



Fire-resistance test on retrofit fire collars protecting a Hebel PowerPanel wall penetrated by services

Test Report

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Contents

1	Introduction	5
1.1	Identification of specimen	5
1.2	Sponsor	5
1.3	Manufacturer	5
1.4	Test standard	5
1.5	Reference standard.....	5
1.6	Test number.....	5
1.7	Test date	6
2	Description of specimen	6
2.1	General.....	6
2.2	Dimensions	9
2.3	Orientation.....	9
2.4	Conditioning.....	9
2.5	Selection, construction and installation of the specimen and the supporting construction	9
3	Documentation	10
4	Equipment.....	10
4.1	Furnace	10
4.2	Temperature	10
4.3	Measurement system	11
5	Ambient temperature	11
6	Departure from standard	11
7	Termination of test	11
8	Test results	11
8.1	Critical observations	11
8.2	Furnace temperature.....	12
8.3	Furnace severity.....	13
8.4	Specimen temperature.....	13
8.5	Performance	13
9	Fire-resistance level (FRL)	14
10	Field of direct application of test results	15
11	Tested by.....	15
	Appendices	16
	Appendix A – Measurement location	16
	Appendix B – Photographs.....	18
	Appendix C – Furnace Temperature	25
	Appendix D – Layout and installation drawings.....	34
	Appendix E – Specimen Drawings	41
	Appendix F – Certificate(s) of Test.....	42
	References.....	48

Fire-resistance test on retrofit fire collars protecting a Hebel PowerPanel wall penetrated by services

Sponsored Investigation No. FSP 2118

1 Introduction

1.1 Identification of specimen

The sponsor identified the specimen as SNAP retrofit fire collars protecting a Hebel PowerPanel wall penetrated by six services.

1.2 Sponsor

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

1.3 Manufacturer

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

1.4 Test standard

Australian Standard 1530, Methods for fire tests on building materials, components and structures, Part 4-2014, Fire-resistance tests for 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 4995/4542

1.7 Test date

The fire-resistance test was conducted on 23 June 2020.

2 Description of specimen

2.1 General

The specimen comprised an 1150-mm x 1150-mm x 75-mm thick Hebel PowerPanel wall penetrated by six (6) services protected by retro-fitted Snap Fire Systems fire collars.

The wall comprised a 75-mm thick Hebel PowerPanel autoclaved aerated concrete (AAC) wall system with an established fire resistance level (FRL) of -/90/90, as detailed in CSIRO test report FSV 0979.

For the purpose of the test, the penetrations are referenced as Specimen 1, 2, 3, 4, 5 and 6. Documents containing a complete description of each specimen were supplied by the sponsor and are retained on file.

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

- BS 476-4:1970: Fire Tests on Building Materials and Structures - Part 4: Non-Combustibility Test for Materials;
- AS 1432:2004 Copper tubes for plumbing, gas fitting and drainage applications;
- AS/NZS 1477:2017 PVC pipes and fittings for pressure applications, and
- AS/NZS 5000.1:2005 (R2017): Electric cables - Polymeric insulated - For working voltages up to and including 0.6/1 (1.2) kV.

Specimen 1 - SNAP MS70R Multi Services Retrofit fire collars protecting a nominal 50-mm polyvinyl chloride (PVC-U) pipe.

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 thick steel base flange with a 162-mm diameter. The 95-mm high collar casing incorporated a 4-mm thick x 90-mm wide x 250-mm long soft Intumesh intumescent wrap lined within the internal circumference of the collar casing. The closing mechanism comprised three stainless steel springs, 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 titled "SNAP 70 Multi Service Retro", dated 23 September 2019, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in a back-to-back configuration using three 14-10 65-mm Hex Head Screws.

The penetrating service comprised a 60.32-mm outside diameter Vinidex PN6 (PVC-U) pipe, with a wall thickness of 1.84-mm, fitted through the collar's sleeve and penetrated the wall through a 64-mm diameter cut-out hole, as shown in drawing titled "Specimen #1 50 PN6 PVC Pipe & MS70R Collar", dated 9 June 2020, by Snap Fire Systems Pty Ltd.

The pipe projected horizontally 2000-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber and was supported at nominally 500-mm and 1500-mm from the unexposed face of the Hebel wall.

The pipe was open at the unexposed end and plugged with ceramic fibre (Superwool) on the exposed end.

Specimen 2 - SNAP MS70R Multi Services Retrofit fire collar protecting a nominal 50-mm PVC conduit incorporating two 6-mm² 3C+E and two 16-mm² 3C+E power cables

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 thick steel base flange with a 162-mm diameter. The 95-mm high collar casing incorporated a 4-mm thick x 90-mm wide x 250-mm long soft Intumesh intumescent wrap lined within the internal circumference of the collar casing. The closing mechanism comprised three stainless steel springs, 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 titled "SNAP 70 Multi Service Retro", dated 23 September 2019, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in a back-to-back configuration using three 14-10 65-mm Hex Head Screws.

The penetrating service comprised a 60-mm outside diameter Telstra PVC conduit with a wall thickness of 2.71 incorporating two 6-mm² 3-core+E power cables and two 16-mm² 3-core+E power cables running through the conduit. All the cables were manufactured by General Cables.

The PVC conduit containing the four power cables was fitted through the collar's sleeve and penetrated the wall through a 64-mm diameter cut-out hole as shown in drawing titled "Specimen #2 50 PVC Conduit with 16mm² 3C+E & 6mm² 3C+E Power Cables & MS70R Collar", dated 9 June 2020, by Snap Fire Systems Pty Ltd", dated 9 June 2020, by Snap Fire Systems Pty Ltd.

The conduit and cables projected horizontally, 2000-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber and was supported at nominally 500-mm and 1500-mm from the unexposed face of the Hebel wall.

The conduit was open at the unexposed end and plugged with ceramic fibre (Superwool) on the exposed end.

Specimen 3 - SNAP MS70R Multi Services Retrofit fire collars protecting a bundle of 20 Category 5e network cables.

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 thick steel base flange with a 162-mm diameter. The 95-mm high collar casing incorporated a 4-mm thick x 90-mm wide x 250-mm long soft Intumesh intumescent wrap lined within the internal circumference of the collar casing. The closing mechanism comprised three stainless steel springs, 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 titled "SNAP 70 Multi Service Retro", dated 23 September 2019, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in a back-to-back configuration using three 14-10 65-mm Hex Head Screws.

The penetrating service comprised a bundle of 20 x 5-mm diameter ADC Krone Category 5e network cables. The cables were fitted through the collar's sleeve and penetrated the wall through a 70-mm diameter cut-out hole, as shown in drawing titled "Specimen #3 20% Full of Cat5e Cables & MS70R Collar", dated 9 June 2020, by Snap Fire Systems Pty Ltd.

The cables projected horizontally 550-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber and were supported at nominally 500-mm from the unexposed face of the Hebel wall.

Specimen 4 - SNAP MS70R Multi Services Retrofit fire collars protecting a bundle of 100 Category 5e network cables.

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 thick steel base flange with a 162-mm diameter. The 95-mm high collar casing incorporated a 4-mm thick x 90-mm wide x 250-mm long soft Intumesh intumescent wrap lined within the internal circumference of the collar casing. The closing mechanism comprised three stainless steel springs, 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 titled "SNAP 70 Multi Service Retro", dated 23 September 2019, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in a back-to-back configuration using three 14-10 65-mm Hex Head Screws.

The penetrating service comprised a bundle of 100 x 5-mm diameter ADC Krone Category 5e network cables. The cables were fitted through the collar's sleeve and penetrated the wall through a 70-mm diameter cut-out hole as shown in drawing titled "Specimen #4 100% Full of Cat5e Cables & MS70R Collar", dated 9 June 2020, by Snap Fire Systems Pty Ltd.

The cables projected horizontally 550-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber and were supported at nominally 500-mm from the unexposed face of the Hebel wall.

Specimen 5 - SNAP MS70R Multi Services Retrofit fire collars protecting a DN25B copper pipe with 19-mm F/R lagging and a thermoplastic-sheathed cable (TPS).

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 thick base flange with a 162-mm diameter. The 95-mm high collar casing incorporated a 4-mm thick x 90-mm wide x 250-mm long soft Intumesh intumescent wrap lined within the internal circumference of the collar casing. The closing mechanism comprised three stainless steel springs, 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 titled "SNAP 70 Multi Service Retro", dated 23 September 2019, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in a back-to-back configuration using three 14-10 65-mm Hex Head Screws.

The penetrating service comprised a 1-inch outside diameter copper pipe with a wall thickness of 1.1-mm, lagged with 19-mm thick E-flex insulation as well as a 3-core 2.5-mm² TPS cable. The lagged pipe and cable were fitted through the collar's sleeve and penetrated the wall through a 64-mm diameter cut-out hole as shown in drawing titled "Specimen #5 1inch Copper Tube with 19mm F/R Lagging, 2.5mm² 3C TPS Cable & MS70R Collar", dated 9 June 2020, by Snap Fire Systems Pty Ltd.

The lagged pipe and cable projected horizontally 550-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber. The lagged pipe and cable were supported at nominally 500-mm from the unexposed face of the Hebel wall.

Specimen 6 - SNAP MS70R Multi Services Retrofit fire collars protecting a bundle of six 16-mm² 3C+E and three 6-mm² 3C+E power cables.

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 thick steel base flange with a 162-mm diameter. The 95-mm high collar casing incorporated a 4-mm thick x 90-mm wide x 250-mm long soft Intumesh intumescent wrap lined within the internal circumference of the collar casing. The closing mechanism comprised three stainless steel springs, 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 titled “SNAP 70 Multi Service Retro”, dated 23 September 2019, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in a back-to-back configuration using three 14-10 65-mm Hex Head Screws.

The penetrating service comprised a bundle of six 16-mm² 3-core+E power cables and three 6-mm² 3-core+E power cables. All power cables were manufactured by General Cables. The cables were fitted through the collar’s sleeve and penetrated the wall through a 70-mm diameter cut-out hole, as shown in drawing titled “Specimen #6 16mm² 3C+E & 6mm² 3C+E Power Cables & MS70R Collar”, dated 9 June 2020, provided by Snap Fire Systems Pty Ltd.

The annular gap around the pipe and Hebel PowerPanel on both sides of the wall was filled with a 10-mm deep bead H.B Fullers Firesound sealant. The cables projected horizontally 550-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber. The cables were supported at nominally 500-mm from the unexposed face of the Hebel wall.

2.2 Dimensions

The wall specimen was nominally 1150-mm wide x 1150-mm high x 75-mm thick.

2.3 Orientation

The Hebel PowerPanel wall was placed vertically against the furnace chamber and subjected to fire exposure from one side only.

2.4 Conditioning

The specimen was delivered on 10 February 2020 and stored under standard laboratory atmospheric conditions until the test date.

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

The supporting wall 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 Wall W-20-F Layout”, dated 9 June 2020, by Snap Fire Systems Pty Ltd.
- Drawing titled “Specimen #1 50 PN6 PVC Pipe & MS70R Collar”, dated 9 June 2020, by Snap Fire Systems Pty Ltd.
- Drawing titled “Specimen #2 50 PVC Conduit with 16mm² 3C+E & 6mm² 3C+E Power Cables & MS70R Collar”, dated 9 June 2020, by Snap Fire Systems Pty Ltd.
- Drawing titled “Specimen #3 20% Full of Cat5e Cables & MS70R Collar”, dated 9 June 2020, provided by Snap Fire Systems Pty Ltd.
- Drawing titled “Specimen #4 100% Full of Cat5e Cables & MS70R Collar”, dated 9 June 2020, provided by Snap Fire Systems Pty Ltd.
- Drawing titled “Specimen #5 1inch Copper Tube with 19mm F/R Lagging, 2.5mm² 3C TPS Cable & MS70R Collar”, dated 9 June 2020, provided by Snap Fire Systems Pty Ltd.
- Drawing titled “Specimen #6 16mm² 3C+E & 6mm² 3C+E Power Cables & MS70R Collar”, dated 9 June 2020, provided by Snap Fire Systems Pty Ltd.
- Drawing titled “SNAP 50 Multi Service Retro”, 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. Additional thermocouples were placed on the unexposed cables at 75-mm and 125-mm from the collar of Specimen 6.

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 14°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 121 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 minutes -	Smoke is being emitted between the collar and pipe of Specimens 1, 2, 3 and 4.
1.30 minute -	Loud clicking noises were heard from Specimen 3, followed by closing of the pipe inside the furnace. The level of smoke emitted from the collars of Specimens 1, 2, 3, and 4 has increased.
2 minutes -	Smoke briefly flued from the end of the pipe of Specimen 2 for approximately 30 seconds before ceasing.
3 minutes -	Smoke is being emitted between the collar and pipe of Specimens 5. The level of smoke emitted from Specimens 1, 2, 3 and 4 has reduced.
4 minutes -	Smoke has ceased fluing from the collars of Specimens 1 and 5.
7 minutes -	Smoke has ceased fluing from the collars of Specimens 2 and 3.
8 minutes -	Smoke discolouration is visible around the base of the PVC pipes adjacent to the collars of Specimens 1 and 2 (photograph 4).
12 minutes -	The bundle of cables from Specimen 3 has been pushed out away from the wall approximately 30-mm.

- 16 minutes - Steam has begun fluing from a small crack at the base of the central wall joint.
- 28 minutes - The E-flex insulation around the copper pipe of Specimen 5 has begun to split.
- 49 minutes - The blue sheath on the cables of Specimen 4 has begun to discolour. Horizontal cracks have begun to form on the wall adjacent to Specimens 3 and 4 (photograph 6).
- 51 minutes - Light smoke has resumed fluing between the collar and pipe of Specimens 3 and 4.
- 58 minutes - Light smoke has resumed fluing between the collar and pipe of Specimens 5 and 6
- 72 minutes - Smoke is being emitted between the collar and pipe of all specimens.
- 73 minutes - The sheath on the 16-mm² cable of Specimen 6 adjacent to the collar has begun to discolour (photograph 8).
- 93 minutes - The sheath on the 16-mm² and 6-mm² cables of Specimen 6 adjacent to the collar have begun to melt.
- 97 minutes - The horizontal crack in the wall adjacent to Specimen 4 has widened with the glow of the furnace visible (photograph 10). Cotton pad test applied above the crack on the wall – no ignition noted at this time.
- 99 minutes - Smoke continues to be emitted from the collar of Specimen 2.
- 103 minutes - Smoke staining is visible on the wall above Specimens 3 and 4.
- 105 minutes - The nylon fuse inside the collar of Specimen 4 on the unexposed face has been released, the two lower nylon fuses remain attached to the casing.
- 117 minutes - Insulation failure of Specimen 4 – maximum temperature rise of 180K is exceeded on the Hebel wall 25-mm from the right hand side of the collar of Specimen 4.
- 118 minutes - Insulation failure of Specimen 5 – maximum temperature rise of 180K is exceeded on the right side of the collar of Specimen 5. Cotton pad test applied above over the horizontal crack on the wall adjacent to Specimen 4 – no ignition noted at this time.
- 119 minutes - Insulation failure of Specimen 6 – maximum temperature rise of 180K is exceeded on the 16-mm² power cables 25-mm from the collar of Specimen 6.
- 120 minutes - Insulation failure of Specimen 3 – maximum temperature rise of 180K is exceeded on the Hebel wall 25-mm from the right hand side of the collar of Specimen 3.
- 121 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 2.

Figure 5 shows the curve of temperature versus time associated with Specimen 3.

Figure 6 shows the curve of temperature versus time associated with Specimen 4.

Figure 7 shows the curve of temperature versus time associated with Specimen 5.

Figure 8 shows the curve of temperature versus time associated with Specimen 6.

