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

Test Report

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Report number: FSP 1641
Date: 25 July 2014

Client: Snap Fire Systems Pty Ltd

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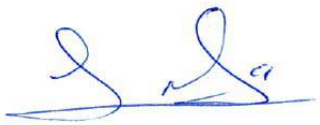		
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Contents

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

Sponsored Investigation No. FSP 1641

1 Introduction

1.1 Identification of specimen

The sponsor identified the specimen as Snap Cast-in Fire Collars protecting a concrete slab penetrated by two (2) P-Trap Floorwastes, one (1) PVC SC stack and one (1) HDPE stack pipe.

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.

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 4419/3721

1.7 Test date

The fire-resistance test was conducted on 8 May 2014.

2 Description of specimen

2.1 General

The specimen comprised a 1150-mm x 1150-mm x 150-mm thick reinforced concrete slab penetrated by two (2) P-Trap Floorwastes, one (1) PVC Sandwich Construction (SC) stack and one (1) HDPE stack pipe protected by cast-in Snap Fire System fire collars.

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

Penetration 1 – LP 65 R retrofitted fire collar protecting a 43-mm diameter Polyvinyl Chloride (PVC) pipe incorporating a floor waste

The SNAP Retrofit LP 65 R fire collar comprised a 0.7-mm steel casing with a 85-mm inner diameter and a 202-mm diameter base flange. The 61-mm high collar casing incorporated a 300-mm x 55-mm x 4-mm thick Intumesh intumescent material. The closing mechanism comprised three stainless steel springs, with nylon fuse links and a 300-mm x 55-mm stainless steel mesh as shown in drawing numbered LP 65 R-T dated 13 June 2014, by SNAP Fire Systems. One collar was fixed to the underside of the slab with PBZ0635 fasteners.

The penetrating service comprised a 43-mm PVC pipe, with a wall thickness of 2-mm fitted through the collar's sleeve. The floor waste system was fitted on the unexposed face with a Chrome brass floor waste grate. On the exposed side of the slab, a 40-mm P-Trap was connected to the penetrating pipe with a glad nut within the collar, supported by M10 HKD clamps fixed to the concrete slab as shown in drawing titled "Penetration #1 – 40-mm P-Trap Floorwaste" dated 1 May 2014, by Snap Fire Systems Pty Ltd. On the exposed end, the floor waste gully was sealed using a 43-mm PVC Pipe and end cap.

The trap was filled with water before the start of the test to the level shown in drawing titled "Penetration #1 – 40-mm P-Trap Floorwaste" dated 1 May 2014, by Snap Fire Systems Pty Ltd.

Penetration 2 – 250 C cast-in fire collar protecting a 250-mm diameter Polyvinyl Chloride (PVC) Sandwich Construction (SC) pipe (slab incorporating an 80-mm thick concrete step)

The SNAP Cast-in 250 C fire collar comprised a 0.95-mm steel casing with a 285-mm inner diameter and a 443-mm diameter base flange. The 326-mm high collar casing incorporated a 920-mm x 175-mm x 10-mm thick Intumesh intumescent material. The closing mechanism comprised five stainless steel springs, with nylon fuse links and a 1060-mm x 174-mm stainless steel mesh as shown in drawing numbered 250 C-T dated 13 June 2014, by SNAP Fire Systems.

The penetrating service comprised a 250-mm PVC SC stack pipe, with a wall thickness of 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 1000-mm from the unexposed face of the concrete slab as shown in drawing titled "Penetration #2 – PVC SC (250-mm OD) Stack" dated 1 May 2014, by Snap Fire Systems Pty Ltd. On the exposed end, the pipe was capped using a PVC End Cap

The concrete slab comprised a 80-mm thick step around the pipe, as shown in drawing titled "Penetration #2 – PVC SC (250-mm OD) Stack" dated 1 May 2014, by Snap Fire Systems Pty Ltd

On the unexposed face, the annular gap between the pipe and the slab was filled with sand and cement to a 40-mm depth controlled by a backing rod.

Penetration 3 – LP 200 R retrofitted fire collar protecting a 200-mm diameter High Density Polyethylene (HDPE) pipe

The SNAP Retrofit LP 200 R fire collar comprised a 0.95-mm steel casing with a 225-mm inner diameter and a 362-mm diameter base flange. The 117-mm high collar casing incorporated 800-mm x 110-mm x 6-mm thick Intumesh intumescent material. The closing mechanism comprised five stainless steel springs, with nylon fuse links and an 860-mm x 110-mm stainless steel mesh as shown in drawing numbered LP 200 R-T dated 13 June 2014, by SNAP Fire Systems. One collar was fixed to the underside of the slab with PBZ0635 fasteners.

The penetrating service comprised a 200-mm OD HDPE pipe, with a wall thickness of 7.1-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 as shown in drawing titled "Penetration #3 – HDPE (200-mm OD) Stack" dated 1 May 2014, by Snap Fire Systems Pty Ltd. On the exposed end, the pipe was capped with a Kaowool Plug.

Penetration 4 – LP 65 R retrofitted fire collar protecting a 50-mm diameter Polyvinyl Chloride (PVC) pipe incorporating a floor waste

The SNAP Retrofit LP 65 R fire collar comprised a 0.7-mm steel casing with an 85-mm inner diameter and a 202-mm diameter base flange. The 61-mm high collar casing incorporated a 300-mm x 55-mm x 4-mm thick Intumesh intumescent material. The closing mechanism comprised three stainless steel springs, with nylon fuse links and a 300-mm x 55-mm stainless steel mesh as shown in drawing numbered LP 65 R-T dated 13 June 2014, by SNAP Fire Systems. One collar was fixed to the underside of the slab with PBZ0635 fasteners.

The penetrating service comprised a 56-mm PVC pipe, with a wall thickness of 2.2-mm fitted through the collar's sleeve. The floor waste system was fitted on the unexposed face with a Chrome brass floor waste grate. On the exposed side of the slab, a 50-mm P-Trap was connected to the penetrating pipe with a glad nut within the collar, supported by M10 HKD clamps fixed to the concrete slab as shown in drawing titled "Penetration #4 – 50-mm P-Trap Floorwaste" dated 1 May 2014, by Snap Fire Systems Pty Ltd. On the exposed end, the floor waste gully was sealed using a 56-mm PVC Pipe and End Cap.

The trap was filled with water before the start of the test to the level shown in drawing titled "Penetration #4 – 50-mm P-Trap Floorwaste" dated 1 May 2014, 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 “Penetration #1 – 40-mm P-Trap Floorwaste” dated 1 May 2014, by Snap Fire Systems Pty Ltd.

Drawing titled “Penetration #2 – PVC SC (250-mm OD) Stack” dated 1 May 2014, by Snap Fire Systems Pty Ltd.

Drawing titled “Penetration #3 – HDPE (200-mm OD) Stack” dated 1 May 2014, by Snap Fire Systems Pty Ltd.

Drawing titled “Penetration #4 – 50-mm P-Trap Floorwaste” dated 1 May 2014, by Snap Fire Systems Pty Ltd.

Drawing numbered LP 65 R-T, dated 13 June 2014, by Snap Fire Systems Pty Ltd.

Drawing numbered 250 C-T, dated 13 June 2014, by Snap Fire Systems Pty Ltd.

Drawing numbered LP 200 R-T, dated 13 June 2014, 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
1 minute -	Light smoke is visible from base of Penetration 3.
2 minutes -	No smoke is visible from the unexposed end of pipes or grates.
3 minutes -	Smoke is visible from Penetration 1
4 minutes -	Penetration 2 is fluing from the unexposed end and small amount of smoke is visible from the unexposed end of pipe.
5 minutes -	Penetration 4 is also fluing smoke.
6 minutes -	Penetration 2 is distorting at the base and an increase of smoke is visible from end of Penetration 3.
7 minutes -	Large amount of smoke is visible from the furnace flues. Penetration 4 is still fluing smoke. Smoke has ceased to flue from Penetration 1.
8 minutes -	Penetration 2 is distorting at first pipe clamp (approx 600-mm above the slab)
9 minutes -	Fluing of smoke is decreasing from Penetrations 2 and 3. Penetration 1 is still fluing smoke.
10 minutes -	Large amount of smoke is visible from furnace flues.

