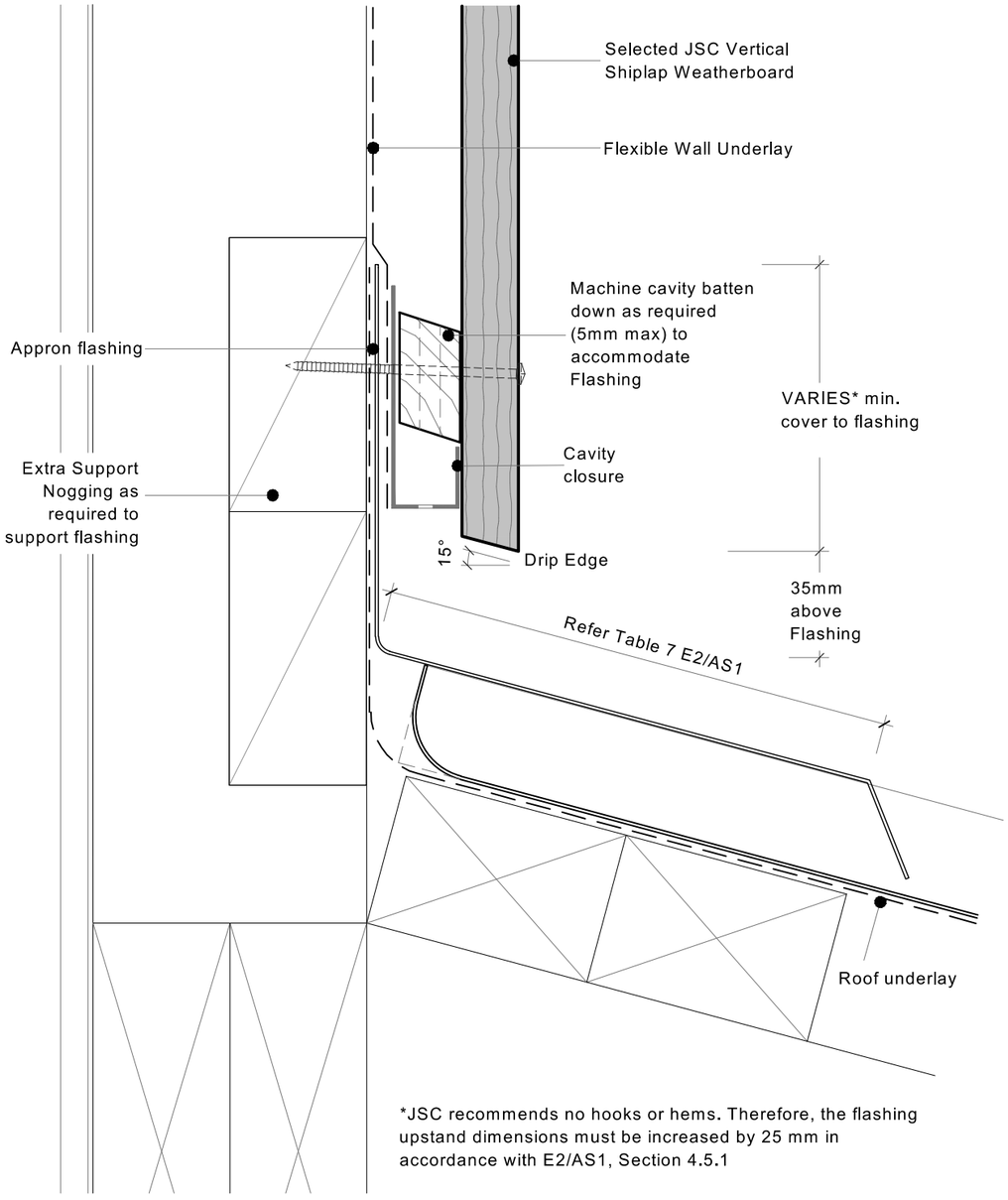
DATE	REV.	AMENDMENTS

Wind Zone: Very High | Earthquake Zone: One | Exposure Zone: C Non Sea Spray
Scale 1:2 @ A3 | Date 10/02/2026
Sheet 23 of 28

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31/04 Shiplap Weatherboard Raked Soffit Detail
Scale 1:2



*JSC recommends no hooks or hems. Therefore, the flashing upstand dimensions must be increased by 25 mm in accordance with E2/AS1, Section 4.5.1

32/04 Shiplap Weatherboard Apron Flashing Detail
Scale 1:2

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Drawing Title: **Shiplap Weatherboard Details**

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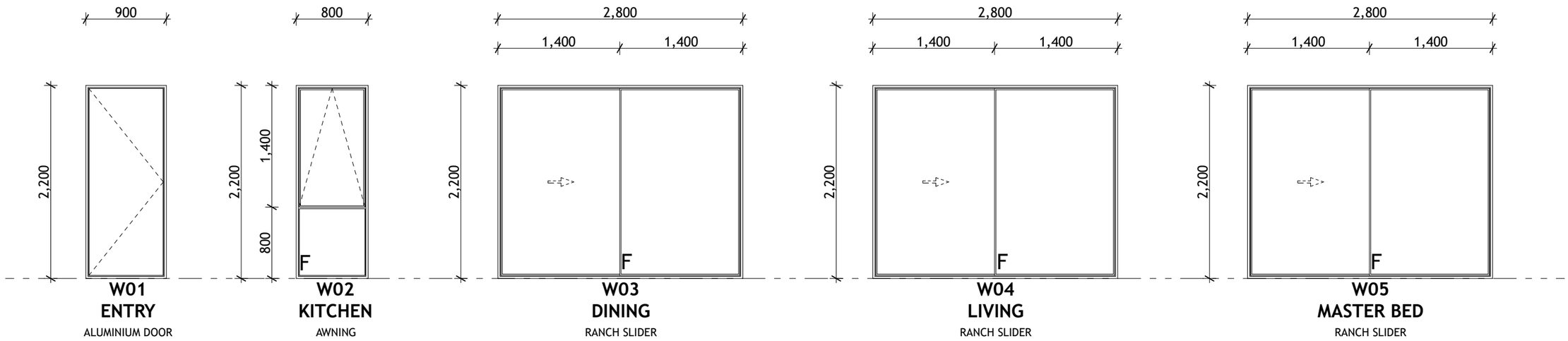
DATE	REV.	AMENDMENTS

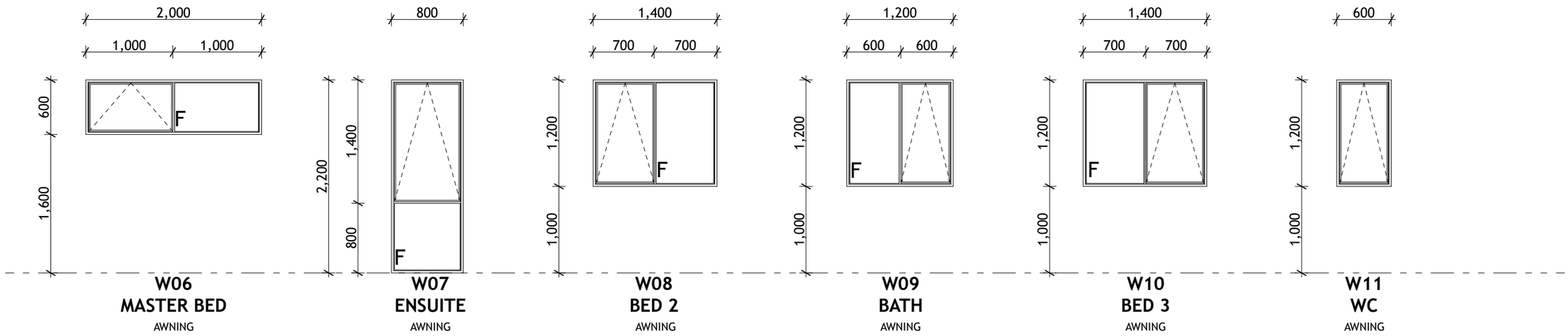
Wind Zone	Earthquake Zone	Exposure Zone
Very High	One	C Non Sea Spray

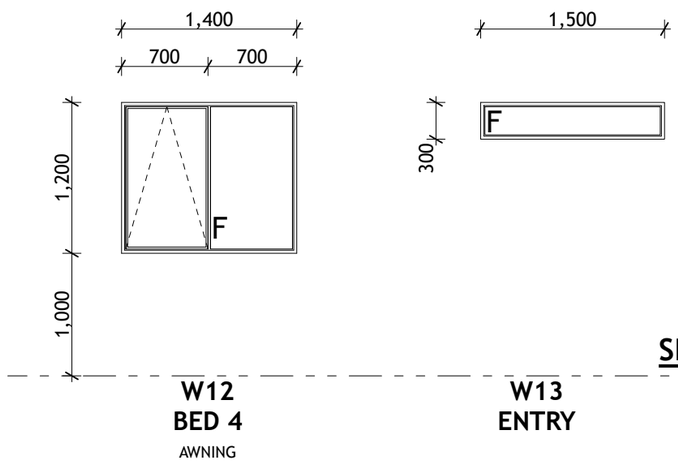
Scale @ A3 | Date 10/02/2026

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WINDOW SCHEDULE 1:50

NOTES:
- ALL ALUMINIUM JOINERY, DOUBLE GLAZED
- ALL JOINERY TO BE SITE MEASURED
- ALL SIZES SHOWN ARE BOX SIZES, PRE-CUT TO ALLOW ADDITIONAL 15mm CLEARANCE

ALL GLAZING TO COMPLY WITH
F2/AS1 1.0 GLAZING
NZS 4223.1-2008,NZS 4223.2-2016 AND 4223.3-2016.
GLAZING TO WET AREAS SAFETY GLASS AS PER TABLE 1 NZS 4223.3-2016

WINDOW OPENINGS TO COMPLY WITH
F4/AS1 2.0 OPENING WINDOWS
(OPENINGS LESS THAN 1.0m WIDE MIN. SILL HEIGHT TO BE 760mm OR RESTRICTOR STAY REQUIRED WITH MAX. 100mm OPENING GAP)
ALL OPENING SASHES COMPLY WITHOUT RESTRICTOR STAYS

AS PER BRANZ HOUSE INSULATION GUIDE 6TH EDITION
- DOUBLE GLAZED
- LOW E
- R0.36

SITE MEASURE BEFORE CONSTRUCTION

WINDOWS VIEWED FROM OUTSIDE

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Drawing Title: **Window Schedule**

