

Results

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|----------------------|-----------------------|-----------------|--|
| To: | Brad Smith | From: | Doug Gaunt |
| Organisation: | Kronospan Trading SRL | Subject: | P21:2010 9mm Kronspan OSB 10mm GIB standard 600 Wall with Brackets |
| Location: | Northcote | Date: | 28 th 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 600mm x 2.40m 9mm Kronspan OSB, 10mm GIB standard walls tested with GIB Handibracs.

1. BU wind = 76 (127 BU/m) as limited by the serviceability load capacity.
2. BU Earthquake = 86 (143 BU/m) as limited by the ultimate load capacity.

Note: NZS3604 notes the bracing ratings for walls on timber floors be limited to 120BU/m and those on concrete floors be limited to 150BU/m.

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 600mm centres, no nogs
- OSB fixing - 50x2.87mm angular groove 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.

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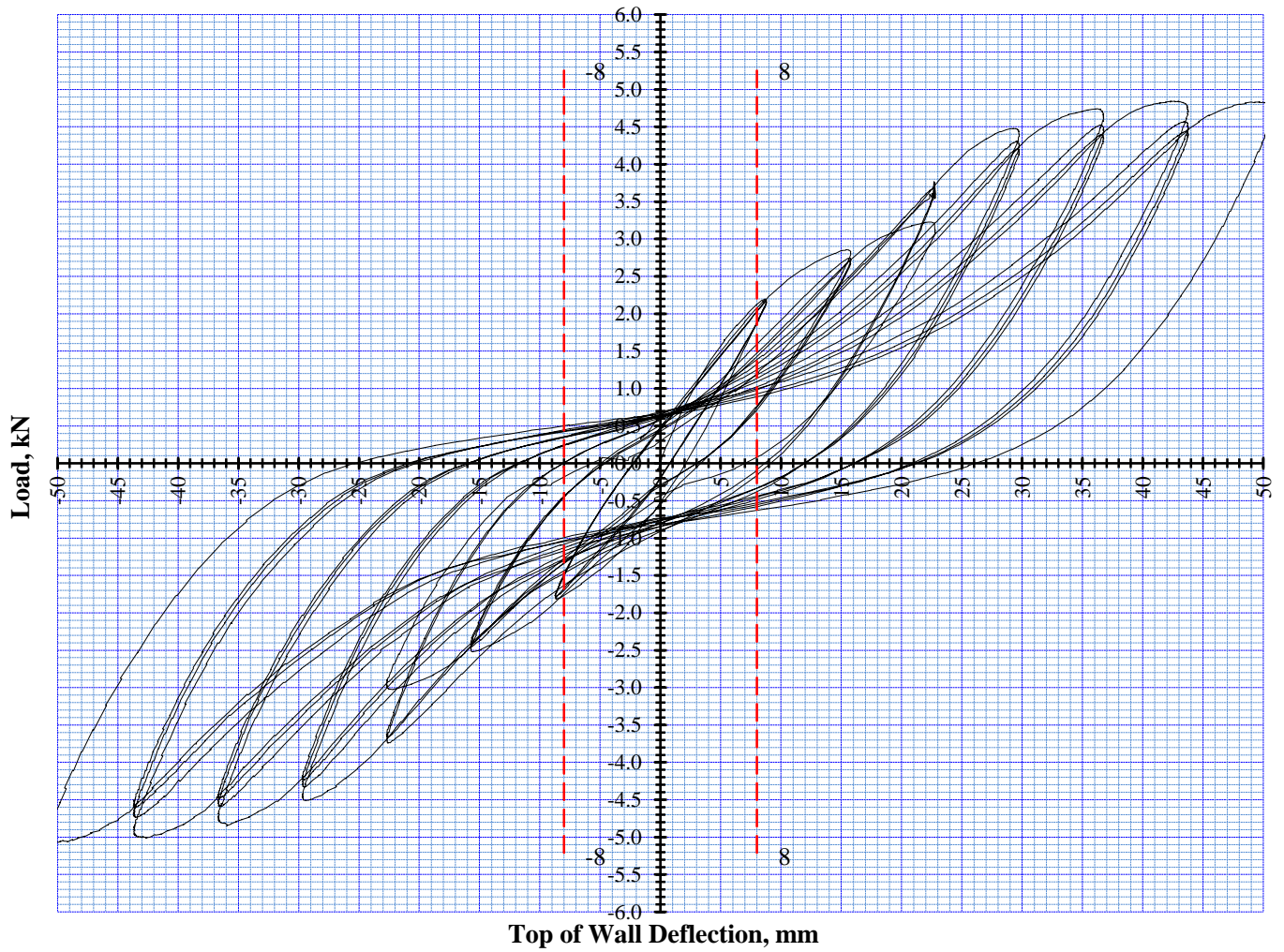


