5 September 2024

WRL Ref: WRL2024007 LR20240905 JTC

SUBJECT TO LEGAL PRIVILEGE

UNSW
Water Research
Laboratory

Eskil Julliard, Northern Beaches Council
C/o- King & Wood Mallesons (Contact: Steven Adler)
Level 61, Governor Phillip Tower, 1 Farrer Place
Sydney NSW 2000

By email: steven.adler@au.kwm.com; Stella.Zhao@au.kwm.com; kate.dean@au.kwm.com

Dear Steven,

RE: Newport SLSC seawall physical model – supplementary wave forces on parapet wall

This letter supplements Carley and Doherty (2024), Newport SLSC stepped seawall physical modelling, WRL Technical Report 2024/20, UNSW Water Research Laboratory.

As directed, the Water Research Laboratory (WRL) of the School of Civil and Environmental Engineering at UNSW Sydney undertook additional force tests on the parapet wall. Testing was undertaken after that report was completed. The supplementary testing was undertaken so that additional valuable data could be acquired from the physical model prior to its removal.

The cross section tested is shown in Figure 1 (reproduced from Figure 3.14 in WRL TR 2024/20).

Figure 1 Design 4, 4 bleachers and SLSC wall (eroded profile), recurved parapet

The maximum pressures measured on the parapet wall in the model (P_{max}, prototype/real world scale) are shown in Table 1. The pressures are based on the measured horizontal forces on a segment of the parapet wall 1.05 m high x 7.5 m long (alongshore, 300 mm model scale). The sampling rate was 200 Hz (prototype/real world, 1000 Hz model scale).

Table 1 P_{max} wave pressure on Design 4 parapet wall

WRL test ID	Structure configuration	Beach state	ARI (years)	Year, SLR	P_{max} (kPa)
0095	Design 4	Eroded	100	2024	46
0096	Design 4	Eroded	100	2084, 0.53 m	92
0098	Design 4	Eroded	1000	2024	95
0099	Design 4	Eroded	1000	2084, 0.53 m	117

The entire time series for each test are shown in Figure 2 to Figure 5.

The P_{max} events for a 1 second duration for each test are shown in Figure 6 to Figure 9.

Additional information on the wave load testing methodology can be found in Sections 3.4.3 and 6.1 of Carley and Doherty (2024).

