STRUCTURES TEST REPORT

ST16738-01-1

BRACING TESTING OF REAL RESOURCE OSB BOARD

CLIENT
HX Building Ltd.
Unit D3
63 Apollo Drive
Auckland 0632
New Zealand

All tests and procedures reported herein, unless indicated, have been performed in accordance with the BRANZ ISO9001 Certification

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1. OBJECTIVE

To obtain bracing ratings (wind and earthquake), in accordance with the BRANZ P21 Test Method [1], for four sizes of Oriented Strand Board (OSB) bracing systems. The OSB is being imported into New Zealand by the Client and bracing units with lengths of 300 mm, 400 mm, 600 mm, and 1200 mm have been tested.

2. DESCRIPTION OF SPECIMEN

2.1 Product description

The OSB tested is manufactured by RealResource© and sheets have dimensions of 2440 mm x 1220 mm x 9 mm. Full sheets weigh 16.2 kg. The OSB is imported into New Zealand by the Client.

The system is to be used in four standard lengths;

- 1200 mm
- 600 mm
- 400 mm
- 300 mm

All of the systems use OSB sheets with a height of 2400 mm.

2.2 Specimen construction

Four sets of three test specimens were constructed by BRANZ staff.

Each specimen consisted of a 90 mm x 45 mm timber frame (SG8 grade, H1.2 treated) constructed in accordance with NZS 3604 [2], with dimensions as per Table 1.

Table 1. Test schedule.

Series	System	Sheet size
1	Single sided 1200 mm x 2400 mm OSB.	2400 mm (h) x 1200 mm (l)
2	Single sided 600 mm x 2400 mm OSB.	2400 mm (h) x 600 mm (l)
3	Single sided 400 mm x 2400 mm OSB.	2400 mm (h) x 400 mm (l)
4	Single sided 300 mm x 2400 mm OSB.	2400 mm (h) x 300 mm (l)

The OSB sheets, as presented in Table 1, were fixed to the frame with 2.8 x 30 mm galvanised flat head nails. One of these nails is shown in Figure 1. Detailed drawings of the fixing layout, for each system, are shown in Appendix B.

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Figure 1. 2.8 x 50 mm galvanised flat head nail.

Hold down brackets were used on the internal faces of the studs for each sample. The hold down brackets were Fortress Fasteners 15 kN bracing brackets. These hold down brackets were bolted to the steel P21 frame through their main mounted hole using M10 threaded rods. The screws supplied with the brackets were also installed as shown in Figure 2.

Figure 2. Bracing brackets. Note – small gap under stud is after testing on 1200 mm sample.

3. DESCRIPTION OF TEST

3.1 Date and location of test

Tests were carried out in October 2022 in the Structures Test Laboratory at BRANZ, Judgeford, New Zealand.

3.2 Test set-up

Each test specimen was mounted in a rigid steel loading frame, with P21 end restraints installed on the end studs. The bottom of the specimen was fixed through a strip of 20 mm thick particle board flooring to the timber foundation beam, which was securely bolted to the steel beams of the P21 testing frame, as shown in Figure 3.

Horizontal load was applied to the centre of the top plate of the specimen using a 30 kN closed loop electro-hydraulic ram and measured with a 25 kN load cell. A linear potentiometer gauge was used to measure the horizontal displacement of the top plate.

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Figure 3. Specimen installed in test jig. (A) 400 mm wide sample. (B) 1200 mm wide sample.

The test load and displacement measurements were recorded using a computer-controlled data acquisition system. The load cell was calibrated to International Standard EN ISO 7500-1 2018 [3] Class 1 accuracy, and the linear potentiometers were calibrated to an accuracy of 0.2 mm.

3.3 Test procedure

The tests were performed according to the recommendations of BRANZ P21:2010 test method [1]. The loading sequence consisted of 3 displacement-controlled cycles of each specimen top plate to displacements of ±9, ±15, ±22, ±29, ±36 and ±43 mm. The cyclic regime used can also be seen in the load displacement plots presented in Appendix A of this report.

4. OBSERVATIONS

4.1 1200 mm samples

As the testing of the samples progressed, the nails began to move around in the OSB material and nails near the corners of the samples began to lift slightly. Fixings on the vertical faces of the samples also began to 'work' the OSB material slightly. Images of the lifted nails and the 'worked' OSB are shown in Figure 4 and Figure 5 respectively.

Figure 4. Lifted nail heads.

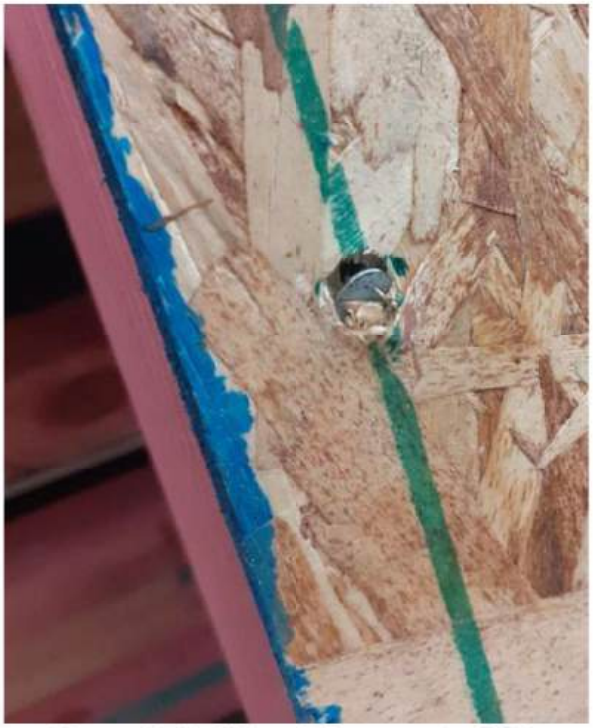

Figure 5. Nail head damage to OSB.

It was also observed during the testing that there was some lifting of the studs during the peak loads.

4.2 600 mm, 400 mm, and 300 mm samples.

These samples saw no observable damage or significant movement to the nails, OSB or timber framing during the testing.

5. RESULTS

Load/displacement plots and the resulting calculation sheets for each test are given in Appendix A.

The results were analysed according to the recommendations of the BRANZ P21 test method, and the resulting bracing ratings are summarised in Table 2.

Note that the results below are given in BU/m and the total BU for each unit is calculated by multiplying the below results by the unit length in m.

Table 2. Test results summary.

Series	System	Rating (BU/m)	
		Wind	Earthquake
1	Single sided 1200 mm x 2400 mm OSB.	117	102
2	Single sided 600 mm x 2400 mm OSB.	104	94
3	Single sided 400 mm x 2400 mm OSB.	89	89
4	Single sided 300 mm x 2400 mm OSB.	75	80

6. REFERENCES

[1] Shelton, R. 2010. Technical Paper P21 (2010) A Wall Bracing Test and Evaluation Procedure. BRANZ Ltd, Judgeford, New Zealand.

[2] Standards New Zealand (SNZ). 2011. NZS 3604:2011. Timber Framed Buildings. SNZ, Wellington, New Zealand.

[3] International Organisation for Standardisation (ISO). 2018. ISO 7500:2018 Metallic Materials – Verification of Static Uniaxial Testing Machines, Part 1: Tension/Compression Testing Machines – Verification and Calibration of the Force-Measuring System. ISO, Geneva, Switzerland.

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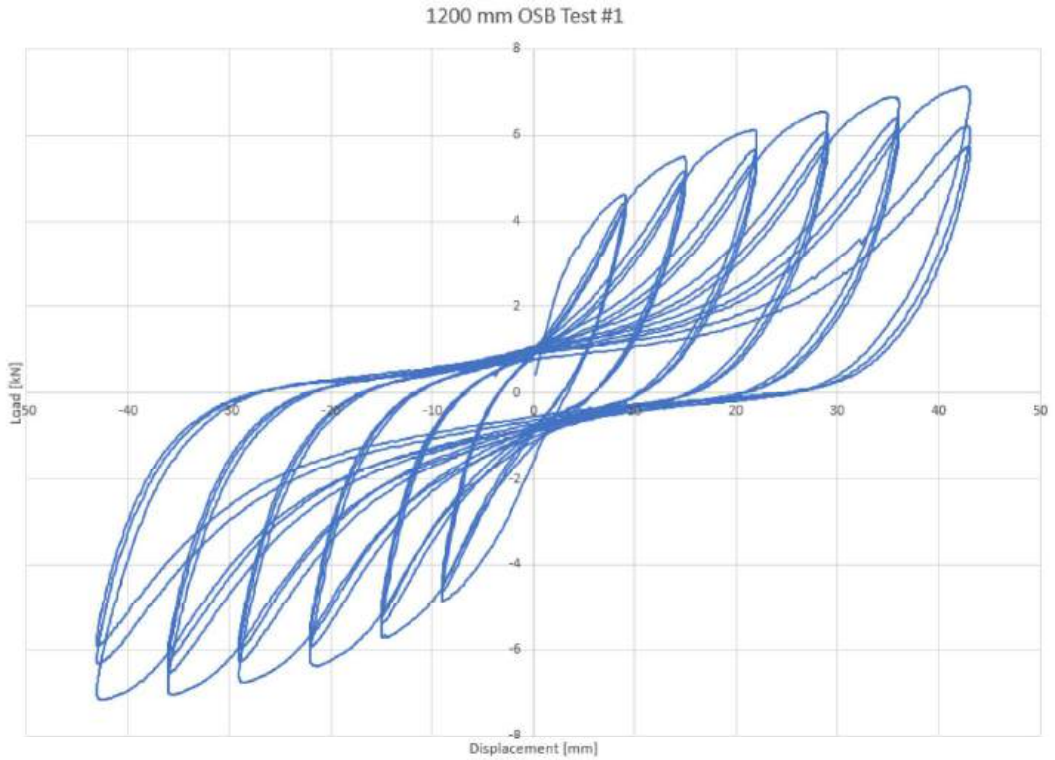
APPENDIX A



