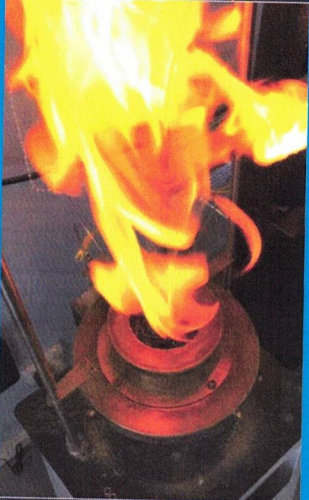
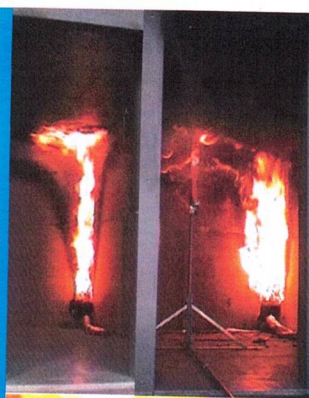


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Embercoat Primer

TEST REPORT RADIANT HEAT EXPOSURE BAL 29 INDICATIVE TESTING

IGNL-100019-23R I01R00

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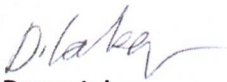
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1 INTRODUCTION

1.1 GENERAL

The purpose of this report is to document three indicative radiation impact tests undertaken by Ignis Labs on the products named as Embercoat primer provided by Pepperberg Pty Ltd, with each test specimen incorporating a different coating system, to establish their capacity to withstand a radiant heat level of 29 kW/m² in line with the levels established by AS 3959 under a Bushfire Attack Level (BAL) of 29, respectively, as well as AS 1530.8.1 being the process of testing. The testing was undertaken utilising a radiant heat panel as well as a rolling bed to move the sample from the radiate heat panel at the set distances of AS 3959.

1.2 COMPLIANCE

In accordance with the National Construction Code Volume One and Two, buildings located in bushfire prone areas are to comply with the requirements of AS 3959.

This assessment reviews the result of Embercoat primer as well as the radiation impact of the product when subjected to BAL 29 conditions set by AS 1530.8.1. Temperature data was recorded in accordance with the Clause 14.3.2 of AS 1530.8.1. No thermocouples were placed in the internal face of construction. The results achieved at a particular peak heat flux level automatically apply to lower heat flux levels with the same testing conditions.

This report is generated for external material performance and recording of observation requirements by the sponsor. It is not generated for compliance with AS 1530.8.1, AS 3959 or the National Construction Code.

1.3 SPECIMEN

The tested specimen named as Embercoat primer. The sponsor described that the specimen as a fire-retardant coating manufactured by Shieldcoat. It has a nominal dimension of 450 mm by 600 mm. It has an end use as external coating for existing structures.

The received specimens were three solid panels of timber with different colours of coating applied to the exposed face. Three specimens were in clear coating, pale grey coating and dark grey coating respectively. The timber panels had a measured thickness of 26 mm.

1.4 SPONSOR

Pepperberg Pty Ltd

PO Box 253

Buddina QLD 4575

1.5 TEST NUMBER

The Ignis Labs reference test number is IGNL-100019-23R.

1.6 TEST DATE

The BAL 29 indicative radiant heat test was conducted on 28 January 2026.

2 DESCRIPTION OF SPECIMEN

2.1 GENERAL

The tested specimen named as Embercoat primer. The sponsor described that the specimen as a fire-retardant coating manufactured by Shieldcoat. It has a nominal dimension of 450 mm by 600 mm. It has an end use as external coating for existing structures.

The received specimens were three solid panels of timber with different colours of coating applied to the exposed face. Three specimens were in clear coating, pale grey coating and dark grey coating respectively. The timber panels had a measured thickness of 26 mm.

Three tests under a Bushfire Attack Level of 29 were undertaken, and the specimen characteristics are listed below.

