

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: Brad Smith From: Doug Gaunt

**Organisation:** Kronospan Trading SRL **Subject:** P21:2010 9mm Kronspan OSB 10mm

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 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.

**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.

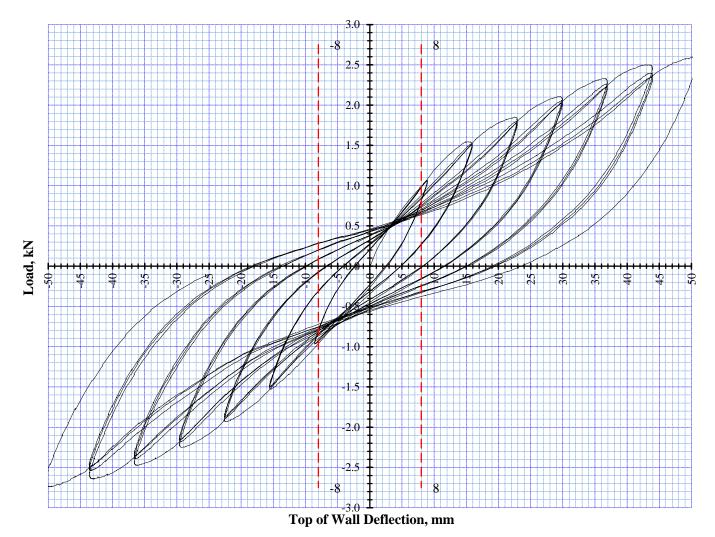


Figure 1: Wall 281757

## **Observations**

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

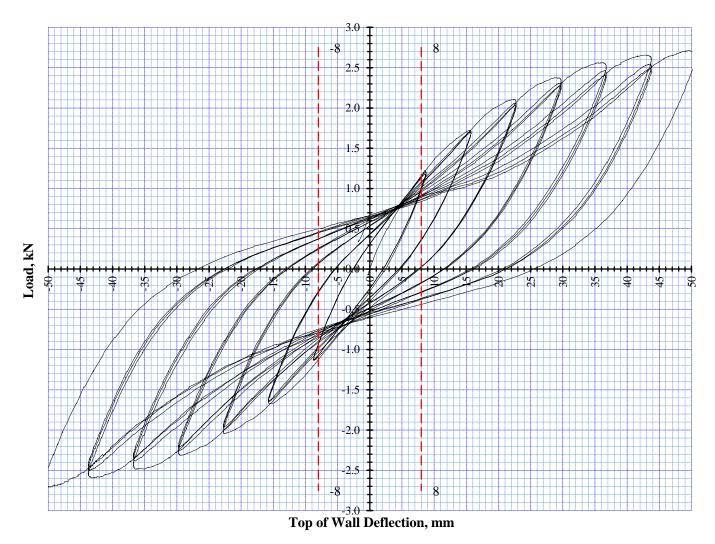
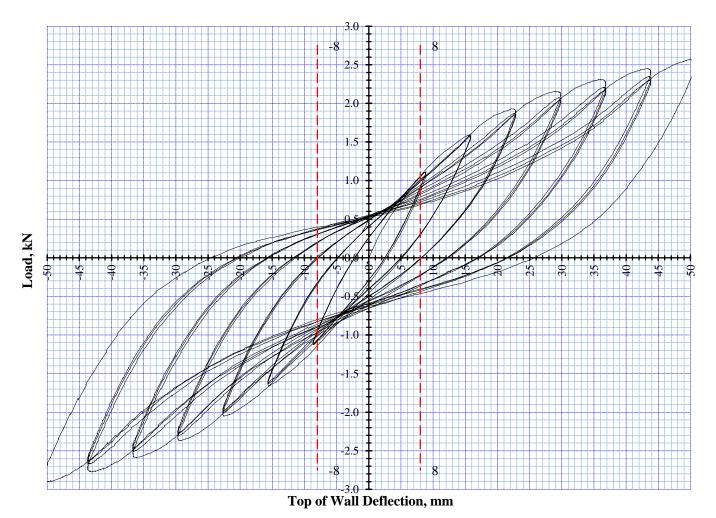