11 minutes -	Small amount of smoke is visible penetrations 2, 3 and 4.
13 minutes -	Quantity of smoke fluing from the furnace has decreased.
14 minutes -	Very little amount of smoke is fluing from the specimens. No smoke is visible from Penetration 1.
22 minutes -	A small amount of smoke is visible from Penetration 2 only.
25 minutes -	A small amount of smoke is visible again from base of Penetrations 3 and 4.
39 minutes -	A small amount of smoke is still visible from the base of Penetrations 3 and 4. No smoke is fluing from the furnace flues.
55 minutes -	An increase of smoke is visible from Penetration 4.
60 minutes -	Very little smoke is visible from pipes or grates.
90 minutes -	No change to specimen.
110 minutes -	Light smoke/steam is fluing from Penetrations 2, 3 and 4.
120 minutes -	No visible change to unexposed face of specimen.
180 minutes -	Little visible change. Light smoke/steam is visible from pipes and grates.
200 minutes –	Increase in smoke is visible from Penetration 3. Base of Pipe of Penetration 2 is starting to melt and a dark discoloured area is visible at the base of the pipe.
204 minutes -	Insulation failure of Penetration 2 – maximum temperature rise of 180 deg C is exceeded on the slab.
210 minutes -	The base of Penetration 3 is distorted at the bottom near the slab.
212 minutes -	Insulation failure of Penetration 4 – maximum temperature rise of 180 deg C is exceeded on the pipe.
220 minutes -	A large hole is visible at the base of Pipe 2 on the east side. There is no visible glow through the hole in this area.
223 minutes -	Insulation failure of Penetration 3 – maximum temperature rise of 180 deg C is exceeded on the pipe.
230 minutes -	Integrity failure of Penetration 3 – Continuous flaming longer than 10 second at the base of the pipe.
234 minutes -	Flaming has spread from Penetration 3 to Penetration 2 .
236 minutes -	Test terminated. Increased flaming as Pipes 2 and 3 continue to burn. Insulation failure of Penetration 1 – maximum temperature rise of 180 deg C is exceeded on the pipe

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.

8.5 Performance

Performance observed in respect of the following AS 1530.4-2005 criteria:

Penetration 1 – LP 65 R retrofitted fire collar protecting a 43-mm diameter Polyvinyl Chloride (PVC) pipe incorporating a floor waste

Structural adequacy	-	not applicable
Integrity	-	no failure at 236 minutes
Insulation	-	236 minutes

Penetration 2 – 250 C cast-in fire collar protecting a 250-mm diameter Polyvinyl Chloride (PVC) Sandwich Construction (SC) pipe (slab incorporating a 80-mm thick concrete step)

Structural adequacy	-	not applicable
Integrity	-	no failure at 236 minutes
Insulation	-	204 minutes

Penetration 3 – LP 200 R retrofitted fire collar protecting a 200-mm diameter High Density Polyethylene (HDPE) pipe

Structural adequacy	-	not applicable
Integrity	-	230 minutes
Insulation	-	223 minutes

Penetration 4 – LP 65 R retrofitted fire collar protecting a 50-mm diameter Polyvinyl Chloride (PVC) pipe incorporating a floor waste

Structural adequacy	-	not applicable
Integrity	-	no failure at 236 minutes
Insulation	-	212 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:

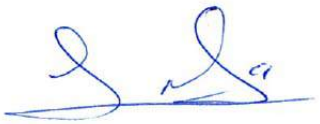
Penetration 1	-	-/180/180;
Penetration 2	-	-/180/180;
Penetration 3	-	-/180/180; and
Penetration 4	-	-/180/180

