

Results

To:	Paul Charteris	From:	Doug Gaunt
Organisation:	Saveboard (NZ) Ltd	Subject:	P21:2010 600 mm x 2.4m 10.0mm Paper faced Saveboard with Brackets
Location:	New Plymouth	Date:	22 December 2021
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Tel No.:		Pages:	

Paul

Please find below your P21 bracing results for your three 600mm x 2.40m 10.0mm Paper faced Saveboard walls as tested with brackets.

1. BU wind = 50 (84 BU/m) as limited by the serviceability load capacity.
2. BU Earthquake = 58 (97 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 H1.2 SG8 framing, studs at 600mm centres, no nogs
- 10.0mm Paper faced Saveboard lining one side,
- Paper faced Saveboard fixed with Gibgrabber 6g x 32mm plasterboard screws to 50,50,50,75,75,150,150mm.... spacing.
- GIB Handibrac brackets each end
- M12 hold down rods to bottom plate and brackets

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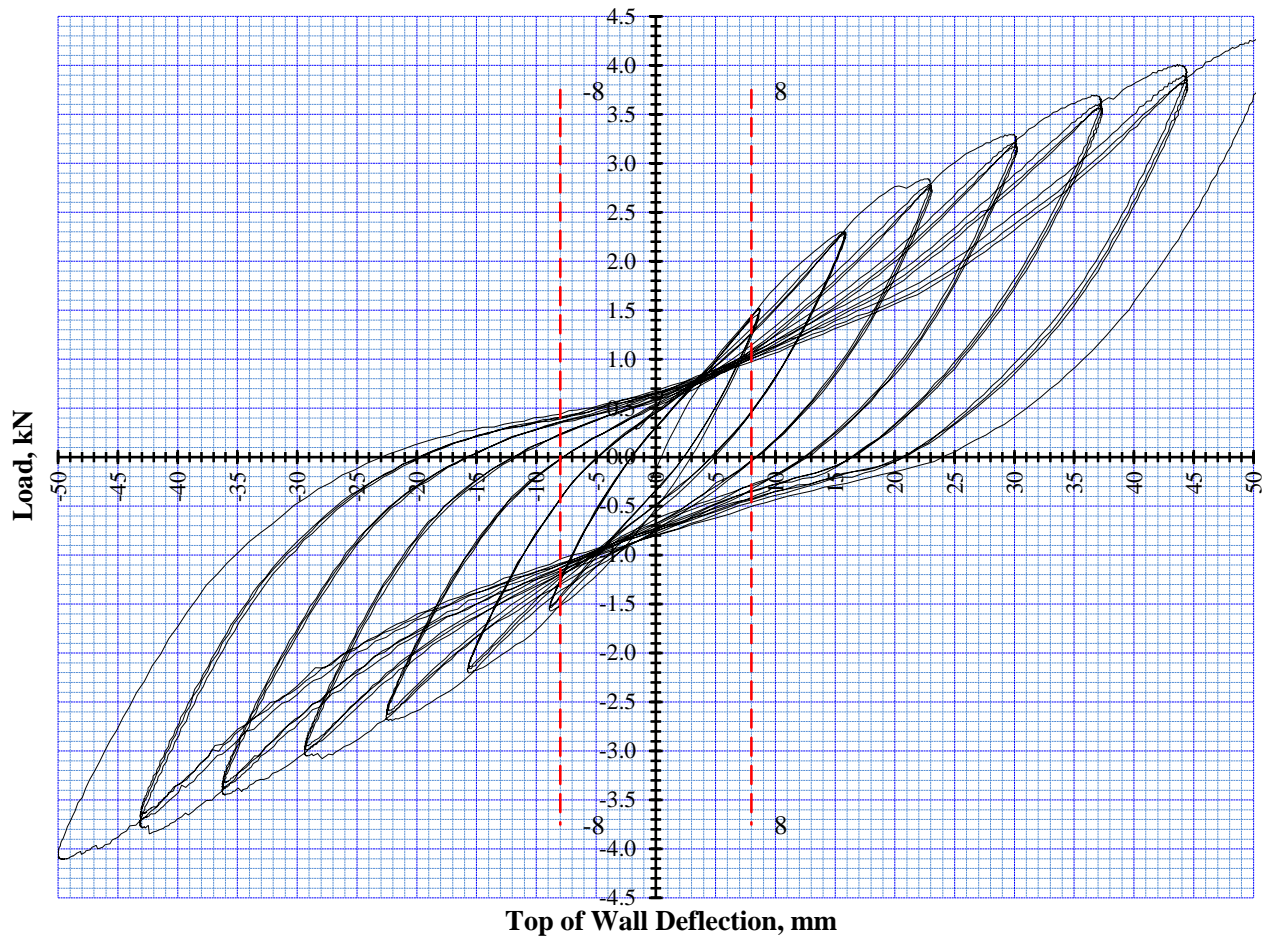