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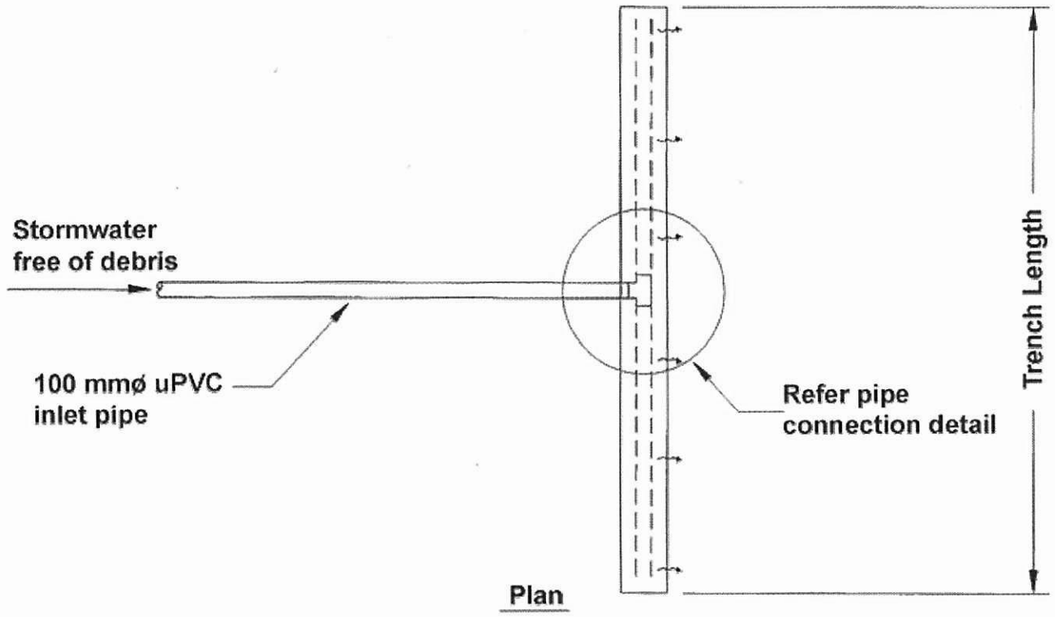
DATE	REV.	AMENDMENTS

Wind Zone: Very High | Earthquake Zone: One | Exposure Zone: C Non Sea Spray

Scale: @ A3 | Date: 2/02/2026

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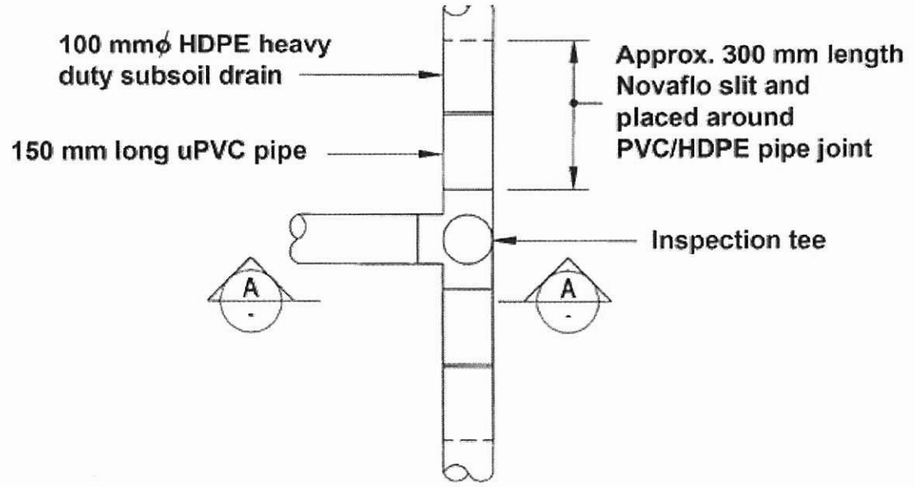


Keep dispersal trench 30 m clear of property boundary

Design Parameters

Effective catchment area drained (m^2)	Trench Length (m)
100	8
200	12
300	14
400	16
500	18
600	20

(Note: effective catchment area drained = impervious area + 0.72 x pervious area



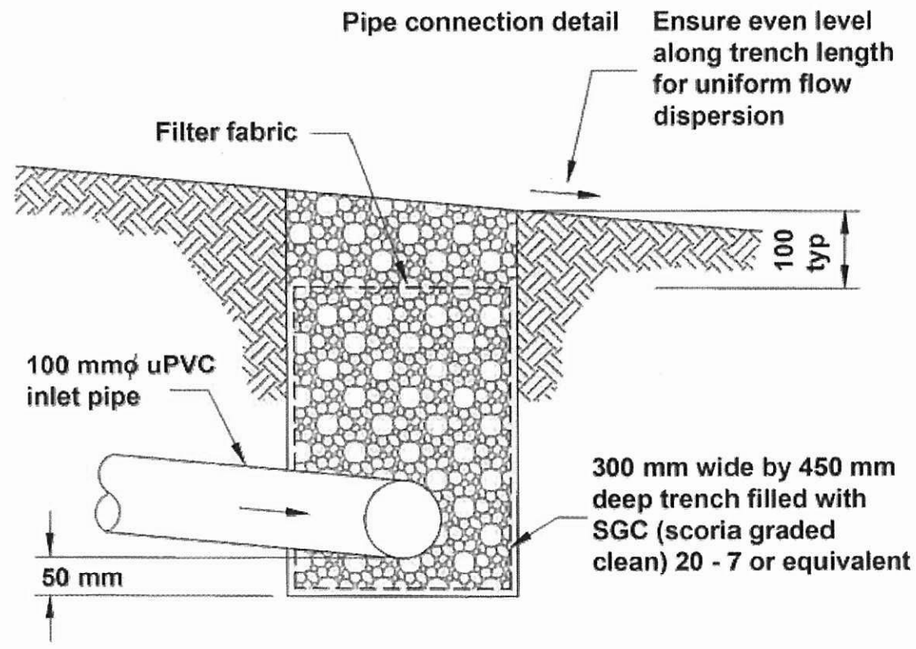


Figure C21
Conceptual Layout of Flow Dispersal Trench

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Drawing Title: **Stormwater**

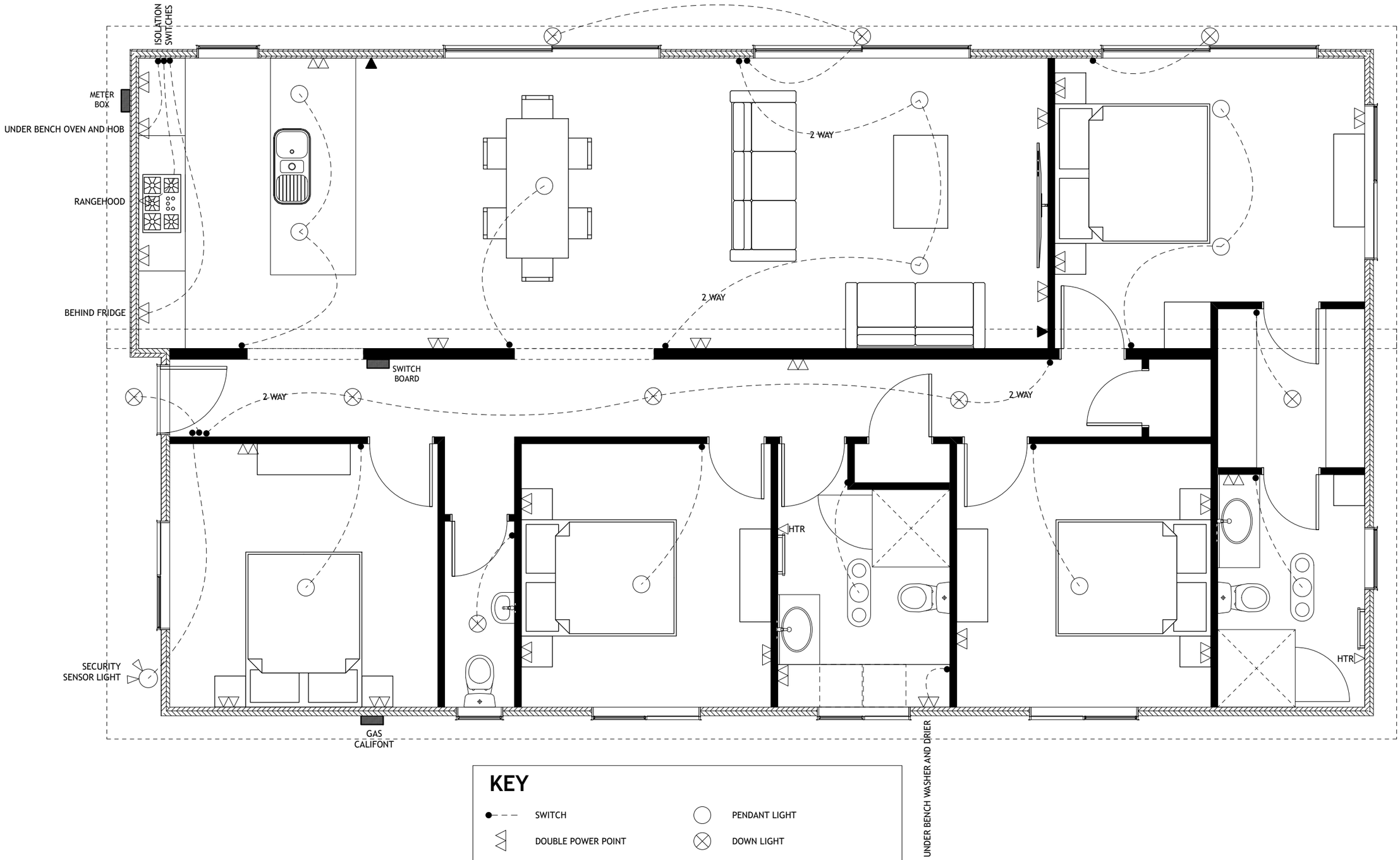
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Very High	One	C Non Sea Spray

Scale @ A3 | Date 2/02/2026

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KEY

- SWITCH
- DOUBLE POWER POINT
- SINGLE POWER POINT
- HTR HEATED TOWEL RAIL
- DATA/ PHONE
- PENDANT LIGHT
- DOWN LIGHT
- POWER POINT WITH ISOLATION SWITCH
- HEAT/ LIGHT/ FAN

ELECTRICAL PLAN 1:50

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DRAVEWAY



WPB7 aggregate , formerly known as WAP7 is the Auckland Council approved bedding layer for permeable paving, such as Firth FlowPave Permeable Pavers. WPB7 is a 2-6mm aggregate metal chip without fines, that will allow water to pass through it. WPB7 is also perfect for drainage and tar sealing and for use in driveways and pathways.

