

Results

To:	Paul Charteris	From:	Doug Gaunt
Organisation:	Saveboard (NZ) Ltd	Subject:	P21:2010 1200 mm x 2.4m 10mm Saveboard with Brackets
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Paul

Please find below your P21 bracing results for your three 1200mm x 2.40m 10mm Saveboard walls as tested with brackets.

1. BU wind = 150 (125 BU/m) as limited by the serviceability load capacity.
2. BU Earthquake = 156 (130 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
- 10mm Saveboard interior ceiling and wall lining one side,
- Saveboard fixed Gibgrabber 6g x 32mm plasterboard screws to Winstones pattern, 50,50,50,75,75,150mm....
- PRYDA brackets each end
- M12 hold down rods to bottom plate and brackets

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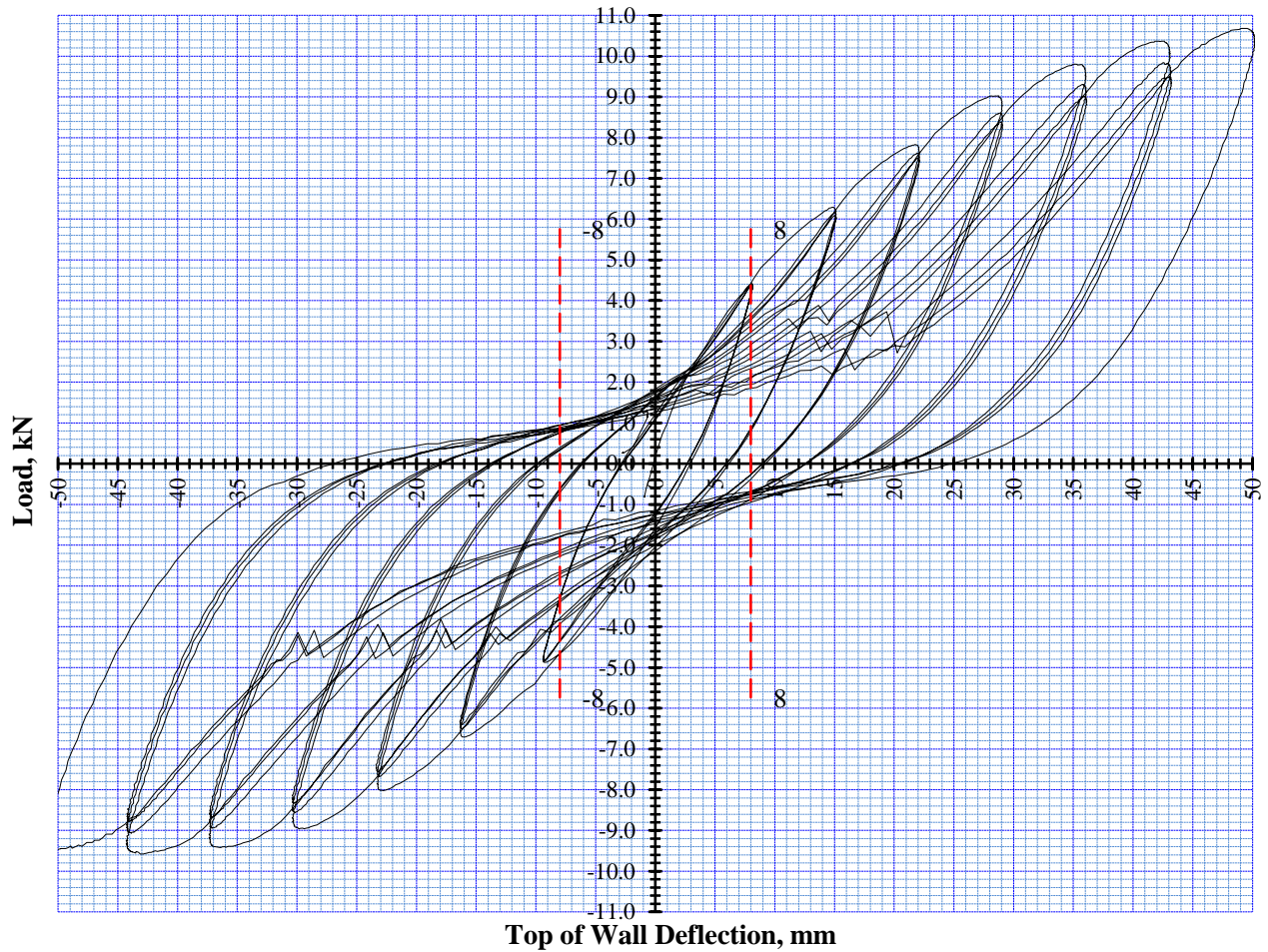


