

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

## Test Report

**Author:** Peter Gordon  
**Report number:** FSP 2203  
**Date:** 13 October 2021

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

Commercial-in-confidence




### Inquiries should be addressed to:

Fire Testing and Assessments	Author	The Client
NATA Registered Laboratory	Infrastructure Technologies	IG6 Pty Ltd as trustee for the IG6 IP Trust
14 Julius Avenue	14 Julius Avenue	1343 Wynnum Road
North Ryde, NSW 2113	North Ryde, NSW 2113	Tingalpa QLD
Telephone +61 2 9490 5444	Telephone +61 2 9490 5500	Telephone + 61 7 3390 5420

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Peter Gordon	Glenn Williams	Brett Roddy
		
13 October 2021	13 October 2021	13 October 2021

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

## Sponsored Investigation No. FSP 2203

### 1 Introduction

#### 1.1 Identification of specimen

The sponsor identified the specimen as six SNAP fire collars protecting a 150-mm thick concrete floor slab penetrated by six services.

#### 1.2 Sponsor

IG6 Pty Ltd as trustee for the IG6 IP Trust  
1343 Wynnum Road  
Tingalpa QLD

#### 1.3 Tingalpa QLD Tingalpa QLD Manufacturers

Snap Fire Systems Pty Ltd  
1343 Wynnum Road  
Tingalpa QLD

#### 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 5092/4666

## 1.7 Test date

The fire-resistance test was conducted on 26 May 2021.

# 2 Description of specimen

## 2.1 General

The specimen comprised an 1150-mm x 1150-mm x 150-mm thick concrete slab. The slab was penetrated by multiple services protected by four cast-in fire collars and two retrofit fire collars.

The 150-mm thick concrete slab was reinforced with a single layer of steel reinforcement providing a Fire Resistance Period (FRP) for insulation of 180 minutes in accordance with table 5.5.1 of AS 3600:2018 - Concrete structures.

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

### Specimen 1 - A SNAP MS70C Multi Service cast-in fire collar protecting a bundle of 80 - Category 7 network cables

The SNAP MS70C Multi Service cast-in fire collar comprised a 1.6-mm thick polypropylene casing with a 79 mm inner diameter and a 168-mm outer diameter base flange. The 250-mm high collar casing incorporated a 280-mm x 65-mm x 5-mm thick Intumesh intumescent material and a rubber ring seal. The closing mechanism comprised three stainless-steel springs bound with nylon fuse links and a 322-mm x 63-mm 316-stainless steel mesh as shown in drawing titled 'SNAP 70 Multi Service Cast In', dated 20 May 2021, by Snap Fire Systems Pty Ltd.

The MS70C collar was cast into a 150-mm thick concrete slab with the collar's casing projecting 100-mm vertically above the unexposed face.

The penetrating service comprised a bundle of eighty 6.7-mm diameter Belden Category 7 network cables. The cables were fitted through the collar's sleeve as shown in drawing titled 'Specimen #1 100% Full of Cat7 Cables & MS70C', dated 17 May 2021, provided by Snap Fire Systems Pty Ltd. The cables projected vertically 520-mm above the concrete and approximately 500 mm below into the furnace chamber. The cables were supported at nominally 500-mm above the unexposed face of the concrete slab.

### Specimen 2 - A SNAP MS70C Multi Service Cast-in fire collar protecting a bundle of six 16-mm<sup>2</sup> 3C+E and three 6-mm<sup>2</sup> 3C+E power cables

The SNAP MS70C Multi Service cast-in fire collar comprised a 1.6-mm thick polypropylene casing with a 79 mm inner diameter and a 168-mm outer diameter base flange. The 250-mm high collar casing incorporated a 280-mm x 65-mm x 5-mm thick Intumesh intumescent material and a rubber ring seal. The closing mechanism comprised three stainless-steel springs bound with nylon fuse links and a 322-mm x 63-mm 316 stainless steel mesh as shown in drawing titled 'SNAP 70 Multi Service Cast In', dated 20 May 2021, by Snap Fire Systems Pty Ltd.

The MS70C collar was cast into a 150-mm thick concrete slab with the collar's casing projecting 100-mm vertically above the unexposed face.

The penetrating service comprised a bundle of six Prysmian 16-mm<sup>2</sup> 3-core + E power cables and three Electra Cables 6-mm<sup>2</sup> 3-core + E power cables. The cables were fitted through the collar's sleeve as shown in drawing titled 'Specimen #2 16mm<sup>2</sup> 3C+E & 6mm<sup>2</sup> 3C+E Power Cables & MS70C', dated 6 April 2021, provided by Snap Fire Systems Pty Ltd. The cables projected vertically 520-mm above the concrete and approximately 500 mm below into the furnace chamber. The cables were supported at nominally 500-mm above the unexposed face of the concrete slab.

#### Specimen 5 – A SNAP MS70R Multi Service Retrofit fire collar protecting a bundle of fibre optic cables penetrating a 67-mm diameter aperture

The SNAP MS70R Multi Service Retrofit 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 outer 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.

The MS70R collar was centrally located over a 67-mm core hole on the underside (exposed face) of the concrete slab and fixed through the 3 mounting brackets using 5-mm x 30-mm long concrete screw bolts.

The penetrating service comprised a bundle of Garland fibre optic cables; 20 x 11-mm diameter and 10 x 6-mm diameter. The cables were fitted through the collar's sleeve and penetrated the concrete slab through a 67-mm diameter cut-out hole as shown in drawing titled 'Specimen #5 Fibre Optic Cables & MS70R', dated 17 May 2021, by Snap Fire Systems Pty Ltd. The cables projected vertically 520-mm above the unexposed face of the concrete slab and approximately 500-mm below into the furnace chamber. The cables were supported at 500-mm above the concrete slab.

## 2.2 Dimensions

The specimen comprised an 1150-mm x 1150-mm x 150-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. The specimen was delivered on 19 May 2021 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 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-21-B Layout', dated 17 May 2021, by Snap Fire Systems Pty Ltd.

Drawing titled 'Specimen #1 100% Full of Cat7 Cables & MS70C', dated 17 May 2021, by Snap Fire Systems Pty Ltd.

Drawing titled 'Specimen #2 16mm<sup>2</sup> 3C+E & 6mm<sup>2</sup> 3C+E Power Cables & MS70C', dated 6 April 2021, by Snap Fire Systems Pty Ltd.

Drawing titled 'Specimen #5 Fibre Optic Cables & MS70R', dated 17 May 2021, by Snap Fire Systems Pty Ltd.

Drawing titled 'SNAP 70 Multi Service Cast In', dated 20 May 2021, by Snap Fire Systems Pty Ltd.

Drawing titled 'SNAP 70 Multi Service Retro', dated 23 September 2019, by Snap Fire Systems Pty Ltd.

No confidential information about the test specimen has been submitted to CSIRO Infrastructure Technologies.

## 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 18°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
30 seconds	Smoke has begun fluing from the cables at the base of Specimen 2.
1 minutes	Smoke has begun fluing from the cables at the base of Specimens 1 and 5.
4 minutes	The level of smoke fluing from Specimen 2 has increased.
12 minutes	The level of smoke being emitted from all specimens has almost ceased.
21 minutes	Moisture is pooling on the top of the slab.
92 minutes	Smoke has resumed fluing from Specimen 2.
93 minutes	The cables at the base of specimen 5 have begun to discolour.
148 minutes	<u>Insulation failure of Specimen 2</u> - maximum temperature rise of 180K is exceeded on the 16-mm <sup>2</sup> power cable 25-mm above the collar casing.
156 minutes	The yellow casing collar of Specimens 1 and 2 have begun to melt.
176 minutes	The yellow casing collar of Specimens 1 and 2 continue to melt.
217 minutes	<u>Insulation failure of Specimen 1</u> - maximum temperature rise of 180K is exceeded on the concrete slab 25-mm from the collar casing.
237 minutes	<u>Insulation failure of Specimen 5</u> - maximum temperature rise of 180K is exceeded on the concrete slab 25-mm from the optical fibre cables.
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 2.

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

### 8.5 Performance

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

Specimen 1 – A SNAP MS70C Multi Service Cast-in fire collar protecting a bundle of 80 Category 7 network cables

Structural adequacy	-	not applicable
Integrity	-	no failure at 241 minutes
Insulation	-	217 minutes

Specimen 2 – A SNAP MS70C Multi Service Cast-in fire collar protecting a bundle of six 16-mm<sup>2</sup> 3C+E and three 6-mm<sup>2</sup> 3C+E power cables

Structural adequacy	-	not applicable
Integrity	-	no failure at 241 minutes
Insulation	-	148 minutes

Specimen 5 – A SNAP MS70R Multi Service Retrofit fire collar protecting a bundle of fibre optic cables penetrating a 67-mm diameter aperture

Structural adequacy	-	not applicable
Integrity	-	no failure at 241 minutes
Insulation	-	237 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 AS 1530.4. Any significant variation with respect to size, construction details, loads, stresses, edge of end conditions, other than that 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 the measurement of fire resistance, it is not possible to provide a stated degree for 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	-	-/240/180*
Specimen 2	-	-/240/120
Specimen 5	-	-/240/180

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

\* Specimens were tested in a concrete slab with a Fire Resistance Period (FRP) for insulation of 180 minutes in accordance with Table 5.5.1 of AS 3600:2018 - Concrete structures. The maximum FRL of any test specimen cannot exceed the FRL achieved by the concrete slab 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



