

# Approved Building Consent Documents

**Please Note: A copy of the stamped approved documents must be available on site for all inspections.**

## Inspection booking timeframes

Call received	before 3pm inspection will be done	after 3pm inspection will be done
Monday	Wednesday	Thursday
Tuesday	Thursday	Friday
Wednesday	Friday	Monday
Thursday	Monday	Tuesday
Friday	Tuesday	Wednesday

Building inspections and enquiries phone: 03 347 2839

**Please ensure all work for inspection is ready the day before. Incomplete work requiring re-inspection will incur an additional inspection fee.**

SDC : SDC Approved and Registered with the Department of Building and Construction



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PROJECT TITLE:  
**J & M TUIMAUNEI**  
**LOT 346**  
**FLEMINGTON**

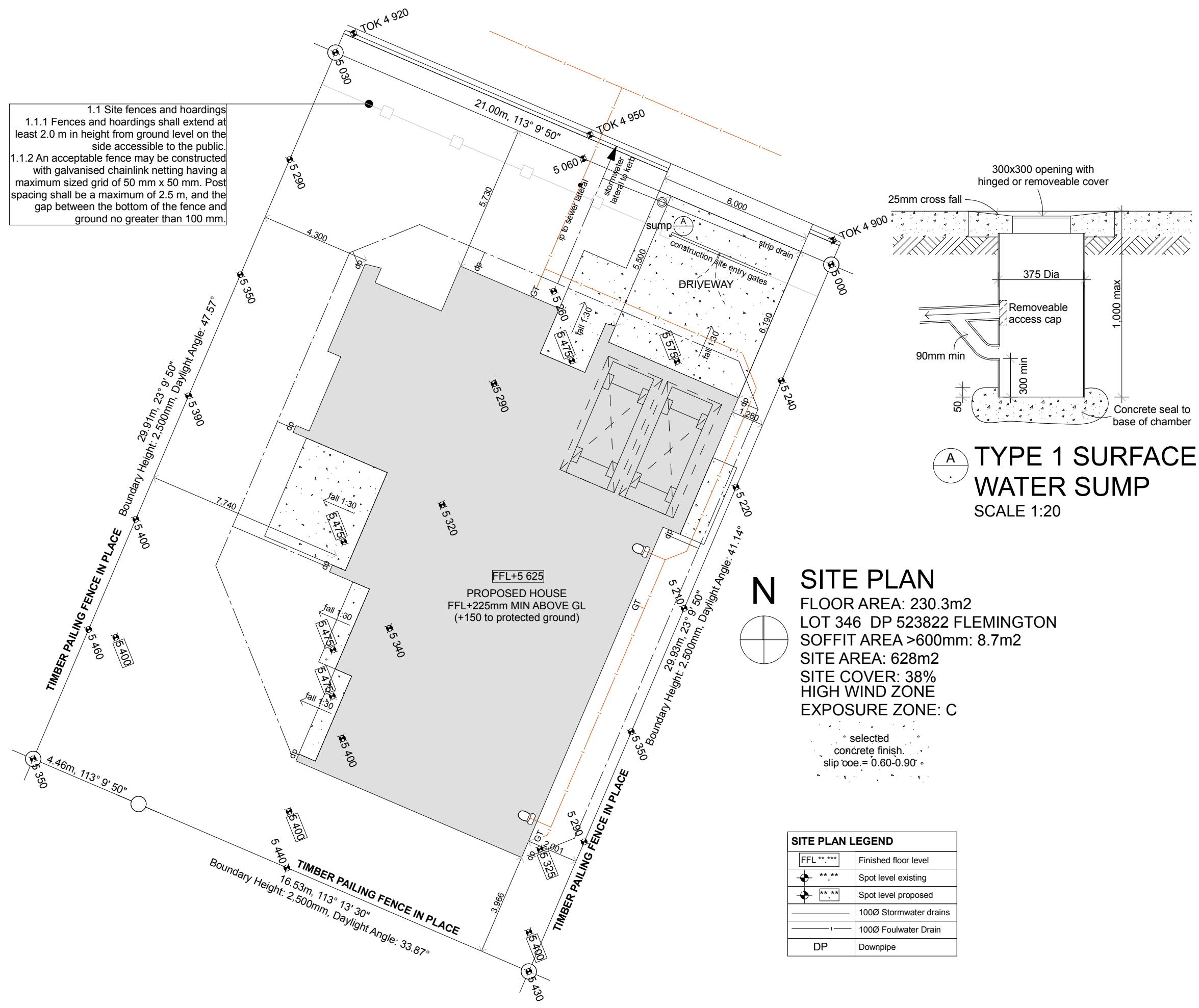
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 JOB REFERENCE: BM-18-006  
 SHEET: 1 OF 40  
 DATE: 12/11/2018

**envy** Architecture  
 nathan vartha  
 architectural designer  
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 AUCKLAND 1011  
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contractor to verify all dimensions on site before commencing any work



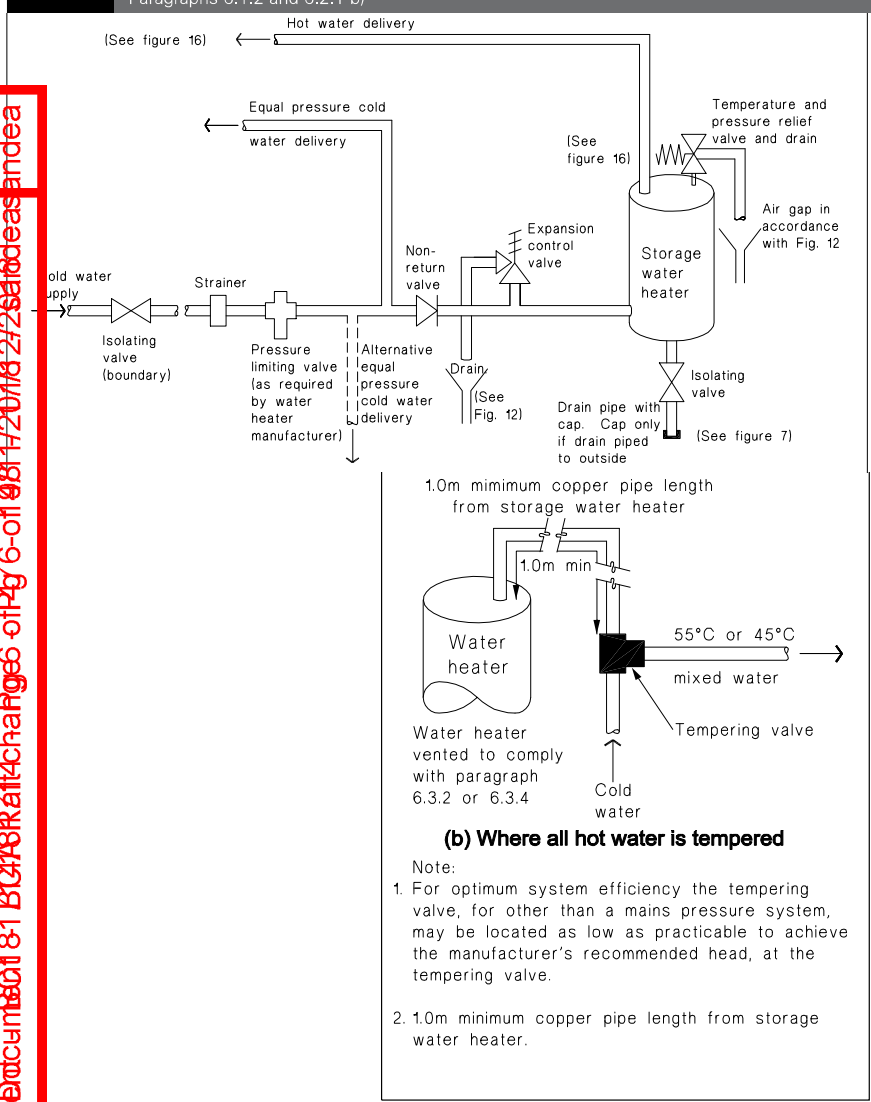






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**Figure 8: Mains Pressure Storage Water Heater System (unvented)**  
Paragraphs 6.1.2 and 6.2.1 b)



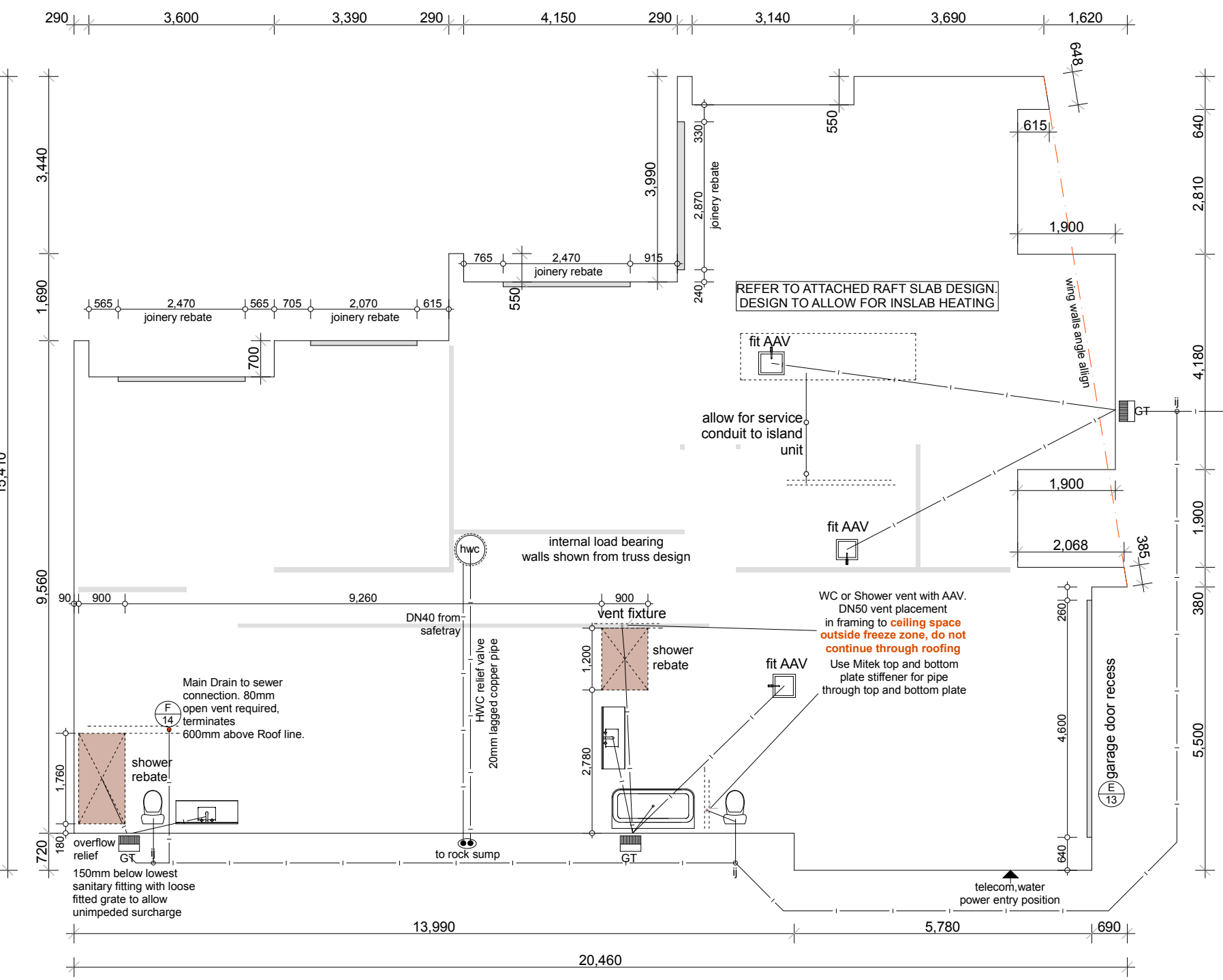
**(b) Where all hot water is tempered**

Note:

1. For optimum system efficiency the tempering valve, for other than a mains pressure system, may be located as low as practicable to achieve the manufacturer's recommended head, at the tempering valve.
2. 1.0m minimum copper pipe length from storage water heater.

**6.14.3 Legionella bacteria**

Irrespective of whether a mixing device is installed, the *storage water heater* control thermostat shall be set at a temperature of not less than 60°C to prevent the growth of Legionella bacteria.



**Pipe sizes and gradients:**

- Hand Basins: DN40 1:40 fall
- Shower/Bath: DN40 1:40 fall
- Kitchen sink/DW combination: DN65 1:40 fall
- laundry tub: DN40 1:30 fall
- WC: 100mm pipe 1:60 min fall

**SEWER PIPES TO BE LAID IAW G13:**

-100mm SEWER DRAIN to be laid at a gradient no less than 1:120

**INSPECTION JUNCTION (ij):**

- For connection WC to Main Drain
- For connection of GT to main drain (required if Gully Trap exceeds 2m from main drain connection)

**INSPECTION BEND: (ib)**

- For bends in Main drain exceeding 45 degrees

**INSPECTION POINT (ip)**

- For connection to sewer lateral located within section boundary.

NOTE: ALL WASTE PIPES PENETRATING FOUNDATION WALL AND SLAB WRAPPED WITH DENSO TAPE TO ALLOW FOR THERMAL MOVEMENT

## FOUNDATION PLAN

Contractor to verify all dimensions on site before commencing any work

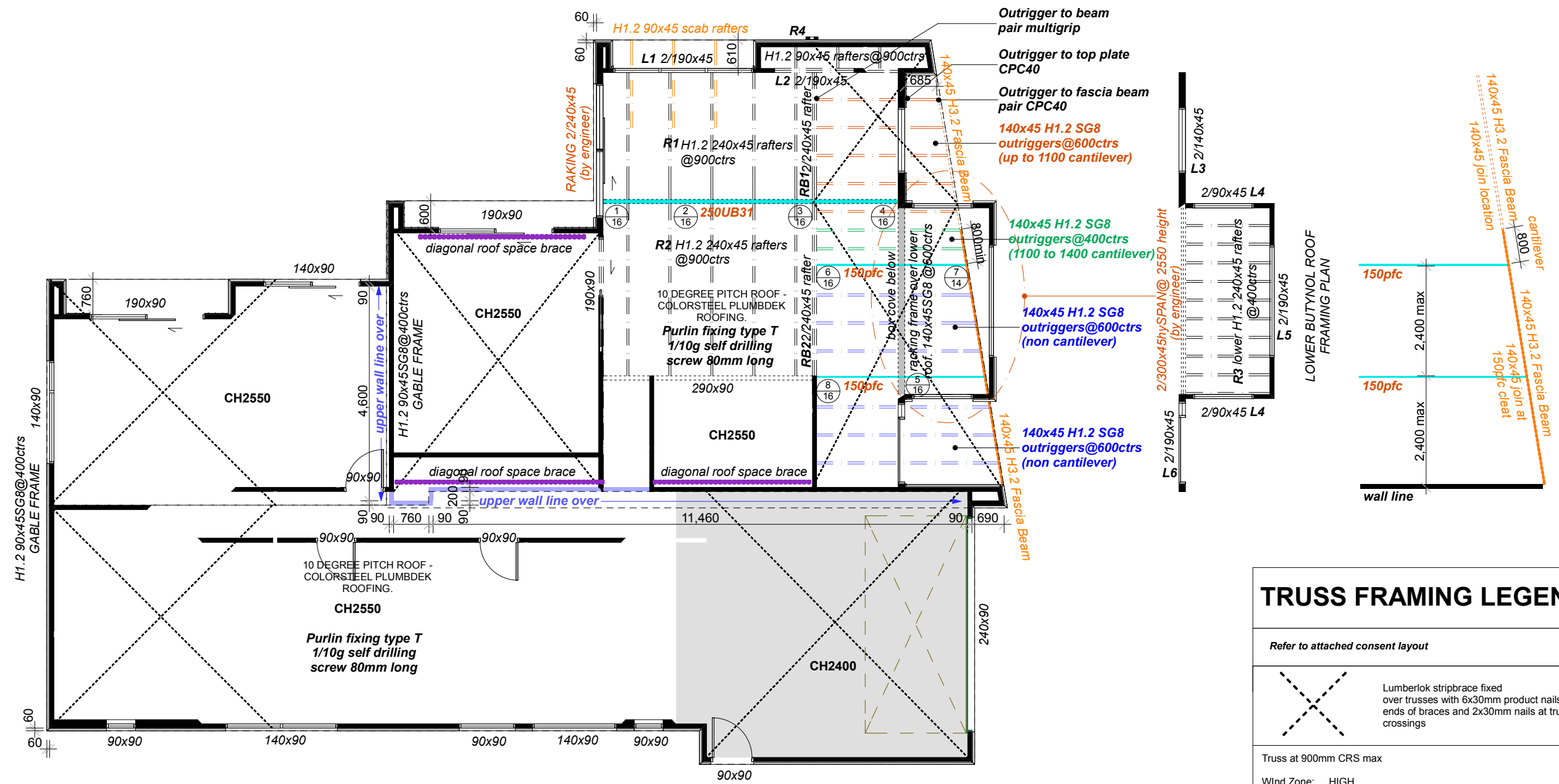
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S.D.C. : S.P.P. 09/11/2018 2/26160easandea



**ROOF PLAN**

SEE ROOF DRAINAGE PLAN FOR ROOF AREA TO DOWNPIPE AREA.

ROOF TRUSSES DESIGNED AND MANUFACTURED BY AN APPROVED FABRICATOR - DESIGN CERTIFICATE TO BE SUPPLIED TO THE BUILDING CERTIFIER

**TRUSS FRAMING LEGEND**

Refer to attached consent layout

Lumberlok stripbrace fixed over trusses with 6x30mm product nails at ends of braces and 2x30mm nails at truss crossings

Truss at 900mm CRS max  
 WInd Zone: \_\_HIGH\_\_  
 \_\_10\_\_ Degree Roof Slope  
 Roofing Material: \_\_LONGRUN PLUMBDEK\_\_

Design by Truss Manufacturer FTMANZ in accordance with NZS 3603 refer to attached documents

Truss fixing to resist uplift.(AS PER FINAL CONSENT TRUSS LAYOUT)

75 x 45 purlins @ 900 crs (for longrun roofing)

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SDC - Spppvep pbrviveim qv tnsgr v r xam d at cum bct 8-1 BCGYRZat14cha Rge10 of g 7 0-01 081 1/2018 2/25af0deas andea

# TIMBER GRADE/TREATMENT

## EXTERIOR WALL FRAMING

Member	Timber species and grade	Treatment
Exterior walls:	Laserframe SG8	H1.2
Exterior gable walls:	Laserframe SG8	H1.2
Cavity battens:	Pin ex finger jointed	H3.2 CCA

## ROOF FRAMING

Member	Timber grade	Treatment
Trusses:	Laserframe SG8	H1.2
Trusses:(coved and gables)	Laserframe SG8	H1.2
Purlins:	Laserframe SG8	H1.2
Ceiling joists:	Laserframe SG8	H1.2
Valley boards:	Laserframe SG8	H1.2

## INTERIOR FRAMING

Member	Timber species and grade	Treatment
Non structural walls:	Laserframe SG8	H1.2
Structural and braced walls:	Laserframe SG8	H1.2
Surrounding wet area walls:	Laserframe SG8	H1.2
Bottom plates:	Laserframe SG8	H1.2

## EXTERIOR FINISHING TIMBERS

Member	Timber species and grade	Treatment
Exterior mouldings:	Pin ex finger jointed	H3.2 CCA

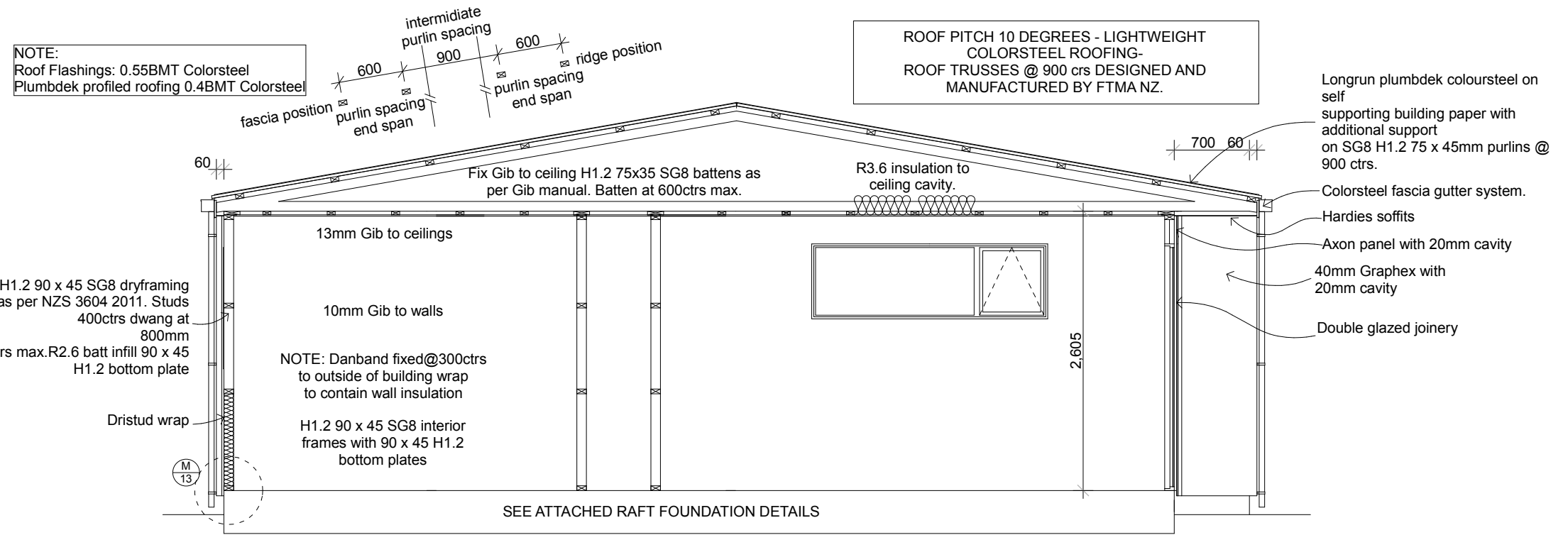
## INTERIOR FINISHING TIMBERS

Member	Timber species	Treatment
Architraves:	Pinex pine or MUF	None
Skirtings:	Pinex pine or MUF	None
Cornices:	Pinex pine or MUF	None
Window/Door Jambs:	Radiata Pine	H3.2

## Insulation Calculation Sheet (Zone 3)

Value		HL reference =		USE CA RATED DOWNLIGHTS		30% of total wall area/.26		(Area glazing-30% of total wall area)/.34						
Wall area (m2)	198.8	Proposed R roof( pR roof)	3.4	505.8	=	Area roof/3.3	+	Area walls (net)/2	+	Area floor/1.3	+	229.4	+	0.0
Floor / roof area (m2)	192.7	Proposed R walls (pR wall)	2.2											
Area of glazing	59.2	Proposed R floor (pR floor)	1.3											
%Glazing/wall area	29.8%	Proposed R glazing (pR glazing)	0.34	HL proposed =		A roof/pR roof	+	A wall (net)/pR wall	+	A floor/pR floor	+	glazing/pR glazin	+	A skylights/pR skylights
Unglazed wall area	139.6	Proposed R skylights	0.34	442.5	=	56.7	+	63.5	+	148.2	+	174.1	+	0.0
Area of skylights	0.0													
m2 Glazing over 30%	NA													
<b>CONSTRUCTION R VALUES ADJUSTMENTS:</b>		ROOF:	Insulation Value= R3.6 Construction Value= r3.4											
		WALL:	Insulation Value= R2.6 Construction Value= R2.2											
Pitch of roof (degrees)	10.0	H new	=	perimeter/r roof	+	A roof/pR roof	+	A wall (net)/pR wall	+	A floor/pR floor	+	glazing/pR glazin	+	A skylights/pR skylights
Perimeter of roof (meters)	52.0	447.8		5.3		56.7		63.5		148.2		174.1		0.0
Pushback for insulation (mm)	285.0													
R value based on 0 insulation	2.8													
Area of roof at R.2.8	14.82	Does the proposal comply?	<b>YES</b>	As HL proposed <= HL reference this proposal complies with NZS4218:2009										

NOTE: PINK BATTTS TECHNICAL UPDATE OPTION 1 HAS BEEN USED FOR THE PURPOSE OF CALCULATING COMPLIANCE WITH NZS4218: 2009



SECTION A

Contractor to verify all dimensions on site before commencing any work



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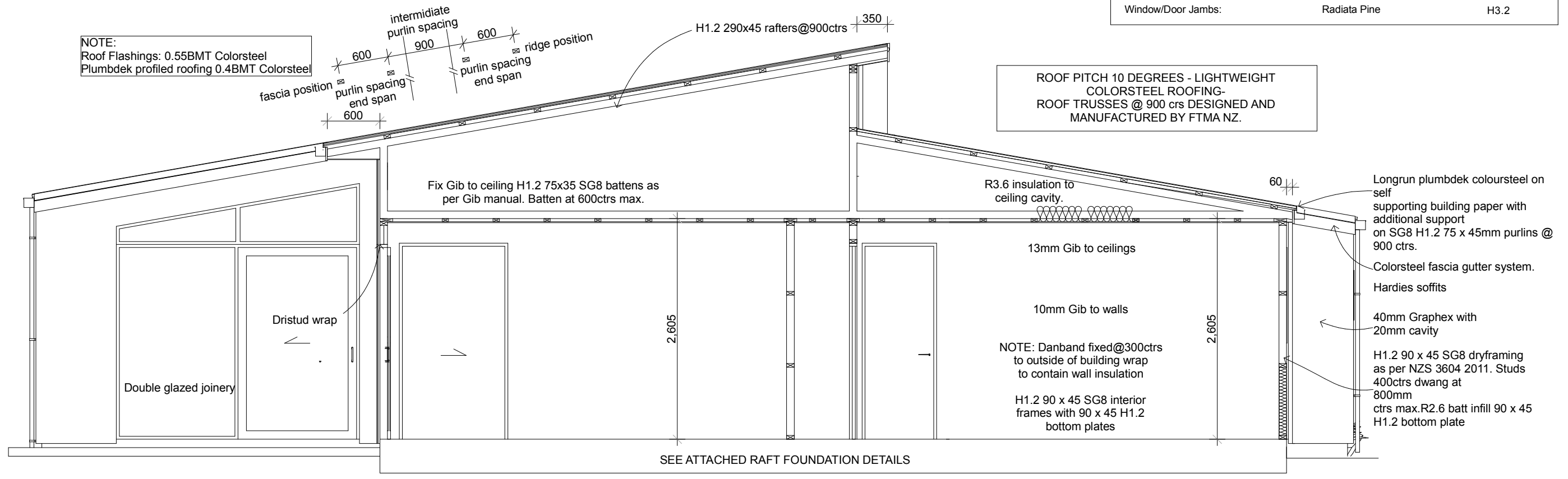


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### TIMBER GRADE/TREATMENT

EXTERIOR WALL FRAMING		
Member	Timber species and grade	Treatment
Exterior walls:	Laserframe SG8	H1.2
Exterior gable walls:	Laserframe SG8	H1.2
Cavity battens:	Pin ex finger jointed	H3.2 CCA
ROOF FRAMING		
Member	Timber grade	Treatment
Trusses:	Laserframe SG8	H1.2
Trusses:(coved and gables)	Laserframe SG8	H1.2
Purlins:	Laserframe SG8	H1.2
Ceiling joists:	Laserframe SG8	H1.2
Valley boards:	Laserframe SG8	H1.2
INTERIOR FRAMING		
Member	Timber species and grade	Treatment
Non structural walls:	Laserframe SG8	H1.2
Structural and braced walls:	Laserframe SG8	H1.2
Surrounding wet area walls:	Laserframe SG8	H1.2
Bottom plates:	Laserframe SG8	H1.2
EXTERIOR FINISHING TIMBERS		
Member	Timber species and grade	Treatment
Exterior mouldings:	Pin ex finger jointed	H3.2 CCA
INTERIOR FINISHING TIMBERS		
Member	Timber species	Treatment
Architraves:	Pinex pine or MUF	None
Skirtings:	Pinex pine or MUF	None
Cornices:	Pinex pine or MUF	None
Window/Door Jambs:	Radiata Pine	H3.2



## SECTION B

Contractor to verify all dimensions on site before commencing any work



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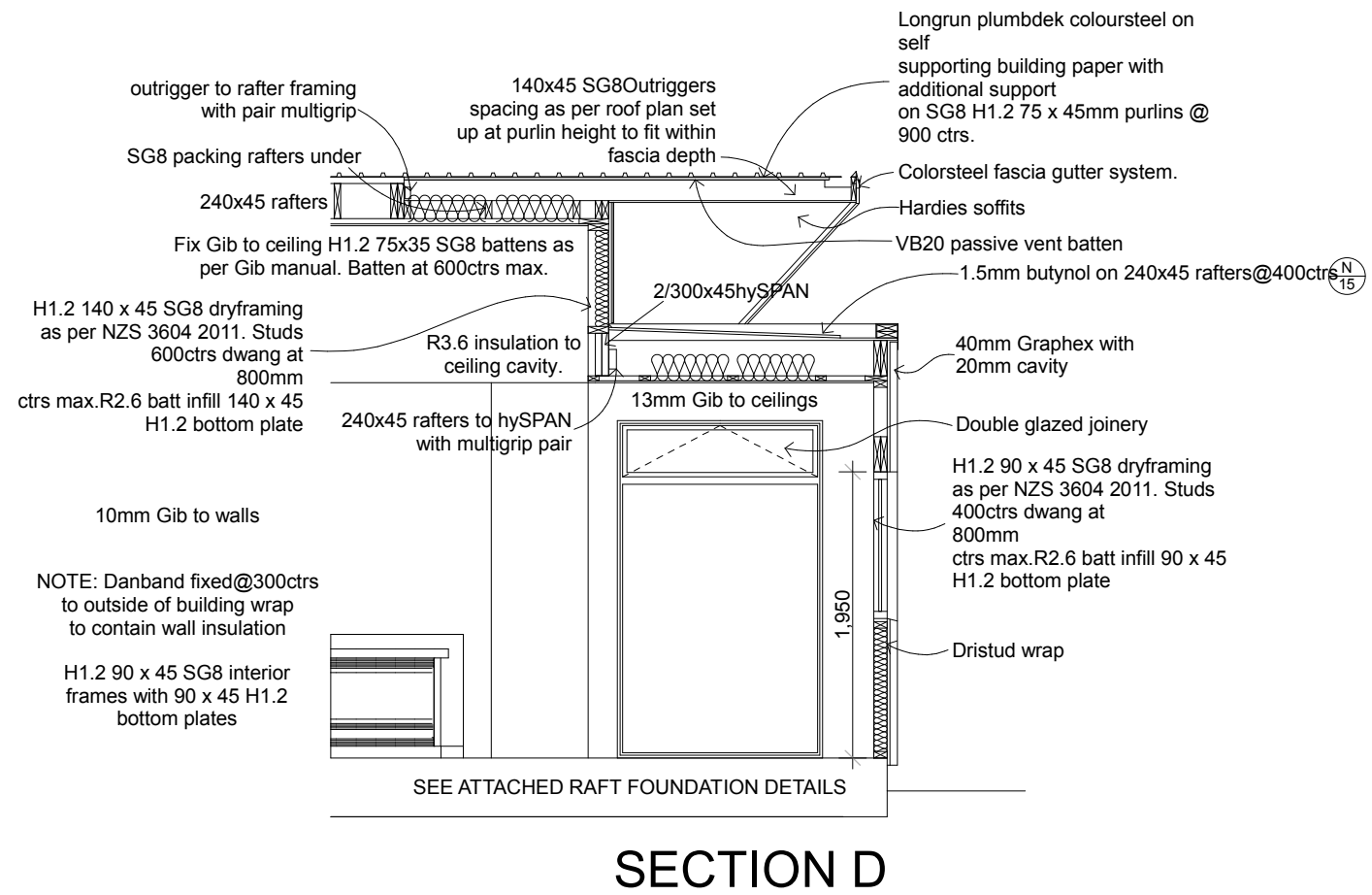
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TIMBER GRADE/TREATMENT		
<b>EXTERIOR WALL FRAMING</b>		
<i>Member</i>	<i>Timber species and grade</i>	<i>Treatment</i>
Exterior walls:	Laserframe SG8	H1.2
Exterior gable walls:	Laserframe SG8	H1.2
Cavity battens:	Pin ex finger jointed	H3.2 CCA
<b>ROOF FRAMING</b>		
<i>Member</i>	<i>Timber grade</i>	<i>Treatment</i>
Trusses:	Laserframe SG8	H1.2
Trusses:(coved and gables)	Laserframe SG8	H1.2
Purlins:	Laserframe SG8	H1.2
Ceiling joists:	Laserframe SG8	H1.2
Valley boards:	Laserframe SG8	H1.2
<b>INTERIOR FRAMING</b>		
<i>Member</i>	<i>Timber species and grade</i>	<i>Treatment</i>
Non structural walls:	Laserframe SG8	H1.2
Structural and braced walls:	Laserframe SG8	H1.2
Surrounding wet area walls:	Laserframe SG8	H1.2
Bottom plates:	Laserframe SG8	H1.2
<b>EXTERIOR FINISHING TIMBERS</b>		
<i>Member</i>	<i>Timber species and grade</i>	<i>Treatment</i>
Exterior mouldings:	Pin ex finger jointed	H3.2 CCA
<b>INTERIOR FINISHING TIMBERS</b>		
<i>Member</i>	<i>Timber species</i>	<i>Treatment</i>
Architraves:	Pinex pine or MUF	None
Skirtings:	Pinex pine or MUF	None
Cornices:	Pinex pine or MUF	None
Window/Door Jambs:	Radiata Pine	H3.2