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

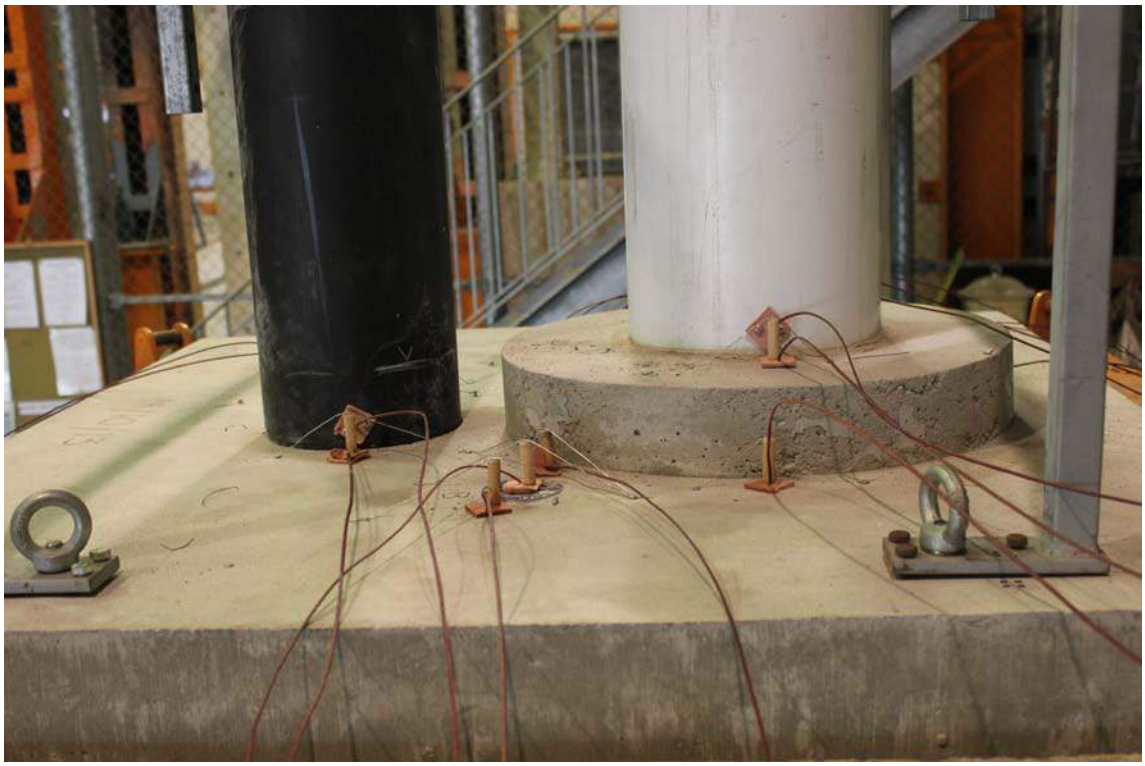
Appendices

Appendix A – Measurement location

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

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

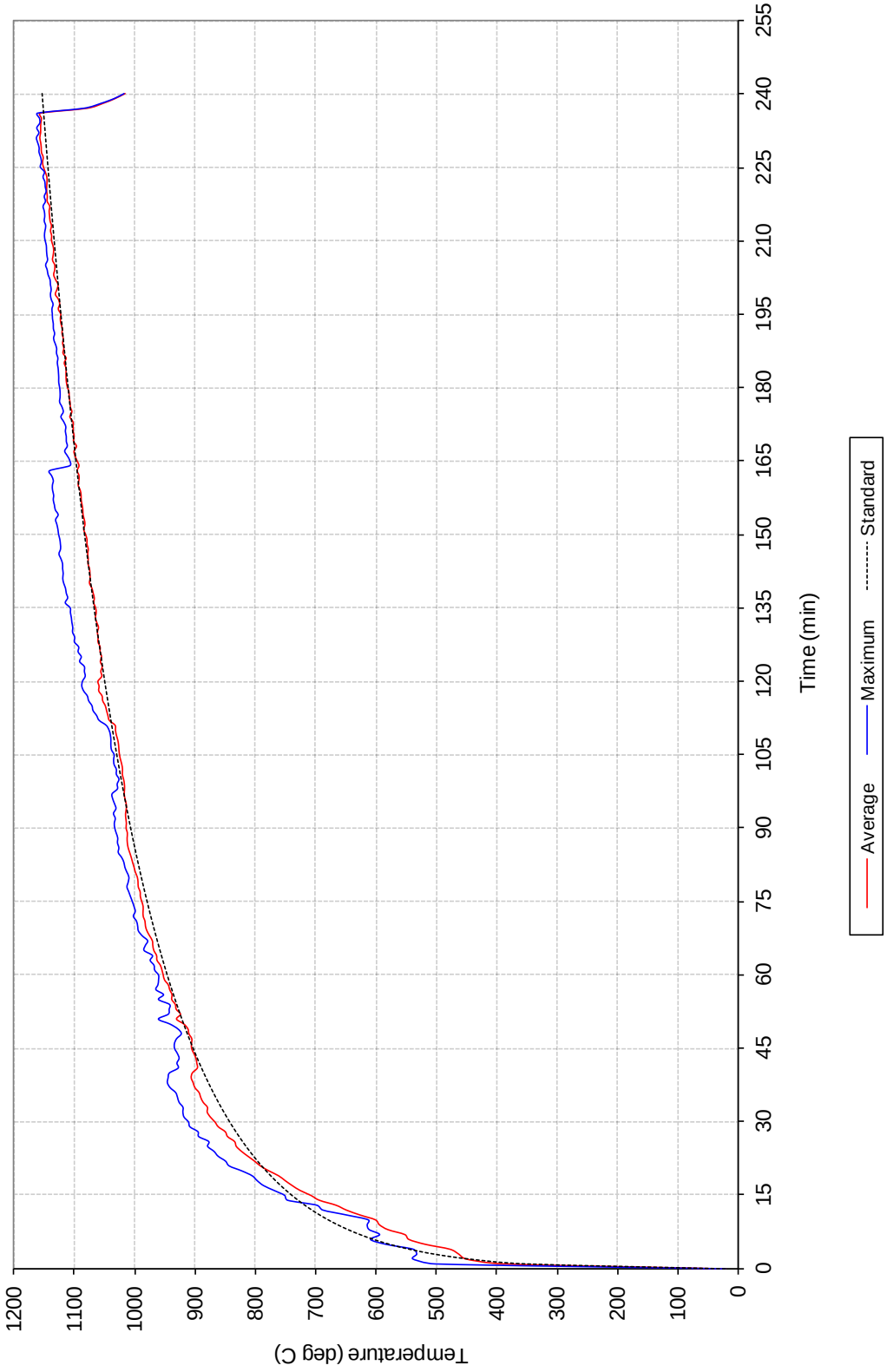


