

Te Papa Tipu Innovation Park 49 Sala Street Private Bag 3020 Rotorua New Zealand Telephone: +64 7 343 5899 DDI: +64 7 343 5763 Facsimile: +64 7 348 0952 Email: douglas.gaunt@scionresearch.com

## Results

To: Organisation:	Brad Smith Kronospan Trading SRL	From: Subject:	Doug Gaunt P21:2010 9mm Kronspan OSB 10mm GIB standard 400 Wall with Brackets								
Location:	Northcote	Date:	28 <sup>th</sup> February 2020								
Fax No.:	021 487007	No. of	5								
Tel No.:	09 3651660	Pages:									
Please call +64 7 343 5763 if transmission incomplete											

Brad

Please call +64 / 343 5763 if transmission incomplete

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.

**RISK AND LIMITATION OF LIABILITY:** Scion's liability to the Client arising out of all claims for any loss or damage resulting from this work will not exceed in aggregate an amount equal to two times the Service Fees actually paid by the Client to Scion. Scion will not be liable in any event for loss of profits or any indirect, consequential or special loss or damage suffered or incurred by the Client as a result of any act or omission of Scion under this Agreement. USE OF NAME: The Client will not use Scion's name in association with the sale and/or marketing of any goods or services

## CAUTION

The information contained in this facsimile is confidential and may be legally privileged. If the reader of this message is not the intended recipient, you are hereby notified that any use, dissemination, distribution or reproduction of this message is prohibited. If you have received this message in error, please notify us immediately and return the message to us by mail. Thank you.

