Fire-resistance test on fire collars protecting a concrete slab penetrated by services

Test Report

Author: Peter Gordon
Report number: FSP 2049 (Revision D)
Date: 4 July 2022

Client: IG6 Pty Ltd as trustee for the IG6 IP Trust

Commercial-in-confidence

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Report Authorisation:

AUTHOR	REVIEWED BY	AUTHORISED BY
Peter Gordon	Brett Roddy	Brett Roddy
		
4 July 2022	4 July 2022	4 July 2022

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Contents

Fire-resistance test on fire collars protecting a concrete slab penetrated by services

Sponsored Investigation No. FSP 2049

1 Introduction

1.1 Identification of specimen

The sponsor identified the specimen as three (3) cast-in and two (2) retrofit fire collars protecting a 120-mm thick concrete floor slab penetrated by three (3) floor wastes and two (2) stack pipes with multiple services.

1.2 Sponsor

IG6 Pty Ltd as trustee for the IG6 IP Trust
3 Skirmish Court
Victoria Point Qld 4165

1.3 Manufacturer

Snap Fire Systems Pty Ltd
Building A, 1343 Wynnum Road
Tingalpa QLD 4173

1.4 Test standard

Australian Standard 1530, Methods for fire tests on building materials, components and structures, Part 4-2014, Fire-resistance tests of elements of construction.

Section 10: Service penetrations and control joints

1.5 Reference standard

Australian Standard 4072, Components for the protection of openings in fire-resistant separating elements, Part 1 - 2005, Service penetrations and control joints.

1.6 Test number

CSIRO Reference test number: FS 4918/4399

1.7 Test date

The fire-resistance test was conducted on 24 September 2019.

2 Description of specimen

2.1 General

The specimen comprised an 1150-mm x 1150-mm x 120-mm thick concrete slab penetrated by three (3) floor wastes and two (2) stack pipes with multiple services protected by three (3) cast-in and two (2) retrofit fire collars.

The penetrated slab comprised a 120-mm thick concrete slab reinforced with a single layer of steel reinforcement providing a Fire Resistance Period (FRP) for insulation of 120 minutes in accordance with table 5.5.1 of AS 3600:2018 - Concrete structures.

The pipes used in the test are stated to be manufactured in accordance with:

- AS/NZS 7671:2010 Plastics piping systems for soil and waste discharge (low and high temperature) inside buildings— Polypropylene (PP);
- AS /NZS 1571 Copper—Seamless tubes for air-conditioning and refrigeration and,
- AS /NZS 2053 Conduits and fittings for electrical installations.

For the purpose of the test, the specimens were referenced as Specimen 1, 2, 3, 4 and 5. Only two (2) specimens are the subject of this report (Specimens 1 and 4). Documents containing a complete description of each specimen were supplied by the sponsor and are retained on file.

<u>Penetration 1 – H150FWS-RR cast-in fire collar protecting nominal 110-mm polypropylene (Triplus) pipe.</u>

The SNAP Cast-in H150FWS-RR fire collar comprised a 2-mm thick polypropylene casing with a 180-mm inner diameter and a 279-mm diameter base flange. The 250-mm high collar casing incorporated a 600-mm x 110-mm x 6-mm thick intumescent material. The closing mechanism comprised four 316 stainless steel springs, a nylon fuse link and a 640-mm x 109-mm stainless steel mesh as shown in drawing numbered H150FWS-RR dated 29 September 2017, by SNAP Fire Systems.

The penetrating service comprised a 109.6-mm outside diameter polypropylene pipe with a wall thickness of 4.1-mm fitted through the collar's sleeve. The floor waste system was fitted with a chrome brass grate, ABS Puddle Flange and a plastic cap. A 30-mm thick grout screed was laid on top of the concrete slab and finished flush with the floor grate. On the exposed side of the slab, a 4-way riser was connected to the penetrating pipe, supported by two M10 threaded rods, a 4-way riser bracket with metal plate and two steel drop-in anchors to the concrete slab. On the exposed face, the 4-way riser was capped with Superwool ceramic fibre plugs. The floor waste gully was charged with water to the level shown in drawing titled "Specimen #1 110 Triplus Floor waste H150FWS-RR", dated 12 September 2019, provided by Snap Fire Systems Pty Ltd.

Specimen 4 - SNAP MS70R Multi Services Retrofit fire collar protecting a ¾-in and a ⅜-in Pair Coil, 12 mm electrical cable and a nominal 20-mm PVC conduit.

The SNAP Multi Service Retrofit MS70R fire collar comprised a 0.75 mm thick steel casing with a 69-mm inner diameter and a 0.95-mm steel base flange with a 162-mm diameter. The 95-mm high collar casing incorporated a closing mechanism which comprised a soft Intumesh intumescent wrap, 4-mm thick x 90-mm wide x 250-mm long lined within the internal circumference of the collar. The closing mechanism comprised three stainless steel springs, with a nylon fuse link, and a 258 mm long x 88-mm wide 316 stainless steel mesh located around the intumescent strip as shown in drawing numbered MS70R dated 23 September 2019, by Snap Fire Systems Pty Ltd. The Snap collar was surface mounted around the pipe on the exposed face of the slab and fixed using three 5-mm x 35-mm concrete screws.

The annular gap around the pipe and slab on the exposed face was filled with H.B Fullers Firesound sealant to a depth of 10-mm.

The penetrating service comprised a cluster of two lagged copper pipes, a PVC conduit and an electrical cable. The ¾-in and a ⅜-in copper pipes, having a wall thickness of 1.5-mm and 1.0mm respectively and both covered with a 10-mm thick crosslinked non fire rated PE foam lagging, a 12-mm grey electrical cable (3 core plus Earth) and a 20-mm PVC conduit with a wall thickness of 2.2 mm, all of which penetrated the slab through a 64-mm diameter cut-out hole as shown in drawing titled “Specimen #4 ¾-in and a ⅜-in Insulated Copper Pair Coil, 20 PVC Conduit, 3 Core Cable + E & MS70R”, dated 12 September 2019”, provided by Snap Fire Systems Pty Ltd.

The 20-mm PVC conduct projected horizontally 2000-mm away from the unexposed face of the slab and approximately 500 mm into the furnace chamber and was supported at nominally 500-mm, and 1500-mm from the unexposed face of the slab. The ¾-in and ⅜-in copper lagged pipes and the electrical cable projected vertically 500-mm from the unexposed face of the slab and approximately 500 mm into the furnace chamber and were supported at nominally 500-mm from the unexposed face of the slab. The 20-mm PVC conduit was open at the unexposed end and capped with a Superwool plug on the exposed end. The ¾-in and a ⅜-in copper pipes were left open on the unexposed face and crimped on the exposed end.

2.2 Dimensions

The specimen comprised an 1150-mm x 1150-mm x 120-mm thick concrete slab to suit the opening in the specimen containing frame.

2.3 Orientation

The reinforced concrete slab was placed horizontally on top of the furnace chamber and subjected to fire exposure from the underside.

2.4 Conditioning

The concrete slab was left to cure for a period longer than 30 days.

2.5 Selection, construction and installation of the specimen and the supporting construction

The supporting floor construction and specimen installation was organised by the sponsor. CSIRO was not involved in the selection of the materials.

3 Documentation

The following documents were supplied or referenced by the sponsor as a complete description of the specimen and should be read in conjunction with this report:

Drawing titled “Test Slab S-19-E Layout”, dated 3 September 2019 provided by Snap Fire Systems Pty Ltd.

Drawing titled “Specimen #1 110 Triplus Floor waste H150FWS-RR”, dated 12 September 2019, provided by Snap Fire Systems Pty Ltd.

Drawing titled “Specimen #4 ¾-in and a ⅜-in Insulated Copper Pair Coil, 20 PVC Conduit, 3 Core Cable + E & MS70R”, dated 12 September 2019, provided by Snap Fire Systems Pty Ltd.

Drawing number H150FWS-RR, dated 29 September 2017, by Snap Fire Systems Pty Ltd.

Drawing number MS70R, dated 23- September 2019, by Snap Fire Systems Pty Ltd.

4 Equipment

4.1 Furnace

The furnace had a nominal opening of 1000-mm x 1000-mm for attachment of vertical or horizontal specimens.

The furnace was lined with refractory bricks and materials with the thermal properties as specified in AS 1530.4-2014 and was heated by combustion of a mixture of natural gas and air.

4.2 Temperature

The temperature in the furnace chamber was measured by four type K, 3-mm diameter, and 310 stainless steel Mineral Insulated Metal Sheathed (MIMS) thermocouples. Each thermocouple was housed in high-nickel steel tubes opened at the exposed end.

The temperatures of the specimen were measured by glass-fibre insulated and sheathed K-type thermocouples with a wire diameter of 0.5-mm.

Location of the thermocouples on the unexposed face of the specimen are described in Appendix A.

4.3 Measurement system

The primary measurement system comprised a multiple-channel data logger, scanning at one minute intervals during the test.

5 Ambient temperature

The temperature of the test area was 19°C at the commencement of the test.

6 Departure from standard

There were no departures from the requirements of AS 1530.4-2014.

7 Termination of test

The test was terminated at 241 minutes by the agreement with the sponsor.

8 Test results

8.1 Critical observations

The following observations were made during the fire-resistance test:

Time	Observation
1 minute -	Smoke is fluing from the end of the PVC conduit of Specimen 4.
2 minutes -	Smoke is emitting from the grate of the Specimen 1 floor waste.
3 minutes -	Cotton wool pad test applied above the grate of the Specimen 1 floor waste. No ignition was noted at this time.
4 minutes -	Cotton wool pad test again applied above the grate of the Specimen 1 floor waste. No ignition was noted at this time.
8 minutes -	Smoke has ceased fluing from the grate of the Specimen 1 floor waste.
11 minutes -	A small quality of smoke is fluing from the ends of the copper pipes of Specimen 4.
18 minutes -	Smoke is being emitted around the base of Specimen 4.
27 minutes -	Smoke has ceased fluing from the end of the pipes of Specimen 4.
34 minutes -	Smoke is continuing to be emitted around the base of Specimen 4, the lagging around the base of the copper pipes have begun to discolour.
43 minutes -	The lagging around the base of the copper pipes of Specimen 4 continues to discolour and has shrink back towards the copper pipes.
47 minutes -	A gap has formed at the base of Specimen 4 between the copper pipe and slab where the lagging has melted and shrivelled. Photograph 4.
48 minutes -	The lagging at the base of Specimen 4 continues to shrink. The fixed thermocouples #19 and #20 are no longer in contact with the shrivelled lagging around the ¾-in and a ⅜-in copper pipes. Temperature data of specimen thermocouples S19 and S20 are unreliable at this time. Therefore the insulation performance of Specimen 4 cannot be assessed beyond this point.
85 minutes -	The PVC conduit above the 1500-mm support has softened and bent over.
133 minutes -	The lagging around the base of Specimen 4 has melted away.
136 minutes -	Smoke has resumed fluing from the grate of the Specimen 1 floor waste.
162 minutes -	Maximum temperature rise of 180K is exceeded on the electric cable of Specimen 4, 25-mm above the mastic on the unexposed face.

191 minutes - Insulation failure of Specimen 1 - maximum temperature rise of 180K is exceeded on the slab 25-mm away from 30-mm screed on the unexposed face.

200 minutes - Smoke being emitted from the grate of the Specimen 1 floor waste has increased.

241 minutes - Test terminated.

8.2 Furnace temperature

Figure 1 shows the standard curves of temperature versus time for heating the furnace chamber and the actual curves of average and maximum temperature versus time recorded during the heating period.

8.3 Furnace severity

Figure 2 shows the curve of furnace severity versus time during the heating period.

8.4 Specimen temperature

Figure 3 shows the curve of temperature versus time associated with Specimen 1.

Figure 4 shows the curve of temperature versus time associated with Specimen 4.