	Serviceability Cycles Cycle To Displacement x = 8 (mm)			Ultimate Cycles Cycle To Displacement y = 36 (mm)			
Specimen No	Load S (kN)	Residual Displacement C (mm)	Maximum Load P(kN)	Calculated P/2(kN)	Displacement @P/2=d (mm)	4th Cycle Load at y mm R (kN)	
1	+ 4.47	+ 2.96	+ 6.89	+ 3.45	+ 4.45	+ 6.00	
	- 4.71	- 3.38	- 7.03			- 6.06	
Averages	S= 4.59	C= 3.17	P= 6.96		d= 4.45	R= 6.03	

K1 = 1.4 - C/X = 1.00

F = K1 x S = 4.59

The "Asymmetry Of Performance" criterion in the last paragraph of Section 6.5 shall be followed.

u = y/d = 8.09

u	1.00	2.00	2.50	3.00	3.50	4.00
K4	0.35	0.60	0.67	0.74	0.87	1.00

For other values of u, linear interpolation is used to determine K4

Therefore K4 = 1.00

EVALUATION : EARTHQUAKE PERFORMANCE

BU(EQ) = 20 x the lesser of K4R or Fx1.2/0.55

K4 x R = 6.03 Fx1.2/0.55 = 10

Therefore BU(EQ) = 20 x 6.03 **BU(EQ) = 121 Bracing Units**

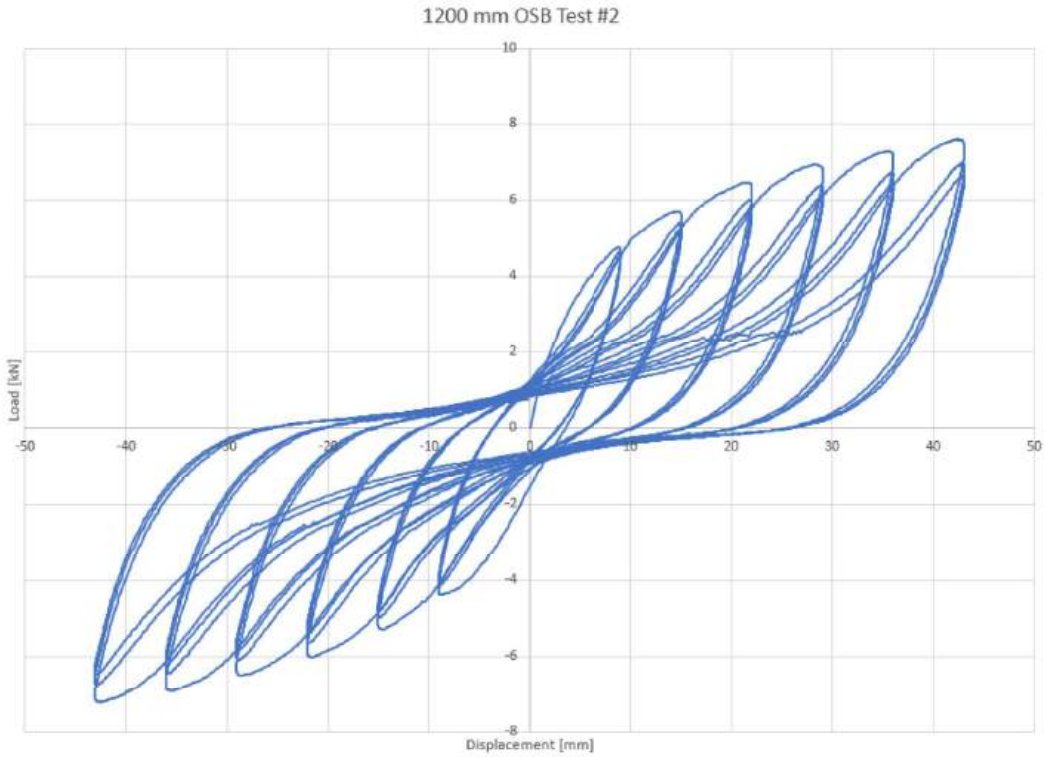
EVALUATION : WIND PERFORMANCE

BU(wind) = 20 x the lesser of P or Fx1.2/0.71

P = 6.96 Fx1.2/0.71 = 7.75

Therefore BU(WIND) = 20 x 6.96 **BU(WIND) = 139 Bracing Units**

Figure A 1. 1200 mm OSB test #1.



	Servicability Cycles Cycle To Displacement x = 8 (mm)			Ultimate Cycles Cycle To Displacement y = 36 (mm)			
Specimen No	Load S (kN)	Residual Displacement C (mm)	Maximum Load P(kN)	Calculated P/2(kN)	Displacement @P/2=d (mm)	4th Cycle Load at y mm R (KN)	
1	+ 4.58	+ 2.96	+ 7.29	+ 3.64	+ 5.05	+ 6.40	
	- 4.33	- 3.57	- 6.92			- 6.09	
Averages	S= 4.46	C= 3.26	P= 7.10		d= 5.05	R= 6.25	

K1 = 1.4 - C/X = 0.99

F = K1 x S = 4.42

The "Asymmetry Of Performance" criterion in the last paragraph of Section 6.5 shall be followed.

u = y/d = 7.13

u	1.00	2.00	2.50	3.00	3.50	4.00
K4	0.35	0.60	0.67	0.74	0.87	1.00

For other values of u, linear interpolation is used to determine K4

Therefore K4 = 1.00

EVALUATION : EARTHQUAKE PERFORMANCE

BU(EQ) = 20 x the lesser of K4R or Fx1.2/0.55

K4 x R = 6.25 Fx1.2/0.55 = 9.65

Therefore BU(EQ) = 20 x 6.25 **BU(EQ) = 125 Bracing Units**

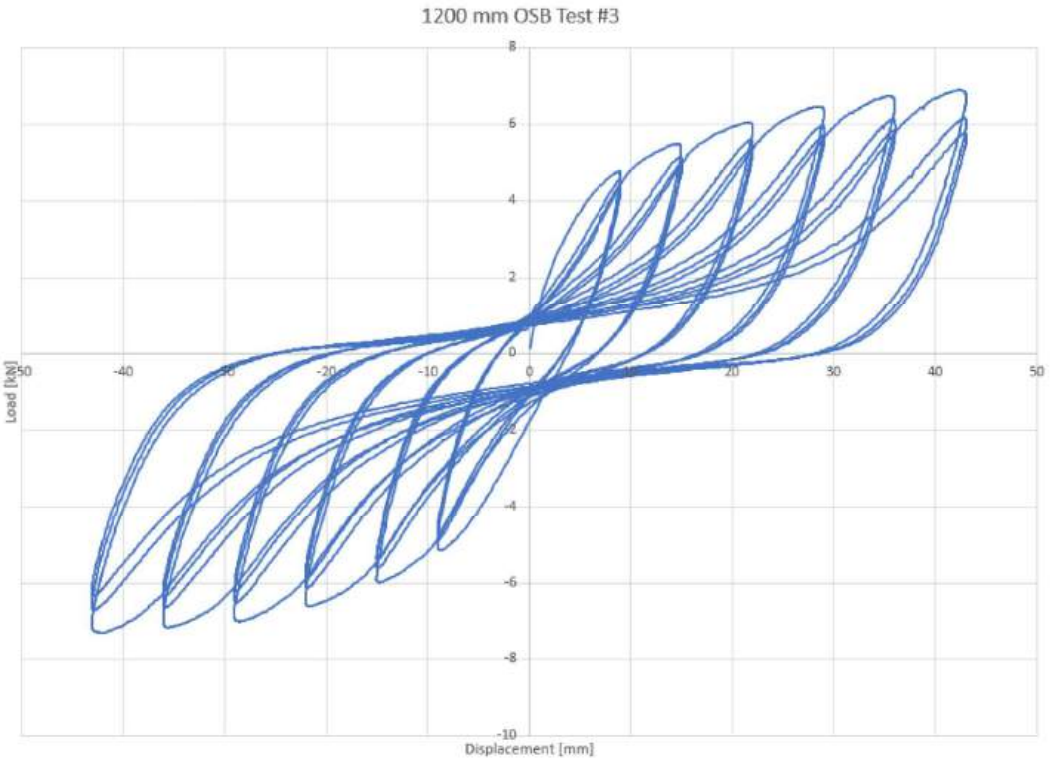
EVALUATION : WIND PERFORMANCE

BU(wind) = 20 x the lesser of P or Fx1.2/0.71

P = 7.10 Fx1.2/0.71 = 7.47

Therefore BU(WIND) = 20 x 7.10 **BU(WIND) = 142 Bracing Units**

Figure A 2. 1200 mm OSB test #2.