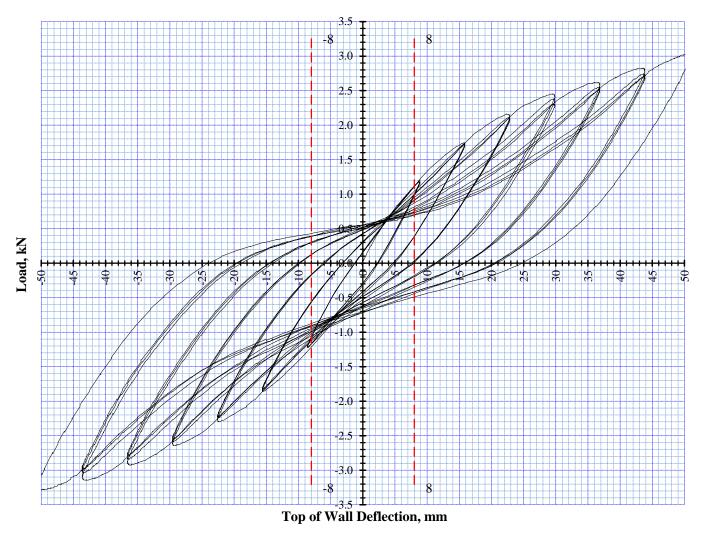


Figure 1: Wall 281754

## 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

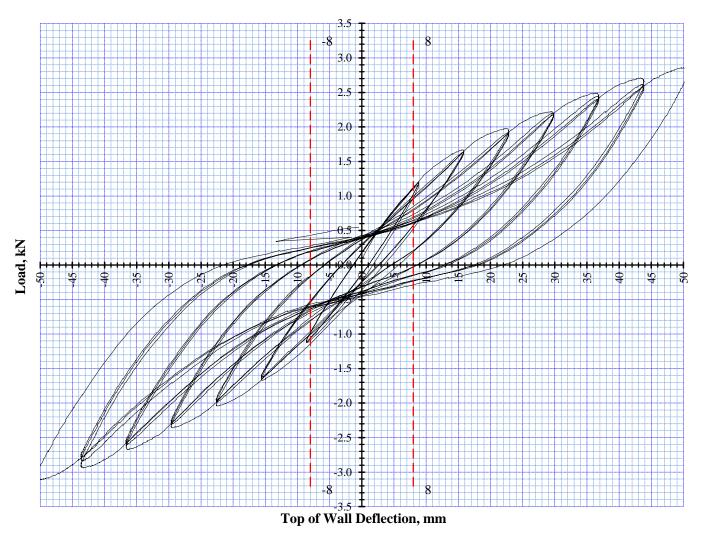


Figure 2: Wall 281755

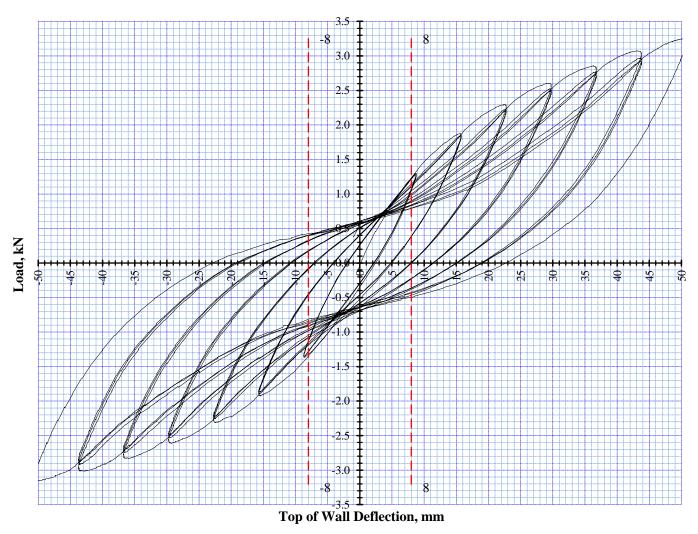


Figure 3: Wall 281756

400mm, 9mm Kro	onspa	n OSB one s	ide. 10mm G	IB standard	other side			
90x45 H1.2 LVL8 fi								
OSB fixing - 50x2.		-		-	150mm	Summary		
centres to plates a						Earthquake	120 (U)	BI I/m
32mmx 6g GIBgra					150mm	Wind		BU/m
GIB Handibracs ea							100 (0)	<b>D</b> 0/III
P21 supplementar						in plate		
Date of test:-	yres	26-Feb-20	Ship No.	2072		Tested by	Jamie Ag	0014
Date of calc's:-		26-Feb-20 26-Feb-20	•	TE19-028		Analysed by		
Calculated to BRANZ	7 02 1				Scion Privato	Bag 3020 Rote		
Calculated to DRANZ	<u> </u>	Serviceability		Ultimate Cyc		bay 3020 Noil	nua.	
		Cycle to H/300 c		Cycle to Dis			Wall dime	oncione
		8.0	Xmm		Jiacement		L(mm)	H(mm
Lab Number		Loads	Residual	y=(mm) Maximum			400	2400
Lab Number	Direction							
	irec	(P <sub>8</sub> )	Defln, C	Load	def @ P		d at P/2	4th,F
		kN	mm	P(kN)	y (mm)	P/2 (kN)	d mm	kN
004754	<u> </u>	4.42	0.00	0.00		4.04	07	0.40
281754	+	1.13	2.30	2.62	36.0	1.31	9.7	2.46
004755	-	1.17	1.30	2.92	36.0	4.04		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 <sub>8</sub> )	(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 Variat	ion 9/	-	25.73	5.57	0.00	5.76	1.31	5.47
y = average failure c					0.00	0.10	1.01	0.17
d= average first cyc					cle wall reach	es the load)		
R = Residual load, I								
Displacement Reco					System	ns factor K2 =	12	
					Cyclon	u = y/d		
Average Structural I						-		
						K4 –	0 94	
Ductility Modificatio	on fact	tor		DI O - Selec	ted deflection	K4 =		202
Ductility Modificatio	on fact	tor		DLQ = Selec	ted deflection	K4 = limit for earthe		es
Ductility Modificatio DLW = Selected de	on fact eflectio	tor on limit for win	d forces			limit for earth		ces
Ductility Modificatio DLW = Selected de P21:2010 BR Calc	on fact eflectio	tor on limit for win K1	d forces	EQ service	Wind Ultimate	limit for earthout		es
Ductility Modificatio DLW = Selected de P21:2010 BR Calc Lab Number	on fact eflectio	tor on limit for win K1 _(= 1.4 - C/X)	d forces EQ ultimate BU's	EQ service BU's	Wind Ultimate BU's	limit for earth Wind Service BU's		ces
Ductility Modificatio DLW = Selected de P21:2010 BR Calc Lab Number 281754	on fact eflectio	tor on limit for win K1 _(= 1.4 - C/X)	d forces EQ ultimate BU's 48.8	EQ service	Wind Ultimate BU's 55.4	limit for earthout		ces
Ductility Modificatio DLW = Selected de P21:2010 BR Calc Lab Number 281754	en fact eflectio s's (BU) BU/m)	tor on limit for win (= 1.4 - C/X) 1.00	d forces EQ ultimate BU's 48.8 122	EQ service BU's 50.2 125	Wind Ultimate BU's 55.4 139	limit for eartho Wind Service BU's 38.9 97		ces
