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

Test Report

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Client: Snap Fire Systems Pty Ltd

Commercial-in-confidence

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

Sponsored Investigation No. FSP 1807

1 Introduction

1.1 Identification of specimen

The sponsor identified the specimen as Snap Retrofit Fire Collars protecting a 75-mm thick Hebel autoclaved aerated concrete (AAC) panel wall system penetrated by two (2) HDPE pipes, two (2) Pex-B pipe, two (2) PVC pipes, one (1) Px-Al-Px pipe, one (1) Valsir Px-Al-Px and one (1) PVC Conduit.

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.

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 4646/3941

1.7 Test date

The fire-resistance test was conducted on 18 January 2017.

2 Description of specimen

2.1 General

The wall system comprised a 75-mm thick Hebel autoclaved aerated concrete (AAC) panel wall system with an established fire resistance level (FRL) of -/90/90 as detailed in CSIRO test report FSV 0979. The wall was penetrated by nine (9) stack pipes protected by a retro-fitted Snap Fire Systems fire collar.

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 1260 - PVC-U pipes and fittings for drain, waste and vent application
- AS/NZS 5065:2005 'Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications'
- AS/NZS 2492:2007 'Cross-linked polyethylene (PE-X) pipes for pressure applications' and
- AS/NZS 4401 Plastics piping systems for soil and waste discharge (low and high temperature) inside buildings – Polythylene (PE)

For the purpose of the test, the specimens were referenced as Penetrations # 1, 2, 3, 4, 5, 6, 7, 8 and 9. Eight specimens are included in this report (Penetration # 1, 2, 3, 4, 5, 7, 8 and 9). Documents containing a complete description of each specimen were supplied by the Sponsor and are retained in file.

<u>Penetration # 1 – LP100R-D Retrofit fire collar protecting a nominal 75-mm High-density polyethylene (HDPE) Pipe</u>

The SNAP Retrofit LP100R-D collar comprised a 0.95-mm thick steel casing with a 122-mm inner diameter and a 195-mm x 195-mm square base flange. The 65-mm high collar casing incorporated a layer of 418-mm x 59-mm x 5-mm thick Intumescent material. The closing mechanism comprised 4 x 304 stainless steel springs bound with black nylon fuse links and 316 stainless steel mesh measuring 415 x 120-mm as shown in drawing numbered LP100R-D-T dated 10 February 2017, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in a back-to-back configuration using 14-10 65-mm Hex Head Screws.

The penetrating service comprised a 75-mm HDPE Pipe, with a wall thickness of 3.5-mm penetrating the wall through a 79-mm diameter cut-out hole as shown in drawing titled "Test Wall W-16-D Penetration # 1, 75-mm HDPE Pipe – LP100R-D Retrofit Collar, dated 6 February 2017", by Snap Fire Systems Pty Ltd. The pipe incorporated a HDPE Coupling located on the exposed side of the wall. The pipe projected horizontally, 2000-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber. The pipe was supported at nominally 500-mm and 1500-mm from the unexposed face of the wall by two support clamps spaced apart at nominally 1000-mm. The pipe was open at the unexposed end and capped on the exposed end with a ceramic fibre (Superwool) plug.

Penetration # 2 – LP65R Retrofit fire collar protecting a 63-mm High-density polyethylene (HDPE) Pipe

The SNAP Retrofit LP65R fire collar comprised a 0.7-mm stainless steel casing with a 85-mm inner diameter and a 222-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 LP65R-T dated 13 June 2014, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in a back-to-back configuration using 14-10 65-mm Hex Head Screws.
The penetrating service comprised a 63-mm HDPE Pipe, with a wall thickness of 3.5-mm penetrating the wall through a 67-mm diameter cut-out hole as shown in drawing titled "Test Wall W-16-D Penetration # 2, 63-mm HDPE Pipe – LP65R Retrofit Collar, dated 6 February 2017". The pipe incorporated a HDPE Coupling located on the exposed side of the wall. The pipe projected horizontally, 2000-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber. The pipe was supported at nominally 500-mm and 1500-mm from the unexposed face of the wall by two support clamps spaced apart at nominally 1000-mm. The pipe was open at the unexposed end and capped on the exposed end with a ceramic fibre (Superwool) plug.

Penetration # 3 – 32R Retrofit fire collar protecting a nominal 25-mm Polyvinyl Chloride (PVC) Conduit with 3-Core Cable

The 32R Retrofit collar comprised a 0.75-mm steel casing with a 40-mm inner diameter and a 106-mm diameter base flange. The 32-mm high collar casing incorporated a closing mechanism that was comprised of two soft Intumesh intumescent strips lined within the internal circumference of the collar. The inner and outer strips were 4-mm thick x 26-mm wide x 135-mm long, and 4-mm thick x 26-mm wide x 154-mm long, respectively. Between the strips was a layer of 304 stainless steel mesh 135 mm long x 25-mm wide with wire mesh diameter of 0.15-mm, as shown in drawing numbered 32R-T dated 12 February 2015, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in a back-to-back configuration using 14-10 65-mm Hex Head Screws.

The penetrating service comprised a 25-mm PVC Conduit with 3-Core Cable, with a wall thickness of 1.8-mm penetrating the wall through a 29-mm diameter cut-out hole as shown in drawing titled "Test Wall W-16-D Penetration # 3, 25-mm PVC Conduit with 3-Core Cable – 32R Retrofit Collar, dated 6 February 2017". The conduit projected horizontally, 2000-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber. The conduit was supported at nominally 500-mm and 1500-mm from the unexposed face of the wall by two support clamps spaced apart at nominally 1000-mm. The conduit was open at the unexposed end and capped on the exposed end with a ceramic fibre (Superwool) plug.

Penetration # 4 – LP100R-D Retrofit fire collar protecting a nominal 80-mm Polyvinyl Chloride (PVC) Pipe with a fitting inside the collar

The SNAP Retrofit LP100R-D collar comprised a 0.95-mm thick steel casing with a 122-mm inner diameter and a 195-mm x 195-mm square base flange. The 65-mm high collar casing incorporated a layer of 418-mm x 59-mm x 5-mm thick Intumescent material. The closing mechanism comprised 4 x 304 stainless steel springs bound with black nylon fuse links and 316 stainless steel mesh measuring 415 x 120-mm as shown in drawing numbered LP100R-D-T dated 10 February 2017, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in a back-to-back configuration using 14-10 65-mm Hex Head Screws.

The penetrating service comprised an 82-mm OD PVC Pipe, with a wall thickness of 3-mm fitted through the collar's sleeve and penetrating the wall through a 89-mm diameter cut-out hole as shown in drawing titled "Test Wall W-16-D Penetration # 4, 80-mm PVC Pipe with fitting inside the collar – LP100R-D Retrofit Collar, dated 6 February 2017". The pipe projected horizontally, 2000-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber. The pipe incorporated an 80-mm PVC Coupling inside the collar located on the exposed side of the wall. The pipe was supported at nominally 500-mm and 1500-mm from the unexposed face of the wall by two support clamps spaced apart at nominally 1000-mm. The pipe was open at the unexposed end and capped on the exposed end with an 80-mm PVC End Cap.

Penetration # 5 – GAS50 collar protecting a 50-mm Px-Al-Px Pipe

The SNAP Retrofit GAS50 collar comprised a 0.95-mm thick steel casing with a 57-mm inner diameter and a 130-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 50-mm OD Px-Al-Px Pipe, with a wall thickness of 5-mm fitted through the collar's sleeve and penetrating the wall through a 56-mm diameter cut-out hole as shown in drawing titled "Test Wall W-16-D Penetration # 5, 50-mm Px-Al-Px Pipe – Gas 50 Collar, dated 6 February 2017". The annular gap between the pipe and opening was sealed with a 10-mm bead of fire rated sealant on both sides of the wall. The pipe projected horizontally, 2000-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber. The pipe was supported at nominally 500-mm and 1500-mm from the unexposed face of the wall by two support clamps spaced apart at nominally 1000-mm. The pipe was open at the unexposed end and capped on the exposed end with a ceramic fibre (Superwool) plug.

A 10-mm bead of fire rated sealant was used around both sides of the pipe.

Penetration # 7 – 32R Retrofit fire collar protecting a nominal 32-mm Pex-b pipe

The 32R Retrofit collar comprised a 0.75-mm steel casing with a 40-mm inner diameter and a 106-mm diameter base flange. The 32-mm high collar casing incorporated a closing mechanism that was comprised of two soft Intumesh intumescent strips lined within the internal circumference of the collar. The inner and outer strips were 4-mm thick x 26-mm wide x 135-mm long, and 4-mm thick x 26-mm wide x 154-mm long, respectively. Between the strips was a layer of 304 stainless steel mesh 135 mm long x 25-mm wide with wire mesh diameter of 0.15-mm, as shown in drawing numbered 32R-T dated 12 February 2015, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in a back-to-back configuration using 14-10 65-mm Hex Head Screws.

The penetrating service comprised a 32-mm Pex-b pipe, with a wall thickness of 3.2-mm penetrating the wall through a 35-mm diameter cut-out hole as shown in drawing titled "Test Wall W-16-D Penetration # 7, 32-mm Pex-b pipe – 32R Retrofit Collar, dated 6 February 2017". The pipe projected horizontally, 2000-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber. The pipe was supported at nominally 500-mm and 1500-mm from the unexposed face of the wall by two support clamps spaced apart at nominally 1000-mm. The pipe was open at the unexposed end and capped on the exposed end with a ceramic fibre (Superwool) plug.

Penetration # 8 – 32R Retrofit fire collar protecting a nominal 20-mm Pex-b pipe

The 32R Retrofit collar comprised a 0.75-mm steel casing with a 40-mm inner diameter and a 106-mm diameter base flange. The 32-mm high collar casing incorporated a closing mechanism that was comprised of two soft Intumesh intumescent strips lined within the internal circumference of the collar. The inner and outer strips were 4-mm thick x 26-mm wide x 135-mm long, and 4-mm thick x 26-mm wide x 154-mm long, respectively. Between the strips was a layer of 304 stainless steel mesh 135 mm long x 25-mm wide with wire mesh diameter of 0.15-mm, as shown in drawing numbered 32R-T dated 12 February 2015, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in a back-to-back configuration using 14-10 65-mm Hex Head Screws.

The penetrating service comprised a 20-mm Pex-b pipe, with a wall thickness of 2-mm penetrating the wall through a 25-mm diameter cut-out hole as shown in drawing titled "Test Wall W-16-D Penetration # 8, 20-mm Pex-b pipe – 32R Retrofit Collar, dated 6 February 2017". The pipe projected horizontally, 2000-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber. The pipe was supported at nominally 500-mm and 1500-mm from the unexposed face of the wall by two support clamps spaced apart at nominally 1000-mm. The pipe was open at the unexposed end and capped on the exposed end with a ceramic fibre (Superwool) plug.

Penetration # 9 – HP150R Retrofit fire collar protecting a nominal 150-mm Polyvinyl Chloride (PVC) Pipe with a fitting inside the collar

The SNAP retrofitted HP150R collar comprised a 0.95-mm thick steel casing with a 175-mm inner diameter and a 326-mm base flange. The 117-mm high collar casing incorporated a strip of 570-mm x 112-mm x 8-mm thick Intumesh intumescent material. The closing mechanism comprised four 304 stainless steel springs bound with nylon fuse links, and a 596-mm x 112-mm stainless steel mesh as shown in drawing numbered HP 150R-T dated 2 October 2015, by Snap Fire Systems Pty. One collar was fixed to each side of the wall in a back-to-back configuration using 14-10 65-mm Hex Head Screws.

