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MAGNUM™ BOARD AND BATTEN CAVITY FIX CLADDING SYSTEM TECHNICAL INFORMATION

Technical Document No.	#058
Title	Magnum Board Technical Information
Issue Date	16-09-2020
Version	1.4

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Magnum Board Cavity Fix Details

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17	Magnum Board Sheet Fixing Layout

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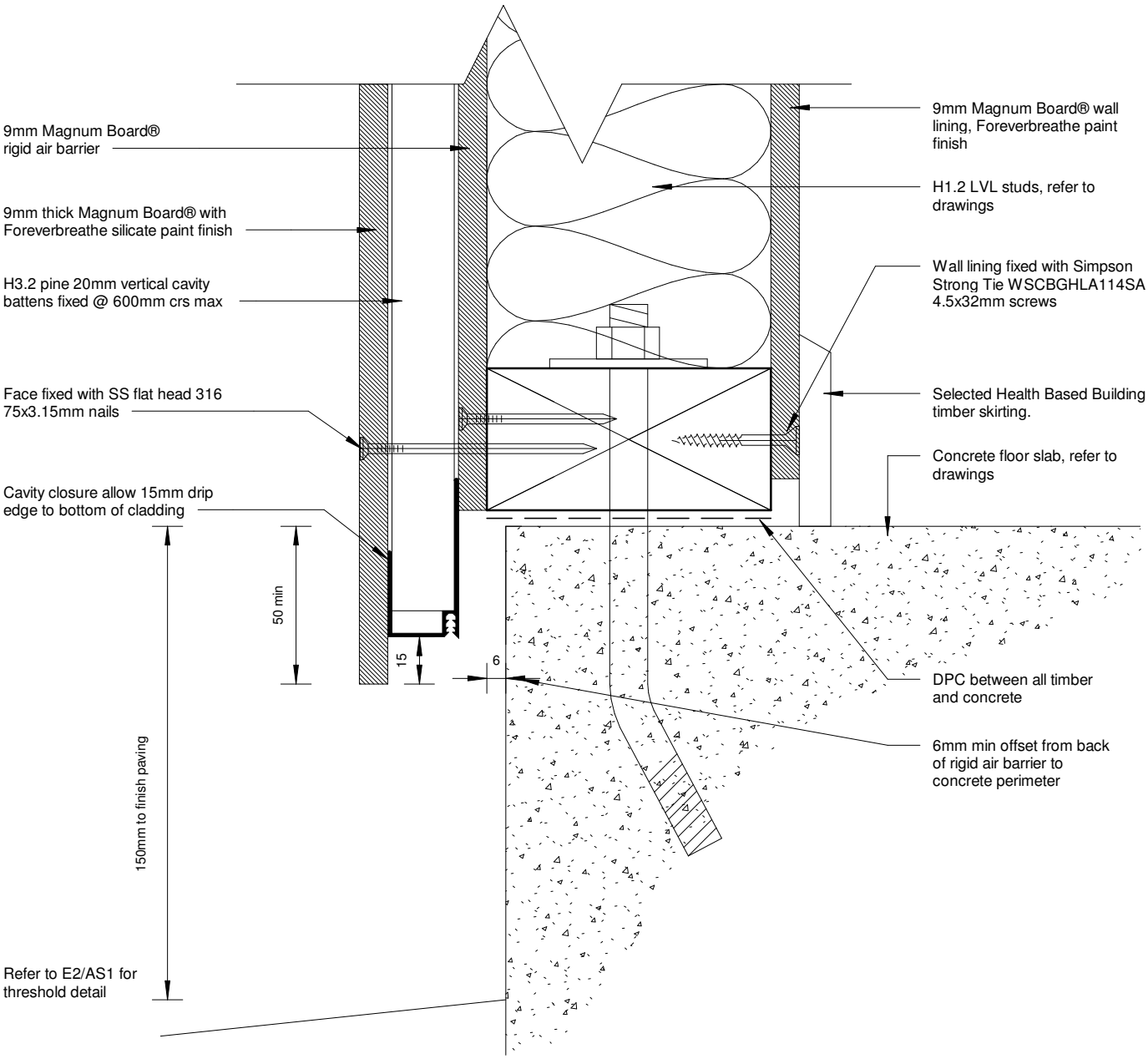

Concrete Foundation Detail

1 : 2

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1/15

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Concrete Foundation Detail

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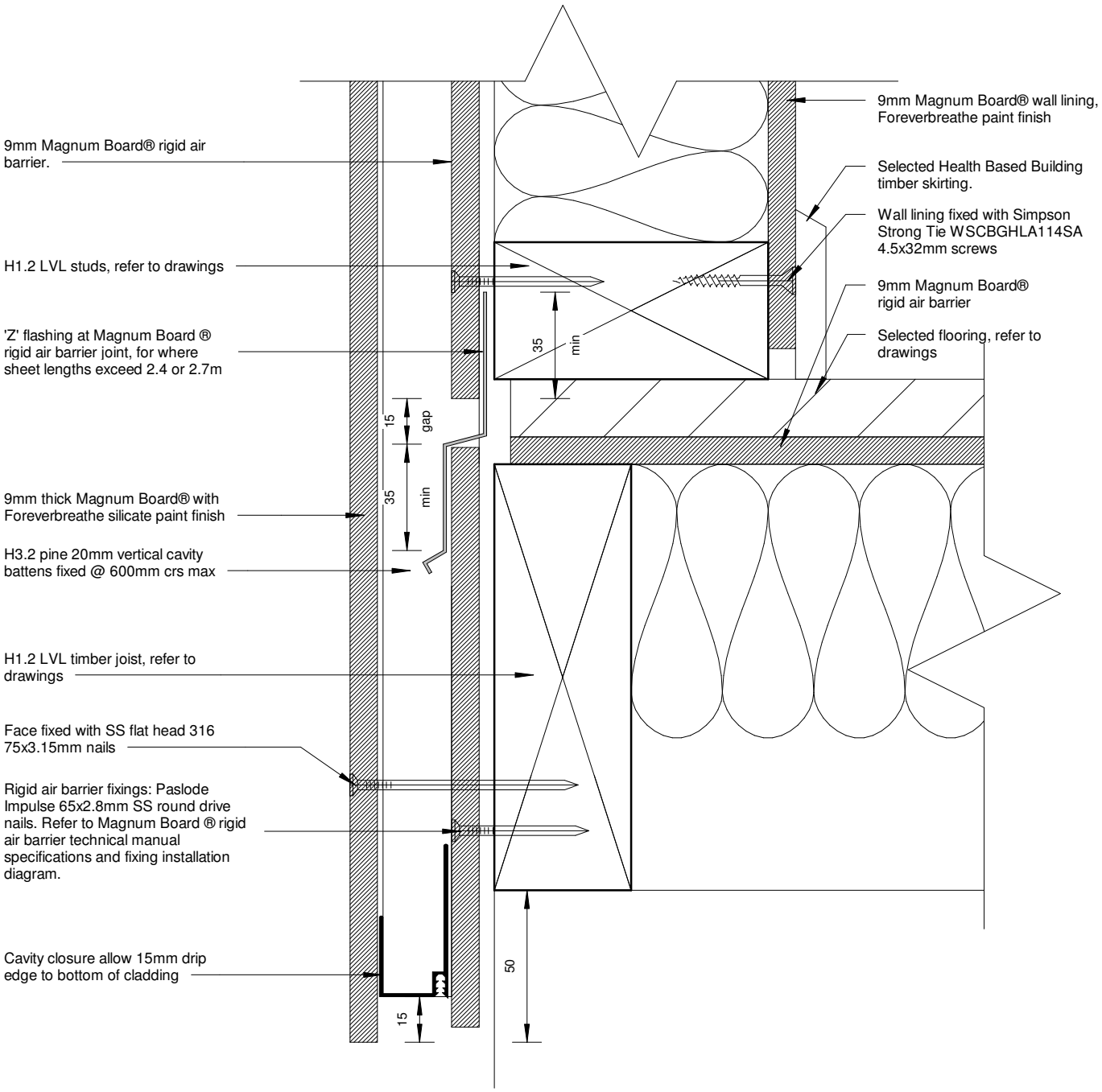

Timber Foundation Detail

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Timber Foundation Detail

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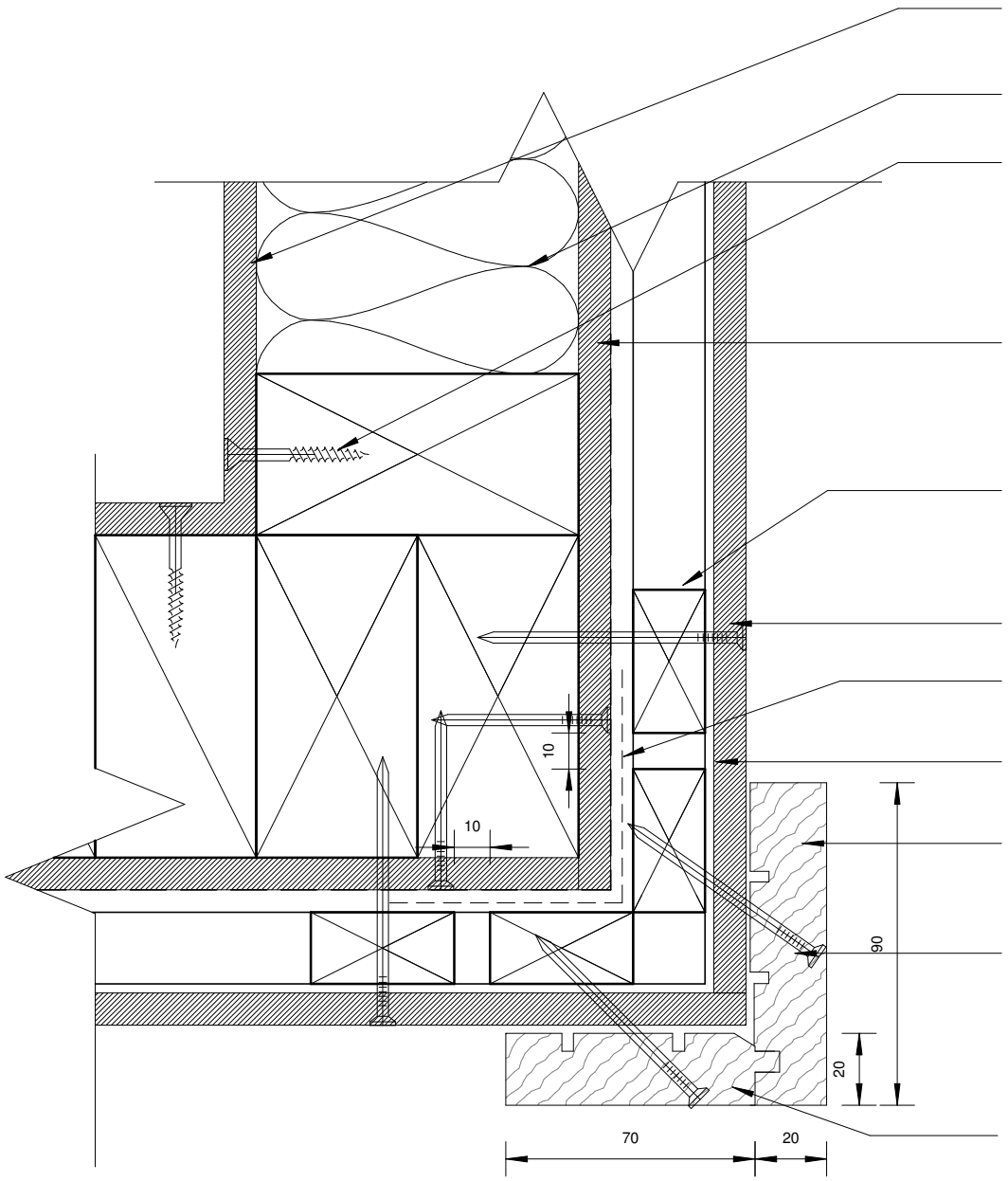

External Corner Detail

1 : 2

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0 10mm

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3/15

Health Based Building Magnum Board Cavity Fix Details

External Corner Detail

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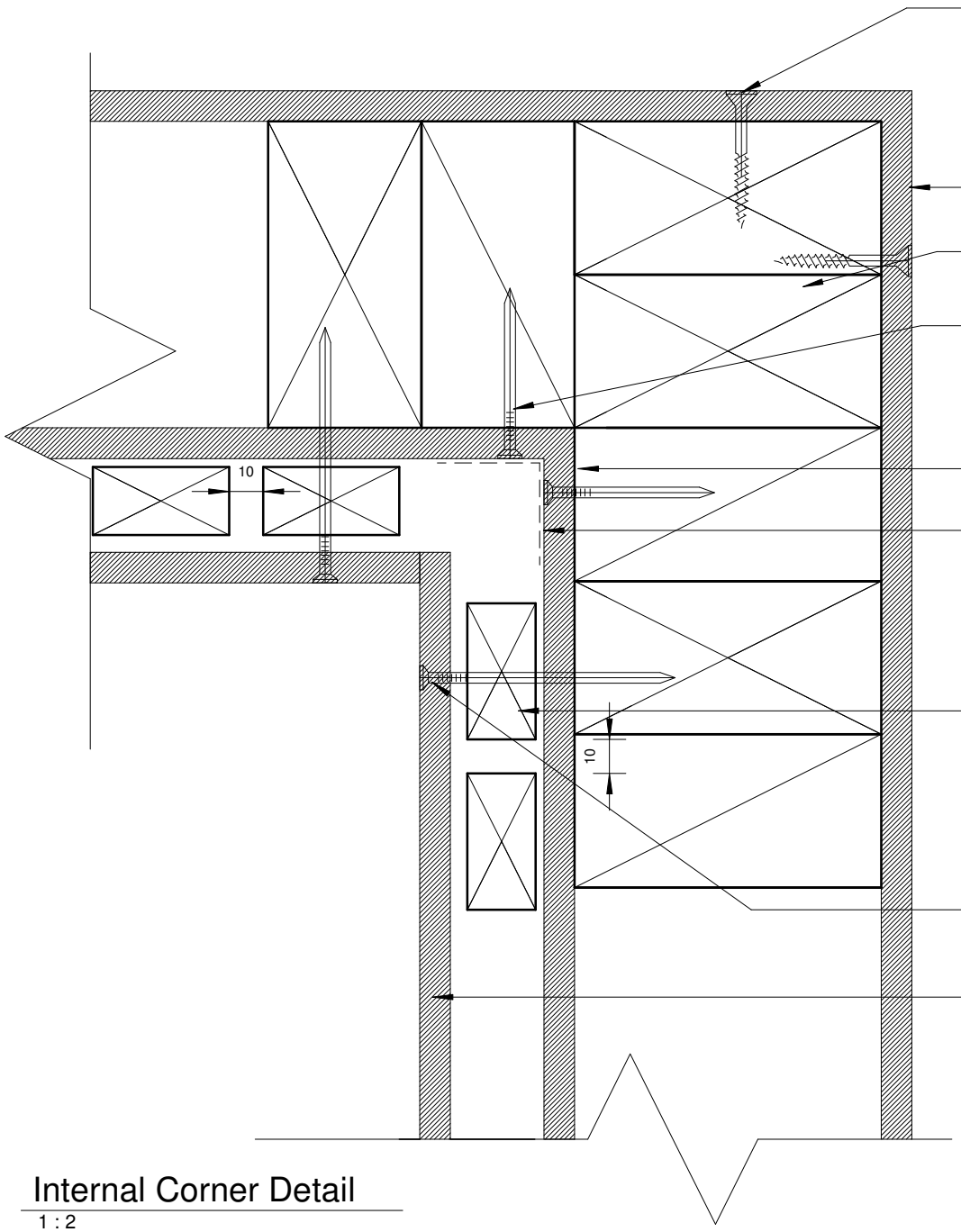

Internal Corner Detail

1 : 2

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0 10mm

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GRAPHIC SCALES

4/15

Health Based Building Magnum Board Cavity Fix Details

Internal Corner Detail

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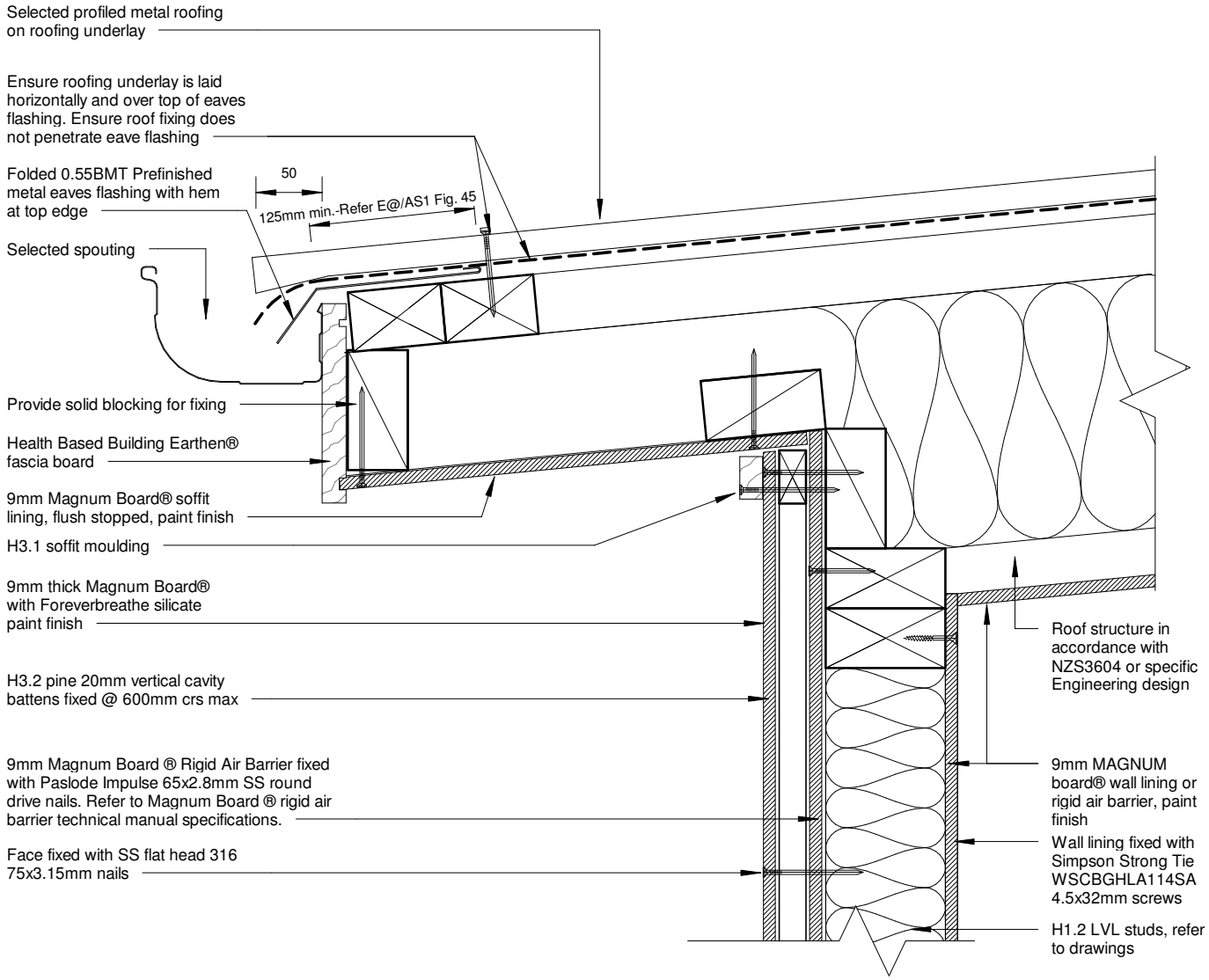

Note;
1. All Magnum Board®, ABEP® flashman® products to be installed by approved installers approved by NZSFP Ltd.
2. ABEP® blue barrier residue shall be removed from the Magnum Board® face before application of Foreverbreathe Silicate paint.
3. Hardie & Thomson® Cover Boards and Scribers, Foreverbreathe Silicate paint, Terra Lana® Wool Insulation are supplied and installed by others.