FIGURE 1 – FURNACE TEMPERATURE

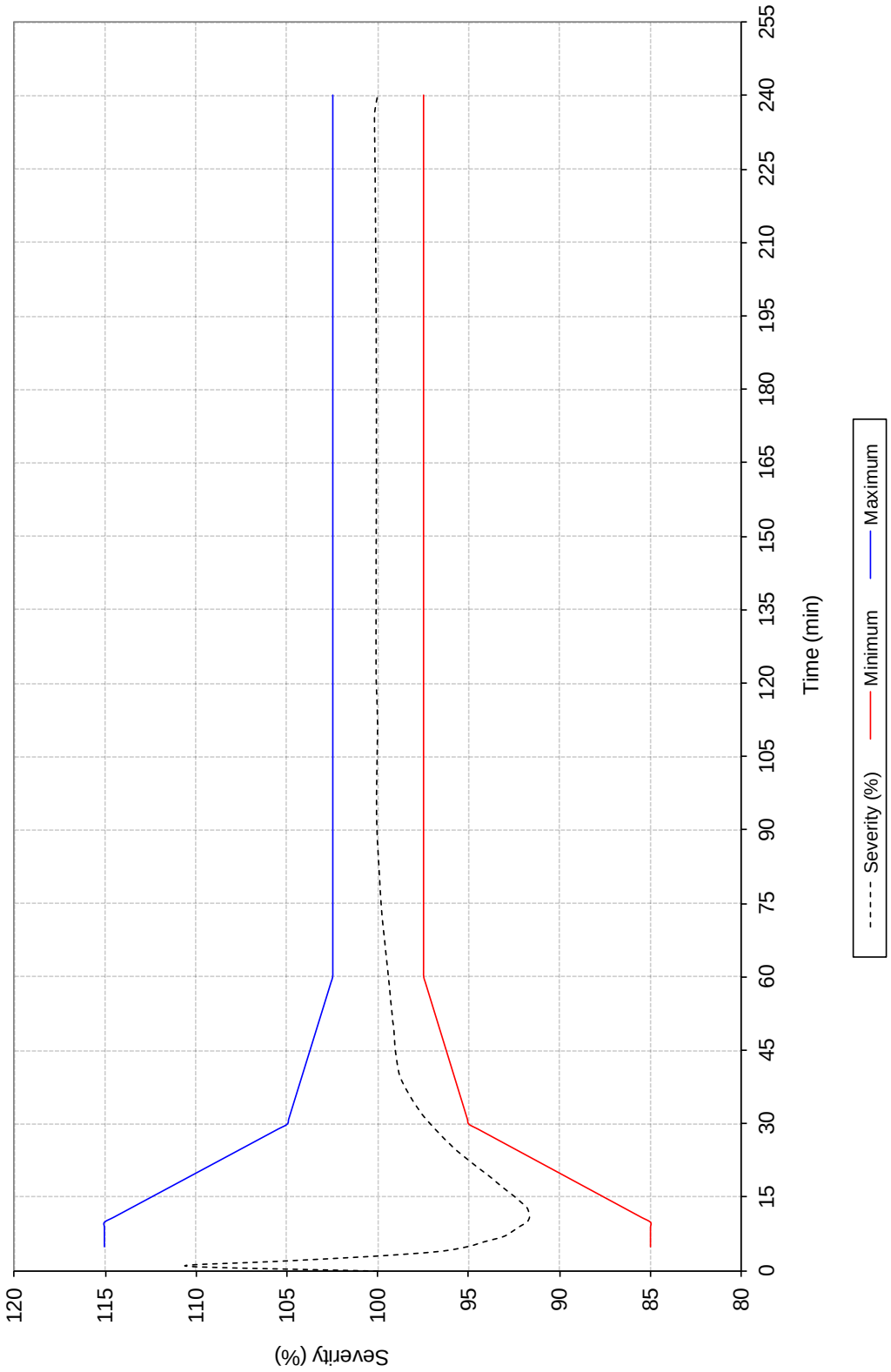


FIGURE 2 – FURNACE SEVERITY

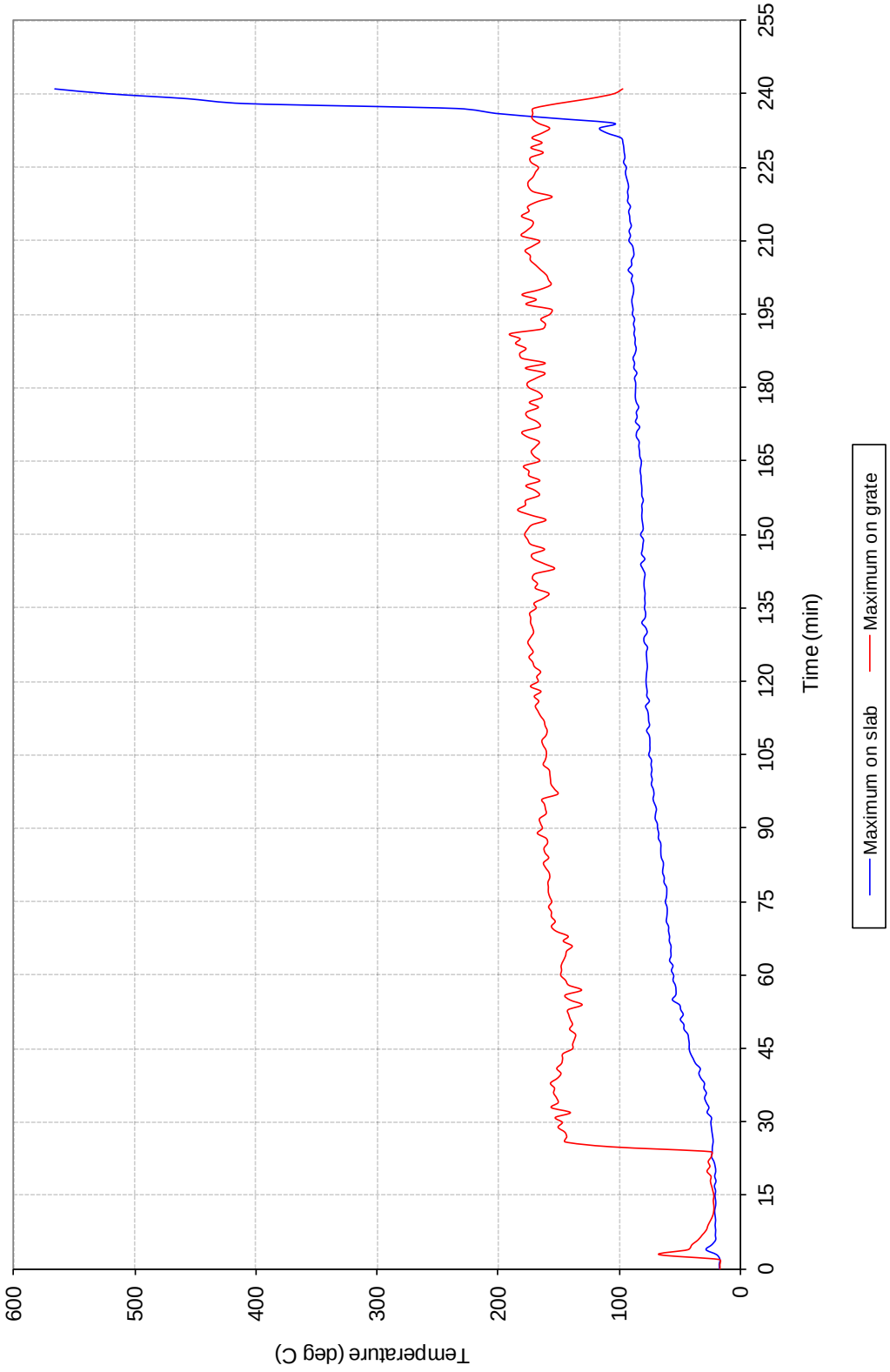


FIGURE 3 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION 1

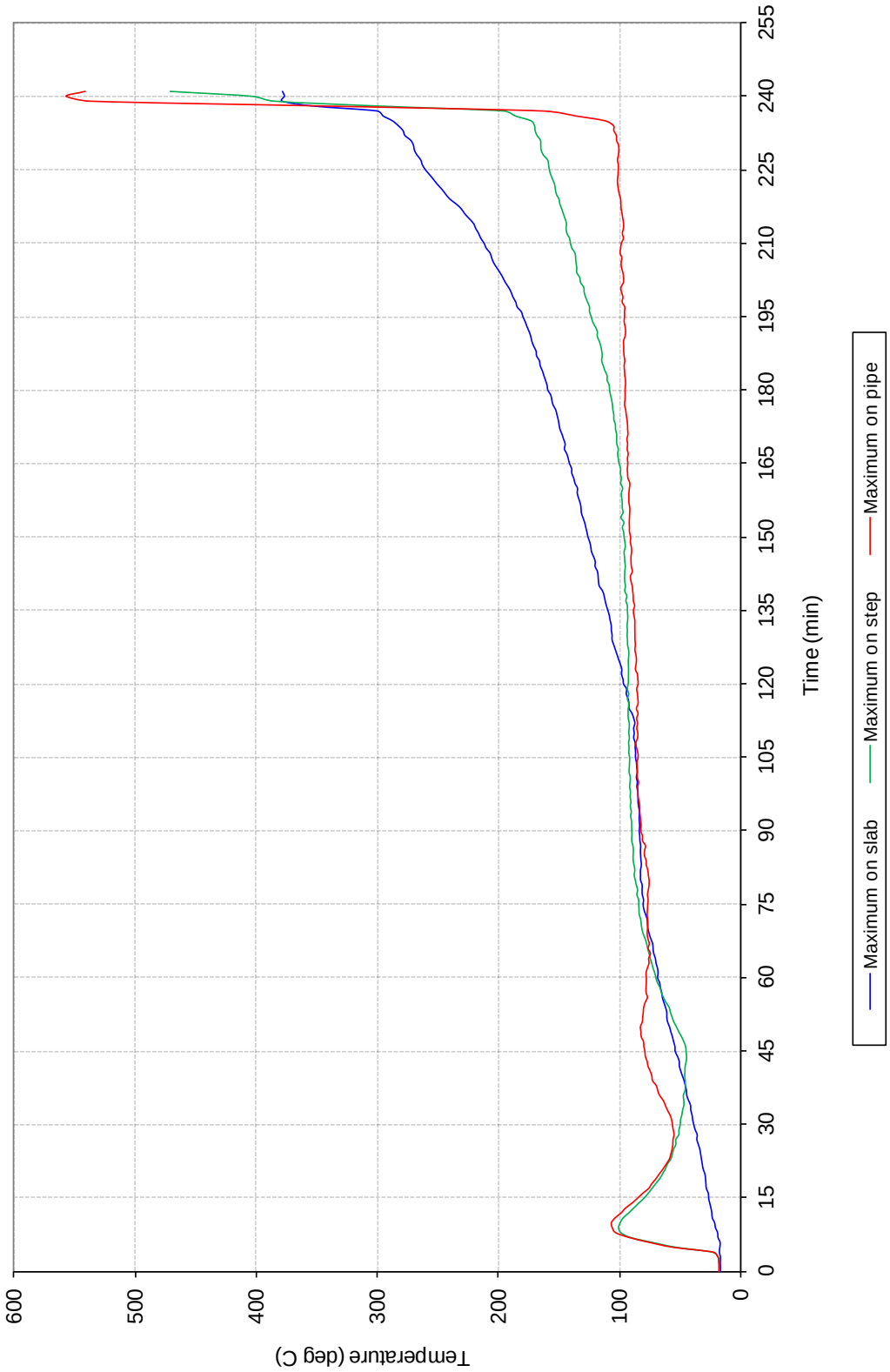