The penetrating service comprised an 160-mm OD PVC Pipe, with a wall thickness of 4-mm fitted through the collar's sleeve and penetrating the wall through a 168-mm diameter cut-out hole as shown in drawing titled "Test Wall W-16-D Penetration # 9, 150-mm PVC Pipe with fitting inside the collar – HP150R Retrofit Collar, dated 6 February 2017". The pipe projected horizontally, 2000-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber. The pipe incorporated an 150-mm PVC Coupling located inside the collar on the exposed side of the wall. The pipe was supported at nominally 500-mm and 1500-mm from the unexposed face of the wall by two support clamps spaced apart at nominally 1000-mm. The pipe was open at the unexposed end and capped on the exposed end with a 150-mm PVC End Cap.

2.2 Dimensions

The wall specimen was nominally 1150-mm wide x 1150-mm high x 75-mm thick. All dimensions are nominal.

2.3 Orientation

The wall specimen system was of symmetrical construction.

2.4 Conditioning

The specimen was left to cure for a period longer than 10 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 HP 150R-T dated 2 October 2015, by Snap Fire Systems Pty Ltd.

Drawing numbered 32R-T, dated 12 February 2015, by Snap Fire Systems Pty Ltd.

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

Drawing numbered LP65R-T, dated 13 June 2014, by Snap Fire Systems Pty Ltd.

Drawing numbered LP100R-D, dated 2 November 2016, by Snap Fire Systems Pty Ltd.

Drawing titled “Test Wall W-16-D Penetration # 1, 75-mm HDPE Pipe – LP100R-D Retrofit Collar, dated 6 February 2017”, provided by Snap Fire Systems Pty Ltd.

Drawing titled “Test Wall W-16-D Penetration # 2, 63-mm HDPE Pipe – LP65R Retrofit Collar, dated 6 February 2017”, provided by Snap Fire Systems Pty Ltd.

Drawing titled “Test Wall W-16-D Penetration # 3, 25-mm PVC Conduit with 3-Core Cable – 32R Retrofit Collar, dated 6 February 2017”, provided by Snap Fire Systems Pty Ltd.

Drawing titled “Test Wall W-16-D Penetration # 4, 80-mm PVC Pipe with fitting inside the collar – LP100R-D Retrofit Collar, dated 6 February 2017”, provided by Snap Fire Systems Pty Ltd.

Drawing titled “Test Wall W-16-D Penetration # 5, 50-mm Px-Al-Px Pipe – Gas 50 Collars, dated 6 February 2017”, provided by Snap Fire Systems Pty Ltd.

Drawing titled “Test Wall W-16-D Penetration # 7, 32-mm Pex-b pipe – 32R Retrofit Collar, dated 6 February 2017”, provided by Snap Fire Systems Pty Ltd.

Drawing titled “Test Wall W-16-D Penetration # 8, 20-mm Pex-b pipe – 32R Retrofit Collar, dated 6 February 2017”, provided by Snap Fire Systems Pty Ltd.

Drawing titled “Test Wall W-16-D Penetration # 9, 150-mm PVC Pipe with fitting inside the collar – HP150R Retrofit Collar, dated 6 February 2017”, provided 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 31°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 121 minutes by the agreement with the sponsor.

8 Test results

8.1 Critical observations

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

Time	Observation
1 minute -	Smoke is observed around Penetrations 9, 1 and 7.
2 minutes -	Smoke is observed around Penetrations 1 and 4.
3 minutes -	Smoke is observed around the collar of Penetrations 2 and 4.
4 minutes -	Smoke is observed at the end of Penetrations 9 and 7.
5 minutes -	A small amount of smoke is noted around Penetrations 1, 2, 4, 5 and 7 and a significant amount of smoke around Penetration 9.

8 minutes -	Smoke has ceased being emitted from Penetrations with exception of Penetration 9 which is decreasing.
14 minutes -	Smoke has almost ceased from end of pipe of Penetration 9.
30 minutes -	Light smoke is noted between collar and pipe of Penetration 9.
40 minutes -	Collar on Penetration 9 is pushing the pipe out and has moved approximately 50-mm out from the collar.
48 minutes -	Light smoke is evident between the pipe and the collar on Penetration 1. Slight smoke is evident from collar of Penetration 5.
60 minutes -	Slight fluing is noted from end of Penetrations 4 and 9. Slight smoke is noted around the collar on Penetration 4.
75 minutes -	Smoke is increasing the the base of Penetrations 4, 5, 1 and 9.
78 minutes -	Inside of furnace is visible between pipe and wall when viewed inside collar of Penetration 1. No fluing noted.
79 minutes -	Insulation failure of Penetration 5.
85 minutes -	Furnace glow is visible between pipe and collar of Penetration 4.
90 minutes -	Vertical cracks are forming in the AAC between Penetration 2 and 5, above Penetration 6 and Penetration 5 and 8.
91 minutes -	Insulation failure of Penetration 2.
110 minutes -	Furnace is visible through the cracks.
114 minutes -	Insulation failure of Penetration 4.
115 minutes -	Cotton Wool Pad test applied to Penetration 1 – No ignition.
116 minutes -	Cotton Wool Pad test applied to Penetration 4 – No ignition.
121 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.

Figure 8 shows the curve of maximum temperature versus time associated with Penetration # 7.

Figure 9 shows the curve of maximum temperature versus time associated with Penetration # 8.

Figure 10 shows the curve of maximum temperature versus time associated with Penetration # 9.

8.5 Performance

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

Penetration # 1 – LP100R-D Retrofit fire collar protecting a nominal 75-mm High-density polyethylene (HDPE) Pipe

Structural adequacy	-	Not applicable
Integrity	-	No failure at 121 minutes
Insulation	-	No failure at 121 minutes

Penetration # 2 – LP65R Retrofit fire collar protecting a nominal 63-mm High-density polyethylene (HDPE) Pipe

Structural adequacy	-	Not applicable
Integrity	-	No failure at 121 minutes
Insulation	-	91 minutes

Penetration # 3 – 32R Retrofit fire collar protecting a nominal 25-mm Polyvinyl Chloride (PVC) Conduit with 3-Core Cable

Structural adequacy	-	Not applicable
Integrity	-	No failure at 121 minutes
Insulation	-	No failure at 121 minutes

Penetration # 4 – LP100R-D Retrofit fire collar protecting a nominal 80-mm Polyvinyl Chloride (PVC) Pipe with fitting inside the collar

Structural adequacy	-	Not applicable
Integrity	-	No failure at 121 minutes
Insulation	-	114 minutes

Penetration # 5 – GAS50 collar protecting a 50-mm Px-Al-Px Pipe

Structural adequacy	-	Not applicable
Integrity	-	No failure at 121 minutes
Insulation	-	79 minutes

Penetration # 7 – 32R Retrofit fire collar protecting a nominal 32-mm Pex-b pipe

Structural adequacy	-	Not applicable
Integrity	-	No failure at 121 minutes
Insulation	-	No failure at 121 minutes

Penetration # 8 – 32R Retrofit fire collar protecting a nominal 20-mm Pex-b pipe

Structural adequacy	-	Not applicable
Integrity	-	No failure at 121 minutes
Insulation	-	No failure at 121 minutes

Penetration # 9 – HP150R Retrofit fire collar protecting a nominal 150-mm Polyvinyl Chloride (PVC) Pipe with fitting inside the collar

Structural adequacy	-	Not applicable
Integrity	-	No failure at 121 minutes
Insulation	-	No failure at 121 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	-	-/90/90	Penetration # 5	-	-/90/60
Penetration # 2	-	-/90/90	Penetration # 7	-	-/90/90
Penetration # 3	-	-/90/90	Penetration # 8	-	-/90/90
Penetration # 4	-	-/90/90	Penetration # 9	-	-/90/90

The fire-resistance level of the wall system is applicable when the system is exposed to fire from either direction.

The fire-resistance level (FRL) are limited to that of the separating element.

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

10 Field of direct application of test results

The results of the fire test contained in this test report are directly applicable, without reference to the testing authority, to similar constructions where one or more changes listed in Clause 10.12 of AS 1530.4-2014, have been made provided no individual component is removed or reduced.