Eave - Section Detail

1 : 5

0 10mm 50 100 150mm

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5/15

Health Based Building Magnum Board Cavity Fix Details

Eave - Section Detail

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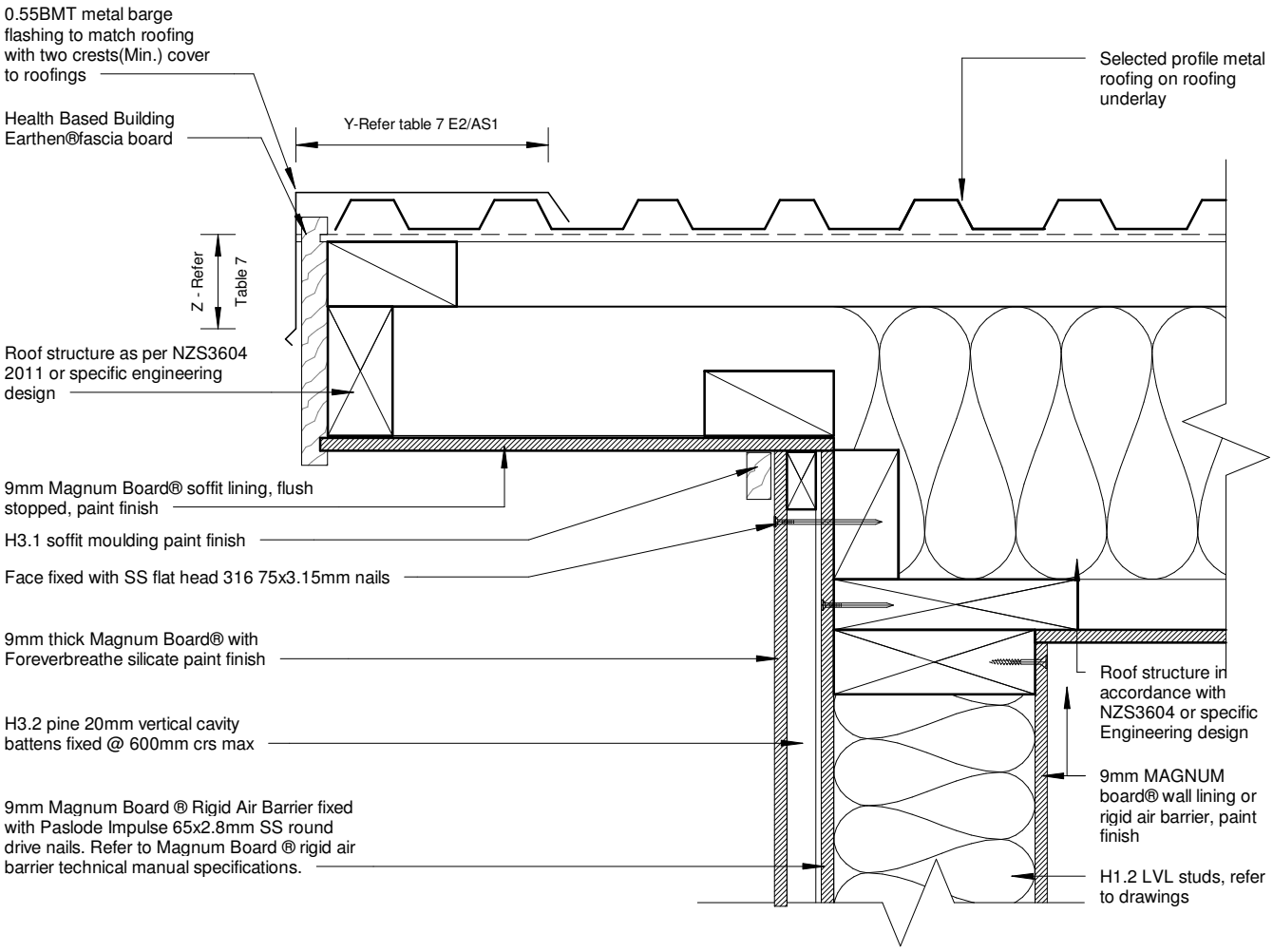

Note;
1. All Magnum Board®, ABEP® flashman® products to be installed by approved installers approved by NZSFP Ltd.
2. ABEP® blue barrier residue shall be removed from the Magnum Board® face before application of Foreverbreathe Silicate paint.
3. Hardie & Thomson® Cover Boards and Scribers, Foreverbreathe Silicate paint, Terra Lana® Wool Insulation are supplied and installed by others.

Barge - Sectional Detail

1 : 5

0 10mm 50 100 150mm

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GRAPHIC SCALES

6/15

Health Based Building Magnum Board Cavity Fix Details

Barge - Section Detail

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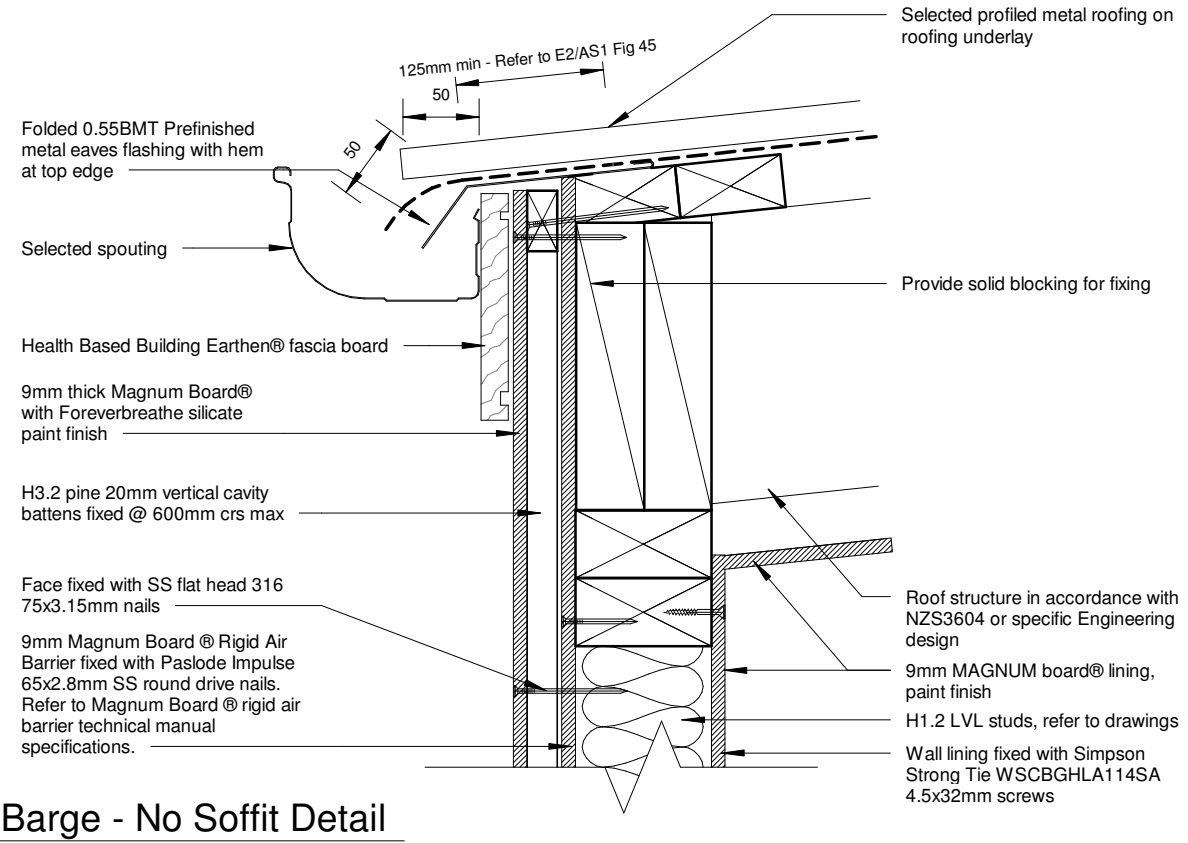
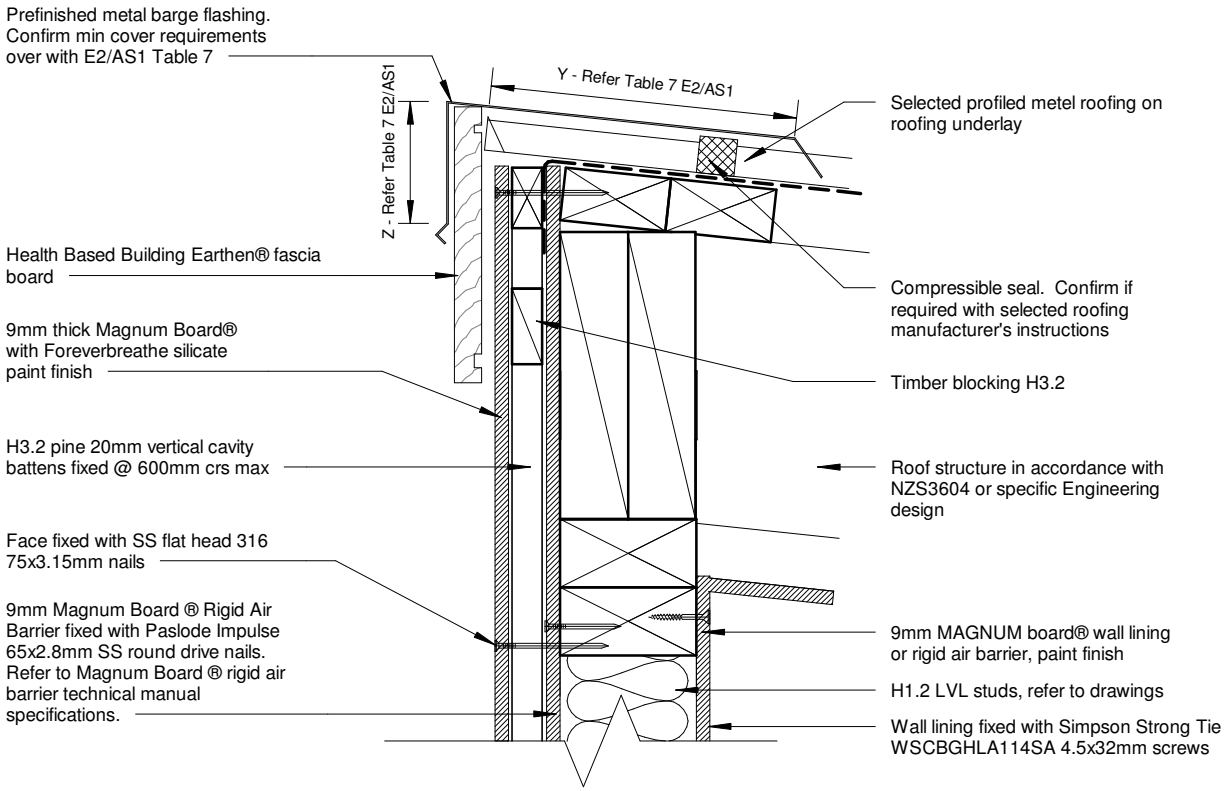


Barge - No Soffit Detail

1 : 5



Roof - Wall ridge - Section Detail

1 : 5

0 10mm 50 100 150mm

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7/15

Health Based Building Magnum Board Cavity Fix Details

Roof - Wall Ridge - Section Detail

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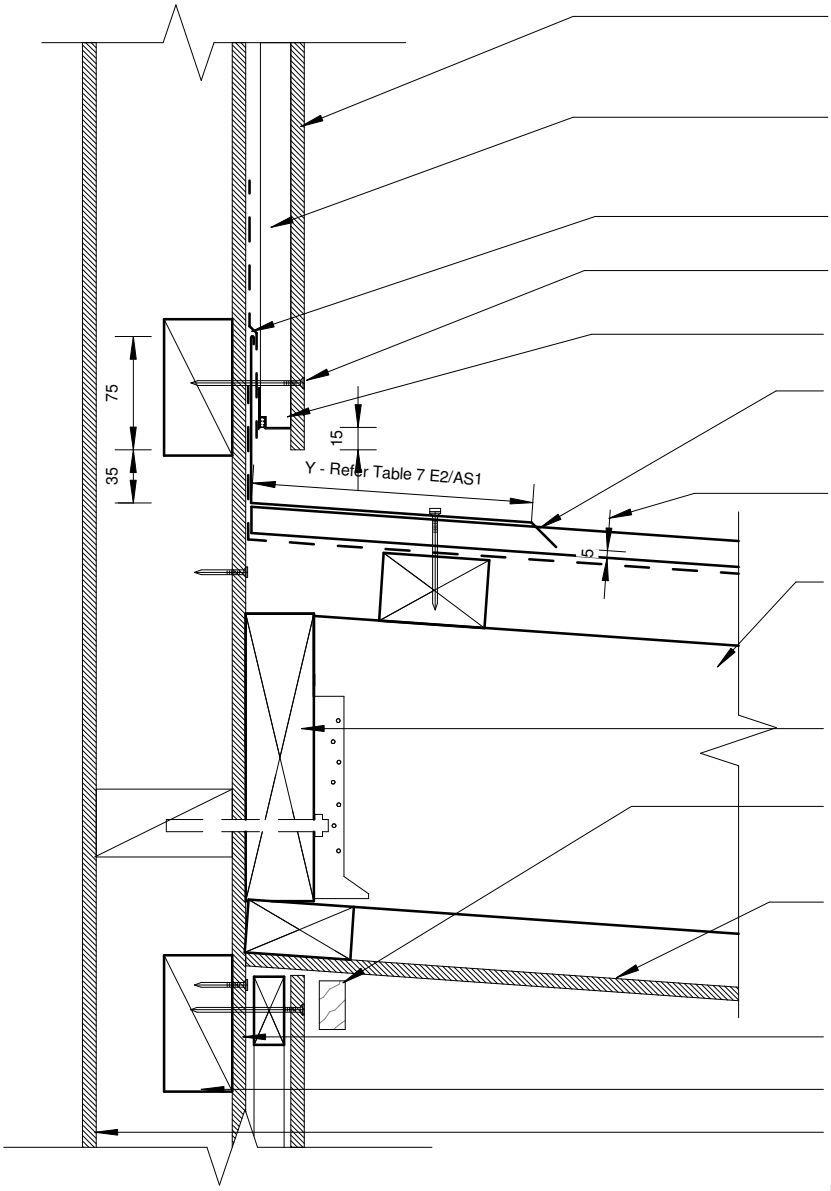

9mm thick Magnum Board® with Foreverbreathe silicate paint finish

H3.2 pine 20mm vertical cavity battens fixed @ 600mm crs max

ABEP ® mulehide tape applied over top of apron flashing

Face fixed with SS flat head 316 75x3.15mm nails

Cavity closure allow 15mm drip edge to bottom of cladding

Prefinish metal apron flashing. 75mm Cover behind cladding. 35mm min. clearance between cladding and flashing. Refer to E2/AS1 Table 7 for cover over roofing

5mm max. Gap between flashing and roofing

Roof structure in accordance with NZS3504:2011 or specific engineer design

Timber stringer fixed to wall framing. Refer to NZS3604:2011

Health Based Building Earthen® soffit moulding

9mm Magnum board® soffit lining. Flush stopped.

9mm Magnum Board® rigid air barrier

H1.2 LVL studs, refer to drawings

9mm MAGNUM board® wall lining or rigid air barrier, paint finish

Note: ABEP® Blue barrier residue shall be removed from the Magnum Board® face before application of Foreverbreathe Silicate paint.

