



TEST REPORT

Full scale bushfire deck test of
NewTechWood UltraShield® Naturale
decking boards in accordance with
AS 1530.8.1-2007

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NewTechWood, Ltd
19111 Walden Forest Drive Suite B
Humble, Texas, 77346, USA

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CONTACT INFORMATION

Exova Warringtonfire Aus Pty Ltd - ABN 81 050 241 524

NATA Registered Laboratory

Unit 2, 409-411 Hammond Road
Dandenong Victoria 3175
Australia

T: +61 (0)3 9767 1000

F: +61 (0)3 9767 1001

New South Wales

Suite 2002a, Level 20
44 Market Street
Sydney NSW 2000
Australia

T: +61 (0)2 8270 7600

F: +61 (0)2 9299 6076

Queensland

Northpoint, Unit 29, Level 6
231 North Quay
Brisbane QLD 4000
Australia

T: +61 (0)7 3238 1700

F: +61 (0)7 3211 4833

SIGNATORIES

Prepared by



Mandeep Kamal

Reviewed by



Steven Halliday

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CONTENTS

1	Construction Details	4
	Test Assembly	4
	Test Specimens	4
	Assembly and Installation Methods	4
	Orientation	4
2	Schedule of Components	5
3	Test Procedure	7
	Statement of compliance	7
	Variations to test method	7
	Pre-test conditioning	7
	Conditioning of timber components	7
	Ambient Temperature	7
	Test Duration	7
	Instrumentation and Equipment	7
4	Test Measurements	7
	Radiation Data	7
	Specimen Temperatures	7
	Observations	7
5	Test Results	8
6	Application of Test Results	8
	Variations from the Tested Specimens	8
	Uncertainty of measurement	8
APPENDIX 1	DRAWINGS OF TEST ASSEMBLY	9
APPENDIX 2	TEST OBSERVATIONS	11
APPENDIX 3	DIRECT FIELD OF APPLICATION	12
APPENDIX 4	INSTRUMENTATION POSITIONS	13
APPENDIX 5	TEST DATA	15
	A 5.1 Heat flux Received	15
	A 5.2 Specimen Temperatures	16
APPENDIX 6	PHOTOGRAPHS	17

1 CONSTRUCTION DETAILS

TEST ASSEMBLY

The test assembly comprised a nominal 1800mm wide x 750mm deep x 450mm high deck that was set within a 1800mm wide x 250mm deep recess formed within a nominal 3000mm x 3000mm wall system.

TEST SPECIMENS

The deck consisted of NewTechWood UltraShield® Naturale decking boards that were 138mm wide x 22.5mm thick, that were installed parallel to the wall system with 6.0mm nominal spacing between each board. The boards were secured to joists with TC-2 Decking Clips. The front fascia of the specimen consisted of a 1-off decking board horizontally installed. Stainless steel mesh was installed below the deck in order to simulate an enclosed sub-floor.

The wall system incorporated a timber frame of 90 x 45mm studs clad with 13mm Gyprock Fyrchek plasterboard and 6mm thick square edge CSR Cemintel fibre-cement board to the exposed side and 10mm standard plasterboard to the unexposed side.

The full description of the specimen is provided in Figures A1.1 to A1.4 and the 'Schedule of Components' in Section 2.

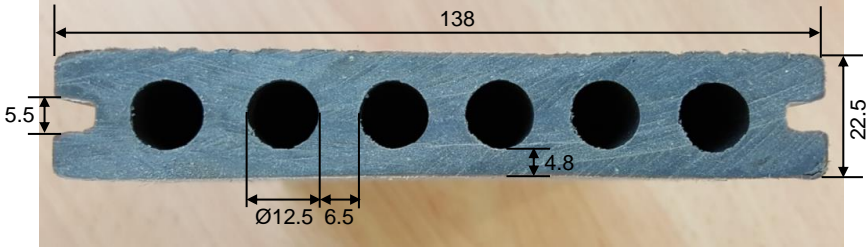
ASSEMBLY AND INSTALLATION METHODS

The wall system was constructed by EWFA representatives on the 4th March 2016. The deck specimen was constructed by EWFA representative on the 7th March 2016.

ORIENTATION

The test assembly was asymmetric and the external face with the assembled deck system was exposed to the radiant heat source. The front face of the deck was exposed to a radiant panel at an initial irradiance level of 29kW/m².

