

Results

To:	Paul Charteris	From:	Doug Gaunt
Organisation:	Saveboard (NZ) Ltd	Subject:	P21:2010 1200 mm x 2.4m 9.0mm Exposed Saveboard with Brackets
Location:	New Plymouth	Date:	22 December 2021
Mob No.:	021 581046	No. of	5
Tel No.:		Pages:	

Paul

Please find below your P21 bracing results for your three 1200mm x 2.40m 9.0mm Exposed Saveboard walls as tested with brackets.

1. BU wind = 122 (102 BU/m) as limited by the serviceability load capacity.
2. BU Earthquake = 149 (125 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, 300mm centres on internal stud.
- GIB Handibrac brackets each end
- M12 hold down rods to bottom plate and brackets

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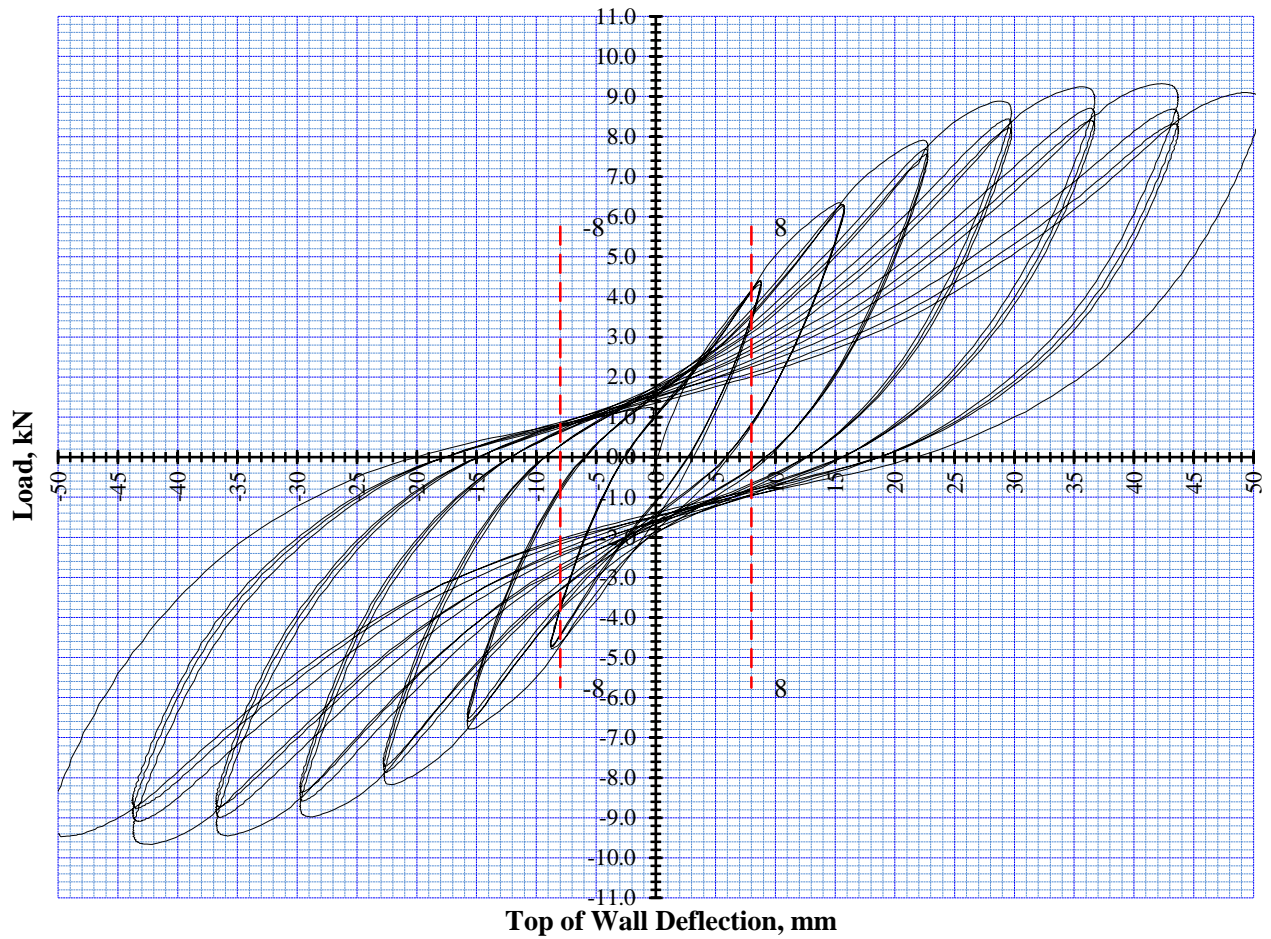


Figure 1: Wall 288521

Observations

- Board pulling at corners and creasing on end studs.

