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Results

To:	Brad Smith	**From:**	Doug Gaunt
Organisation:	Kronospan Trading SRL	**Subject:**	P21:2010 9mm Kronspan OSB 10mm 400 Wall with Brackets
Location:	Northcote	**Date:**	28th February 2020
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Brad

Please find below the P21 bracing results for your three 400mm x 2.40m 9mm Kronspan OSB walls tested with GIB Handibracs.

1. BU wind = 35 (89 BU/m) as limited by the serviceability load capacity.
2. BU Earthquake = 44 (111 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

- 9mm Kronspan OSB one side
- 90x45 H1.2 SG8 framing, studs at 400mm centres, no nogs
- OSB fixing - 50x2.87mm angular grove Paslode gun nails at 150mm centres to plates and end studs
- GIB Handibracs each end
- M12 hold down bolts to Handibracs and bottom plate
- P21 supplementary restraints used.

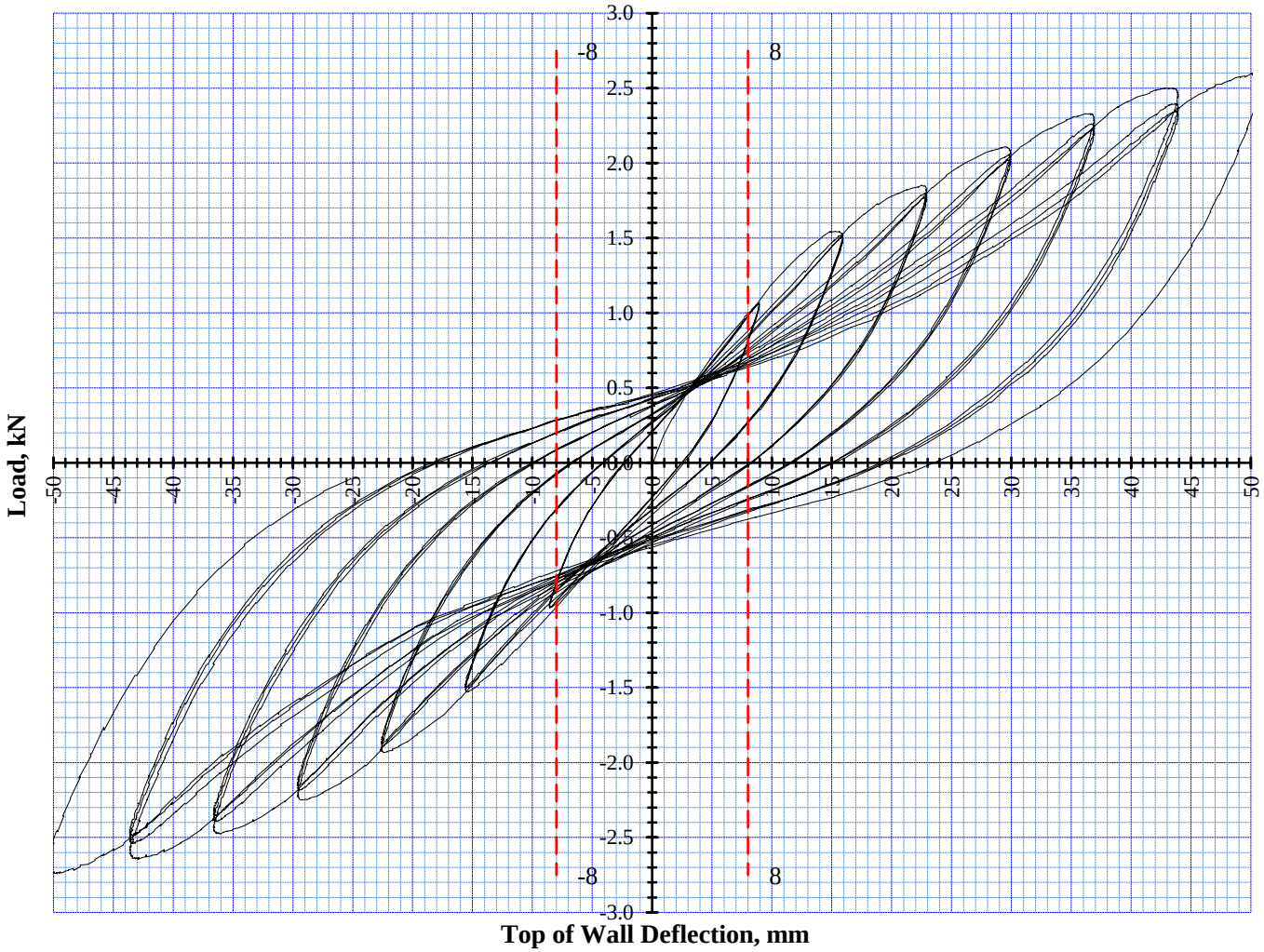

Figure 1: *Wall 281757*

Observations

- No obvious signs of failure to framing.
- No obvious signs of failure to Handibracs.
- No obvious signs of failure to OSB

