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

Test Report

Author: Russell Collins
Report number: FSP 1771
Date: 25 January 2017

Client: Snap Fire Systems Pty Ltd

Commercial-in-confidence

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25 January 2017	25 January 2017	25 January 2017

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

Sponsored Investigation No. FSP 1771

1 Introduction

1.1 Identification of specimen

The sponsor identified the specimen as four (4) Snap Cast-in and one (1) retrofit Fire Collars protecting a 150-mm thick concrete floor slab penetrated by four (4) stack pipes and one (1) floor waste.

1.2 Sponsor

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

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.

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 4600/SP4006

1.7 Test date

The fire-resistance test was conducted on 18 August 2016.

2 Description of specimen

2.1 General

The specimen comprised an 1150-mm x 1150-mm x 150-mm thick reinforced concrete slab penetrated by three (3) stack pipes and one (1) floor waste protected by Cast-in Snap Fire Systems fire collars and one (1) stack pipe protected by Retrofit Snap Fire Systems fire collars.

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

- AS 4176.1-2010 : Multilayer pipes for pressure applications - Multilayer piping systems for hot and cold water plumbing applications - General (ISO 21003-1:2008, MOD)
- AS/NZS 5065:2005 'Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications'

For the purpose of the test, the specimens were referenced as Penetrations 1, 2, 3, 4 and 5.

Penetration 1 – H100S-RR cast-in fire collar protecting a nominal 70-mm diameter Wavin AS Pipe

The SNAP Cast-in H100S-RR fire collar comprised a 1.6-mm thick polypropylene casing with a 126.5-mm inner diameter and a 213-mm diameter base flange. The 250-mm high collar casing incorporated a 412-mm x 85-mm x 4-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 460-mm x 85-mm stainless steel mesh as shown in drawing numbered H100S-RR-T dated 29 September 2015, by Snap Fire Systems Pty Ltd.

The penetrating service comprised a nominal 70-mm Wavin AS Pipe, with a wall thickness of 4.5-mm fitted through the collar's sleeve. The pipe 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 "Test Slab S-16-F Penetration # 1 – 70mm Wavin AS Pipe & H100S-RR" dated 16 September 2016, by Snap Fire Systems Pty Ltd. On the exposed end, the pipe was plugged with Superwool. On the unexposed face, the annular gap between the pipe and slab was sealed with non-shrink grout backfill.

Penetration 2 – H100S-RR cast-in fire collar protecting a nominal 110-mm diameter Wavin AS Pipe

The SNAP Cast-in H100S-RR fire collar comprised a 1.6-mm thick polypropylene casing with a 126.5-mm inner diameter and a 213-mm diameter base flange. The 250-mm high collar casing incorporated a 412-mm x 85-mm x 4-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 460-mm x 85-mm stainless steel mesh as shown in drawing numbered H100S-RR-T dated 29 September 2015, by Snap Fire Systems Pty Ltd.

The penetrating service comprised a nominal 110-mm Wavin AS pipe, with a wall thickness of 5.7-mm fitted through the collar's sleeve. The pipe 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 "Test Slab S-16-F Penetration # 2 – 110mm Wavin AS Pipe & H100S-RR" dated 16 September 2016, by Snap Fire Systems Pty Ltd. On the exposed end, the pipe was plugged with Superwool. On the unexposed face, the annular gap between the pipe and slab was sealed with Bostik Fireban-1 Sealant.

Penetration 3 – H65S-RR cast-in fire collar protecting a nominal 56-mm diameter Wavin AS Pipe

The SNAP Cast-in H65S-RR fire collar comprised a 1.6-mm thick polypropylene casing with a 84-mm inner diameter and a 168-mm 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 galvanised steel springs bound with nylon fuse links and a 322-mm x 65-mm stainless steel mesh as shown in drawing numbered H65S-RR-T dated 29 September 2015, by Snap Fire Systems Pty Ltd.

The penetrating service comprised a nominal 56-mm Wavin AS pipe, with a wall thickness of 4.8-mm fitted through the collar's sleeve. The pipe 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 "Test Slab S-16-F Penetration # 3 – 56-mm Wavin AS Pipe & H65S-RR" dated 16 September 2016, by Snap Fire Systems Pty Ltd. On the exposed end, the pipe was plugged with Superwool. On the unexposed face, the annular gap between the pipe and slab was sealed with non-shrink grout backfill.

Penetration 4 – H65FWS-RR cast-in fire collar protecting a nominal 56-mm diameter Wavin AS Pipe and 56-mm Wavin AS P-Trap floor waste

The SNAP Cast-in H65FWS-RR fire collar comprised a 1.6-mm thick polypropylene casing with a 84-mm inner diameter and a 168-mm 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 a black nylon fuse link and a 322-mm x 65-mm stainless steel mesh as shown in drawing numbered H65FWS-RR-T dated 29 September 2015, by Snap Fire Systems Pty Ltd.

The penetrating service comprised a nominal 56-mm Wavin AS pipe, with a wall thickness of 4.8-mm fitted through the collar's sleeve. The floor waste system was fitted with a chromed brass floor waste grate. A 35-mm thick cement screed was laid on top of the concrete slab and finished flush with the floor grate. On the exposed side of the slab, 3 x nominal 56-mm OD Wavin AS P-Trap 90° elbows were connected to the penetrating pipe, supported by pipe brackets with PBZ anchors to the concrete slab. On the exposed face, the gully trap was capped using a Superwool plug.

The floor waste gully was charged with water to the level shown in drawing titled "Test Slab S-16-F Penetration # 4 56-mm Wavin AS Pipe & H65FWS-RR, dated 16 September 2016, by Snap Fire Systems Pty Ltd.

Penetration 5 – Gas50 retrofit fire collar protecting a nominal 50-mm diameter Valsir Pexal Pipe

The SNAP Retrofit Gas50 collar comprised a 0.95-mm thick steel casing with a 57-mm inner diameter and a 30-mm diameter base flange. The 92-mm high collar casing incorporated a layer of 215-mm x 85-mm x 4-mm thick Intumescent material and a layer of 190-mm x 85-mm x 4-mm thick intumescent material. The closing mechanism comprised 1 x 304 stainless steel spring bound with a black nylon fuse link and a 316 stainless steel mesh measuring 190 x 84-mm as shown in drawing numbered Gas50-T dated 16 September 2016, by Snap Fire Systems Pty Ltd.

The penetrating service comprised a nominal 50-mm Px-Al-Px pipe, with a wall thickness of 4.2-mm fitted through the collar's sleeve. The pipe 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 "Test Slab S-16-F Penetration # 5 – 50-mm Pexal Pipe & Gas50" dated 16 September 2016, by Snap Fire Systems Pty Ltd. On the exposed end, the pipe was plugged with Superwool.

2.2 Dimensions

The overall dimension of the concrete slab was 1150-mm wide x 1150-mm long x 150-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 H100 S-RR-T dated 29 September 2015, by SNAP Fire Systems Pty Ltd.

Drawing numbered H65S-RR-T dated 29 September 2015, by SNAP Fire Systems Pty Ltd.

Drawing numbered GAS50-T dated 16 September 2016, by Snap Fire Systems Pty Ltd.

Drawing numbered H65FWS-RR-T dated 29 September 2015, by SNAP Fire Systems Pty Ltd.

Drawing titled "Test Slab S-16-F Penetration # 1 – 70-mm Wavin AS Pipe & H100S-RR" dated 16 September 2016, by Snap Fire Systems Pty Ltd.

Drawing titled "Test Slab S-16-F Penetration # 2 – 110-mm Wavin AS Pipe & H100S-RR" dated 16 September 2016, by Snap Fire Systems Pty Ltd.

Drawing titled "Test Slab S-16-F Penetration # 3 – 56-mm Wavin AS Pipe & H65S-RR" dated 16 September 2016, by Snap Fire Systems Pty Ltd.

Drawing titled "Test Slab S-16-F Penetration # 4 – 56-mm Wavin AS Pipe & H65FWS-RR" dated 16 September 2016, by Snap Fire Systems Pty Ltd.

Drawing titled "Test Slab S-16-F Penetration # 5 – 50-mm Pexal Pipe & Gas50" dated 16 September 2016, by Snap Fire Systems Pty Ltd.

4 Equipment

4.1 Furnace

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

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

4.2 Temperature

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

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

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

4.3 Measurement system

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

5 Ambient temperature

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

6 Departure from standard

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

7 Termination of test

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

8 Test results

8.1 Critical observations

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

Time	Observation
2 minutes -	Smoke is being emitted from the furnace flues.
5 minutes -	A small amount of smoke is fluing from Penetration # 1. Light smoke is visible from Penetration # 4.
6 minutes -	Smoke from Penetration # 1 has stopped. Penetration # 2 has started to flue vigorously but has slowed.
7 minutes -	Smoke is fluing from Penetration # 5. Penetration # 2 is fluing again. Smoke has ceased fluing from Penetration # 4.
9 minutes -	Fluing from Penetration # 2 has slowed. Smoke is continuing to be emitted from Penetration # 5.
11 minutes -	Fluing from Penetration # 5 has stopped. A small quantity of smoke is being emitted from Penetration # 2 and Penetration # 4 (waste).
20 minutes -	Penetration # 5 is fluing again.
27 minutes -	Water is starting to pool on top of the slab.
167 minutes -	Penetration # 5 is distorting near the base. A small amount of smoke is fluing from the top.
190 minutes -	Smoke is starting to flue from Penetration # 5.
191 minutes -	Insulation failure of Penetration # 5. Temperature recorded on the pipe 25-mm above the slab exceeded 180K.
220 minutes -	Penetration # 5 is starting to disclour near the base.
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 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.

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

8.5 Performance

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

Penetration 1 – H100S-RR cast-in fire collar protecting a nominal 70-mm diameter Wavin AS Pipe

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

Penetration 2 – H100S-RR cast-in fire collar protecting a nominal 110-mm diameter Wavin AS Pipe

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

Penetration 3 – H65S-RR cast-in fire collar protecting a nominal 56-mm diameter Wavin AS Pipe

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

Penetration 4 – H65FWS-RR cast-in fire collar protecting a nominal 56-mm diameter Wavin AS Pipe and 56-mm Wavin AS P-Trap floor waste

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

Penetration 5 – Gas50 retrofit fire collar protecting a 50-mm diameter Pexal Pipe

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

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

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

9 Fire-resistance level (FRL)

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

Penetration 1	-	-/240/240	Penetration 4	-	-/240/240
Penetration 2	-	-/240/240	Penetration 5	-	-/240/180
Penetration 3	-	-/240/240			

