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

Test Report

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

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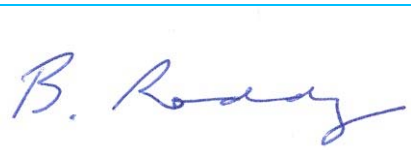
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Fire-resistance test on fire collars protecting a concrete slab penetrated by services

Sponsored Investigation No. FSP 2174

1 Introduction

1.1 Identification of specimen

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

1.2 Sponsor

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

1.3 Manufacturers

Snap Fire Systems Pty Ltd
Building A, 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 5049/4601

1.7 Test date

The fire-resistance test was conducted on 11 January 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 six (6) retrofit fire collars and one (1) cast-in fire collar.

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.

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

- AS/NZS 1260 PVC-U pipes and fittings for drain, waste and vent application;
- AS/NZS 2492:2007/Amdt 1:2018 : Cross-linked polyethylene (PE-X) pipes for pressure applications;
- AS/NZS 5000.1:2005 (R2017): Electric cables - Polymeric insulated - For working voltages up to and including 0.6/1 (1.2) kV and
- AS/NZS 7671:2010 Plastics piping systems for soil and waste discharge (low and high temperature) inside buildings— Polypropylene (PP)

For the purpose of the test, the penetrations were referenced as Specimens 1, 2, 3, 4, 5, 6 and 7. Only five specimens are the subject of this report (Specimens 1, 2, 5, 6 and 7). Documents containing a complete description of each specimen were supplied by the sponsor and are retained on file.

Specimen 1 - A SNAP LP50R Low Profile Retrofit fire collar protecting a nominal 50-mm Valsir Triplus polypropylene floor waste incorporating a P-trap penetrating a 52-mm diameter core hole.

The SNAP LP50R Low Profile Retrofit fire collar comprised a 0.75-mm steel casing with a 69-mm inner diameter and a 203-mm diameter base flange. The 61.5-mm high collar casing incorporated a closing mechanism which comprised a 252-mm x 58-mm x 4-mm thick Intumesh intumescent wrap lined within the internal circumference of the collar casing. The closing mechanism comprised three stainless steel springs, with black nylon fuse links and a 260-mm x 58-mm stainless steel mesh, as shown in drawing titled 'SNAP 50 Low Profile Retro', dated 25 March 2019, by Snap Fire Systems Pty Ltd.

The collar was centrally located over a 52-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 49.9-mm outside diameter Valsir Triplus (polypropylene) pipe with a wall thickness of 2.13-mm fitted through the collar's sleeve incorporating a P-trap attached below the collar. The floor waste system was fitted with a metal grate and a plastic puddle flange. A 15-mm thick grout screed was laid on top of the concrete slab and finished flush with the floor grate. On the exposed side a M10 threaded rod and nut clip was connected to the P-trap and fixed to the concrete slab with a steel drop-in anchor. The exposed end of the P-trap was plugged with ceramic fibre. The floor waste gully was charged with water to the level shown in drawing titled 'Specimen #1 50 Triplus Floorwaste & LP50R', dated 21 December 2020, by Snap Fire Systems Pty Ltd.

Specimen 2 – A SNAP 110R Retrofit fire collar protecting a nominal 110-mm Valsir Triplus polypropylene stack pipe penetrating a 117-mm core hole.

The SNAP 110R Retrofit fire collar comprised a 0.75-mm steel casing with a 122 mm inner diameter and a 206-mm diameter base flange. The 62-mm high collar casing incorporated a closing mechanism which comprised three soft Intumesh intumescent wraps and wire meshes lined within the internal circumference of the collar. Intumescent A was 2.5-mm thick x 58-mm wide x 424-mm long, Intumescent B was 2.5-mm thick x 58-mm wide x 407-mm long and Intumescent C was 2.5-mm thick x 58-mm wide x 389-mm long. Between intumescent strips A and B was a layer of 316 stainless steel mesh 415-mm long x 58-mm wide and between intumescent strips B and C was a layer of 316 stainless steel mesh 398-mm long x 58-mm wide. Both had wire mesh diameters of 0.15-mm, as shown in drawing titled 'SNAP 110 Retro', dated 16 January 2019, by Snap Fire Systems Pty Ltd.

The collar was centrally located over a 117-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 111.25-mm outside diameter Triplus Valsir polypropylene pipe with a wall thickness of 3.68-mm fitted through the core hole and the collar's sleeve as shown in drawing titled 'Specimen #2 110 Triplus Stack & 110R', dated 21 December 2020, by Snap Fire Systems Pty Ltd. The pipe projected vertically, approximately 2000-mm above from the unexposed face of the concrete floor and approximately 500-mm into the furnace chamber. The pipe was supported at nominally 500-mm and 1500-mm from the unexposed face of the slab. The pipe was open at the unexposed end and plugged with ceramic fibre on the exposed end.

Specimen 5 – A SNAP MS70R Multi Services Retrofit fire collar and nominal 60-mm diameter polyvinyl chloride (PVC-U) conduit protecting three 6-mm^2 3C+E and three 16-mm^2 3C+E power cables penetrating a 67-mm core hole.

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 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 cluster of three 6-mm^2 3-core + E power cables and three 16-mm^2 3-core + E power cables running through the inside of the conduit. All the cables were manufactured by General Cables. The PVC conduit and six power cables were fitted through the core hole and the MS70R collar's sleeve. A 350-mm long piece of 60-mm outside diameter Telstra PVC-U conduit with a wall thickness of 3-mm was fitted around the cables and inside the core hole that extended 100-mm from both sides of the slab and inside the MS70R collar's sleeve as shown in drawing titled 'Specimen #5 50 PVC Conduit with 16mm² 3C + E & 6mm² 3C + E Power Cables & MS70R', dated 21 December 2020, by Snap Fire Systems Pty Ltd. The cables projected vertically approximately 550-mm above the slab and 500-mm below into the furnace chamber. The cables were supported at 500-mm above the slab.

Specimen 6 – A SNAP 50R Retrofit fire collar protecting a nominal 40-mm Valsir Triplus polypropylene stack pipe penetrating a 52-mm core hole.

The SNAP 50R Retrofit fire collar comprised a 0.75-mm steel casing with a 62-mm inner diameter and a 147-mm diameter base flange. The 47-mm high collar casing incorporated a closing mechanism which comprised two soft Intumesh intumescent wraps lined within the internal circumference of the collar. Intumescent A was 4-mm thick x 43-mm wide x 220-mm long and Intumescent B was 4-mm thick x 43-mm wide x 200-mm long. Between the strips was a layer of 316 grade stainless steel mesh measuring 210-mm long x 42-mm wide with a wire mesh diameter of 0.15-mm, as shown in drawing titled 'SNAP 50 Retro', dated 18 January 2019, by Snap Fire Systems Pty Ltd.

The 50R collar was centrally located over a 52-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 40-mm outside diameter Valsir Triplus polypropylene pipe with a wall thickness of 2.06-mm fitted through the core hole and the collar's sleeve as shown in drawing titled 'Specimen #6, 40 Triplus Stack & 50R', dated 21 December 2020, by Snap Fire Systems Pty Ltd. The pipe projected vertically 2000-mm above the concrete slab and 500-mm into the furnace chamber. The pipe was supported at nominally 500-mm and 1500-mm from the unexposed face of the slab. The pipe was open on the unexposed end and plugged with ceramic fibre on the exposed end on the exposed end.

Specimen 7 – A SNAP H50S-RR High-Top Stack cast-in fire collar protecting a nominal 25-mm Rehau Rautitan PEX-a stack pipe.

The SNAP H50S-RR High-Top Stack cast-in fire collar comprised a 1.6-mm thick polypropylene casing with a 67-mm inner diameter and a 150-mm diameter base flange. The 150-mm (cut down to size from 250-mm) high collar casing incorporated a 230-mm x 55-mm x 5-mm thick Intumesh intumescent material and a rubber ring seal. The closing mechanism comprised three galvanised steel springs bound with nylon fuse links and a 268-mm x 53-mm 316 stainless steel mesh as shown in drawing titled 'SNAP 50 High-Top Stack', dated 29 September 2017, by Snap Fire Systems Pty Ltd.

The penetrating service comprised a 25.35-mm outside diameter Rehau Rautitan PEX-a pipe with a wall thickness of 4-mm fitted through the collar's sleeve. The annular gap between the pipe and the inside collar incorporated a PE foam backing rod, back filled with grout to a depth of 30 mm and finished flush with the slab as shown in drawing titled 'Specimen #7, 25 PEX-a Stack & H50S-RR', dated 21 December 2020, by Snap Fire Systems Pty Ltd.

The pipe projected vertically, 2000-mm above from the unexposed face of the concrete slab and 500-mm into the furnace chamber. The pipe was supported at nominally 500-mm and 1500-mm from the unexposed face of the slab. The pipe was open on the unexposed end and closed with a ceramic fibre plug on the exposed end.

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 6 January 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-20-O Layout', dated 21 December 2020 by, Snap Fire Systems Pty Ltd.

Drawing titled 'Specimen #1 50 Triplus Floorwaste & LP50R', dated 21 December 2020, by Snap Fire Systems Pty Ltd.

Drawing titled 'Specimen #2 110 Triplus Stack & 110R', dated 21 December 2020, by Snap Fire Systems Pty Ltd.

Drawing titled 'Specimen #5 50 PVC Conduit with 16mm² 3C + E & 6mm² 3C + E Power Cables & MS70R', dated 21 December 2020, by Snap Fire Systems Pty Ltd.

Drawing titled 'Specimen #6, 40 Triplus Stack & 50R', dated 21 December 2020, by Snap Fire Systems Pty Ltd.

Drawing titled 'Specimen #7, 25 PEX-a Stack & H50S-RR', dated 21 December 2020, by Snap Fire Systems Pty Ltd.

Drawing titled 'SNAP 50 Low Profile Retro', dated 25 March 2019, by Snap Fire Systems Pty Ltd.

Drawing titled 'SNAP 110 Retro', dated 16 January 2019, by Snap Fire Systems Pty Ltd.

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

Drawing title 'SNAP 50 Retro', dated 18 January 2019, by Snap Fire Systems Pty Ltd.

Drawing titled 'SNAP 50 High-Top Stack', dated 29 September 2017, 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 17°C at the commencement of the test.

6 Departure from standard

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

7 Termination of test

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

8 Test results

8.1 Critical observations

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

Time	Observation
1 minute -	Smoke is being emitted at the base of Specimens 2 and 5.
3 minutes -	Smoke has begun fluing from the end of the pipes of Specimens 2 and 7.
5 minutes -	The level of smoke fluing from of the pipe of Specimen 2 has reduced. The level of smoke being emitted from the base of Specimens 2 and 5 has reduced.
6 minutes -	The black PEX-a pipe of Specimen 7 has started to deform slightly at mid height.
9 minutes -	The light smoke being emitted from the base of Specimen 2 and has almost ceased and the smoke from the base of Specimen 5 has reduced. (Photograph 4).
10 minutes -	Smoke has ceased fluing from the end of the pipe of Specimen 7.
13 minutes -	Light smoke is venting from the grate of Specimen 1 floor waste.
27 minutes -	The level of smoke being emitted from the base of Specimens 2 and 5 has increased. (Photograph 5).
40 minutes -	Light smoke has resumed fluing from the end of the pipe of Specimen 2.
41 minutes -	Water has begun to pool at top of the slab around Specimens 1 and 7.
41 minutes -	The level of smoke being emitted from the base of Specimens 2 and 5 continues to increase.
83 minutes -	Smoke continues to flue from the base of Specimen 5.
161 minutes -	Steam is venting at the base of Specimen 7.
184 minutes -	The level of smoke fluing from the end of the pipe of Specimen 2 has started to increase.
187 minutes -	Integrity Failure Specimen 2 – Sustained flaming for a duration of greater than 10 seconds observed at the base the pipe of Specimen 2 (Photograph 13). The base of Specimen 2 was plugged with ceramic fibre.
239 minutes -	Insulation failure of Specimen 5 - maximum temperature rise of 180K is exceeded on the 6-mm^2 cable 25-mm above the conduit.
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.

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

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

8.5 Performance

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

Specimen 1 - A SNAP LP50R Retrofit fire collar protecting a nominal 50-mm Valsir Triplus polypropylene floor waste incorporating a P-trap penetrating a 52-mm diameter core hole

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

Specimen 2 – A SNAP 110R Retrofit fire collar protecting a nominal 110-mm Valsir Triplus polypropylene pipe penetrating a 117-mm diameter opening

Structural adequacy	-	not applicable
Integrity	-	187 minutes
Insulation	-	188 minutes

Specimen 5 – A SNAP MS70R Multi Services Retrofit fire collar and nominal 50-mm diameter polyvinyl chloride (PVC-U) conduit protecting three 6-mm^2 3C+E and three 16-mm^2 3C+E power cables penetrating 67-mm core hole

Structural adequacy	-	not applicable
Integrity	-	no failure at 241 minutes
Insulation	-	239 minutes

Specimen 6 – A SNAP 50R Retrofit fire collar protecting a nominal 40-mm Valsir Triplus polypropylene stack pipe penetrating a 52-mm core hole

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

Specimen 7 – A SNAP H50S-RR High-Top Stack cast-in fire collar protecting a nominal 25-mm Rehau Rautitan PEX-a stack pipe

Structural adequacy	-	not applicable
Integrity	-	no failure at 241 minutes
Insulation	-	no failure at 241 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 6	-	-/240/180*
Specimen 2	-	-/180/180	Specimen 7	-	-/240/180*
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.

