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

Test Report

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Report number: FSP 1696
Date: 31 August 2015

Client: Snap Fire Systems Pty Ltd

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Contents

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

Sponsored Investigation No. FSP 1696

1 Introduction

1.1 Identification of specimen

The sponsor identified the specimen as Snap Cast-in Fire Collars protecting a 150-mm thick concrete slab penetrated by three (3) stack pipes and two (2) floor waste.

1.2 Sponsor

Snap Fire Systems Pty Ltd
Unit 2/160 Redland Bay Road
CAPALABA QLD

1.3 Manufacturer

Snap Fire Systems Pty Ltd
Unit 2/160 Redland Bay Road
CAPALABA QLD

1.4 Test standard

Australian Standard 1530, Methods for fire tests on building materials, components and structures, Part 4-2005, 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 4478/3846

1.7 Test date

The fire-resistance test was conducted on 16 March 2015.

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 two (2) floor wate protected by retrofit Snap Fire System fire collars.

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
- EN 1519-1:2000 - Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure. Polyethylene (PE). Specifications for pipes, fittings and the system

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

Penetration # 1 – H65S-RR cast-in fire collar protecting a 69-mm diameter Polyvinyl Chloride (PVC) Pipe-Stack with a fitting inside the collar

The SNAP H65S-RR cast-in 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, nylon fuse links, and a 322-mm x 65-mm 304 stainless steel mesh as shown in drawing numbered H65S-RR-T dated 23 April 2015, by Snap Fire Systems Pty Ltd.

The penetrating service comprised a 69-mm diameter Polyvinyl Chloride (PVC) Pipe-Stack, with a wall thickness of 3-mm fitted through the collar's sleeve. The pipe projected vertically, 2000-mm above the concrete slab. The pipe was supported at 500-mm and 1000-mm from the unexposed face of the concrete slab. On the exposed side of the slab, a nominal 69-mm OD PVC Elbow was connected to the penetrating pipe within the collar, supported by a Pipe Bracket with two 6.5-m Hex Head Concrete anchors to the concrete slab. On the exposed face, the pipe was capped using a PVC end cap.

On the unexposed face, the gap between the pipe and the slab was filled with a bead of Fullers Firesound as show in drawing titled "Test Slab S-15-A Penetration #1 – 69-mm PVC Pipe Stack, dated 18 June 2015, by Snap Fire Systems Pty Ltd.

Penetration 2 – H65FWS cast-in fire collar protecting a 69-mm diameter Polyvinyl Chloride (PVC) pipe incorporating a floor waste and a fitting inside the collar

The SNAP H65FWS cast 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. The closing mechanism comprised three stainless steel springs, nylon fuse links, and a 322-mm x 65-mm stainless steel mesh, as shown in drawing numbered H65FWS-T, dated 8 July 2015, by Snap Fire Systems Pty Ltd.

The penetrating service comprised a 69-mm diameter Polyvinyl Chloride (PVC) Pipe, with a wall thickness of 3.2-mm fitted through the collar's sleeve. The floor waste system was fitted with a chrome brass 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, a nominal 69-mm OD PVC Elbow was connected to the penetrating pipe, supported by a Pipe Bracket with two 6.5-m Hex Head Concrete anchors to the concrete slab. On the exposed face, the gully trap was capped using a PVC end cap.

The floor waste gully was charged with water to the level shown in drawing titled "Test Slab S-15-A Penetration #2 69-mm PVC Pipe - Floor Waste", dated 18 June 2015, by Snap Fire Systems Pty Ltd.

Penetration # 3 – H65S cast-in fire collar protecting a 56-mm diameter Polyvinyl Chloride (PVC) Pipe-Stack with a fitting inside the collar

The SNAP cast-in H65S collar comprised a 1.6-mm thick polypropylene casing 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 strip of Intumesh intumescent material. The closing mechanism comprised three stainless steel springs, nylon fuse links, and a 322-mm x 65-mm 304 stainless steel mesh as shown in drawing numbered H65S-T dated 8 July 2015, by Snap Fire Systems Pty Ltd.

The penetrating service comprised a 56-mm diameter Polyvinyl Chloride (PVC) Pipe-Stack, with a wall thickness of 2.6-mm fitted through the collar's sleeve. The pipe projected vertically, 2000-mm above the concrete slab. The pipe was supported at 500-mm and 1000-mm from the unexposed face of the concrete slab. On the exposed side of the slab, a nominal 56-mm OD PVC Elbow was connected to the penetrating pipe within the collar, supported by a Pipe Bracket with two 6.5-m Hex Head Concrete anchors to the concrete slab. On the exposed face, the gully trap was capped using a PVC end cap.

On the unexposed face, the gap between the pipe and the slab was filled with a bead of Fullers Firesound as show in drawing titled "Test Slab S-15-A Penetration #3 – 56-mm PVC Pipe-Stack", dated 18 June 2015, by Snap Fire Systems Pty Ltd.

Penetration 4 – H65FWS-RR cast-in fire collar protecting a 56-mm diameter Polyvinyl Chloride (PVC) pipe incorporating a floor waste and fitting inside the collar

The SNAP H65FWS-RR cast 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, nylon fuse links, and a 322-mm x 65-mm stainless steel mesh, as shown in drawing numbered H65FWS-RR-T, dated 23 April 2015, by Snap Fire Systems Pty Ltd.

The penetrating service comprised a 56-mm diameter Polyvinyl Chloride (PVC) Pipe, with a wall thickness of 2.6-mm fitted through the collar's sleeve. The floor waste system was fitted with a chrome brass 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, a nominal 56-mm OD PVC Elbow was connected to the penetrating pipe, supported by a Pipe Bracket with two 6.5-m Hex Head Concrete anchors to the concrete slab. On the exposed face, the gully trap was capped using a PVC end cap.

The floor waste gully was charged with water to the level shown in drawing titled "Test Slab S-15-A Penetration #4 56-mm PVC Pipe - Floor Waste", dated 18 June 2015, by Snap Fire Systems Pty Ltd.

Penetration # 5 – H65S cast-in fire collar protecting a 63-mm diameter High Density Polyethylene (HDPE) Pipe-Stack

The SNAP cast-in H65S 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 strip of Intumesh intumescent material. The closing mechanism comprised three stainless steel springs, nylon fuse links, and a 322-mm x 65-mm 304 stainless steel mesh as shown in drawing numbered H65S-T dated 8 July 2015, by Snap Fire Systems Pty Ltd. The penetrating service comprised a 63-mm diameter High Density Polyethylene (HDPE) Pipe-Stack, with a wall thickness of 3.7-mm fitted through the collar's sleeve. The pipe projected vertically, 2000-mm above the concrete slab. The pipe was supported at 500-mm and 1000-mm from the unexposed face of the concrete slab. On the exposed end, the pipe was capped with a Kaowool Plug.

On the unexposed face, the gap between the pipe and the slab was filled with a bead of Fullers Firesound as show in drawing titled "Test Slab S-15-A Penetration #5 – 63-mm HDPE Pipe-Stack", dated 18 June 2015, by Snap Fire Systems Pty Ltd.

2.2 Dimensions

The overall dimension of the concrete slab was 1150-mm wide x 1150-mm long, 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 titled "Test Slab S-15-A Penetration #1 – 69-mm PVC Pipe Stack", dated 18 June 2015, by Snap Fire Systems Pty Ltd.

Drawing titled "Test Slab S-15-A Penetration #2 69-mm PVC Pipe - Floor Waste", dated 18 June 2015, by Snap Fire Systems Pty Ltd.

Drawing titled "Test Slab S-15-A Penetration #3 – 56mm PVC Pipe-Stack", dated 18 June 2015, by Snap Fire Systems Pty Ltd.

Drawing titled "Test Slab S-15-A Penetration # 4 – 56-mm PVC Pipe – Floor Waste", dated 18 June 2015, by Snap Fire Systems Pty Ltd.

Drawing titled "Test Slab S-15-A Penetration #5 – 63mm HDPE Pipe-Stack, dated 18 June 2015, by Snap Fire Systems Pty Ltd.

Drawing numbered H65S-RR-T, dated 23 April 2015, by Snap Fire Systems Pty Ltd.

Drawing numbered H65FWS-RR-T, dated 23 April 2014, by Snap Fire Systems Pty Ltd.

Drawing numbered H65S-T, dated 8 July 2015, by Snap Fire Systems Pty Ltd.

Drawing numbered H65FWS-T, dated 8 July 2015, 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 1530.4-2005 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 21°C at the commencement of the test.

6 Departure from standard

There were no departures from the requirements of AS 1530.4-2005.

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 fluing from Penetration 5.
3 minutes -	Light smoke is visible fluing from Penetration 2.
4 minutes -	Smoke is fluing from furnace flues.
5 minutes -	The quantity of smoke fluing from Penetration 2 has increased.
6 minutes -	Smoke has ceased fluing from Penetration 5.
7 minutes -	Light smoke is visible fluing from Penetration 4 (floor waste).
8 minutes -	The quantity of smoke fluding from Penetration 2 has decresed.
16 minutes -	Smoke is visible fluing from the unexposed end of penetration 1.
19 minutes -	Light smoke is visible fluing from Penetrations 2 and 4 (floor wastes).
24 minutes -	The quantity of smoke fluing from Penetration 2 (floor waste) has increased slightly.
30 minutes -	Little visible change.
60 minutes -	Smoke is no longer visible fluing from the specimens.
90 minutes -	Light smoke is visible fluing from Penetrations 2 and 4 (floor wastes).
120 minutes -	Little visible change.
180 minutes -	Little visible change.
198 minutes -	Light smoke is visible from Penetration 2 (floor waste).
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 1530.4-2005 criteria:

Penetration # 1 – H65S-RR cast-in fire collar protecting a 69-mm diameter Polyvinyl Chloride (PVC) Pipe-Stack with a fitting inside the collar

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

Penetration 2 – H65FWS cast-in fire collar protecting a 69-mm diameter Polyvinyl Chloride (PVC) pipe incorporating a floor waste and a fitting inside the collar

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

Penetration # 3 – H65S cast-in fire collar protecting a 56-mm diameter Polyvinyl Chloride (PVC) Pipe-Stack with a fitting inside the collar

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 56-mm diameter Polyvinyl Chloride (PVC) pipe incorporating a floor waste and a fitting inside the collar

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

Penetration # 5 – H65S cast-in fire collar protecting a 63-mm diameter High Density Polyethylene (HDPE) Pipe-Stack

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 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 2	-	-/240/240
Penetration 3	-	-/240/240
Penetration 4	-	-/240/240; and
Penetration 5	-	-/240/240

For the purposes of AS 1530.4-2005 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 1530.4-2005, have been made provided no individual component is removed or reduced.