Peter Gordon  
Testing Officer

# Appendices

## Appendix A – Measurement location

Specimen	T/C Position	T/C designation
Specimen 1 – A SNAP MS70C Multi Service Cast-in fire collar protecting a bundle of 80 Category 7 network cables.	On top of the slab, 25-mm from collar (West)	S1
	On top of the slab, 25-mm from collar (East)	S2
	On collar, 25-mm from slab (NE)	S3
	On collar, 25-mm from slab (SW)	S4
	On cables, 25-mm from collar (North)	S5
	On cables, 25-mm from collar (South)	S6
Specimen 2 – A SNAP MS70C Multi Service Cast-in fire collar protecting a bundle of six 16-mm <sup>2</sup> 3C+E and three 6-mm <sup>2</sup> 3C+E power cables.	On top of the slab – 25-mm from collar casing (West)	S7
	On top of the slab – 25-mm from the collar casing (East)	S8
	On collar casing – 25-mm above slab (West)	S9
	On collar casing – 25-mm above slab (East)	S10
	On 16-mm <sup>2</sup> cable, 25-mm above collar (West)	S11
	On 16-mm <sup>2</sup> cable, 25-mm above collar (East)	S12
	On 6-mm <sup>2</sup> cable, 25-mm above collar (NW)	S13
On 6-mm <sup>2</sup> cable, 25-mm above collar (NE)	S14	
Specimen 5 – A SNAP MS70R Multi Service Retrofit fire collar protecting a bundle of Optic Fibre cables penetrating a 67-mm diameter aperture.	On slab, 25-mm from cables (North)	S27
	On slab, 25-mm from cables (South)	S28
	On cables, 25-mm above slab (North)	S29
	On cables, 25-mm above slab (South)	S30
Rover		S35
Ambient		S36

Appendix B – Photographs

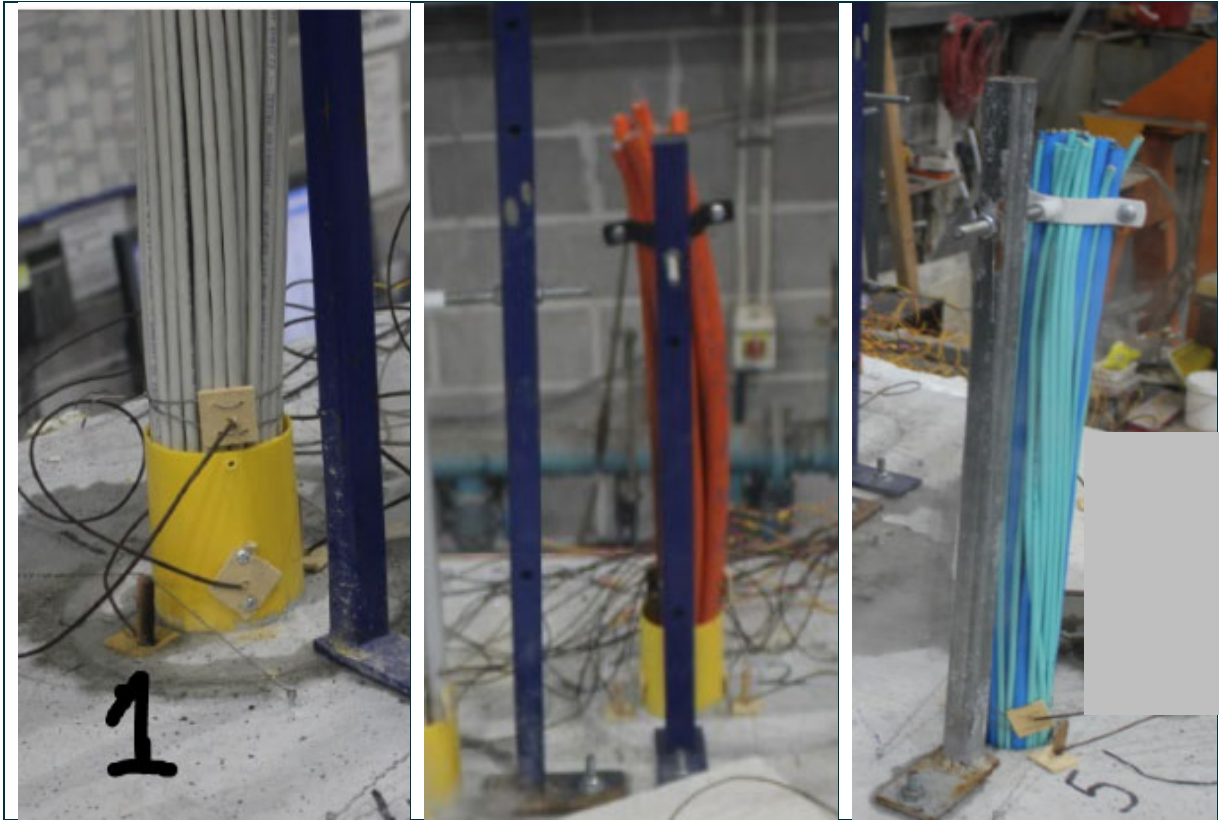


PHOTOGRAPH 1 – EXPOSED FACE OF SPECIMEN 1, 2, AND 5 PRIOR TO TESTING

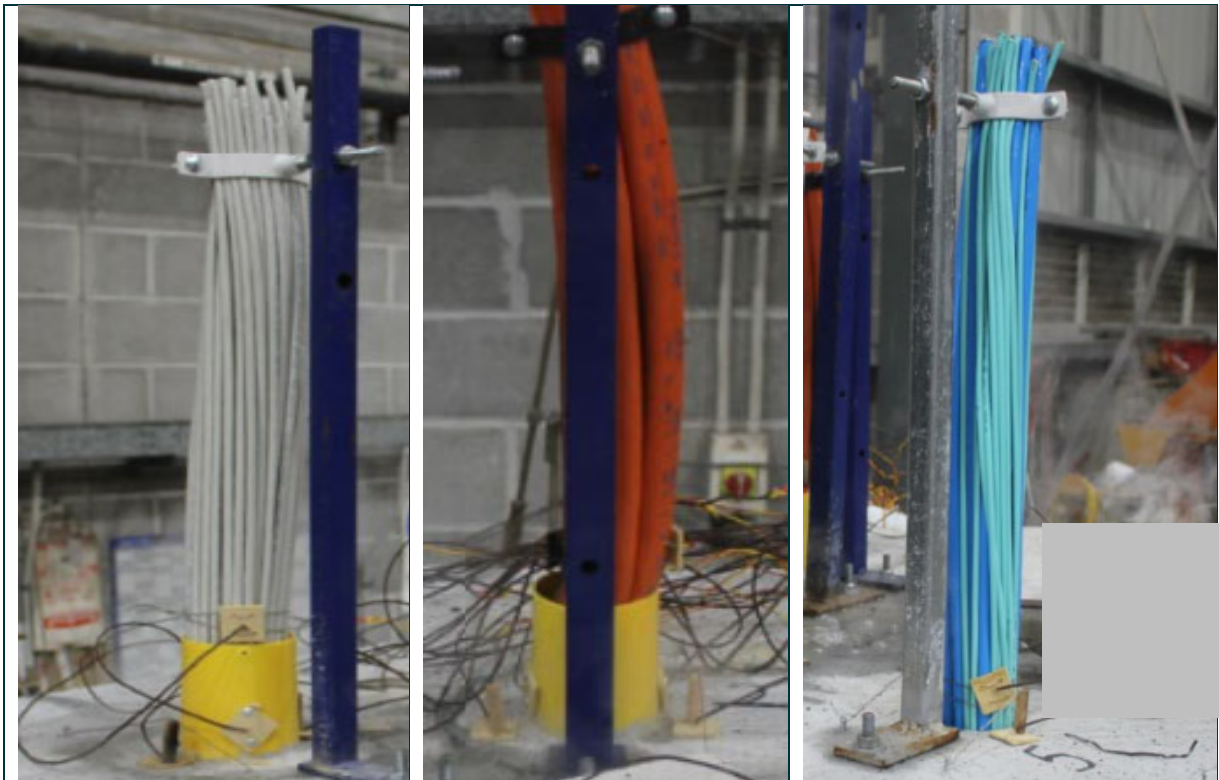


PHOTOGRAPH 2 – UNEXPOSED FACE OF SPECIMEN 1, 2, AND 5 PRIOR TO TESTING





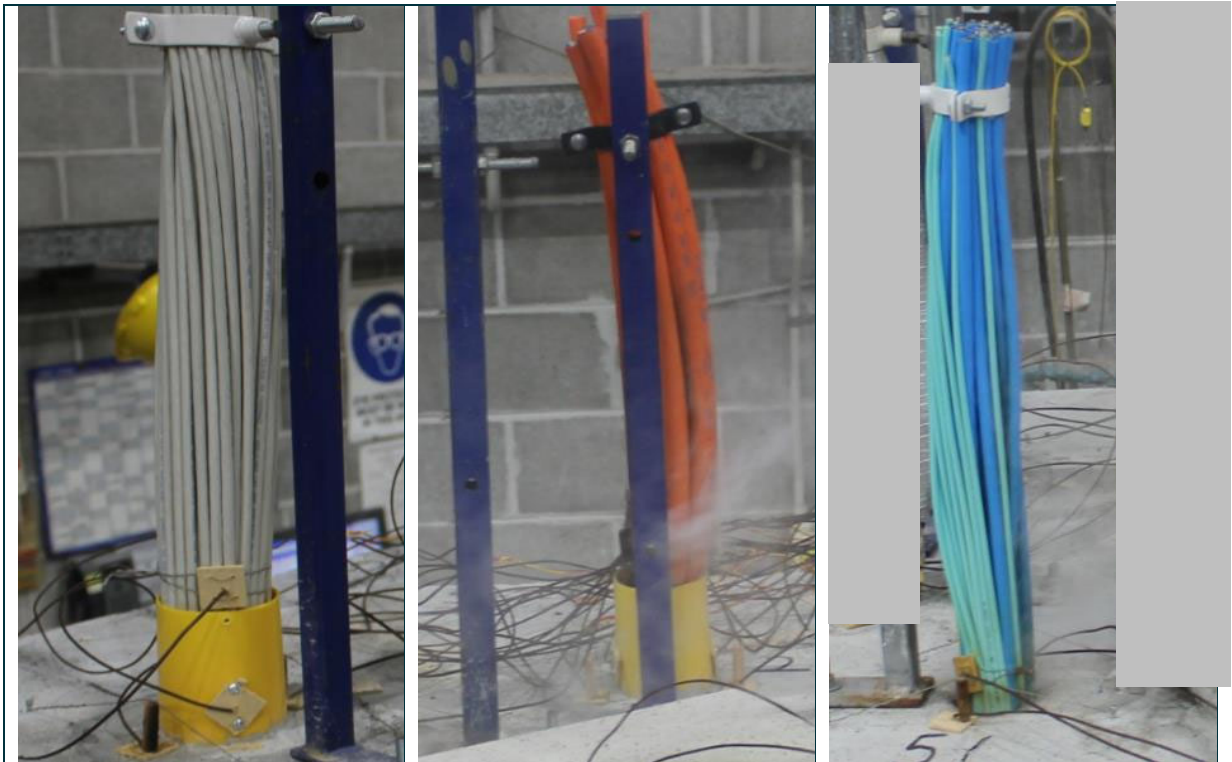
**PHOTOGRAPH 3 – SPECIMENS 1, 2 AND 5 AT 30 MINUTES INTO THE TEST**