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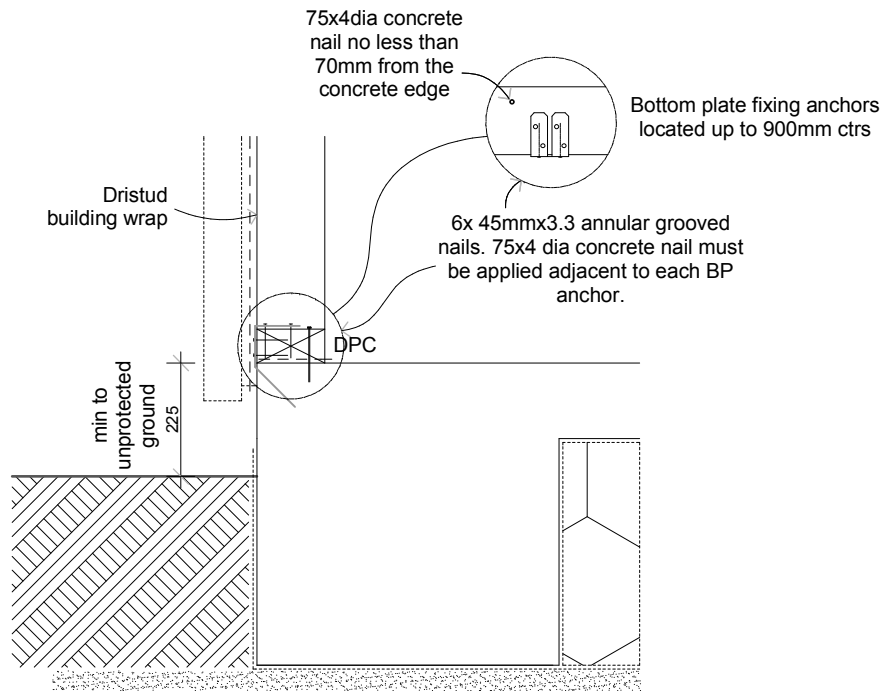
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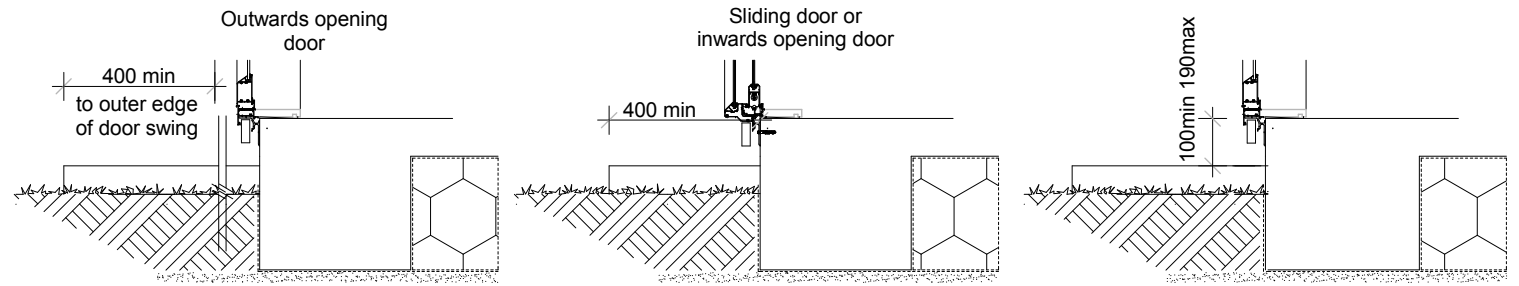
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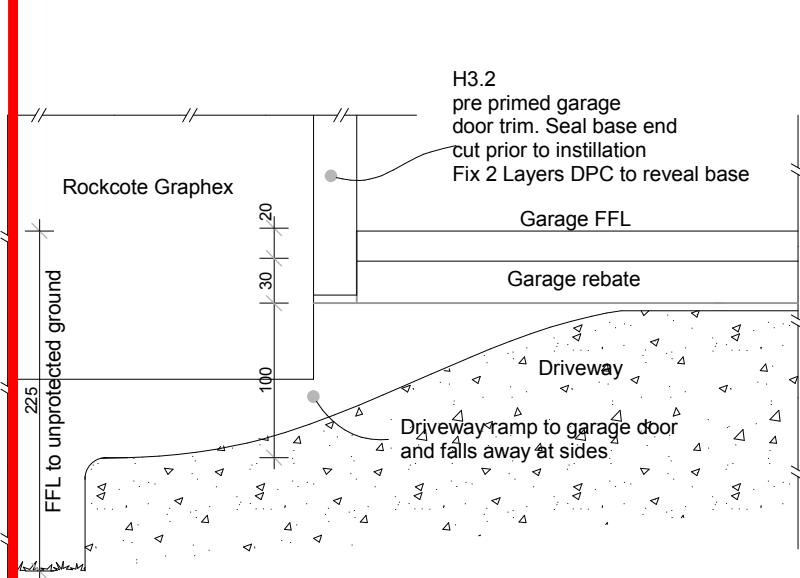
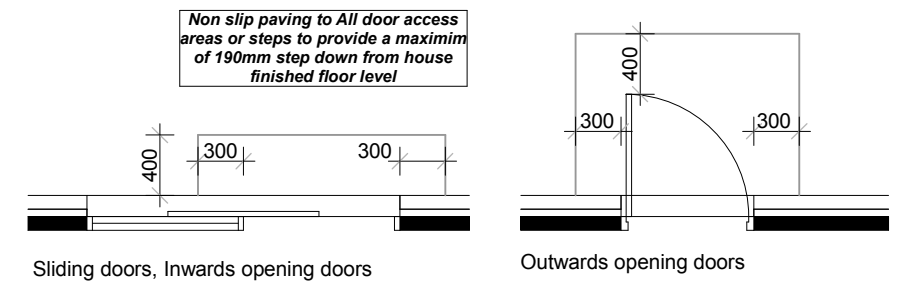
**M/9** BOTTOM PLATE FIXING



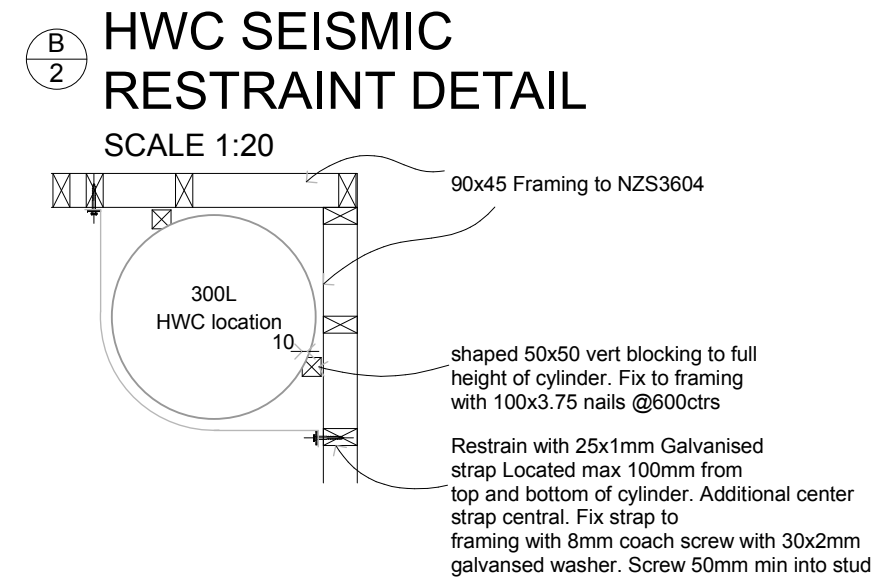
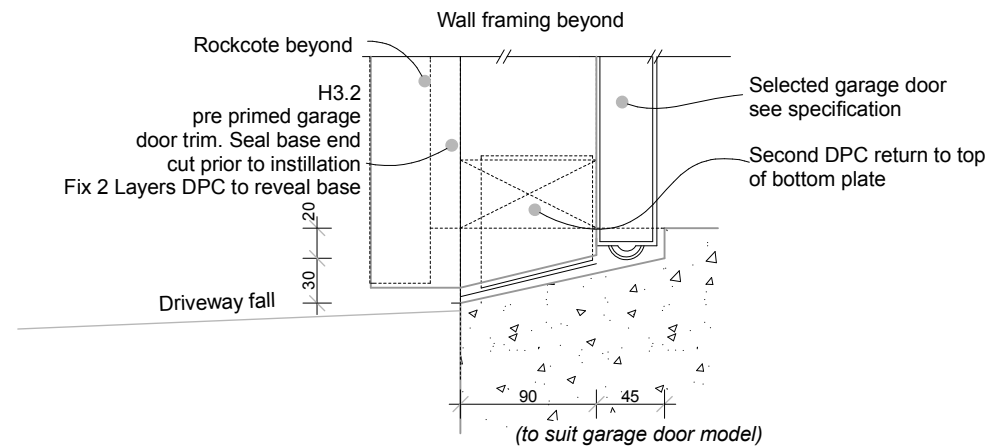
**ENTRY THRESHOLD**  
SCALE 1:20

**MINIMUM CLEARANCES**  
SCALE 1:20

**MINIMUM REQUIREMENTS FOR EXTERNAL ACCESS**



**D/6** GARAGE SLAB REBATE



**B/2** HWC SEISMIC RESTRAINT DETAIL  
SCALE 1:20

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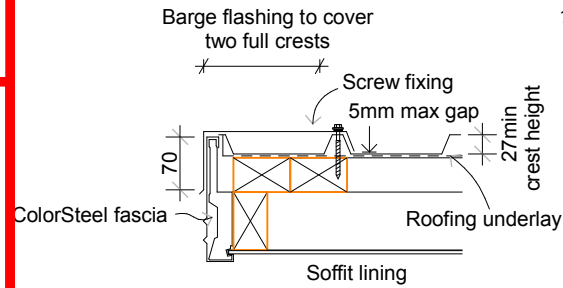
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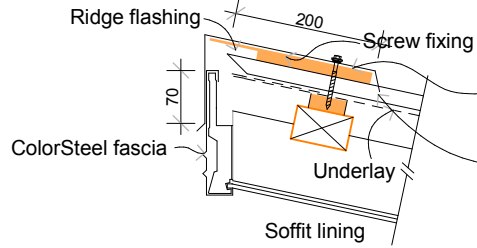
(CATCHMENT AREA LIMITED TO RANFALL INTENSITY WITH AVERAGE RECURRENCE INTERVAL NO GREATER THAN 100MM PER HOUR)

NOTE: MAXIMUM CATCHMENT AREA FOR VALLEY GUTTER SHOWN IS 25m<sup>2</sup> AS PER E2 TABLE 8



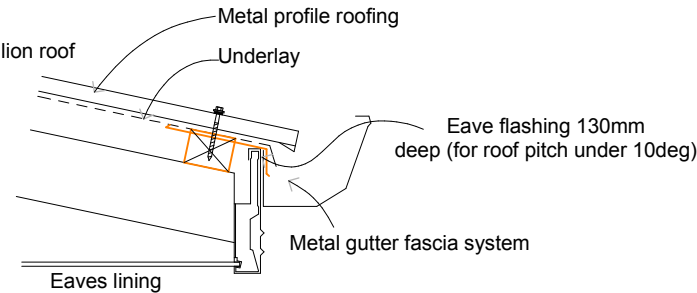
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SCALE 1:10

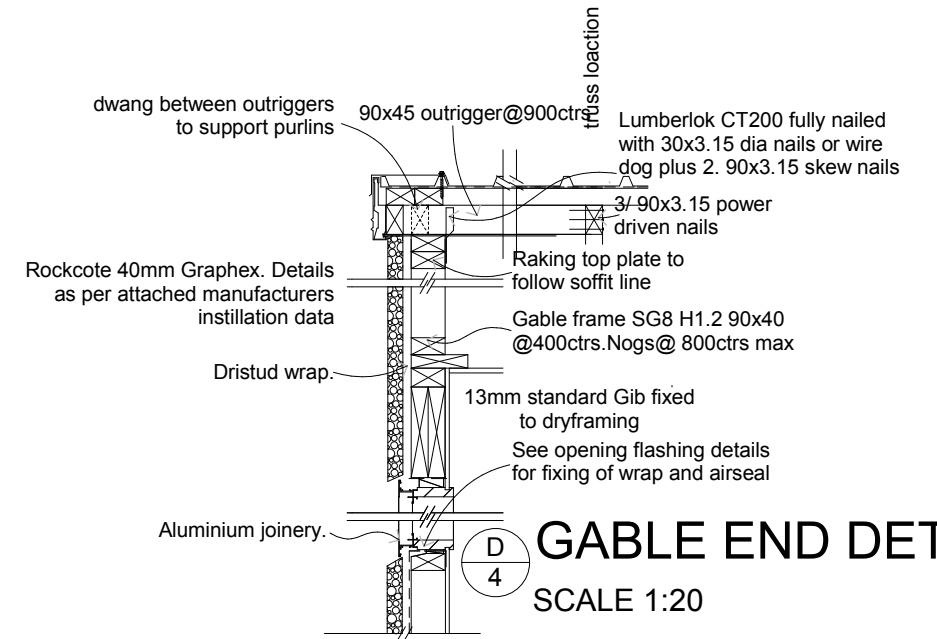


**I**  
**METAL PROFILE ROOFING**

SCALE 1:10

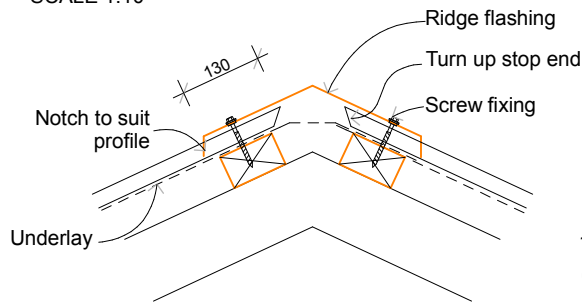


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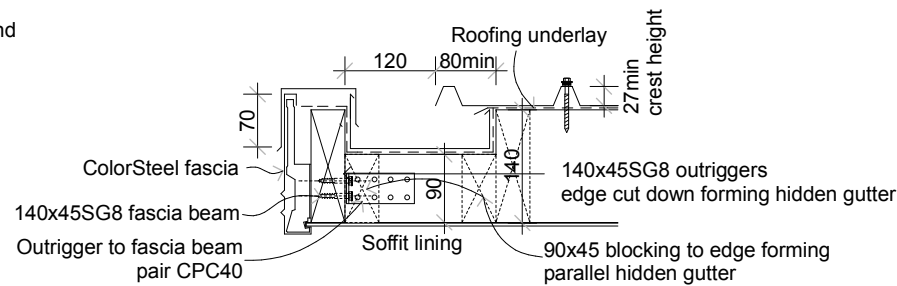
**D**  
**GABLE END DETAIL**

SCALE 1:20

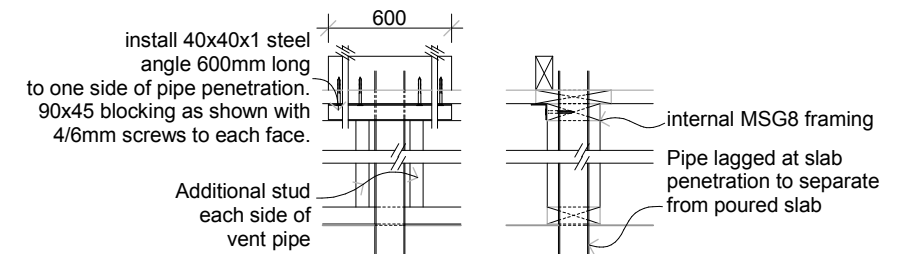


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**RIDGE FOR PROFILED METAL**

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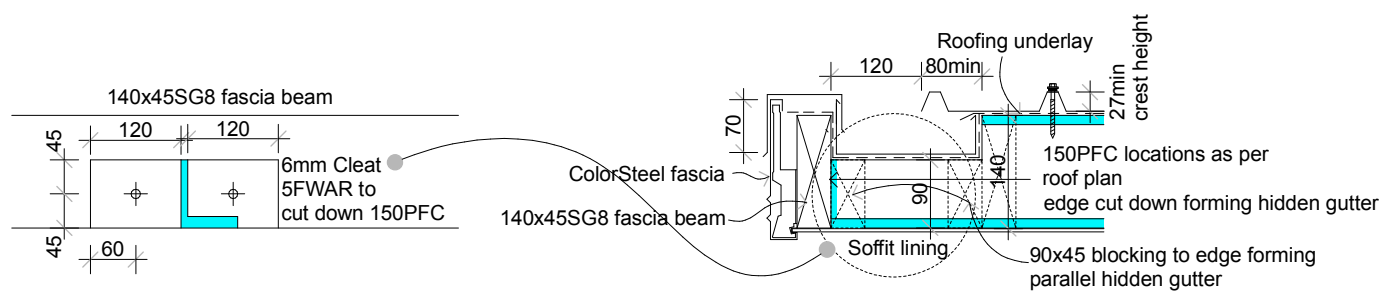


**L**  
**PARALLEL HIDDEN GUTTER PROFILED METAL WITH SG8 OUTRIGGER**

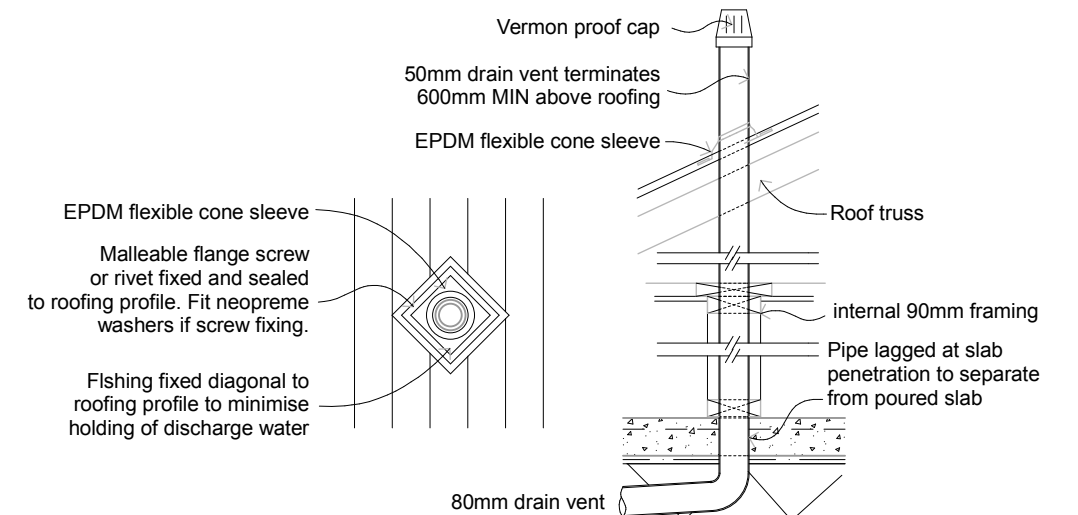


**F**  
**DRAIN VENT INTERNAL WALL PLACEMENT**

SCALE 1:20



**7**  
**6**  
**PARALLEL HIDDEN GUTTER PROFILED METAL WITH 150pfc OUTRIGGER**



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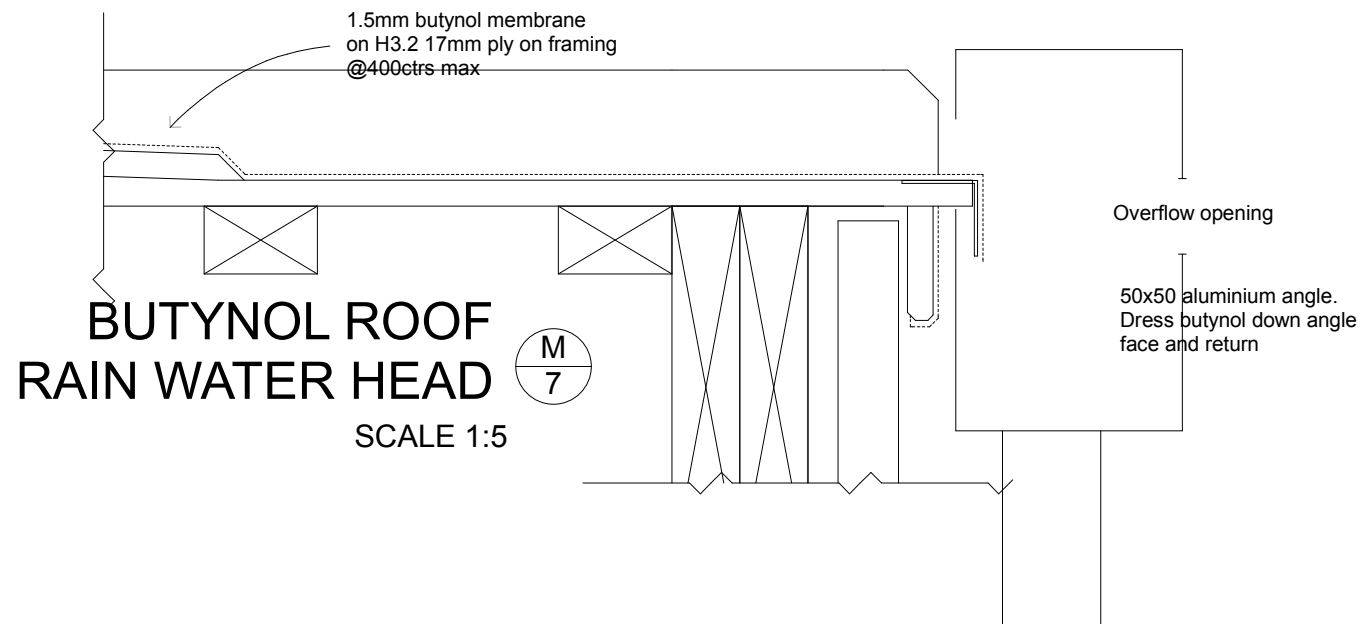
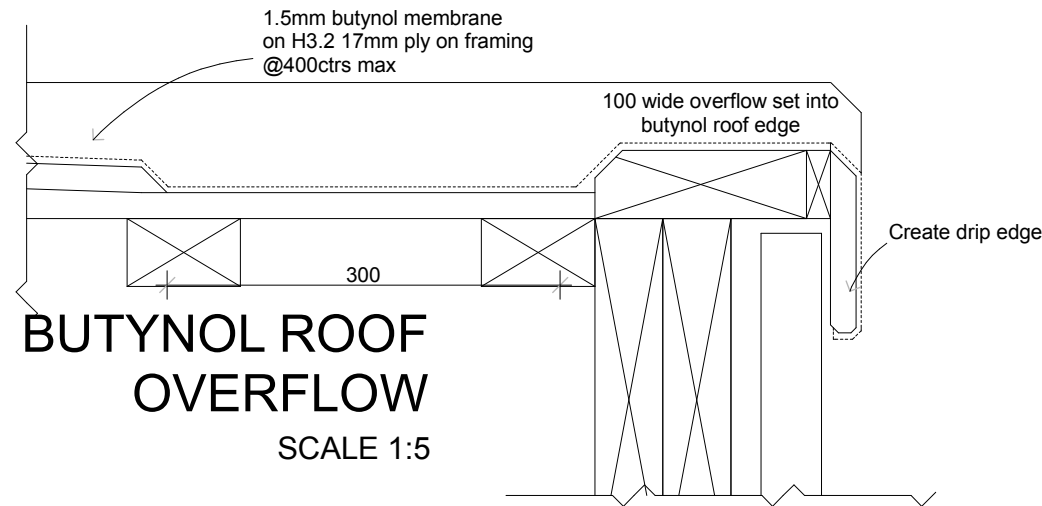
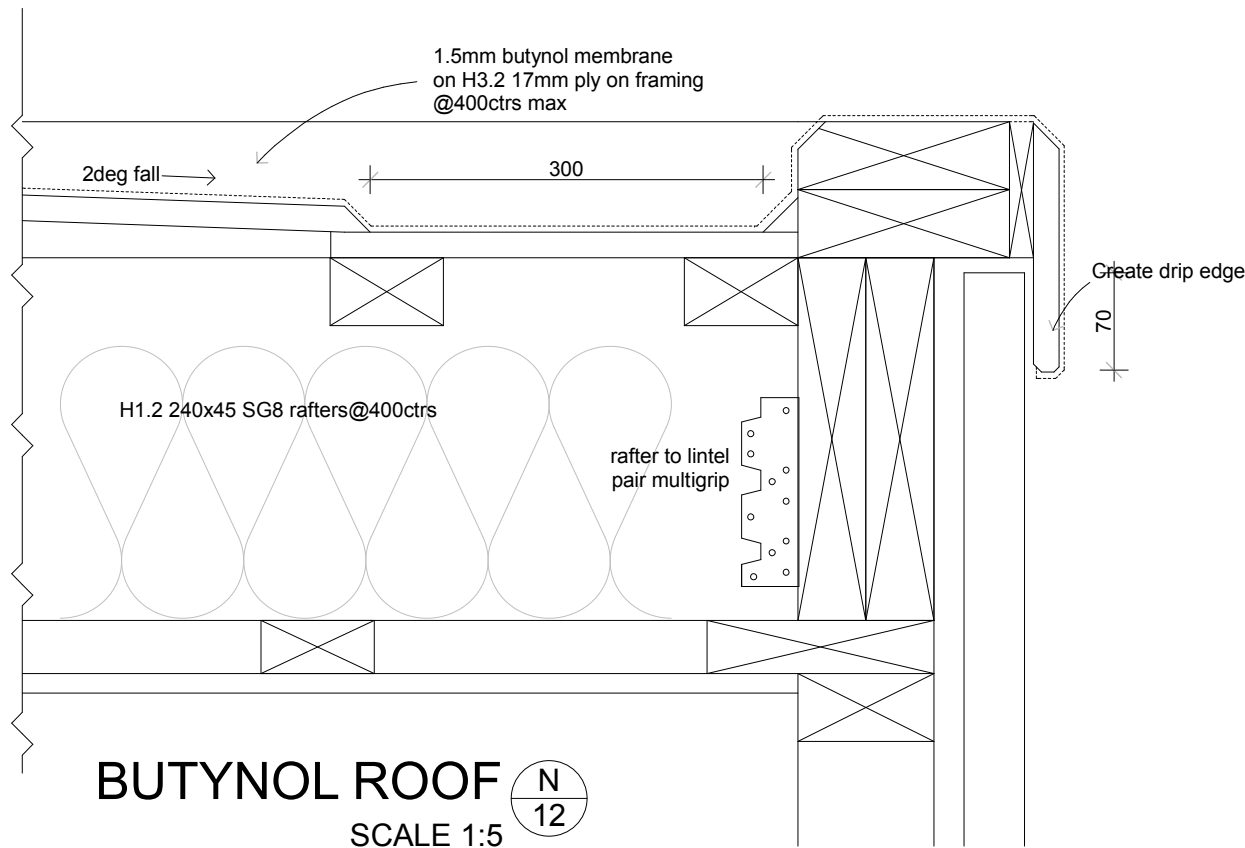
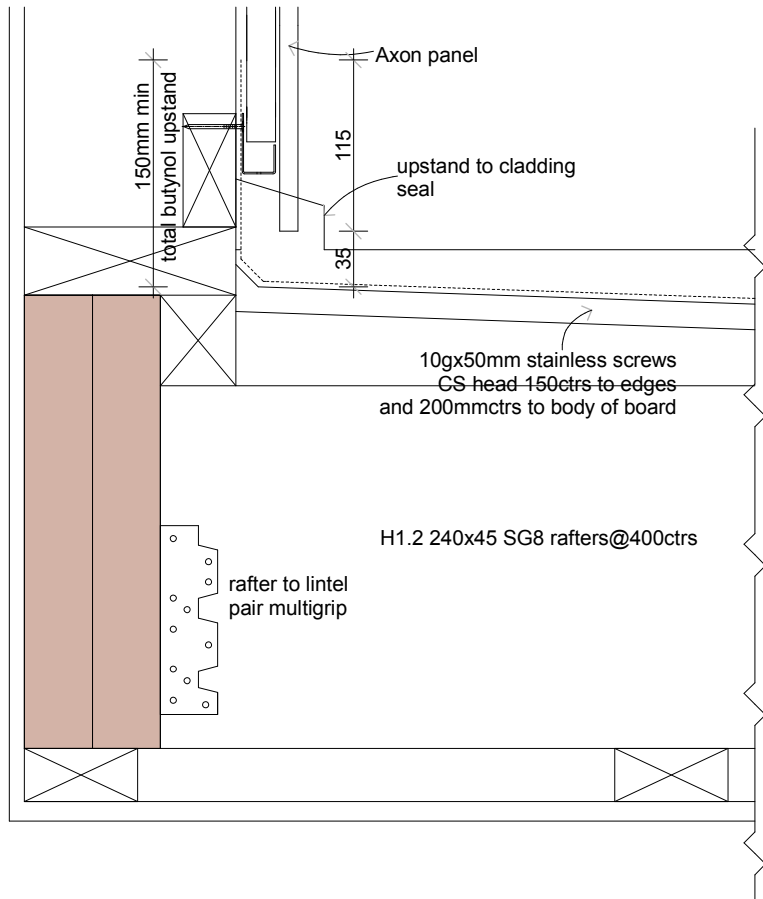
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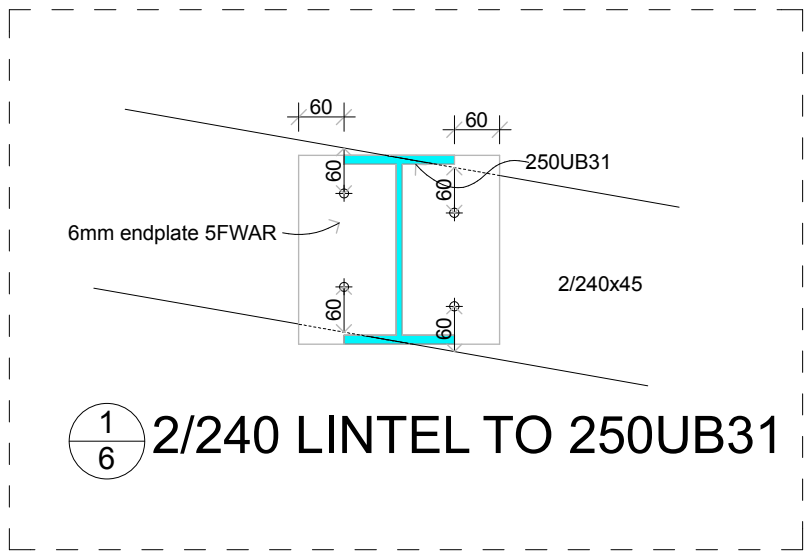
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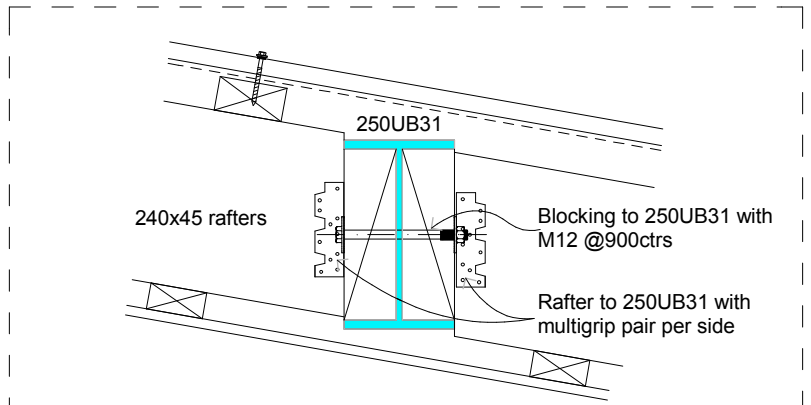