11 Tested by

Mario Lara-Ledermann
Testing Officer

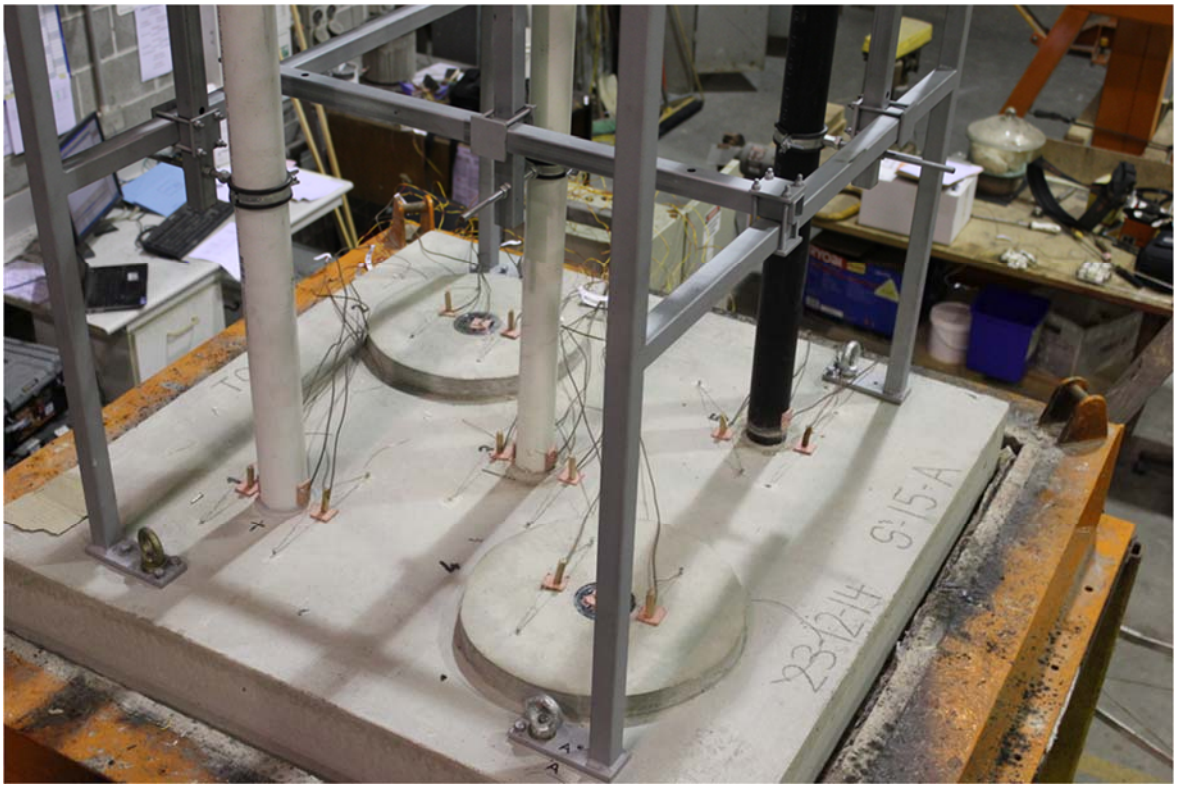
Appendices

Appendix A – Measurement location

Measurement Location		
Group location	**T/C Position**	**T/C designation**
Specimen		
Penetration 1	On slab, 25-mm from pipe.	S1
	On slab, 25-mm from pipe.	S2
	On pipe, 25-mm from slab.	S3
	On pipe, 25-mm from slab.	S4
Penetration 2	On grate.	S7
	On step, 25-mm from grate.	S5
	On step, 25-mm from grate.	S6
Penetration 3	On slab, 25-mm from pipe.	S8
	On slab, 25-mm from pipe.	S9
	On pipe, 25-mm from slab.	S10
	On pipe, 25-mm from slab.	S11
Penetration 4	On grate.	S14
	On step, 25-mm from grate.	S12
	On step, 25-mm from grate.	S13
Penetration 5	On slab, 25-mm from pipe.	S15
	On slab, 25-mm from pipe.	S16
	On pipe, 25-mm from slab.	S17
	On pipe, 25-mm from slab.	S18