CEDAR CLADDING



Wood-X Exterior Wood Oil
Flint

CedarLine Evolve
Western Red Cedar
Premium Finger Joint Western Red Cedar
Ideal for use as stain/oil finish vertical and horizontal cladding, battens, screen, fencing and panelling.
Manufactured using mid length (0.9 - 1.52m), mixed grain Western Red Cedar blocks, finger jointed into long lengths.
Finger joint blocks at each end of a full length board maybe shorter than 0.91m.
Finger jointed using premium, structural grade, exterior glue.
All product manufacturing (drying, finger jointing, profiling and coating) undertaken in New Zealand.
Length specification: Generally 6.1m lengths with a maximum of 10% of the total lineal metre volume as shorter lengths
(1.83-5.79m). Selected and other lengths available on request.
Minimal grade feature removal may be required to meet some end use requirements.
Supplied as Combed Face for cladding and panelling and Combed 4 Faces (C4F) for battens, screens and fencing.



Ebony
TSR:5.0
LVR:4.6
RGB:52/52/53

COLORSTEEL ROOFING, GUTTER AND FASCIA

UltraZen® provides colour options with additional durability, thanks to the combination of an extra thick200gsm coating of zinc-aluminum and our advanced protective paint system.

It is the recommended product for locations closer to the coast, suitable for both Severe Marine and Very Severe Marine environmental zones, which typically starts 100meters from breaking surf.

JOINERY



Black Matt 20S9041M

Protexture™ is designed for:

Non-thermally improved joinery in residential buildings and light commercial, less than 4 levels
Areas where high mar and scuff resistance is required
Properties greater than 10 metres from high tide level
Offers a 15 year film and colour integrity warranty.

GLASS

Non-reflective, low-emissivity (Low-E) glass features a microscopically thin, virtually invisible coating that minimizes infrared and UV light transfer while maximizing visible light transmission. Engineered to improve energy efficiency, these coatings reflect heat back to its source—keeping homes warmer in winter and cooler in summer—without the high-reflection mirror effect of traditional tinted or solar-control glass.

WATER TANKS



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Architectural Design
NZDAT
Mobile. 021 139 3871
Email. nick@obelladesign.co.nz
LICENSED BUILDING PRACTITIONER BUILDING CONFIDENCE
BP132379

Client: MILLBROOK ESTATE PROPERTY DEVELOPMENTS
Site Address: **20 Groom Rise, Lot 8 Waipu**

Drawing Title: **Colours**

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DATE	REV.	AMENDMENTS

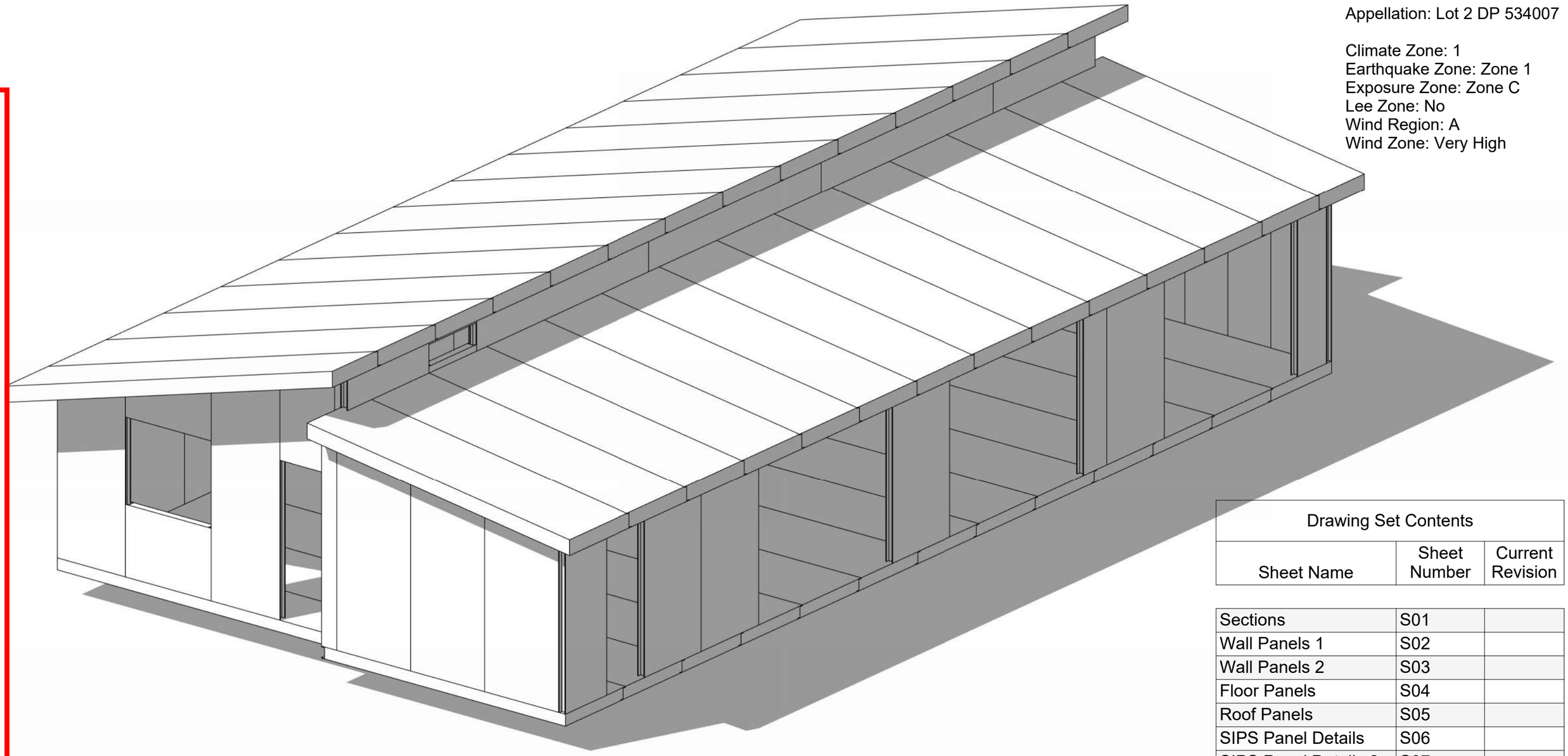
Wind Zone: Very High | Earthquake Zone: One | Exposure Zone: C Non Sea Spray
Scale: @ A3 | Date: 2/02/2026
Sheet: 28 of 28

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Lot 8, 20 Groom Rise, Waipu

Appellation: Lot 2 DP 534007

Climate Zone: 1
Earthquake Zone: Zone 1
Exposure Zone: Zone C
Lee Zone: No
Wind Region: A
Wind Zone: Very High



Drawing Set Contents		
Sheet Name	Sheet Number	Current Revision
Sections	S01	
Wall Panels 1	S02	
Wall Panels 2	S03	
Floor Panels	S04	
Roof Panels	S05	
SIPS Panel Details	S06	
SIPS Panel Details 2	S07	

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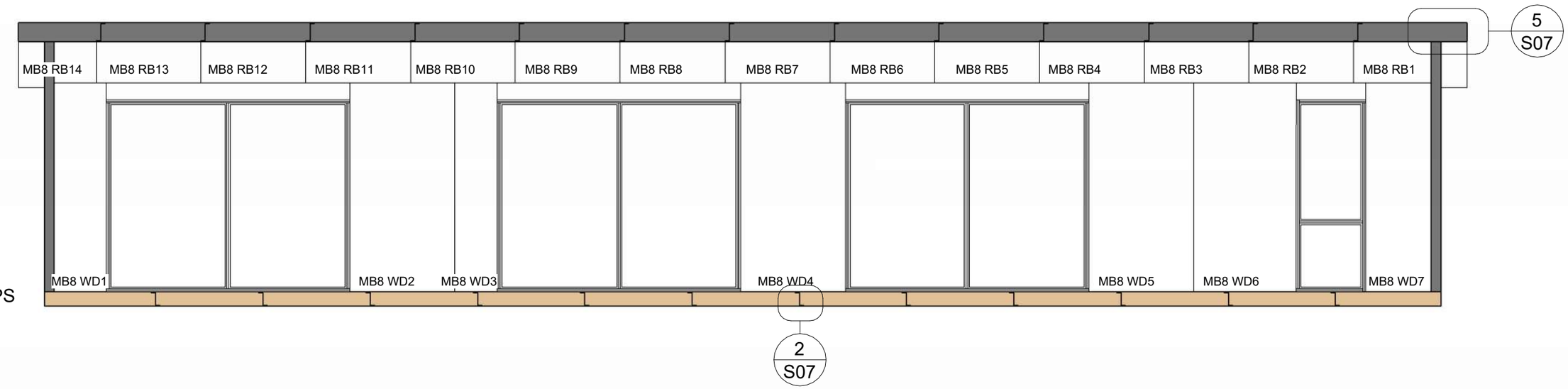
Panel Drawing Set

