

# TEST REPORT

## Wind Uplift Strength of Super Seam Claddings Under Static and Cyclic Wind Loading

**CLIENT: The Roofing Store**



<b>Document Title</b>	Wind Uplift Strength of Super Seam Claddings Under Static and Cyclic Wind Loading
<b>Document No.</b>	TRS-RPT-005-UOA

## DOCUMENT PREPARATION AND APPROVALS

Action	Name	Position	Organization	Date	Signature
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Reviewed by					
Approved by					
Accepted by					

# Super Seam



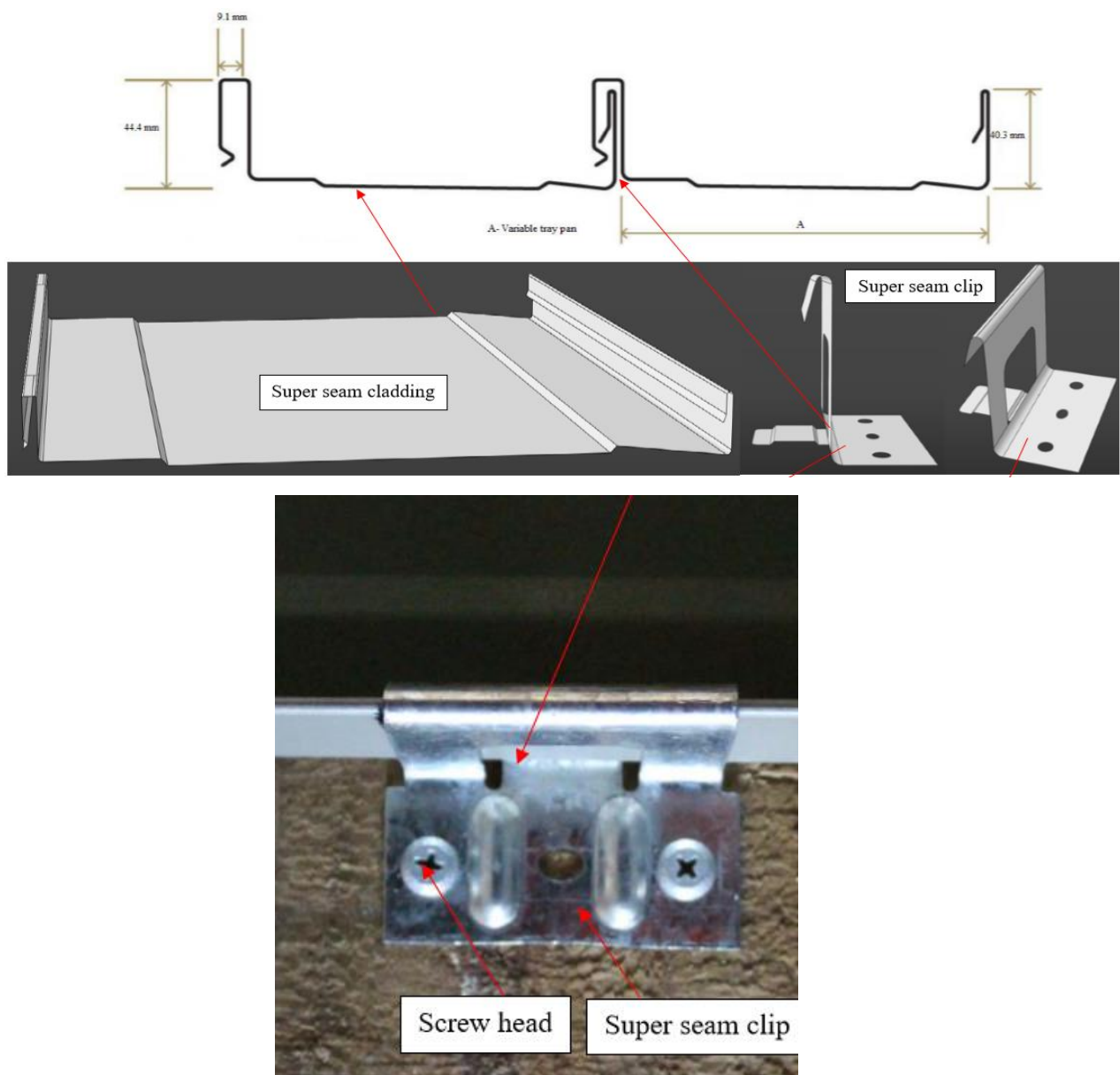
**Applications:** Super seam is ideal for use on new homes, reroofing, and existing buildings where a stylish versatile cladding system is desirable.

- Areas of application could include: Roof, Façade, Turrets, Domes, Soffits, Facias
- Super seam is also ideal for creating features as: Chimney cladding, Flashings, Interior feature walls, Pillar and column surrounds, Gable and infill, Gothic style homes, Entrance canopies