Ductility Modificatio DLW = Selected de P21:2010 BR Calc Lab Number 281754 (1) 281755	on fact eflectio <b>'s</b> (BU) 'BU/m) (BU)	tor on limit for win (= 1.4 - C/X) 1.00	d forces EQ ultimate BU's 48.8	EQ service BU's 50.2	Wind Ultimate BU's 55.4	limit for earth Wind Service BU's 38.9		
Ductility Modificatio DLW = Selected de P21:2010 BR Calc Lab Number 281754 ( 281755	en fact eflectio s's (BU) BU/m)	tor on limit for win (= <b>1.4 - C/X)</b> 1.00	d forces EQ ultimate BU's 48.8 122 45.6	EQ service BU's 50.2 125 48.4	Wind Ultimate BU's 55.4 139 51.5	limit for earth Wind Service BU's 38.9 97 37.5		
Ductility Modificatio DLW = Selected de P21:2010 BR Calc Lab Number 281754 (1 281755 (1 281756	n fact eflectio 's (BU) 'BU/m) (BU) BU/m)	tor on limit for win (= <b>1.4 - C/X)</b> 1.00	d forces EQ ultimate BU's 48.8 122 45.6 114	EQ service BU's 50.2 125 48.4 121	Wind Ultimate BU's 55.4 139 51.5 129	limit for earth Wind Service BU's 38.9 97 37.5 94		
Ductility Modificatio DLW = Selected de P21:2010 BR Calc Lab Number 281754 (1 281755 (1 281756	(BU) (BU/m) (BU/m) (BU/m) (BU)	tor on limit for win (= <b>1.4 - C/X)</b> 1.00	d forces EQ ultimate BU's 48.8 122 45.6 114 49.9 125	EQ service BU's 50.2 125 48.4 121 56.1	Wind Ultimate BU's 55.4 139 51.5 129 56.8 142	limit for earth Wind Service BU's 38.9 97 37.5 94 43.4		
Ductility Modificatio DLW = Selected de P21:2010 BR Calc Lab Number 281754 (1 281755 (1 281756	(BU) (BU/m) (BU/m) (BU/m) (BU)	tor on limit for win (= 1.4 - C/X) 1.00 1.00	d forces EQ ultimate BU's 48.8 122 45.6 114 49.9 125 2% Ok result	EQ service BU's 50.2 125 48.4 121 56.1 140 -4% Ok result	Wind Ultimate BU's 55.4 139 51.5 129 56.8 142	limit for earth Wind Service BU's 38.9 97 37.5 94 43.4 109 -4% Ok result		
Ductility Modificatio DLW = Selected de P21:2010 BR Calc Lab Number 281754 (( 281755 () 281756 ()	(BU) (BU/m) (BU/m) (BU/m) (BU)	tor on limit for win (= 1.4 - C/X) 1.00 1.00 281754	d forces EQ ultimate BU's 48.8 122 45.6 114 49.9 125 2% Ok result -8% Ok result	EQ service BU's 50.2 125 48.4 121 56.1 140 -4% Ok result -10% Ok result	Wind Ultimate BU's 55.4 139 51.5 129 56.8 142 2% Ok result	limit for earth Wind Service BU's 38.9 97 37.5 94 43.4 109 -4% Ok result		
Ductility Modificatio DLW = Selected de P21:2010 BR Calc Lab Number 281754 (( 281755 () 281756 ()	n fact eflectio ''s (BU/m) (BU/m) (BU/m) (BU/m)	tor on limit for win (= 1.4 - C/X) 1.00 1.00 281754 281755 281756	d forces EQ ultimate BU's 48.8 122 45.6 114 49.9 125 2% Ok result -8% Ok result 5% Ok result	EQ service BU's 50.2 125 48.4 121 56.1 140 -4% Ok result -10% Ok result 12% Ok result	Wind Ultimate BU's 55.4 139 51.5 129 56.8 142 2% Ok result -9% Ok result 6% Ok result	limit for eartho Wind Service BU's 38.9 97 37.5 94 43.4 109 -4% Ok result -10% Ok result 12% Ok result		