Lot 8 Millbrook
For: Dane Holdings

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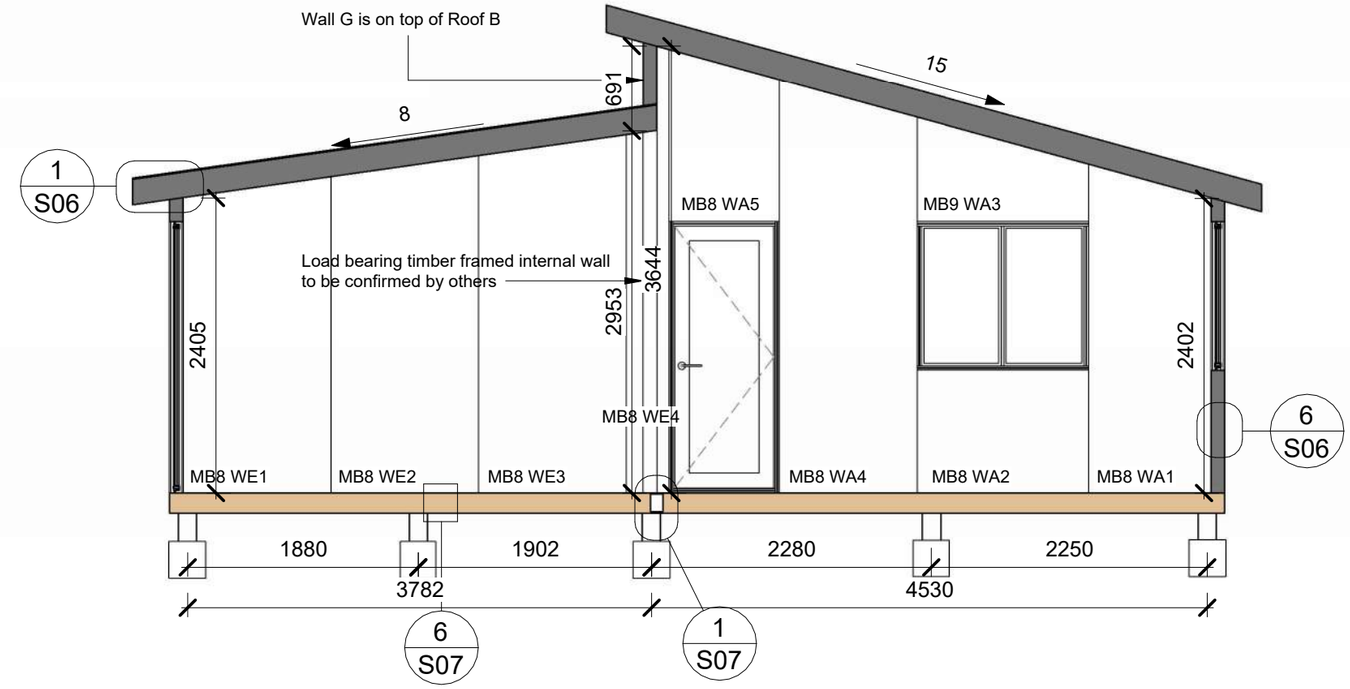
Project: 2010
Title Sheet S00
8 December 2025

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1 Section 1 SIPS

1 : 50



3 Section 2 SIPS

1 : 50

Panel Drawing Set

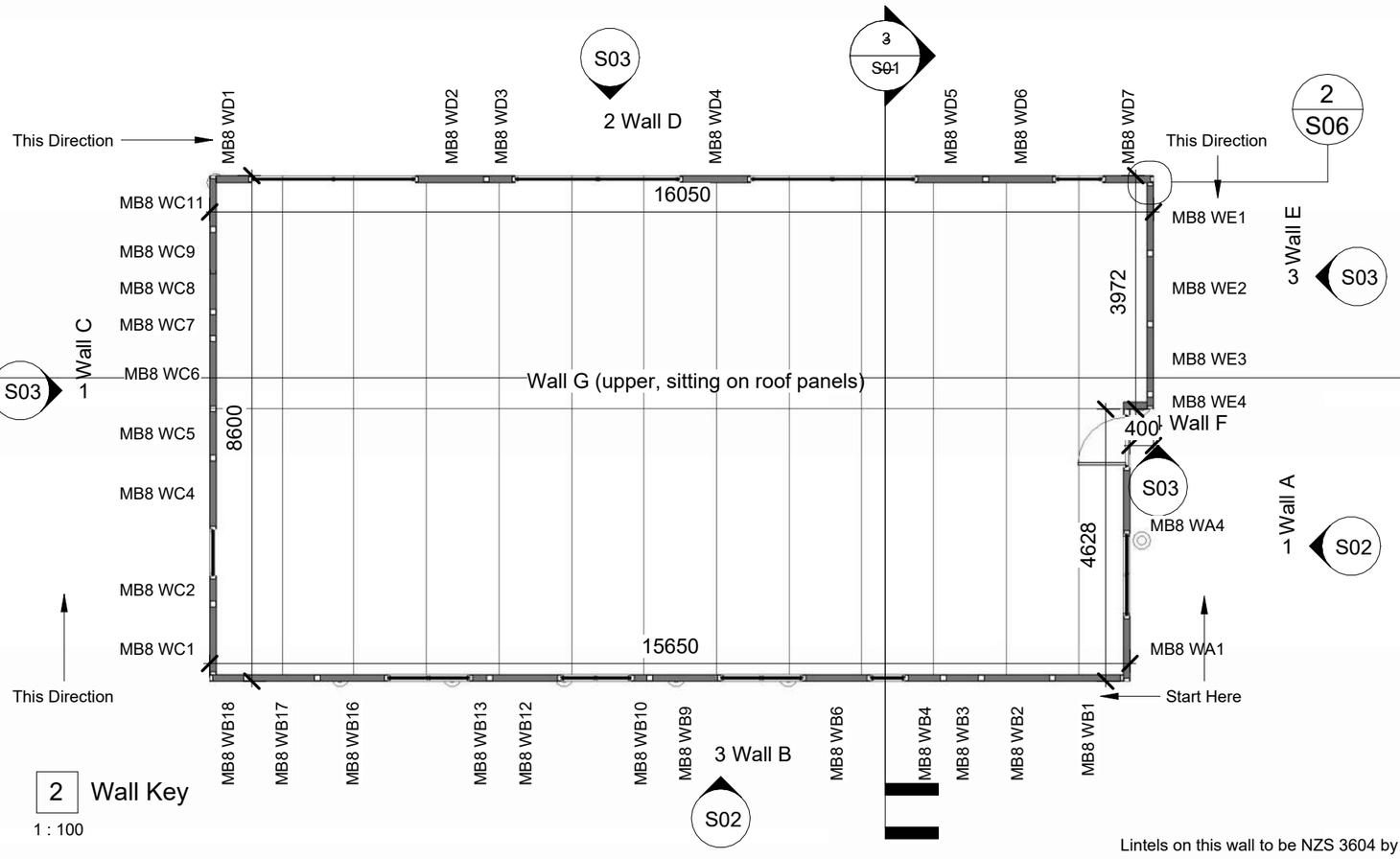
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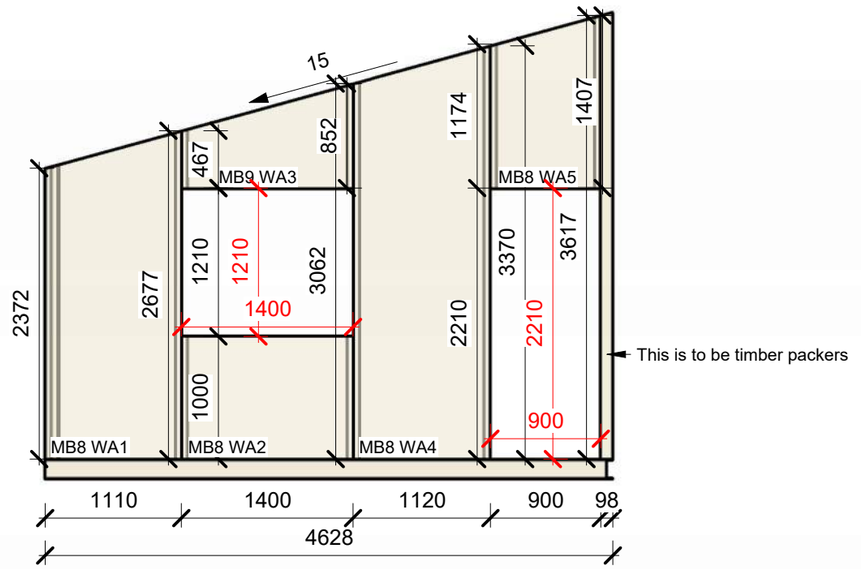
Project: 2010
Sections S01
8 December 2025

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2 Wall Key

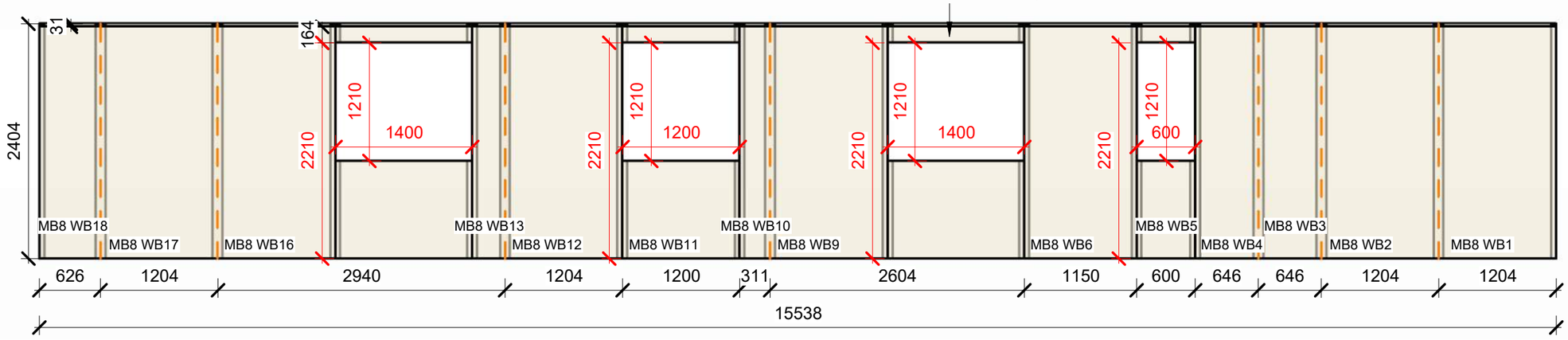
1 : 100



1 Wall A

1 : 50

Lintels on this wall to be NZS 3604 by others



3 Wall B

1 : 50

Notes:

- Insulated spline, nailbond + nails both sides @ 150 crs
- Solid timber spline, nailbond + nails both sides @ 150 crs
- Lap joint, , nailbond + nails both sides @ 150 crs
- 20mm min cable void

Panel number is on outer face at the edge. Lay in numbered order.