	Servicability Cycles Cycle To Displacement x = 8 (mm)			Ultimate Cycles Cycle To Displacement y = 36 (mm)			
Specimen No	Load S (kN)	Residual Displacement C (mm)	Maximum Load P(kN)	Calculated P/2(kN)	Displacement @P/2=d (mm)	4th Cycle Load at y mm R (kN)	
1	+ 4.61	+ 3.41	+ 6.74	+ 3.37	+ 4.15	+ 5.80	
	- 5.05	- 3.04	- 7.16			- 6.22	
Averages	S= 4.83	C= 3.22	P= 6.95		d= 4.15	R= 6.01	

K1 = 1.4 - C/X = 1.00

F = K1 x S = 4.82

The "Asymmetry Of Performance" criterion in the last paragraph of Section 6.5 shall be followed.

u = y/d = 8.68

u	1.00	2.00	2.50	3.00	3.50	4.00
K4	0.35	0.60	0.67	0.74	0.87	1.00

For other values of u, linear interpolation is used to determine K4

Therefore K4 = 1.00

EVALUATION : EARTHQUAKE PERFORMANCE

BU(EQ) = 20 x the lesser of K4R or Fx1.2/0.55

K4 x R = 6.01 Fx1.2/0.55 = 10.5

Therefore BU(EQ) = 20 x 6.01 **BU(EQ) = 120 Bracing Units**

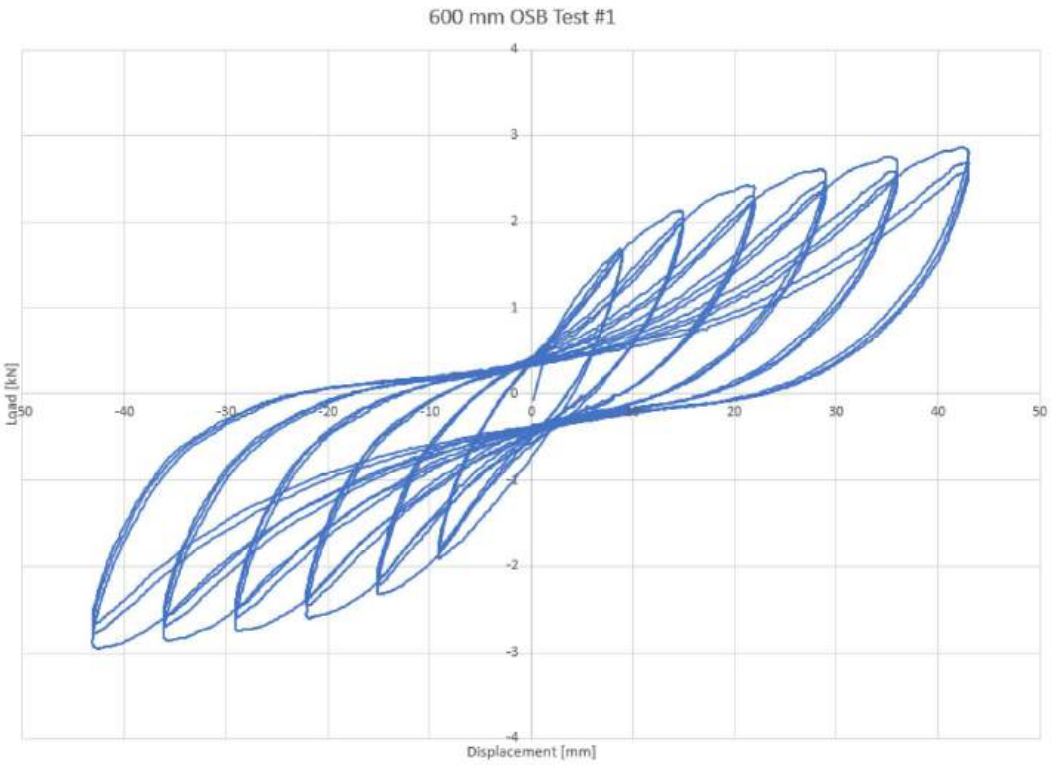
EVALUATION : WIND PERFORMANCE

BU(wind) = 20 x the lesser of P or Fx1.2/0.71

P = 6.95 Fx1.2/0.71 = 8.14

Therefore BU(WIND) = 20 x 6.95 **BU(WIND) = 139 Bracing Units**

Figure A 3. 1200 mm OSB test #3.



	Servicability Cycles Cycle To Displacement x = 8 (mm)			Ultimate Cycles Cycle To Displacement y = 36 (mm)			
Specimen No.	Load S (kN)		Residual Displacement C (mm)	Maximum Load P(kN)	Calculated P/2(kN)	Displacement @P/2=d (mm)	4th Cycle Load at y mm R (kN)
1	+ 1.60		+ 3.65	+ 2.76	+ 1.38	+ 5.99	+ 2.52
	- 1.80		- 2.57	- 2.86			- 2.59
Averages	S= 1.70		C= 3.11	P= 2.81		d= 5.99	R= 2.55

K1 = 1.4 - C/X = 1.00

F = K1 x S = 1.70

The "Asymmetry Of Performance" criterion in the last paragraph of Section 6.5 shall be followed.

u = y/d = 6.01

u	1.00	2.00	2.50	3.00	3.50	4.00
K4	0.35	0.60	0.67	0.74	0.87	1.00

For other values of u, linear interpolation is used to determine K4

Therefore K4 = 1.00

EVALUATION : EARTHQUAKE PERFORMANCE

BU(EQ) = 20 x the lesser of K4R or Fx1.2/0.55

K4 x R = 2.55 Fx1.2/0.55 = 3.72

Therefore BU(EQ) = 20 x 2.55 **BU(EQ) = 51** **Bracing Units**

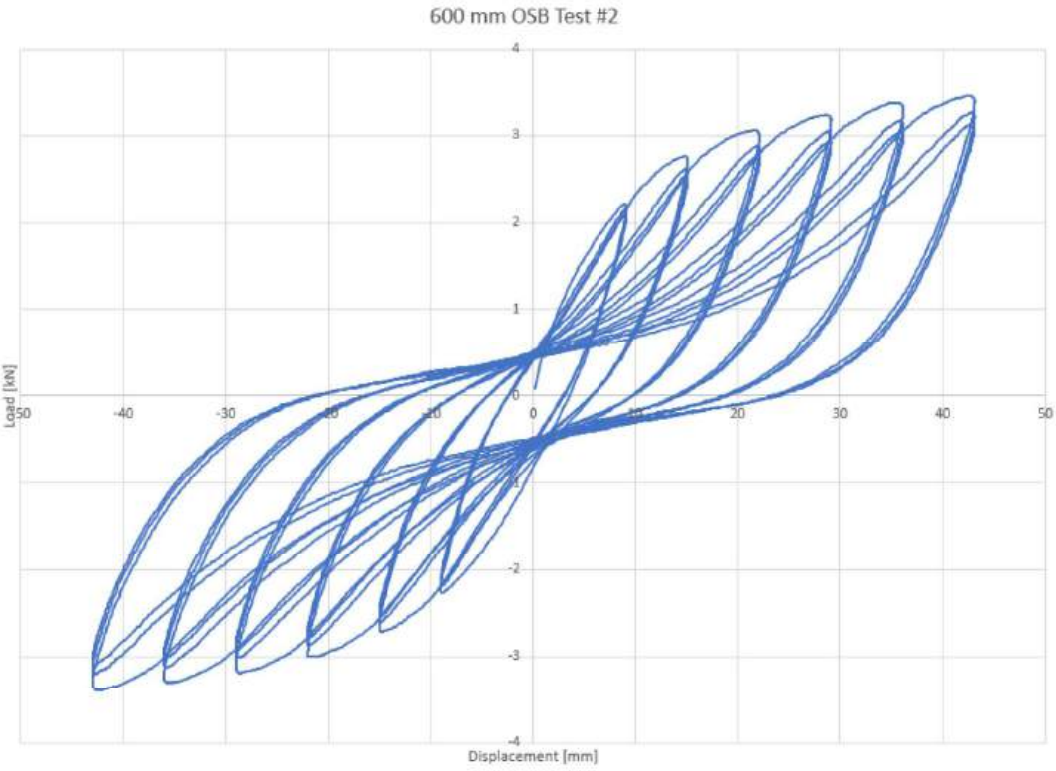
EVALUATION : WIND PERFORMANCE

BU(wind) = 20 x the lesser of P or Fx1.2/0.71

P = 2.81 Fx1.2/0.71 = 2.88

Therefore BU(WIND) = 20 x 2.81 **BU(WIND) = 56** **Bracing Units**

Figure A 4. 600 mm OSB test #1.