11 Tested by

Chris Wojcik
Testing Officer

Appendices

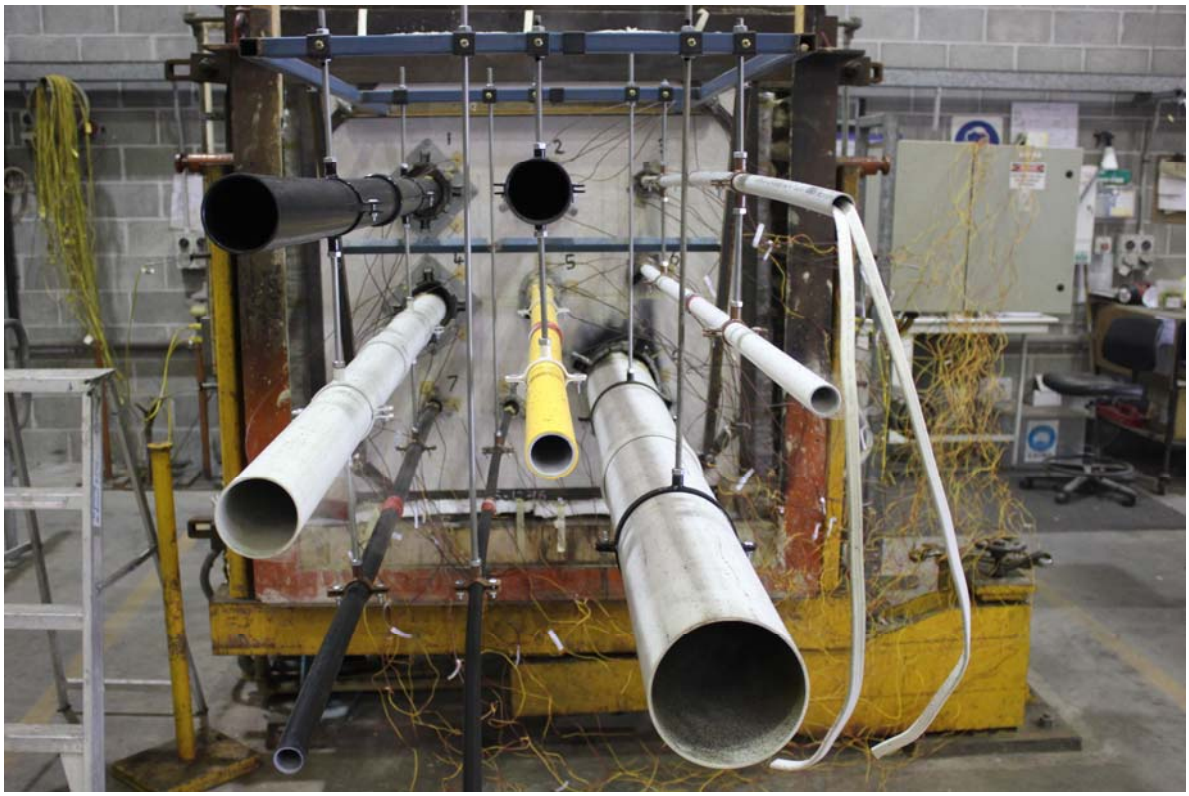
Appendix A – Measurement location

Measurement Location		Data Logger Channel Information
Specimen	**T/C Position**	**T/C designation**
Specimen 1 – HDPE 75mm protected with Snap LP100R-D	On wall – 25-mm above collar	S1
	On wall – 25-mm beside collar	S2
	On top of collar	S3
	On side of collar	S4
	On top of pipe 25-mm from collar	S5
	On side of pipe 25-mm from collar	S6
Specimen 2 – HDPE 63.5mm x 3.5mm wall thickness pipe protected with Snap LP65R	On wall – 25-mm above collar	S7
	On wall – 25-mm beside collar	S8
	On top of collar	S9
	On side of collar	S10
	On top of pipe 25-mm from collar	S11
	On side of pipe 25-mm from collar	S12
Specimen 3 – PVC 25mm electrical conduit protected with Snap 32R	On wall – 25-mm above collar	S13
	On wall – 25-mm beside collar	S14
	On top of collar	S15
	On side of collar	S16
	On top of pipe 25-mm from collar	S17
	On side of pipe 25-mm from collar	S18
Specimen 4 – rigid PVC 82mm pipe protected with Snap LP100R-D	On wall – 25-mm above collar	S19
	On wall – 25-mm beside collar	S20
	On top of collar	S21
	On side of collar	S22
	On top of pipe 25-mm from collar	S23
	On side of pipe 25-mm from collar	S24
Specimen 5 – Pex-Al-Pex 50mm gas pipe protected with Snap 50gas	On wall – 25-mm above collar	S25
	On wall – 25-mm beside collar	S26
	On top of collar	S27
	On side of collar	S28
	On top of pipe 25-mm from collar	S29
	On side of pipe 25-mm from collar	S30
Specimen 7 – Pex-b 32mm gas pipe protected with Snap 32R	On wall – 25-mm above collar	S37
	On wall – 25-mm beside collar	S38
	On top of collar	S39
	On side of collar	S40
	On top of pipe 25-mm from collar	S41
	On side of pipe 25-mm from collar	S42

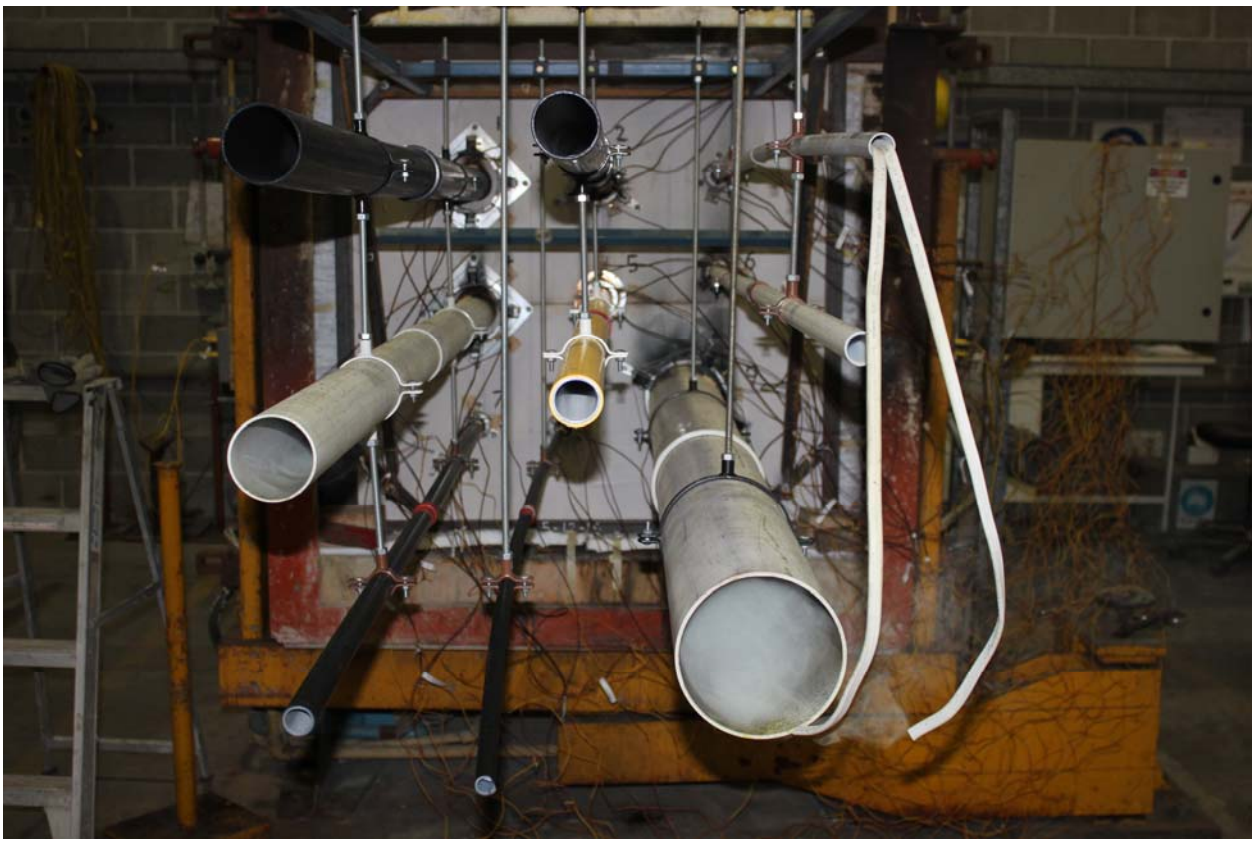
Specimen 8 – Pex-b 20mm gas pipe protected with Snap 32R	On wall – 25-mm above collar	S43
	On wall – 25-mm beside collar	S44
	On top of collar	S45
	On side of collar	S46
	On top of pipe 25-mm from collar	S47
	On side of pipe 25-mm from collar	S48
Specimen 9 – PVC 150mm water pipe protected with Snap HP150R	On wall – 25-mm above collar	S49
	On wall – 25-mm beside collar	S50
	On top of collar	S51
	On side of collar	S52
	On top of pipe 25-mm from collar	S53
	On side of pipe 25-mm from collar	S54