Canopy Junction - Section Detail

1 : 5

150mm
100
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0 10mm

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Health Based Building Magnum Board Cavity Fix Details

Canopy Junction - Section Detail

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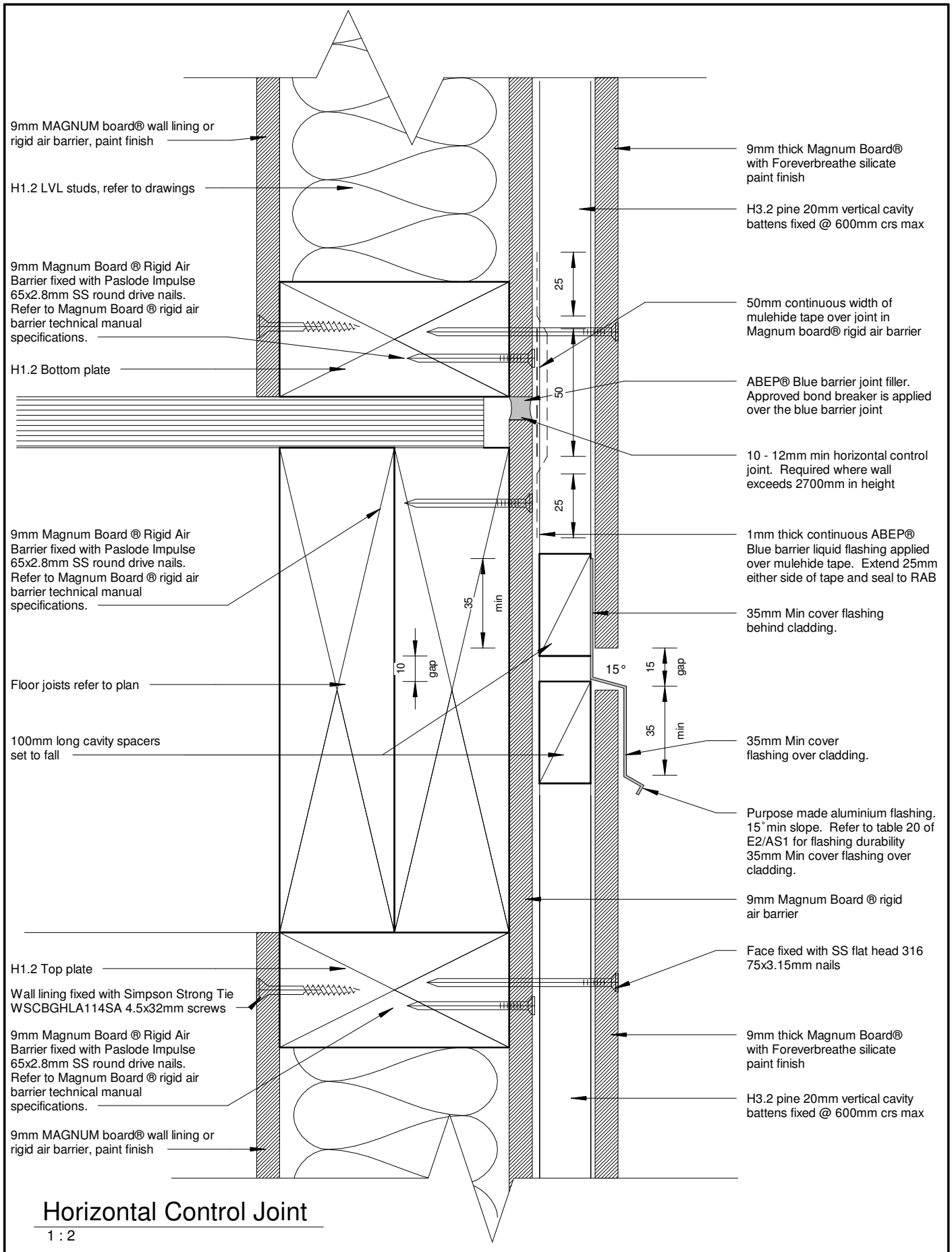

Horizontal Control Joint

1 : 2

9/15

Health Based Building Magnum Board Cavity Fix Details

Horizontal Control Joint

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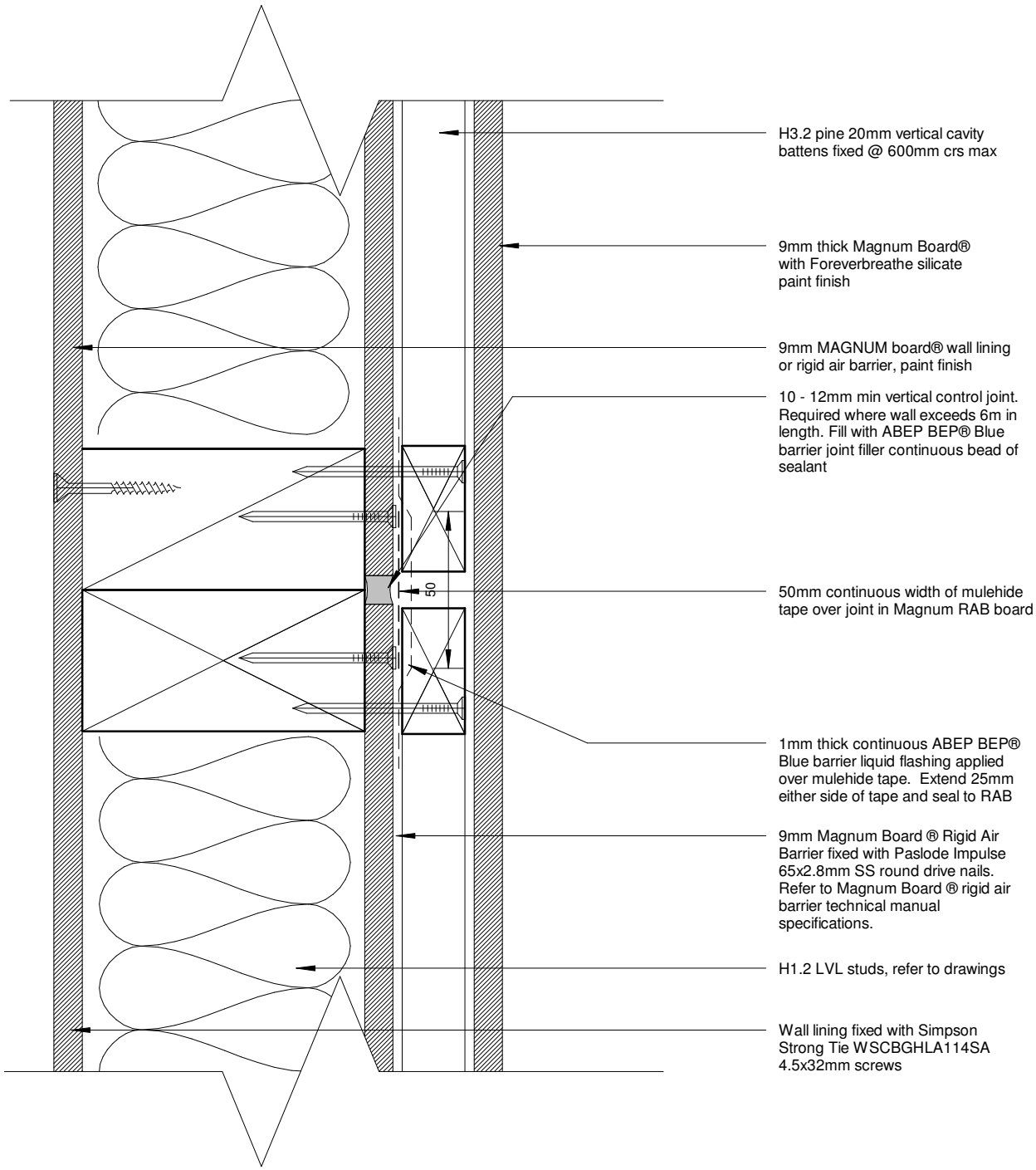

Vertical RAB Joint

1 : 2

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Health Based Building Magnum Board Cavity Fix Details

Vertical RAB Joint

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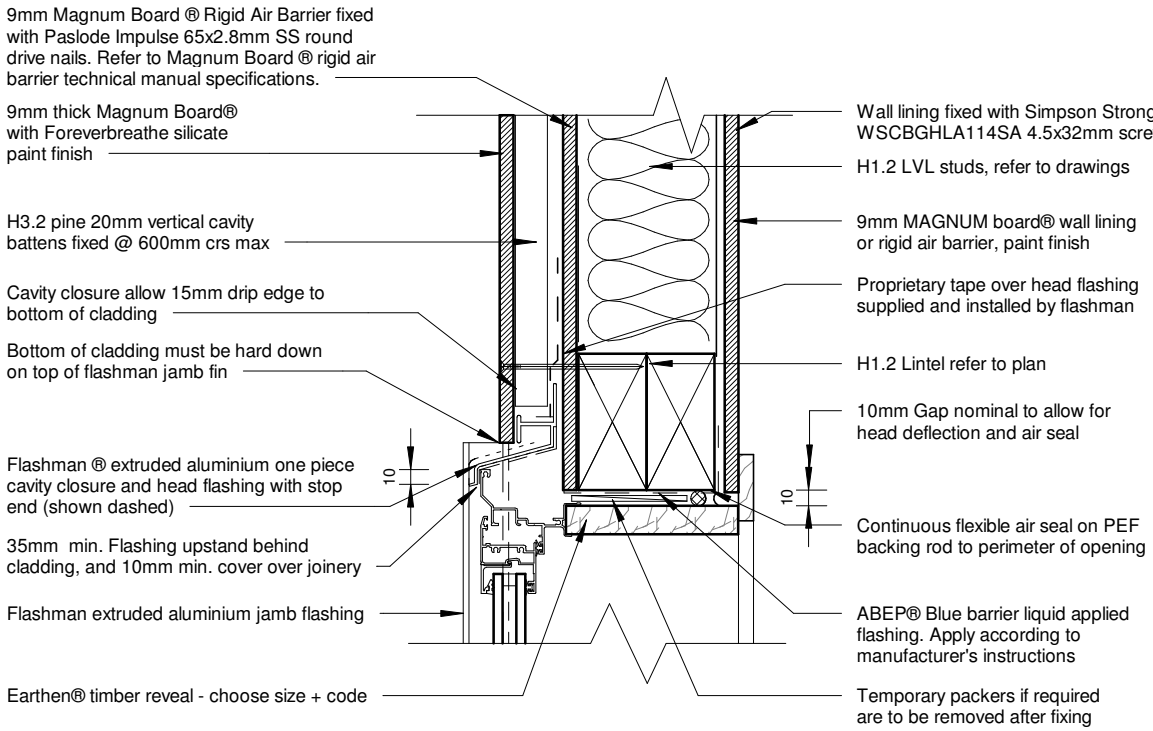
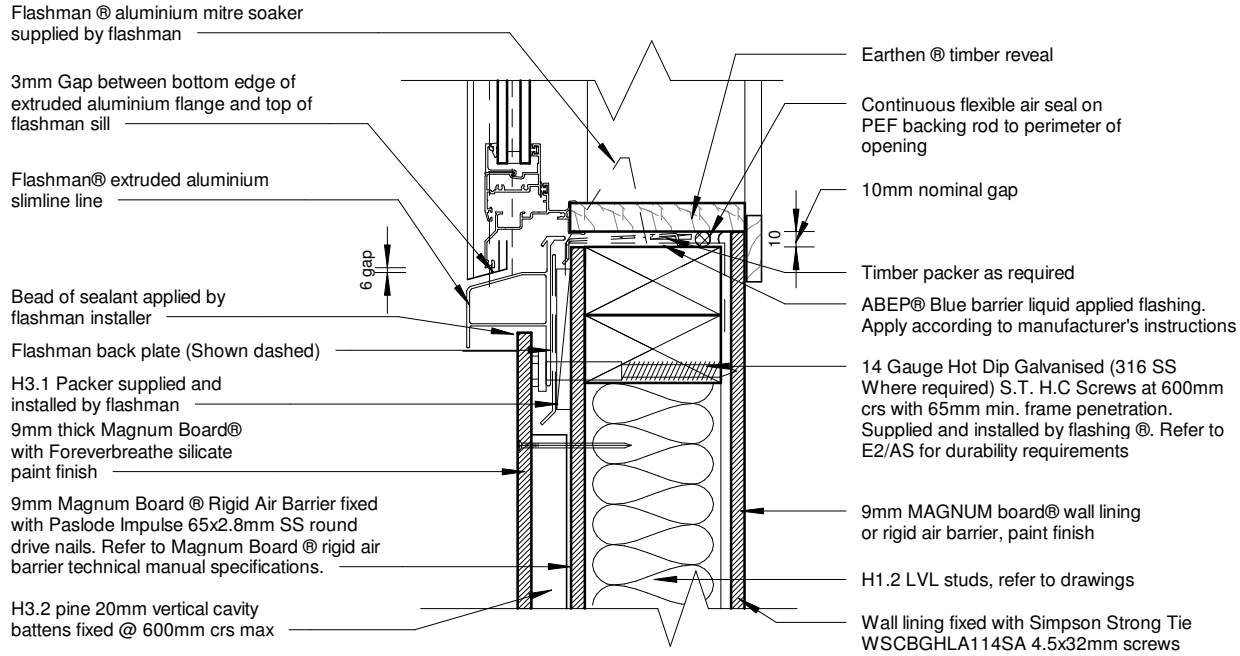


Typical Head Detail

1 : 5



Typical Sill Detail

1 : 5

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0 10mm

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GRAPHIC SCALES

11/15

Health Based Building Magnum Board Cavity Fix Details

Typical Head and Sill Detail

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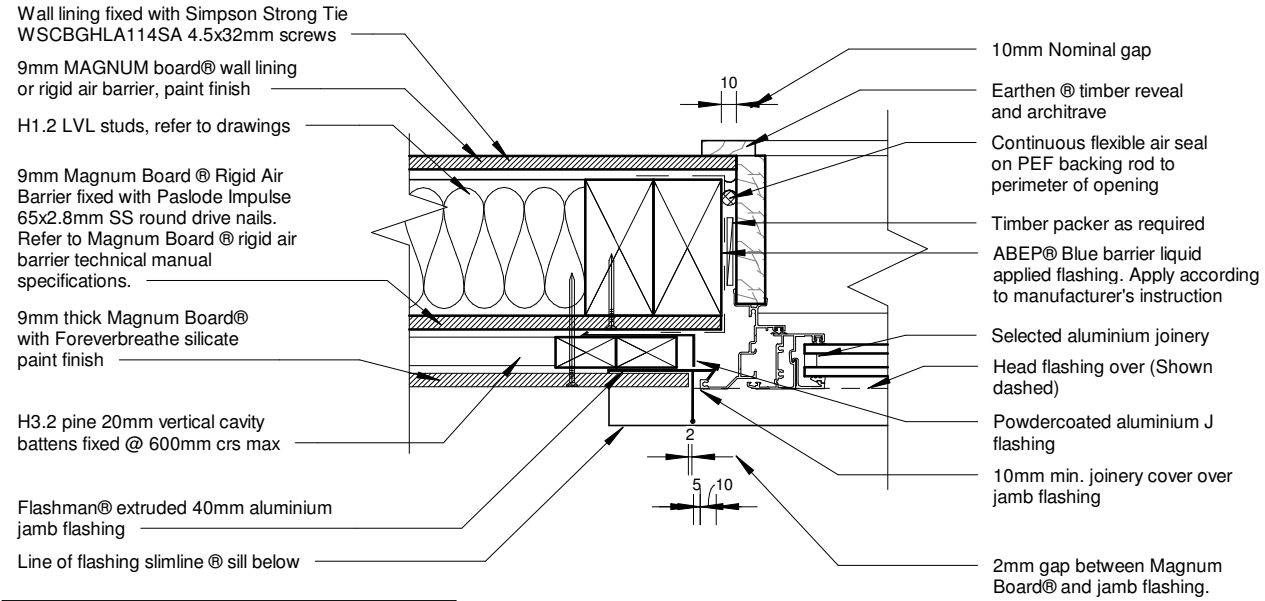

Note: ABEP® Blue barrier residue shall be removed from the Magnum Board® face before application of Foreverbreathe Silicate paint.

DO NOT FIX THROUGH JAMB FLASHING

Typical Jamb Detail

1 : 5

150mm
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GRAPHIC SCALES

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Health Based Building Magnum Board Cavity Fix Details

Typical Jamb Detail

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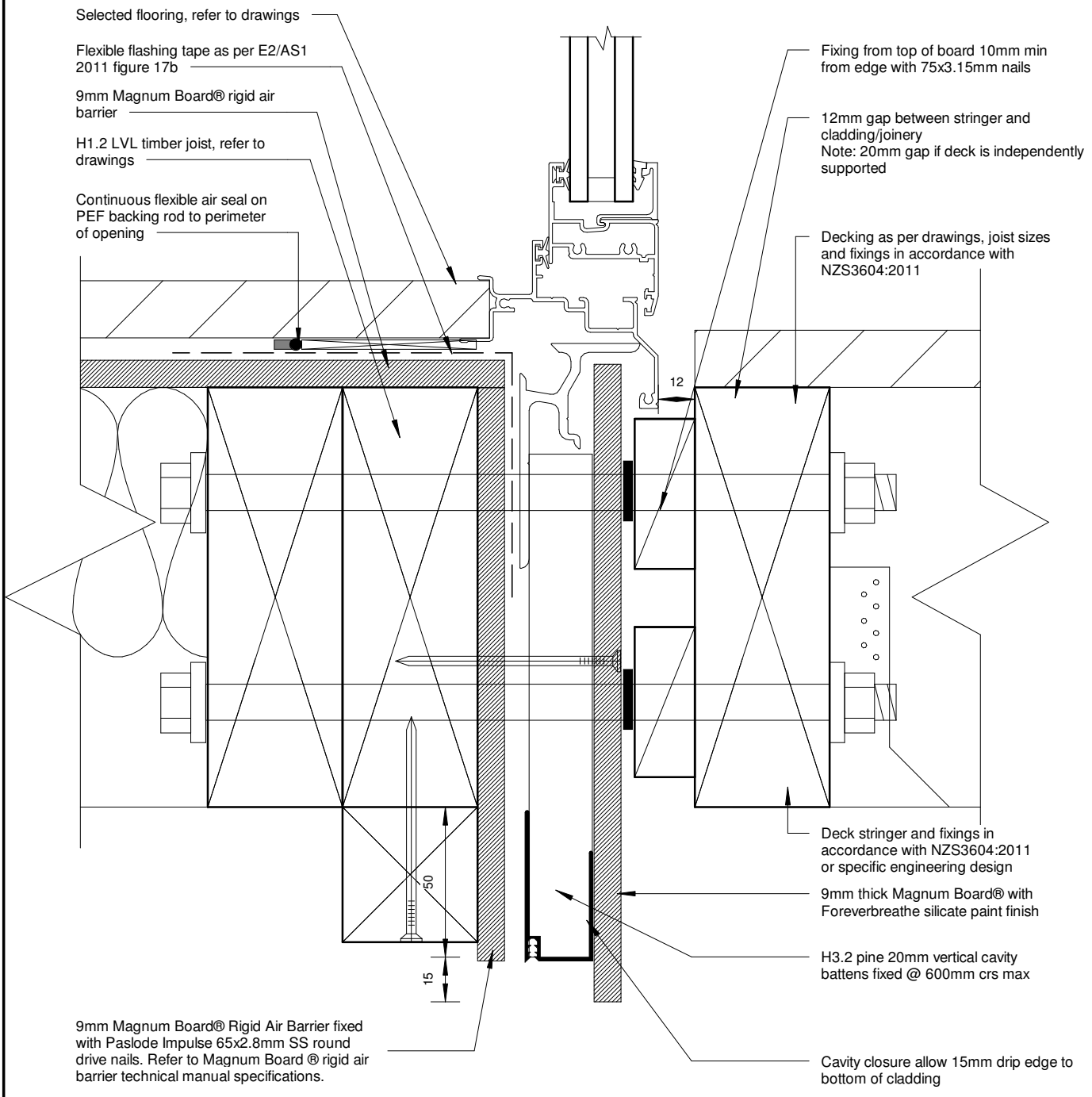