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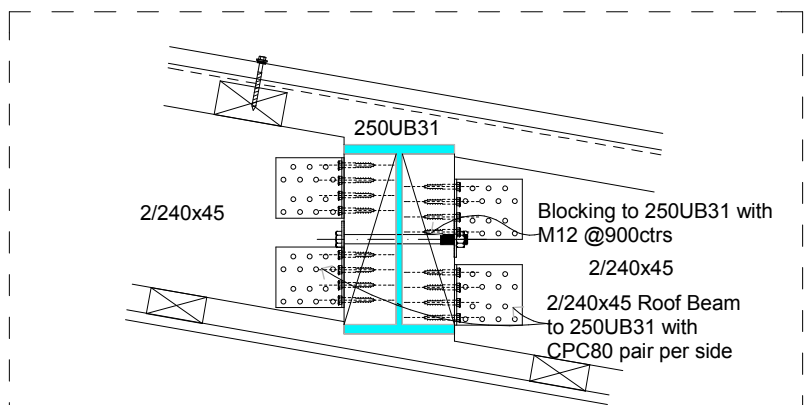
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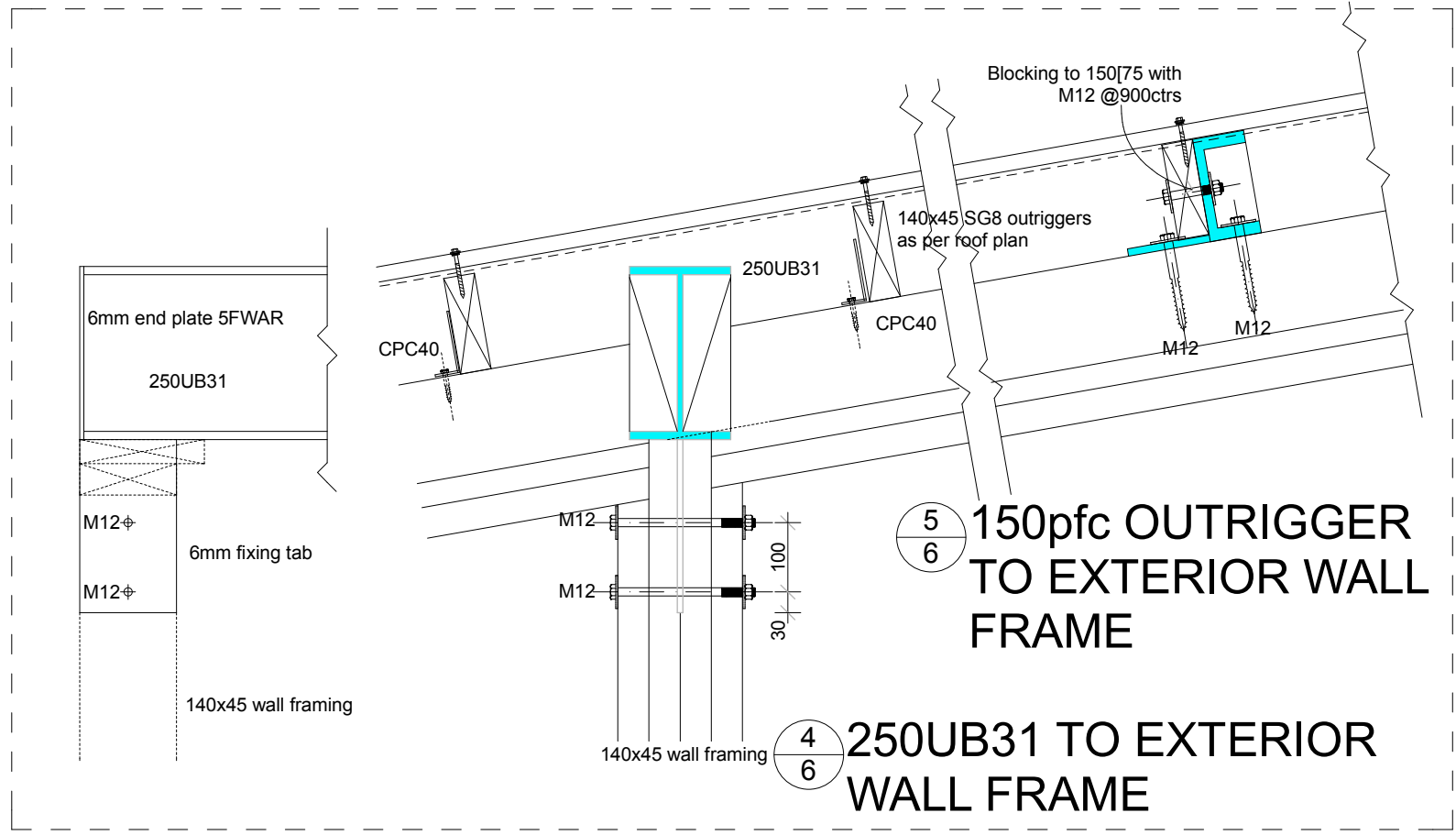
1/6 2/240 LINTEL TO 250UB31



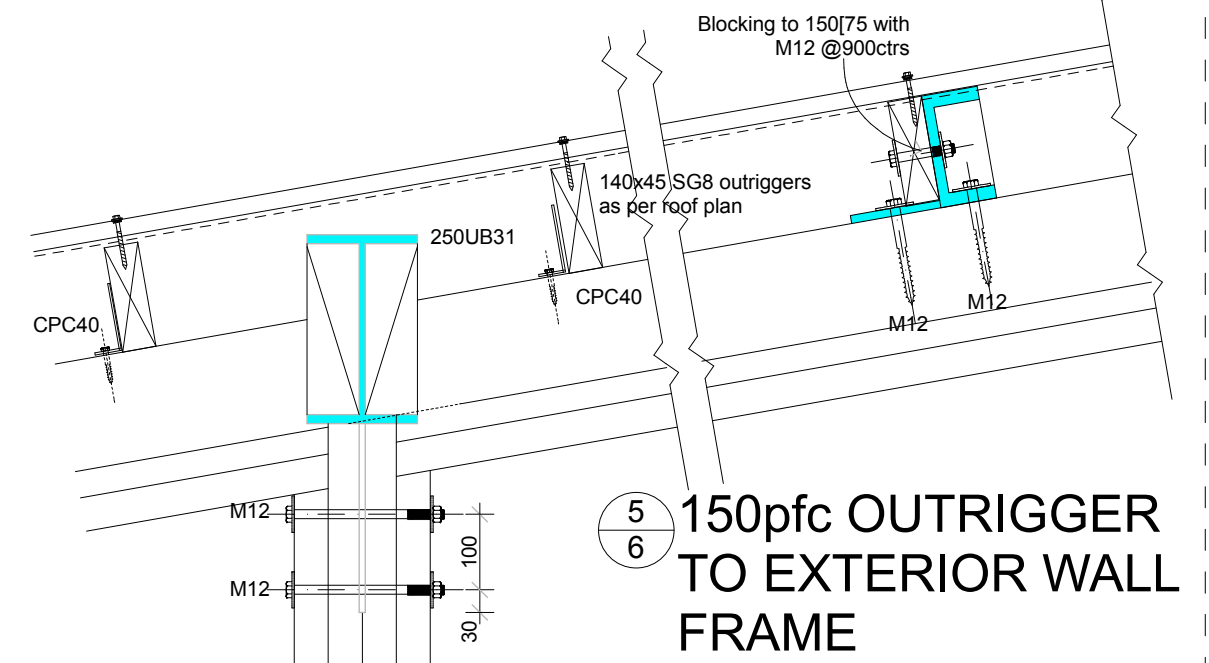
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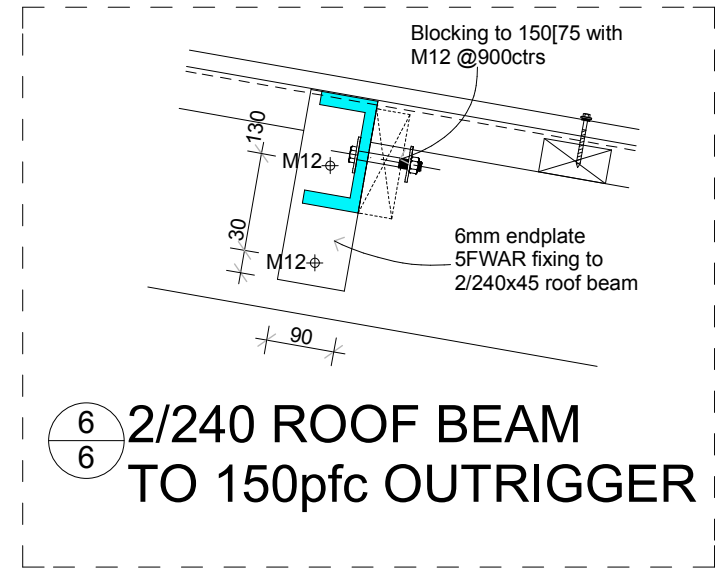
3/6 2/240 ROOF BEAM TO 250UB31



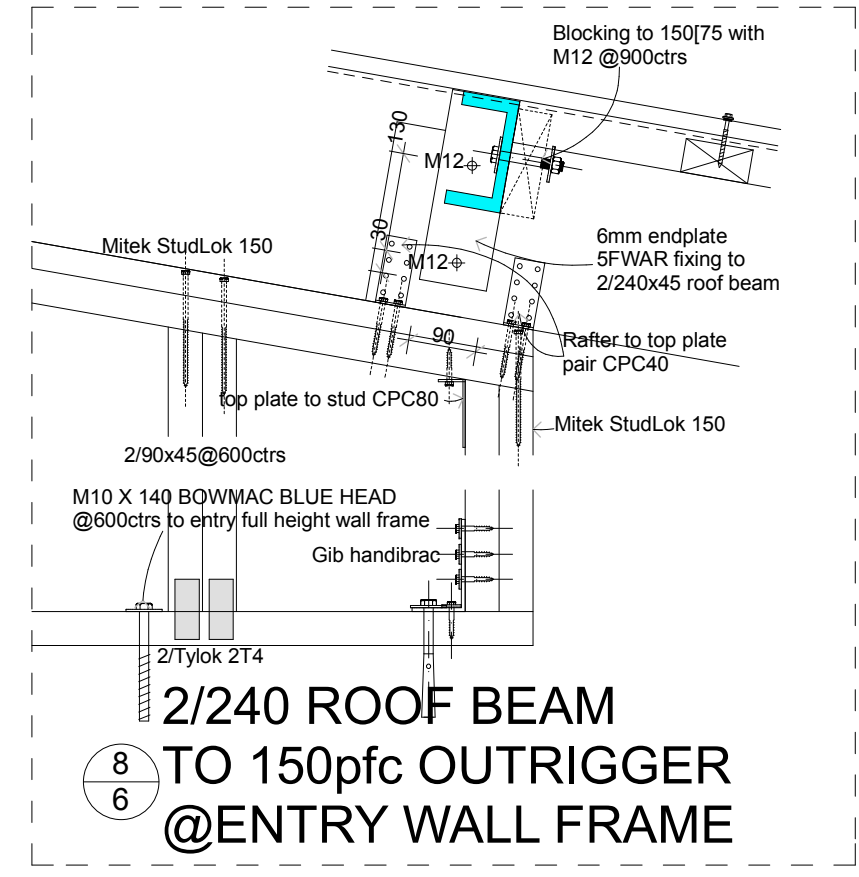
4/6 250UB31 TO EXTERIOR WALL FRAME



5/6 150pfc OUTRIGGER TO EXTERIOR WALL FRAME



6/6 2/240 ROOF BEAM TO 150pfc OUTRIGGER



8/6 2/240 ROOF BEAM TO 150pfc OUTRIGGER @ ENTRY WALL FRAME

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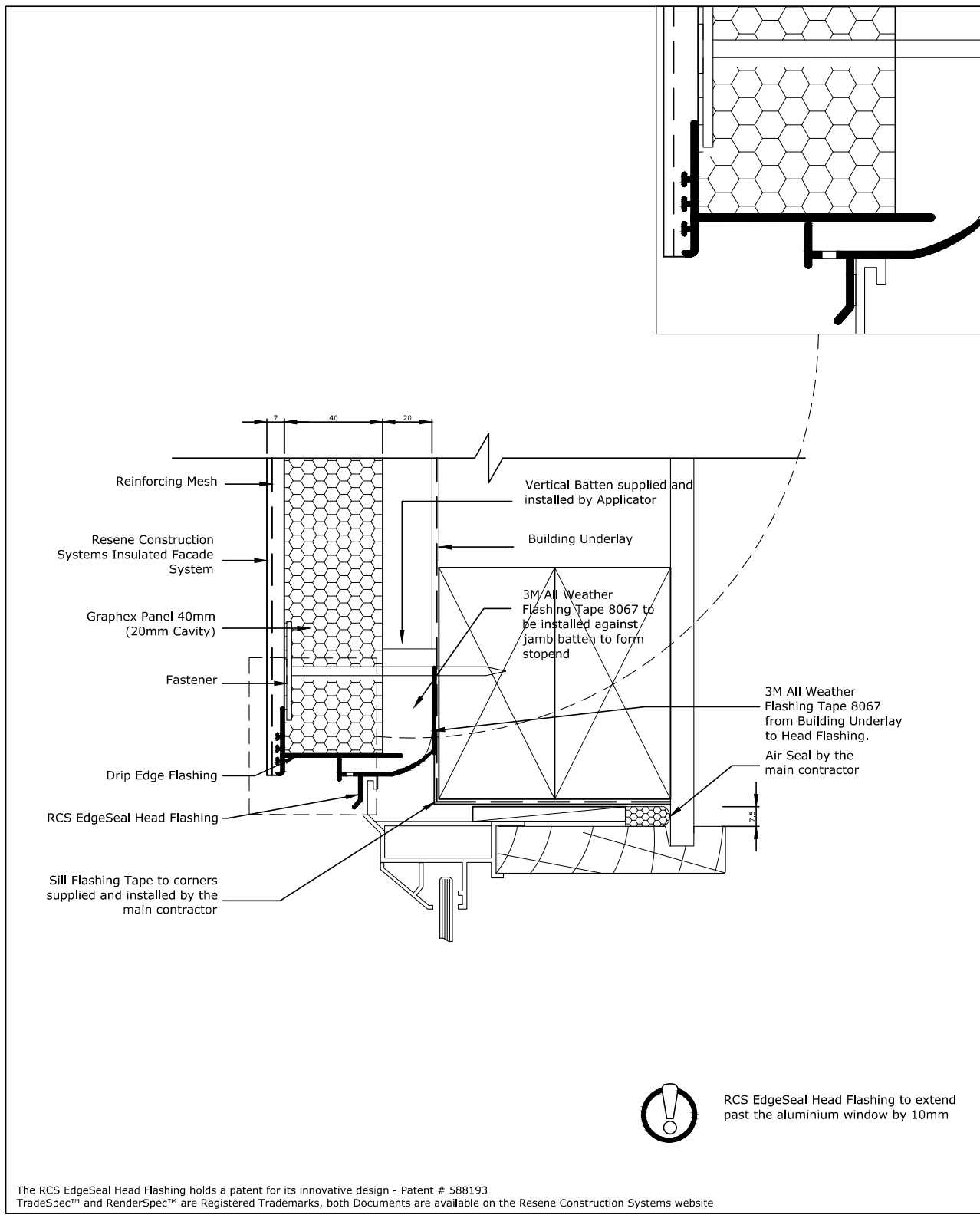




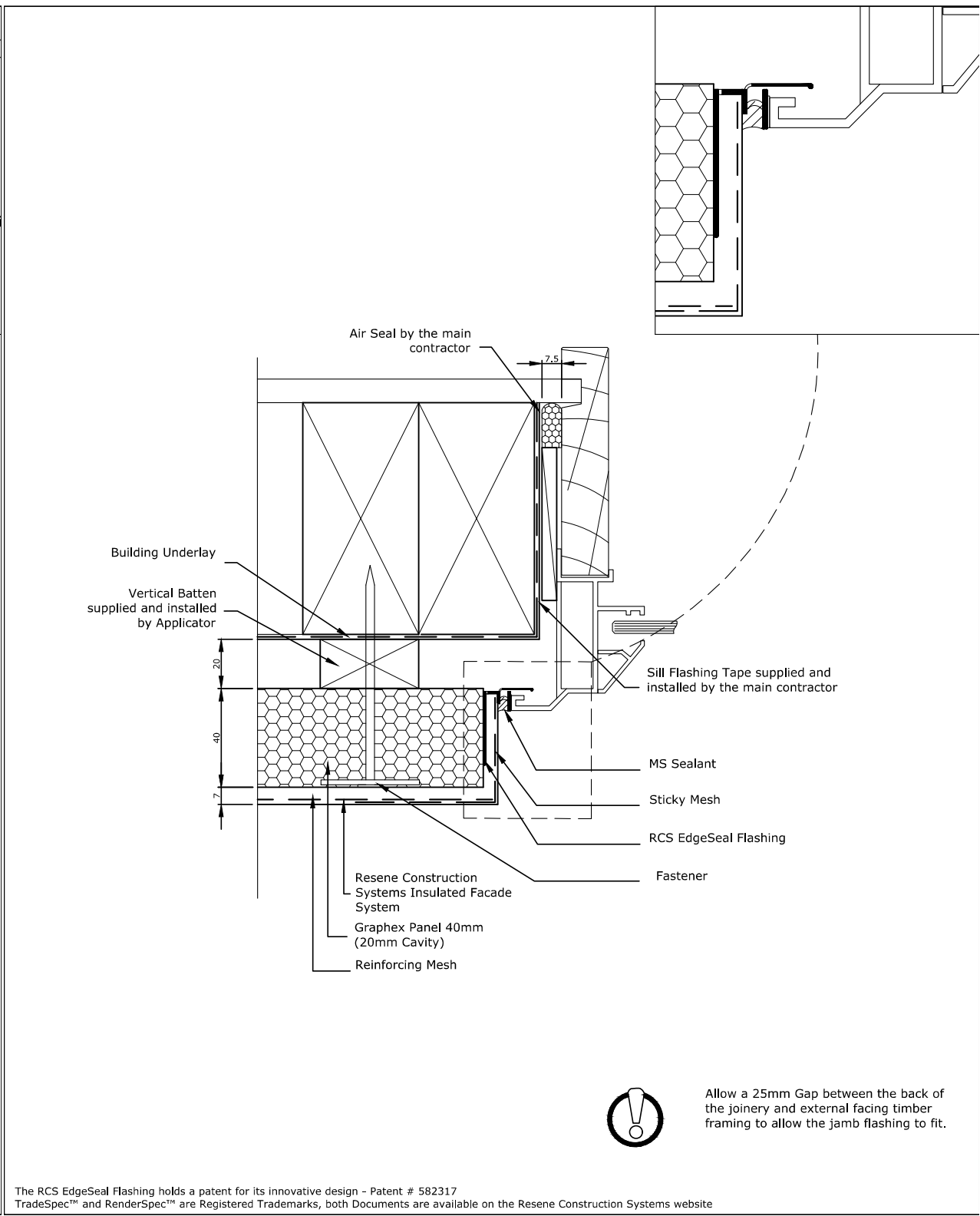




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The RCS EdgeSeal Head Flashing holds a patent for its innovative design - Patent # 588193  
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The RCS EdgeSeal Flashing holds a patent for its innovative design - Patent # 582317  
 TradeSpec™ and RenderSpec™ are Registered Trademarks, both Documents are available on the Resene Construction Systems website

**Resene Construction Systems**

System: Insulated Facade System  
 Substrate: Graphex Panel 40mm (20mm Cavity)  
 Drawing Name: Window Head - Option 1

Scale: 1 : 2 @ A4  
 Date: 1 November 2017  
 Sheet: 70.07.00

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**Resene Construction Systems**

System: Insulated Facade System  
 Substrate: Graphex Panel 40mm (20mm Cavity)  
 Drawing Name: Window Jamb

Scale: 1 : 2 @ A4  
 Date: 1 November 2017  
 Sheet: 70.06.00

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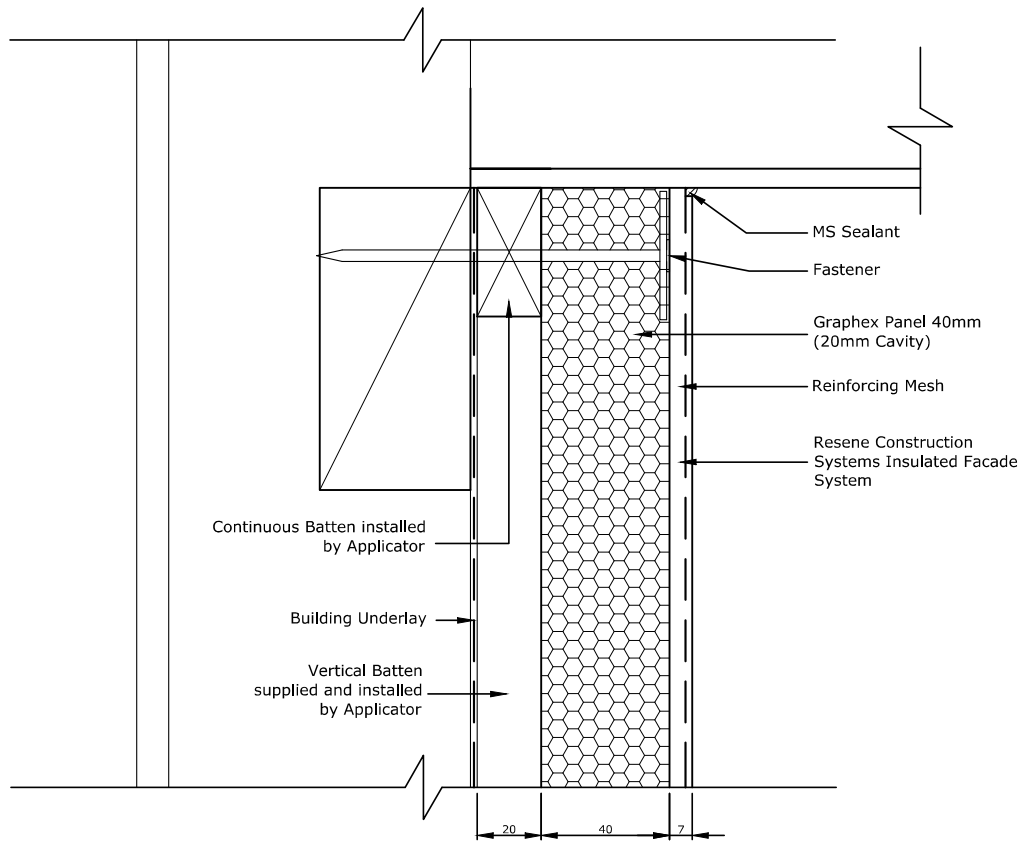
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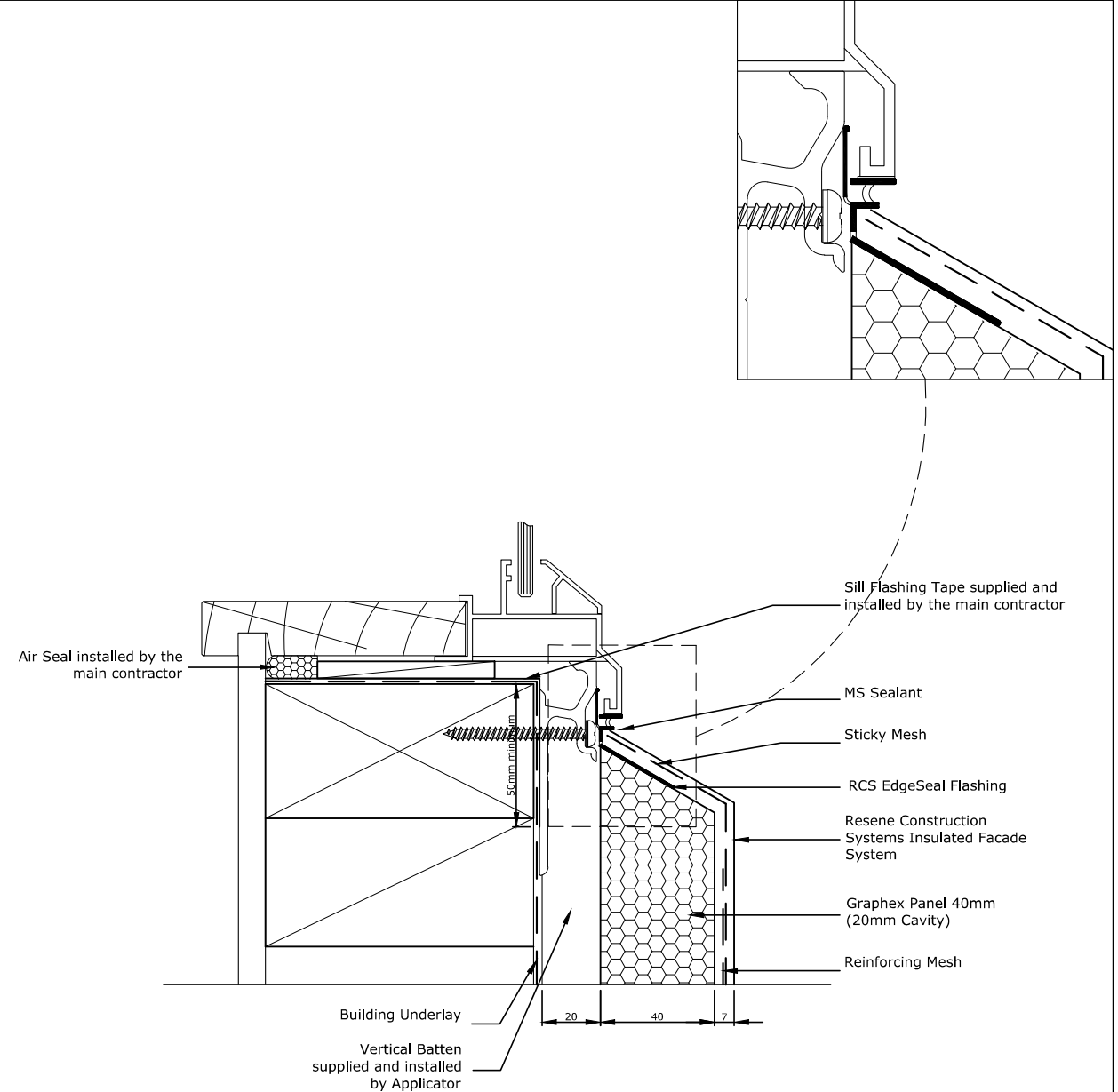


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Allow a 25mm Gap between the back of the joinery and external facing timber framing to allow the sill flashing to fit.