	Serviceability Cycles Cycle To Displacement x = 8 (mm)			Ultimate Cycles Cycle To Displacement y = 36 (mm)					
Specimen No.	Load S (kN)		Residual Displacement C (mm)	Maximum Load P(kN)		Calculated P/2(kN)	Displacement @P/2=d (mm)	4th Cycle Load at y mm R (kN)	
1	+	2.09	+ 3.13	+	3.37	+ 1.69	+ 5.64	+	3.04
	-	2.19	- 2.44	-	3.30			-	3.02
Averages	S=	2.14	C= 2.78	P=	3.34		d= 5.64	R=	3.03

K1 = 1.4 - C/X = 1.00

F = K1 x S = 2.14

The "Asymmetry Of Performance" criterion in the last paragraph of Section 6.5 shall be followed.

u = y/d = 6.39

u	1.00	2.00	2.50	3.00	3.50	4.00
K4	0.35	0.60	0.67	0.74	0.87	1.00

For other values of u, linear interpolation is used to determine K4

Therefore K4 = 1.00

EVALUATION : EARTHQUAKE PERFORMANCE

BU(EQ) = 20 x the lesser of K4R or Fx1.2/0.55

K4 x R = 3.03 Fx1.2/0.55 = 4.67

Therefore BU(EQ) = 20 x 3.03 **BU(EQ) = 61 Bracing Units**

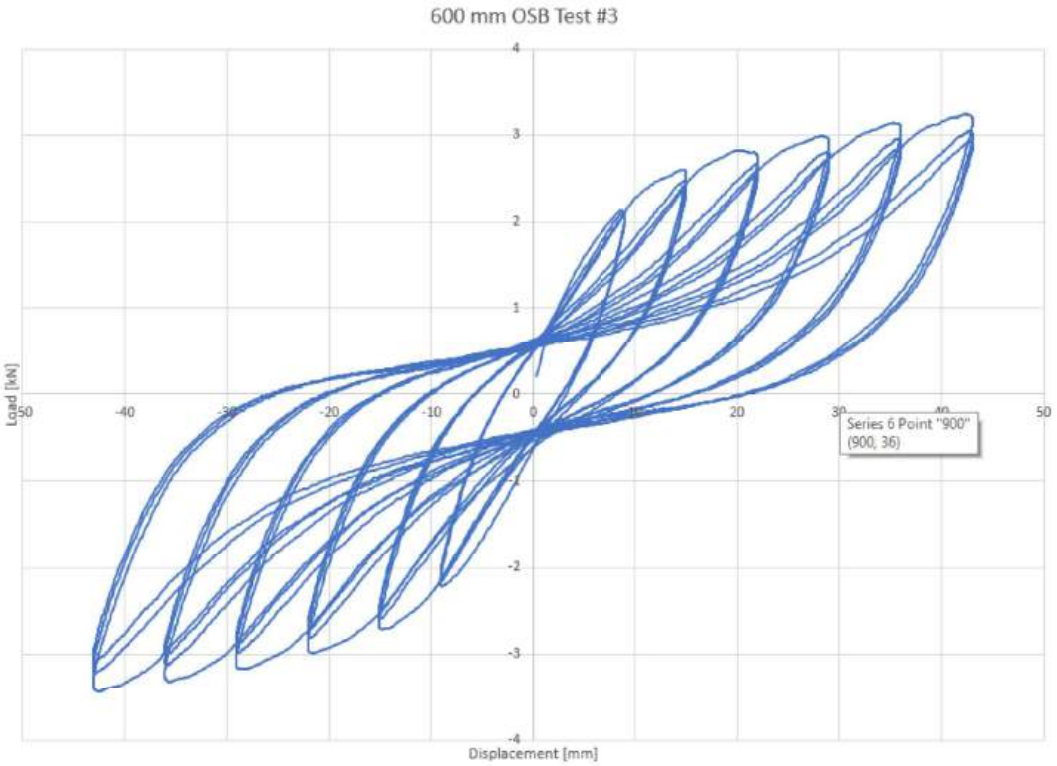
EVALUATION : WIND PERFORMANCE

BU(wind) = 20 x the lesser of P or Fx1.2/0.71

P = 3.34 Fx1.2/0.71 = 3.62

Therefore BU(WIND) = 20 x 3.34 **BU(WIND) = 67 Bracing Units**

Figure A 5. 600 mm OSB test #2.



	Servicability Cycles Cycle To Displacement x = 8 (mm)			Ultimate Cycles Cycle To Displacement y = 36 (mm)			
Specimen No	Load S (kN)		Residual Displacement C (mm)	Maximum Load P(kN)	Calculated P/2(kN)	Displacement @P/2=d (mm)	4th Cycle Load at y mm R (KN)
1	+ 2.07		+ 2.90	+ 3.14	+ 1.57	+ 4.99	+ 2.85
	- 2.13		- 2.93	- 3.32			- 2.98
Averages	S= 2.10		C= 2.92	P= 3.23		d= 4.99	R= 2.92

K1 = 1.4 - C/X = 1.00

F = K1 x S = 2.10

The "Asymmetry Of Performance" criterion in the last paragraph of Section 6.5 shall be followed.

u = y/d = 7.22

u	1.00	2.00	2.50	3.00	3.50	4.00
K4	0.35	0.60	0.67	0.74	0.87	1.00

For other values of u, linear interpolation is used to determine K4

Therefore K4 = 1.00

EVALUATION : EARTHQUAKE PERFORMANCE

BU(EQ) = 20 x the lesser of K4R or Fx1.2/0.55

K4 x R = 2.92 Fx1.2/0.55 = 4.58

Therefore BU(EQ) = 20 x 2.92 **BU(EQ) = 58 Bracing Units**

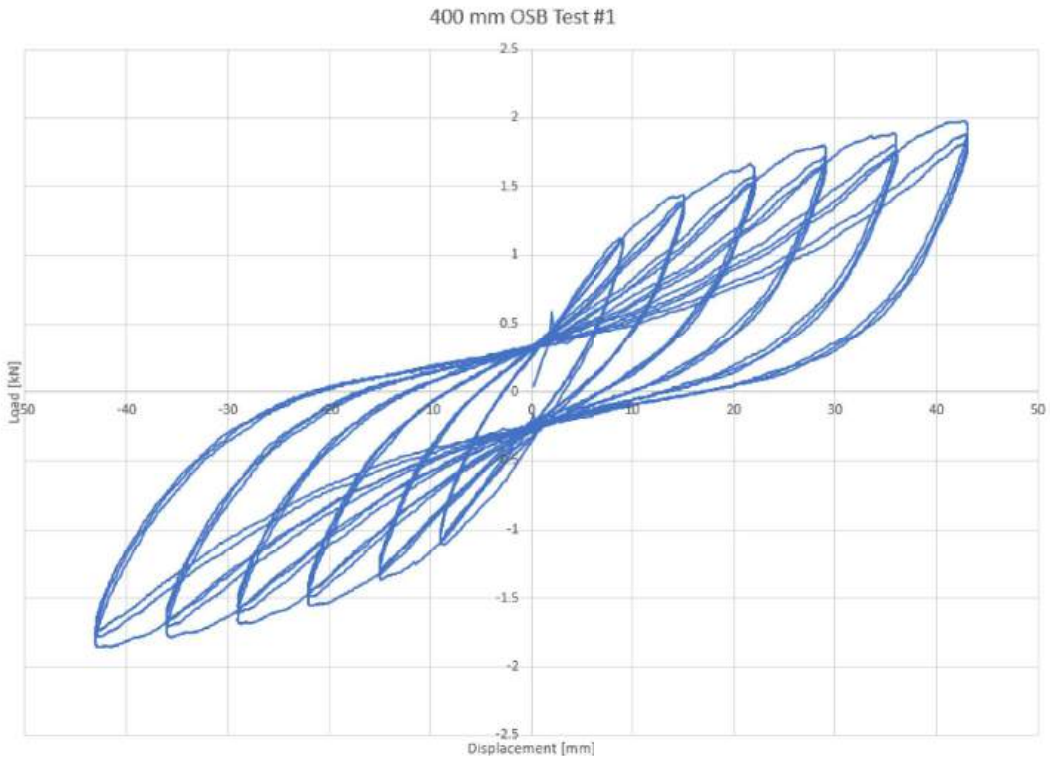
EVALUATION : WIND PERFORMANCE

BU(wind) = 20 x the lesser of P or Fx1.2/0.71

P = 3.23 Fx1.2/0.71 = 3.55

Therefore BU(WIND) = 20 x 3.23 **BU(WIND) = 65 Bracing Units**

Figure A 6. 600 mm OSB test #3.