- Specimen height (mm): 600 mm (Sp1), 600 mm (Sp2), 600 mm (Sp3)
- Specimen width (mm): 450 mm (Sp1), 450 mm (Sp2), 450 mm (Sp3)
- Specimen thickness (mm): 26.91 mm (Sp1), 26.44 mm (Sp2), 26.93 mm (Sp3)
- Specimen colour: Clear (Sp1), Pale grey (Sp2), Dark grey (Sp3)

The specimens before the test are shown below:

FIGURE 1:

TEST SPECIMEN IMAGE



2.2 ORIENTATION

The specimen was tested in a vertical position where the radiation was impacted centrally.

2.3 CONDITIONING

The specimens were kept in a dry and laboratory conditioned space being maintained at 20 °C prior to the test being conducted.

2.4 SELECTION, CONSTRUCTION AND INSTALLATION OF THE SPECIMEN

The specimen was sampled and fabricated by the test sponsor. Ignis Labs was not involved in the selection of the materials. Ignis Labs was only involved to install the specimen to the testing machine.

The specimen was clamped to the specimen holder in four places. A woven metal radiant panel was used in lieu of ceramic tiles.

3 EQUIPMENT

3.1 RADIANT PANEL

The radiant panel was a 300 mm x 300 mm burner with a woven steel mesh and an air fuel mix of LPG.

3.2 RADIANT PROFILE

The radiant panel was heated to a point where at a distance from the panel 29 kW/m^2 was received on the specimen. The following table sets the radiation values and distances from the burner to receive the respective radiation value set in accordance with Table 14.3.1 of AS 1530.8.1. Calibration of the temperatures was undertaken prior to the test to ensure the distances replicated the heat flux set in AS 1530.8.1.

FIGURE 2:

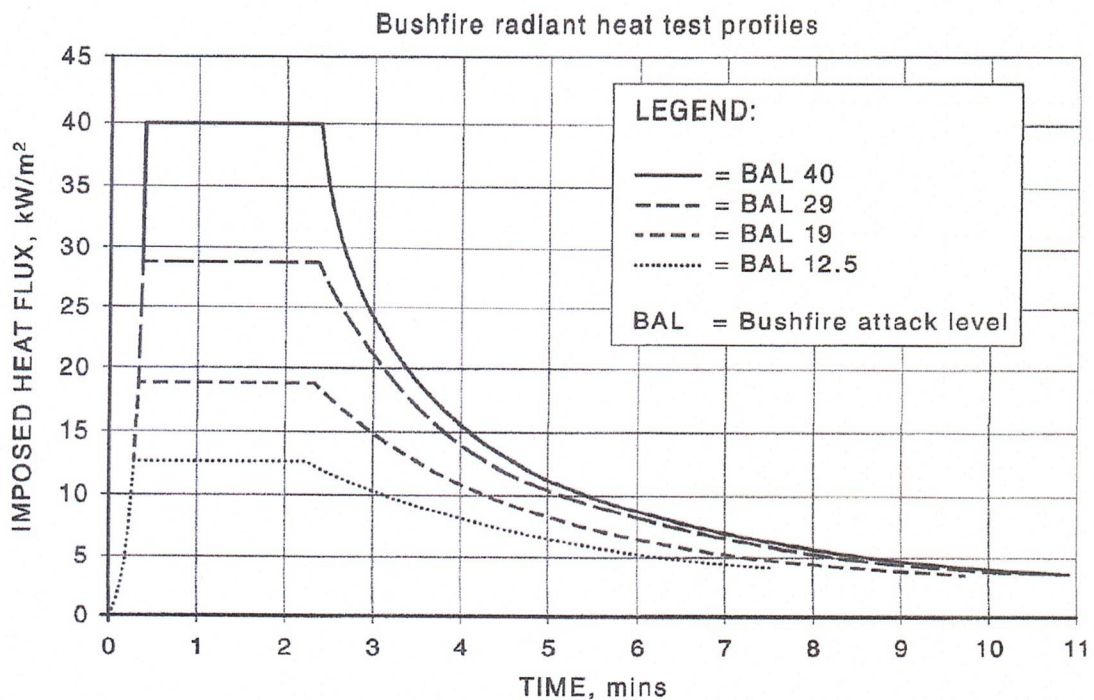
RADIANT IMPACT AND TIME

Bushfire Attack Level (BAL)	Incident Radiation kW/m^2	Time from start of test (s)								
		20-140	140-180	180-240	240-300	300-360	360-420	420-480	480-540	540-600
High	29	Min 29	21	14	11	8	6.5	5	3.5	3
Distance (mm)		180	235	315	365	442	497	570	695	750

The test profile for the bushfire testing is detailed below. After 11 minutes the panel is maintained for observation for up to 60 minutes. Piloted ignition sources were provided to areas which showed signs of releasing volatiles that may ignite. The following graph extracted from AS 1530.8.1 details the radiation profile.