All wall panels are 10mm Triboard/93mm EPS/10mm Triboard

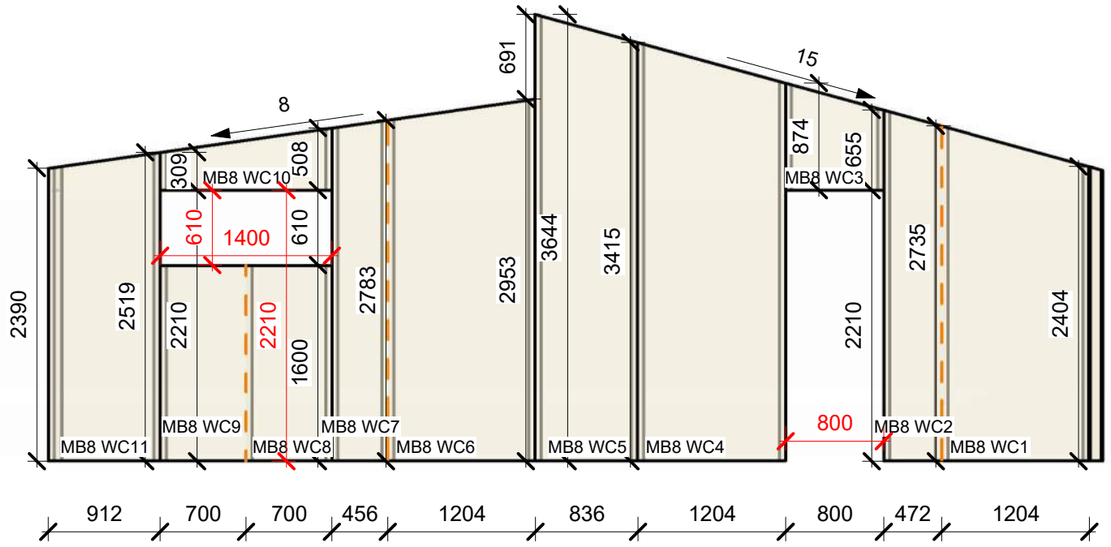
Panel Drawing Set

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For: Dane Holdings

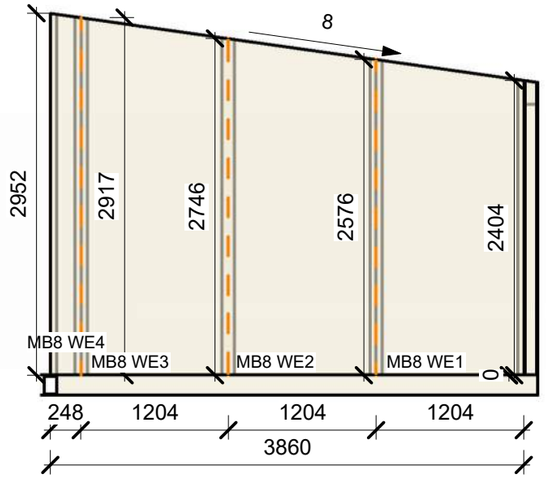
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Project: 2010
Wall Panels 1 S02
8 December 2025



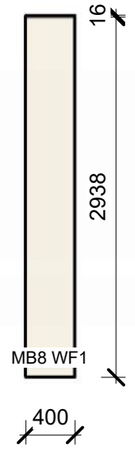
1 Wall C

1 : 50



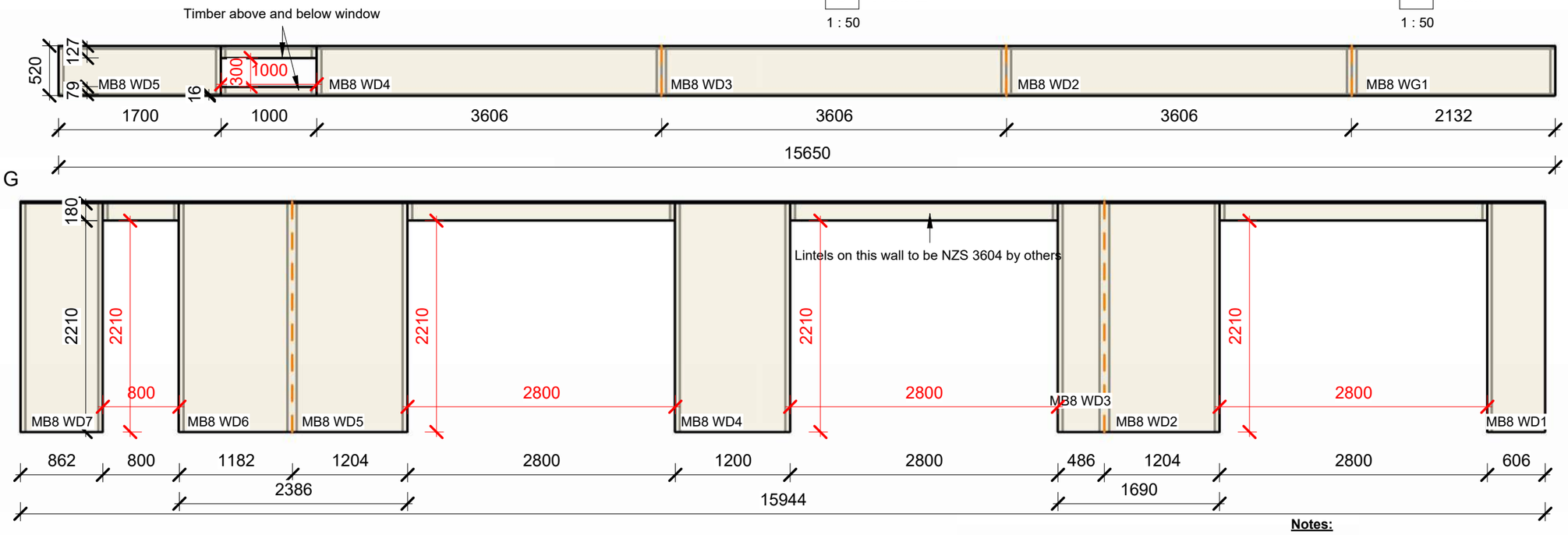
3 Wall E

1 : 50



4 Wall F

1 : 50



5 Wall G

1 : 50

2 Wall D

1 : 50

Notes:

- Insulated spline, nailbond + nails both sides @ 150 crs
- Solid timber spline, nailbond + nails both sides @ 150 crs
- Lap joint, , nailbond + nails both sides @ 150 crs
- 20mm min cable void

Panel number is on outer face at the edge. Lay in numbered order.

All wall panels are 10mm Triboard/93mm EPS/10mm Triboard

Panel Drawing Set

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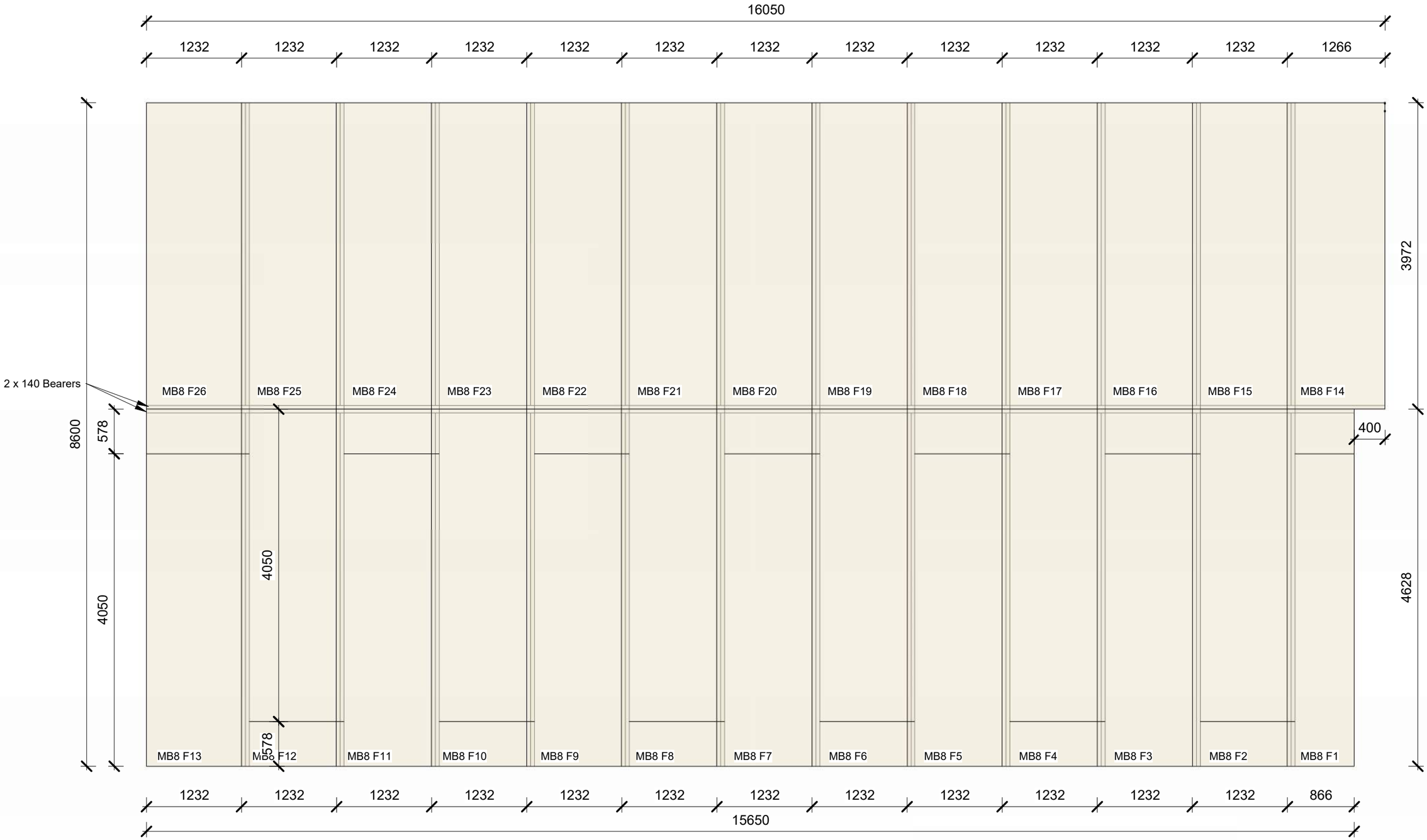
Lot 8 Millbrook
For: Dane Holdings

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Project: 2010
Wall Panels 2 S03
8 December 2025

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Notes:

- Insulated spline, nailbond + nails both sides @ 150 crs
- Solid timber spline, nailbond + nails both sides @ 150 crs
- Lap joint, , nailbond + nails both sides @ 150 crs
- 20mm min cable void

All floor panels are 15mm Triboard/143mm EPS/15mm Triboard

All panels viewed from the top. Panel number is on outer face at the edge. Lay in numbered order.