8.5 Performance

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

Specimen 1 - SNAP MS70R Multi Services Retrofit fire collars protecting a nominal 50-mm polyvinyl chloride (PVC-U) pipe

Structural adequacy	-	not applicable
Integrity	-	no failure at 121 minutes
Insulation	-	no failure at 121 minutes

Specimen 2 - SNAP MS70R Multi Services Retrofit fire collar protecting a nominal 50-mm PVC conduit incorporating two 6-mm² 3C+E and two 16-mm² 3C+E power cables

Structural adequacy	-	not applicable
Integrity	-	no failure at 121 minutes
Insulation	-	no failure at 121 minutes

Specimen 3 - SNAP MS70R Multi Services Retrofit fire collars protecting a bundle of 20 Category 5e network cables

Structural adequacy	-	not applicable
Integrity	-	no failure at 121 minutes
Insulation	-	120 minutes

Specimen 4 - SNAP MS70R Multi Services Retrofit fire collars protecting a bundle of 100 Category 5e network cables

Structural adequacy	-	not applicable
Integrity	-	no failure at 121 minutes
Insulation	-	117 minutes

Specimen 5 - SNAP MS70R Multi Services Retrofit fire collars protecting a DN25B copper tube with 19-mm F/R lagging and a thermoplastic-sheathed cable (TPS)

Structural adequacy	-	not applicable
Integrity	-	no failure at 121 minutes
Insulation	-	118 minutes

Specimen 6 - SNAP MS70R Multi Services Retrofit fire collars protecting a bundle of six 16-mm² 3C+E and three 6-mm² 3C+E power cables

Structural adequacy	-	not applicable
Integrity	-	no failure at 121 minutes
Insulation	-	119 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 AS1530.4. 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 - -/90/90

Specimen 2 - -/90/90

Specimen 3 - -/90/90

Specimen 4 - -/90/90

Specimen 5 - -/90/90

Specimen 6 - -/90/90

The fire-resistance level is applicable when the system is exposed to fire from either direction.

The test was conducted on a wall system with an established FRL of -/90/90. The maximum FRL of any test specimen cannot exceed the FRL achieved by the wall system in which it was installed.

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 10.12 of AS 1530.4-2014, have been made provided no individual component is removed or reduced.

11 Tested by

A handwritten signature in blue ink, appearing to read 'Peter Gordon', with a stylized flourish at the end.

Peter Gordon
Testing Officer

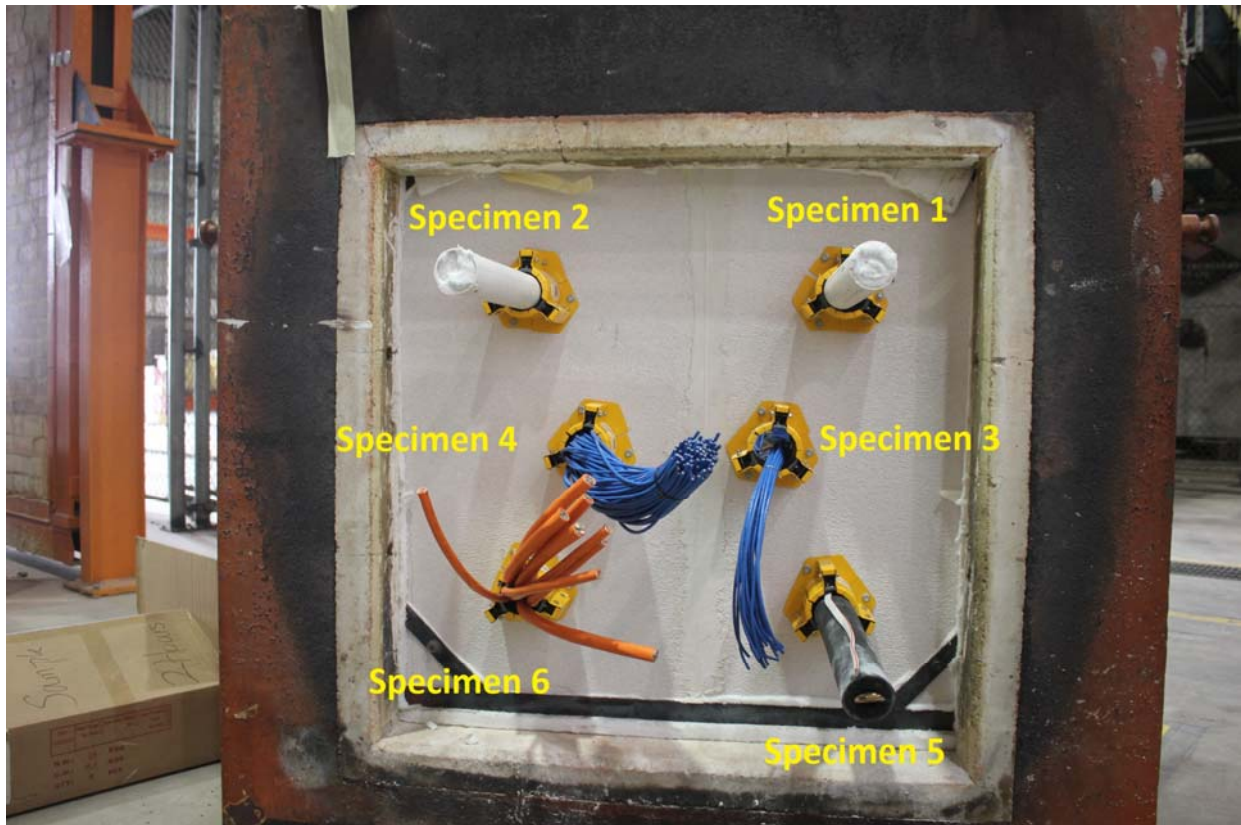
Appendices

Appendix A – Measurement location

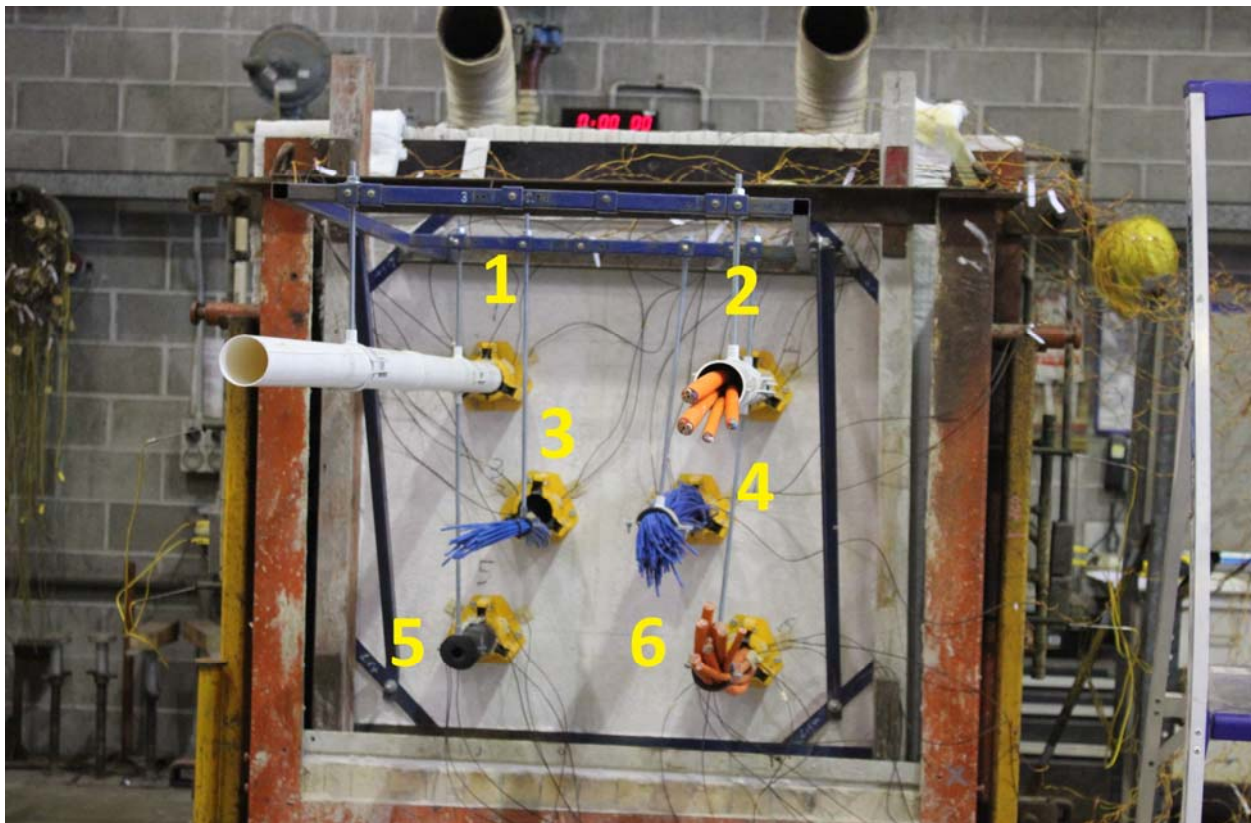
SPECIMEN	T/C Position	T/C designation
Specimen 1 - SNAP MS70R Multi Services Retrofit fire collars protecting a 60-mm polyvinyl chloride (PVC-U) pipe.	On Hebel wall, 25-mm from collar left side	S1
	On Hebel wall, 25-mm from collar right side	S2
	On collar left side	S3
	On collar right side	S4
	On top of pipe, 25-mm from collar	S5
	On bottom of pipe, 25-mm from collar	S6
Specimen 2 - SNAP MS70R Multi Services Retrofit fire collar protecting a nominal 50-mm PVC conduit incorporating two 16-mm ² 3C+E and two 6-mm ² 3C+E power cables.	On Hebel wall, 25-mm from collar left side	S7
	On Hebel wall, 25-mm from collar right side	S8
	On collar left side	S9
	On collar right side	S10
	On top of pipe, 25-mm from collar	S11
	On bottom of pipe, 25-mm from collar	S12
Specimen 3 - SNAP MS70R Multi Services Retrofit fire collars protecting a bundle of 20 Category 5e network cables.	On Hebel wall, 25-mm from collar left side	S13
	On Hebel wall, 25-mm from collar right side	S14
	On collar left side	S15
	On collar right side	S16
	On top of cables, 25-mm from collar	S17
	On bottom of cables, 25-mm from collar	S18
Specimen 4 - SNAP MS70R Multi Services Retrofit fire collars protecting a bundle of 100 Category 5e network cables.	On Hebel wall, 25-mm from collar left side	S19
	On Hebel wall, 25-mm from collar right side	S20
	On collar left side	S21
	On collar right side	S22
	On top of cables, 25-mm from collar	S23
	On bottom of cables, 25-mm from collar	S24
Specimen 5 - SNAP MS70R Multi Services Retrofit fire collars protecting a DN25B copper pipe with Thermotec E-flex ST FRV and a thermoplastic-sheathed (TPS) cable.	On Hebel wall, 25-mm from collar left side	S25
	On Hebel wall, 25-mm from collar right side	S26
	On collar left side	S27
	On collar right side	S28
	On TPS cable, 25-mm from collar	S29
	On left side of lagging, 25-mm from collar	S30
	On right side of lagging, 25-mm from collar	S31

SPECIMEN	T/C Position	T/C designation
Specimen 6 - SNAP MS70R Multi Services Retrofit fire collars protecting a bundle six 16-mm ² 3C+E and three 6-mm ² 3C+E power cables.	On Hebel wall, 25-mm from collar left side	S32
	On Hebel wall, 25-mm from collar right side	S33
	On collar left side	S34
	On collar right side	S35
	On 16-mm ² cable, 25-mm from collar	S36
	On 6-mm ² cable, 25-mm from collar	S37
Additional Thermocouples placed on cables of Specimen 6.	On 16-mm ² cable, 75-mm from collar	S38
	On 6-mm ² cable, 75-mm from collar	S39
	On 16-mm ² cable, 125-mm from collar	S40
	On 6-mm ² cable, 125-mm from collar	S41
Rover		S42
Ambient		S43