FIGURE 4 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION 2

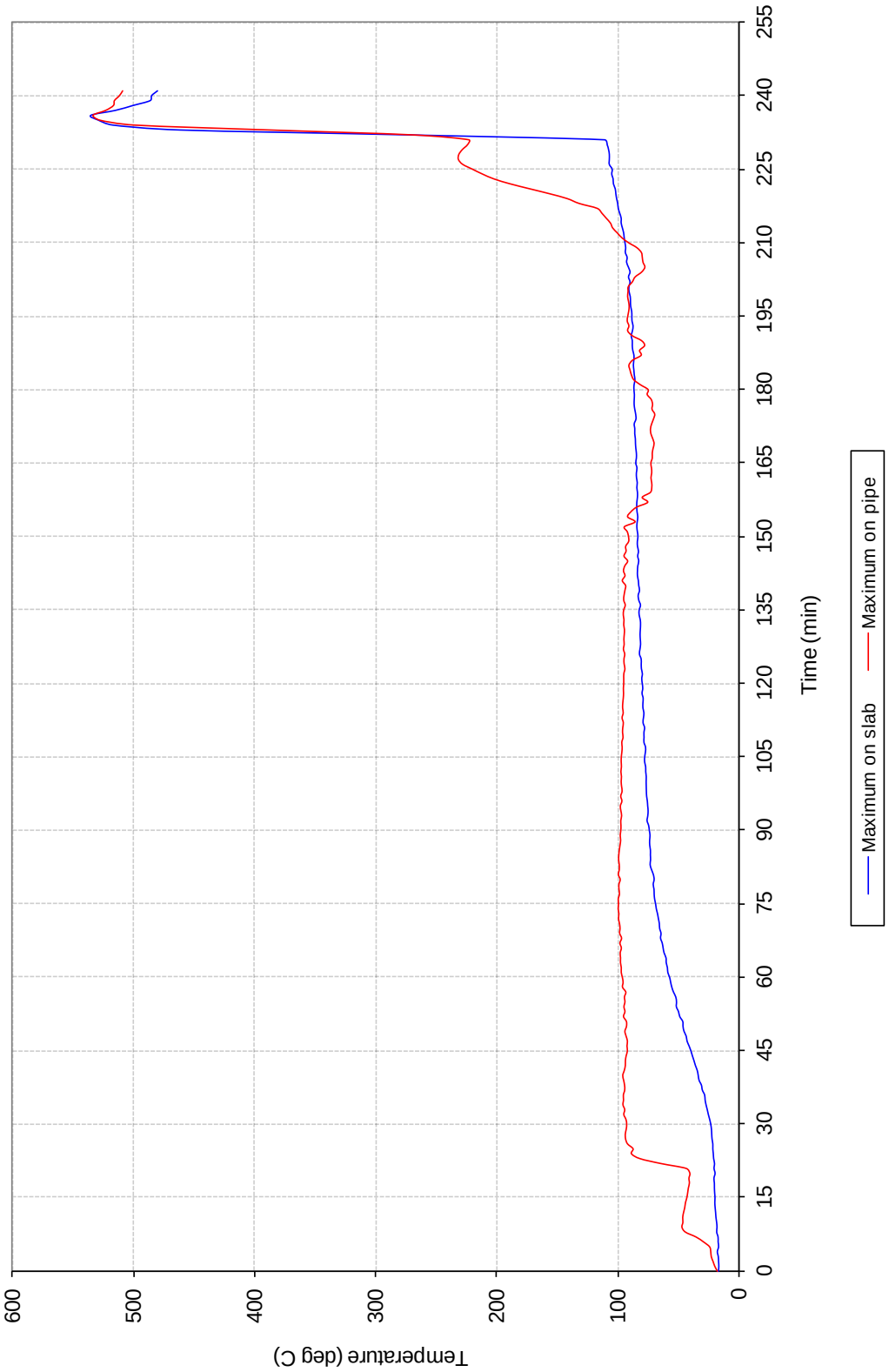


FIGURE 5 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION 3

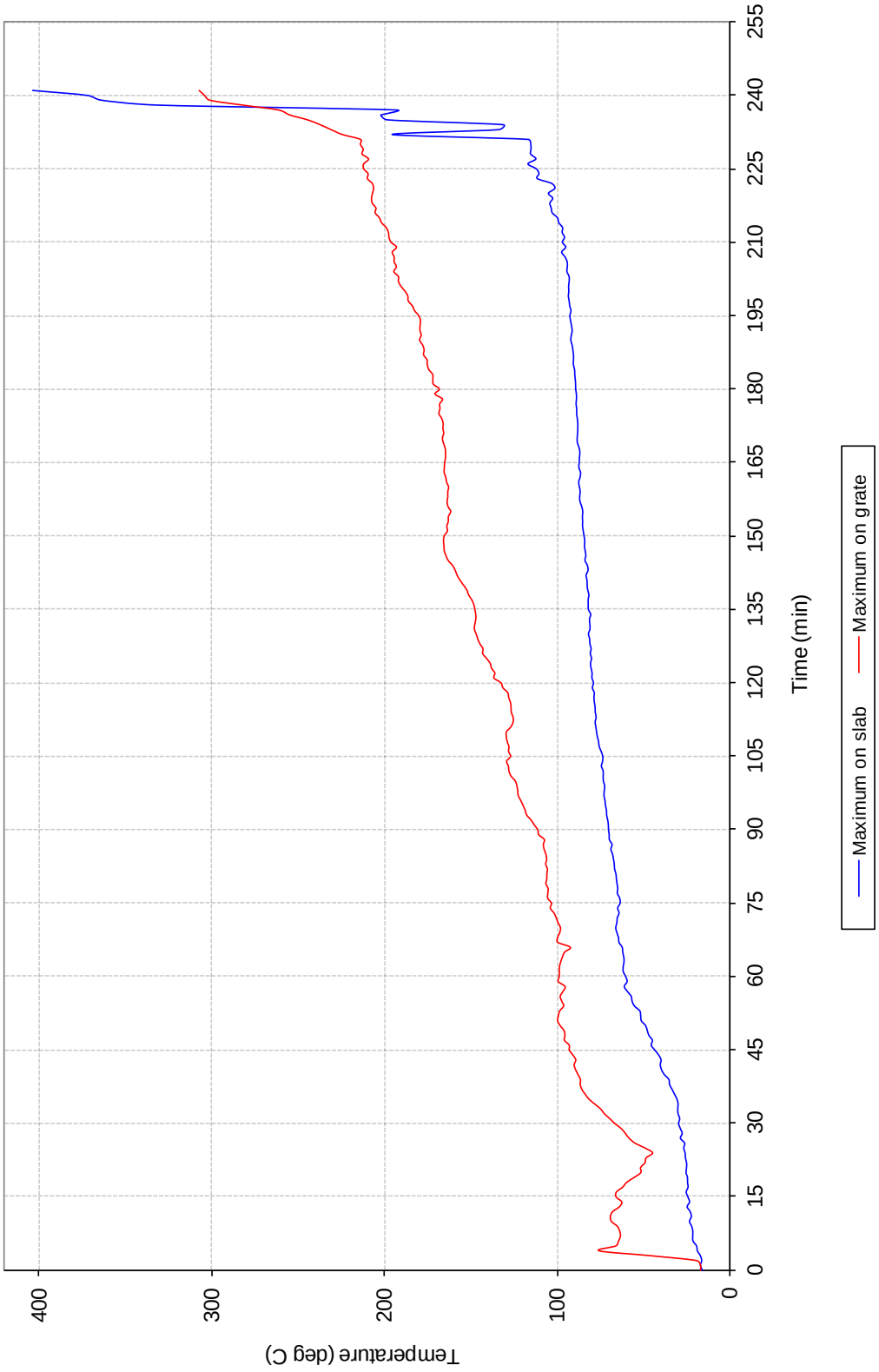
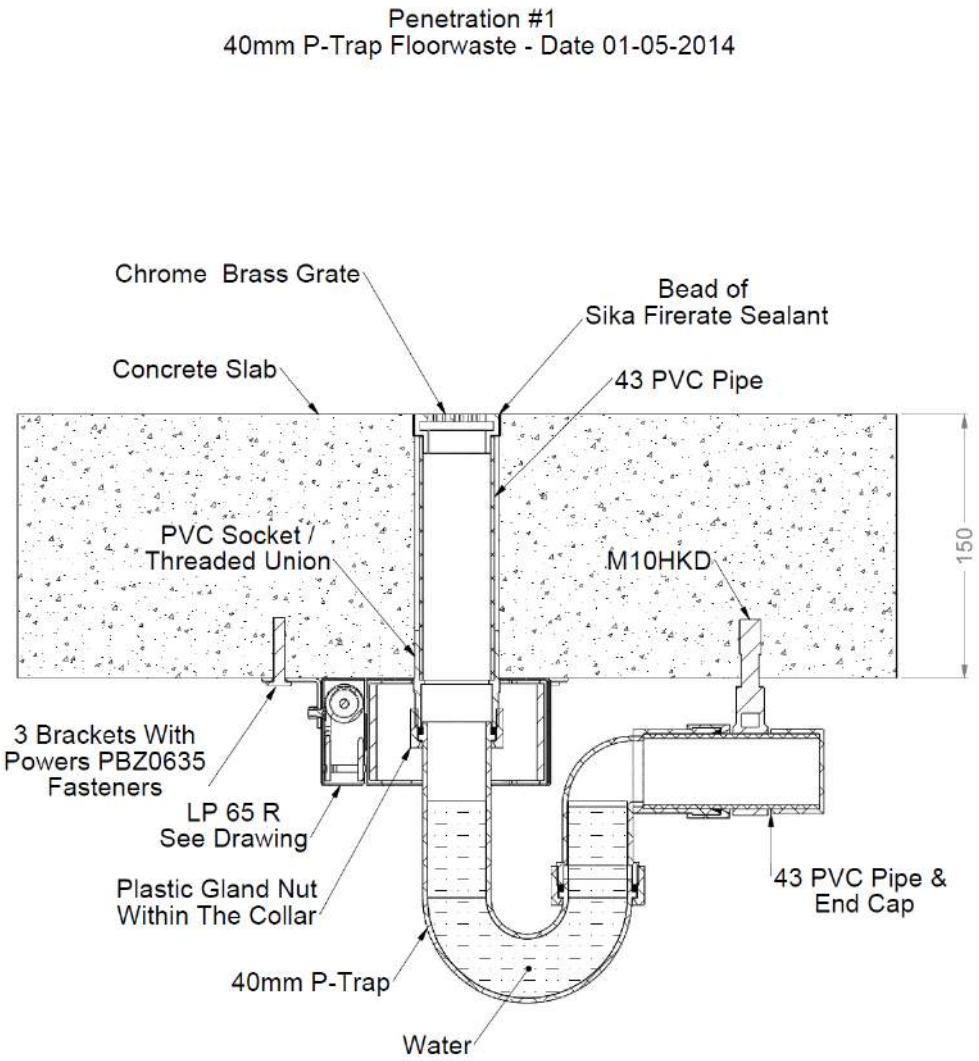
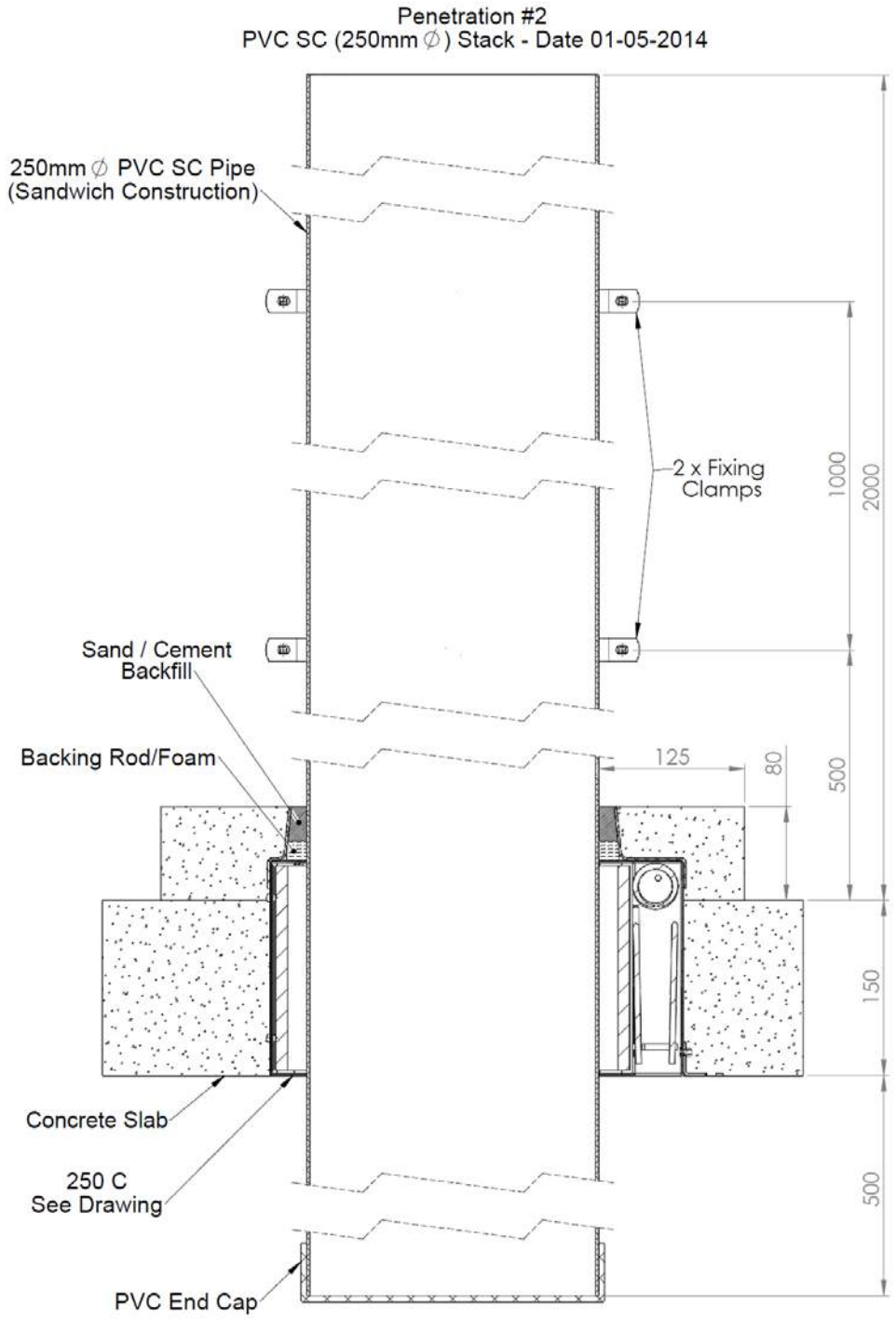