2 SCHEDULE OF COMPONENTS

Item	Description	
1	Name	NewTechWood UltraShield® Naturale decking boards
	Material	Wood Plastic Composite consisting of two layers, the core and the shield. The core is inner layer composed of 60% recycled wood fibre and 40% recycled high density polyethylene (HDPE) by weight. The shield is the outer layer that caps or wraps around the entire core 360 degrees and is finished with a natural wood grain and variegated colouring. (provided by client) The boards incorporated circular hollow grooves (Ø12.5mm) along its length.  <p style="text-align: right;">*dimensions in millimetres</p>
	Size	138mm wide × 22.5mm thick (measured)
	Installation	Positioned on the top side of the joists parallel to the wall system. There was a gap of 6.0mm between boards. The 1 st board was cut to 50mm width so that 1 st joint was under the crib. One full width board was used as fascia and positioned such that the top of the board was in line with decking surface.
	Fixing	The decking boards were secured with TC-2 Decking Clips (Item 2) and decking screws (Item 3) at every joint to joist below.
2	Name	TC-2 Decking Clips with decking screws
	Material	TPO Polymer clips 8g × 35mm long, torx head, Coated stainless steel screws
	Installation	Installed at every decking board joint (inserted into the board grooves) and fixed into the joist using the decking screws.
3	Name	Cap-Tor® xd - Headcote® Stainless 316 Decking Screws
	Size	#10 × 65mm long, torx head
	Installation	Used to fix the first and last decking board (Item 1) to the joists underneath. The screws were located 25mm from the board edges.
4	Name	CSR Cemintel fibre-cement board
	Size	6mm thick
	Density	1468kg/m ³ (Measured)
	Installation	Fixed to the exposed side of the wall on top of Item 5 at nominal 200mm centres with 6g × 40mm long needle point screws.
5	Name	Gyprock Fyrchek Plasterboard
	Size	13mm thick
	Density	847 kg/m ³ (measured)
	Installation	Fixed to the exposed side of the wall directly to the wall framing at nominal 400mm centres with 32mm long × 6g needle point screws.

Item	Description	
6	Name	Gyprock Standard Plasterboard
	Size	10mm thick
	Density	691 kg/m ³ (measured)
	Installation	Fixed to the unexposed side of the wall at nominal 400mm centres with 32mm long x 6g needle point screws.
7	Name	Eaves sheet lining
	Material	4.5mm thick cement sheet
	Density	1468 kg/m ³ (measured)
	Location	Nominal 250mm width of cement sheet was located into the top of the recess formed in the wall system approximately 1800mm long and secured to the eaves framing with two screws at each support location.
8	Name	Sub-floor of deck
	Material	KD Hardwood
	Size	90mm x 45mm
	Density	721 kg/m ³
	Moisture Content	Average of 10.6% for the joists (measured) Average of 10.6% for the bearers (measured)
	Fixings	2-off 3mm diameter x 75mm long nails on each joist to the bearer
	Installation	5-off 750mm long lengths to form the joists that were located perpendicular to the wall, at nominal 450mm centres. 2-off 1800mm lengths to form the bearers were located parallel to the wall; the bearers were located at the front and back edge of the specimen.
9	Name	Wall framing
	Material	90mm x 45mm MGP10 timber
	Density	540 kg/m ³ (measured)
	Installation	Assembled using 3 inch gun nails
10	Name	Metal mesh
	Material	Stainless steel
	Size	0.4mm thick with 1.87mm square holes.
	Installation	The mesh was stapled to the bearers and front fascia, to ensure no gaps greater than 3mm in diameter to the subfloor area.

3 TEST PROCEDURE

STATEMENT OF COMPLIANCE

The test was performed in accordance with the requirements of AS 1530.8.1-2007 Section 21.

VARIATIONS TO TEST METHOD

None

PRE-TEST CONDITIONING

The construction of the specimen was finished on the 7th March 2016. During the construction period, the test specimen was subject to normal laboratory temperatures and relative humidity conditions.

CONDITIONING OF TIMBER COMPONENTS

The timber components of the specimen and specimen supporting construction were within the limits of AS 1530.8.1-2007.

AMBIENT TEMPERATURE

The ambient temperature at the start of the test was 40°C and varied between 40°C and 43°C during the test.

TEST DURATION

The test was terminated at 60 minutes in accordance with the procedure of AS 1530.8.1-2007.

INSTRUMENTATION AND EQUIPMENT

The instrumentation was provided in accordance with AS 1530.8.1-2007 as detailed below:

The radiation received at the front of the deck system was measured by a heat flux meter for the radiant exposure portion of this test.

A second heat flux meter was placed in the centre of the wall to provide additional information. The heat flux meter positions are shown on Figure A4.1 in Appendix 4.

The internal specimen temperatures were measured by Type K thermocouples with wire diameters less than 0.5 mm diameter soldered to 12 mm diameter × 0.2 mm thick copper discs covered by 30 mm × 30 mm × 2.0 mm inorganic insulating pads. The thermocouples' positions are shown on Figure A4.2 in Appendix 4.

A pilot ignition source was available to assess any areas of the specimen producing significant quantities of volatiles.

A 3±0.1mm gap gauge was available during the test to assess the performance under the criteria for integrity.

Crib was conditioned for at least 24 hours in a conditioning oven and removed 1 hour prior to the commencement of the test. Crib was weighed to confirm that it was within the 0.25±0.05kg mass required by the standard. The crib was lit over a 3 minute period; 30 seconds per exposed side with an additional 30 seconds of overall coverage using an acetylene torch with a Type 551 Size 8 × 10 tip.