Figure 1: Wall 288524

Observations

- Sheet flexing
- No damage to sheet or brackets.

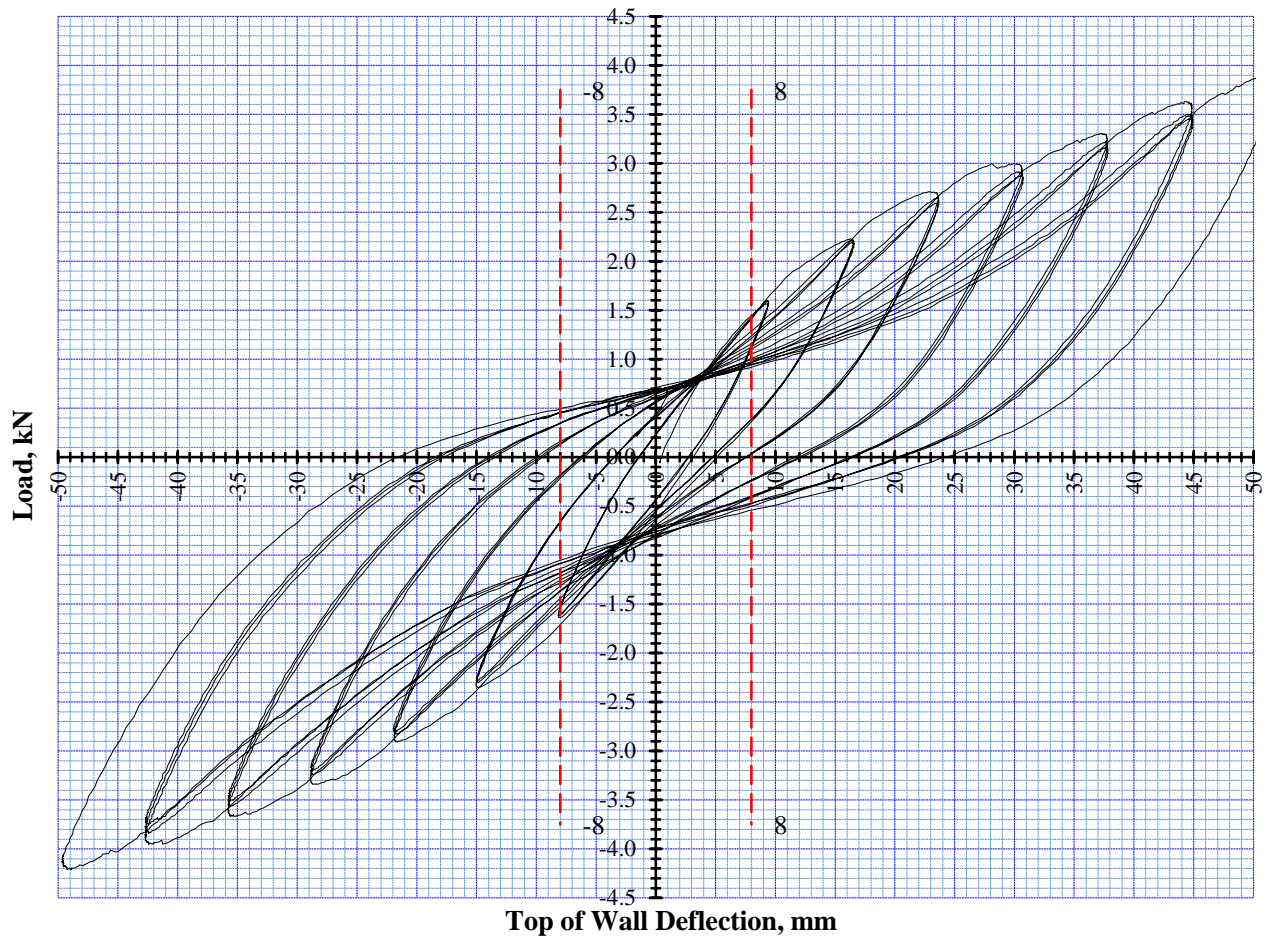


Figure 2: Wall 288525

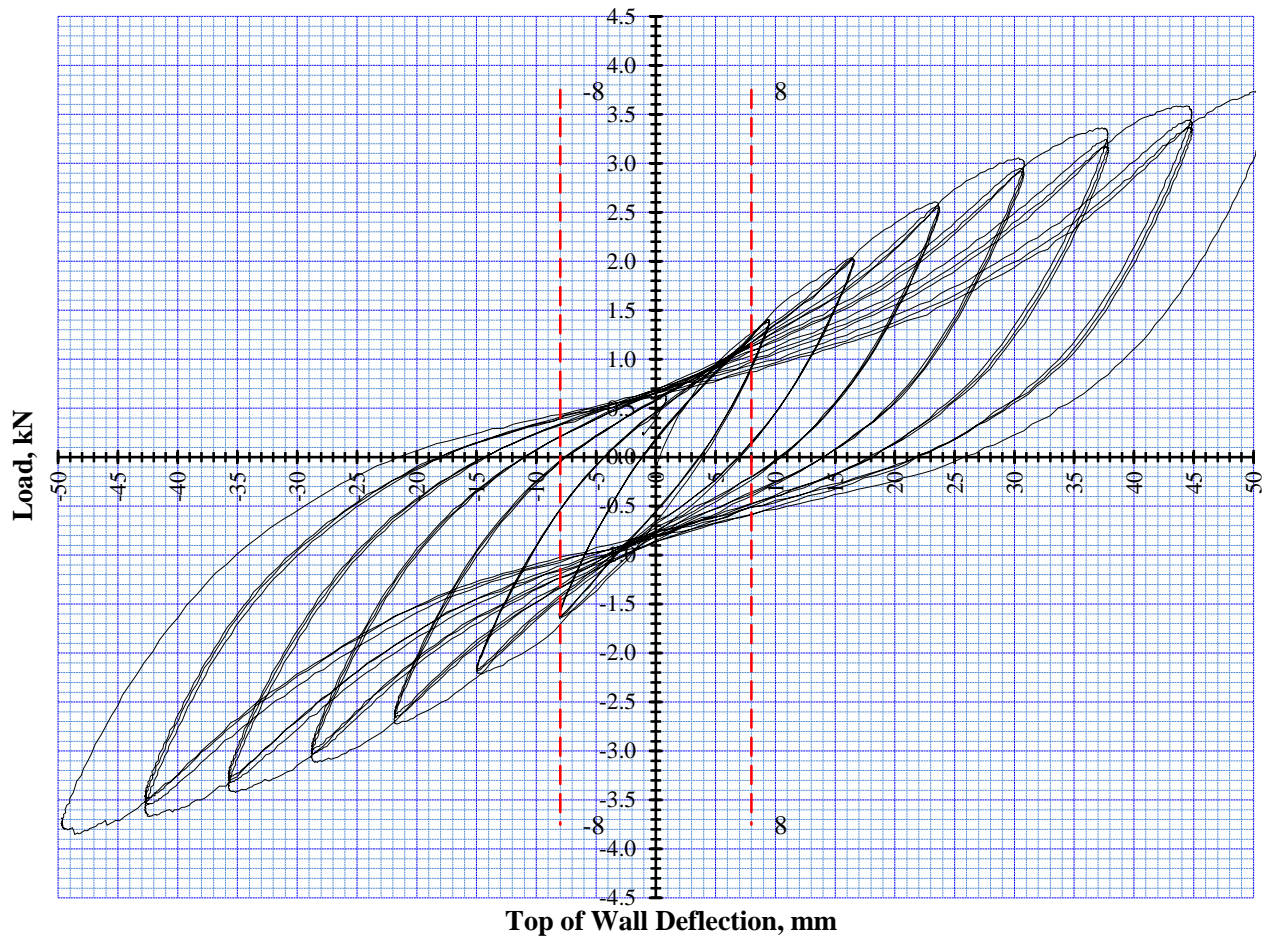


Figure 3: Wall 288526

P21:2010 BRACING RACKING TEST RESULT EVALUATION								
Wall Construction								
600mm, 10mm Paper both sides Saveboard one side								
90x45 H1.2 SG8 framing, studs at 600mm centres, no nogs								
Paper both sides Saveboard fixed 32mm x 6g plasterboard screws to 50,50,50,75,75,150,150mm.... Spacing						Summary		
GIB Handibracs brackets used each end						Earthquake	97 (U)	BU/m
M12 hold down bolts to bottom plate and brackets						Wind	84 (S)	BU/m
P21 Supplementary restraints used								
Date of test:-		21-Dec-21	Ship No.		3228	Tested by		Jamie Agnew
Date of calc's:-		21-Dec-21	Job No.		TE21-040	Analysed by		Doug Gaunt