Appendix B – Photographs

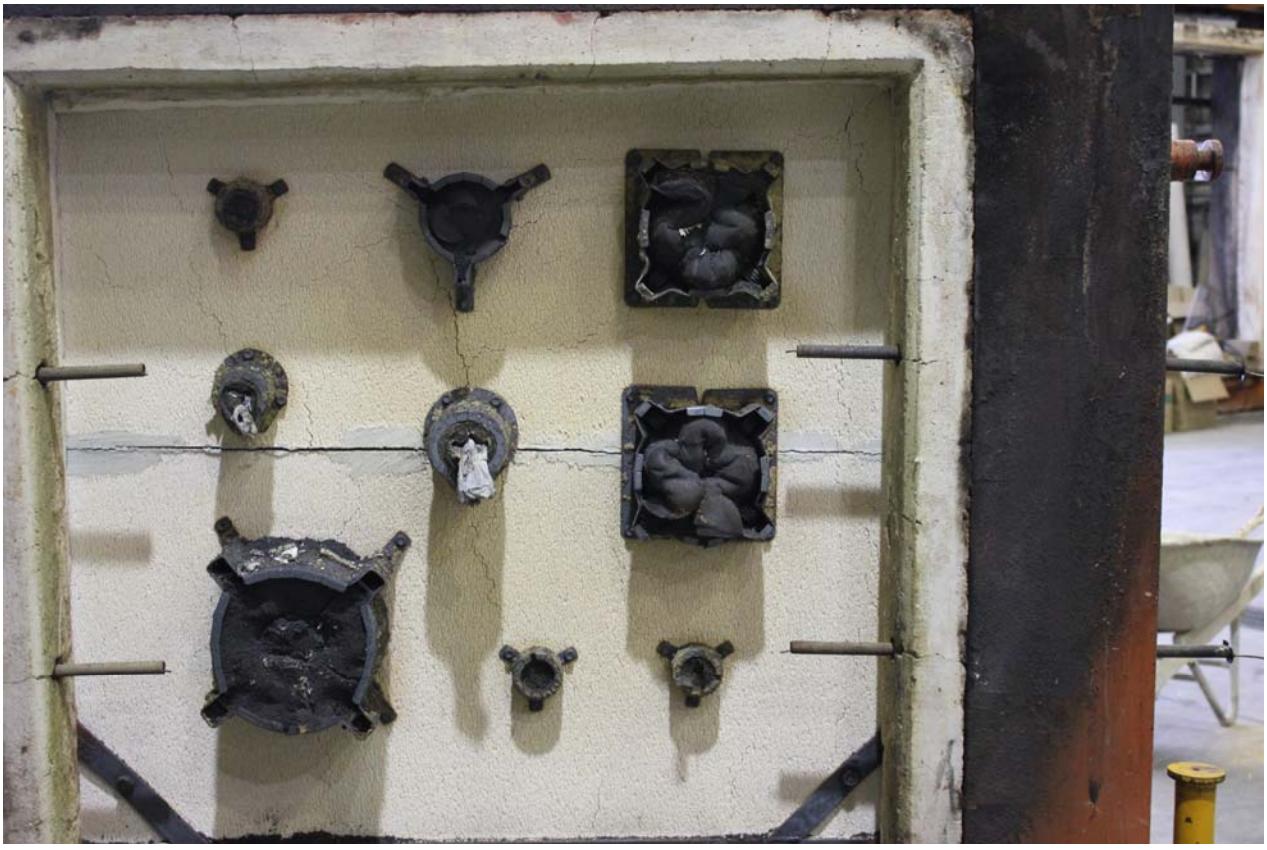
PHOTOGRAPH 1 – UNEXPOSED FACE OF SPECIMENS PRIOR TO TESTING



PHOTOGRAPH 2 – SPECIMENS AFTER 60 MINUTES OF TESTING



PHOTOGRAPH 3 – SPECIMENS AFTER 120 MINUTES OF TESTING



PHOTOGRAPH 4 – EXPOSED FACE OF SPECIMENS AT CONCLUSION OF TESTING

Appendix C – Furnace Temperature

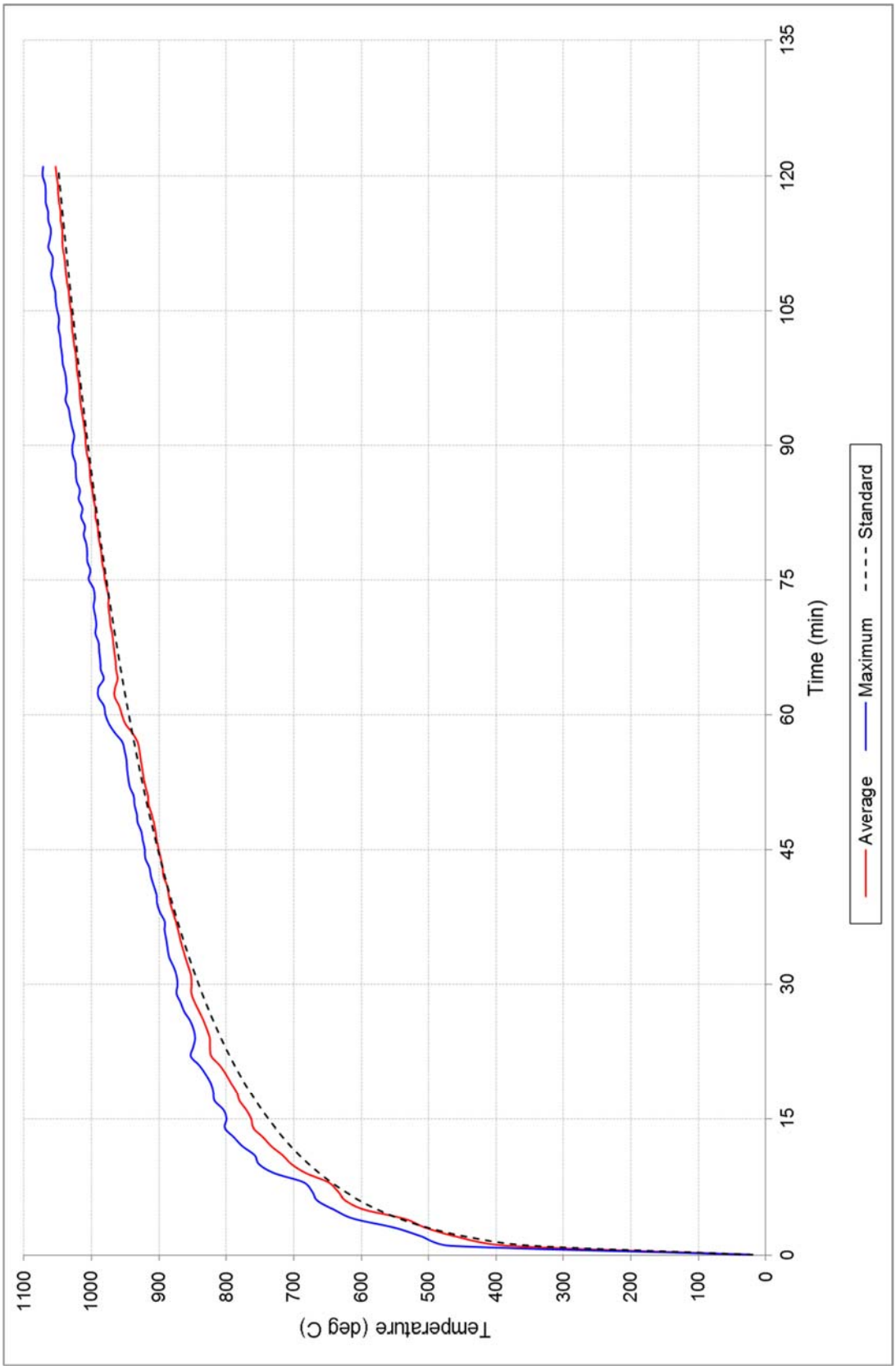


FIGURE 1 – FURNACE TEMPERATURE

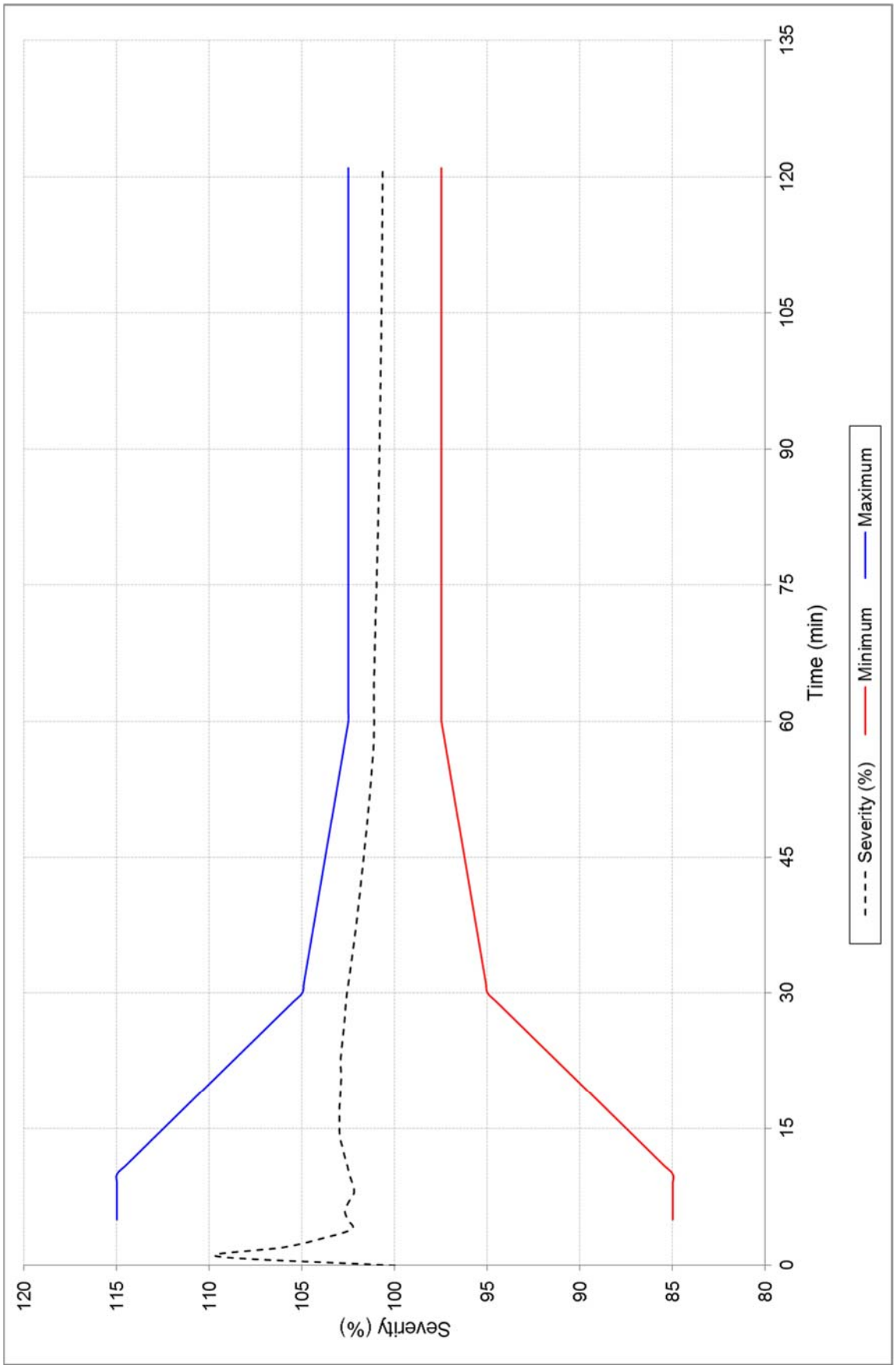