Figure 1: Wall 281760

Observations

- No obvious signs of failure to framing.
- No obvious signs of failure to Handbracs.
- No obvious signs of failure to OSB
- GIB starting to pull away on bottom plate nails.

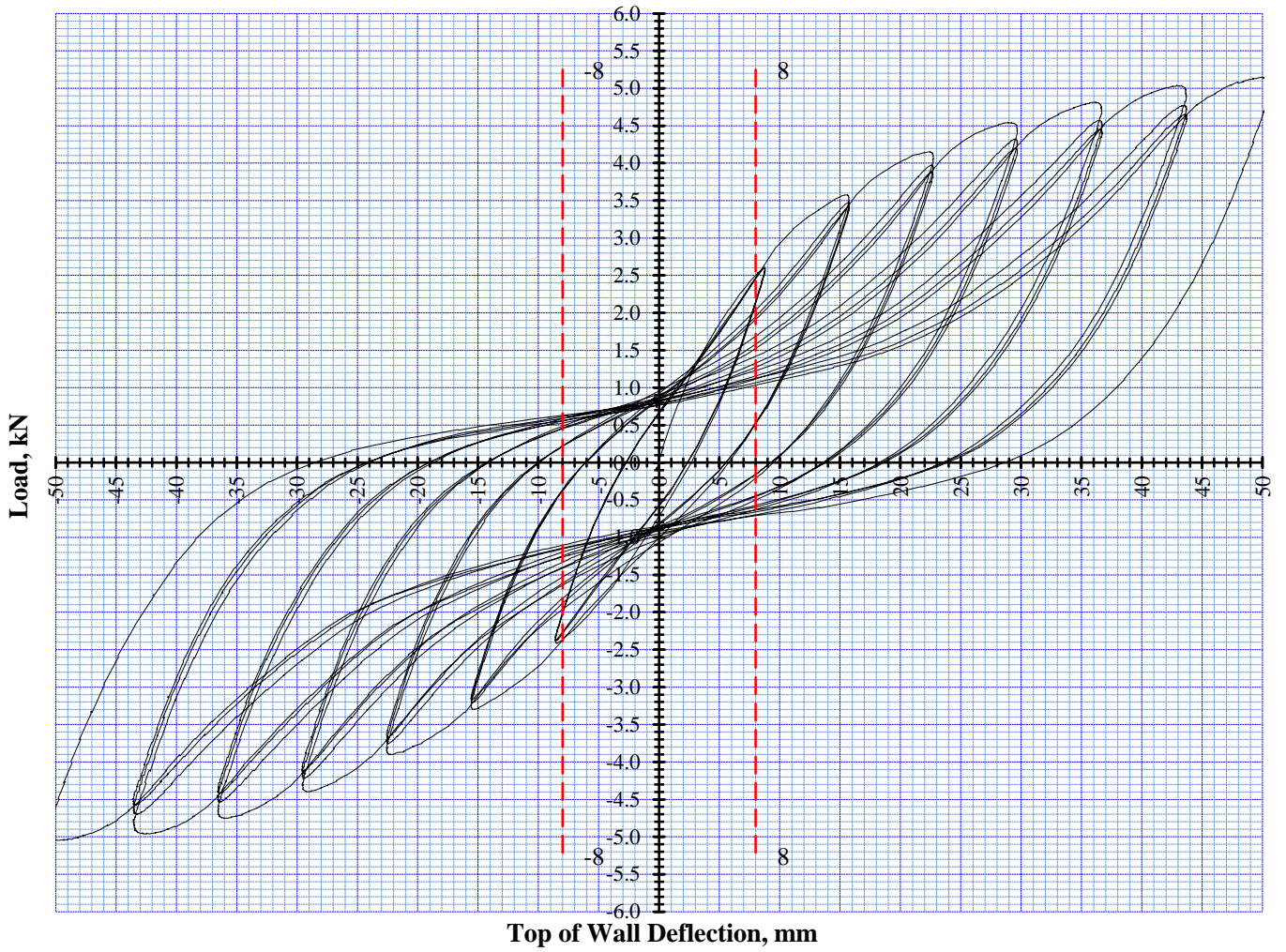


Figure 2: Wall 281761

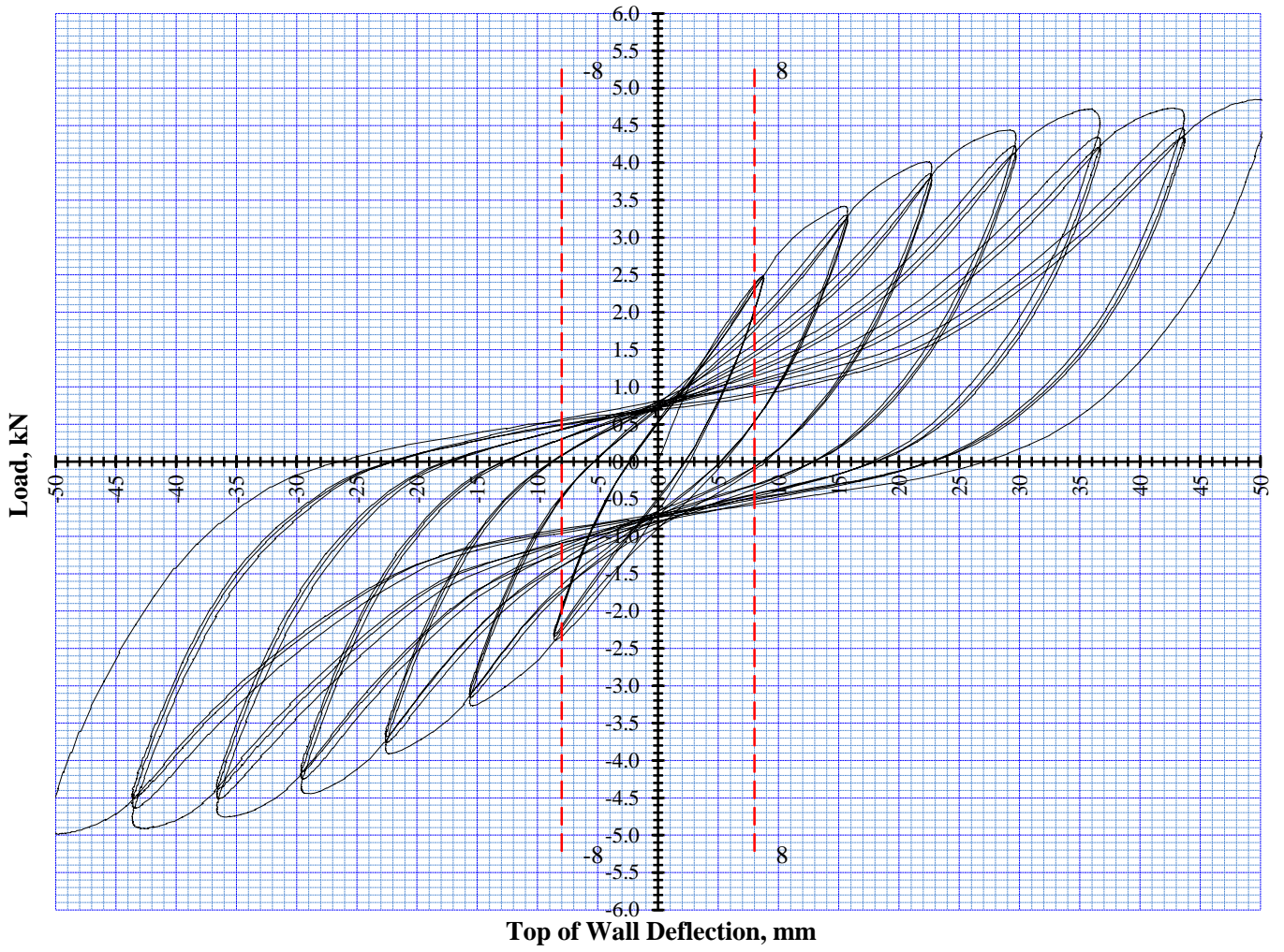


Figure 3: Wall 281762

| P21:2010 BRACING RACKING TEST RESULT EVALUATION | | | | | | | | |
|--|-----------|--------------------------------|---------------------------|---------------------------|---|----------------|-----------------|-------------------|
| Wall Construction | | | | | | | | |
| 600mm, 9mm Kronspan OSB one side, 10mm GIB standard other side | | | | | | | | |
| 90x45 H1.2 LVL8 framing, studs at 600mm centres, no nogs | | | | | | | | |
| OSB fixing - 50x2.87mm angular groove Paslode gun nails at 150mm centres to plates and end studs. GIB fixed with 32mmx 6g GIBgrabbers to Winstones pattern 50,50,50,75,75,150mm... | | | | | | Summary | | |
| | | | | | | Earthquake | 143 (U) | BU/m |