4 TEST MEASUREMENTS

RADIATION DATA

Radiation data is provided in A 5.1 in Appendix 5.

SPECIMEN TEMPERATURES

Specimen temperature data is provided in A 5.2 in Appendix 5.

OBSERVATIONS

A table that includes observations of the significant behaviour of the specimen and details of the occurrence of the various performance criteria specified in AS 1530.8.1- 2007 is provided in Appendix 2. Photographs of the specimen are included in Appendix 6.

5 TEST RESULTS

The specimens listed below achieved the following performance when tested in accordance with AS 1530.8.1- 2007.

Performance Criteria	Time to Failure (min.)	Position of Failure
Formation of through-gaps greater than 3 mm	No Failure	-
Sustained flaming for 10 s on the non-fire side	No Failure	-
Extent of flaming exceeding 500mm limits on decking boards	No Failure	-
Flaming on the fire-exposed side at the end of the 60 minute test period.	No Failure	-
Radiant heat flux 365mm from the non-fire side exceeding 15 kW m ⁻²	Not applicable	-
Mean and maximum temperature rises greater than 140K and 180K	Not applicable	-
Radiant heat flux 250 mm from the specimen, greater than 3 kW m ⁻² between 20 min and 60 min	Not applicable	-
Mean and maximum temperature of internal faces exceeding 250°C and 300 °C respectively between 20 min and 60 min after commencement of test	No Failure	-
Crib class	A	Peak heat flux
Test Result	BAL A29	

6 APPLICATION OF TEST RESULTS

TEST LIMITATIONS

The results of this fire test may be used to directly assess fire hazard, but it should be recognized that a single test method will not provide a full assessment of fire hazard under all fire conditions. The results only relate to the behaviour of the specimen of the element of the construction under the particular conditions of the test; they are not intended to be the sole criteria for assessing the potential fire performance of the element in use nor do they necessarily reflect the actual behaviour in fires.

VARIATIONS FROM THE TESTED SPECIMENS

This report details the methods of construction, the test conditions and the results obtained when the specific element of construction described herein was tested following the general procedure outlined in AS1530.8.1. Any significant variation with respect to size, constructional details, loads, stresses, edge or end conditions, other than those allowed under the field of direct application in the relevant test method, is not addressed by this report. It is recommended that any proposed variation to the tested configuration other than as permitted under the field of direct application specified in Appendix 3 should be referred to the test sponsor in the first instance to obtain appropriate documentary evidence of compliance from Exova Warringtonfire Aus Pty Ltd or another Registered Testing Authority.

UNCERTAINTY OF MEASUREMENT

Because of the nature of fire resistance testing and the consequent difficulty in quantifying the uncertainty of measurement of fire resistance, it is not possible to provide a stated degree of accuracy of the result.