FIGURE 3:

GRAPH OF RADIANT IMPACT OVER TIME



3.3 MEASUREMENT SYSTEM

The panels surface temperatures and rear temperature was measured by a radiant thermal probe and recorded within a table of notes to provide an indicative thermal impact.

Observations were undertaken of the panel as per the acceptance criteria.

4 ACCEPTANCE CRITERIA

Regards to AS 1530.8.1 Clause 14.4, the following conditions on the test performance of the specimen used as building exterior shall not be permitted:

- Formation of an opening with a diameter greater than 3 mm during the 60-minute test period.
- Sustained flaming for 10 s on the non-fire side during the 60-minute test period.
- Flaming on the fire exposed at end of 60-minute test period.
- Mean and Max temperature rise greater than 140 K and 180 K on the non-fire side.
- Mean and max temperature of internal face exceeding 250 °C and 300 °C between 20 min and 60 min after the commencement of test.
- Radiant heat flux 365 mm from the non-fire side of the specimen in excess of 15 kW/m² from glazed and uninsulated areas during the 60 min test. This element has not been evaluated due to the size of the test apparatus.
- Radiant heat flux 250 mm from the fire-exposed face of the specimen greater than 3 kW/m² between 20 min and 60 min after the commencement of the test. This element has not been evaluated due to the size of the test apparatus.

5 DEPARTURE FROM THE STANDARD

The burner size was 300 mm x 300 mm in lieu of 3 m x 3 m as established by AS 1530.8.1. The intent of the testing was to determine the likelihood of the panels having capacity to withstand a heat flux of 29 kW/m² when simulated to the requirements of AS 1530.8.1. No timber crib was applied during the whole test.

The test process involved moving the specimen back away from the radiant panel beginning at 29 kW. The average is the radiation received around the perimeter of the specimen. Approximately a 40 % reduction occurs from the centre to the outer side of the specimen.

6 TEST RESULTS

The test shows the Embercoat primer does have capacity to withstand a radiant heat level 29 kW/m² inline with the levels established by AS 3959 under a Bushfire Attack Level of 29 and demonstrate the impact of the particular level of radiation on the specimen.

6.1 CRITICAL OBSERVATIONS

Specimen 1 exhibited rapid charring and discolouration upon exposure to radiant heat. Peak smoke was observed at approximately 2 minutes. The clear coating on the exposed face of the specimen exhibited slight bubbling between 1 and 3 minutes, and popping noises were noted between 1 and 2 minutes. Discolouration reached its maximum observed extent at approximately 4 minutes, after which no further visible changes were observed for the remainder of the test. No ignition was observed.

Specimen 2 exhibited charring from the commencement of heat exposure until approximately 4 minutes, after which no further visible changes were observed. Smoke release was observed between 1 and 4 minutes. No ignition was observed.

Specimen 3 exhibited charring from the commencement of heat exposure until approximately 4 minutes, after which no further visible changes were observed. Smoke release was observed between 1 and 6 minutes. Intermittent flashes of flame were observed between 1:22 and 2:00. Ignition due to radiant heat was observed between 2:17 and 2:40. A second ignition event, attributed to the pilot flame, was observed between 3:43 and 5:03.

As a result, the test specimen is considered likely to satisfy the requirements of BAL 29.

With the test method deviations, the test result shall only be used for indicative or guidance purpose.

The following figures detail results of the tested specimen.