Panel Drawing Set

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For: Dane Holdings

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Project: 2010
Floor Panels S04
8 December 2025



1 Roof A
1 : 50

2 Roof B
1 : 50

Notes:

- Insulated spline, nailbond + nails both sides @ 150 crs
- Solid timber spline, nailbond + nails both sides @ 150 crs
- Lap joint, , nailbond + nails both sides @ 150 crs
- 20mm min cable void

All roof panels are 10mm Triboard/192mm Carbon EPS/10mm Triboard

All panels viewed from the top. Panel number is on outer face at the edge. Lay in numbered order.

Panel Drawing Set

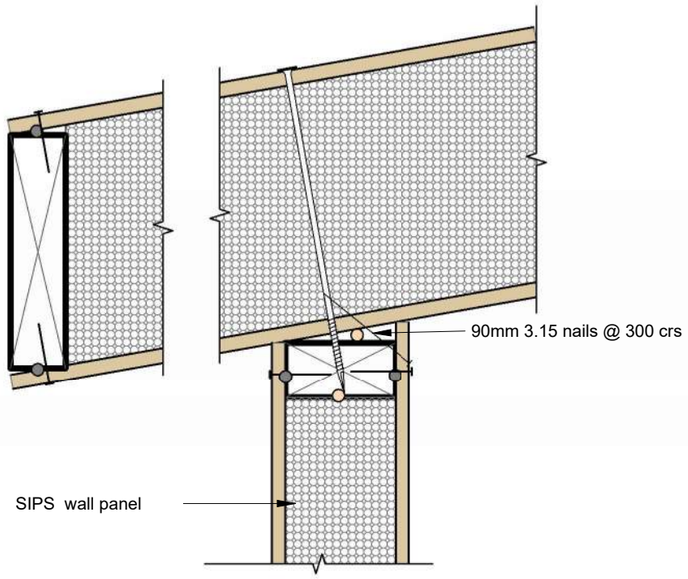
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Project: 2010
Roof Panels S05
8 December 2025

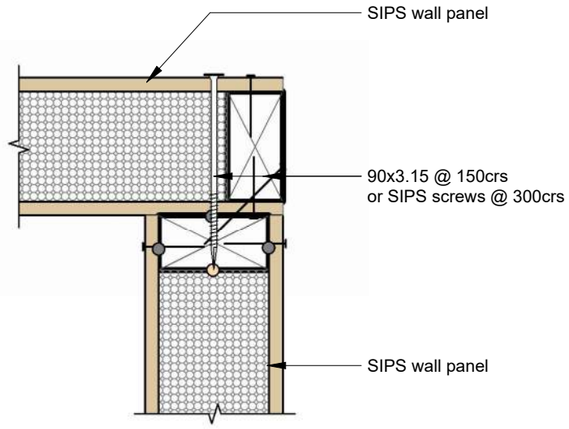
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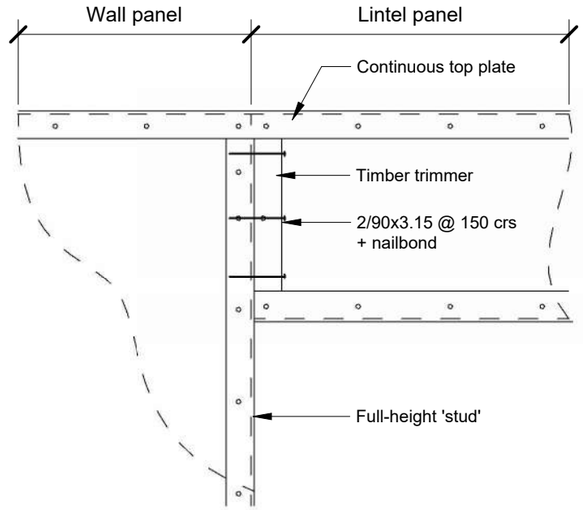
1 Eave

1 : 5



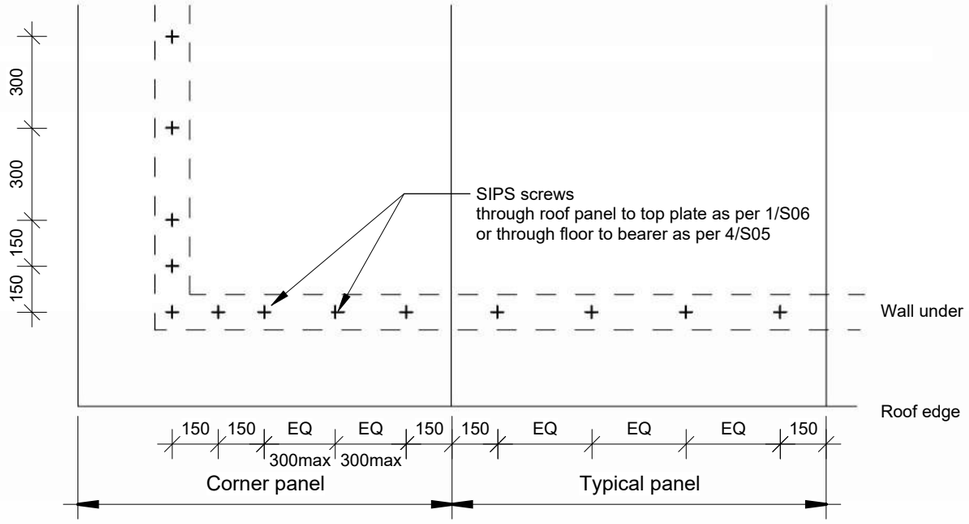
2 Wall Corner (Plan View)

1 : 5



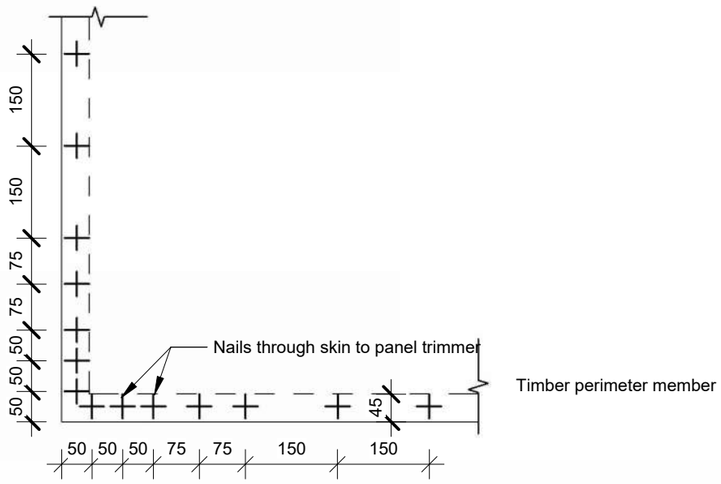
3 Lintel-Panel

1 : 10



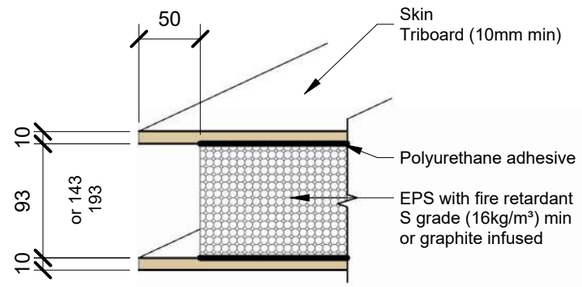
4 Typical Roof/Floor Fixing to Support

1 : 20



5 Typical Panel Trimmer Fixing

1 : 10



6 Typical Panel View

1 : 5

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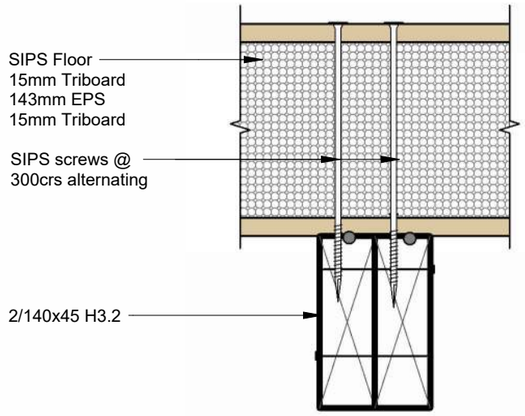
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Panel Drawing Set

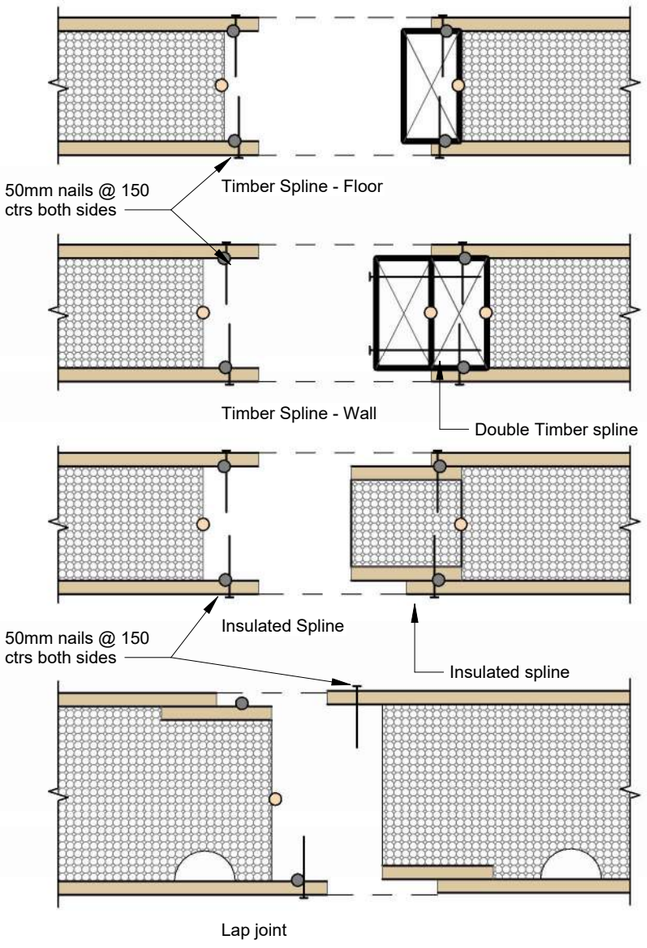
Project: 2010
SIPS Panel Details S06
8 December 2025