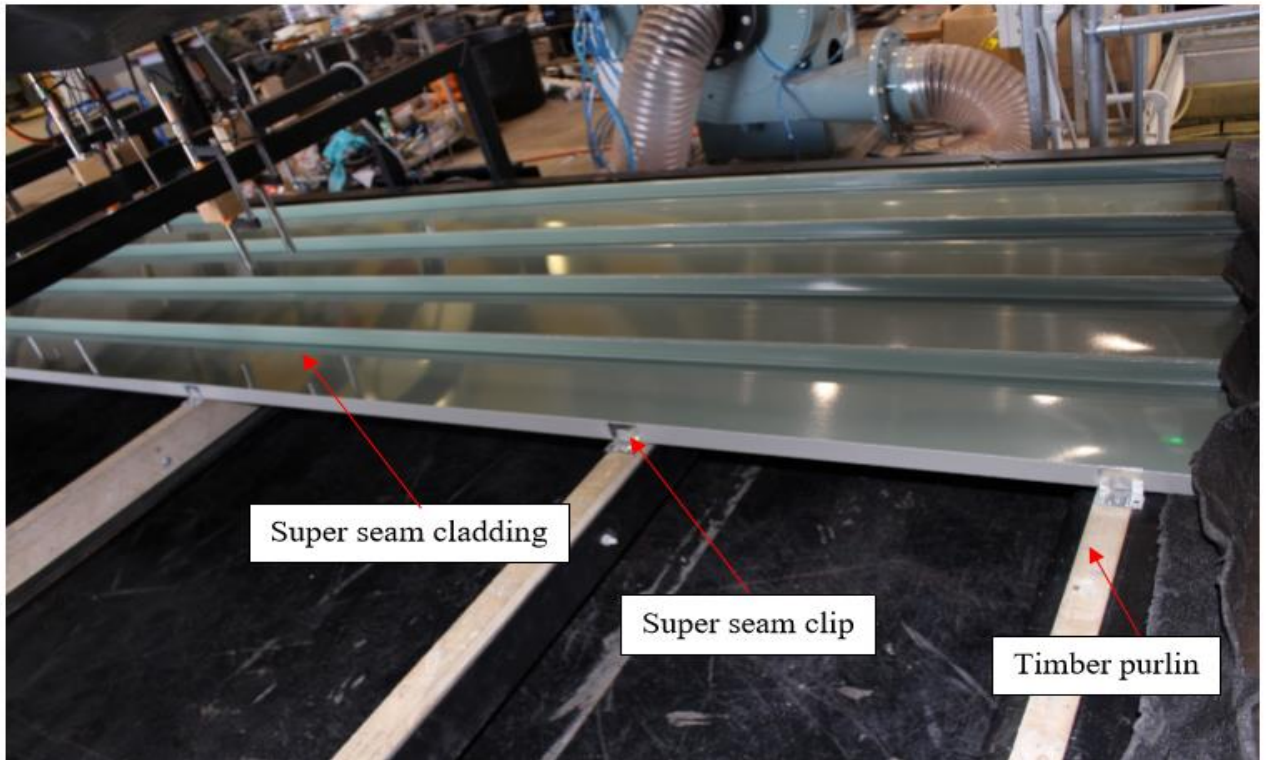
**Advantages:** Allows a much greater flexibility in design than other standard long run profiles. Tray sizes may vary depending on design requirements.

**Profile information:** Super seam is available in a variety of widths. We can offer 250 & 450 Wide pans as our most cost-effective widths for manufacture and installation. Please consult with The Roofing Store for alternative tray sizing.

**Super seam cladding dimensions:**



**Fig. 1:** Photograph of super seam claddings



**Fig. 2:** Details of the super seam cladding fixings

**Wall cladding and roofs with a minimum pitch:** 3 degree

**Variable pan:** from 200 to 630 mm

**Seam height:**45mm overall Height





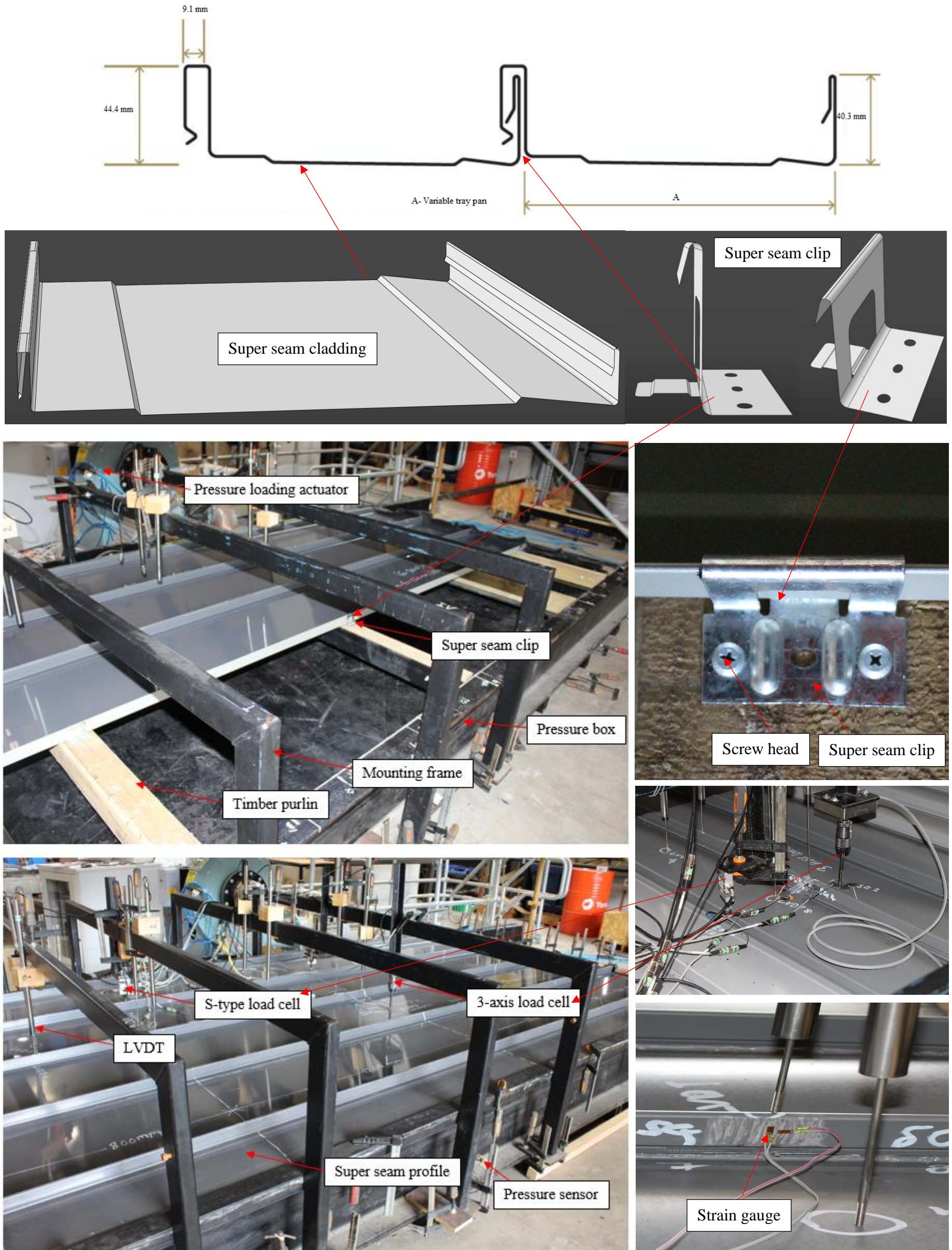
(a) Super seam claddings with pan width of 200 mm