Deck Threshold Detail

1 : 2

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13/15

Health Based Building Magnum Board Cavity Fix Details

Deck Threshold Detail

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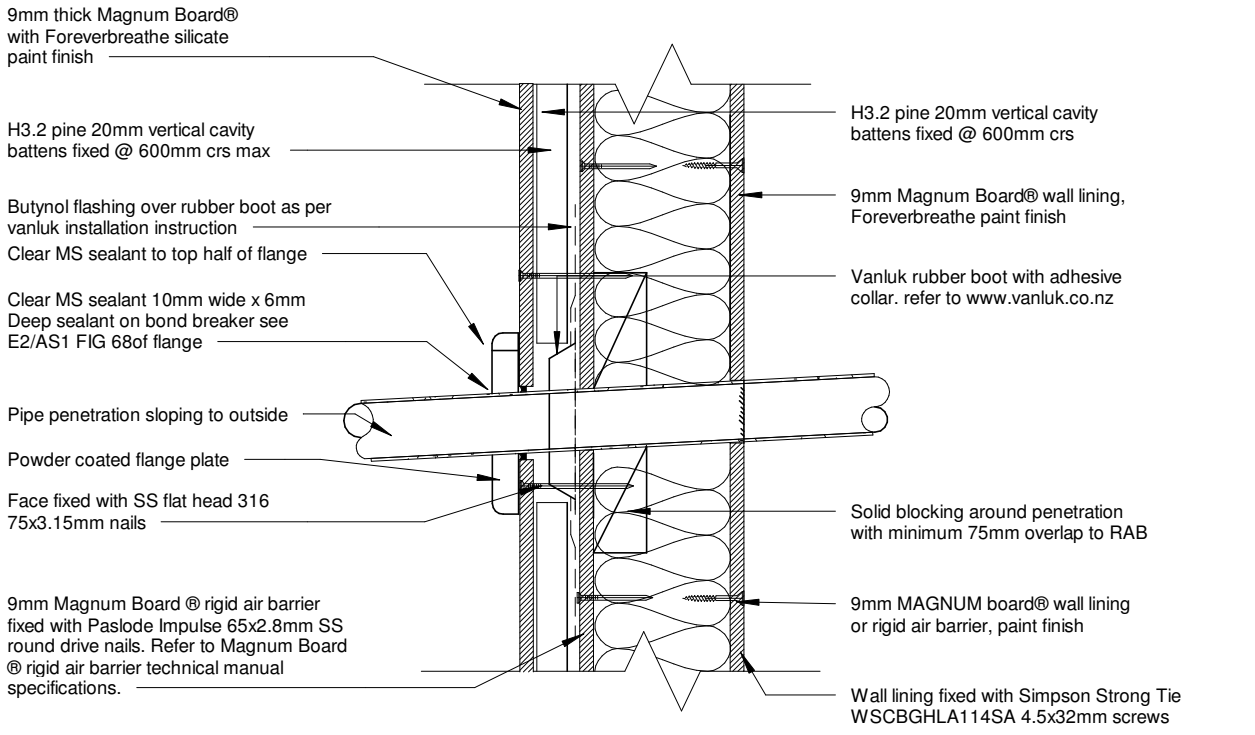
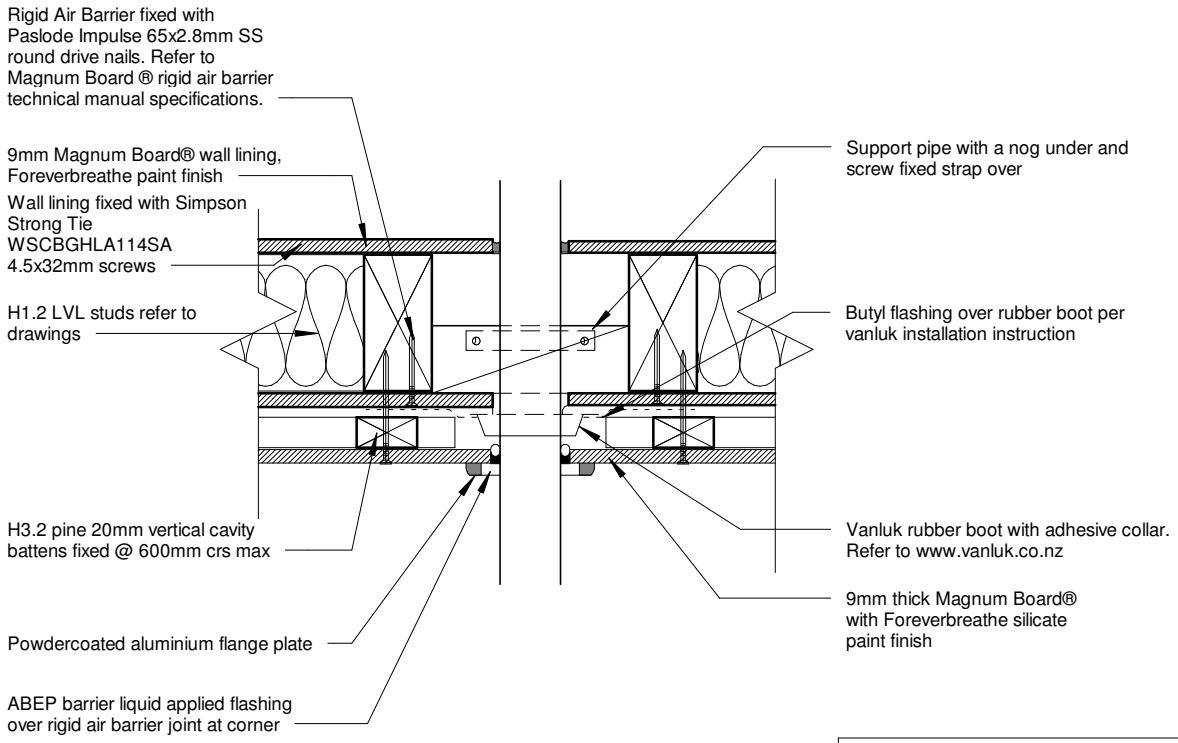


Note: ABEP® Blue barrier residue shall be removed from the Magnum Board® face before application of Foreverbreathe Silicate paint.

Pipe Penetration Section Detail

1 : 5



Note: Alternative option is to remove flange plate and provide clear sealant in place of ABEP Blue barrier joint filler

Pipe Penetration Plan Detail

1 : 5

14/15

Health Based Building Magnum Board Cavity Fix Details

Pipe Penetration - Plan & Section Detail

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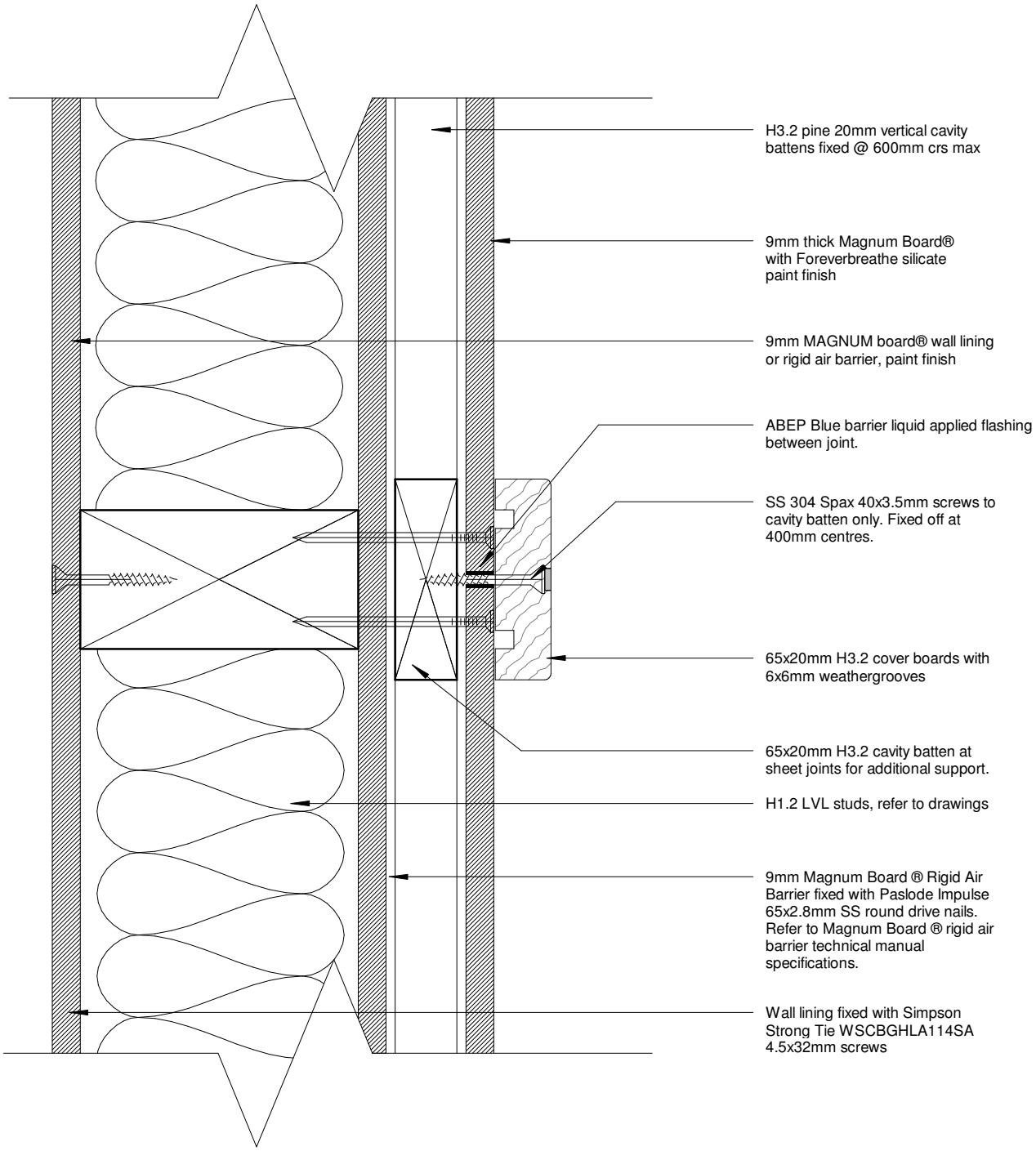

Vertical Cladding Joint

1 : 2

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0 10mm

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GRAPHIC SCALES

15/15

Health Based Building Magnum Board Cavity Fix Details

Vertical Cladding Joint

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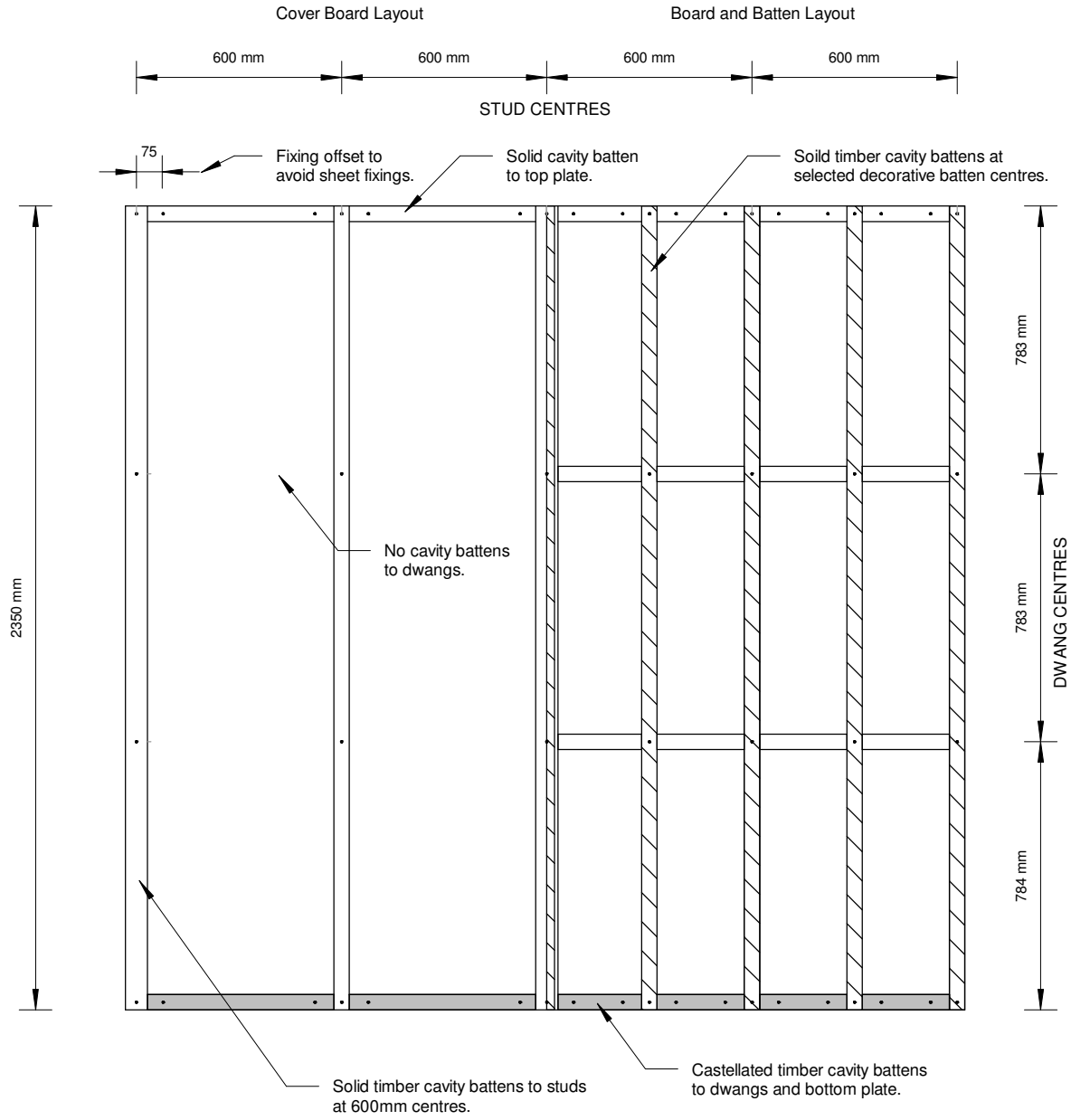

Magnum Board Cavity Batten Layout

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Health Based Building Magnum Board Cavity Fix Details

Magnum Board Cavity Batten Layout

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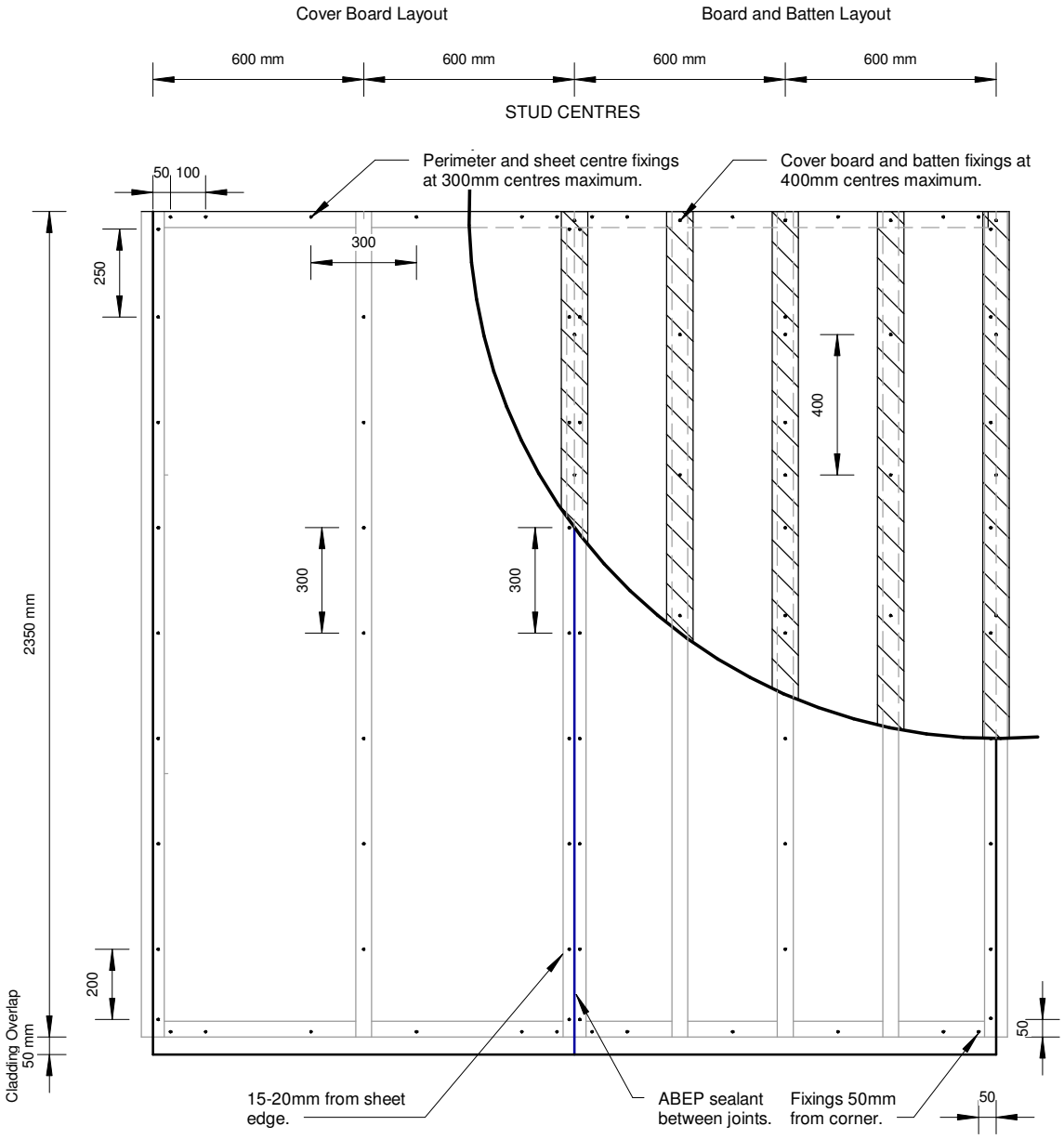

Magnum Board Sheet Fixing Layout

1 : 20

Notes:

Standard cover boards are required at sheet joints only and they are to be fixed off as per detail 15.

Board and batten decorative cover boards can be installed at 600mm; 400mm; 300mm centres. Please note that decorative cover boards are to be continuously supported with solid timber cavity battens when installed between studs. Additionally all cover boards shall be fixed off with SS 304 Spax 40x3.5 screws.

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GRAPHIC SCALES

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MAGNUM™ BOARD P21 BRACING TEST
2400 X 1200

Te Papa Tipu Innovation Park
49 Sala Street
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Email: douglas.gaunt@scionresearch.com

Facsimile

To:	Robin Curtis	**From:**	Doug Gaunt
Organisation:	New Zealand Sustainable Forest Products L.P	**Subject:**	P21:2010 1200mm x 2.4m Wall 9mm Magnum board one side, No Hold Down Brackets
Location:	Christchurch	**Date:**	21 August 2013
Fax No.:	03 7328 415	**No. of Pages:**	5
Tel No.:	03 7328 414		

Please call +64 7 343 5763 if transmission incomplete

Robin

Please find below the results of your three 1200mm x 2.4m 9mm Magnum board one side walls as tested on a concrete floor with no hold-downs.

1. BU wind = 136 (113 BU/m) as limited by the ultimate load capacity.
2. BU Earthquake = 121 (101 BU/m) as limited by the ultimate load capacity.