**PHOTOGRAPH 4 – SPECIMENS 1, 2 AND 5 AT 60 MINUTES INTO THE TEST**

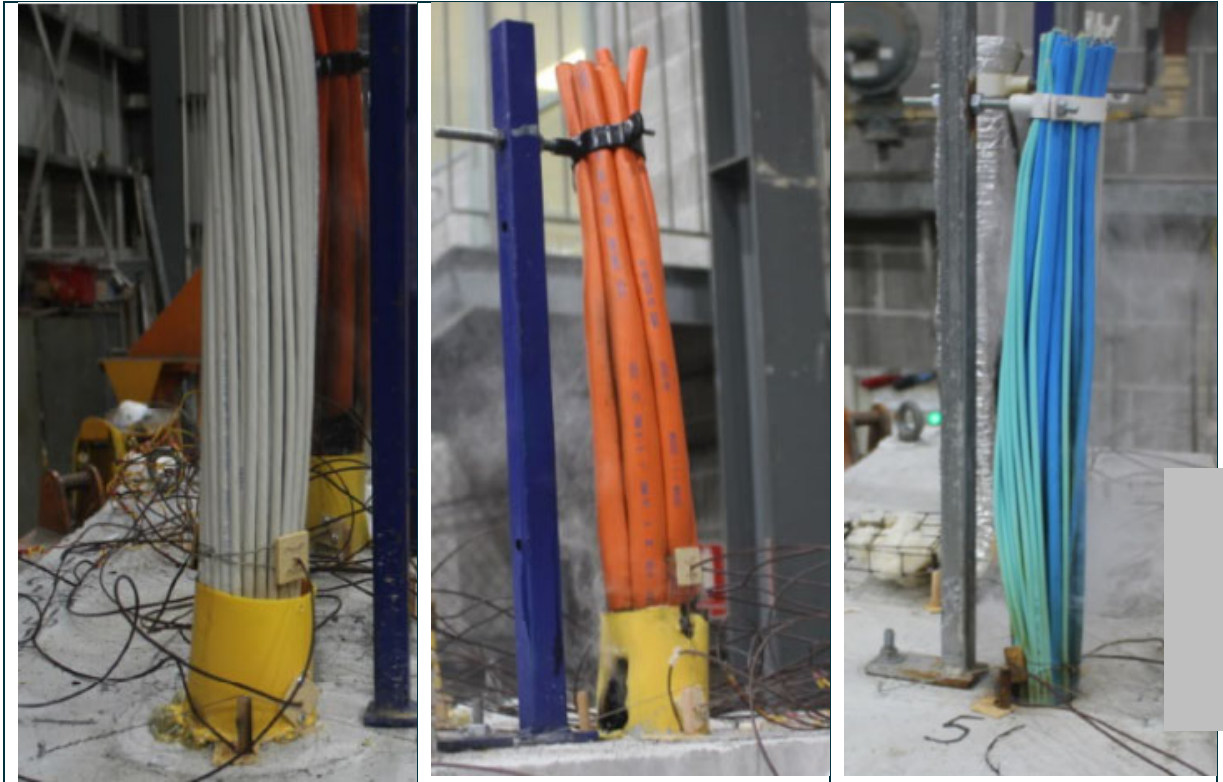


**PHOTOGRAPH 5 – SPECIMENS 1, 2 AND 5 AT 90 MINUTES INTO THE TEST**



**PHOTOGRAPH 6 – SPECIMENS 1, 2 AND 5 AT 120 MINUTES INTO THE TEST**



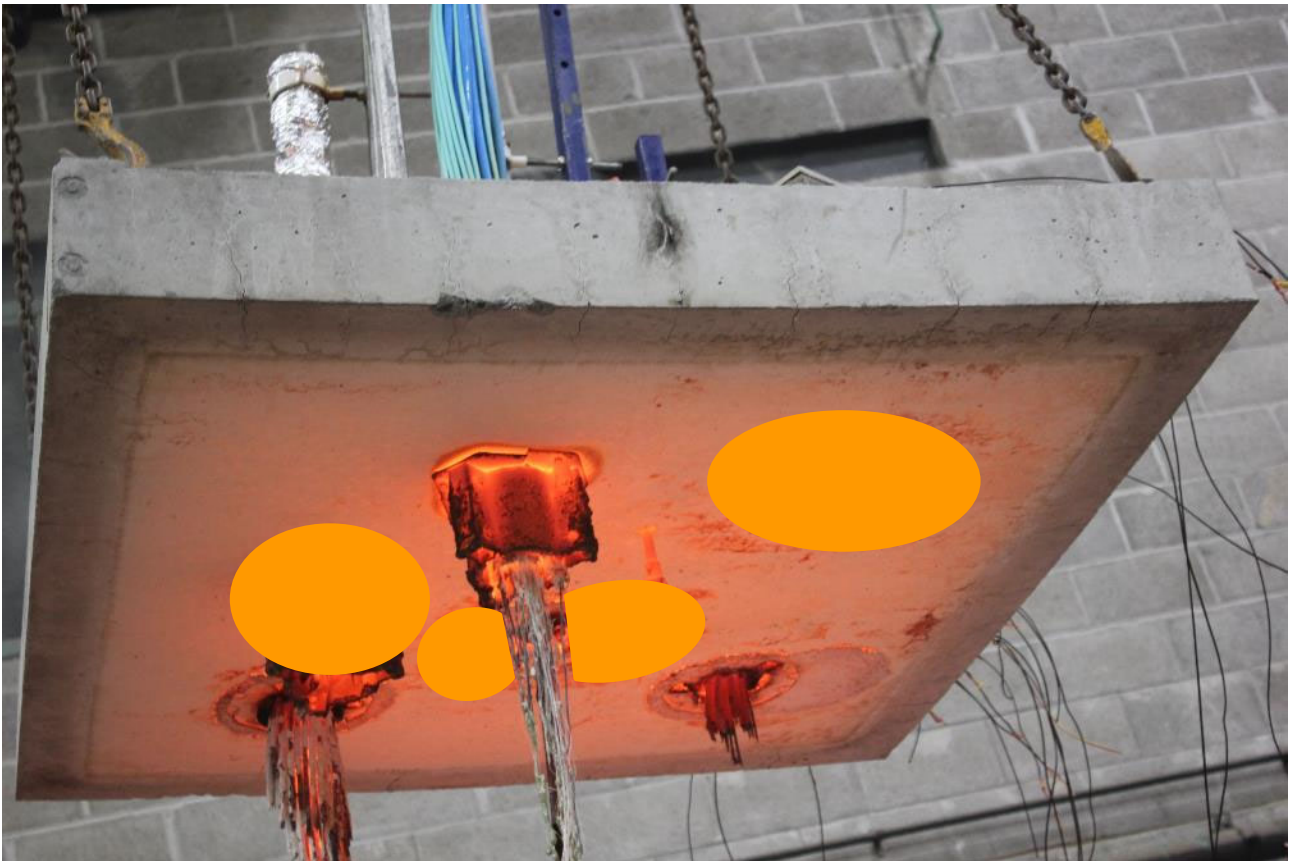