	Serviceability Cycles Cycle To Displacement x = 8 (mm)			Ultimate Cycles Cycle To Displacement y = 36 (mm)			
Specimen No	Load S (kN)		Residual Displacement C (mm)	Maximum Load P(kN)	Calculated P/2(kN)	Displacement @P/2=d (mm)	4th Cycle Load at y mm R (KN)
1	+ 1.07		+ 2.81	+ 1.89	+ 0.94	+ 6.61	+ 1.74
	- 1.07		- 2.81	- 1.79			- 1.67
Averages	S= 1.07		C= 2.81	P= 1.84		d= 6.61	R= 1.70

K1 = 1.4 - C/X = 1.00

F = K1 x S = 1.07

The "Asymmetry Of Performance" criterion in the last paragraph of Section 6.5 shall be followed.

u = y/d = 5.45

u	1.00	2.00	2.50	3.00	3.50	4.00
K4	0.35	0.60	0.67	0.74	0.87	1.00

For other values of u, linear interpolation is used to determine K4

Therefore K4 = 1.00

EVALUATION : EARTHQUAKE PERFORMANCE

BU(EQ) = 20 x the lesser of K4R or Fx1.2/0.55

K4 x R = 1.70 Fx1.2/0.55 = 2.34

Therefore BU(EQ) = 20 x 1.70 **BU(EQ) = 34 Bracing Units**

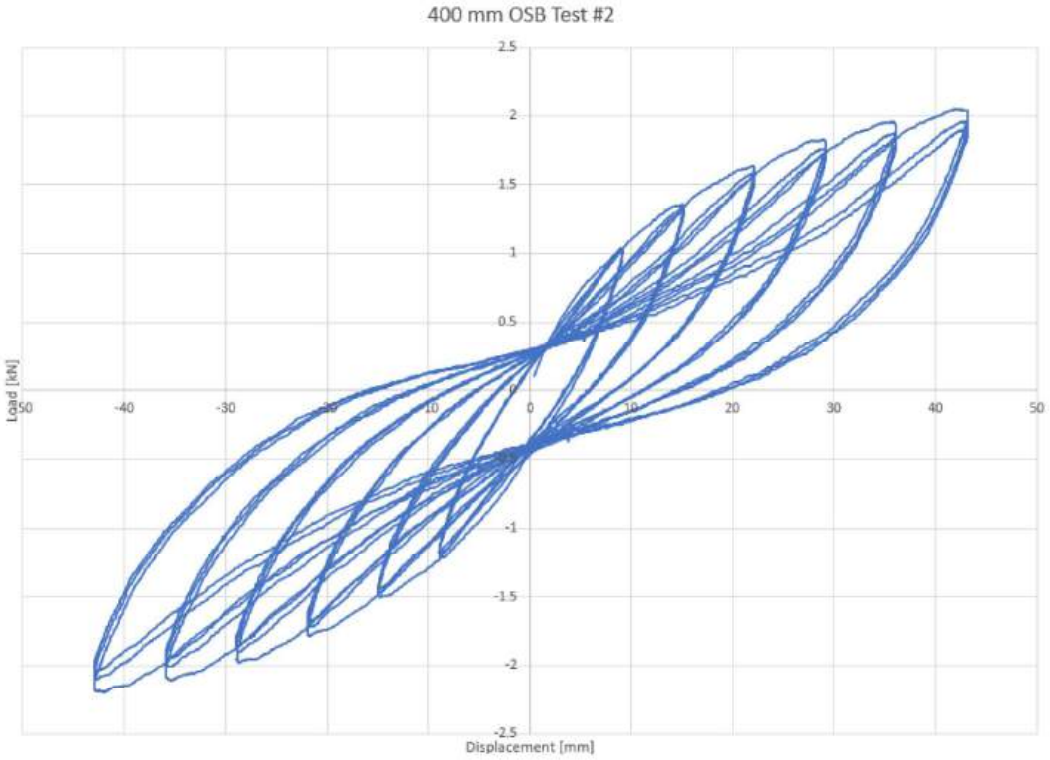
EVALUATION : WIND PERFORMANCE

BU(wind) = 20 x the lesser of P or Fx1.2/0.71

P = 1.84 Fx1.2/0.71 = 1.81

Therefore BU(WIND) = 20 x 1.81 **BU(WIND) = 36 Bracing Units**

Figure A 7. 400 mm OSB test #1.



	Servicability Cycles Cycle To Displacement x = 8 (mm)			Ultimate Cycles Cycle To Displacement y = 36 (mm)					
Specimen No	Load S (kN)		Residual Displacement C (mm)		Maximum Load P(kN)		Calculated P/2(kN)	Displacement @P/2=d (mm)	4th Cycle Load at y mm R (kN)
1	+	0.96	+	3.68	+	1.96	+ 0.98	+ 8.20	+ 1.83
	-	1.15	-	1.56	-	2.11			- 1.99
Averages	S=	1.06	C=	2.62	P=	2.03		d= 8.20	R= 1.91

K1 = 1.4 - C/X = 1.00

F = K1 x S = 1.06

The "Asymmetry Of Performance" criterion in the last paragraph of Section 6.5 shall be followed.

u = y/d = 4.39

u	1.00	2.00	2.50	3.00	3.50	4.00
K4	0.35	0.60	0.67	0.74	0.87	1.00

For other values of u, linear interpolation is used to determine K4

Therefore K4 = 1.00

EVALUATION : EARTHQUAKE PERFORMANCE

BU(EQ) = 20 x the lesser of K4R or Fx1.2/0.55

K4 x R = 1.91 Fx1.2/0.55 = 2.3

Therefore BU(EQ) = 20 x 1.91 **BU(EQ) = 38** **Bracing Units**

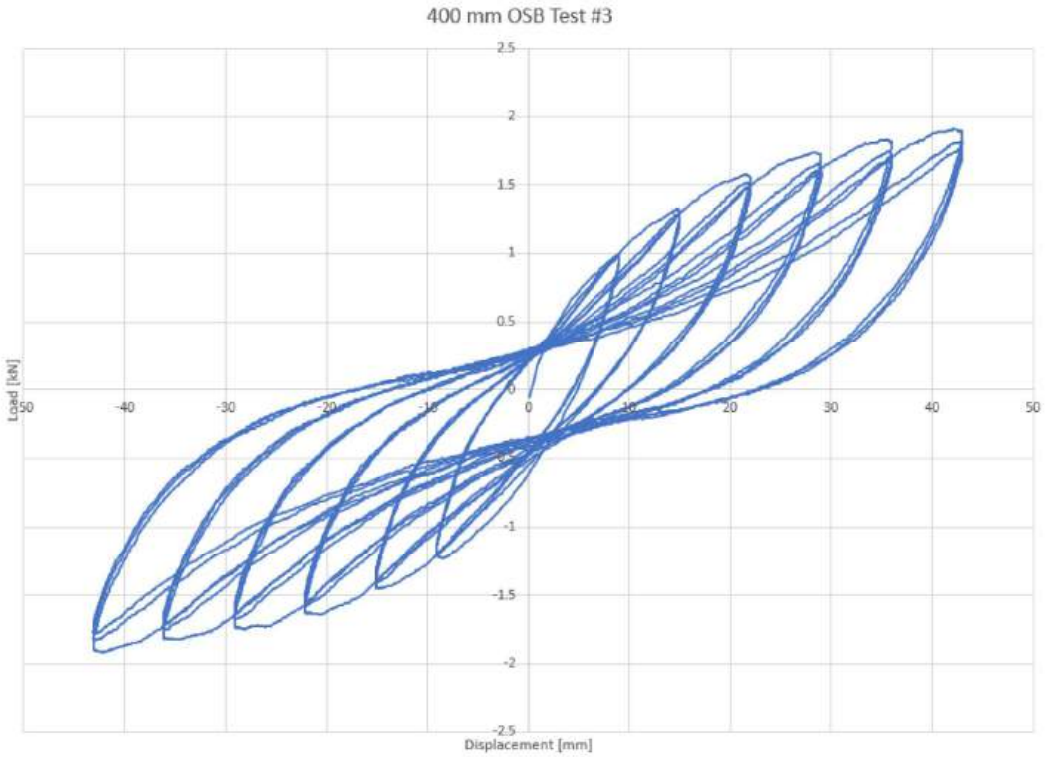
EVALUATION : WIND PERFORMANCE

BU(wind) = 20 x the lesser of P or Fx1.2/0.71

P = 2.03 Fx1.2/0.71 = 1.78

Therefore BU(WIND) = 20 x 1.78 **BU(WIND) = 36** **Bracing Units**

Figure A 8. 400 mm OSB test #2.