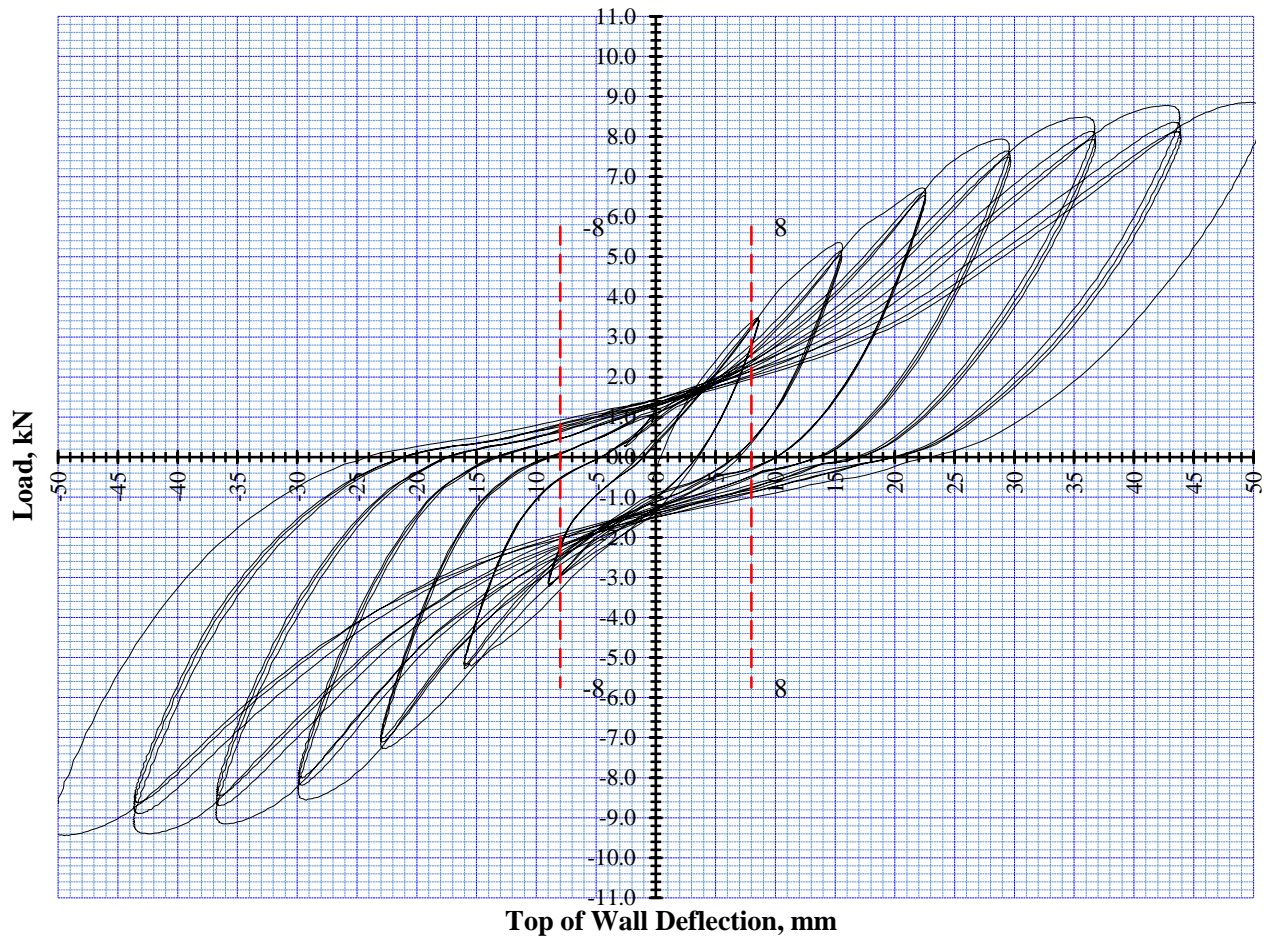


Figure 2: Wall 288522

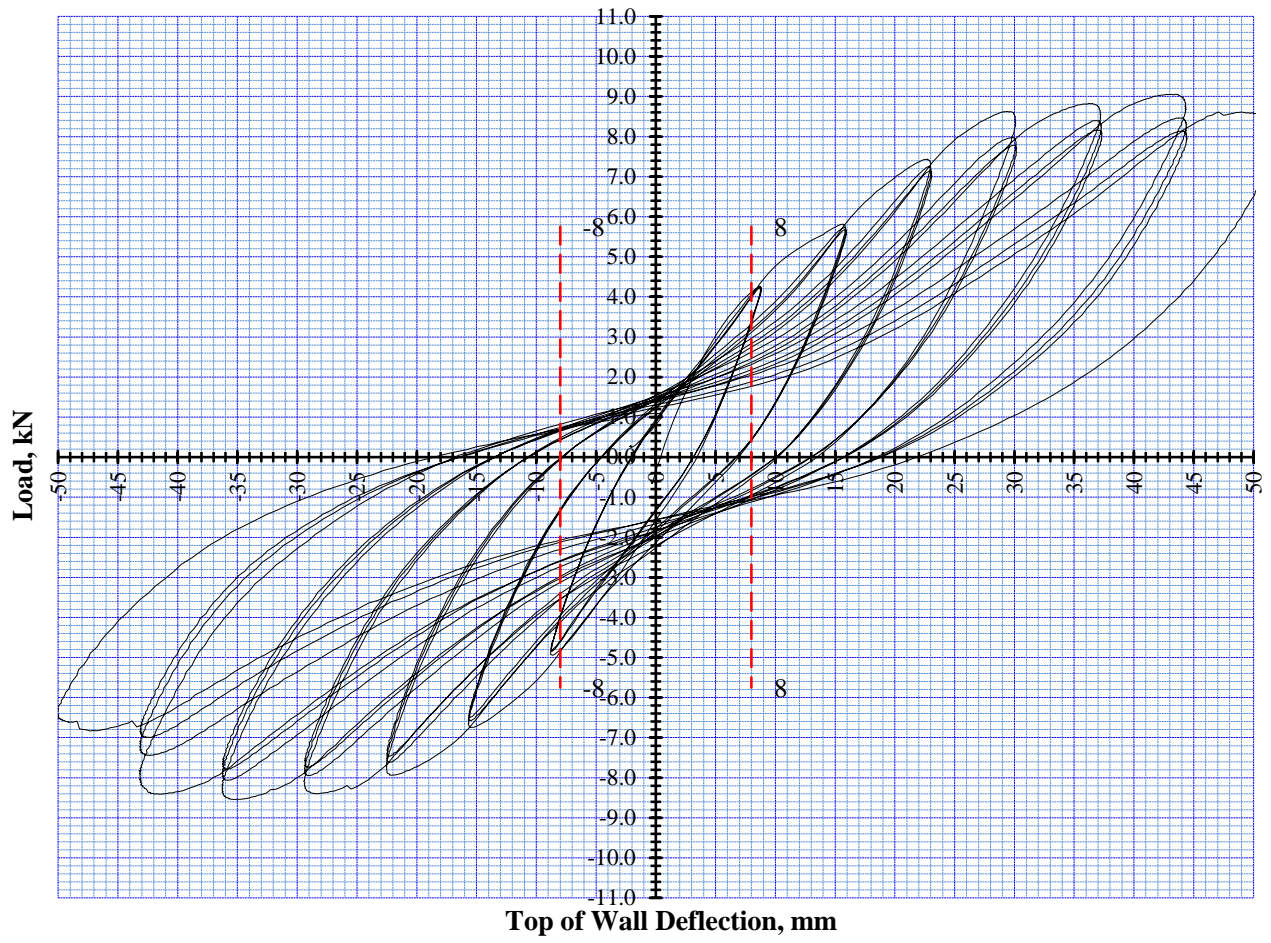


Figure 3: Wall 288523

P21:2010 BRACING RACKING TEST RESULT EVALUATION								
Wall Construction								
1200mm, 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						Summary		
to 50,50,50,75,75,150,150mm.... Spacing, 300mm centres on internal stud						Earthquake	125 (U)	BU/m
GIB Handibracs brackets used each end						Wind	102 (S)	BU/m
M12 hold down bolts to bottom plate and brackets								
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
288521	+	4.20	2.60	9.23	36.0	4.62	9.1	8.37
	-	4.65	2.60	9.42	36.0			8.62
288522	+	3.37	3.40	8.48	36.0	4.24	10.5	7.86
	-	3.00	1.20	9.15	36.0			8.40
288523	+	4.08	3.10	8.80	36.0	4.40	9.8	8.00
	-	4.80	2.00	8.50	36.0			7.80
		(P ₈)	(C)	(P)	(y)	P/2 (kN)	(d)	(Ry)
Averages		4.02	2.48	8.93	36.00	4.42	9.80	8.18
Coefficient of Variation %		16.08	29.08	4.04	0.00	3.48	5.83	3.73
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 3.67		
Ductility Modification factor						K4 = 0.91		
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		
288521	(BU)	1.00	155.3	193.1	186.5	149.6		
	(BU/m)		129	161	155	125		
288522	(BU)	1.00	148.6	139.0	176.3	107.7		
	(BU/m)		124	116	147	90		
288523	(BU)	1.00	144.4	193.7	173.0	150.1		
	(BU/m)		120	161	144	125		
		288521	6% Ok result	166.8	6% Ok result	129.2		
<20% Result Check		288522	-1% Ok result	-39% Ok result	-2% Ok result	-39% Ok result		
		288523	-5% Ok result	166.8	-5% Ok result	129.2		
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 =	149	(P8 x K1) x (K2/0.55) =		158		
		125	BU/m	Limited by		Ultimate limit state		
Average Wind BR			Ultimate			Serviceability		
Wind (BU's)		20 * P =	179	(P8 x K1) x (K2/0.71) =		122		
		102	BU/m	Limited by		Serviceability limit state		

Figure 4: P21:2010 calculations for the 1200mm x 2.4m, 9.5mm Exposed Saveboard with brackets

Please feel free to contact me to discuss this information.

Doug Gaunt 