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

Test Report

Author: Peter Gordon
Report number: FSP 1872
Date: 12 June 2019

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

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Report Authorization:

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12 June 2019	12 June 2019	12 June 2019

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Contents

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

Sponsored Investigation No. FSP 1872

1 Introduction

1.1 Identification of specimen

The sponsor identified the specimen as three (3) cast in fire collars and one (1) retrofit fire collar protecting a 120-mm thick concrete floor slab penetrated by one (1) PVC pipe and two (2) clusters of Pex-a pipes and one (1) cluster of insulated copper pipes and electrical cable.

1.2 Sponsor

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

1.3 Manufacturer

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

1.4 Test standard

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

Section 10: Service penetrations and control joints

1.5 Reference standard

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

1.6 Test number

CSIRO Reference test number: FS 4731/4195

1.7 Test date

The fire-resistance test was conducted on 04 January 2018.

2 Description of specimen

2.1 General

The specimen comprised an 1150-mm x 1150-mm x 120-mm thick reinforced concrete slab penetrated by three (3) cast-in and one (1) retrofit fire collars protecting a 120-mm thick concrete floor slab penetrated by one (1) PVC pipe and two (2) clusters of Pex-B pipes and one (1) cluster of insulated copper pipes and electrical cable.

The pipes 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 'Cross-linked polyethylene (PE-X) pipes for pressure applications'; and
- AS/NZS 1571:1995 'Copper - Seamless tubes for air-conditioning and refrigeration'

For the purpose of the test, the specimens were referenced as Penetrations 1, 2, 3 and 4.

Penetration 1 – HP315R Retrofit fire collar protecting a nominal 300-mm diameter Polyvinyl Chloride (PVC) Stack Pipe

The SNAP retrofitted HP315R collar comprised a 0.95-mm steel casing with a 327-mm inner diameter and a 501-mm diameter base flange. The 202-mm high collar casing incorporated two strips of Intumesh intumescent material, 1064-mm x 197-mm x 12-mm thick and 1111-mm x 197-mm x 2.5-mm thick. The closing mechanism comprised six 5-mm diameter stainless steel springs with a nylon fuse links and a 1102-mm x 192-mm 316 stainless steel mesh located in between the intumescent strips . The HP315R collar was fixed to the underside of the slab using six 30-mm x 5-mm concrete screws as shown in drawing numbered HP315R-T dated 16 August 2017, by Snap Fire Systems Pty Ltd.

The penetrating service comprised a 315-mm OD PVC Stack Pipe, with a wall thickness of 7-mm fitted through the collar's sleeve. The pipe penetrated the 120-mm thick section of the slab through a 315-mm diameter opening and projected vertically 2000-mm above the concrete and 500-mm into the furnace chamber. The pipe was supported at 500-mm and 1500-mm from the unexposed face of the concrete slab as shown in drawing titled "Specimen # 1 315 PVC Stack Pipe & HP315R" dated 1 February 2018, provided by Snap Fire Systems Pty Ltd. On the exposed end, the pipe was capped with a 315-mm PVC end cap.

Penetration 2 – H50FWS-RR Cast-in fire collar protecting a nominal cluster of 3 x 25-mm diameter Pex-B pipes

The SNAP retrofit H50FWS-RR fire collar comprised a moulded plastic body casing with a 63-mm inner diameter and a 150-mm diameter base flange. The 120-mm high collar (cut down to size from 250-mm) casing incorporated three strips of Intumesh intumescent material, 230-mm x 55-mm x 5-mm thick. The closing mechanism comprised three 3.15-mm diameter stainless steel springs, with nylon fuse links and a 268-mm x 53-mm 316 stainless steel mesh located in between the intumescent strips as shown in drawing numbered H50FWS-RR, dated 29 September 2017, by Snap Fire Systems Pty Ltd.

The penetrating service comprised a cluster of 3 x 25-mm Pex-B Pipes, with an individual wall thickness of 2.6-mm fitted through the collar's sleeve. The pipes penetrated the slab through the 66-mm diameter collar sleeve and projected vertically 2000-mm above the concrete slab and 500-mm into the furnace chamber. The pipe was supported at 500-mm and 1500-mm from the unexposed face of the concrete slab as shown in drawing titled "Specimen # 2, 3 x 25mm Pex B & H50FWS-RR" dated 7 February 2018, provided by Snap Fire Systems Pty Ltd. On the exposed end, the pipes were capped using ceramic fibre plugs.

Penetration 3 – H50FWS-RR Cast-in fire collar protecting a nominal cluster of 4 x 20-mm diameter Pex-B pipes

The SNAP retrofit H50FWS-RR fire collar comprised a moulded plastic body casing with a 63-mm inner diameter and a 150-mm diameter base flange. The 120-mm high collar casing (cut down to size from 250-mm) incorporated three strips of Intumesh intumescent material, 230-mm x 55-mm x 5-mm thick. The closing mechanism comprised three 3.15-mm diameter stainless steel springs with a nylon fuse links and a 268-mm x 53-mm 316 stainless steel mesh located in between the intumescent strips as shown in drawing numbered H50FWS-RR, dated 29 September 2017, by Snap Fire Systems Pty Ltd.

The penetrating service comprised a cluster of 4 x 20-mm Pex-B Pipes, with an individual wall thickness of 2.4-mm fitted through the collar's sleeve. The pipes penetrated the slab through the 66-mm diameter collar sleeve and projected vertically 2000-mm above the concrete slab and 500-mm into the furnace chamber. The pipe was supported at 500-mm and 1500-mm from the unexposed face of the concrete slab as shown in drawing titled "Specimen # 3, 4 x 20-mm Pex B & H50FWS-RR" dated 7 February 2018, provided by Snap Fire Systems Pty Ltd. On the exposed end, the pipes were capped using ceramic fibre plugs.

Penetration 4 – H50FWS-RR Cast-in fire collar protecting a nominal 3/4 and 3/8 Insulated Copper Pair Coil pipes plus 4 Core + E Cable

The SNAP retrofit H50FWS-RR fire collar comprised a moulded plastic body casing with a 63-mm inner diameter and a 150-mm diameter base flange. The 120-mm high collar casing (cut down to size from 250-mm) incorporated three strips of Intumesh intumescent material, 230-mm x 55-mm x 5-mm thick. The closing mechanism comprised three 3.15-mm diameter stainless steel springs with nylon fuse links and a 268-mm x 53-mm 316 stainless steel mesh located in between the intumescent strips as shown in drawing numbered H50FWS-RR, dated 29 September 2017, by Snap Fire Systems Pty Ltd.

The penetrating service comprised a 3/4 and 3/8 Insulated Copper Pair Coil pipes plus 4 Core + E Cable, with an individual wall thickness of 1.36-mm fitted through the collar's sleeve. The pipes penetrated the slab through the 66-mm diameter collar sleeve and projected vertically 2000-mm above the concrete and 500-mm into the furnace chamber. The pipe was supported at 500-mm and 1500-mm from the unexposed face of the concrete slab as shown in drawing titled "Specimen # 4, 3/4 and 3/8 Insulated Copper Pair Coil plus 4 Core + E Cable & H50FWS-RR" dated 8 February 2018, provided by Snap Fire Systems Pty Ltd. On the exposed end, the pipe ends were pinched closed.

2.2 Dimensions

The overall dimension of the concrete slab was 1150-mm wide x 1150-mm long x 120-mm thick, 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.

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 numbered H50FWS-RR-T dated 29 September 2017, by Snap Fire Systems Pty Ltd.

Drawing numbered HP315R- T dated 16 August 2017, by Snap Fire Systems Pty Ltd.

Drawing titled “Test Slab S-17-A Specimen #1, 315-mm PVC Stack Pipe & HP315R” dated 1 February 2018, provided by Snap Fire Systems Pty Ltd.

Drawing titled “Test Slab S-17-A Specimen #2, 3 x 25-mm Pex B & H50FWS-RR” dated 7 February 2018, provided by Snap Fire Systems Pty Ltd.

Drawing titled “Test Slab S-17-A Specimen #3, 4 x 20-mm Pex B & H50FWS-RR” dated 7 February 2018, provided by Snap Fire Systems Pty Ltd.

Drawing titled “Test Slab S-17-A Specimen #4, 3/4 & 3/8 Insulated Copper Pair Coil plus 4 Core +E Cable & H50FWS-RR” dated 7 February 2018, provided by Snap Fire Systems Pty Ltd.

3.1 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.

3.2 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.

3.3 Measurement system

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

4 Ambient temperature

The temperature of the test area was 14°C at the commencement of the test.

5 Departure from standard

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

6 Termination of test

The test was terminated at 204 minutes after sustained flaming on all specimens was observed.

7 Test results

7.1 Critical observations

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

Time	Observation
2 minutes -	Fluing is noted from Penetration 2. Light smoke is being emitted from the base of Penetrations 2, 3 and 4.
3 minutes -	Fluing is noted from Penetration 3.
4 minutes -	Heavy Fluing is noted on Penetration 1.
4 minutes -	Flaming is noted on Penetration 1.
7 minutes -	Base of Penetration 1 is starting to deform and collapse (photograph 3), Thermocouple 2 dislodged.
8 minutes -	Light smoke continues to flue from Penetration 1.
9 minutes -	Fluing from Penetrations 2 and 3 has ceased.
17 minutes -	Moisture forming at the base of Penetration #3.
26 minutes -	Fluing from Penetration 2 increased.
30 minutes -	Moisture forming at the base of Penetration 2.
94 minutes -	Insulation Failure Penetration 4 – maximum temperature rise of 180K is exceeded on the large pipe of Penetration 4 - Thermocouple S20.