Appendix B – Photographs



PHOTOGRAPH 1 – EXPOSED FACE OF SPECIMENS PRIOR TO TESTING



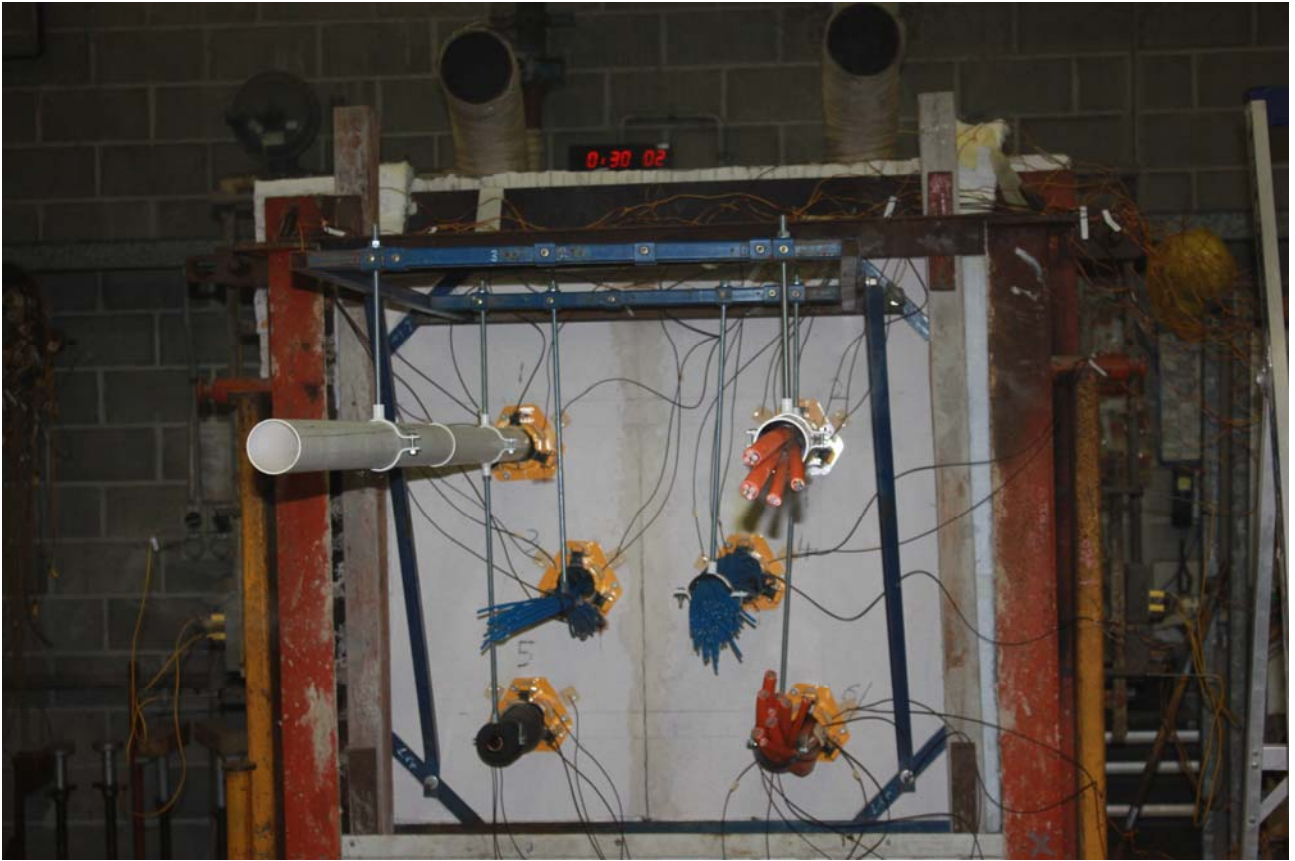
PHOTOGRAPH 2 – UNEXPOSED FACE OF SPECIMENS PRIOR TO TESTING



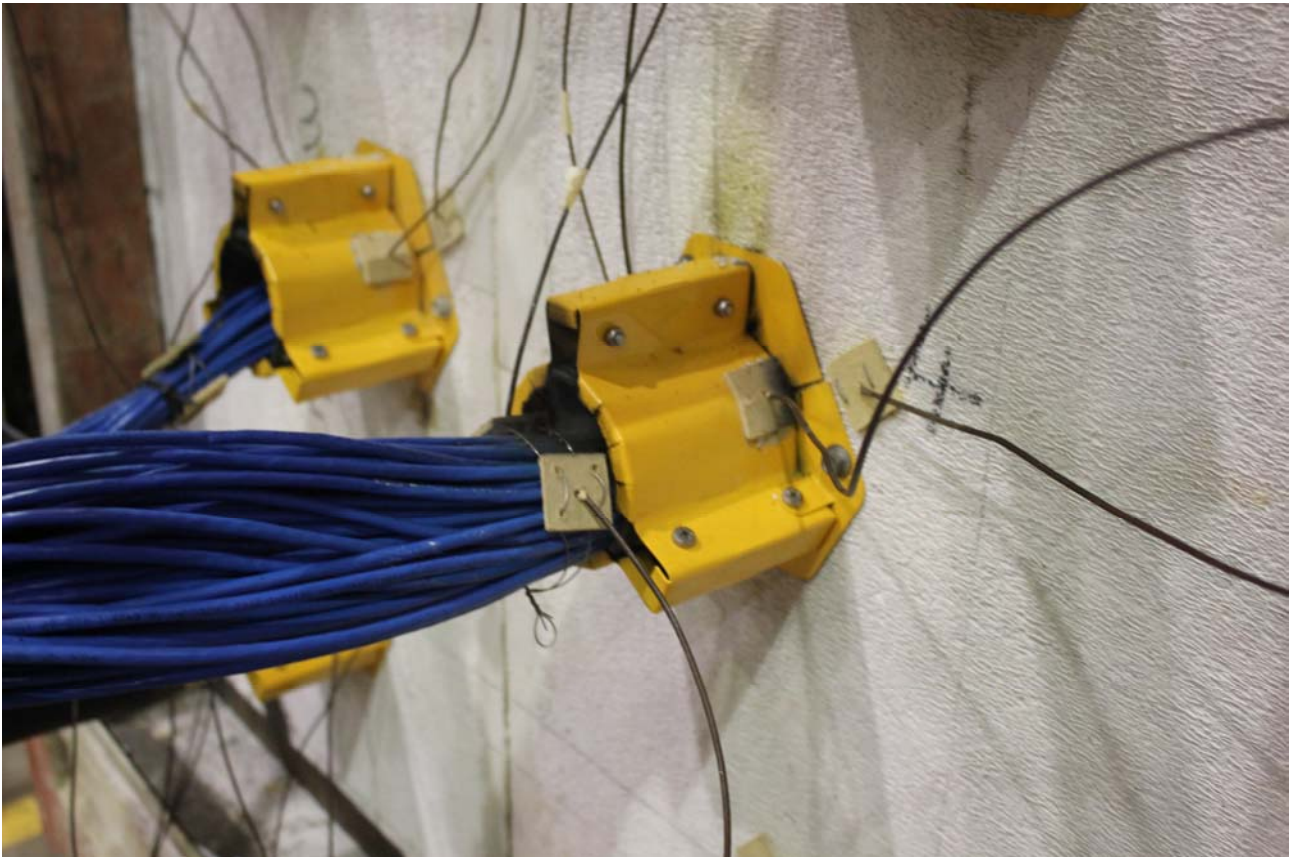
PHOTOGRAPH 3 – SPECIMENS AFTER 3 MINUTES OF TESTING



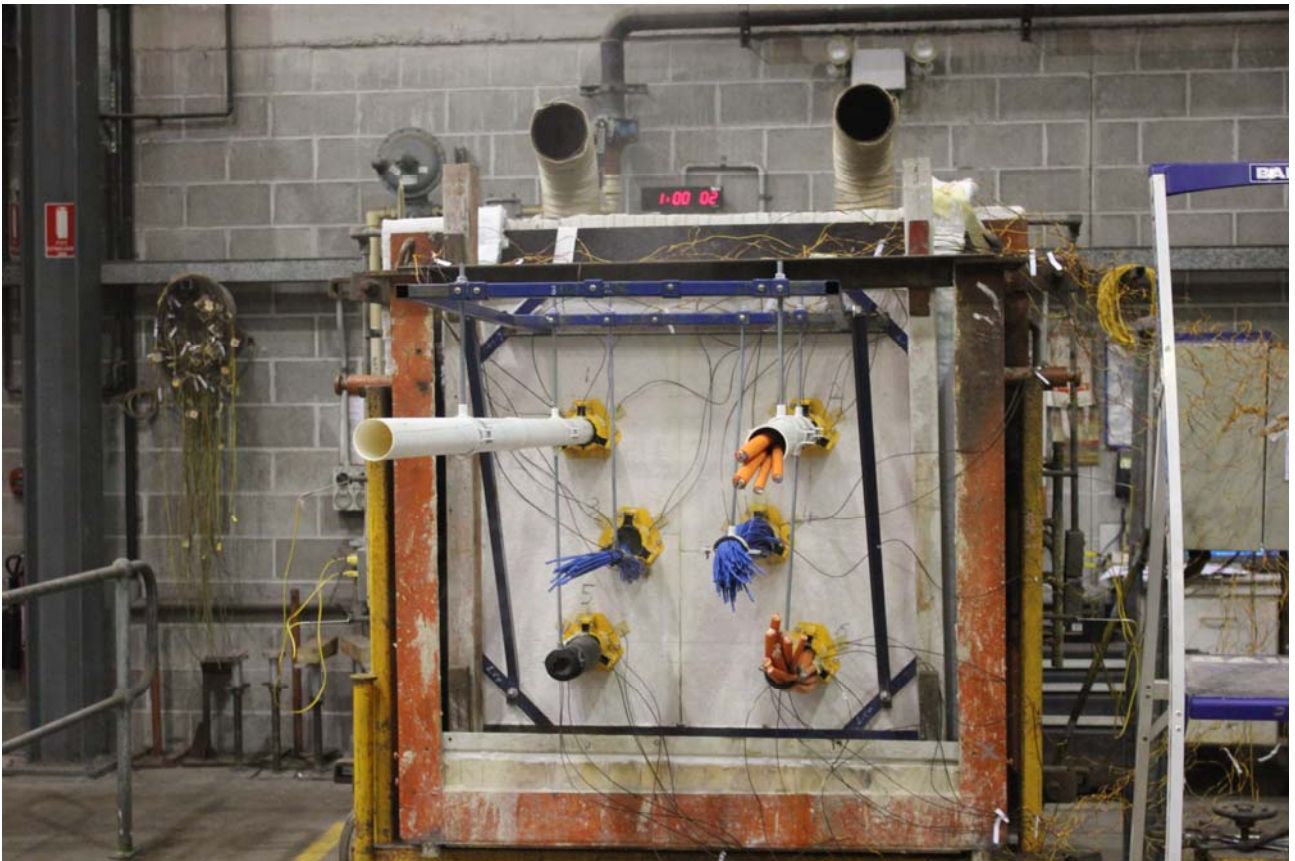
PHOTOGRAPH 4 – SPECIMENS 1 AND 2 AFTER 8 MINUTES OF TESTING



PHOTOGRAPH 5 – SPECIMENS AFTER 30 MINUTES OF TESTING



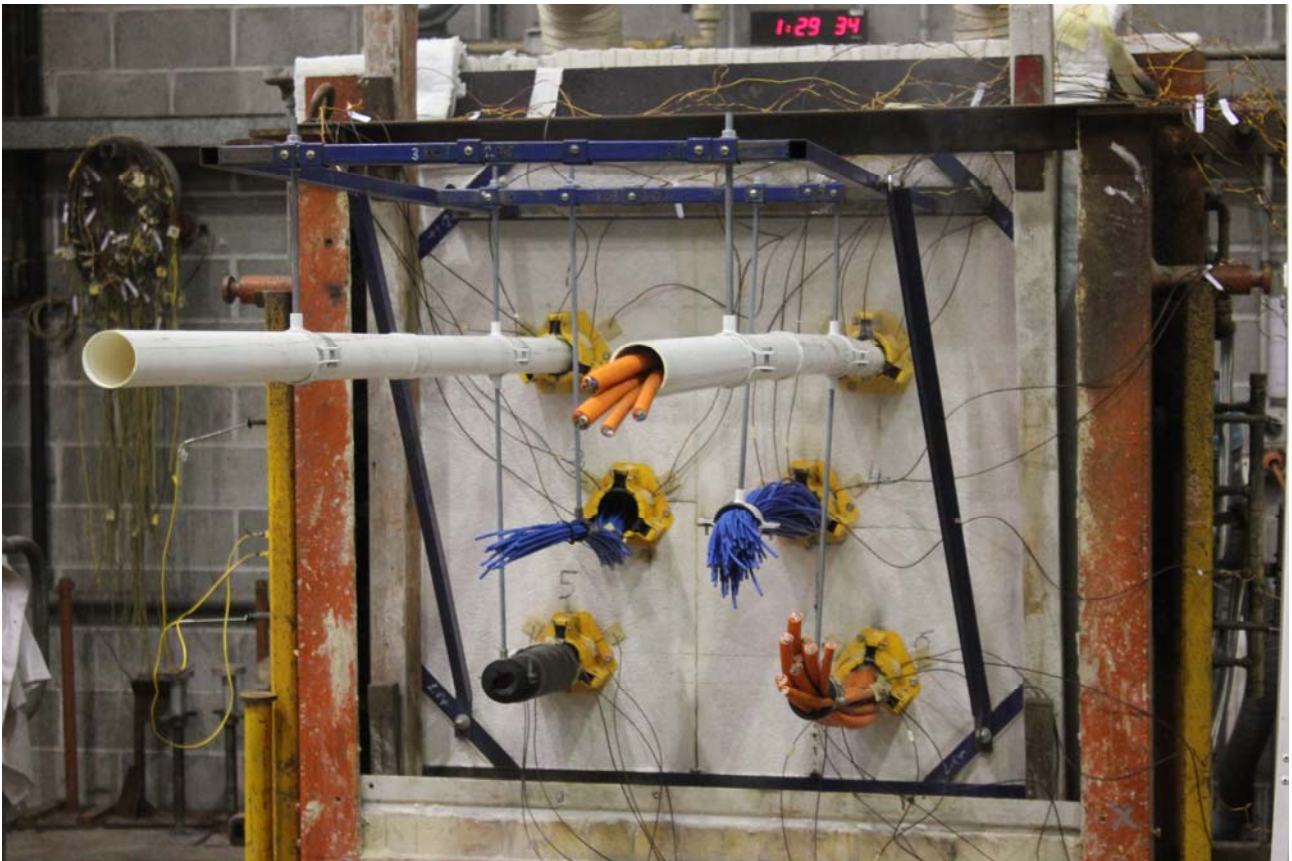
PHOTOGRAPH 6 –SPECIMENS 3 AND 4 AFTER 49 MINUTES OF TESTING



PHOTOGRAPH 7 – SPECIMENS AFTER 60 MINUTES OF TESTING



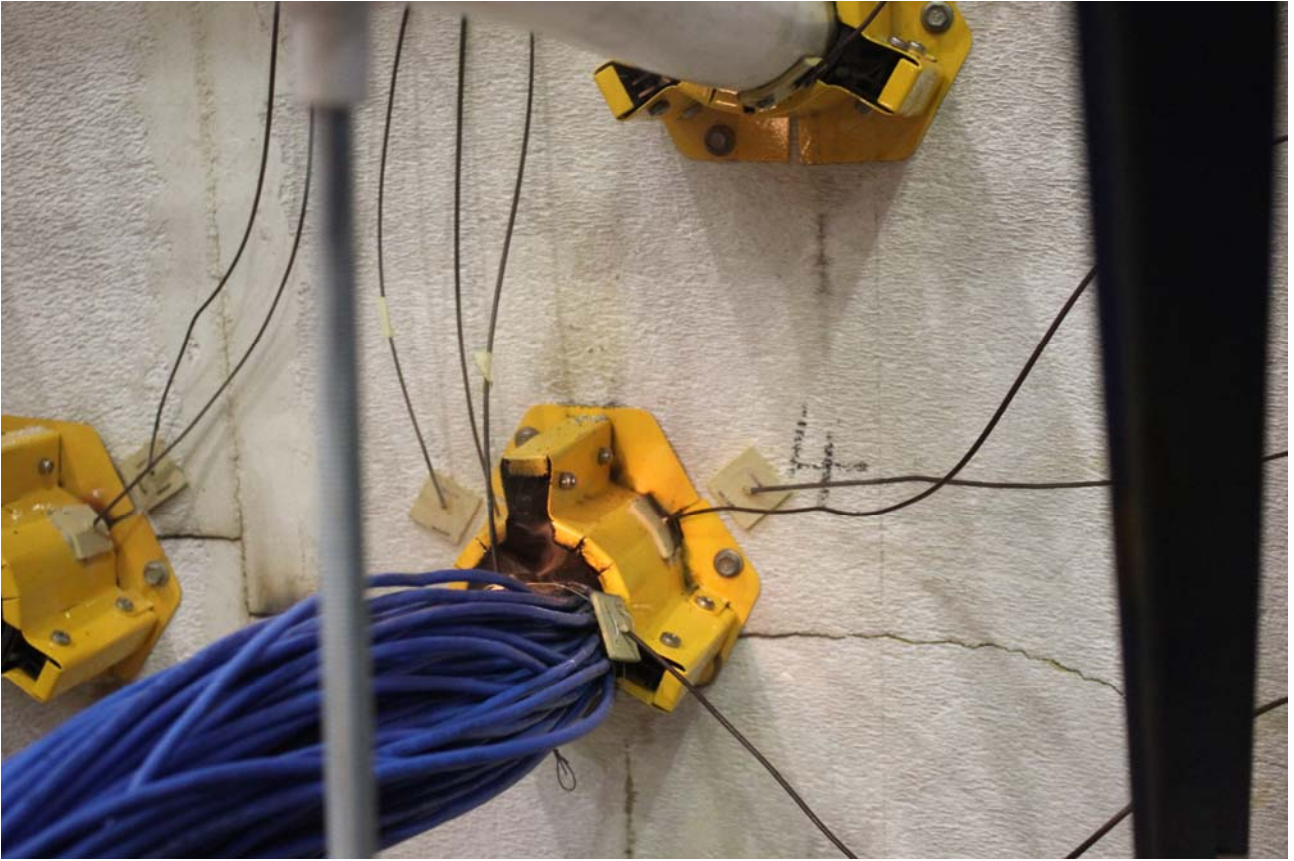
PHOTOGRAPH 8 – SPECIMEN 6 AFTER 73 MINUTES OF TESTING