Ductility Modificatio DLW = Selected de P21:2010 BR Calc Lab Number 281754 (() 281755 () 281756 () 281756	(BU) (BU) (BU/m) (BU/m) (BU/m) (BU/m) (BU/m)	tor on limit for win (= 1.4 - C/X) 1.00 1.00 281754 281755 281756 BR Wind or BR I	d forces EQ ultimate BU's 48.8 122 45.6 114 49.9 125 2% Ok result 5% Ok result 5% Ok result 5% Ok result 20 for any spec.	EQ service BU's 50.2 125 48.4 121 56.1 140 -4% Ok result 12% Ok result 12% Ok result imen is more the	Wind Ultimate BU's 55.4 139 51.5 129 56.8 142 2% Ok result -9% Ok result 6% Ok result an 20% greater of	limit for earth Wind Service BU's 38.9 97 37.5 94 43.4 109 -4% Ok result -10% Ok result 12% Ok result than		
Ductility Modificatio DLW = Selected de P21:2010 BR Calc Lab Number 281754 (( 281755 (() 281756 (() 281756 (() 281756 () () 281756 ()	(BU) (BU) (BU/m) (BU/m) (BU/m) (BU/m) (BU/m)	tor on limit for win (= 1.4 - C/X) 1.00 1.00 281754 281755 281756 BR Wind or BR I cimens, assign i	d forces EQ ultimate BU's 48.8 122 45.6 114 49.9 125 2% Ok result 5% Ok result 5% Ok result 5% Ok result 4 or any species t a value of 1.2 to	EQ service BU's 50.2 125 48.4 121 56.1 140 -4% Ok result 12% Ok result 12% Ok result imen is more the	Wind Ultimate BU's 55.4 139 51.5 129 56.8 142 2% Ok result -9% Ok result 6% Ok result an 20% greater of	limit for earth Wind Service BU's 38.9 97 37.5 94 43.4 109 -4% Ok result 10% Ok result 12% Ok result than raging.	quake forc	
Ductility Modificatio DLW = Selected de P21:2010 BR Calc Lab Number 281754 (( 281755 (() 281756 (() 281756 (() 281756 (() 281756 () 281756 () 281756 () Average Earthqua	(BU) (BU) (BU/m) (BU/m) (BU/m) (BU/m) (BU/m) (BU/m) (BU/m)	tor on limit for win (= 1.4 - C/X) 1.00 1.00 281754 281755 281756 BR Wind or BR I cimens, assign i	d forces EQ ultimate BU's 48.8 122 45.6 114 49.9 125 2% Ok result 5% Ok result 5% Ok result EQ for any species t a value of 1.2 to Ultimate	EQ service BU's 50.2 125 48.4 121 56.1 140 -4% Ok result 12% Ok result 12% Ok result imen is more the imes the lower of	Wind Ultimate BU's 55.4 139 51.5 129 56.8 142 2% Ok result -9% Ok result 6% Ok result an 20% greater of ralue before ave	limit for earth Wind Service BU's 38.9 97 37.5 94 43.4 109 -4% Ok result 12% Ok result 12% Ok result than raging.	quake forc	
Ductility Modificatio DLW = Selected de P21:2010 BR Calc Lab Number 281754 (( 281755 (() 281756 (() 281756 (() 281756 () () 281756 ()	(BU) (BU) (BU/m) (BU/m) (BU/m) (BU/m) (BU/m) (BU/m) (BU/m)	tor on limit for win (= 1.4 - C/X) 1.00 1.00 281754 281755 281756 BR Wind or BR I cimens, assign i R 20 x K4 x Ry =	d forces EQ ultimate BU's 48.8 122 45.6 114 49.9 125 2% Ok result -8% Ok result 5% Ok result 2Q for any species t a value of 1.2 to Ultimate 48	EQ service BU's 50.2 125 48.4 121 56.1 140 -4% Ok result 12% Ok result 12% Ok result imen is more the imes the lower of	Wind Ultimate BU's 55.4 139 51.5 129 56.8 142 2% Ok result -9% Ok result 6% Ok result 6% Ok result an 20% greater in ralue before ave x (K2/0.55) =	limit for earth Wind Service BU's 38.9 97 37.5 94 43.4 109 -4% Ok result 12% Ok result 12% Ok result than raging. Serviceabili 52	quake forc	