* All test 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 – SNAP LP50R Retrofit fire collar protecting a nominal 50 Valsir Triplus polypropylene floor waste incorporating a p-trap penetrating a 52-mm diameter core hole	On top of the slab – 25-mm from screed (West)	S1
	On top of the slab – 25-mm from screed (South/East)	S2
	On screed – 25-mm from grate (West)	S3
	On screed – 25-mm from grate (South/East)	S4
	On centre of the Grate	S5
Specimen 2 – A SNAP 110R Retrofit fire collar protecting a nominal 110-mm Valsir Triplus polypropylene stack pipe penetrating a 117-mm core hole	On slab 25-mm from pipe (North/ West)	S6
	On slab 25-mm from pipe (South/ West)	S7
	On pipe 25-mm above slab (West)	S8
	On pipe 25-mm above slab (South/East)	S9
Specimen 5 – A SNAP MS70R Multi Services Retrofit fire collar and nominal 50-mm diameter polyvinyl chloride (PVC-U) conduit protecting three 6-mm^2 3C+E and three 16-mm^2 3C+E power cables penetrating 67-mm core hole	On slab 25-mm from conduit (North)	S22
	On slab 25-mm from conduit (South)	S23
	On conduit 25-mm from slab – (North)	S24
	On conduit 25-mm from slab – (N/W)	S25
	On 6-mm2 cable 25-mm above conduit (North)	S26
	On 6-mm2 cable 25-mm above conduit (West)	S27
	On 16-mm2 cable 25-mm above conduit (West)	S28
	On 16-mm2 cable 25-mm above slab (South)	S29
Specimen 6 – A SNAP 50R Retrofit fire collar protecting a nominal 40-mm Valsir Triplus polypropylene stack pipe penetrating a 52-mm core hole	On slab 25-mm from pipe (West)	S30
	On slab 25-mm from pipe (East)	S31
	On pipe 25-mm above slab (North/East)	S32
	On pipe 25-mm above slab (South/West)	S33

Specimen	T/C Position	T/C designation
Specimen 7 – A SNAP H50S-RR High-Top Stack cast-in fire collar protecting a nominal 25-mm Rehau Rautitan PEX-a stack pipe	On slab 25-mm from grout (North/East)	S34
	On slab 25-mm from grout (South)	S35
	On grout – (West)	S36
	On grout – (South/East)	S37
	On pipe 25-mm above grout (North)	S38
	On pipe 25-mm above grout (South)	S39
Rover	Rover	S40
Ambient	Ambient	S41

Appendix B – Photographs

PHOTOGRAPH 1 – EXPOSED FACE OF SPECIMENS PRIOR TO TESTING

PHOTOGRAPH 2 – UNEXPOSED FACE OF SPECIMENS PRIOR TO TESTING

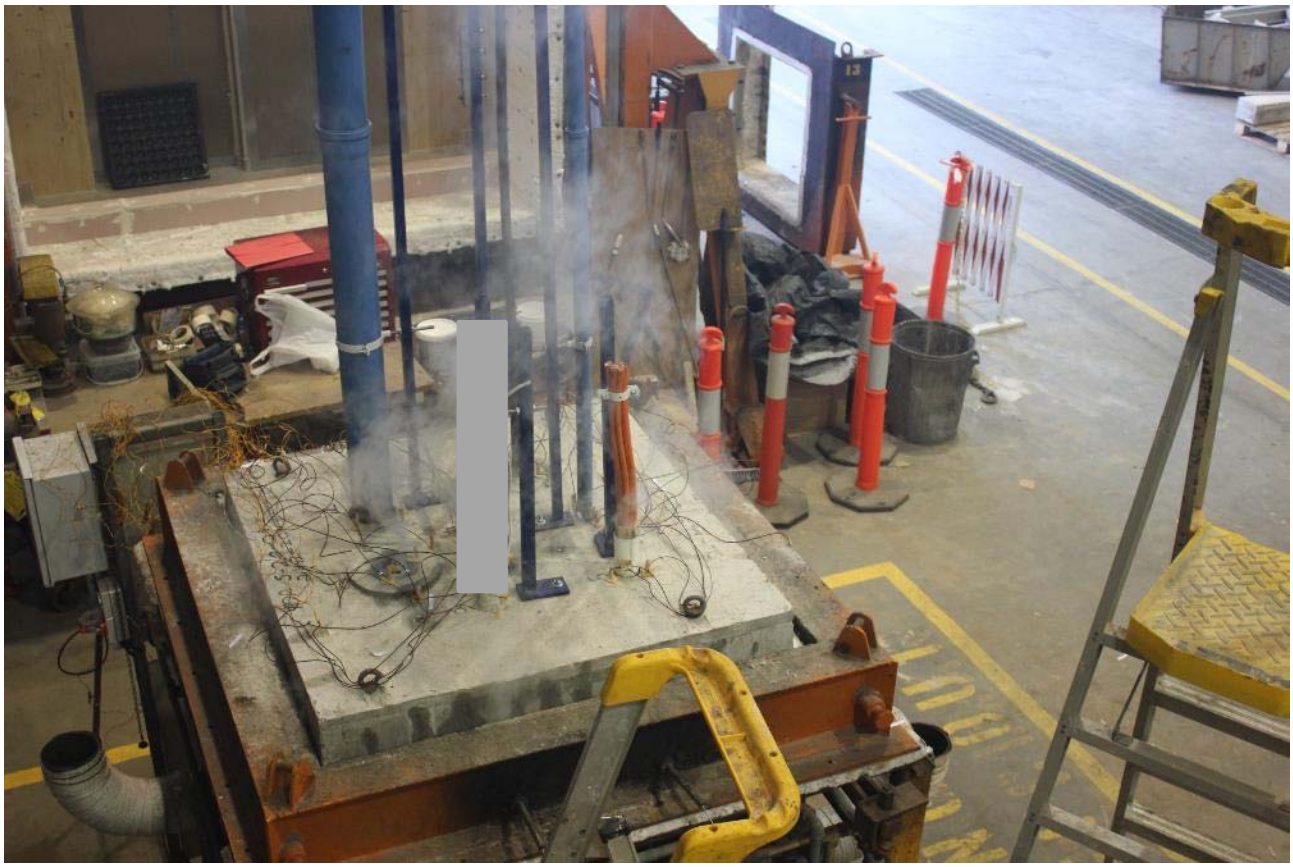
PHOTOGRAPH 3 –SPECIMENS AT 2 MINUTES INTO THE TEST

PHOTOGRAPH 4 – SPECIMENS AT 9 MINUTES INTO THE TEST

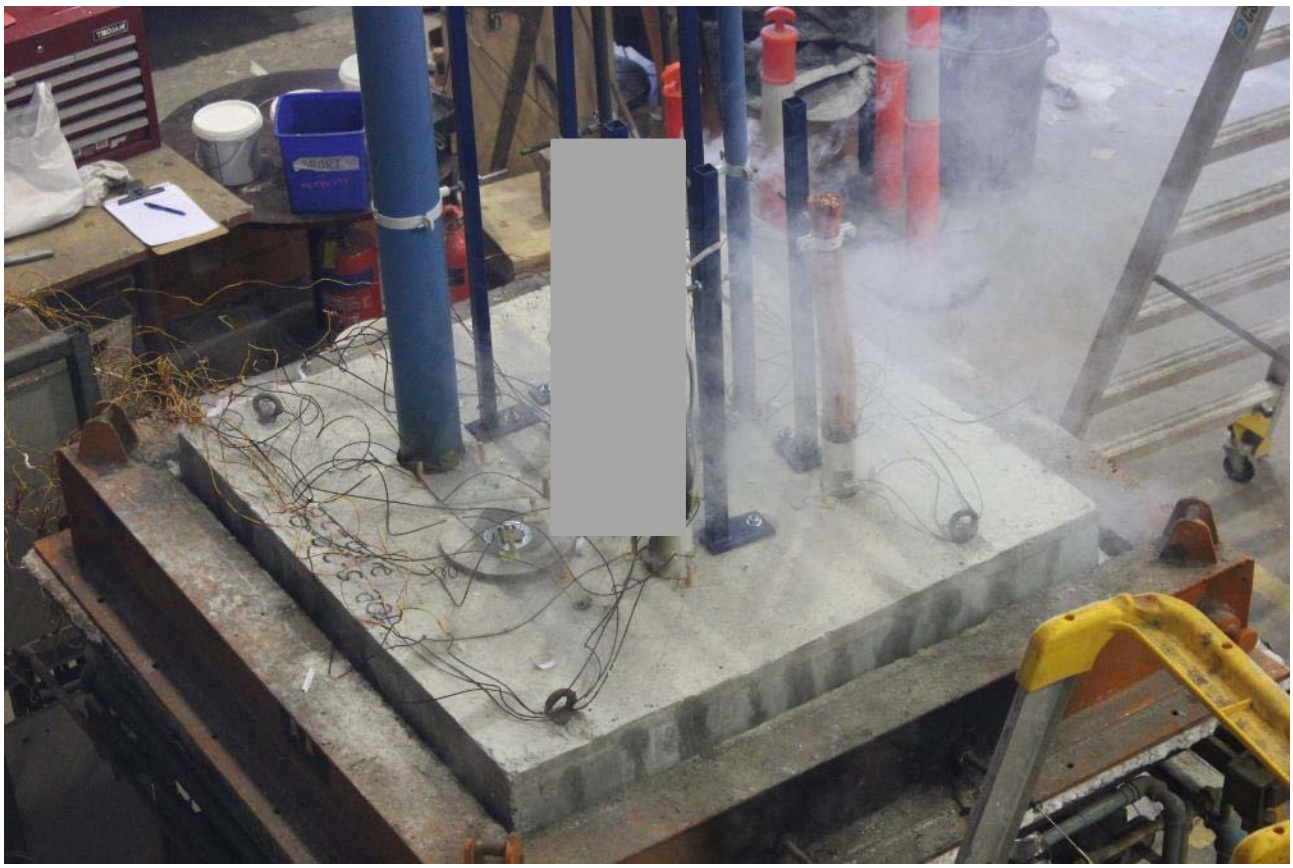
PHOTOGRAPH 5 – SPECIMENS AT 27 MINUTES INTO THE TEST

PHOTOGRAPH 6 – SPECIMENS AT 30 MINUTES INTO THE TEST

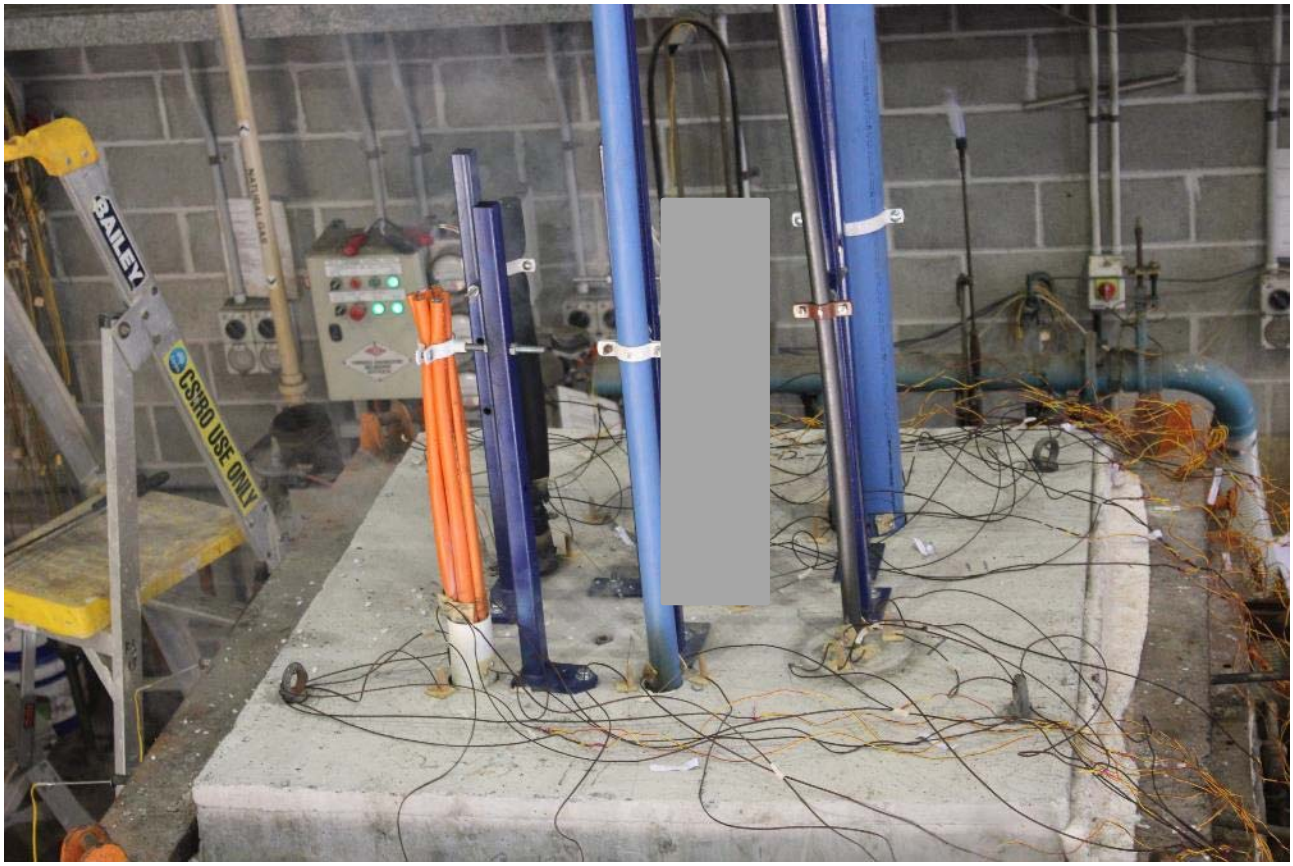
PHOTOGRAPH 7 – SPECIMENS AT 41 MINUTES INTO THE TEST