The RCS EdgeSeal Flashing holds a patent for its innovative design - Patent # 582317  
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System  
Insulated Facade System  
Scale  
1 : 2 @ A4

Substrate  
Graphex Panel 40mm (20mm Cavity)  
Date  
1 November 2017

Drawing Name  
Soffit  
Sheet  
70.08.00

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System  
Insulated Facade System  
Scale  
1 : 2 @ A4

Substrate  
Graphex Panel 40mm (20mm Cavity)  
Date  
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Drawing Name  
Window Sill  
Sheet  
70.05.00

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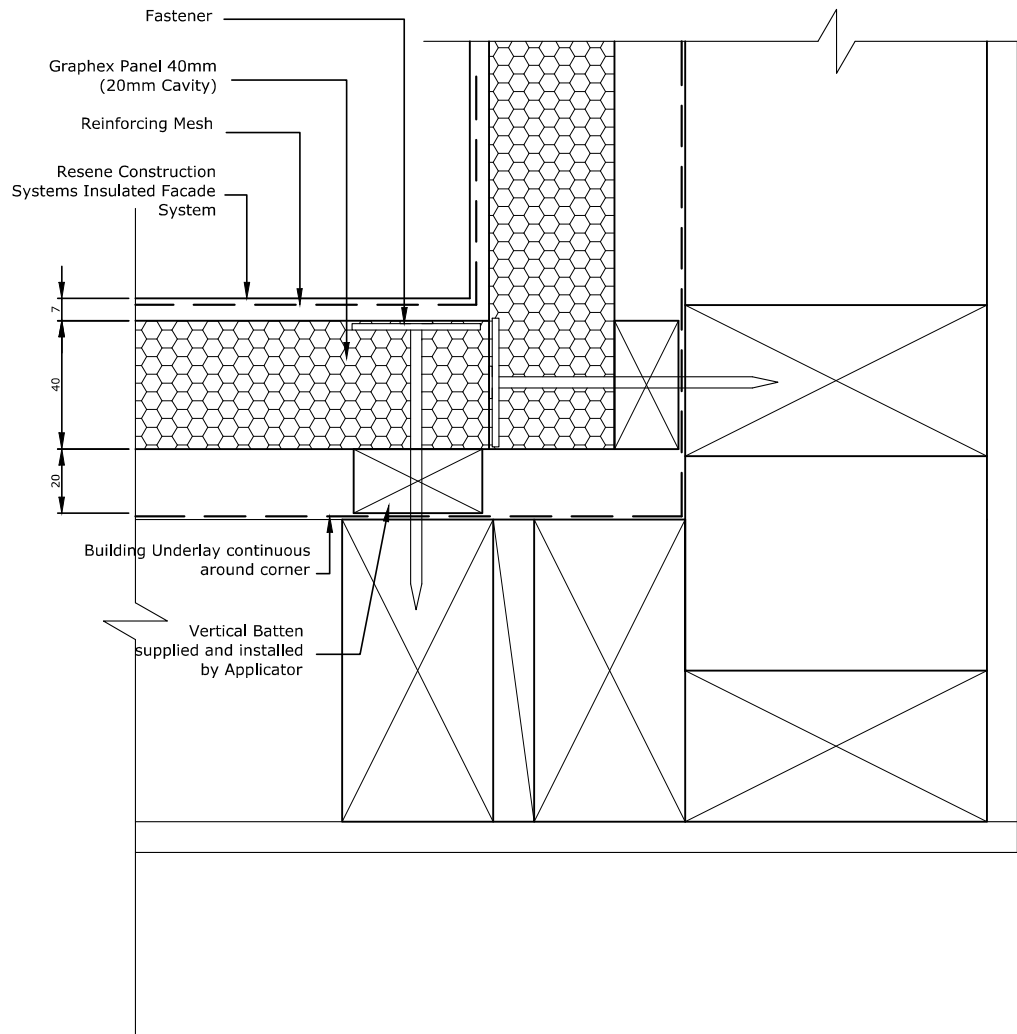
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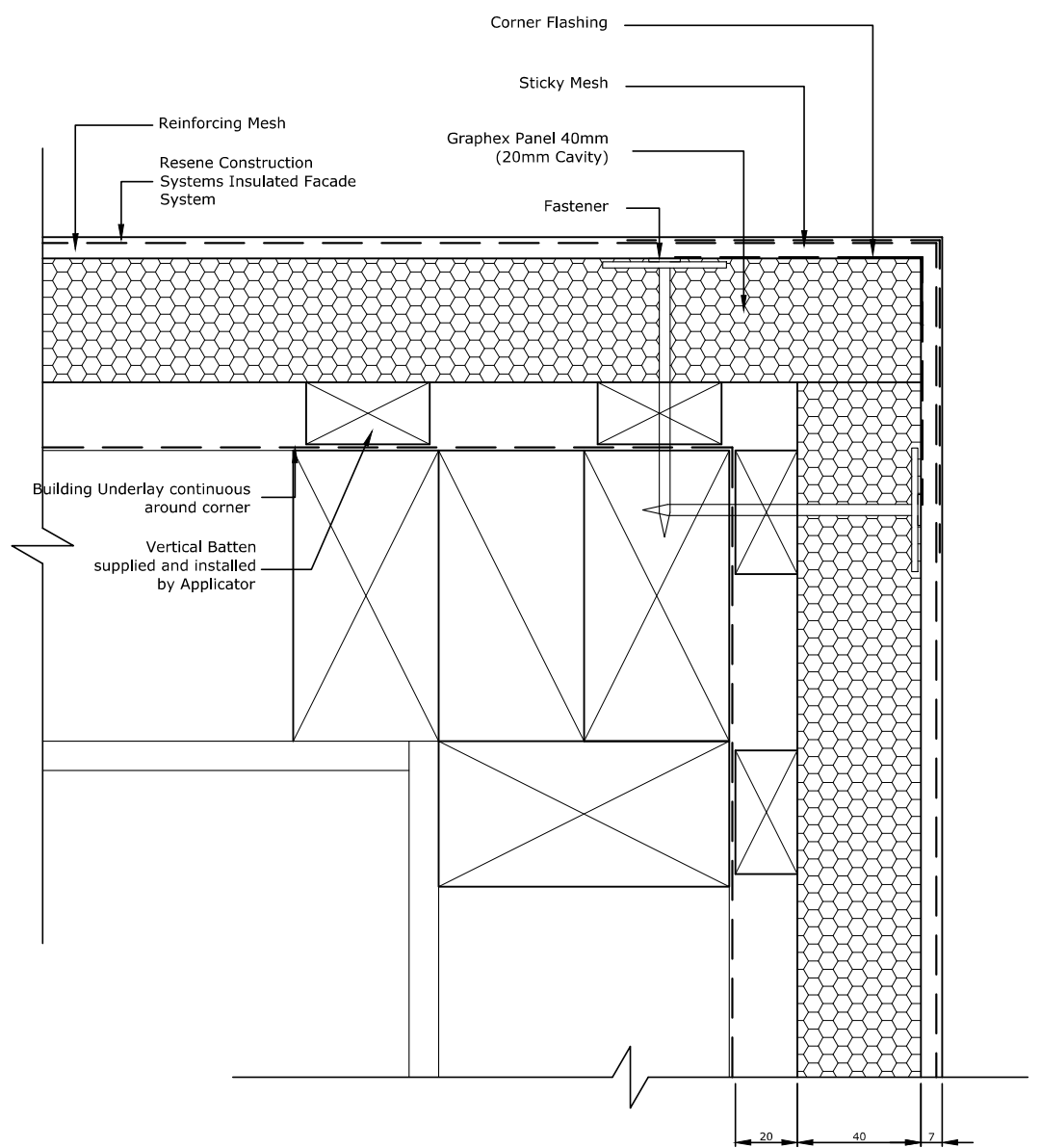


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 Mesh to be wrapped continuously around the internal corner, if there is a break in the mesh then an additional layer of Sticky Mesh must be used


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System  
 Insulated Facade System  
 Substrate  
 Graphex Panel 40mm (20mm Cavity)  
 Drawing Name  
 Internal Corner  
 Scale  
 1 : 2 @ A4  
 Date  
 1 November 2017  
 Sheet  
 70.04.00

  
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System  
 Insulated Facade System  
 Substrate  
 Graphex Panel 40mm (20mm Cavity)  
 Drawing Name  
 External Corner  
 Scale  
 1 : 2 @ A4  
 Date  
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 Sheet  
 70.03.00

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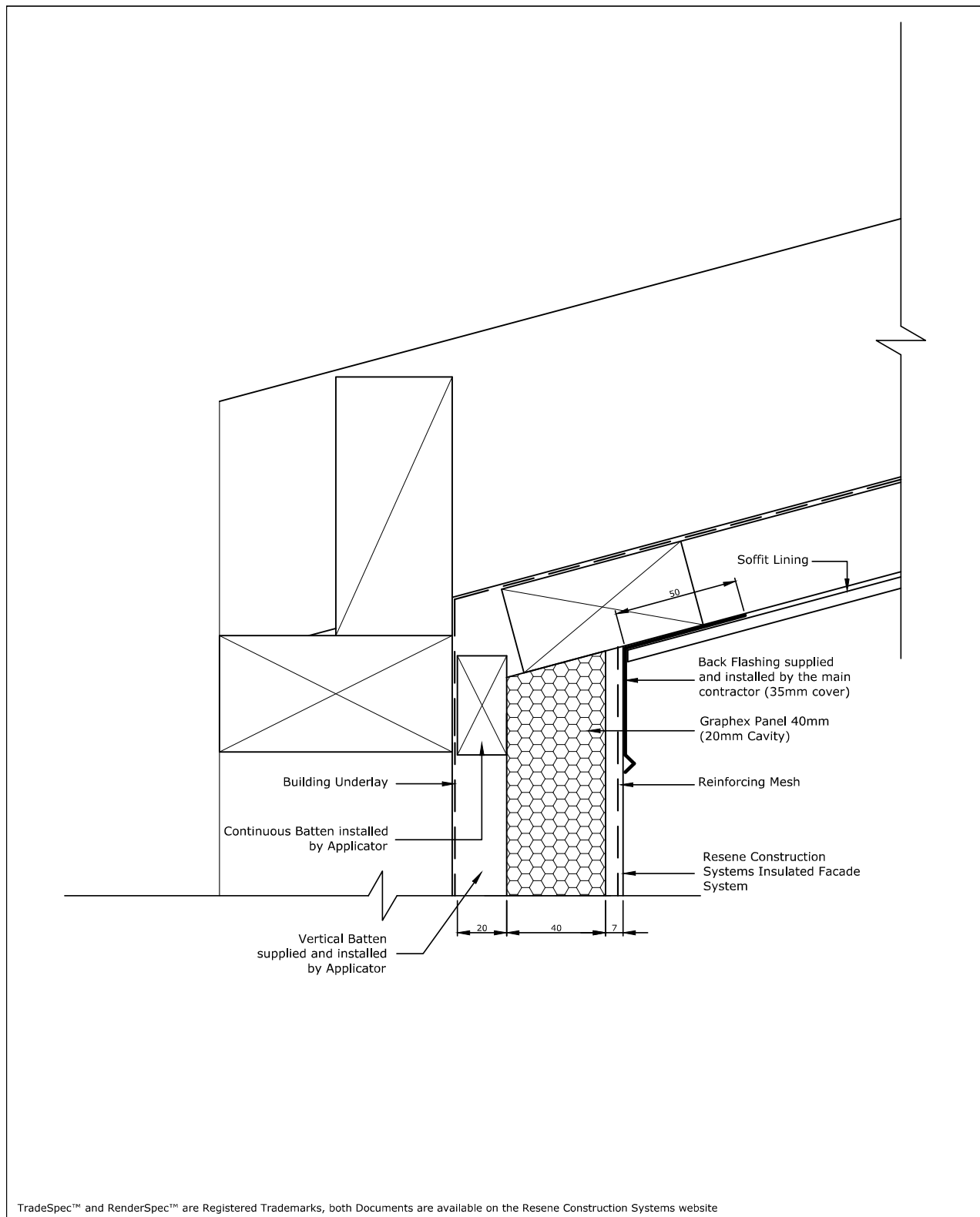
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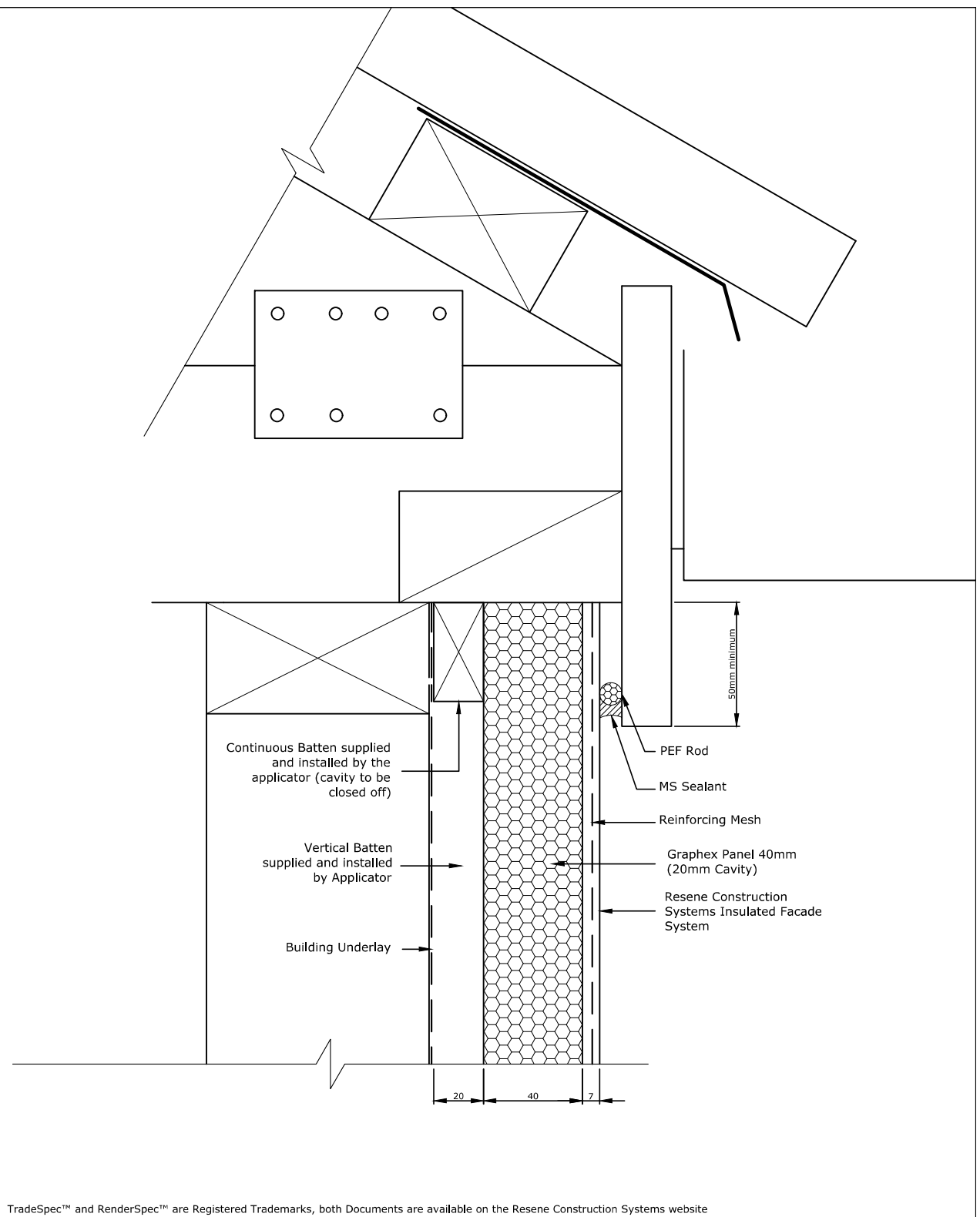
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**Resene Construction Systems**

System: Insulated Facade System  
 Substrate: Graphex Panel 40mm (20mm Cavity)  
 Drawing Name: Raking Soffit - Option 1

Scale: 1 : 2 @ A4  
 Date: 1 November 2017  
 Sheet: 70.08.30

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**Resene Construction Systems**

System: Insulated Facade System  
 Substrate: Graphex Panel 40mm (20mm Cavity)  
 Drawing Name: Face Fixed Fascia - Option 1

Scale: 1 : 2 @ A4  
 Date: 1 November 2017  
 Sheet: 70.08.40

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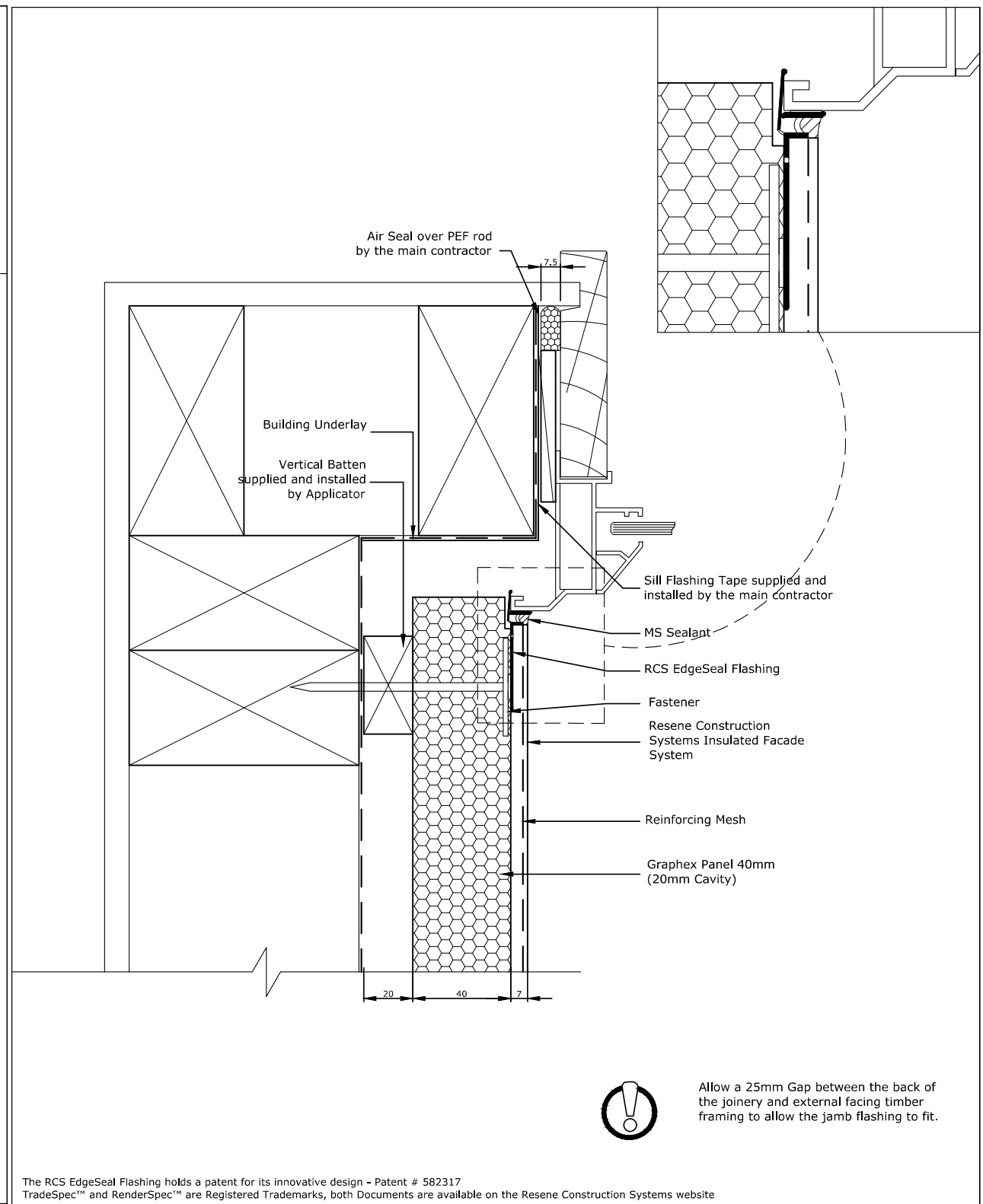
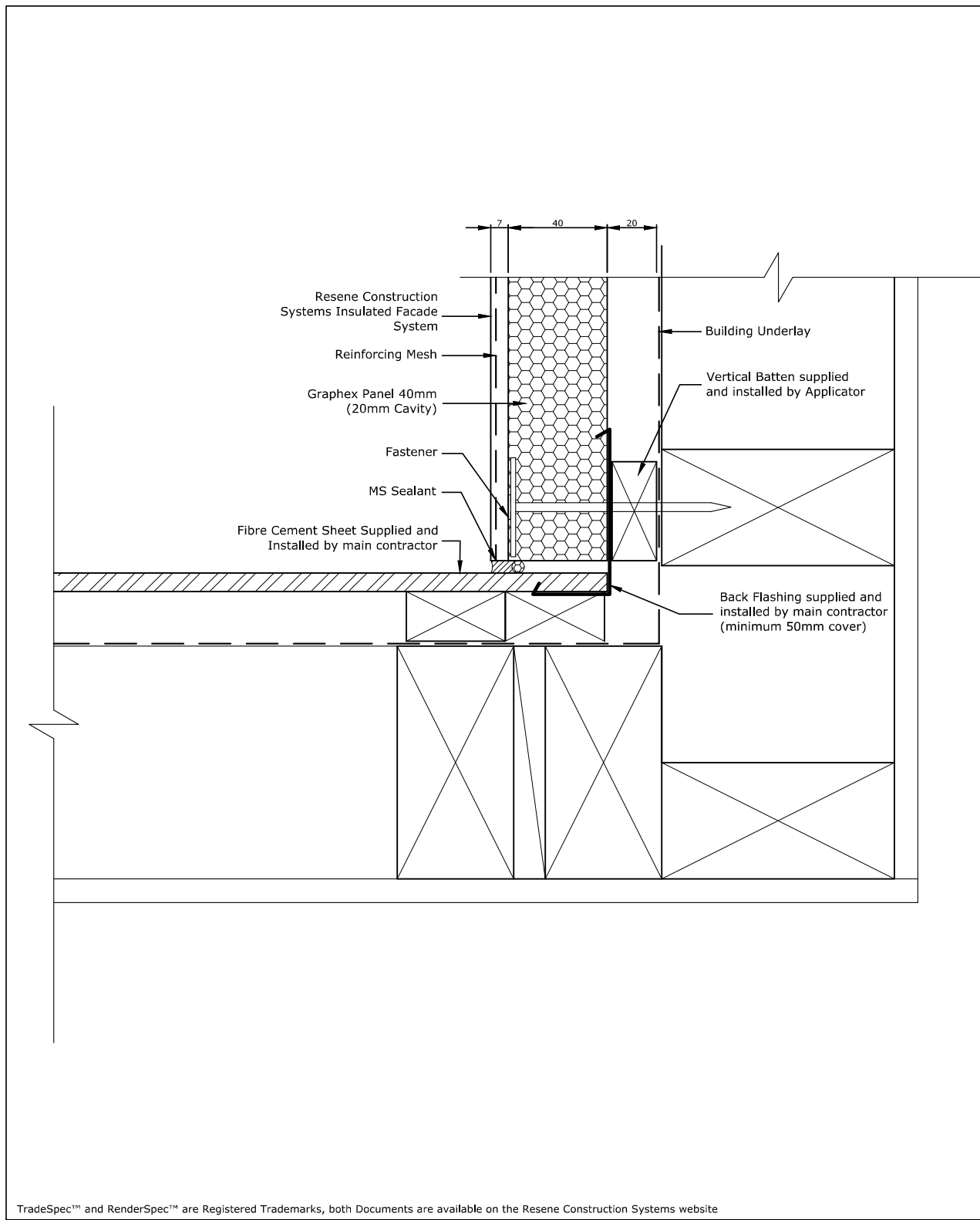
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Allow a 25mm Gap between the back of the joinery and external facing timber framing to allow the jamb flashing to fit.

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The RCS EdgeSeal Flashing holds a patent for its innovative design - Patent # 582317  
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	Substrate Graphex Panel 40mm (20mm Cavity)	Date 1 November 2017
	Drawing Name Internal Corner with Fibre Cement Sheet	Sheet 70.04.30

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	Substrate Graphex Panel 40mm (20mm Cavity)	Date 1 November 2017
	Drawing Name Internal Corner to Jamb - Option 1	Sheet 70.06.60

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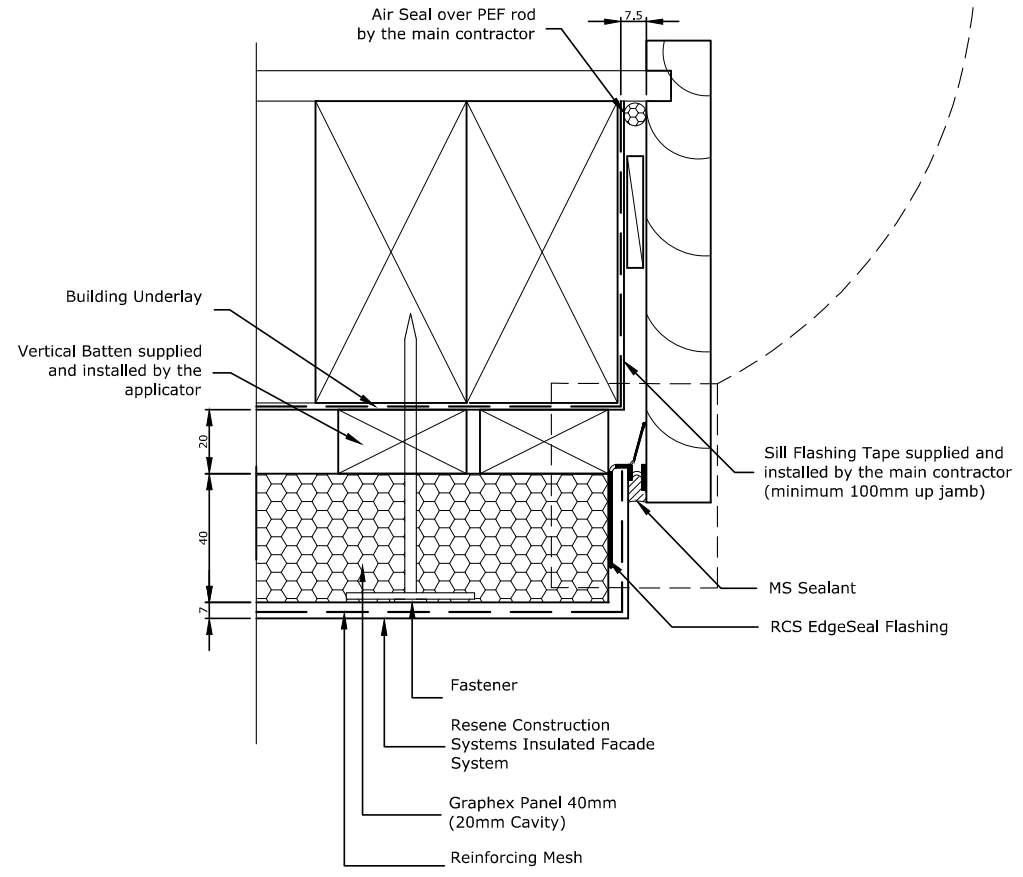


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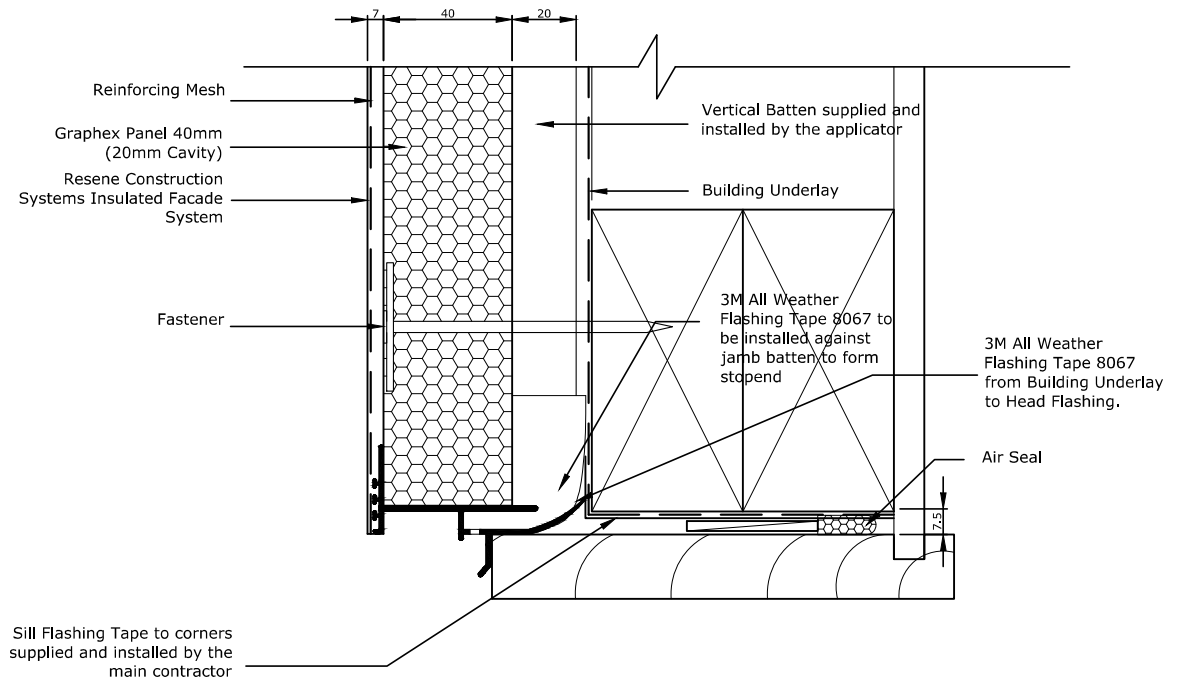


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The RCS EdgeSeal Head Flashing holds a patent for its innovative design - Patent # 588193  
 TradeSpec™ and RenderSpec™ are Registered Trademarks, both Documents are available on the Resene Construction Systems website

The RCS EdgeSeal Head Flashing must be installed so that it extends 10mm either side of the jamb extrusion.