Figures 1, 2 & 3 show the load deflection plots, Figure 4 shows the P21:2010 calculations.

Wall Construction

- 90x45 SG8 studs (600 centres), plates, no nogs
- 9mm Magnum board one side fixed vertically
- 32mm screws at 300mm nominal c/c's to plates, end studs & centre studs
- No hold-down brackets
- Tested on a 'concrete' floor with M12 hold down bolts and 50x50x3mm washers

RISK AND LIMITATION OF LIABILITY: Scion's liability to the Client arising out of all claims for any loss or damage resulting from this work will not exceed in aggregate an amount equal to two times the Service Fees actually paid by the Client to Scion. Scion will not be liable in any event for loss of profits or any indirect, consequential or special loss or damage suffered or incurred by the Client as a result of any act or omission of Scion under this Agreement.
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NOW AVAILABLE: MAGNUM® BOARD

A NEW GENERATION 'breathable' building material developed for our time.

MAGNUM BOARD® – A mineral based product that will ensure your next build meets the criteria now demanded by Health Based Building projects. MAGNUM BOARD® is one of the few NEGATIVE CO_2 building materials available to the market worldwide.

Install it for health – Install it for life.

A world leader, MAGNUM BOARD® is a technologically advanced, high-quality Magnesium Oxide Board (MgO Board) building material that offers superior performance in every category when compared to traditional wood fibre, gypsum and cement based products. It is homogenous – NO de-lamination.

Breathability and versatility are its greatest asset. There is a product available for most applications.

Exterior
- Cladding
- Fascia
- Soffit
- Trim
- Lap Siding
- SIP Panels

Interior
- Wall board – square or tapered edge
- Ceiling board
- Tile backer
- Underlayment
- Drop ceiling tiles
- SIP Panels

Why Magnum Board?

It allows wall systems to breathe, helping to create a healthy microclimate.

It is unique – engineered to eliminate the toughest problems: fire, water, insects, mould, mildew, impact and toxins. Literally billions of dollars are spent every year as a result of damage caused by these problems. Illnesses and even deaths directly resulted from these problems cost even more. Avoid all this by choosing MAGNUM BOARD® when considering building materials such as wood fibre, gypsum or cement based products.

It is considered a 'GREEN' product.

It is a Health Based Building Product completely free of toxins.

It has been subjected to some of the toughest building materials testing regimes. Such as UL 2000 hour freeze thaw test simulating 20 years of wear and tear in all climatic conditions. MAGNUM BOARD® is NZ appraised for interior use including wet areas and exterior use as weather boards and rigid air barrier in extra high wind zones. This is indeed a one of a kind material.

It is dimensionally stable in freeze, thaw, heat and humidity cycles.

Excellent adhesion properties allow fantastic finishes with paint, stucco, wallpaper, stone, tile, brick and much more. It is the perfect product for Structural Insulated Panels, Exterior Insulated Finish Systems, and fabric or veneer interior wall systems.

Overall installation and life cycle costs ensure MAGNUM BOARD® is very competitively priced due to its high resilience to all damage and 'one product fits all' positioning.

It is both easy and very safe to install.

HEALTH BASED BUILDING™

Install it for **health**
Install it for **life**
MAGNUM® BOARD

Is MAGNUM BOARD® considered a health based building product?

Yes it is. MAGNUM BOARD® is a mineral product, completely free of toxins such as asbestos, formaldehyde or silica, is manufactured completely at ambient temperature, and is considered a green product.

Is MAGNUM BOARD® considered a negative CO_2 product?

Yes indeed the MAGNUM BOARD® product line is CO_2 negative meaning the product and / or its process absorbs CO_2 and turns it into magnesium carbonate and that remains in the board until the board is retired from service, in which case, the magnesium carbonate can be recycled to make MgO and ultimately recycled into more MAGNUM BOARD®.

Has MAGNUM BOARD® been tested?

Yes indeed. Magnum Board® has been subjected to some of the toughest testing being conducted on building materials today including the freeze / thaw and 2,000 hour weathering test which simulates 20 years of wear and tear in all climatic conditions including high heat and snow. Magnum Board® products are fully appraised in NZ and Underwriters Laboratory (UL) approved. This is indeed a one of a kind material. Our factory is ISO certified and is audited on a quarterly basis by Underwriters Laboratories (UL).

Is MAGNUM BOARD® dimensionally stable in freeze, thaw, heat and humidity cycles?

Yes it is. Unlike Portland type materials the coefficient of expansion for MAGNUM BOARD® is extremely low; therefore, when selecting and installing products such as our exterior lap siding, there is no need to leave gaps between butt joints to accommodate for such expansion and contraction. This provides a much more aesthetically pleasing finish for many years to come.

What are the adhesion values of MAGNUM BOARD®?

Excellent allowing you to finish MAGNUM BOARD® with any product you desire such as paint, Portland type stucco, synthetic stucco, wall paper, stone, tile, brick and much more. The excellent adhesion properties of MAGNUM BOARD® also make it a perfect product for Structural Insulated Panels (SIPS), Exterior Insulated Finish Systems (EIFS) and interior wall systems using fabrics and veneers.

Is the cost of MAGNUM BOARD® competitive with other products?

When considering overall installation and life cycle costs, **absolutely**. By using MAGNUM BOARD® you don't have to worry about damage caused by low or high impacts, termites, carpenter ants or any other pests; decay caused by moisture and UV; warping, swelling and wood rot caused by water; mould and mildew; and, toxins that are found in many wood fibre panels, plastics, gypsum and cement based products.

How can I hang pictures and other items on MAGNUM BOARD®

It's simple and easy to hang just about anything from MAGNUM BOARD®. What works with gypsum based panel's works with Magnum Board.

How do I store MAGNUM BOARD®?

Storage and handling of MAGNUM BOARD® is simple. Refer to the technical manual for details.

Is MAGNUM BOARD® easy to install?

Indeed it is. MAGNUM BOARD® installs with screws or pneumatic nailers depending on the application you are using it for. Always follow the MAGNUM® Building Products installation recommendations.

Finishing interior walls and ceilings is also easy using standard joint compound and fibre or paper tape. Since MAGNUM BOARD® is smooth on one side, you can achieve a level 5 beautiful and durable finish with much less work (man-hours) than typical gypsum based panels.

Is MAGNUM BOARD® safe for installers?

Yes. In fact installing Magnum Board® is as safe if not safer than installing any other material on the market today. Magnum Board® is a mineral based product free of carcinogens and silica. Magnum Board® is extremely safe for installers and consumers alike.

WHY USE MAGNUM® BOARD

MAGNUM BOARD® is Virtually Impervious to:

Fire Non-Flammable BRANZ appraised Group 1S NZ appraised 60 minute fire rating Non-Combustible (E136).

Water Does Not Feed Mould or Mildew nor does it decay in any way.

Insects Such as termites, borer and sugar ants.

MAGNUM BOARD® is Non-Toxic (U-Pitt Protocol) and VOC compliant (D5116).

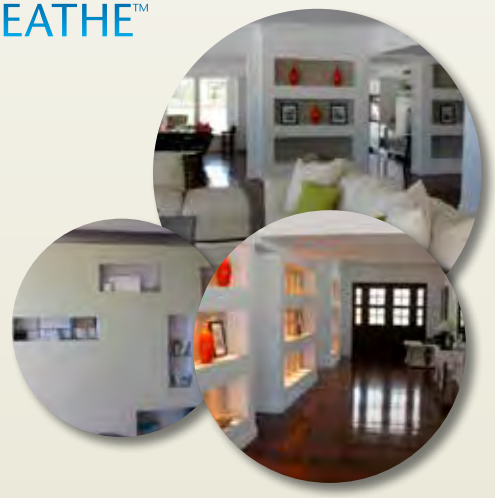
MAGNUM BOARD® is NZ appraised for interior applications such as: Backer Board - Underlayment – Walls - Ceilings – Trim – Drop Ceiling Tiles – One Hour Fire Walls.

MAGNUM BOARD® is NZ appraised for exterior applications such as: Wall and Ceiling Board – SIPS – Fascia – Soffit – Trim – Exterior Lap Siding and RAB.

MAGNUM BOARD® can be finished with almost any product, such as paint, synthetic stuccos, breathable renders, certain decorative laminations and stains.

MAGNUM BOARD® is now fully appraised in Foreverbreathe™ High Performance Breathable Wall Systems.

FOREVER BREATHE™



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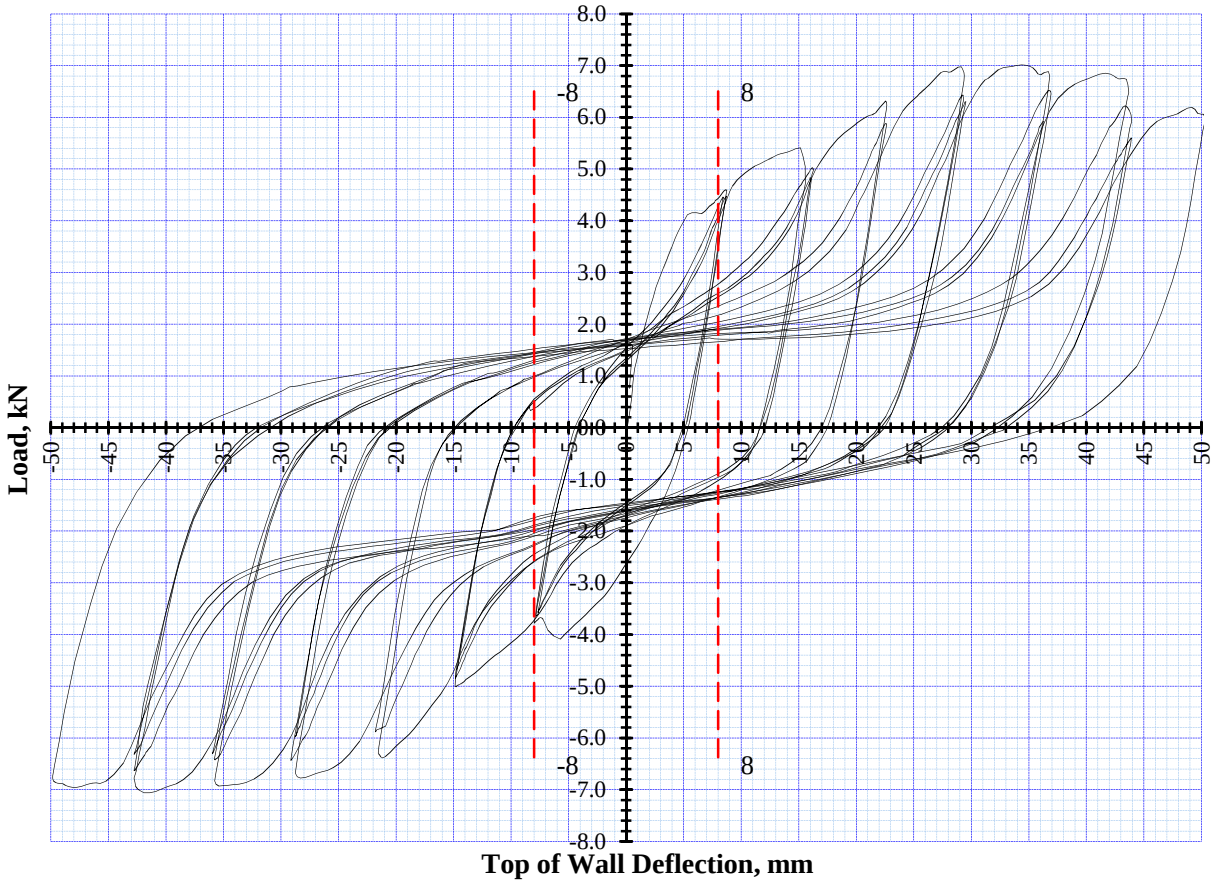


Figure 1: *Wall 267442*

Wall Condition after test

- All the walls after the full P21 still exhibited significant load carrying capacity as evidenced by the relatively constant load as the deflection cycles continued out past 40mm. This maintenance of load capacity is evidence in itself of limited damage to the walls.
- The screws remained intact.
- No fractures were seen in the Magnum board.
- No damage was seen in the timber framing.
- The only apparent damage was a widening of the screw hole through the Magnum board predominantly around those screws on the bottom plate and on the bottom section on the end studs.

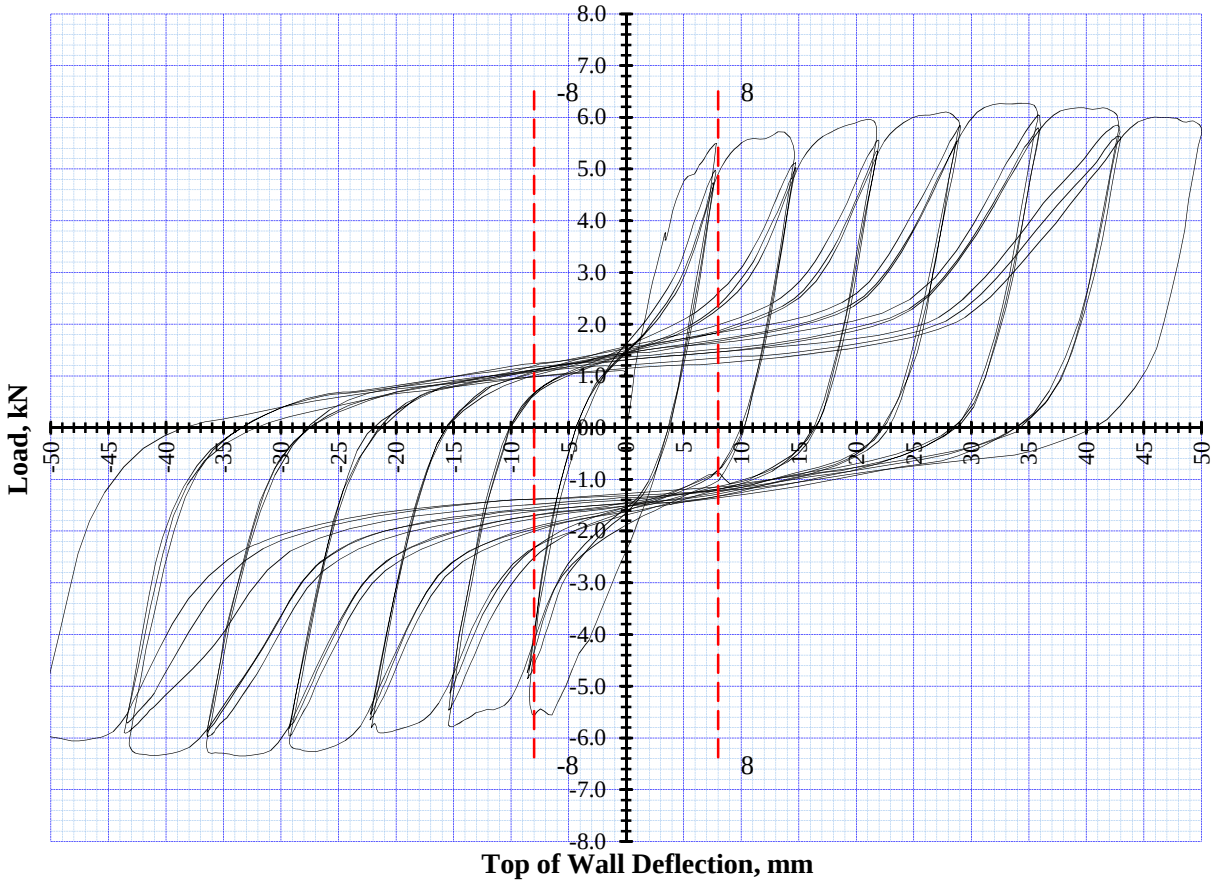


Figure 2: *Wall 267443*

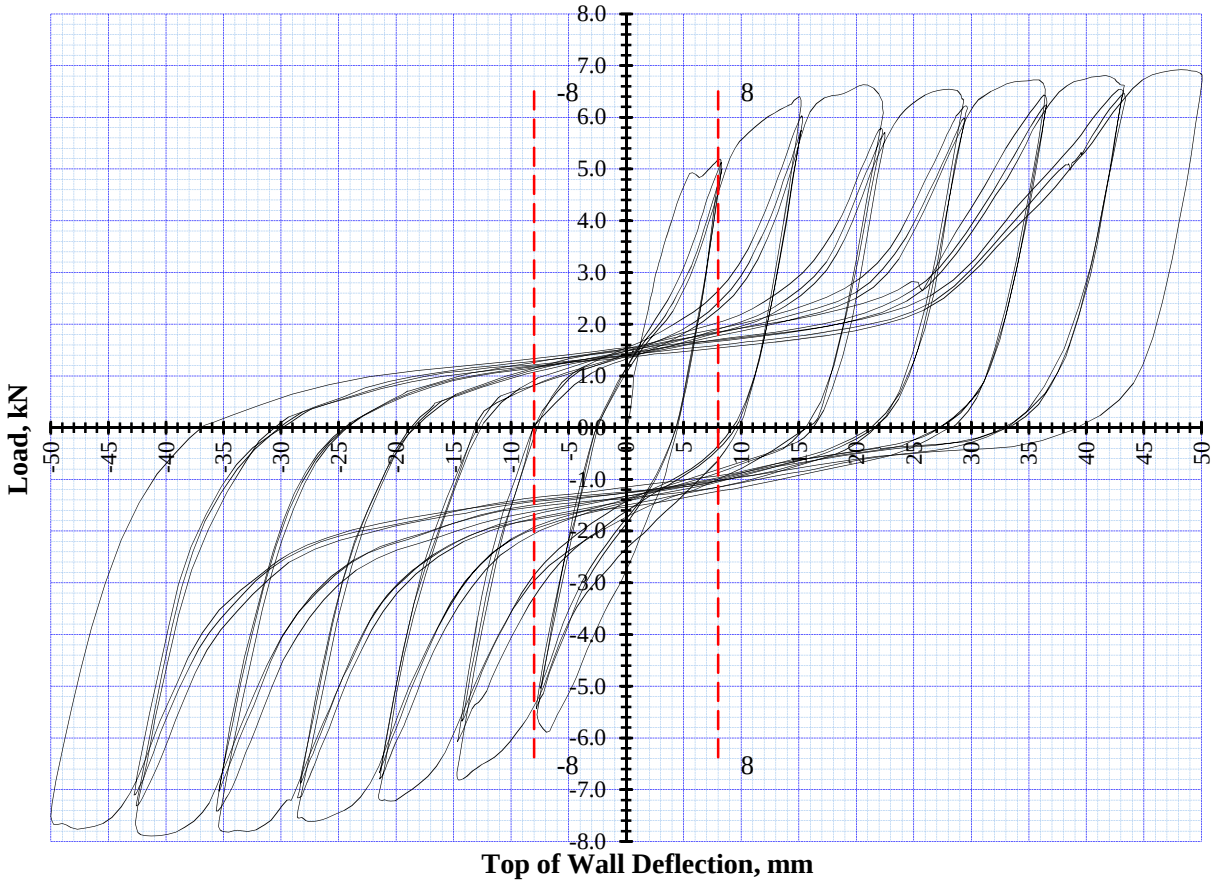


Figure 3: *Wall 267444*

P21:2010 BRACING RACKING TEST RESULT EVALUATION

Wall Construction

1200mm, 9mm Magnum board one side , 32mm Screws at 300mm nom c/c's to plates & end studs

