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Results

To:	Brad Smith	**From:**	Doug Gaunt
Organisation:	Kronospan Trading SRL	**Subject:**	P21:2010 9mm Kronspan OSB 10mm GIB standard 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, 10mm GIB standard walls tested with GIB Handibracs.

1. BU wind = 40 (100 BU/m) as limited by the serviceability load capacity.
2. BU Earthquake = 48 (120 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
- 10mm GIB standard other 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 fixed with Gibgrabber 32mm x 6g screws to Winstones pattern 50,50,50,75,75,150mm…
- GIB Handibracs each end
- M12 hold down bolts to Handibracs and bottom plate
- P21 supplementary restraints used.

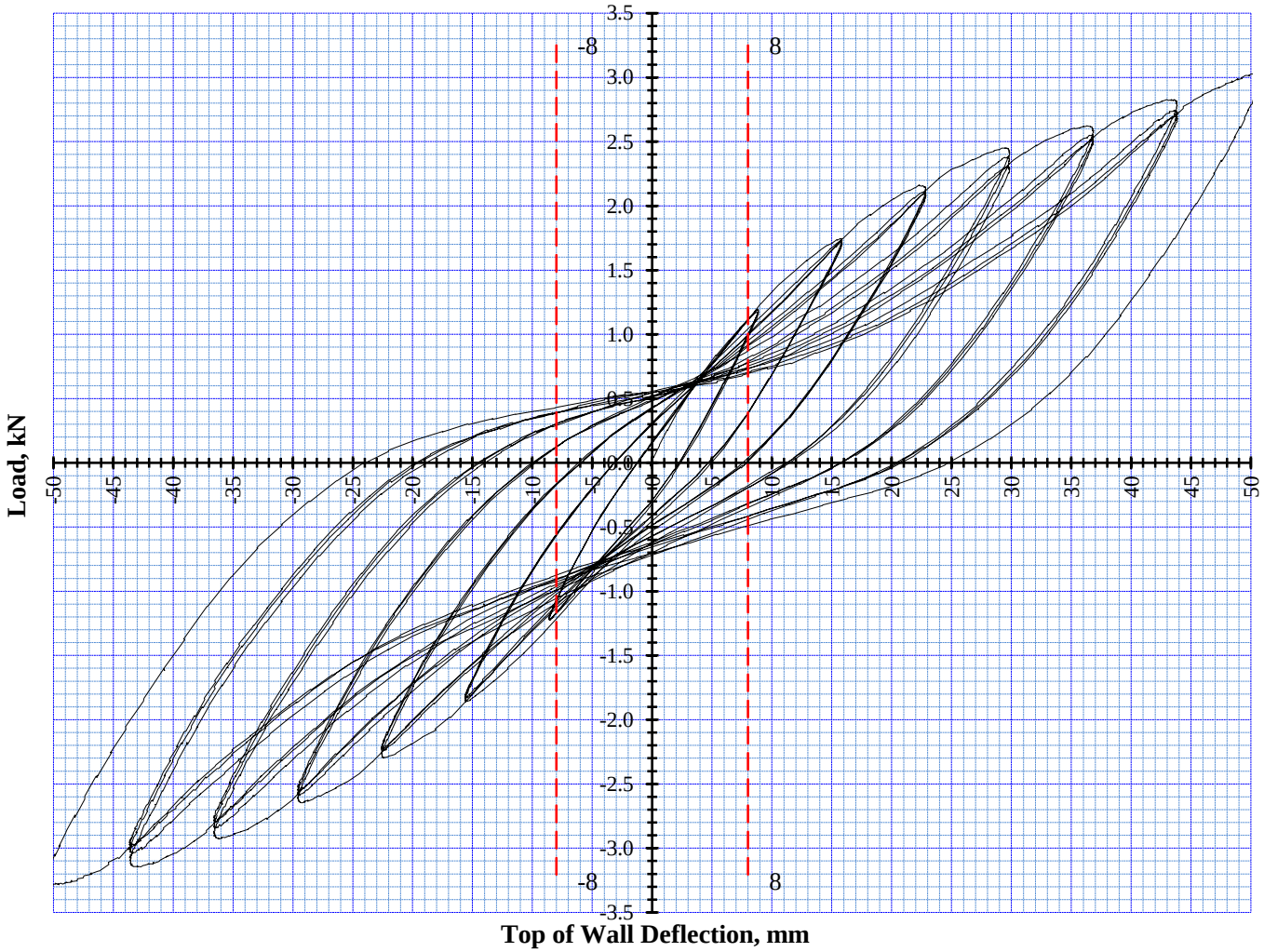

Figure 1: *Wall 281754*

Observations

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

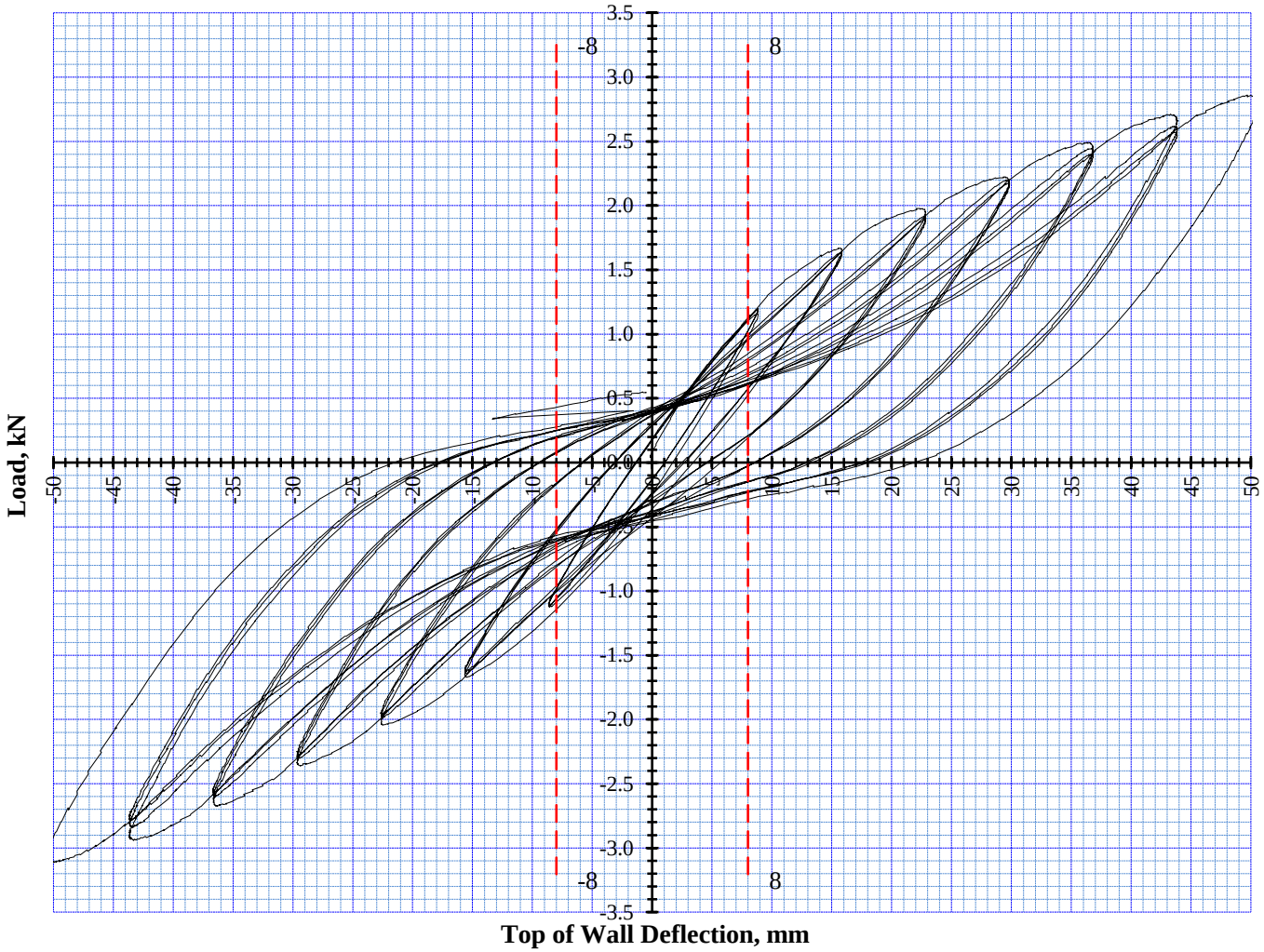

Figure 2: *Wall 281755*

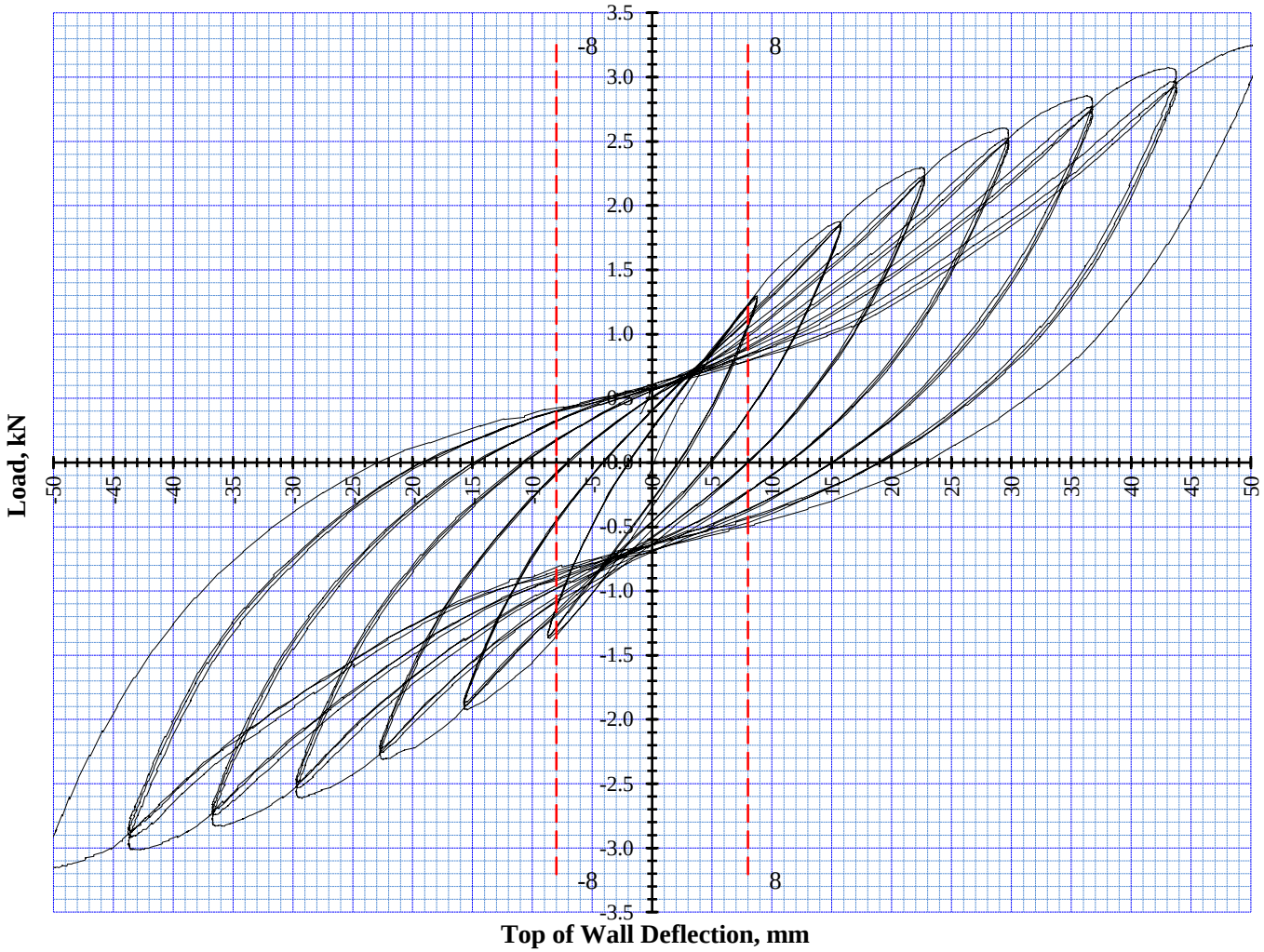