**PHOTOGRAPH 7 – SPECIMENS 1, 2 AND 5 AT 180 MINUTES INTO THE TEST**



**PHOTOGRAPH 8 – SPECIMENS 2 AND 5 AT 240 MINUTES INTO THE TEST**





**PHOTOGRAPH 9 – EXPOSED FACE OF SPECIMENS AT THE CONCLUSION OF TESTING**

## Appendix C – Test Data chart

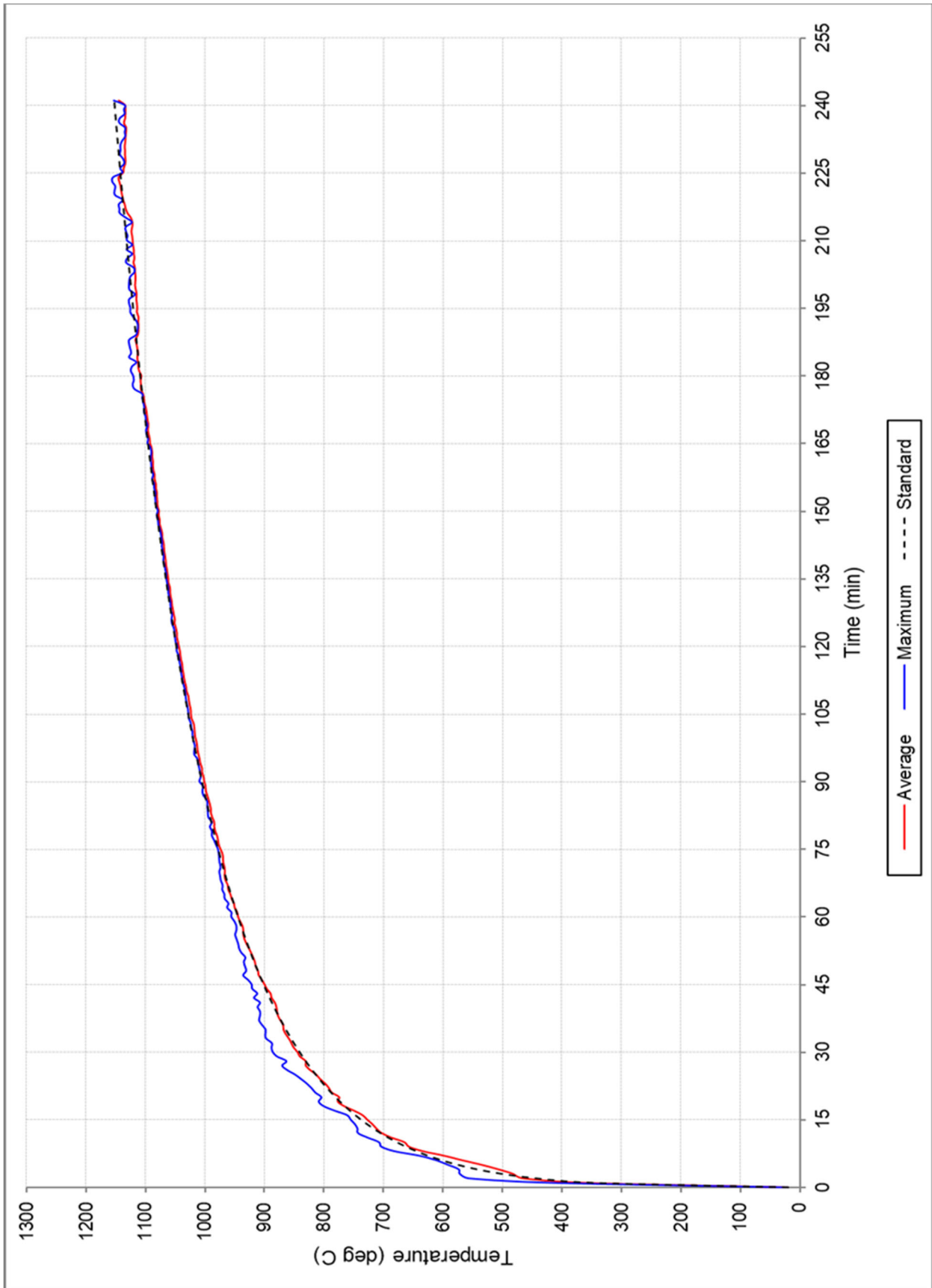


FIGURE 1 – FURNACE TEMPERATURE

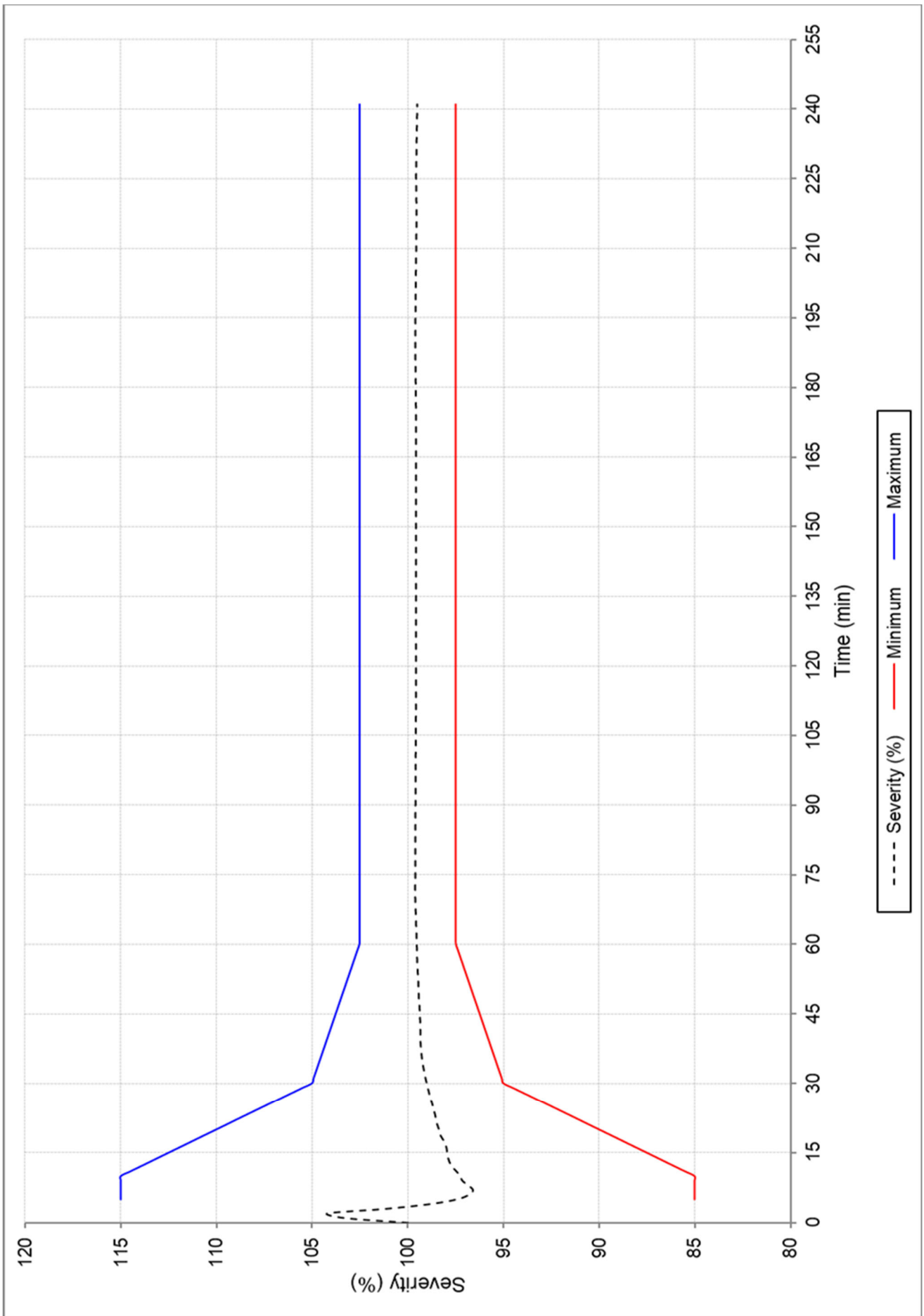