FIGURE 2 – FURNACE SEVERITY

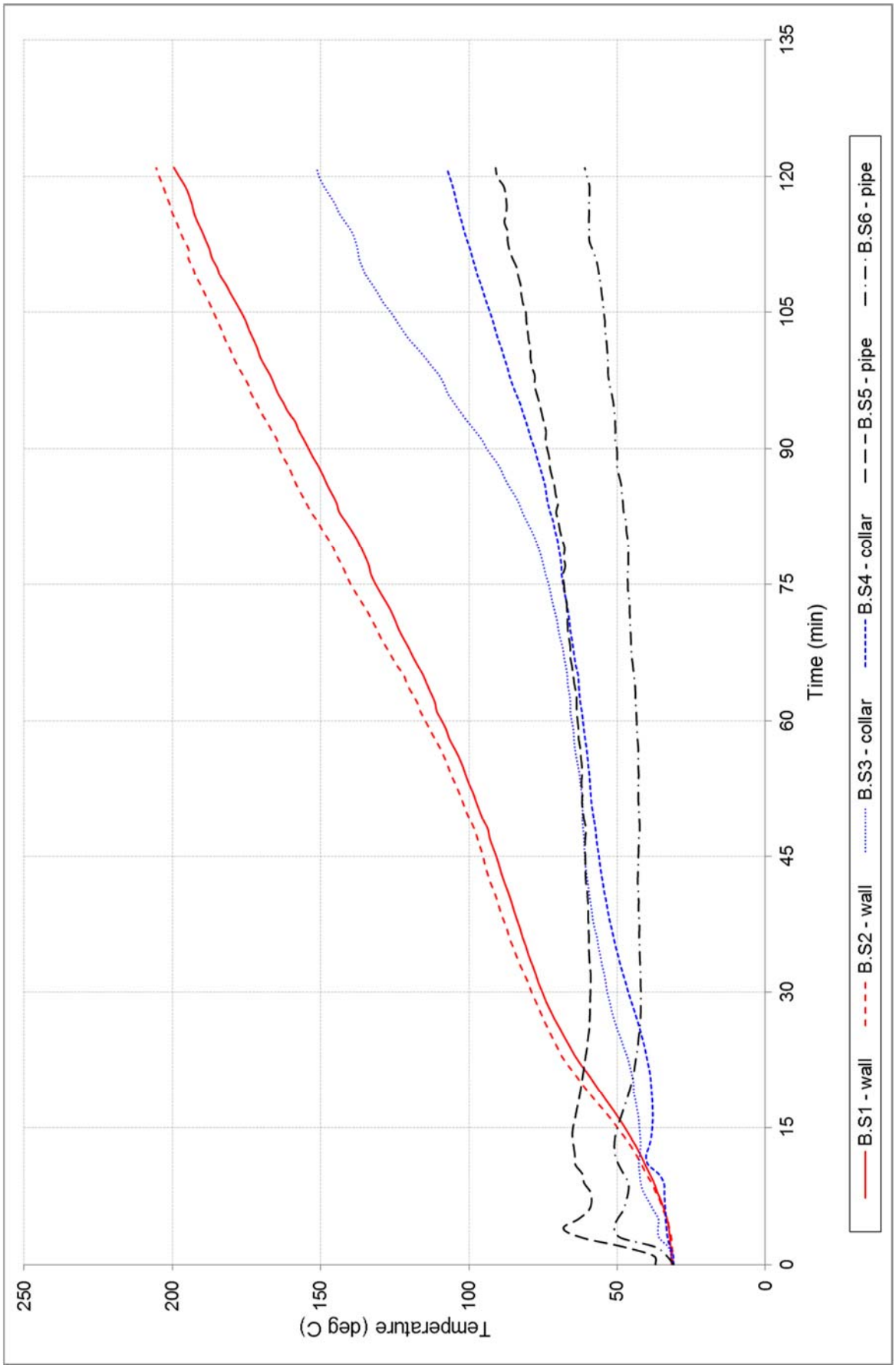


FIGURE 3 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 1

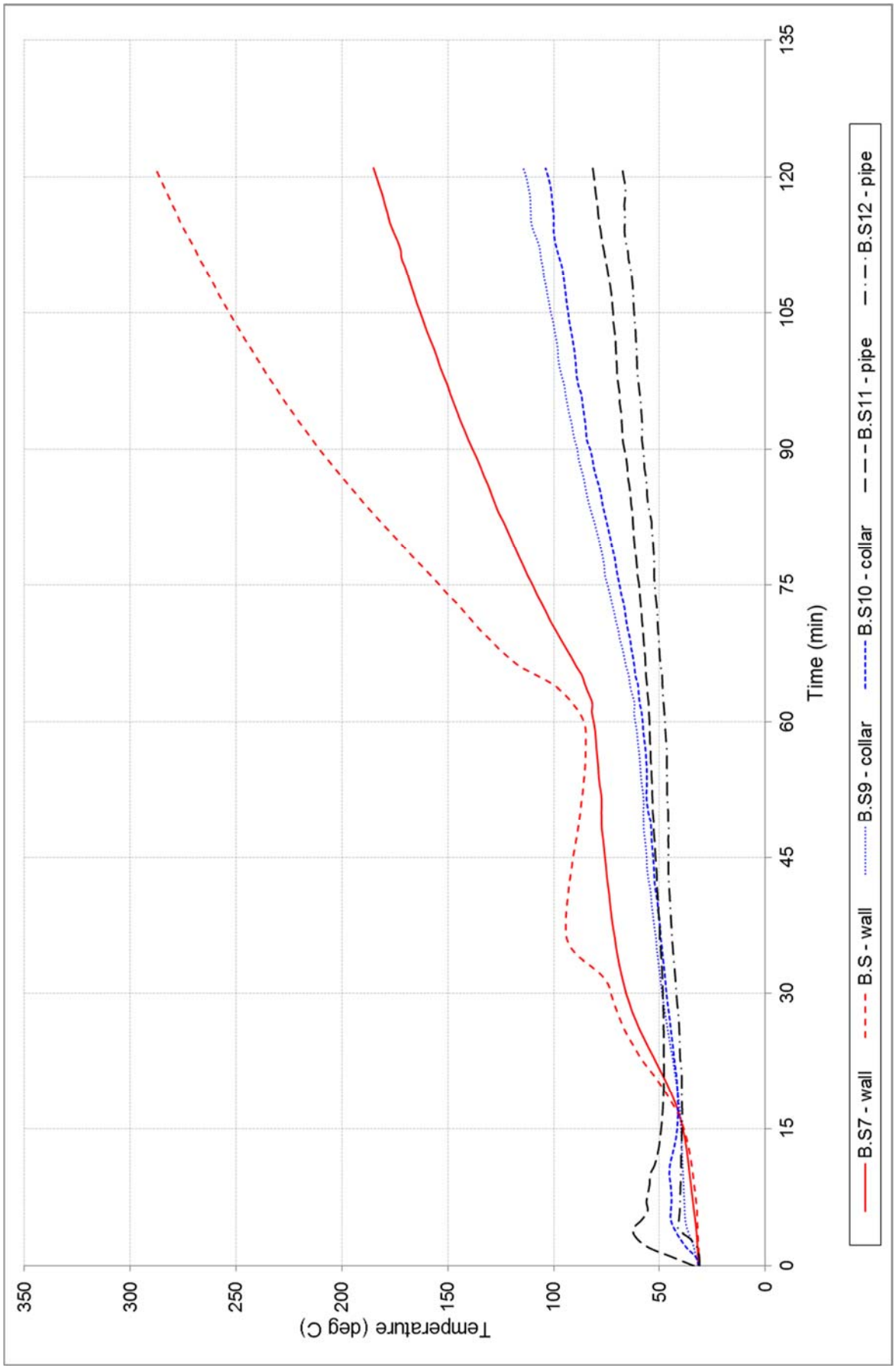


FIGURE 4 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 2

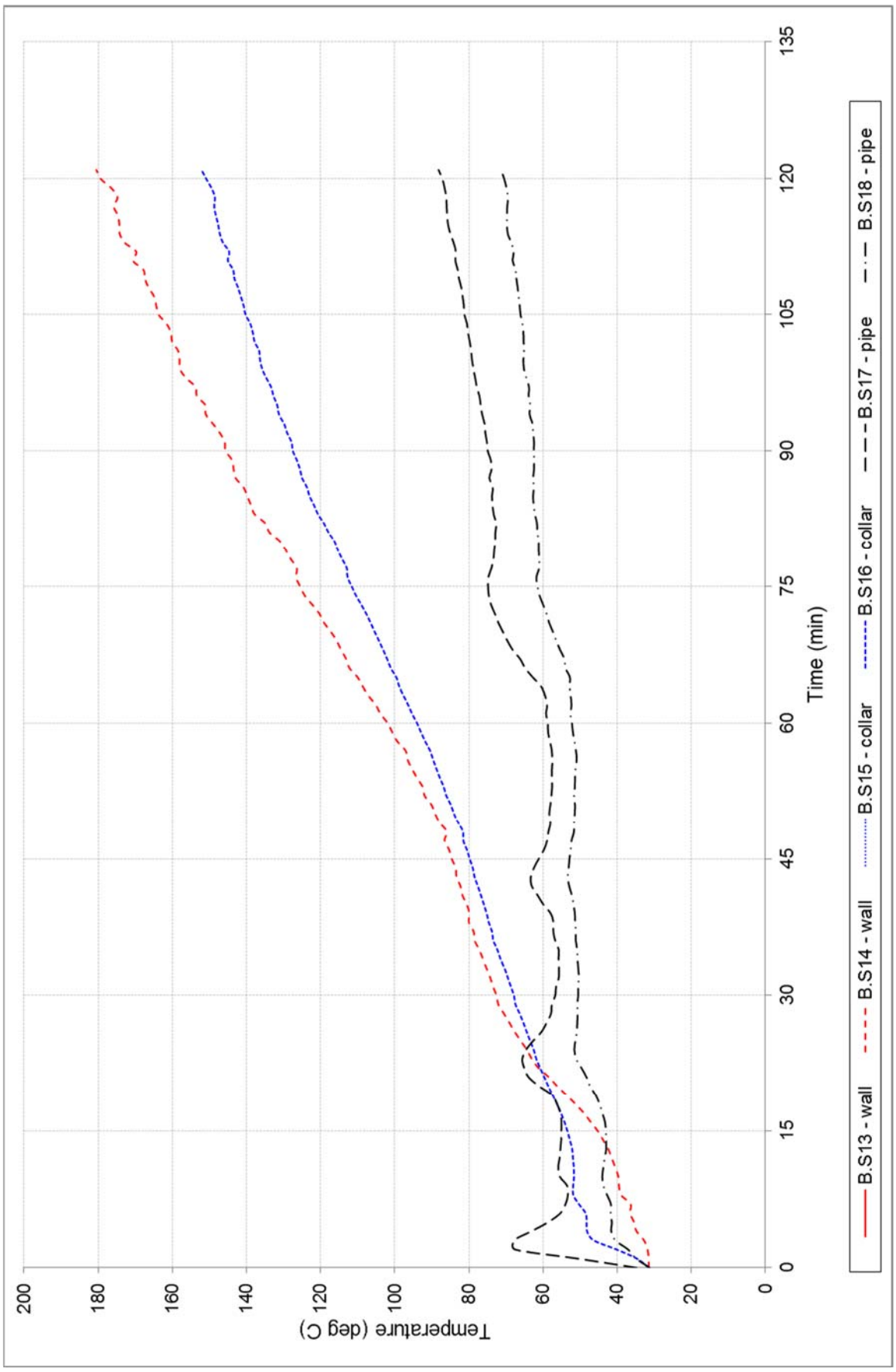


FIGURE 5 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 3

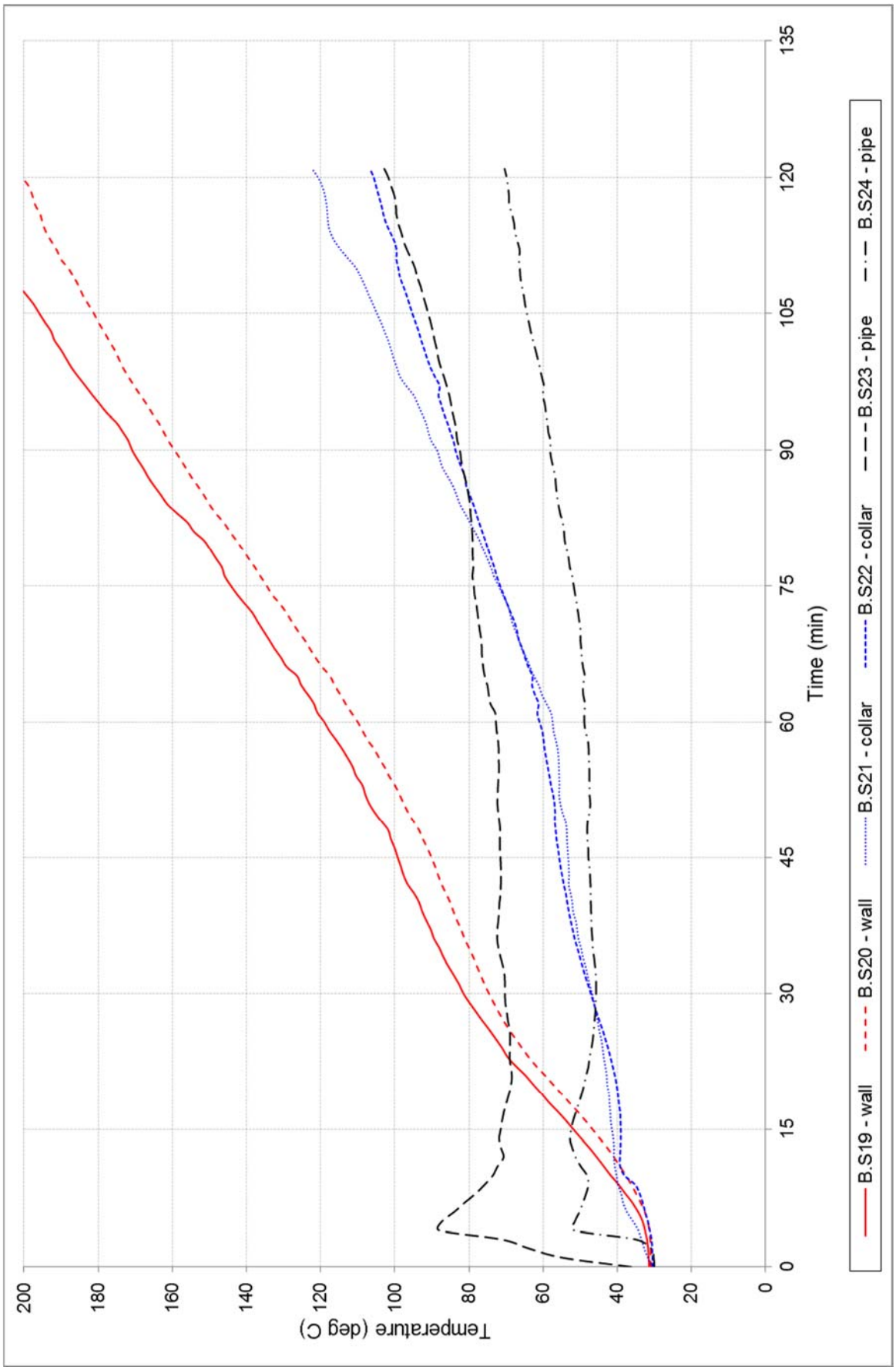