PHOTOGRAPH 8 – SPECIMENS AT 60 MINUTES INTO THE TEST

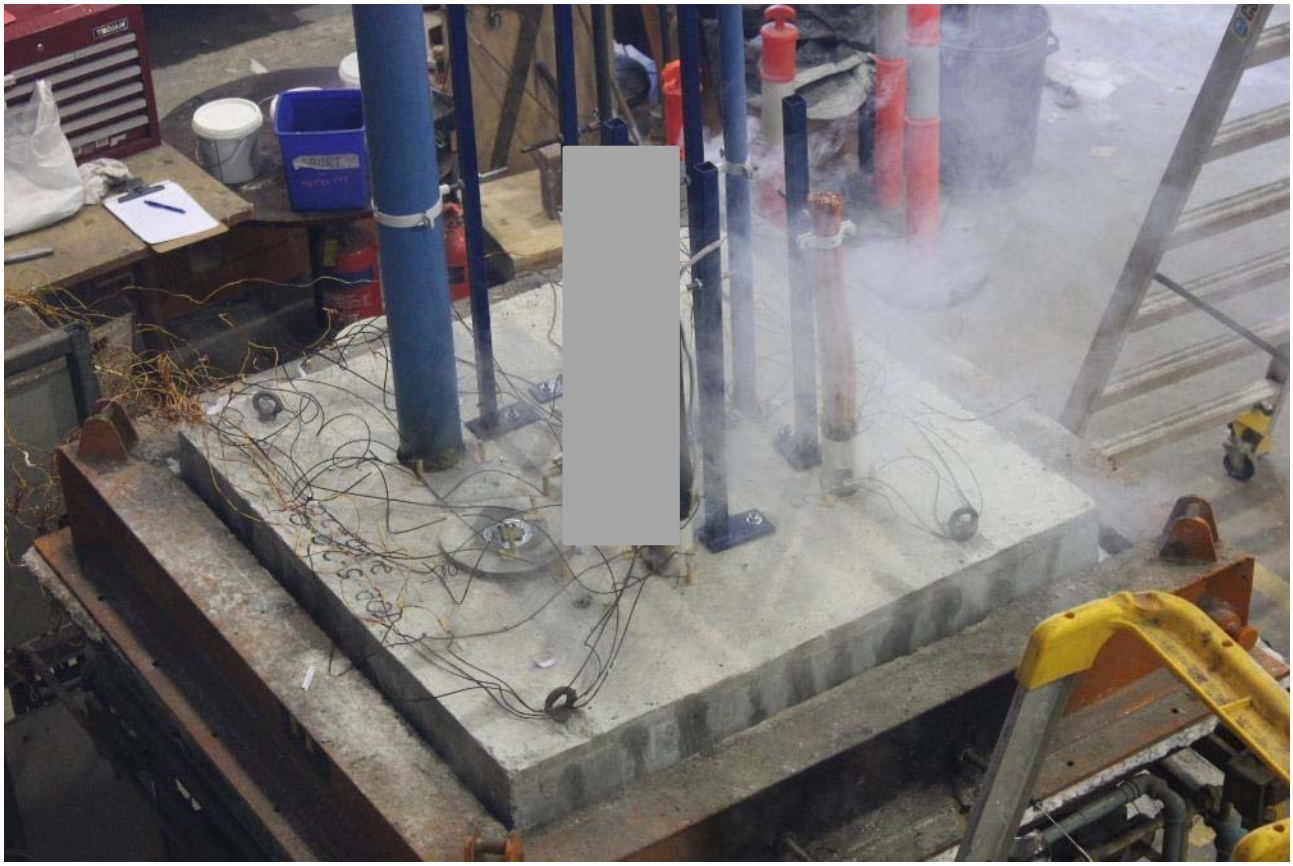


PHOTOGRAPH 9 – SPECIMENS AT 90 MINUTES INTO THE TEST

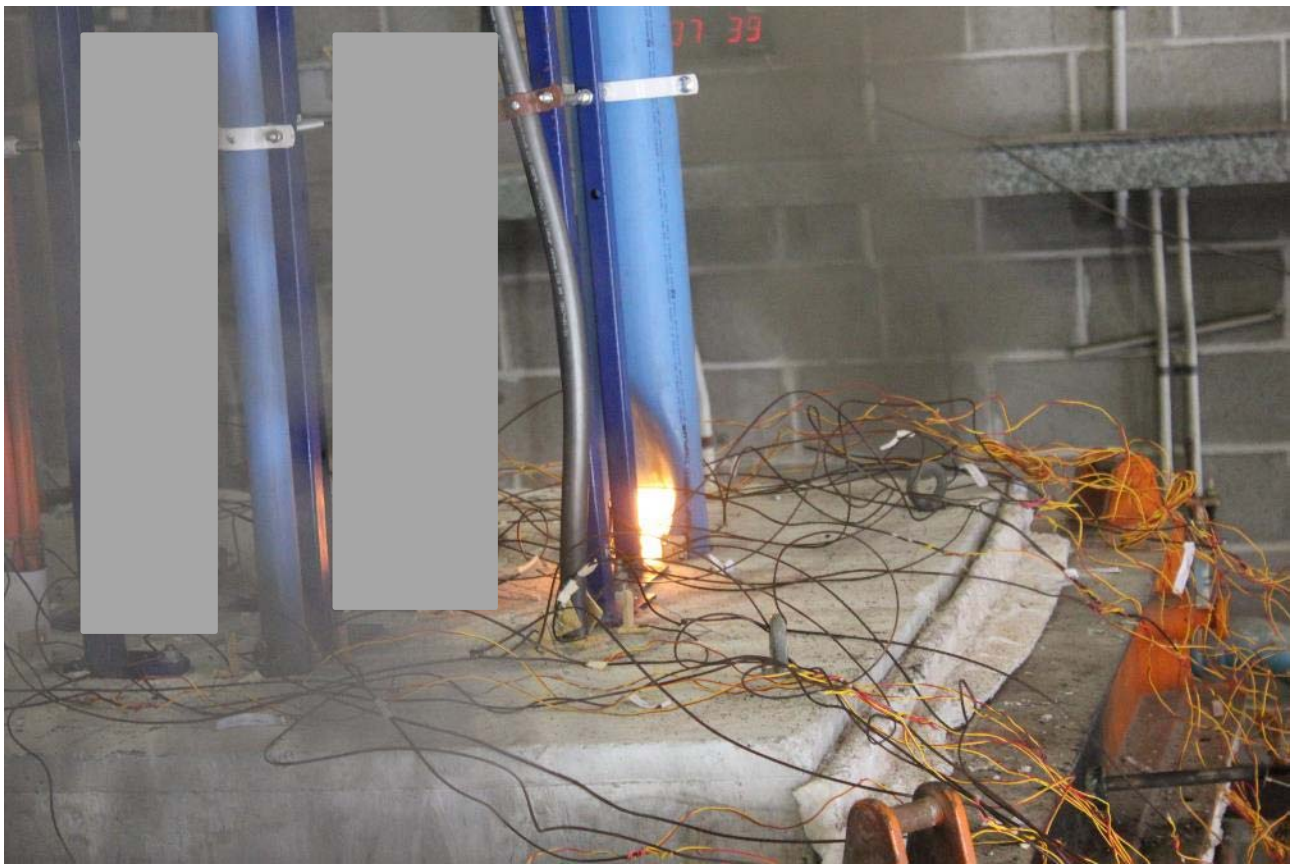


PHOTOGRAPH 10 – SPECIMENS AT 120 MINUTES INTO THE TEST

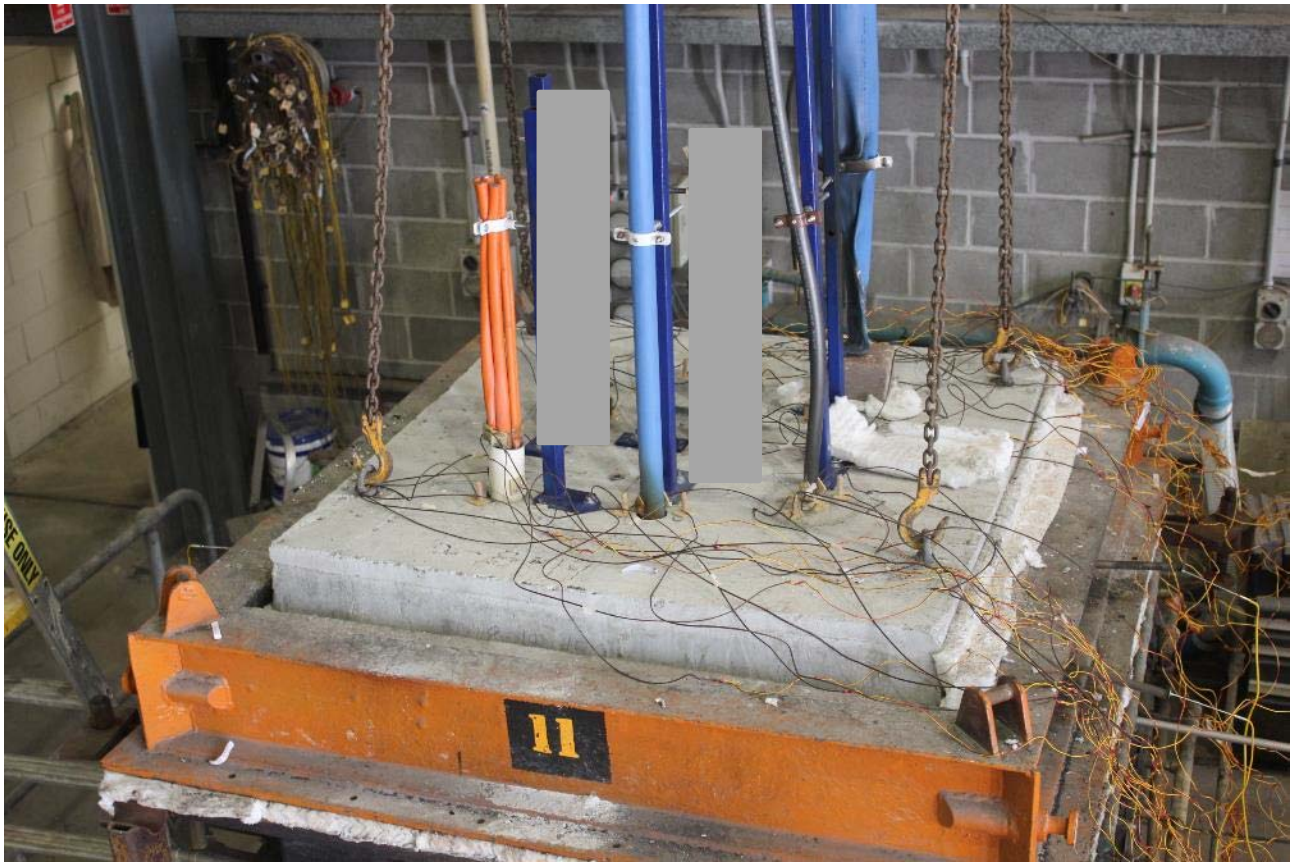
PHOTOGRAPH 11 – SPECIMENS AT 150 MINUTES INTO THE TEST