(b) Super seam claddings with pan width of 450 mm

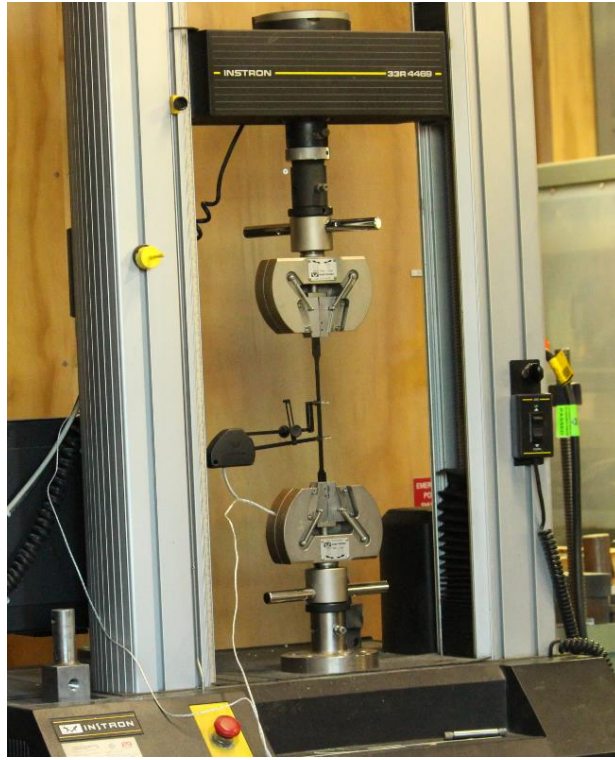
**Fig. 3:** Installation of the super seam claddings in the pressure box