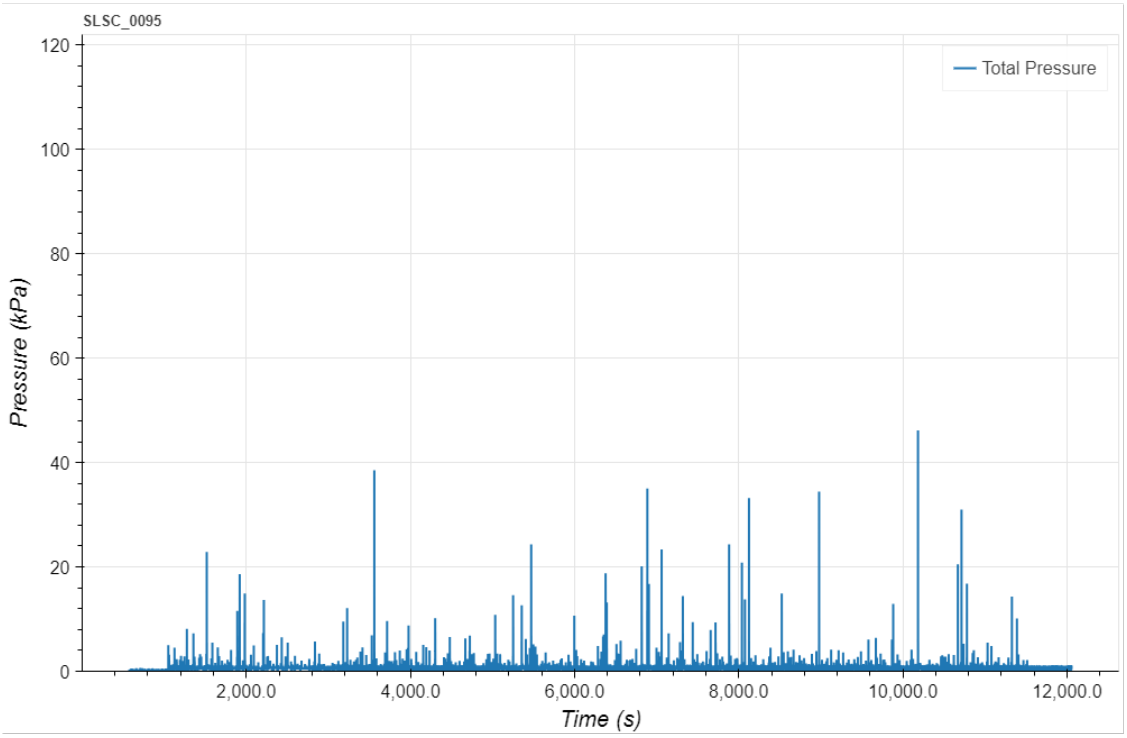

Figure 2 Time series for 100 year ARI, 2024

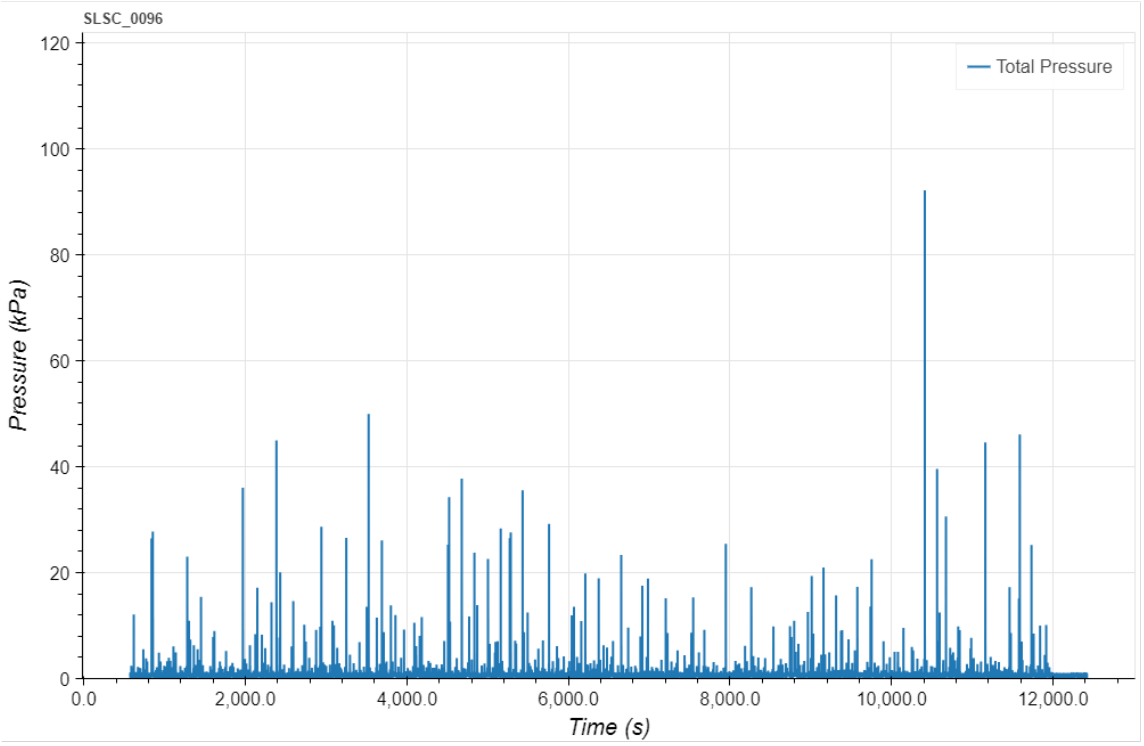

Figure 3 Time series for 100 year ARI, 2084

