Australian Compliance Laboratory

Test Report

Report ID ACL1357 issued 25 March 2022

Testing a weldless steel guardrail assembly to the requirements of AS 1657 (2018), Appendix B.

Client details:	Barrier Group Pty. Ltd. 58-62 Separation Street, North Geelong, VIC 3215
Packaging tested:	Weldless steel guardrail assembly. Assembled with pillars and two-tier rails. The guardrail is secured together using cast steel joiners that incorporate grub screws. Pillar feet rotated 90 degrees to test for incorrect installation.

Job notes

1. **Guardrail sample.** The sample components were selected and supplied by the client. The components formed two sections of guardrail with incorporated three posts and four rails.
2. **Assembled by ACL.** The sample was assembled by ACL to the client's instructions, whereby the grub screws were torqued to 60Nm. The M12x60mm Ramset Dynabolts used for securing the footings were supplied by ACL. The concrete slab for mounting the sample was cast by ACL two weeks prior to testing (9 March 2022). Refer to Appendix B for the guardrail geometry and Appendix C for the concrete slab geometry.
3. **Retest.** After the sample was tested once, the footings of the guardrail were re-orientated 90 degrees so that they were in-line with the rail. The sample was then tested again with the *vertical point load on top rail* (being excluded from the schedule.

TESTING OF GUARDRAIL ING COMPRISING RAILS AND POSTS

Test method: AS 1657 (2018), Appendix B: Fixed platforms, walkways, stairways and ladders – Design, construction and installation. **Result criteria:** AS 1657 (2018), Appendix B5. **Testing location:** The tests were conducted at the laboratory plant.

The guardrail was reassembled as per the client's instructions in a concrete slab. The rail was then preloaded to 50% of the target test load for 1-minute before being subjected to each of the tests. The force was then gradually increased to the target test load and held for 1-minute, and then the deflection measured. The force was then removed for 2-minutes and then the residual deflection was measured. The test was conducted at ambient conditions. The same rail was used for all the tests in the order that they're presented.

Test name	Target test load	Actual test load	Result		
			Deflection at load	Residual deflection	Determination
Horizontal point load at top of post (B4.5)	600N	604.8N	7.0mm	0.5mm	Pass
Horizontal point load on top rail (B4.6)	600N	602.3N	8.0mm	0.5mm	Pass
Horizontal UDL on top rail (B4.8)	721N	728.4N	6.5mm	0mm	Pass
Horizontal point load at top of post (B4.9)	1200N	1206.6N	18.5mm	2.0mm	Pass
Horizontal UDL on top rail (B4.10)	1442.1N	1452.4N	26.0mm	5.0mm	Pass
Horizontal point load on top rail (B4.11)	1200N	1205.6N	20.0mm	0mm	Pass

Calculations:

$Test\ load = Pressure \times Area$

$Uniform\ distributed\ load\ (UDL)(N) = \ 2.06m\ rail\ length \times 350N/m = 721N$

$ULD\ tests, pneumatic\ ram\ spacing = 2.06m\ rail\ length \div 4 = 515mm$

Notes:

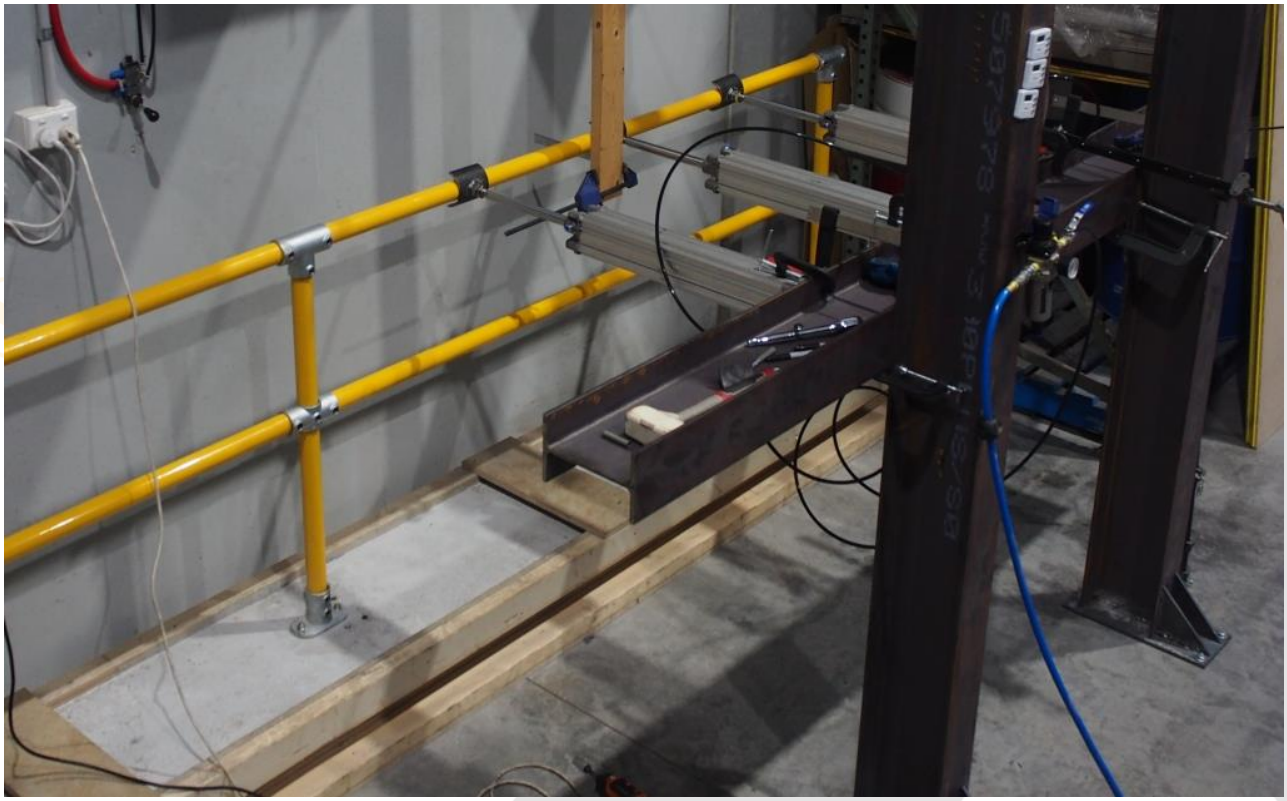
1. No permanent deflection was observed.
2. The test load was applied using pneumatic rams and the force was measured using a pressure transducer.
3. The uniform distributed load (UDL) tests were conducted using three pneumatic rams with a spacing of 515mm.

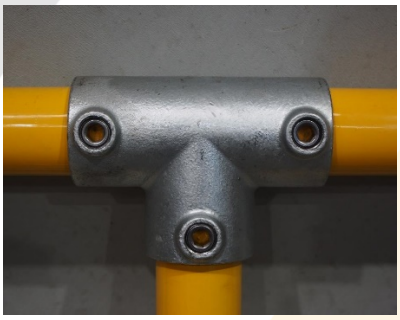
Instrumentation ID: PRES.01, RULE.04

Authorising signatory:

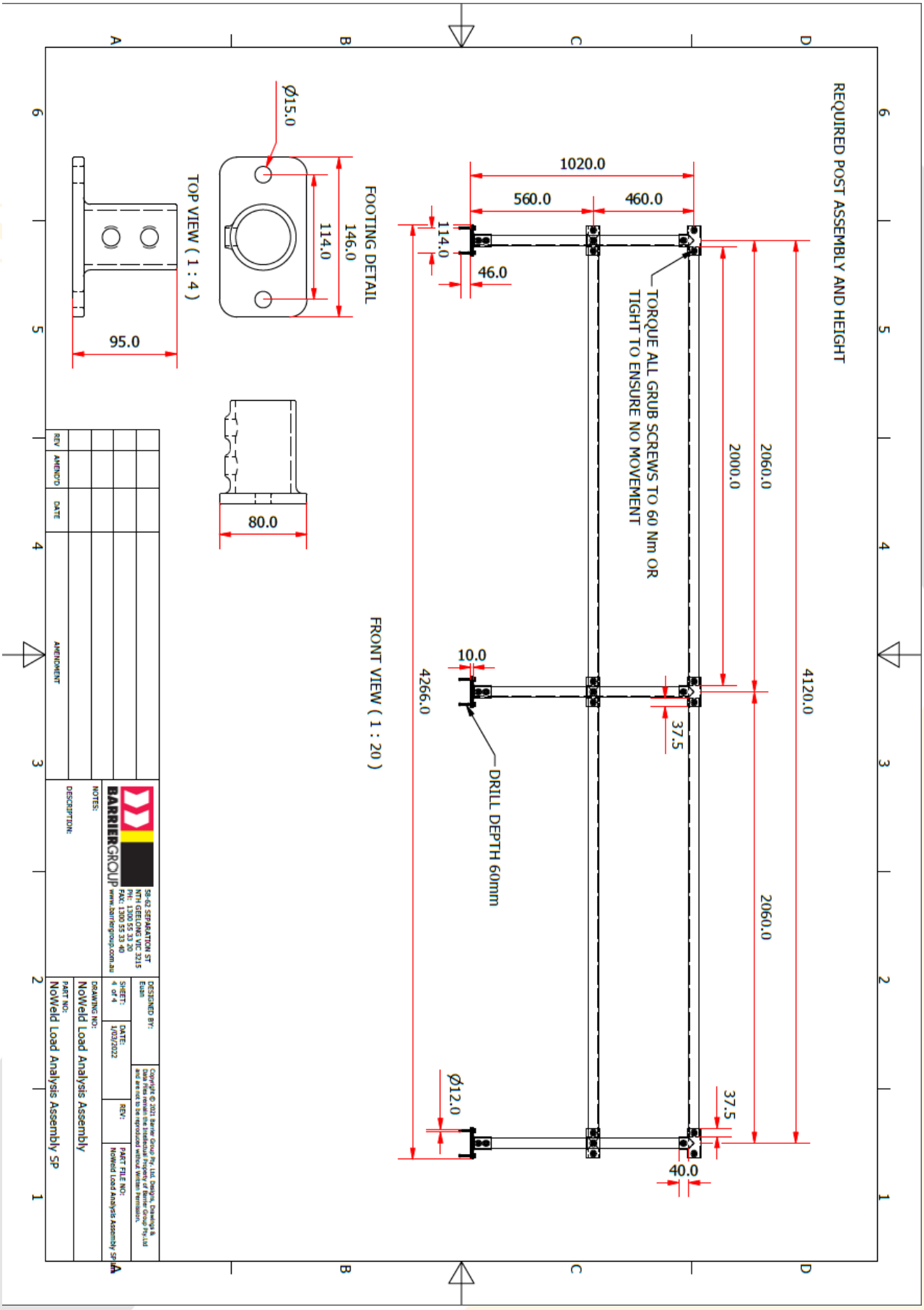
Harley Donkers, Senior Signatory Officer