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

10 Field of direct application of test results

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

11 Tested by

Russell Collins
Testing Officer

Appendices

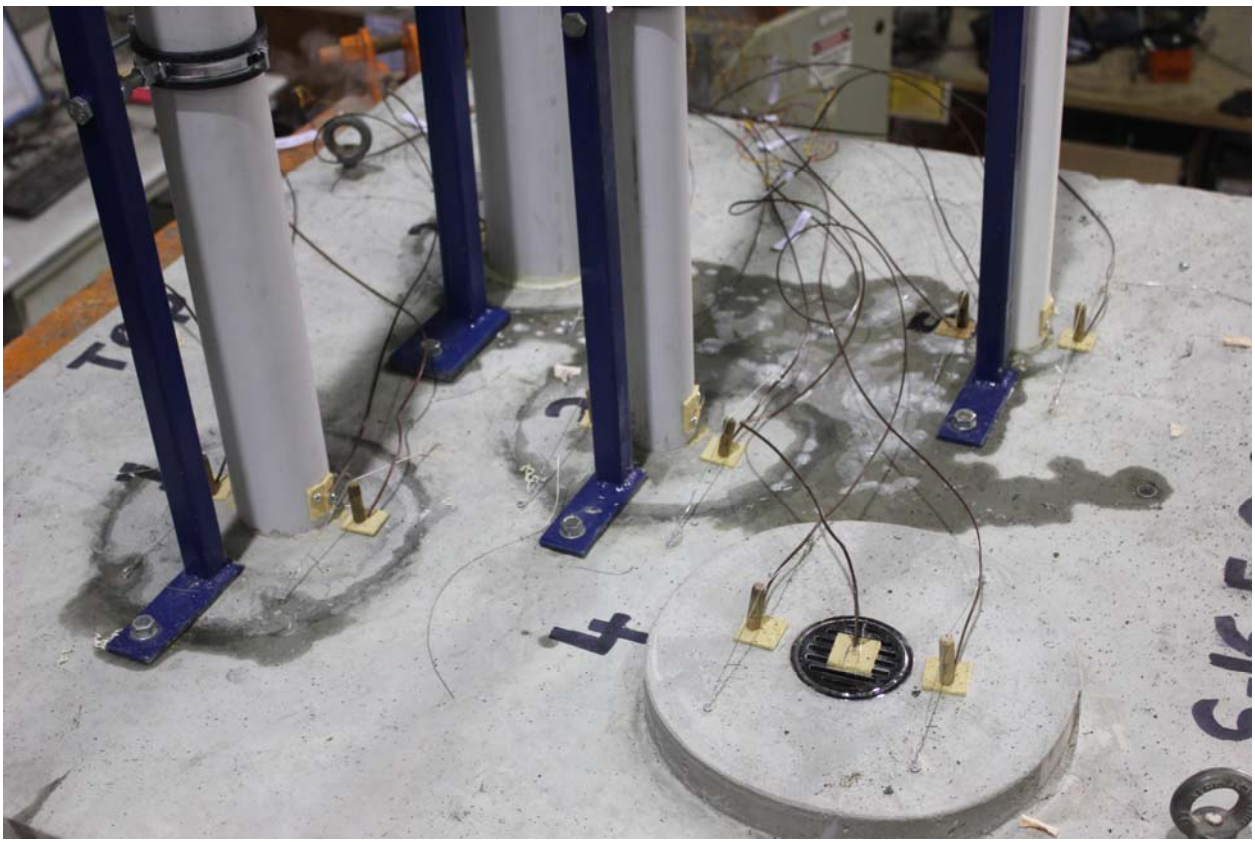
Appendix A – Measurement location

Measurement Location		
Group location **Specimen**	**T/C Position**	**T/C designation**
SPECIMEN 1 – Wavin astolan pipe 78-mm OD protected with H100S-RR cast-in fire collar.	On concrete, 25-mm from the pipe	S1
	On concrete, 25-mm from the pipe	S2
	On pipe – 25-mm up from the concrete slab	S3
	On pipe – 25-mm up from the concrete slab	S4
Specimen 2 – Wavin astolan pipe 110-mm OD protected with H100S-RR cast-in fire collar.	On concrete, 25-mm from the pipe	S5
	On concrete, 25-mm from the pipe	S6
	On pipe – 25-mm up from the concrete slab	S7
	On pipe – 25-mm up from the concrete slab	S8
Specimen 3 – Wavin astolan pipe 58-mm OD protected with H65S-RR cast-in fire collar.	On concrete, 25-mm from the pipe	S9
	On concrete, 25-mm from the pipe	S10
	On pipe – 25-mm up from the concrete slab	S11
	On pipe – 25-mm up from the concrete slab	S12
Specimen 4 – Wavin astolan pipe 58-mm OD protected with H65S-RR cast-in fire collar (floor waste)	On the concrete – 25-mm from the grate	S13
	On the concrete – 25-mm from the grate	S14
	On the floor waste grate	S15
Specimen 5 – Pexal px-al-px pipe 50-mm OD x 4.25-mm wall thickness pipe protected with Gas50 retro fit fire collar.	On concrete, 25-mm from the pipe	S16
	On concrete, 25-mm from the pipe	S17
	On pipe – 25-mm up from the concrete slab	S18
	On pipe – 25-mm up from the concrete slab	S19