Figure 1: Wall 282365

Observations

- Board fracturing at corners as below
- Brackets flexing



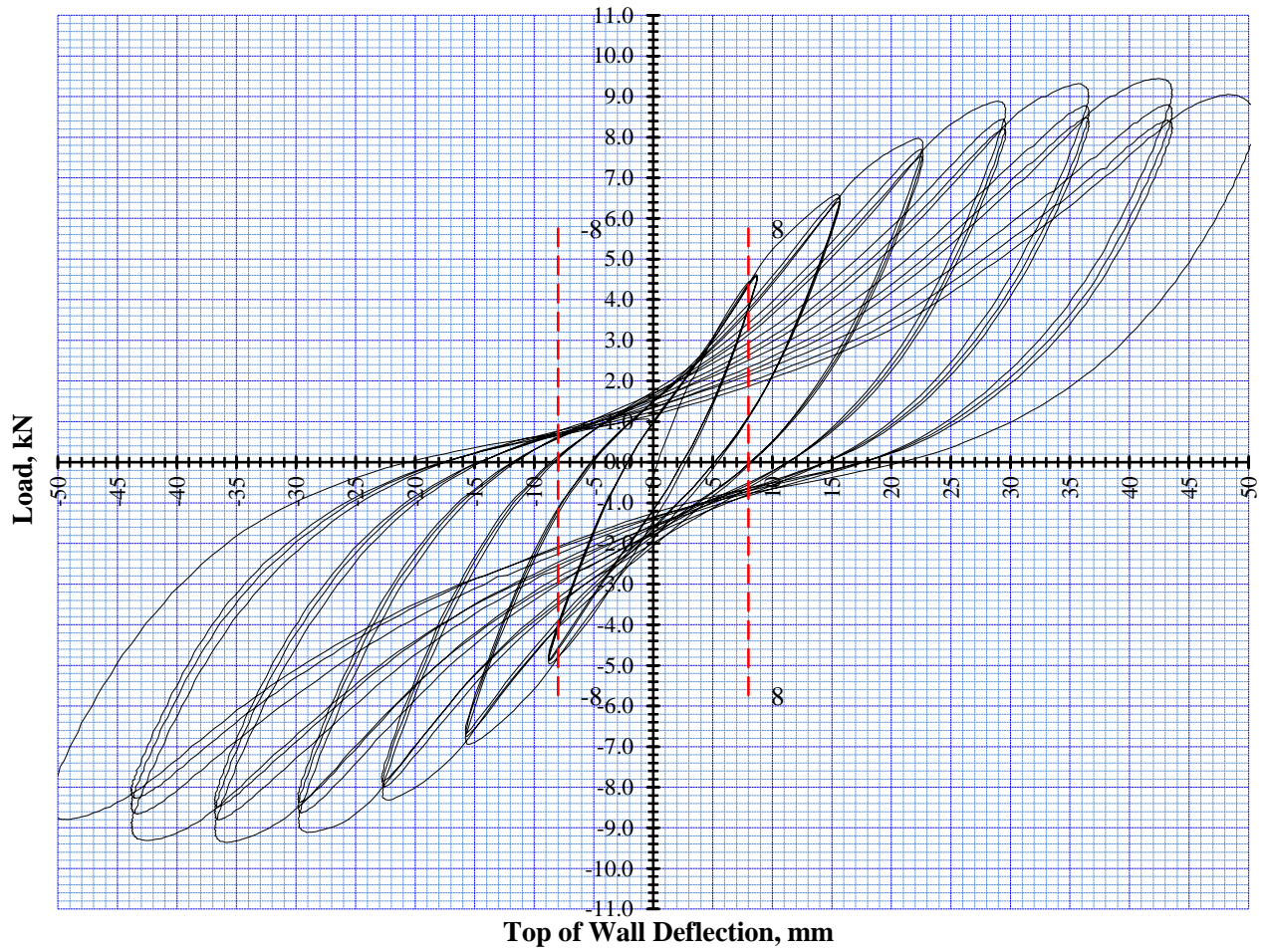


Figure 2: Wall 287924

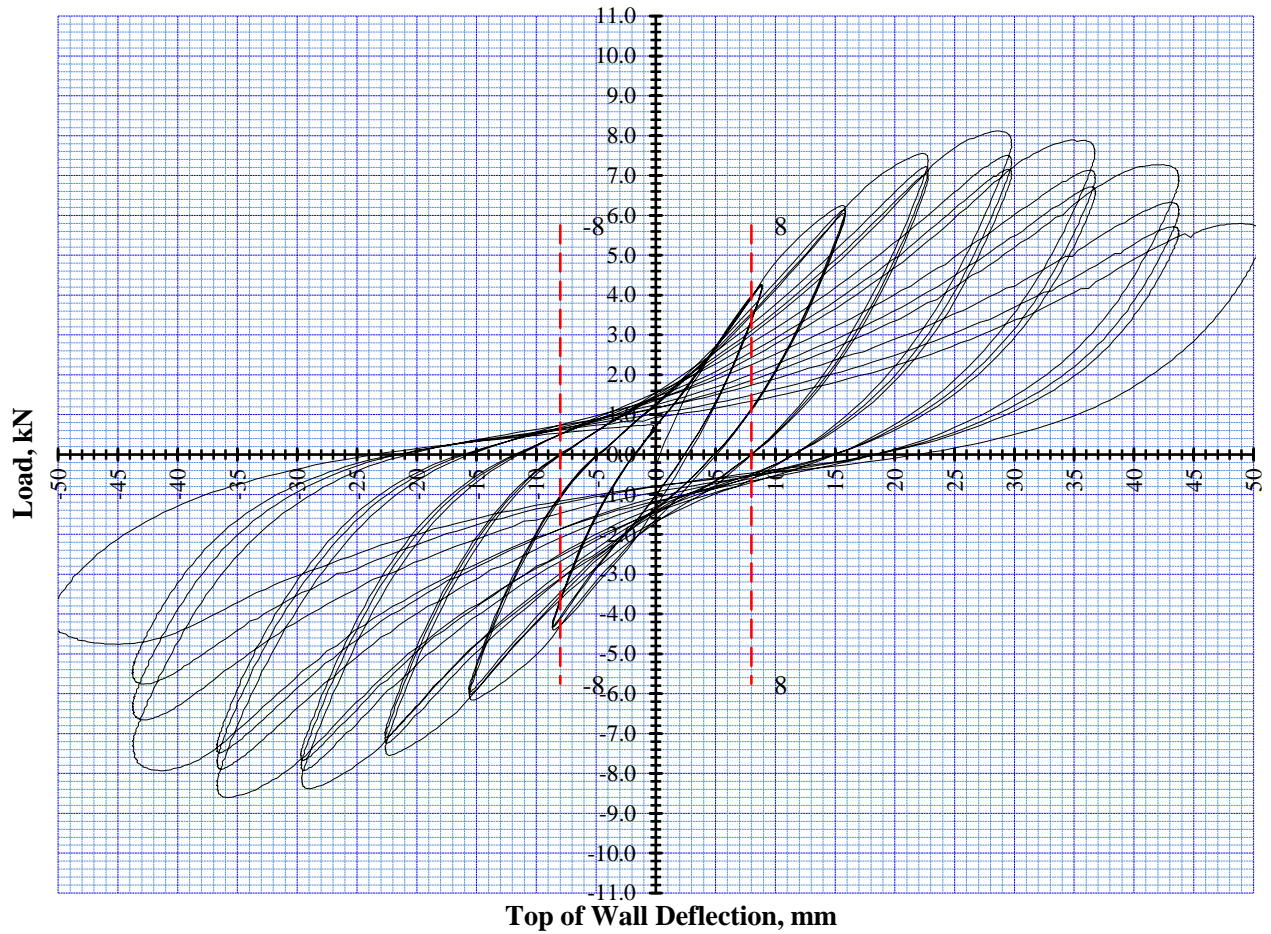


Figure 3: Wall 287925

P21:2010 BRACING RACKING TEST RESULT EVALUATION									
Wall Construction									
1200mm, 10mm Saveboard Interior Wall and Ceiling lining one side									
90x45 H1.2 SG8 framing, studs at 600mm centres, no nogs									
Saveboard fixed 32mm x 6g plasterboard screws							Summary		
to Winstone pattern, 50,50,50,75,75,150mm....							Earthquake	130 (U)	BU/m
PRYDA brackets used each end							Wind	125 (S)	BU/m
M12 hold down bolts to bottom plate and brackets									
P21 Supplementary restraints used									
Date of test:-	20-Jul-21	Ship No.	3205				Tested by	Jamie Agnew	
