

Results

To:	Paul Charteris	From:	Doug Gaunt
Organisation:	Saveboard (NZ) Ltd	Subject:	P21:2010 600 mm x 2.4m 9.0mm Exposed Saveboard with Brackets
Location:	New Plymouth	Date:	22 December 2021
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Paul

Please find below your P21 bracing results for your three 600mm x 2.40m 9.0mm Exposed Saveboard walls as tested with brackets.

1. BU wind = 48 (81 BU/m) as limited by the serviceability load capacity.
2. BU Earthquake = 56 (93 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
- 9.0mm Exposed Saveboard lining one side,
- Exposed 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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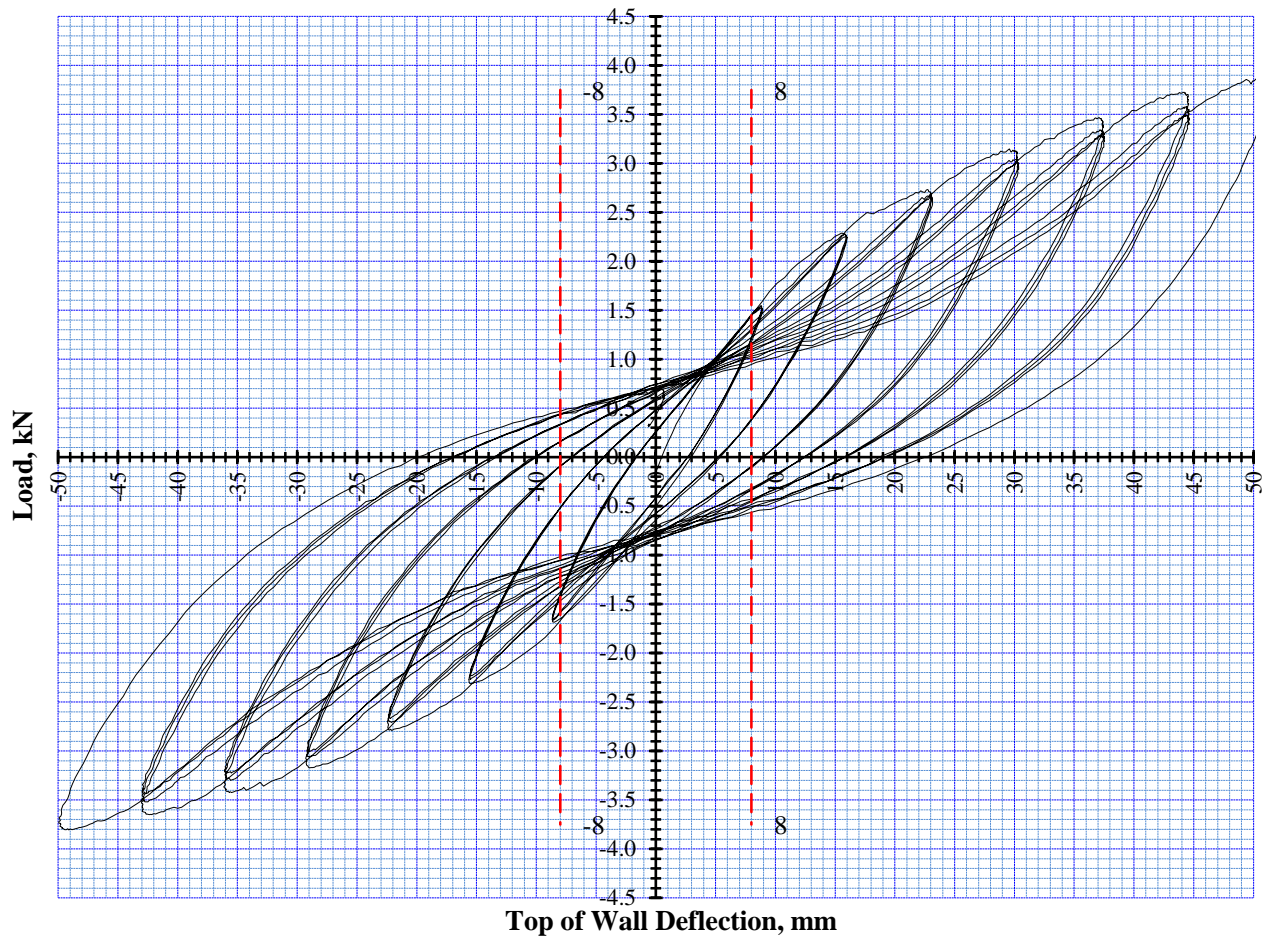


Figure 1: Wall 288527

Observations

- Sheet flexing
- No damage to sheet or brackets.