Appendix B – Photographs

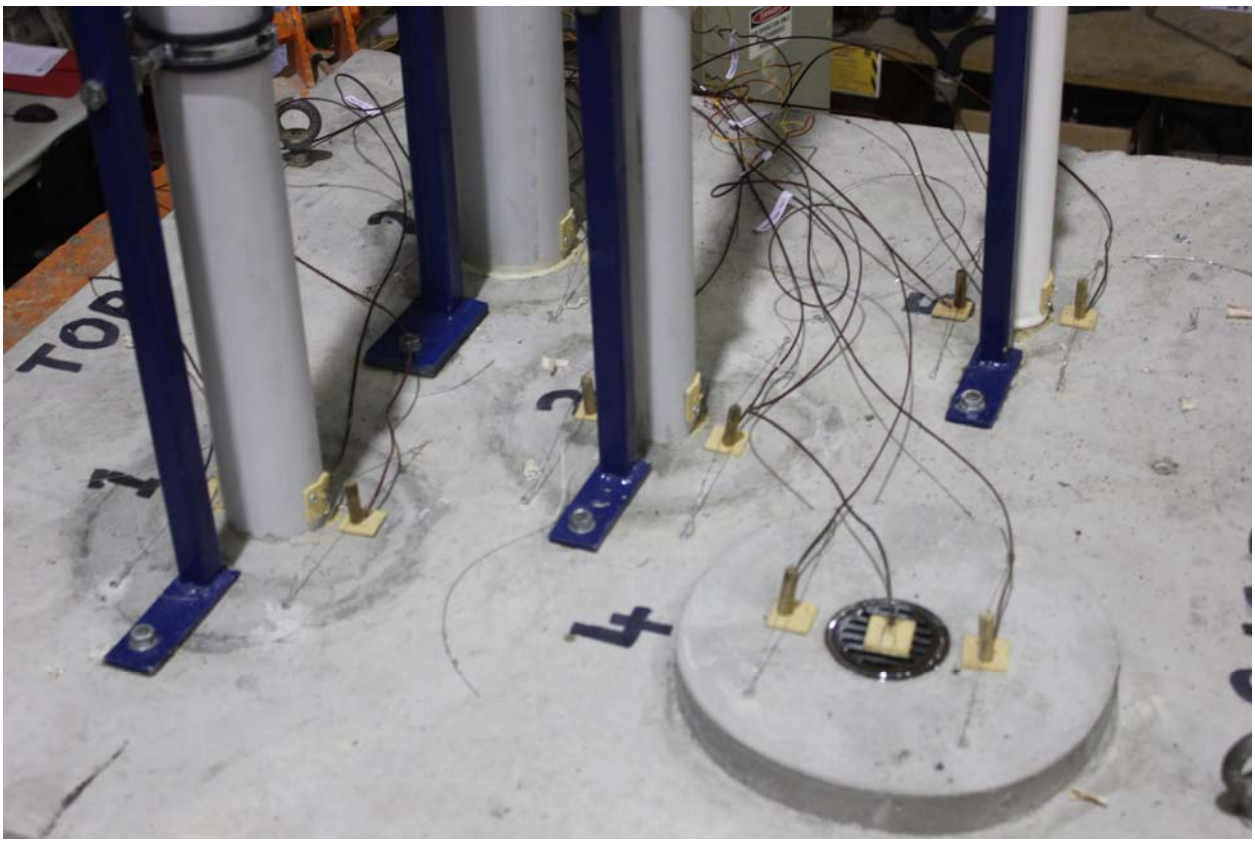
PHOTOGRAPH 1 – EXPOSED FACE OF SPECIMENS PRIOR TO TESTING

PHOTOGRAPH 2 – UNEXPOSED FACE OF SPECIMENS PRIOR TO TESTING

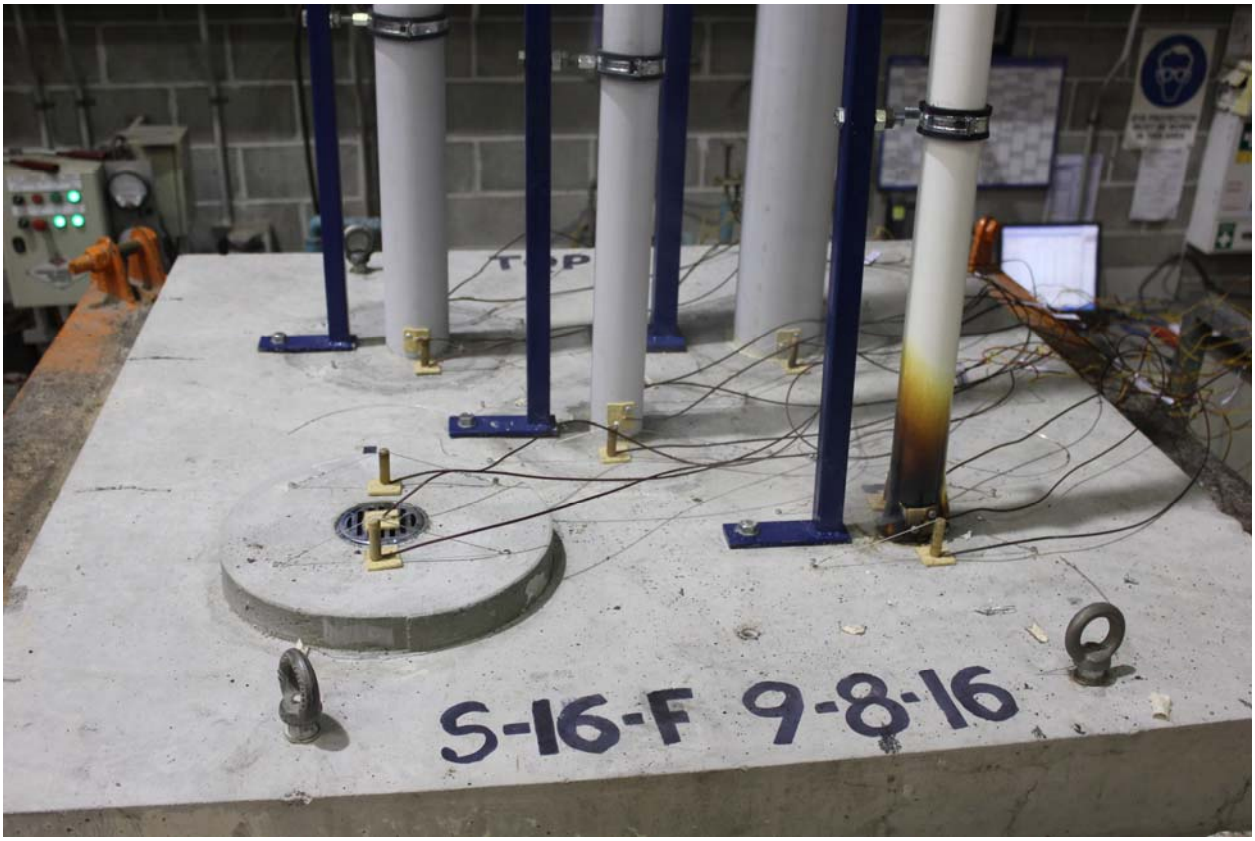


PHOTOGRAPH 3 – SPECIMENS AFTER 60 MINUTES OF TESTING

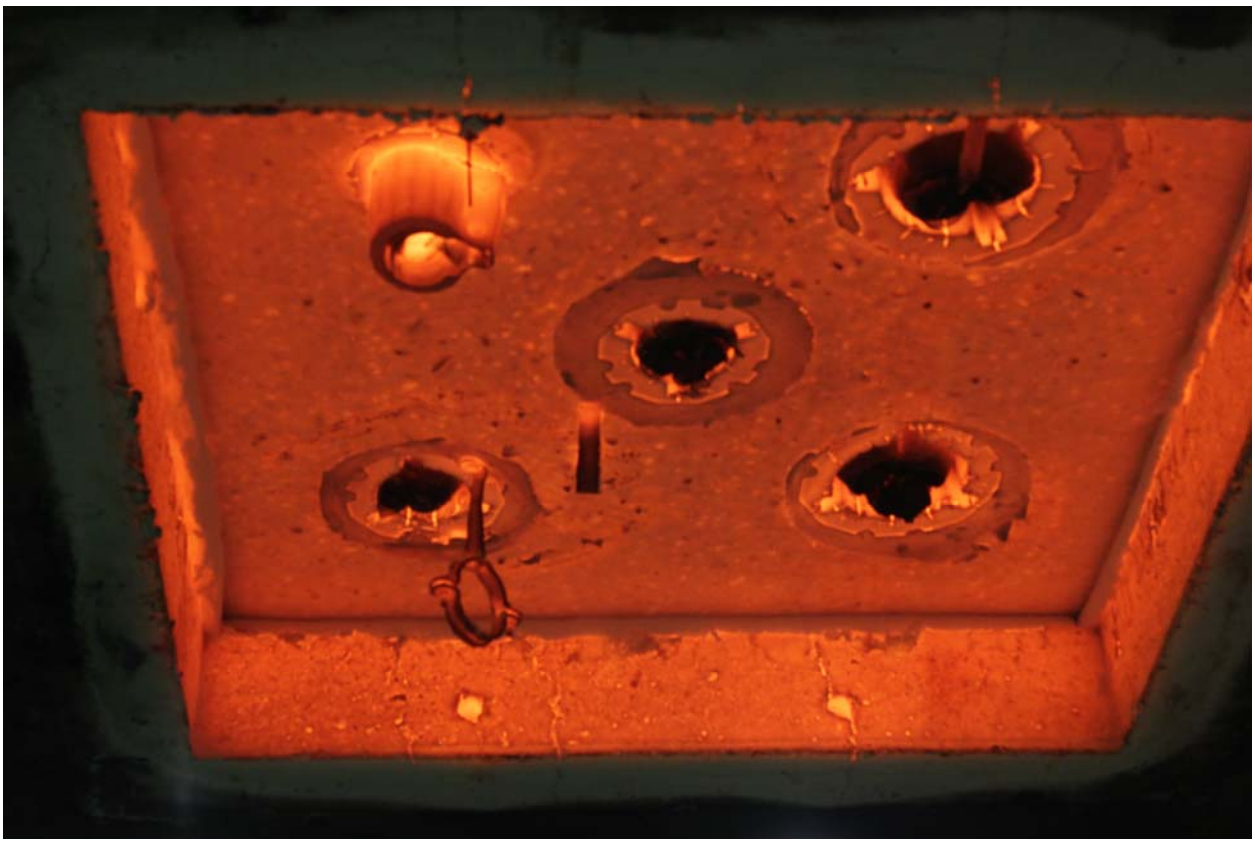
PHOTOGRAPH 4 – SPECIMENS AFTER 120 MINUTES OF TESTING



PHOTOGRAPH 5 – SPECIMENS AFTER 180 MINUTES OF TESTING