FIGURE 6 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 4

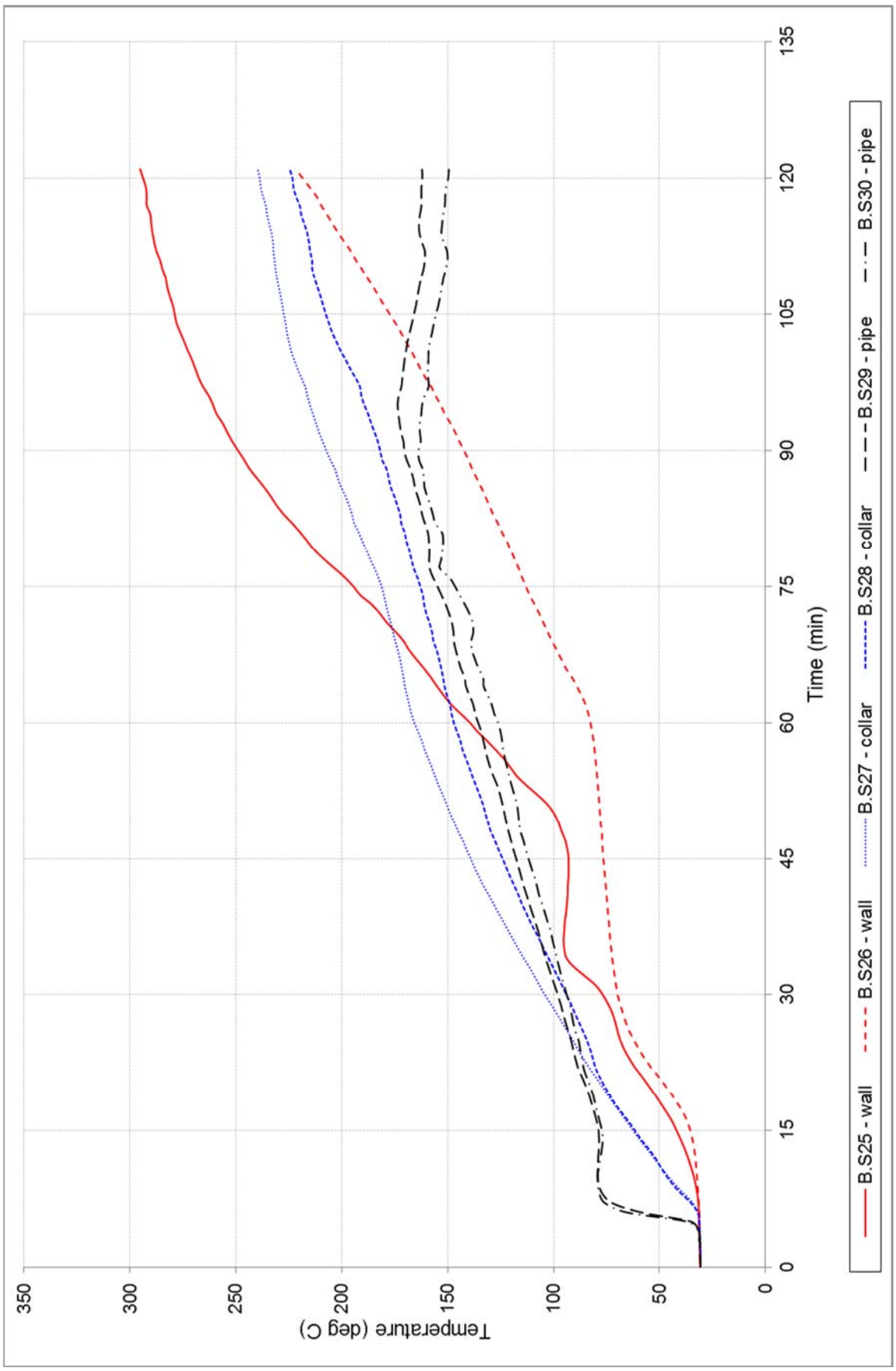


FIGURE 7 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 5

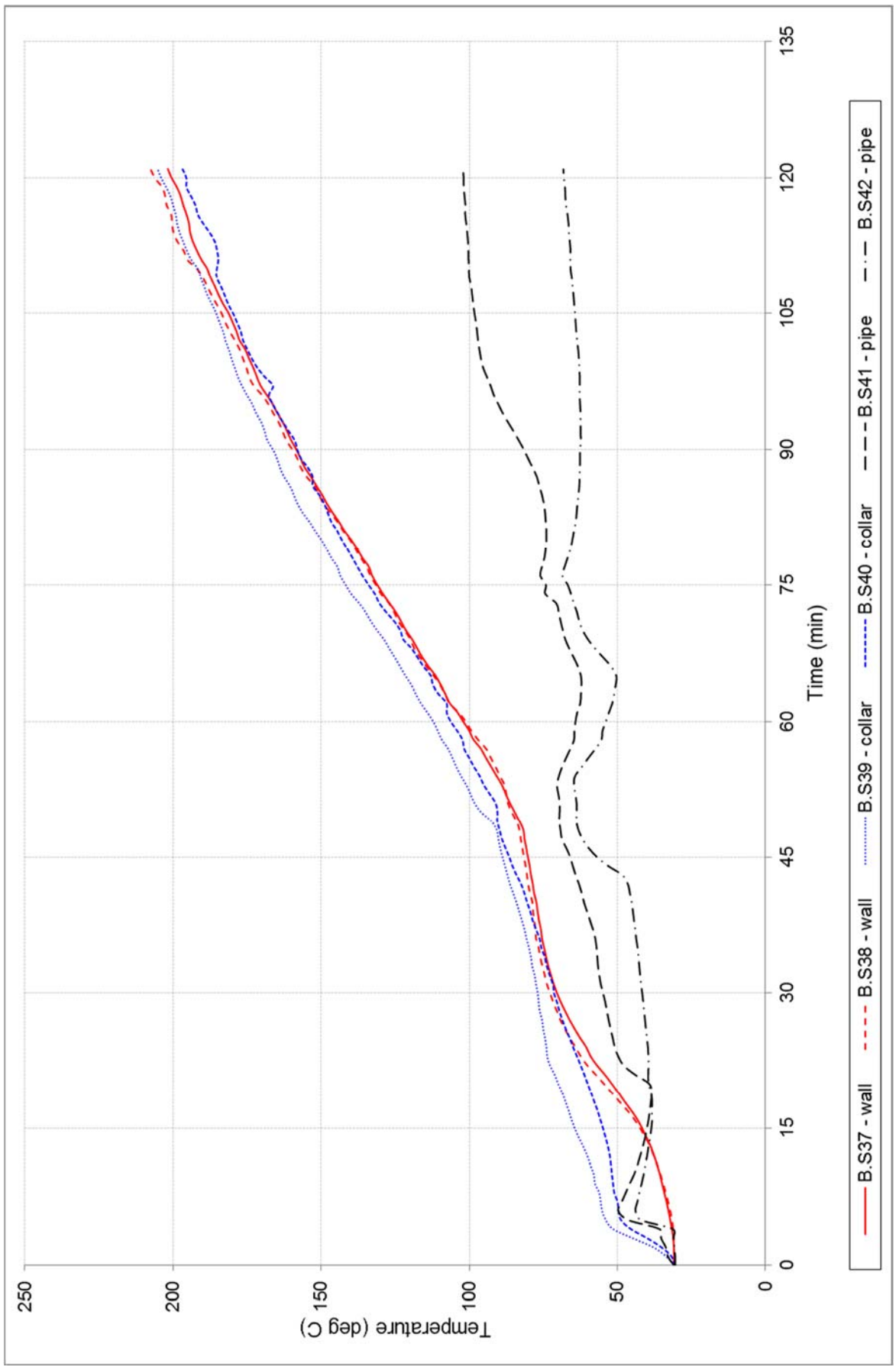


FIGURE 8 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 7

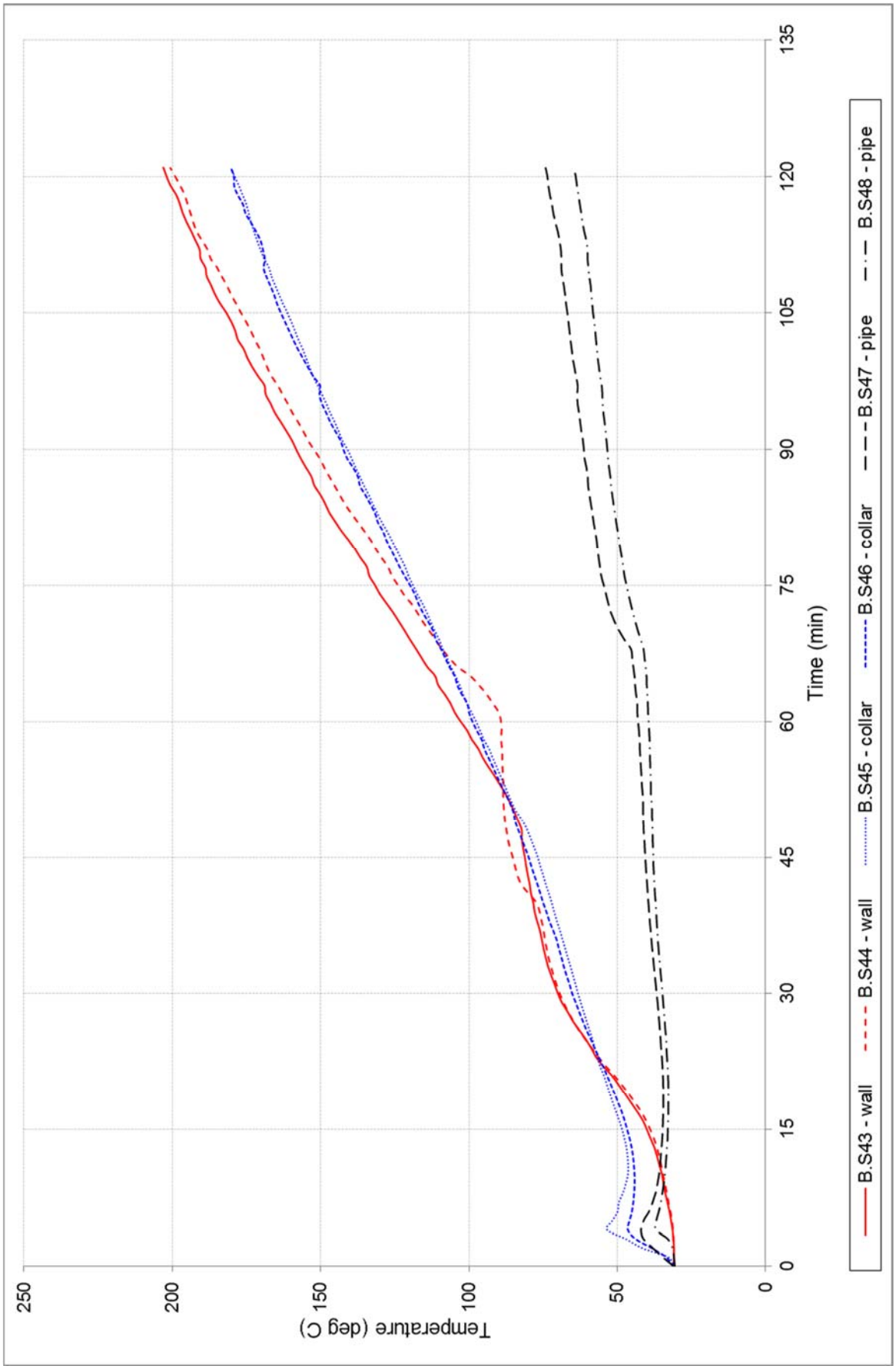


FIGURE 9 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 8

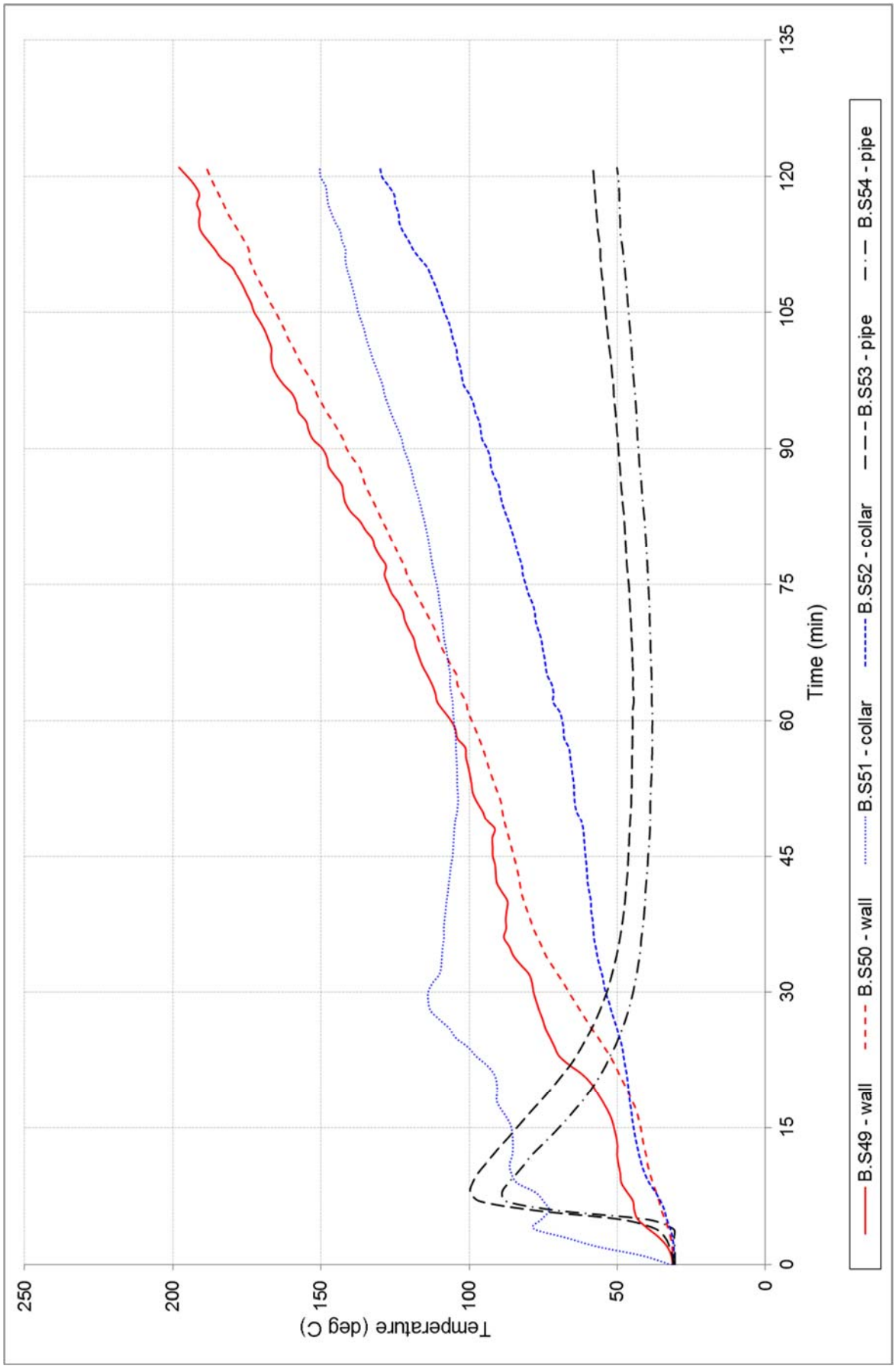
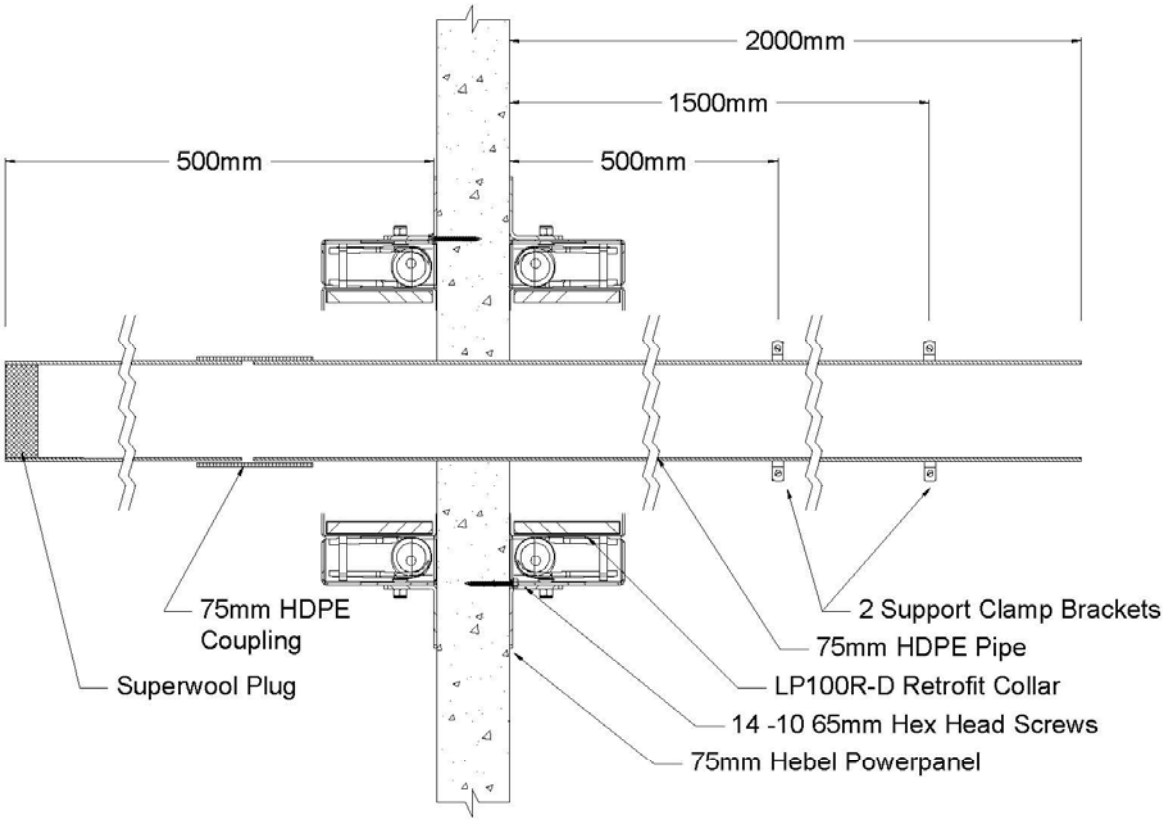