**Fig. 4:** Photograph of the pressure box and sensors



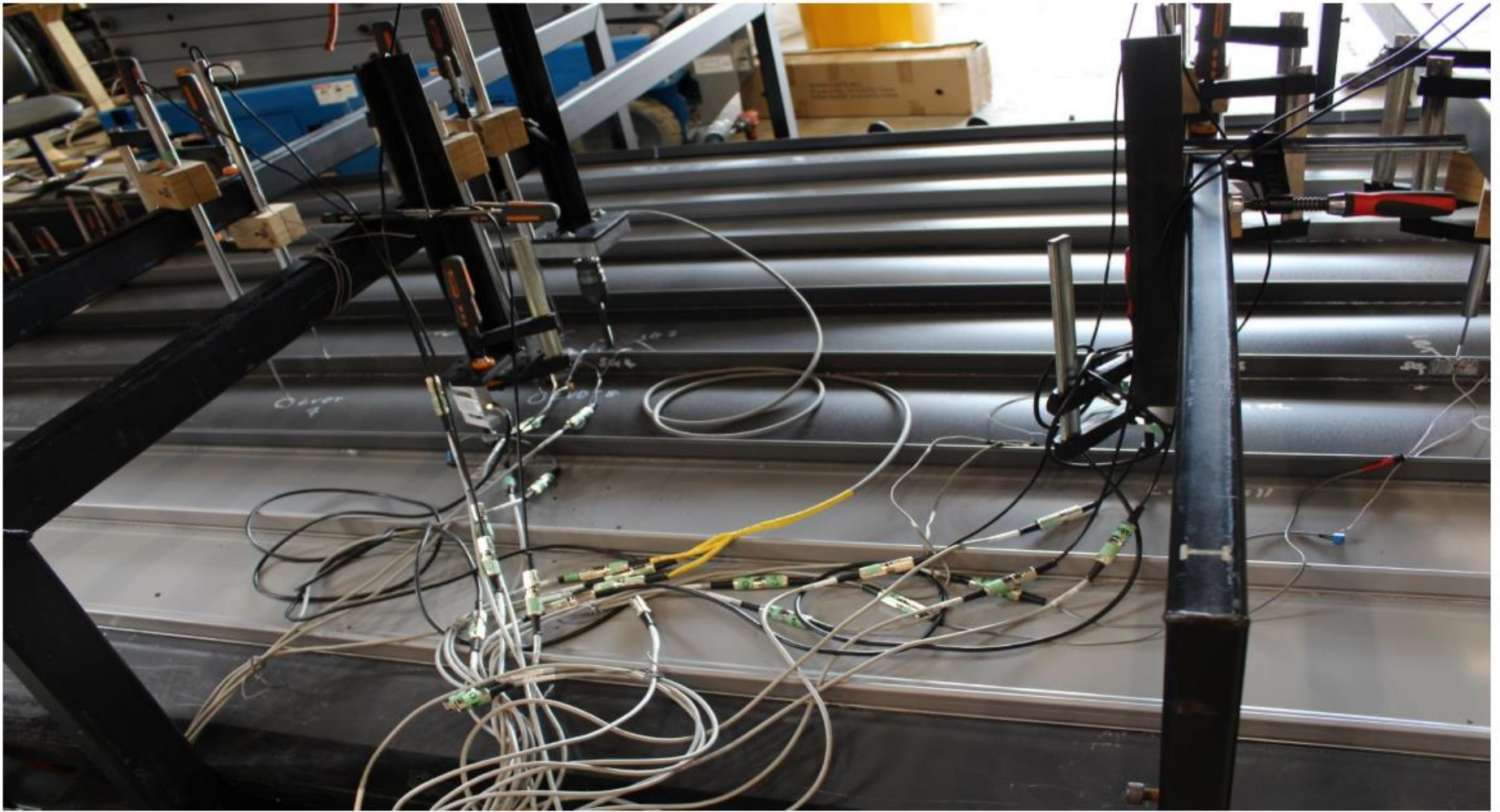


**Fig. 5:** Determination of material properties by tensile coupon tests



**Fig. 6:** Super seam cladding of 450 mm pan width in static uplift test for “Superseam-S2000-t0.55” at the middle of the test (end of tests)





**Fig. 7:** Super seam cladding of 200 mm pan width in static uplift test for “Superseam-S600-t0.55” (end of tests)

**Table 1:** Ultimate and serviceability limit state wind pressures from experimental tests for 450 mm wide pan super seam claddings

## (a) Static uplift tests

Specimen	Span S (mm)	Thickness t (mm)	Super seam roof or wall cladding					
			Ultimate Limit State wind pressure (kPa)			Serviceability limit State wind pressure (kPa)		
			Single	End	Internal	Single	End	Internal
Superseam-S500-t0.55	500	0.55	4.29	4.69	5.08	3.15	3.42	3.76
Superseam-S600-t0.55	600	0.55	4.10	4.30	4.72	2.92	3.10	3.41
Superseam-S800-t0.55	800	0.55	3.79	3.58	4.01	2.24	2.40	2.64
Superseam-S900-t0.55	900	0.55	2.82	3.19	3.72	2.14	2.29	2.52
Superseam-S1000-t0.55	1000	0.55	2.15	2.43	3.43	2.05	2.18	2.38
Superseam-S1200-t0.55	1200	0.55	1.45	1.69	2.74	1.62	1.73	1.85
Superseam-S1500-t0.55	1500	0.55	1.03	1.25	2.31	1.35	1.43	1.62
Superseam-S2000-t0.55	2000	0.55	0.81	0.95	1.69	1.07	1.17	1.21

## (b) Cyclic tests

Specimen	Span S (mm)	Thickness t (mm)	Super seam roof or wall cladding					
			Ultimate Limit State wind pressure (kPa)			Serviceability limit State wind pressure (kPa)		
			Single	End	Internal	Single	End	Internal
Superseam-S500-t0.55	500	0.55	3.21	3.34	3.52	2.36	2.45	2.61
Superseam-S600-t0.55	600	0.55	2.75	2.87	3.02	2.11	2.20	2.34
Superseam-S800-t0.55	800	0.55	2.45	2.56	2.69	1.84	1.92	2.04
Superseam-S900-t0.55	900	0.55	2.21	2.30	2.42	1.63	1.70	1.81
Superseam-S1000-t0.55	1000	0.55	1.99	2.07	2.18	1.57	1.64	1.74
Superseam-S1200-t0.55	1200	0.55	1.65	1.72	1.81	1.27	1.33	1.41
Superseam-S1500-t0.55	1500	0.55	1.30	1.35	1.42	1.06	1.11	1.18
Superseam-S2000-t0.55	2000	0.55	0.94	0.98	1.03	0.79	0.83	0.88

**Table 2: Failure loads at central clip under static and cyclic wind pressure for 450 mm wide pan super seam claddings**

**(a) Static tests**

Specimen	Span (S) (mm)	Thickness (t) (mm)	Experimental vertical load at each clip, $F_{Z-EXP}$ (N)	Design vertical load at each clip from eq-1, $F_{Z-eq-1}$ (N)	Comparison $F_{Z-EXP} / F_{Z-eq-1}$
Superseam-S500-t0.55	500	0.55	784.2	768.8	1.02
Superseam-S600-t0.55	600	0.55	701.4	681.0	1.03
Superseam-S800-t0.55	800	0.55	612.8	589.2	1.04
Superseam-S900-t0.55	900	0.55	579.2	567.8	1.02
Superseam-S1000-t0.55	1000	0.55	548.5	532.5	1.03
Superseam-S1200-t0.55	1200	0.55	461.8	457.2	1.01
Superseam-S1500-t0.55	1500	0.55	358.2	344.4	1.04
Superseam-S2000-t0.55	2000	0.55	278.7	270.6	1.03