| | | | | | | Wind | 127 (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:- | | 27-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 | | | | | | | | |
| Lab Number | Direction | Cycle to H/300 or DLQ or DLW | | Cycle to Displacement | | | Wall dimensions | |
| | | 8.0 Loads (P ₈) kN | X mm Residual Defln, C mm | y=(mm) Maximum Load P(kN) | def @ P y (mm) | P/2 (kN) | L(mm) 600 | H(mm) 2400 |
| 281760 | + | 2.15 | 0.80 | 4.73 | 36.0 | 2.37 | 10.0 | 4.30 |
| | - | 1.76 | 1.30 | 4.83 | 36.0 | | | 4.35 |
| 281761 | + | 2.52 | 2.30 | 4.81 | 36.0 | 2.41 | 7.5 | 4.33 |
| | - | 2.36 | 2.70 | 4.75 | 36.0 | | | 4.37 |
| 281762 | + | 2.39 | 2.20 | 4.72 | 36.0 | 2.36 | 8.0 | 4.10 |
| | - | 2.33 | 2.40 | 4.76 | 36.0 | | | 4.25 |
| | | (P ₈) | (C) | (P) | (y) | P/2 (kN) | (d) | (R _y) |
| Averages | | 2.25 | 1.95 | 4.77 | 36.00 | 2.38 | 8.50 | 4.28 |
| Coefficient of Variation % | | 10.89 | 34.37 | 0.84 | 0.00 | 0.85 | 12.71 | 2.11 |
| 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 4.24 | | | |
| 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 | | |