Figure 2: Wall 281758



**Figure 3**: Wall 281759

400mm, 9mm Kro	nena	n OSP	ido					
90x45 H1.2 LVL8 fi					450	0		
OSB fixing - 50x2.87mm angular grocentres to plates and end studs.			ove Pasiode	gun nails at	150mm	Summary	444 (11)	D11/
GIB Handibracs each end						Earthquake	111 (U)	
						Wind	89 (S)	BU/m
M12 hold down bo			and bottom	plate				
P21 supplementar	y res		01: 11	0070				
Date of test:-		26-Feb-20	Ship No.			Tested by	Jamie Ag	
Date of calc's:-		26-Feb-20		TE19-028	01 01	Analysed by		unt
Calculated to BRANZ	ZP21:					Bag 3020 Rote	orua.	
		Serviceability		Ultimate Cyc				<u> </u>
		Cycle to H/300 c		Cycle to Disp	olacement		Wall dim	
Lab Number		8.0	Xmm	y=(mm)			L(mm)	H(mm
	Direction	Loads	Residual	Maximum			400	2400
	lec le	(P <sub>8</sub> )	Defln, C	Load	def @ P		d at P/2	4th,R
	ā	kN	mm	P(kN)	y (mm)	P/2 (kN)	d mm	kN
201757		1.00	2.40	2 22	26.0	1 17	0.6	2 40
281757	+	1.00	2.40	2.33	36.0	1.17	9.6	2.18
204750	<u> </u>	0.94 1.15	2.30	2.47 2.56	36.0	4.00	0.2	2.33
281758	+		2.00		36.0	1.28	9.2	2.37
004750	-	1.09	2.60	2.47	36.0	4.44	0.0	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
		(D.)	(C)	(P)	(1)	D/2 (kN)	(4)	(D <sub>V</sub> )
•		(P <sub>8</sub> )	(C)		(y)	P/2 (kN)	(d)	(Ry)
Coefficient of Variat y = average failure od d= average first cyc	deflec le dis	tion or peak deplacement at	half peak, (the	e very first cy	36.00 0.00	1.18 6.14 es the load)	9.13 4.50	
Coefficient of Variaty y = average failure of d= average first cyc R = Residual load, l Displacement Reco Average Structural I	deflec le dis P = P very f Displa	6.34 tion or peak deplacement at leak Load, S = Factor (K1), (0acement Ducti	9.13 eflection of th half peak, (the Serviceabilit	5.39 e three tests. e very first cyc y load	0.00	6.14 es the load) as factor K2 = u = y/d	4.50 1.2 3.94	
Coefficient of Variaty = average failure of d= average first cyc R = Residual load, I Displacement Reco Average Structural I Ductility Modificatio	deflec le dis P = P very f Displa n fact	6.34 tion or peak deplacement at eak Load, S = Factor (K1), (0) acement Duction	9.13 eflection of th half peak, (the e Serviceabilit .8 <= K1 <= lity factor	5.39 e three tests. e very first cyd y load 1.0)	0.00 cle wall reache System	6.14 es the load) as factor K2 = u = y/d K4 =	4.50 1.2 3.94 0.97	4.66
Coefficient of Variaty = average failure of d= average first cyc R = Residual load, I Displacement Reco Average Structural I Ductility Modificatio	deflec le dis P = P very f Displa n fact	6.34 tion or peak deplacement at eak Load, S = Factor (K1), (0) acement Duction	9.13 eflection of th half peak, (the e Serviceabilit .8 <= K1 <= lity factor	5.39 e three tests. e very first cyd y load 1.0)	0.00 cle wall reache System	6.14 es the load) as factor K2 = u = y/d	4.50 1.2 3.94 0.97	2.29 4.66
Coefficient of Variating a verage failure of decrease first cycles are residual load, I be a verage Structural I buctility Modification DLW = Selected decrease failure in the control of	deflectie dis P = P very F Displant faction fa	6.34 tion or peak deplacement at eak Load, S = Factor (K1), (Oacement Duction on limit for win	9.13 eflection of th half peak, (the Serviceabilit .8 <= K1 <= lity factor d forces	5.39 e three tests. e very first cyd y load 1.0)  DLQ = Select	0.00 cle wall reache System ted deflection	6.14 es the load) as factor K2 = u = y/d K4 = limit for earth	4.50 1.2 3.94 0.97	4.66