FIGURE 4:

POST TEST SPECIMEN - FRONT VIEW

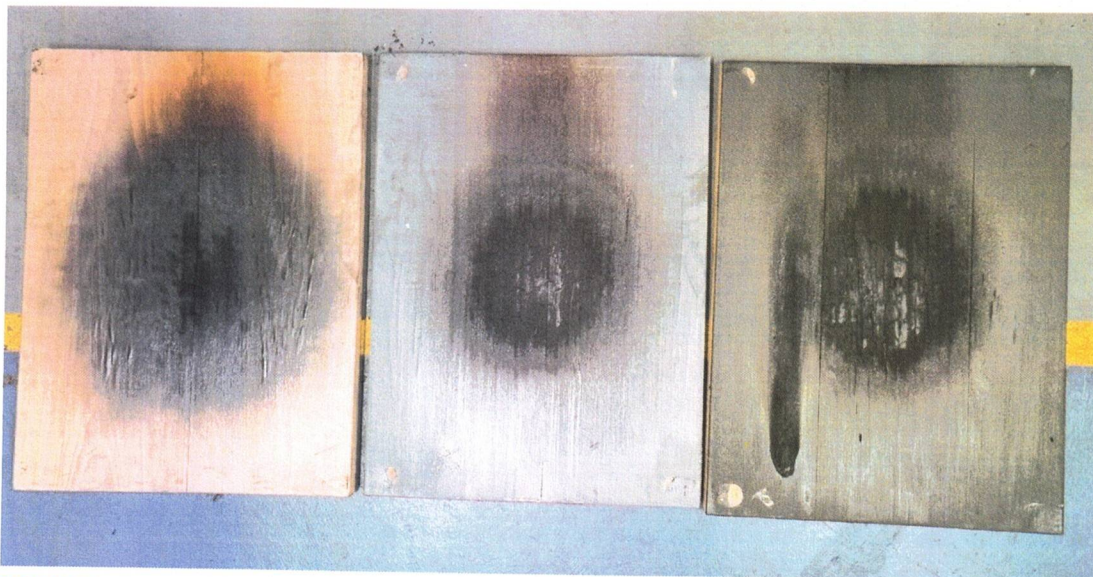
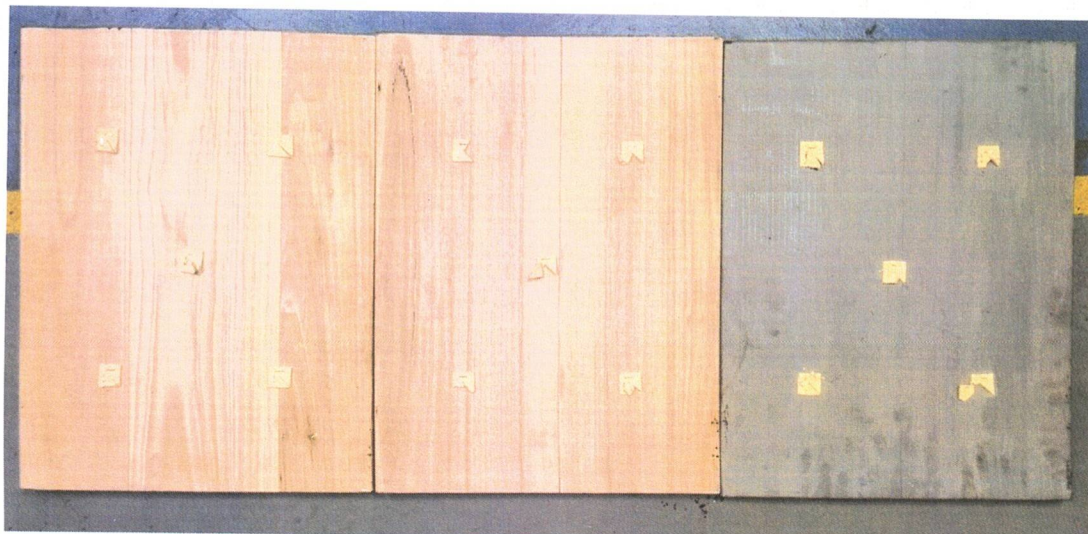


FIGURE 5:

POST TEST SPECIMEN - BACK VIEW



The specimen temperature on the non-fire exposure side was monitored by five thermocouples distributed as the figure above.

The following graph shows the temperature of the test specimen on the non-fire side of the test specimen. It was observed that none of the specimen temperature measured at all five locations on the non-fire side didn't exceed the permissible limit of 180 K above the initial temperature during the test. The mean temperature didn't exceed the permissible limit of 140 K above the initial temperature.