Appendix B – Photographs

PHOTOGRAPH 1 – EXPOSED FACE OF SPECIMENS PRIOR TO TESTING

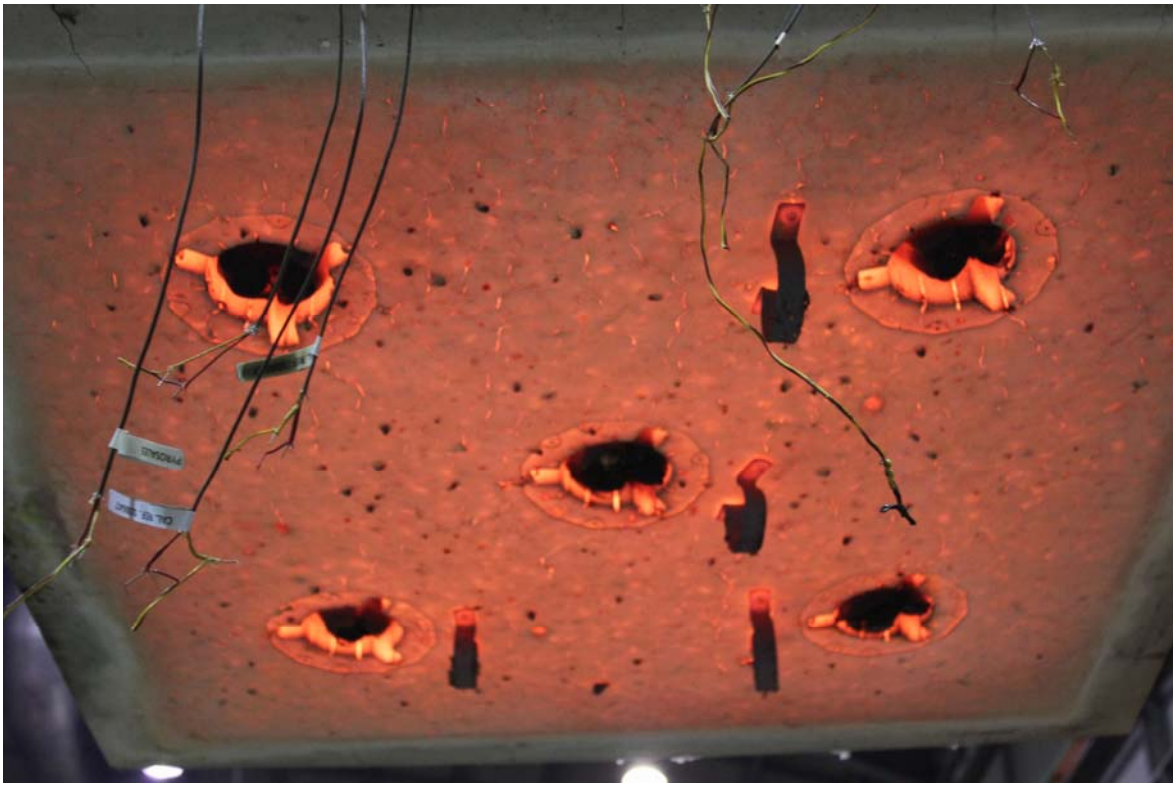


PHOTOGRAPH 2 – UNEXPOSED FACE OF SPECIMENS PRIOR TO TESTING

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 – EXPOSED FACE OF SPECIMENS AT CONCLUSION OF TESTING

Appendix C – Furnace Temperature