32mm Screws at 300mm nom c/c's to centre stud, No Hold down brackets each end

50x50x3 washers M12 bolts to Concrete Floor

90x45 SG8 plates & Studs (600mm c/c), no nogs

Calculated to BRANZ P21:2010, AS/NZS1170.2&5, NZS3604:2010

Scion, Private Bag 3020 Rotorua. Timber Engineering Lab

Summary		
Earthquake	**101 (U)**	**BU/m**
Wind	**113 (U)**	**BU/m**

Date of test:-		**21-Aug-13**	Ship No.	**2693**		Tested by	Doug Gaunt
Date of calc's:-		**21-Aug-13**	Job No.	**TE13-023**		Analysed by	Doug Gaunt

		Serviceability Cycles		Ultimate Cycles				
		Cycle to H/300 or DLQ or DLW		Cycle to Displacement			Wall dimensions	
		8.0	X mm	y=(mm)			L(mm)	H(mm)
Lab Number	Direction	Loads	Residual	Maximum			1200	2400
		(P_8)	Defln, C	Load	def @ P		d at P/2	4th,R
		kN	mm	P(kN)	y (mm)	P/2 (kN)	d mm	kN
267442	**+**	**4.42**	**5.00**	**6.85**	**36.0**	3.43	**3.9**	**5.72**
	-	**3.75**	**4.20**	**6.90**	**36.0**			**6.08**
267443	**+**	**5.48**	**3.90**	**6.20**	**36.0**	3.10	**2.7**	**5.75**
	-	**5.52**	**4.10**	**6.30**	**36.0**			**5.75**
267444	**+**	**5.16**	**4.30**	**6.71**	**36.0**	3.36	**3.1**	**5.95**
	-	**5.50**	**2.50**	**7.80**	**36.0**			**7.10**
		(P_8)	(C)	(P)	(y)	P/2 (kN)	(d)	(Ry)
Averages		4.97	4.00	6.79	36.00	3.29	3.23	6.06
Coefficient of Variation %		13.42	18.82	7.67	0.00	4.24	15.43	7.98

y = average failure deflection or peak deflection of the three tests.

d= average first cycle displacement at half peak, (the very first cycle wall reaches the load)

R = Residual load, P = Peak Load, S = Serviceability load

Displacement Recovery Factor (K1), (0.8 <= K1 <= 1.0) — Systems factor K2 = 1.2

Average Structural Displacement Ductility factor — u = y/d 11.13

Ductility Modification factor — K4 = 1.00

DLW = Selected deflection limit for wind forces — DLQ = Selected deflection limit for earthquake forces

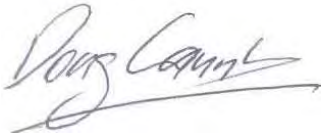
P21:2010 BR Calc's		**K1**	**EQ ultimate**	**EQ service**	**Wind Ultimate**	**Wind Service**
Lab Number		**(= 1.4 - C/X)**	**BU's**	**BU's**	**BU's**	**BU's**
267442	(BU)	0.83	118.0	147.1	137.5	113.9
	(BU/m)		98	123	115	95
267443	(BU)	0.90	115.0	216.0	125.0	167.3
	(BU/m)		96	180	104	139
267444	(BU)	0.98	130.5	226.8	145.1	175.7
	(BU/m)		109	189	121	146
		267442	*-4% Ok result*	*-51% Ok result*	*2% Ok result*	*-51% Ok result*
<20% Result Check		*267443*	*-8% Ok result*	*13% Ok result*	*-13% Ok result*	*13% Ok result*
		267444	*11% Ok result*	*20% Ok result*	*10% Ok result*	*20% Ok result*

Note: Where the value of BR Wind or BR EQ for any specimen is more than 20% greater than either of the other two specimens, assign it a value of 1.2 times the lower value before averaging.

Average Earthquake BR		**Ultimate**		**Serviceability**
EQ (BU's)	20 x K4 x Ry =	**121**	(P8 x K1) x (K2/0.55) =	**197**
	101	**BU/m**	**Limited by**	**Ultimate limit state**
Average Wind BR		**Ultimate**		**Serviceability**
Wind (BU's)	20 * P =	**136**	(P8 x K1) x (K2/0.71) =	**152**
	113	**BU/m**	**Limited by**	**Ultimate limit state**

Figure 4: *P21:2010 calculations for a 1200mm x 2.4m 9mm Magnum board one side wall*

Please feel free to contact me to discuss this information.

Doug Gaunt 

MAGNUM™ BOARD P21 BRACING TEST
2400 X 600

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Results

To:	Robin Curtis	**From:**	Doug Gaunt
Organisation:	New Zealand Sustainable Forest Products L.P	**Subject:**	P21:2010 600mm x 2.4m Wall 9mm Magnum board one side, No Hold Down Brackets
Location:	Christchurch	**Date:**	19 October 2016
Fax No.:	03 7328 415	**No. of Pages:**	5
Tel No.:	03 7328 414		

Please call +64 7 343 5763 if transmission incomplete

Robin

Please find below the results of your three 600mm x 2.4m 9mm Magnum board one side walls as tested on with no hold-downs.

1. BU wind = 46 (77 BU/m) as limited by the ultimate load capacity.
2. BU Earthquake = 41 (68 BU/m) as limited by the ultimate load capacity.

Figures 1, 2 & 3 show the load deflection plots, Figure 4 shows the P21:2010 calculations.

Wall Construction

- 90x45 SG8 studs (600 centres), plates, two rows of nogs
- 9mm Magnum board one side fixed vertically
- 32 mm screws@ 50, 250, then 300mm c/c to studs and 50, 250 to plates plus spot glued at approx 300 centres around edge
- No hold-down brackets
- Tested with M12 hold down bolts and 50x50x3mm washers

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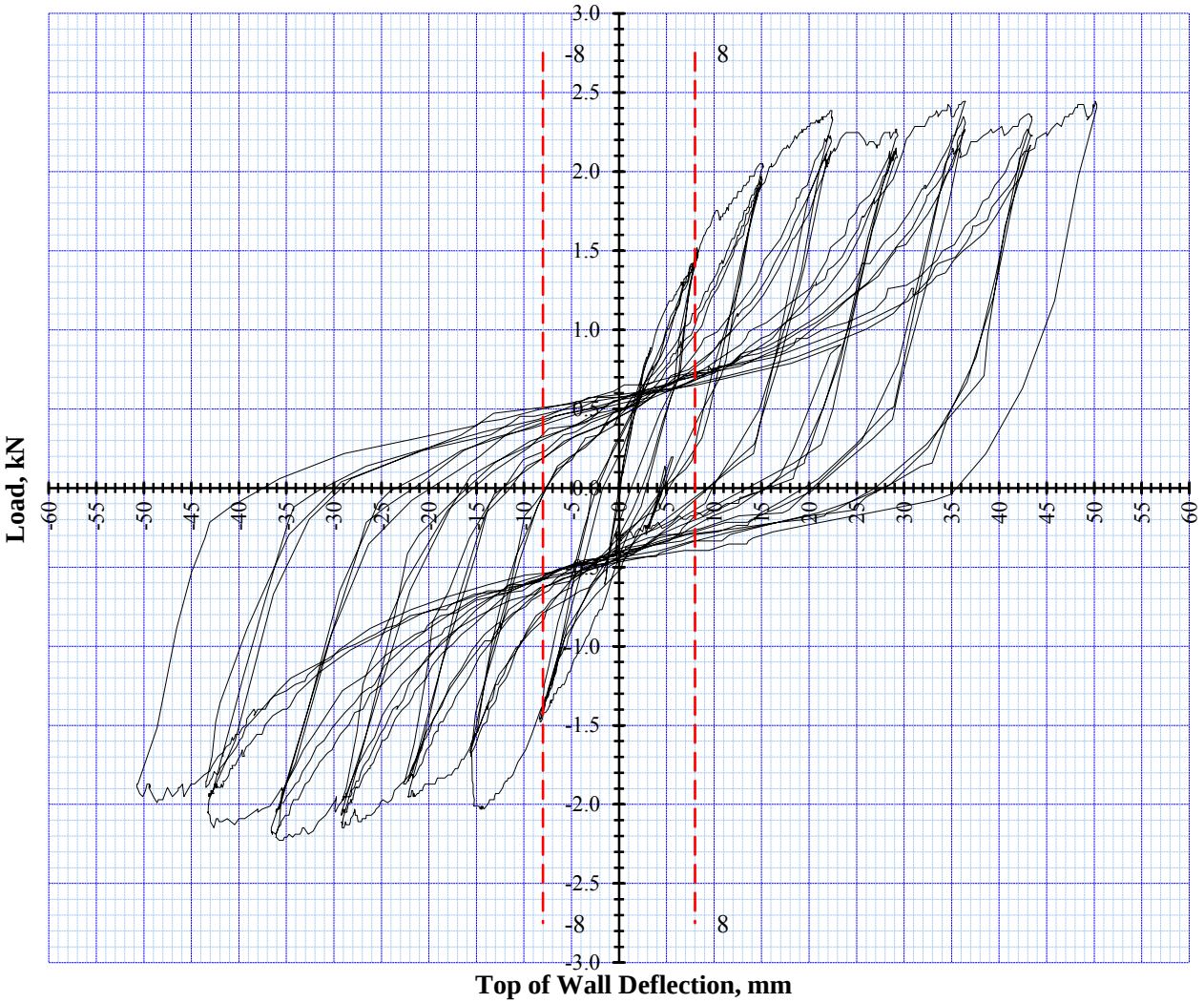

Figure 1: *Wall 276256*

Wall Condition after test

- The screws remained intact.
- No fractures were seen in the Magnum board for walls 276256 & 276257 however wall 276258 fracture along the bottom plate screw line
- For walls 276256 & 276257 the only apparent damage was a widening of the screw hole through the Magnum board predominantly around those screws on the bottom plate and on the bottom section on the end studs.
- No damage was seen in the timber framing.

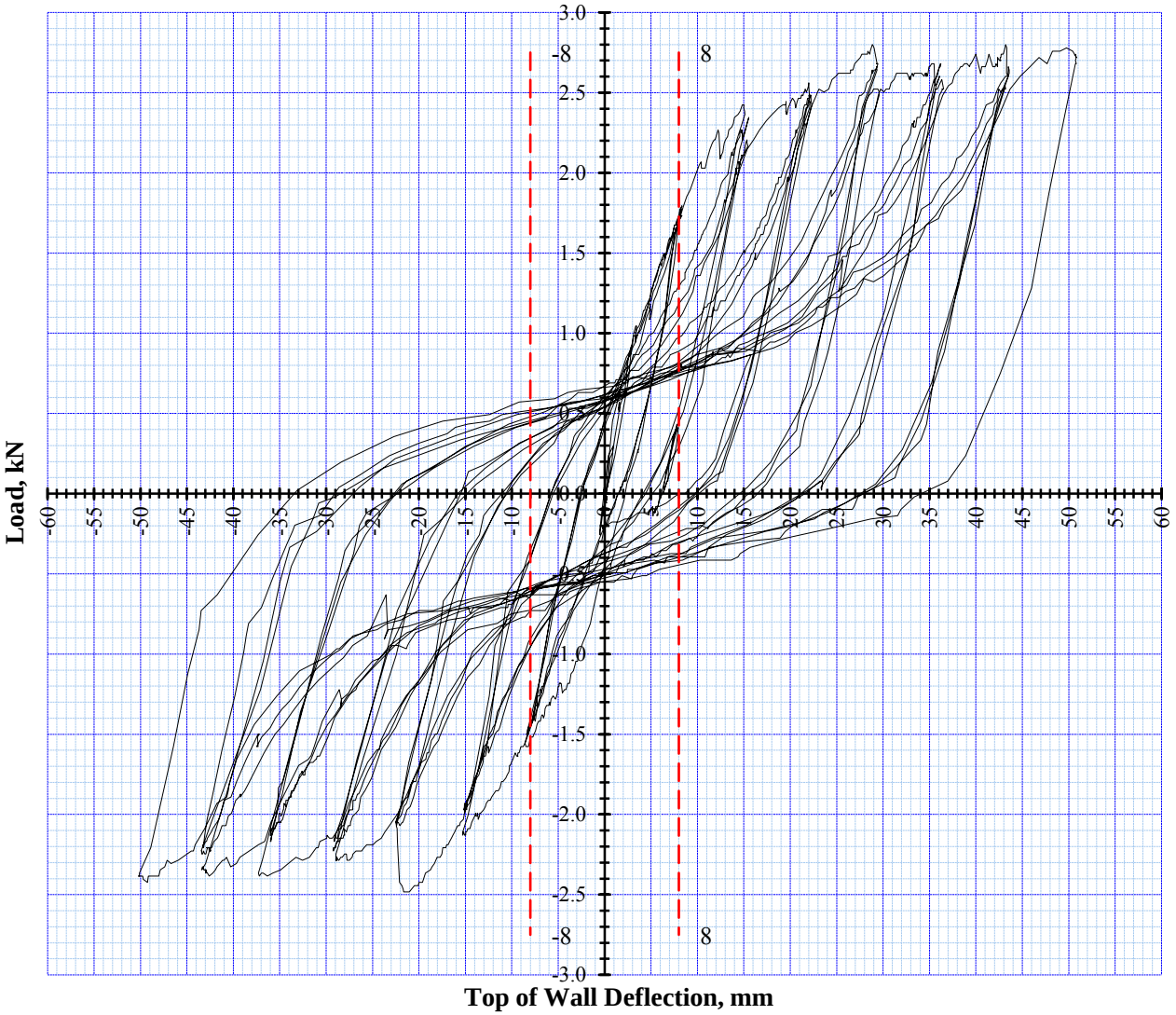

Figure 2: *Wall 276257*

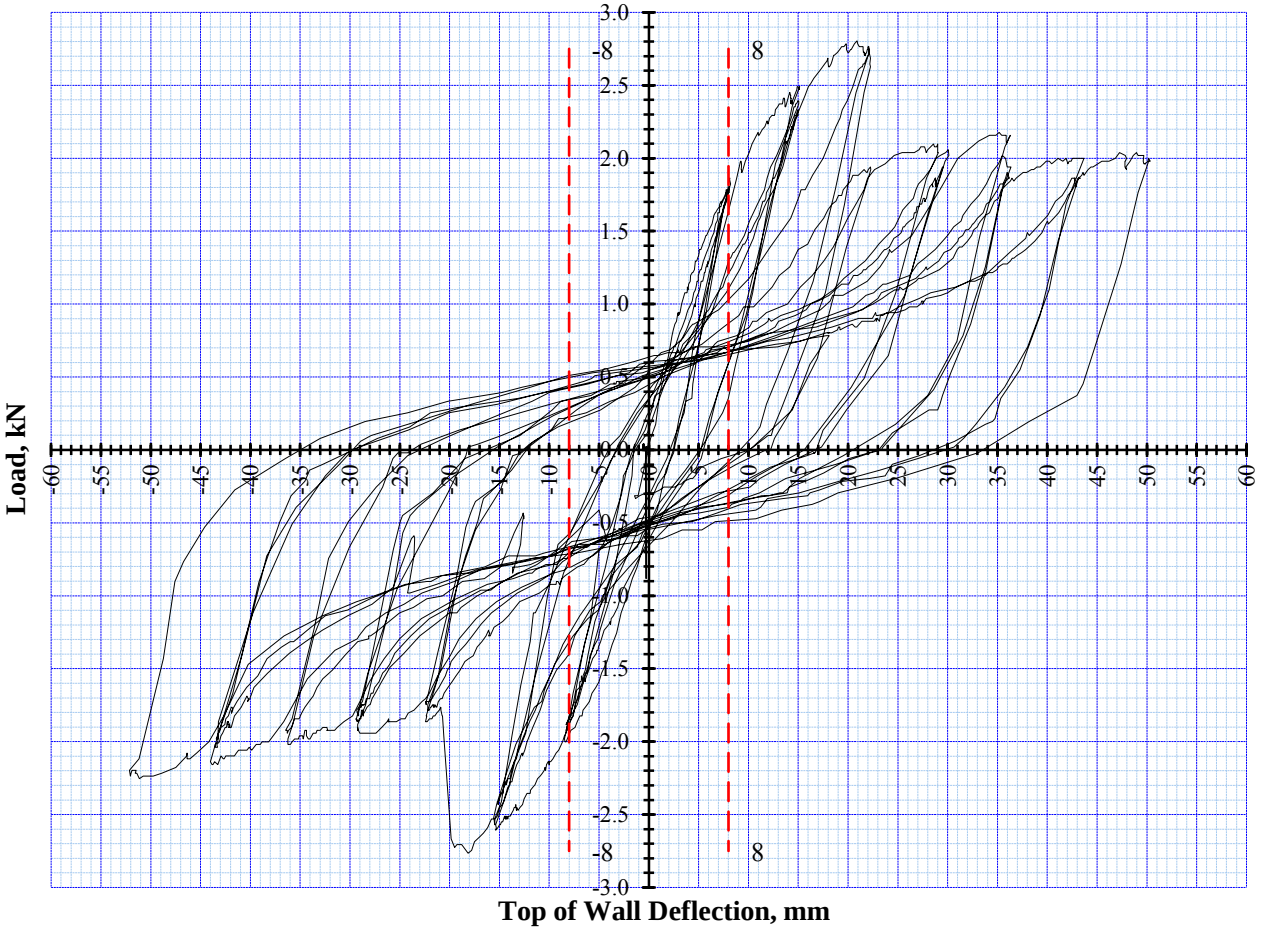

Figure 3: *Wall 276258*

P21:2010 BRACING RACKING TEST RESULT EVALUATION

Wall Construction

600mm, 9mm Magnum board one side using 32mm screws @ 50, 250, then 300mm c/c to studs and 50, 250 to plates plus spot glued at approx 300 centres around edge

90x45 H1.2 SG8 top and bottom plates, studs 600mm c/cs, two rows of no 2 x 12mm Hold downs one each end with 50x50x3mm flat washers to bottom plate

Summary		
Earthquake	68 (U)	BU/m
Wind	77 (U)	BU/m

Date of test:-	19-Oct-16	Ship No.	2921		Tested by	Doug Gaunt	
Date of calc's:-	19-Oct-16	Job No.	TE16-028		Analysed by	Doug Gaunt	

Calculated to BRANZ P21:2010, AS/NZS1170.2&5, NZS3604:2010 *Scion, Private Bag 3020 Rotorua.*

		Serviceability Cycles		Ultimate Cycles				
		Cycle to H/300 or DLQ or DLW		Cycle to Displacement			Wall dimensions	
		8.0	X mm	y=(mm)			L(mm)	H(mm)
Lab Number	Direction	Loads	Residual	Maximum			600	2400
		(P_8)	Defln, C	Load	def @ P		d at P/2	4th,R
		kN	mm	P(kN)	y (mm)	P/2 (kN)	d mm	kN
276256	+	1.42	2.00	2.43	36.0	1.22	6.4	2.15
	-	1.43	2.00	2.23	36.0			1.95
276257	+	1.75	1.80	2.67	36.0	1.34	5.4	2.40
	-	1.55	2.60	2.37	36.0			2.06
276258	+	1.80	2.30	2.16	36.0	1.08	3.8	1.83
	-	1.93	1.50	2.02	36.0			1.78
		(P_8)	(C)	(P)	(y)	P/2 (kN)	(d)	(Ry)
Averages		1.65	2.03	2.31	36.00	1.21	5.20	2.03
Coefficient of Variation %		11.68	17.19	9.01	0.00	8.61	20.59	10.28

y = average failure deflection or peak deflection of the three tests.
d= average first cycle displacement at half peak, (the very first cycle wall reaches the load)
R = Residual load, P = Peak Load, S = Serviceability load
Displacement Recovery Factor (K1), (0.8 <= K1 <= 1.0) Systems factor K2 = 1.2
Average Structural Displacement Ductility factor u = y/d 6.92
Ductility Modification factor K4 = 1.00
DLW = Selected deflection limit for wind forces DLQ = Selected deflection limit for earthquake forces

P21:2010 BR Calc's		K1	EQ ultimate	EQ service	Wind Ultimate	Wind Service
Lab Number		(= 1.4 - C/X)	BU's	BU's	BU's	BU's
276256	(BU)	1.00	41.0	62.2	46.6	48.2
	(BU/m)		68	104	78	80
276257	(BU)	1.00	44.6	72.0	50.4	55.8
	(BU/m)		74	120	84	93
276258	(BU)	1.00	36.1	81.4	41.8	63.0
	(BU/m)		60	136	70	105
		276256	*2% Ok result*	*-23% Ok result*	*1% Ok result*	*-23% Ok result*
<20% Result Check		*276257*	*14% Ok result*	*0% Ok result*	*12% Ok result*	*0% Ok result*
		276258	*-19% Ok result*	*74.6*	*-16% Ok result*	*57.8*

Note: Where the value of BR Wind or BR EQ for any specimen is more than 20% greater than either of the other two specimens, assign it a value of 1.2 times the lower value before averaging.