PHOTOGRAPH 12 – SPECIMENS AT 180 MINUTES INTO THE TEST

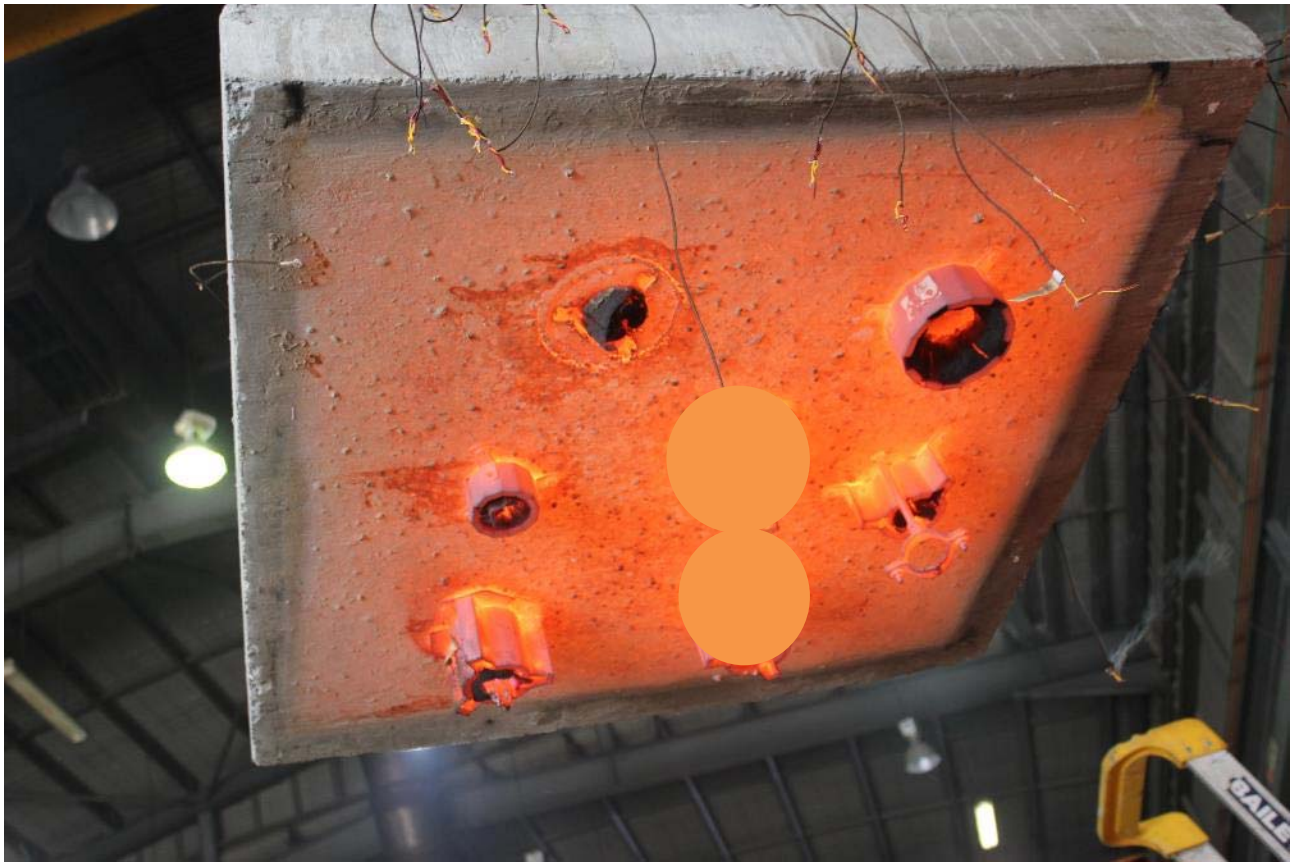


PHOTOGRAPH 13 – SPECIMENS AT 187 MINUTES INTO THE TEST



PHOTOGRAPH 14 – SPECIMENS AT 180 MINUTES INTO THE TEST

PHOTOGRAPH 15 – SPECIMENS AT THE CONCLUSION OF TESTING



PHOTOGRAPH 16 – EXPOSED FACE OF SPECIMENS AT THE CONCLUSION OF TESTING

Appendix C – Test Data charts

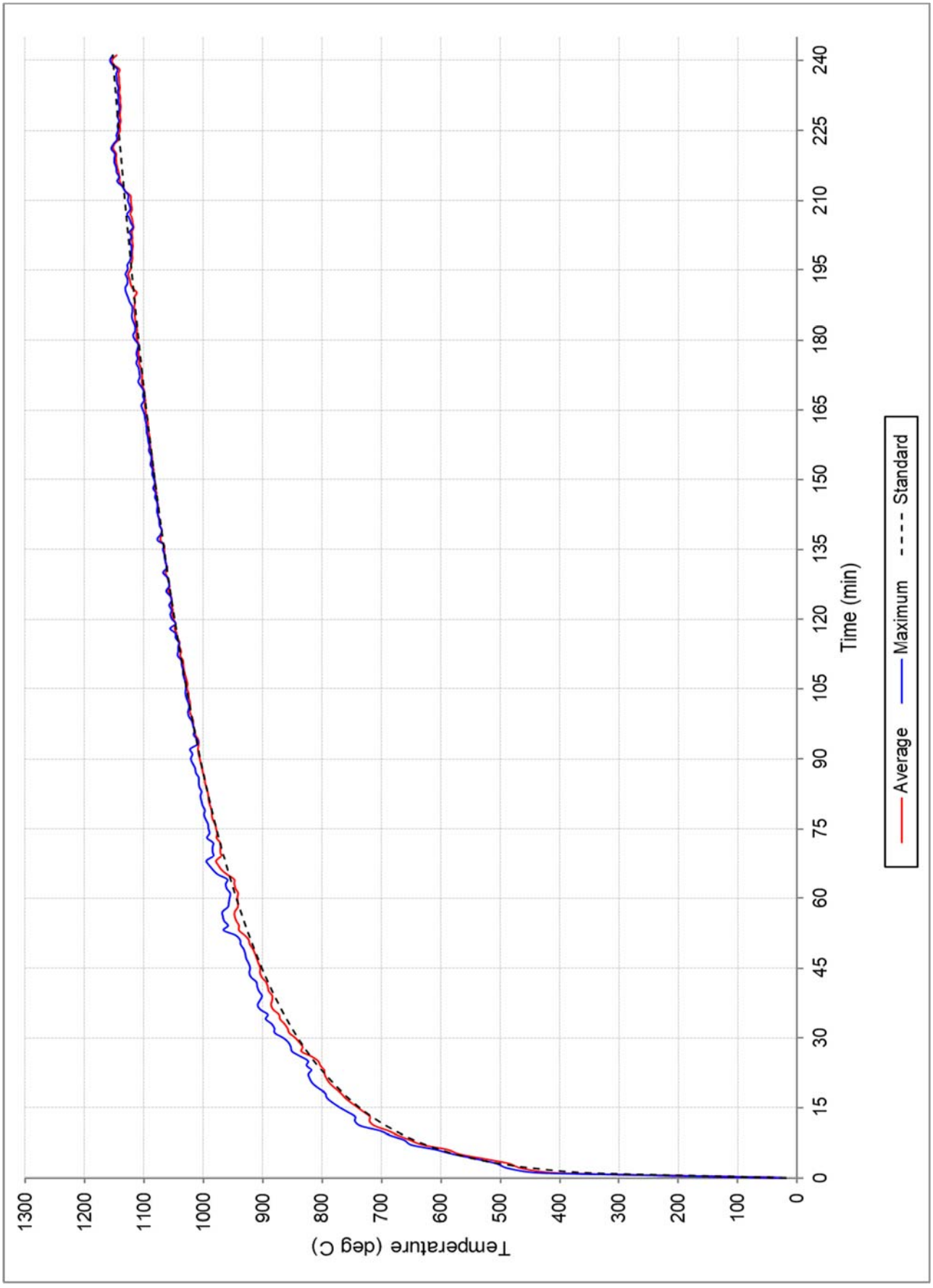


FIGURE 1 – FURNACE TEMPERATURE

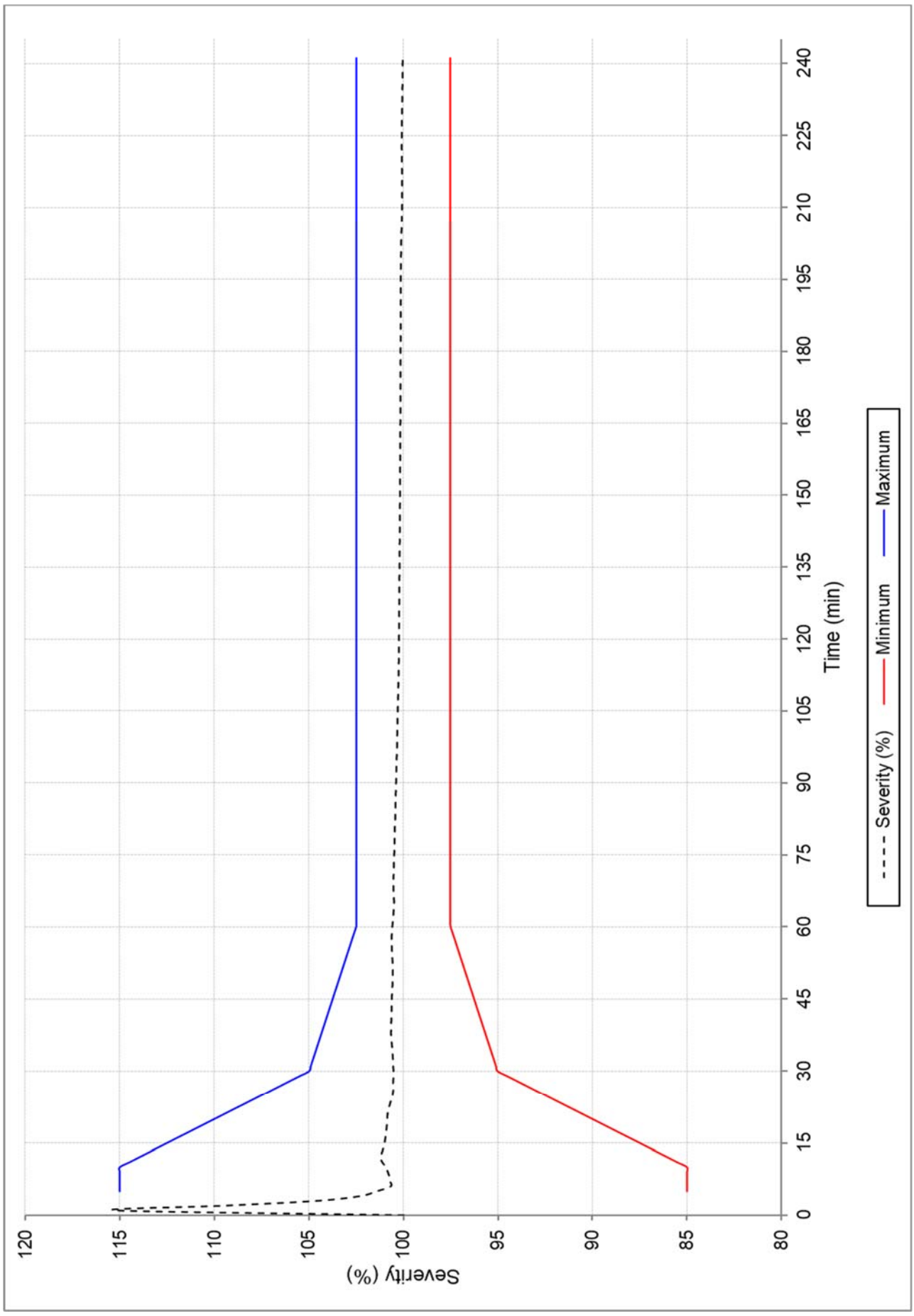


FIGURE 2 – FURNACE SEVERITY

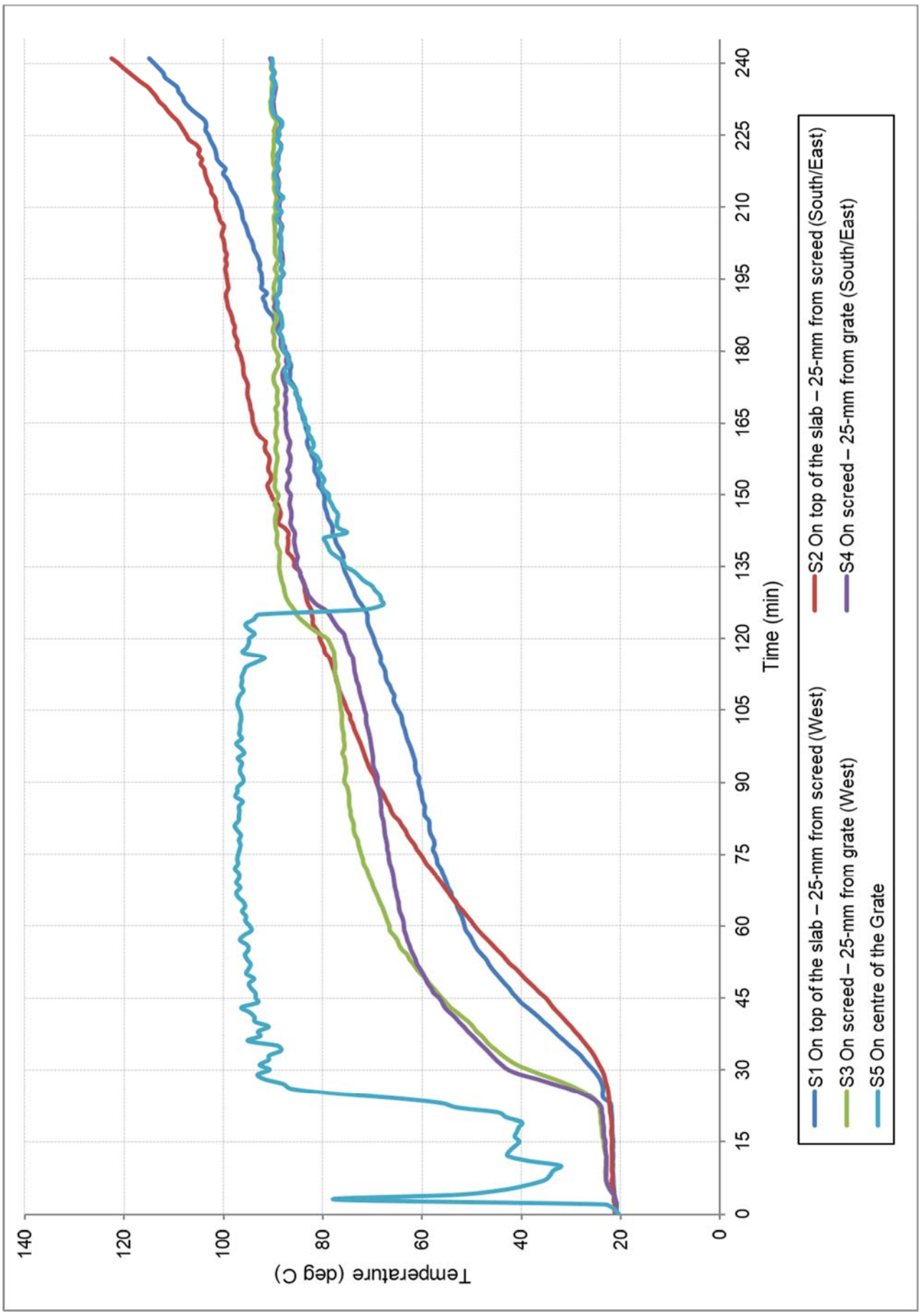


FIGURE 3 – SPECIMEN TEMPERATURE – ASSOCIATED WITH SPECIMEN 1

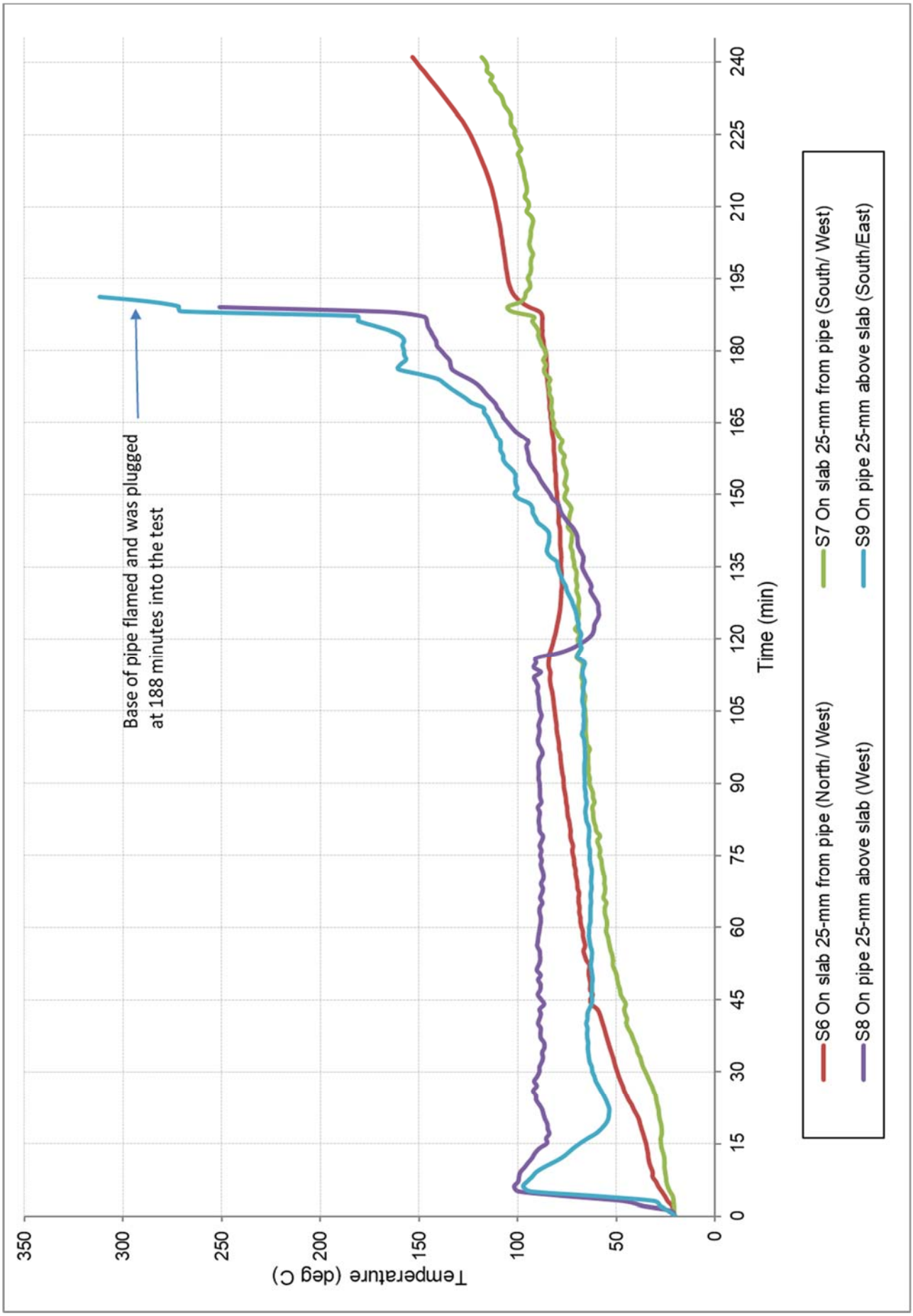


FIGURE 4 – SPECIMEN TEMPERATURE – ASSOCIATED WITH SPECIMEN 2

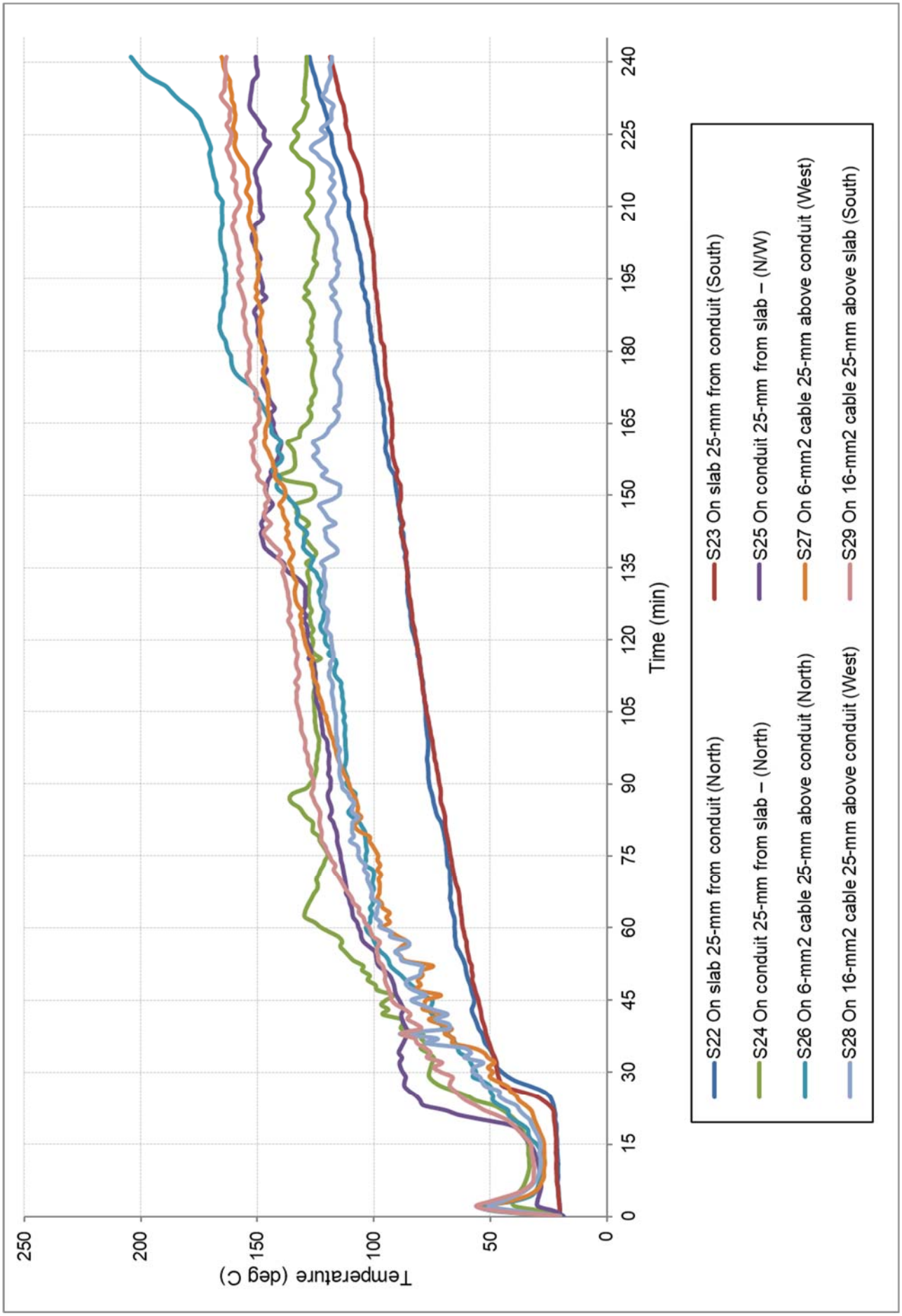