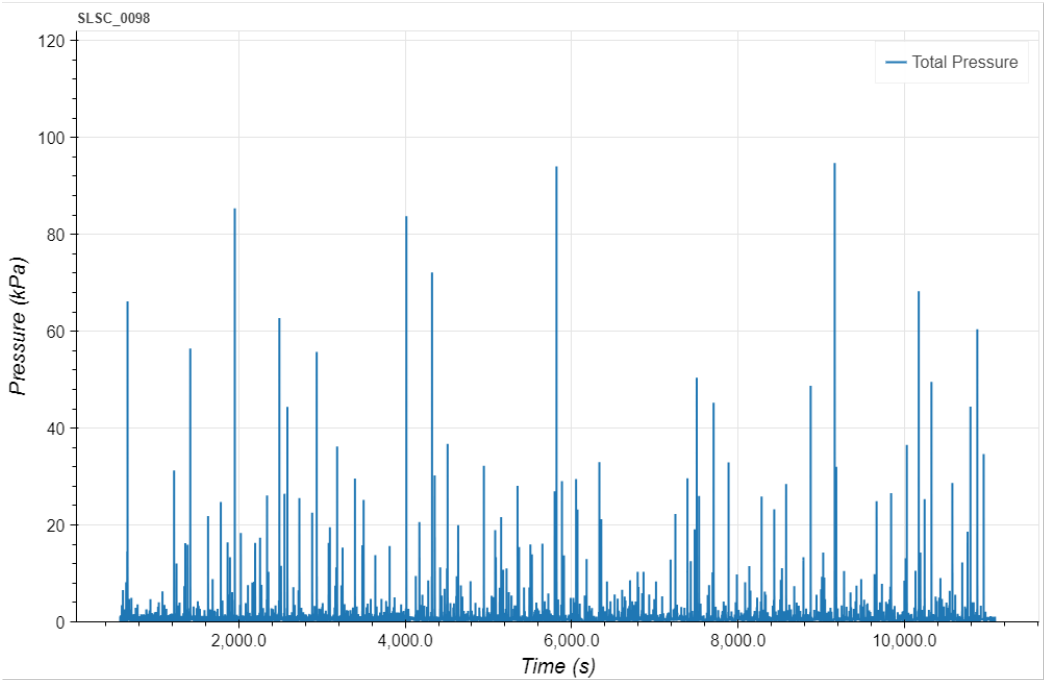

Figure 4 Time series for 1000 year ARI, 2024

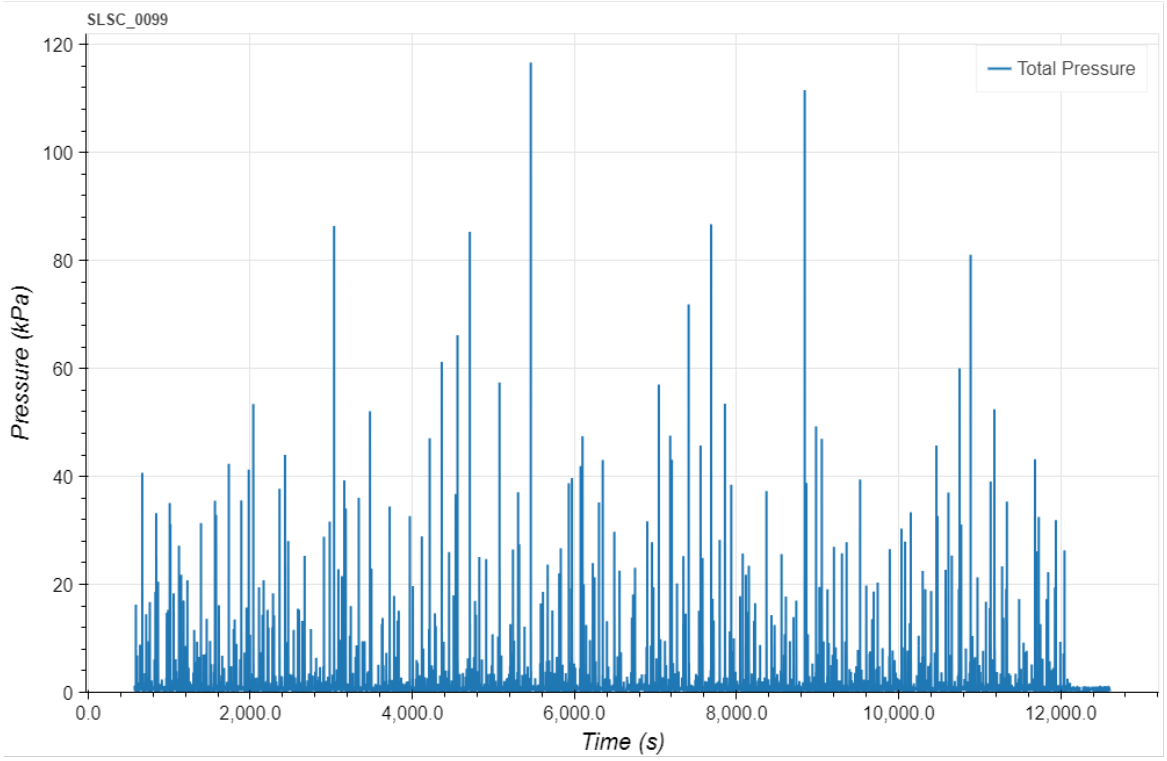

Figure 5 Time series for 1000 year ARI, 2084