8.5 Performance

Performance observed in respect of the following AS 1530.4-2014 criteria:

Penetration 1 – H150FWS-RR cast-in fire collar protecting nominal 110-mm polypropylene (Triplus) pipe.

Structural adequacy	-	not applicable
Integrity	-	no failure at 241 minutes
Insulation	-	191 minutes

Specimen 4 - SNAP MS70R Multi Services Retrofit fire collar protecting a ¾-in and a ⅜-in Pair Coil, 12 mm electrical cable and a nominal 20-mm PVC conduit.

Structural adequacy	-	not applicable
Integrity	-	no failure at 241 minutes
Insulation	-	not measured after 48 minutes

This report details methods of construction, the test conditions and the results obtained when the specific element of construction described herein was tested following the procedure outlined in this standard. 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.

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.

9 Fire-resistance level (FRL)

For the purpose of building regulations in Australia, the FRL's of the test specimens were as follows:

Specimen 1 - -/120/120

Specimen 4 - -/120/30

The fire-resistance level of the specimen is applicable when the system is exposed to fire from the same direction as tested.

For the purposes of AS 1530.4-2014 the results of these fire tests may be used to directly assess fire hazard, but it should be noted that a single test method will not provide a full assessment of fire hazard under all fire conditions.

10 Field of direct application of test results

The results of the fire test contained in this test report are directly applicable, without reference to the testing authority, to similar constructions where one or more changes listed in Clause 10.11 of AS 1530.4-2014, have been made provided no individual component is removed or reduced.

11 Tested by

Peter Gordon
Testing Officer

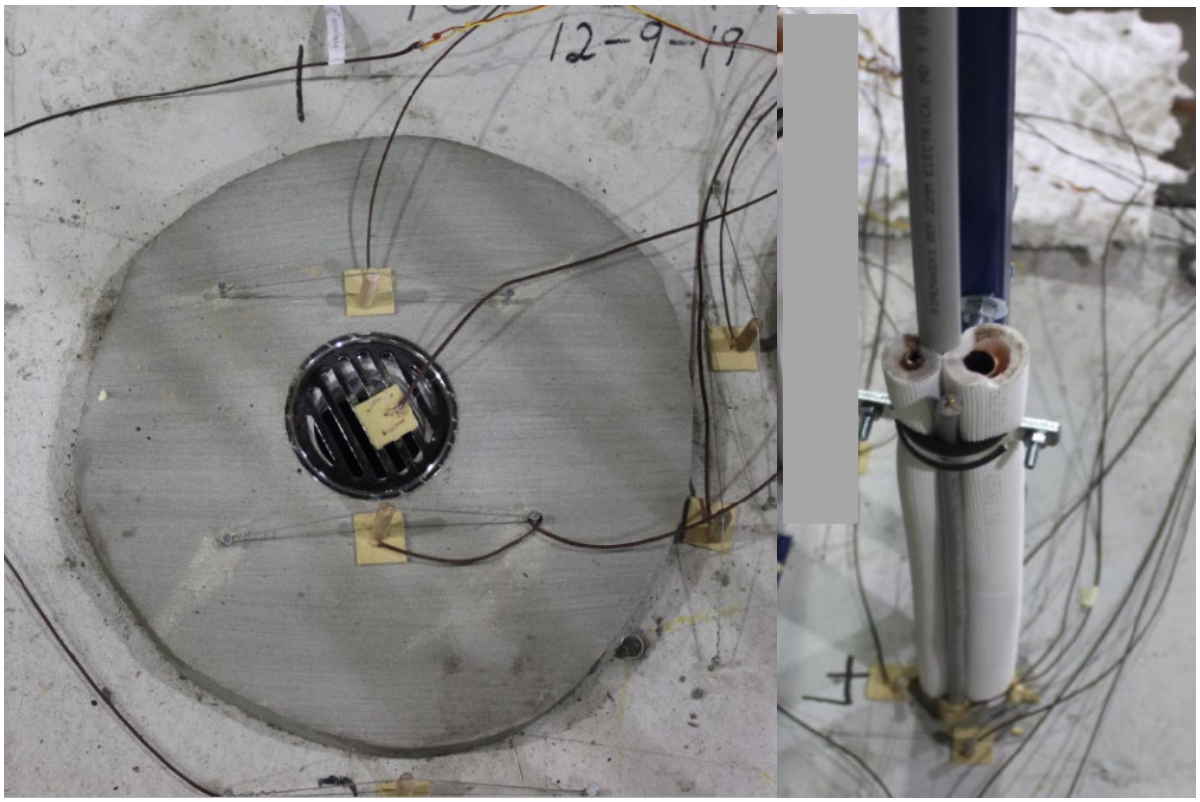
Appendices

Appendix A – Measurement location

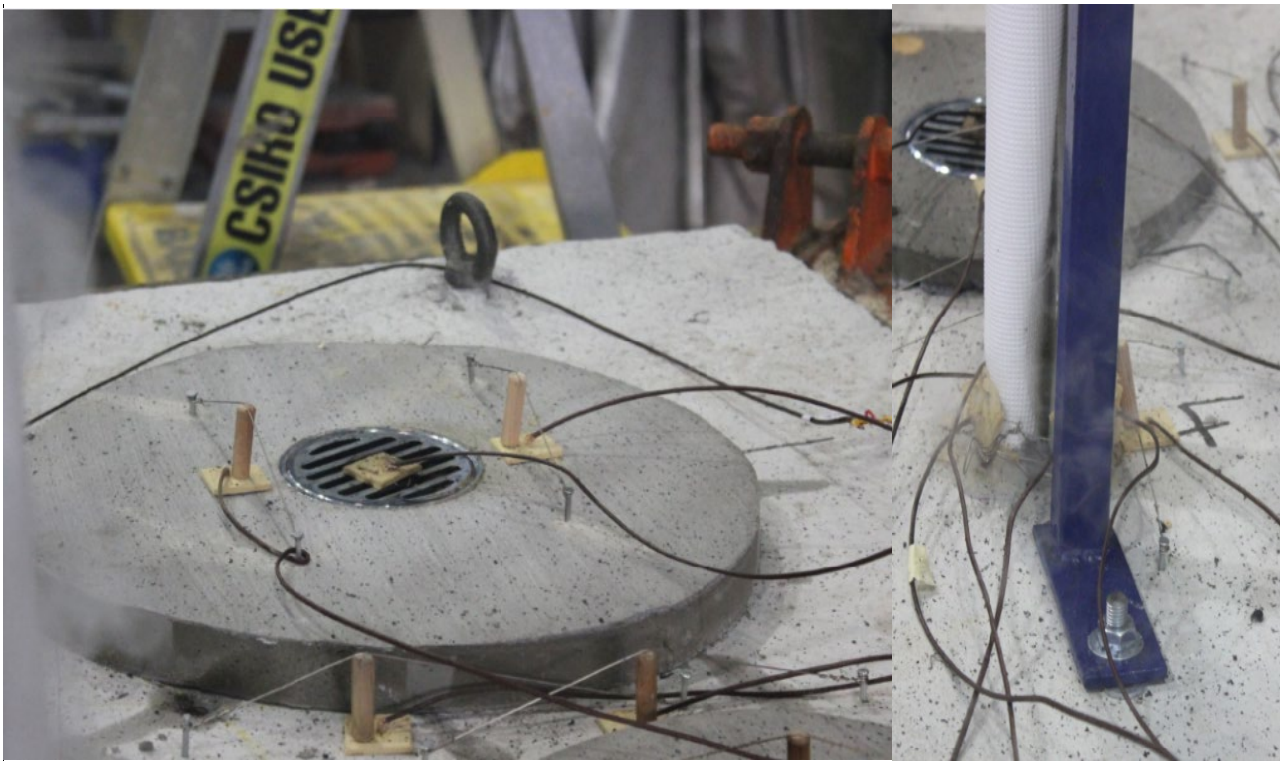
Specimen	T/C Position	T/C designation
SPECIMEN 1 – Valsir Triplus polypropylene pipe 109.6-mm OD x 4.1-mm wall thickness pipe with a floor waste and 4 Way riser protected with a H150FWS cast-in fire collar.	On top of the slab – 25-mm from screed (East)	S1
	On top of the slab – 25-mm from screed (South)	S2
	On screed 25-mm from Grate (North)	S3
	On screed 25-mm from Grate (South)	S4
	On centre of the Grate	S5
SPECIMEN 4 – A cluster of ¾-in and a ⅜-in Insulated Copper Pair Coil with a wall thickness of 1.5-mm and 1-mm respectively, 20 PVC Conduit with a wall thickness of 2.2-mm and a 12-mm OD 3 Core Cable + E protected with a MS70R standard retrofit fire collar. The annular gap around the 64-mm opening and the service on the exposed side was sealed with a 10-mm deep bead of Fullers Firesound sealant.	On top of the slab – 25-mm from mastic (North)	S16
	On top of the slab – 25-mm from Mastic (West)	S17
	On PVC conduit 25-mm from mastic (East)	S18
	On ⅜-in Insulated Copper Pair Coil 25-mm from mastic (North)	S19
	On ¾-in Insulated Copper Pair Coil 25-mm from mastic (South)	S20
	On 4 Core Cable + E 25-mm from mastic (West)	S21
Rover		S28
Ambient		S29