FIGURE 5 – SPECIMEN TEMPERATURE – ASSOCIATED WITH SPECIMEN 5

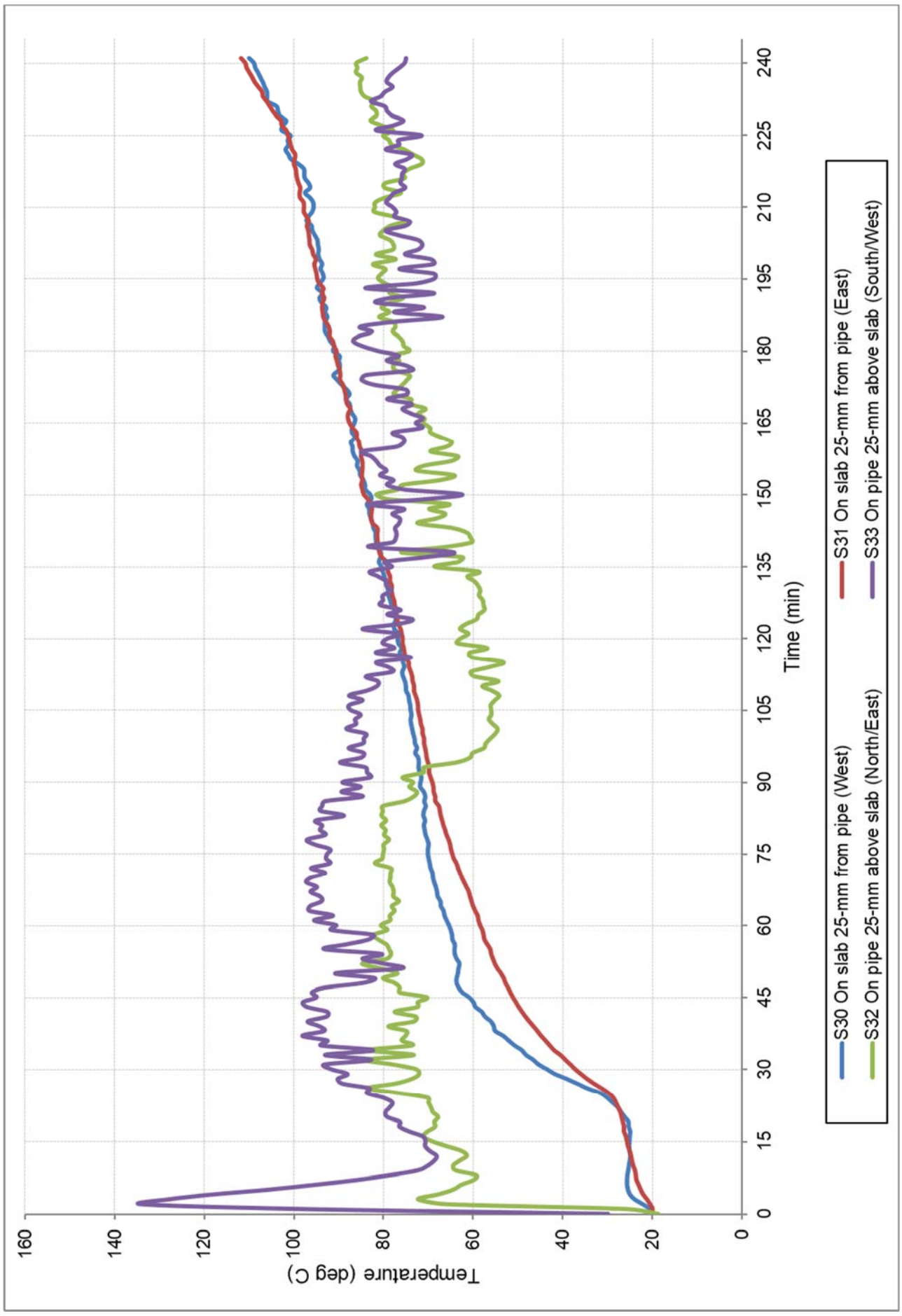


FIGURE 6 – SPECIMEN TEMPERATURE – ASSOCIATED WITH SPECIMEN 6

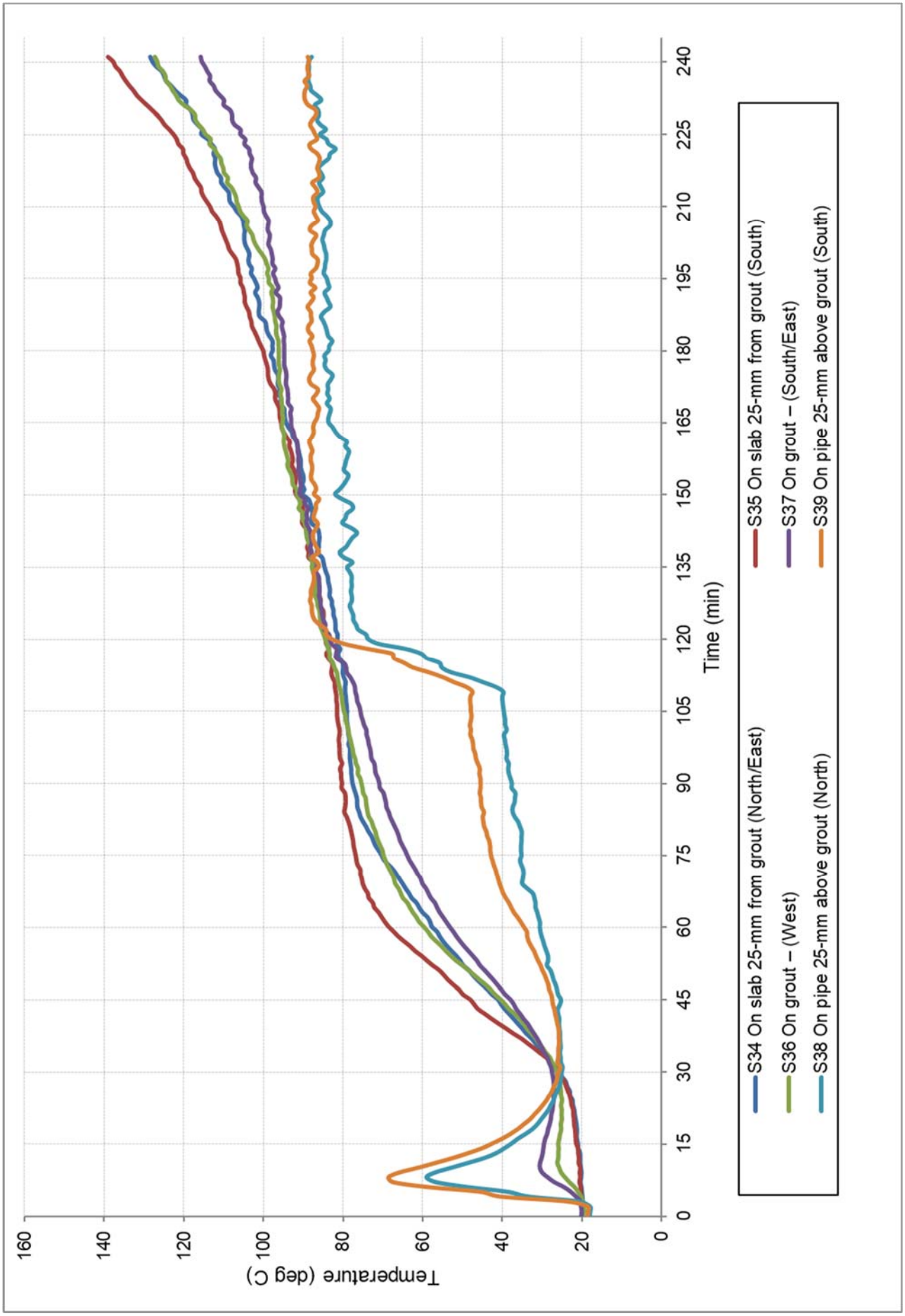


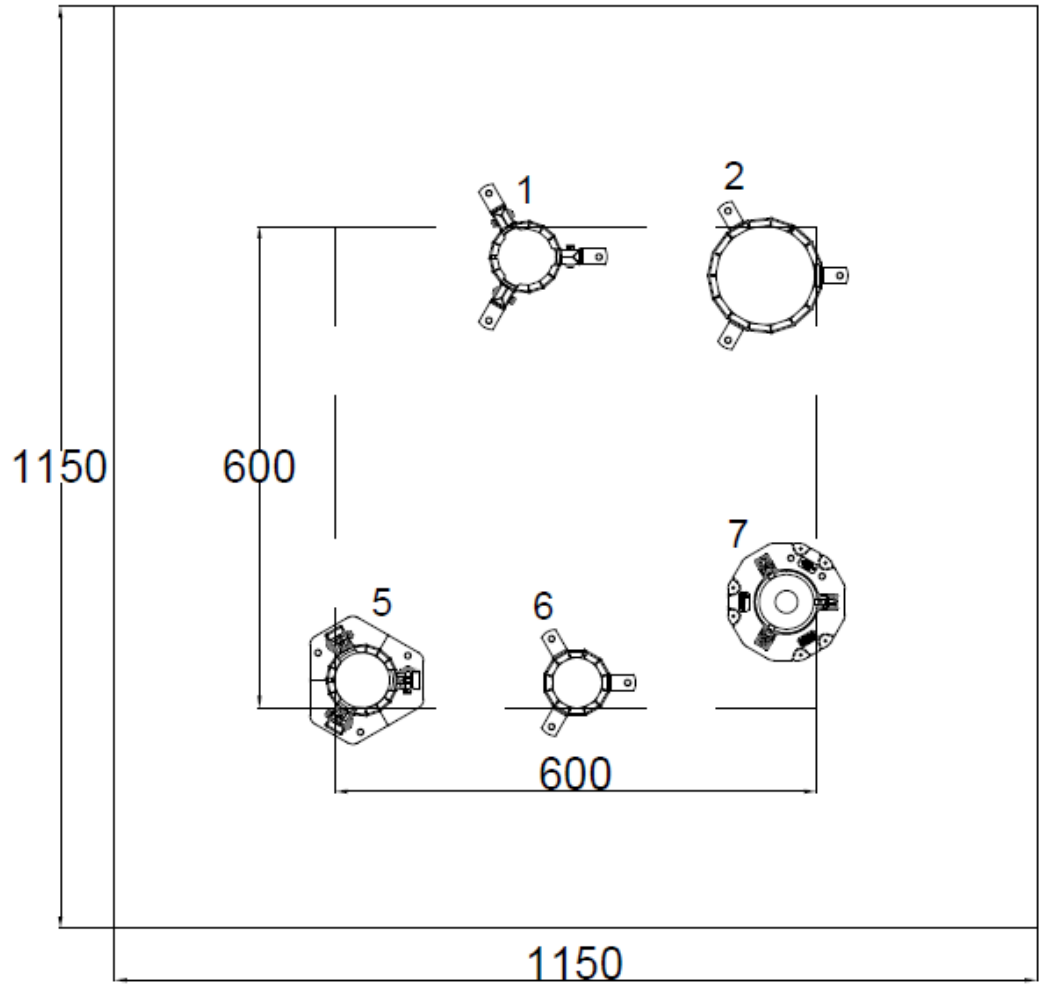
FIGURE 7 – SPECIMEN TEMPERATURE – ASSOCIATED WITH SPECIMEN 7

Appendix D – Installation drawings

Snap Fire Systems Pty Ltd

Test Slab S-20-O Layout

Date: 21 DEC 2020



Penetration	Collar Code	Pipe Type	Pipe Diameter
1	LP50R	Triplus	50
2	110R	Triplus	110
5	MS70R	Orange Power Cables + Short Conduit	3x(6mm² 3C+E), 3x(16mm² 3C+E) & 60mm
6	50R	Triplus	40
7	H50S-RR	PEX-a	25

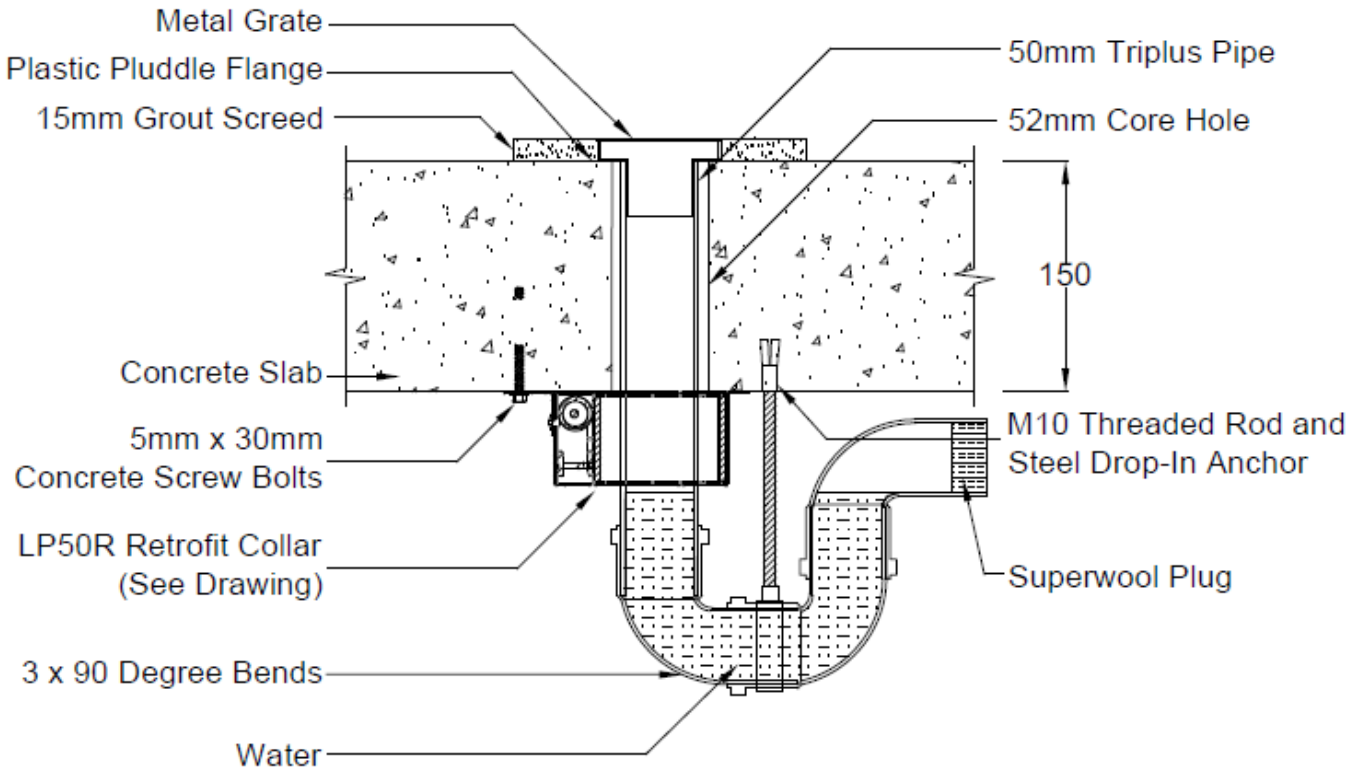
DRAWING TITLED 'TEST SLAB S-20-O LAYOUT', DATED 21 DECEMBER 2020, BY SNAP FIRE SYSTEMS PTY LTD