	Servicability Cycles Cycle To Displacement x = 8 (mm)			Ultimate Cycles Cycle To Displacement y = 36 (mm)					
Specimen No	Load S (kN)		Residual Displacement C (mm)	Maximum Load P(kN)		Calculated P/2(kN)	Displacement @P/2=d (mm)	4th Cycle Load at y mm R (kN)	
1	+	0.94	+ 4.50	+	1.83	+ 0.91	+ 7.69	+	1.70
	-	1.13	- 2.50	-	1.82			-	1.72
Averages	S=	1.04	C= 3.50	P=	1.83		d= 7.69	R=	1.71

K1 = 1.4 - C/X = 0.96

F = K1 x S = 1.00

The "Asymmetry Of Performance" criterion in the last paragraph of Section 6.5 shall be followed.

u = y/d = 4.68

u	1.00	2.00	2.50	3.00	3.50	4.00
K4	0.35	0.60	0.67	0.74	0.87	1.00

For other values of u, linear interpolation is used to determine K4

Therefore K4 = 1.00

EVALUATION : EARTHQUAKE PERFORMANCE

BU(EQ) = 20 x the lesser of K4R or Fx1.2/0.55

K4 x R = 1.71 Fx1.2/0.55 = 2.17

Therefore BU(EQ) = 20 x 1.71 **BU(EQ) = 34 Bracing Units**

EVALUATION : WIND PERFORMANCE

BU(wind) = 20 x the lesser of P or Fx1.2/0.71

P = 1.83 Fx1.2/0.71 = 1.68

Therefore BU(WIND) = 20 x 1.68 **BU(WIND) = 34 Bracing Units**

Figure A 9. 400 mm OSB test #3.

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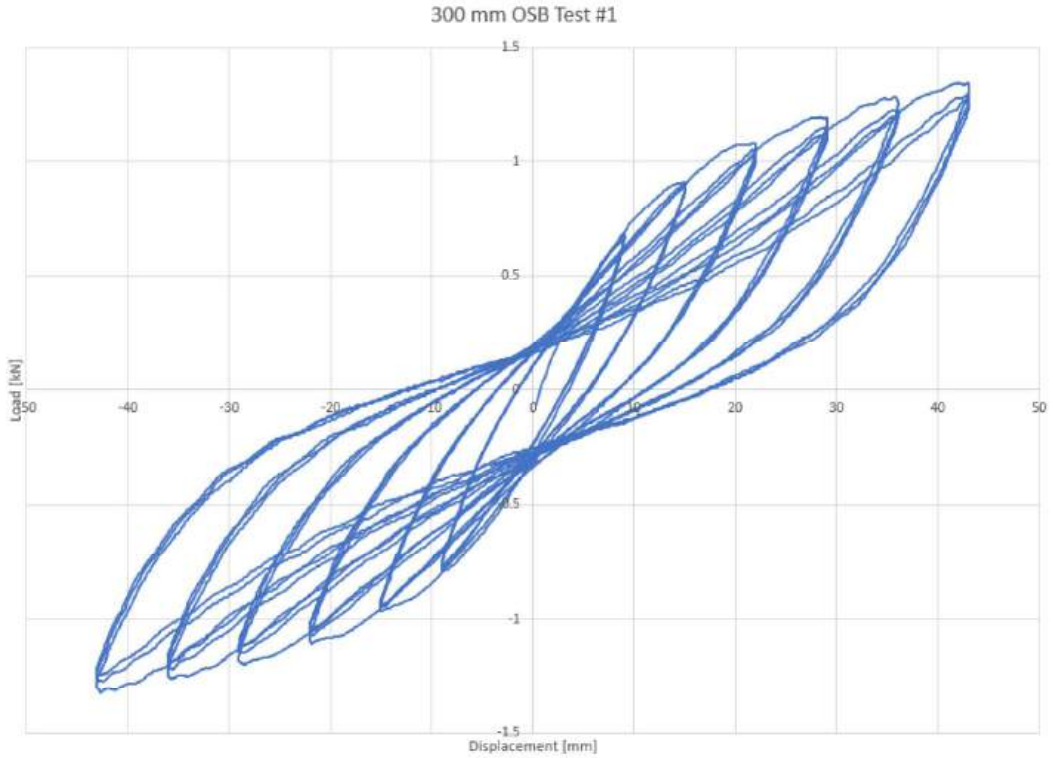


	Servicability Cycles Cycle To Displacement x = 8 (mm)			Ultimate Cycles Cycle To Displacement y = 36 (mm)					
Specimen No	Load S (kN)		Residual Displacement C (mm)	Maximum Load P(kN)		Calculated P/2(kN)	Displacement @P/2=d (mm)	4th Cycle Load at y mm R (kN)	
1	+	0.62	+ 3.14	+	1.28	+ 0.64	+ 8.57	+	1.20
	-	0.74	- 1.61	-	1.26			-	1.20
Averages	S=	0.68	C= 2.38	P=	1.27		d= 8.57	R=	1.20

K1 = 1.4 - C/X = 1.00

F = K1 x S = 0.68

The "Asymmetry Of Performance" criterion in the last paragraph of Section 6.5 shall be followed.

u = y/d = 4.20

u	1.00	2.00	2.50	3.00	3.50	4.00
K4	0.35	0.60	0.67	0.74	0.87	1.00

For other values of u, linear interpolation is used to determine K4

Therefore K4 = 1.00

EVALUATION : EARTHQUAKE PERFORMANCE

BU(EQ) = 20 x the lesser of K4R or Fx1.2/0.55

K4 x R = 1.20 Fx1.2/0.55 = 1.49

Therefore BU(EQ) = 20 x 1.20 **BU(EQ) = 24 Bracing Units**

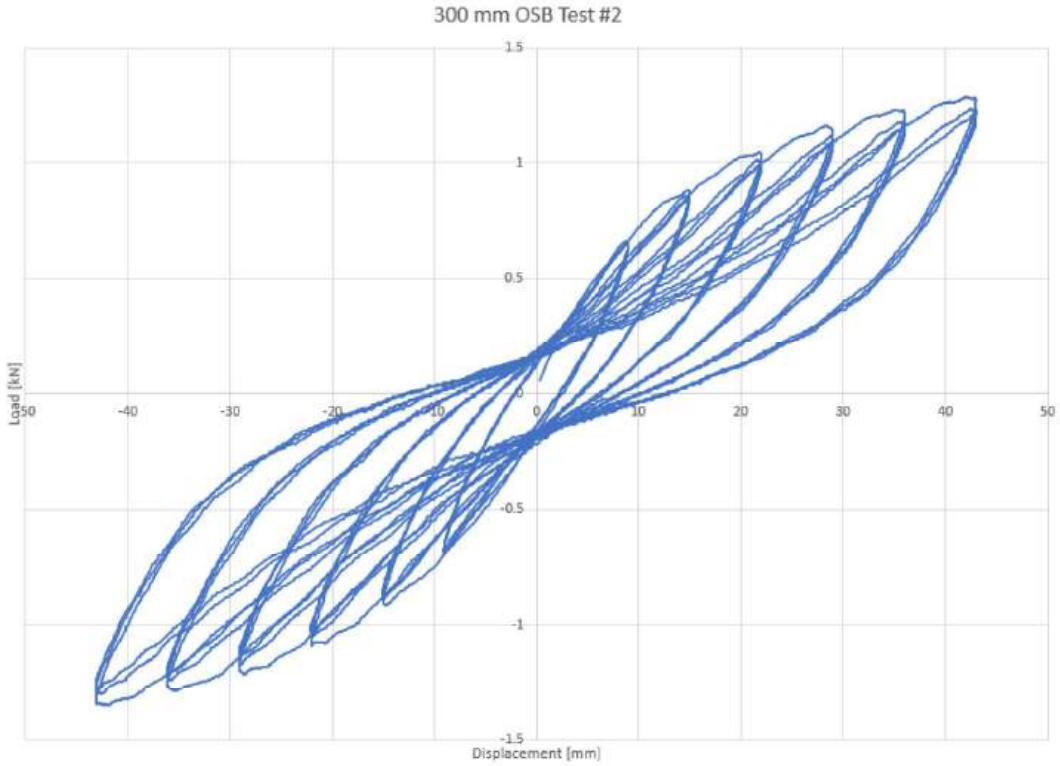
EVALUATION : WIND PERFORMANCE

BU(wind) = 20 x the lesser of P or Fx1.2/0.71

P = 1.27 Fx1.2/0.71 = 1.15

Therefore BU(WIND) = 20 x 1.15 **BU(WIND) = 23 Bracing Units**

Figure A 10. 300 mm OSB test #1.