Appendix B – Photographs

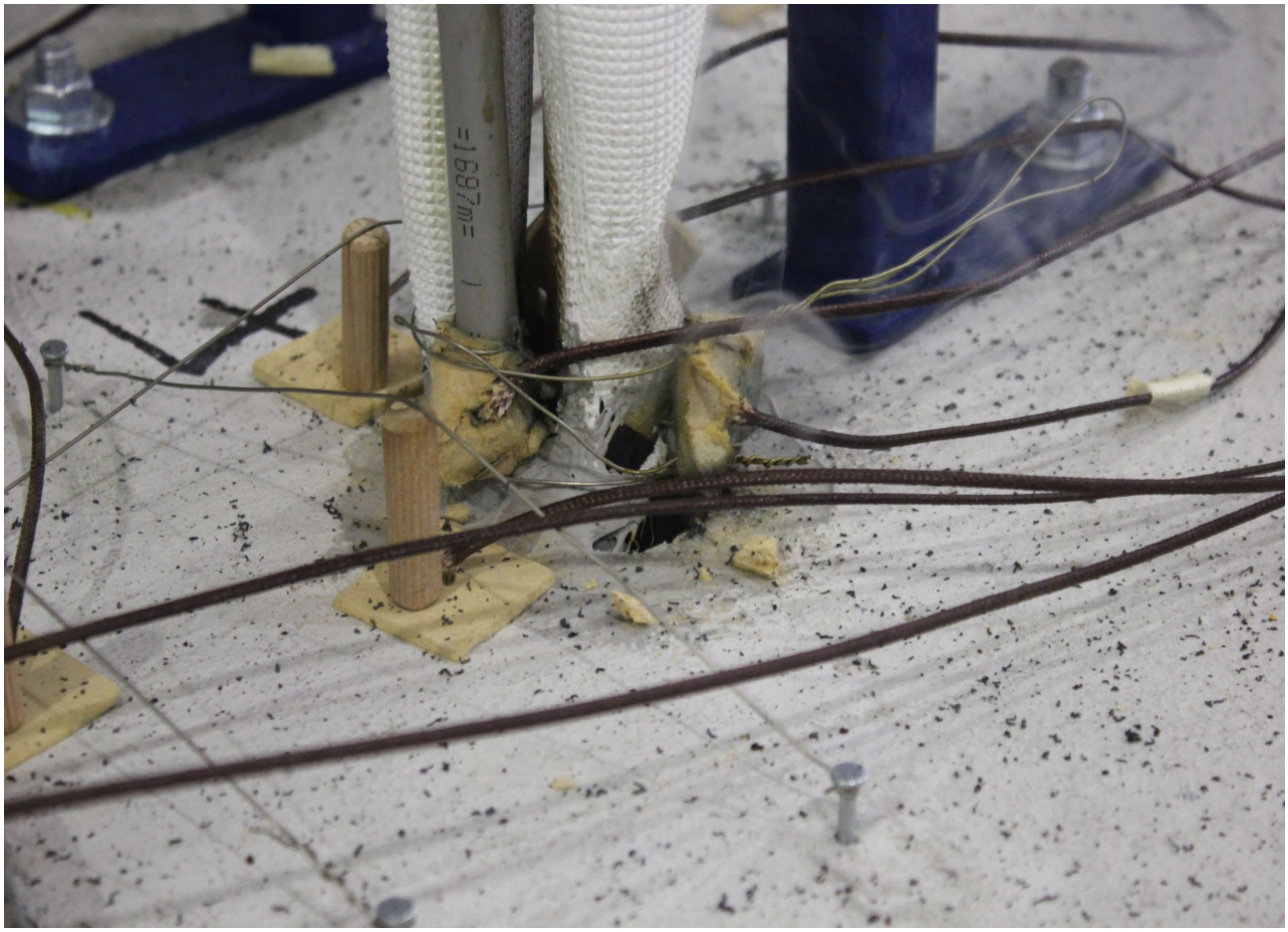
PHOTOGRAPH 1 – EXPOSED FACE OF SPECIMENS 1 AND 4 PRIOR TO TESTING



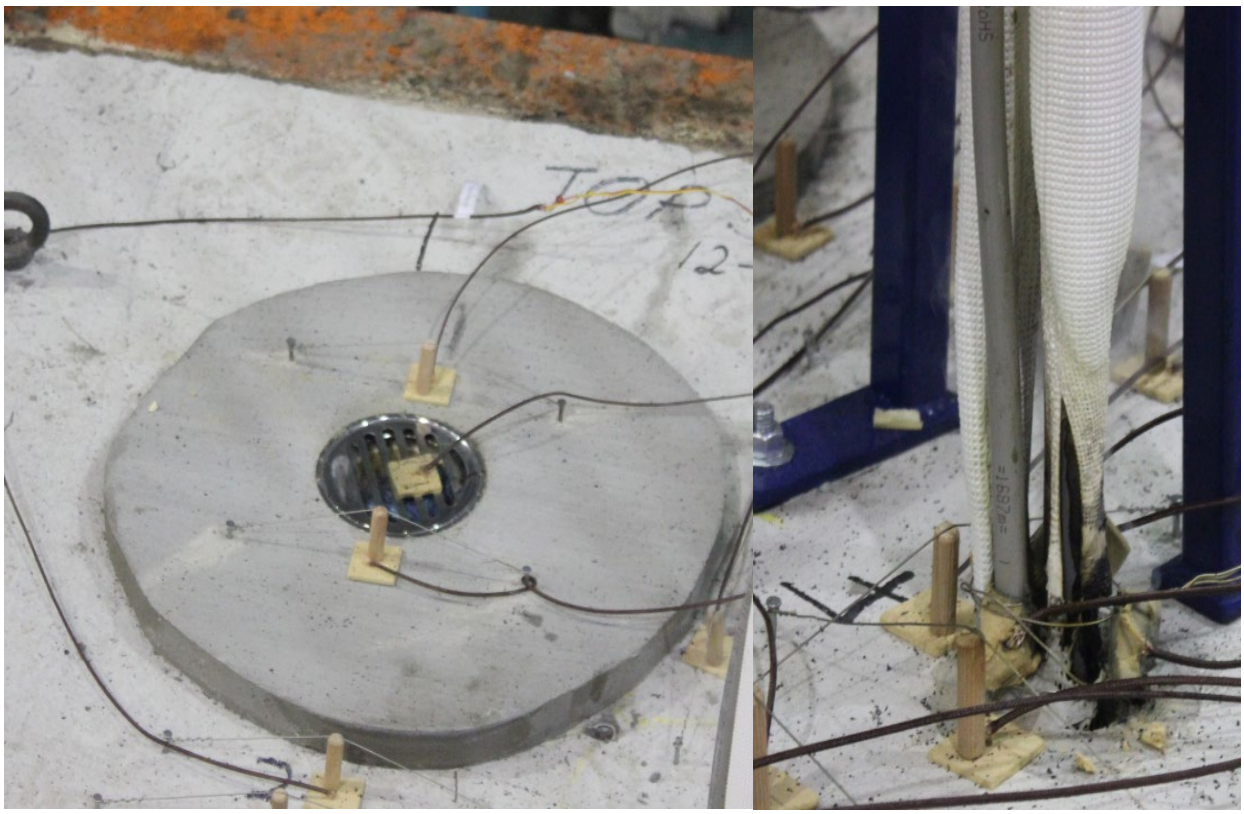
PHOTOGRAPH 2 – UNEXPOSED FACE OF SPECIMENS 1 AND 4 PRIOR TO TESTING



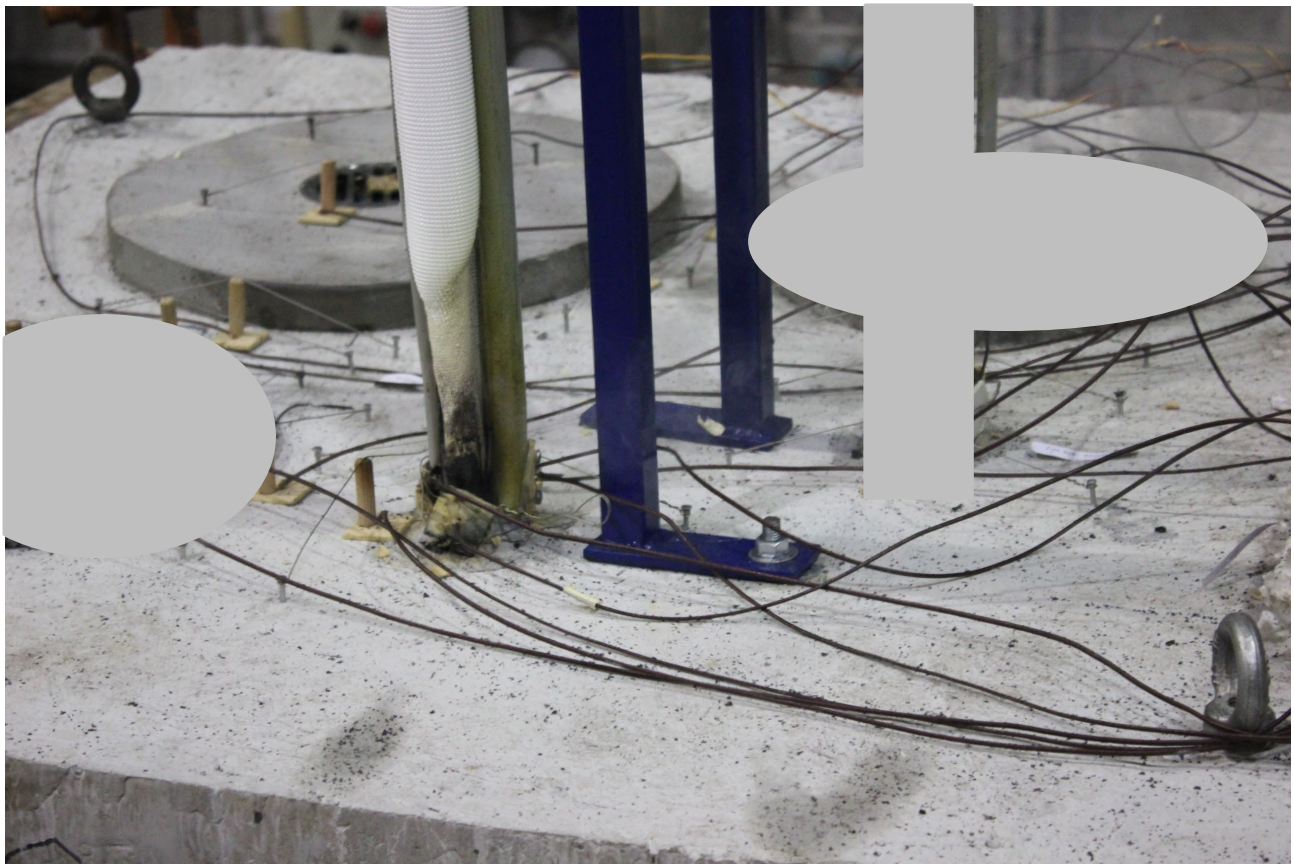
PHOTOGRAPH 3 – SPECIMENS 1 & 4 AFTER 30 MINUTES OF TESTING



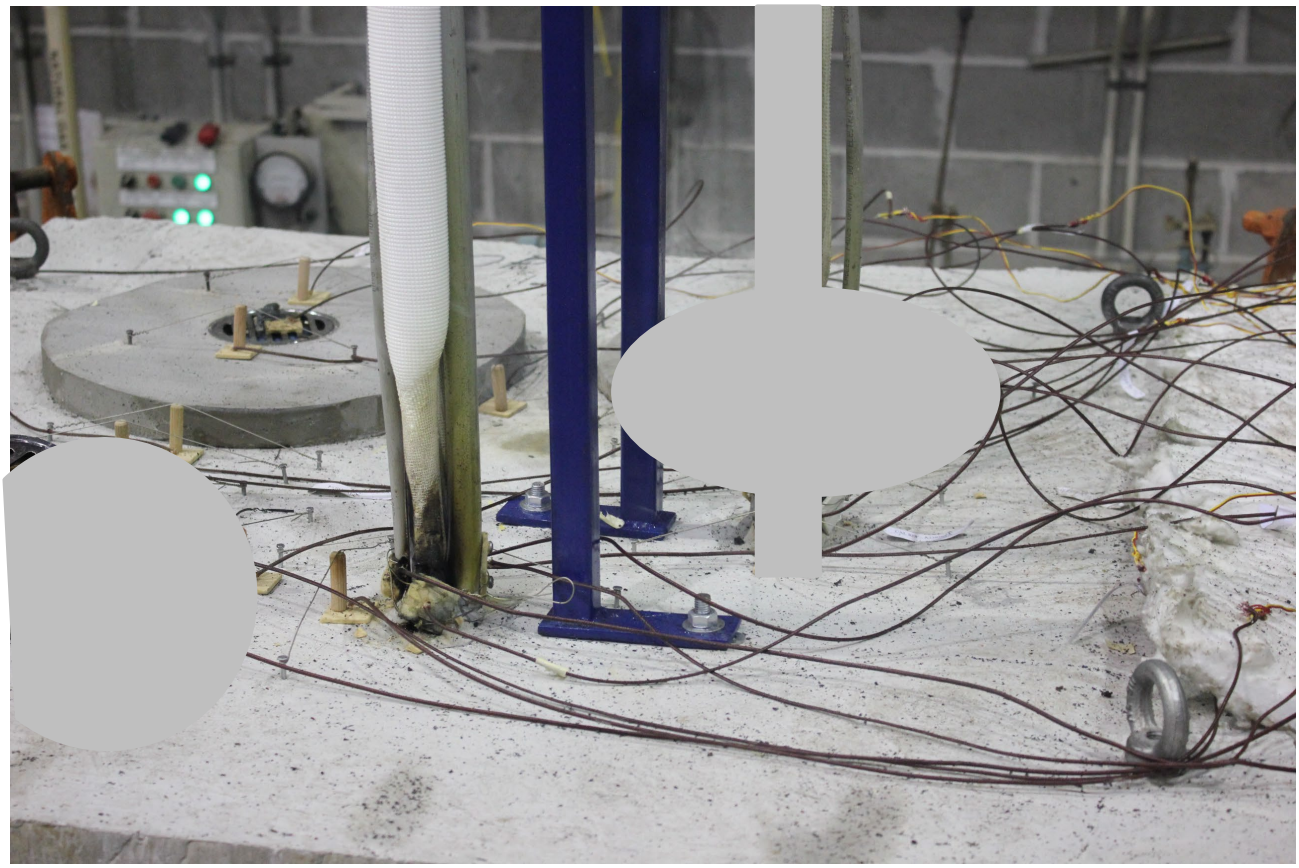
PHOTOGRAPH 4 – SPECIMEN 4 AFTER 47 MINUTES OF TESTING