Calculated to BRANZ P21:2010, AS/NZS1170.2&5, NZS3604:2011 Scion, Private Bag 3020 Rotorua.								
Serviceability Cycles			Ultimate Cycles			Wall dimensions		
Lab Number	Direction	Cycle to H/300 or DLQ or DLW	X mm	Cycle to Displacement	y=(mm)	L(mm)	H(mm)	
		Loads	Residual	Maximum		600	2410	
		(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
288524	+	1.43	2.30	3.66	36.0	1.83	10.8	3.45
	-	1.49	2.00	3.44	36.0			3.38
288525	+	1.50	2.20	3.17	36.0	1.59	8.6	3.06
	-	1.58	1.80	3.56	36.0			3.53
288526	+	1.32	3.10	3.33	36.0	1.67	11.2	3.04
	-	1.62	1.60	3.41	36.0			3.32
Averages		(P ₈)	(C)	(P)	(y)	P/2 (kN)	(d)	(Ry)
Averages		1.49	2.17	3.43	36.00	1.69	10.20	3.30
Coefficient of Variation %		6.58	22.08	4.58	0.00	6.02	11.21	5.64
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 3.53		
Ductility Modification factor						K4 = 0.88		
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		
288524	(BU)	1.00	60.4	63.7	71.0	49.4		
	(BU/m)		101	106	118	82		
288525	(BU)	1.00	58.3	67.2	67.3	52.1		
	(BU/m)		97	112	112	87		
288526	(BU)	1.00	56.2	64.1	67.4	49.7		
	(BU/m)		94	107	112	83		
<20% Result Check		288524	5% Ok result	-3% Ok result	5% Ok result	-3% Ok result		
		288525	0% Ok result	5% Ok result	-3% Ok result	5% Ok result		
		288526	-6% Ok result	-2% Ok result	-3% Ok result	-2% 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 =	58	(P8 x K1) x (K2/0.55) =			65	
			97 BU/m	Limited by			Ultimate limit state	
Average Wind BR			Ultimate	Serviceability				
Wind (BU's)		20 * P =	69	(P8 x K1) x (K2/0.71) =			50	
			84 BU/m	Limited by			Serviceability limit state	

Figure 4: P21:2010 calculations for the 600mm x 2.4m, 10mm Paper faced Saveboard with brackets

Please feel free to contact me to discuss this information.

Doug Gaunt