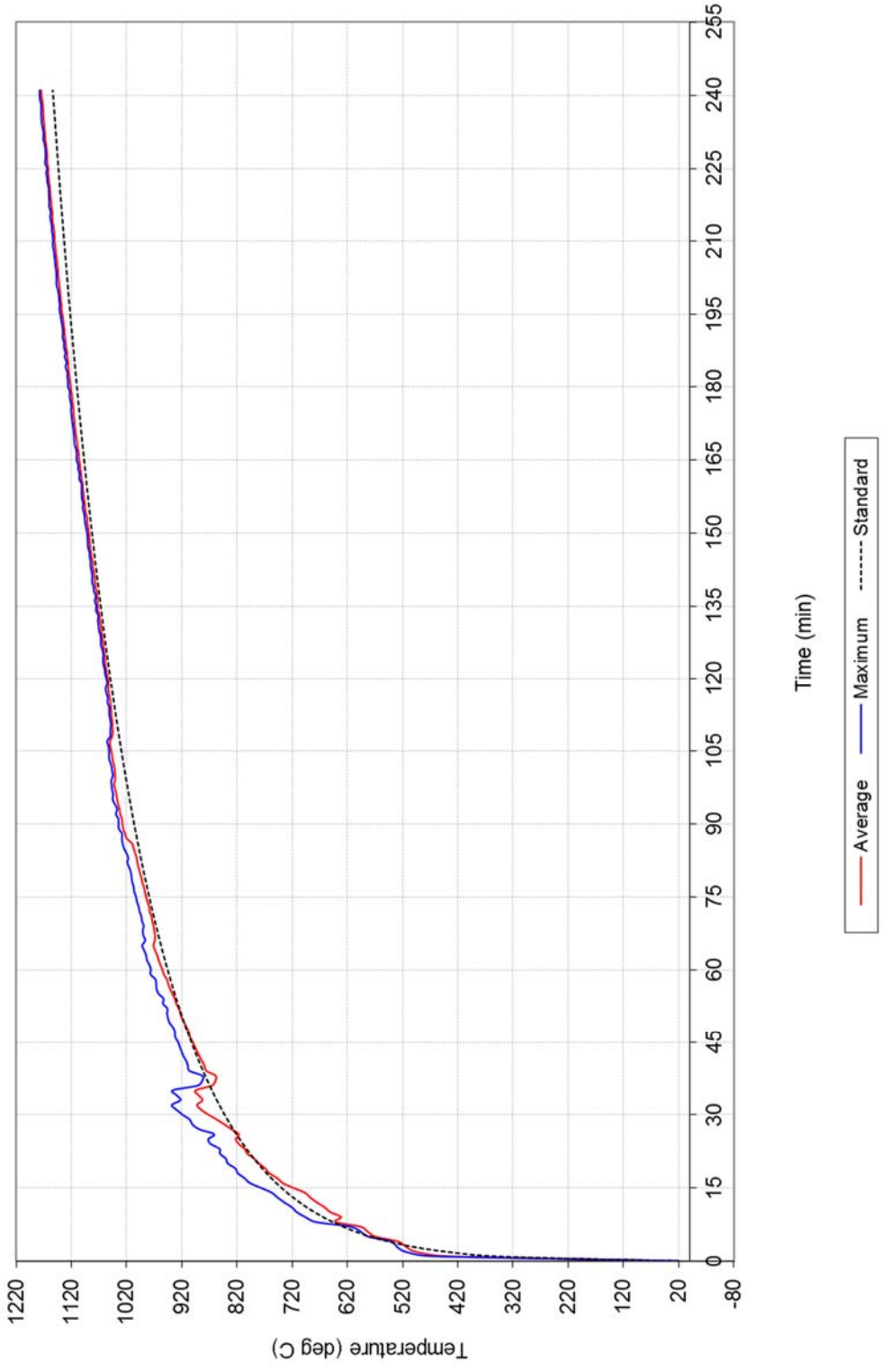


FIGURE 1 – FURNACE TEMPERATURE

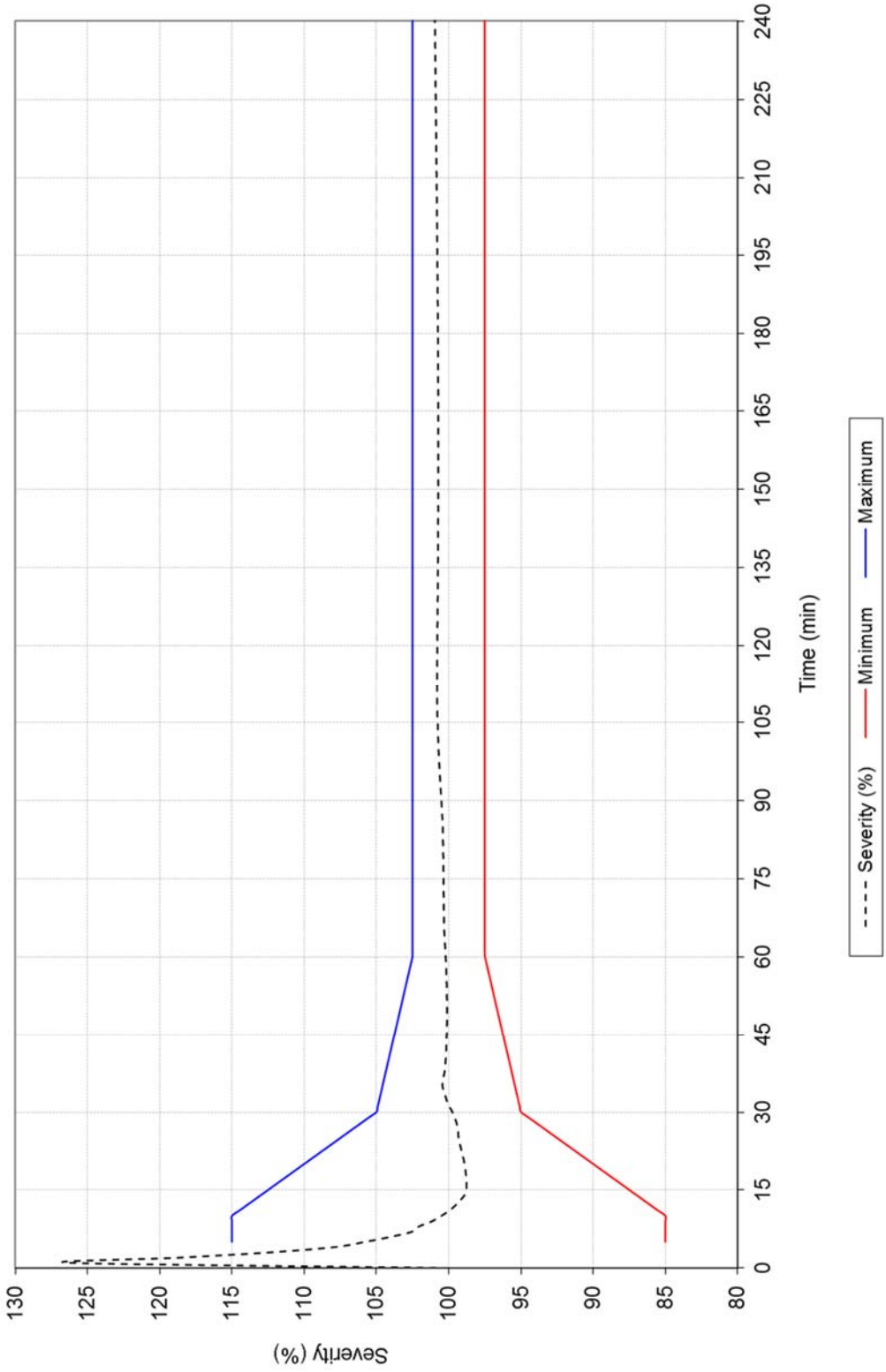


FIGURE 2 – FURNACE SEVERITY

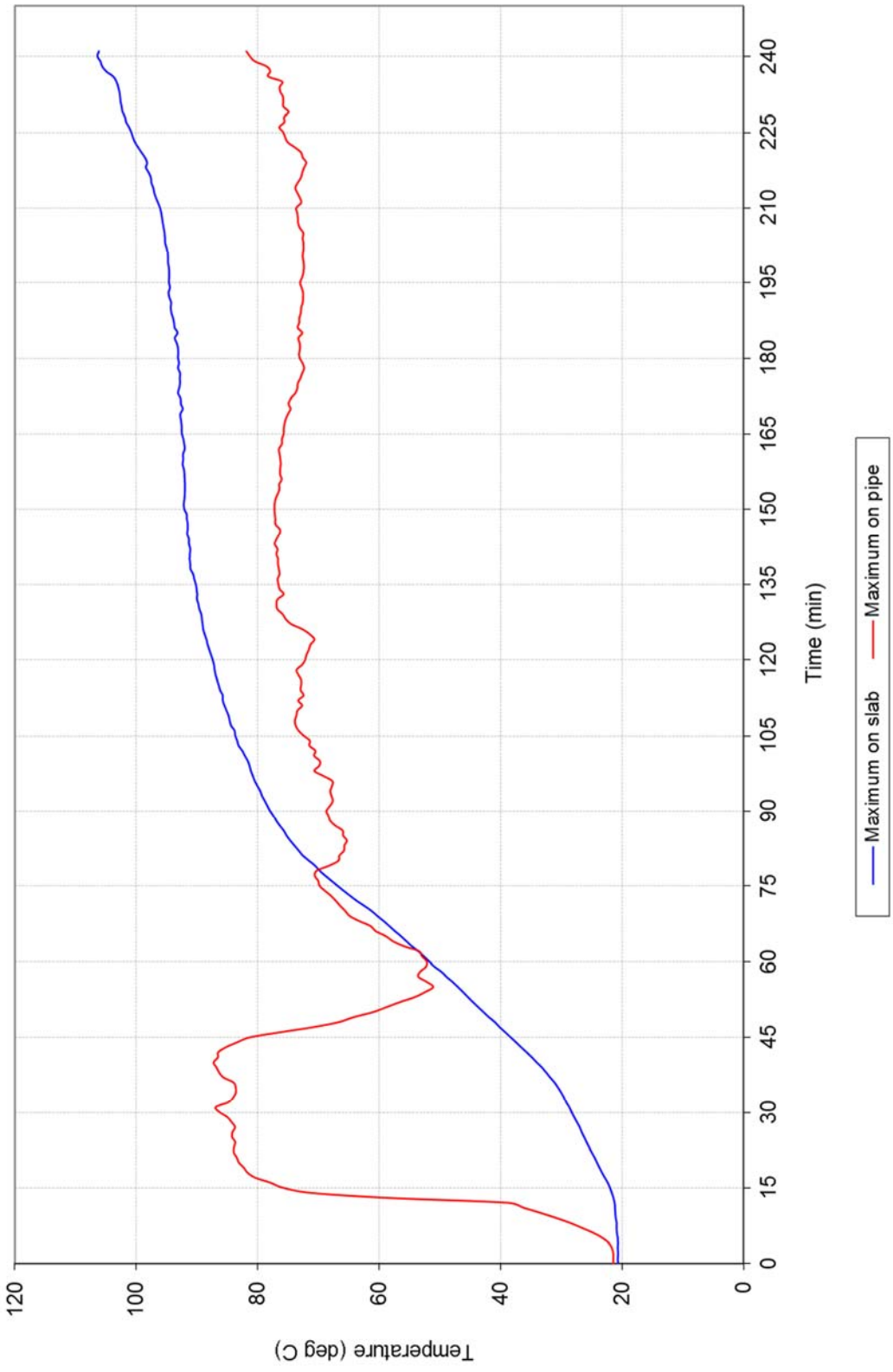


FIGURE 3 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION 1

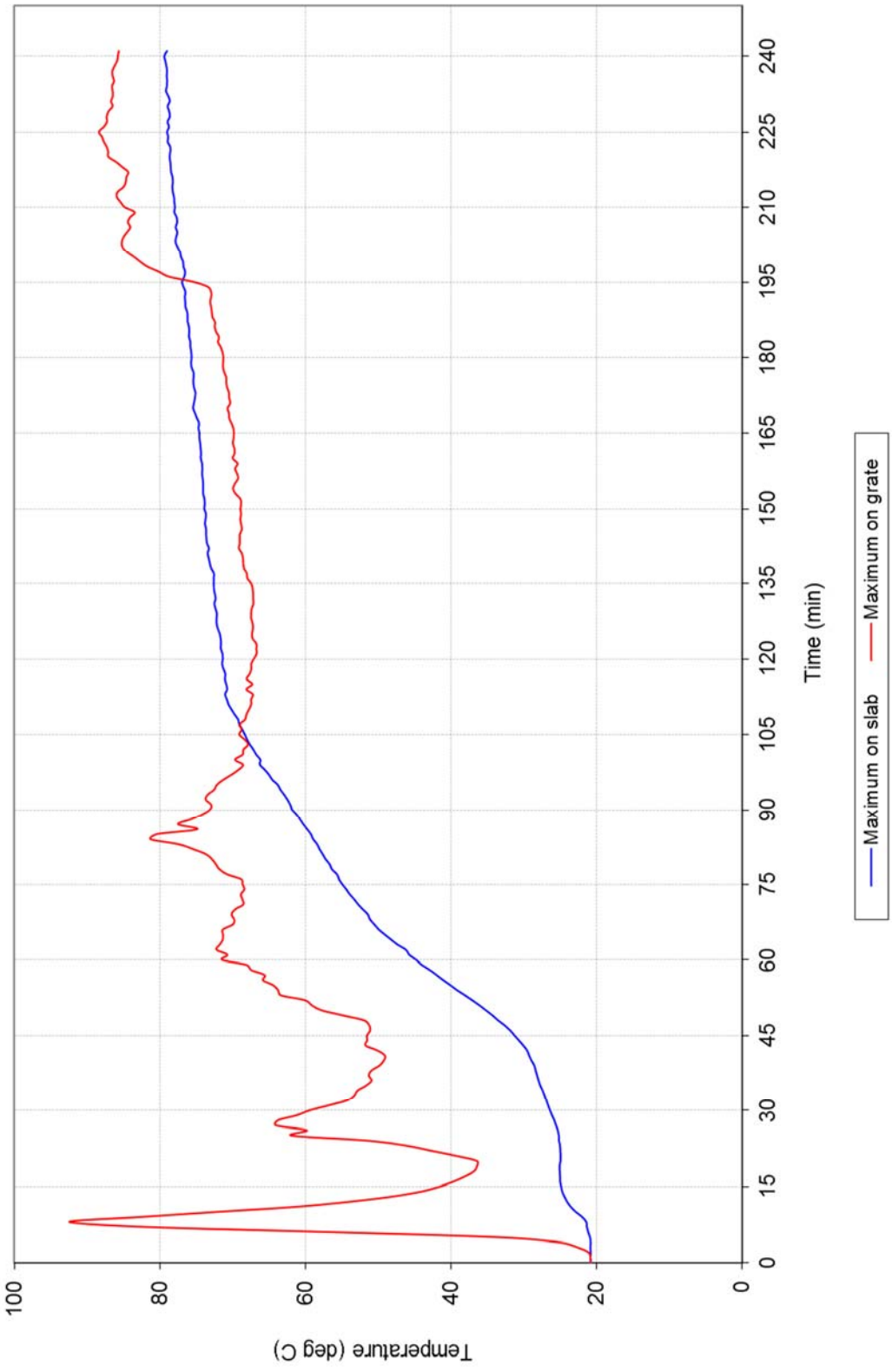


FIGURE 4 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION 2