**Resene Construction Systems**

System: Insulated Facade System  
 Substrate: Graphex Panel 40mm (20mm Cavity)  
 Drawing Name: Garage Door Jamb - Option 1

Scale: 1 : 2 @ A4  
 Date: 1 November 2017  
 Sheet: 70.06.50

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**Resene Construction Systems**

System: Insulated Facade System  
 Substrate: Graphex Panel 40mm (20mm Cavity)  
 Drawing Name: Garage Door Head - Option 1

Scale: 1 : 2 @ A4  
 Date: 1 November 2017  
 Sheet: 70.07.50

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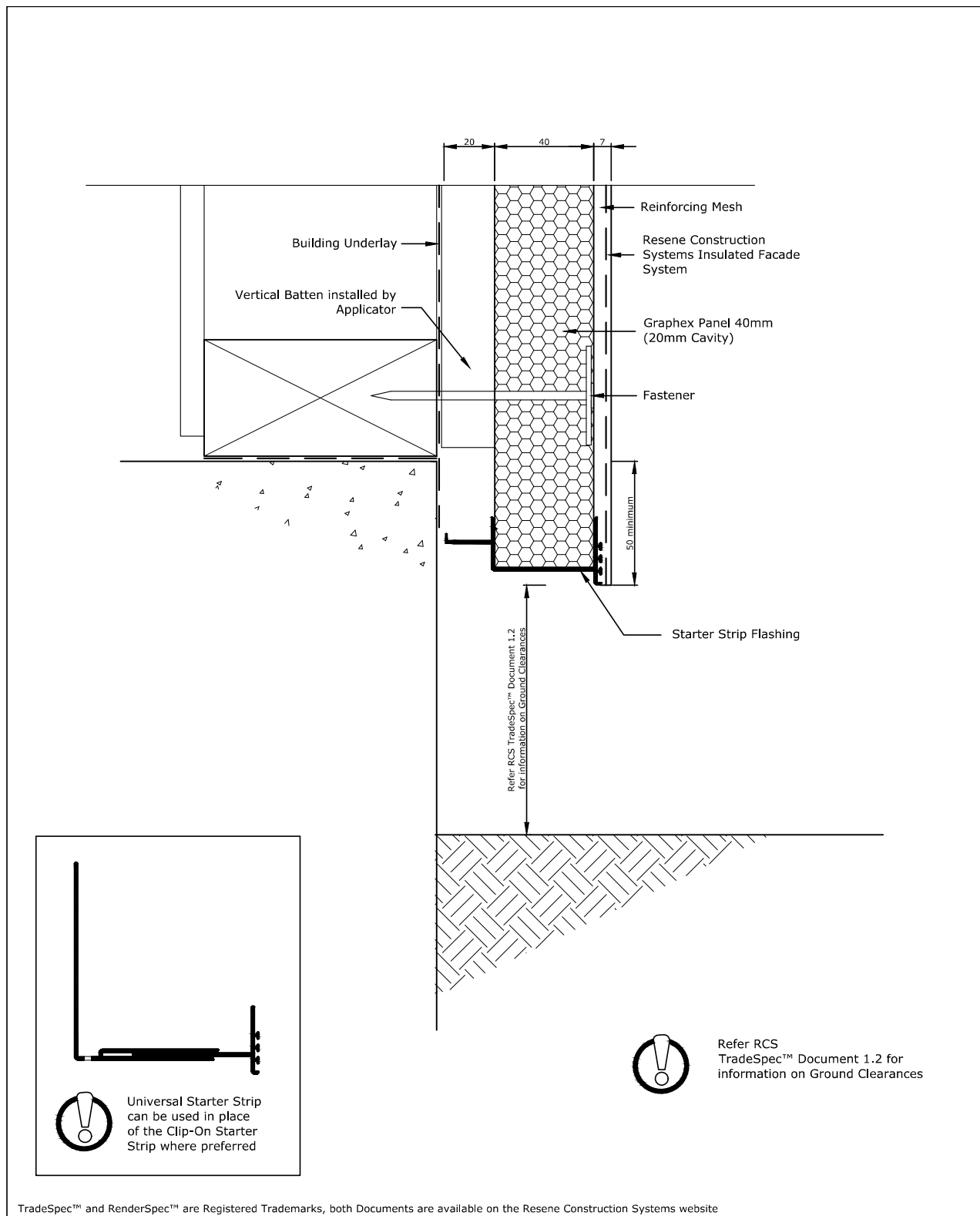
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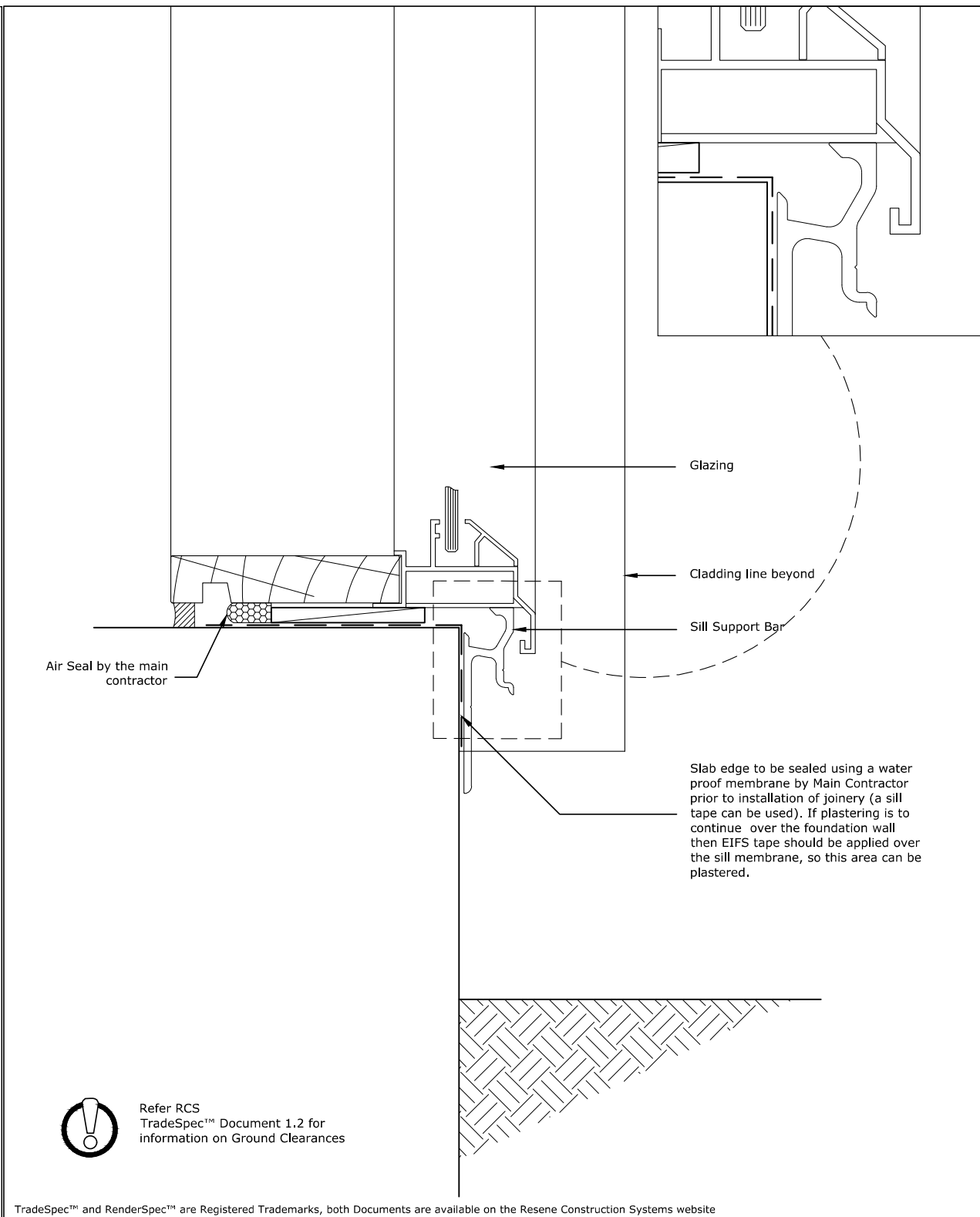


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**Resene Construction Systems**

System: Insulated Facade System  
 Substrate: Graphex Panel 40mm (20mm Cavity)  
 Drawing Name: Foundation

Scale: 1 : 2 @ A4  
 Date: 1 November 2017  
 Sheet: 70.02.00

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**Resene Construction Systems**

System: Insulated Facade System  
 Substrate: Graphex Panel 40mm (20mm Cavity)  
 Drawing Name: Door Sill - Option 1

Scale: 1 : 2 @ A4  
 Date: 1 November 2017  
 Sheet: 70.05.60

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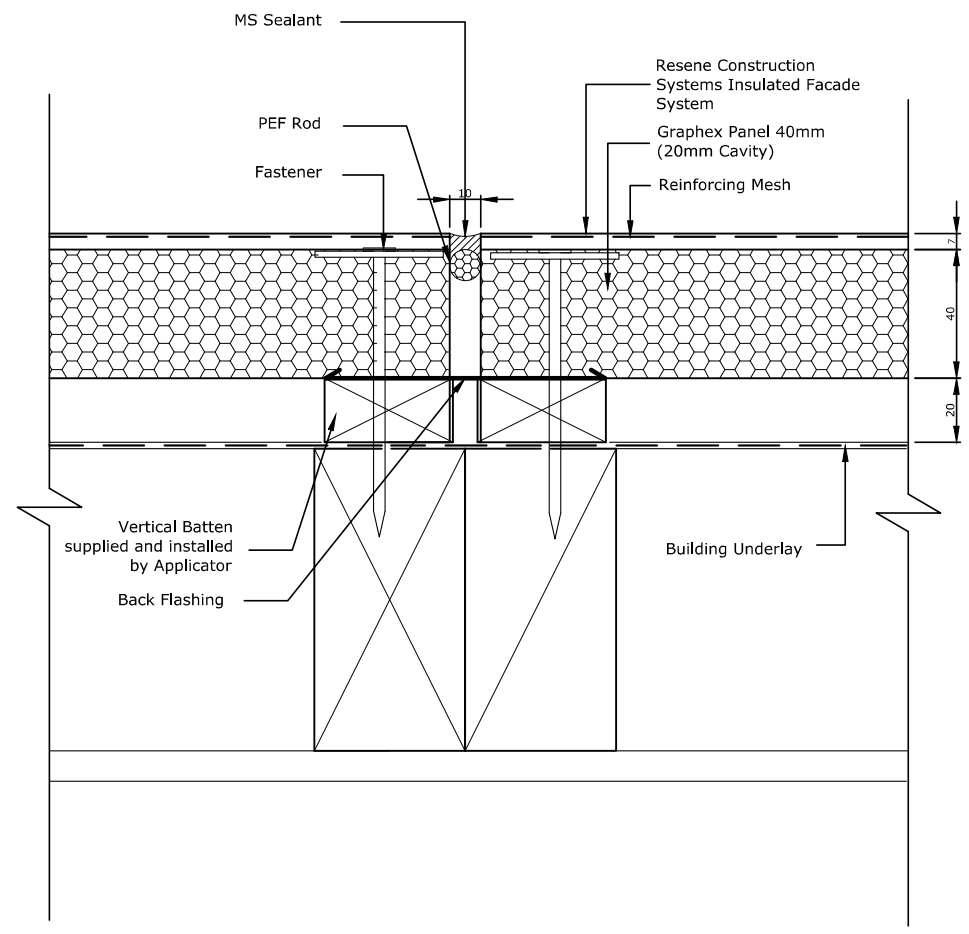
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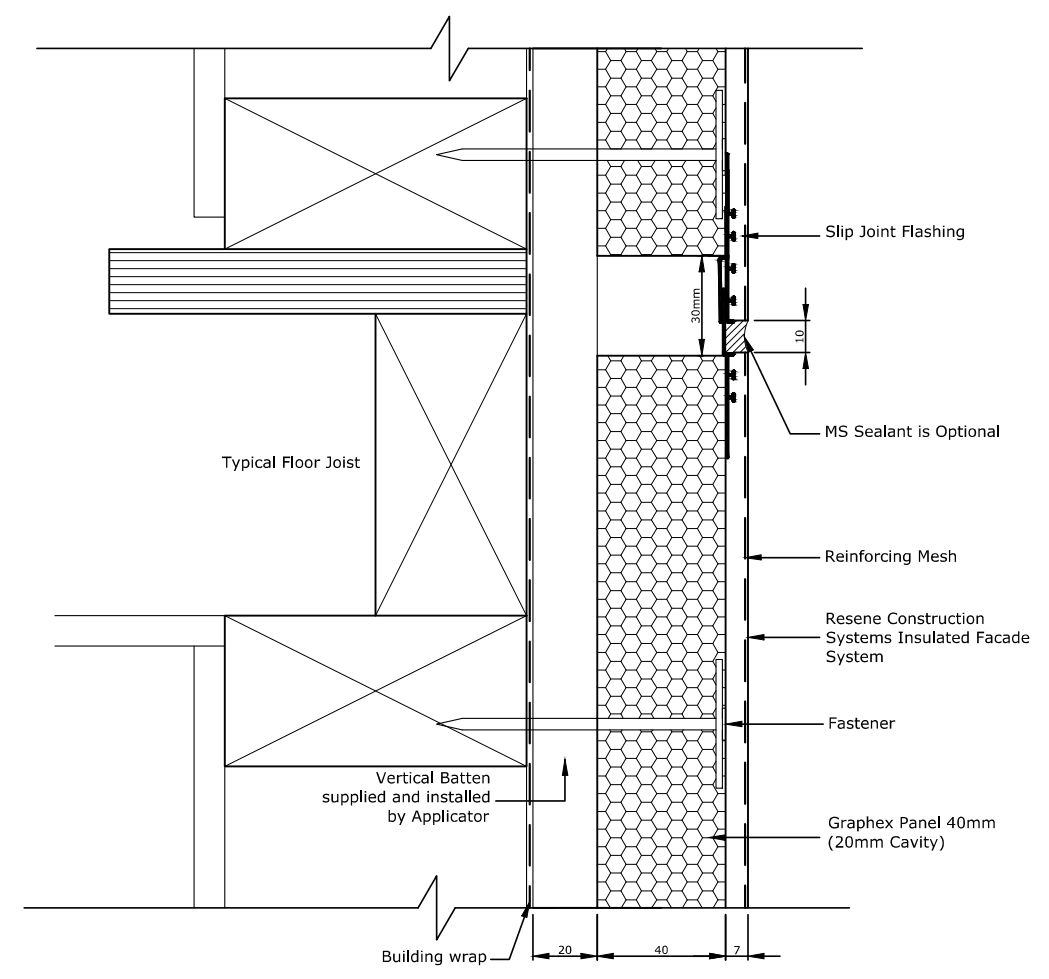



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 All Control Joint spacings and setouts are the responsibility of the Designer, for suggested locations refer to RCS TradeSpec™ Document 1.4


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 Please note that there should be no fixings into the floor joists, the substrate should be left floating over this point.  
 All Control Joint spacings and setouts are the responsibility of the Designer, for suggested locations refer to RCS TradeSpec™ Document 1.4 for suggested locations  
 Continuous cavities must not be limited to two-storeys or 7m in height in accordance with E2/AS1 Paragraph 9.1.9.4.

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	Substrate	Graphex Panel 40mm (20mm Cavity)	Date	1 November 2017
	Drawing Name	Vertical Control Joint - Option 1	Sheet	70.10.00

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	Substrate	Graphex Panel 40mm (20mm Cavity)	Date	1 November 2017
	Drawing Name	Horizontal Control Joint	Sheet	70.11.00

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**LOT 346**  
**FLEMINGTON**

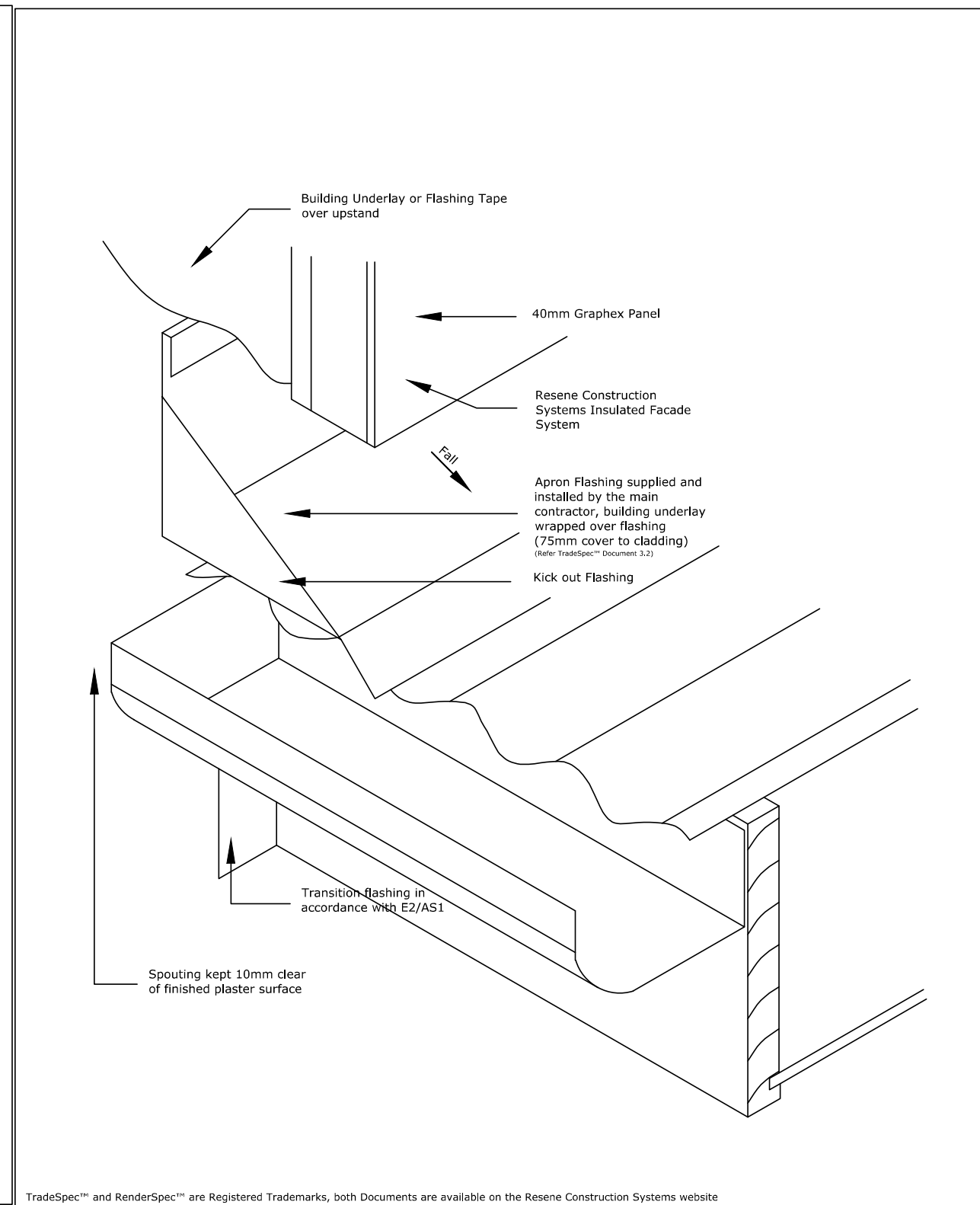
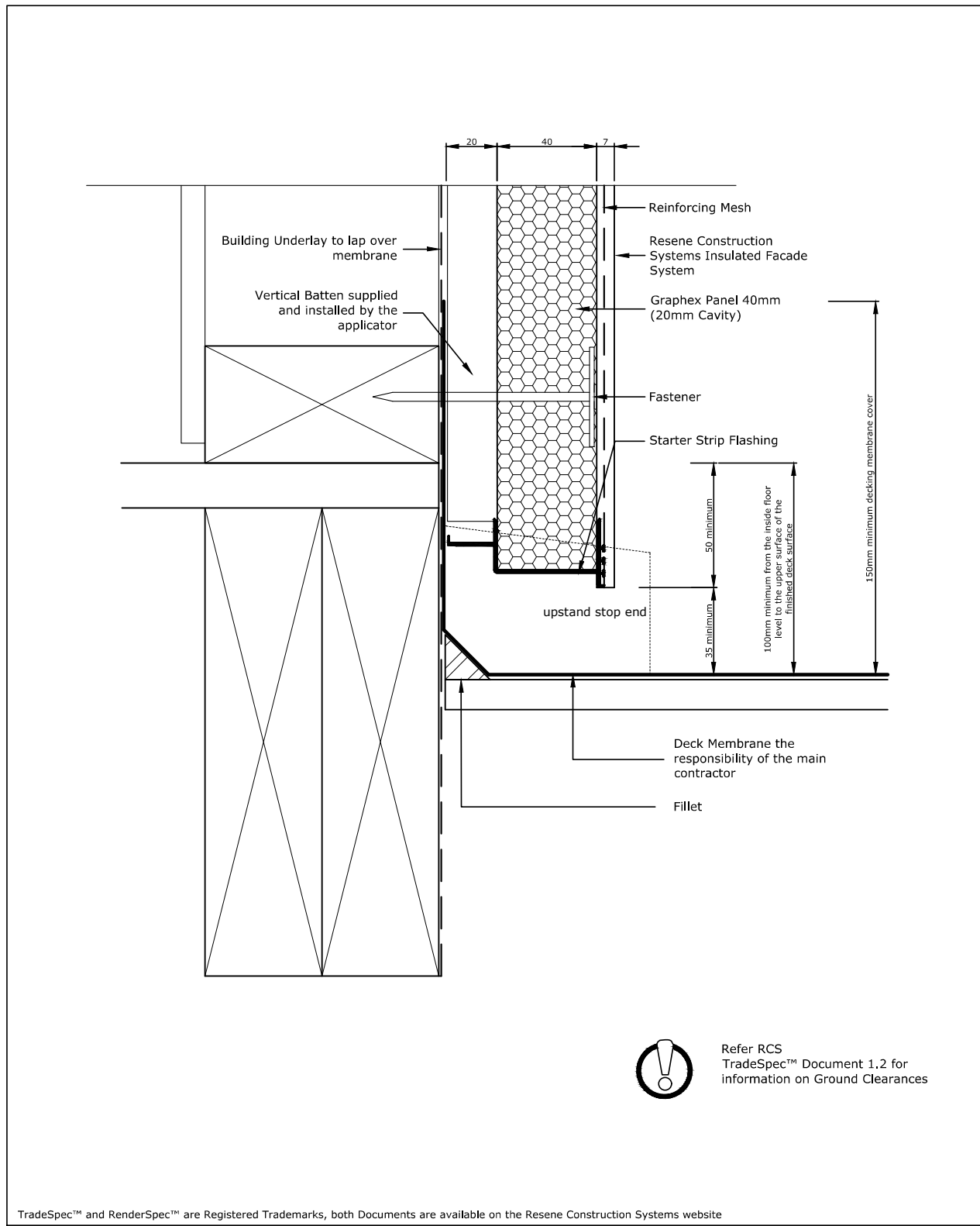
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 DATE: 12/11/2018



SDC - Sappreapthri veimthi thirugru vaxum thacum thoti 8-1 BGRIRZAIKhaRge30 of 70-01 081 1/20/18 2/26/18 deas andea



**Resene Construction Systems**

System: Insulated Facade System  
 Substrate: Graphex Panel 40mm (20mm Cavity)  
 Drawing Name: Deck Clearance

Scale: 1 : 2 @ A4  
 Date: 1 November 2017  
 Sheet: 70.14.00

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**Resene Construction Systems**

System: Insulated Facade System  
 Substrate: Graphex Panel 40mm (20mm Cavity)  
 Drawing Name: Roof Kickout Diverter

Scale: NTS @ A4  
 Date: 1 November 2017  
 Sheet: 70.09.02

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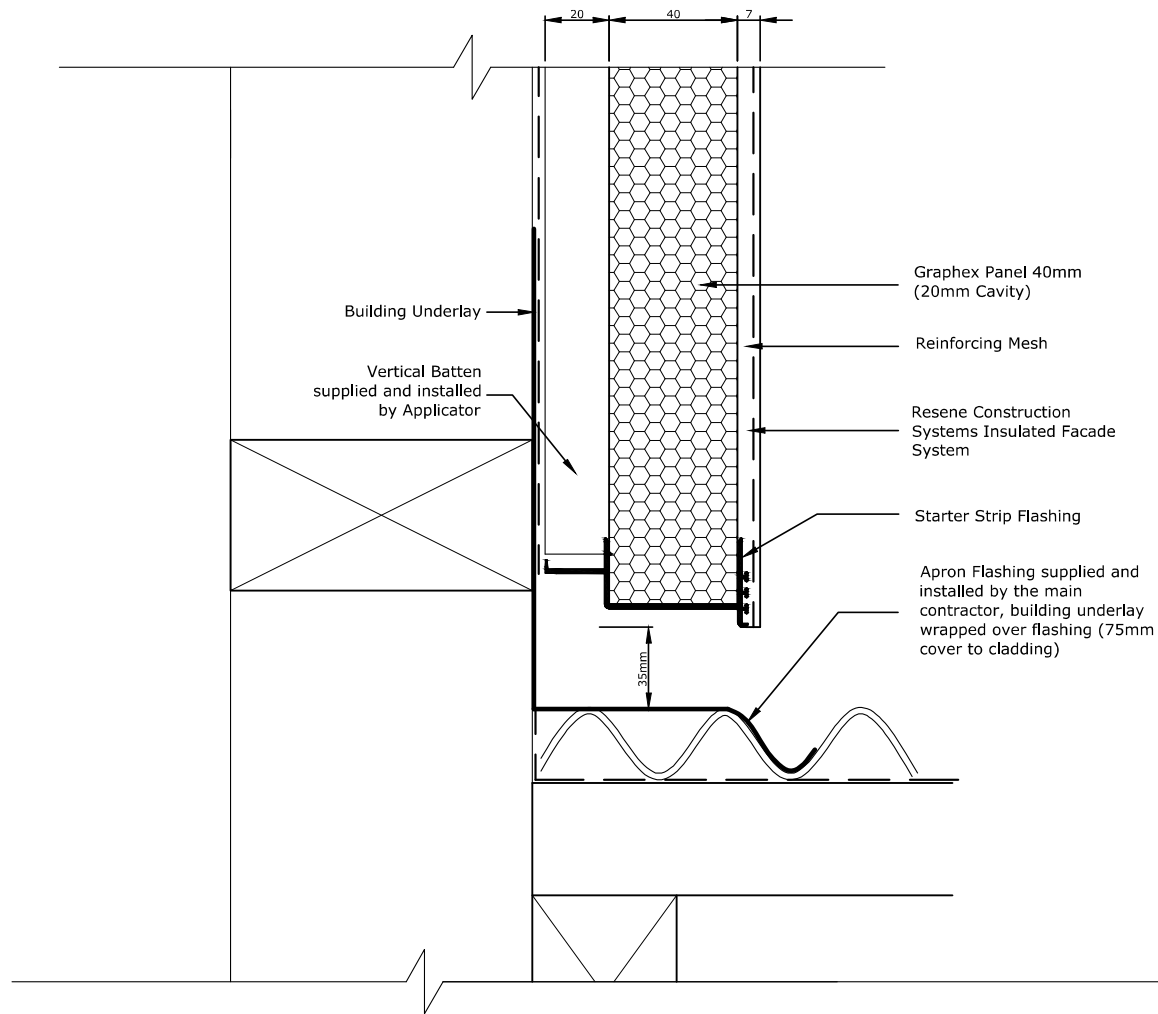
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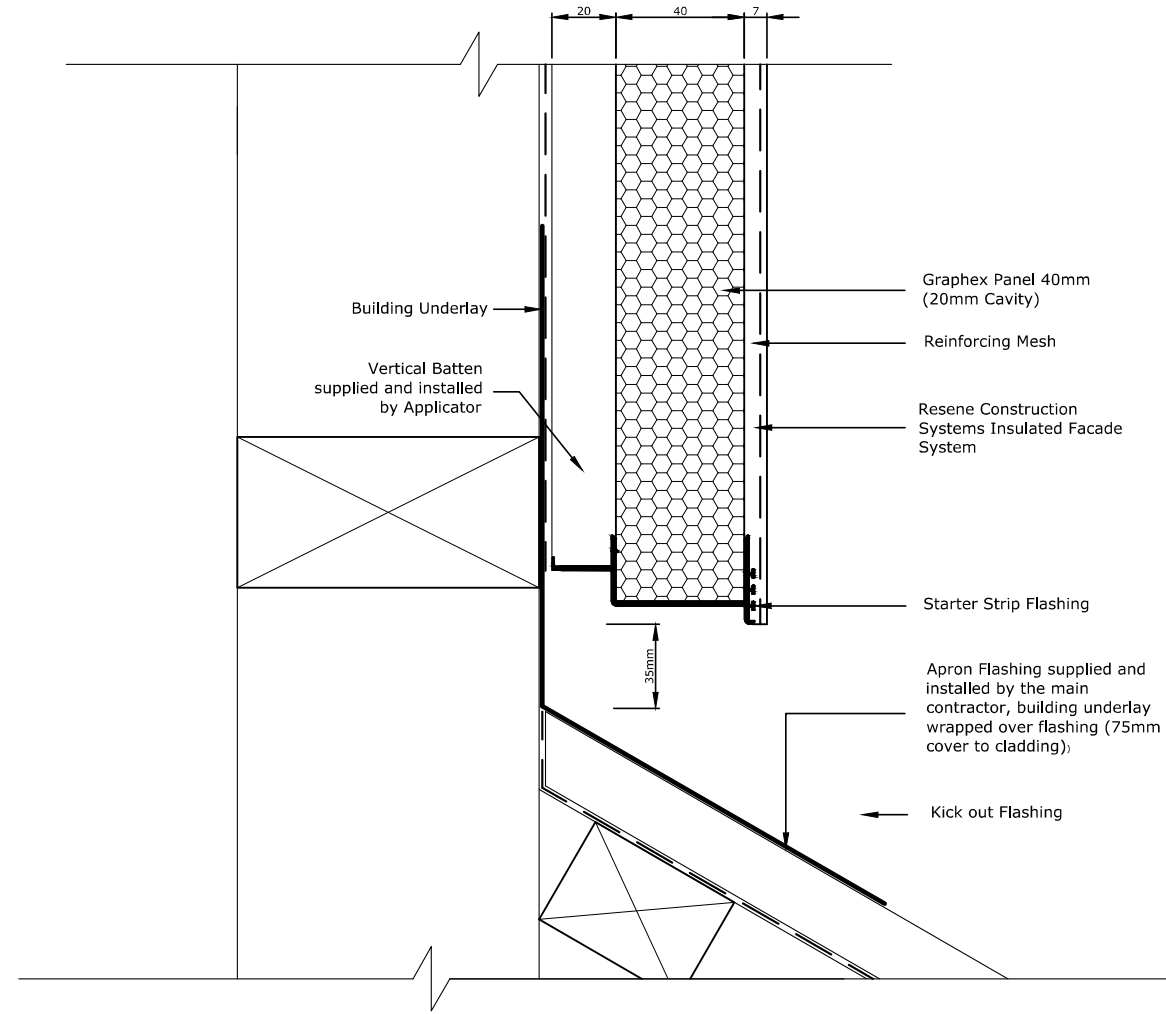
SDC - SappreavapbhoiveimlkuwthisgruwruxuumEatacumbe0t 8-1 BCGYRZRZat4chaRge34 ofgtz 1-on 081/2018 2/26at0deasandea



Refer RCS TradeSpec™ Document 1.2 for information on Roof Clearances

Metal flashing must be taped to the Building Underlay by the main contractor

TradeSpec™ and RenderSpec™ are Registered Trademarks, both Documents are available on the Resene Construction Systems website



Refer RCS TradeSpec™ Document 1.2 for information on Roof Clearances

Metal flashing must be taped to the Building Underlay by the main contractor

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System  
Insulated Facade System

Substrate  
Graphex Panel 40mm (20mm Cavity)

Drawing Name  
Roof Apron - Horizontal

Scale  
1 : 2 @ A4

Date  
1 November 2017

Sheet  
70.09.01



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System  
Insulated Facade System

Substrate  
Graphex Panel 40mm (20mm Cavity)