Figure 3: *Wall 281756*

P21:2010 BRACING RACKING TEST RESULT EVALUATION								
Wall Construction								
400mm, 9mm Kronspan OSB one side, 10mm GIB standard other 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. GIB fixed with						**Earthquake**	**120 (U)**	**BU/m**
32mmx 6g GIBgrabbers to Winstones pattern 50,50,50,75,75,150mm…						**Wind**	**100 (S)**	**BU/m**
GIB Handibracs each end, 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
281754	**+**	**1.13**	**2.30**	**2.62**	**36.0**	1.31	**9.7**	**2.46**
	-	**1.17**	**1.30**	**2.92**	**36.0**			**2.76**
281755	**+**	**1.13**	**1.20**	**2.48**	**36.0**	1.24	**9.4**	**2.35**
	-	**1.09**	**1.40**	**2.67**	**36.0**			**2.53**
281756	**+**	**1.24**	**2.20**	**2.85**	**36.0**	1.43	**9.5**	**2.69**
	-	**1.33**	**2.00**	**2.83**	**36.0**			**2.65**
		(P_8)	(C)	(P)	(y)	P/2 (kN)	(d)	(Ry)
Averages		1.18	1.73	2.73	36.00	1.33	9.53	2.57
Coefficient of Variation %		6.85	25.73	5.57	0.00	5.76	1.31	5.47
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	3.78	
Ductility Modification factor						K4 =	0.94	
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**
281754	(BU)	1.00	48.8	50.2	55.4	38.9
	(BU/m)		122	125	139	97
281755	(BU)	1.00	45.6	48.4	51.5	37.5
	(BU/m)		114	121	129	94
281756	(BU)	1.00	49.9	56.1	56.8	43.4
	(BU/m)		125	140	142	109
		281754	*2% Ok result*	*-4% Ok result*	*2% Ok result*	*-4% Ok result*
<20% Result Check		*281755*	*-8% Ok result*	*-10% Ok result*	*-9% Ok result*	*-10% Ok result*
		281756	*5% Ok result*	*12% Ok result*	*6% Ok result*	*12% 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 =	**48**	(P8 x K1) x (K2/0.55) =		**52**
	120	**BU/m**		**Limited by**	**Ultimate limit state**
Average Wind BR		**Ultimate**			**Serviceability**
Wind (BU's)	20 * P =	**55**	(P8 x K1) x (K2/0.71) =		**40**
	100	**BU/m**		**Limited by**	**Serviceability limit state**

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

Please feel free to contact me to discuss this information.

Doug Gaunt