104 minutes - Sealant at the base of the large pipe in Penetration 4 has started to melt or deform.

143 minutes - Fluing from Penetration #1 has increased.

177 minutes - Insulation Failure Penetration 3 – maximum temperature rise of 180K is exceeded on the concrete slab 25-mm from Penetration 3 - Thermocouple S20.

183 minutes - Sealant at the base of Penetrations #2 and #3 has started to deform.

199 minutes - Insulation Failure Penetration 2 – maximum temperature rise of 180K is exceeded on the concrete slab 25-mm from Penetration 2 - Thermocouple S9.

199 minutes - Insulation Failure Penetration 1 – maximum temperature rise of 180K is exceeded on pipe of Penetration 1 - Thermocouple S7.

200 minutes - Integrity Failure Penetration 1 – Flaming for a duration of greater than 10 seconds observed on the unexposed face of Penetration 1.

201 minutes - Integrity Failure Penetrations 2, 3 and 4 – Flaming for a duration of greater than 10 seconds observed on the unexposed face of Penetrations 2, 3 and 4. (As flaming spread from Penetration 1.)

204 minutes - Test terminated.

7.2 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.

7.3 Furnace severity

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

7.4 Specimen temperature

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

Figure 4 shows the curve of maximum temperature versus time associated with Penetration 2.

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

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

7.5 Performance

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

Penetration 1 – HP315R Retrofit fire collar protecting a nominal 300-mm diameter Polyvinyl Chloride (PVC) Stack Pipe

Structural adequacy	-	not applicable
Integrity	-	200 minutes
Insulation	-	199 minutes

Penetration 2 – H50FWS-RR Cast-in fire collar protecting a nominal cluster of 3 x 25-mm diameter Pex-B pipes

Structural adequacy	-	not applicable
Integrity	-	201 minutes
Insulation	-	199 minutes

Penetration 3 – H50FWS-RR Cast-in fire collar protecting a nominal cluster of 4 x 20-mm diameter Pex-B pipes

Structural adequacy	-	not applicable
Integrity	-	201 minutes
Insulation	-	177 minutes

Penetration 4 – H50FWS-RR Cast-in fire collar protecting a nominal 3/4 and 3/8 Insulated Copper Pair Coil pipes plus 4 Core + E Cable

Structural adequacy	-	not applicable
Integrity	-	201 minutes
Insulation	-	94 minutes

This report details methods of construction, the test conditions and the results obtained when the specific element of construction described herein was tested following the procedure outlined in this standard. Any significant variation with respect to size, constructional details, loads, stresses, edge or end conditions, other than those allowed under the field of direct application in the relevant test method, is not covered by this report.

Because of the nature of fire resistance testing and the consequent difficulty in quantifying the uncertainty of measurement of fire resistance, it is not possible to provide a stated degree of accuracy of the result.

8 Fire-resistance level (FRL)

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

Penetration 1 - -/180/180

Penetration 2 - -/180/180

Penetration 3 - -/180/120

Penetration 4 - -/180/90

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.

9 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.

10 Tested by

Peter Gordon
Testing Officer

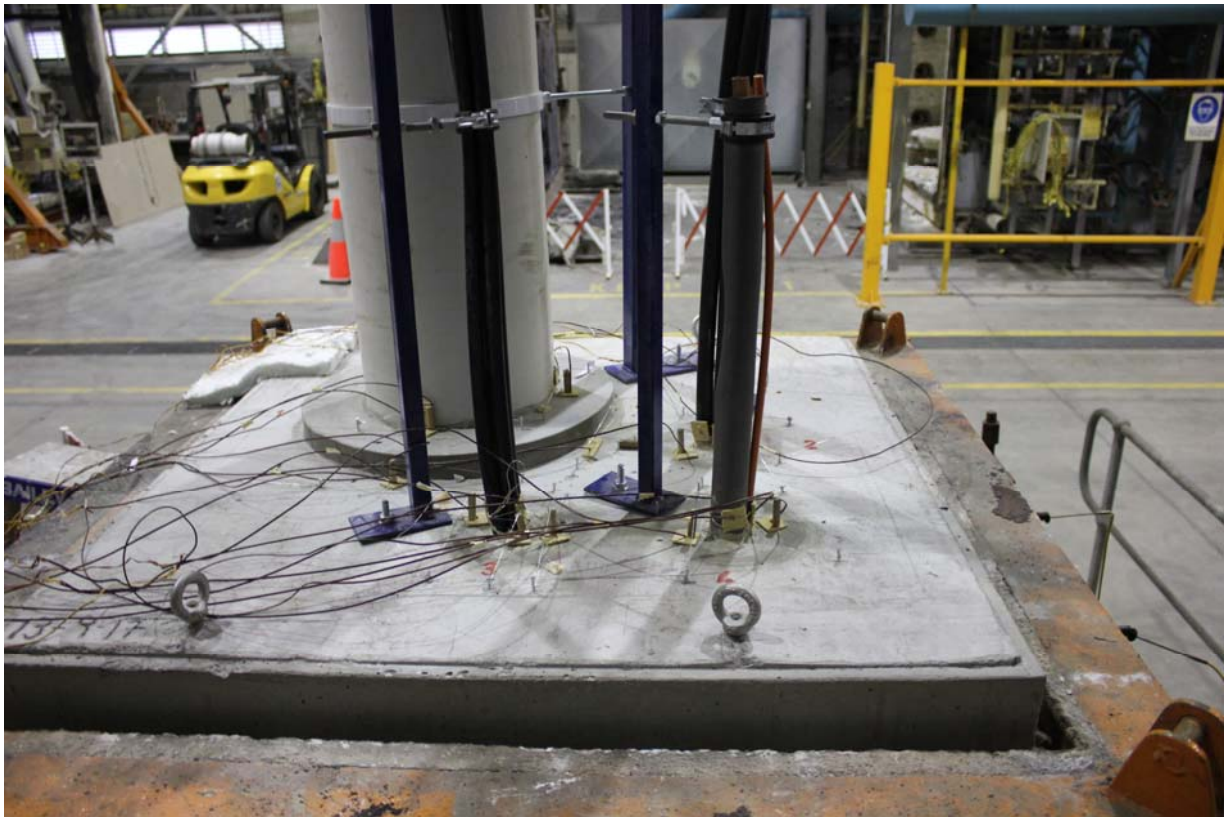
Appendices

Appendix A – Measurement location

Measurement Location		Data Logger Channel Information
Group location **Specimen**	**T/C Position**	**T/C designation**
Specimen 1 – (Pipemakers) PVC pipe 315-mm OD	On the slab – 25-mm from the hob	S1
	On the slab – 25-mm from the hob	S2
	On the hob – 25-mm from the pipe	S3
	On the hob – 25-mm from the pipe	S4
	On the pipe - 25-mm from the hob	S5
	On the pipe -25-mm from the hob	S6
	On the pipe -25-mm from the hob	S7
Specimen 2 – (CXL) PEX pipes 25.2-mm OD x 3	On the slab – 25-mm from the pipe WEST	S8
	On the slab – 25-mm from the pipe NORTH	S9
	On mastic - 25-mm from the slab SOUTH	S10
	On the pipe - 25-mm from the mastic EAST.	S11
	On the pipe - 25-mm from the mastic NORTH.	S12
Specimen 3 – (CXL) PEX pipes 20.4-mm OD x 4	On the slab – 25-mm from the pipe	S13
	On the slab – 25-mm from the pipe.	S14
	On the pipe - 25-mm from the mastic EAST.	S15
	On the pipe - 25-mm from the mastic NORTH.	S16
	On the pipe – 25-mm from mastic EAST	S17
Specimen 4 – Copper coils and orange TPS cable	On the slab – 25-mm from the pipe WEST	S18
	On the slab – 25-mm from the pipe EAST	S19
	On the large pipe lagging - 25-mm from mastic	S20
	On the small pipe lagging- 25-mm from the slab	S21