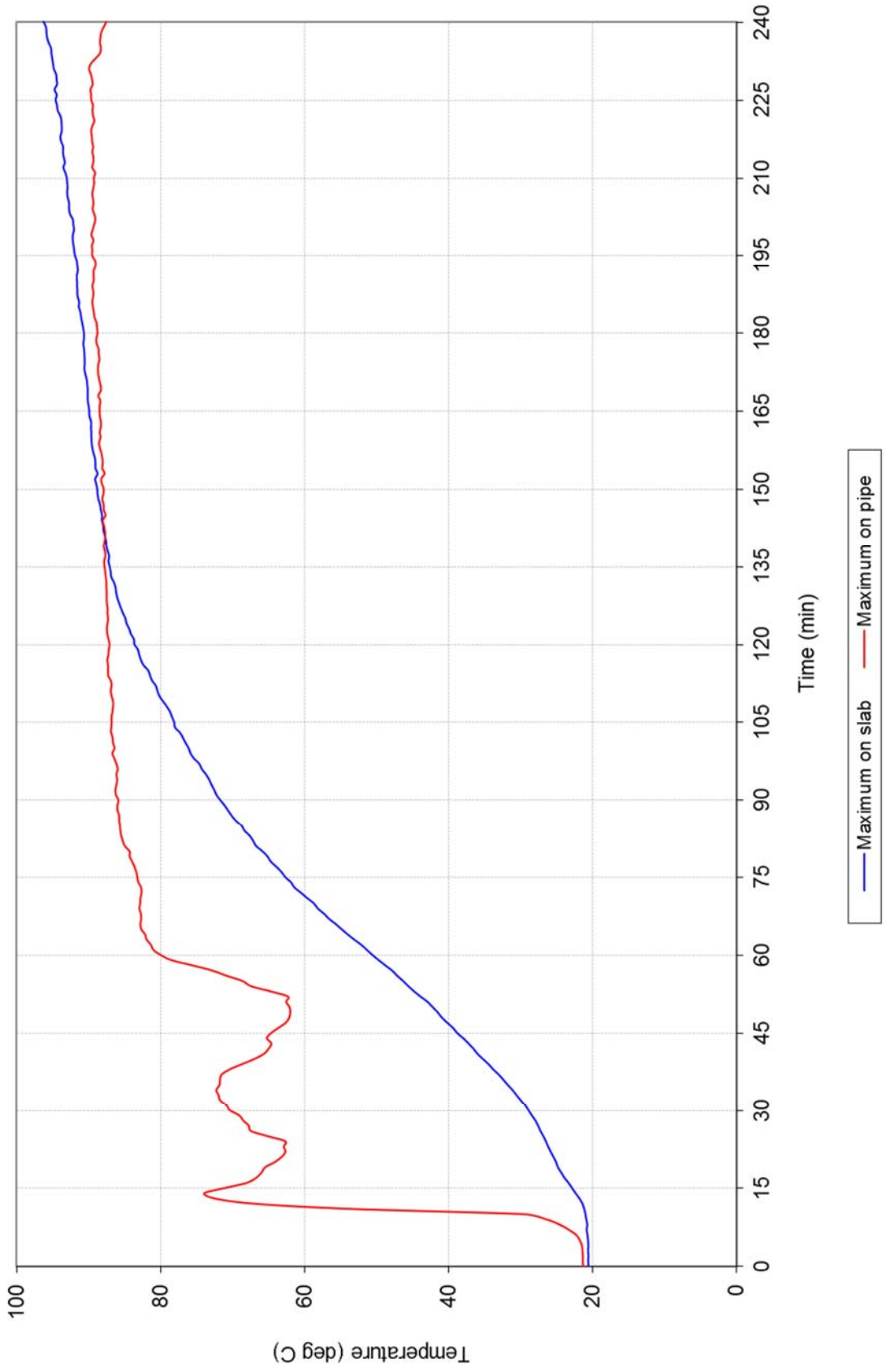


FIGURE 5 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION 3

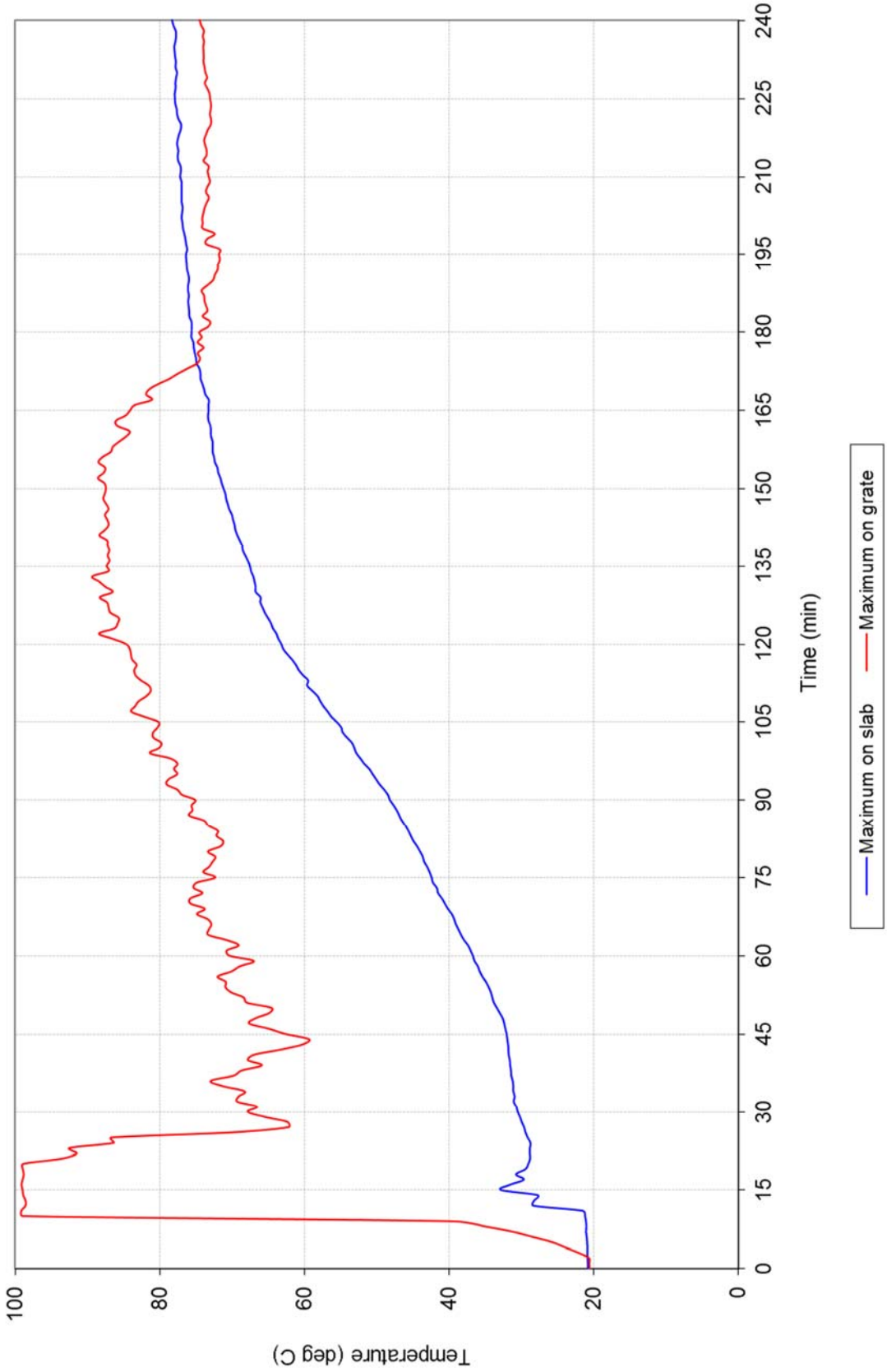


FIGURE 6 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION 4

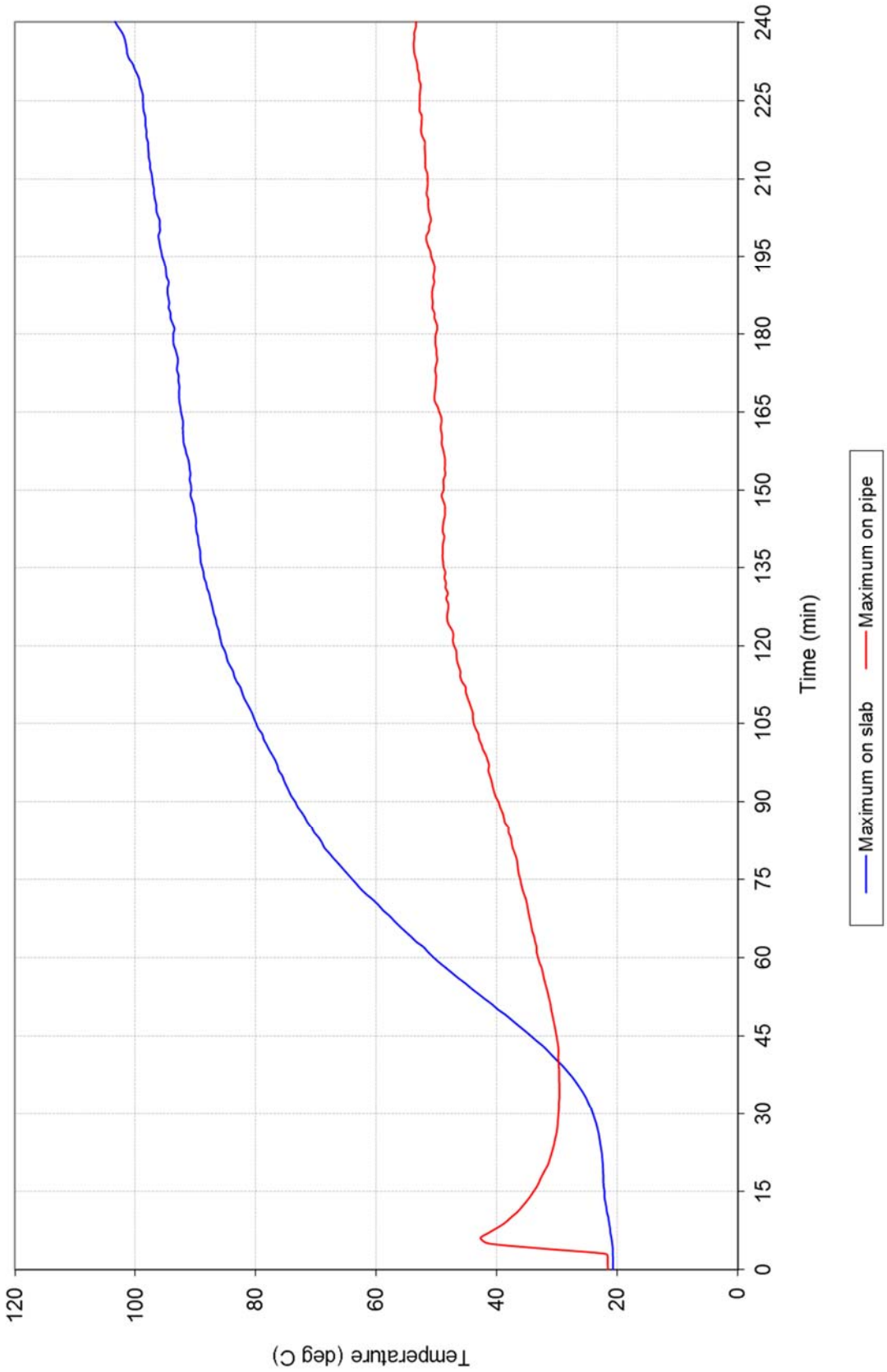
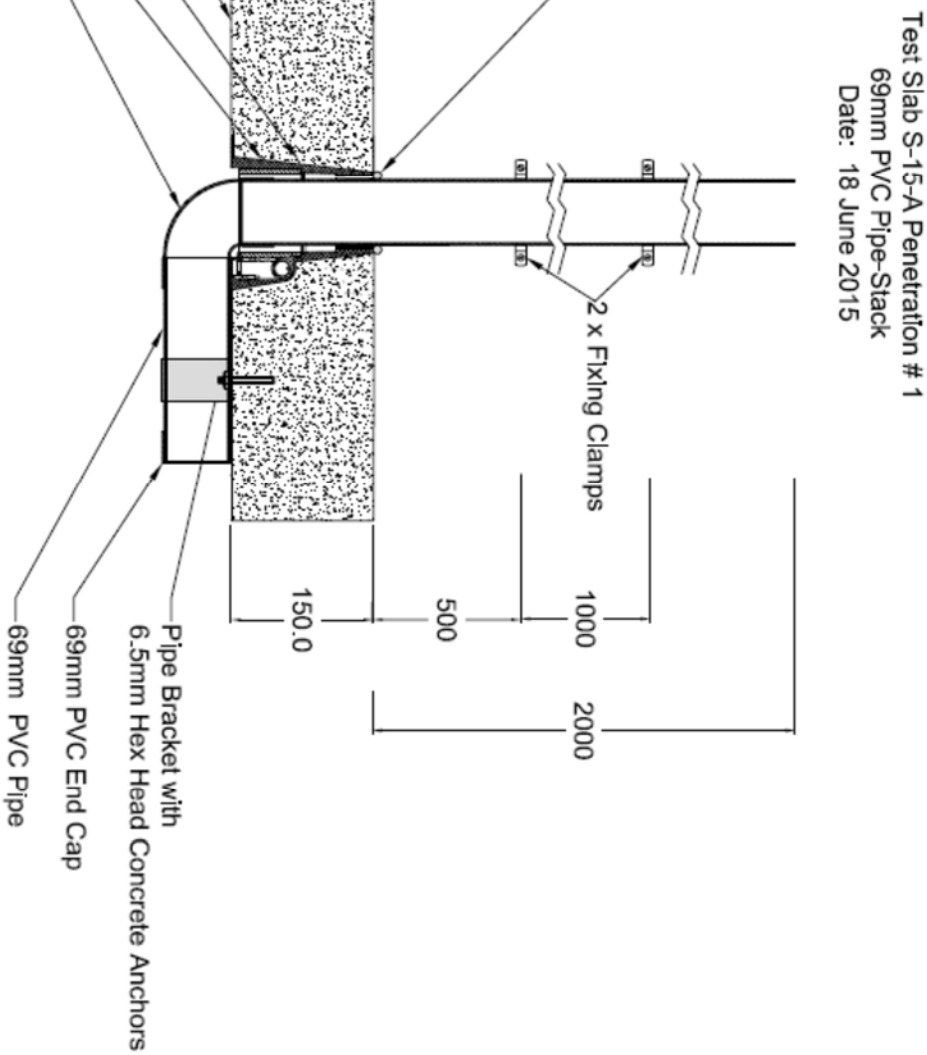
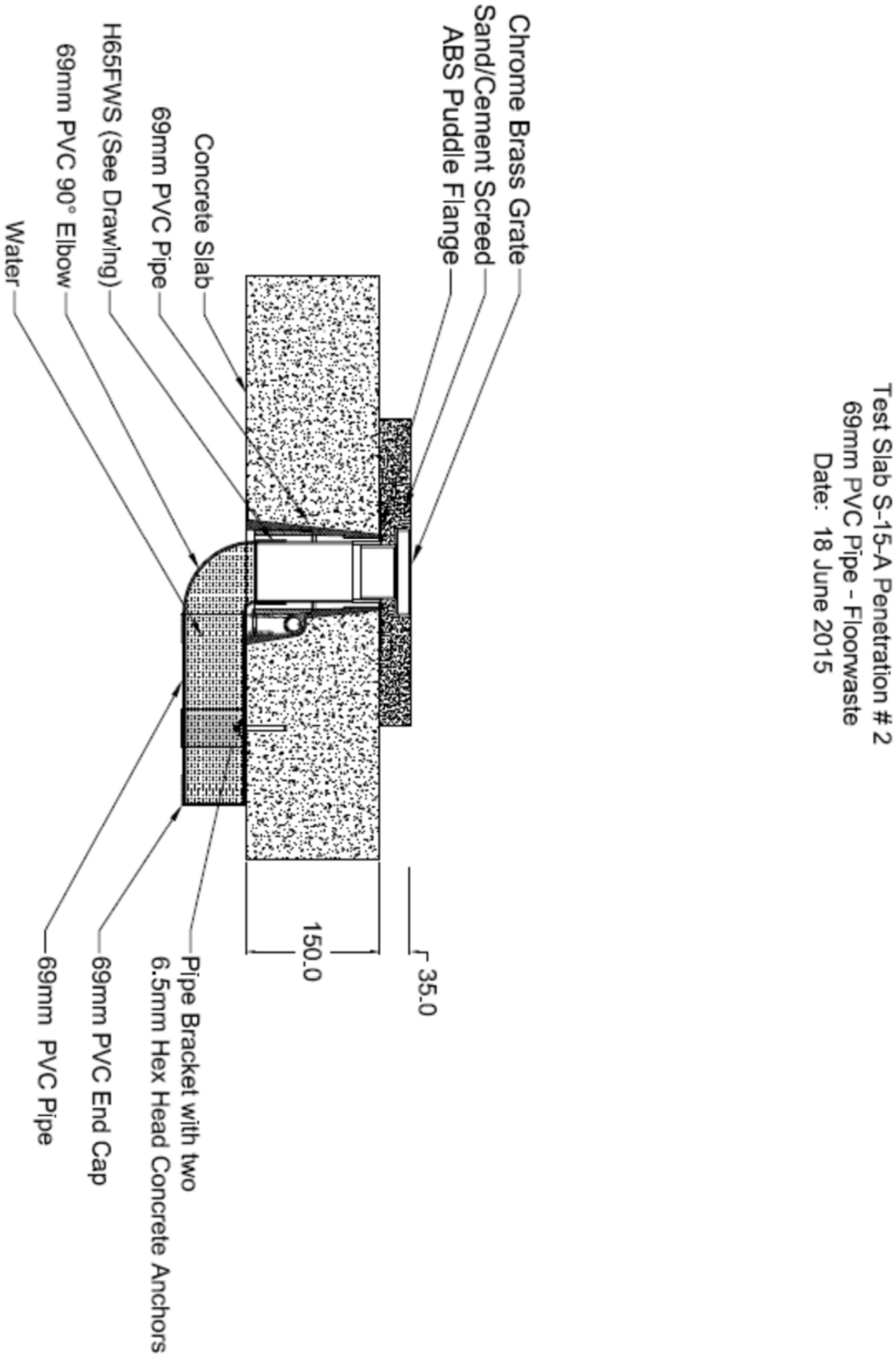