APPENDIX 1 DRAWINGS OF TEST ASSEMBLY

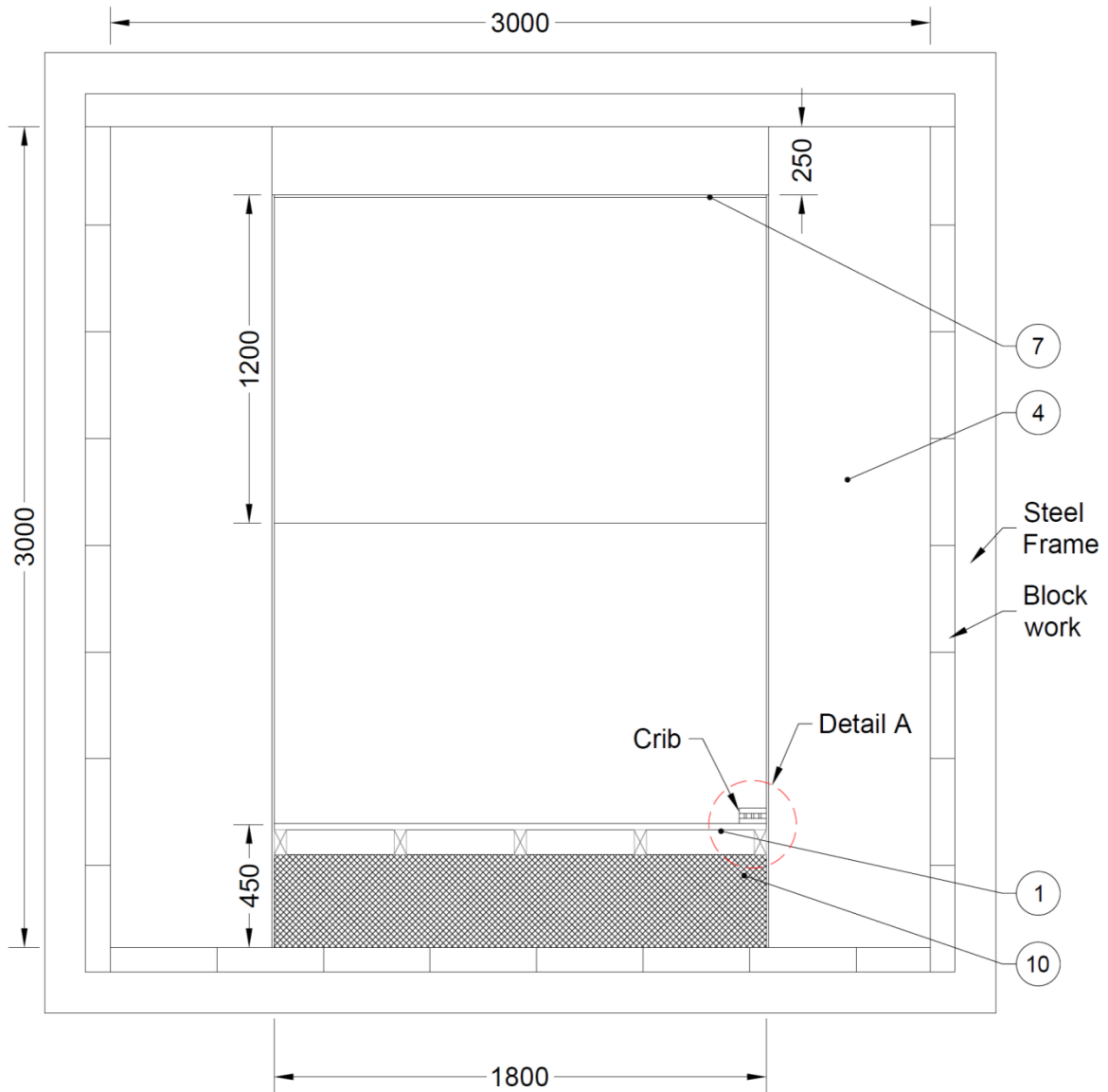


Figure A1.1: Exposed side elevation of test specimen

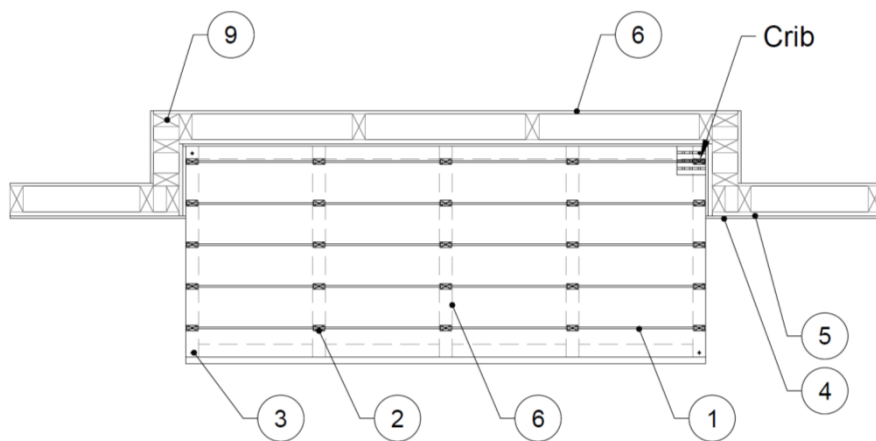


Figure A1.2: Horizontal section through test specimen

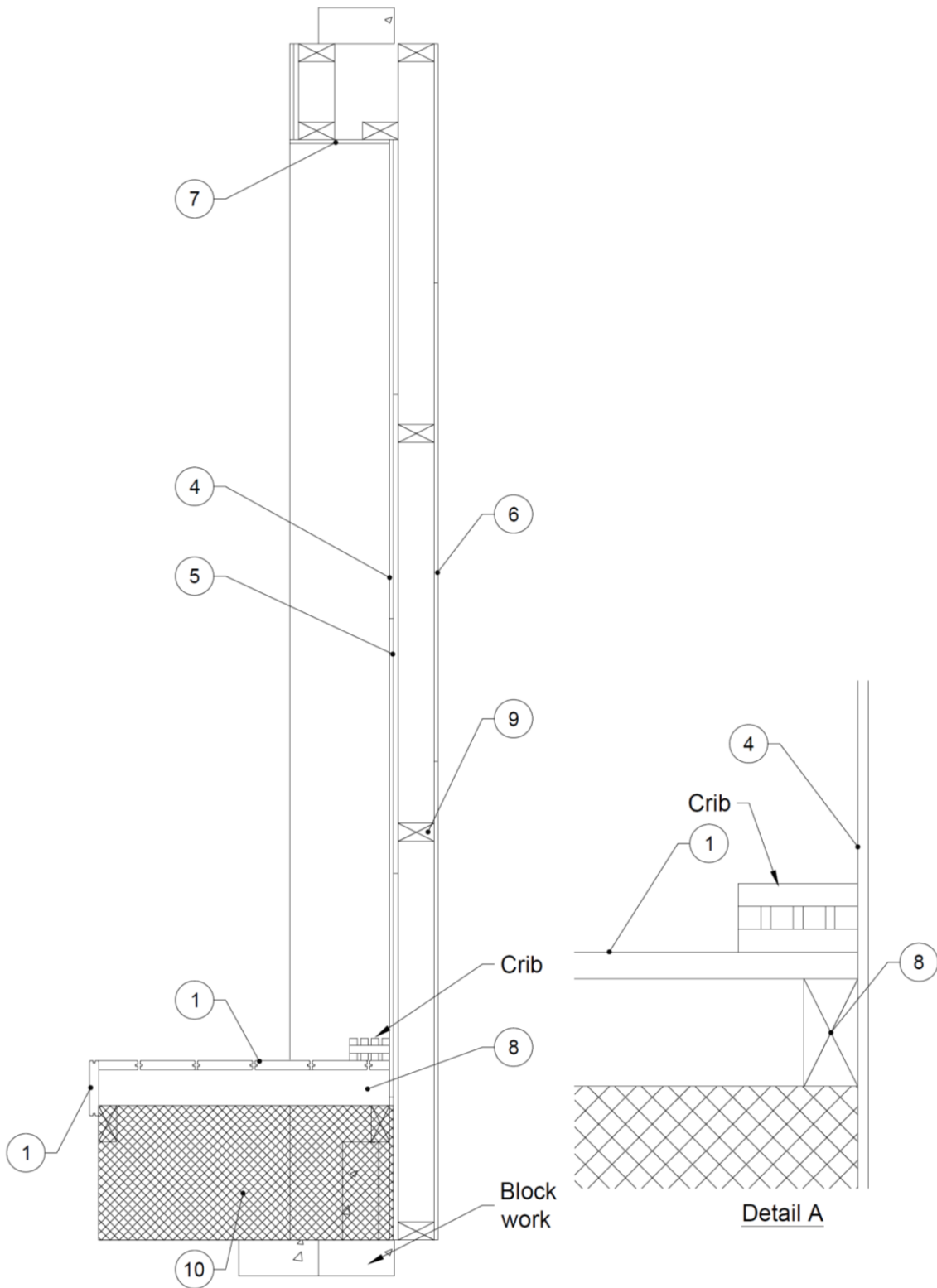


Figure A1.3: Vertical cross section through test specimen

APPENDIX 2 TEST OBSERVATIONS

The following include observations of the significant behaviour of the specimen.

Time		Observation
min	sec	
0	00	The bushfire test was commenced and the ambient air temperature was approximately 40°C. The ignited crib was positioned in the south corner of the wall.
0	07	The screen was removed and the specimen was exposed to the radiant heat profile for BAL 29 as specified in AS1530.8.1- 2007.
0	30	Smoke emissions from deck fascia had become evident.
1	15	Darkening of deck fascia had become evident.
2	30	Cracking had become evident on fascia surface in line with the screw locations at joists.
4	00	Flaming of decking board had reached approximately 180mm from the back wall at the crib location.
10	00	Screen positioned in front of the furnace and exposure to the radiant heat profile for BAL 29 ceased. Monitoring of the specimen to the criteria specified in AS1530.8.1-2007 continued.
50	00	Flaming still evident from decking board close to the back wall at crib location. Board along the back wall had lifted up approximately 200mm from the internal corner. Bubbling had become evident on the underside of decking board at crib location.
58	00	Flaming of decking board at crib location had self-extinguished.
60	00	The bushfire test was stopped in accordance with the procedures of AS 1530.8.1-2007.

APPENDIX 3 DIRECT FIELD OF APPLICATION

A 3.1 GENERAL

AS 1530.8.1-2007 states that the results of the fire test contained in the test report are directly applicable, without reference to the testing authority for a technical opinion, to similar constructions where one or more of the following changes have been made provided no individual component is removed or reduced:

- a) Increase in thickness of solid decking material.
- b) Increase in cross-section of bearers and joists.
- c) Increase in the size of the deck.