PHOTOGRAPH 6 – UNEXPOSED FACED OF SPECIMEN AT CONCLUSION OF TESTING



PHOTOGRAPH 7 – EXPOSED FACE OF SPECIMENS AT CONCLUSION OF TESTING

Appendix C – Furnace Temperature

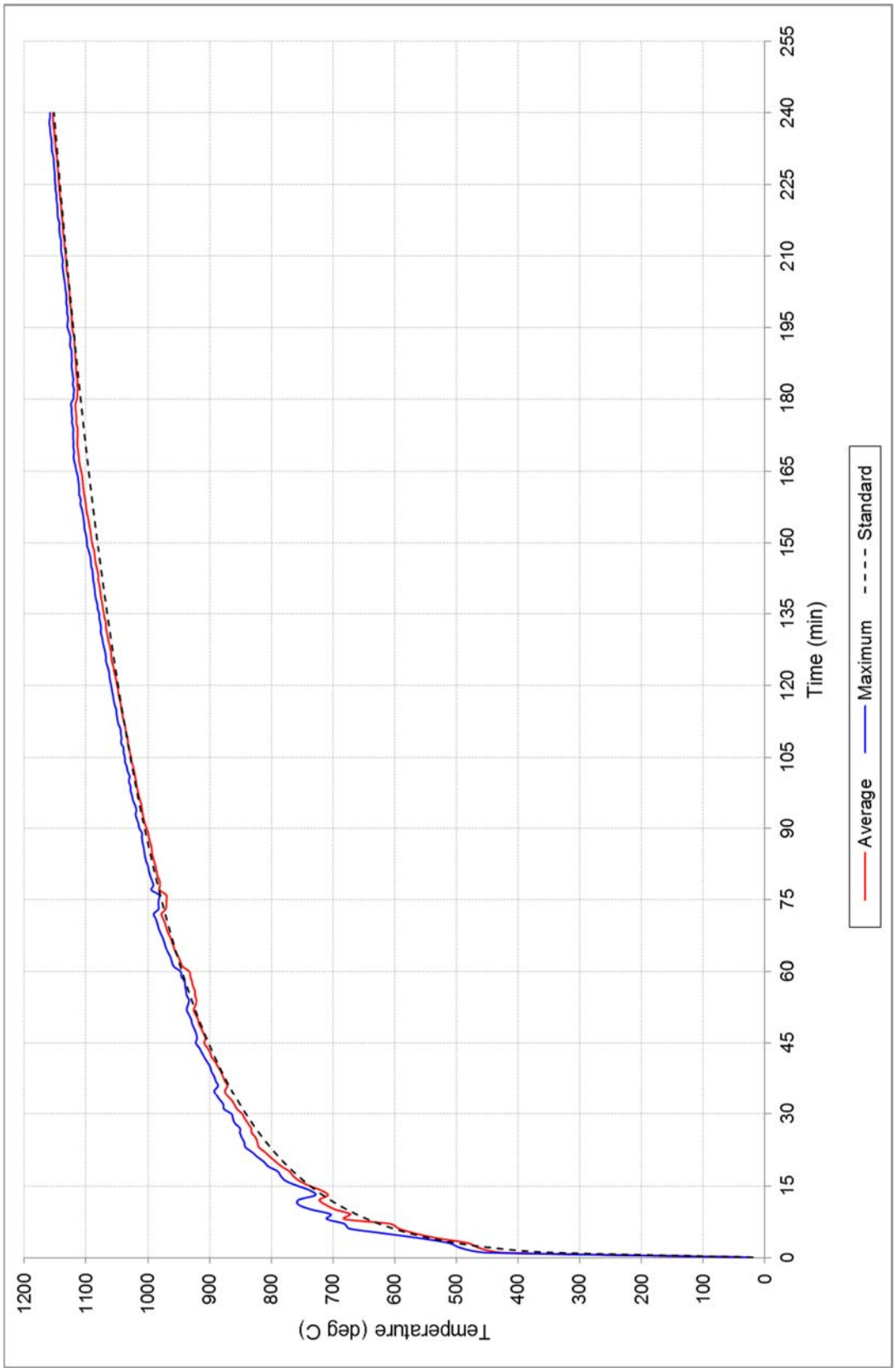


FIGURE 1 – FURNACE TEMPERATURE

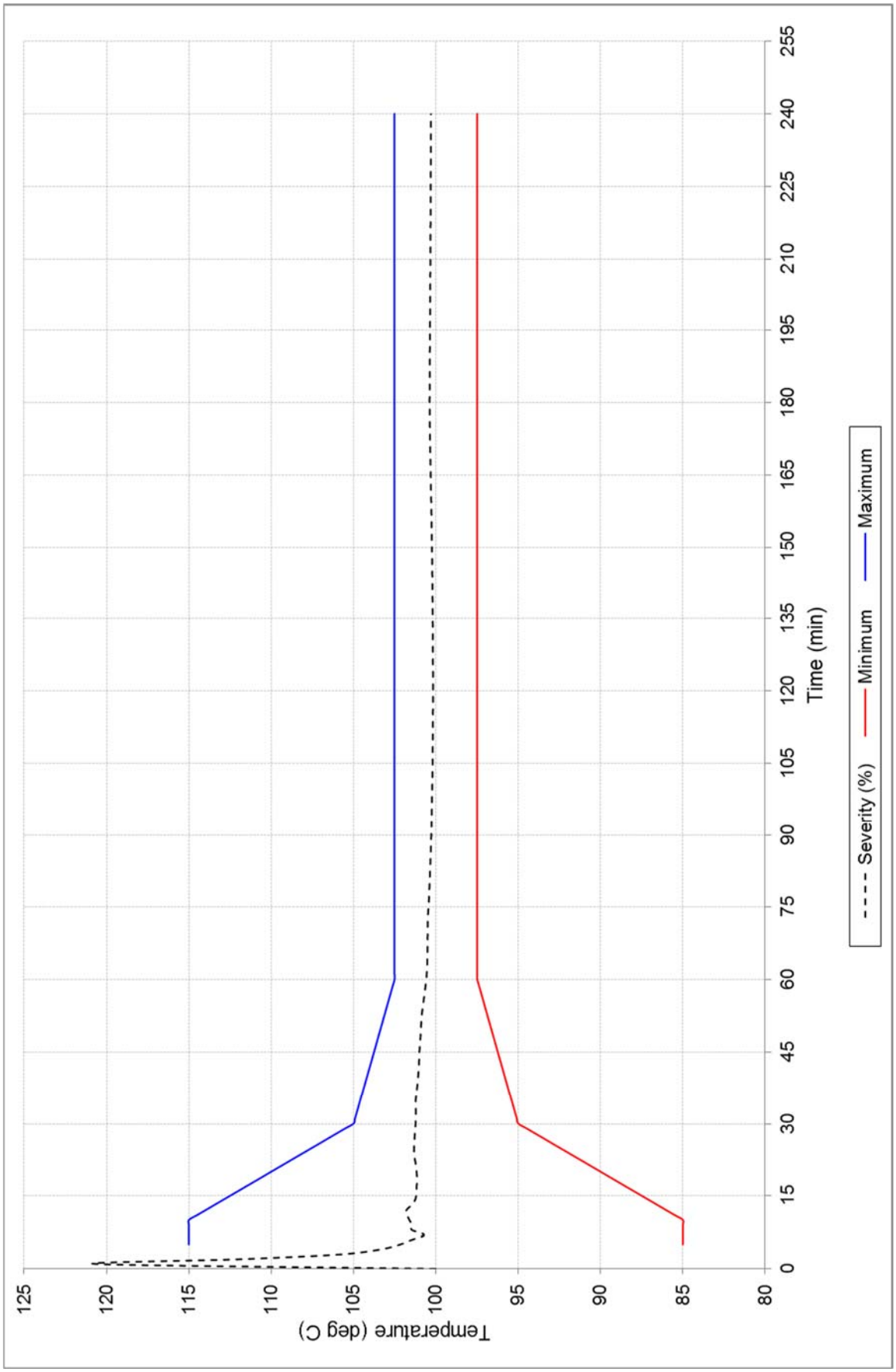


FIGURE 2 – FURNACE SEVERITY

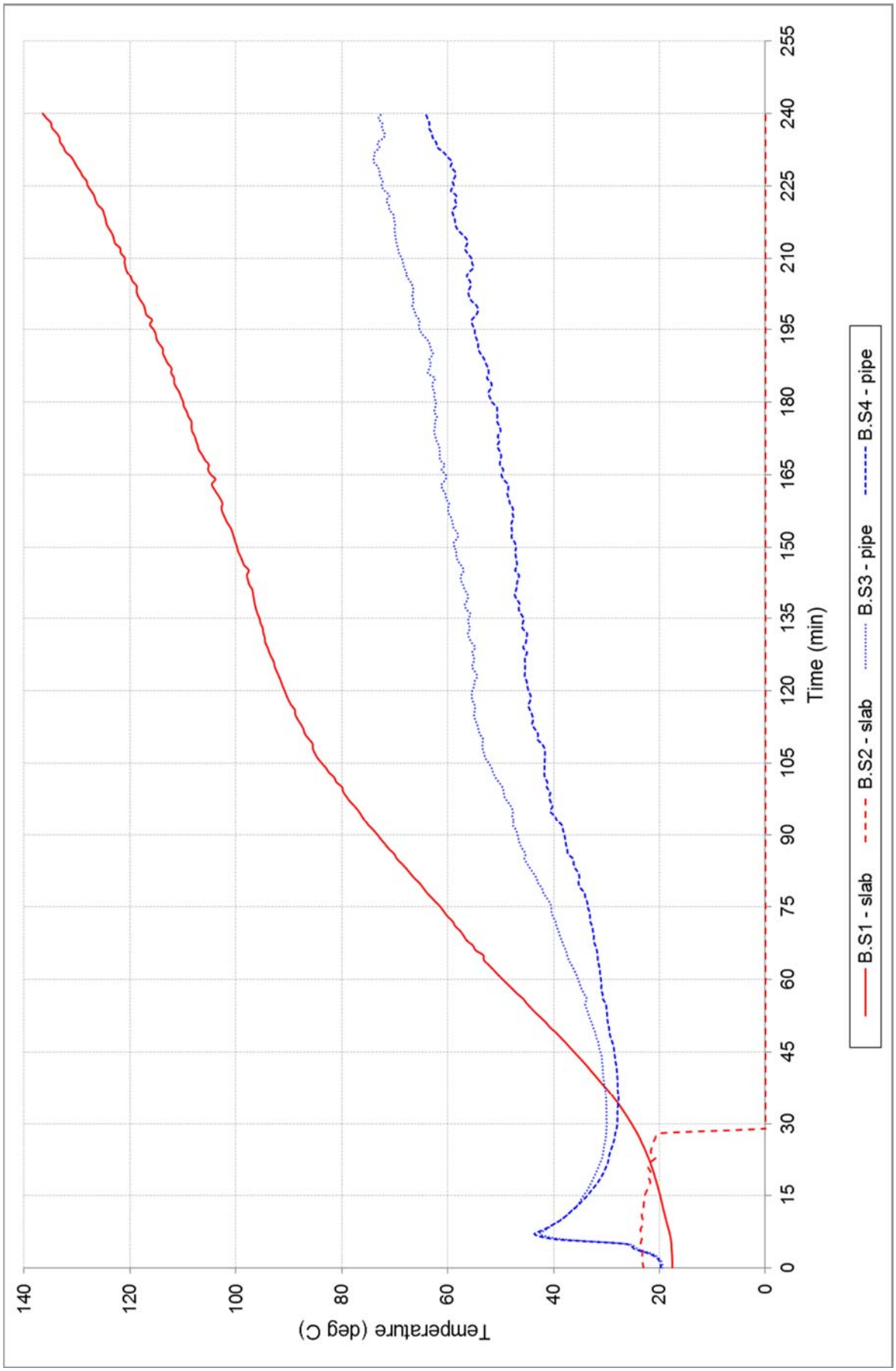


FIGURE 3 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 1