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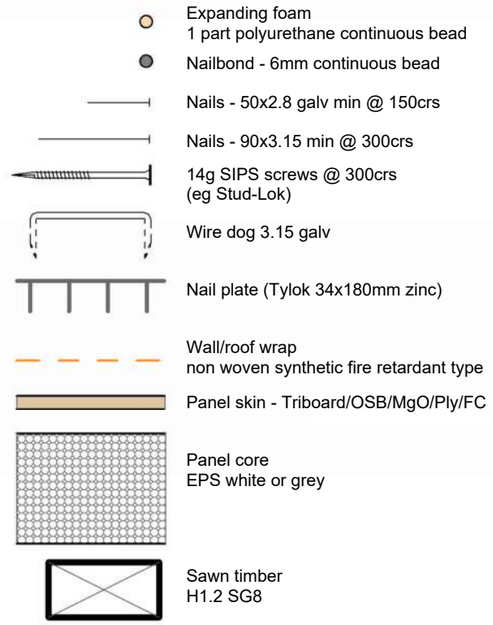
WDC - Approved Building Consent Document - BC2600060 - Pg 37 of 46 - 16/02/2026 - NZBTC



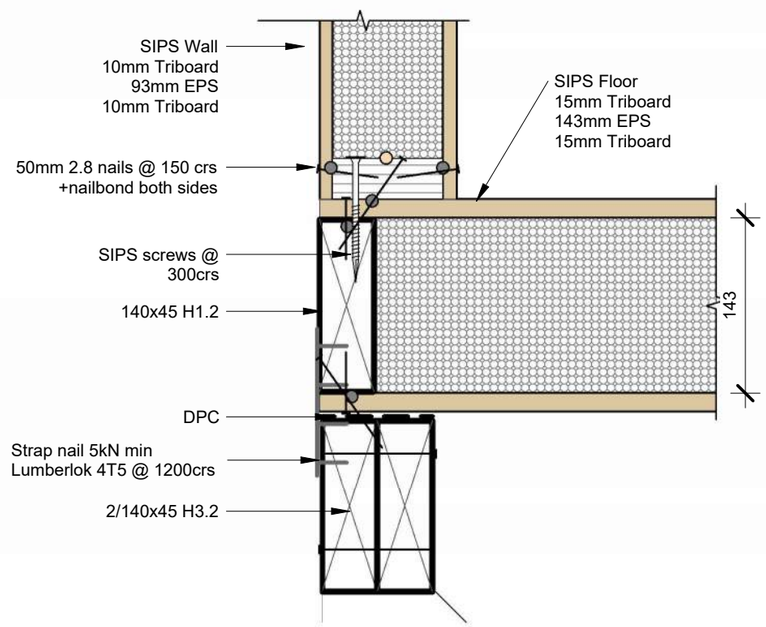
1 Mid Span Bearer
1 : 5



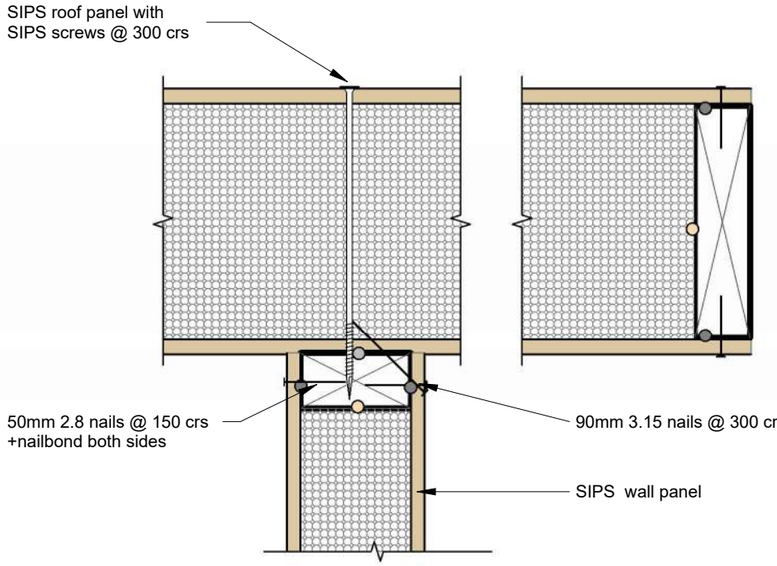
2 Splines
1 : 5



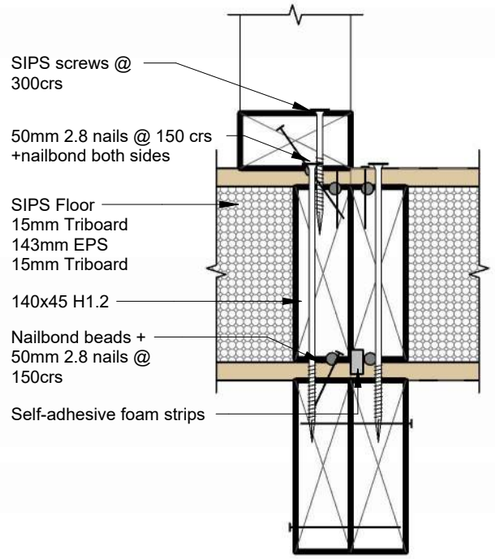
3 Typical Connectors and Components
1 : 5



4 Wall Base
1 : 5



5 Barge
1 : 5



6 Floor Junction
1 : 5

Panel Drawing Set

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For: Dane Holdings

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Project: 2010
SIPS Panel Details 2 S07
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FERUM
CONSULTING EINGINEERS

1 March 2021

Waitomo District Council
PO Box 404
Queen Street,
Te Kuiti 3941.

Dear Sir / Madam

RE: BC210008 - REQUEST FOR FURTHER INFORMATION

We have received Request for Information from Waitomo District Council dated 15 February 2021. Please refer below for our response to the structural items.

ITEM	RFI	RESPONSE
1.	Nail fixings for WBD system to SIPS panel unsatisfactory evidence of compliance. nail fixings tested in timber framing with 35mm penetration. 12mm Strand board does not provide satisfactory hold: please provide evidence of satisfactory hold or detail suitable alternative fixing detail.	In the absence of nail withdrawal capacity for OSB sheets as part of SIP panels from SIPs Direct Limited, reference has been made to Premier SIPS Technical Bulletin 12b and NZS3603 for nail withdrawal capacity from 11mm thick OSB sheets. This is valid as the OSB sheets used by SIPs Direct Limited has the same mechanical properties as the one used by Premier SIPS. Refer to the OSB datasheet attached. Φ = 0.7 — NZS3603/Cl2.5 Nail = 6d Smooth Galvanised — This is equivalent to 3.15mm Nail Q_n = 59lbs 262N — Premier SIPS Technical Bulleting 12b. Also attached to this letter. ΦQ_n = 183N Ult. Wind pressure Wu = $1.82 x C_{fig}$ kPa — Structural calculation Ref: 20A018 Dated Jan 2021 Max suction aerodynamic factor C_{fig} = 0.7 — Leeward Walls Local factor = 2.0 Max suction on walls = 2.55kPa No. of Nail required per m^2 = 14 — Therefore, ADOPT 3.15 Nails at 500crs horizontally and 120crs vertically

We trust this provides the information that you are seeking.

Regards,

Amin Momtahan

Director
FERUM CONSULTING ENGINEERS

Attachments:

- *Premier SIPS Technical Bulletin 12b*
- *OSB Datasheet*

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Technical Bulletin #12b

Created: 12-18-98, Revised: 6-15-11

NAIL WITHDRAWL CAPACITIES IN OSB

With the use of Premier SIPs Structural Insulated Panels there are numerous instances where the attachment of finishing materials such as shingles, siding, drywall etc... is required. The application of these materials is typically accomplished through the use of conventional nail products. Data pertaining to the pullout resistance of nails in OSB is not readily available. To provide data on direct withdrawal resistance of nail fasteners placed into the face of Premier SIPs, an independent code recognized testing firm conducted withdrawal tests following standard ASTM D1037 procedures. The following is a summary of the average ultimate values achieved for various nail fasteners placed into 7/16" OSB.

AVERAGE DIRECT WITHDRAWAL (PULLOUT) – lbs.	
NAIL SIZE & DESCRIPTION	AVG. ULTIMATE PULLOUT
4d ring shank-drywall nail	133
6d smooth galvanized	59
Roofing Nail-smooth galvanized	51
8d smooth coated sinker	150
8d smooth galvanized spiral shank	112
8d galvanized ring shank	77
8d smooth galvanized	65
8d bright box	107
10d galvanized ring shank	164
16d smooth galvanized	63
16d bright box	90
These values are ultimate values. Appropriate safety factors should be applied to obtain design values.	

This data has been compiled to provide manufacturers, designers and engineers with values for assessment of fastener requirements.

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APA PRODUCT REPORT®

www.apawood.org

Norbord Proprietary OSB Facers for SIPs — PR-N612
Norbord Inc. — Revised April 19, 2019

Product: Norbord 7/16 Proprietary OSB Facers
Norbord Inc., 1 Toronto Street, Suite 600, Toronto, Ontario M5C 2W4, Canada
(416) 365-0705
www.norbord.com

1. Basis of the product report:
   - 2018 and 2015 International Residential Code (IRC): Section R610 Structural Insulated Panel Wall Construction
   - 2012 IRC: Section R613 Structural Insulated Panel Wall Construction
   - Performance Standard for Wood-Based Structural-Use Panels, PS 2
   - ANSI/APA PRS 610.1-2013, Standard for Performance-Rated Structural Insulated Panels in Wall Applications
   - APA Reports T2010P-07 and T2010P-44, and other qualification data

2. Product description:
   Norbord proprietary OSB facers are 7/16 Performance Category panel sheathing that can be used as facers of structural insulated panels (SIPs) when manufactured to a proprietary mill specification documented in the in-plant manufacturing standard and approved by APA. In addition to the requirements for PS 2, the proprietary OSB facers meet the higher properties specified in Table R610.3.2 of the 2015 IRC, Table R613.3.2 of the 2012 IRC, and Table 2 of ANSI/APA PRS 610.1, as shown in Section 3 of this report. The proprietary OSB facers are also listed in APA Product Report PR-N610. Products may be treated with *Borogard*® ZB (registered trademark of U.S. Borax; an EPA registered zinc borate preservative), as recognized in APA Product Report PR-N213. The efficacy of the preservative treatment is outside the scope of this report and the APA certification program. The properties of the proprietary OSB facers are quality-controlled on an on-going basis.