FIGURE 5 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION 4

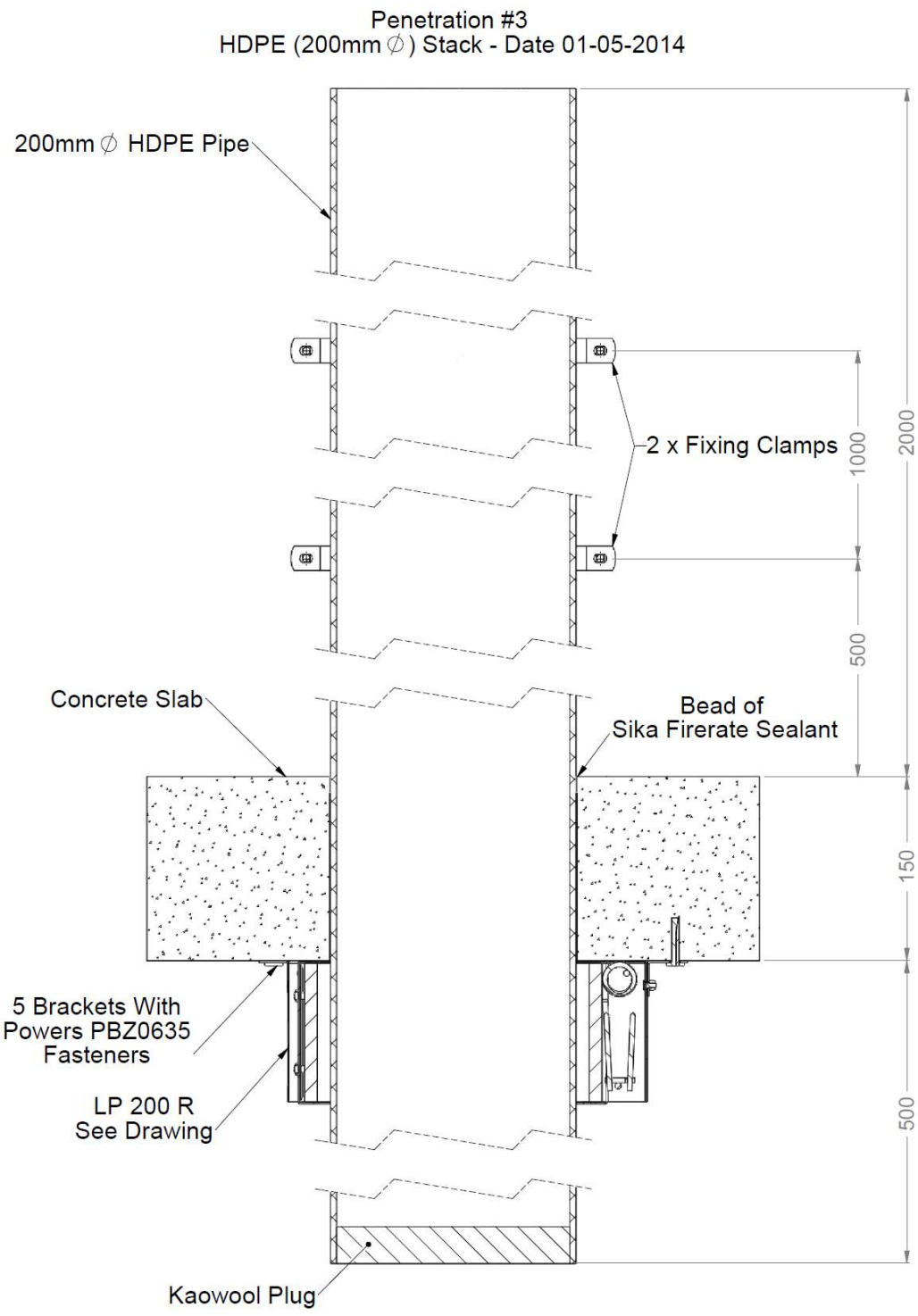
Appendix D – Installation drawings



DRAWING TITLED "PENETRATION #1 – 40-MM P-TRAP FLOORWASTE", DATED 1/05/2014 SUPPLIED BY SNAP FIRE SYSTEMS PTY LTD

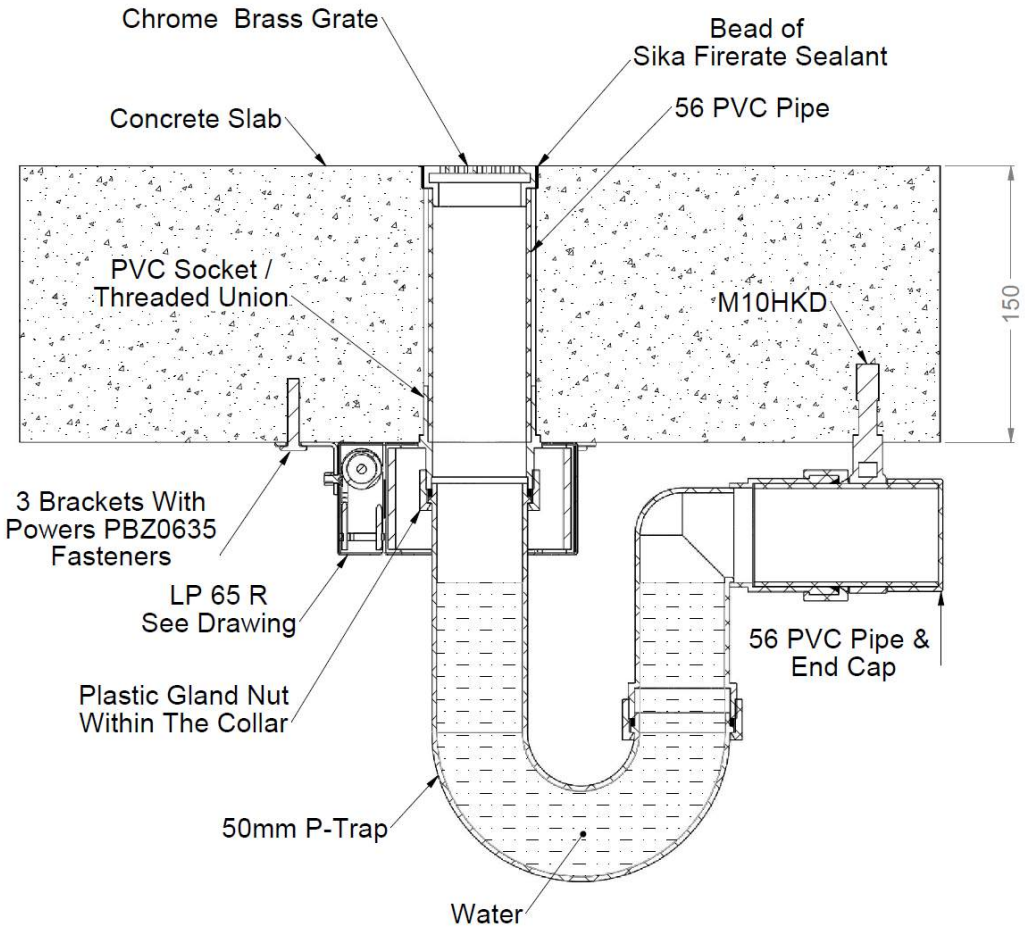


DRAWING TITLED "PENETRATION #2 – PVC SC (250-MM OD) STACK", DATED 1/05/2014 SUPPLIED BY SNAP FIRE SYSTEMS PTY LTD



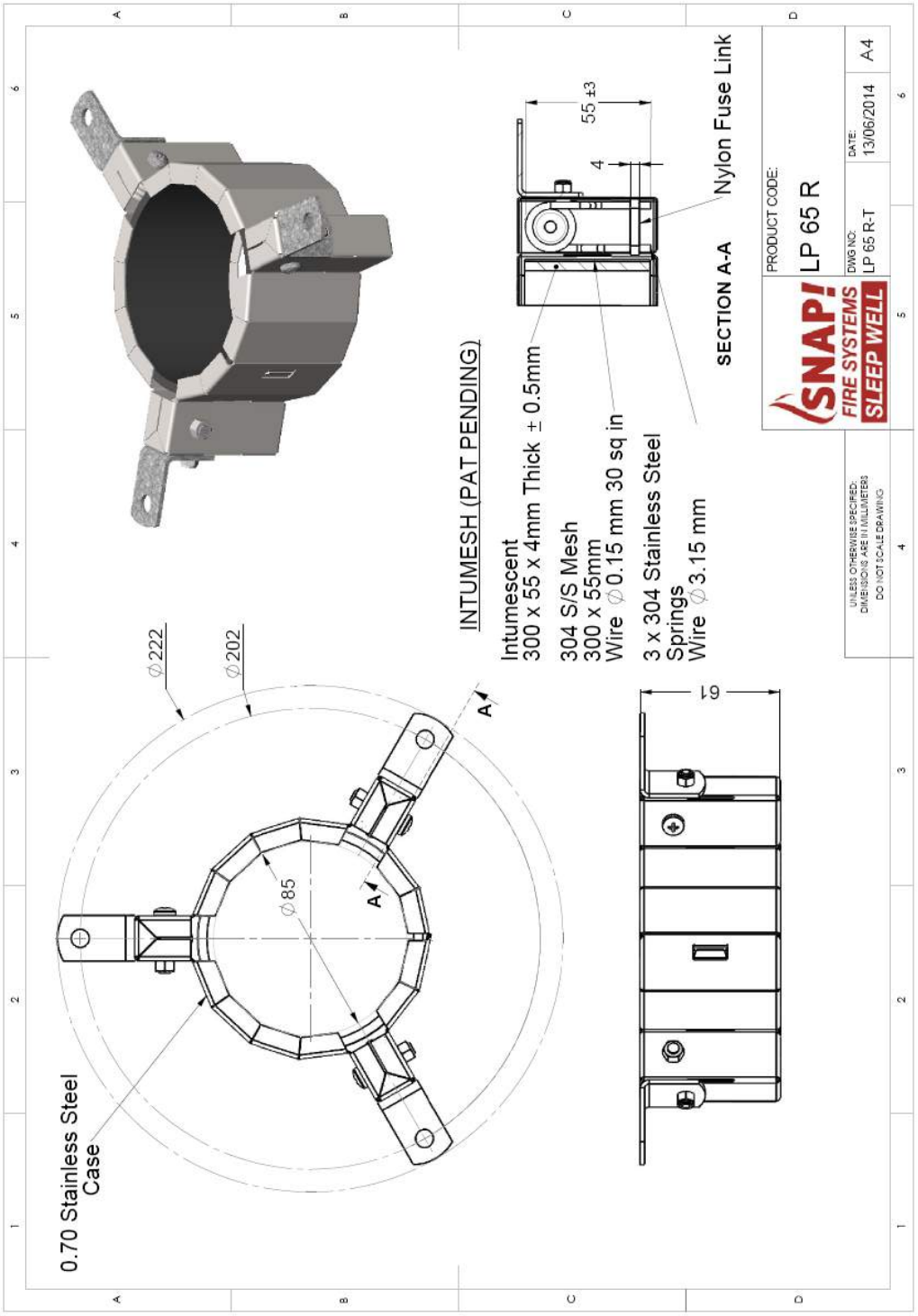
DRAWING TITLED "PENETRATION #3 – HDPE (200-MM OD) STACK", DATED 1/05/2014 SUPPLIED BY SNAP FIRE SYSTEMS PTY LTD