Appendix A – Product photographs

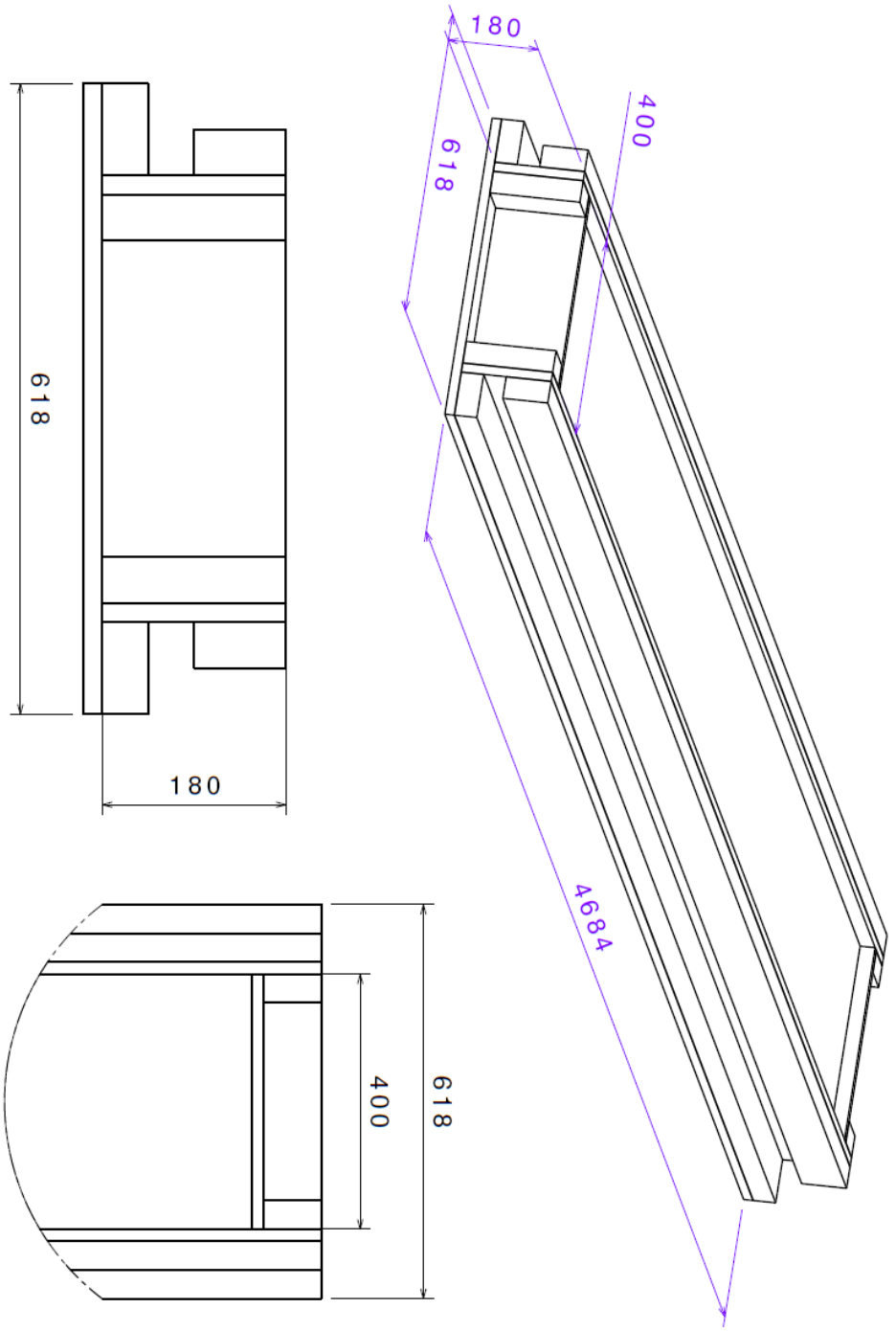




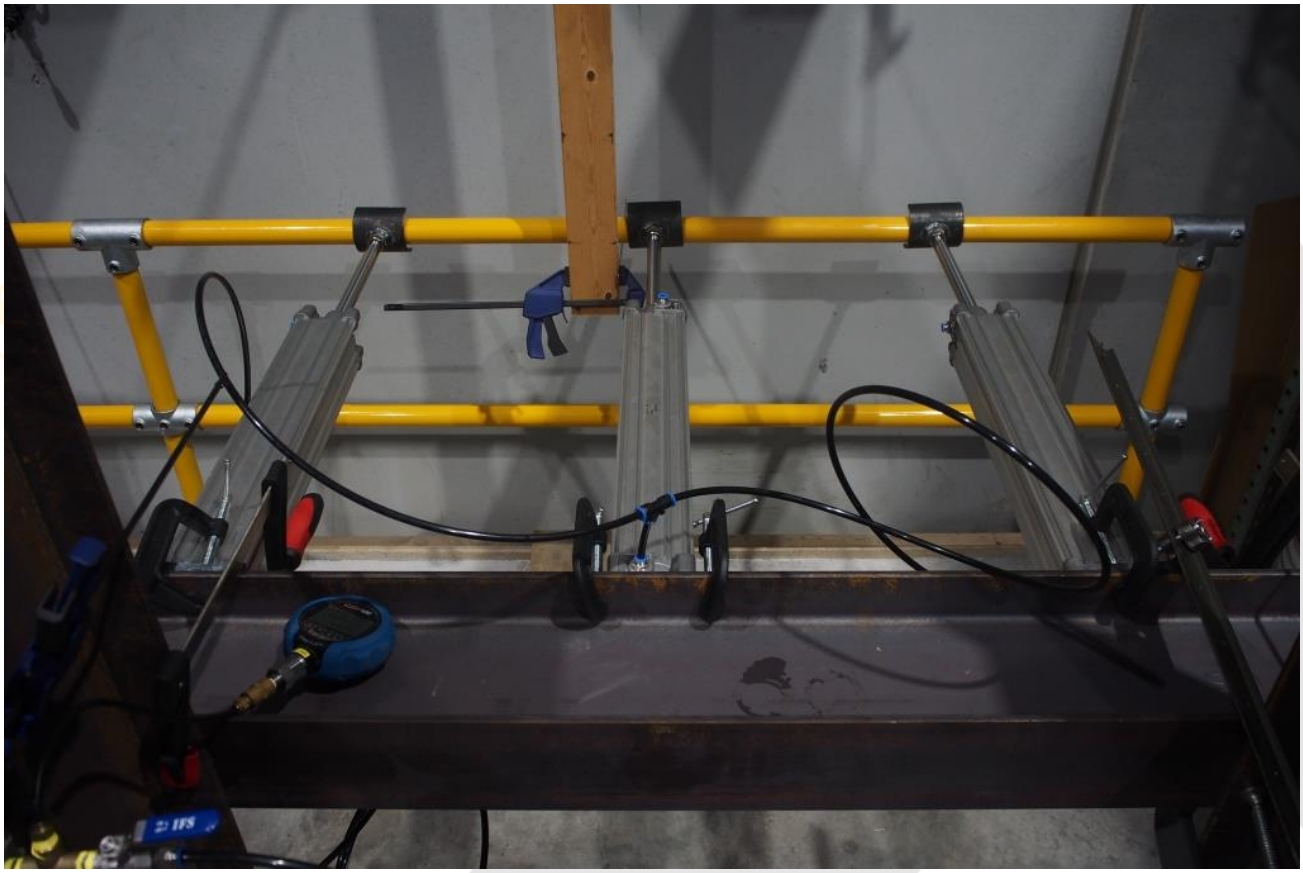
Appendix B – Product sketch



Appendix C – Concrete mould sketch



Appendix D – Uniform distributed load picture



Report information

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The packagings tested in this report were prepared as if for transport. The results of the reported performance tests only relate to those packagings tested. Thus, the use of other packaging methods or components may render the testing in this report invalid.

The information and opinions in this report have been compiled by ACL and are believed to be accurate at the time of issue. However, this report may be changed with written notice.

* Indicates details that have been nominated by the client for which they are responsible for.

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Table of revisions

Report ID	Date issued	Details of the change
ACL1357	25/03/2022	Original issue.

End of report