PHOTOGRAPH 9 – SPECIMENS AFTER 89 MINUTES OF TESTING



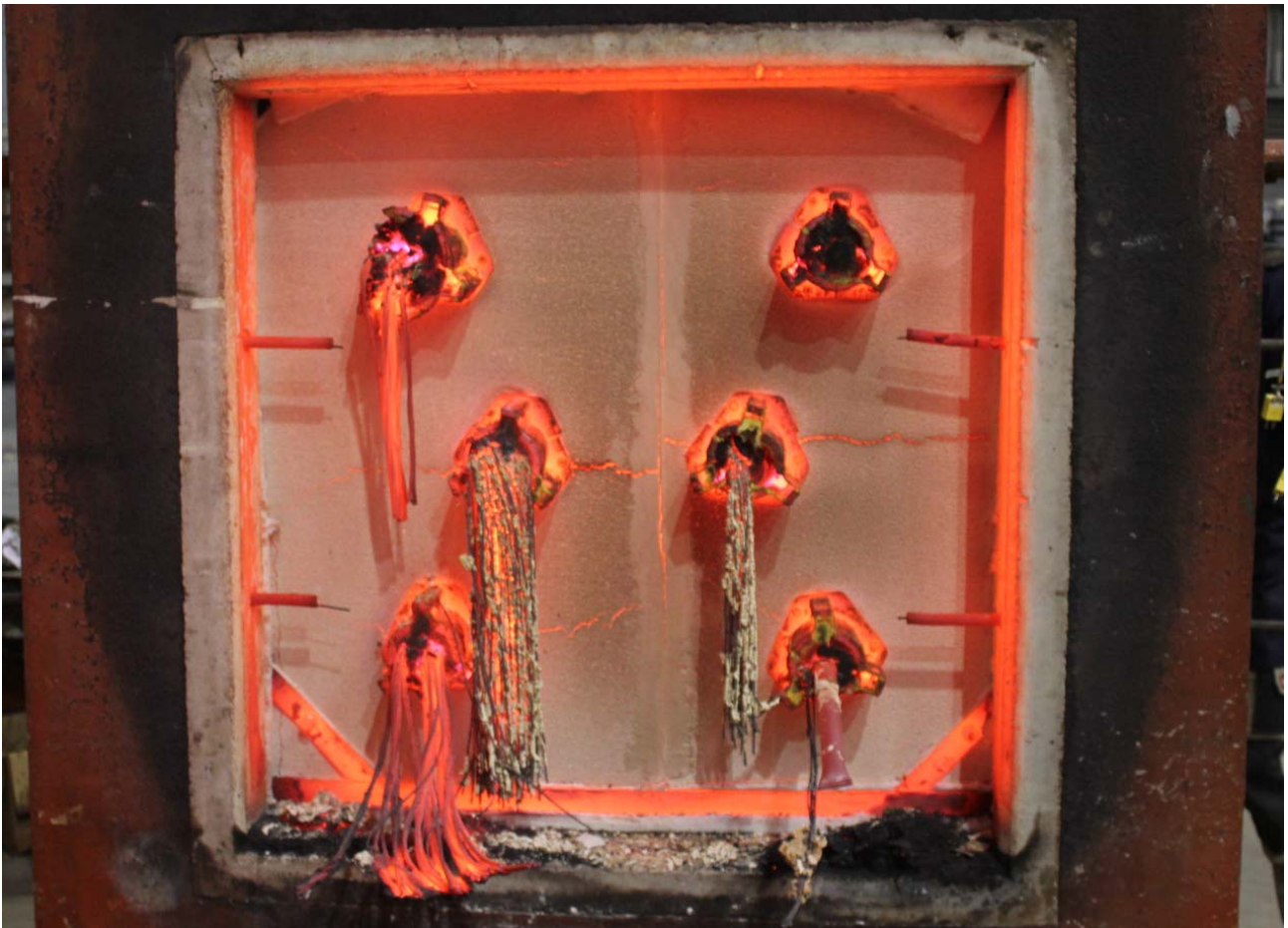
PHOTOGRAPH 10 – THE WALL ADJACENT TO SPECIMENS 3 AND 4 AFTER 97 MINUTES OF TESTING