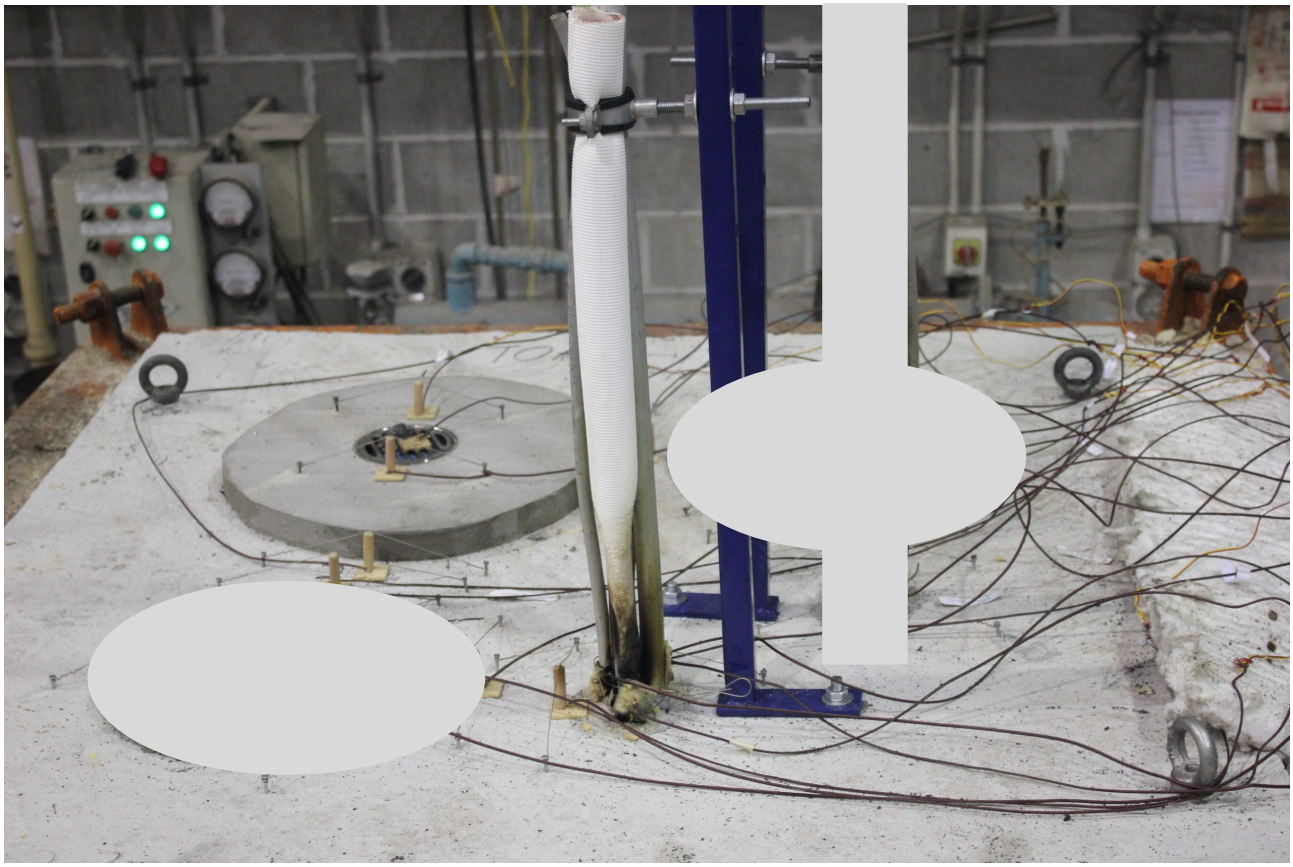
PHOTOGRAPH 5 – SPECIMENS 1 & 4 AFTER 60 MINUTES OF TESTING



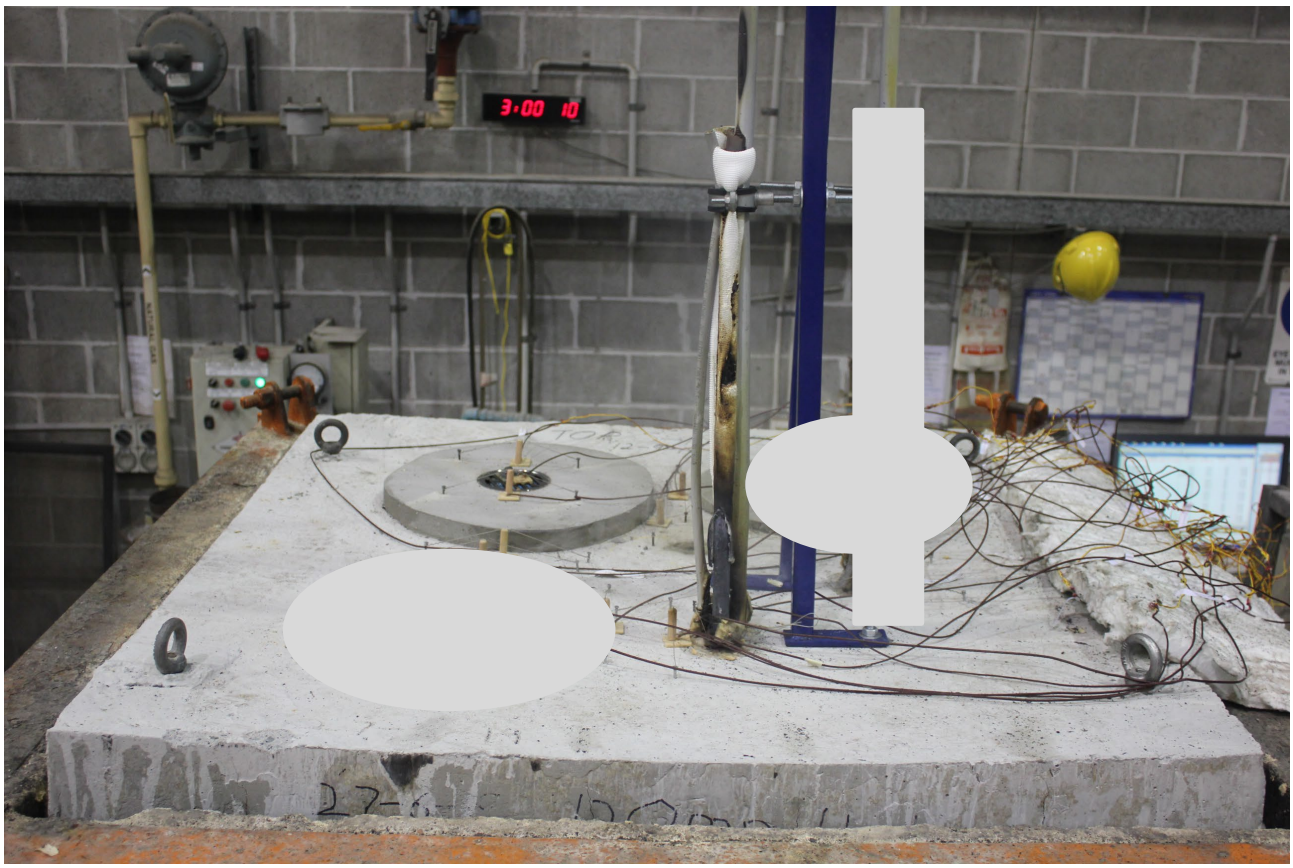
PHOTOGRAPH 6 – SPECIMENS 1 & 4 AFTER 90 MINUTES OF TESTING



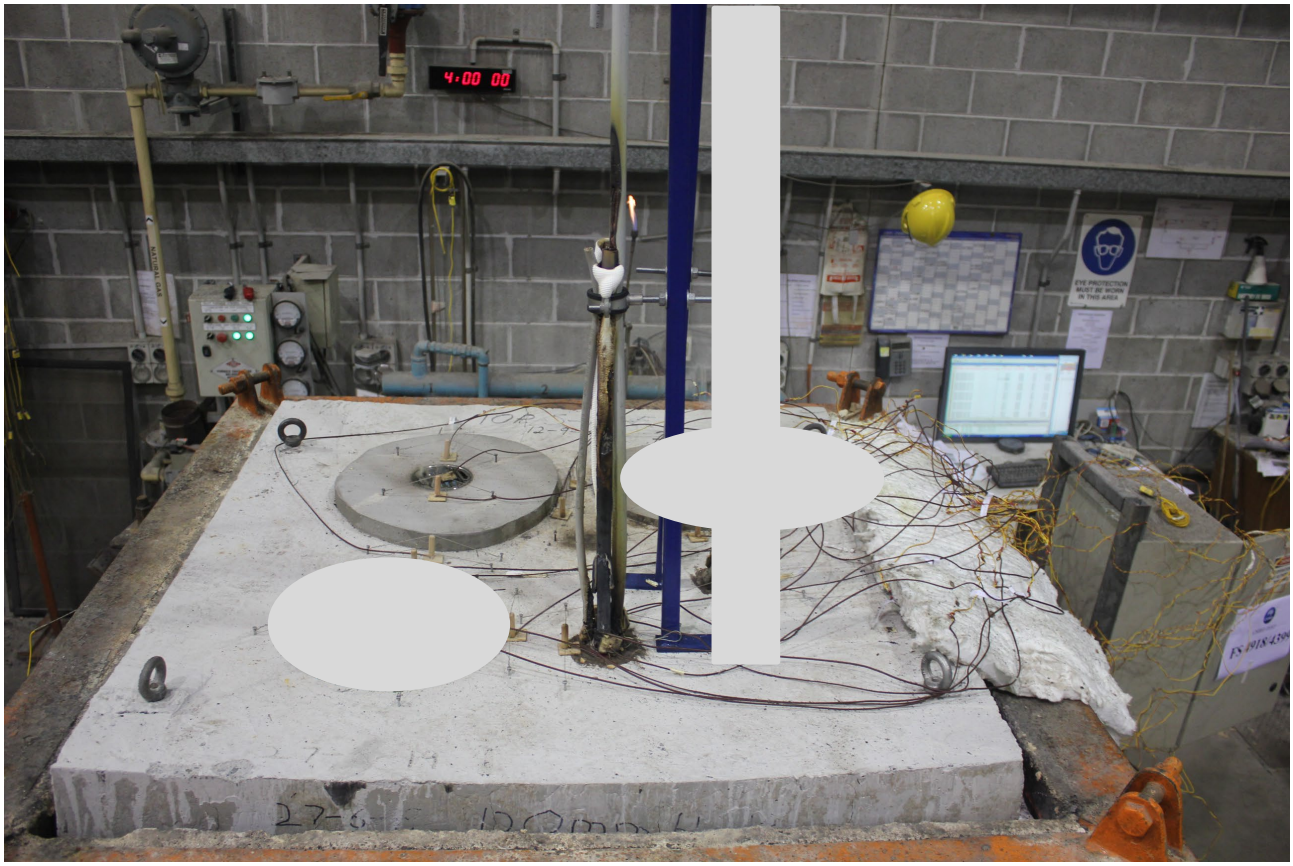
PHOTOGRAPH 7 – SPECIMENS AFTER 120 MINUTES OF TESTING