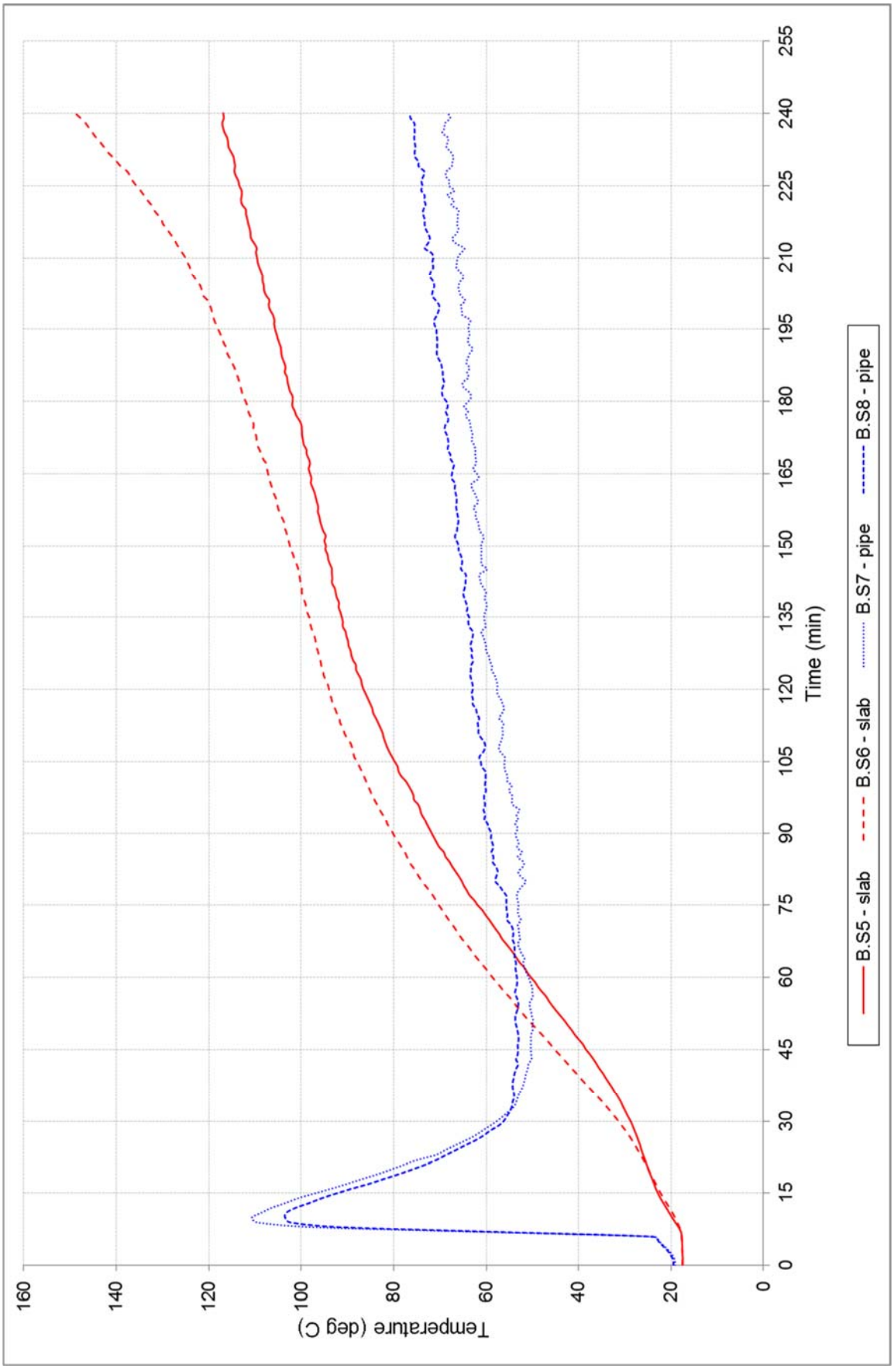


FIGURE 4 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 2

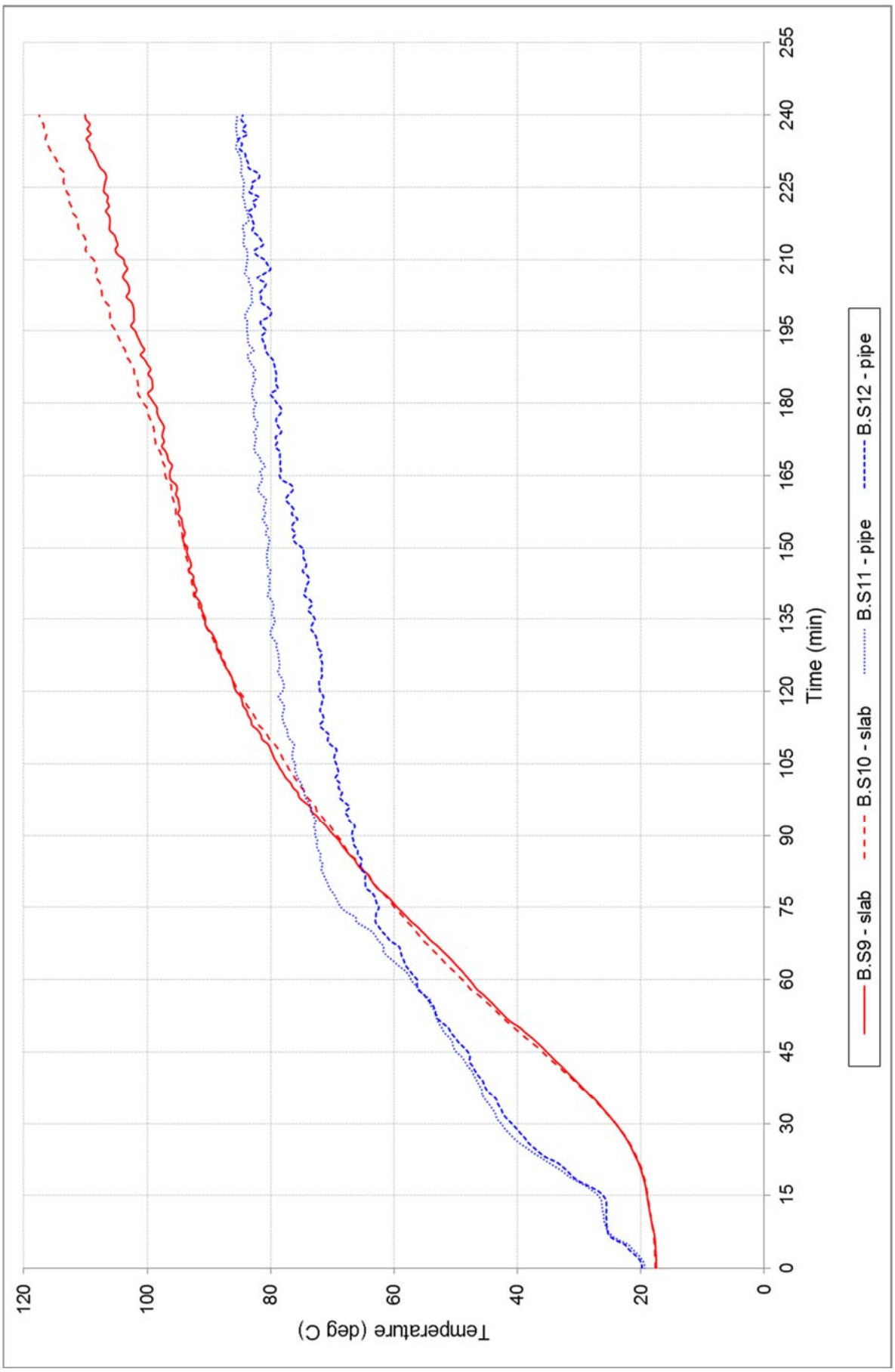


FIGURE 5 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 3

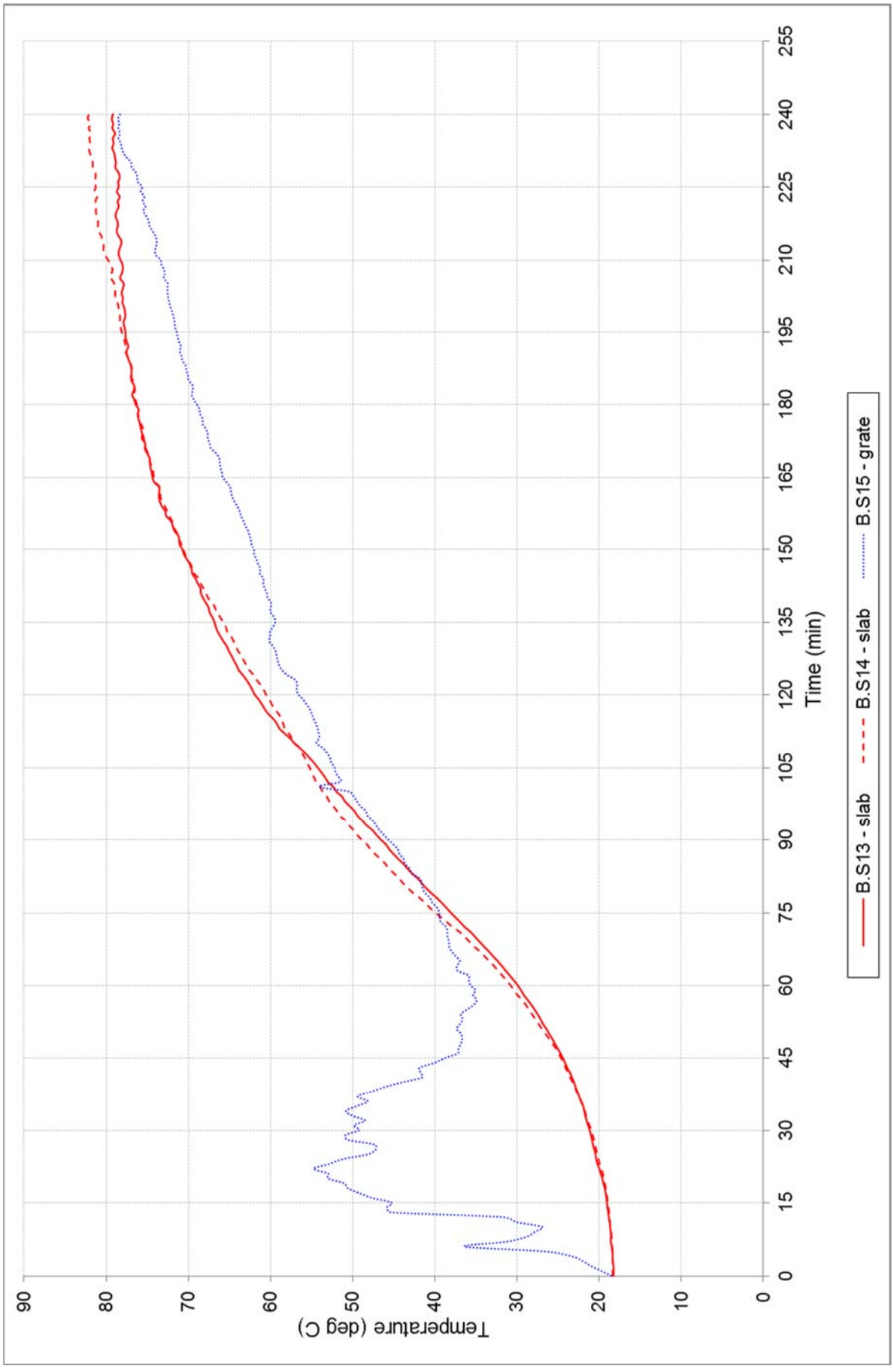


FIGURE 6 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 4

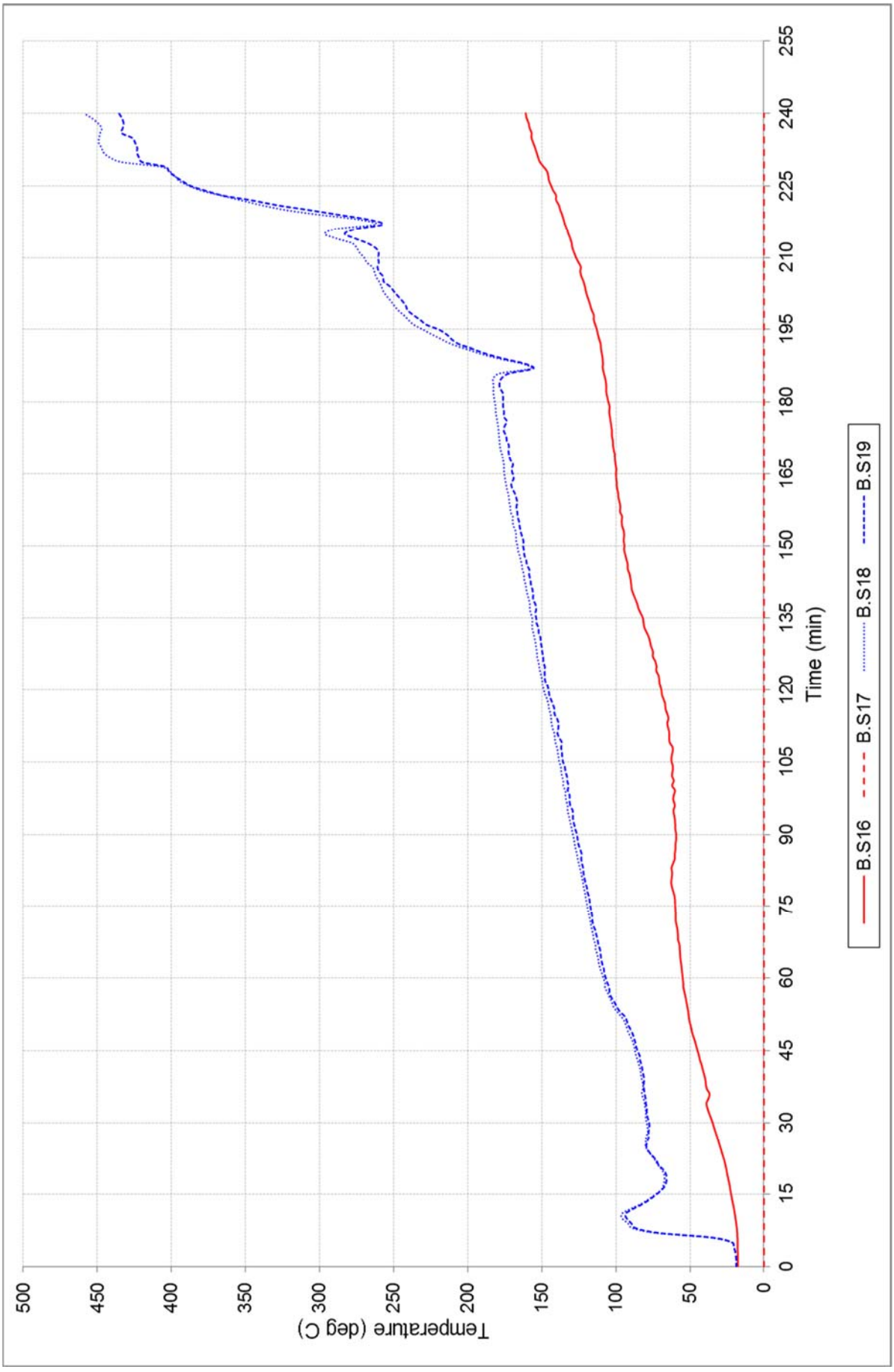
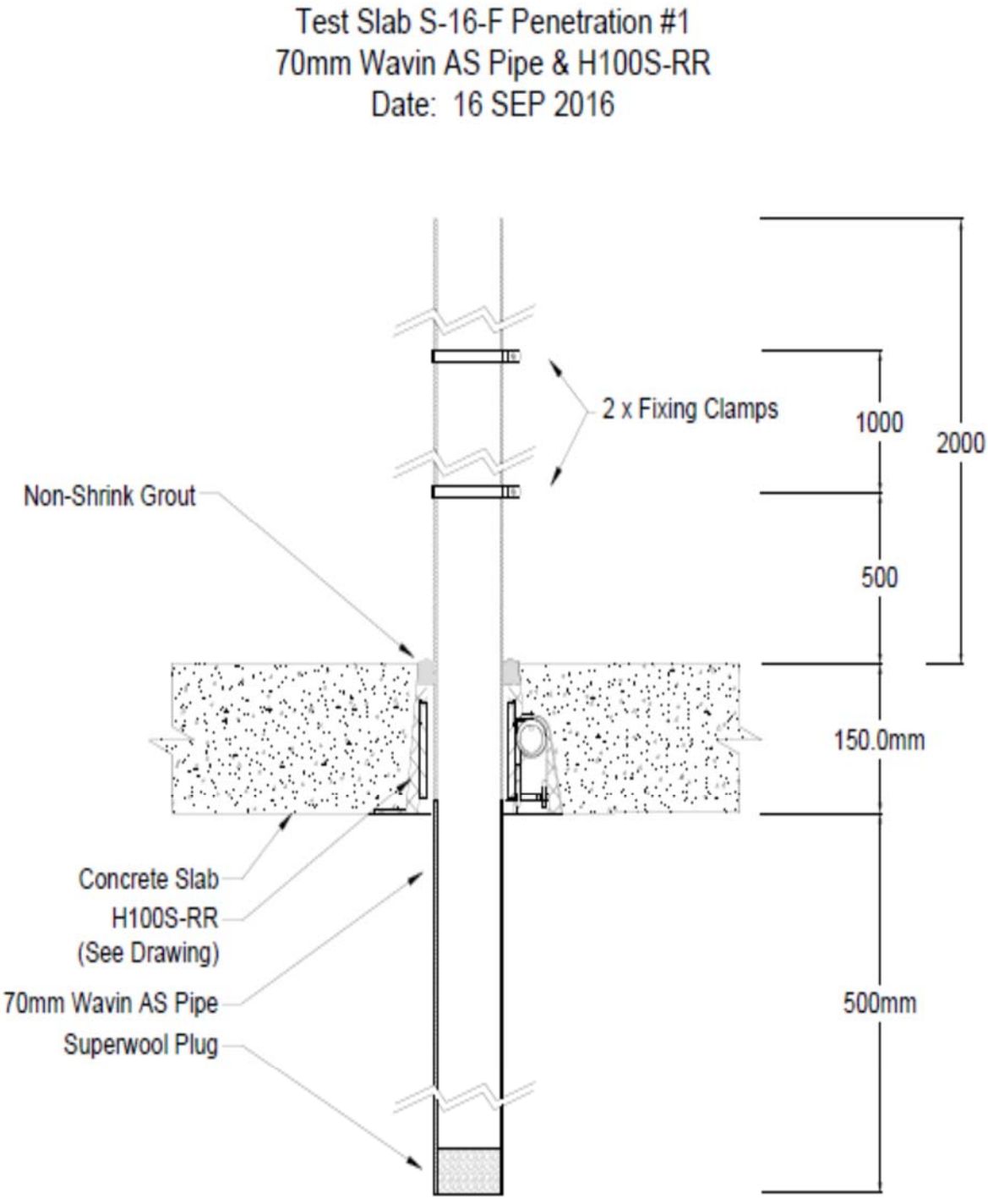
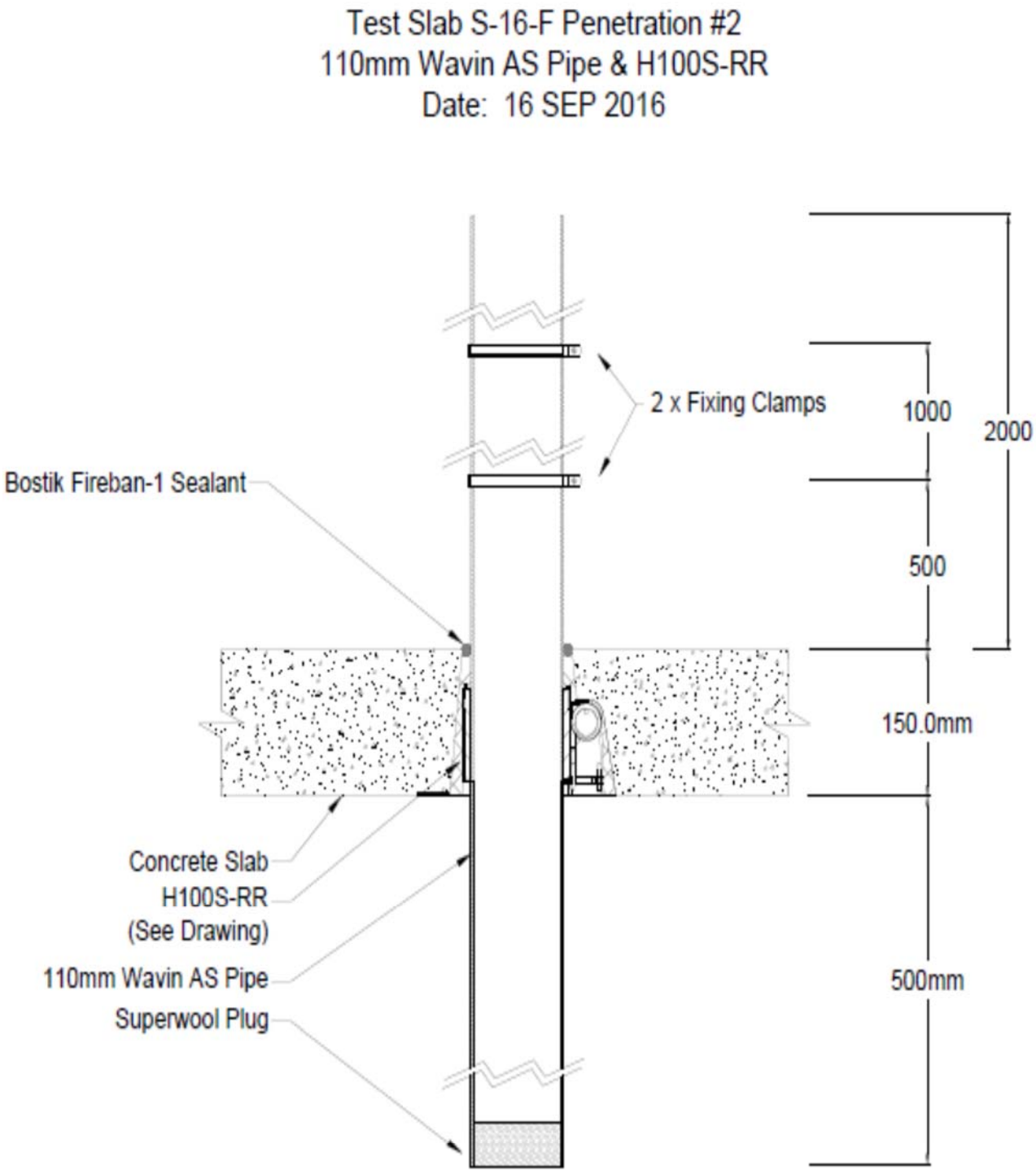