PHOTOGRAPH 11 – SPECIMEN 4 AFTER 105 MINUTES OF TESTING



PHOTOGRAPH 12 – SPECIMENS AFTER 120 MINUTES OF TESTING



PHOTOGRAPH 13 – EXPOSED FACE OF SPECIMENS AT CONCLUSION OF TESTING

Appendix C – Furnace Temperature

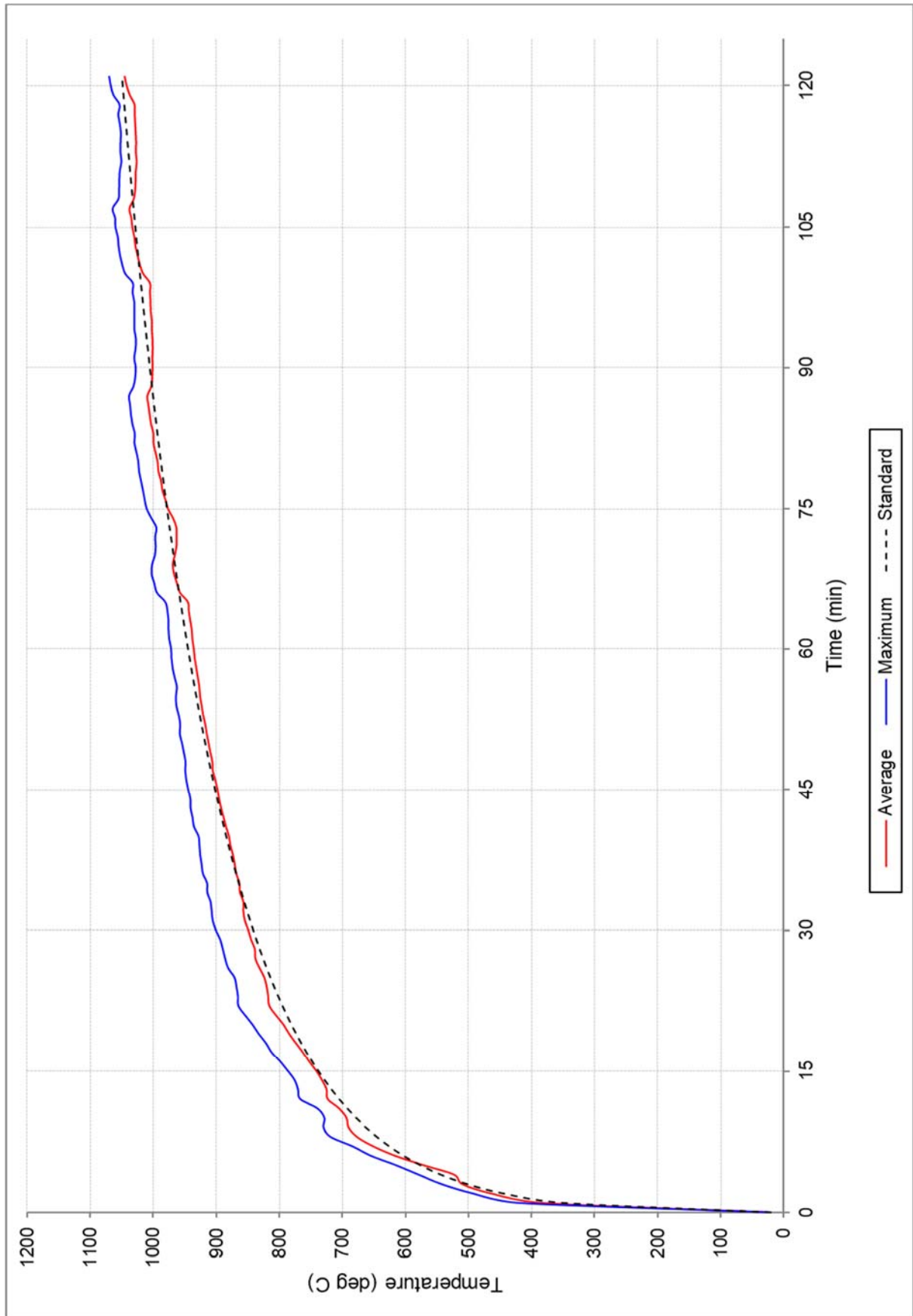


FIGURE 1 – FURNACE TEMPERATURE

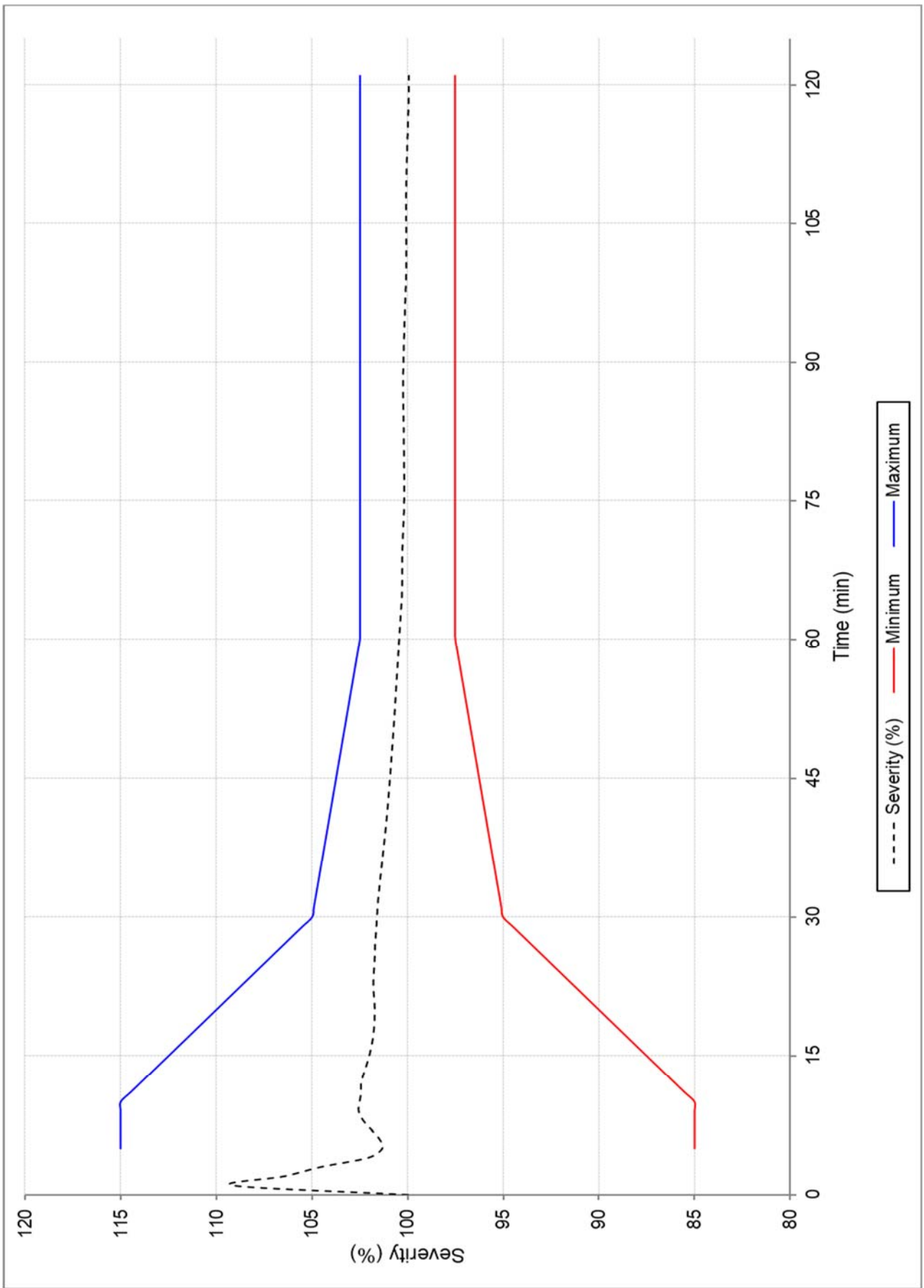


FIGURE 2 – FURNACE SEVERITY

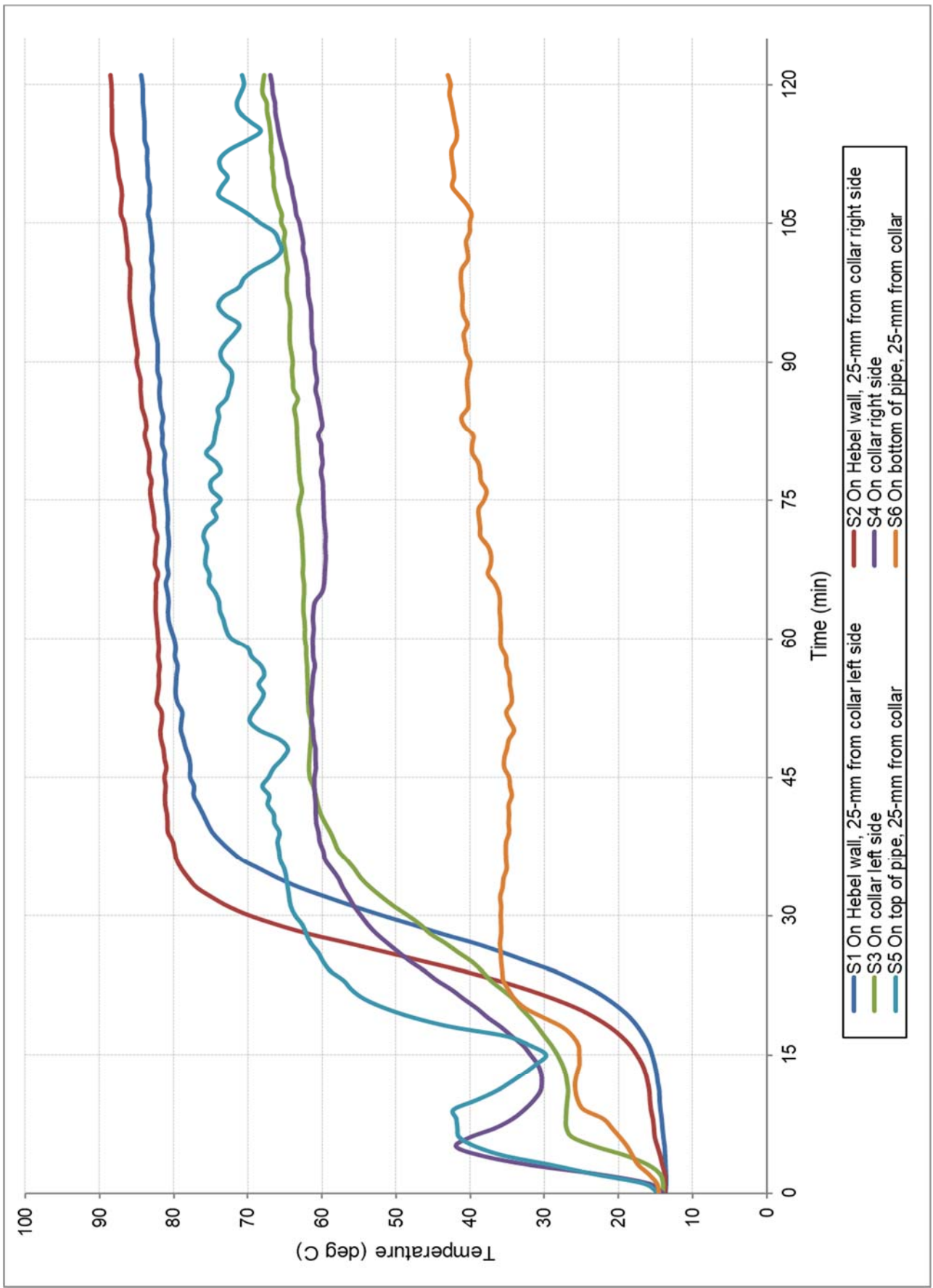


FIGURE 3 - TEMPERATURE VERSUS TIME ASSOCIATED WITH SPECIMEN #1

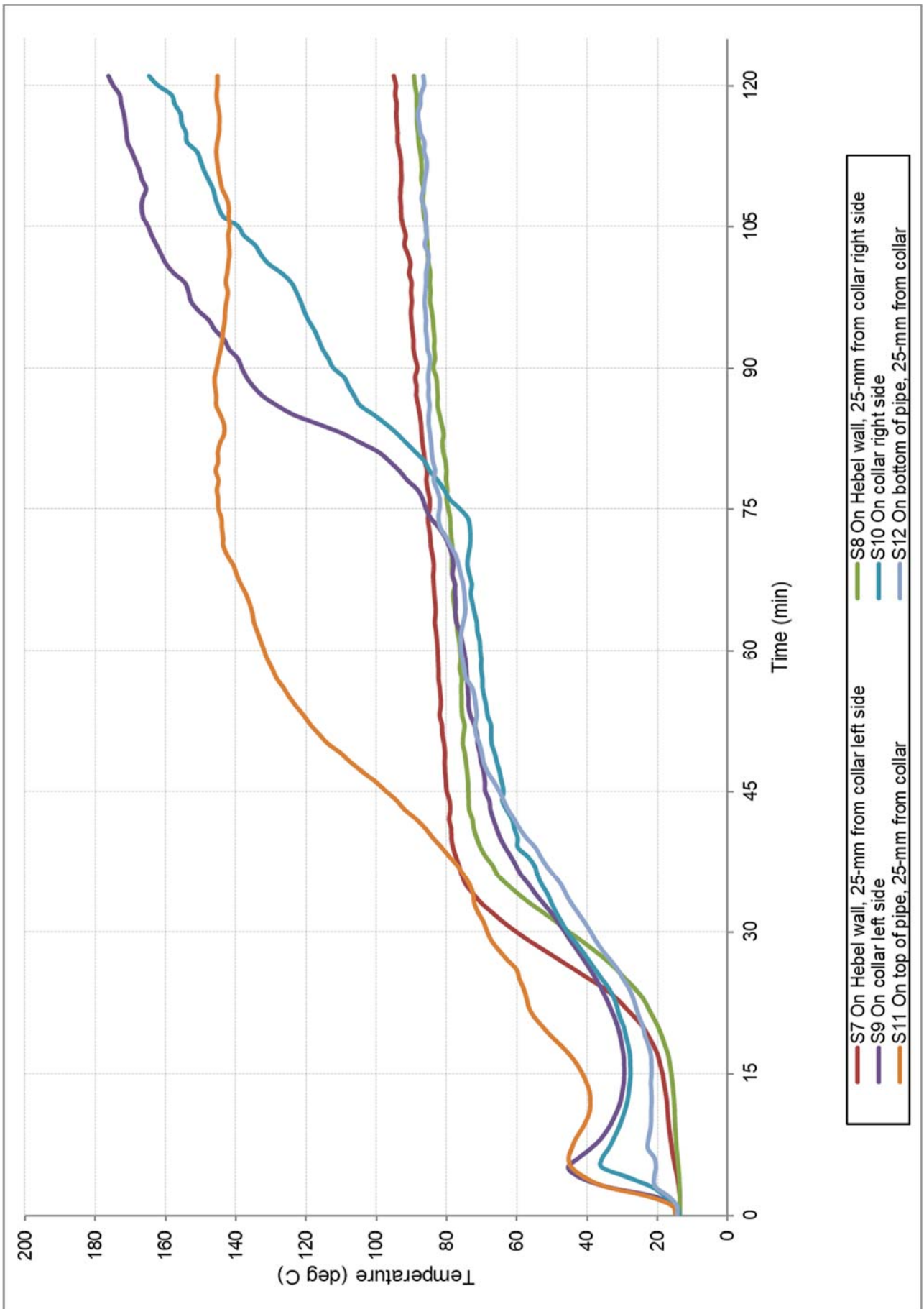


FIGURE 4 - TEMPERATURE VERSUS TIME ASSOCIATED WITH SPECIMEN #2

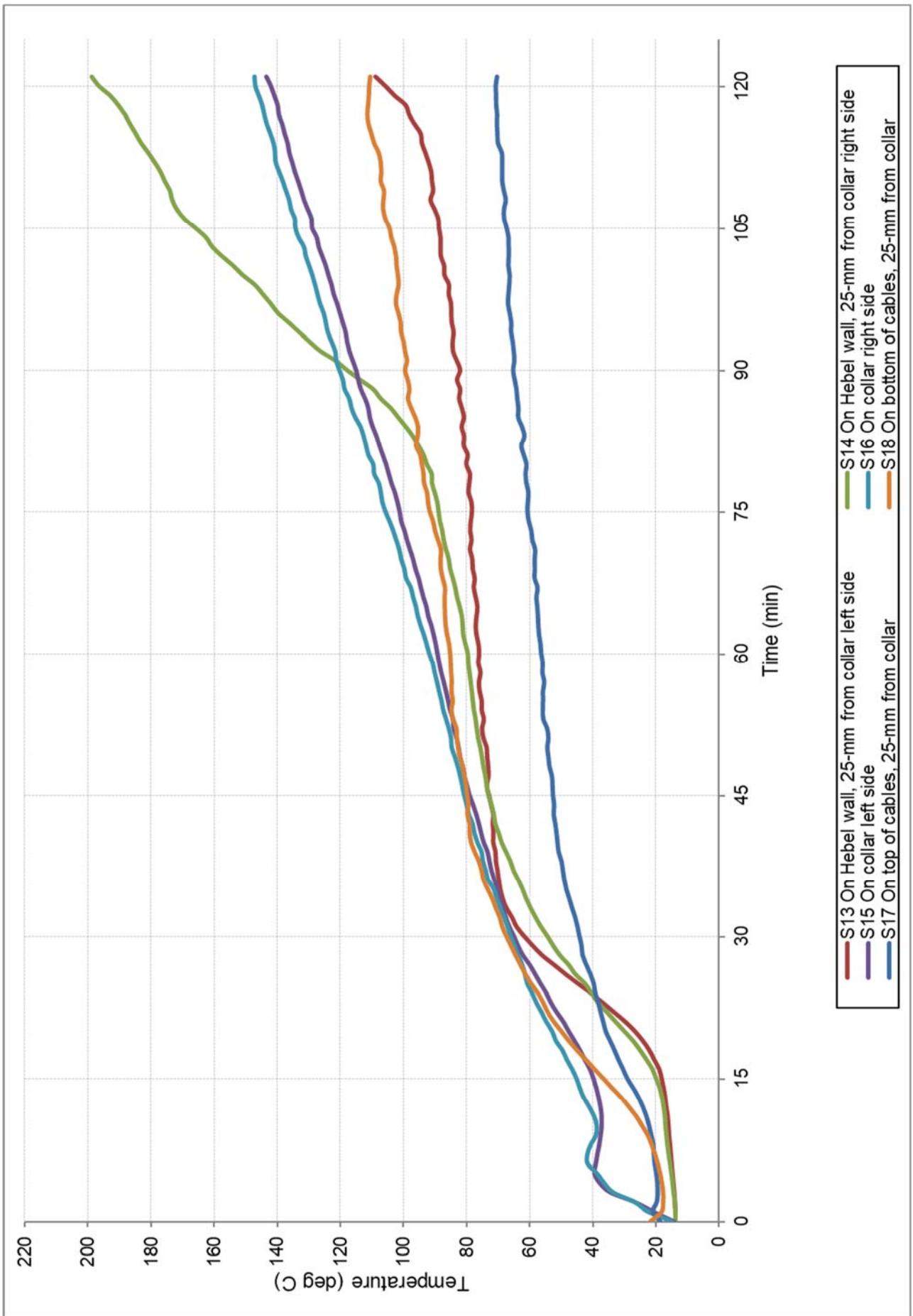


FIGURE 5 - TEMPERATURE VERSUS TIME ASSOCIATED WITH SPECIMEN #3

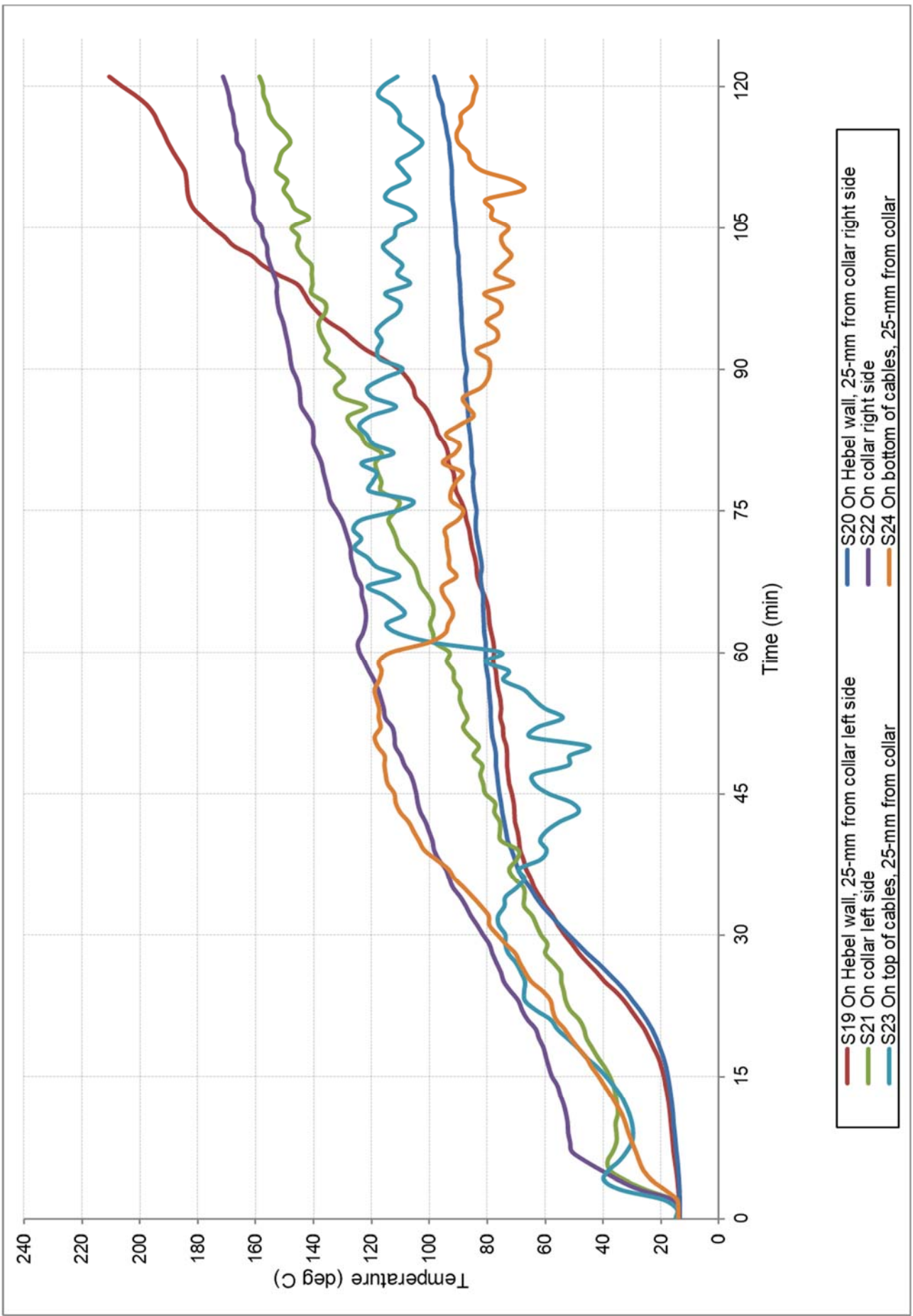


FIGURE 6 - TEMPERATURE VERSUS TIME ASSOCIATED WITH SPECIMEN #4

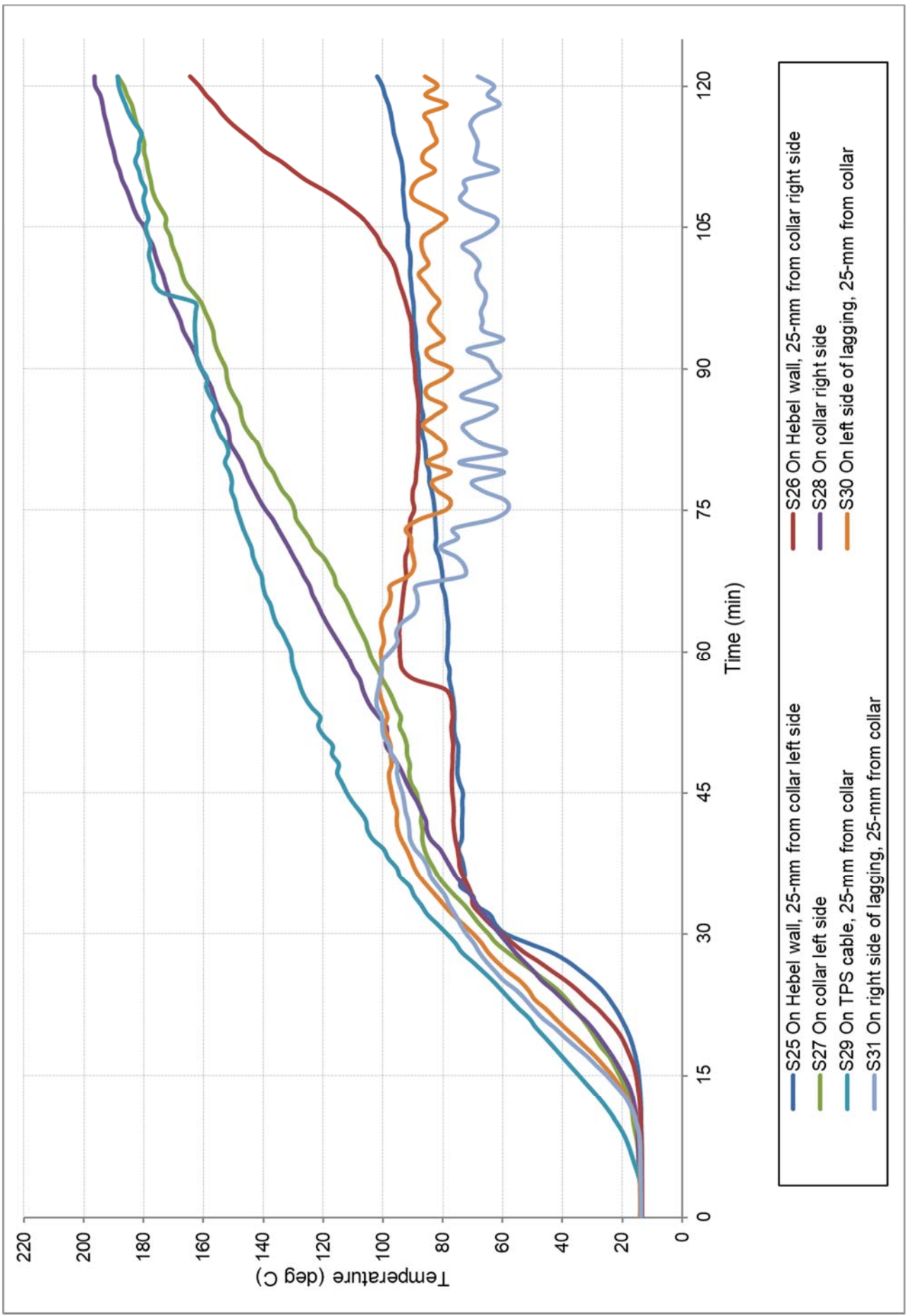


FIGURE 7 - TEMPERATURE VERSUS TIME ASSOCIATED WITH SPECIMEN #5

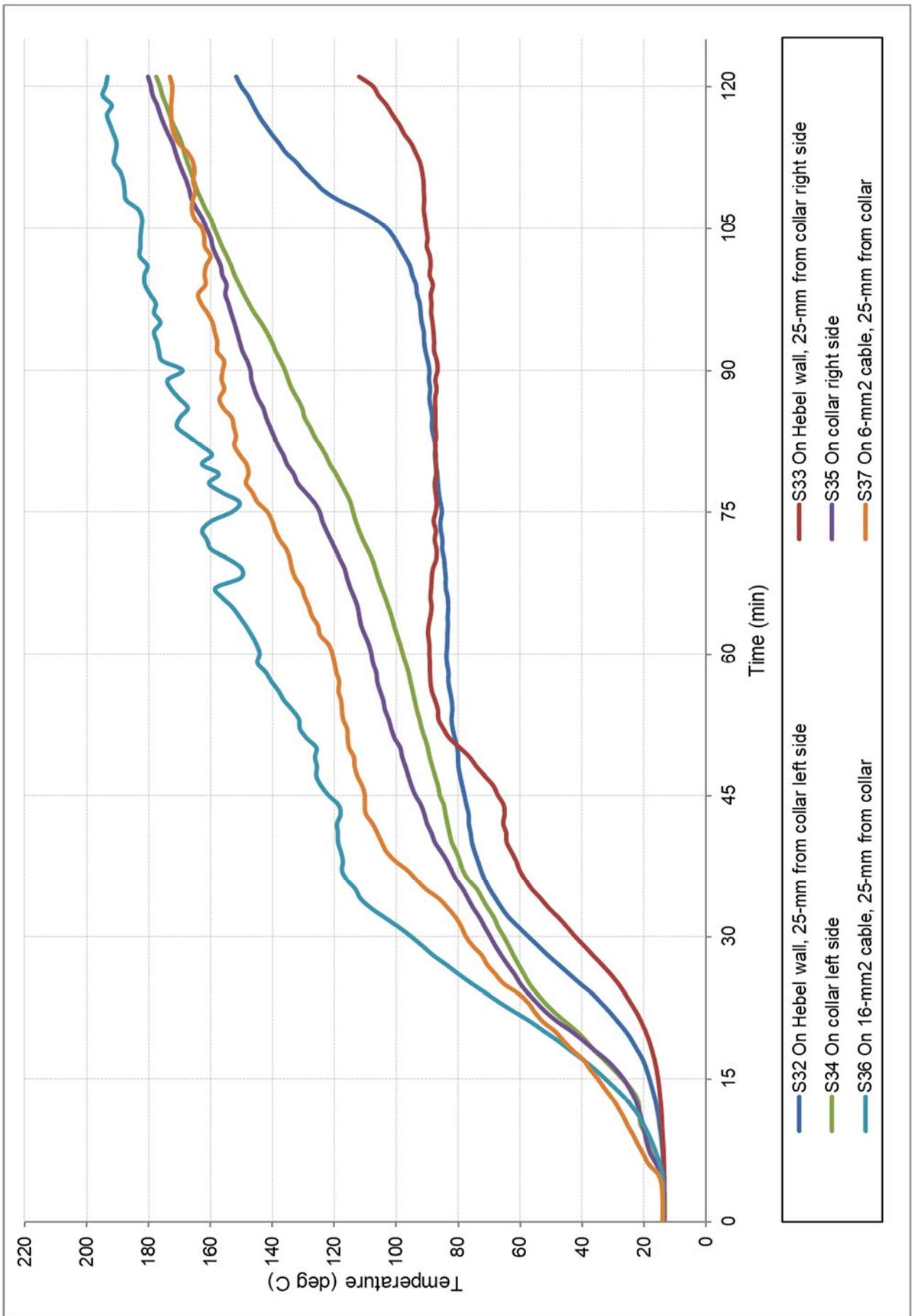


FIGURE 8 - TEMPERATURE VERSUS TIME ASSOCIATED WITH SPECIMEN #6

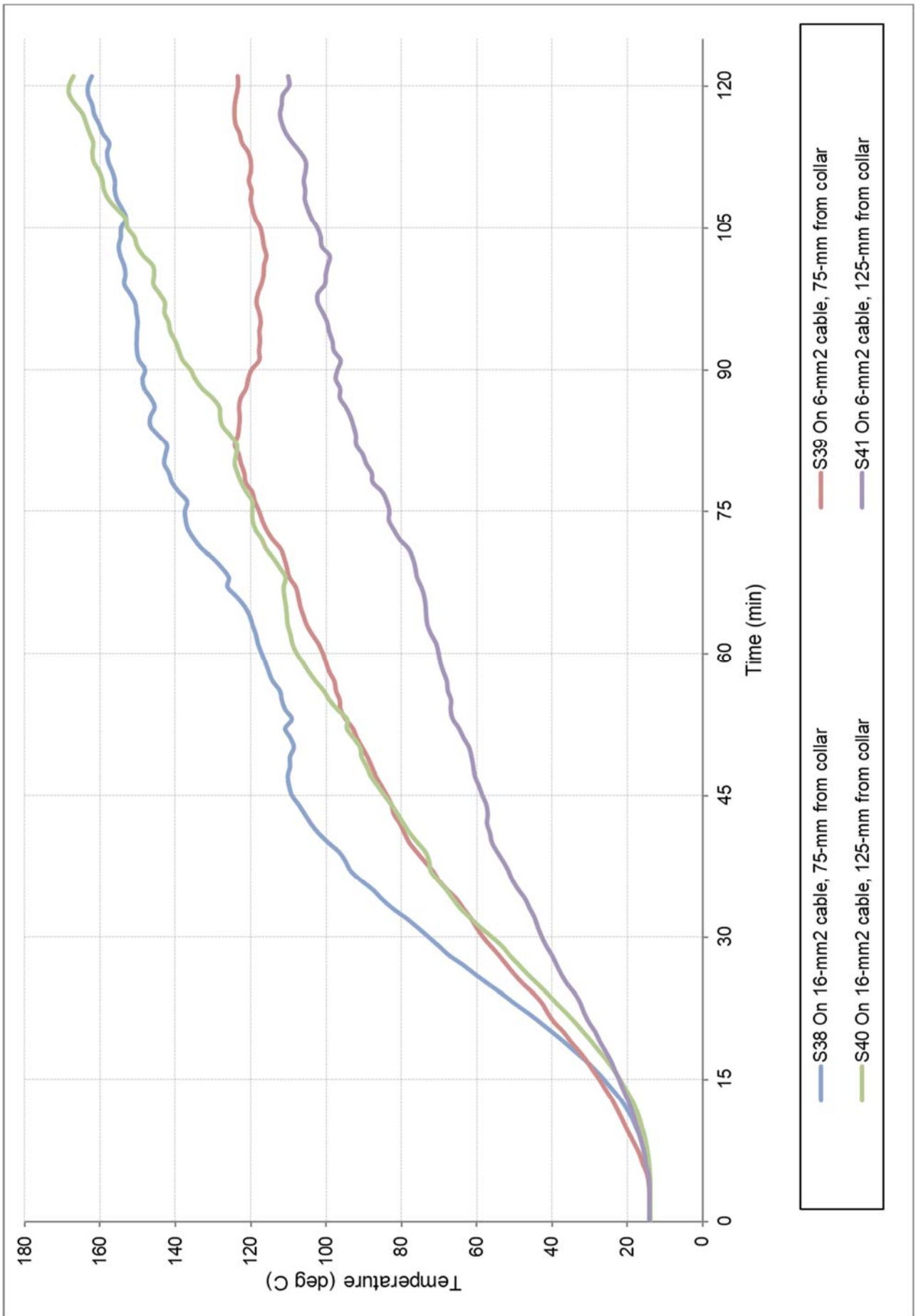