	Servicability Cycles Cycle To Displacement x = 8 (mm)			Ultimate Cycles Cycle To Displacement y = 36 (mm)			
Specimen No	Load S (kN)		Residual Displacement C (mm)	Maximum Load P(kN)	Calculated P/2(kN)	Displacement @P/2=d (mm)	4th Cycle Load at y mm R (kN)
1	+ 0.61		+ 2.33	+ 1.23	+ 0.61	+ 8.18	+ 1.16
	- 0.63		- 2.14	- 1.29			- 1.22
Averages	S= 0.62		C= 2.23	P= 1.26		d= 8.18	R= 1.19

K1 = 1.4 - C/X = 1.00

F = K1 x S = 0.62

The "Asymmetry Of Performance" criterion in the last paragraph of Section 6.5 shall be followed.

u = y/d = 4.40

u	1.00	2.00	2.50	3.00	3.50	4.00
K4	0.35	0.60	0.67	0.74	0.87	1.00

For other values of u, linear interpolation is used to determine K4

Therefore K4 = 1.00

EVALUATION : EARTHQUAKE PERFORMANCE

BU(EQ) = 20 x the lesser of K4R or Fx1.2/0.55

K4 x R = 1.19 Fx1.2/0.55 = 1.36

Therefore BU(EQ) = 20 x 1.19 **BU(EQ) = 24** **Bracing Units**

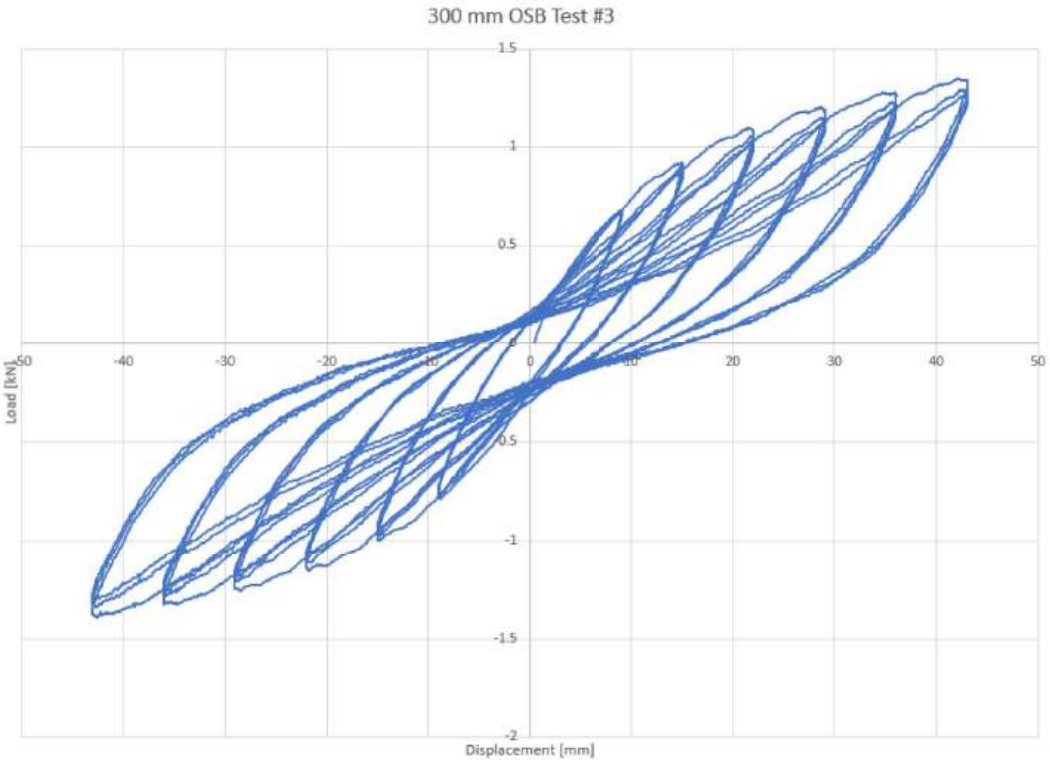
EVALUATION : WIND PERFORMANCE

BU(wind) = 20 x the lesser of P or Fx1.2/0.71

P = 1.26 Fx1.2/0.71 = 1.05

Therefore BU(WIND) = 20 x 1.05 **BU(WIND) = 21** **Bracing Units**

Figure A 11. 300 mm OSB test #2.



	Servicability Cycles Cycle To Displacement x = 8 (mm)			Ultimate Cycles Cycle To Displacement y = 36 (mm)					
Specimen No	Load S (kN)		Residual Displacement C (mm)	Maximum Load P(kN)		Calculated P/2(kN)	Displacement @P/2=d (mm)	4th Cycle Load at y mm R (kN)	
1	+	0.63	+ 3.11	+	1.27	+ 0.64	+ 8.22	+	1.19
	-	0.75	- 1.82	-	1.33			-	1.24
Averages	S=	0.69	C= 2.46	P=	1.30		d= 8.22	R=	1.21

K1 = 1.4 - C/X = 1.00

F = K1 x S = 0.69

The "Asymmetry Of Performance" criterion in the last paragraph of Section 6.5 shall be followed.

u = y/d = 4.38

u	1.00	2.00	2.50	3.00	3.50	4.00
K4	0.35	0.60	0.67	0.74	0.87	1.00

For other values of u, linear interpolation is used to determine K4

Therefore K4 = 1.00

EVALUATION : EARTHQUAKE PERFORMANCE

BU(EQ) = 20 x the lesser of K4R or Fx1.2/0.55

K4 x R = 1.21 Fx1.2/0.55 = 1.51

Therefore BU(EQ) = 20 x 1.21 **BU(EQ) = 24 Bracing Units**

EVALUATION : WIND PERFORMANCE

BU(wind) = 20 x the lesser of P or Fx1.2/0.71

P = 1.30 Fx1.2/0.71 = 1.17

Therefore BU(WIND) = 20 x 1.17 **BU(WIND) = 23 Bracing Units**

Figure A 12. 300 mm OSB test #3.

APPENDIX B

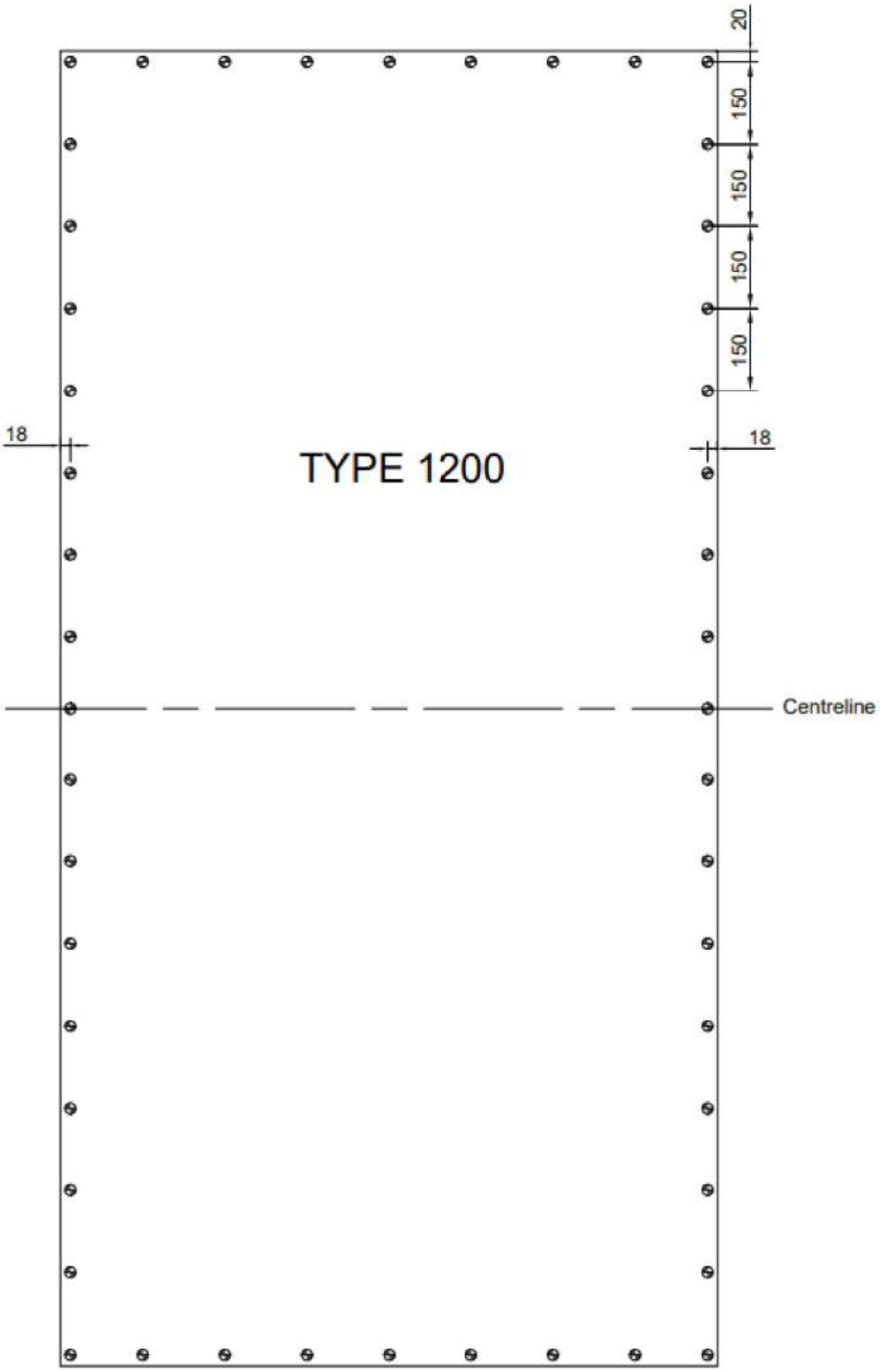


Figure B 1. 1200 mm sample screw layout.