FIGURE 7 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION 5

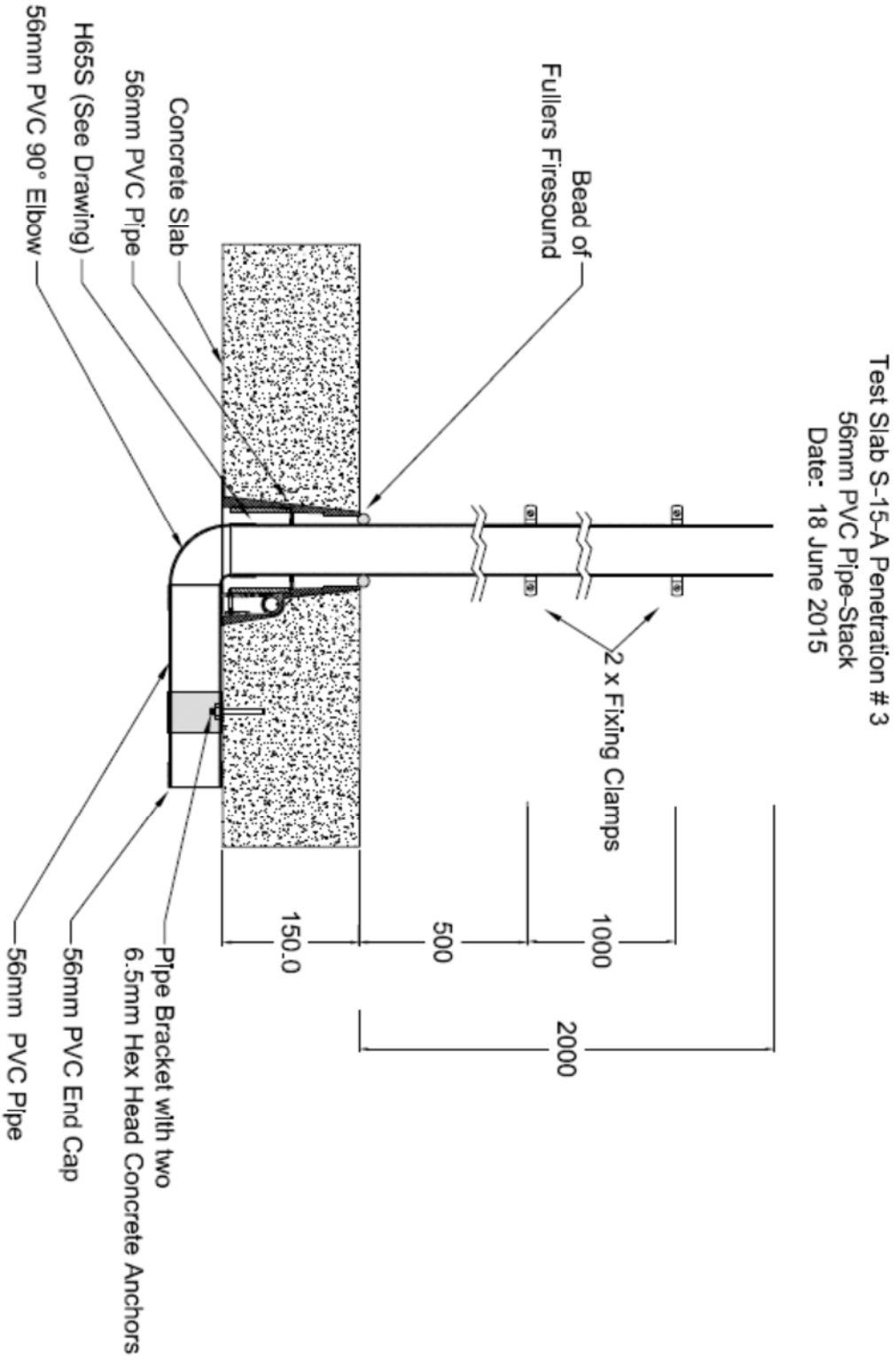
Appendix D – Installation drawings



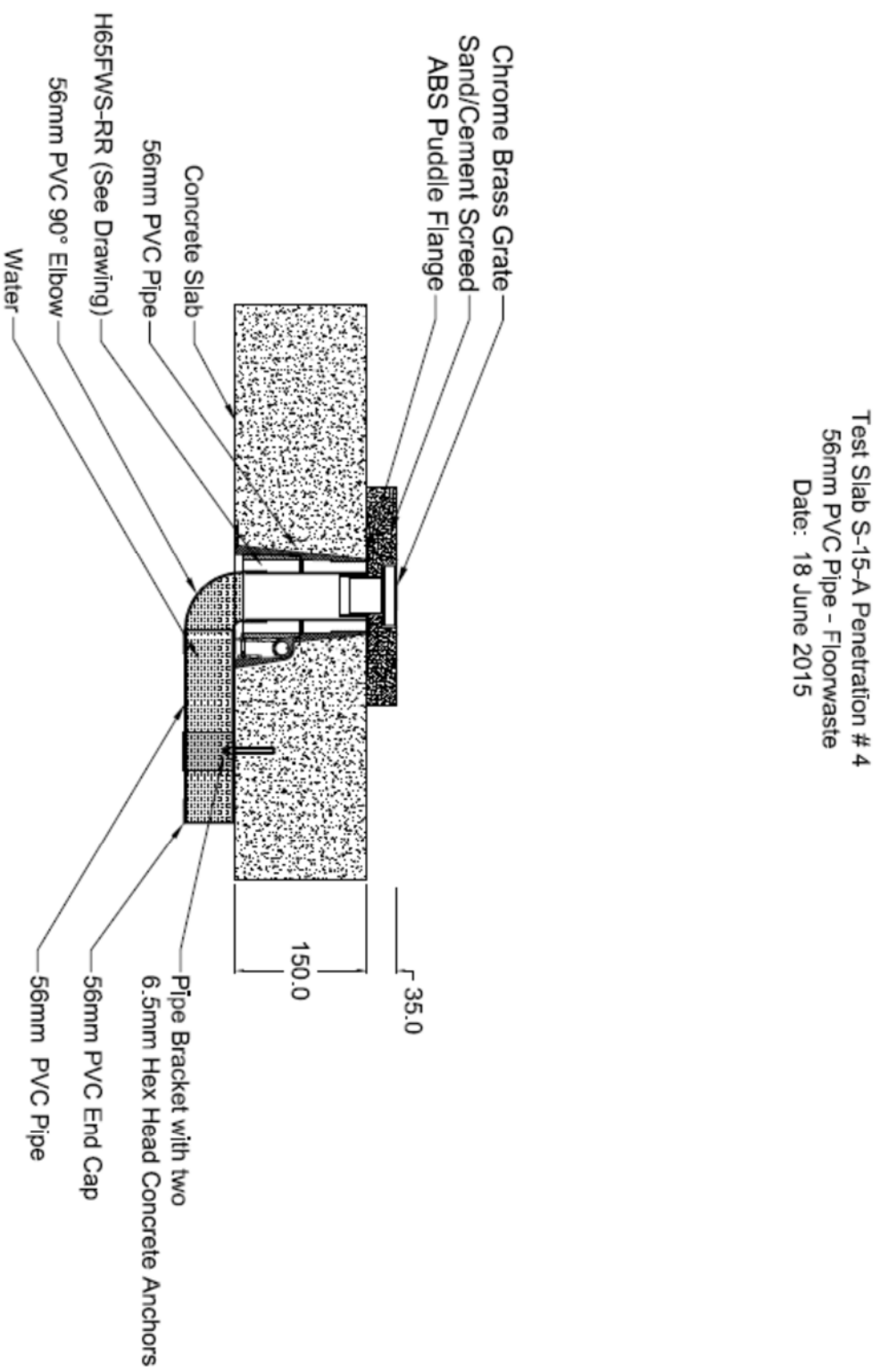
DRAWING TITLED "TEST SLAB S-15-A PENETRATION #1 – 69MM PVC PIPE-STACK", DATED 18 JUNE 2015, BY SNAP FIRE SYSTEMS PTY LTD.



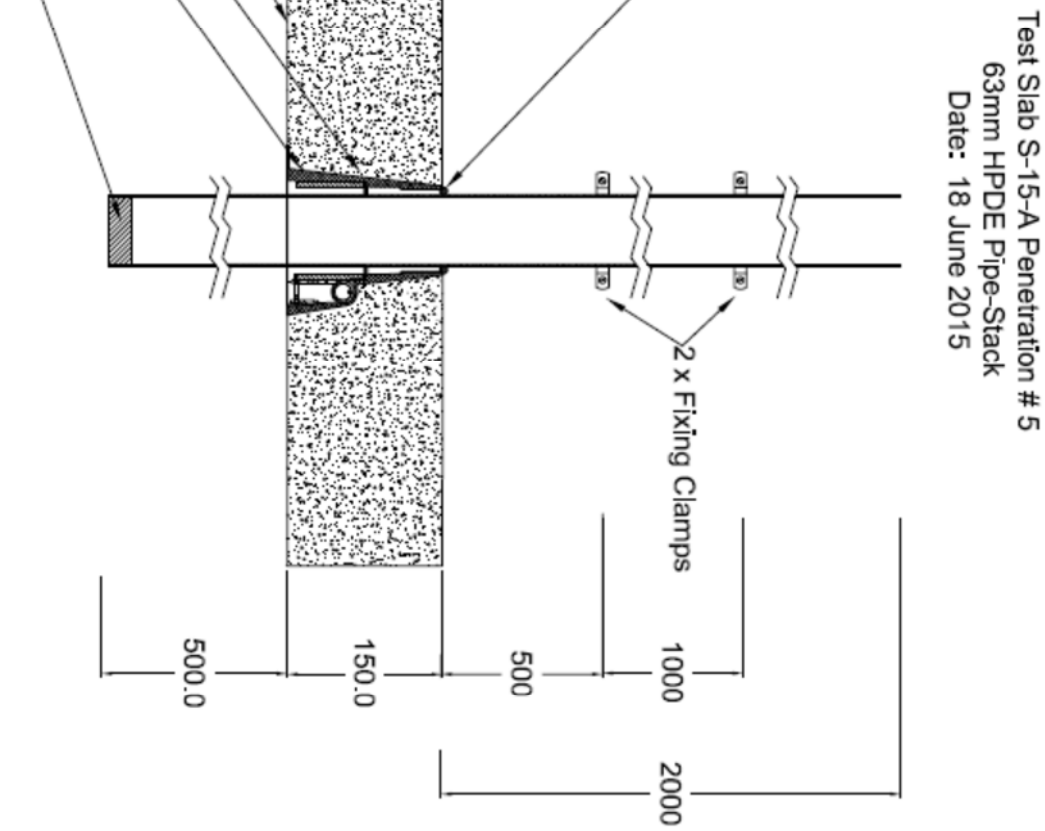
DRAWING TITLED "TEST SLAB S-15-A PENETRATION #2 - 69MM PVC PIPE – FLOORWASTE", DATED 18 JUNE 2015, BY SNAP FIRE SYSTEMS PTY LTD.



DRAWING TITLED "TEST SLAB S-15-A PENETRATION #3 – 56MM PVC PIPE-STACK", DATED 18 JUNE 2015, BY SNAP FIRE SYSTEMS PTY LTD.

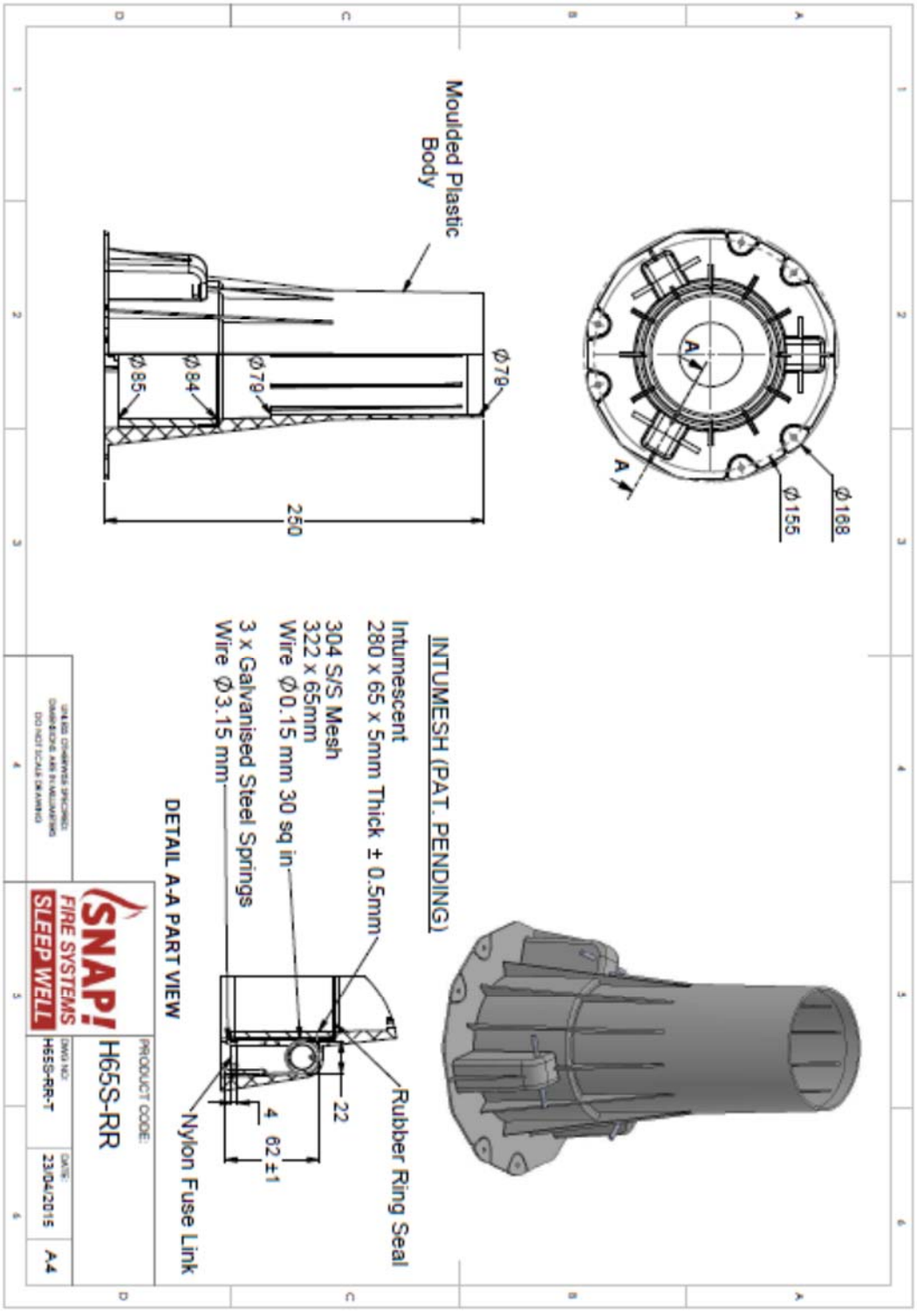


DRAWING TITLED "TEST SLAB S-15-A PENETRATION # 4 – 56-MM PVC PIPE – FLOOR WASTE", DATED 18 JUNE 2015, BY SNAP FIRE SYSTEMS PTY LTD