FIGURE 2 – FURNACE SEVERITY

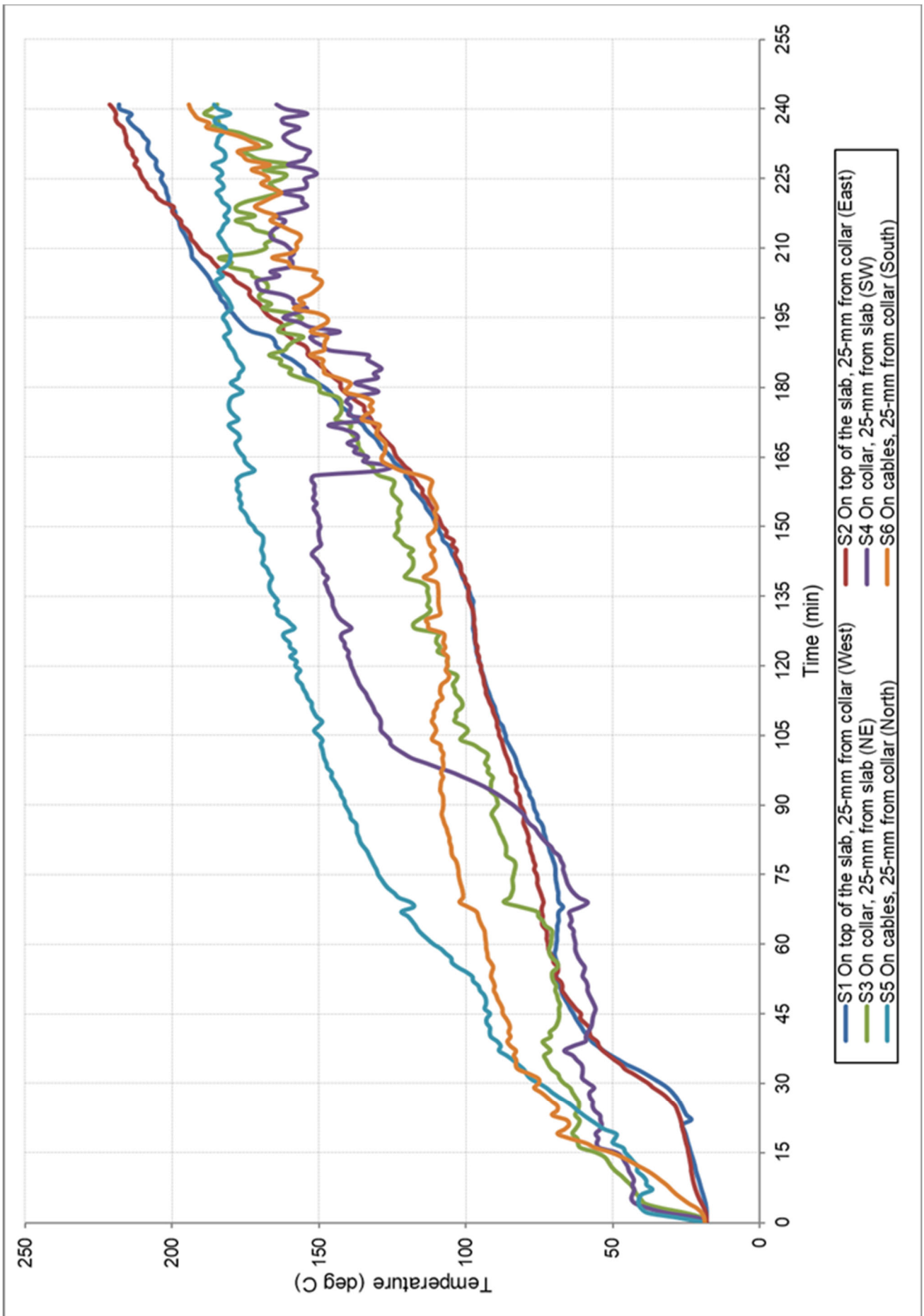


FIGURE 3 – SPECIMEN TEMPERATURE – ASSOCIATED WITH SPECIMEN 1

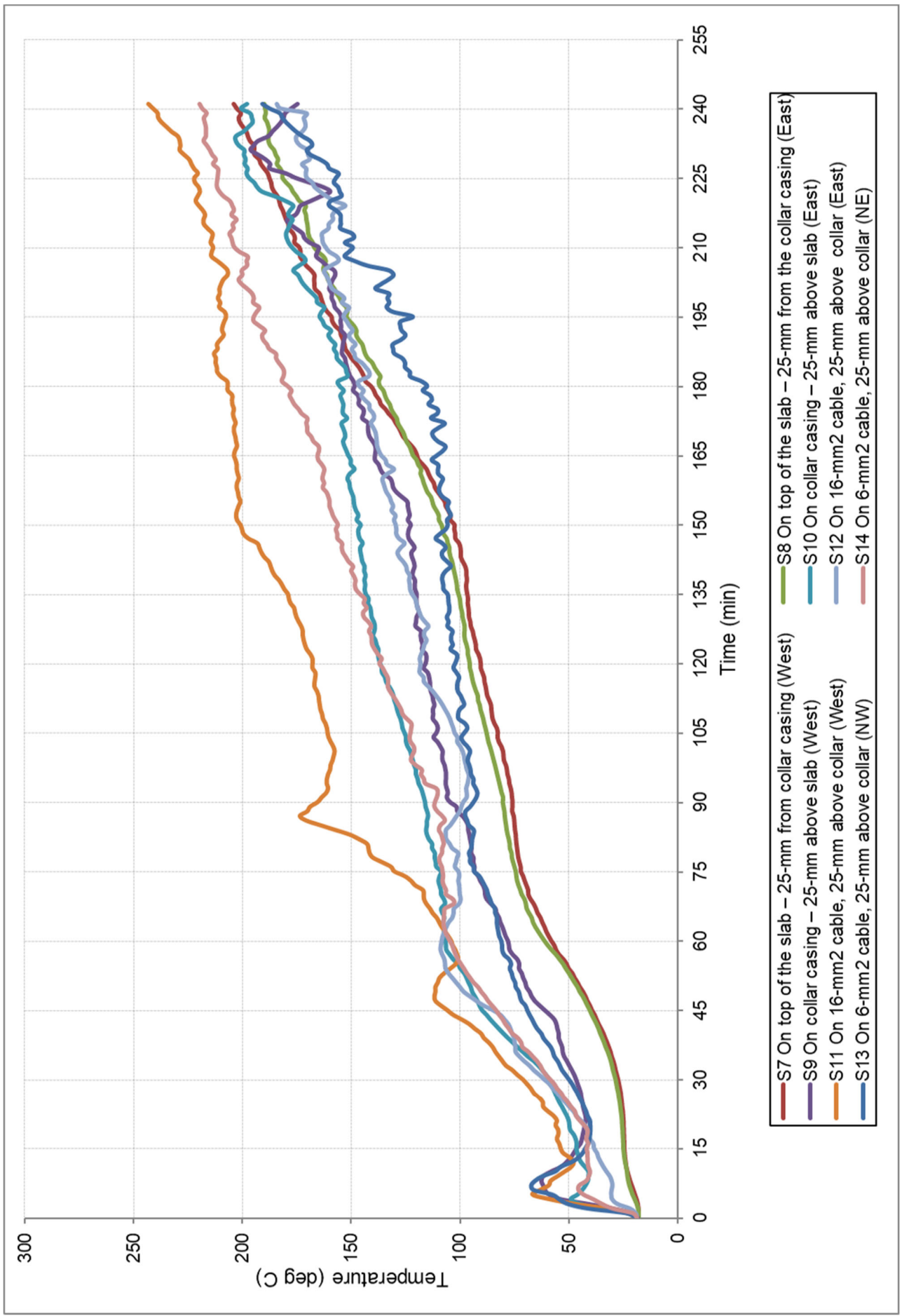


FIGURE 4 – SPECIMEN TEMPERATURE – ASSOCIATED WITH SPECIMEN 2

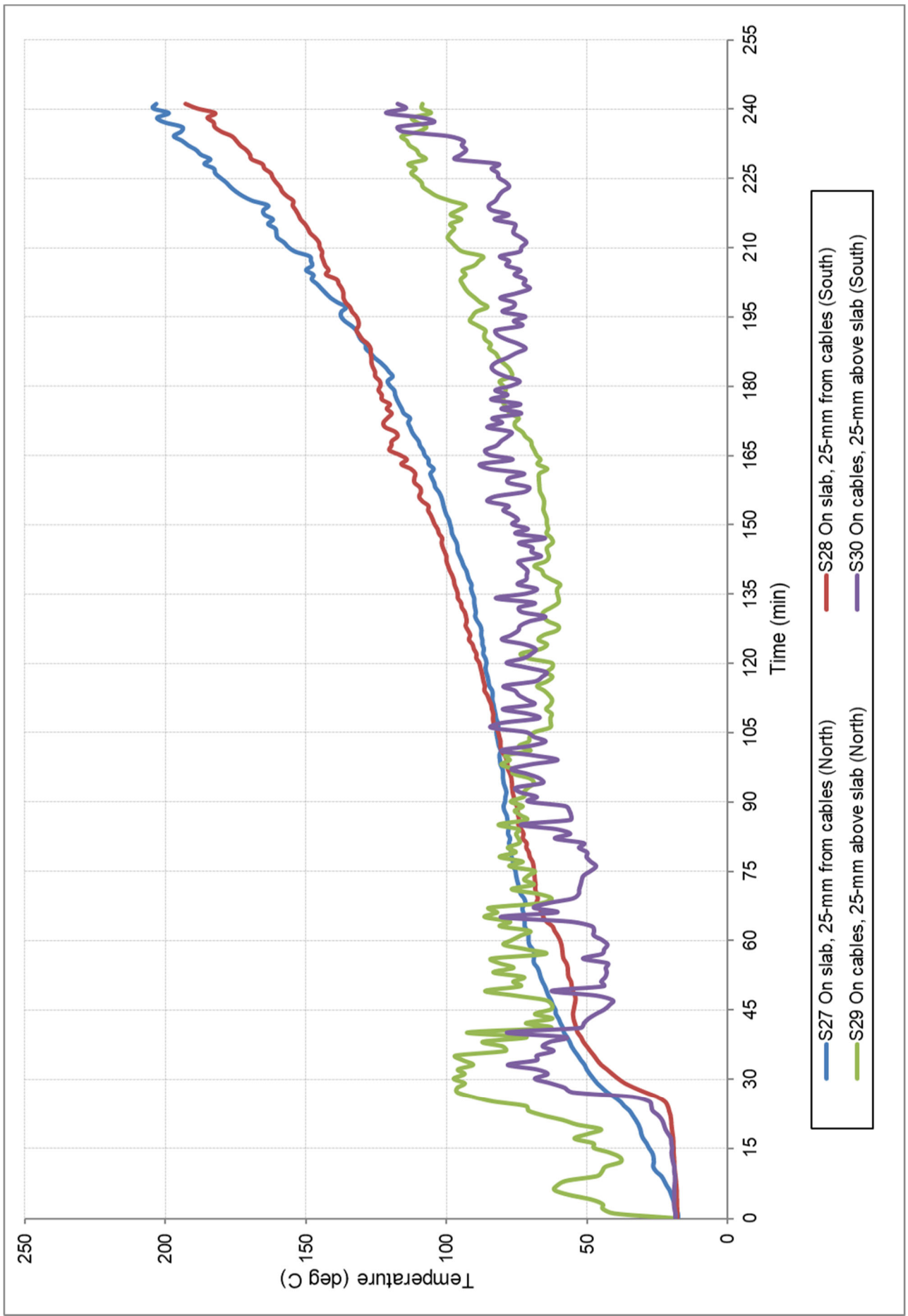
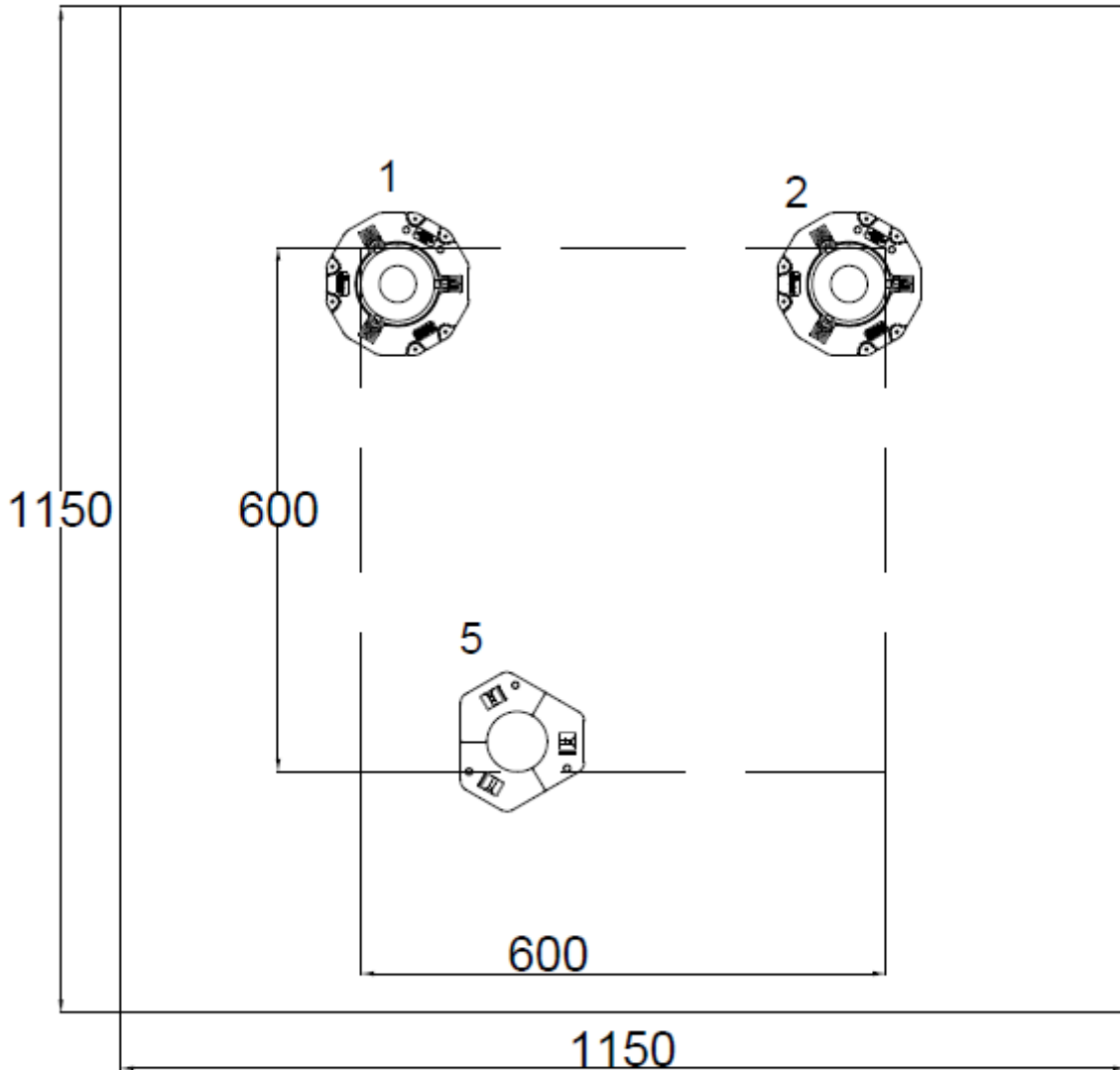