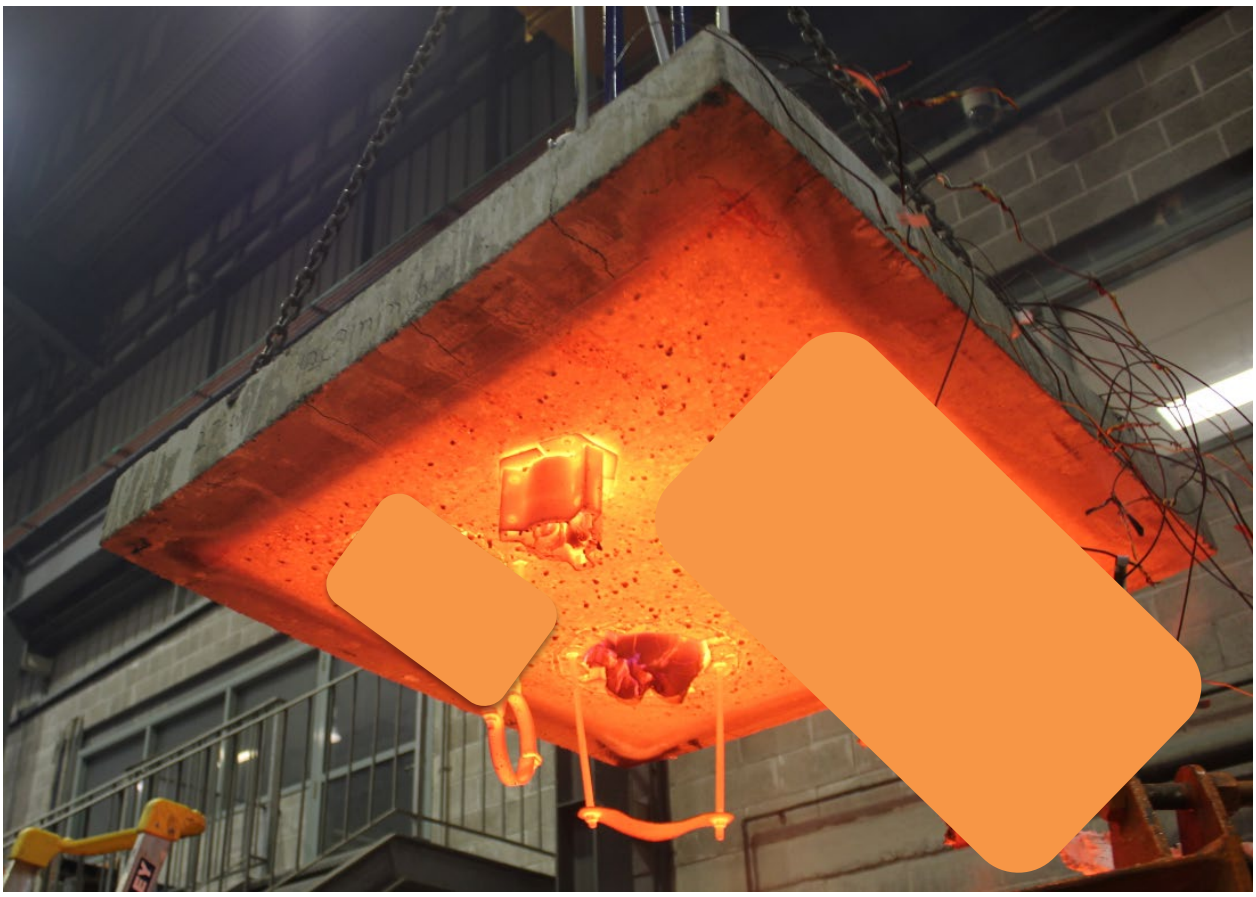
PHOTOGRAPH 8 – SPECIMENS AFTER 150 MINUTES OF TESTING