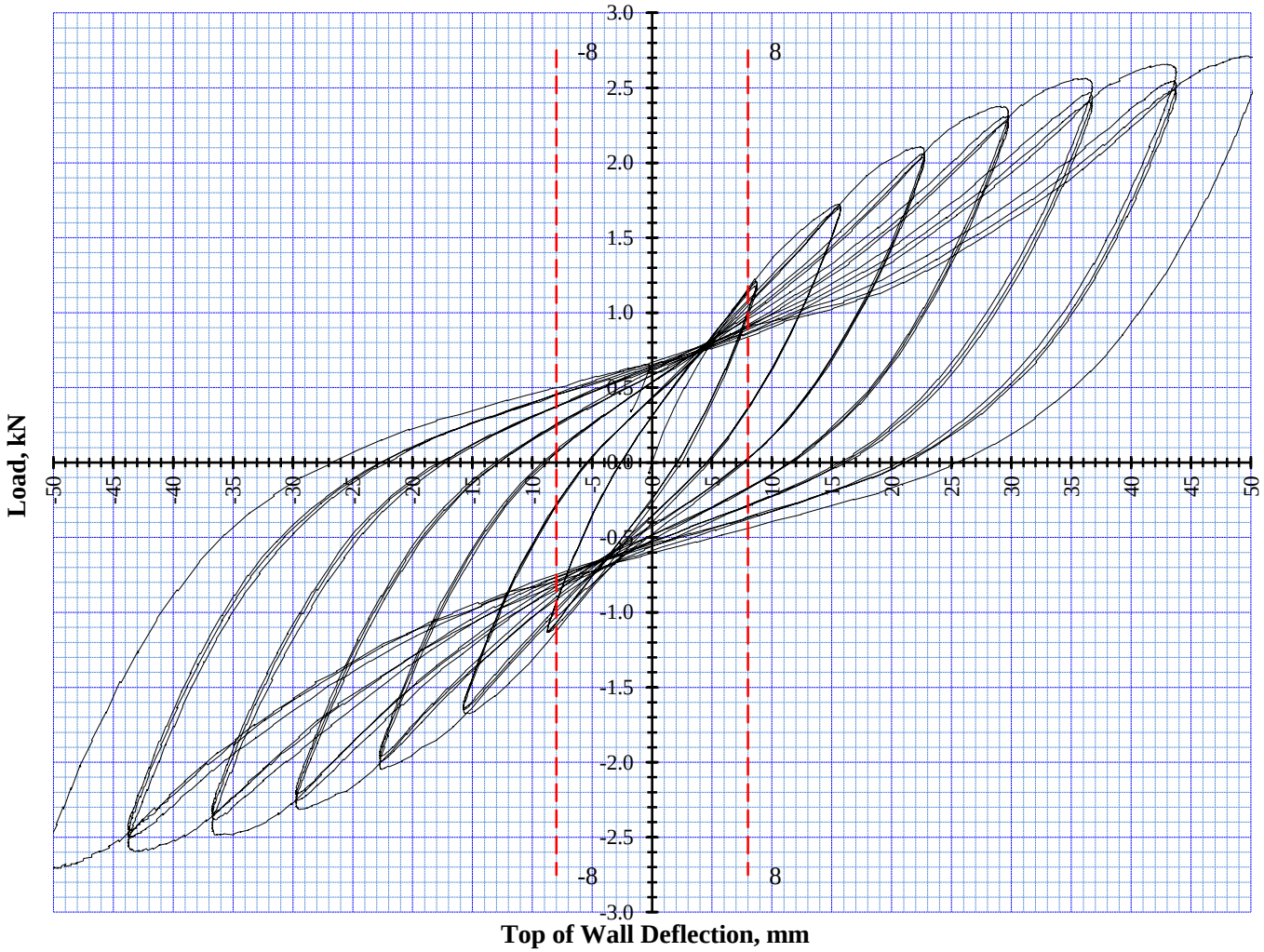

Figure 2: *Wall 281758*

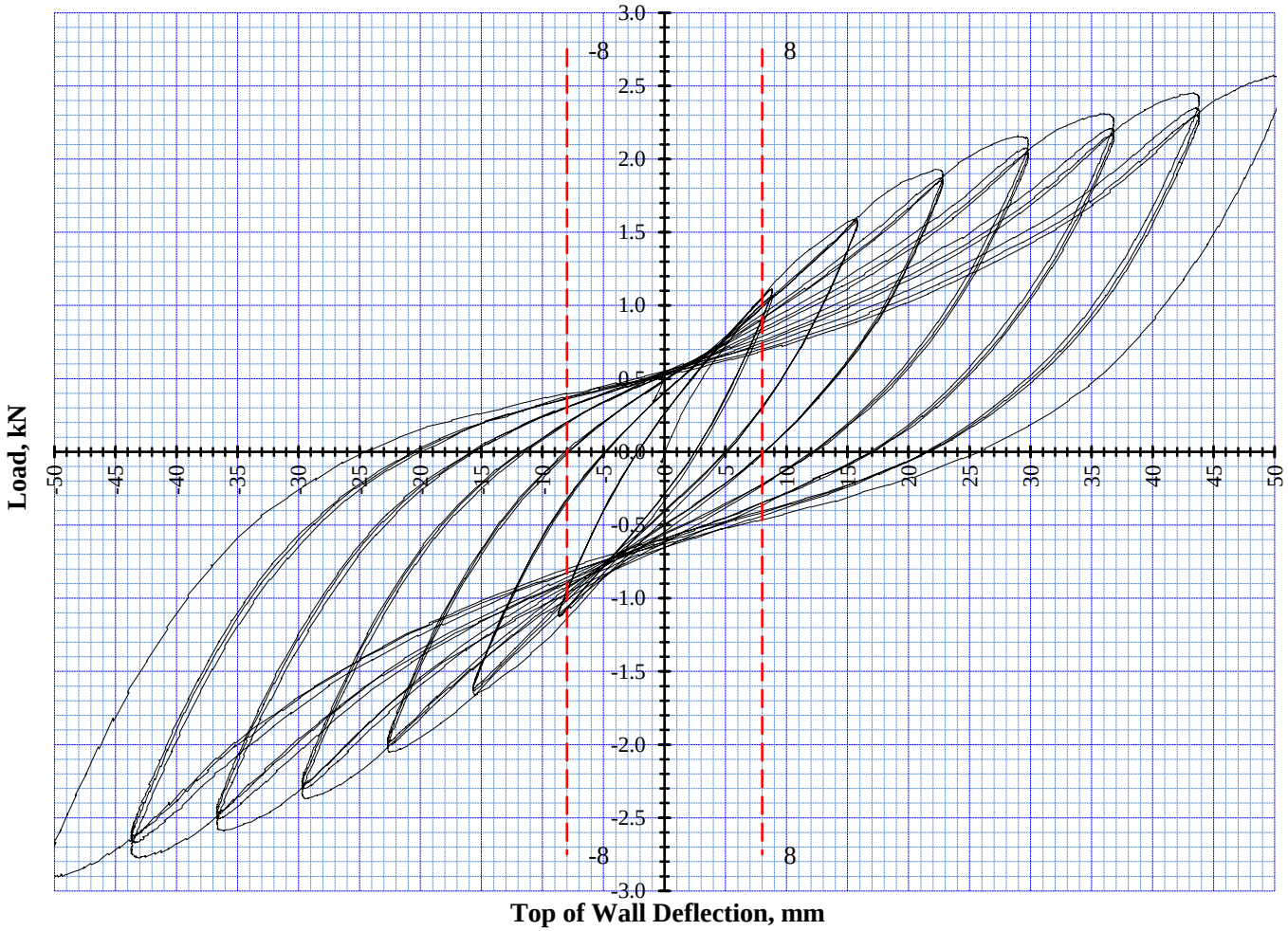

Figure 3: *Wall 281759*

P21:2010 BRACING RACKING TEST RESULT EVALUATION								
Wall Construction								
400mm, 9mm Kronspan OSB one side								
90x45 H1.2 LVL8 framing, studs at 400mm centres, no nogs								
OSB fixing - 50x2.87mm angular grove Paslode gun nails at 150mm						**Summary**		
centres to plates and end studs.						**Earthquake**	**111 (U)**	**BU/m**
GIB Handibracs each end						**Wind**	**89 (S)**	**BU/m**
M12 hold down bolts to Handibracs and bottom plate								
P21 supplementary restraints used								
Date of test:-		**26-Feb-20**	Ship No.	**3072**		Tested by	Jamie Agnew	
Date of calc's:-		**26-Feb-20**	Job No.	**TE19-028**		Analysed by	Doug Gaunt	