3. Minimum panel properties:
   Norbord proprietary OSB facers meet the properties specified in Table 1.

Table 1. Minimum Properties for Norbord Proprietary OSB Facers [a]

Thickness (in.)	Flatwise Stiffness [b] (lbf-in.^{2}/ft)		Flatwise Strength [c] (lbf-in./ft)		Tension [c] (lbf/ft)		Density [d] (pcf)
	Along	Across	Along	Across	Along	Across	
7/16	55,600	27,100	1,040	870	7,450	6,500	35

For SI: 1 lbf-in.^{2}/ft = 9.415 x 10^{-6} kN-m^2/m, 1 lbf-in./ft = 3.707 x 10^{-4} kN-m/m, 1 lbf/ft = 0.0146 N/mm, 1 pcf = 16.018 kg/m^3

[a] Tabulated values are test values, which are not intended for use in design.
[b] Mean test value shall be in accordance with Section 7.6 of PS 2.
[c] Characteristic test value (5th percentile with 75% confidence).
[d] Mean density value shall be based on oven-dry weight and oven-dry volume in accordance with Method A of ASTM D2395.

4. Limitations:
   a) The properties listed in Table 1 are minimum test values and related only to the Norbord proprietary OSB facers. Design values for SIPs shall be provided by the SIP manufacturer.

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b) Norbord proprietary OSB facers are limited to dry service conditions where the average equilibrium moisture content of sawn lumber is less than 16 percent.
c) Norbord proprietary OSB facers are produced by Norbord Inc. at the facilities in 100 Mile House, BC, and Barwick, ON, under a quality assurance program audited by APA. The efficacy of the preservative treatment is outside the scope of this report and the APA certification program.
d) This report is subject to re-examination in one year.

5. Identification:
Norbord proprietary OSB facers recognized in this report are identified by a label bearing the manufacturer's name and/or trademark (Norbord), the APA assigned plant number (445 for 100 Mile House, BC, and 498 for Barwick, ON), the product Performance Category (7/16), the Span Rating (24/16), the Exposure Rating, the APA logo, the report number PR-N612, and a means of identifying the date of manufacture.

APA – The Engineered Wood Association is an approved national standards developer accredited by American National Standards Institute (ANSI). APA publishes ANSI standards and Voluntary Product Standards for wood structural panels and engineered wood products. APA is an accredited certification body under ISO/IEC 17065 by Standards Council of Canada (SCC), an accredited inspection agency under ISO/IEC 17020 by International Code Council (ICC) International Accreditation Service (IAS), and an accredited testing organization under ISO/IEC 17025 by IAS. APA is also an approved Product Certification Agency, Testing Laboratory, Quality Assurance Entity, and Validation Entity by the State of Florida, and an approved testing laboratory by City of Los Angeles.

APA – THE ENGINEERED WOOD ASSOCIATION
HEADQUARTERS
7011 So. 19th St. ▪ Tacoma, Washington 98466
Phone: (253) 565-6600 ▪ Fax: (253) 565-7265 ▪ Internet Address: www.apawood.org

PRODUCT SUPPORT HELP DESK
(253) 620-7400 ▪ *E-mail Address*: help@apawood.org

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15 December 2025

To whom it may concern

Whangarei District Council
Regulatory Services Unit
Private Bag 9023
Te Mai
Whangārei 0143

Dear Sir/Madam

RE: BC2025213205 - REQUEST FOR FURTHER INFORMATION – VRFI2

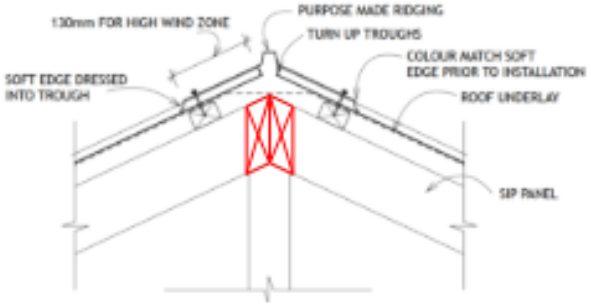
We have received a Request for Information from the Whangarei District Council on 15 December 2025. Please see the items below for our response to the structural matters.

ITEM	RFI	RESPONSE
2.	Construction & Weathertightness Detailing: Please re-visit the weathertightness details supplied that show cladding over a timber frame. As discussed with Nick, the fixing of weatherboards relies on nail embedment into framing timber (typically 30-35mm in E2/AS1) - this is not achieved by fixing into a 15mm re-constituted wood panel and foam. Construction & Weathertightness Detailing: **VRFI2:** The nail calculation uses a different facing material, and an unknown nail type that is unlikely to match what is proposed for the cladding - please re-visit. Please re-visit the weathertightness details supplied that show cladding over a timber frame. As discussed with Nick, the fixing of weatherboards relies on nail embedment into framing timber (typically 30-35mm in E2/AS1) - this is not achieved by fixing into a 15mm re-constituted wood panel and foam.	The metal roofing is connected to timber battens in accordance with NZS 3604 and other relevant clauses of NZBC, and the timber battens are subsequently attached to the SIP panels using a series of Type 17, 14g screws. The SIP roof panels in this project consist of 10mm thick Triboard skins and 192mm thick EPS. Unfortunately, there is no literature or testing data confirming the withdrawal capacity of fasteners to Triboard sheets. In the absence of such information, reference has been made to the following standards. NZS 3603:1993 AS/NZS 17020.1:2022 EN 1995.1.1:2004 AWC, NDS for Wood Construction:2018 We know that the metal roof sheeting is connected to the timber batten in accordance with the sheeting manufacturer's specification and the NZ Roofing Code of Practice. Therefore, the focus herein is on the connection between the roofing battens and the SIP panel top skin. We also understand that the SIP panels have solid boundary members around the roof perimeters and the ridge line. However, at the ridge line, because the battens are slightly offset, they will most likely connect to the SIP skin rather than the solid timber.

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		 Therefore, we aim to check the screw withdrawal capacity at the ridge and middle areas of the roof, where the local wind factor can reach 2.0, in accordance with AS/NZS1170.2:2021, Table 5.6. From the results shown in the following table, the wood screw withdrawal capacity obtained in accordance with NZS3603 is more conservative and has therefore been adopted here. For a high wind zone, considering the local factor of 2.0, and ignoring the self-weight of roofing sheeting, the demand on roofing screws will be: $P^* = 1.16 \times 0.9 \times 2 = 2.1 kN/m^2$ Considering purlins at 800 crs and screws at 300 crs, we have approx. 4 screws per m^2. Therefore, $\emptyset Q_n = 0.56 \times 4 = 2.24 kN \geq P^* = 2.1 kN$ – **SATISFACTORY** Please note that along the ridge line, the number of screws can reach 11 per m^2.
3.	Roof Frame Detail: Please indicate how roof claddings are proposed to be structurally connected to the SIPs panels. Roof Frame Detail: **VRFI2:** The nail calculation uses an unknown nail type that is unlikely to match what is proposed for the roofing - with a proposed spacing of 500mm horizontally, and 120mm vertically - clearly not matching the fixing centres or type proposed for the roofing (and the fixing capacity thereof). Please re-visit. Please indicate how roof claddings are proposed to be structurally connected to the SIPs panels.	Same as above.

We trust this provides the information that you are seeking.

Regards,

Amin Momtahan
Director
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Screw Withdrawal Capacity:

Assumptions: Wind Local Factor = 2.0 Wind zone = High Wind (ULS Pressure 1.16×C_{fig} kPa) Triboard density = 600kg/m^3 Triboard thickness = 10mm Screw penetration = 10mm Screw = Type 17, 14g, $d_{nominal}$ = 6.1mm	
NZS 3603:1993	
Ø = 0.7	(Cl 2.5)
K_1 = 1.0	(Table 2.4)
Timber group = J4 (Screw in withdrawal)	(Table 4.1)
$N^* \leq ØQ_n$	(Eq 4.8)
$Q_n = n \times K \times p \times Q_k$	(Eq 4.9)
Q_k = 79.5N/mm	
P = 10mm	
$ØQ_n = 0.7 \times 1.0 \times 1.0 \times 10 \times 79.5 / 1000 = 0.56kN$	
AS/NZS1720.1:2022	
$N_{d,j} = ØK_{13} \times l_p \times n \times Q_k$	(Cl 4.3.3.4)
Type 2 Joints	(Cl 4.3.2.3)
Ø = 0.80	(Cl 2.3)
n = 1.0	
l_p = 10mm	
Joint Group = JD4	
Q_k = 85 N/mm	(Cl 4.1.2)
$N_{d,j} = 0.8 \times 10 \times 85 / 1000 = 0.68kN$	(Table 4.6(B))
EN 1995.1.1:2004	
$R_d = K_{mod} \times R_k / \gamma_m$	(Cl 2.4.3)
γ_m = 1.3	(Table 2.3)
K_{mod} = 1.10	(Table 3.1)
$f_{ax,k} = 0.52 \times d^{-0.5} \times l_{ef}^{-0.1} \times \rho_k^{0.8}$	(Eq 8.39)
d = 61mm	
l_{ef} = 10mm	
ρ_k = 600kg/m^3	
$f_{ax,k}$ = 28.3N/mm^2	
k_d = 0.75	(Eq 8.40)
$F_{ax,k,Rk} = \frac{n_{ef}\, f_{ax,\alpha,k}\, d\, l_{ef}\, k_d}{1.2\cos^2\alpha + \sin^2\alpha}$	(Eq 8.38)
$F_{ax,k,Rk}$= 1.27kN	
Fax,d = 1.27 × 1.1 / 1.3 = 1.08kN	
AWC, NDS for Wood Construction:2018	
W = 2850 × G^2 × D (lb/in)	(Cl 12.2.2), (Eq 12.2-2)
W = reference withdrawal design value (lbf)	
G = the equivalent specific gravity of the wood receiving member.	
D = nominal screw diameter (in.)	
L = length of thread penetration into the panel (in.)	
We need to convert to metric units.	
$W_{metric} = 2850 \times (4.448/25.4) \times G^2 \times D \times (1/25.4)$	
$W_{metric} = 19.6 \times G^2 \times D$	

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The withdrawal capacity must also be multiplied by the load duration factor. C_D = 1.60 (for wind loading) Ø = 0.65 K_F = 3.32 D = 61mm L = 10mm G = 0.6 > 0.45 -> 0.45 $W_{metric} = 0.65 \times 3.32 \times 1.6 \times (19.6 \times 0.45^2 \times 6.1 \times 10) / 1000$ W_{metric} = 0.835kN	 (Table 11.3.1) (Table 11.3.1) (Table 11.3.1)