PHOTOGRAPH 9 – SPECIMENS AFTER 180 MINUTES OF TESTING



PHOTOGRAPH 10 – SPECIMENS AFTER 240 MINUTES OF TESTING



PHOTOGRAPH 11 – EXPOSED FACE OF SPECIMENS 1 AND 4 AT THE CONCLUSION OF TESTING

Appendix C – Test Data charts

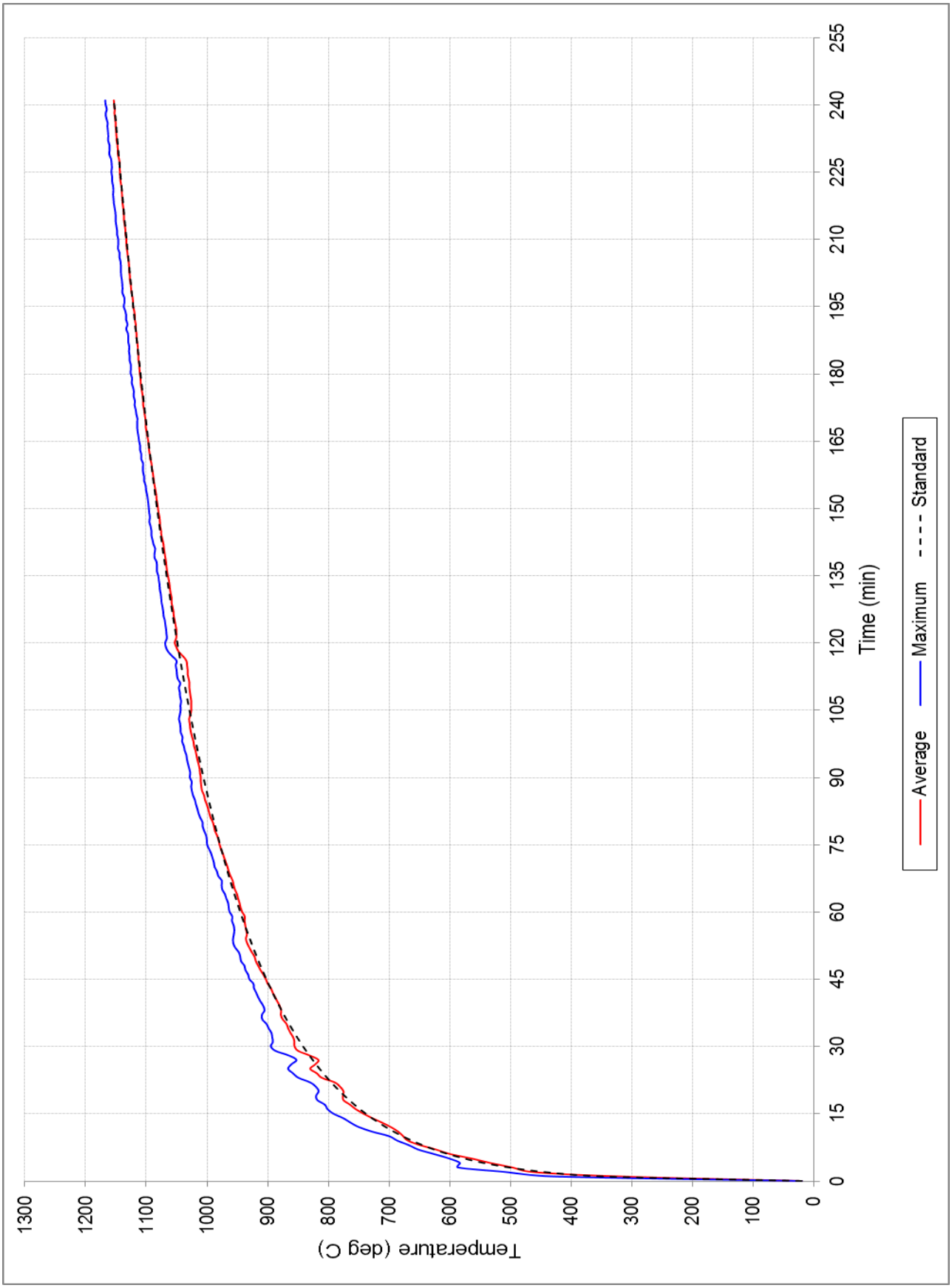


FIGURE 1 – FURNACE TEMPERATURE

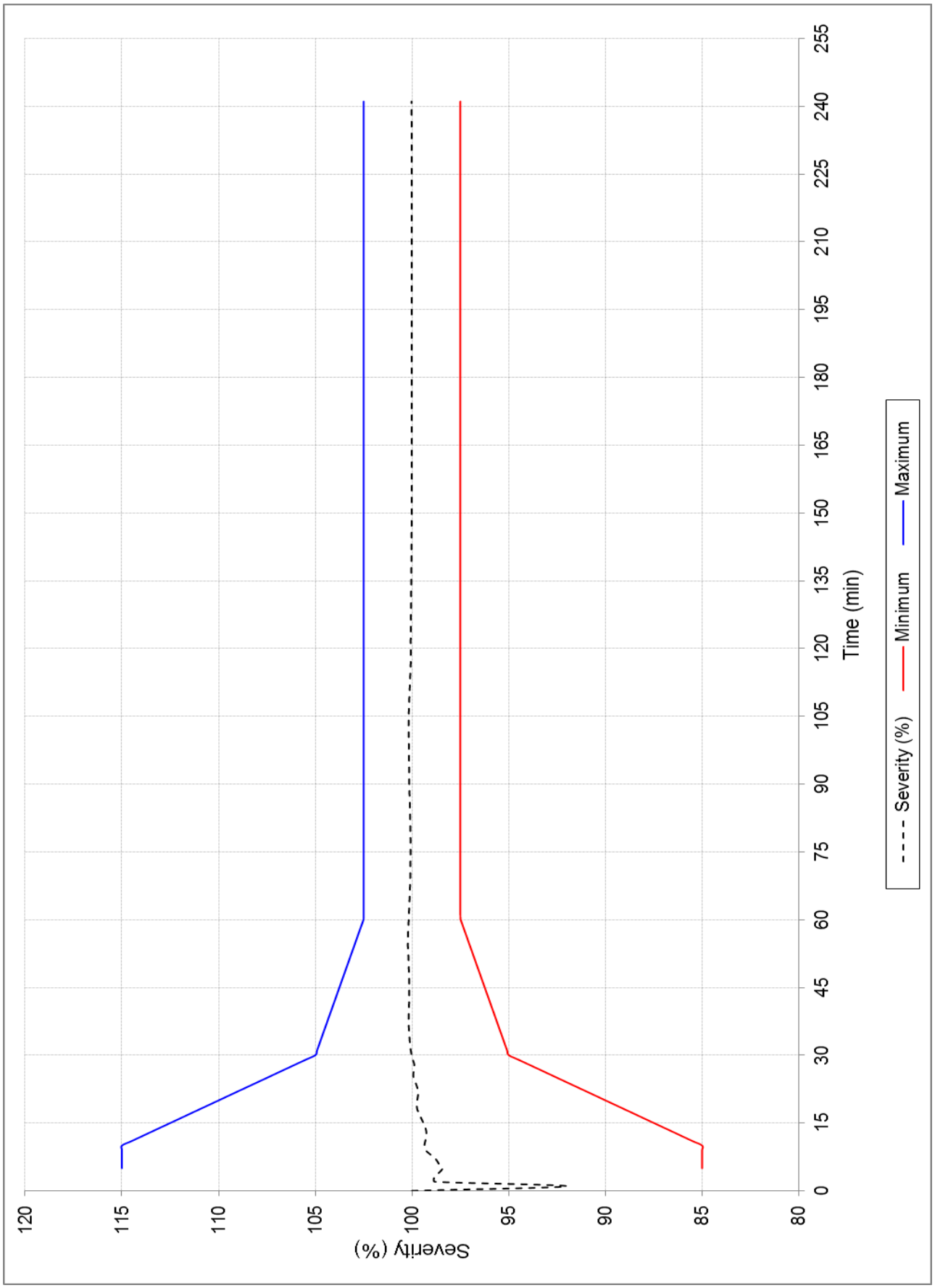


FIGURE 2 – FURNACE SEVERITY

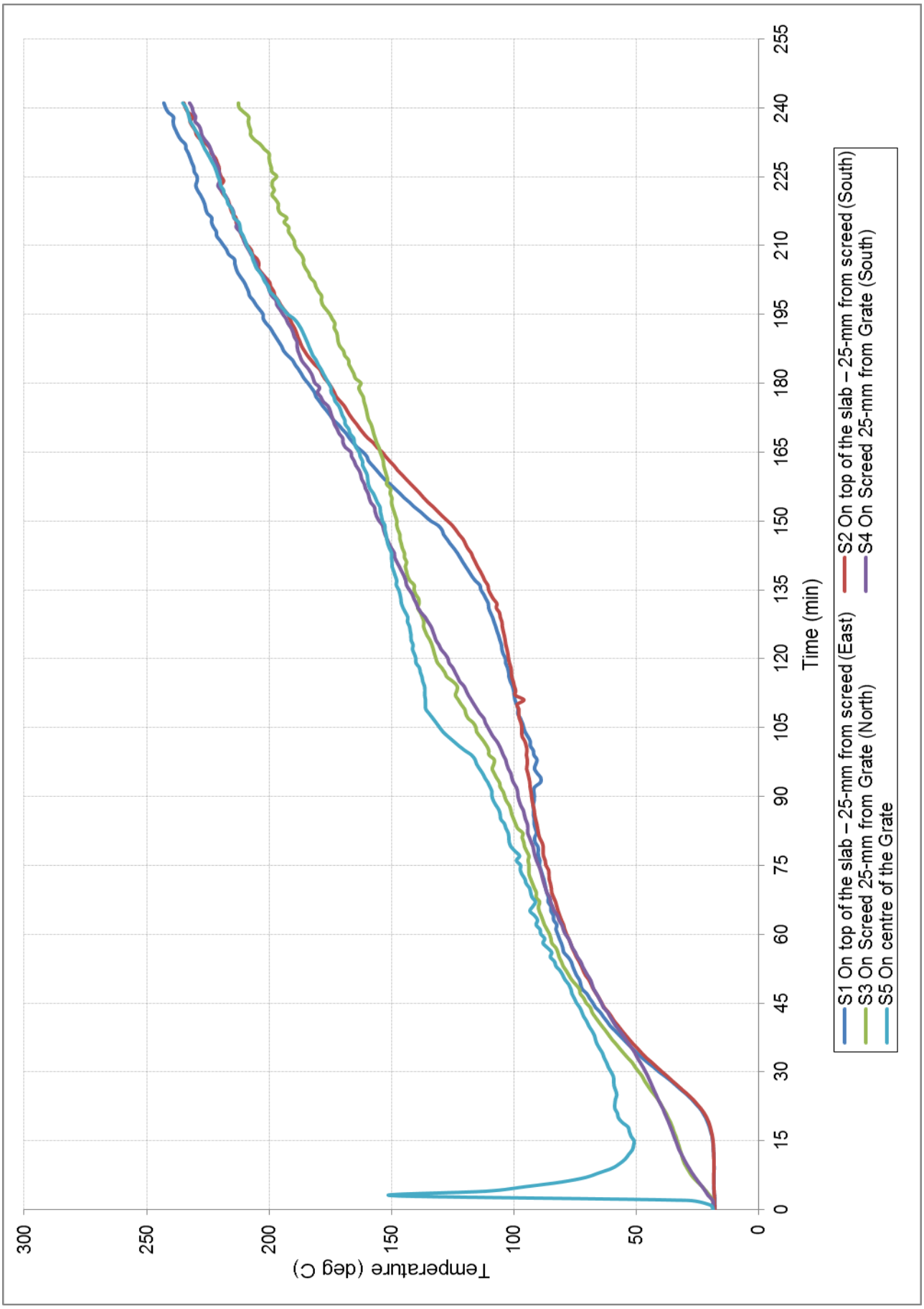


FIGURE 3 – SPECIMEN TEMPERATURE – ASSOCIATED WITH SPECIMEN 1

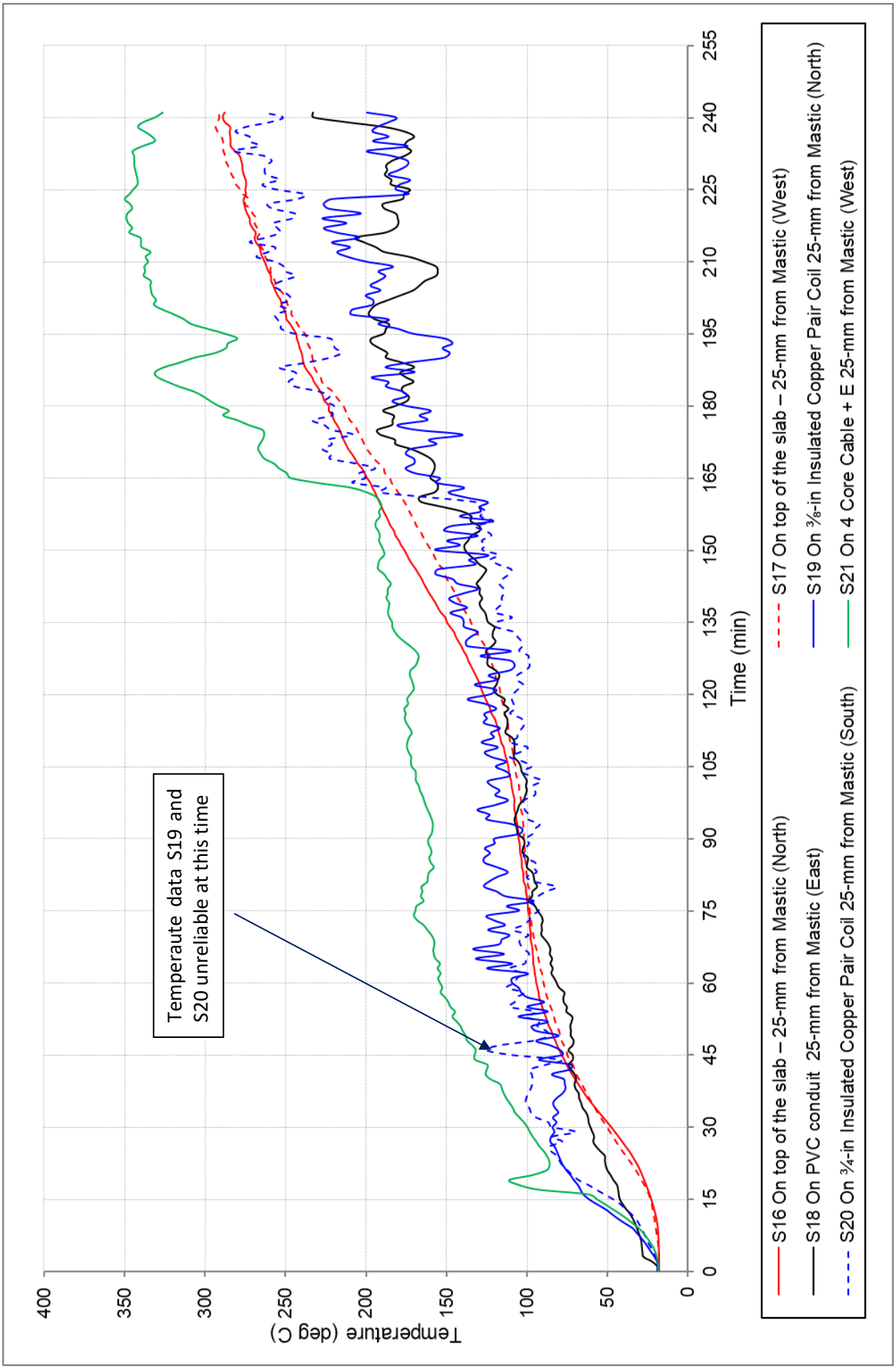
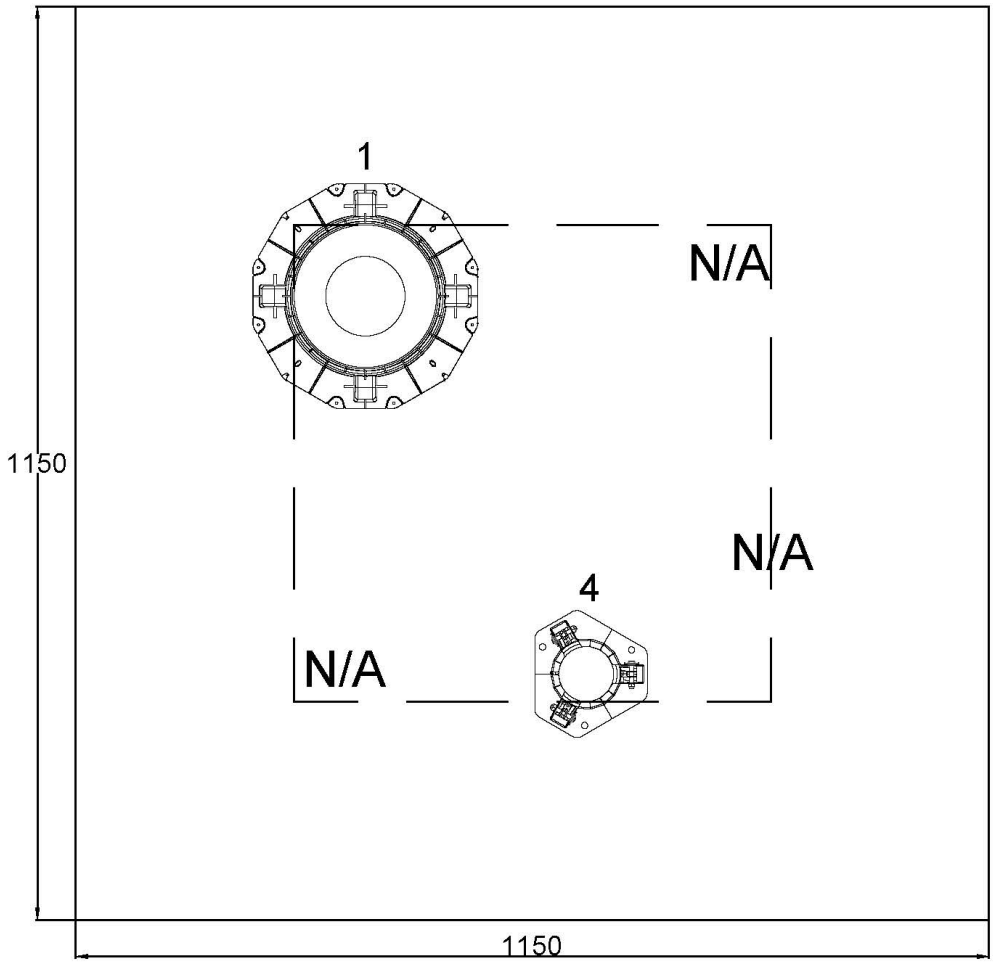


FIGURE 4 – SPECIMEN TEMPERATURE – ASSOCIATED WITH SPECIMEN 4

Appendix D – Installation drawings

Snap Fire Systems Pty Ltd
Test Slab S-19-E Layout
Date: 03 SEPT 2019



Penetration	Collar Code	Pipe Type	Pipe Diameter (mm)	Fitting
1	H150FWS	Triplus	110	N/A
4	MS70R	Pair Coil + Conduit + Cable	¾ & ⅜, 20mm Conduit, 2.5mm² 4C+E Cable	N/A