Appendix B – Photographs

PHOTOGRAPH 1 – EXPOSED FACE OF SPECIMENS PRIOR TO TESTING



PHOTOGRAPH 2 – UNEXPOSED FACE OF PENETRATIONS PRIOR TO TESTING

PHOTOGRAPH 3 – PENETRATION 1 AFTER 7 MINUTES OF TESTING

PHOTOGRAPH 4 – PENETRATIONS AFTER 30 MINUTES OF TESTING

PHOTOGRAPH 5 – PENETRATIONS AFTER 60 MINUTES OF TESTING

PHOTOGRAPH 6 – PENETRATIONS AFTER 120 MINUTES OF TESTING

PHOTOGRAPH 7 – PENETRATIONS AFTER 180 MINUTES OF TESTING

PHOTOGRAPH 8 – UNEXPOSED FACED OF PENETRATION AT CONCLUSION OF TESTING

PHOTOGRAPH 9 – EXPOSED FACE OF PENETRATIONS AT CONCLUSION OF TESTING

Appendix C – Furnace Temperature

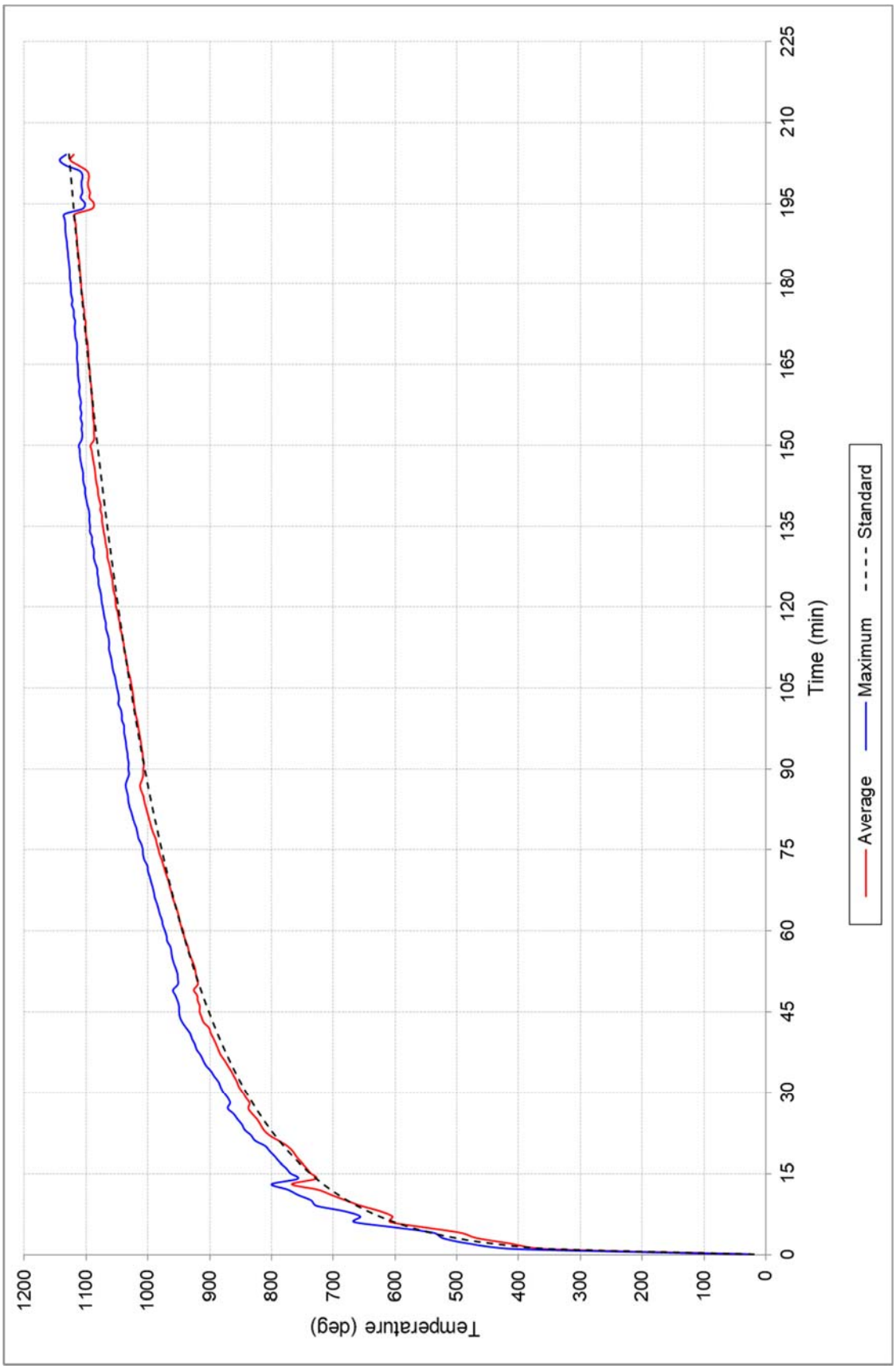


FIGURE 1 – FURNACE TEMPERATURE

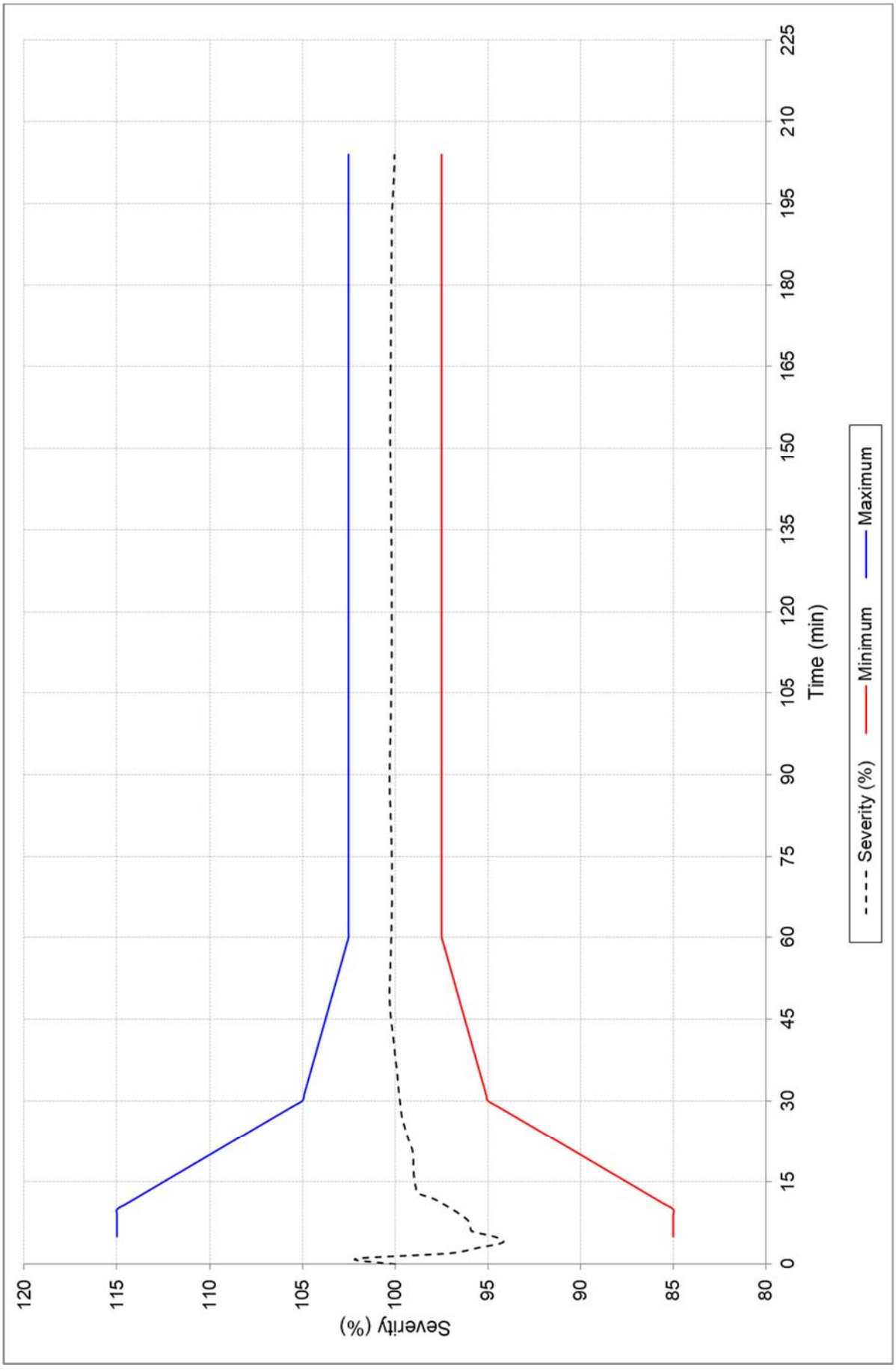


FIGURE 2 – FURNACE SEVERITY

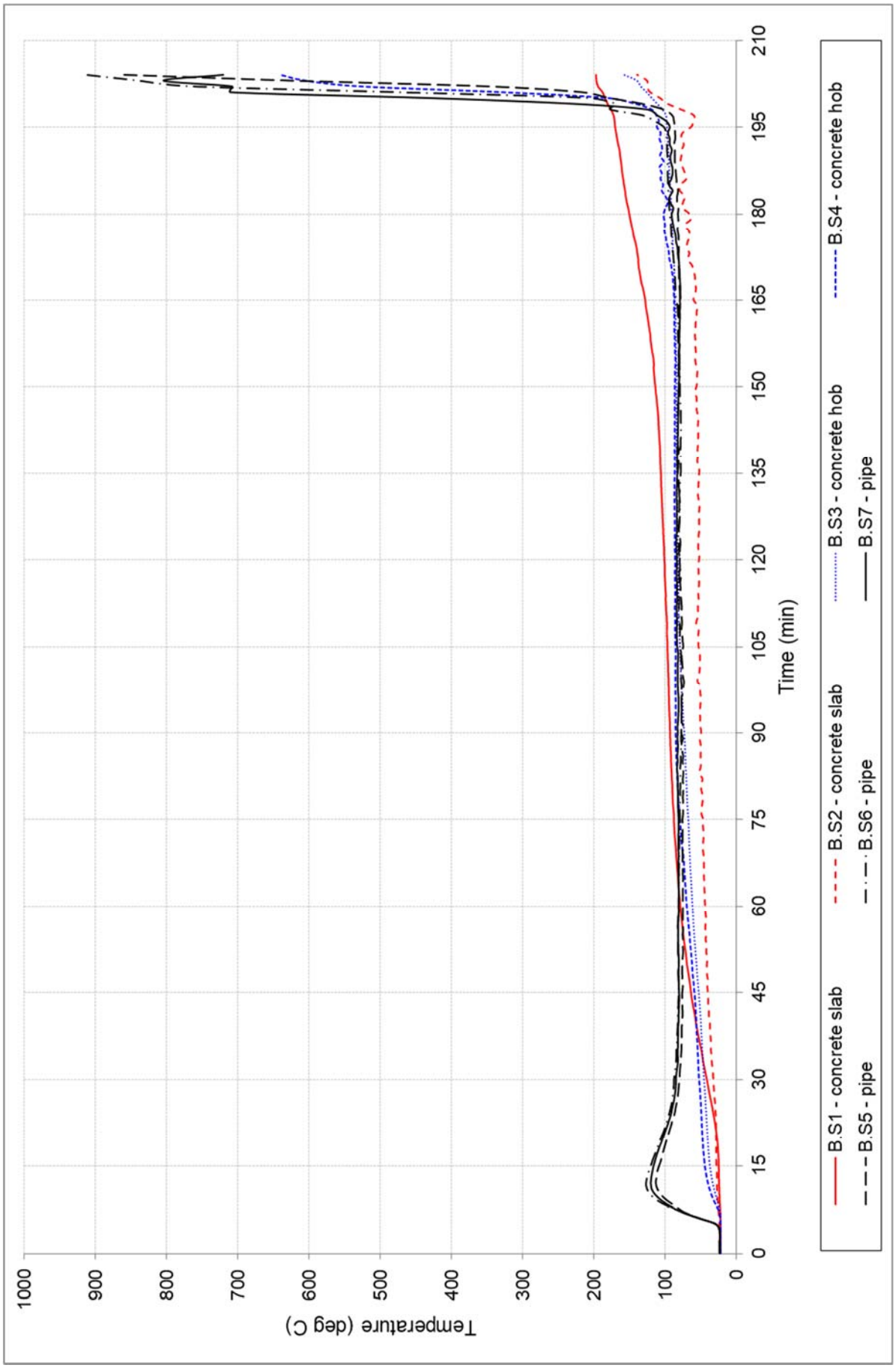


FIGURE 3 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 1

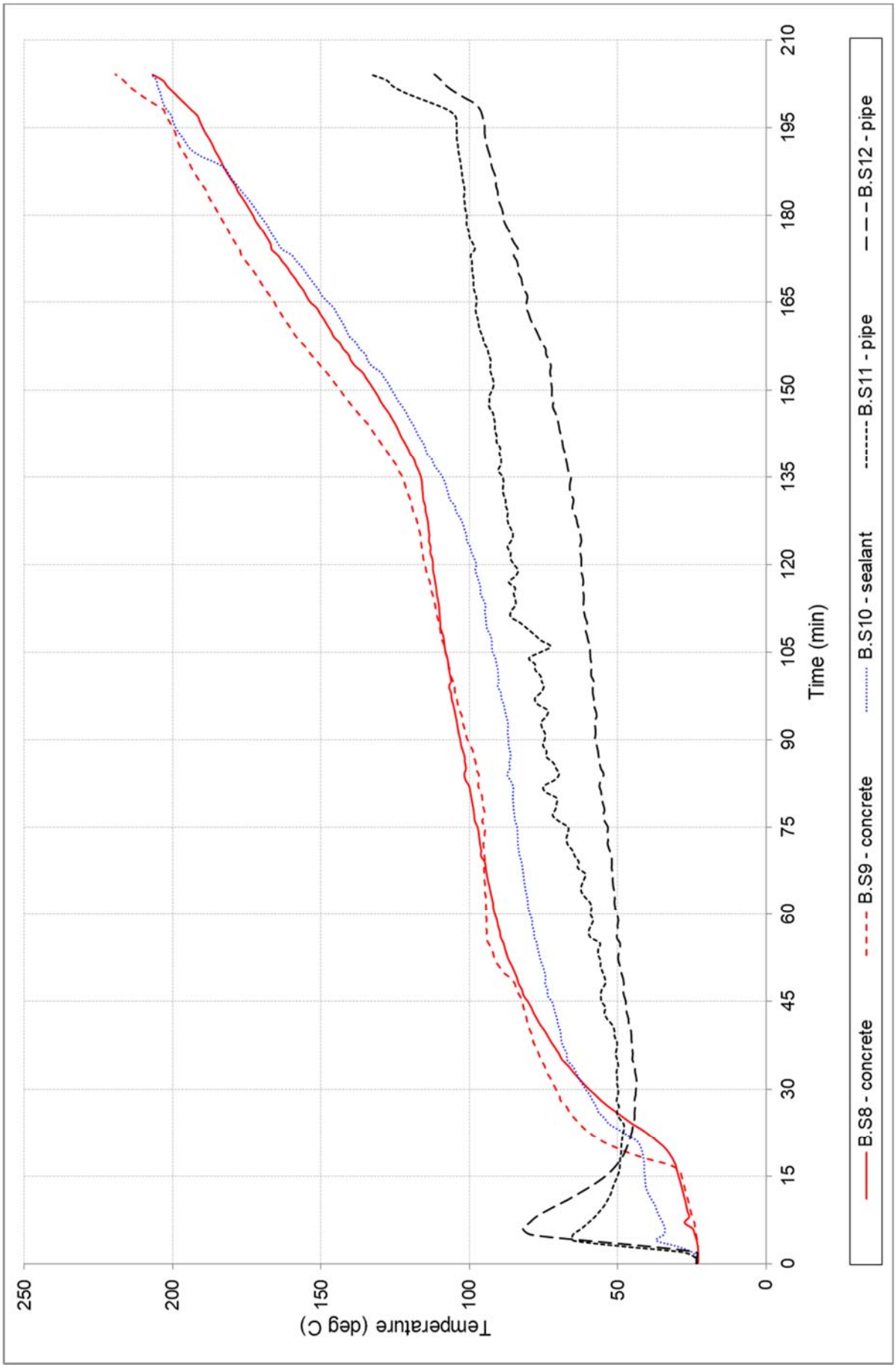