FIGURE 5 – SPECIMEN TEMPERATURE – ASSOCIATED WITH SPECIMEN 5



Appendix D – Installation drawings

**Snap Fire Systems Pty Ltd**  
 Test Slab S-21-B Layout  
 Date: 17 MAY 2021



Penetration	Collar Code	Pipe Type	Pipe Diameter
1	MS70C	Cat7 Cables	80x7mm
2	MS70C	Orange Power Cables	3x(6mm <sup>2</sup> 3C+E), 6x(16mm <sup>2</sup> 3C+E)
5	MS70R	Optical Fibre Bundle	20x11mm & 10x5mm

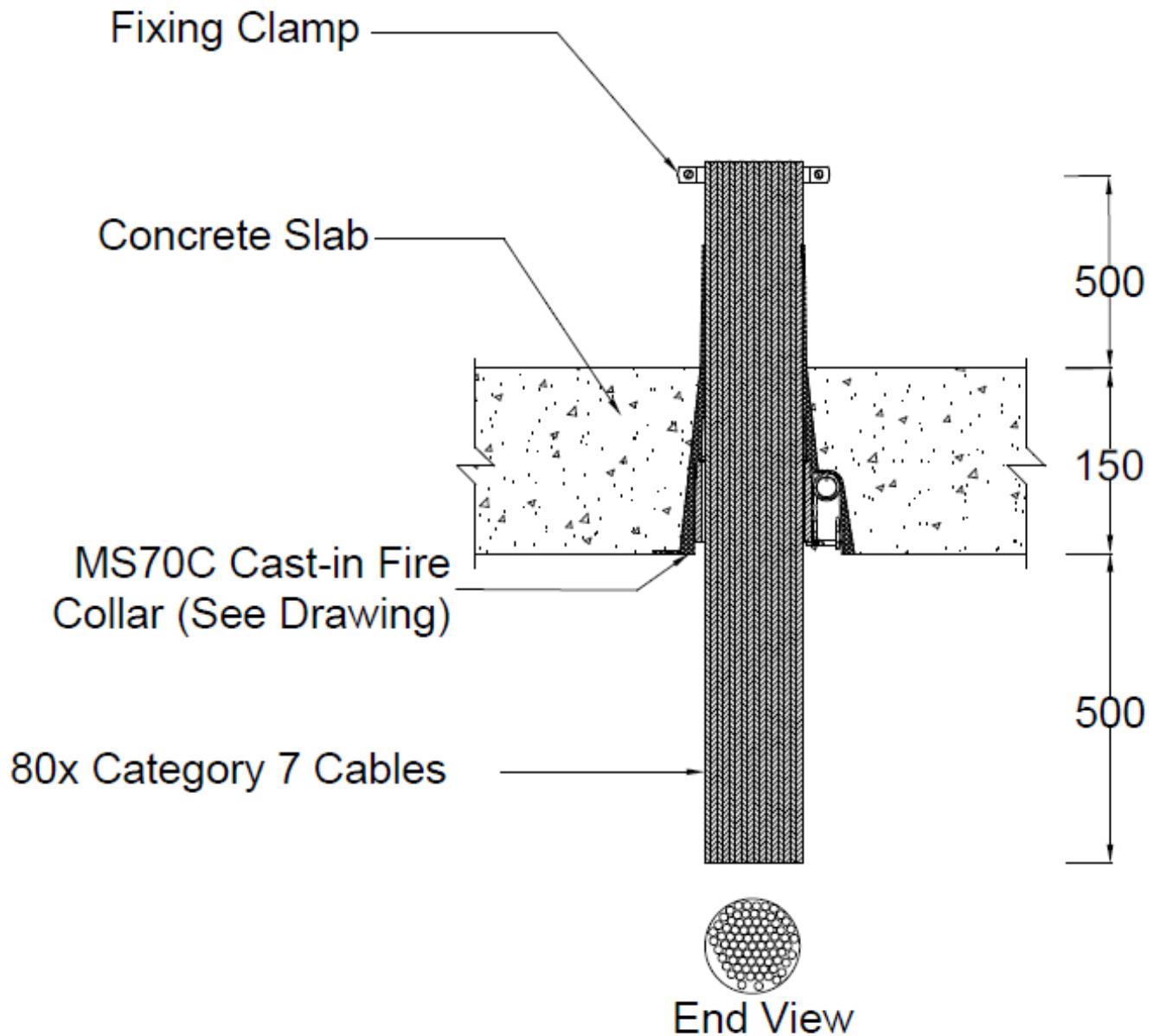
**DRAWING TITLED 'TEST SLAB S-21-B LAYOUT', DATED 17 MAY 2021, BY SNAP FIRE SYSTEMS PTY LTD**