Coefficient of Variative Coefficient of Variative Coefficient of Variative Coefficient Coe	deflected le dis P = P P P P P P P P P P P P P P P P P	6.34 tion or peak deplacement at eak Load, S = Factor (K1), (0) accement Duction on limit for win K1	9.13 eflection of th half peak, (the e Serviceabilit .8 <= K1 <= lity factor d forces  EQ ultimate	5.39 e three tests. e very first cyd y load 1.0)  DLQ = Select  EQ service	0.00  cle wall reache System  ted deflection  Wind Ultimate	es the load)  as factor K2 =  u = y/d  K4 =  limit for earthe	4.50 1.2 3.94 0.97	4.66
Coefficient of Variative average failure of decrease first cycles average Structural Induction of the coefficient of the cycles average Structural Induction of the cycles average first of the cycles average failure of the cycles average first of the cycles average failure of the cycles average first cycles a	deflection	6.34 tion or peak diplacement at eak Load, S = Factor (K1), (0 acement Duction on limit for wind K1  (= 1.4 - C/X)	9.13 eflection of th half peak, (the serviceabilit .8 <= K1 <= lity factor  d forces  EQ ultimate BU's	5.39 e three tests. e very first cyd y load 1.0)  DLQ = Select EQ service BU's	0.00  cle wall reache  System  ted deflection  Wind Ultimate  BU's	es the load)  as factor K2 = u = y/d     K4 = limit for earth  Wind Service BU's	4.50 1.2 3.94 0.97	4.66
Coefficient of Variat y = average failure of d= average first cyc R = Residual load, I Displacement Reco Average Structural I Ductility Modificatio DLW = Selected de  P21:2010 BR Calc Lab Number 281757	deflection	6.34 tion or peak deplacement at eak Load, S = Factor (K1), (0) accement Duction on limit for win K1	9.13 eflection of th half peak, (the serviceabilit .8 <= K1 <= lity factor  d forces  EQ ultimate BU's 43.7	5.39 e three tests. e very first cyd y load 1.0)  DLQ = Select  EQ service  BU's  42.3	0.00  cle wall reache  System  ted deflection  Wind Ultimate  BU's  48.0	es the load)  as factor K2 = u = y/d     K4 = limit for earth  Wind Service     BU's     32.8	4.50 1.2 3.94 0.97	4.66
Coefficient of Variate y = average failure of d= average first cyc R = Residual load, I Displacement Reco Average Structural I Ductility Modificatio DLW = Selected de  P21:2010 BR Calc Lab Number 281757	deflection	6.34 tion or peak diplacement at eak Load, S = Factor (K1), (0 acement Duction on limit for win (= 1.4 - C/X)	9.13 eflection of th half peak, (the serviceabilit .8 <= K1 <= lity factor  d forces  EQ ultimate BU's 43.7	5.39 e three tests. e very first cyd y load 1.0)  DLQ = Select  EQ service  BU's  42.3  106	0.00  Cle wall reache  System  ted deflection  Wind Ultimate  BU's  48.0  120	es the load)  as factor K2 = u = y/d    K4 = limit for earth  Wind Service   BU's  32.8   82	4.50 1.2 3.94 0.97	4.66