APPENDIX 4 INSTRUMENTATION POSITIONS

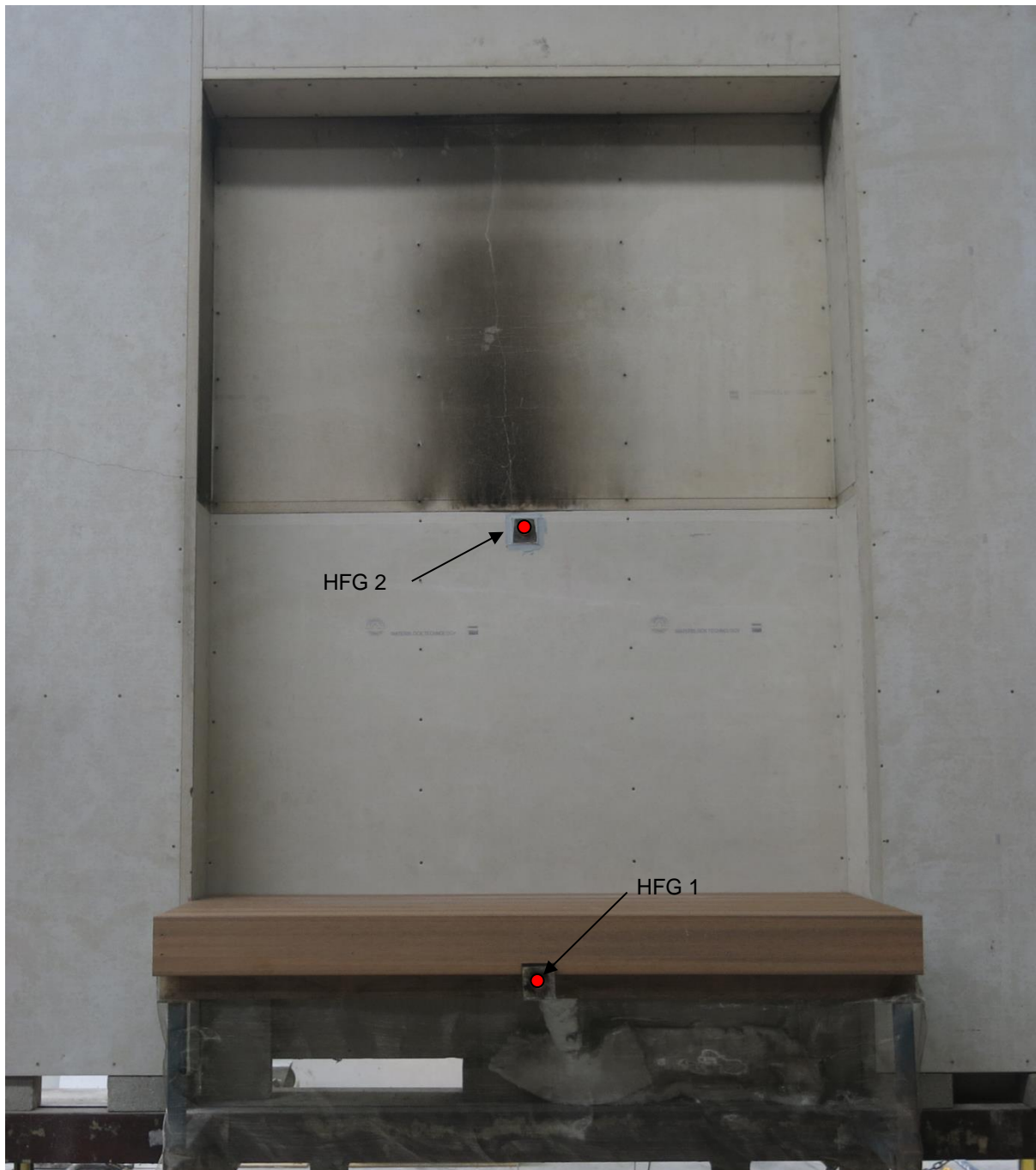


Figure A4.1: Heat Flux Gauge locations on exposed side
HFG 1 centrally located across the deck, nominal 50mm below the bottom of the deck.
HFG 2 located at the centre of the wall.