# Snap Fire Systems Pty Ltd

Specimen #1

100% Full of Cat7 Cables & MS70C

Date: 17 MAY 2021



DRAWING TITLED 'SPECIMEN #1 100% FULL CAT 7 CABLES & MS70C & UL100FWS', DATED 17 MAY 2021, BY SNAP FIRE SYSTEMS PTY LTD

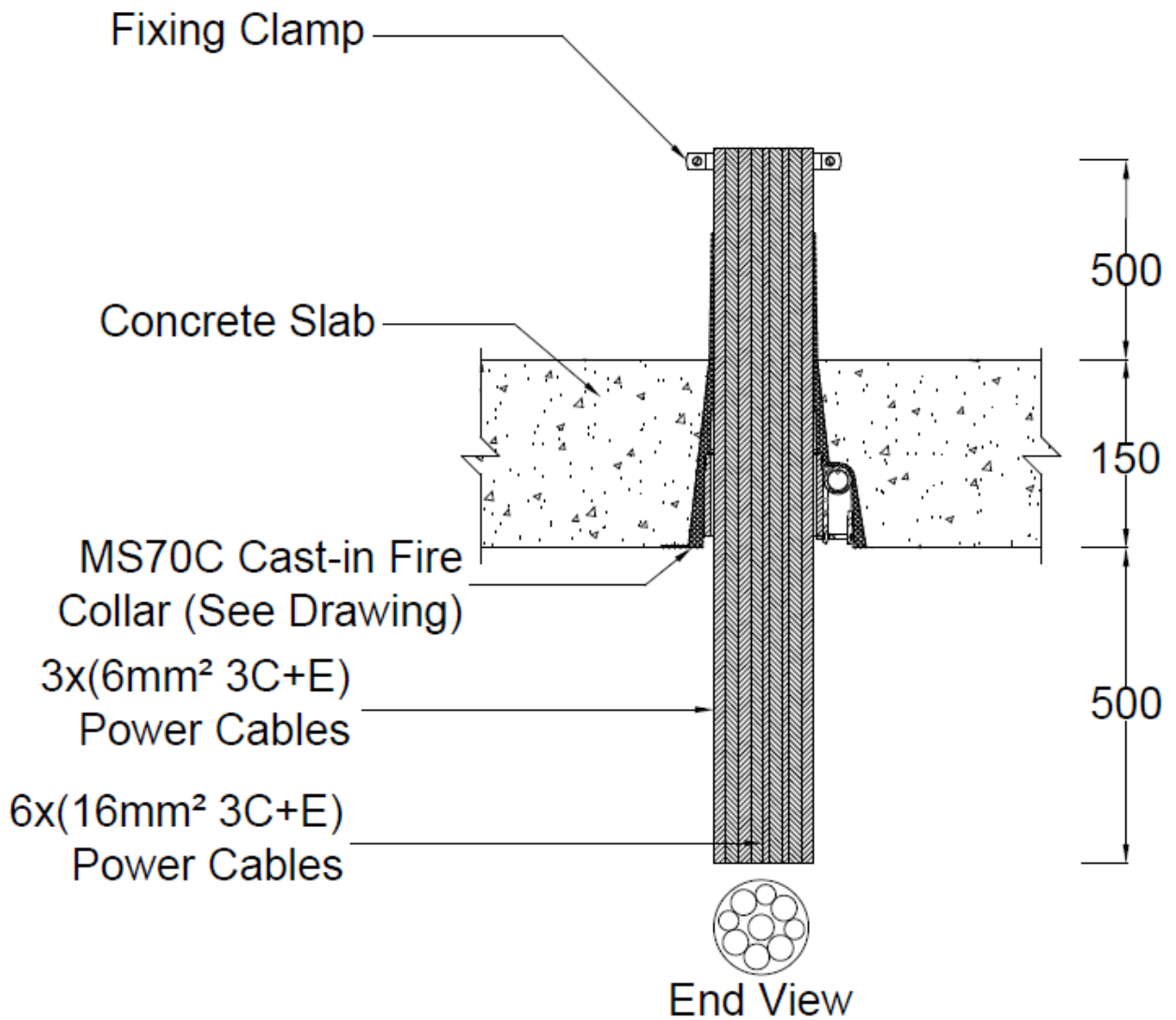


# Snap Fire Systems Pty Ltd

Specimen #2

16mm<sup>2</sup> 3C+E & 6mm<sup>2</sup> 3C+E Power Cables &  
MS70C

Date: 06 APR 2021



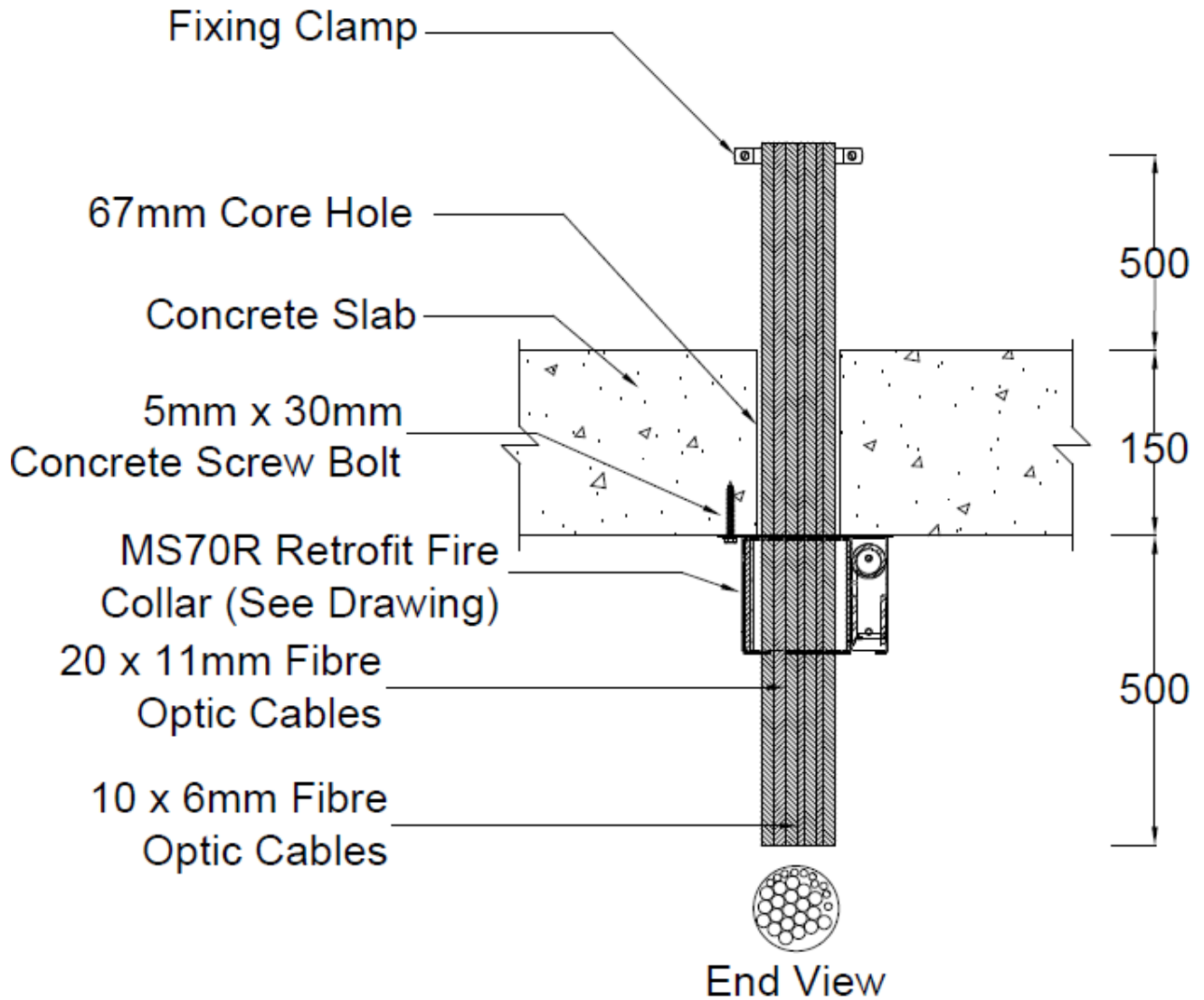
DRAWING TITLED 'SPECIMEN #2 16MM<sup>2</sup> 3C+E & 6-MM<sup>2</sup> 3C+E POWER CABLES & MS70C', DATED 6 APRIL 2021,  
Y SNAP FIRE SYSTEMS PTY LTD