Coefficient of Variate y = average failure of d= average first cyc R = Residual load, I Displacement Reco Average Structural I Ductility Modificatio DLW = Selected de  P21:2010 BR Calc Lab Number 281757	deflection le dispersion le di	6.34 tion or peak diplacement at eak Load, S = Factor (K1), (0 acement Duction on limit for wind K1  (= 1.4 - C/X)	9.13 eflection of th half peak, (the serviceabilit .8 <= K1 <= lity factor  d forces  EQ ultimate BU's 43.7 109 45.3	5.39 e three tests. e very first cyd y load 1.0)  DLQ = Select  EQ service  BU's  42.3	0.00  System  ted deflection  Wind Ultimate  BU's  48.0  120  50.3	es the load)  as factor K2 = u = y/d     K4 = limit for earth  Wind Service     BU's     32.8	4.50 1.2 3.94 0.97	4.66
Coefficient of Variate y = average failure of d= average first cyc R = Residual load, I Displacement Reco Average Structural I Ductility Modificatio DLW = Selected de  P21:2010 BR Calc Lab Number 281757	deflection le disserver le diss	6.34 tion or peak deplacement at leak Load, S = Factor (K1), (0 acement Duction on limit for win 1.00	9.13 eflection of th half peak, (the serviceabilit .8 <= K1 <= lity factor  d forces  EQ ultimate BU's 43.7	5.39 e three tests. e very first cyd y load 1.0)  DLQ = Select  EQ service  BU's  42.3  106  48.9	0.00  Cle wall reache  System  Ited deflection  Wind Ultimate  BU's  48.0  120  50.3  126	es the load)  as factor K2 = u = y/d    K4 = limit for earth  Wind Service BU's 32.8 82 37.9 95	4.50 1.2 3.94 0.97	4.66
Coefficient of Variate y = average failure of d= average first cyc R = Residual load, I Displacement Reco Average Structural I Ductility Modificatio DLW = Selected de  P21:2010 BR Calc Lab Number 281757  (281758	deflection le dispersion le di	6.34 tion or peak diplacement at eak Load, S = Factor (K1), (0 acement Duction on limit for win (= 1.4 - C/X)	9.13 eflection of th half peak, (the serviceabilit .8 <= K1 <= lity factor d forces  EQ ultimate BU's 43.7 109 45.3 113	5.39 e three tests. e very first cyd y load 1.0)  DLQ = Select  EQ service BU's 42.3 106 48.9 122	0.00  System  ted deflection  Wind Ultimate  BU's  48.0  120  50.3	es the load)  as factor K2 = u = y/d    K4 = limit for earth  Wind Service   BU's    32.8    82    37.9	4.50 1.2 3.94 0.97	4.66
Coefficient of Variative average failure of decoration average first cycles average Structural Induction average Induction Induct	deflection le dis P = P very F Displain faction le displain faction le displain le displai	6.34 tion or peak deplacement at leak Load, S = Factor (K1), (0 acement Duction on limit for win 1.00	9.13 eflection of th half peak, (the E Serviceabilit 8 <= K1 <= lity factor  d forces  EQ ultimate BU's 43.7 109 45.3 113 44.3 111	5.39 e three tests. e very first cyd y load 1.0)  DLQ = Select  EQ service BU's 42.3 106 48.9 122 46.3	0.00  System  ted deflection  Wind Ultimate  BU's  48.0  120  50.3  126  48.0  120	6.14 es the load) es factor K2 = u = y/d K4 = limit for earth Wind Service BU's 32.8 82 737.9 95 35.8	4.50 1.2 3.94 0.97	4.66