FIGURE 10 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 9

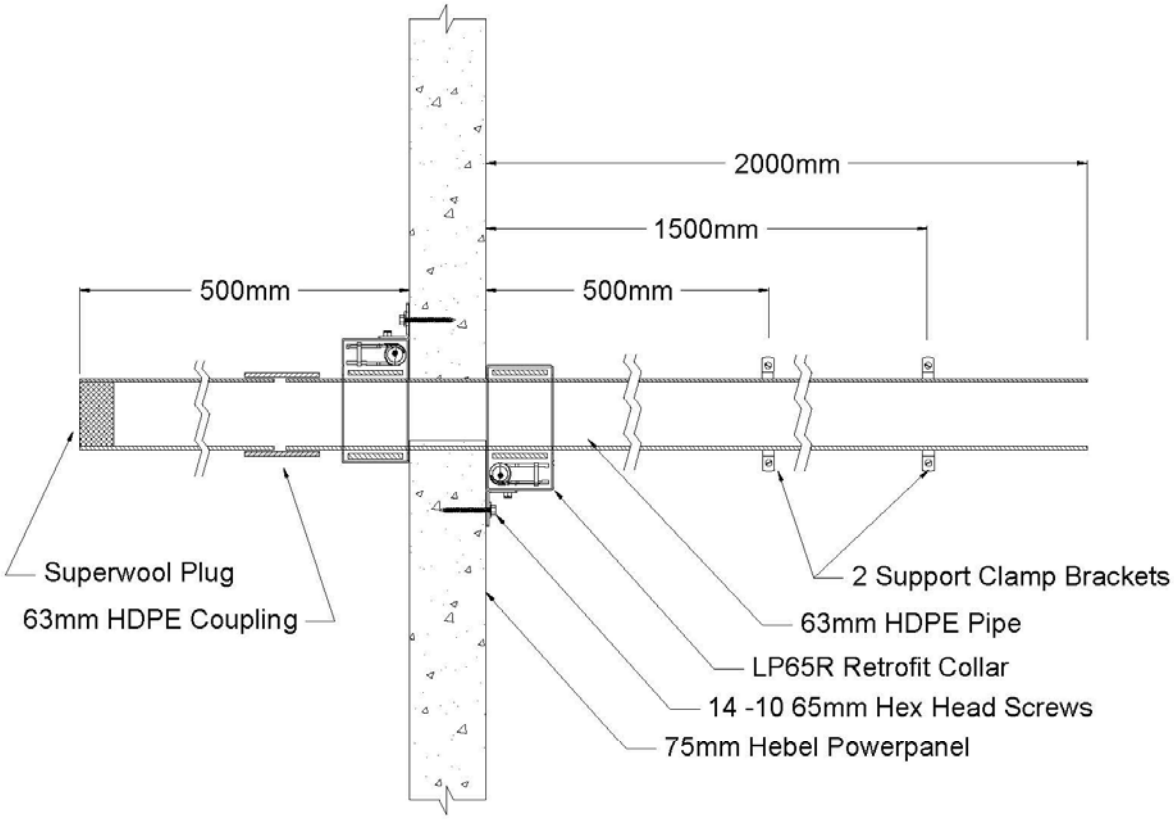
Appendix D – Installation drawings

Test Wall W-16-D Penetration # 1
75mm HDPE Pipe – LP100R-D Retrofit Collar
06 FEB 2017



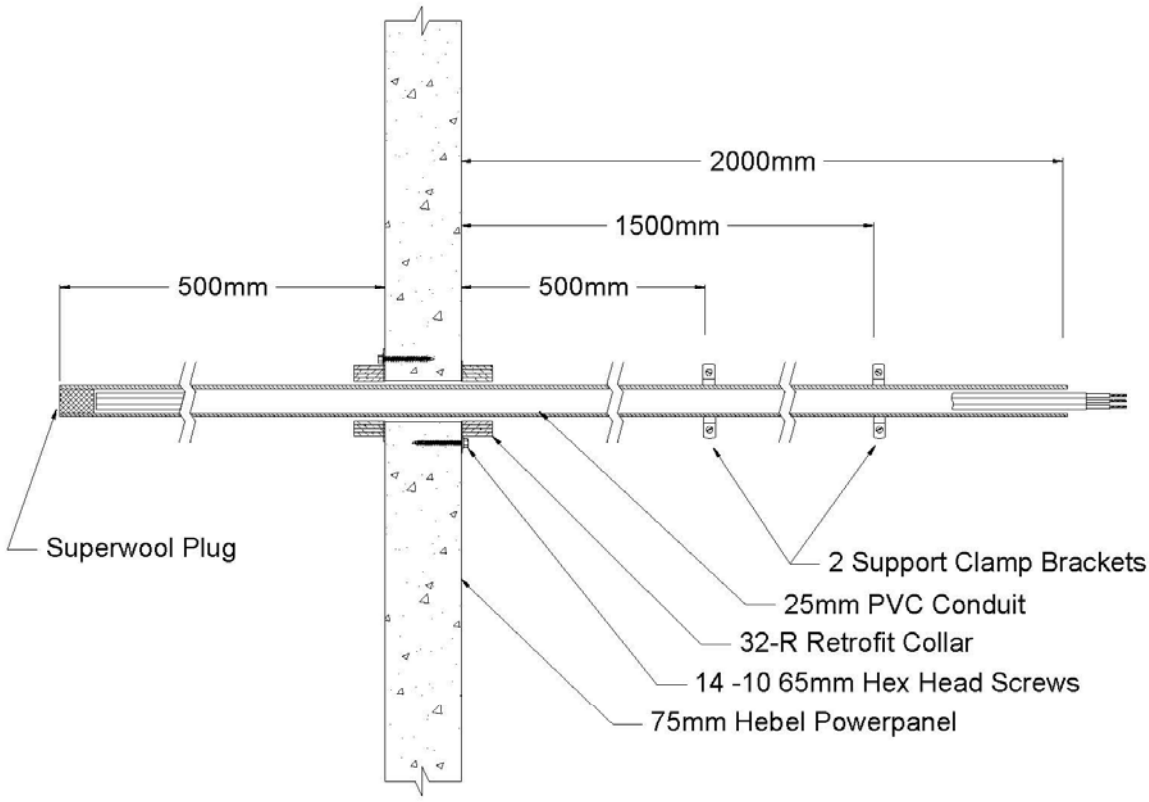
DRAWING TITLED "TEST WALL W-16-D PENETRATION # 1, 75-MM HDPE PIPE – LP100R-D RETROFIT COLLAR, DATED 6 FEBRUARY 2017", PROVIDED BY SNAP FIRE SYSTEMS PTY LTD.