Penetration #4
50mm P-Trap Floorwaste - Date 01-05-2014

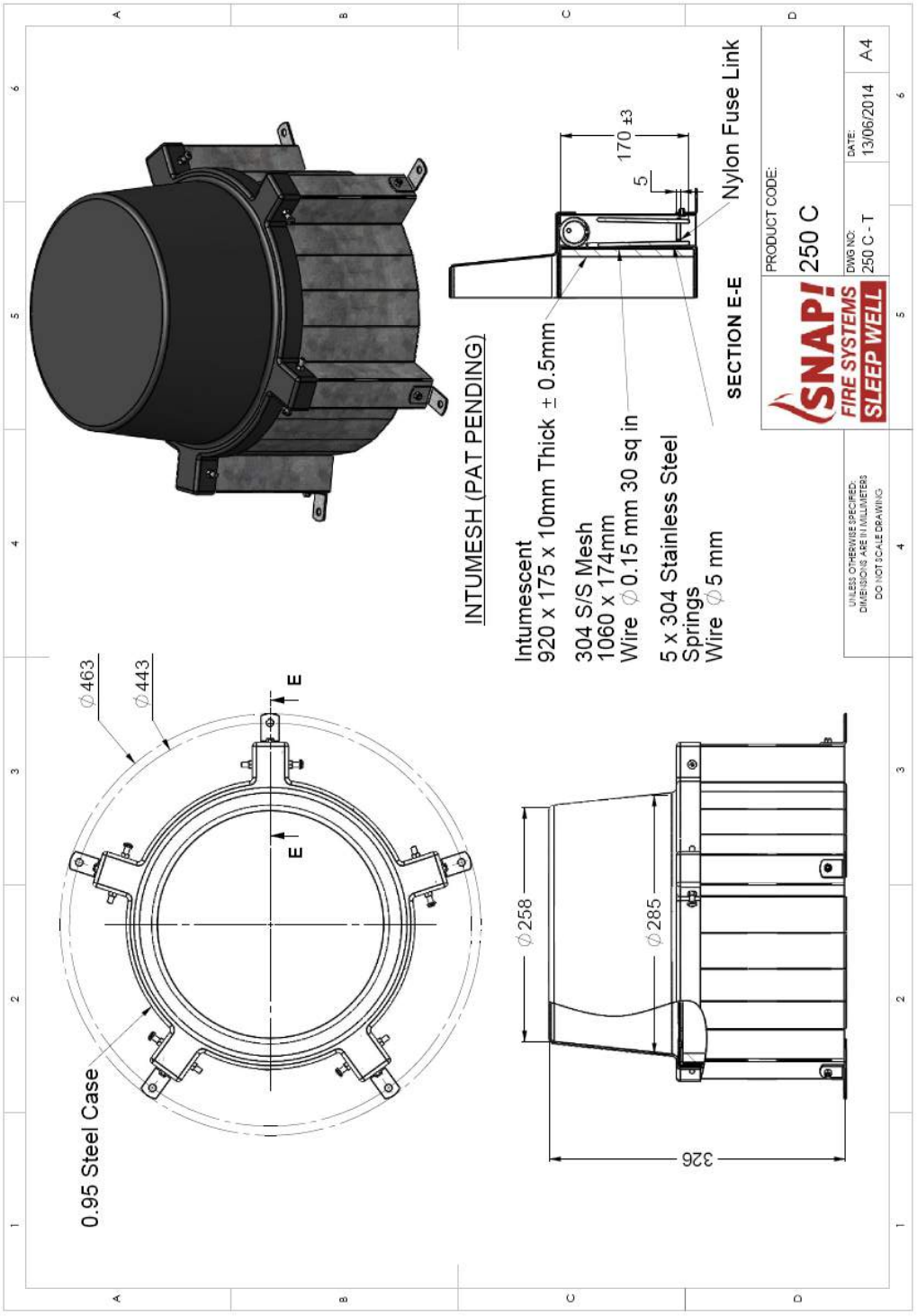


DRAWING TITLED "PENETRATION #4 – 50-MM P-TRAP FLOORWASTE", DATED 1/05/2014 SUPPLIED BY SNAP FIRE SYSTEMS PTY LTD

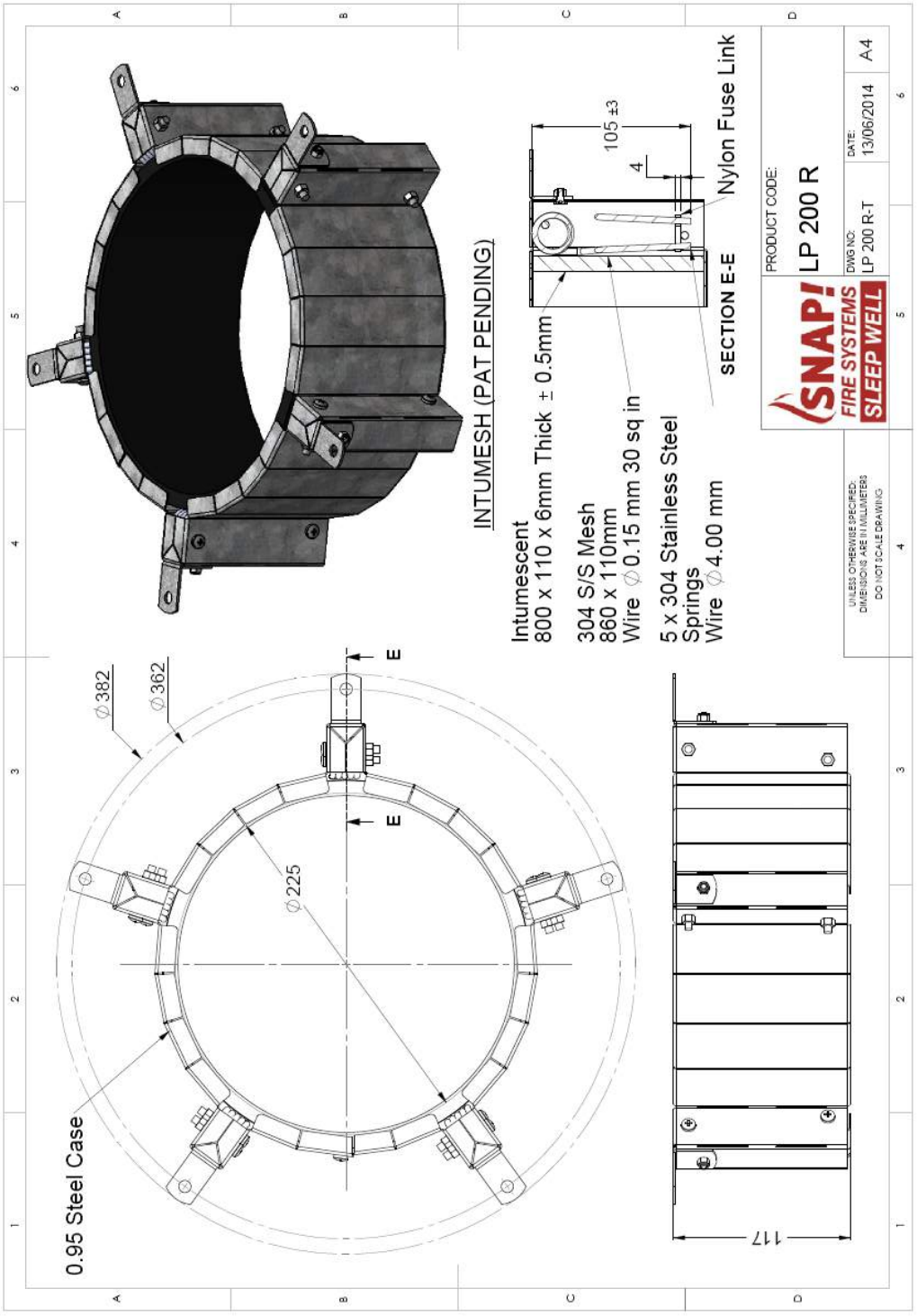
Appendix E – Specimen Drawings



DRAWING NUMBERED LP 65 R-T, DATED 13 JUNE 2014, BY SNAP FIRE SYSTEMS PTY LTD.



DRAWING NUMBERED 250 C-T, DATED 13 JUNE 2014, BY SNAP FIRE SYSTEMS PTY LTD.



DRAWING NUMBERED LP 200 R-T, DATED 13 JUNE 2014, BY SNAP FIRE SYSTEMS PTY LTD.

Appendix F – Certificates

INFRASTRUCTURE TECHNOLOGIES
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14 Julius Avenue, North Ryde NSW 2113
PO Box 310, North Ryde NSW 1670, Australia
T (02) 9490 5444 • **ABN** 41 687 119 230

Certificate of Test

No. 2559

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 1641.

Product Name: Penetration 1 – LP 65 R retrofitted fire collar protecting a 43-mm diameter Polyvinyl Chloride (PVC) pipe incorporating a floor waste

Description: The SNAP Retrofit LP 65 R fire collar comprised a 0.7-mm steel casing with a 85-mm inner diameter and a 202-mm diameter base flange. The 61-mm high collar casing incorporated a 300-mm x 55-mm x 4-mm thick Intumesh intumescent material. The closing mechanism comprised three stainless steel springs, with nylon fuse links and a 300-mm x 55-mm stainless steel mesh as shown in drawing numbered LP 65 R-T dated 13 June 2014, by SNAP Fire Systems. One collar was fixed to the underside of the slab with PBZ0635 fasteners.
The penetrating service comprised a 43-mm PVC pipe, with a wall thickness of 2-mm fitted through the collar's sleeve. The floor waste system was fitted on the unexposed face with a Chrome brass floor waste grate. On the exposed side of the slab, a 40-mm P-Trap was connected to the penetrating pipe with a glad nut within the collar, supported by M10 HKD clamps fixed to the concrete slab as shown in drawing titled "Penetration #1 – 40-mm P-Trap Floorwaste" dated 1 May 2014, by Snap Fire Systems Pty Ltd. On the exposed end, the floor waste gully was sealed using a 43-mm PVC Pipe and end cap.
The trap was filled with water before the start of the test to the level shown in drawing titled "Penetration #1 – 40-mm P-Trap Floorwaste" dated 1 May 2014, by Snap Fire Systems Pty Ltd.

The element of construction described above satisfied the following criteria for fire-resistance for the period stated.

Structural Adequacy	not applicable
Integrity	no failure at 236 minutes
Insulation	236 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/180/180. 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: 8 May 2014

Issued on the 25th day of July 2014 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

COPY OF CERTIFICATE OF TEST – NO. 2559

INFRASTRUCTURE TECHNOLOGIES
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PO Box 310, North Ryde NSW 1670, Australia
T (02) 9490 5444 • **ABN** 41 687 119 230

Certificate of Test

No. 2560

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 1641.

Product Name: Penetration 2 – 250 C cast-in fire collar protecting a 250-mm diameter Polyvinyl Chloride (PVC) Sandwich Construction (SC) pipe (slab incorporating an 80-mm thick concrete step)

Description: The SNAP Cast-in 250 C fire collar comprised a 0.95-mm steel casing with a 285-mm inner diameter and a 443-mm diameter base flange. The 326-mm high collar casing incorporated a 920-mm x 175-mm x 10-mm thick Intumesh intumescent material. The closing mechanism comprised five stainless steel springs, with nylon fuse links and a 1060-mm x 174-mm stainless steel mesh as shown in drawing numbered 250 C-T dated 13 June 2014, by SNAP Fire Systems.

The penetrating service comprised a 250-mm PVC SC stack pipe, with a wall thickness of 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 1000-mm from the unexposed face of the concrete slab as shown in drawing titled "Penetration #2 – PVC SC (250-mm OD) Stack" dated 1 May 2014, by Snap Fire Systems Pty Ltd. On the exposed end, the pipe was capped using a PVC End Cap

The concrete slab comprised a 80-mm thick step around the pipe, as shown in drawing titled "Penetration #2 – PVC SC (250-mm OD) Stack" dated 1 May 2014, by Snap Fire Systems Pty Ltd

On the unexposed face, the annular gap between the pipe and the slab was filled with sand and cement to a 40-mm depth controlled by a backing rod.