Coefficient of Variative average failure of decorate average first cycles average Structural Inductional Ductility Modificational DLW = Selected decorate average Structural Inductional Structural Inductional Inductiona	deflection le dis P = P very F Displain faction le displain faction le displain le displai	6.34 tion or peak diplacement at eak Load, S = Factor (K1), (0 acement Duction on limit for win 1.00  1.00	9.13 eflection of th half peak, (the E Serviceabilit 8 <= K1 <= lity factor  d forces  EQ ultimate BU's 43.7 109 45.3 113 44.3 111	5.39 e three tests. e very first cyc y load 1.0)  DLQ = Select  EQ service BU's 42.3 106 48.9 122 46.3 116 -12% Ok result	0.00  System  ted deflection  Wind Ultimate  BU's  48.0  120  50.3  126  48.0  120	6.14 es the load) es the load) es factor K2 = u = y/d K4 = limit for earther  Wind Service BU's 32.8 82 37.9 95 35.8 90	4.50 1.2 3.94 0.97	4.66
Coefficient of Variatity = average failure of decorate de	deflec le dis P = P very I I Displation n faction 's (BU) BU/m) (BU) BU/m)	6.34 tion or peak diplacement at eak Load, S = Factor (K1), (0 acement Duction on limit for wind 1.00 1.00 1.00 281757 281758 281759	9.13 eflection of th half peak, (the e Serviceabilit .8 <= K1 <= lity factor  d forces  EQ ultimate BU's 43.7 109 45.3 113 44.3 111 -2% Ok result 0% Ok result	5.39 e three tests. e very first cyc y load 1.0)  DLQ = Select  EQ service BU's 42.3 106 48.9 122 46.3 116 -12% Ok result 1% Ok result	0.00  Cle wall reache  System  Ited deflection  Wind Ultimate  BU's  48.0  120  50.3  126  48.0  120  -2% Ok result  5% Ok result  -2% Ok result	es the load)  as factor K2 = u = y/d K4 = limit for earth  Wind Service BU's  32.8 82 37.9 95 35.8 90 -12% Ok result 9% Ok result 1% Ok result	4.50 1.2 3.94 0.97	4.66
Coefficient of Variative average failure of decoration average first cycles average Structural Induction average Induction Induct	le dis P = P very I	6.34 tion or peak diplacement at eak Load, S = Factor (K1), (0 acement Duction on limit for wind 1.00  1.00  281757 281758 281759 BR Wind or BR I	9.13 eflection of th half peak, (the e Serviceabilit .8 <= K1 <= lity factor  d forces  EQ ultimate BU's 43.7 109 45.3 113 44.3 111 -2% Ok result 3% Ok result 0% Ok result EQ for any spec	5.39 e three tests. e very first cyc y load 1.0)  DLQ = Select  EQ service BU's 42.3 106 48.9 122 46.3 116 -12% Ok result 1% Ok result imen is more the	0.00  Cle wall reacher  System  Ited deflection  Wind Ultimate  BU's  48.0  120  50.3  126  48.0  120  -2% Ok result  5% Ok result -2% Ok result an 20% greater to	es the load)  as factor K2 = u = y/d K4 = limit for earth  Wind Service BU's 32.8 82 37.9 95 35.8 90 -12% Ok result 1% Ok result 1% Ok result	4.50 1.2 3.94 0.97	4.66
Coefficient of Variatity = average failure of de average first cycle R = Residual load, I Displacement Recolon Average Structural I Ductility Modification DLW = Selected de P21:2010 BR Calcab Number 281757  281758  (281759  (20% Result Check Note: Where the valeither of the other two	le dis P = P very I f Displain n faction in faction (BU) BU/m) (BU) BU/m)  BU/m)  lue of no speci	6.34 tion or peak diplacement at eak Load, S = Factor (K1), (0 acement Duction on limit for wind 1.00  1.00  281757 281758 281759 BR Wind or BR Betimens, assign in part each of peak diplacement in the composition of the co	9.13 eflection of the half peak, (the serviceability).8 <= K1 <= lity factor  d forces  EQ ultimate BU's 43.7 109 45.3 113 44.3 111 -2% Ok result 0% Ok result EQ for any spect to a value of 1.2 to	5.39 e three tests. e very first cyc y load 1.0)  DLQ = Select  EQ service BU's 42.3 106 48.9 122 46.3 116 -12% Ok result 1% Ok result imen is more the	0.00  Cle wall reacher  System  Ited deflection  Wind Ultimate  BU's  48.0  120  50.3  126  48.0  120  -2% Ok result  5% Ok result -2% Ok result an 20% greater to	es the load)  as factor K2 = u = y/d K4 = limit for earth  Wind Service BU's  32.8 82  37.9 95 35.8 90 -12% Ok result 1% Ok result 1% Ok result than reging.	1.2 3.94 0.97 quake force	4.66