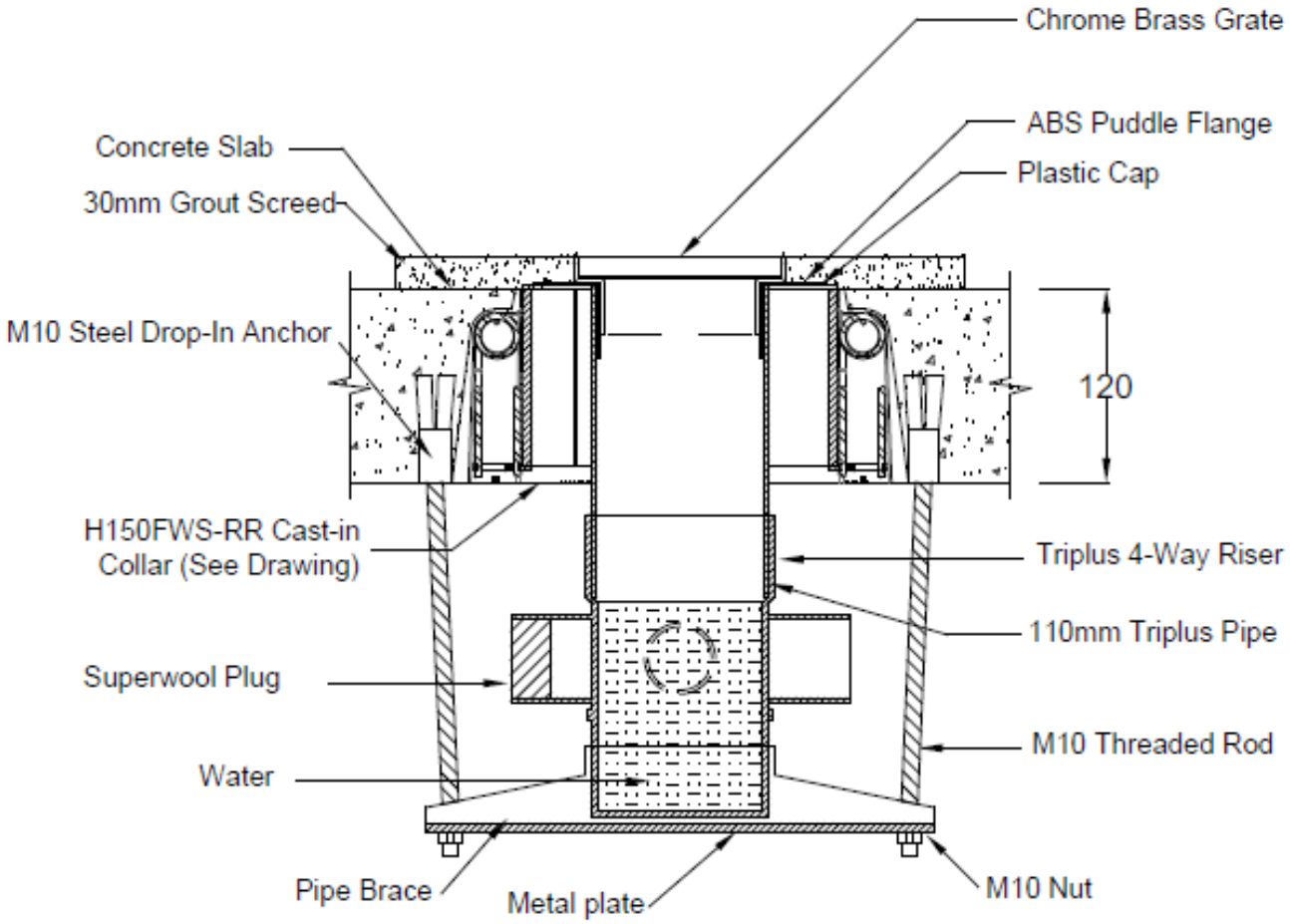
DRAWING TITLED "TEST SLAB S-19-E LAYOUT", DATED 3 SEPTEMBER 2019, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD

Snap Fire Systems Pty Ltd

Specimen #1

110 Triplus Floorwaste H150FWS-RR

Date: 12 SEPT 2019



DRAWING TITLED "SPECIMEN #1 110 TRIPLUS FLOORWASTE H150FWS-RR", DATED 12 SEPTEMBER 2019, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD.