Average Earthquake BR		**Ultimate**		**Serviceability**
EQ (BU's)	20 x K4 x Ry =	**41**	(P8 x K1) x (K2/0.55) =	**70**
	68	**BU/m**	**Limited by**	**Ultimate limit state**
Average Wind BR		**Ultimate**		**Serviceability**
Wind (BU's)	20 * P =	**46**	(P8 x K1) x (K2/0.71) =	**54**
	77	**BU/m**	**Limited by**	**Ultimate limit state**

Figure 4: *P21:2010 calculations for a 600mm x 2.4m 9mm Magnum board one side wall*

Please feel free to contact me to discuss this information.

Doug Gaunt

MAGNUM™ BOARD FLAME SPREAD ASSESSMENT REPORT

MAGNUM BOARD

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FIRE ASSESSMENT REPORT

FAR 4338

ASSESSMENT REPORT ON MAGNUM BOARD

CLIENT
New Zealand Sustainable Forest Products
10 Gannons Road
RD1
Reefton 7895
New Zealand

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ASSESSMENT OBJECTIVE

This report gives the BRANZ assessment of the Group Number Classification in accordance with the New Zealand Building Code C/VM2 (ISO 9705) in relation to the fire hazard properties of wall and ceiling lining materials and assemblies for Magnum Board.

CLIENT

New Zealand Sustainable Forest Products
10 Gannons Road
RD1
Reefton 7895
New Zealand

PRODUCT

Magnum Board

CONCLUSION

For the purposes of compliance with the NZBC Verification Method C/VM2 Appendix A for the Classification of Fire Performance of Wall and Ceiling Lining Materials, the following classification is considered applicable to the product as detailed in Section 2.

Product name	Group Number	Average Specific Extinction Area(m^2/kg)
Magnum Board	1	Less than 250

LIMITATION

This report is subject to the accuracy and completeness of the information supplied.

BRANZ reserves the right to amend or withdraw this assessment if information becomes available which indicates the stated fire performance may not be achieved.

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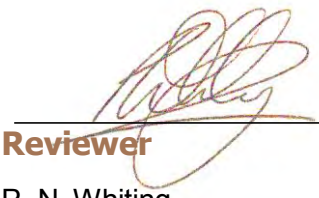

Reviewer

P. N. Whiting
Senior Fire Engineer/Fire Testing Team Leader

DOCUMENT REVISION STATUS

ISSUE NO.	DATE ISSUED	DESCRIPTION
1	24 October 2014	Initial Issue

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1. INTRODUCTION

This report gives the BRANZ assessment of the Group Number Classification in accordance with the New Zealand Building Code (NZBC) C/VM2 (ISO 9705) in relation to the fire hazard properties of wall and ceiling lining materials and assemblies for Magnum Board.

2. BACKGROUND

This assessment is based on two sets Cone Calorimeter tests conducted to ULC-S135-04 on 100 x 100 mm samples at a heat flux of 50 kW/m^2 follows:

Exova test report Number 13-0020529(A) on 3 mm thick Magnum Board where the mean and peak heat release rate (HRR) were 0.7 and 5.8 kW/m^2 respectively and Average Extinction Area (SEA) (m^2/kg) of 0.0.

Interteck test report number 101433709MID-001Rev1 on 15 mm thick Magnum Board where the mean and peak HRR were 4.15 and 10.14 kW/m^2 respectively and Average Extinction Area (SEA) (m^2/kg) of -1.41.

BRANZ has received written permission from Magnum Building Products to reference these cone calorimeter test reports in the preparation of this assessment of Group numbers in accordance with NZBC C/VM2.

3. TEST STANDARD

The above tests have been conducted in accordance with ULC-S135-04, which is essentially a standard for the cone calorimeter test with no significant differences from the requirements of ISO 5560 in that the same sample size of 100 x 100 mm and the heat flux of 50 kW/m^2 are identical and the output parameters from the oxygen consumption calculations for HRR, and SEA for smoke are comparable. So on this basis the test outputs can be used as a comparison and assessment of what the result would be it the tests had been conducted to ISO 5660.

4. DISCUSSION

The determination for Group Numbers in accordance with the New Zealand Building Code (NZBC) C/VM2 (ISO 9705) from Cone Calorimeter test data collected in accordance with ISO 5660 is detailed in Appendix A as attached on pages 7 and 8.

4.1 HRR to Group Number

The relevant part is of Appendix A is A1.3 and 5 steps are required to determine a Group Number.

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Although the process normally requires HRR data in the form of ordered pairs in a spreadsheet from which the calculations involving the ignitability, two integrals, three integral limits and satisfying one inequality. This calculation for Magnum Board was not possible because the required test data was not available in electronic form.

However, from the HRR graphs in the Exova and Interdeck reports in is clear that the peak HRRs recorded are 5.8 and 10.14 kW/m^2 respectively.

Applying the five steps in the calculation process produces the following result:

Step 1: Determine the time to ignition (t_{ig}) which is the time (in seconds) in seconds when the *HRR* reaches or first exceeds a value of 50kW/m^2. For the data provided a *HRR* of 50 kW/m^2 is not reached.

Steps 2, 3, and 4: The calculations cannot be performed. So advancing to step 5.

Step 5 (v): If the ignition criterion in Step 1 is not reached, therefore Magnum Board is deemed a Group 1 material.

4.2 The average specific extinction area (SEA)

In accordance with NZBC Verification Method C/VM2 Appendix A, samples achieving either a Group Number classification 1 or 2, and with an average specific extinction area less than 250 m²/kg are identified with "S" post-script to the Group number determined above.

The measured average SEA in the Exova and Interdeck reports are 0.0 and -1.41 m^2/kg respectively, so the "S" post-script may be included with the Group Number.

5. CONCLUSION

On the basis of the two cone calorimeter reports:

- Exova test report Number 13-0020529(A) and
- Interteck test report number 101433709MID-001Rev1.

Submitted in support of an assessment of Magnum Board for the purposes of compliance with the NZBC Verification Method C/VM2 Appendix A.

It is considered that the assessed Group Number Classification in Table 1 is considered applicable to the Magnum Board product as described in the above test reports.

Table 1: Assessed performance to NZBC C/VM2

Product name	Group Number
Magnum Board	1-S

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Appendix C/VM2

Appendix A (normative): Establishing Group Numbers for lining materials

A1.1 Tests for material Group Numbers

Materials shall be assigned a material *Group Number* when tested to either:

a) ISO 9705 Fire tests – full scale room test for surface products, or

b) ISO 5660 Reaction to fire tests (Heat release, smoke production and mass loss rate) Part 1: Heat release rate (cone calorimeter method); and ISO 5660 Reaction to fire tests (Heat release, smoke production and mass loss rate) Part 2: Smoke production rate (dynamic measurement).

This is except in the following cases:

a) Metal-skin panel assemblies with *combustible* core materials, which shall only be assessed using either the ISO 9705 or ISO 13784 Part 1 test method, or

b) Foil-faced *combustible* materials, which shall only be assessed using the ISO 9705 test method, but if forming part of rigid and flexible ductwork may instead satisfy the requirements of A1.4 a), or

Amend 3 Dec 2013

c) Other products that an accredited test laboratory believes are not appropriate to be evaluated using the ISO 5660 test method due to the configuration or other characteristics of the product. Such products shall be assessed using either the ISO 9705 test or another large scale test if deemed to be appropriate.

Comment:
ISO 5660 is unsuitable in cases where the fire performance of the assembly is dominated by the construction details rather than the flammability characteristics of the surface material or in cases where, due to the configuration of the material in the test, significant mechanical damage occurs at full scale which does not occur with small, horizontal samples.

A1.2 Determining a material's Group Number when tested to ISO 9705

For a material tested to ISO 9705, the material's *Group Number* shall be determined as follows:

Group Number 1 material has total heat release not greater than 1 MW following exposure to 100 kW for 10 minutes then 300 kW for 10 minutes

Group Number 1–S material has total heat release not greater than 1 MW following exposure to 100 kW for 10 minutes then 300 kW for 10 minutes and the average smoke production rate over the period 0–20 min is not greater than 5.0 m^2/s

Group Number 2 material has total heat release not greater than 1 MW following exposure to 100 kW for 10 minutes

Group Number 2–S material has total heat release not greater than 1 MW following exposure to 100 kW for 10 minutes and the average smoke production rate over the period 0–10 min is not greater than 5.0 m^2/s

Group Number 3 material has total heat release not greater than 1 MW following exposure to 100 kW for 2 minutes, and

Group Number 4 material has total heat release greater than 1 MW following exposure to 100 kW for 2 minutes.

The rate of total heat release determined in ISO 9705 includes contribution from both the internal lining and the exposure source (100 kW or 300 kW).

The *Group Number* of a material predicted in accordance with Paragraph A1.3 using data obtained by testing the material at 50 kW/m^2 irradiance in the horizontal orientation with edge frame in accordance with ISO 5660 is given by:

Group Number 1 material: as predicted in accordance with Paragraph A1.3

Group Number 1-S material: as predicted in accordance with Paragraph A1.3 and an average *specific extinction area* less than 250 m^2/kg.

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Appendix C/VM2

Group Number 2 material: as predicted in accordance with Paragraph A1.3

Group Number 2-S material: as predicted in accordance with Paragraph A1.3 and an average *specific extinction area* less than 250 m^2/kg

Group Number 3 material: as predicted in accordance with Paragraph A1.3, and

Group Number 4 material: as predicted in accordance with Paragraph A1.3.

A1.3 Determining a material's Group Number when tested to ISO 5660

For a material tested to ISO 5660, the material's *Group Number* must be determined in accordance with the following:

a) Data must be in the form of time and *HRR* pairs for the duration of the test. The time interval between pairs should not be more than 5 seconds. The end of the test (t_f) is determined as defined in ISO 5660, and

b) At least three replicate specimens must be tested.

The following five steps must be applied separately to each specimen:

Step 1: Determine time to ignition (t_{ig}). This is defined as the time (in seconds) when the *HRR* reaches or first exceeds a value of 50 kW/m^2.

Step 2: Calculate the Ignitability Index (I_{ig}) expressed in reciprocal minutes.

$$I_{ig} = \frac{60}{t_{ig}}$$

Step 3: Calculate the following two *HRR* indices:

$$IQ_1 = \int_{t_{ig}}^{t_f} \left[\frac{q''(t)}{(t - t_{ig})^{0.58}} \right] dt$$

$$IQ_2 = \int_{t_{ig}}^{t_f} \left[\frac{q''(t)}{(t - t_{ig})^{0.85}} \right] dt$$

Amend 3 Dec 2013

Comment:
These definite integral expressions represent the area under a curve from the ignition time until the end of the test, where the parameter is plotted on the vertical axis and time (t) is plotted on the horizontal axis.

Step 4: Calculate the following three integral limits:

$$IQ_{10min} = 6800 - 540 I_{ig}$$

$$IQ_{2min} = 2475 - 165 I_{ig}$$

$$IQ_{12min} = 1650 - 165 I_{ig}$$

Step 5: Classify the material in accordance with the following:

i) If $IQ_1 > IQ_{10}$ min and $IQ_2 > IQ_2$ min, the material is a *Group Number* 4 material

ii) If $IQ_1 > IQ_{10}$ min and $IQ_2 \leq IQ_2$ min, the material is a *Group Number* 3 material

iii) If $IQ_1 \leq IQ_{10}$ min and $IQ_2 > IQ_{12}$ min, the material is a *Group Number* 2 material

iv) If $IQ_1 \leq IQ_{10}$ min and $IQ_2 \leq IQ_{12}$ min, the material is a *Group Number* 1 material, or

v) If the ignition criterion in Step 1 above is not reached, the material is a *Group Number* 1 material.

Repeat steps 1 to 5 above for each replicate specimen tested. If a different classification group is obtained for different specimens tested, then the highest (worst) classification for any specimen must be taken as the final classification for that material.

Comment:
It is expected that the fire testing laboratory will determine the material Group Number as described in this section when reporting the fire test results.

A1.4 Determining a Group Number for surfaces of ducts for HVAC systems

Surfaces of rigid and flexible ductwork for *HVAC* systems shall be assigned either:

a) A material *Group Number* of 1-s when the ductwork complies with the fire hazard properties set out in AS 4254, or

b) A material *Group Number* as determined by A1.2 or A1.3.

Amend 3 Dec 2013

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MAGNUM™ BOARD 60 MINUTE FIRE RATING

Assessment Report

Fire Resistance of a Steel or Timber Framed Magnum Board Lined Wall

Prepared for New Zealand Sustainable Forest Products

By Jason King, Fire Engineer

18 July 2014

1 Scope

This report examines the fire resistance to AS 1530.4-2005 of a steel or timber framed wall lined on each side with nominal 12 mm Magnum magnesium oxide board, and with mineral fibre insulation in the wall cavity. The required fire resistance rating (FRR) is -/60/60.

2 Background

In Southwest Research Institute (SWRI) fire endurance test No. 01.15210.01.101c a 9 foot high x 12 foot wide non-loadbearing steel framed wall was tested in accordance with ASTM E119-08a and achieved a fire resistance for integrity and insulation of 60 minutes with no failure.

The framing comprised nominal 3 ⅝ inch 20 gauge steel studs and tracks. Studs were at 24 inch centres between top and bottom tracks. A horizontal stud section was fixed 1 foot from the bottom of the wall.

The wall cavity was filled with nominal 2 pcf (32 kg/m^3) IIG MinWool Sound Attenuation Fire Batts.

The wall was lined on each face with nominal 12 mm thick Magnum board using 1 ⅝ inch screws at 8 inch centres at the perimeter of each sheet, and at 18 inch centres on the intermediate studs. All sheet joints were formed on framing members, with vertical joints offset between faces of the wall. A horizontal joint was formed on the horizontal framing member on each face of the wall with no offset between faces. The joints were stopped with jointing compound and fibreglass tape. Screw heads were stopped with jointing compound.

The test was conducted on behalf of Magnum Building Products, who have given permission for the report to be used in support of this assessment.

3 Proposed Construction

3.1 Steel Framed Walls

It is proposed to construct non-loadbearing steel framed walls lined with Magnum Board and insulated with mineral fibre insulation as follows.

Framing comprises 92 mm minimum depth x 34 mm minimum width studs and tracks of minimum nominal 1 mm base metal thickness galvanised steel. Studs are to be placed at 600 mm maximum centres between top and bottom tracks, fixed to the tracks with at least 10 gauge steel self-drilling screws. Horizontal members of the same section as the studs are to be located to correspond to horizontal joints in the linings. The horizontal members are to be fixed to the studs at each intersection using at least 10 gauge steel self-drilling screws.

The cavity is to be insulated with mineral fibre insulation of at least 40 kg/m^3 density and at least 89 mm thick, having a fibre melting point at least 1000 °C. Rockwool Rocktech S would be a suitable insulating material.

The wall is to be lined on each side with one layer of nominal 12 mm thick x 1200 mm wide Magnum Board, with the sheets placed vertically. The linings are to be fixed with 40 mm minimum length steel screws at 200 mm maximum centres at the perimeter of each board, and at 450 mm maximum centres on each intermediate stud.

Vertical sheet joints are to be offset on opposite sides of the wall by at least 600 mm. Horizontal joints may be formed on the same steel member. All sheet joints are to be stopped with fibreglass tape and jointing compound. All screw heads are to be stopped with jointing compound.

3.2 Timber Framed Walls

It is proposed to construct non-loadbearing timber framed walls lined with Magnum Board and insulated with mineral fibre insulation as follows.

Framing comprises 94 mm minimum depth x 46 mm minimum width studs and top and bottom plates. Studs are to be placed at 600 mm maximum centres between top and bottom plates. Noggings of the same section as the studs are to be located to correspond to horizontal joints in the linings.

The cavity is to be insulated with mineral fibre insulation of at least 40 kg/m^3 density and at least 89 mm thick, having a fibre melting point at least 1000 °C. Rockwool Rocktech S would be a suitable insulating material.