DLW = Selected de  P21:2010 BR Calc Lab Number 281757 ( 281758 ( 281759 (  <20% Result Check  Note: Where the va either of the other tw	deflec le dis P = P = P very I =	6.34 tion or peak diplacement at eak Load, S = Factor (K1), (0 acement Duction on limit for wind 1.00 1.00 1.00 281757 281758 281759 BR Wind or BR Istimens, assign in the peak to peak to the peak to	9.13 eflection of the half peak, (the serviceability).8 <= K1 <= lity factor  d forces  EQ ultimate BU's 43.7 109 45.3 113 44.3 111 -2% Ok resulty 3% Ok resulty EQ for any spectot a value of 1.2 to	5.39 e three tests. e very first cyc y load 1.0)  DLQ = Select EQ service BU's 42.3 106 48.9 122 46.3 116 -12% Ok result 1% Ok result imen is more the lower v	0.00  Cle wall reache System  Ited deflection  Wind Ultimate BU's 48.0 120 50.3 126 48.0 120 -2% Ok result 5% Ok result -2% Ok result an 20% greater to ralue before aver	es the load)  as factor K2 = u = y/d K4 = limit for earth  Wind Service BU's  32.8 82  37.9 95 35.8 90 -12% Ok result 1% Ok result 1% Ok result than reging.	1.2 3.94 0.97 quake force	4.66
Coefficient of Variatity = average failure of de average first cycle R = Residual load, I Displacement Recolon Average Structural I Ductility Modification DLW = Selected de P21:2010 BR Calcab Number 281757  281758  (281759  (20% Result Check Note: Where the valeither of the other two	deflec le dis P = P = P very I =	6.34 tion or peak diplacement at leak Load, S = Factor (K1), (0 acement Duction on limit for wind 1.00 1.00 1.00 281757 281758 281759 BR Wind or BR Beimens, assign i	9.13 eflection of th half peak, (the EServiceabilit 8 <= K1 <= lity factor  d forces  EQ ultimate BU's 43.7 109 45.3 113 44.3 111 -2% Ok result 3% Ok result GO ok result EQ for any spect t a value of 1.2 t	5.39 e three tests. e very first cyc y load 1.0)  DLQ = Select EQ service BU's 42.3 106 48.9 122 46.3 116 -12% Ok result 1% Ok result imen is more the lower v	0.00  Cle wall reache System  Ited deflection  Wind Ultimate BU's 48.0 120 50.3 126 48.0 120 -2% Ok result 5% Ok result -2% Ok result an 20% greater to ralue before averall	es the load)  as factor K2 =  u = y/d  K4 =  limit for earth  Wind Service  BU's  32.8  82  37.9  95  35.8  90  -12% Ok result  1% Ok result  than  raging.  Serviceabili  46	4.50  1.2 3.94 0.97 quake force	4.66