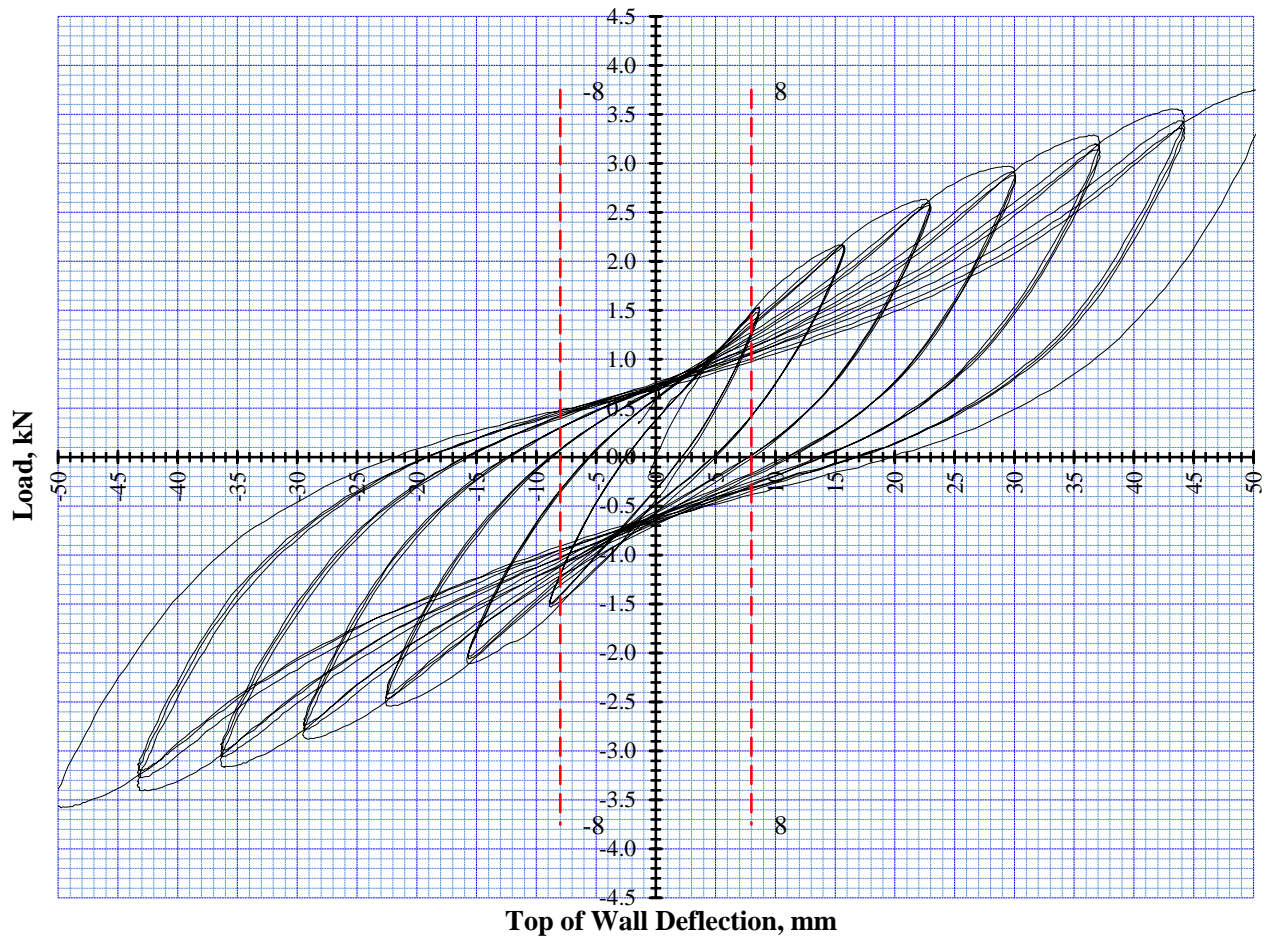


Figure 2: Wall 288528

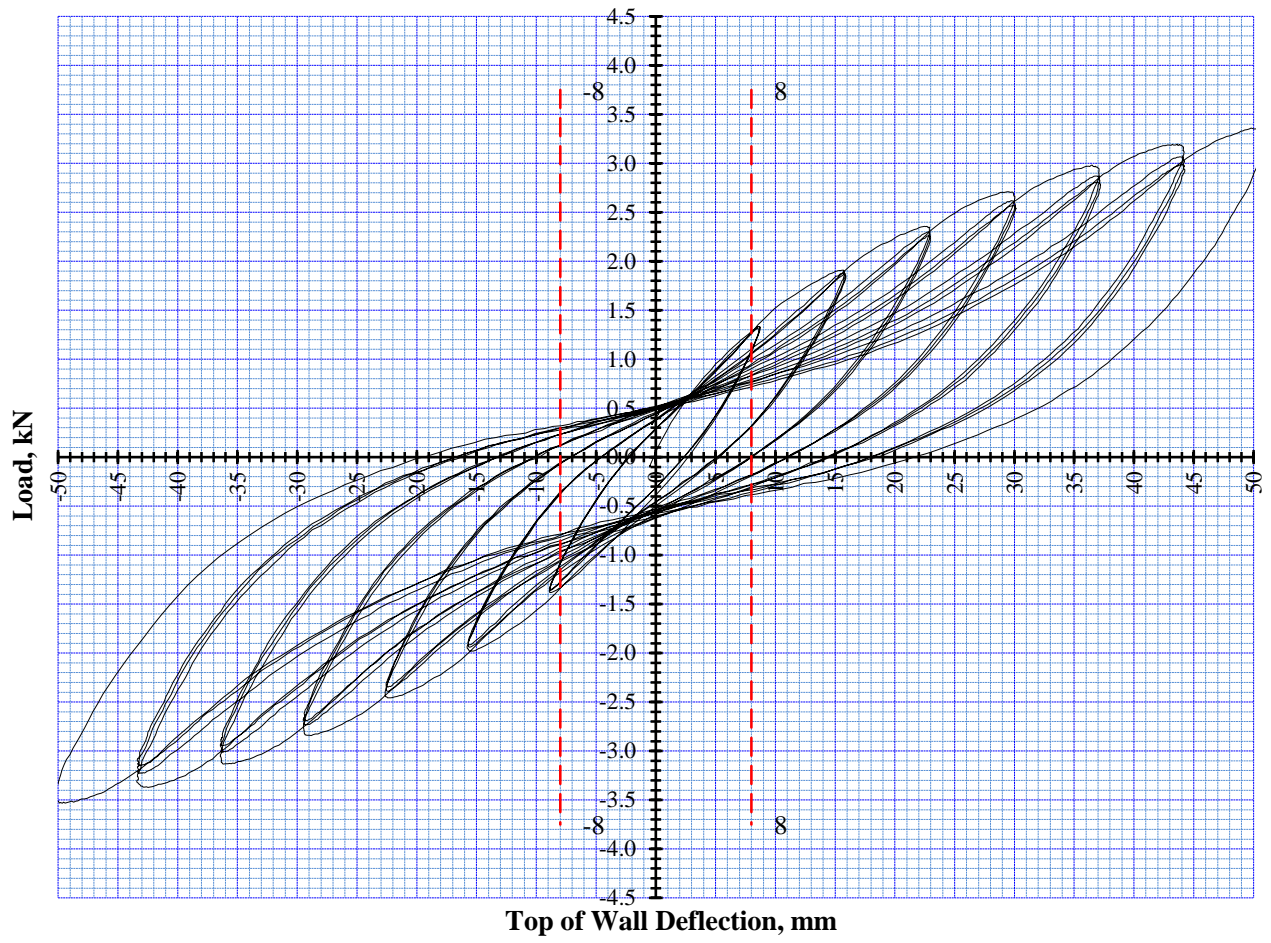


Figure 3: Wall 288529

P21:2010 BRACING RACKING TEST RESULT EVALUATION								
Wall Construction								
600mm, 9.0mm Exposed Internal lining Saveboard one side								
90x45 H1.2 SG8 framing, studs at 600mm centres, no nogs								
Exposed Saveboard fixed 32mm x 6g plasterboard screws to 50,50,50,75,75,150,150mm.... Spacing						Summary		
GIB Handibracs brackets used each end						Earthquake	93 (U)	BU/m
M12 hold down bolts to bottom plate and brackets						Wind	81 (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			
Lab Number	Direction	Cycle to H/300 or DLQ or DLW		Cycle to Displacement		Wall dimensions		
		8.0	X mm	y=(mm)		L(mm)	H(mm)	
		Loads	Residual	Maximum				
		(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
288527	+	1.45	2.70	3.44	36.0	1.72	9.6	3.14
	-	1.55	1.70	3.40	36.0			3.20
288528	+	1.47	2.30	3.28	36.0	1.64	9.7	3.08
	-	1.48	2.40	3.16	36.0			3.03
288529	+	1.29	2.30	2.96	36.0	1.48	9.6	2.73
	-	1.34	2.20	3.13	36.0			2.96
		(P ₈)	(C)	(P)	(y)	P/2 (kN)	(d)	(Ry)