FIGURE 7 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 5

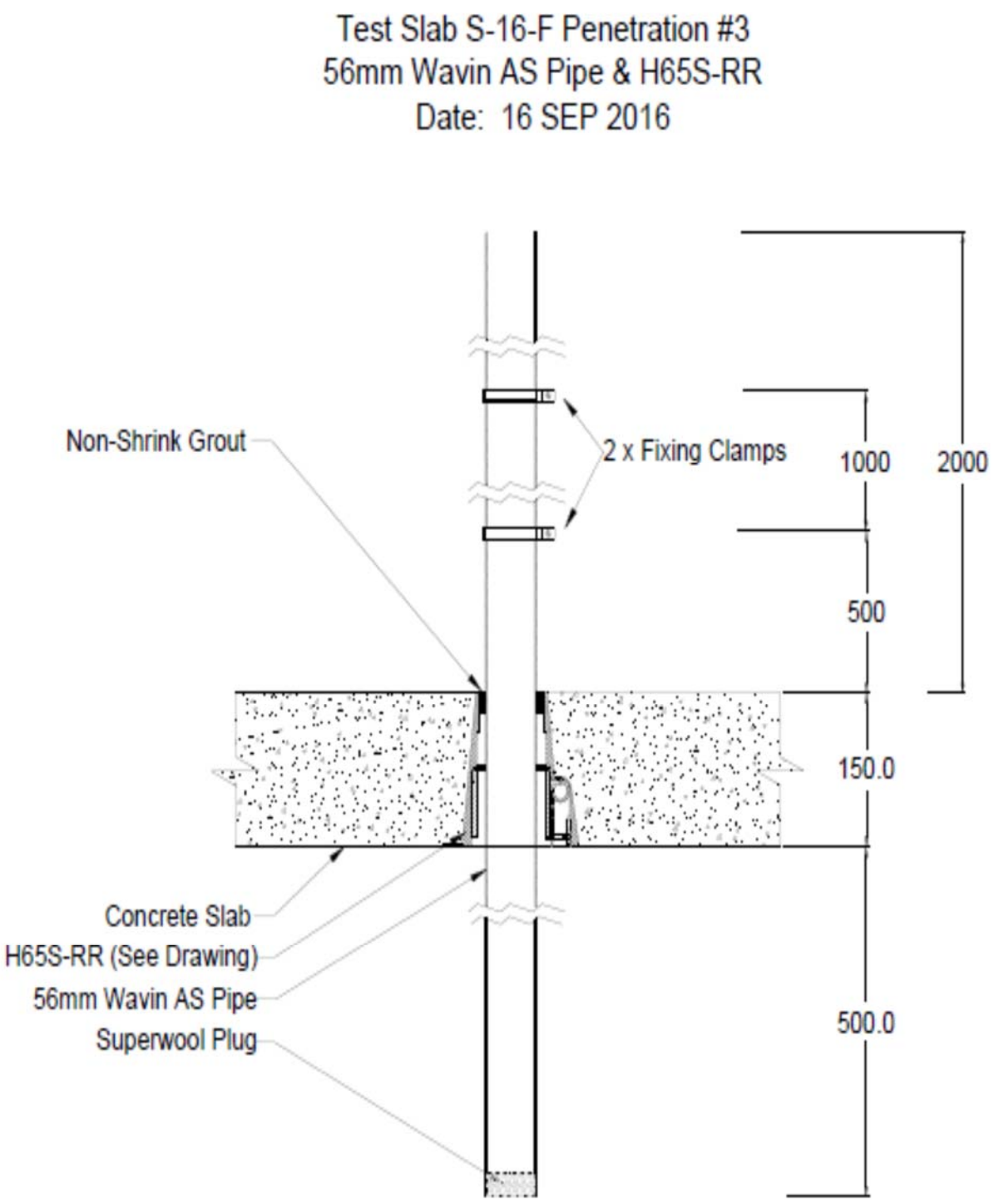
Appendix D – Installation drawings



DRAWING TITLED "TEST SLAB S-16-F PENETRATION # 1 – 70MM WAVIN AS PIPE & H100S -RR" DATED 16 SEPTEMBER 2016, BY SNAP FIRE SYSTEMS PTY LTD.

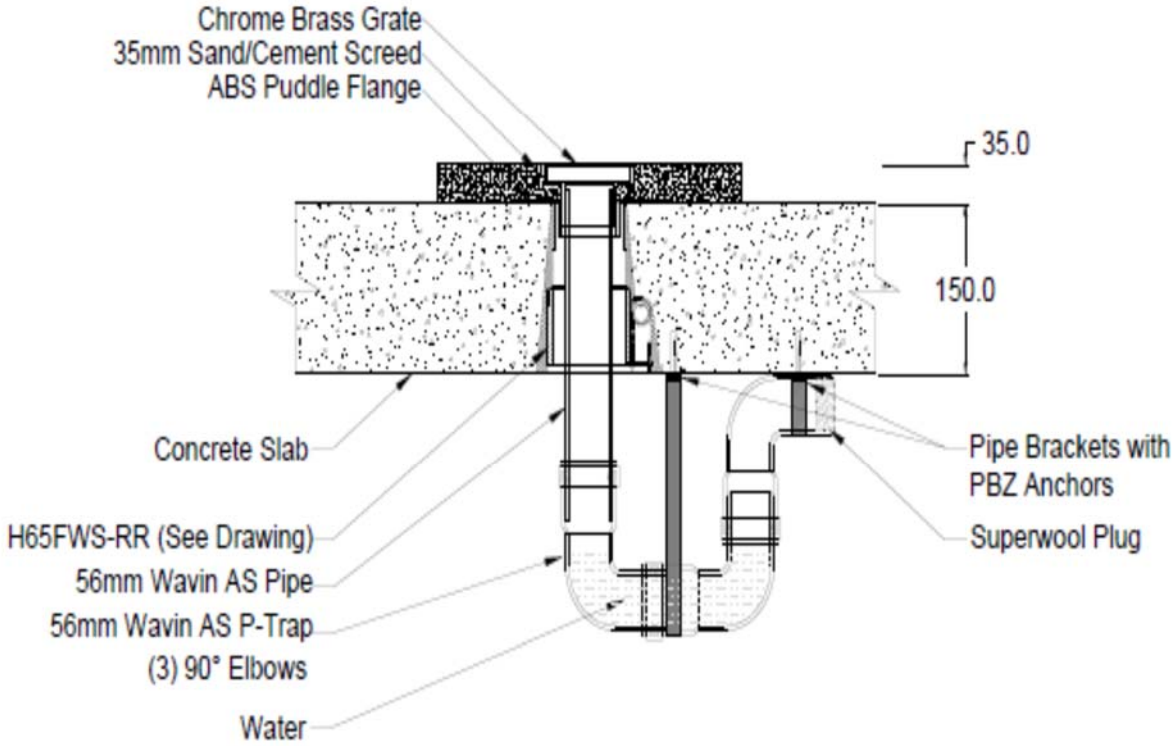


DRAWING TITLED "TEST SLAB S-16-F PENETRATION # 2 – 110MM WAVIN AS PIPE & H100S -RR" DATED 16 SEPTEMBER 2016, BY SNAP FIRE SYSTEMS PTY LTD.

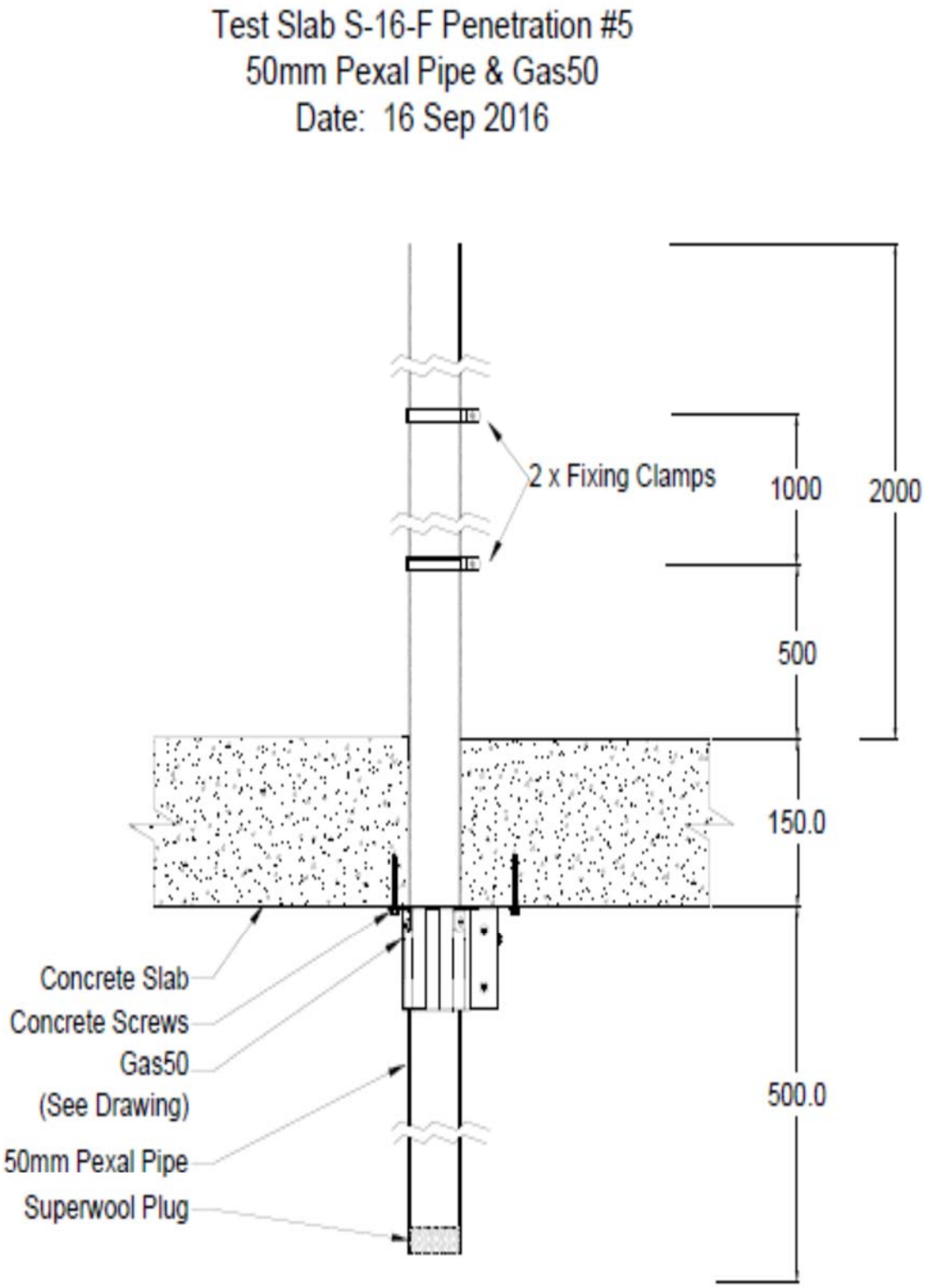


DRAWING TITLED "TEST SLAB S-16-F PENETRATION # 3 – 56-MM WAVIN AS PIPE & H65S -RR" DATED 16 SEPTEMBER 2016, BY SNAP FIRE SYSTEMS PTY LTD.