Snap Fire Systems Pty Ltd

Specimen #1

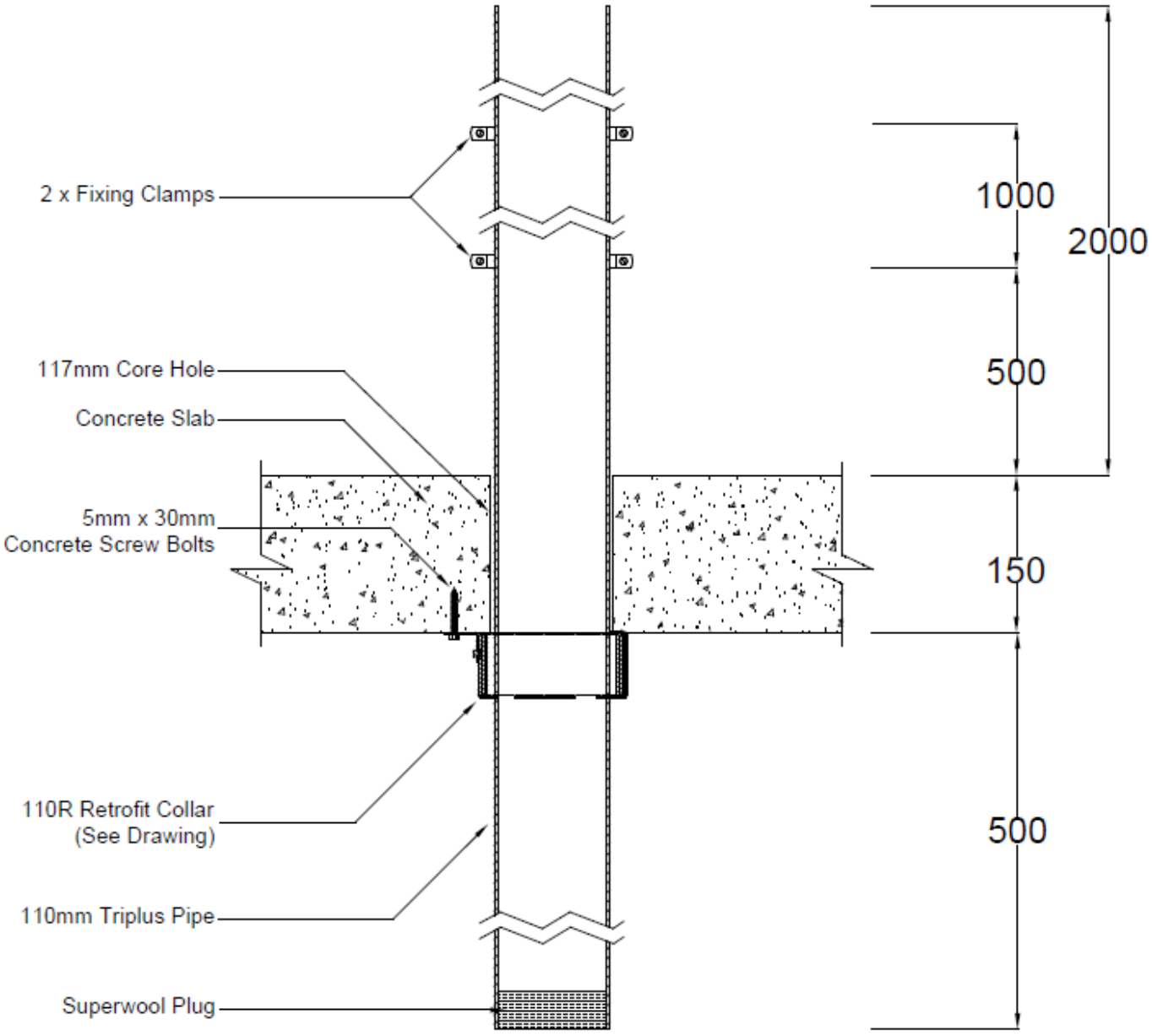
50 Triplus Floorwaste & LP50R

Date: 21 DEC 2020



DRAWING TITLED 'SPECIMEN #1 50 TRIPLUS FLOORWASTE & LP50R', DATED 21 DECEMBER 2020, BY SNAP FIRE SYSTEMS PTY LTD

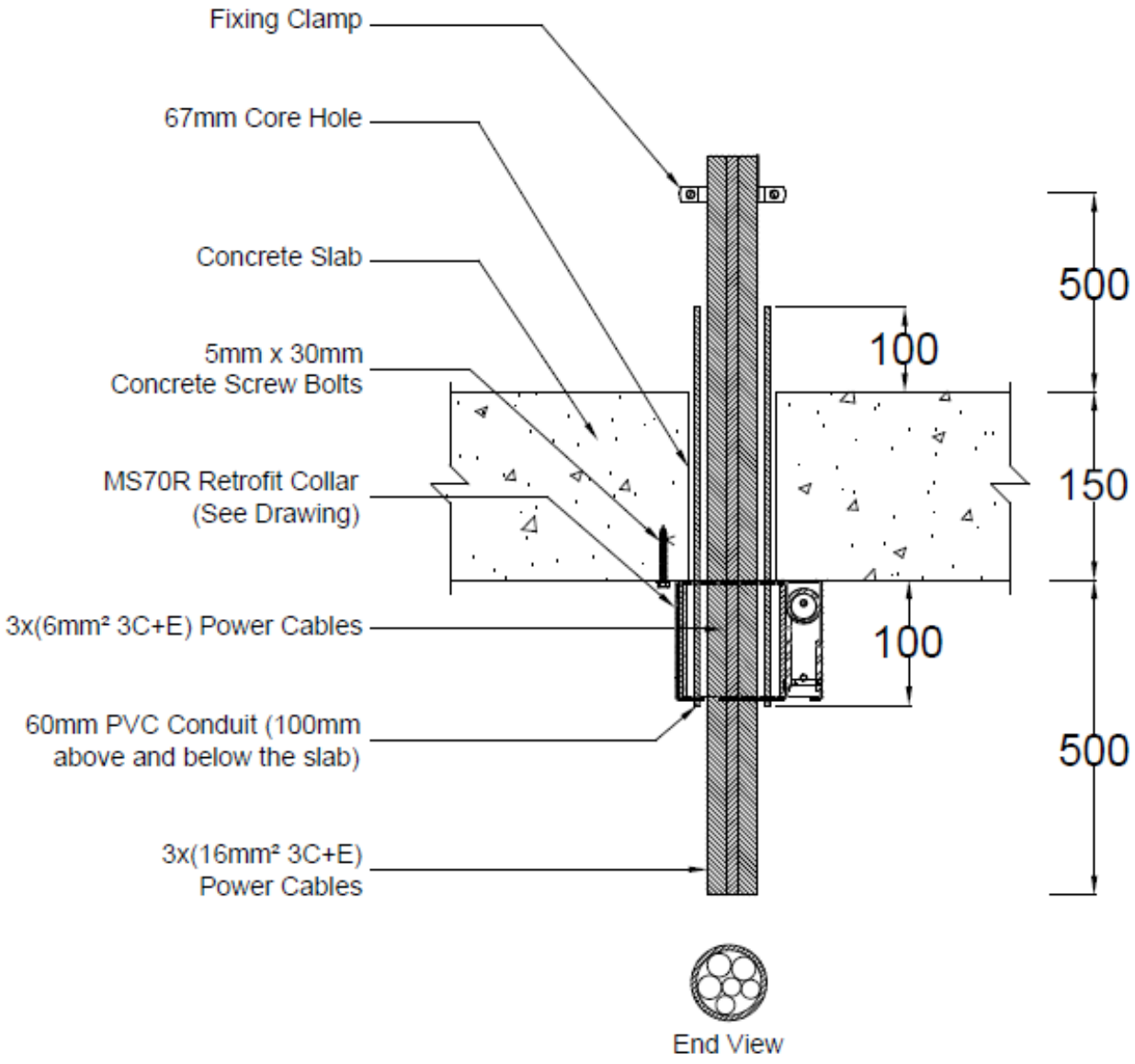
Snap Fire Systems Pty Ltd
Specimen #2
110 Triplus Stack & 110R
Date: 21 DEC 2020



DRAWING TITLED 'SPECIMEN #2 110 TRIPLUS STACK & 100R', DATED 21 DECEMBER 2020, BY SNAP FIRE SYSTEMS PTY LTD

Snap Fire Systems Pty Ltd

Specimen #5
50 PVC Conduit with 16mm² 3C+E & 6mm² 3C+E Power Cables & MS70R
Date: 21 DEC 2020



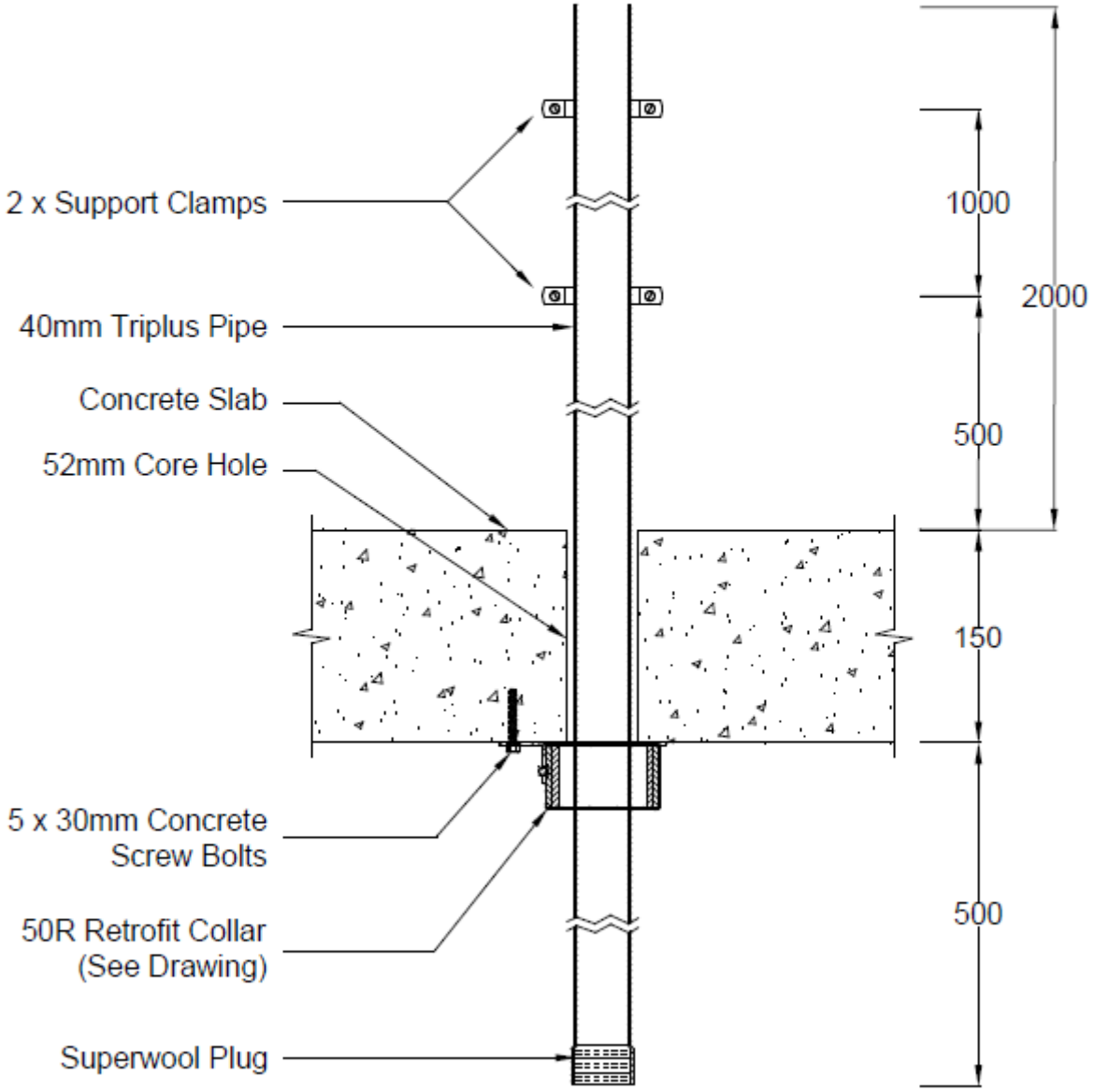
DRAWING TITLED 'SPECIMEN #5 50 PVC CONDUIT WITH 16MM² 3C+E & 6MM² 3C+E POWER CABLES & MS70R', DATED 21 DECEMBER 2020, BY SNAP FIRE SYSTEMS PTY LTD

Snap Fire Systems Pty Ltd

Specimen #6

40 Triplus Stack & 50R

Date: 21 DEC 2020



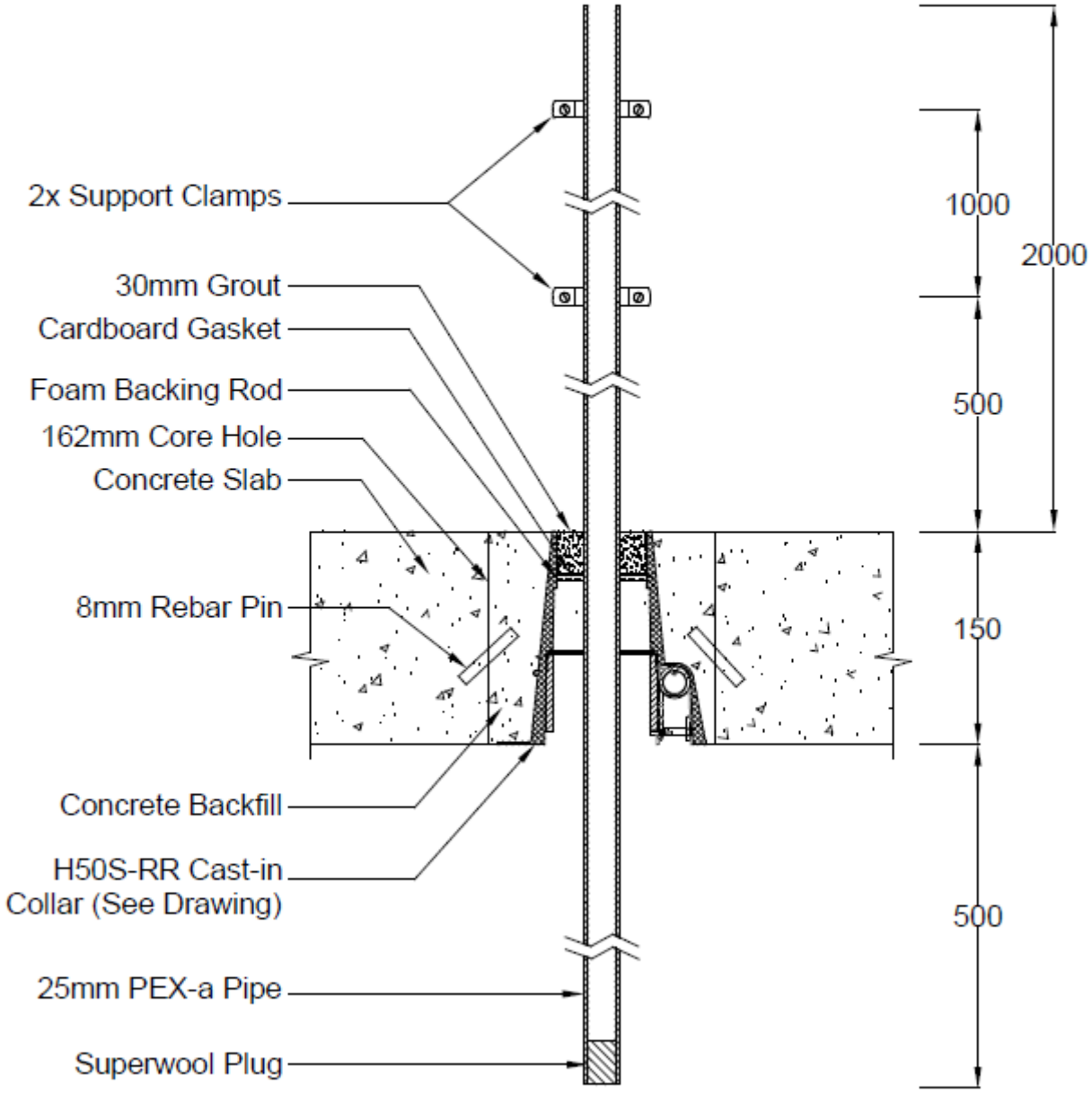
DRAWING TITLED 'SPECIMEN #6 50 TRIPLUS STACK AND 50R', DATED 21 DECEMBER 2020, BY SNAP FIRE SYSTEMS PTY LTD