Drawing Name  
Roof Apron

Scale  
1 : 2 @ A4

Date  
1 November 2017

Sheet  
70.09.00

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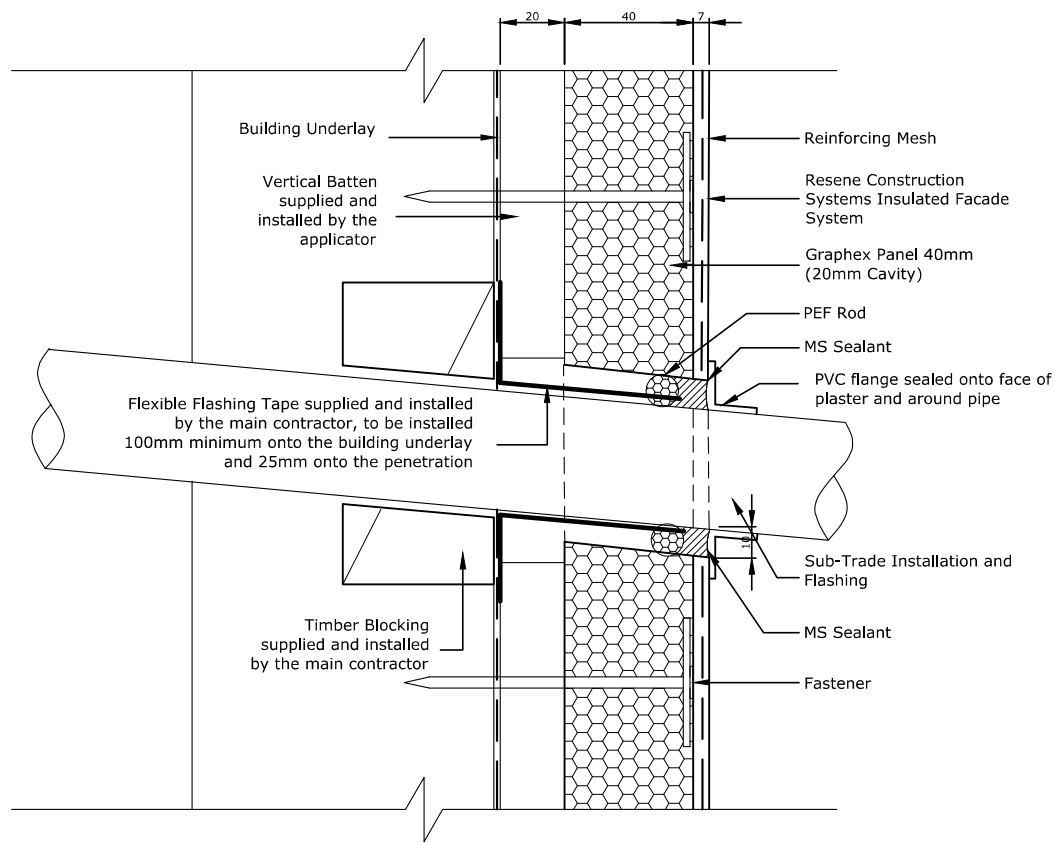
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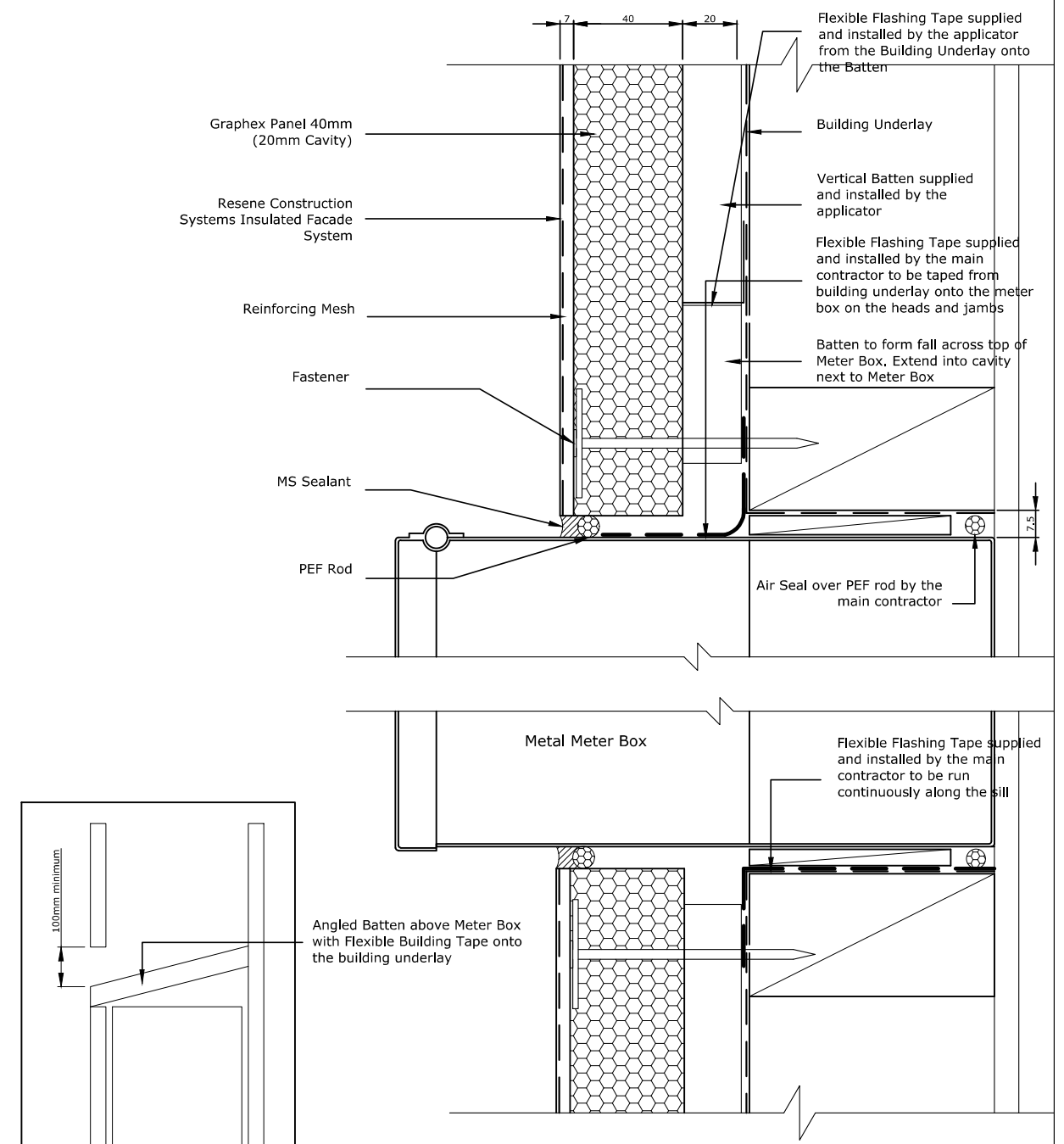



SDCC - Sappreavapbhoiveimkkuvetinsgru vaxuum Eacumbeu 8-1 BCG#RZa14cha Rge32 of 72-01 081 1/2018 2/26afodeas andea




 The responsibility for the penetration is the responsibility of the main contractor, where possible and practical use a flange.  
 It is important that there is adequate support for the penetration in the form of timber packing. The penetration should be angled slightly away from the cladding so any moisture is diverted away from the cladding.

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 The responsibility for the penetration is the responsibility of the main contractor, where possible and practical use a flange.

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 System: Insulated Facade System  
 Substrate: Graphex Panel 40mm (20mm Cavity)  
 Drawing Name: Pipe Penetration  
 Scale: 1 : 2 @ A4  
 Date: 1 November 2017  
 Sheet: 70.12.20

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 System: Insulated Facade System  
 Substrate: Graphex Panel 40mm (20mm Cavity)  
 Drawing Name: Meter Box Penetration  
 Scale: 1 : 2 @ A4  
 Date: 1 November 2017  
 Sheet: 70.12.10

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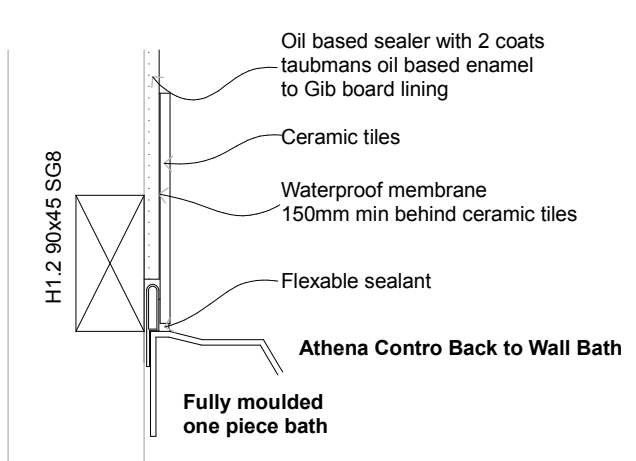
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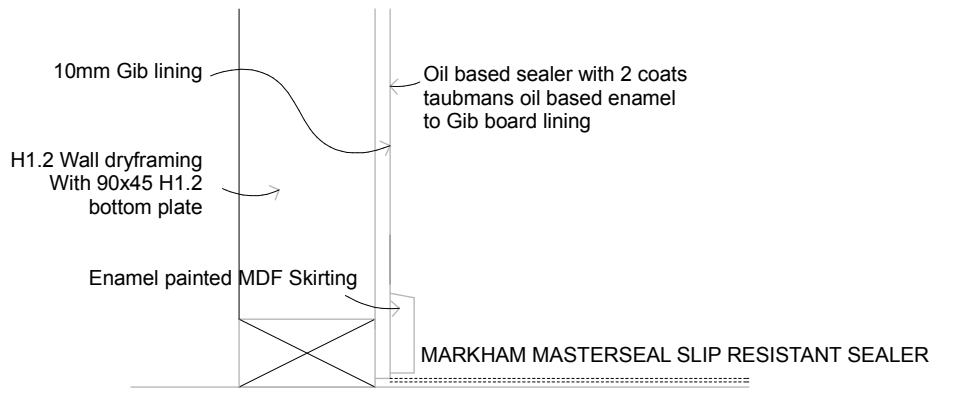


SDC - Sppprevepuphroiveimkkuvetrisgru wruuum mtaucumtu 8-1 BCGH8RZa14cha fige33 of 73-01 081 1/2018 2/25a10deasandea



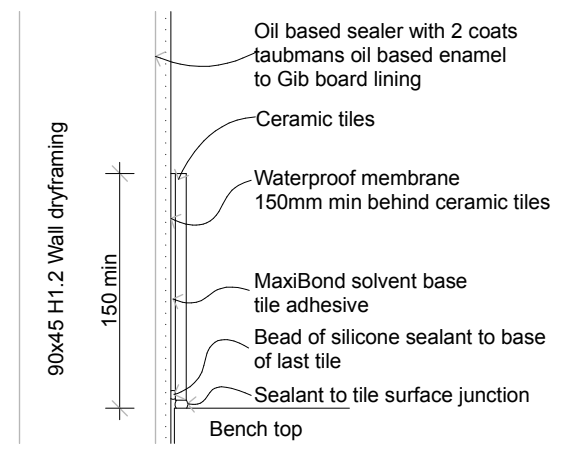
### BATH SPLASHBACK

SCALE: 1:5

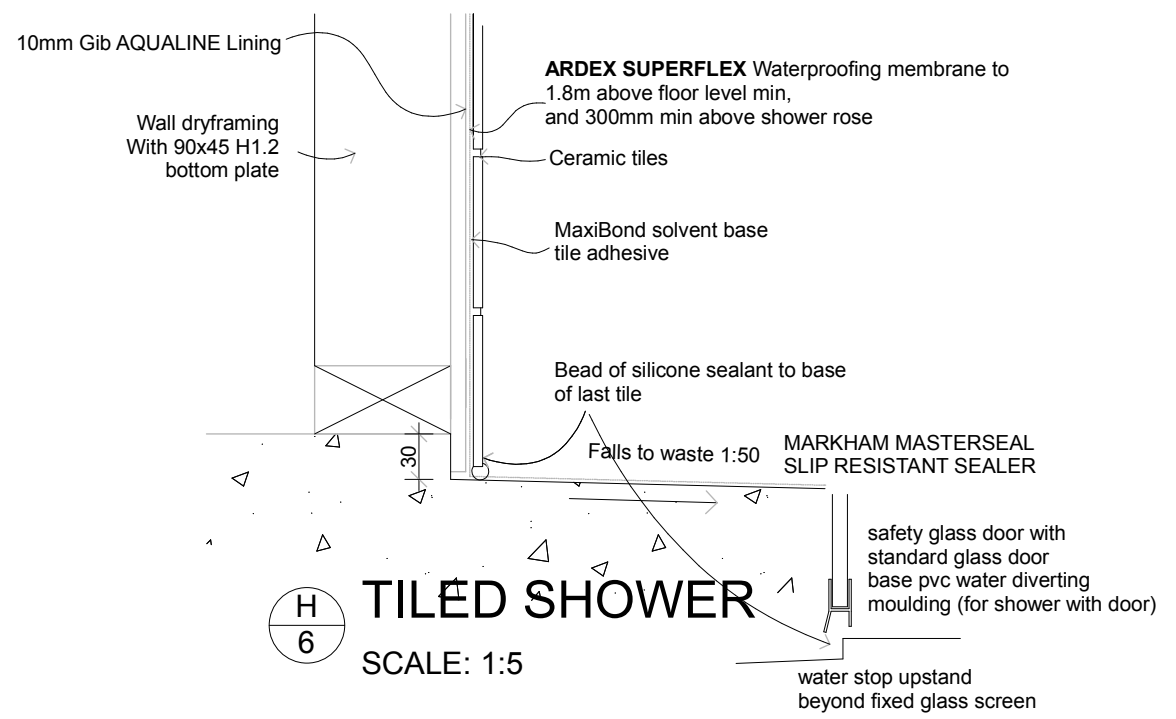


### POLISHED CONCRETE FLOOR

SCALE: 1:5

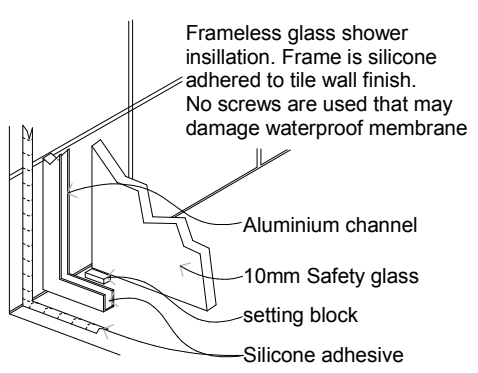


### BASIN/BENCH TOP SPLASHBACK

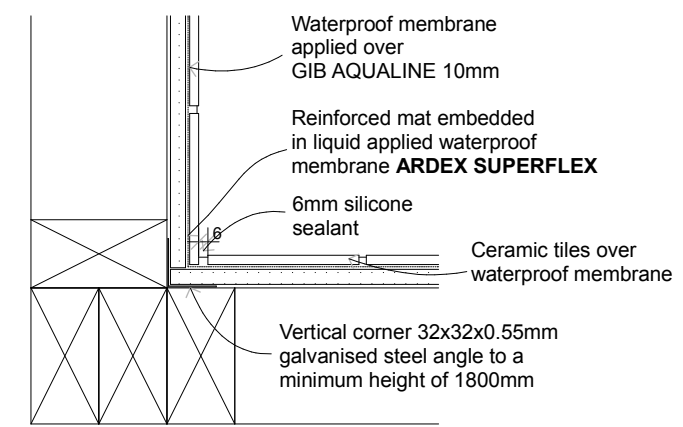


### TILED SHOWER

SCALE: 1:5

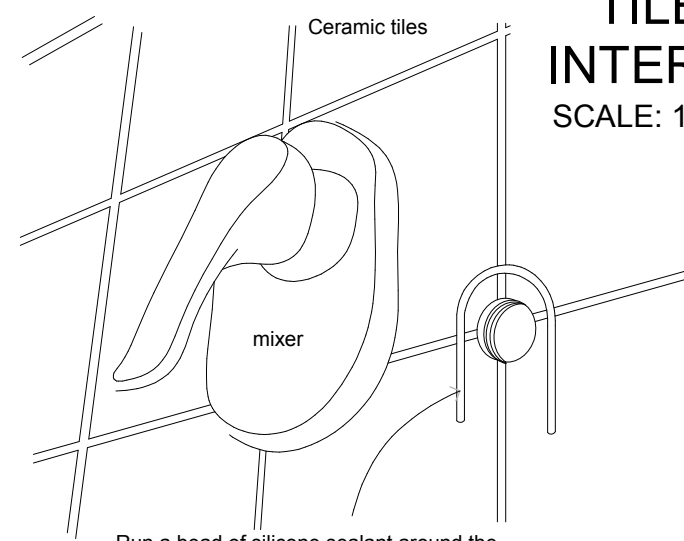


### GLASS SHOWER SCREEN INSTALL



### TILED SHOWER INTERNAL CORNER

SCALE: 1:5



Run a bead of silicone sealant around the mixer unit on the tiles extending below the bottom of the pipe aperture.

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### BRACING PLAN

### GENERAL LIGHTING PLAN

- IC RATED RECESSED DOWNLIGHT WITH COMPACT FLUORESCENT LAMPS
- DOUBLE POWER OUTLETS
- INDICATES TOP PLATE CONTINUATION OR CEILING BATTEN LOCATION as per NZS3602 2011 8.7.3.4

140 x 35 extra top plate when used (see 8.7.4.2)

Connection rated as per table below

(A) BUTT JOINT

450 long blocking fixed to each plate with connection capacity in tables below. Fix blocking to top plate and to ceiling joist

(B) BUTT JOINT (WITH CEILING JOIST)

Capacities of metal plate joints		Capacities of nailed joints	
Up to 3 kN	3 / 30 x 3.15 mm nails per side	Up to 3 kN	3 / 100 x 3.75 mm nails per side
Up to 6 kN	6 / 30 x 3.15 mm nails per side	Up to 6 kN	6 / 100 x 3.75 mm nails per side

NOTE – See section 4 for durability requirements.

Unless otherwise stated, all dimensions are in mm.

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## Demand Calculation Sheet

### Job Details

Name:	J&M TUIMAUNIE
Street and Number:	LOT 346 FLEMINGTON
Lot and DP Number:	
City/Town/District:	LINCOLN
Designer:	
Company:	
Date:	

### Building Specification

Number of Storeys	1
Floor Loading	2 kPa
Foundation Type	Slab
<b>Single</b>	
Cladding Weight	Light
Roof Weight	Light
Room in Roof Space	No
Roof Pitch (degrees)	10
Roof Height above Eaves (m)	2.2
Building Height to Apex (m)	4.8
Ground to Lower Floor (m)	0.2
Average Stud Height (m)	2.55
Building Length (m)	20.46
Building Width (m)	15.41
Building Plan Area (m <sup>2</sup> )	230.3

### Building Location

<b>Wind Zone = High</b>	<b>Earthquake Zone 2</b>
Wind Region: A	Soil Type: D & E (Deep to Very Soft)
Lee Zone: No	Annual Prob. of Exceedance: 1 in 500 (NZS3604:2011 Default)
Ground Roughness: Open	
Site Exposure: Exposed	
Topography Class: T1	

### Bracing Units required for Wind

	Along	Across
Single Level	791	990

### Bracing Units required for Earthquake

	Along & Across
Single Level	869

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PROJECT TITLE:  
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## Single Level Along Resistance Sheet

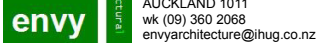
Job Name: J&M TUIMAUNIE									Wind	EQ
									Demand	
									791	869
									Achieved	
									2031	1835
									257%	211%
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)		
A	A1	0.60		2.55	EP1 0.6	Ecoply	54	59		
	A2	1.20		2.55	EP1 1.2	Ecoply	136	152		
									189 OK	212 OK
B	B1	0.60		2.55	BL1-H	GIB®	56	57		
	B2	0.40		2.55	BL1-H	GIB®	34	38		
	B3	0.60		2.55	BL1-H	GIB®	56	57		
	B4	0.60		2.55	BL1-H	GIB®	56	57		
	B5	0.90		2.55	BL1-H	GIB®	96	87		
	B6	0.90		2.55	BL1-H	GIB®	96	87		
									393 OK	382 OK
C	C1	4.40		2.55	GS1-N	GIB®	286	248		
	C2	2.40		2.55	GS1-N	GIB®	156	136		
	C3	0.80		3.9	GS2-N	GIB®	42	38		
									484 OK	422 OK
D	D1	2.20		2.55	GS1-N	GIB®	143	124		
	D2	1.60		2.55	BL1-H	GIB®	193	157		
	D3	3.00		2.4	GS1-N	GIB®	207	180		
									543 OK	461 OK
E	E1	0.50		2.55	GS1-N	GIB®	26	27		
	E2	2.00		2.55	BL1-H	GIB®	241	196		
	E3	1.20		2.55	GS1-N	GIB®	78	68		
	E4	1.20		2.55	GS1-N	GIB®	78	68		
									423 OK	359 OK



## Single Level Across Resistance Sheet

Job Name: J&M TUIMAUNIE									Wind	EQ
									Demand	
									990	869
									Achieved	
									1947	1744
									197%	201%
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)		
M	M1	2.60		2.55	GS1-N	GIB®	169	147		
	M2	0.90		2.55	GS1-N	GIB®	53	50		
									222 OK	197 OK
N	N1	3.10		2.55	GS1-N	GIB®	201	175		
	N2	3.60		2.55	GS1-N	GIB®	234	203		
									435 OK	378 OK
O	O1	3.10		2.55	GS1-N	GIB®	201	175		
	O2	3.60		2.55	GS1-N	GIB®	234	203		
									435 OK	378 OK
P	P1	1.80		2.55	GS1-N	GIB®	117	102		
	P2	1.40		2.55	GS1-N	GIB®	91	79		
	P3	2.00		2.55	GS1-N	GIB®	130	113		
	P4	0.70		2.55	EP1 0.6	Ecoply	63	69		
									400 OK	363 OK
Q	Q1	2.30		3.8	BL1-H	GIB®	186	151		
									186 OK	151 OK
R	R1	0.50		2.4	BL1-H	GIB®	47	50		
	R2	0.50		2.4	BL1-H	GIB®	47	50		
	R3	0.70		2.55	GS1-N	GIB®	39	39		
	R4	0.70		2.55	GS1-N	GIB®	39	39		
	R5	0.60		3.1	BL1-H	GIB®	46	47		
	R6	0.60		2.8	BL1-H	GIB®	51	52		
									268 OK	277 OK

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## DESIGN CERTIFICATE

Technical basis for structural design methodology contained in designIT for houses - New Zealand.

designIT for houses, New Zealand has been developed by experienced timber engineers to assist designers in selecting appropriate sizes of structural laminated veneer lumber products manufactured by Carter Holt Harvey (including hySPAN, hy90, hyONE and hyJOIST) and other generic stress grades of timber, to be used as structural elements for the construction of buildings that fall within the scope of NZS 3604.

The design methodology used for the software complies with the loading and general design requirements contained within AS/NZS 1170 and with timber structural design in accordance with NZS 3603:1993 including Amendment 4 (Verification method B1/MM1, 6.1).

designIT relies on the accurate input of span and loading information by the user. Where accurate inputs are submitted the product and/or stress grade and the size given will comply with the structural requirements of the New Zealand Building Code (NZBC), provided the installation is in accordance with the installation requirements provided by designIT and/or in product literature and/or NZS 3604, or specific engineering design, as appropriate.

Futurebuild LVL and Laserframe components, when used and treated to the required treatment levels prescribed in NZS 3602 and NZS 3604, as modified by Acceptable Solution B2/AS1, will comply with the requirements of the NZBC (Acceptable Solution B2/AS1, 3.2).

### References:

NZS 3603:1993 Timber Structures Standard.	AS/NZS 1170:2002 Structural design actions, Parts 0 and 1.
NZS 3604:2011 Timber-framed buildings.	AS/NZS 1170:2011 Structural design actions, Part 2: Wind actions.
AS 1720.1:2010 Timber structures. Part 1: Design methods.	AS/NZS 1170:2003 Structural design actions, Part 3: Snow and ice actions.
AS 1720.3:2016 Timber structures. Part 3: Design criteria for timber-framed residential buildings	

This Design Certificate, and any associated warranty/certification, is void where there has been substitution of alternate products not detailed within the Member Specification.

Version date: 3 May 2017

### For further information or advice contact:

Carter Holt Harvey Woodproducts New Zealand,  
173 Captain Springs Road, Onehunga. Auckland  
Telephone: 0800 808 131  
Facsimilie: 0800 808 132  
Email: designit@chhwoodproducts.co.nz  
Web: http://www.chhwoodproducts.co.nz

### Specifier details:

Specifier:	Nathan Vartha
Business name:	Envy Architecture
Email:	nathan@nvad.co.nz

### Project & site details:

Project:	Tuimaunei House
At (address):	
Design wind zone	High
Snow loading	Design snow zone: N4, Altitude: 120 m (sub-alpine), Ground snow load, $S_g^{1,2} = 1.0$ kPa

- designIT does not include any allowance for the effects of drifting and sliding of snow.
- Snow loads are applied to roofed over structures only, the design of exposed floors/decks are not covered by designIT.

## MEMBER DESIGN DETAILS

### Member 1

- 1) Member code and description R1 - Common rafters
- 2) Date prepared 29 August 2018

- 3) Serviceability criteria AS 1720.1: 2010 and AS 1720.3: 2016
- 4) Design inputs
 

Span	2.8 m - single span
Rafter spacing	900 mm
Roof mass	30 kg/m <sup>2</sup>
Lateral restraint condition	Bottom edge restrained by ceiling/ceiling battens at 600 crs max.
Roof snow load	0.7 kPa ( $\mu=0.7$ , $C_e=1.0$ )
- 5) Member specification
 

Size, stress grade/product	Use 240 x 45 SG8 Laserframe
Material type	Dry softwood, machine stress graded and verified (NZS 3622)
Assumed design density	< 480 kg/m <sup>3</sup>

### 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi_L Q^*$	9.3 mm	1.2 mm (long term)	7.5
Live load - $\Psi_S Q$	11.2 mm	0.4 mm	25.8
Live load - $\Psi_S Q$	11.2 mm	1.2 mm	9.2
Wind load - $W_s$	18.7 mm	1.3 mm	14.4
Snow load - $S_s$	9.3 mm	1.0 mm	9.5

\*Critical serviceability load case  
See 'Notes for interpretation of serviceability data' at the end of this report

### 7) Reactions

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup>	
		End kN <sup>4</sup>	
1.35G	0.60	-0.7	
1.2G + 1.5Q	0.80	-2.3	
1.2G + $S_u$ + $\Psi_c Q$	0.80	-1.5	
1.2G + $W_u$ + $\Psi_c Q$	1.00	-1.6	
0.9G + $W_u$	1.00	1.1	

### 8) Installation requirements

- Minimum bearing - end supports, 30 mm.

## Member 2

- 1) Member code and description R2 - Common rafters
- 2) Date prepared 29 August 2018
- 3) Serviceability criteria AS 1720.1: 2010 and AS 1720.3: 2016
- 4) Design inputs
 

Span	3.8 m - single span
Rafter spacing	900 mm
Roof mass	30 kg/m <sup>2</sup>
Lateral restraint condition	Bottom edge restrained by ceiling/ceiling battens at 600 crs max.

SDC - SpppvepdpbriiveimtkuwtisgruwruxamEacumB0t18-1BC118RZa14chaRge36 of g1 36-01 081 1/2018 2/26af0deasandea

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Roof snow load 0.7 kPa ( $\mu_i=0.7$ ,  $C_e=1.0$ )

**5) Member specification**

Size, stress grade/product Use 240 x 45 SG8 Laserframe  
Material type Dry softwood, machine stress graded and verified (NZS 3622)  
Assumed design density < 480 kg/m<sup>2</sup>

**6) Serviceability**

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi_{LQ}$ *	12.7 mm	4.2 mm (long term)	3.0
Live load - $\Psi_{sQ}$	15.2 mm	1.5 mm	10.3
Live load - $\Psi_{sQ}$ *	15.2 mm	2.8 mm	5.5
Wind load - $W_s$	25.3 mm	4.4 mm	5.8
Snow load - $S_s$	12.7 mm	3.3 mm	3.8

\*Critical serviceability load case  
See 'Notes for interpretation of serviceability data' at the end of this report

**7) Reactions**

Load case	$k_1$ <sup>1</sup>	Limit States Design Reaction <sup>2,3</sup>	
		End kN <sup>4</sup>	
1.35G	0.60	-0.9	
1.2G + 1.5Q	0.80	-2.5	
1.2G + $S_u$ + $\Psi_{cQ}$	0.80	-2.0	
1.2G + $W_u$ + $\Psi_{cQ}$	1.00	-2.1	
0.9G + $W_u$	1.00	1.5	

**8) Installation requirements**

- Minimum bearing - end supports, 30 mm.

**Member 3**

- 1) Member code and description** R3 - Common rafters
- 2) Date prepared** 29 August 2018
- 3) Serviceability criteria** AS 1720.1: 2010 and AS 1720.3: 2016
- 4) Design inputs**
  - Span 1.8 m - single span
  - Rafter spacing 400 mm
  - Roof mass 30 kg/m<sup>2</sup>
  - Lateral restraint condition Bottom edge restrained by ceiling/ceiling battens at 600 crs max.
  - Roof snow load 0.7 kPa ( $\mu_i=0.7$ ,  $C_e=1.0$ )
- 5) Member specification**
  - Size, stress grade/product Use 240 x 45 SG8 Laserframe
  - Material type Dry softwood, machine stress graded and verified (NZS 3622)
  - Assumed design density < 480 kg/m<sup>2</sup>

**6) Serviceability**

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi_{LQ}$	6.0 mm	0.1 mm (long term)	53.0
Live load - $\Psi_{sQ}$	7.2 mm	0.0 mm	218.5
Live load - $\Psi_{sQ}$ *	7.2 mm	0.3 mm	22.3
Wind load - $W_s$	12.0 mm	0.1 mm	121.8
Snow load - $S_s$	6.0 mm	0.1 mm	80.8

\*Critical serviceability load case  
See 'Notes for interpretation of serviceability data' at the end of this report

**7) Reactions**

Load case	$k_1$ <sup>1</sup>	Limit States Design Reaction <sup>2,3</sup>	
		End kN <sup>4</sup>	
1.35G	0.60	-0.2	
1.2G + 1.5Q	0.80	-1.9	
1.2G + $S_u$ + $\Psi_{cQ}$	0.80	-0.5	
1.2G + $W_u$ + $\Psi_{cQ}$	1.00	-0.5	
0.9G + $W_u$	1.00	0.3	

**8) Installation requirements**

- Minimum bearing - end supports, 30 mm.