FIGURE 4 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 2

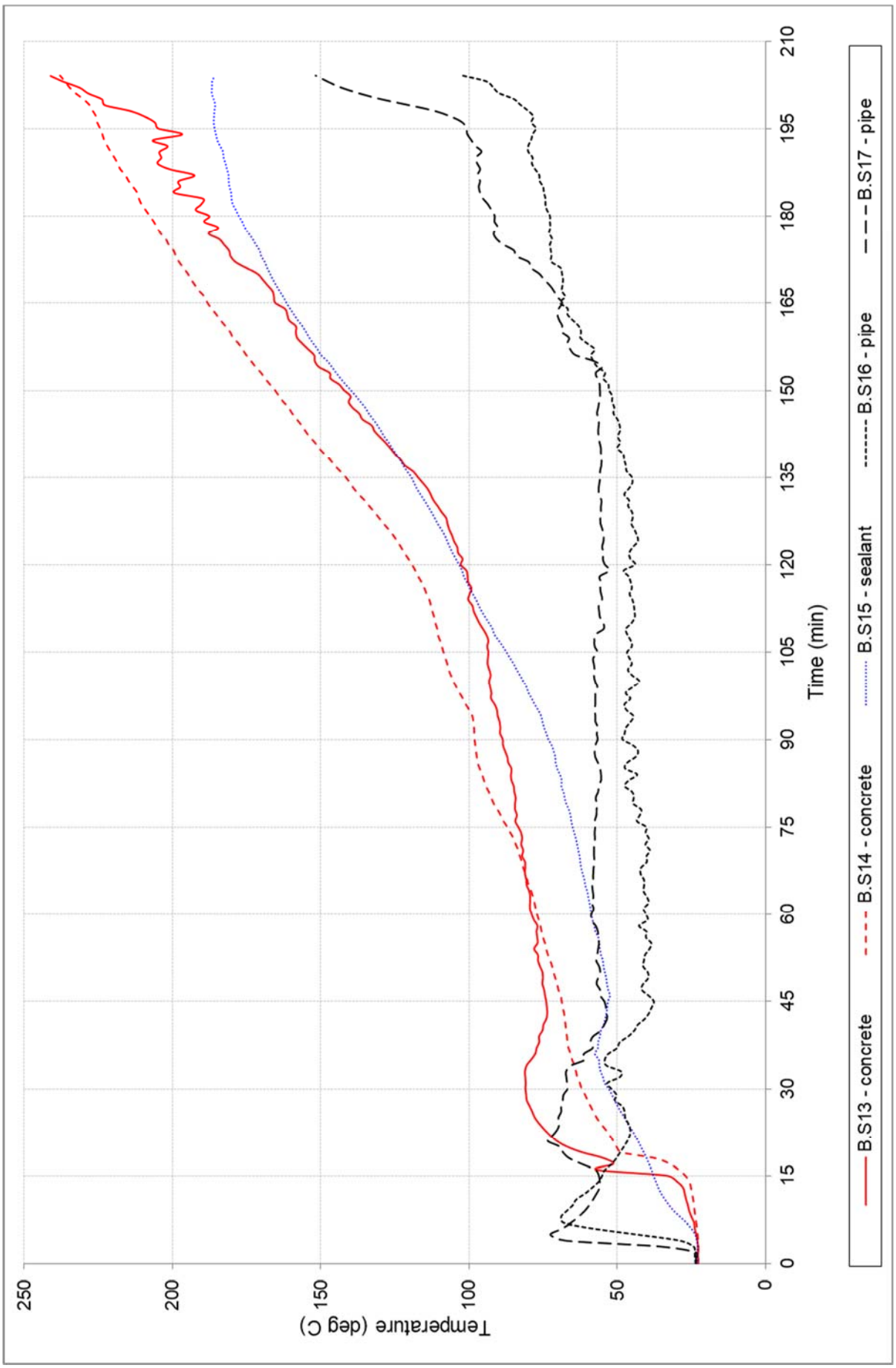


FIGURE 5 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 3

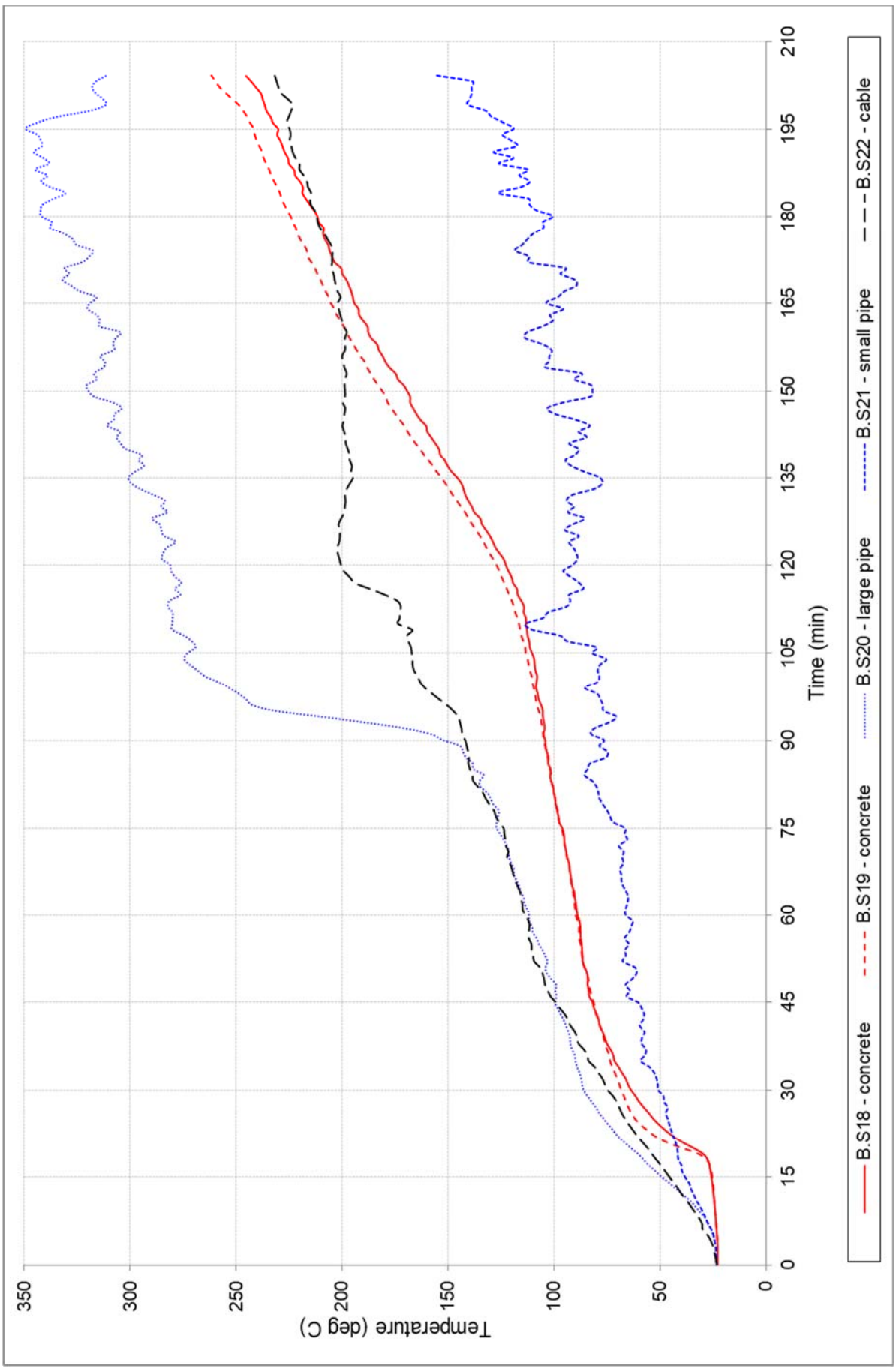
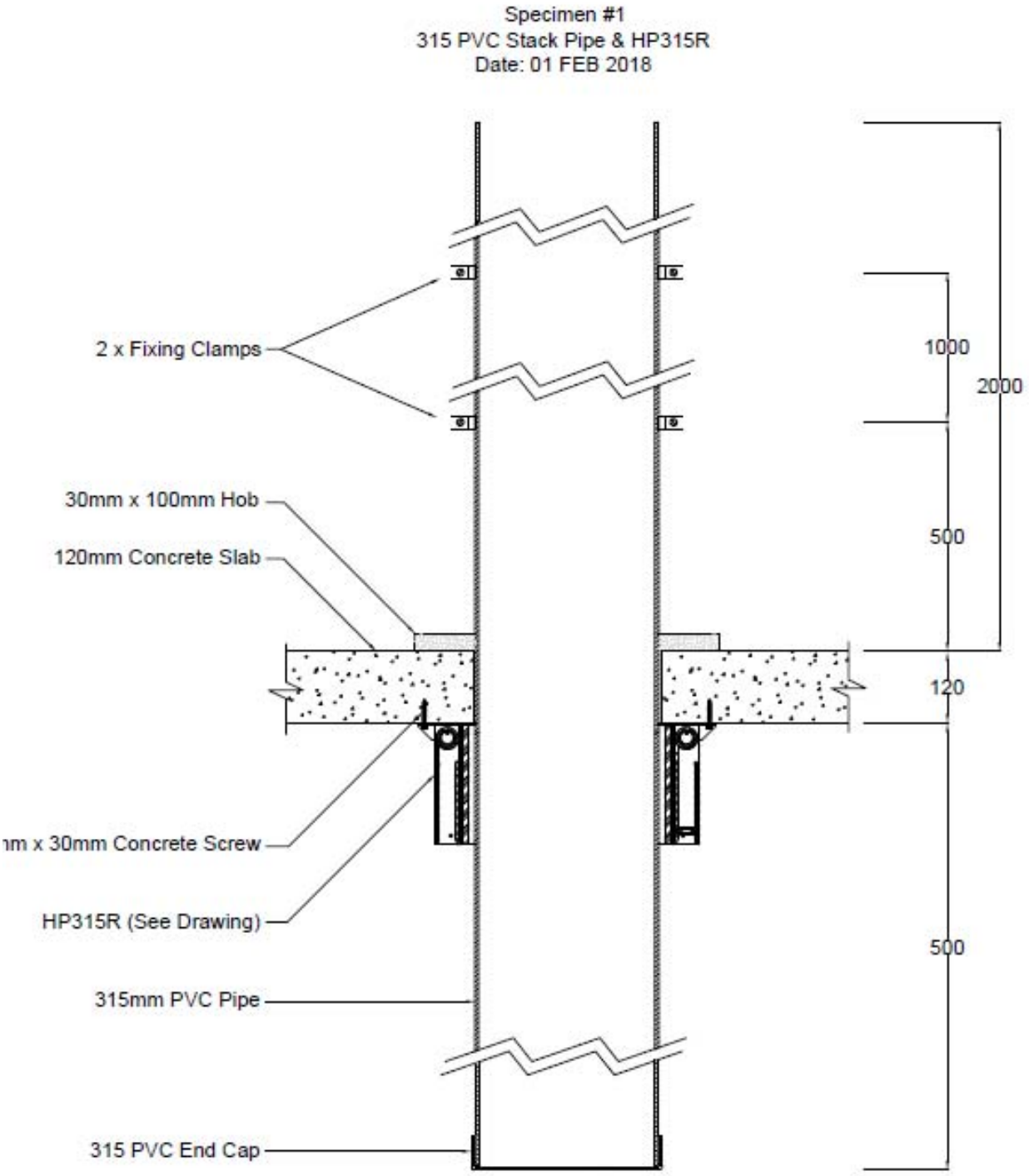
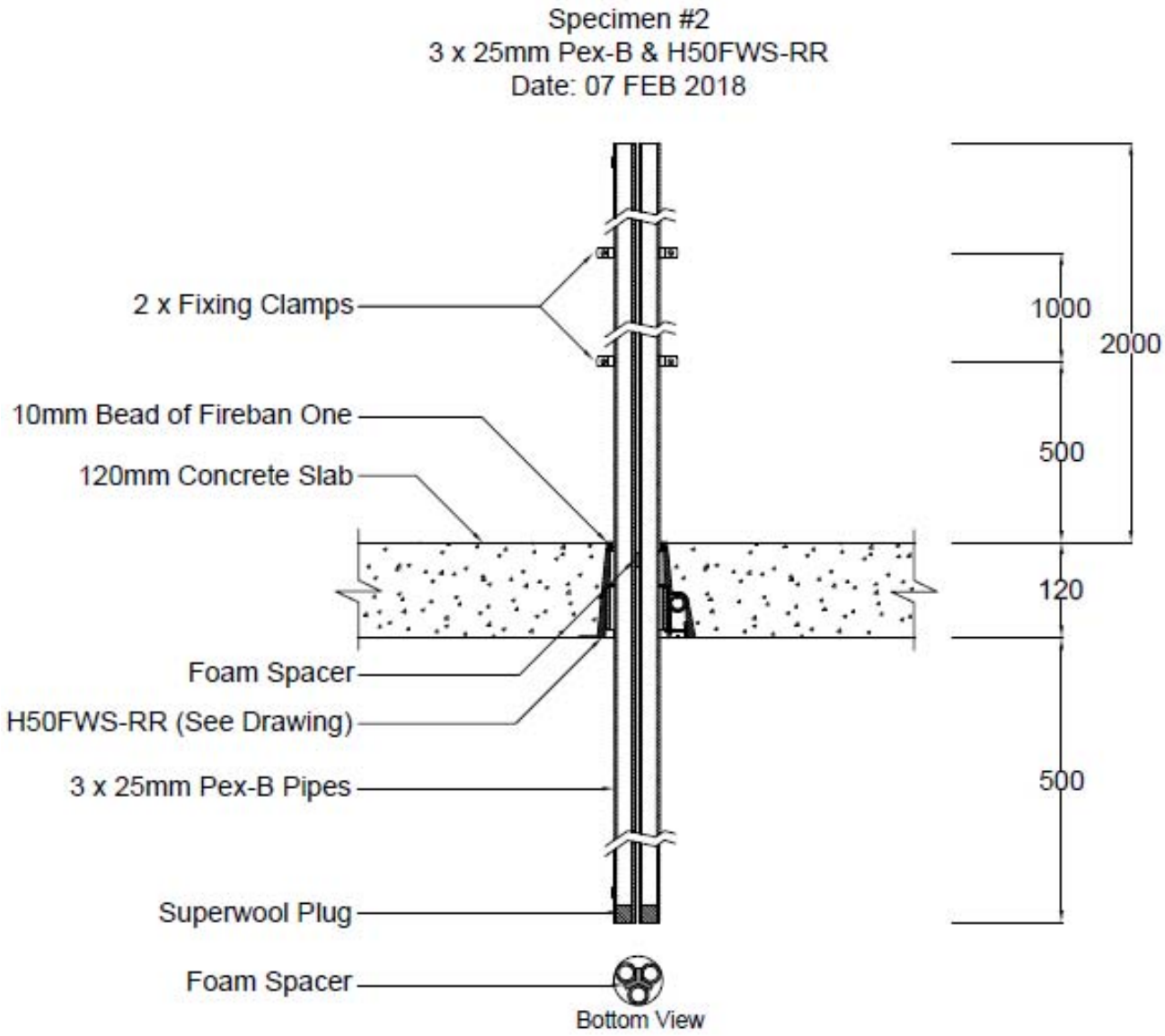