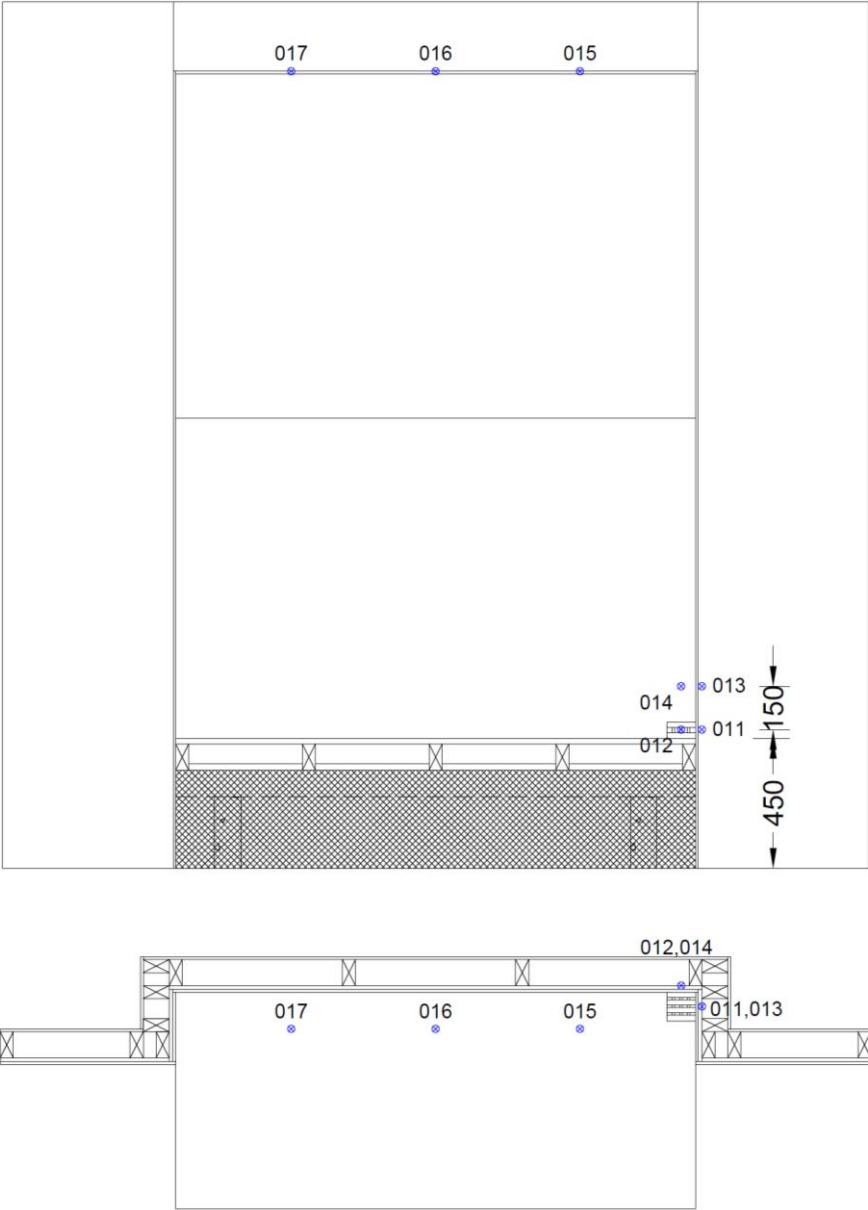


Figure A4.2: Thermocouple locations

APPENDIX 5 TEST DATA

A 5.1 HEAT FLUX RECEIVED

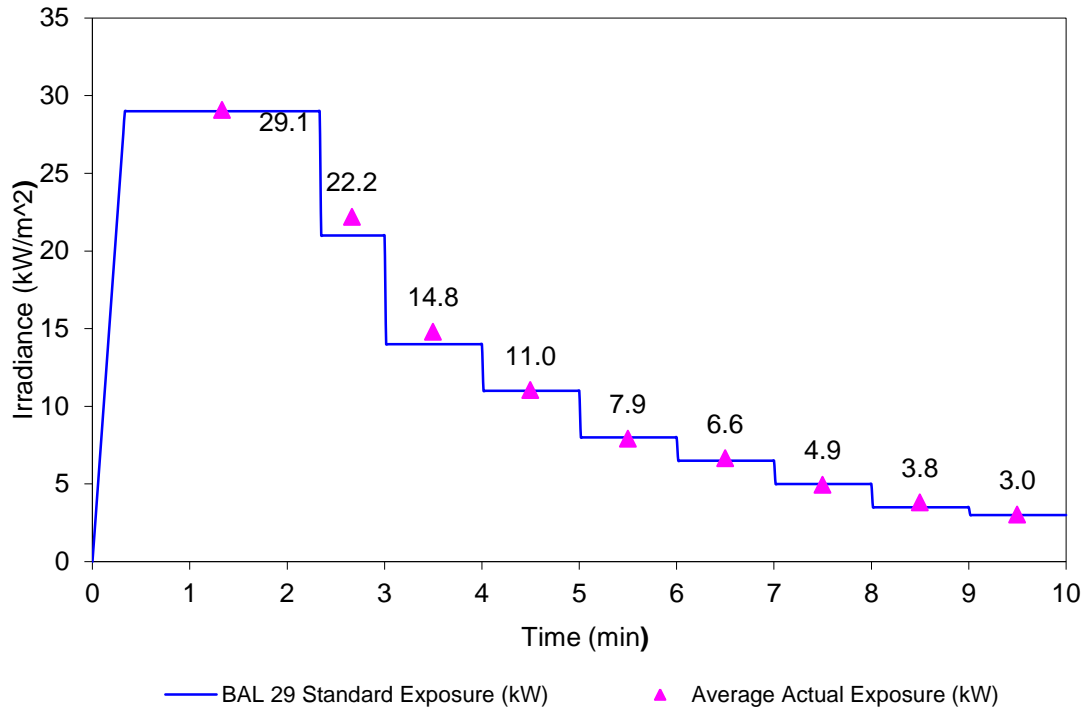


Figure A5.1: Irradiance levels received at the front of the decking system

A 5.2 SPECIMEN TEMPERATURES

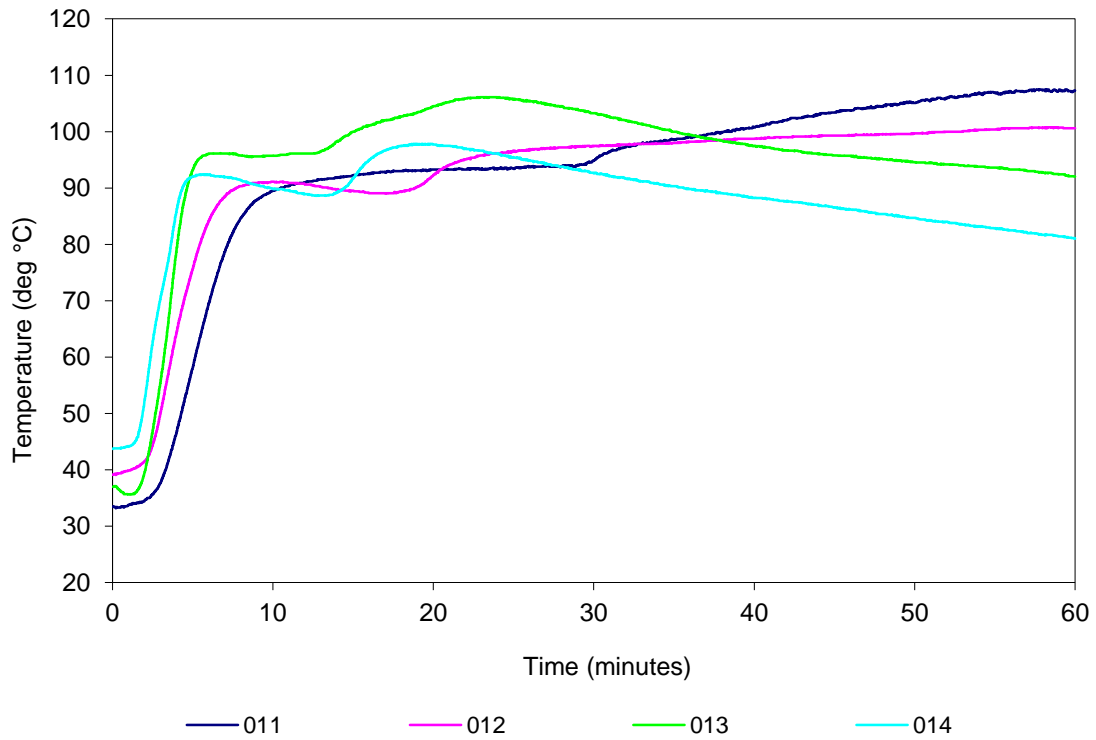


Figure A5.2: Crib Specimen temperatures. Temperatures vs. time