Averages		1.43	2.27	3.23	36.00	1.61	9.63	3.02
Coefficient of Variation %		6.16	13.15	5.11	0.00	6.18	0.49	5.02
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 3.74			
Ductility Modification factor					K4 = 0.93			
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		
288527	(BU)	1.00	58.8	65.5	68.4	50.7		
	(BU/m)		98	109	114	85		
288528	(BU)	1.00	56.6	64.4	64.4	49.9		
	(BU/m)		94	107	107	83		
288529	(BU)	1.00	52.7	57.4	60.9	44.5		
	(BU/m)		88	96	102	74		
<20% Result Check		288527	7% Ok result	7% Ok result	8% Ok result	7% Ok result		
		288528	2% Ok result	5% Ok result	0% Ok result	5% Ok result		
		288529	-9% Ok result	-13% Ok result	-9% Ok result	-13% 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 =	56	(P8 x K1) x (K2/0.55) =		62		
			93 BU/m	Limited by		Ultimate limit state		
Average Wind BR			Ultimate			Serviceability		
Wind (BU's)		20 * P =	65	(P8 x K1) x (K2/0.71) =		48		
			81 BU/m	Limited by		Serviceability limit state		

Figure 4: P21:2010 calculations for the 600mm x 2.4m, 9.5mm Exposed Saveboard with brackets

Please feel free to contact me to discuss this information.

Doug Gaunt