**Member 4**

- 1) Member code and description** R4 - Common rafters
- 2) Date prepared** 29 August 2018
- 3) Serviceability criteria** AS 1720.1: 2010 and AS 1720.3: 2016
- 4) Design inputs**
  - Span 0.5 m - single span
  - Rafter spacing 900 mm
  - Roof mass 30 kg/m<sup>2</sup>
  - Lateral restraint condition Bottom edge restrained by ceiling/ceiling battens at 600 crs max.
  - Roof snow load 0.7 kPa ( $\mu_i=0.7$ ,  $C_e=1.0$ )
- 5) Member specification**
  - Size, stress grade/product Use 90 x 45 SG8 Laserframe
  - Material type Dry softwood, machine stress graded and verified (NZS 3622)
  - Assumed design density < 480 kg/m<sup>2</sup>

**6) Serviceability**

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi_{LQ}$	1.7 mm	0.0 mm (long term)	77.4
Live load - $\Psi_{sQ}$	2.0 mm	0.0 mm	238.9
Live load - $\Psi_{sQ}$ *	2.0 mm	0.1 mm	15.3
Wind load - $W_s$	3.3 mm	0.0 mm	133.2
Snow load - $S_s$	1.7 mm	0.0 mm	88.4

SDC - Support and provide the dimensions to the contractor to verify all dimensions on site before commencing any work



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DATE: 31/08/2018

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\*Critical serviceability load case  
See 'Notes for interpretation of serviceability data' at the end of this report

7) Reactions

Load case	k <sub>1</sub> <sup>1</sup>	Limit States Design Reaction <sup>2,3</sup>	
		End kN <sup>4</sup>	
1.35G	0.60	-0.1	
1.2G + 1.5Q	0.80	-2.0	
1.2G + S <sub>u</sub> + Ψ <sub>c</sub> Q	0.80	-0.3	
1.2G + W <sub>u</sub> + Ψ <sub>c</sub> Q	1.00	-0.4	
0.9G + W <sub>u</sub>	1.00	0.3	

8) Installation requirements

- Minimum bearing - end supports, 30 mm.

Member 5

- 1) Member code and description: RB1 - Intermediate beam
- 2) Date prepared: 29 August 2018
- 3) Serviceability criteria: AS 1720.1: 2010 and AS 1720.3: 2016
- 4) Design inputs
  - Span: 2.8 m - single span
  - Roof load width 'RLW': 1.2 m
  - Roof type and mass: Light roof and ceiling - 40 kg/m<sup>2</sup>
  - Roof snow load: 0.7 kPa (μ=0.7, C<sub>e</sub>=1.0)
- 5) Member specification
  - Size, stress grade/product: Use 2/240 x 45 SG8 Laserframe
  - Material type: Dry softwood, machine stress graded and verified (NZS 3622)
  - Assumed design density: < 480 kg/m<sup>2</sup>

6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + Ψ <sub>L</sub> Q <sup>*</sup>	9.3 mm	1.8 mm (long term)	5.3
Live load - Ψ <sub>s</sub> Q	11.2 mm	0.4 mm	26.1
Live load - Ψ <sub>s</sub> Q	11.2 mm	0.9 mm	12.5
Wind load - W <sub>s</sub>	18.7 mm	1.3 mm	14.6
Snow load - S <sub>s</sub>	9.3 mm	1.0 mm	9.7

\*Critical serviceability load case  
See 'Notes for interpretation of serviceability data' at the end of this report

7) Reactions

Load case	k <sub>1</sub> <sup>1</sup>	Limit States Design Reaction <sup>2,3</sup>	
		End kN <sup>4</sup>	
1.35G	0.60	-1.2	
1.2G + 1.5Q	0.80	-2.7	
1.2G + S <sub>u</sub> + Ψ <sub>c</sub> Q	0.80	-2.2	

1.2G + W <sub>u</sub> + Ψ <sub>c</sub> Q	1.00	-2.3
0.9G + W <sub>u</sub>	1.00	1.2

8) Installation requirements

- Provide at least 30 mm bearing at end supports

Member 6

- 1) Member code and description: RB2 - Intermediate beam
- 2) Date prepared: 29 August 2018
- 3) Serviceability criteria: AS 1720.1: 2010 and AS 1720.3: 2016
- 4) Design inputs
  - Span: 3.8 m - single span
  - Roof load width 'RLW': 1.2 m
  - Roof type and mass: Light roof and ceiling - 40 kg/m<sup>2</sup>
  - Roof snow load: 0.7 kPa (μ=0.7, C<sub>e</sub>=1.0)
- 5) Member specification
  - Size, stress grade/product: Use 2/240 x 45 SG8 Laserframe
  - Material type: Dry softwood, machine stress graded and verified (NZS 3622)
  - Assumed design density: < 480 kg/m<sup>2</sup>

6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + Ψ <sub>L</sub> Q <sup>*</sup>	12.7 mm	5.9 mm (long term)	2.1
Live load - Ψ <sub>s</sub> Q	15.2 mm	1.5 mm	10.4
Live load - Ψ <sub>s</sub> Q	15.2 mm	2.2 mm	6.8
Wind load - W <sub>s</sub>	25.3 mm	4.3 mm	5.8
Snow load - S <sub>s</sub>	12.7 mm	3.3 mm	3.9

\*Critical serviceability load case  
See 'Notes for interpretation of serviceability data' at the end of this report

7) Reactions

Load case	k <sub>1</sub> <sup>1</sup>	Limit States Design Reaction <sup>2,3</sup>	
		End kN <sup>4</sup>	
1.35G	0.60	-1.6	
1.2G + 1.5Q	0.80	-3.2	
1.2G + S <sub>u</sub> + Ψ <sub>c</sub> Q	0.80	-3.0	
1.2G + W <sub>u</sub> + Ψ <sub>c</sub> Q	1.00	-3.1	
0.9G + W <sub>u</sub>	1.00	1.6	

8) Installation requirements

- Provide at least 30 mm bearing at end supports

Member 7

SDC - Support Approval required to confirm dimensions on site before commencing any work

contractor to verify all dimensions on site before commencing any work



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- 1) Member code and description** L1 - Lintels - In single or upper storey load bearing walls
- 2) Date prepared** 29 August 2018
- 3) Serviceability criteria** AS 1720.1: 2010 and AS 1720.3: 2016
- 4) Design inputs**
- Span 3.0 m
  - Roof load width 'RLW' 2.2 m
  - Roof type and mass Light roof and ceiling - 40 kg/m<sup>2</sup>
  - Nominal wall thickness 90 mm
  - Roof snow load 0.7 kPa, snow overhang 0.1 kN/m ( $\mu_i=0.7$ ,  $C_e=1.0$ ,  $k=0.5$ )
- 5) Member specification**
- Size, stress grade/product Use 2/190 x 45 SG8 Laserframe
  - Material type Dry softwood, machine stress graded and verified (NZS 3622)
  - Assumed design density < 480 kg/m<sup>3</sup>

**6) Serviceability**

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi_L Q^*$	10.0 mm	7.0 mm (long term)	1.4
Live load - $\Psi_S Q$	12.0 mm	2.0 mm	6.0
Wind load - $W_s$	15.0 mm	6.1 mm	2.5
Snow load - $S_s$	10.0 mm	4.7 mm	2.1

\*Critical serviceability load case  
See 'Notes for interpretation of serviceability data' at the end of this report

**7) Reactions**

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup>
		End kN <sup>4</sup>
1.35G	0.60	-2.3
1.2G + 1.5Q	0.80	-3.6
1.2G + $S_u$ + $\Psi_c Q$	0.80	-5.0
1.2G + $W_u$ + $\Psi_c Q$	1.00	-5.0
0.9G + $W_u$	1.00	3.1

**8) Installation requirements**

- Provide at least 30 mm bearing at end supports

**Member 8**

- 1) Member code and description** L2 - Lintels - In single or upper storey load bearing walls
- 2) Date prepared** 29 August 2018
- 3) Serviceability criteria** AS 1720.1: 2010 and AS 1720.3: 2016
- 4) Design inputs**
- Span 1.8 m
  - Roof load width 'RLW' 2.8 m
  - Roof type and mass Light roof and ceiling - 40 kg/m<sup>2</sup>

- Nominal wall thickness 90 mm
  - Roof snow load 0.7 kPa, snow overhang 0.1 kN/m ( $\mu_i=0.7$ ,  $C_e=1.0$ ,  $k=0.5$ )
- 5) Member specification**
- Size, stress grade/product Use 190 x 45 SG8 Laserframe
  - Material type Dry softwood, machine stress graded and verified (NZS 3622)
  - Assumed design density < 480 kg/m<sup>3</sup>

**6) Serviceability**

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi_L Q^*$	6.0 mm	2.2 mm (long term)	2.7
Live load - $\Psi_S Q$	7.2 mm	0.7 mm	10.9
Wind load - $W_s$	9.0 mm	2.0 mm	4.5
Snow load - $S_s$	6.0 mm	1.5 mm	3.9

\*Critical serviceability load case  
See 'Notes for interpretation of serviceability data' at the end of this report

**7) Reactions**

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup>
		End kN <sup>4</sup>
1.35G	0.60	-1.9
1.2G + 1.5Q	0.80	-3.0
1.2G + $S_u$ + $\Psi_c Q$	0.80	-4.2
1.2G + $W_u$ + $\Psi_c Q$	1.00	-4.2
0.9G + $W_u$	1.00	2.7

**8) Installation requirements**

- Provide at least 30 mm bearing at end supports

**Member 9**

- 1) Member code and description** L3 - Lintels - In single or upper storey load bearing walls
- 2) Date prepared** 29 August 2018
- 3) Serviceability criteria** AS 1720.1: 2010 and AS 1720.3: 2016
- 4) Design inputs**
- Span 1.4 m
  - Roof load width 'RLW' 1.8 m
  - Roof type and mass Light roof and ceiling - 40 kg/m<sup>2</sup>
  - Nominal wall thickness 90 mm
  - Roof snow load 0.7 kPa, snow overhang 0.1 kN/m ( $\mu_i=0.7$ ,  $C_e=1.0$ ,  $k=0.5$ )
- 5) Member specification**
- Size, stress grade/product Use 2/140 x 45 SG8 Laserframe
  - Material type Dry softwood, machine stress graded and verified (NZS 3622)
  - Assumed design density < 480 kg/m<sup>3</sup>

SDC - Support and provide the dimensions on site before commencing any work

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6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi_L Q^*$	4.7 mm	0.8 mm (long term)	5.7
Live load - $\Psi_S Q$	5.6 mm	0.2 mm	23.0
Wind load - $W_s$	7.0 mm	0.7 mm	9.5
Snow load - $S_s$	4.7 mm	0.6 mm	8.2

\*Critical serviceability load case  
See 'Notes for interpretation of serviceability data' at the end of this report

7) Reactions

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup> End kN <sup>4</sup>
1.35G	0.60	-1.0
1.2G + 1.5Q	0.80	-1.6
1.2G + $S_u$ + $\Psi_c Q$	0.80	-2.3
1.2G + $W_u$ + $\Psi_c Q$	1.00	-2.3
0.9G + $W_u$	1.00	1.4

8) Installation requirements

- Provide at least 30 mm bearing at end supports

Member 10

- Member code and description** L4 - Lintels - In single or upper storey load bearing walls
- Date prepared** 29 August 2018
- Serviceability criteria** AS 1720.1: 2010 and AS 1720.3: 2016
- Design inputs**
  - Span 1.3 m
  - Roof load width 'RLW' 0.6 m
  - Roof type and mass Light roof and ceiling - 40 kg/m<sup>2</sup>
  - Nominal wall thickness 90 mm
  - Roof snow load 0.7 kPa, snow overhang 0.1 kN/m ( $\mu=0.7$ ,  $C_e=1.0$ ,  $k=0.5$ )
- Member specification**
  - Size, stress grade/product Use 2/90 x 45 SG8 Laserframe
  - Material type Dry softwood, machine stress graded and verified (NZS 3622)
  - Assumed design density < 480 kg/m<sup>2</sup>

6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi_L Q^*$	4.3 mm	0.6 mm (long term)	6.7
Live load - $\Psi_S Q$	5.2 mm	0.2 mm	28.7
Wind load - $W_s$	6.5 mm	0.5 mm	11.9
Snow load - $S_s$	4.3 mm	0.5 mm	9.4

\*Critical serviceability load case  
See 'Notes for interpretation of serviceability data' at the end of this report

7) Reactions

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup> End kN <sup>4</sup>
1.35G	0.60	-0.4
1.2G + 1.5Q	0.80	-0.6
1.2G + $S_u$ + $\Psi_c Q$	0.80	-0.9
1.2G + $W_u$ + $\Psi_c Q$	1.00	-0.8
0.9G + $W_u$	1.00	0.5

8) Installation requirements

- Provide at least 30 mm bearing at end supports

Member 11

- Member code and description** L5 - Lintels - In single or upper storey load bearing walls
- Date prepared** 29 August 2018
- Serviceability criteria** AS 1720.1: 2010 and AS 1720.3: 2016
- Design inputs**
  - Span 2.4 m
  - Roof load width 'RLW' 1.2 m
  - Roof type and mass Light roof and ceiling - 40 kg/m<sup>2</sup>
  - Nominal wall thickness 90 mm
  - Roof snow load 0.7 kPa, snow overhang 0.1 kN/m ( $\mu=0.7$ ,  $C_e=1.0$ ,  $k=0.5$ )
- Member specification**
  - Size, stress grade/product Use 2/190 x 45 SG8 Laserframe
  - Material type Dry softwood, machine stress graded and verified (NZS 3622)
  - Assumed design density < 480 kg/m<sup>2</sup>

6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi_L Q^*$	8.0 mm	1.4 mm (long term)	5.8
Live load - $\Psi_S Q$	9.6 mm	0.4 mm	27.2
Wind load - $W_s$	12.0 mm	1.1 mm	11.3
Snow load - $S_s$	8.0 mm	0.8 mm	9.5

\*Critical serviceability load case  
See 'Notes for interpretation of serviceability data' at the end of this report

7) Reactions

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup> End kN <sup>4</sup>
1.35G	0.60	-1.1
1.2G + 1.5Q	0.80	-1.7
1.2G + $S_u$ + $\Psi_c Q$	0.80	-2.4
1.2G + $W_u$ + $\Psi_c Q$	1.00	-2.3
0.9G + $W_u$	1.00	1.4

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**8) Installation requirements**

- Provide at least 30 mm bearing at end supports

**Member 12**

- 1) Member code and description** L6 - Lintels - In single or upper storey load bearing walls
- 2) Date prepared** 29 August 2018
- 3) Serviceability criteria** AS 1720.1: 2010 and AS 1720.3: 2016
- 4) Design inputs**
- Span 1.8 m
  - Roof load width 'RLW' 2.8 m
  - Roof type and mass Light roof and ceiling - 40 kg/m<sup>2</sup>
  - Nominal wall thickness 90 mm
  - Roof snow load 0.7 kPa, snow overhang 0.1 kN/m ( $\mu=0.7$ ,  $C_e=1.0$ ,  $k=0.5$ )
- 5) Member specification**
- Size, stress grade/product Use 2/190 x 45 SG8 Laserframe
  - Material type Dry softwood, machine stress graded and verified (NZS 3622)
  - Assumed design density < 480 kg/m<sup>3</sup>

**6) Serviceability**

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi$ LQ*	6.0 mm	1.2 mm (long term)	5.0
Live load - $\Psi$ SQ	7.2 mm	0.3 mm	20.7
Wind load - W <sub>s</sub>	9.0 mm	1.0 mm	8.6
Snow load - S <sub>s</sub>	6.0 mm	0.8 mm	7.5

\*Critical serviceability load case  
See 'Notes for interpretation of serviceability data' at the end of this report

**7) Reactions**

Load case	k <sub>1</sub> <sup>1</sup>	Limit States Design Reaction <sup>2,3</sup>
		End kN <sup>4</sup>
1.35G	0.60	-1.9
1.2G + 1.5Q	0.80	-3.0
1.2G + S <sub>u</sub> + $\Psi$ cQ	0.80	-4.2
1.2G + W <sub>u</sub> + $\Psi$ cQ	1.00	-4.2
0.9G + W <sub>u</sub>	1.00	2.7

**8) Installation requirements**

- Provide at least 30 mm bearing at end supports

**Notes for interpretation of serviceability data**

1. 'average deflection' is an engineering concept based upon a notional estimated load, notional member rigidity and, in some cases, an approximate model of material response to environmental conditions. These parameters are, 'standardised' in AS 1170 and AS 1720. Deflections calculated using this methodology cannot therefore be usefully compared with deflections calculated using other methods, eg GLTAA design methodology.

2. Deflection is the flexural response to load 'out-of-level' measurements of installations are not necessarily deflections and can incorporate 'initial out-of-straightness', whether intended or not. Furthermore, loads can be higher/lower than the notional estimate and in any comparison with measured levels, material variability needs to also be considered. AS 1720 gives the following basis for estimation of upper bound deflections for various materials.

No 1 Framing – visually graded to NZS 3631	Average + 100%
SG grades - mechanically graded to AS/NZS 1748	Average + 43%
GL grades for glulam to AS 1328	Average + 33%
LVL to AS/NZS 4357 (includes hySPAN and hyJOIST)	Average +18%

As can be seen, comparison of the 'average deflection' for different materials, even if calculated on the same basis, does not give the whole picture!

3. The limits referred are those specified in AS 1720.3 for the stated load case.

4. 'Rigidity ratio' expresses the rigidity of the specified beam relative to the rigidity of a notional beam just meeting the serviceability requirements of AS 1720.3

**Notes for interpretation of reaction data**

1. Duration of load factor 'k<sub>1</sub>' for strength as per NZ 3603:1993
2. Negative (-) reactions relate to the 'gravity' or 'downwards' force on the support
3. Positive reactions relate to the 'upwards' forces or 'tie-down' requirement on the support
4. End reaction includes allowance for overhang/cantilever where one has been designed

SDC - Support Approval required. Please refer to the relevant code of practice for the design and construction of the structure. The design and construction of the structure must comply with the relevant code of practice. The design and construction of the structure must comply with the relevant code of practice.

Contractor to verify all dimensions on site before commencing any work



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PROJECT TITLE:  
**J & M TUIMAUNEI**  
**LOT 346**  
**FLEMINGTON**

REVISIONS:  
CONSENT  
ISSUE A: 31-8-18

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SCALES: 1:1.11  
JOB REFERENCE: BM-18-006  
SHEET: 40 OF 40  
DATE: 31/08/2018



SDC - Approved Building Consent Document - BC181714A Raft change - Pg 42 of 48 - 17/12/2018 - sandea

**GENERAL**

1. Do not scale from drawings. These drawings are to be read in conjunction with the architectural drawings and all other related documents. Refer to architectural drawings for dimensions, rebates & recesses.
2. Contact the architect/engineer if any discrepancies are found.
3. Under no circumstances shall polystyrene spacers be used. Use recommended spacers as per details provided.
4. DPM shall be in accordance with NZS3604 (polyethylene sheet, min. 0.25mm). Do not use multiple layers. All penetrations through the DPM shall be sealed.
5. A layer of sand blinding or granular fines (GAP7) shall be placed, screeded and compacted over the building platform. The maximum thickness of this layer shall be no more than 50mm.
6. All service trenches shall be properly backfilled and compacted.
7. Where underfloor heating is installed, floor topping shall be increased to 110mm.
8. Where the floor is concrete polished, the floor thickness shall be increased such that the final topping depth is no less than that specified on the plans after all polishing.
9. Polystyrene pods shall be 1100 x 1100 x 220mm.

**CONCRETE**

1. All concrete work and materials shall conform to NZS3109 and applicable building consent authority regulations.
2. No cuts shall be made to the floor other than those shown on the drawings.
3. Unless otherwise noted, concrete shall be:  
20MPa minimum with Firth 2019 TC2 fibre mix (or 25MPa, Firth 2519 TC2 fibre mix if in exposure zone D )  
Optional: topping concrete (top 110mm) may be replaced with 25MPa minimum Firth Raftmix as preferred.

**REINFORCEMENT**

1. Unless otherwise specified, all reinforcement shall be Ductility Class E, in accordance with NZS 4671.
2. All bend diameters shall comply with NZS 3109. Re-bending of reinforcement is not permitted. 'Spot' welding of reinforcement is not permitted.
3. All mesh reinforcement shall be Ductility Class E as per NZS4671
4. Unless otherwise specified by proprietary product specifications, mesh shall be lapped a minimum of 250mm or by a grid plus 50mm, whichever is greater.
5. Unless otherwise specified on plans, minimum covers are:  
exposed to earth: 75mm  
exposed to edge: 50mm  
protected by damp proofing: 50mm
6. Unless otherwise specified, reinforcement laps are:

Reinforcement Grade	Nomination	min. lap (whichever is greater)	concrete strength (MPa)
300	'D'	40Ø or min. 600mm	all blockfill, 20 and 25
500	'HD'	70Ø	all blockfill
500	'HD'	56Ø	20
500	'HD'	50Ø	25

**SITE CONDITIONS**

1. Design based on soils report/assessment

By: **Davis & Ogilvie Ltd.**  
Ref: **31425**  
Dated: **29-Jun-2018**

Specifically: Design based on all unsuitable material removed (to approximate depth of 0.3-0.4m) and uniform soils across building platform with an ultimate bearing capacity of 200kPa. For filled ground, minimum ultimate bearing capacity of 300kPa for hardfill such as GAP40 etc, and minimum shear strength of 150 kPa for clay fill, subject to engineers confirmation.

**INSPECTIONS**

1. Check the BUILDING CONSENT CONDITIONS for any inspections that are required by the Building Consent Authority (BCA).
2. It is increasingly common for building consent authorities to require a "PS4" for specifically designed structures. For Wilton Joubert Ltd. to issue this, we need to carry out inspections as per the building consent requirements. Ring Wilton Joubert Ltd. local office to arrange a booking.  
**NO INSPECTION EQUALS NO PS4 ISSUED.**
3. Recommended Inspections:
  - Site cut to suitable subgrade (This may be carried out by Wilton Joubert Ltd. or by the author of the geotechnical report).
  - Compaction of fill (This may be carried out by Wilton Joubert Ltd. or by the author of the geotechnical report).
  - Concrete pre-pour of foundations (& any other structural elements).

It is the building consent applicant's (or authorised agent) responsibility to ensure that Wilton Joubert Ltd. is notified in advance of the required inspection. We cannot issue PS4 for items we did not inspect. Bookings should be made 48 hours prior to the desired time of inspection.

NOTES:

Revision	Description	Date



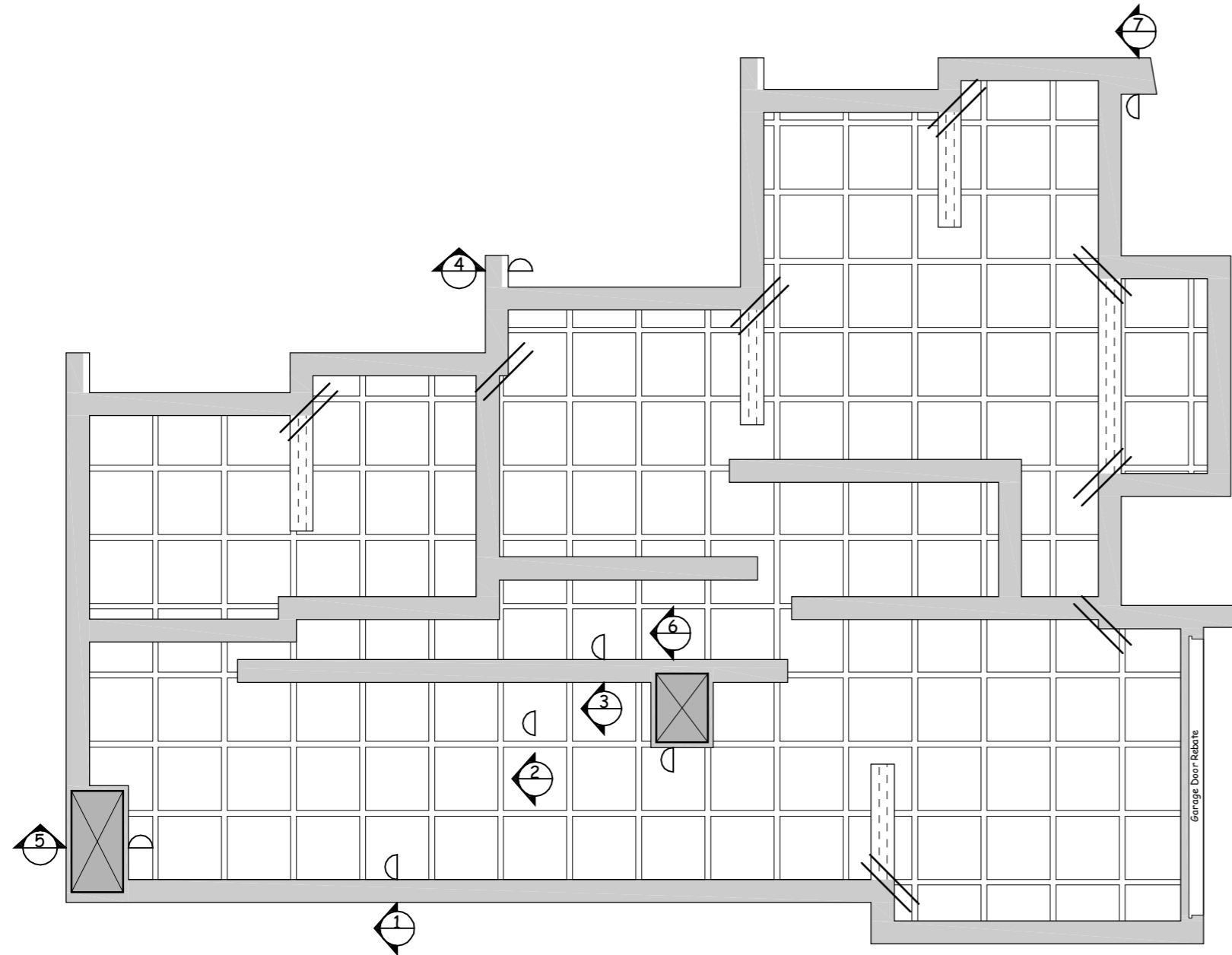
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Consulting Engineers

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Job Title:  
**Proposed Residence**  
**Lot 346**  
**Flemington Subdivision**  
**Lincoln, Canterbury**



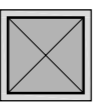
Sheet Title:  
**General Notes**

Designed: <b>AO</b>	Drawn: <b>MH</b>
Checked: <b>DL</b>	
	Date: <b>12-12-2018</b>
<b>Job # 82453</b>	
	Plan No: <b>50</b>



 Ribraft Floor Plan  
 Scale 1:100

**Legend:**

-  Re Entrant corner steel  
2/HD 12 x 1200mm  
at 200 crs
-  400W x 305D  
edge beam extension  
extending into slab as shown  
(2.0m minimum)  
with lap min 55XØ
-  Shower setdown:  
solid pour under shower  
D10 @ 300c/c both ways  
cranked 600mm into topping.  
HD 12 trim around top.  
Steel in ribs, thickenings and  
edge beams continuous through

Quantities of Spacers (Quantities are approximate and to be used as a guide only)	
Item	Qty.
WJ100 Centre Spacer	250
WJ101 Clip-on Spacer	120

**NOTES:**  
 Do not scale from Drawings.  
 Refer Architectural Drawings for  
 overall dimensions. To be read in  
 conjunction with all other related  
 documents.