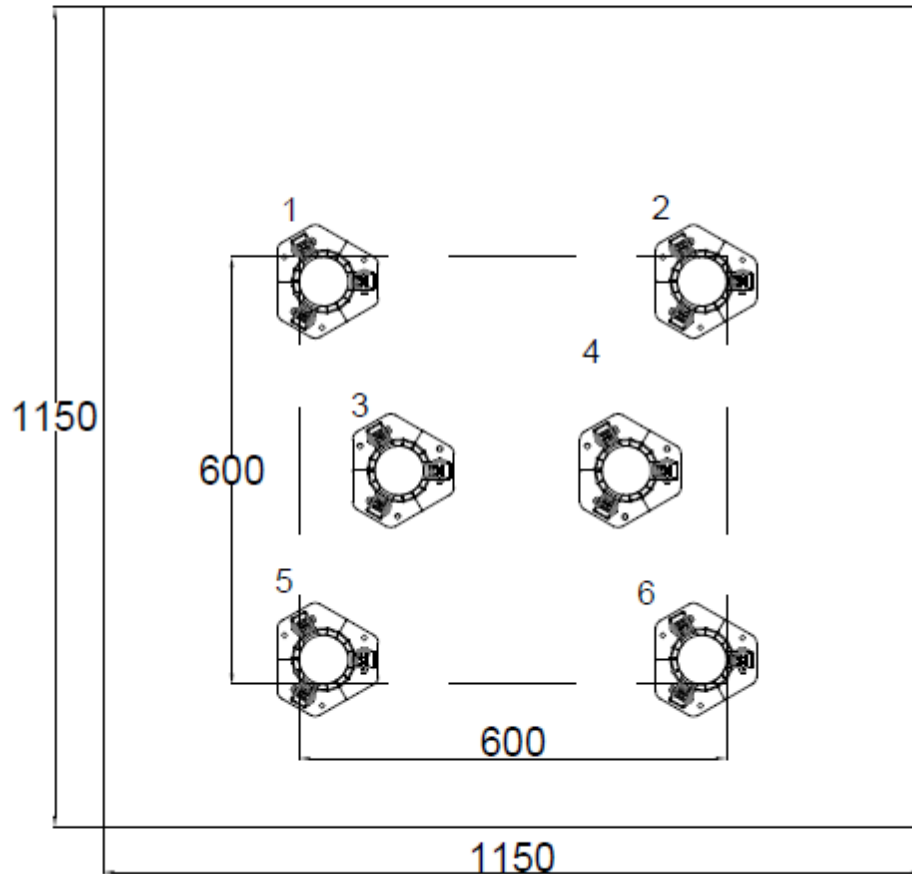
FIGURE 9 - TEMPERATURE ASSOCIATED WITH EXTRA THERMOCOUPLES ON SPECIMEN #6

Appendix D – Layout and installation drawings

Snap Fire Systems Pty Ltd

Test Wall W-20-F Layout

Date: 09 JUN 2020



Penetration	Collar Code	Pipe Type	Pipe Diameter
1	MS70R	PN6 Pressure PVC	50
2	MS70R	Medium Duty PVC Conduit with Orange Power Cables	50, 2x(16mm ² 3C+E) & 2x(6mm ² 3C+E)
3	MS70R	20xCat5e Cables	
4	MS70R	100xCat5e Cables	
5	MS70R	Copper Tube with F/R lagging and TPS cable	1in(19mm Lagging) & 2.5mm ² 3C
6	MS70R	Orange Power Cables	3x(6mm ² 3C+E) & 6x(16mm ² 3C+E)

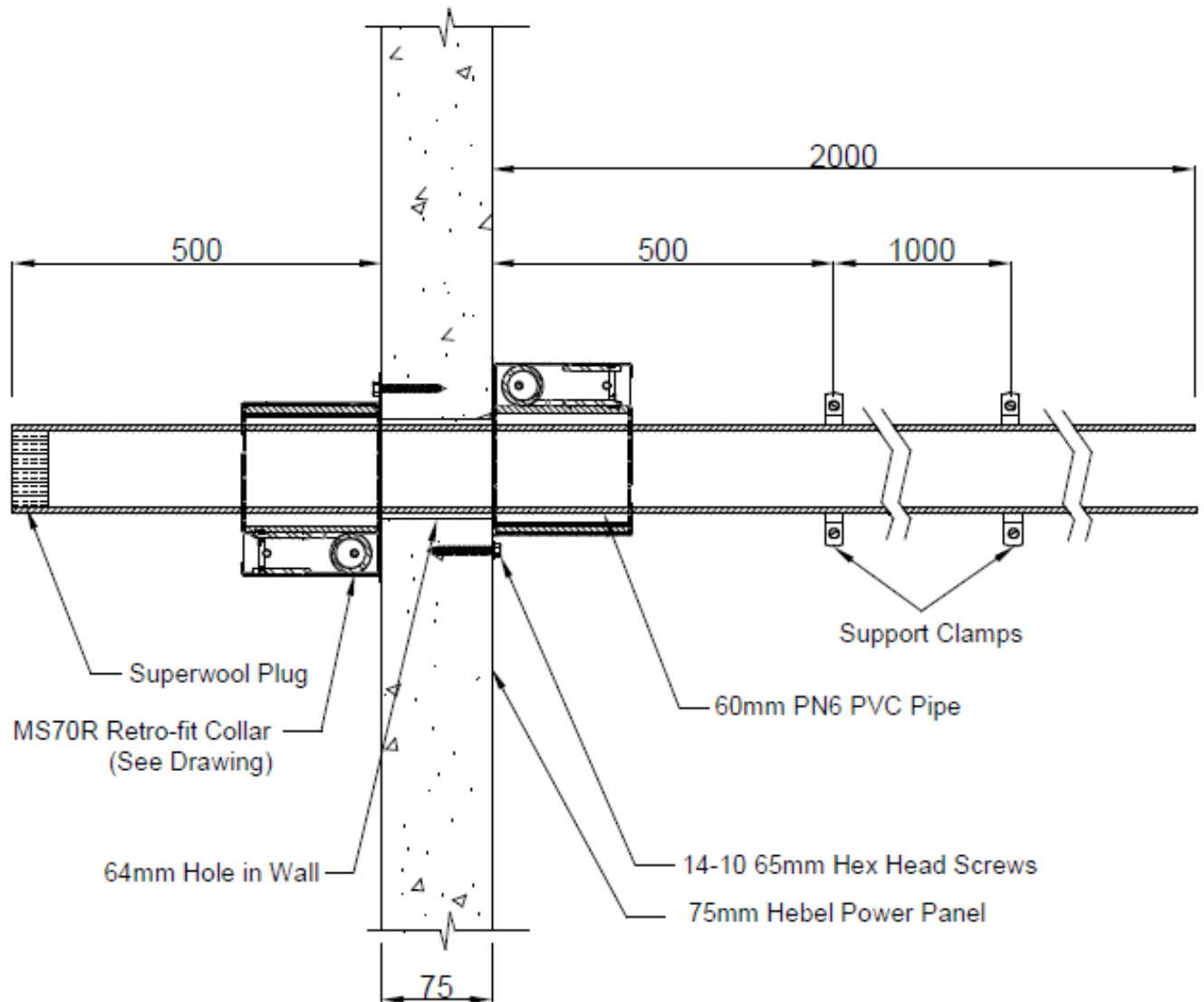
DRAWING TITLED "TEST WALL W-20-F LAYOUT, DATED 9 JUNE 2020, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD.

Snap Fire Systems Pty Ltd

Specimen #1

50 PN6 PVC Pipe & MS70R Collar

Date: 09 JUN 2020



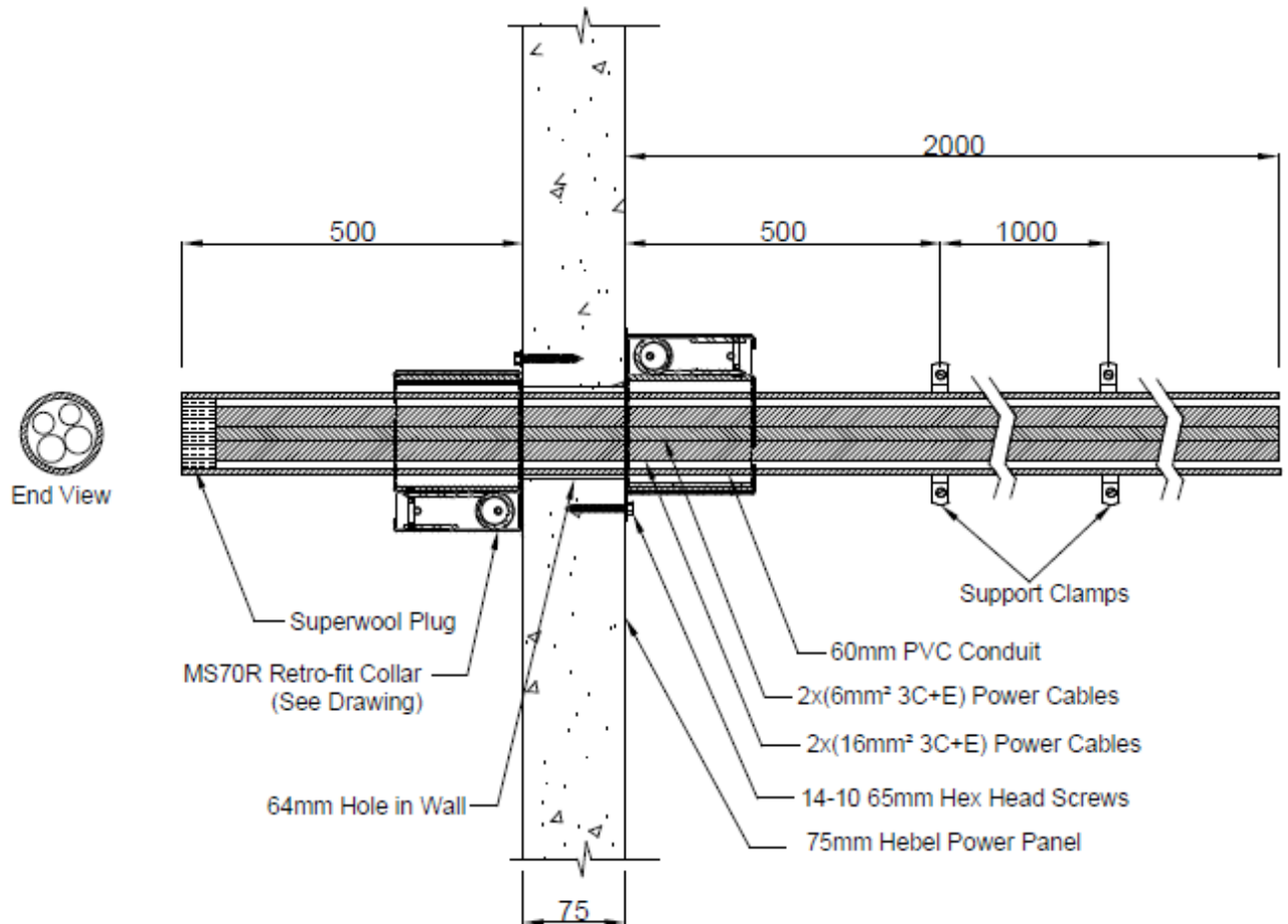
DRAWING TITLED "SPECIMEN #1 50 PN6 PVC PIPE & MS70R COLLAR", DATED 9 JUNE 2020, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD

Snap Fire Systems Pty Ltd

Specimen #2

50 PVC Conduit with 16mm² 3C+E &
6mm² 3C+E Power Cables & MS70R Collar

Date: 09 JUN 2020



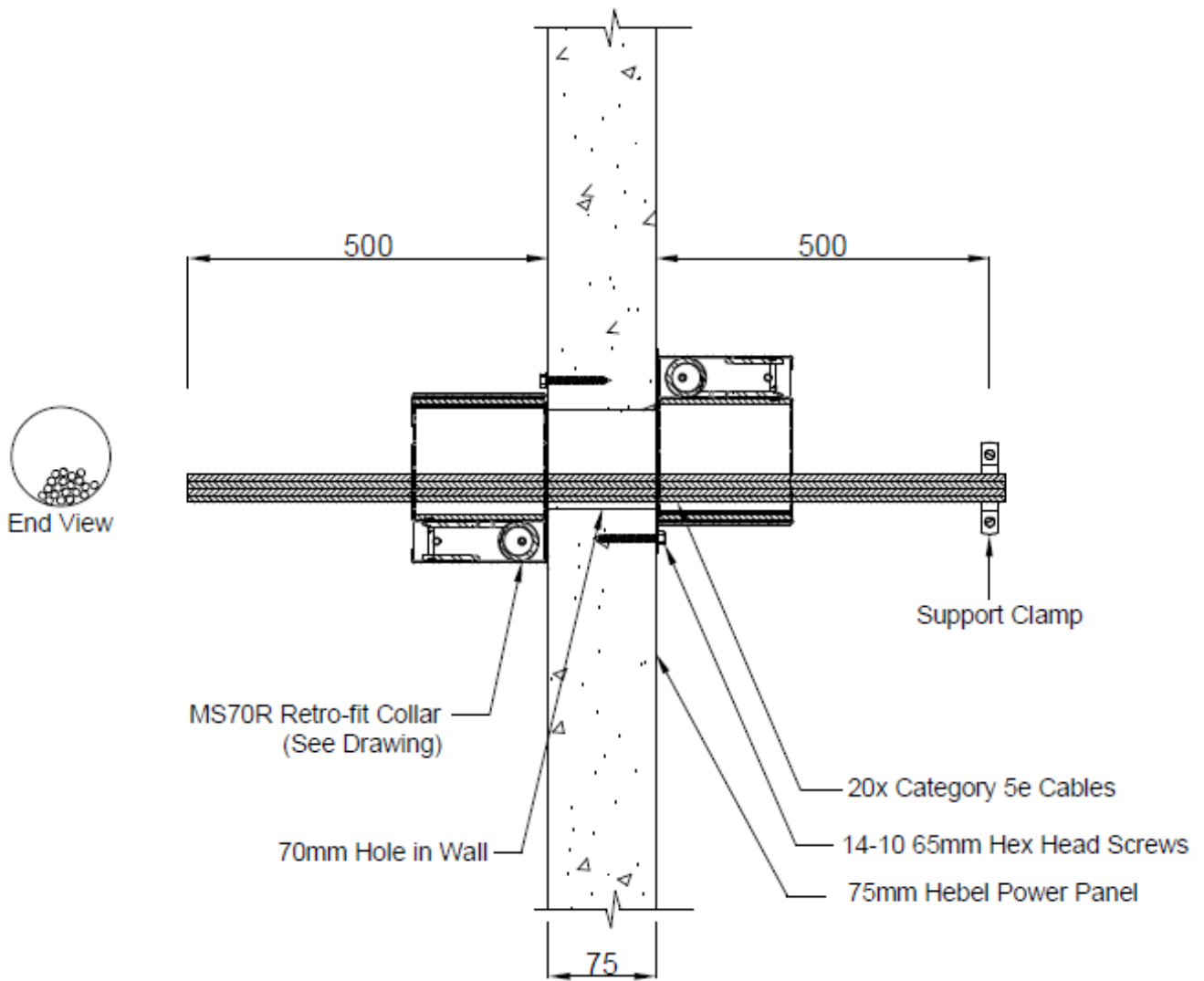
DRAWING TITLED "SPECIMEN #2 50 PVC CONDUIT WITH 16MM² 3C+E & 6MM² 3C+E POWER CABLES & MS70R COLLAR", DATED 9 JUNE 2020, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD

Snap Fire Systems Pty Ltd

Specimen #3

20% Full of Cat5e Cables & MS70R Collar

Date: 09 JUN 2020



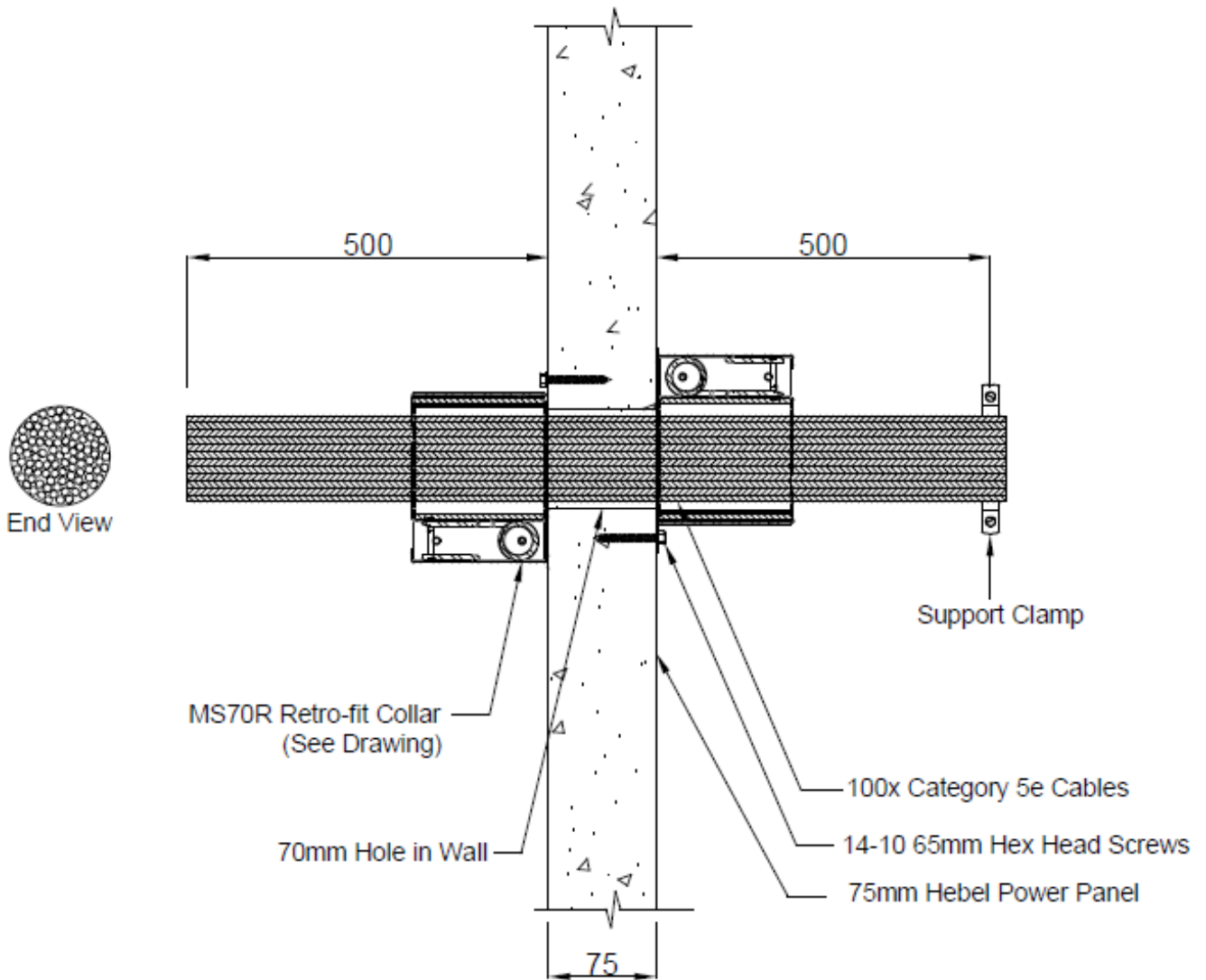
**DRAWING TITLED "SPECIMEN #3 20% FULL OF CAT5E CABLES & MS70R COLLAR", DATED 9 JUNE 2020,
PROVIDED BY SNAP FIRE SYSTEMS PTY LTD, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD**

Snap Fire Systems Pty Ltd

Specimen #4

100% Full of Cat5e Cables & MS70R Collar

Date: 09 JUN 2020



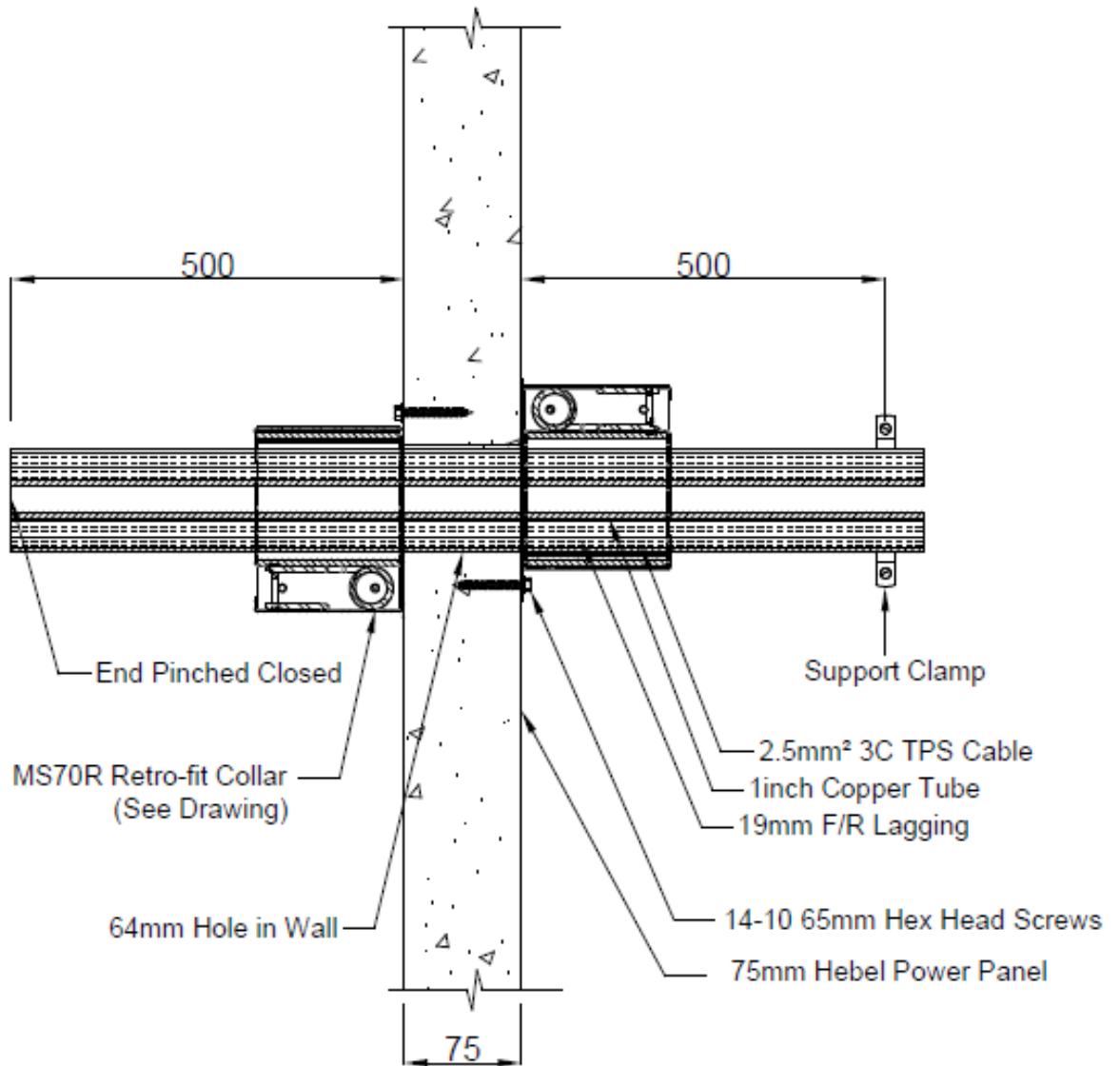
DRAWING TITLED "SPECIMEN #4 100% FULL OF CAT5E CABLES & MS70R COLLAR", DATED 9 JUNE 2020,
PROVIDED BY SNAP FIRE SYSTEMS PTY LTD, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD

Snap Fire Systems Pty Ltd

Specimen #5

1inch Copper Tube with 19mm F/R Lagging,
2.5mm² 3C TPS Cable & MS70R Collar

Date: 09 JUN 2020



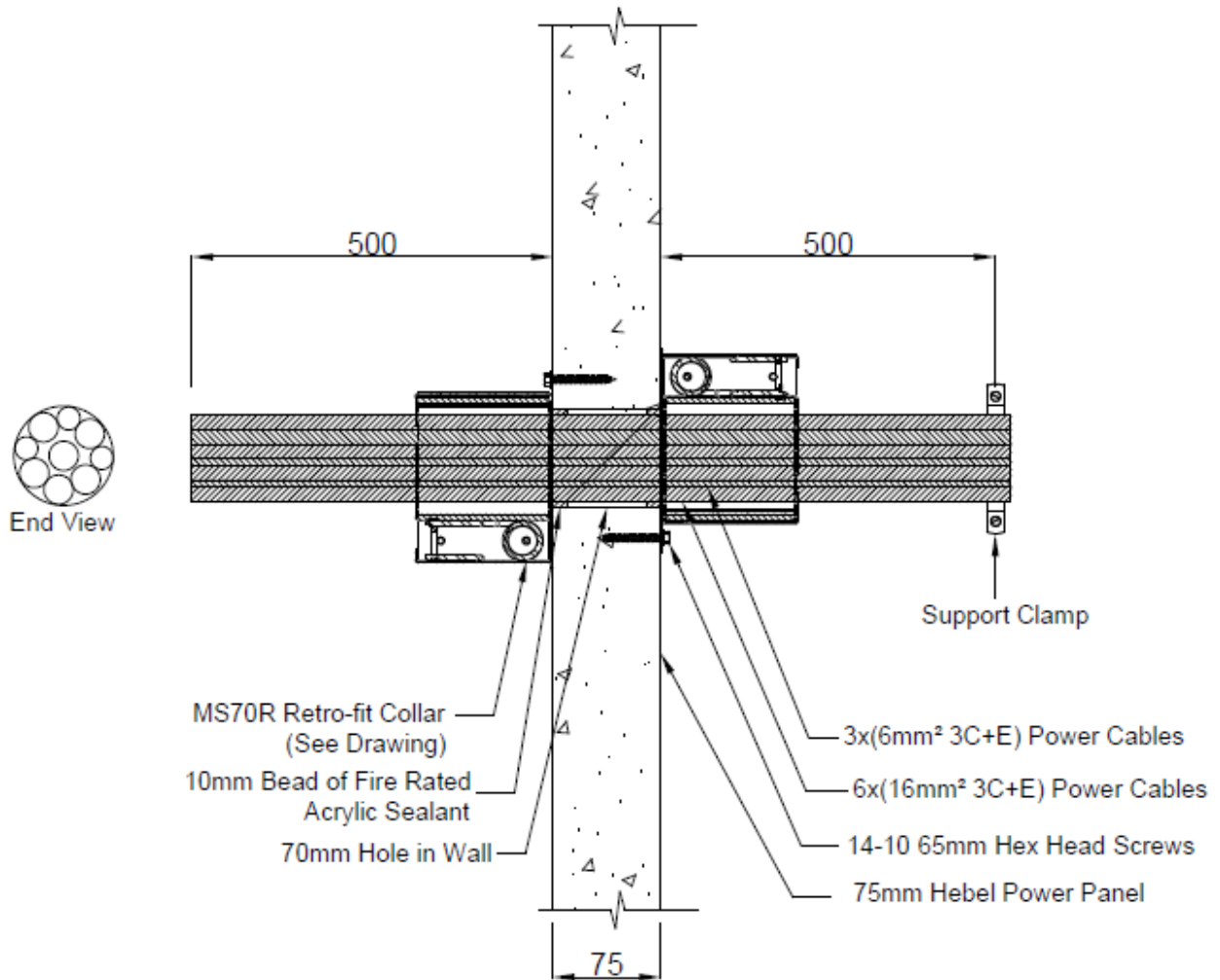
DRAWING TITLED "SPECIMEN #5 1 INCH COPPER TUBE WITH 19MM F/R LAGGING, 3C TPS CABLE & MS70R COLLAR", DATED 9 JUNE 2020, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD

Snap Fire Systems Pty Ltd

Specimen #6




16mm² 3C+E & 6mm² 3C+E Power Cables & MS70R Collar

Date: 09 JUN 2020



DRAWING TITLED "SPECIMEN #6 16MM² 3C+E & 6MM² 3C+E POWER CABLES & MS70R COLLAR", DATED 9 JUNE 2020, PROVIDED 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		
<h2>Certificate of Test</h2>		No. 3470
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 2118.		
Product Name: SNAP MS70R Multi Services Retrofit fire collars protecting a nominal 50-mm polyvinyl chloride (PVC-U) pipe (Specimen 1)		
Description:	The specimen comprised an 1150-mm x 1150-mm x 75-mm thick Hebel PowerPanel wall penetrated by a service protected by retro-fitted Snap Fire Systems fire collars. The wall comprised a 75-mm thick Hebel PowerPanel autoclaved aerated concrete (AAC) wall system with an established fire resistance level (FRL) of -/90/90, as detailed in CSIRO test report FSV 0979. 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 thick steel base flange with a 162-mm diameter. The 95 mm high collar casing incorporated a 4-mm thick x 90-mm wide x 250-mm long soft Intumesh intumescent wrap lined within the internal circumference of the collar casing. The closing mechanism comprised three stainless steel springs, 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 titled "SNAP 70 Multi Service Retro", dated 23 September 2019, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in a back-to-back configuration using three 14-10 65-mm Hex Head Screws. The penetrating service comprised a 60.32-mm outside diameter Vinidex PN6 (PVC-U) pipe, with a wall thickness of 1.84 mm, fitted through the collar's sleeve and penetrated the wall through a 64 mm diameter cut-out hole, as shown in drawing titled "Specimen #1 50 PN6 PVC Pipe & MS70R Collar", dated 9 June 2020, by Snap Fire Systems Pty Ltd. The pipe projected horizontally 2000-mm away from the unexposed face of the wall and approximately 500 mm into the furnace chamber and was supported at nominally 500-mm and 1500-mm from the unexposed face of the Hebel wall. The pipe was open at the unexposed end and plugged with ceramic fibre (Superwool) on the exposed end.	
Performance observed in respect of the following AS 1530.4-2014 criteria		
	Structural Adequacy	- not applicable
	Integrity	- no failure at 121 minutes
	Insulation	- no failure at 121 minutes
and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/90/90.		
The fire-resistance level (FRL) of the specimen is applicable when the system is exposed to fire from either direction. The maximum FRL of any test specimen cannot exceed the FRL achieved by the system in which it was installed. 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: 23 June 2020
Issued on the 1 st day of September 2020 without alterations or additions.		
 Brett Roddy Manager, Fire Testing and Assessments		
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	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. 3470



Certificate of Test

No. 3471

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 2118.

Product Name: SNAP MS70R Multi Services Retrofit fire collar protecting a nominal 50-mm PVC conduit incorporating two 6-mm² 3C+E and two 16-mm² 3C+E power cables (Specimen 2)

Description: The specimen comprised an 1150-mm x 1150-mm x 75-mm thick Hebel PowerPanel wall penetrated by a service protected by retro-fitted Snap Fire Systems fire collars. The wall comprised a 75-mm thick Hebel PowerPanel autoclaved aerated concrete (AAC) wall system with an established fire resistance level (FRL) of -/90/90, as detailed in CSIRO test report FSV 0979. 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 thick steel base flange with a 162-mm diameter. The 95 mm high collar casing incorporated a 4-mm thick x 90-mm wide x 250-mm long soft Intumesh intumescent wrap lined within the internal circumference of the collar casing. The closing mechanism comprised three stainless steel springs, 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 titled "SNAP 70 Multi Service Retro", dated 23 September 2019, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in a back-to-back configuration using three 14-10 65-mm Hex Head Screws. The penetrating service comprised a 60-mm outside diameter Telstra PVC conduit with a wall thickness of 2.71 incorporating two 6-mm² 3-core+E power cables and two 16-mm² 3 core+E power cables running through the conduit. All the cables were manufactured by General Cables. The PVC conduit containing the four power cables was fitted through the collar's sleeve and penetrated the wall through a 64-mm diameter cut-out hole as shown in drawing titled "Specimen #2 50 PVC Conduit with 16mm² 3C+E & 6mm² 3C+E Power Cables & MS70R Collar", dated 9 June 2020, by Snap Fire Systems Pty Ltd, dated 9 June 2020, by Snap Fire Systems Pty Ltd. The conduit and cables projected horizontally, 2000-mm away from the unexposed face of the wall and approximately 500 mm into the furnace chamber and was supported at nominally 500-mm and 1500-mm from the unexposed face of the Hebel wall. The conduit was open at the unexposed end and plugged with ceramic fibre (Superwool) on the exposed end.

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

Structural Adequacy	-	not applicable
Integrity	-	no failure at 121 minutes
Insulation	-	no failure at 121 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/90/90.

The fire-resistance level (FRL) of the specimen is applicable when the system is exposed to fire from either direction. The maximum FRL of any test specimen cannot exceed the FRL achieved by the system in which it was installed. 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: 23 June 2020

Issued on the 1st day of September 2020 without alterations or additions.

Brett Roddy | Manager, Fire Testing and Assessments

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COPY OF CERTIFICATE OF TEST – NO. 3471



Certificate of Test

No. 3472

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 2118.

Product Name: SNAP MS70R Multi Services Retrofit fire collar protecting a bundle of 20 Category 5e network cables (Specimen 3)

Description: The specimen comprised an 1150-mm x 1150-mm x 75-mm thick Hebel PowerPanel wall penetrated by a service protected by retro-fitted Snap Fire Systems fire collars. The wall comprised a 75-mm thick Hebel PowerPanel autoclaved aerated concrete (AAC) wall system with an established fire resistance level (FRL) of -/90/90, as detailed in CSIRO test report FSV 0979. 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 thick steel base flange with a 162-mm diameter. The 95 mm high collar casing incorporated a 4-mm thick x 90-mm wide x 250-mm long soft Intumesh intumescent wrap lined within the internal circumference of the collar casing. The closing mechanism comprised three stainless steel springs, 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 titled "SNAP 70 Multi Service Retro", dated 23 September 2019, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in a back-to-back configuration using three 14-10 65-mm Hex Head Screws. The penetrating service comprised a bundle of 20 x 5-mm diameter ADC Krone Category 5e network cables. The cables were fitted through the collar's sleeve and penetrated the wall through a 70-mm diameter cut-out hole, as shown in drawing titled "Specimen #3 20% Full of Cat5e Cables & MS70R Collar", dated 9 June 2020, by Snap Fire Systems Pty Ltd. The cables projected horizontally 550-mm away from the unexposed face of the wall and approximately 500 mm into the furnace chamber and were supported at nominally 500-mm from the unexposed face of the Hebel wall.

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

Structural Adequacy	-	not applicable
Integrity	-	no failure at 121 minutes
Insulation	-	120 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/90/90.

The fire-resistance level (FRL) of the specimen is applicable when the system is exposed to fire from either direction. The maximum FRL of any test specimen cannot exceed the FRL achieved by the system in which it was installed. 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: 23 June 2020

Issued on the 1st day of September 2020 without alterations or additions.

B. Roddy

Brett Roddy | Manager, Fire Testing and Assessments

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Certificate of Test

No. 3473

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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 2118.

Product Name: SNAP MS70R Multi Services Retrofit fire collar protecting a bundle of 100 Category 5e network cables (Specimen 4)

Description: The specimen comprised an 1150-mm x 1150-mm x 75-mm thick Hebel PowerPanel wall penetrated by a service protected by retro-fitted Snap Fire Systems fire collars. The wall comprised a 75-mm thick Hebel PowerPanel autoclaved aerated concrete (AAC) wall system with an established fire resistance level (FRL) of -/90/90, as detailed in CSIRO test report FSV 0979. 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 thick steel base flange with a 162-mm diameter. The 95 mm high collar casing incorporated a 4-mm thick x 90-mm wide x 250-mm long soft Intumesh intumescent wrap lined within the internal circumference of the collar casing. The closing mechanism comprised three stainless steel springs, 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 titled "SNAP 70 Multi Service Retro", dated 23 September 2019, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in a back-to-back configuration using three 14-10 65-mm Hex Head Screws. The penetrating service comprised a bundle of 100 x 5-mm diameter ADC Krone Category 5e network cables. The cables were fitted through the collar's sleeve and penetrated the wall through a 70-mm diameter cut-out hole as shown in drawing titled "Specimen #4 100% Full of Cat5e Cables & MS70R Collar", dated 9 June 2020, by Snap Fire Systems Pty Ltd. The cables projected horizontally 550-mm away from the unexposed face of the wall and approximately 500 mm into the furnace chamber and were supported at nominally 500-mm from the unexposed face of the Hebel wall.

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

Structural Adequacy	-	not applicable
Integrity	-	no failure at 121 minutes
Insulation	-	117 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/90/90.

The fire-resistance level (FRL) of the specimen is applicable when the system is exposed to fire from either direction. The maximum FRL of any test specimen cannot exceed the FRL achieved by the system in which it was installed. 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: 23 June 2020

Issued on the 1st day of September 2020 without alterations or additions.

Brett Roddy | Manager, Fire Testing and Assessments

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Certificate of Test

No. 3474

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 2118.

Product Name: SNAP MS70R Multi Services Retrofit fire collars protecting a DN25B copper tube with 19-mm F/R lagging and a thermoplastic-sheathed cable (TPS) (Specimen 5)

Description: The specimen comprised an 1150-mm x 1150-mm x 75-mm thick Hebel PowerPanel wall penetrated by a service protected by retro-fitted Snap Fire Systems fire collars. The wall comprised a 75-mm thick Hebel PowerPanel autoclaved aerated concrete (AAC) wall system with an established fire resistance level (FRL) of -/90/90, as detailed in CSIRO test report FSV 0979. 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 thick base flange with a 162-mm diameter. The 95 mm high collar casing incorporated a 4-mm thick x 90-mm wide x 250-mm long soft Intumesh intumescent wrap lined within the internal circumference of the collar casing. The closing mechanism comprised three stainless steel springs, 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 titled "SNAP 70 Multi Service Retro", dated 23 September 2019, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in a back-to-back configuration using three 14-10 65-mm Hex Head Screws. The penetrating service comprised a 1-inch outside diameter copper pipe with a wall thickness of 1.1 mm, lagged with 19-mm thick E-flex insulation as well as a 3-core 2.5 mm² TPS cable. The lagged pipe and cable were fitted through the collar's sleeve and penetrated the wall through a 64-mm diameter cut-out hole as shown in drawing titled "Specimen #5 1inch Copper Tube with 19mm F/R Lagging, 2.5mm² 3C TPS Cable & MS70R Collar", dated 9 June 2020, by Snap Fire Systems Pty Ltd. The lagged pipe and cable projected horizontally 550-mm away from the unexposed face of the wall and approximately 500 mm into the furnace chamber. The lagged pipe and cable were supported at nominally 500 mm from the unexposed face of the Hebel wall.

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

Structural Adequacy	-	not applicable
Integrity	-	no failure at 121 minutes
Insulation	-	118 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/90/90.

The fire-resistance level (FRL) of the specimen is applicable when the system is exposed to fire from either direction. The maximum FRL of any test specimen cannot exceed the FRL achieved by the system in which it was installed. 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: 23 June 2020

Issued on the 1st day of September 2020 without alterations or additions.

Brett Roddy | Manager, Fire Testing and Assessments

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COPY OF CERTIFICATE OF TEST – NO. 3474



Certificate of Test

No. 3475

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 2118.

Product Name: SNAP MS70R Multi Services Retrofit fire collars protecting a bundle of six 16-mm² 3C+E and three 6-mm² 3C+E power cables (Specimen 6)

Description: The specimen comprised an 1150-mm x 1150-mm x 75-mm thick Hebel PowerPanel wall penetrated by a service protected by retro-fitted Snap Fire Systems fire collars. The wall comprised a 75-mm thick Hebel PowerPanel autoclaved aerated concrete (AAC) wall system with an established fire resistance level (FRL) of -/90/90, as detailed in CSIRO test report FSV 0979. 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 thick steel base flange with a 162-mm diameter. The 95 mm high collar casing incorporated a 4-mm thick x 90-mm wide x 250-mm long soft Intumesh intumescent wrap lined within the internal circumference of the collar casing. The closing mechanism comprised three stainless steel springs, 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 titled "SNAP 70 Multi Service Retro", dated 23 September 2019, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in a back-to-back configuration using three 14-10 65-mm Hex Head Screws. The penetrating service comprised a bundle of six 16-mm² 3-core+E power cables and three 6-mm² 3-core+E power cables. All power cables were manufactured by General Cables. The cables were fitted through the collar's sleeve and penetrated the wall through a 70-mm diameter cut-out hole, as shown in drawing titled "Specimen #6 16mm² 3C+E & 6mm² 3C+E Power Cables & MS70R Collar", dated 9 June 2020, provided by Snap Fire Systems Pty Ltd. The annular gap around the pipe and Hebel PowerPanel on both sides of the wall was filled with a 10-mm deep bead H.B Fullers Firesound sealant. The cables projected horizontally 550-mm away from the unexposed face of the wall and approximately 500 mm into the furnace chamber. The cables were supported at nominally 500-mm from the unexposed face of the Hebel wall.

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

Structural Adequacy	-	not applicable
Integrity	-	no failure at 121 minutes
Insulation	-	119 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/90/90.

The fire-resistance level (FRL) of the specimen is applicable when the system is exposed to fire from either direction. The maximum FRL of any test specimen cannot exceed the FRL achieved by the system in which it was installed. 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: 23 June 2020

Issued on the 1st day of September 2020 without alterations or additions.

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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 for 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. |

*** end of report ***

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FOR FURTHER INFORMATION

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