Coefficient of Variatity = average failure of de average first cycle R = Residual load, I Displacement Recolon Average Structural I Ductility Modification DLW = Selected de P21:2010 BR Calcate Lab Number 281757 (281758 (281759) (20% Result Checkate Note: Where the value ither of the other two EQ (BU's)	deflec le dis P = P = P very I f le dis P = P = P very I f le dis P = P very I f le dis P = P very I f le dis P e very I f le	6.34 tion or peak diplacement at leak Load, S = Factor (K1), (0 acement Duction on limit for wind 1.00 1.00 1.00 281757 281758 281759 BR Wind or BR Beimens, assign i	9.13 eflection of th half peak, (the Eserviceabilit .8 <= K1 <= lity factor  d forces  EQ ultimate BU's 43.7 109 45.3 113 44.3 111 -2% Ok result 3% Ok result EQ for any spect ta value of 1.2 t  Ultimate  44 BU/m	5.39 e three tests. e very first cyc y load 1.0)  DLQ = Select EQ service BU's 42.3 106 48.9 122 46.3 116 -12% Ok result 1% Ok result imen is more the lower v	0.00  Cle wall reache System  Ited deflection  Wind Ultimate BU's 48.0 120 50.3 126 48.0 120 -2% Ok result 5% Ok result -2% Ok result an 20% greater to ralue before averall	es the load)  as factor K2 =	4.50  1.2 3.94 0.97 quake force	4.66
Coefficient of Variative average failure of de average first cyc R = Residual load, I Displacement Reco Average Structural I Ductility Modification DLW = Selected de P21:2010 BR Calc Lab Number 281757  (281758  (281759  (20% Result Check Note: Where the valeither of the other two Average Earthqua EQ (BU's)  Average Wind BR	deflection le dispersion le di	6.34 tion or peak diplacement at eak Load, S = Factor (K1), (0 acement Duction on limit for wind 1.00  1.00  1.00  281757 281758 281759 BR Wind or BR Beimens, assign in R 20 x K4 x Ry = 111	9.13 eflection of th half peak, (the EServiceabilit .8 <= K1 <= lity factor d forces  EQ ultimate BU's 43.7 109 45.3 113 44.3 111 -2% Ok result 3% Ok result 0% Ok result EQ for any spect t a value of 1.2 to Ultimate  44 BU/m Ultimate	5.39 e three tests. e very first cyc y load 1.0)  DLQ = Select  EQ service BU's 42.3 106 48.9 122 46.3 116 -12% Ok result 1% Ok result imen is more the times the lower w	0.00  Cle wall reacher  System  Ited deflection  Wind Ultimate  BU's  48.0  120  50.3  126  48.0  120  -2% Ok result 5% Ok result -2% Ok result an 20% greater to ralue before aver	es the load)  as factor K2 =	4.50  1.2 3.94 0.97 quake force	4.66
Coefficient of Variative average failure of de average first cycle average Structural ID Displacement Recolon Average Structural ID Ductility Modification DLW = Selected de P21:2010 BR Calcle Lab Number 281757  281758  281759  (20% Result Check Note: Where the value ither of the other two Average Earthqua EQ (BU's)	deflection le dispersion le di	6.34 tion or peak diplacement at eak Load, S = Factor (K1), (0 acement Duction on limit for wind 1.00  1.00  1.00  281757 281758 281759 BR Wind or BR Beimens, assign in the content of th	9.13 eflection of th half peak, (the EServiceabilit .8 <= K1 <= lity factor d forces  EQ ultimate BU's 43.7 109 45.3 113 44.3 111 -2% Ok result 3% Ok result 0% Ok result EQ for any spect t a value of 1.2 to Ultimate  44 BU/m Ultimate	5.39 e three tests. e very first cyc y load 1.0)  DLQ = Select  EQ service BU's 42.3 106 48.9 122 46.3 116 -12% Ok result 1% Ok result imen is more the times the lower w	0.00  Cle wall reacher  System  Ited deflection  Wind Ultimate  BU's  48.0  120  50.3  126  48.0  120  -2% Ok result 5% Ok result -2% Ok result an 20% greater to ralue before aver  x (K2/0.55) =  Limited by	es the load)  as factor K2 =	1.2 3.94 0.97 quake force	4.66

Please feel free to contact me to discuss this information.

Doug Gaunt