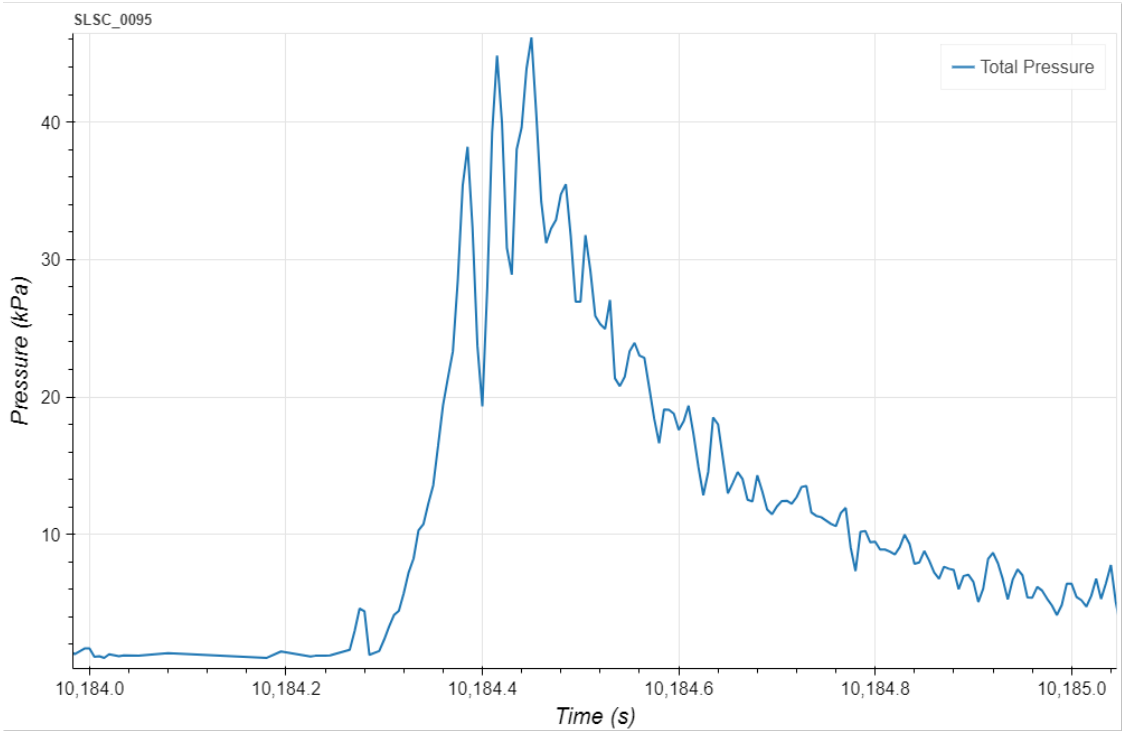

Figure 6 P_{max} 1 second peak for 100 year ARI, 2024

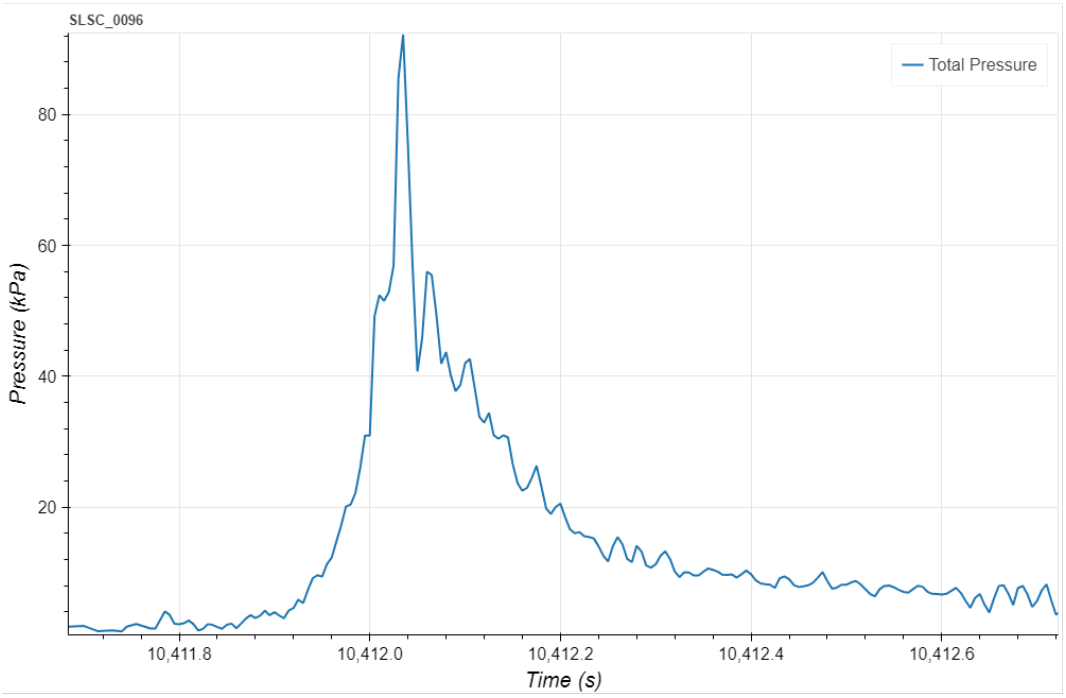

Figure 7 P_{max} 1 second peak for 100 year ARI, 2084