Snap Fire Systems Pty Ltd

Specimen #7

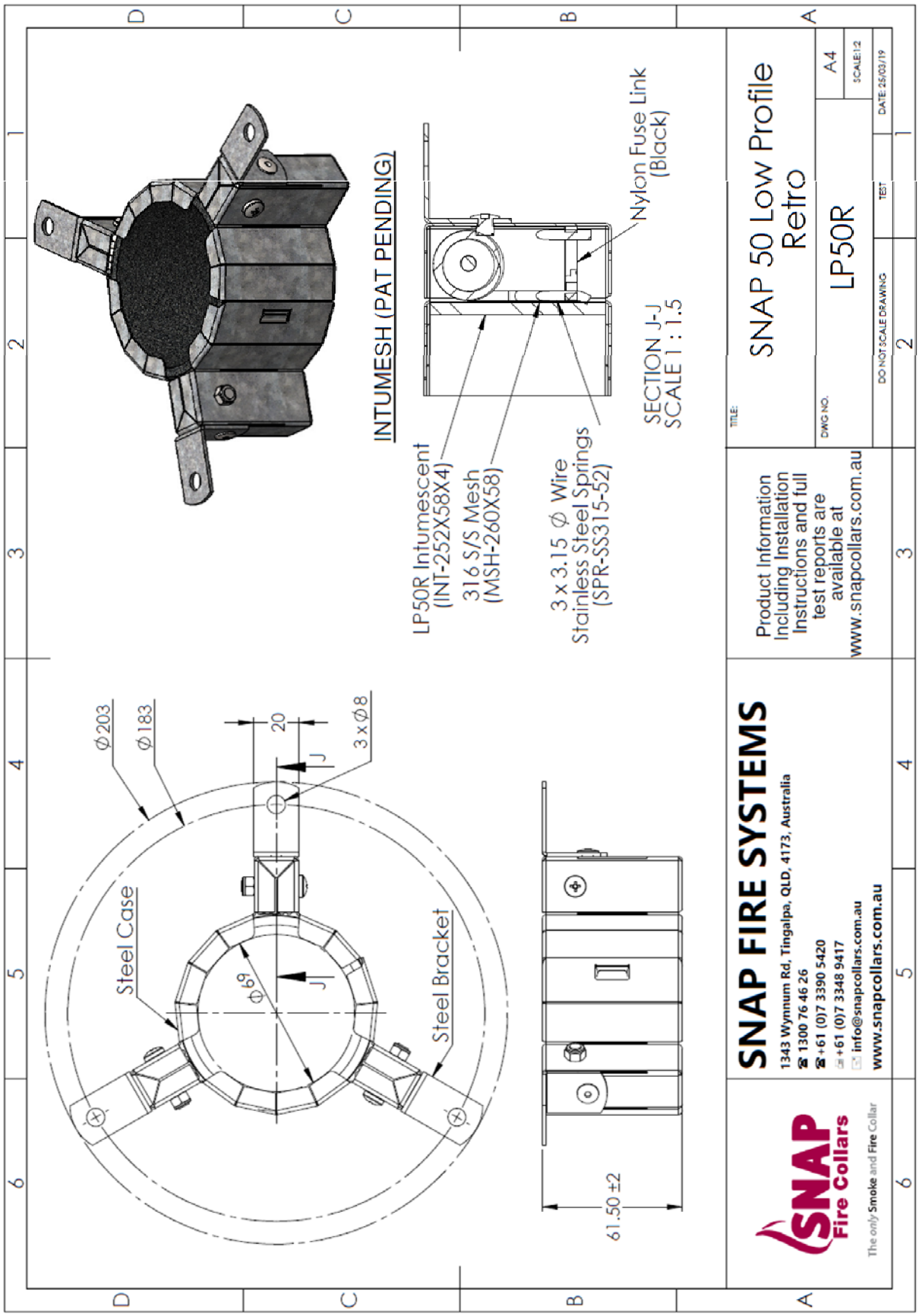
25 PEX-a Stack & H50S-RR

Date: 21 DEC 2020

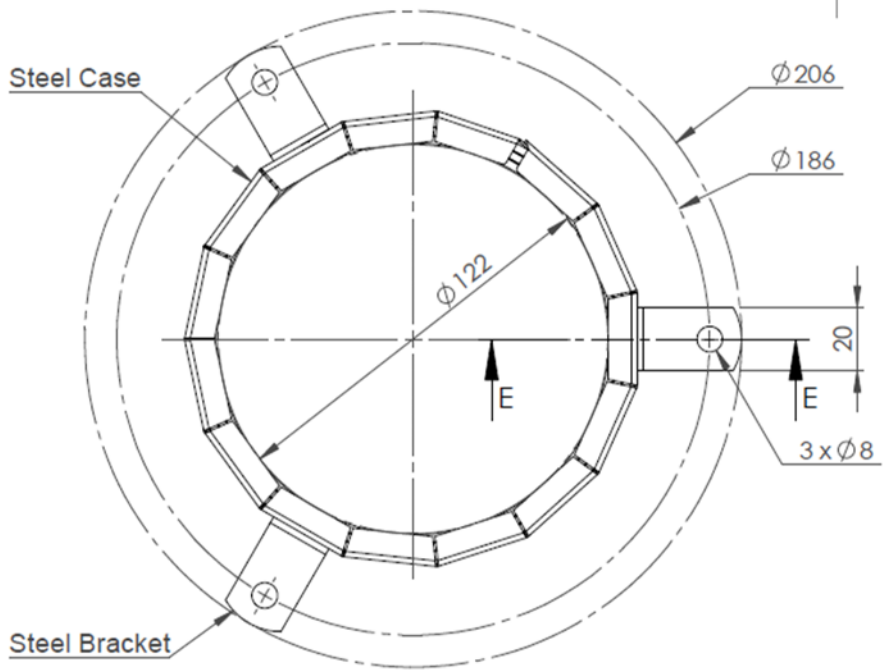


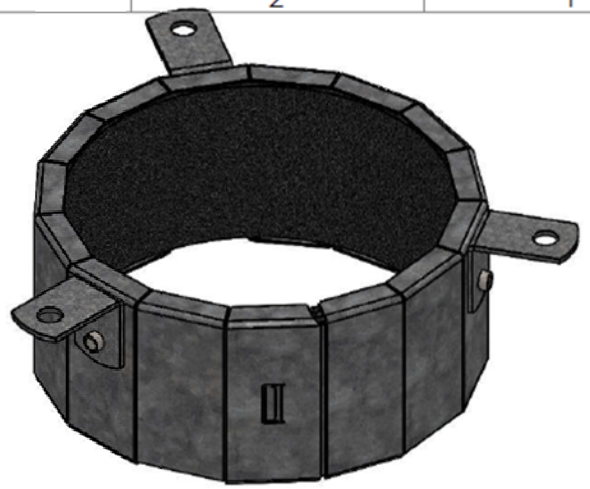
DRAWING TITLED 'SPECIMEN #7 25 PEX-A & H50S-RR', DATED 21 DECEMBER 2020, BY SNAP FIRE SYSTEMS PTY LTD

Appendix E – Specimen Drawings

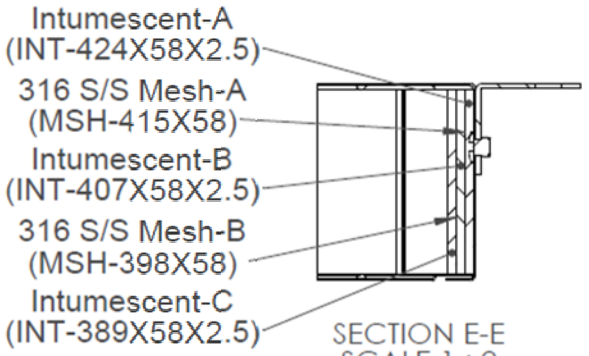


DRAWING TITLED 'SNAP 50 LOW PROFILE RETRO', DATED 25 MARCH 2019, BY SNAP FIRE SYSTEMS PTY LTD





INTUMESH (PAT PENDING)



SECTION E-E
SCALE 1 : 2

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☎ +61 (0)7 3390 5420
+61 (0)7 3348 9417
info@snapcollars.com.au
www.snapcollars.com.au

SNAP Fire Collars
The *only* Smoke and Fire Collar

Product Information Including Installation Instructions and full test reports are available at www.snapcollars.com.au