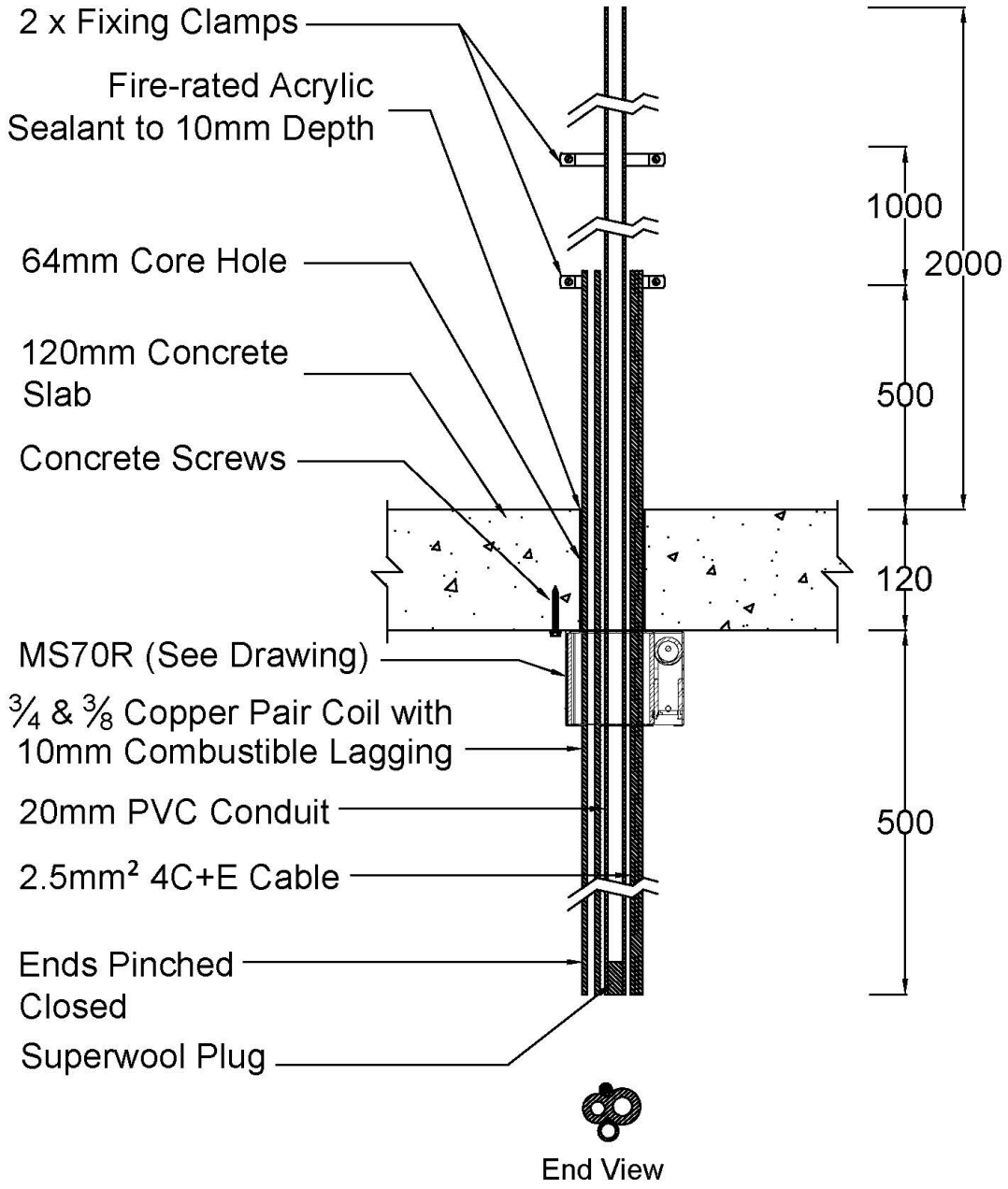
Snap Fire Systems Pty Ltd

Specimen #4

¾ & ⅜ Insulated Copper Pair Coil, 20 PVC Conduit

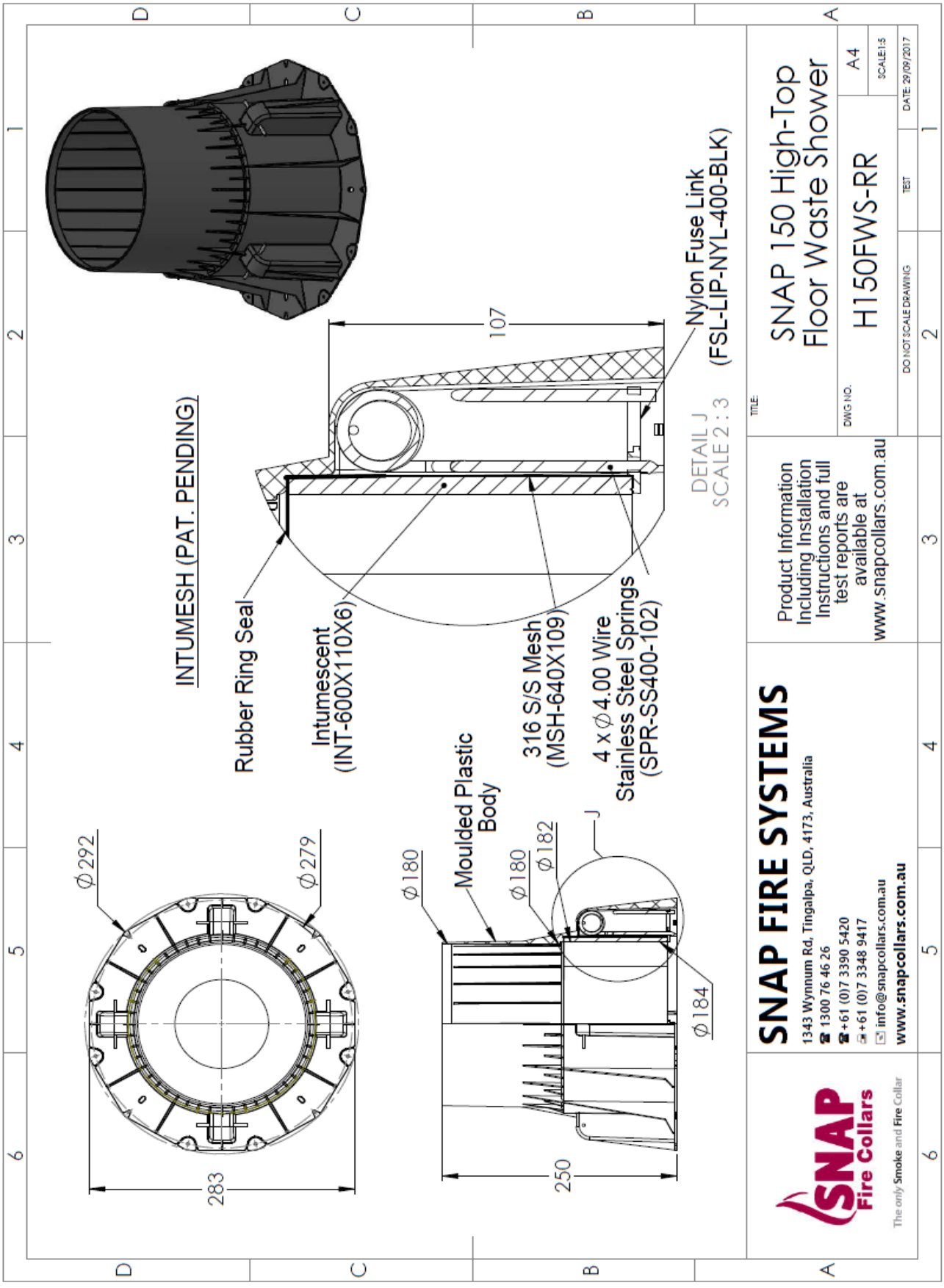
2.5mm² 4C+E Cable & MS70R

Date: 12 SEPT 2019

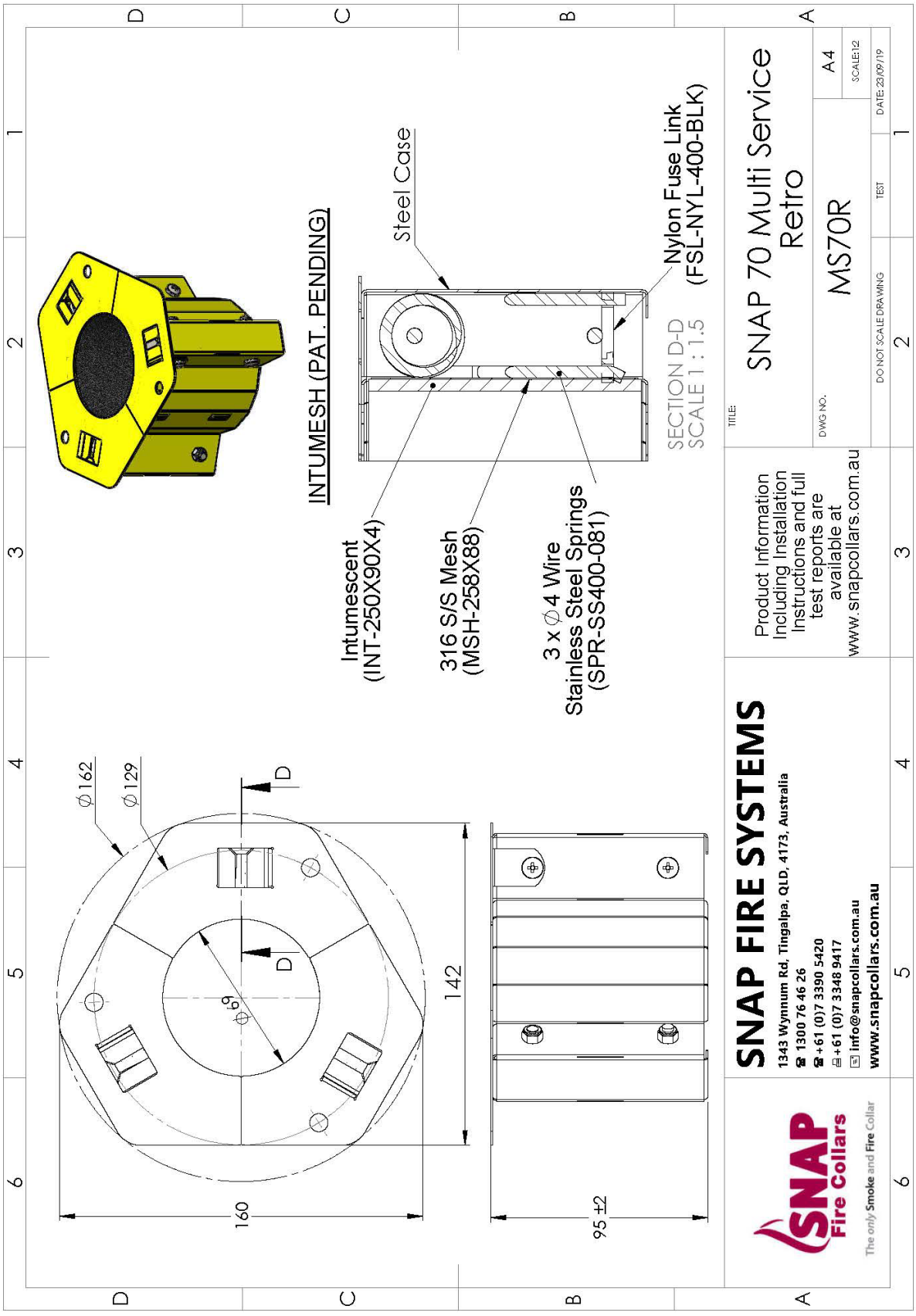


DRAWING TITLED "SPECIMEN #4 ¾-IN AND A ⅜-IN INSULATED COPPER PAIR COIL, 20 PVC CONDUIT, 3 CORE CABLE + E & MS70R", DATED 12 SEPTEMBER 2019, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD

Appendix E – Specimen Drawings



DRAWING NUMBER H150FWS-RR-T, DATED 29 SEPTEMBER 2017, BY SNAP FIRE SYSTEMS PTY LTD



DRAWING TITLED "SNAP 50 MULTI SERVICE RETRO", DATED 23 SEPTEMBER 2019, BY SNAP FIRE SYSTEMS PTY LTD.

Appendix F – Certificate(s) of Test

INFRASTRUCTURE TECHNOLOGIES
www.csiro.au

14 Julius Avenue, North Ryde NSW 2113
PO Box 52, North Ryde NSW 1670, Australia
T (02) 9490 5444 • **ABN** 41 687 119 230

Certificate of Test

No. 3339

This is to certify that the element of construction described below was tested by CSIRO Infrastructure Technologies in accordance with Australian Standard 1530, Methods for fire tests on building materials, components and structures, Part 4 Fire-resistance tests of elements of construction, 2014, Section 10: Service penetrations and control joints, on behalf of:

IG6 Pty Ltd as trustee for the IG6 IP Trust
3 Skirmish Court
Victoria Point Qld 4165

A full description of the test specimen and the complete test results are detailed in the Division's report numbered FSP 2049.

Product Name: H150FWS-RR cast-in fire collar protecting nominal 110-mm polypropylene (Triplus) pipe (Specimen 1)

Description: The specimen comprised an 1150-mm x 1150-mm x 120-mm thick concrete slab penetrated by a polypropylene (Triplus) pipe and floor waste protected by a cast-in fire collar. The penetrated slab comprised a 120-mm thick concrete slab reinforced with a single layer of steel reinforcement providing a Fire Resistance Period (FRP) for insulation of 120 minutes in accordance with table 5.5.1 of AS 3600:2018 - Concrete structures. The SNAP Cast-in H150FWS-RR fire collar comprised a 2-mm thick polypropylene casing with a 180 mm inner diameter and a 279-mm diameter base flange. The 250-mm high collar casing incorporated a 600-mm x 110-mm x 6-mm thick intumescent material. The closing mechanism comprised four 316 stainless steel springs, a nylon fuse link and a 640-mm x 109-mm stainless steel mesh. The penetrating service comprised a 109.6-mm outside diameter polypropylene pipe with a wall thickness of 4.1-mm fitted through the collar's sleeve. The floor waste system was fitted with a chrome brass grate, ABS Puddle Flange and a plastic cap. A 30-mm thick grout screed was laid on top of the concrete slab and finished flush with the floor grate. On the exposed side of the slab, a 4-way riser was connected to the penetrating pipe, supported by two M10 threaded rods, a 4-way riser bracket with metal plate and two steel drop-in anchors to the concrete slab. On the exposed face, the 4-way riser was capped with Superwool ceramic fibre plugs. The floor waste gully was charged with water to the level shown in drawing titled "Specimen #1 110 Triplus Floor waste H150FWS RR", dated 12 September 2019, provided by Snap Fire Systems Pty Ltd.

Performance observed in respect of the following AS 1530.4-2014 criteria

Structural Adequacy	-	not applicable
Integrity	-	no failure at 241 minutes
Insulation	-	191 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/120/120.

The FRL is applicable when the system is exposed to fire from the same direction as tested. The FRL is limited to that of the separating element. For the purposes of AS 1530.4-2014 the results of these fire tests may be used to directly assess fire hazard, but it should be noted that a single test method will not provide a full assessment of fire hazard under all fire conditions. This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Peter Gordon Date of Test: 24 September 2019

Issued on the 8th day of November 2019 without alterations or additions.

Brett Roddy | Manager, Fire Testing and Assessments

This document is issued in accordance with NATA's accreditation requirements.
Accreditation No. 165 – Corporate Site No. 3625
Accredited for compliance with ISO/IEC 17025 - Testing

COPY OF CERTIFICATE OF TEST – NO. 3339

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Certificate of Test

No. 3340 (Revision B)

This is to certify that the element of construction described below was tested by CSIRO Infrastructure Technologies in accordance with Australian Standard 1530, Methods for fire tests on building materials, components and structures, Part 4 Fire-resistance tests of elements of construction, 2014, Section 10: Service penetrations and control joints, on behalf of:

IG6 Pty Ltd as trustee for the IG6 IP Trust
3 Skirmish Court
Victoria Point Qld 4165

A full description of the test specimen and the complete test results are detailed in the Division's report numbered FSP 2049 (Revision D).

Product Name: SNAP MS70R Multi Services Retrofit fire collar protecting a ¾-in and a ⅜-in Pair Coil, 12 mm electrical cable and a nominal 20-mm PVC conduit (Specimen 4)

Description: The specimen comprised an 1150-mm x 1150-mm x 120-mm thick concrete slab penetrated by a ¾-in and a ⅜-in Pair Coil, 12 mm electrical cable and a nominal 20-mm PVC conduit protected by a retrofit fire collar. The 120-mm thick concrete slab was reinforced with a single layer of steel reinforcement providing a Fire Resistance Period (FRP) for insulation of 120 minutes in accordance with table 5.5.1 of AS 3600:2018 - Concrete structures. The SNAP Multi Service Retrofit MS70R fire collar comprised a 0.75 mm thick steel casing with a 69-mm inner dia. and a 0.95-mm steel base flange with a 162-mm dia. The 95-mm high collar casing incorporated a closing mechanism which comprised a soft Intumesh intumescent wrap, 4-mm thick x 90-mm wide x 250-mm long lined within the internal circumference of the collar. The closing mechanism comprised three stainless steel springs, with a nylon fuse link, and a 258 mm long x 88-mm wide 316 stainless steel mesh located around the intumescent strip. The Snap collar was surface mounted around the pipe on exposed face of slab and fixed using three concrete screws. The annular gap around pipe and slab on exposed face was filled with H.B Fullers Firesound sealant. The penetrating service comprised a cluster of two lagged copper pipes, a PVC conduit and an electrical cable. The copper pipes, having a wall thickness of 1.5-mm and 1.0mm respectively and both covered with a 10-mm thick crosslinked non fire rated PE foam lagging, a 12 mm grey electrical cable and a 20-mm PVC conduit with a wall thickness of 2.2 mm, all penetrated slab through a 64-mm dia. cut-out hole. The PVC conduct projected horizontally 2000-mm away from unexposed face of slab and approx. 500 mm into furnace chamber and was supported at nom. 500 mm, and 1500-mm from the unexposed face of the slab. The pipes and electrical cable projected vertically 500-mm from unexposed face of slab and approx. 500 mm into furnace chamber and supported at nom. 500-mm from unexposed face of slab. PVC conduit was open at unexposed end and capped with a Superwool plug on exposed end. Copper pipes were open on unexposed face and crimped on exposed end.

Performance observed in respect of the following AS 1530.4-2014 criteria

Structural Adequacy	-	not applicable
Integrity	-	no failure at 241 minutes
Insulation	-	not measured after 48 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/120/30.

The FRL is applicable when the system is exposed to fire from the same direction as tested. The FRL is limited to that of the separating element. For the purposes of AS 1530.4-2014 the results of these fire tests may be used to directly assess fire hazard, but it should be noted that a single test method will not provide a full assessment of fire hazard under all fire conditions. This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Peter Gordon Date of Test: 24 September 2019

Issued on the 4th day of July 2022. This Certificate supersedes issue dated 8th November 2019.

B. Roddy

Brett Roddy | Manager, Fire Testing and Assessments

This document is issued in accordance with NATA's accreditation requirements.
Accreditation No. 165 – Corporate Site No. 3625
Accredited for compliance with ISO/IEC 17025 - Testing

COPY OF CERTIFICATE OF TEST – NO. 3340 (REVISION B)

References

The following informative documents are referred to in this Report:

AS 1530.4-2014	Methods for fire tests on building materials, components and structures Part 4: Fire-resistance tests of elements of building construction.
AS 4072.1-2005	Components for the protection of openings in fire-resistant separating elements. Part 1: Service penetrations and control joints.
AS 3600-2018	Concrete structures

*** end of report ***

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FOR FURTHER INFORMATION

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