**(b) Cyclic tests**

Specimen	Span (S) (mm)	Thickness (t) (mm)	Experimental fastener load, $F_{Z-EXP}$ (N)	Design fastener load from eq-1, $F_{Z-eq-1}$ (N)	Comparison $F_{Z-EXP} / F_{Z-eq-1}$
Superseam-S500-t0.55	500	0.55	564.6	542.9	1.04
Superseam-S600-t0.55	600	0.55	505.0	481.0	1.05
Superseam-S800-t0.55	800	0.55	441.2	432.5	1.02
Superseam-S900-t0.55	900	0.55	417.0	404.9	1.03
Superseam-S1000-t0.55	1000	0.55	394.9	387.2	1.02
Superseam-S1200-t0.55	1200	0.55	332.5	319.7	1.04
Superseam-S1500-t0.55	1500	0.55	257.9	250.4	1.03
Superseam-S2000-t0.55	2000	0.55	200.7	196.8	1.02



**Table 3:** Ultimate and serviceability limit state wind pressures from experimental tests for 200 mm wide pan super seam claddings

## (a) 200 mm pan-static

Specimen	Span S (mm)	Thickness t (mm)	Super seam roof or wall cladding					
			Ultimate Limit State wind pressure (kPa)			Serviceability limit State wind pressure (kPa)		
			Single	End	Internal	Single	End	Internal
Superseam-S500-t0.55	500	0.55	7.51	7.74	8.14	3.15	3.42	6.71
Superseam-S600-t0.55	600	0.55	6.72	6.90	7.35	2.92	3.10	6.20
Superseam-S800-t0.55	800	0.55	5.64	5.82	6.16	2.24	2.40	5.21
Superseam-S900-t0.55	900	0.55	5.36	5.42	5.76	2.14	2.29	4.65
Superseam-S1000-t0.55	1000	0.55	4.78	4.88	5.18	2.05	2.18	4.33
Superseam-S1200-t0.55	1200	0.55	4.19	4.37	4.54	1.62	1.73	3.64
Superseam-S1500-t0.55	1500	0.55	3.34	3.45	3.69	1.35	1.43	2.96
Superseam-S2000-t0.55	2000	0.55	2.67	2.74	2.81	1.07	1.17	2.15

## (b) 200 mm pan-cyclic

Specimen	Span S (mm)	Thickness t (mm)	Super seam roof or wall cladding					
			Ultimate Limit State wind pressure (kPa)			Serviceability limit State wind pressure (kPa)		
			Single	End	Internal	Single	End	Internal
Superseam-S500-t0.55	500	0.55	5.26	5.37	5.71	4.30	4.39	4.57
Superseam-S600-t0.55	600	0.55	4.64	4.74	5.04	3.79	3.87	4.03
Superseam-S800-t0.55	800	0.55	4.80	4.90	5.21	3.92	4.00	4.17
Superseam-S900-t0.55	900	0.55	3.69	3.77	4.01	3.02	3.08	3.21
Superseam-S1000-t0.55	1000	0.55	3.28	3.35	3.56	2.68	2.73	2.85
Superseam-S1200-t0.55	1200	0.55	2.93	2.99	3.18	2.39	2.44	2.54
Superseam-S1500-t0.55	1500	0.55	2.26	2.30	2.45	1.84	1.88	1.96
Superseam-S2000-t0.55	2000	0.55	1.68	1.71	1.82	1.37	1.40	1.46