Calculated to BRANZ P21:2010, AS/NZS1170.2&5, NZS3604:2011					*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			400	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
281757	**+**	**1.00**	**2.40**	**2.33**	**36.0**	1.17	**9.6**	**2.18**
	-	**0.94**	**2.30**	**2.47**	**36.0**			**2.33**
281758	**+**	**1.15**	**2.00**	**2.56**	**36.0**	1.28	**9.2**	**2.37**
	-	**1.09**	**2.60**	**2.47**	**36.0**			**2.30**
281759	**+**	**1.05**	**2.50**	**2.21**	**36.0**	1.11	**8.6**	**2.13**
	-	**1.07**	**2.10**	**2.59**	**36.0**			**2.44**
		(P_8)	(C)	(P)	(y)	P/2 (kN)	(d)	(Ry)
Averages		1.05	2.32	2.44	36.00	1.18	9.13	2.29
Coefficient of Variation %		6.34	9.13	5.39	0.00	6.14	4.50	4.66
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	3.94	
Ductility Modification factor						K4 =	0.97	
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**
281757	(BU)	1.00	43.7	42.3	48.0	32.8
	(BU/m)		109	106	120	82
281758	(BU)	1.00	45.3	48.9	50.3	37.9
	(BU/m)		113	122	126	95
281759	(BU)	1.00	44.3	46.3	48.0	35.8
	(BU/m)		111	116	120	90
		281757	*-2% Ok result*	*-12% Ok result*	*-2% Ok result*	*-12% Ok result*
<20% Result Check		*281758*	*3% Ok result*	*9% Ok result*	*5% Ok result*	*9% Ok result*
		281759	*0% Ok result*	*1% Ok result*	*-2% Ok result*	*1% 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 =	**44**	(P8 x K1) x (K2/0.55) =	**46**
	111	**BU/m**	**Limited by**	**Ultimate limit state**
Average Wind BR		**Ultimate**		**Serviceability**
Wind (BU's)	20 * P =	**49**	(P8 x K1) x (K2/0.71) =	**35**
	89	**BU/m**	**Limited by**	**Serviceability limit state**

Figure 4: *P21:2010 calculations for 400mm x 2.40m, OSB walls with brackets*

Please feel free to contact me to discuss this information.

Doug Gaunt