FIGURE 5:

Temperature of the specimen 1 on the five different locations on the non-fire side

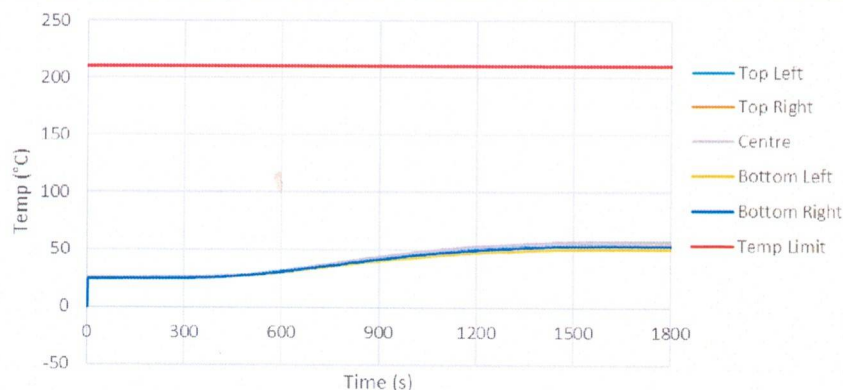


FIGURE 7:

Temperature of the specimen2 on the five different locations on the non-fire side

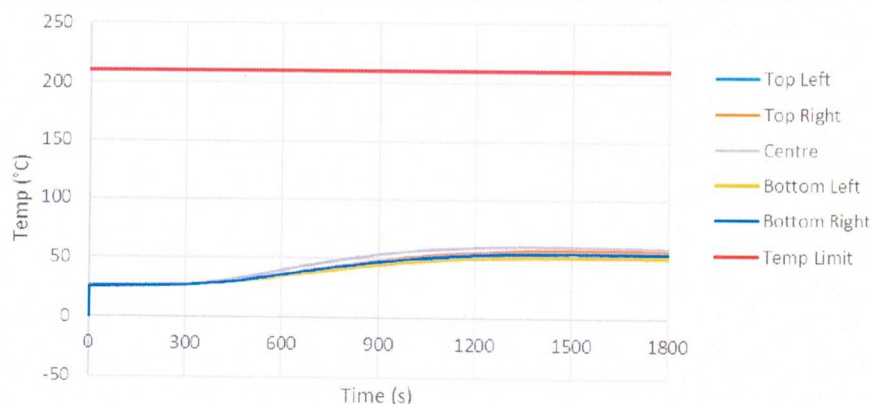
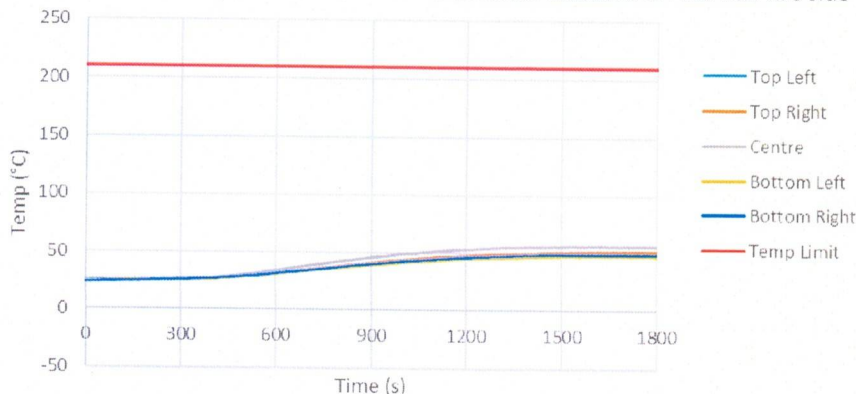


FIGURE 8:

Temperature of the specimen 3 on the five different locations on the non-fire side



The following graph shows the heat flux measured 365 mm from the non-fire side of the specimen during the 60 min test. It is observed that heat flux measured 365 mm from the non-fire side didn't exceed 15 kW/m² over the 60-minute test duration.