281754 (( 281755 (( 281756 () <20% Result Check () <20% Result Check Note: Where the val either of the other tw Average Earthqua EQ (BU's)	(BU) (BU) (BU/m) (BU) (BU/m) (BU) (BU/m) (BU) (BU/m) (BU/m) (BU/m)	tor on limit for win (= 1.4 - C/X) 1.00 1.00 281754 281755 281756 BR Wind or BR I cimens, assign i R 20 x K4 x Ry =	d forces EQ ultimate BU's 48.8 122 45.6 114 49.9 125 2% Ok result -8% Ok result 5% Ok result 5% Ok result Q for any spec. t a value of 1.2 to Ultimate 48 BU/m	EQ service BU's 50.2 125 48.4 121 56.1 140 -4% Ok result 12% Ok result 12% Ok result imen is more the imes the lower of	Wind Ultimate BU's 55.4 139 51.5 129 56.8 142 2% Ok result -9% Ok result 6% Ok result 6% Ok result an 20% greater in ralue before ave x (K2/0.55) =	limit for earth Wind Service BU's 38.9 97 37.5 94 43.4 109 -4% Ok result 10% Ok result 12% Ok result 12% Ok result 52 Ultimate lim	quake forc	
Ductility Modificatio DLW = Selected de P21:2010 BR Calc Lab Number 281754 (( 281755 (() 281756) (() 281756 (()	(BU) (BU) (BU/m) (BU) (BU/m) (BU) (BU/m) (BU) (BU/m) (BU) (BU/m) (BU) (BU/m)	tor on limit for win (= 1.4 - C/X) 1.00 1.00 281754 281755 281756 BR Wind or BR I cimens, assign i R 20 x K4 x Ry = 120	d forces EQ ultimate BU's 48.8 122 45.6 114 49.9 125 2% Ok result 5% Ok result 5% Ok result 5% Ok result Ultimate 48 BU/m Ultimate	EQ service BU's 50.2 125 48.4 121 56.1 140 -4% Ok result -10% Ok result 12% Ok result 12% Ok result imen is more th imes the lower w (P8 x K1)	Wind Ultimate BU's 55.4 139 51.5 129 56.8 142 2% Ok result -9% Ok result 6% Ok result 6% Ok result an 20% greater ralue before ave x (K2/0.55) = Limited by	limit for earth Wind Service BU's 38.9 97 37.5 94 43.4 109 -4% Ok result 10% Ok result 12% Ok result 12% Ok result 52 Ultimate lim Serviceabili	quake forc	
Ductility Modificatio DLW = Selected de P21:2010 BR Calc Lab Number 281754 (( 281755 (() 281756 (() 281756 (() 281756 (() 281756 () 2	(BU) (BU) (BU/m) (BU) (BU/m) (BU) (BU/m) (BU) (BU/m) (BU) (BU/m) (BU) (BU/m)	tor on limit for win (= 1.4 - C/X) 1.00 1.00 281754 281755 281756 BR Wind or BR I cimens, assign i R 20 x K4 x Ry = 120 20 * P =	d forces EQ ultimate BU's 48.8 122 45.6 114 49.9 125 2% Ok result 5% Ok result 5% Ok result 5% Ok result Ultimate 48 BU/m Ultimate	EQ service BU's 50.2 125 48.4 121 56.1 140 -4% Ok result -10% Ok result 12% Ok result 12% Ok result imen is more th imes the lower w (P8 x K1)	Wind Ultimate BU's 55.4 139 51.5 129 56.8 142 2% Ok result -9% Ok result 6% Ok result an 20% greater ralue before ave x (K2/0.55) = Limited by	limit for earth Wind Service BU's 38.9 97 37.5 94 43.4 109 -4% Ok result 10% Ok result 12% Ok result 12% Ok result 52 Ultimate lim Serviceabili	quake forc	

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.

Cant

Doug Gaunt