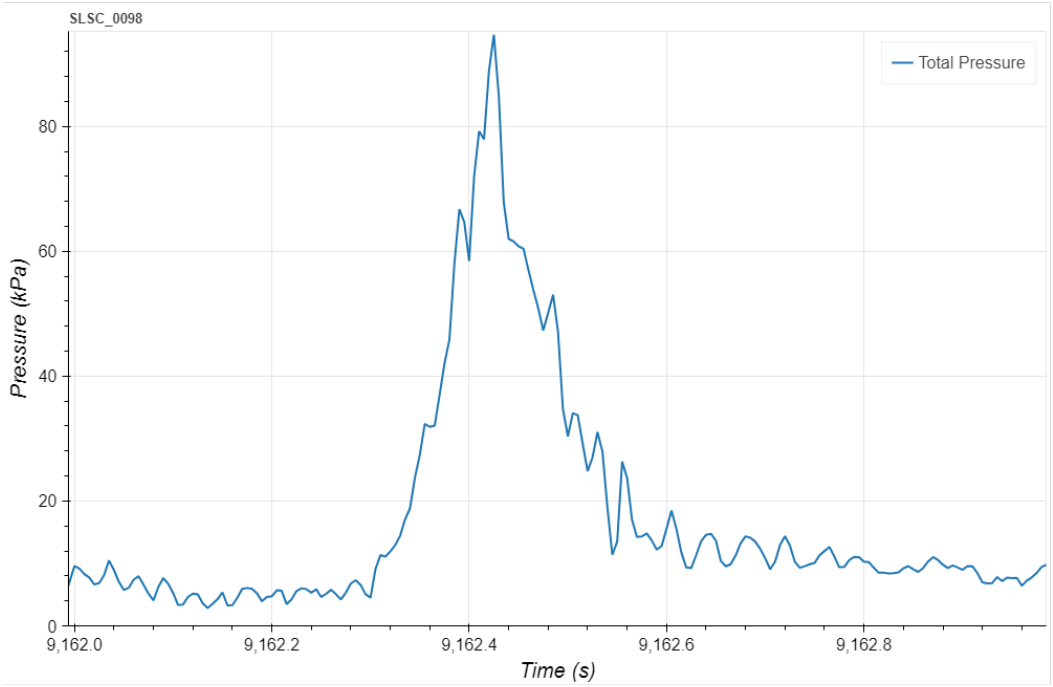

Figure 8 P_{max} 1 second peak for 1000 year ARI, 2024

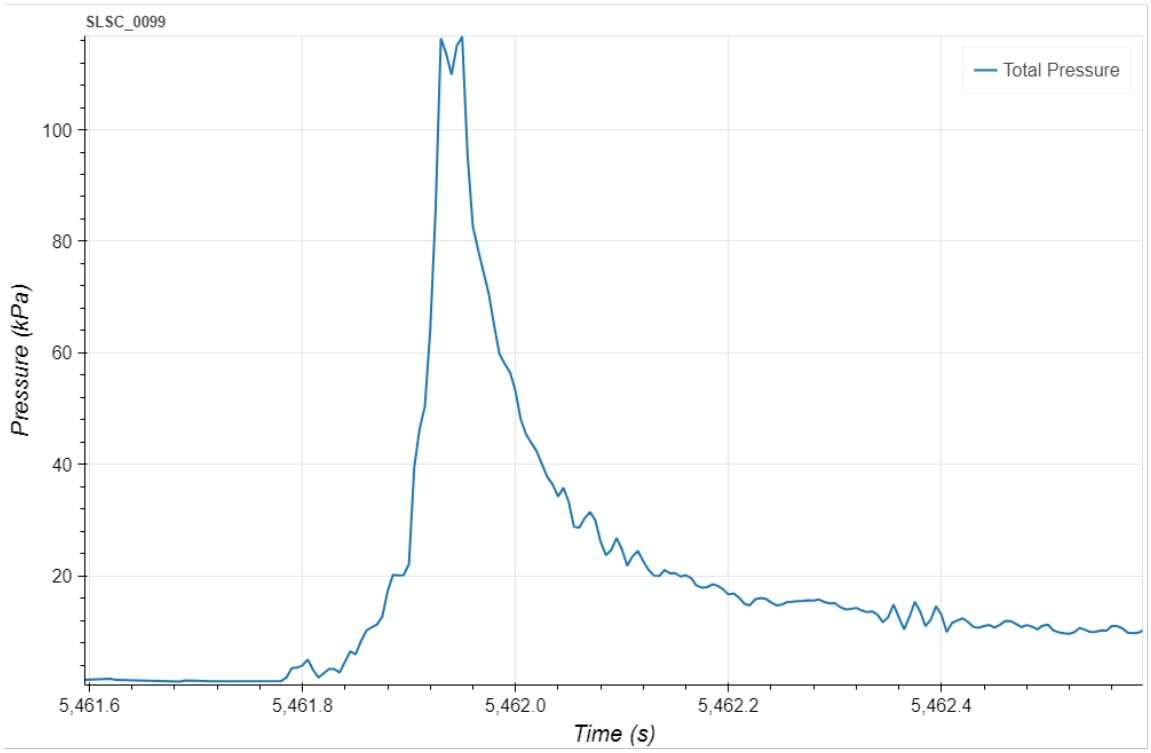

Figure 9 P_{max} 1 second peak for 1000 year ARI, 2084

Please contact James Carley on 0414 385 053 should you require further information.

Yours sincerely,

Dr Francois Flocard
Director, Industry Research