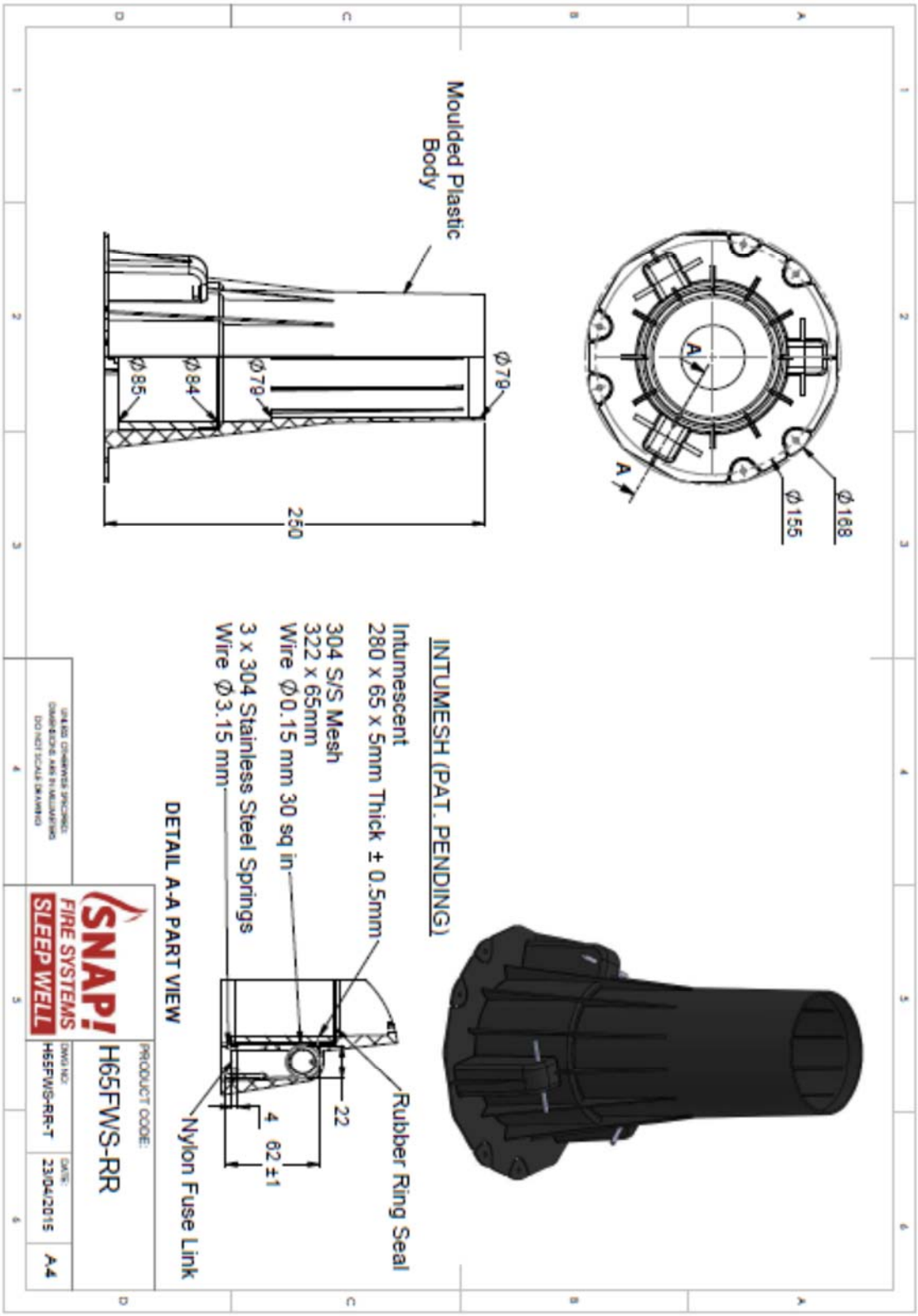


DRAWING TITLED "TEST SLAB S-15-A PENETRATION #5 – 63MM HDPE PIPE-STACK, DATED 18 JUNE 2015, BY SNAP FIRE SYSTEMS PTY LTD.

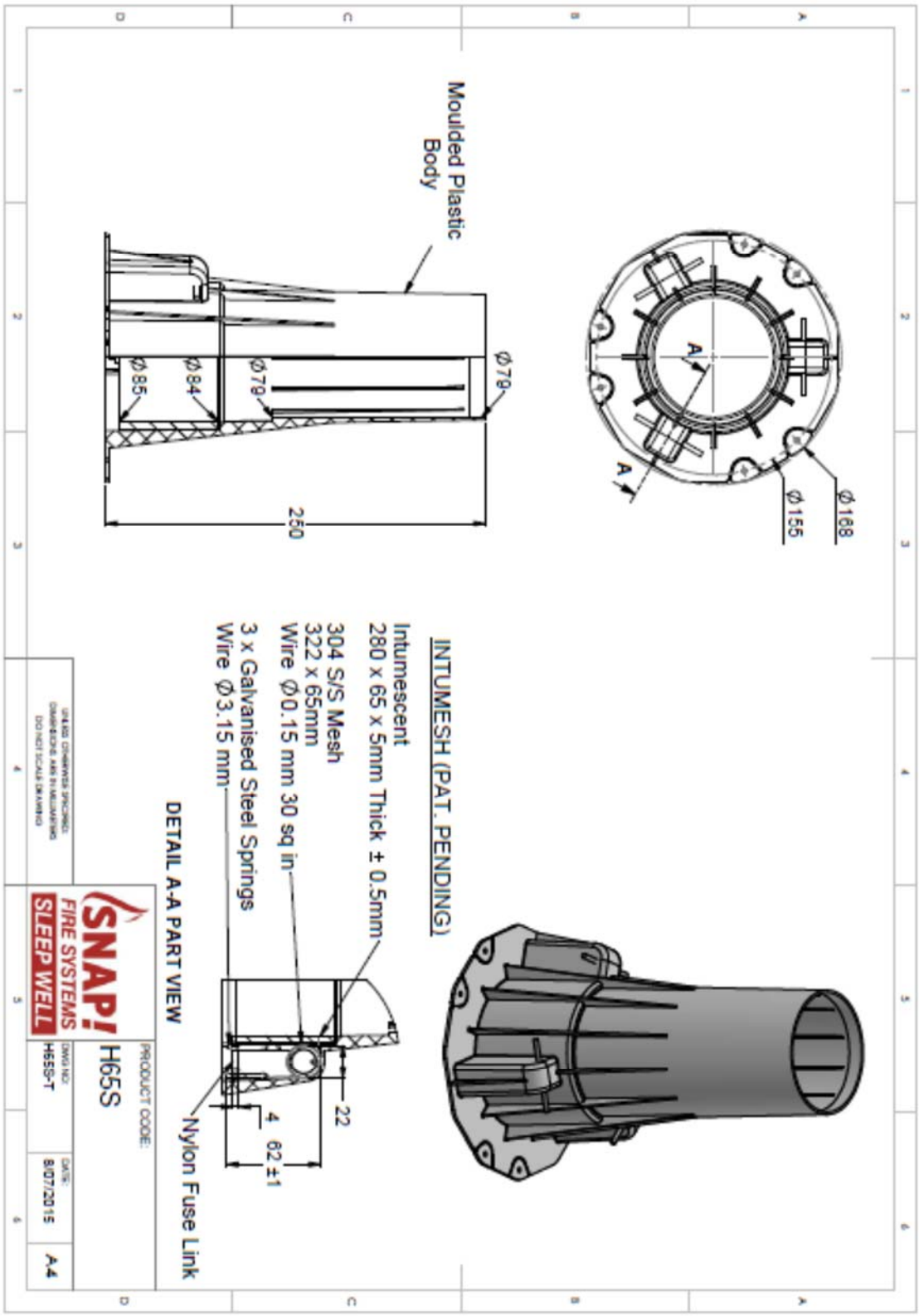
Appendix E – Specimen Drawings



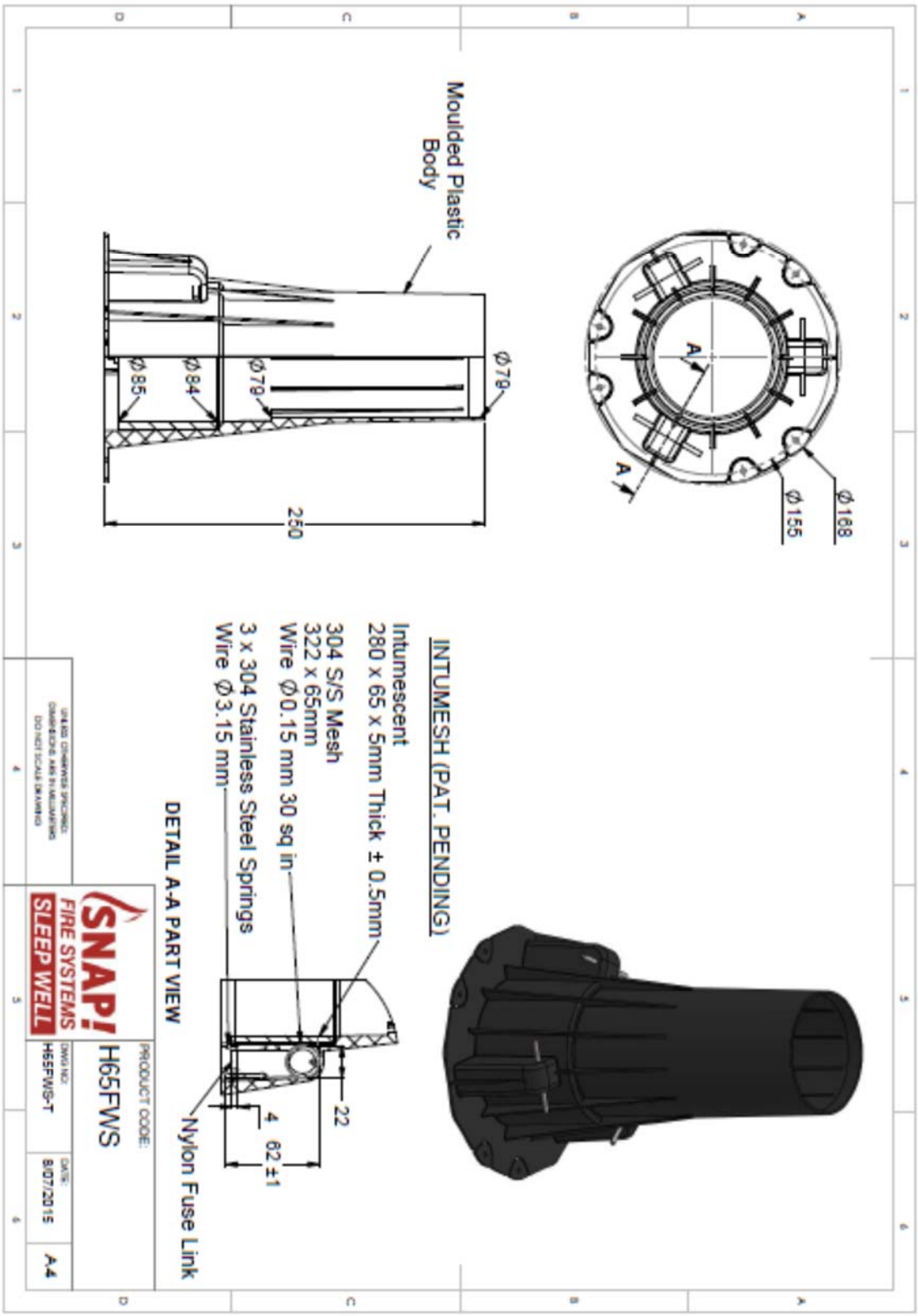
DRAWING NUMBERED H65S-RR-T, DATED 23 APRIL 2015, BY SNAP FIRE SYSTEMS PTY LTD.