Test Slab S-16-F Penetration #4
56mm Wavin AS Pipe & H65FWS-RR
Date: 16 SEP 2016

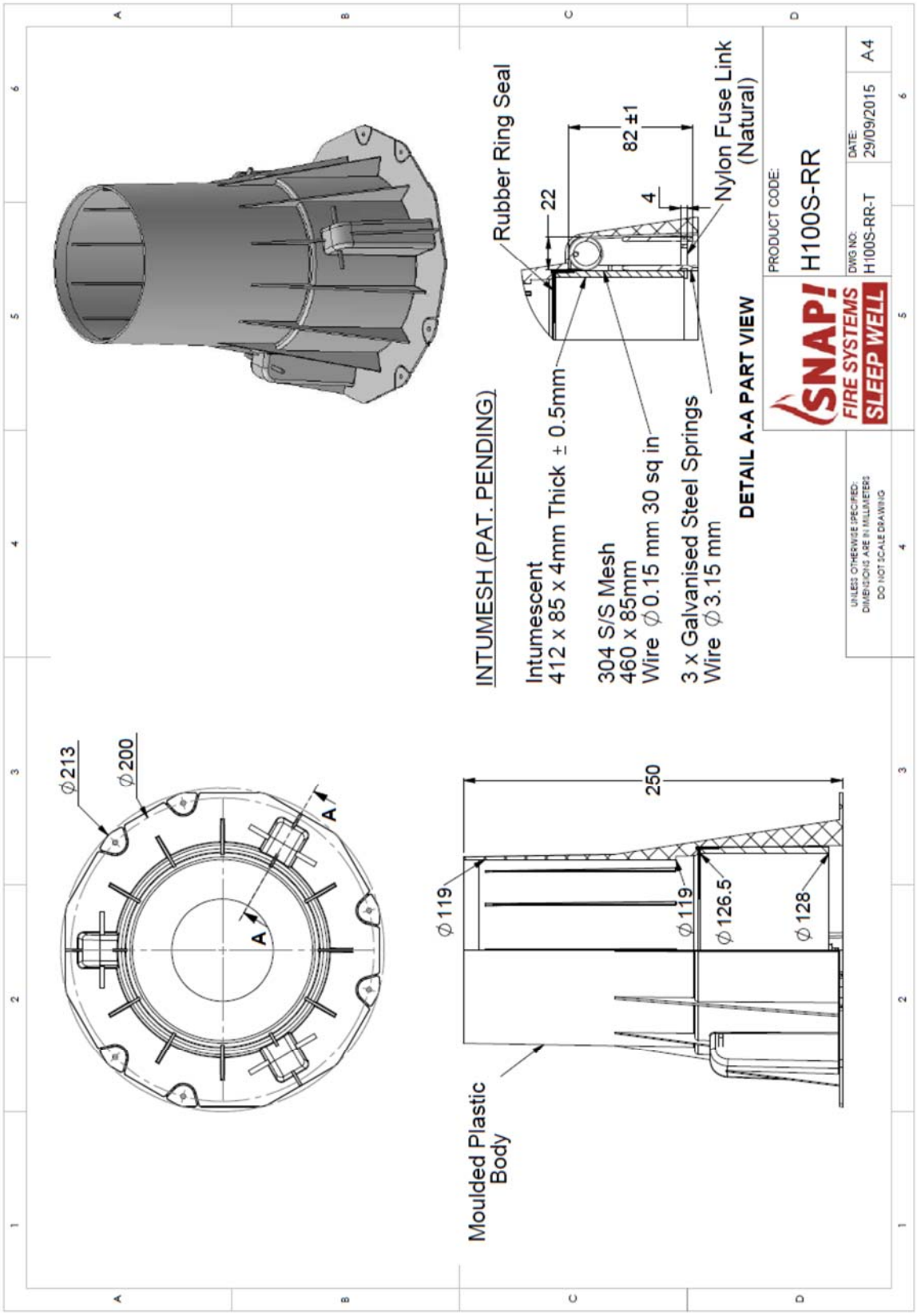


DRAWING TITLED "TEST SLAB S-16-F PENETRATION # 4 – 56-MM WAVIN AS PIPE & H65FWS -RR" DATED 16 SEPTEMBER 2016, BY SNAP FIRE SYSTEMS PTY LTD.

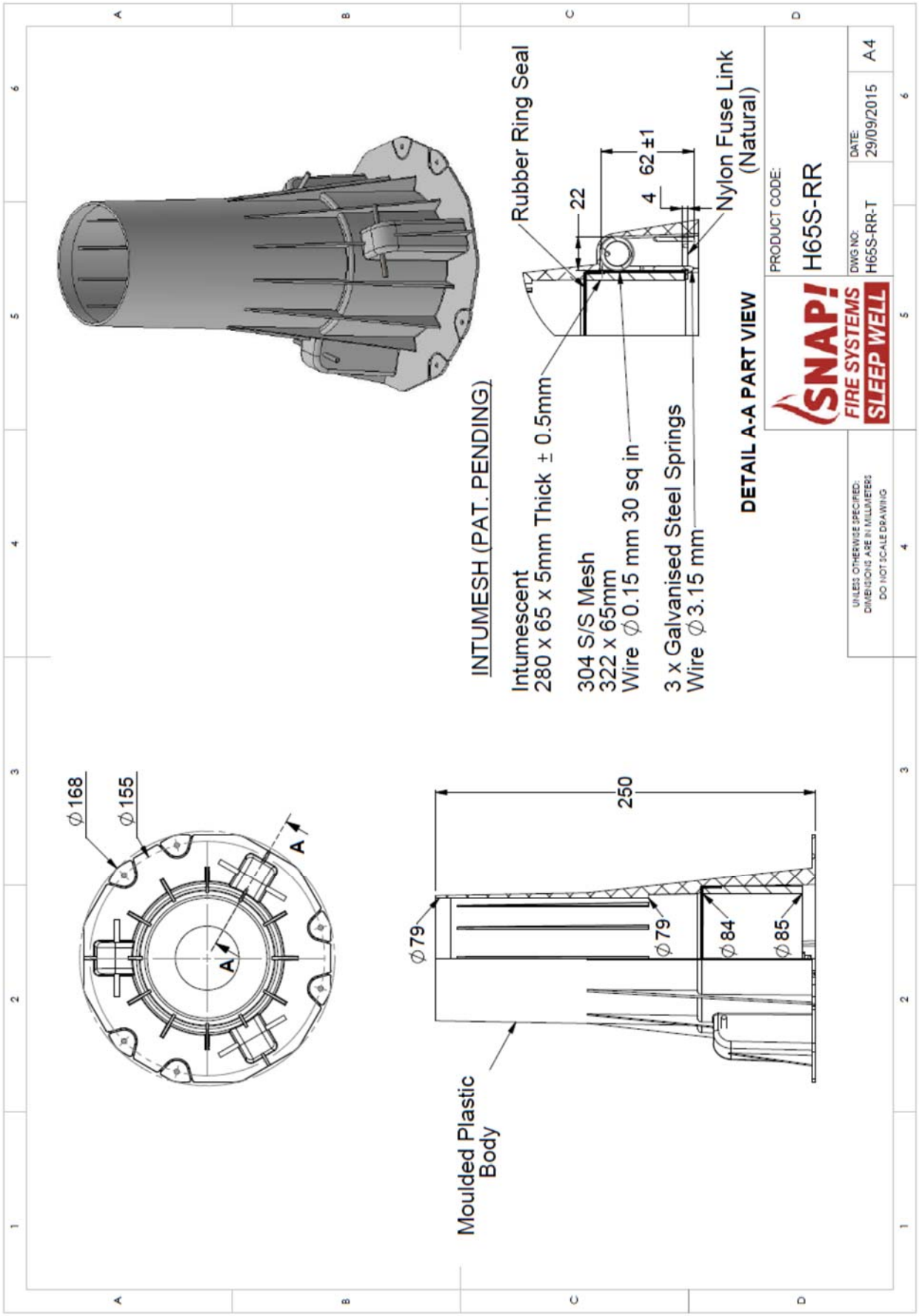


DRAWING TITLED "TEST SLAB S-16-F PENETRATION # 5 – 50-MM PEXAL PIPE & GAS50" DATED 16 SEPTEMBER 2016, BY SNAP FIRE SYSTEMS PTY LTD.