FIGURE 6:

Heat flux of the specimen 1 on the unexposed face

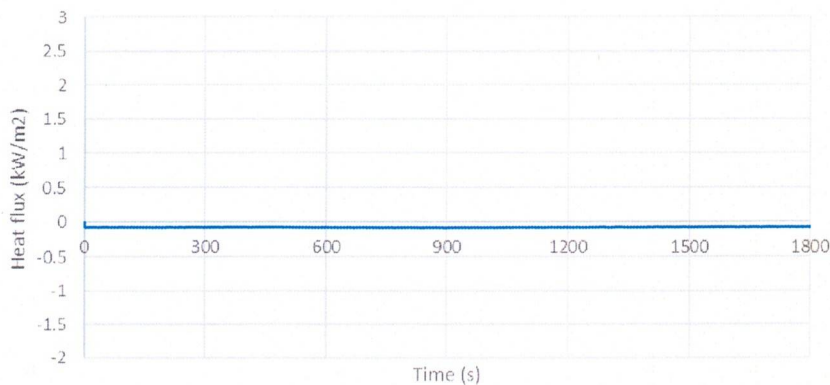


FIGURE 7:

Heat flux of the specimen 2 on the unexposed face

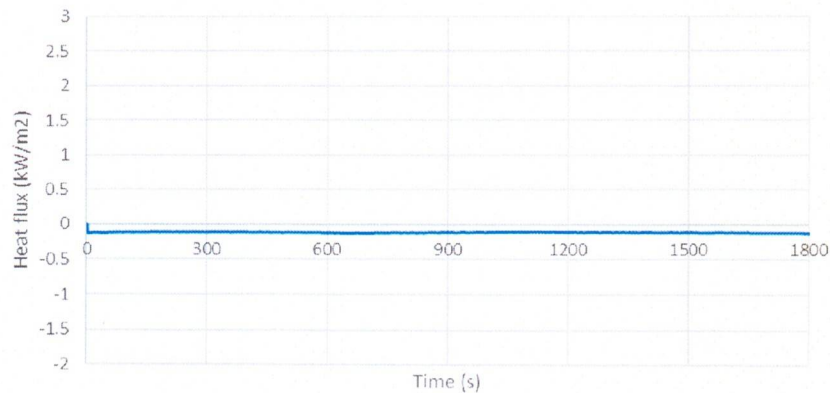
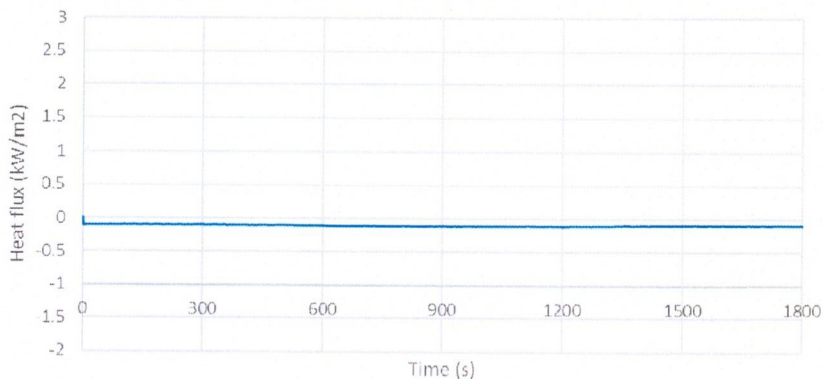


FIGURE 8:

Heat flux of the specimen 3 on the unexposed face



7 TEST SUMMARY

The above details provide an indication of performance where the Embercoat Primer is likely to have the capacity to perform within the full BAL 29 test.

The results achieved at a particular peak heat flux level automatically apply to lower heat flux levels with the same testing conditions.

8 FIELD OF DIRECT APPLICATION OF TEST RESULTS

The results of the fire test contained in this test report are directly applicable to similar constructions. This report details methods of construction, the test conditions and the results obtained when specific element of construction described herein was tested following the procedure outlined above. 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 covered by this report based on the application of an indicative result.

It should be borne in mind that the measures contained in AS 3959 as well as this evaluation cannot guarantee that a building will survive a bushfire event on every occasion. This is substantially due to the degree of vegetation management, the unpredictable nature and behaviour of fire, and extreme weather conditions.

Because of the nature of fire 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.

This is not an applicable BAL test report in accordance with AS 1530.8.1, AS 3959 or the National Construction Code.

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--- END OF REPORT ---

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