| 281760 | (BU) | 1.00 | 86.5 | 85.3 | 95.6 | 66.1 | | |
| | (BU/m) | | 144 | 142 | 159 | 110 | | |
| 281761 | (BU) | 1.00 | 87.0 | 106.5 | 95.6 | 82.5 | | |
| | (BU/m) | | 145 | 177 | 159 | 137 | | |
| 281762 | (BU) | 1.00 | 83.5 | 103.0 | 94.8 | 79.8 | | |
| | (BU/m) | | 139 | 172 | 158 | 133 | | |
| <20% Result Check | | 281760 | 1% Ok result | -23% Ok result | 0% Ok result | -23% Ok result | | |
| | | 281761 | 2% Ok result | 12% Ok result | 0% Ok result | 12% Ok result | | |
| | | 281762 | -4% Ok result | 7% Ok result | -1% Ok result | 7% 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 = | 86 | (P8 x K1) x (K2/0.55) = | 98 | | | |
| | | | 143 BU/m | Limited by | Ultimate limit state | | | |
| Average Wind BR | | Ultimate | | | Serviceability | | | |
| Wind (BU's) | | 20 * P = | 95 | (P8 x K1) x (K2/0.71) = | 76 | | | |
| | | | 127 BU/m | Limited by | Serviceability limit state | | | |

Figure 4: P21:2010 calculations for 600mm x 2.40m, OSB+ GIB walls with brackets

Please feel free to contact me to discuss this information.


Doug Gaunt