DRAWING NUMBERED H65FWS-RR-T, DATED 23 APRIL 2014, BY SNAP FIRE SYSTEMS PTY LTD.



DRAWING NUMBERED H65S-T, DATED 8 JULY 2015, BY SNAP FIRE SYSTEMS PTY LTD.



DRAWING NUMBERED H65FWS-T, DATED 8 JULY 2015, BY SNAP FIRE SYSTEMS PTY LTD.

References

The following informative documents are referred to in this Report:

AS 1530.4-2005	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.

Appendix F – Certificates

- COPY OF CERTIFICATE OF TEST – NO. 2669
- COPY OF CERTIFICATE OF TEST – NO. 2670
- COPY OF CERTIFICATE OF TEST – NO. 2671
- COPY OF CERTIFICATE OF TEST – NO. 2672
- COPY OF CERTIFICATE OF TEST – NO. 2673

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Certificate of Test

No. 2669

This is to certify that the element of construction described below was tested by the CSIRO Division of Materials Science and Engineering in accordance with Australian Standard 1530, Methods for fire tests on building materials, components and structures, Part 4-2005 on behalf of:

Snap Fire Systems Pty Ltd
Unit 2/160 Redland Bay Road
CAPALABA QLD

A full description of the test specimen and the complete test results are detailed in the Division's Sponsored Investigation report numbered FSP 1696.

Product Name: Penetration # 1 – H65S-RR cast-in fire collar protecting a 69-mm diameter Polyvinyl Chloride (PVC) Pipe-Stack with a fitting inside the collar

Description: The SNAP H65S-RR cast-in 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, nylon fuse links, and a 322-mm x 65-mm 304 stainless steel mesh as shown in drawing numbered H65S-RR-T dated 23 April 2015, by Snap Fire Systems Pty Ltd. The penetrating service comprised a 69-mm diameter Polyvinyl Chloride (PVC) Pipe-Stack, with a wall thickness of 3-mm fitted through the collar's sleeve. The pipe projected vertically, 2000-mm above the concrete slab. The pipe was supported at 500-mm and 1000-mm from the unexposed face of the concrete slab. On the exposed side of the slab, a nominal 69-mm OD PVC Elbow was connected to the penetrating pipe within the collar, supported by a Pipe Bracket with two 6.5-m Hex Head Concrete anchors to the concrete slab. On the exposed face, the pipe was capped using a PVC end cap. On the unexposed face, the gap between the pipe and the slab was filled with a bead of Fullers Firesound as show in drawing titled "Test Slab S-15-A Penetration #1 – 69-mm PVC Pipe Stack, dated 18 June 2015, 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 FRL is applicable for exposure to the fire from the same direction as tested.

This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Mario Lara-Ledermann Date of Test: 16 March 2015

Issued on the 31st day of August 2015 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

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Certificate of Test

No. 2670

This is to certify that the element of construction described below was tested by the CSIRO Division of Materials Science and Engineering in accordance with Australian Standard 1530, Methods for fire tests on building materials, components and structures, Part 4-2005 on behalf of:

Snap Fire Systems Pty Ltd
Unit 2/160 Redland Bay Road
CAPALABA QLD

A full description of the test specimen and the complete test results are detailed in the Division's Sponsored Investigation report numbered FSP 1696.

Product Name: Penetration # 2 – H65FWS cast-in fire collar protecting a 69-mm diameter Polyvinyl Chloride (PVC) pipe incorporating a floor waste and a fitting inside the collar

Description: The SNAP H65FWS cast 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. The closing mechanism comprised three stainless steel springs, nylon fuse links, and a 322-mm x 65-mm stainless steel mesh, as shown in drawing numbered H65FWS-T, dated 8 July 2015, by Snap Fire Systems Pty Ltd. The penetrating service comprised a 69-mm diameter Polyvinyl Chloride (PVC) Pipe, with a wall thickness of 3.2-mm fitted through the collar's sleeve. The floor waste system was fitted with a chrome brass 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, a nominal 69-mm OD PVC Elbow was connected to the penetrating pipe, supported by a Pipe Bracket with two 6.5-m Hex Head Concrete anchors to the concrete slab. On the exposed face, the gully trap was capped using a PVC end cap. The floor waste gully was charged with water to the level shown in drawing titled "Test Slab S-15-A Penetration #2 69-mm PVC Pipe - Floor Waste", dated 18 June 2015, 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 FRL is applicable for exposure to the fire from the same direction as tested.

This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Mario Lara-Ledermann Date of Test: 16 March 2015

Issued on the 31st day of August 2015 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

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Certificate of Test

No. 2671

This is to certify that the element of construction described below was tested by the CSIRO Division of Materials Science and Engineering in accordance with Australian Standard 1530, Methods for fire tests on building materials, components and structures, Part 4-2005 on behalf of:

Snap Fire Systems Pty Ltd
Unit 2/160 Redland Bay Road
CAPALABA QLD

A full description of the test specimen and the complete test results are detailed in the Division's Sponsored Investigation report numbered FSP 1696.

Product Name: Penetration # 3 – H65S cast-in fire collar protecting a 56-mm diameter Polyvinyl Chloride (PVC) Pipe-Stack with a fitting inside the collar

Description: The SNAP cast-in H65S 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 strip of Intumesh intumescent material. The closing mechanism comprised three stainless steel springs, nylon fuse links, and a 322-mm x 65-mm 304 stainless steel mesh as shown in drawing numbered H65S-T dated 8 July 2015, by Snap Fire Systems Pty Ltd. The penetrating service comprised a 56-mm diameter Polyvinyl Chloride (PVC) Pipe-Stack, with a wall thickness of 2.6-mm fitted through the collar's sleeve. The pipe projected vertically, 2000-mm above the concrete slab. The pipe was supported at 500-mm and 1000-mm from the unexposed face of the concrete slab. On the exposed side of the slab, a nominal 56-mm OD PVC Elbow was connected to the penetrating pipe within the collar, supported by a Pipe Bracket with two 6.5-m Hex Head Concrete anchors to the concrete slab. On the exposed face, the gully trap was capped using a PVC end cap. On the unexposed face, the gap between the pipe and the slab was filled with a bead of Fullers Firesound as show in drawing titled "Test Slab S-15-A Penetration #3 – 56-mm PVC Pipe-Stack", dated 18 June 2015, 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 FRL is applicable for exposure to the fire from the same direction as tested.

This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Mario Lara-Ledermann Date of Test: 16 March 2015

Issued on the 31st day of August 2015 without alterations or additions.

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Brett Roddy
Manager, Fire Testing and Assessments

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Certificate of Test

No. 2672

This is to certify that the element of construction described below was tested by the CSIRO Division of Materials Science and Engineering in accordance with Australian Standard 1530, Methods for fire tests on building materials, components and structures, Part 4-2005 on behalf of:

Snap Fire Systems Pty Ltd
Unit 2/160 Redland Bay Road
CAPALABA QLD

A full description of the test specimen and the complete test results are detailed in the Division's Sponsored Investigation report numbered FSP 1696.

Product Name: Penetration # 4 – H65FWS-RR cast-in fire collar protecting a 56-mm diameter Polyvinyl Chloride (PVC) pipe incorporating a floor waste and fitting inside the collar

Description: The SNAP H65FWS-RR cast 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, nylon fuse links, and a 322-mm x 65-mm stainless steel mesh, as shown in drawing numbered H65FWS-RR-T, dated 23 April 2015, by Snap Fire Systems Pty Ltd. The penetrating service comprised a 56-mm diameter Polyvinyl Chloride (PVC) Pipe, with a wall thickness of 2.6-mm fitted through the collar's sleeve. The floor waste system was fitted with a chrome brass 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, a nominal 56-mm OD PVC Elbow was connected to the penetrating pipe, supported by a Pipe Bracket with two 6.5-m Hex Head Concrete anchors to the concrete slab. On the exposed face, the gully trap was capped using a PVC end cap. The floor waste gully was charged with water to the level shown in drawing titled "Test Slab S-15-A Penetration #4 56-mm PVC Pipe - Floor Waste", dated 18 June 2015, 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 FRL is applicable for exposure to the fire from the same direction as tested.

This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Mario Lara-Ledermann Date of Test: 16 March 2015

Issued on the 31st day of August 2015 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

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Certificate of Test

No. 2673

This is to certify that the element of construction described below was tested by the CSIRO Division of Materials Science and Engineering in accordance with Australian Standard 1530, Methods for fire tests on building materials, components and structures, Part 4-2005 on behalf of:

Snap Fire Systems Pty Ltd
Unit 2/160 Redland Bay Road
CAPALABA QLD

A full description of the test specimen and the complete test results are detailed in the Division's Sponsored Investigation report numbered FSP 1696.

Product Name: Penetration # 5 – H65FWS-RR cast-in fire collar protecting a 56-mm diameter Polyvinyl Chloride (PVC) pipe incorporating a floor waste and fitting inside the collar

Description: The SNAP cast-in H65S 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 strip of Intumesh intumescent material. The closing mechanism comprised three stainless steel springs, nylon fuse links, and a 322-mm x 65-mm 304 stainless steel mesh as shown in drawing numbered H65S-T dated 8 July 2015, by Snap Fire Systems Pty Ltd. The penetrating service comprised a 63-mm diameter High Density Polyethylene (HDPE) Pipe-Stack, with a wall thickness of 3.7-mm fitted through the collar's sleeve. The pipe projected vertically, 2000-mm above the concrete slab. The pipe was supported at 500-mm and 1000-mm from the unexposed face of the concrete slab. On the exposed end, the pipe was capped with a Kaowool Plug. On the unexposed face, the gap between the pipe and the slab was filled with a bead of Fullers Firesound as show in drawing titled "Test Slab S-15-A Penetration #5 – 63-mm HDPE Pipe-Stack", dated 18 June 2015, 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 FRL is applicable for exposure to the fire from the same direction as tested.

This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Mario Lara-Ledermann Date of Test: 16 March 2015

Issued on the 31st day of August 2015 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

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