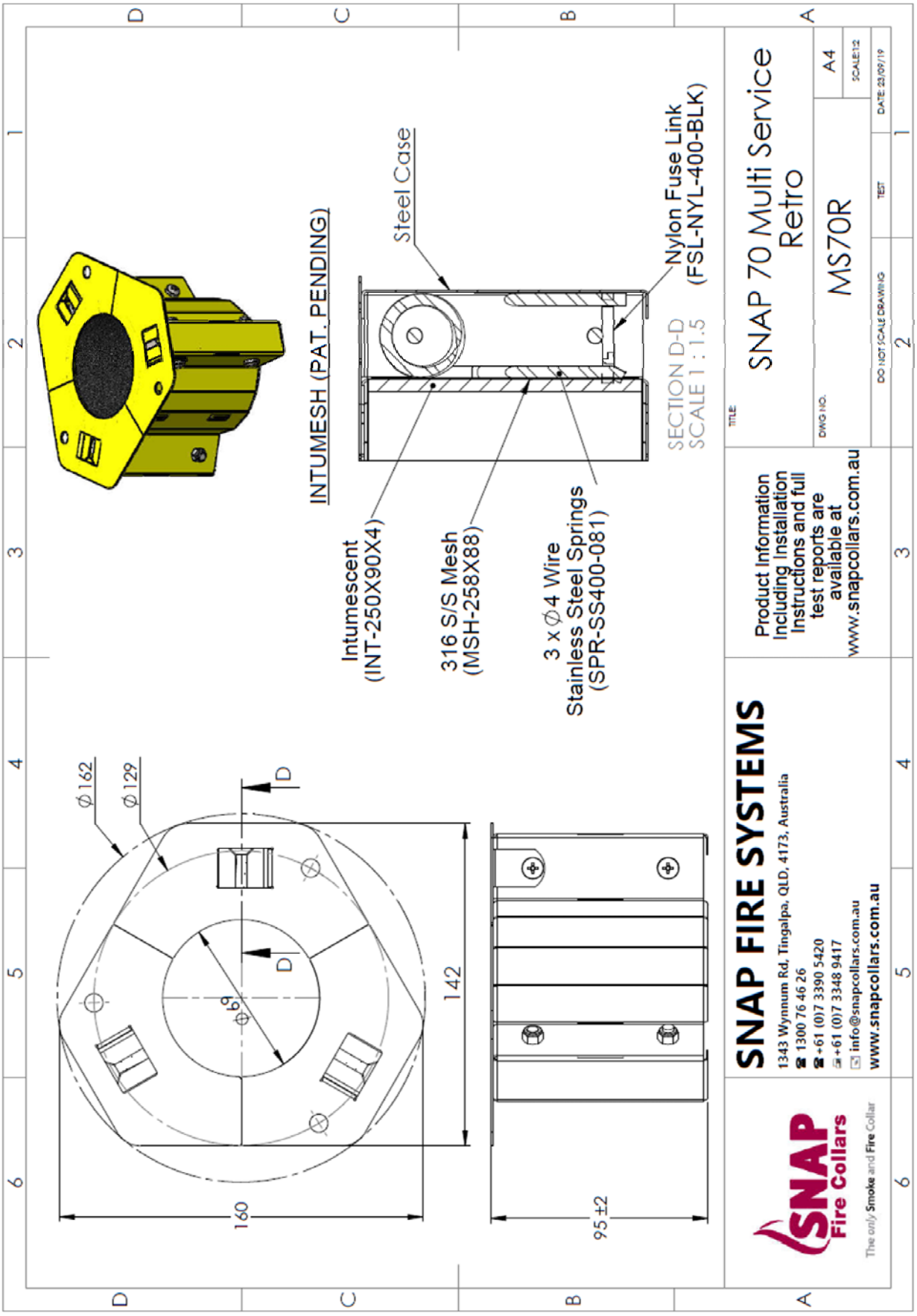
TITLE: SNAP 110 Retro

DWG NO. 110R

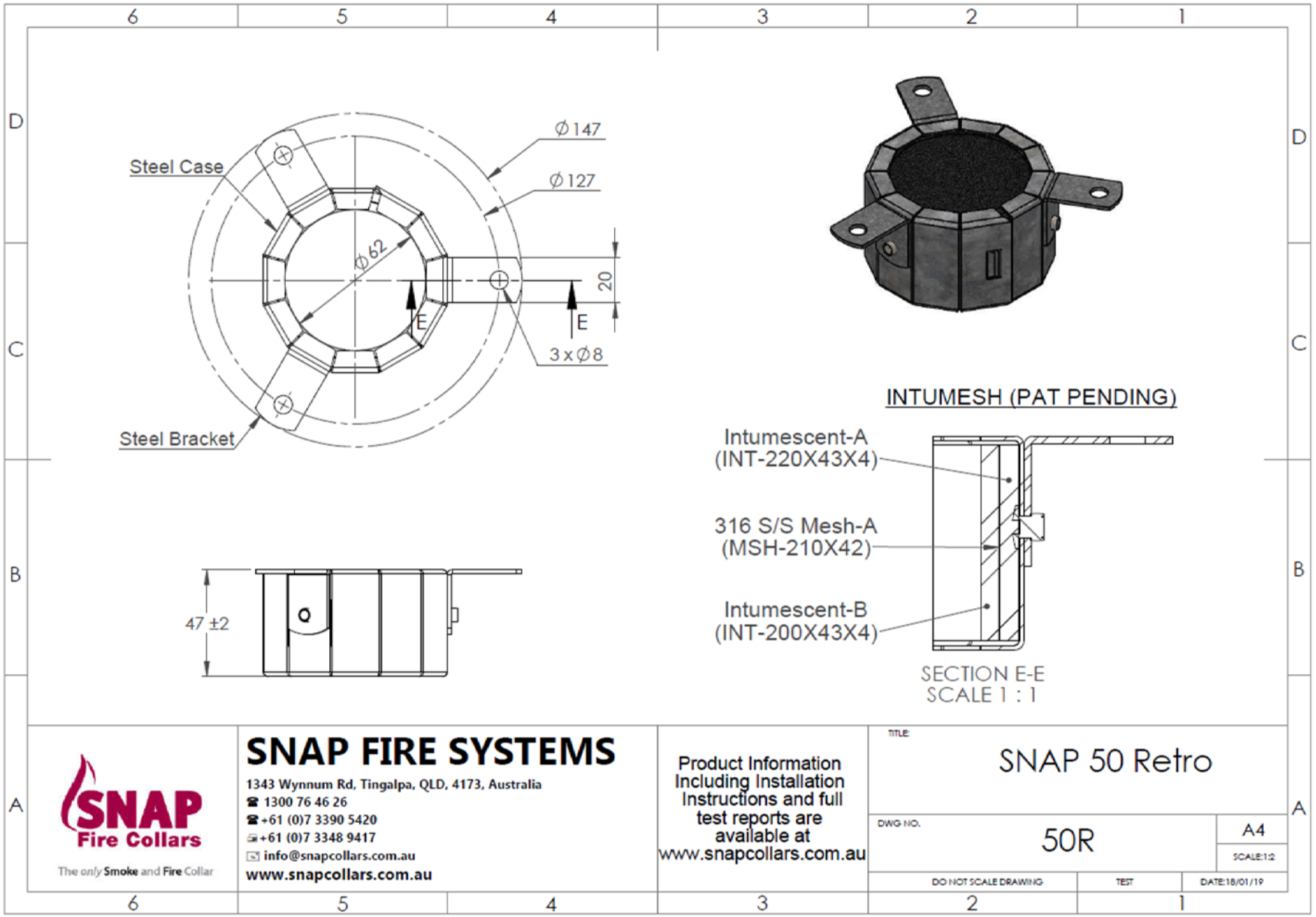
A4

SCALE:1:2

DO NOT SCALE DRAWING | TEST | DATE: 16/01/19



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



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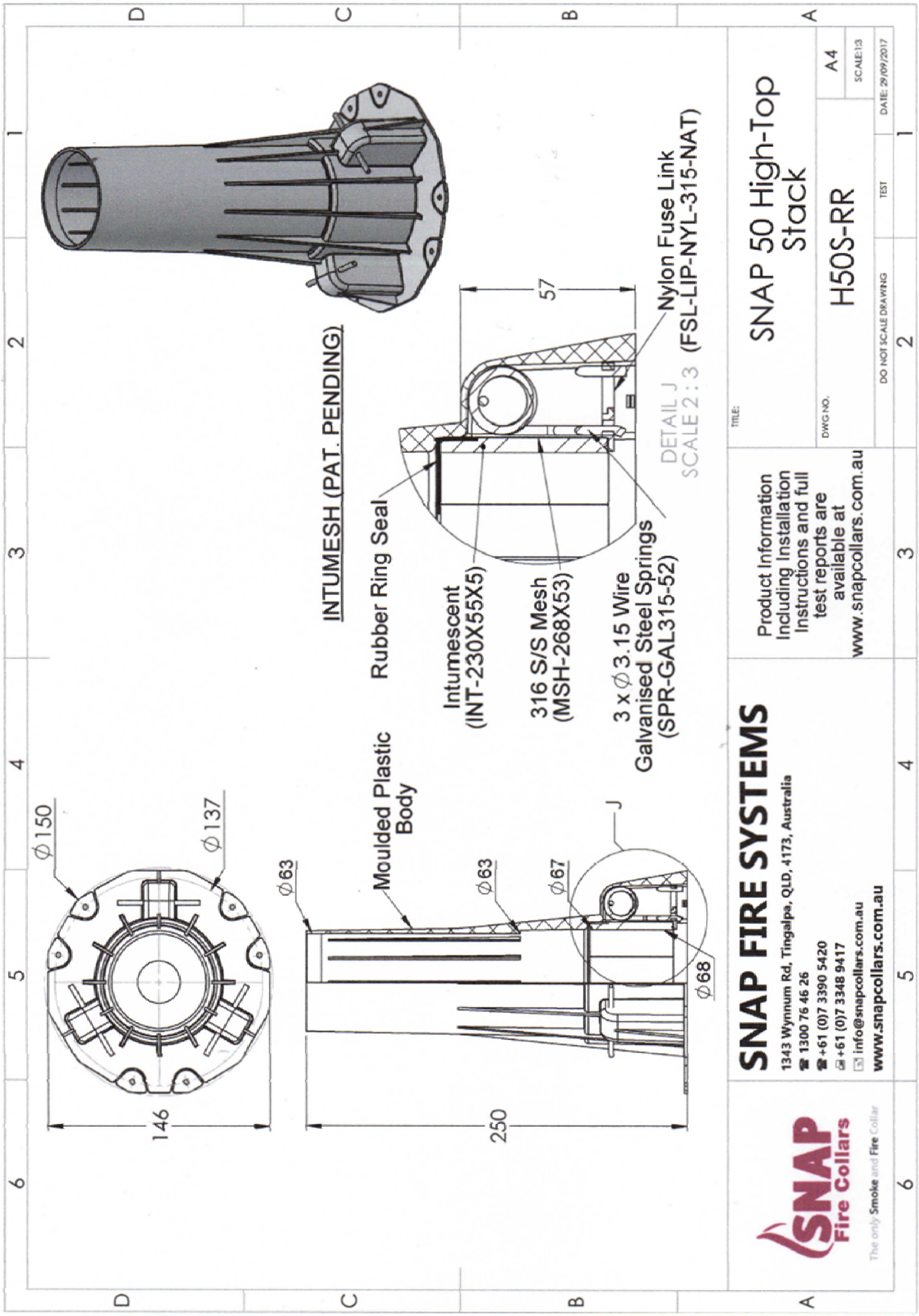
www.snapcollars.com.au

Product Information Including Installation Instructions and full test reports are available at www.snapcollars.com.au

TITLE: SNAP 50 Retro

DWG NO. 50R | A4 | SCALE:1:2

DO NOT SCALE DRAWING | TEST | DATE:18/01/19



DRAWING TITLED 'SNAP 50 HIGH-TOP STACK', DATED 29 JANUARY 2017, BY SNAP FIRE SYSTEMS PTY LTD

Appendix F – Certificate(s) of Test

INFRASTRUCTURE TECHNOLOGIES
www.csiro.au

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

Certificate of Test

No. 3556

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 2174.

Product Name: SNAP LP50R Low Profile Retrofit fire collar protecting a nominal 50-mm Valsir Triplus polypropylene floor waste incorporating a P-trap penetrating a 52-mm diameter core hole (Specimen 1)

Description: The specimen comprised an 1150-mm x 1150-mm x 150-mm thick concrete slab. The slab was penetrated by a nominal 50-mm Valsir Triplus polypropylene floor waste incorporating a P-trap penetrating a 52-mm diameter core hole, protected by SNAP LP50R Low Profile Retrofit fire collar. 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'. The SNAP LP50R Low Profile Retrofit fire collar comprised a 0.75-mm steel casing with a 69 mm inner diameter and a 203-mm diameter base flange. The 61.5-mm high collar casing incorporated a closing mechanism which comprised a 252-mm x 58-mm x 4-mm thick Intumesh intumescent wrap lined within the internal circumference of the collar casing. The closing mechanism comprised three stainless steel springs, with black nylon fuse links and a 260-mm x 58 mm stainless steel mesh, as shown in drawing titled 'SNAP 50 Low Profile Retro', dated 25 March 2019, by Snap Fire Systems Pty Ltd. The collar was centrally located over a 52-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 49.9-mm outside diameter Valsir Triplus (polypropylene) pipe with a wall thickness of 2.13-mm fitted through the collar's sleeve incorporating a P-trap attached below the collar. The floor waste system was fitted with a metal grate and a plastic puddle flange. A 15-mm thick grout screed was laid on top of the concrete slab and finished flush with the floor grate. On the exposed side a M10 threaded rod and nut clip was connected to the P-trap and fixed to the concrete slab with a steel drop-in anchor. The exposed end of the P-trap was plugged with ceramic fibre. The floor waste gully was charged with water to the level shown in drawing titled 'Specimen #1 50 Triplus Floorwaste & LP50R', dated 21 December 2020, by Snap Fire Systems Pty Ltd.

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

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

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

The fire-resistance level (FRL) of the specimen is applicable when the system is exposed to fire from the same direction as tested. The test specimen was 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: 11 January 2021

Issued on the 30th day of March 2021 without alterations or additions.

Brett Roddy | Manager, Fire Testing and Assessments

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

COPY OF CERTIFICATE OF TEST – NO. 3556

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

Certificate of Test

No. 3557

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 2174.

Product Name: SNAP 110R Retrofit fire collar protecting a nominal 110-mm Valsir Triplus polypropylene stack pipe penetrating a 117-mm core hole (Specimen 2)

Description: The specimen comprised an 1150-mm x 1150-mm x 150-mm thick concrete slab. The slab was penetrated by a nominal 110-mm Valsir Triplus polypropylene stack pipe penetrating a 117-mm core hole, protected by SNAP 110R Retrofit fire collar. 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'. The SNAP 110R Retrofit fire collar comprised a 0.75-mm steel casing with a 122 mm inner dia. and a 206-mm dia. base flange. The 62-mm high collar casing incorporated a closing mechanism comprised of 3 x soft Intumesh intumescent wraps and wire meshes lined within internal circumference of collar. Intumescent A was 2.5-mm thick x 58-mm wide x 424-mm long, Intumescent B was 2.5-mm thick x 58-mm wide x 407-mm long and Intumescent C was 2.5 mm thick x 58-mm wide x 389-mm long. Between intumescent strips A and B was a layer of 316 stainless steel mesh 415-mm long x 58-mm wide and between intumescent strips B and C was a layer of 316 stainless steel mesh 398-mm long x 58-mm wide. Both had wire mesh dia. of 0.15-mm, refer drawing 'SNAP 110 Retro', dated 16/01/19, by Snap Fire Systems P/L. The collar was centrally located over a 117-mm core hole on underside (exposed face) of concrete slab and fixed through 3 mounting brackets using 5-mm x 30-mm long concrete screw bolts. The penetrating service comprised a 111.25-mm outside dia. Triplus Valsir polypropylene pipe with wall thickness of 3.68-mm fitted through the core hole and collar's sleeve, refer drawing 'Specimen #2 110 Triplus Stack & 110R', dated 21/12/20, by Snap Fire Systems P/L. Pipe projected vertically, approximately 2000-mm above from the unexposed face of concrete floor and approx. 500-mm into the furnace chamber. The pipe was supported at nominally 500-mm and 1500-mm from the unexposed face of the slab. The pipe was open at unexposed end and plugged with ceramic fibre on exposed end.

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

Structural Adequacy	-	not applicable
Integrity	-	187 minutes
Insulation	-	188 minutes

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

The fire-resistance level (FRL) of the specimen is applicable when the system is exposed to fire from the same direction as tested. The test specimen was 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: 11 January 2021

Issued on the 30th day of March 2021 without alterations or additions.

B. Roddy

Brett Roddy | Manager, Fire Testing and Assessments

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PO Box 52, North Ryde NSW 1670, Australia
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Certificate of Test

No. 3558

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 2174.

Product Name: SNAP MS70R Multi Services Retrofit fire collar and nominal 60-mm diameter polyvinyl chloride (PVC-U) conduit protecting three 6-mm2 3C+E and three 16-mm2 3C+E power cables penetrating a 67-mm core hole (Specimen 5)

Description: The specimen comprised an 1150-mm x 1150-mm x 150-mm thick concrete slab. The slab was penetrated by a nom. 60-mm dia. polyvinyl chloride (PVC-U) conduit protecting three 6-mm2 3C+E and three 16-mm2 3C+E power cables penetrating a 67-mm core hole, protected by SNAP MS70R Multi Services Retrofit fire collar. 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'. 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 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 cluster of three 6-mm2 3-core + E power cables and three 16 mm2 3-core + E power cables running through the inside of the conduit. All the cables were manufactured by General Cables. The PVC conduit and six power cables were fitted through the core hole and the MS70R collar's sleeve. A 350-mm long piece of 60-mm outside diameter Telstra PVC U conduit with a wall thickness of 3-mm was fitted around the cables and inside the core hole that extended 100-mm from both sides of the slab and inside the MS70R collar's sleeve as shown in drawing titled 'Specimen #5 50 PVC Conduit with 16mm² 3C + E & 6mm² 3C + E Power Cables & MS70R', dated 21 December 2020, by Snap Fire Systems Pty Ltd. The cables projected vertically approximately 550-mm above the slab and 500-mm below into the furnace chamber. The cables were supported at 500 mm above the slab.

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

Structural Adequacy	-	not applicable
Integrity	-	no failure at 241 minutes
Insulation	-	239 minutes

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

The fire-resistance level (FRL) of the specimen is applicable when the system is exposed to fire from the same direction as tested. The test specimen was 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: 11 January 2021

Issued on the 30th day of March 2021 without alterations or additions.

Brett Roddy | Manager, Fire Testing and Assessments

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

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

Certificate of Test

No. 3559

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 2174.

Product Name: SNAP 50R Retrofit fire collar protecting a nominal 40-mm Valsir Triplus polypropylene stack pipe penetrating a 52-mm core hole (Specimen 6)

Description: The specimen comprised an 1150-mm x 1150-mm x 150-mm thick concrete slab. The slab was penetrated by a nominal 40-mm Valsir Triplus polypropylene stack pipe penetrating a 52-mm core hole, protected by SNAP 50R Retrofit fire collar. 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'. The SNAP 50R Retrofit fire collar comprised a 0.75-mm steel casing with a 62-mm inner diameter and a 147-mm diameter base flange. The 47-mm high collar casing incorporated a closing mechanism which comprised two soft Intumesh intumescent wraps lined within the internal circumference of the collar. Intumescent A was 4-mm thick x 43-mm wide x 220-mm long and Intumescent B was 4-mm thick x 43-mm wide x 200-mm long. Between the strips was a layer of 316 grade stainless steel mesh measuring 210-mm long x 42-mm wide with a wire mesh diameter of 0.15-mm, as shown in drawing titled 'SNAP 50 Retro', dated 18 January 2019, by Snap Fire Systems Pty Ltd. The 50R collar was centrally located over a 52-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 40-mm outside diameter Valsir Triplus polypropylene pipe with a wall thickness of 2.06-mm fitted through the core hole and the collar's sleeve as shown in drawing titled 'Specimen #6, 40 Triplus Stack & 50R', dated 21 December 2020, by Snap Fire Systems Pty Ltd. The pipe projected vertically 2000-mm above the concrete slab and 500-mm into the furnace chamber. The pipe was supported at nominally 500-mm and 1500-mm from the unexposed face of the slab. The pipe was open on the unexposed end and plugged with ceramic fibre on the exposed end on the exposed end.

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

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

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

The fire-resistance level (FRL) of the specimen is applicable when the system is exposed to fire from the same direction as tested. The test specimen was 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: 11 January 2021

Issued on the 30th day of March 2021 without alterations or additions.

Brett Roddy | Manager, Fire Testing and Assessments

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

COPY OF CERTIFICATE OF TEST – NO. 3559

INFRASTRUCTURE TECHNOLOGIES
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Certificate of Test

No. 3560

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 2174.

Product Name: SNAP H50S-RR High-Top Stack cast-in fire collar protecting a nominal 25-mm Rehau Rautitan PEX-a stack pipe (Specimen 7)

Description: The specimen comprised an 1150-mm x 1150-mm x 150-mm thick concrete slab. The slab was penetrated by a nominal 25-mm Rehau Rautitan PEX-a stack pipe, protected by SNAP H50S-RR High-Top Stack cast-in fire collar. 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'. The SNAP H50S-RR High-Top Stack cast-in fire collar comprised a 1.6-mm thick polypropylene casing with a 67-mm inner diameter and a 150-mm diameter base flange. The 150-mm (cut down to size from 250-mm) high collar casing incorporated a 230-mm x 55-mm x 5-mm thick Intumesh intumescent material and a rubber ring seal. The closing mechanism comprised three galvanised steel springs bound with nylon fuse links and a 268-mm x 53-mm 316 stainless steel mesh as shown in drawing titled 'SNAP 50 High-Top Stack', dated 29 September 2017, by Snap Fire Systems Pty Ltd. The penetrating service comprised a 25.35-mm outside diameter Rehau Rautitan PEX-a pipe with a wall thickness of 4-mm fitted through the collar's sleeve. The annular gap between the pipe and the inside collar incorporated a PE foam backing rod, back filled with grout to a depth of 30 mm and finished flush with the slab as shown in drawing titled 'Specimen #7, 25 PEX-a Stack & H50S-RR', dated 21 December 2020, by Snap Fire Systems Pty Ltd. The pipe projected vertically, 2000-mm above from the unexposed face of the concrete slab and 500-mm into the furnace chamber. The pipe was supported at nominally 500-mm and 1500-mm from the unexposed face of the slab. The pipe was open on the unexposed end and closed with a ceramic fibre plug on the exposed end.

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

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

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

The fire-resistance level (FRL) of the specimen is applicable when the system is exposed to fire from the same direction as tested. The test specimen was 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: 11 January 2021

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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.

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FOR FURTHER INFORMATION

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