# Snap Fire Systems Pty Ltd

Specimen #5

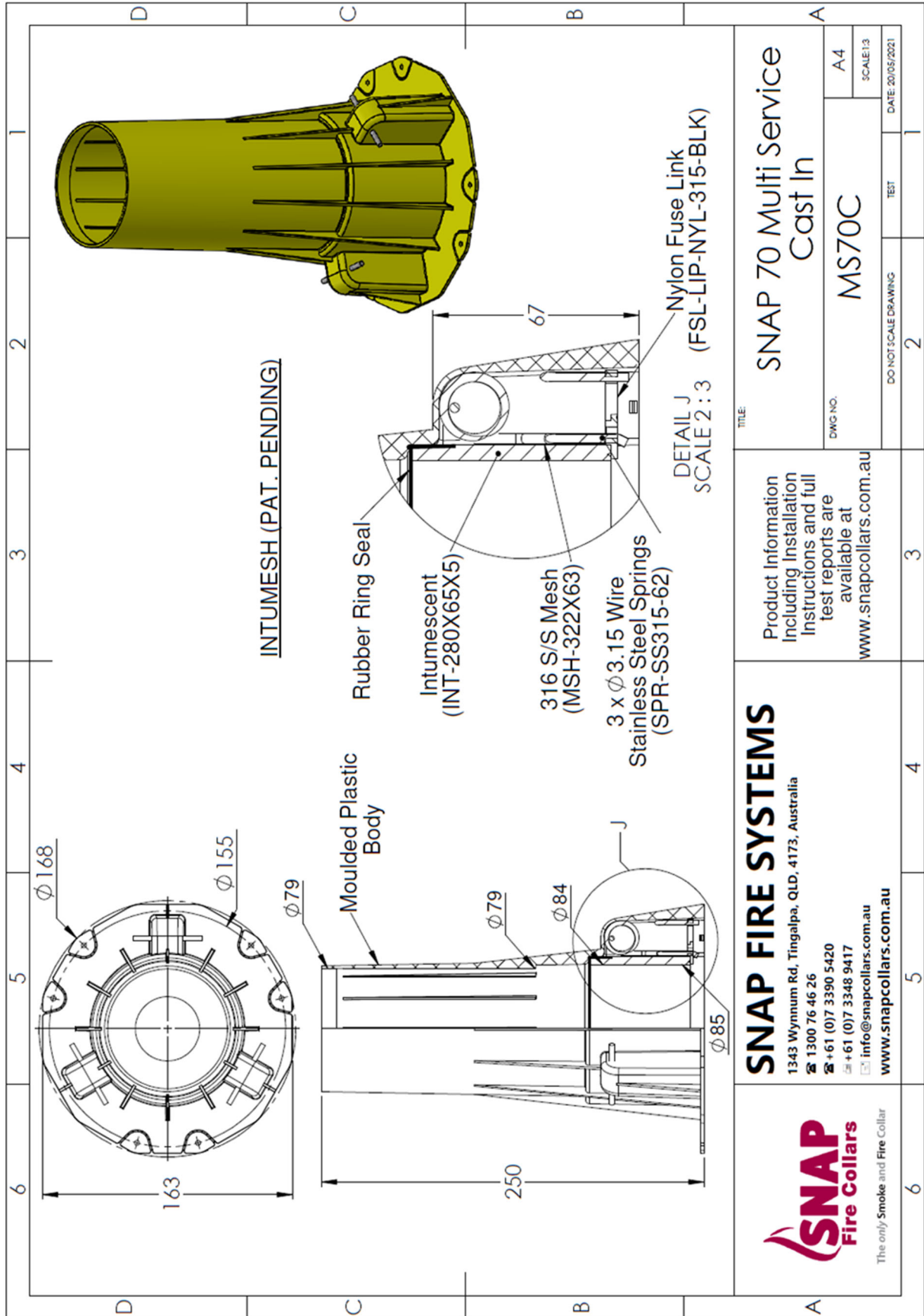
Fibre Optic Cables & MS70R

Date: 17 MAY 2021

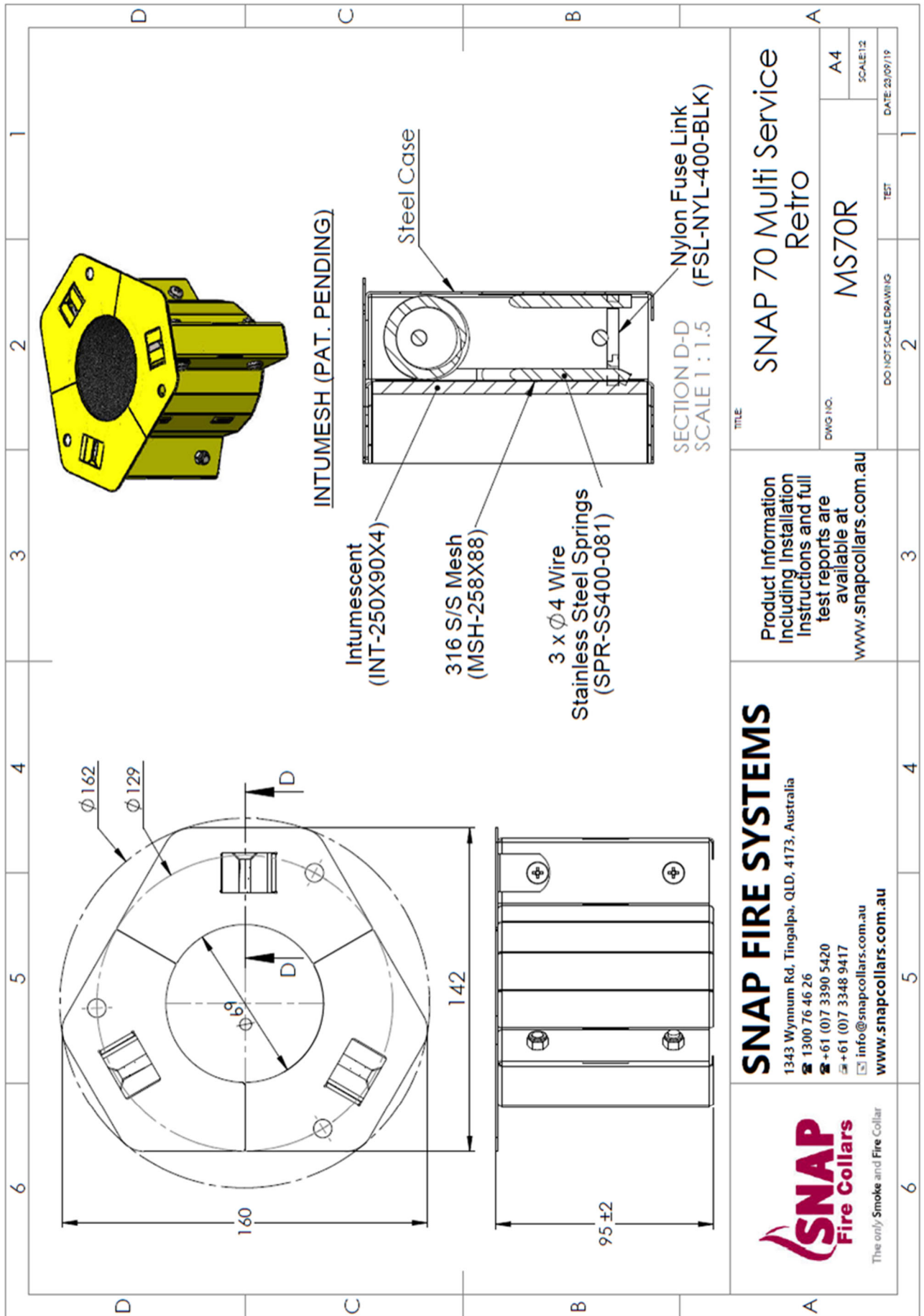


DRAWING TITLED 'SPECIMEN #5 FIBRE OPTICAL CABLES & MS70R', DATED 17 MAY 2021,  
BY SNAP FIRE SYSTEMS PTY LTD

Appendix E – Specimen Drawings






DRAWING TITLED 'SNAP 70 MULTI SERVICE CAST IN', DATED 20 MAY 2021, BY SNAP FIRE SYSTEMS PTY LTD



DRAWING TITLED 'SNAP 70 MULTI SERVICE RETRO', DATED 23 SEPTEMBER 2019, BY SNAP FIRE SYSTEMS PTY LTD

# Appendix F – Certificate(s) of Test

<b>INFRASTRUCTURE TECHNOLOGIES</b> <a href="http://www.csiro.au">www.csiro.au</a>		
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. 3625
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 1343 Wynnum Road Tingalpa QLD		
A full description of the test specimen and the complete test results are detailed in the Division's report numbered FSP 2203.		
Product Name: SNAP MS70C Multi Service cast-in fire collar protecting a bundle of 80 - Category 7 network cables (Specimen 1)		
Description: The specimen comprised an 1150-mm x 1150-mm x 150-mm thick concrete slab. The slab was penetrated by multiple services protected by four cast-in fire collars and two retrofit fire collars. The 150-mm thick concrete slab was reinforced with a single layer of steel reinforcement providing a Fire Resistance Period (FRP) for insulation of 180 minutes in accordance with table 5.5.1 of AS 3600:2018 - Concrete structures. Specimens 1 is the subject of this Certificate. The SNAP MS70C Multi Service cast-in fire collar comprised a 1.6-mm thick polypropylene casing with a 79 mm inner diameter and a 168-mm outer diameter base flange. The 250-mm high collar casing incorporated a 280-mm x 65-mm x 5-mm thick Intumesh intumescent material and a rubber ring seal. The closing mechanism comprised three stainless-steel springs bound with nylon fuse links and a 322-mm x 63-mm 316-stainless steel mesh. The MS70C collar was cast into a 150-mm thick concrete slab with the collar's casing projecting 100 mm vertically above the unexposed face. The penetrating service comprised a bundle of eighty 6.7-mm diameter Belden Category 7 network cables. The cables were fitted through the collar's sleeve. The cables projected vertically 520-mm above the concrete and approximately 500 mm below into the furnace chamber. The cables were supported at nominally 500-mm above the unexposed face of the concrete slab. The Sponsor provided documents titled 'Test Slab S-21-B Layout' and 'Specimen #1 100% Full of Cat7 Cables & MS70C', both dated 17 May 2021 and 'SNAP 70 Multi Service Cast In', dated 20 May 2021, as a complete description of the specimen and should be read in conjunction with this Certificate.		
Performance observed in respect of the following AS 1530.4-2014 criteria		
Structural Adequacy	-	not applicable
Integrity	-	no failure at 241 minutes
Insulation	-	217 minutes
and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/240/180.		
The fire-resistance level of the specimen is applicable when the system is exposed to fire from the same direction as tested. * Specimens were tested in a concrete slab with a Fire Resistance Period (FRP) for insulation of 180 minutes in accordance with Table 5.5.1 of AS 3600:2018 - Concrete structures. The maximum FRL of any test specimen cannot exceed the FRL achieved by the concrete slab 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: 26 May 2021
Issued on the 13 <sup>th</sup> day of October 2021 without alterations or additions.		
 Brett Roddy   Manager, Fire Testing and Assessments		
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**COPY OF CERTIFICATE OF TEST – NO. 3625**





## Certificate of Test

No. 3626

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  
1343 Wynnum Road  
Tingalpa QLD

A full description of the test specimen and the complete test results are detailed in the Division's report numbered FSP 2203.

Product Name: SNAP MS70C Multi Service Cast-in fire collar protecting a bundle of six 16-mm<sup>2</sup> 3C+E and three 6-mm<sup>2</sup> 3C+E power cables (Specimen 2)

Description: The specimen comprised an 1150-mm x 1150-mm x 150-mm thick concrete slab. The slab was penetrated by multiple services protected by four cast-in fire collars and two retrofit fire collars. The 150-mm thick concrete slab was reinforced with a single layer of steel reinforcement providing a Fire Resistance Period (FRP) for insulation of 180 minutes in accordance with table 5.5.1 of AS 3600:2018 - Concrete structures. Specimens 2 is the subject of this Certificate. The SNAP MS70C Multi Service cast-in fire collar comprised a 1.6-mm thick polypropylene casing with a 79 mm inner diameter and a 168-mm outer diameter base flange. The 250-mm high collar casing incorporated a 280-mm x 65-mm x 5-mm thick Intumesh intumescent material and a rubber ring seal. The closing mechanism comprised three stainless-steel springs bound with nylon fuse links and a 322-mm x 63-mm 316 stainless steel mesh. The MS70C collar was cast into a 150-mm thick concrete slab with the collar's casing projecting 100 mm vertically above the unexposed face. The penetrating service comprised a bundle of six Prysmian 16-mm<sup>2</sup> 3-core + E power cables and three Electra Cables 6 mm<sup>2</sup> 3-core + E power cables. The cables were fitted through the collar's sleeve. The cables projected vertically 520-mm above the concrete and approximately 500 mm below into the furnace chamber. The cables were supported at nominally 500-mm above the unexposed face of the concrete slab. The Sponsor provided documents titled 'Test Slab S-21-B Layout', dated 17 May 2021, 'Specimen #2 16mm<sup>2</sup> 3C+E & 6mm<sup>2</sup> 3C+E Power Cables & MS70C', dated 6 April 2021 and 'SNAP 70 Multi Service Cast In', dated 20 May 2021, as a complete description of the specimen and should be read in conjunction with this Certificate.

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

Structural Adequacy	-	not applicable
Integrity	-	no failure at 241 minutes
Insulation	-	148 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/240/120.

The fire-resistance level of the specimen is applicable when the system is exposed to fire from the same direction as tested. \* Specimens were tested in a concrete slab with a Fire Resistance Period (FRP) for insulation of 180 minutes in accordance with Table 5.5.1 of AS 3600:2018 - Concrete structures. The maximum FRL of any test specimen cannot exceed the FRL achieved by the concrete slab 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: 26 May 2021

Issued on the 13<sup>th</sup> day of October 2021 without alterations or additions.

Brett Roddy | Manager, Fire Testing and Assessments

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## Certificate of Test

No. 3627

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  
1343 Wynnum Road  
Tingalpa QLD

A full description of the test specimen and the complete test results are detailed in the Division's report numbered FSP 2203.

Product Name: SNAP MS70R Multi Service Retrofit fire collar protecting a bundle of fibre optic cables penetrating a 67-mm diameter aperture (Specimen 5)

Description: The specimen comprised an 1150-mm x 1150-mm x 150-mm thick concrete slab. The slab was penetrated by multiple services protected by four cast-in fire collars and two retrofit fire collars. The 150-mm thick concrete slab was reinforced with a single layer of steel reinforcement providing a Fire Resistance Period (FRP) for insulation of 180 minutes in accordance with table 5.5.1 of AS 3600:2018 - Concrete structures. Specimens 5 is the subject of this Certificate. The SNAP MS70R Multi Service Retrofit 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 outer 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. The MS70R collar was centrally located over a 67-mm core hole on the underside (exposed face) of the concrete slab and fixed through the 3 mounting brackets using 5-mm x 30-mm long concrete screw bolts. The penetrating service comprised a bundle of Garland fibre optic cables; 20 x 11-mm diameter and 10 x 6 mm diameter. The cables were fitted through the collar's sleeve and penetrated the concrete slab through a 67-mm diameter cut-out hole. The cables projected vertically 520 mm above the unexposed face of the concrete slab and approximately 500-mm below into the furnace chamber. The cables were supported at 500-mm above the concrete slab. The Sponsor provided documents titled 'Test Slab S-21-B Layout' and 'Specimen #5 Fibre Optic Cables & MS70R', both dated 17 May 2021 and 'SNAP 70 Multi Service Retro', dated 23 September 2019, as a complete description of the specimen and should be read in conjunction with this Certificate.

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

Structural Adequacy	-	not applicable
Integrity	-	no failure at 241 minutes
Insulation	-	237 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/240/180.

The fire-resistance level of the specimen is applicable when the system is exposed to fire from the same direction as tested. \* Specimens were tested in a concrete slab with a Fire Resistance Period (FRP) for insulation of 180 minutes in accordance with Table 5.5.1 of AS 3600:2018 - Concrete structures. The maximum FRL of any test specimen cannot exceed the FRL achieved by the concrete slab 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: 26 May 2021

Issued on the 13<sup>th</sup> day of October 2021 without alterations or additions.

Brett Roddy | Manager, Fire Testing and Assessments

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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.            |
| AS 3600-2018   | Concrete structures.   |



#### CONTACT US

**t** 1300 363 400  
+61 3 9545 2176  
**e** [enquiries@csiro.au](mailto:enquiries@csiro.au)  
**w** [www.csiro.au](http://www.csiro.au)

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#### FOR FURTHER INFORMATION

##### **Infrastructure Technologies**

Brett Roddy

Group Leader, Fire Testing and Assessments

**t** +61 2 94905449

**e** [brett.rodny@csiro.au](mailto:brett.rodny@csiro.au)

**w** [www.csiro.au/en/Do-business/Services/Materials-infrastructure/Fire-safety](http://www.csiro.au/en/Do-business/Services/Materials-infrastructure/Fire-safety)