Revision	Description	Date



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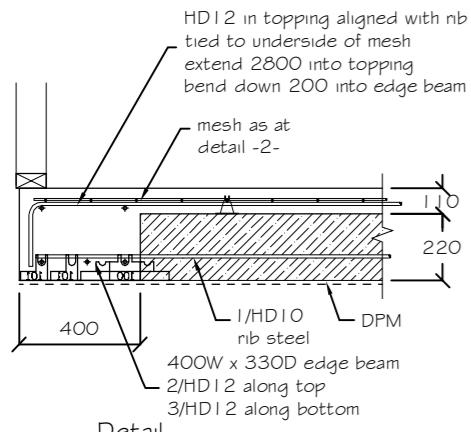
*Consulting Engineers*

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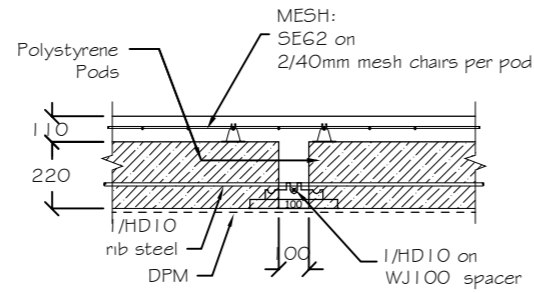
Job Title:  
 Proposed Residence  
 Lot 346  
 Flemington Subdivision  
 Lincoln, Canterbury

Sheet Title:  
 Ribraft Floor  
 Plan

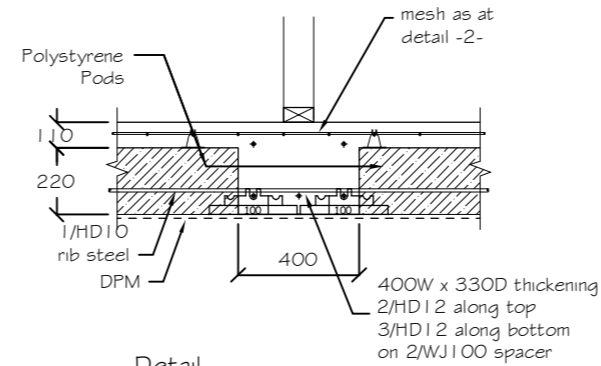
Consent: AO	Drawn: MH
Checked: DL	Revised: ...
Scale: 1:100	Date: 12-12-2018
<b>Job # 82453</b>	Sheet No: <b>S1</b>



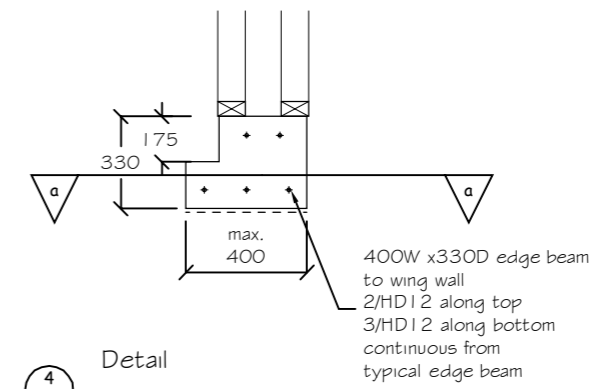
1 Detail  
Raftfloor Edge Beam - 400  
Scale 1:25



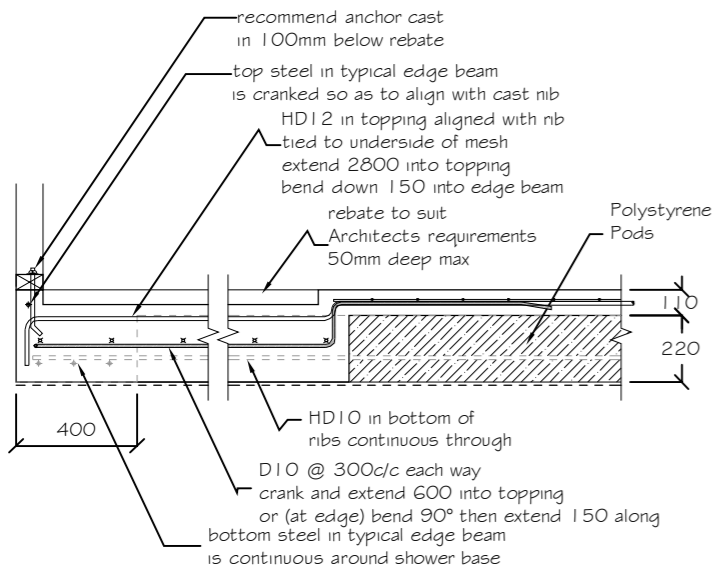
2 Detail  
Raftfloor Internal Rib - 100  
Scale 1:25



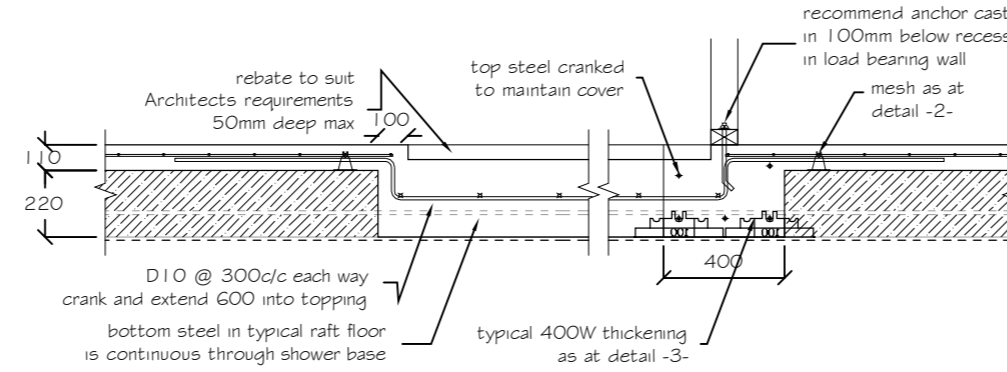
3 Detail  
Raftfloor Internal Rib - 400  
Scale 1:25



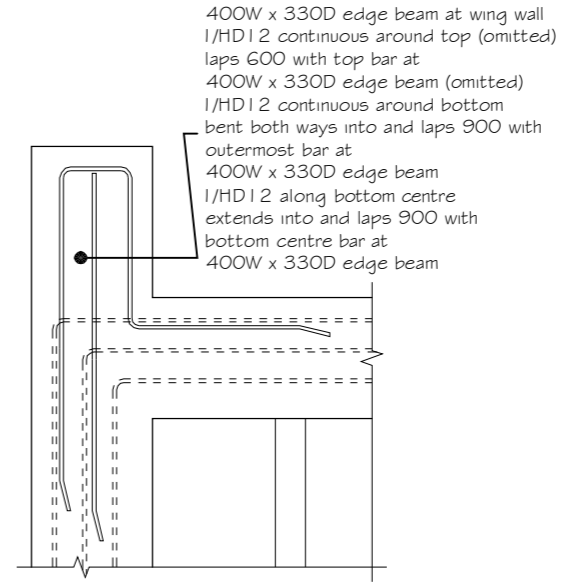
4 Detail  
Raftfloor Edge Beam - 400  
At Wing Wall  
Scale 1:25



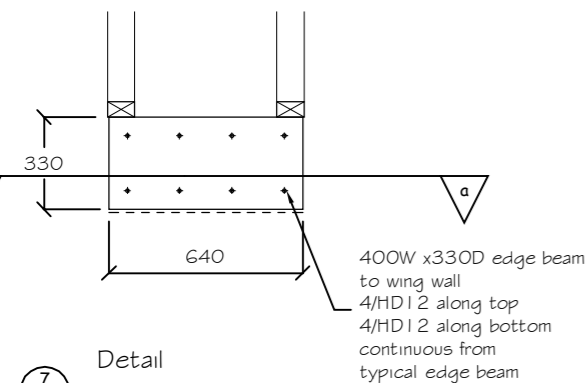
5 Detail  
Raftfloor Edge Beam - 400  
Scale 1:25  
NOTE:  
Allow for Ribs and or  
Thickenings as may be shown on plan



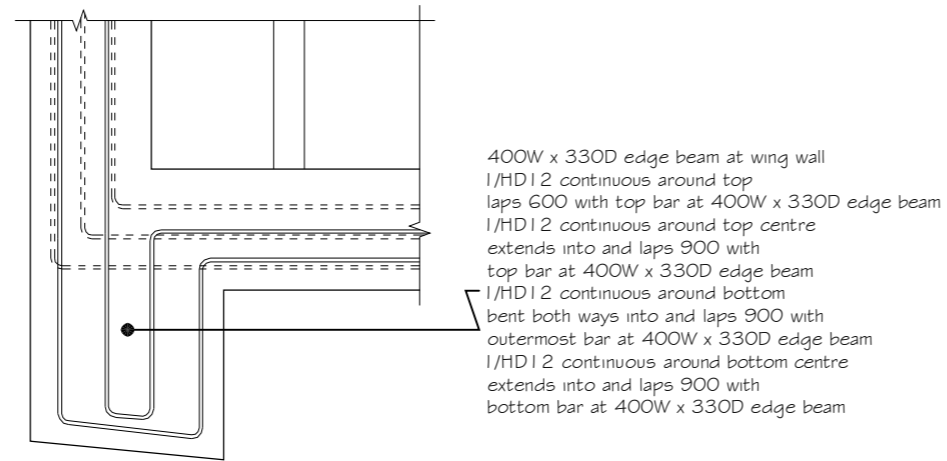
6 Detail  
Raftfloor Solid Pour  
Shower Setdown at  
Internal thickening - 400  
Scale 1:25



4a



7 Detail  
Raftfloor Edge Beam - 400  
At Wing Wall  
Scale 1:25



7a

NOTES:  
Do not scale from Drawings.  
Refer Architectural Drawings for  
overall dimensions. To be read in  
conjunction with all other related  
documents.

Revision	Description	Date

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Job Title:  
Proposed Residence  
Lot 346  
Flemington Subdivision  
Lincoln, Canterbury

Sheet Title:  
Ribraft Floor  
Details

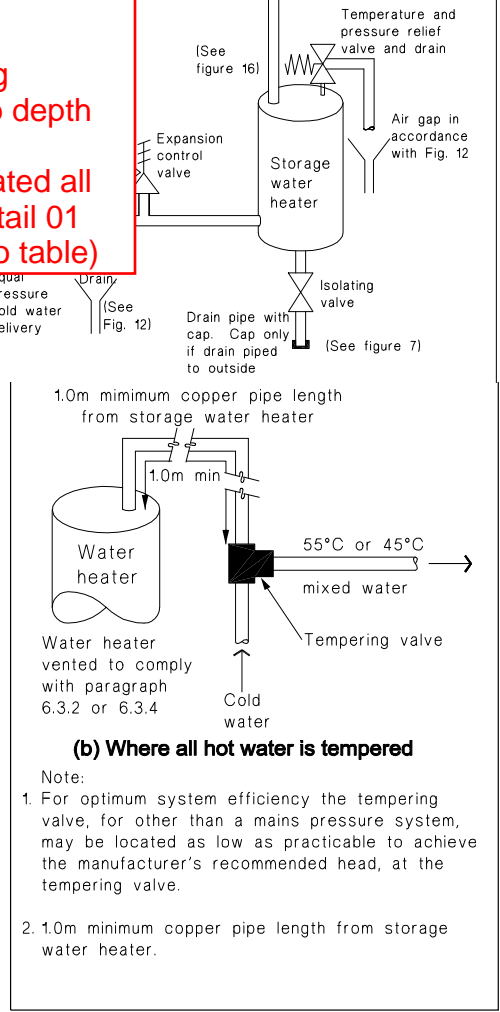
Drawn: AO	Drawn: MH
Checked: DL	Checked: ...
Scale: 1:25	Date: 12-12-2018
Job # 82453	
52	

Drainage Mark-Up  
WJL # 82082

Lot 346  
Flemington Subdivision  
Lincoln  
Canterbury

1. Plan/Details for keeping drainage pipes within slab depth
2. Unless otherwise indicated all other pipes are as per Detail 01 on Sheet D1, (also refer to table)

SDC - Approved Building Consent Document - BC181714A Raft change - Pg 45 of 48 - 17/11/18



**6.14.3 Legionella bacteria**

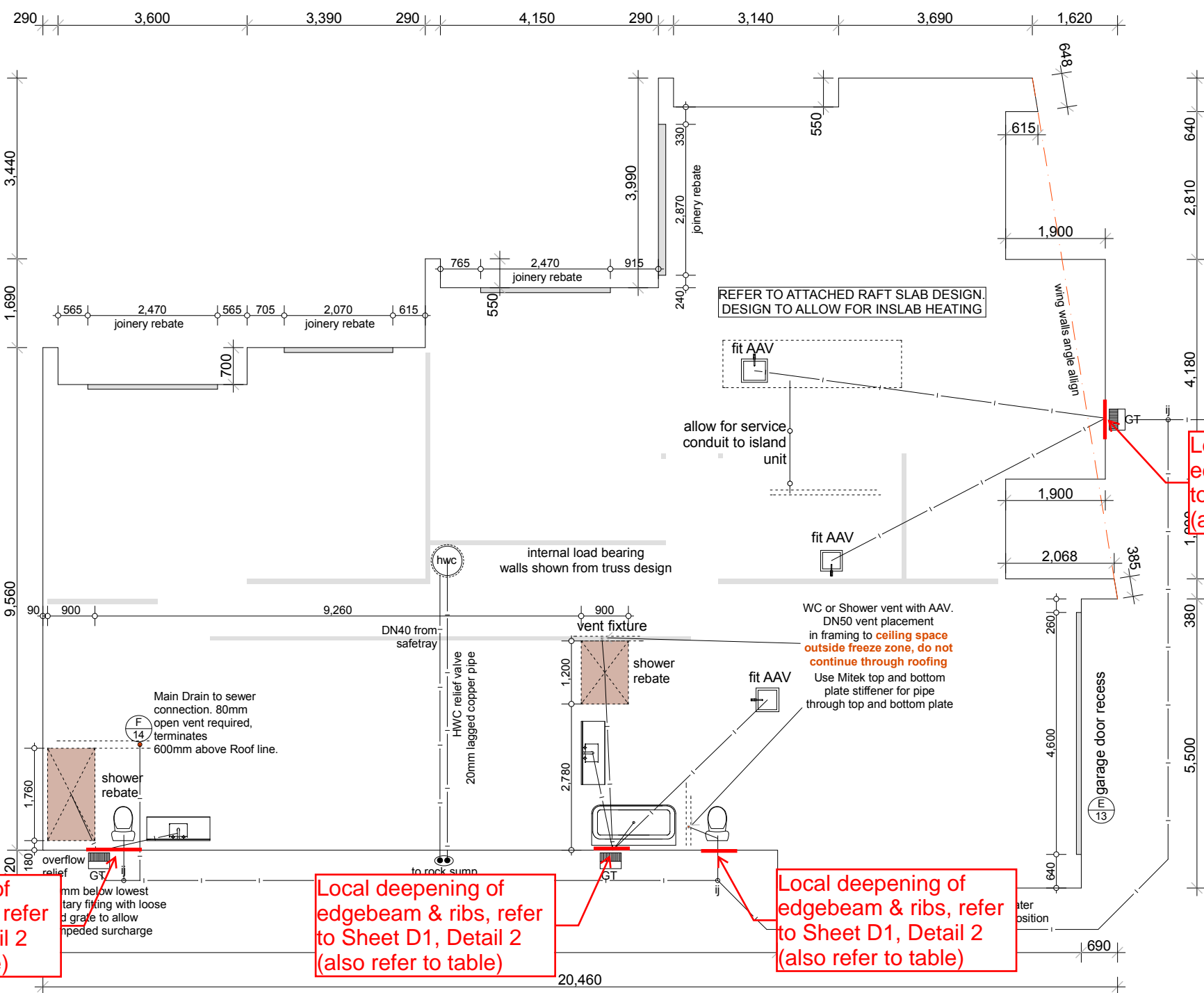
Irrespective of whether a m... installed, the storage water thermostat shall be set at a... of not less than 60°C to pre... of Legionella bacteria.

Local deepening of edgebeam & ribs, refer to Sheet D1, Detail 2 (also refer to table)

Local deepening of edgebeam & ribs, refer to Sheet D1, Detail 2 (also refer to table)

Local deepening of edgebeam & ribs, refer to Sheet D1, Detail 2 (also refer to table)

Local deepening of edgebeam & ribs, refer to Sheet D1, Detail 2 (also refer to table)



**Pipe sizes and gradients:**  
 -Hand Basins: DN40 1:40 fall  
 -Shower/Bath: DN40 1:40 fall  
 -Kitchen sink/DW combination: DN65 1:40 fall  
 laundry tub: DN40 1:30 fall  
 -WC: 100mm pipe 1:60 min fall

**SEWER PIPES TO BE LAID IAW G13:**  
 -100mm SEWER DRAIN to be laid at a gradient no less than 1:120

**INSPECTION JUNCTION (ij):**  
 -For connection WC to Main Drain  
 -For connection of GT to main drain (required if Gully Trap exceeds 2m from main drain connection)  
**INSPECTION BEND: (ib)**  
 -For bends in Main drain exceeding 45 degrees  
**INSPECTION POINT (ip)**  
 -For connection to sewer lateral located within section boundary.

NOTE: ALL WASTE PIPES PENETRATING FOUNDATION WALL AND SLAB WRAPPED WITH DENSO TAPE TO ALLOW FOR THERMAL MOVEMENT

**FOUNDATION PLAN**

Contractor to verify all dimensions on site before commencing any work



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PROJECT TITLE:  
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**FLEMINGTON**

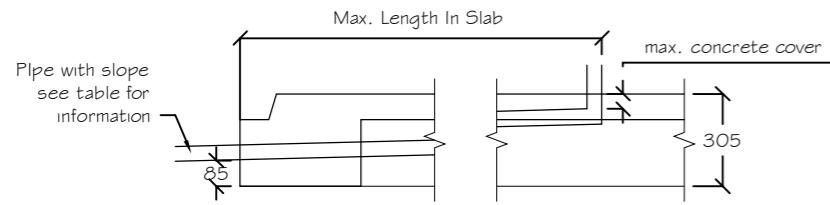
REVISIONS:  
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 ISSUE D: 12-11-18

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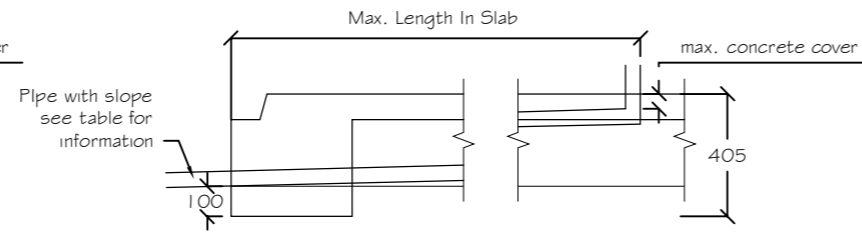
SCALES: 1:100  
 JOB REFERENCE: BM-18-006  
 SHEET: 5 OF 40  
 DATE: 12/11/2018

envy  
 nathan vartha  
 architectural designer  
 10 O'Neill Street, Ponsonby  
 AUCKLAND 1011  
 wk (09) 360 2068  
 envyarchitecture@ihug.co.nz

### Maximum Horizontal Travel of Pipe

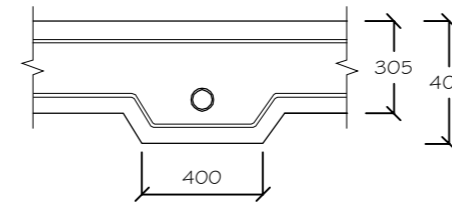


Detail O1: Pipe Within Floor Depth



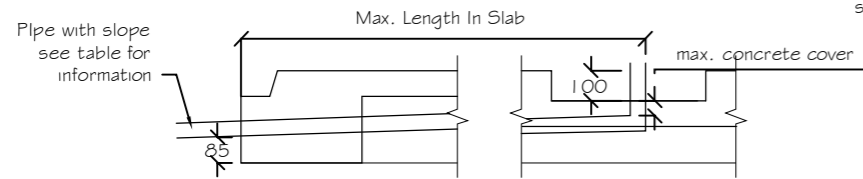
Detail O2: Pipe Within Floor Depth - With Local Deepening Of Edge Beam

NOTE:  
Minimum lapping length of 600mm for HD12 bar if required

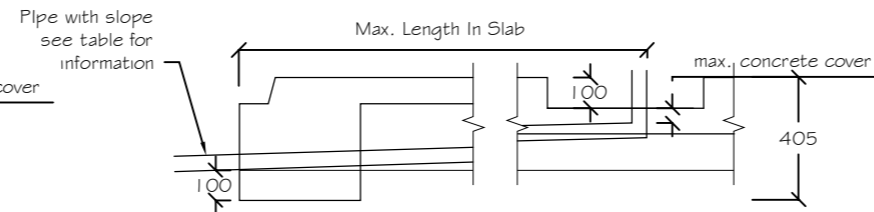


Cross-Section For Detail O2:  
Pipe Within Floor Depth - With Local Deepening Of Edge Beam

### Maximum horizontal travel of pipe from shower recess (if required)

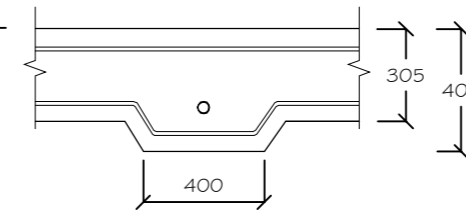


Detail O3: Pipe within floor depth



Detail O4: Pipe within floor depth - with local deepening of edge beam

NOTE:  
Minimum lapping length of 600mm for HD12 bar if required



Cross-section:  
Within floor depth - with local deepening of edge beam

Option	Pipe Diameter		Slope	Max. Concrete Cover	Max. Length in Slab (mm)			
	Internal Ø	Approx. External Ø			Detail O1	Detail O2	Detail O3	Detail O4
	(mm)	(mm)		(mm)	(mm)	(mm)	(mm)	(mm)
A1	32	40	1:20	50	2600	4300	—	—
A2 (for shower recess)	40	50	1:40		—	—	800	4800
A3			1:40		4800	8200	—	—
A4	50	60	1:40		4400	7800	—	—
A5	65	75	1:40		3800	7200	—	—
A6	100	115	1:60	100	300	5400	—	—

NOTES:

Revision	Description	Date
1	redesign for	Date



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Job Title:

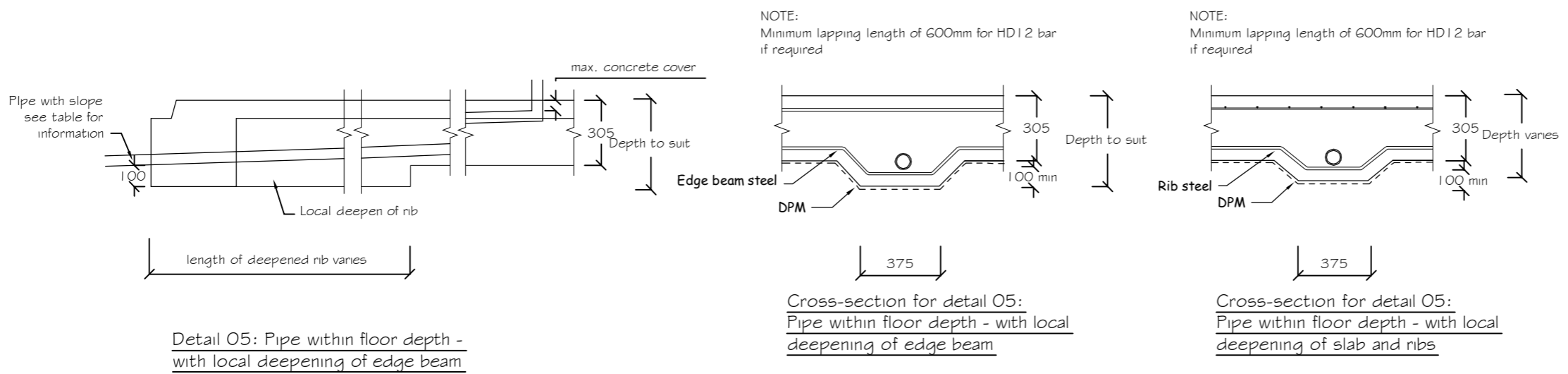
Optional details for pipes within the depth of floor slab

Sheet Title:

Typical Pipe Details

Drawn: AO	Check: AO
Checked: AA	Date: AA
Scale: NTS	Date: 2017
Revision: 1	<b>D1</b>

For Pipe Travels Exceed Max. Length



NOTES:

1	redesign for	Date
Revision	Description	Date

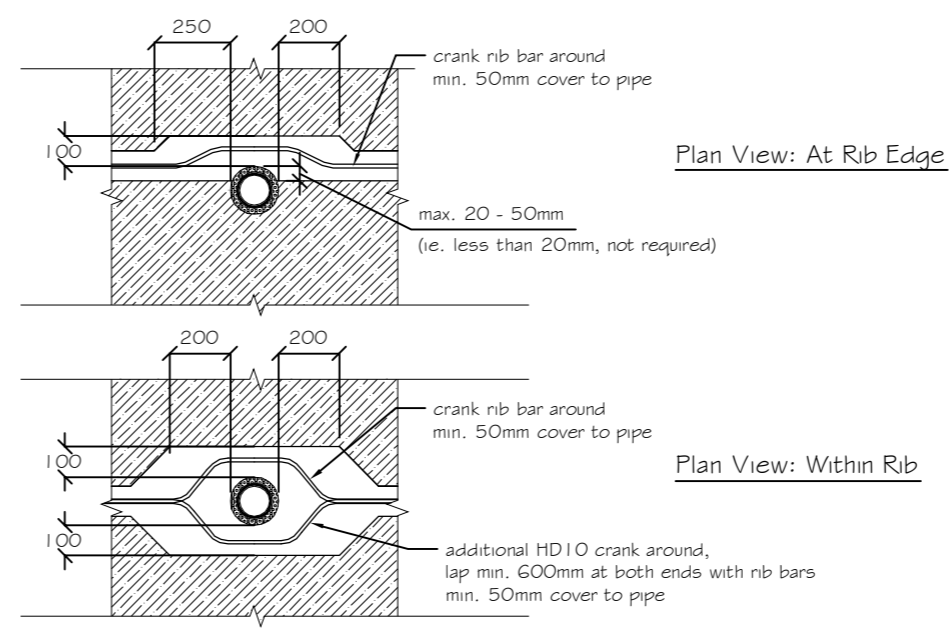
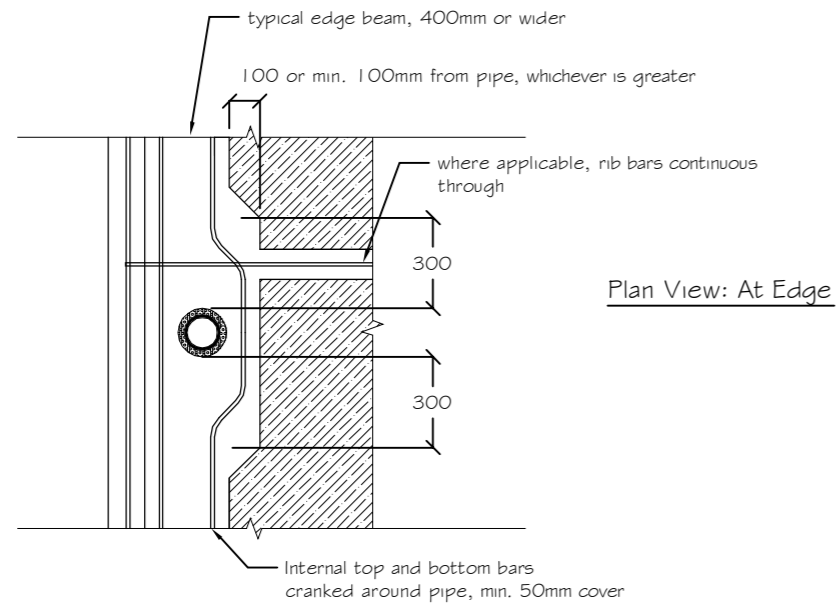
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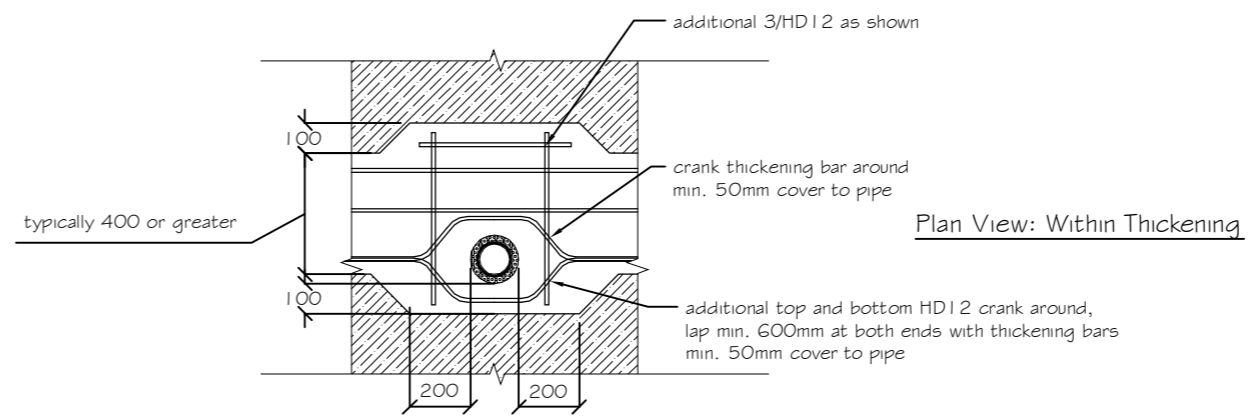
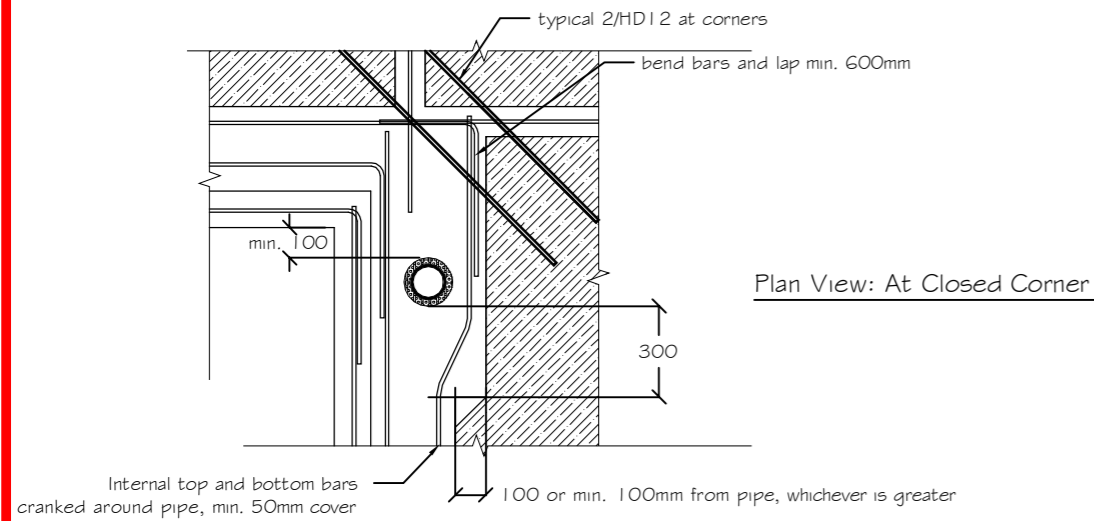
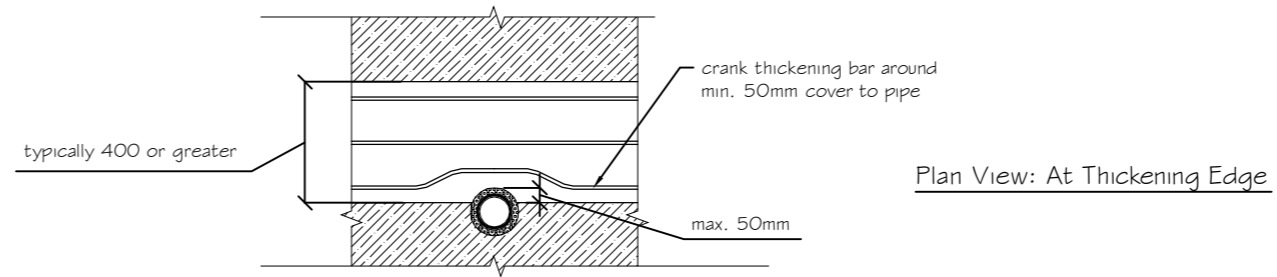
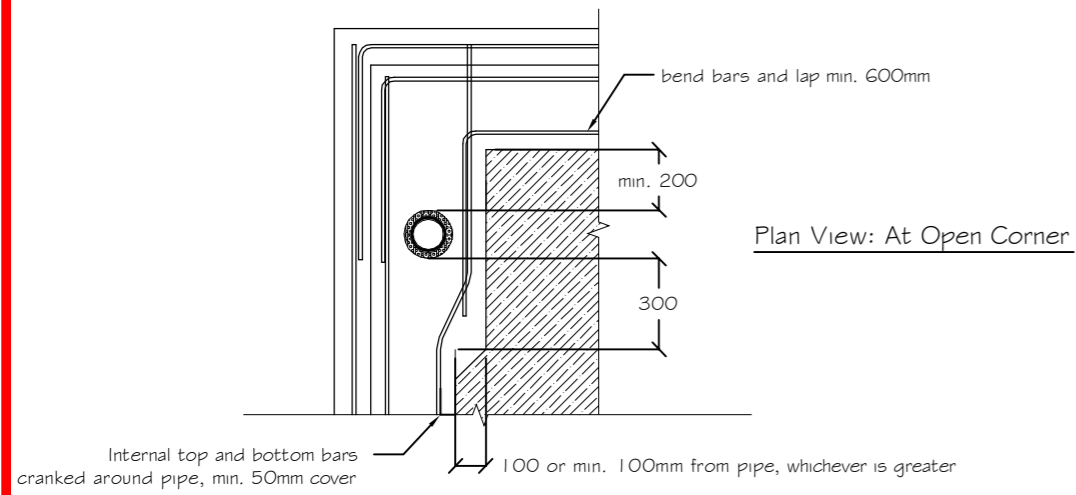
Job Title:  
Optional details for pipes within the depth of floor slab

Sheet Title:  
Typical Pipe Details

Designed: AO	Drawn: AO
Checked: AA	Checked: AA
Scale: N15	Date: 2017
Job No. / Revision No.:	Sheet No. <b>D2</b>
Revision 1	



○ Typical Detail Around Pipes  
Raftfloor Internal Ribs



○ Typical Detail Around Pipes  
Raftfloor Internal Thickenings

○ Typical Detail Around Pipes  
Raftfloor Edge Beam

NOTES:

Member sizes and reinforcing shown are indicative only, details shown on raftslab plan & details shall take precedence over the details shown here.

Also refer to separate details for pipes running within floor depth.

NOTES:

Revision	Description	Date
1	redesign for	

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Job Title:

Optional details for pipes within the depth of floor slab

Sheet Title:

Typical Pipe Details

Drawn: AO	Checked: AO
Checked: AA	Checked: AA
Scale: N15	Date: 2017
Job No.:	Revision: 1
<b>D3</b>	