Thermocouples located where the crib was positioned on the deck

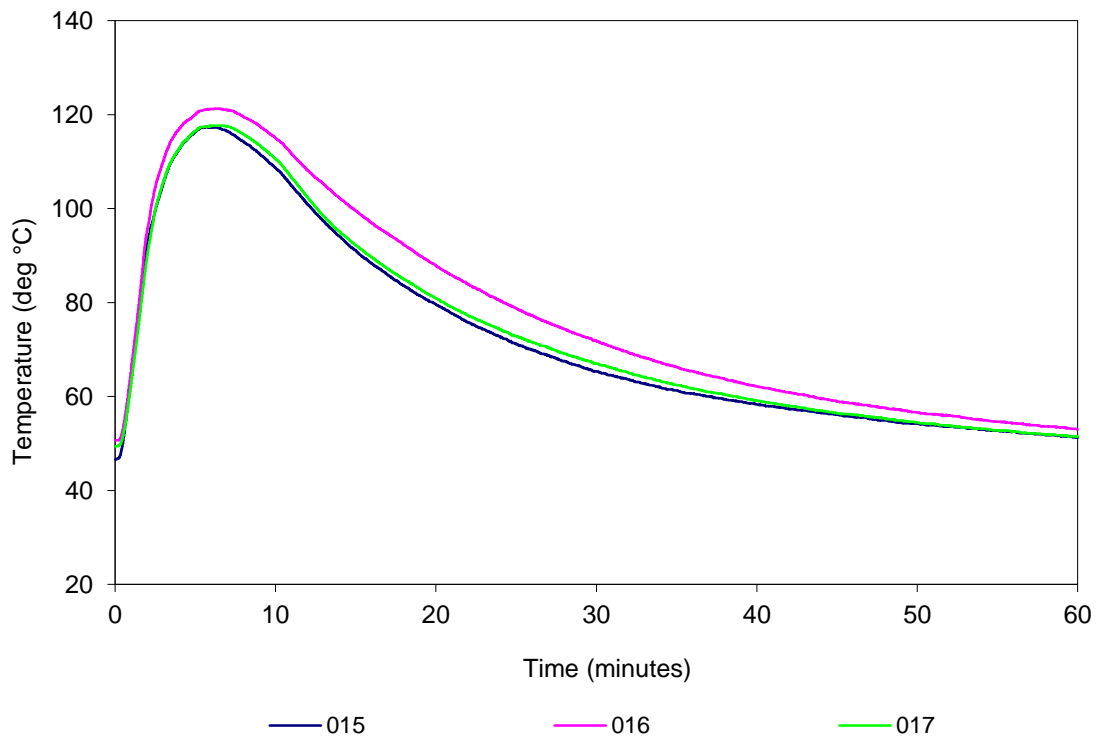


Figure A5.3: Eaves temperatures. Temperatures vs. time

APPENDIX 6 PHOTOGRAPHS



Figure A6.1: Exposed face of specimen before commencement of the fire-resistance test



Figure A6.2: Exposed face of specimen at the end of the test



Figure A6.3: Crib location at the end of the test.