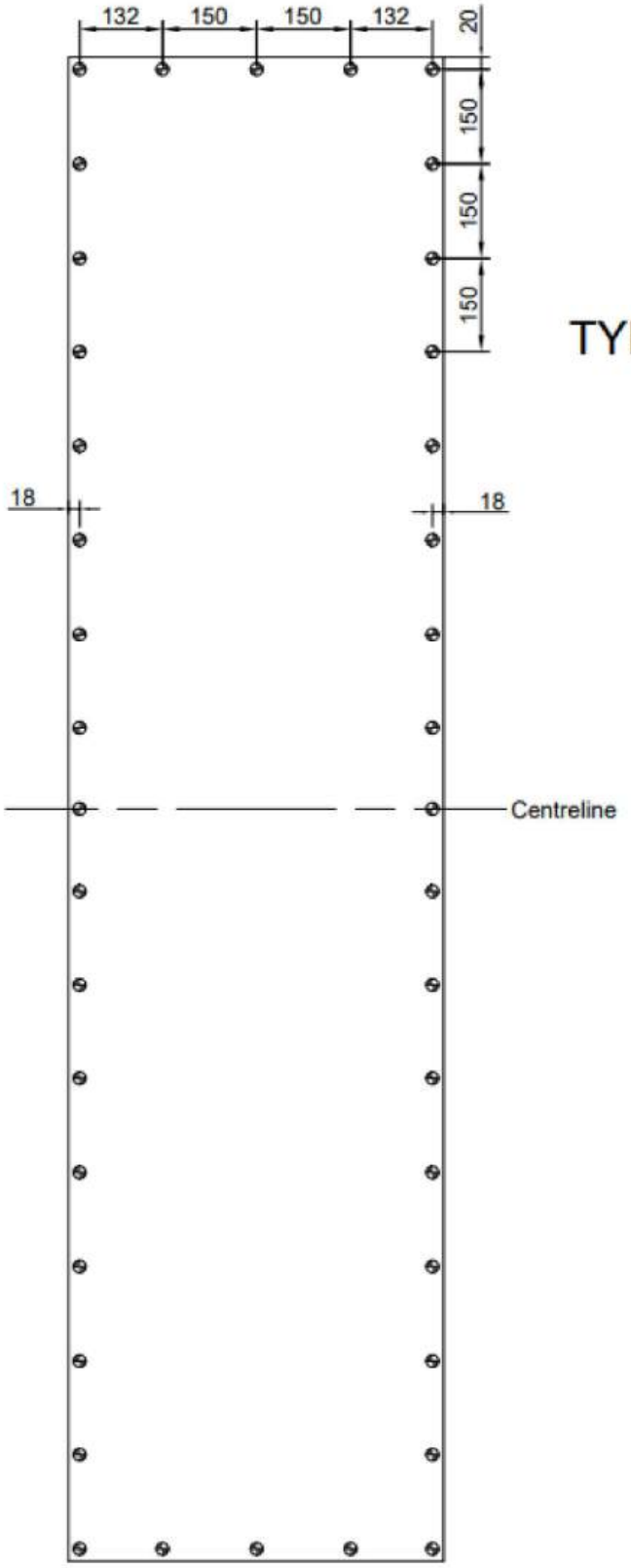


Figure B 2. 600 mm sample screw layout.

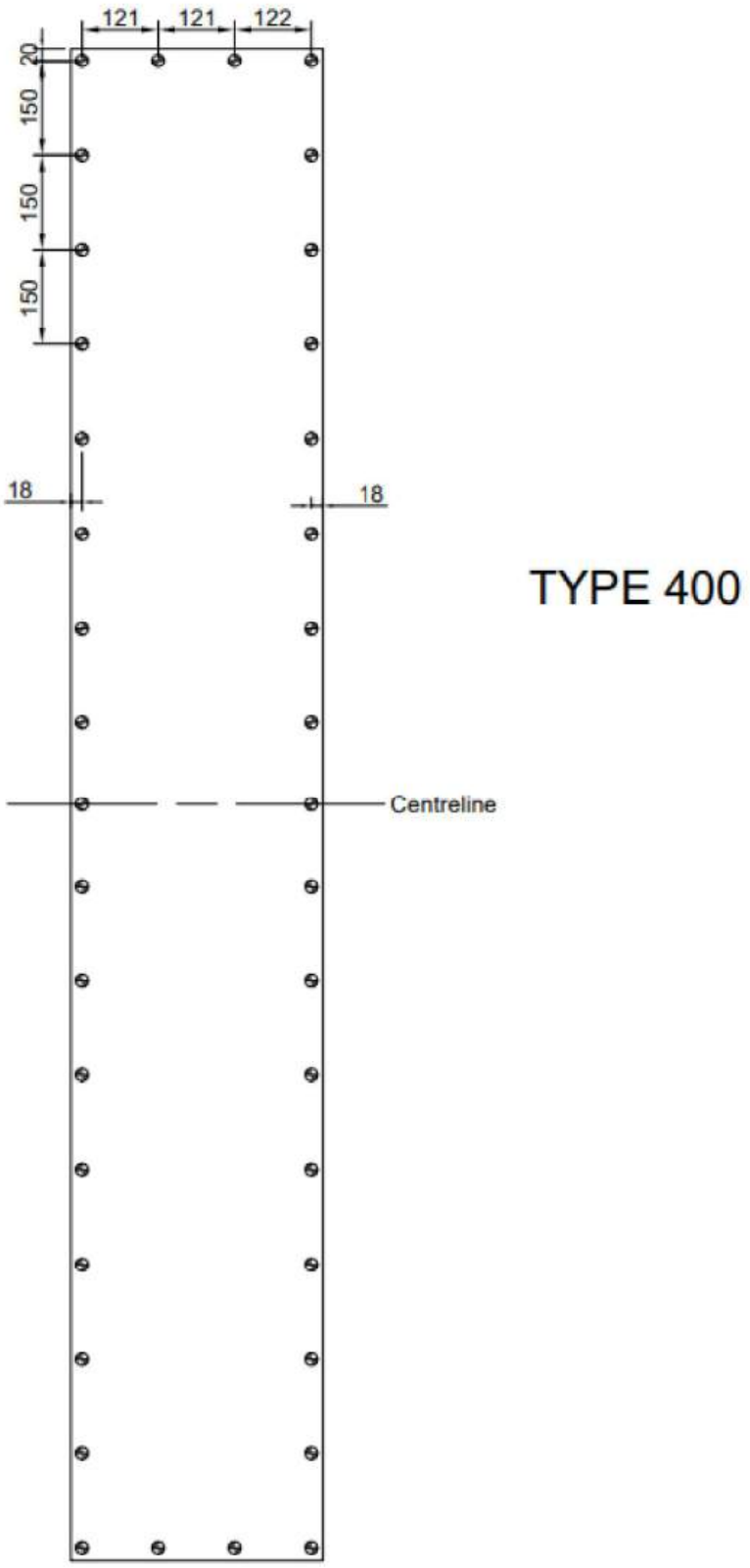


Figure B 3. 400 mm sample screw layout.

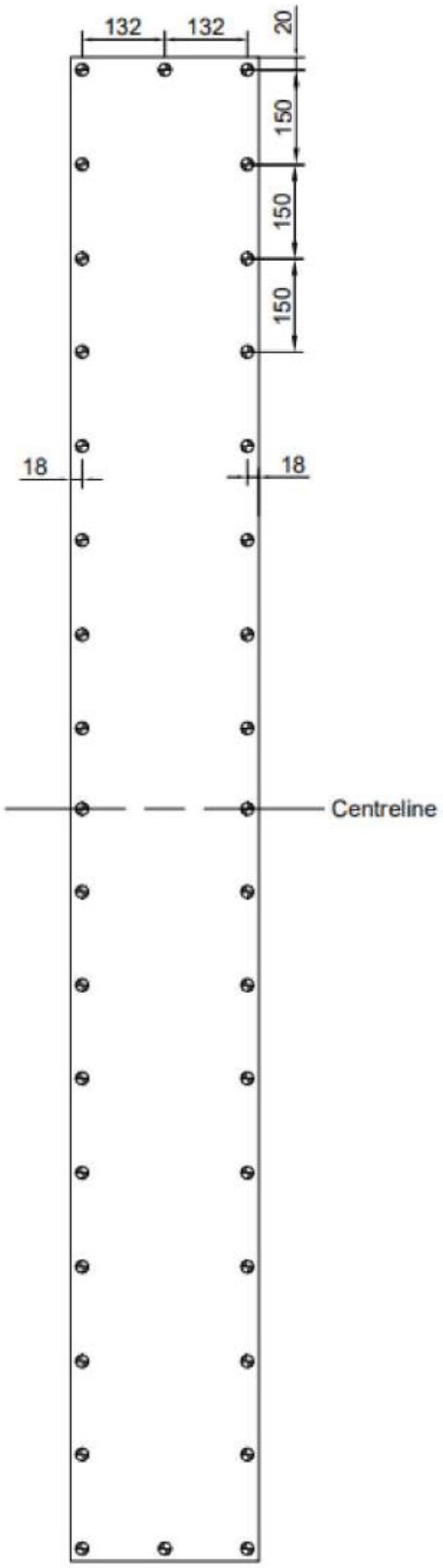


Figure B 4. 300 mm sample screw layout.