Date of calc's:-	21-Jul-21	Job No.	TE21-007				Analysed by	Doug Gaunt	
Calculated to BRANZ P21:2010, AS/NZS 1170.2&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	d at P/2		4th, R		
		(P ₈)	Defn, C	Load	def @ P				
		kN	mm	P(kN)	y (mm)	P/2 (kN)	d mm	kN	
282365	+	4.40	2.70	9.80	36.0	4.90	9.3	9.10	
	-	4.68	2.70	9.40	36.0			8.65	
287924	+	4.60	1.90	9.30	36.0	4.65	8.6	8.40	
	-	4.63	2.60	9.36	36.0			8.40	
287925	+	4.16	1.90	7.87	36.0	3.94	8.1	6.52	
	-	4.15	2.30	8.60	36.0			7.17	
		(P ₈)	(C)	(P)	(y)	P/2 (kN)	(d)	(Ry)	
Averages		4.44	2.35	9.06	36.00	4.50	8.67	8.04	
Coefficient of Variation %		4.90	14.69	7.04	0.00	9.10	5.68	11.15	
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 4.15				
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			
282365	(BU)	1.00	177.5	198.1	192.0	153.5			
	(BU/m)		148	165	160	128			
287924	(BU)	1.00	168.0	201.4	186.6	156.0			
	(BU/m)		140	168	156	130			
287925	(BU)	1.00	136.9	181.3	164.7	140.5			
	(BU/m)		114	151	137	117			
		282365	164.3	3% Ok result	9% Ok result	3% Ok result			
<20% Result Check		287924	6% Ok result	6% Ok result	4% Ok result	6% Ok result			
		287925	-26% Ok result	-10% Ok result	-15% Ok result	-10% 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 =		156	(P8 x K1) x (K2/0.55) =		194			
	130		BU/m	Limited by		Ultimate limit state			
Average Wind BR			Ultimate			Serviceability			
Wind (BU's)	20 * P =		181	(P8 x K1) x (K2/0.71) =		150			
	125		BU/m	Limited by		Serviceability limit state			

Figure 4: P21:2010 calculations for the 1200mm x 2.4m, 10mm Saveboard with brackets

Please feel free to contact me to discuss this information.

Doug Gaunt 