FIGURE 6 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 4

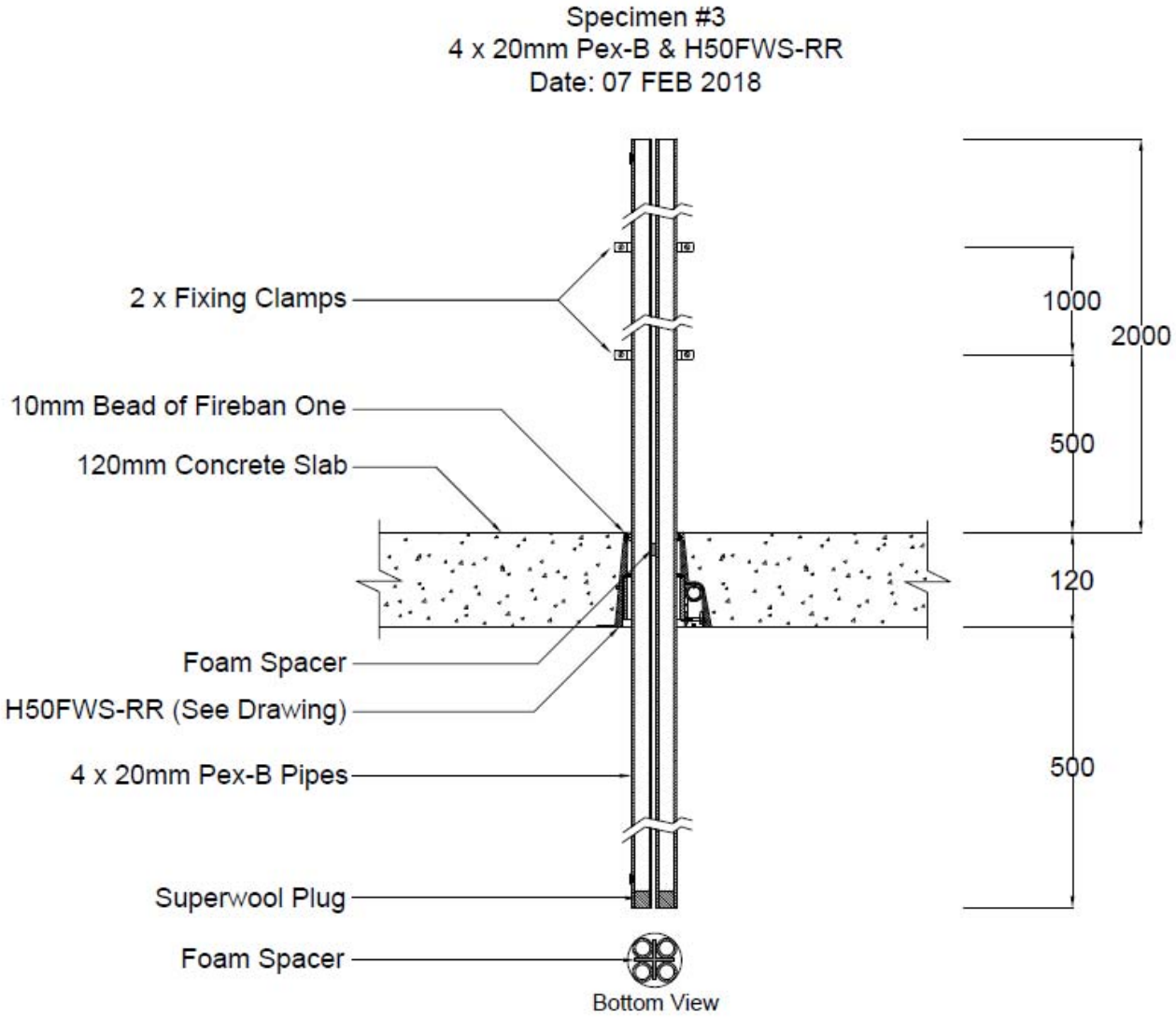
Appendix D – Installation drawings



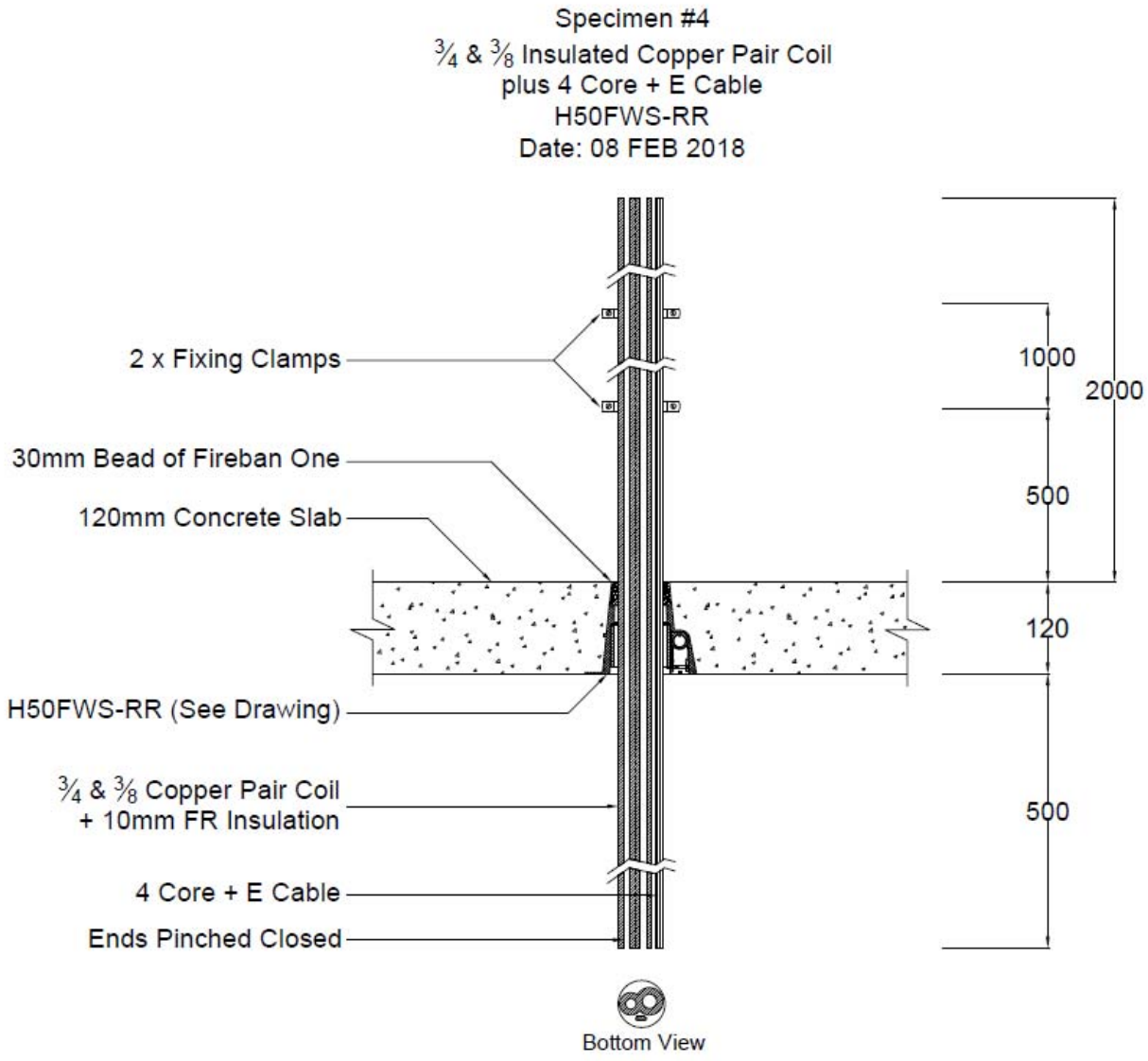
DRAWING TITLED "TEST SLAB S-17-A SPECIMEN #1, 315-MM PVC STACK PIPE & HP315R" DATED 1 FEBRUARY 2018, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD.



DRAWING TITLED "TEST SLAB S-17-A SPECIMEN #2, 3 X 25-MM PEX B & H50FWS-RR" DATED 7 FEBRUARY 2018, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD.

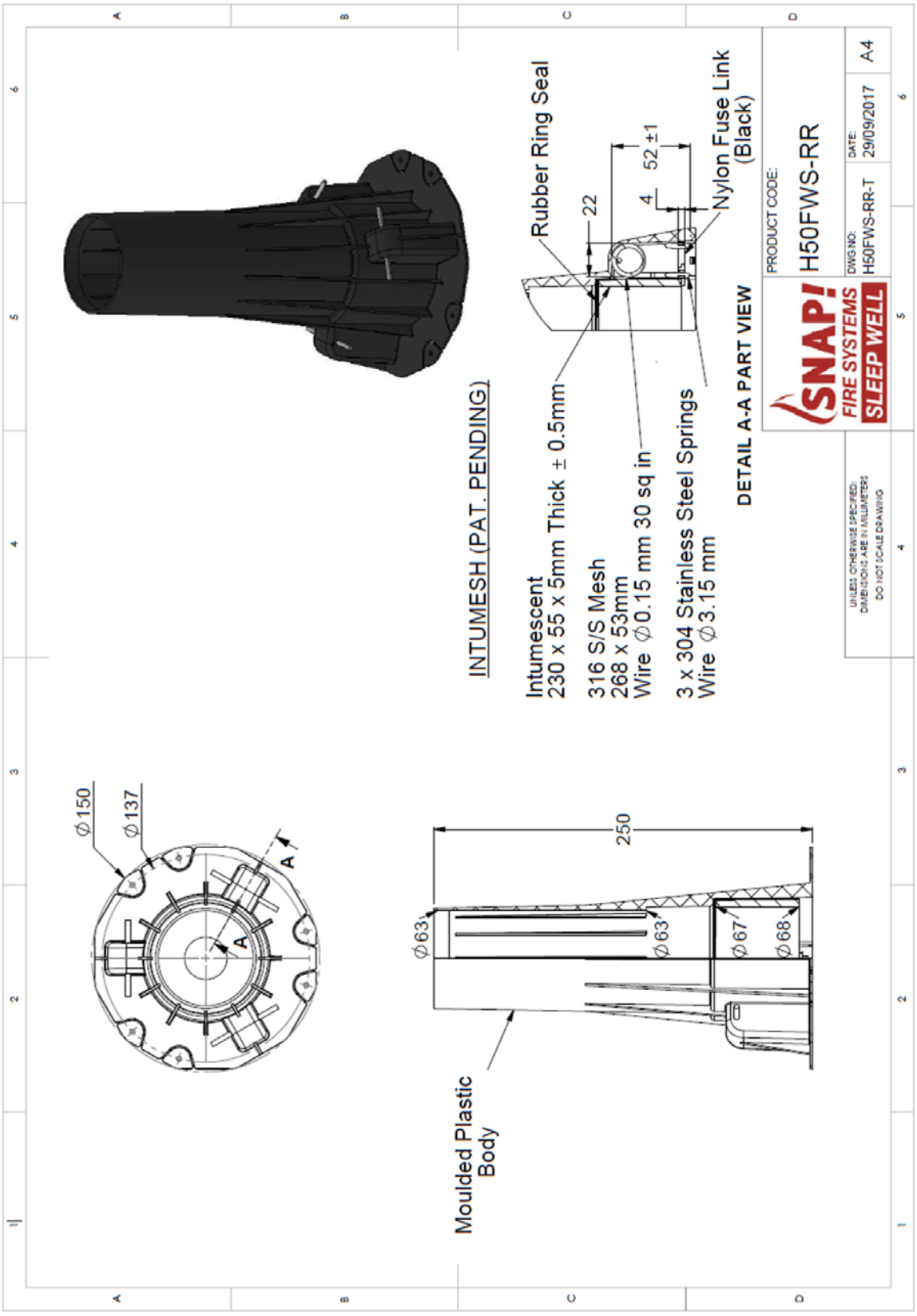


DRAWING TITLED "TEST SLAB S-17-A SPECIMEN #3, 4 X 20-MM PEX B & H50FWS-RR" DATED 7 FEBRUARY 2018, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD

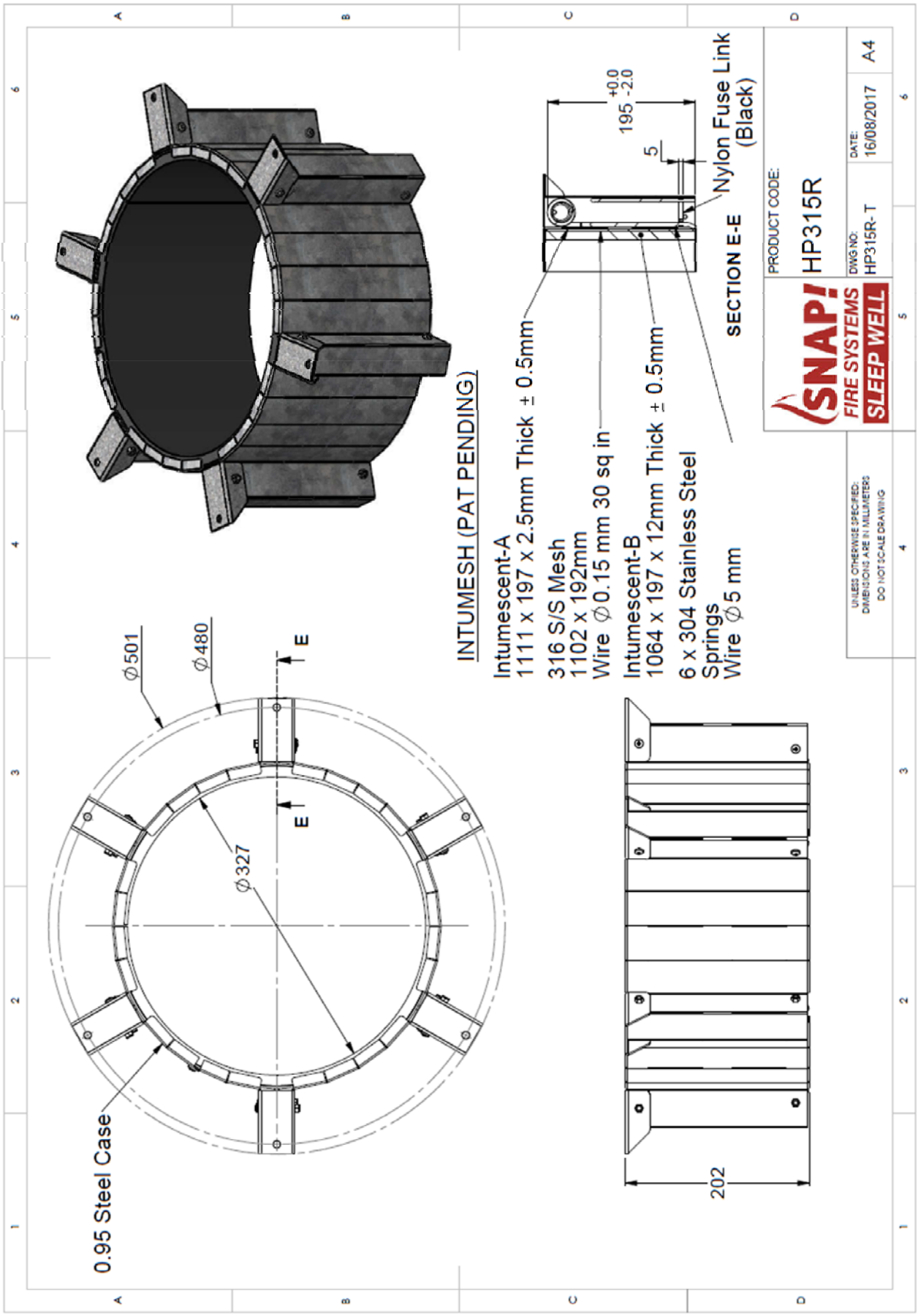


DRAWING TITLED "TEST SLAB S-17-A SPECIMEN #4, 3/4 & 3/8 INSULATED COPPER PAIR COIL PLUS 4 CORE +E CABLE & H50FWS-RR" DATED 7 FEBRUARY 2018, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD

Appendix E – Specimen Drawings



DRAWING NUMBERED H50FWS-RR-T DATED 29 SEPTEMBER 2017, BY SNAP FIRE SYSTEMS PTY LTD.



DRAWING NUMBERED HP315R- T DATED 16 AUGUST 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. 3159a

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 Sponsored Investigation report numbered FSP 1872.

Product Name: HP315R Retrofit fire collar protecting a nominal 300-mm diameter Polyvinyl Chloride (PVC) Stack Pipe

Description: The specimen comprised an 1150-mm x 1150-mm x 120-mm thick reinforced concrete slab penetrated by HP315R Retrofit fire collar protecting a nominal 300-mm diameter Polyvinyl Chloride (PVC) Stack Pipe. The SNAP retrofitted HP315R collar comprised a 0.95-mm steel casing with a 327-mm inner diameter and a 501-mm diameter base flange. The 202-mm high collar casing incorporated two strips of Intumesh intumescent material, 1064-mm x 197-mm x 12-mm thick and 1111-mm x 197-mm x 2.5-mm thick. The closing mechanism comprised six 5-mm diameter stainless steel springs with a nylon fuse links and a 1102-mm x 192-mm 316 stainless steel mesh located in between the intumescent strips . The HP315R collar was fixed to the underside of the slab using six 30-mm x 5-mm concrete screws as shown in drawing numbered HP315R-T dated 16 August 2017, by Snap Fire Systems Pty Ltd. The penetrating service comprised a 315-mm OD PVC Stack Pipe, with a wall thickness of 7-mm fitted through the collar's sleeve. The pipe penetrated the 120-mm thick section of the slab through a 315-mm diameter opening and projected vertically 2000-mm above the concrete and 500-mm into the furnace chamber. The pipe was supported at 500-mm and 1500-mm from the unexposed face of the concrete slab as shown in drawing titled "Specimen # 1 315 PVC Stack Pipe & HP315R" dated 1 February 2018, provided by Snap Fire Systems Pty Ltd. On the exposed end, the pipe was capped with a 315-mm PVC end cap.

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

Structural Adequacy	not applicable
Integrity	200 minutes
Insulation	199 minutes

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

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 recognized 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: 4 January 2018

Issued on the 25th day of October 2018 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. 3159A

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. 3160

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 Sponsored Investigation report numbered FSP 1872.

Product Name: H50FWS-RR Cast-in fire collar protecting a nominal cluster of 3 x 25-mm diameter Pex-B pipes

Description: The SNAP retrofit H50FWS-RR fire collar comprised a moulded plastic body casing with a 63-mm inner diameter and a 150-mm diameter base flange. The 120-mm high collar (cut down to size from 250-mm) casing incorporated three strips of Intumesh intumescent material, 230-mm x 55-mm x 5-mm thick. The closing mechanism comprised three 3.15-mm diameter stainless steel springs, with nylon fuse links and a 268-mm x 53-mm 316 stainless steel mesh located in between the intumescent strips as shown in drawing numbered H50FWS-RR, dated 29 September 2017, by Snap Fire Systems Pty Ltd. The penetrating service comprised a cluster of 3 x 25-mm Pex-B Pipes, with an individual wall thickness of 2.6-mm fitted through the collar's sleeve. The pipes penetrated the slab through the 66-mm diameter collar sleeve and projected vertically 2000-mm above the concrete slab and 500-mm into the furnace chamber. The pipe was supported at 500-mm and 1500-mm from the unexposed face of the concrete slab as shown in drawing titled "Specimen # 2, 3 x 25mm Pex B & H50FWS-RR" dated 7 February 2018, provided by Snap Fire Systems Pty Ltd. On the exposed end, the pipes were capped using ceramic fibre plugs.

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

Structural Adequacy	not applicable
Integrity	201 minutes
Insulation	199 minutes

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

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 recognized 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: 4 January 2018

Issued on the 28th day of September 2018 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

This document is issued in accordance with NATA's accreditation requirements.
Accreditation No. 165 – Corporate Site No. 3625
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Certificate of Test

No. 3161a

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 Sponsored Investigation report numbered FSP 1872.

Product Name: H50FWS-RR Cast-in fire collar protecting a nominal cluster of 4 x 20-mm diameter Pex-B pipes

Description: The SNAP retrofit H50FWS-RR fire collar comprised a moulded plastic body casing with a 63-mm inner diameter and a 150-mm diameter base flange. The 120-mm high collar casing (cut down to size from 250-mm) incorporated three strips of Intumesh intumescent material, 230-mm x 55-mm x 5-mm thick. The closing mechanism comprised three 3.15-mm diameter stainless steel springs with a nylon fuse links and a 268-mm x 53-mm 316 stainless steel mesh located in between the intumescent strips as shown in drawing numbered H50FWS-RR, dated 29 September 2017, by Snap Fire Systems Pty Ltd. The penetrating service comprised a cluster of 4 x 20-mm Pex-B Pipes, with an individual wall thickness of 2.4-mm fitted through the collar's sleeve. The pipes penetrated the slab through the 66-mm diameter collar sleeve and projected vertically 2000-mm above the concrete slab and 500-mm into the furnace chamber. The pipe was supported at 500-mm and 1500-mm from the unexposed face of the concrete slab as shown in drawing titled "Specimen # 3, 4 x 20-mm Pex B & H50FWS-RR" dated 7 February 2018, provided by Snap Fire Systems Pty Ltd. On the exposed end, the pipes were capped using ceramic fibre plugs.

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

Structural Adequacy	not applicable
Integrity	201 minutes
Insulation	177 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/180/120.

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 recognized 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: 4 January 2018

Issued on the 25th day of October 2018 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

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Certificate of Test

No. 3162a

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 Sponsored Investigation report numbered FSP 1872.

Product Name: H50FWS-RR Cast-in fire collar protecting a nominal ¾ and 3/8 Insulated Copper Pair Coil pipes plus 4 Core + E Cable

Description: The SNAP retrofit H50FWS-RR fire collar comprised a moulded plastic body casing with a 63-mm inner diameter and a 150-mm diameter base flange. The 120-mm high collar casing (cut down to size from 250-mm) incorporated three strips of Intumesh intumescent material, 230-mm x 55-mm x 5-mm thick. The closing mechanism comprised three 3.15-mm diameter stainless steel springs with nylon fuse links and a 268-mm x 53-mm 316 stainless steel mesh located in between the intumescent strips as shown in drawing numbered H50FWS-RR, dated 29 September 2017, by Snap Fire Systems Pty Ltd. The penetrating service comprised a 3/4 and 3/8 Insulated Copper Pair Coil pipes plus 4 Core + E Cable, with an individual wall thickness of 1.36-mm fitted through the collar's sleeve. The pipes penetrated the slab through the 66-mm diameter collar sleeve and projected vertically 2000-mm above the concrete and 500-mm into the furnace chamber. The pipe was supported at 500-mm and 1500-mm from the unexposed face of the concrete slab as shown in drawing titled "Specimen # 4, 3/4 and 3/8 Insulated Copper Pair Coil plus 4 Core + E Cable & H50FWS-RR" dated 8 February 2018, provided by Snap Fire Systems Pty Ltd. On the exposed end, the pipe ends were pinched closed.

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

Structural Adequacy	not applicable
Integrity	201 minutes
Insulation	94 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/180/90.

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 recognized 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: 4 January 2018

Issued on the 25th day of October 2018 without alterations or additions.

B. Roddy

Brett Roddy
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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 of elements of building construction.
AS 4072.1-2005	Components for the protection of openings in fire-resistant separating elements. Part 1: Service penetrations and control joints.

-----end of report-----

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FOR FURTHER INFORMATION

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