The wall is to be lined on each side with one layer of nominal 12 mm thick x 1200 mm wide Magnum Board, with the sheets placed vertically. The linings are to be fixed with 40 mm minimum length steel screws at 200 mm maximum centres at the perimeter of each board, and at 450 mm maximum centres on each intermediate stud.

Vertical sheet joints are to be offset on opposite sides of the wall by at least 600 mm. Horizontal joints may be formed on the same nogging. All sheet joints are to be stopped with fibreglass tape and jointing compound. All screw heads are to be stopped with jointing compound.

4 Discussion

4.1 Test Standard

The referenced fire endurance test was conducted in accordance with ASTM E119-08a. This standard differs from AS 1530.4-2005 in a number of respects. The features that differ significantly with respect to the referenced test specimen are identified as follows:

The time temperature curves differ slightly for the two standards during a 1 hour duration test, however each is within the permitted temperature variation tolerances of the other. The minor variation in temperature is not considered significant.

The method of furnace temperature measurement is significantly different, with ASTM E119 requiring fully enclosed Type K thermocouples, where AS 1530.4 requires the thermocouple measuring junction to be fully exposed to the furnace gases. This difference means that there will be a lag in the temperature measured with the enclosed thermocouple compared to the exposed thermocouple, leading to hotter temperatures in the furnace with enclosed thermocouples.

Therefore the exposure temperature of the ASTM E119 test is more severe than AS 1530.4. For the purpose of this assessment the exposure temperature is conservatively taken as being equivalent for the two standards.

The furnace pressure for ASTM E119 is not specified. For the test the pressure was set approximately equal to the laboratory pressure at the top of the specimen. This means there is a negative pressure in the furnace relative to the laboratory over the full height of the specimen. For AS 1530.4 the pressure is set equal to the laboratory pressure at 500 mm above the floor of the furnace, giving a positive relative pressure over the upper section of the specimen.

The higher pressure of AS 1530.4 is more likely to force hot gases through any gaps or openings that may form in the specimen. For this test there were no gaps or openings formed, and therefore the pressure difference is not considered likely to alter the result.

Specimen temperature is measured generally similarly for the two standards, except that for ASTM E119 the thermocouple junctions are covered by larger insulating pads than for AS 1530.4. This will tend to lead to higher temperatures being measured to ASTM E119, and it is therefore conservative to assume that the same temperatures would be recorded to AS 1530.4.

The failure criteria for integrity are similar for the two standards. For insulation ASTM E119 considers failure to occur when the average temperature of the unexposed face rises by more than 139 °C, or the maximum temperature rises by more than 180 °C. For AS 1530.4 the average and maximum limits are 140 and 180 °C respectively.

ASTM E119 requires a partition specimen to be restrained on all edges where AS 1530.4 requires the partition to be fixed at one edge and unrestrained at the other. This is intended to model a wall of unlimited length. As tested the wall was 12 ft (3.66 m) wide which exceeds the minimum 3 m required width. No adverse effects were noted as a result of the increased width. On this basis it is considered that provision of an unrestrained edge as required for AS 1530.4 compliance would not have prejudiced the result of the test at 60 minutes.

ASTM E119 requires a hose stream test to be applied. The hose stream test is not required for AS 1530.4 therefore the result of the hose stream test is not considered for this assessment.

On the basis of the above discussion it is considered that the partition tested in the referenced fire endurance test would have achieved at least equivalent performance if tested in accordance with AS 1530.4-2005.

4.2 Dimensions

The dimensions of the specimen as tested were given in imperial units. Comparisons of relevant dimensions are as follows. In all cases the tested and proposed dimensions are considered sufficiently similar that the test result would not be significantly affected.

Wall overall dimensions were 9 ft x 12 ft = 2.743 m x 3.657 m. The minimum required dimensions for AS 1530.4 are 3.0 m.

The maximum board dimensions are not stated in the test report, but are deduced to be 8 ft x 4 ft (2438 x 1219 mm). The length of the boards is not considered significant to their

performance. The proposed width of 1200 mm is slightly less than the tested board width which is not expected to be detrimental to the performance of the boards.

Steel stud and tracks as tested were of nominal 3 ⅝ inch = 92.1 mm depth. The width of the tested studs and tracks is not recorded in the test report. The difference from the proposed 92 mm minimum dimension is considered negligible. The proposed 34 mm minimum width is sufficient to allow the linings to be screwed to the stud with at least a 12 mm edge clearance, and is therefore considered acceptable.

The 20 gauge steel as tested is approximately 0.95 mm thick. The proposed 1 mm minimum thickness is considered to be equivalent or better than the tested thickness.

Stud are at 24 inch centres = 609.6 mm. The proposed 600 mm spacing is smaller, and therefore not likely to be detrimental to the performance.

Screw spacings are 8 or 18 inches = 203.2 mm or 457.2 mm. The proposed screw spacings are smaller than as tested, therefore unlikely to be detrimental to performance.

The tested screw length was 1 ⅝ inches = 41.275 mm. For fixing linings to steel once the screw thread has engaged in the steel any additional screw length provides no advantage. Therefore the proposed 40 mm screws are considered equivalent to the 1 ⅝ inch screws tested.

4.3 Timber Framing

Timber framing is expected to deform less than steel framing as tested, and therefore the lining boards will be subjected to less stress and are expected to remain in place similarly to those tested.

The mineral fibre insulation is expected to protect the sides of the framing from significant fire attack and the Magnum board will provide substantial protection to the fire side face of the timber. It is expected that the proposed 40 mm screws will retain the board in place for at least 60 minutes.

4.4 Insulation

The wall as tested was insulated with IIG MinWool Sound Attenuation Fire Batts, with a density of 40 kg/m^3 and stated melting point of at least 1093 °C.

It is proposed to replace the IIG MinWool Sound Attenuation Fire Batts with Rockwool Rocktech S mineral fibre slabs, with a density of at least 60 k g/m^3 and melting point approximately 1000 °C, or an equivalent mineral fibre insulation material. It is expected that the proposed mineral fibre, being of higher density and similar composition and thickness, with a melting point higher than the furnace temperature, will provide at least equivalent contribution to the fire resistance of the wall.

5 Opinion

It is our opinion that a steel or timber framed wall lined with nominal 12 mm Magnum board, insulated with Rockwool Rocktech S or equivalent, constructed as described in this report, would achieve a fire resistance of at least 60 minutes for Integrity and Insulation if tested in accordance with AS 1530.4-2005.

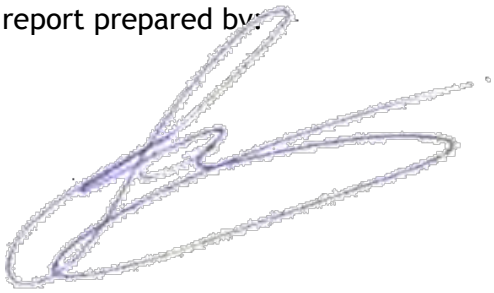
6 Limitations

This assessment report may only be quoted or reproduced in full, and is subject to the completeness and accuracy of information provided.

This assessment is issued on the basis of test data and information available at the time of issue. If test evidence contradictory to this assessment becomes available, we reserve the right to withdraw the assessment unconditionally but not retrospectively.

The opinion stated represents our assessment of likely performance, based on our experience and professional judgement in addition to the information provided. This is in line with internationally accepted practice of extrapolation from test results to increase the range of options available. It is recognised that the particular combinations of wall framing, lining and insulation assessed have not been subjected to the standard fire resistance test.

This report prepared by:



Jason King, BE, DipEngFire

HOME of MAGNUM BOARD®

"The New Generation *GREEN* Building Material"

"Install It for Health-Install It for Life"

Sheathing & Trim Products

Material Safety Data Sheet
MSDS No.: MBGEP-032107-5

Magnum Board® Brand Products

SECTION 1: COMPANY AND PRODUCT INFORMATION

Magnum Building Products LLC
405 North Reo Street
Tampa, FL 33609
USA

Phone: 813-304-2577

Facsimile: 813-304-2578

Website: www.magnumbp.com

Email: Info@magnumbp.com

Use: Exterior: Sheathing, ceiling board, drop ceiling, siding, cladding and trim material.

Interior: Wallboard, ceiling board, tile backer board, underlayment and trim materials.

Structural Insulated Panels (SIPS) and Exterior Insulated Finish Systems (EIFS)

SECTION 2: COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient	CAS No.	Hazard Class
Magnesium Oxide	1309-48-4	None
Magnesium Chloride	7786-30-3	None
Cellulose	9004-34-6	None
Perlite	93763-70-3	None
Proprietary Additives	N/A	None
Fiberglass Scrim	65997-17-3	None

SECTION 3: HAZARDS IDENTIFICATION

Emergency Overview: Non-toxic, non explosive and is not a fire hazard.

Primary Routes of Entry:

Eyes:
Dust may irritate the eyes from mechanical abrasion causing watering and redness.

Skin:
Dust may cause irritation of the skin from friction but cannot be absorbed through intact skin.

Ingestion:
Unlikely under normal conditions of use, but swallowing the dust from this product may result in irritation to the mouth and gastrointestinal tract.

Inhalation:
Dust may cause irritation of the nose, throat, and airways, resulting in coughing and sneezing. Certain susceptible individuals may experience wheezing (spasms of the bronchial airways) on inhaling dust during sanding or sawing operations.

SECTION 4: FIRST AID MEASURES

EYES:
Remove contact lens. Flush with running water or saline for at least 15 minutes. Seek medical attention if redness persists or if visual changes occur.

SKIN:
Wash with mild soap and water. Contact physician if irritation persists or later develops.

INGESTION:
If ingested, dilute by drinking large amounts of water. Do not induce vomiting. Seek medical attention.
If unconscious, loosen tight clothing and lay the person on his / her side. Give nothing by mouth to an individual who is not alert and conscious. Seek medical attention.

INHALATION:
Remove to fresh air. If shortness of breath or wheezing develops, seek medical attention.

NOTES TO PHYSICIAN OR FIRST AID PROVIDERS:
Treat symptomatically.

SECTION 5: FIRE-FIGHTING MEASURES

Magnum™ Building Products line of "Magnum Board®" Products are non flammable, non explosive and non combustible.

Fire and Explosion Hazard

Flash Point: Not applicable.
Auto-ignition: Not applicable

Extinguishing Media:
This material is non combustible. Appropriate extinguishing media should be used for surrounding fire.

Fire Fighting:
Fire fighting personnel should wear normal protective equipment.

SECTION 6: ACCIDENTAL RELEASE MEASURES

No special precautions are necessary to pick up product that has been dropped. The following applies only to spills or releases of dust generated during cutting or sanding Magnum Board®.

Precautions:
Good housekeeping practices are necessary for cleaning up areas where dust has been produced. Take measures to either eliminate or minimize the creation of dust.

Wherever possible, practices likely to generate dust should be controlled with engineering controls such as local exhaust ventilation, dust suppression with water and containment, enclosure or covers.

Cleanup Methods:
A fine water spray may be used to suppress dust when sweeping (dry sweeping is not recommended). Vacuuming with an industrial vacuum cleaner outfitted with a high-efficiency particulate (HEPA) filter is recommended over sweeping. Waste may be disposed of by landfill in compliance with federal, provincial, state and local requirements governing non-toxic mineral materials

Avoid using materials and products that are incompatible with this product. (Refer to section 10.)

SECTION 7: HANDLING AND STORAGE

Handling and Storage Products in their intact state do not present a health hazard. The controls below apply to dust generated from the boards by cutting, drilling, routing, sawing, crushing, or otherwise abrading, and cleaning or moving sawdust.

Other Precautions:
Even though Magnum Board® has been tested and deemed non toxic, Magnum Building Products recommends that exposure to dust be kept as low as reasonably possible. Respirable levels should not exceed those specified by OSHA and MSHA and identified in this MISDS. Exposure to respirable (fine) dust depends on a variety of factors, including activity rate (i.e. cutting rate), method of handling (i.e. electric shears), environmental conditions (i.e. weather conditions, workstation orientation) and control measures used.
Wherever possible, practices likely to generate dust should be carried out in well ventilated areas (i.e. outside). The work practices and engineering controls set out in Section 8 should be followed as precautions to reduce dust exposures.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls

Cutting Outdoors:

1. Magnum Building Products recommends positioning cutting station so that wind will blow dust away from user or others in working area and allow for ample dust dissipation.
2. Use one of the following methods based on the required cutting rate and jobsite conditions.

Best

- Score and snap using carbide-tipped scoring knife or utility knife (Ability to use this method depends on thickness of Magnum Board® being installed.)
- Fibercement board shears (electric or pneumatic).

Better

- Dust reducing circular saw equipped with appropriate blade and HEPA vacuum extraction.

Good (for low to moderate cutting only)

- Dust reducing circular saw with appropriate saw blade.

Always use correct tools when executing all cutting operations.

Ventilation:
Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limit.

Respiratory Protection:
Dust mask is recommended. .

Eye Protection:
When cutting material, dust resistant safety goggles / glasses should be worn and used in compliance with ANSI Standard Z87.1-1-1989 and applicable OSHA (i.e. 29 CFR 1910.133) standards.

Skin Protection:
Loose comfortable clothing should be worn. Magnum Building Products recommends that direct skin contact with dust and debris be avoided when possible by wearing long sleeved shirts and long trousers, a cap or hat, and gloves.

Sanding / Drilling / Other Machining:
If sanding, drilling, or other machining is conducted, Magnum Building Products recommends wear a NIOSH-approved dust mask.

Important Notes:
1. For maximum protection (lowest respirable dust production), Magnum Building Products recommends always using "Best" level cutting methods where feasible.
2. Always use a circular saw blade that is appropriate for the specific operation being undertaken.
3. Dry sweeping is not the preferred clean up method - Magnum Building Production suggests wet suppression methods or HEPA vacuum.
4. It is not recommended that a grinder or continuous rim diamond blade be used for cutting.
5. Always follow tool manufacturer's safety recommendations.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:
Various colors depending on application, each with varying dimensions according to product used.

Odor:
Very mild

Physical State:
Solid boards

Vapor Pressure:
Not relevant.

Specific Gravity:
Not relevant.

Flammability Limits:
Not relevant.

Boiling Point:
Not relevant

Melting Points:
Not relevant.

Flash Point:
Not relevant.

Auto-ignition Temperature:
Not relevant.

Volatility:
Not relevant.

Solubility in Water:
Not relevant.

Evaporation rate:
Not applicable.

NFPA Ratings (Scale 0 – 4)
Health = 1
Flammability = 0
Reactivity = 0
Personal Protection = E

SECTION 10: STABILITY AND REACTIVITY

Stability:
The Magnum Board products identified in section 1 are stable under ordinary conditions.

Conditions to Avoid:
Excessive dust generation without proper dust mask protection.

Materials to Avoid:

Incompatibility: Hydrofluoric acid will dissolve Magnesium Oxide and can generate Magnesium Chloride fumes.

SECTION 11: TOLXICOLOGICAL INFORMATION

Magnum Board® products are non toxic in their intact form. The following applies to dust that may be generated during cutting and sanding.

Chronic Effects:

Inhaled: Repeated and prolonged overexposures to dust may cause increased risk of bronchitis. It is possible that repeated inhalation exposure to Magnum Board® fiber dust over time may lead to inflammation of the lungs in humans. All necessary precautions should be taken to prevent inhalation of dust to prevent these problems.

SECTION 12: ECOLOGICAL INFORMATION

Because Magnesium Oxide is a naturally occurring mineral, releases that may occur into the environment are not expected to leave any hazardous material that could cause a significant adverse impact.

SECTION 13: DISPOSAL CONSIDERATIONS

Dispose of material, as an inert, inorganic mineral, in conformance with federal, provincial, state and local regulations. Magnum Board® is not an RCRA hazardous waste.

SECTION 14: TRANSPORT INFORMATION

There are no special requirements for storage and transport of Magnum Board™.

UN No:	None allocated
Dangerous Goods Class:	None allocated
Hazchem Code:	None allocated
Poisons Schedule:	None allocated
Packing Group:	Not applicable
Label:	Not a DOT hazardous material.

SECTION 15: REGULATORY INFORMATION

DOT Hazard Classification: None

Placard Requirement: Not a DOT hazardous material.

CERCLA Hazardous Substance (40 CFR Part 302)

Listed substance:	No
Unlisted Substance:	No
Reportable Quantity (RQ):	None
Characteristic(s):	Not applicable
RCRA Waste Number:	Not applicable

SECTION 16: OTHER INFORMATION

Preparation of Information and Disclaimer:
This form has been prepared to meet current Federal OSHA hazard communication regulations and is offered without any warranty or guarantee of any type. Magnum Building Products cannot control the use of its products, and therefore specifically disclaims liability and responsibility arising from the use, misuse and/ or alteration of its products.

The information contained in this MSDS was produced without independent scientific or medical studies analyzing the effects of Magnum Board® dust upon human health. The information contained herein is based upon scientific and other data Magnum Building Products believes is valid and reliable and provides the basis for this MSDS. The information contained herein relates only to specific materials listed in the document. It does not address the effects of Magnum Board® dust when used in combination with other materials or substances, or when used in other processes. Because conditions of use are beyond Magnum Building Products control, the company makes no representations, guarantees or warranties, either express or implied warranties as to the fitness of the product for use, and assume no liability related to the information contained above.

Magnum Building Products requires, as a condition of use of its products, that purchasers comply with all applicable Federal, Provincial, State, and Local health and safety laws, regulations, orders, requirements, and strictly adhere to all instructions and warnings which accompany the product.

Product Technical Statement

This PTS follows the format proposed by MBIE in their document 'Product technical statement tool'

Product Description: Magnum Board & Batten

Scope of Use: external environment above ground, with a (seismic) locality factor (Z) of up to 0.42 (Upper Hutt), in a temperate climate; the system is limited to use for residential housing including Class 1 and Class 2 type construction. i.e. stand-alone houses and multi-apartment dwellings, up to three stories high; installation of the product is undertaken by persons properly trained and approved by the manufacturer.

Compliance with the NZBC:

Magnum Board and Batten meets the following requirements of the NZBC.

Structure - B1: Magnum Board and Batten meets the requirements of B1.3.3 (h)

Durability - B2: Magnum Board and Batten meets the durability performance requirements of section B2.3.1 (a)

External Moisture – E2: Magnum Board and Batten meets the external moisture requirements of section E2.3.2.

Hazardous Building Materials - F2 3.1: Magnum Board and Batten will not present a health hazard when handled as per its technical specifications.

Installation: Magnum Board and Batten must be installed in accordance with Technical Specification.
The specification and details are available at:-
https://www.healthbasedbuilding.com/magnum-board/board-and-batten **or** **www.healthbasedbuilding.com**

The result of these considerations is: Magnum Board and Batten, when installed according to the manufacturer's instructions, will comply with Performance Clauses B1.3.3 (h), B2.3.1 (a), E2.3.2, and F2.3.1 of the NZBC.