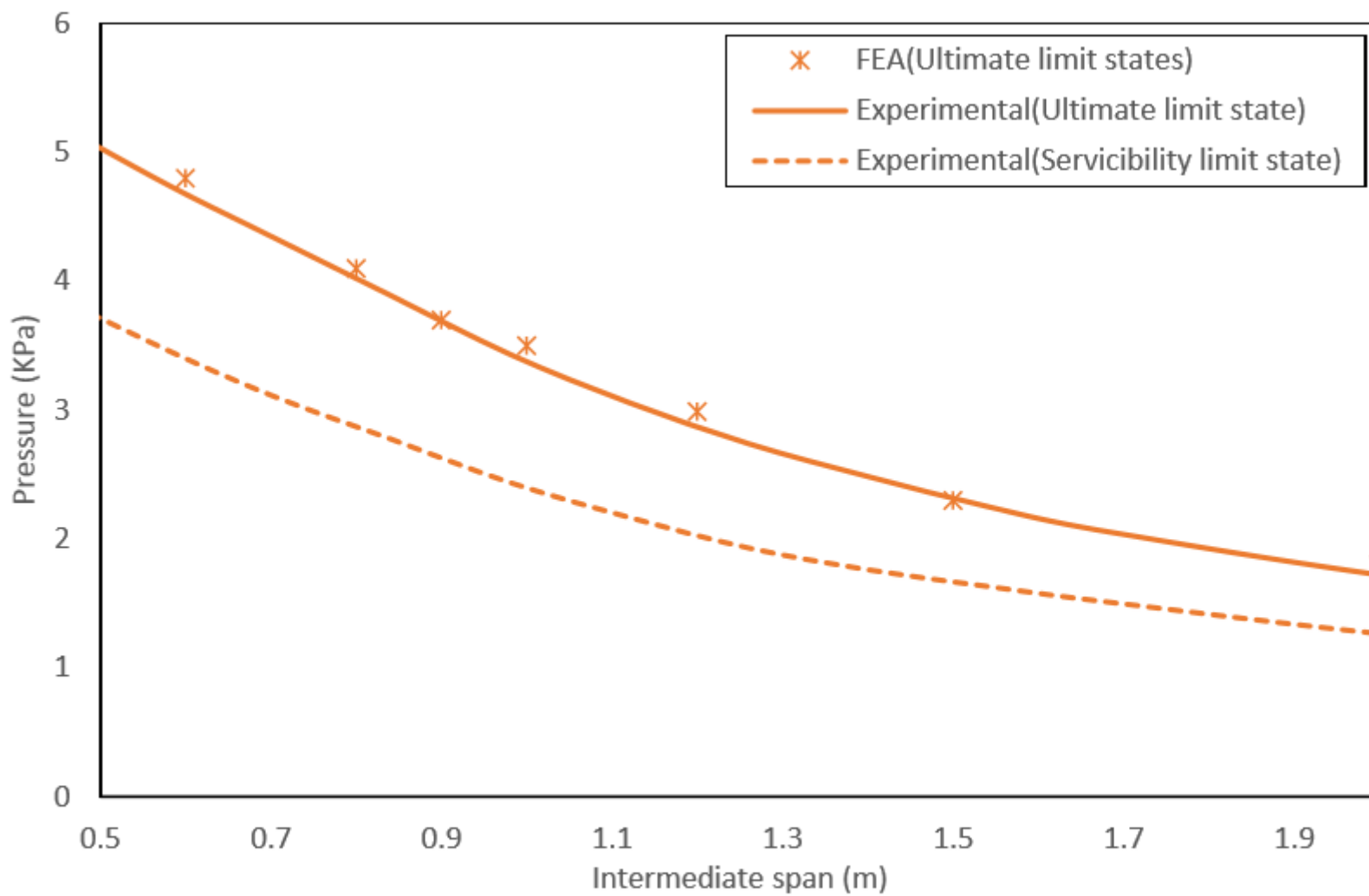
**Table 4:** Failure loads at central clip under static and cyclic wind pressure for 200 mm wide pan super seam claddings

(a) Static-uplift tests

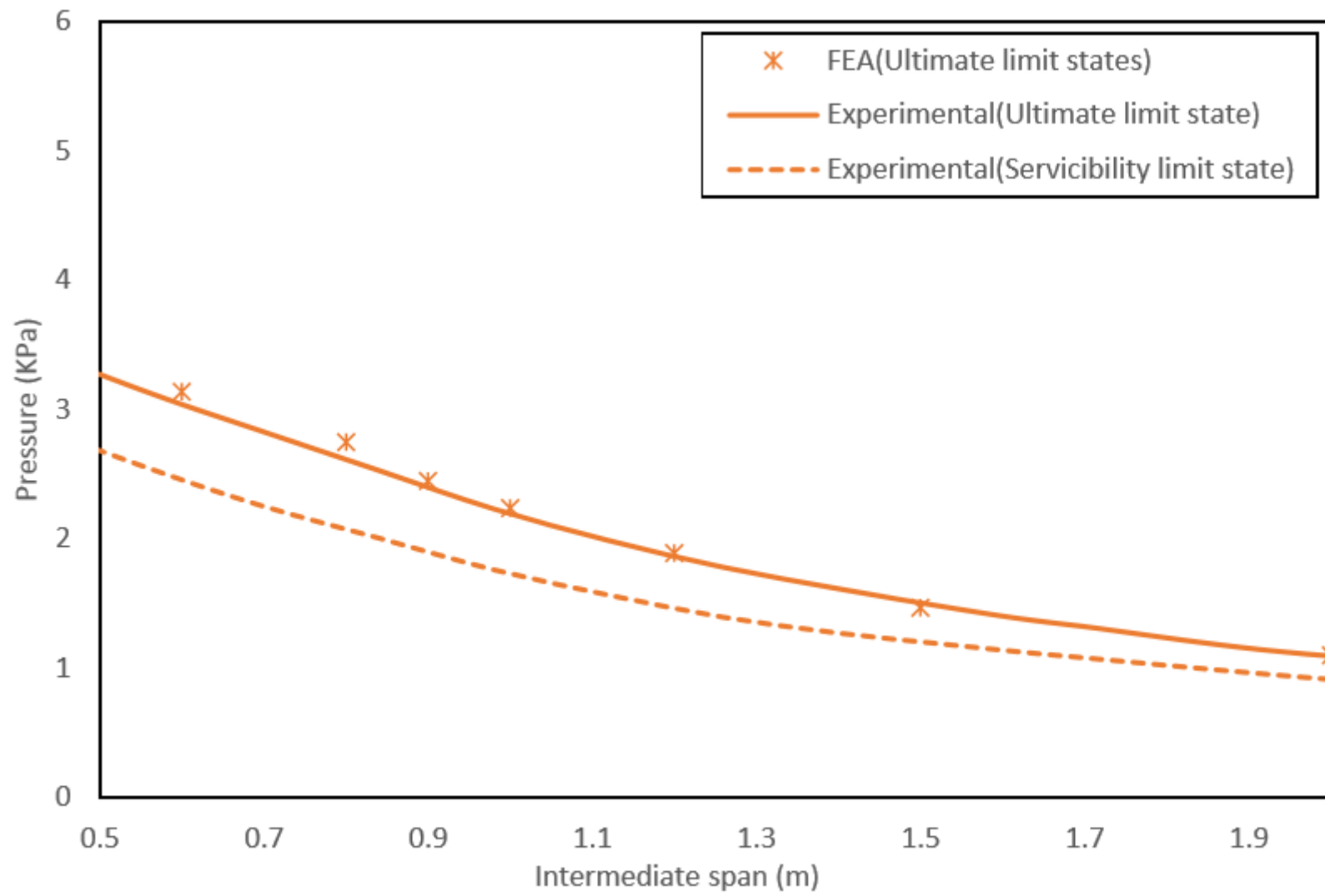
Specimen	Span (S) (mm)	Thickness (t) (mm)	Experimental vertical load at each clip, FZ-EXP (N)	Design vertical load at each clip from eq-1, FZ-eq-1 (N)	Comparison $F_{Z-EXP} / F_{Z-eq-1}$
Superseam-S500-t0.55	500	0.55	1658.9	1610.6	1.03
Superseam-S600-t0.55	600	0.55	1475.6	1446.7	1.02
Superseam-S800-t0.55	800	0.55	1287.3	1226.0	1.05
Superseam-S900-t0.55	900	0.55	1216.4	1169.6	1.04
Superseam-S1000-t0.55	1000	0.55	1151.4	1117.9	1.03
Superseam-S1200-t0.55	1200	0.55	969.2	931.9	1.04
Superseam-S1500-t0.55	1500	0.55	756.8	742.0	1.02
Superseam-S2000-t0.55	2000	0.55	586.3	569.2	1.03