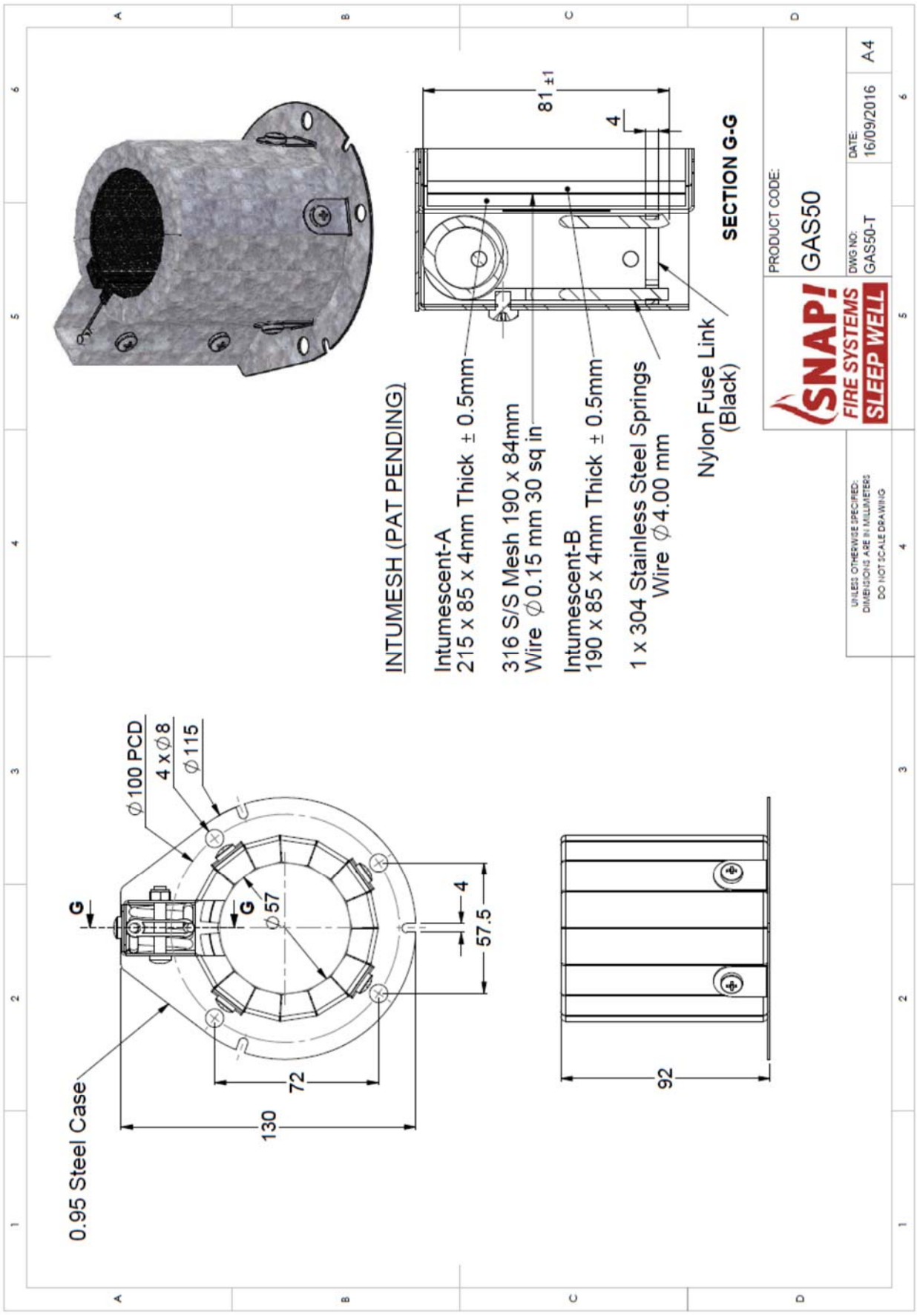
Appendix E – Specimen Drawings



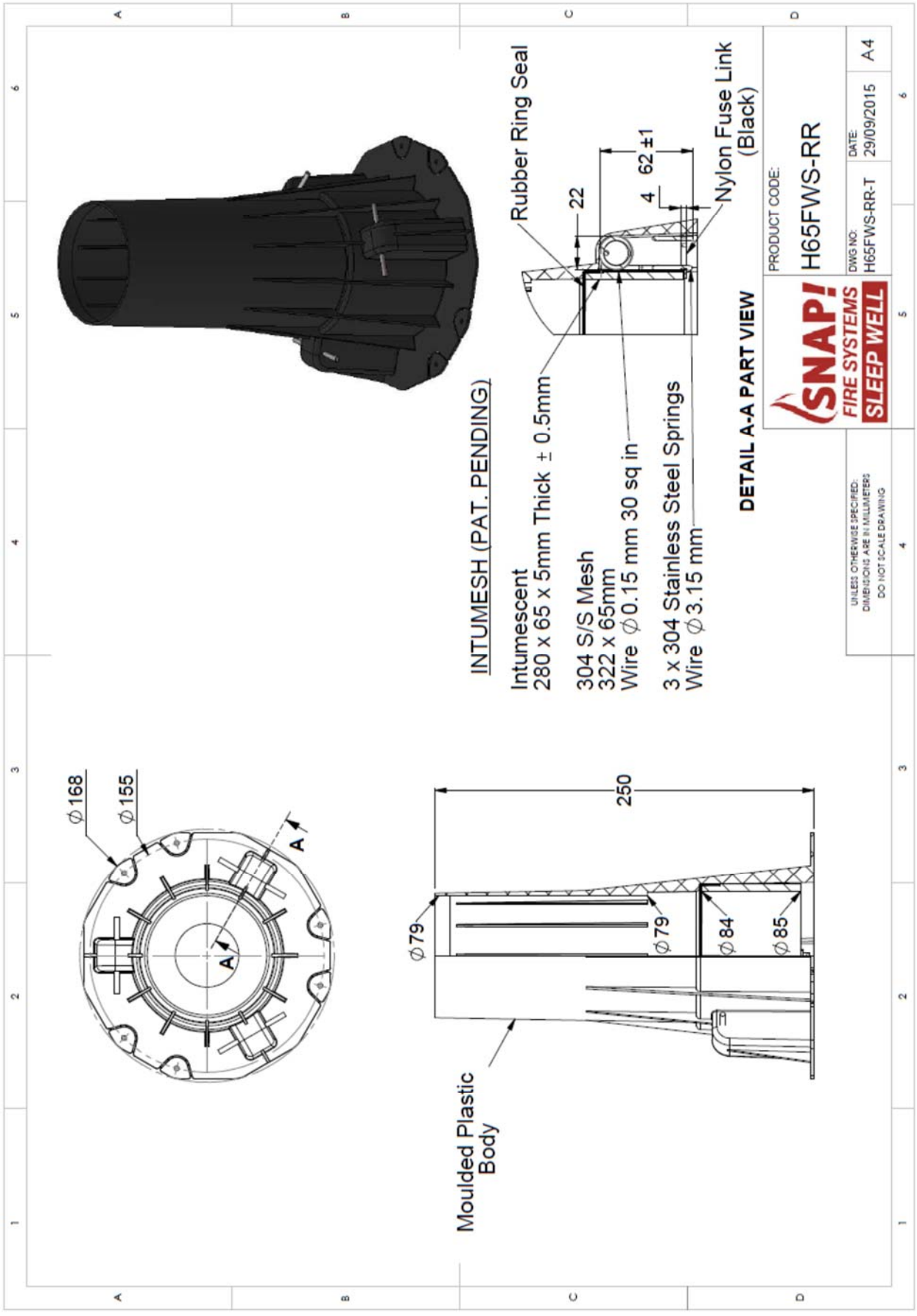
DRAWING NUMBERED H100 S-RR-T DATED 29 SEPTEMBER 2015, BY SNAP FIRE SYSTEMS PTY LTD.



DRAWING NUMBERED H65S-RR-T DATED 29 SEPTEMBER 2015, BY SNAP FIRE SYSTEMS PTY LTD.



DRAWING NUMBERED GAS50-T DATED 16 SEPTEMBER 2016, BY SNAP FIRE SYSTEMS PTY LTD.



DRAWING NUMBERED H65FWS-RR-T DATED 29 SEPTEMBER 2015, BY SNAP FIRE SYSTEMS PTY LTD.

Appendix F – Certificates

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. 2867

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 on behalf of:

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

A full description of the test specimen and the complete test results are detailed in the Division's Sponsored Investigation report numbered FSP 1771.

Product Name: Penetration 1 – H100S-RR cast-in fire collar protecting a nominal 70-mm diameter Wavin AS Pipe

Description: The SNAP Cast-in H100S-RR fire collar comprised a 1.6-mm thick polypropylene casing with a 126.5-mm inner diameter and a 213-mm diameter base flange. The 250-mm high collar casing incorporated a 412-mm x 85-mm x 4-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 460-mm x 85-mm stainless steel mesh as shown in drawing numbered H100S-RR-T dated 29 September 2015, by SNAP Fire Systems Pty Ltd. The penetrating service comprised a nominal 70-mm Wavin AS Pipe, with a wall thickness of 4.5-mm fitted through the collar's sleeve. The pipe 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 "Test Slab S-16-F Penetration # 1 – 70mm Wavin AS Pipe & H100S-RR" dated 16 September 2016, by Snap Fire Systems Pty Ltd. On the exposed end, the pipe was plugged with Superwool. On the unexposed face, the annular gap between the pipe and slab was sealed with non-shrink grout backfill.

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 -/240/240. The fire-resistance level (FRL) are limited to that of the separating element. This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Russell Collins Date of Test: 18 August 2016

Issued on the 25th day of January 2017 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
Accredited for compliance with ISO/IEC 17025 - Testing

COPY OF CERTIFICATE OF TEST – NO. 2867

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. 2868

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 on behalf of:

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

A full description of the test specimen and the complete test results are detailed in the Division's Sponsored Investigation report numbered FSP 1771.

Product Name: Penetration 2 – H100S-RR cast-in fire collar protecting a nominal 110-mm diameter Wavin AS Pipe

Description: The SNAP Cast-in H100S-RR fire collar comprised a 1.6-mm thick polypropylene casing with a 126.5-mm inner diameter and a 213-mm diameter base flange. The 250-mm high collar casing incorporated a 412-mm x 85-mm x 4-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 460-mm x 85-mm stainless steel mesh as shown in drawing numbered H100S-RR-T dated 29 September 2015, by SNAP Fire Systems Pty Ltd. The penetrating service comprised a nominal 110-mm Wavin AS pipe, with a wall thickness of 5.7-mm fitted through the collar's sleeve. The pipe 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 "Test Slab S-16-F Penetration # 2 – 110mm Wavin AS Pipe & H100S-RR" dated 16 September 2016, by Snap Fire Systems Pty Ltd. On the exposed end, the pipe was plugged with Superwool. On the unexposed face, the annular gap between the pipe and slab was sealed with Bostik Fireban-1 Sealant.

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 -/240/240. The fire-resistance level (FRL) are limited to that of the separating element. This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Russell Collins Date of Test: 18 August 2016

Issued on the 25th day of January 2017 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

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Certificate of Test

No. 2869

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 on behalf of:

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

A full description of the test specimen and the complete test results are detailed in the Division's Sponsored Investigation report numbered FSP 1771.

Product Name: Penetration 3 – H65S-RR cast-in fire collar protecting a nominal 56-mm diameter Wavin AS Pipe

Description: The SNAP Cast-in H65S-RR fire collar comprised a 1.6-mm thick polypropylene casing with a 84-mm inner diameter and a 168-mm 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 galvanised steel springs bound with nylon fuse links and a 322-mm x 65-mm stainless steel mesh as shown in drawing numbered H65S-RR-T dated 29 September 2015, by SNAP Fire Systems Pty Ltd. The penetrating service comprised a nominal 56-mm Wavin AS pipe, with a wall thickness of 4.8-mm fitted through the collar's sleeve. The pipe 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 "Test Slab S-16-F Penetration # 3 – 56-mm Wavin AS Pipe & H65S-RR" dated 16 September 2016, by Snap Fire Systems Pty Ltd. On the exposed end, the pipe was plugged with Superwool. On the unexposed face, the annular gap between the pipe and slab was sealed with non-shrink grout backfill.

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 -/240/240. The fire-resistance level (FRL) are limited to that of the separating element. This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Russell Collins Date of Test: 18 August 2016

Issued on the 25th day of January 2017 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

This document is issued in accordance with NATA's accreditation requirements.
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Certificate of Test

No. 2870

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 on behalf of:

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

A full description of the test specimen and the complete test results are detailed in the Division's Sponsored Investigation report numbered FSP 1771.

Product Name: Penetration 4 – H65FWS-RR cast-in fire collar protecting a nominal 56-mm diameter Wavin AS Pipe and 56-mm Wavin AS P-Trap floor waste

Description: The SNAP Cast-in H65FWS-RR fire collar comprised a 1.6-mm thick polypropylene casing with an 84-mm inner diameter and a 168-mm 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 a black nylon fuse link and a 322-mm x 65-mm stainless steel mesh as shown in drawing numbered H65FWS-RR-T dated 29 September 2015, by SNAP Fire Systems Pty Ltd. The penetrating service comprised a nominal 56-mm Wavin AS pipe, with a wall thickness of 4.8-mm fitted through the collar's sleeve. The floor waste system was fitted with a chromed brass floor waste grate. A 35-mm thick cement screed was laid on top of the concrete slab and finished flush with the floor grate. On the exposed side of the slab, 3 x nominal 56-mm OD Wavin AS P-Trap 90° elbows were connected to the penetrating pipe, supported by pipe brackets with PBZ anchors to the concrete slab. On the exposed face, the gully trap was capped using a Superwool plug. The floor waste gully was charged with water to the level shown in drawing titled "Test Slab S-16-F Penetration # 4 56-mm Wavin AS Pipe & H65FWS-RR, dated 16 September 2016, by Snap Fire Systems Pty Ltd.

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 -/240/240. The fire-resistance level (FRL) are limited to that of the separating element. This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Russell Collins Date of Test: 18 August 2016

Issued on the 25th day of January 2017 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. 2871

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 on behalf of:

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

A full description of the test specimen and the complete test results are detailed in the Division's Sponsored Investigation report numbered FSP 1771.

Product Name: Penetration 5 – Gas50 retrofit fire collar protecting a nominal 50-mm diameter Valsir Pexal Pipe

Description: The SNAP Retrofit Gas50 collar comprised a 0.95-mm thick steel casing with a 57-mm inner diameter and a 30-mm diameter base flange. The 92-mm high collar casing incorporated a layer of 215-mm x 85-mm x 4-mm thick Intumescent material and a layer of 190-mm x 85-mm x 4-mm thick intumescent material. The closing mechanism comprised 1 x 304 stainless steel spring bound with a black nylon fuse link and a 316 stainless steel mesh measuring 190 x 84-mm as shown in drawing numbered Gas50-T dated 16 September 2016, by Snap Fire Systems Pty Ltd. The penetrating service comprised a nominal 50-mm Px-Al-Px pipe, with a wall thickness of 4.2 mm fitted through the collar's sleeve. The pipe 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 "Test Slab S-16-F Penetration # 5 – 50-mm Pexal Pipe & Gas50" dated 16 September 2016, by Snap Fire Systems Pty Ltd. On the exposed end, the pipe was plugged with Superwool.

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

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/240/180. The fire-resistance level (FRL) are limited to that of the separating element. This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Russell Collins Date of Test: 18 August 2016

Issued on the 25th day of January 2017 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

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COPY OF CERTIFICATE OF TEST – NO. 2871

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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