The element of construction described above satisfied the following criteria for fire-resistance for the period stated.

Structural Adequacy	not applicable
Integrity	no failure at 236 minutes
Insulation	204 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/180/180. 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: 8 May 2014

Issued on the 25th day of July 2014 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

NATA	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

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Certificate of Test

No. 2561

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 1641.

Product Name: Penetration 3 – LP 200 R retrofitted fire collar protecting a 200-mm diameter High Density Polyethylene (HDPE) pipe

Description: The SNAP Retrofit LP 200 R fire collar comprised a 0.95-mm steel casing with a 225-mm inner diameter and a 362-mm diameter base flange. The 117-mm high collar casing incorporated 800-mm x 110-mm x 6-mm thick Intumesh intumescent material. The closing mechanism comprised five stainless steel springs, with nylon fuse links and an 860-mm x 110-mm stainless steel mesh as shown in drawing numbered LP 200 R-T dated 13 June 2014, by SNAP Fire Systems. One collar was fixed to the underside of the slab with PBZ0635 fasteners.
The penetrating service comprised a 200-mm OD HDPE pipe, with a wall thickness of 7.1-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 as shown in drawing titled "Penetration #3 – HDPE (200-mm OD) Stack" dated 1 May 2014, by Snap Fire Systems Pty Ltd. On the exposed end, the pipe was capped with a Kaowool Plug.

The element of construction described above satisfied the following criteria for fire-resistance for the period stated.

Structural Adequacy	not applicable
Integrity	230 minutes
Insulation	223 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/180/180. 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: 8 May 2014

Issued on the 25th day of July 2014 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

NATA	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

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Certificate of Test

No. 2562

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 1641.

Product Name: Penetration 4 – LP 65 R retrofitted fire collar protecting a 50-mm diameter Polyvinyl Chloride (PVC) pipe incorporating a floor waste

Description: The SNAP Retrofit LP 65 R fire collar comprised a 0.7-mm steel casing with an 85-mm inner diameter and a 202-mm diameter base flange. The 61-mm high collar casing incorporated a 300-mm x 55-mm x 4-mm thick Intumesh intumescent material. The closing mechanism comprised three stainless steel springs, with nylon fuse links and a 300-mm x 55-mm stainless steel mesh as shown in drawing numbered LP 65 R-T dated 13 June 2014, by SNAP Fire Systems. One collar was fixed to the underside of the slab with PBZ0635 fasteners.
The penetrating service comprised a 56-mm PVC pipe, with a wall thickness of 2.2-mm fitted through the collar's sleeve. The floor waste system was fitted on the unexposed face with a Chrome brass floor waste grate. On the exposed side of the slab, a 50-mm P-Trap was connected to the penetrating pipe with a glad nut within the collar, supported by M10 HKD clamps fixed to the concrete slab as shown in drawing titled "Penetration #4 – 50-mm P-Trap Floorwaste" dated 1 May 2014, by Snap Fire Systems Pty Ltd. On the exposed end, the floor waste gully was sealed using a 56-mm PVC Pipe and End Cap.
The trap was filled with water before the start of the test to the level shown in drawing titled "Penetration #4 – 50-mm P-Trap Floorwaste" dated 1 May 2014, by Snap Fire Systems Pty Ltd.

The element of construction described above satisfied the following criteria for fire-resistance for the period stated.

Structural Adequacy	not applicable
Integrity	no failure at 236 minutes
Insulation	212 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/180/180. 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: 8 May 2014

Issued on the 25th day of July 2014 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

NATA	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

COPY OF CERTIFICATE OF TEST – NO. 2562

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.

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FOR FURTHER INFORMATION

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