(b) Cyclic tests

Specimen	Span (S) (mm)	Thickness (t) (mm)	Experimental vertical load at each clip, FZ-EXP (N)	Design vertical load at each clip from eq-1, FZ-eq-1 (N)	Comparison $F_{Z-EXP} / F_{Z-eq-1}$
Superseam-S500-t0.55	500	0.55	1211.0	1164.4	1.04
Superseam-S600-t0.55	600	0.55	1077.2	1025.9	1.05
Superseam-S800-t0.55	800	0.55	939.7	921.3	1.02
Superseam-S900-t0.55	900	0.55	888.0	862.1	1.03
Superseam-S1000-t0.55	1000	0.55	840.6	808.3	1.04
Superseam-S1200-t0.55	1200	0.55	707.5	686.9	1.03
Superseam-S1500-t0.55	1500	0.55	552.5	526.2	1.05
Superseam-S2000-t0.55	2000	0.55	428.0	411.5	1.04

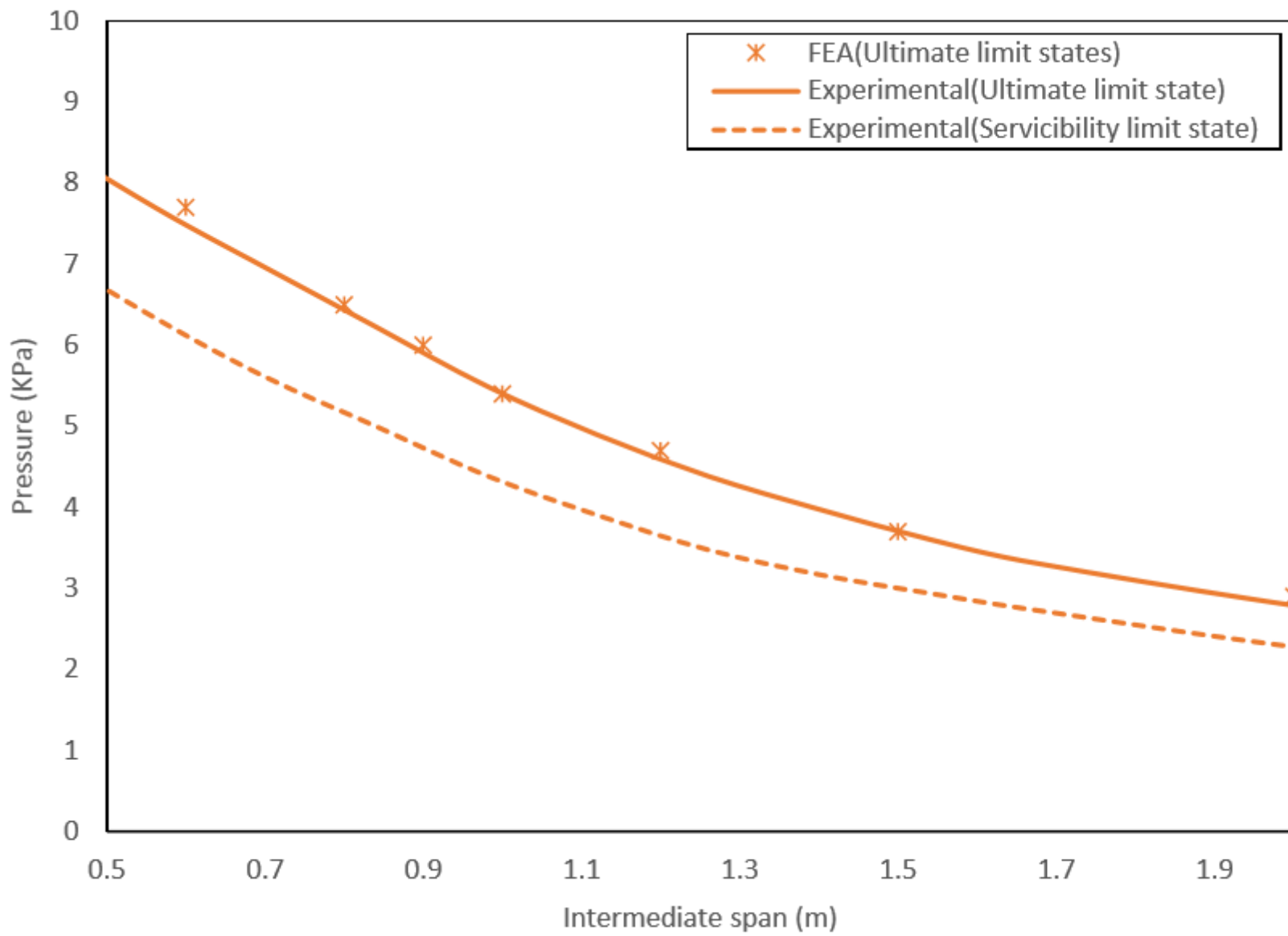


(a) Static uplift wind pressure



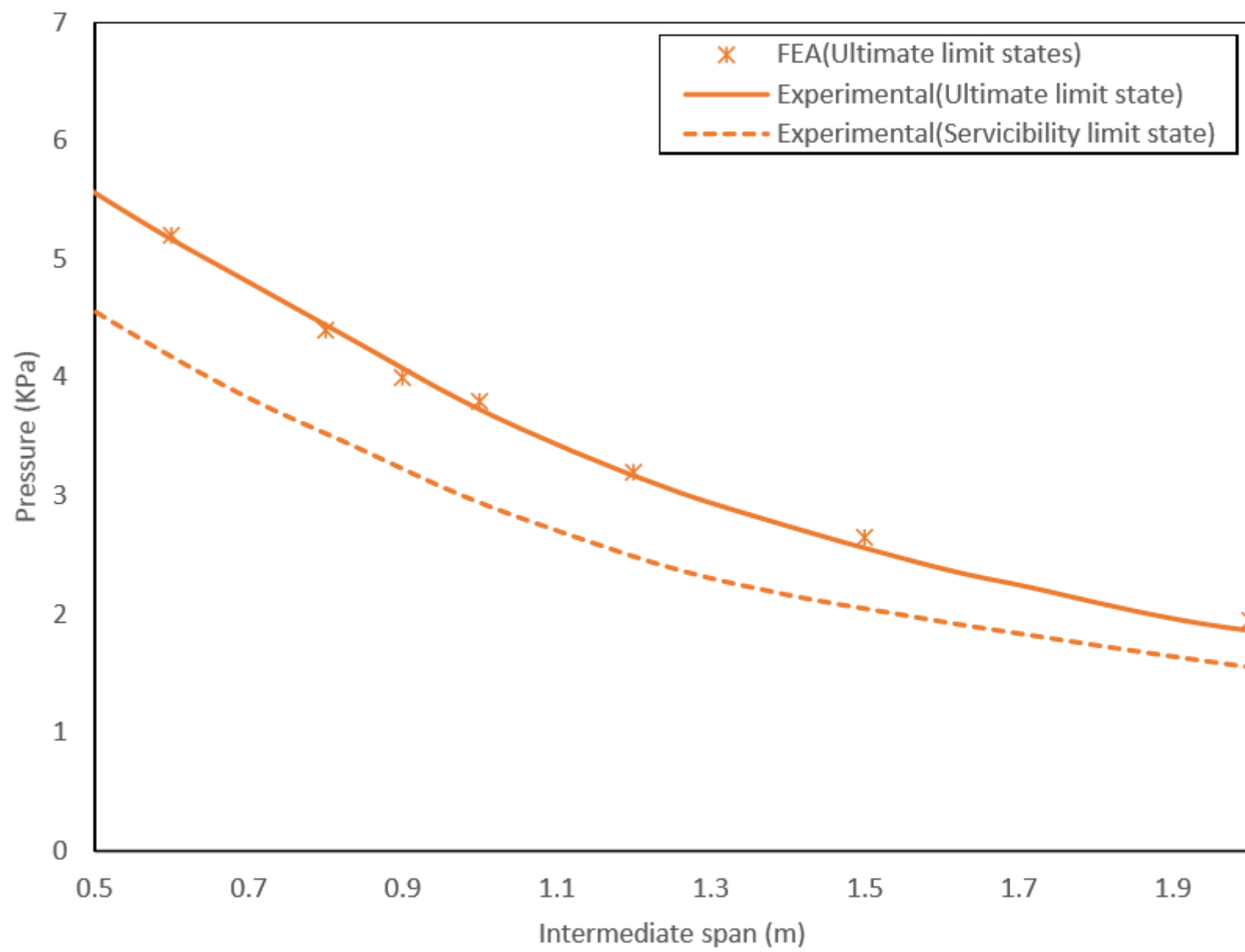
(b) Cyclic wind pressure

Fig. 8: Load- span relationship for 0.55 mm thick, 450 mm pan, G300 grade steel super seam cladding



(a) Static wind pressure





(b) Cyclic wind pressure

Fig. 9: Load- span relationship for 0.55 mm thick, 200 mm pan, G300 grade steel super seam cladding