Test Wall W-16-D Penetration # 2
63mm HDPE Pipe – LP65R Retrofit Collar
06 FEB 2017



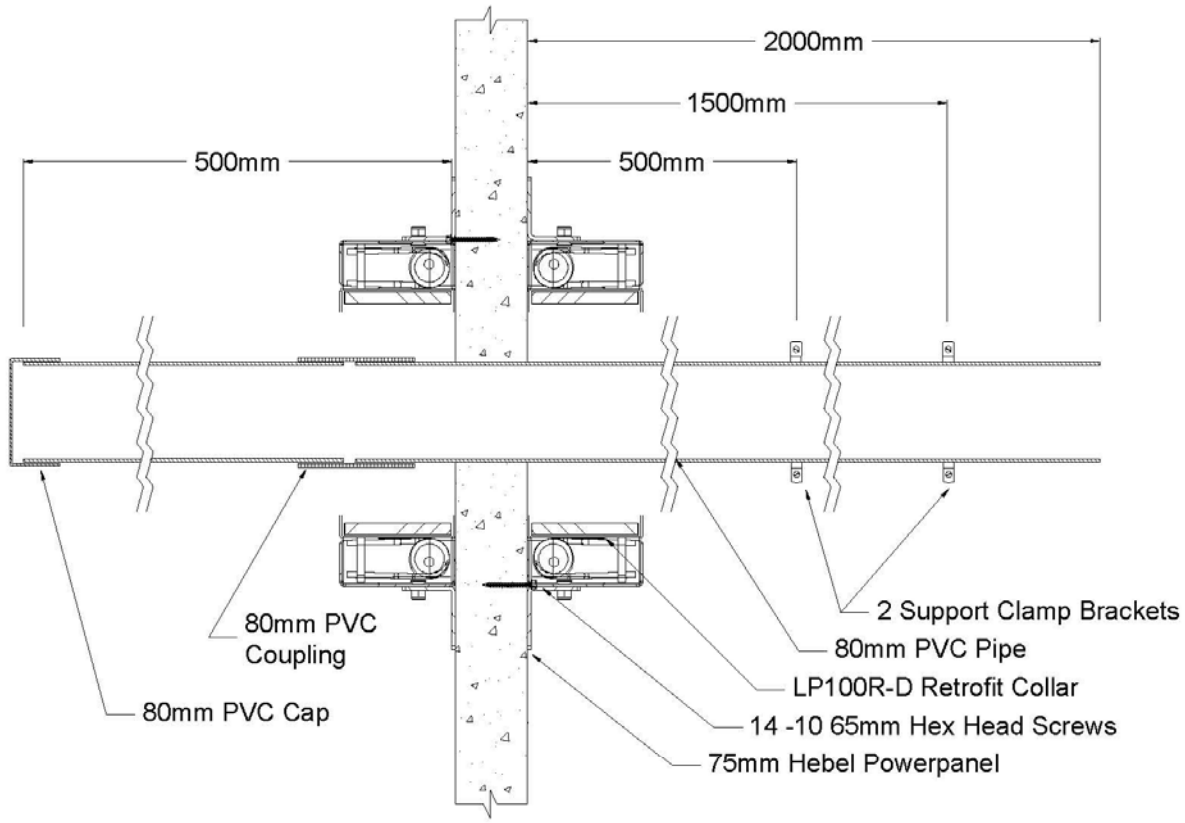
DRAWING TITLED "TEST WALL W-16-D PENETRATION # 2, 63-MM HDPE PIPE – LP65R RETROFIT COLLAR, DATED 6 FEBRUARY 2017", PROVIDED BY SNAP FIRE SYSTEMS PTY LTD.

Test Wall W-16-D Penetration # 3
25mm PVC Conduit w 3-core Cable– 32R Retrofit Collar
06 FEB 2017



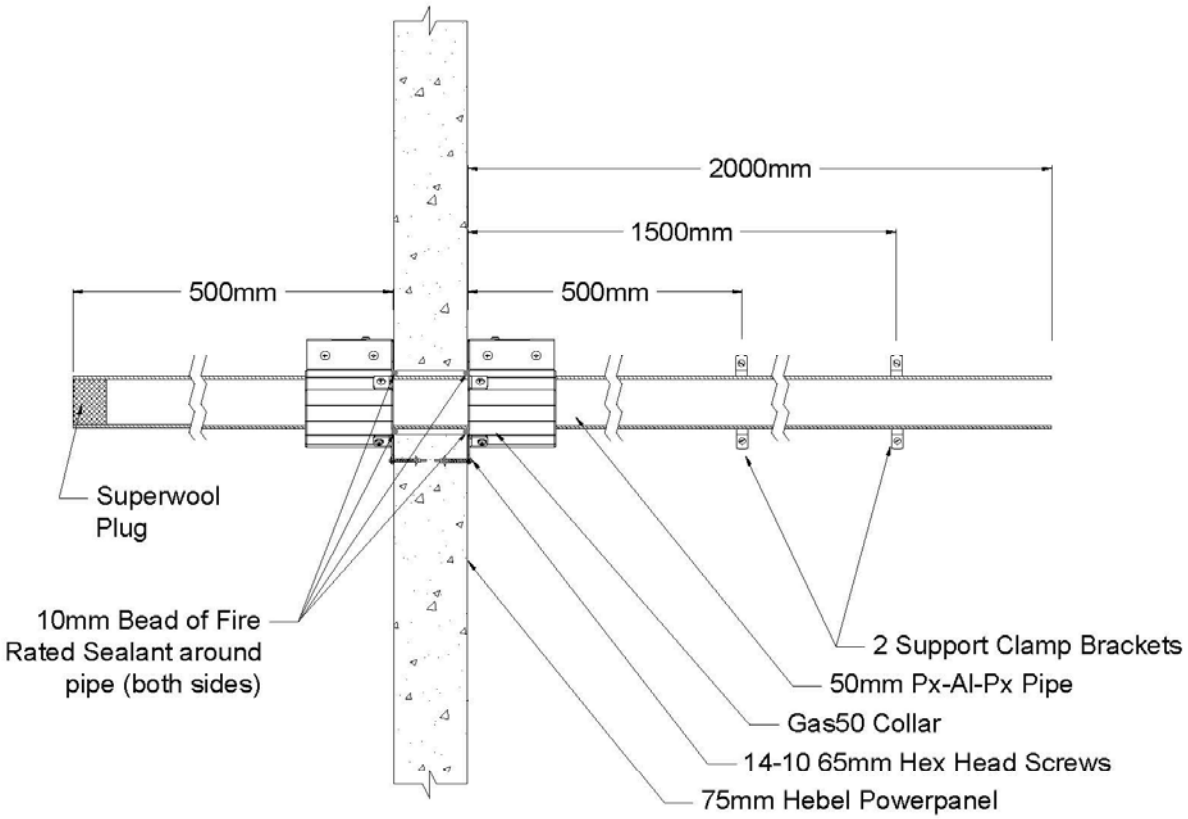
DRAWING TITLED "TEST WALL W-16-D PENETRATION # 3, 25-MM PVC CONDUIT WITH 3-CORE CABLE – 32R RETROFIT COLLAR, DATED 6 FEBRUARY 2017", PROVIDED BY SNAP FIRE SYSTEMS PTY LTD.

Test Wall W-16-D Penetration # 4
80mm PVC Pipe w Fitting Inside Collar – LP100R-D Retrofit Collar
06 FEB 2017



DRAWING TITLED "TEST WALL W-16-D PENETRATION # 4, 80-MM PVC PIPE WITH FITTING INSIDE THE COLLAR – LP100R-D RETROFIT COLLAR, DATED 6 FEBRUARY 2017", PROVIDED BY SNAP FIRE SYSTEMS PTY LTD.

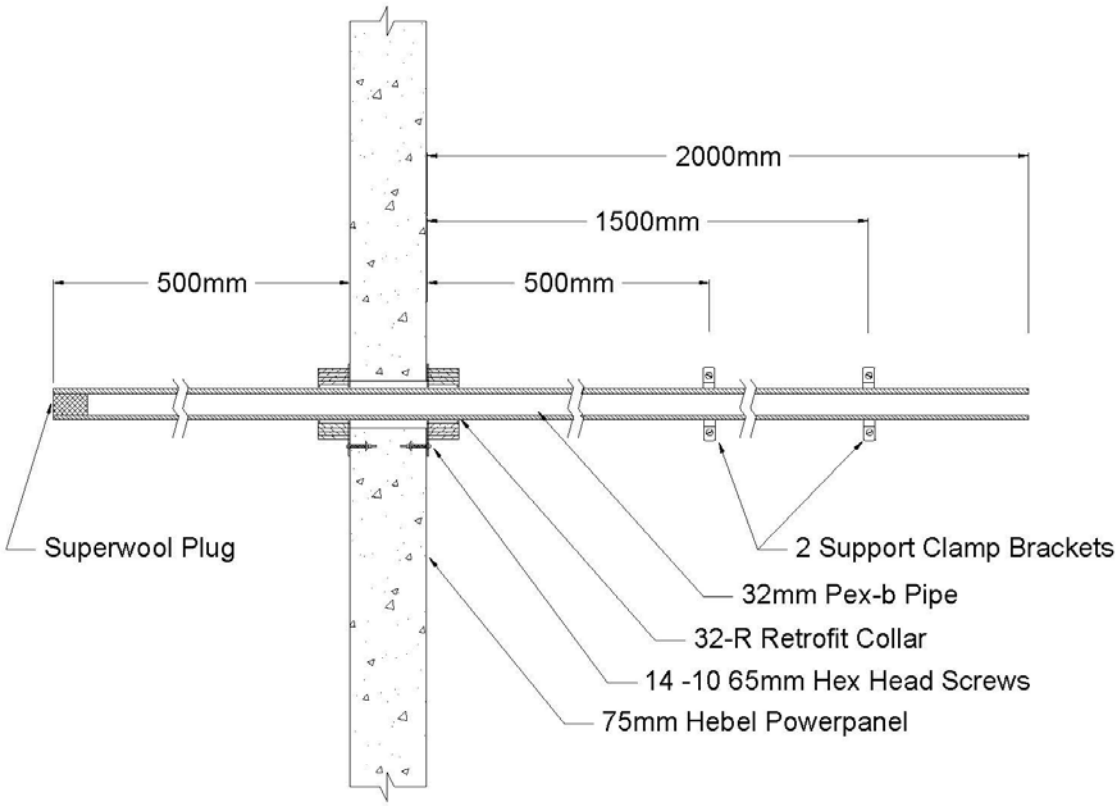
Test Wall W-16-D Penetration # 5
50mm Px-Al-Px Pipe – Gas 50 Collars
06 FEB 2017



2/13/2017 8:42:38 AM

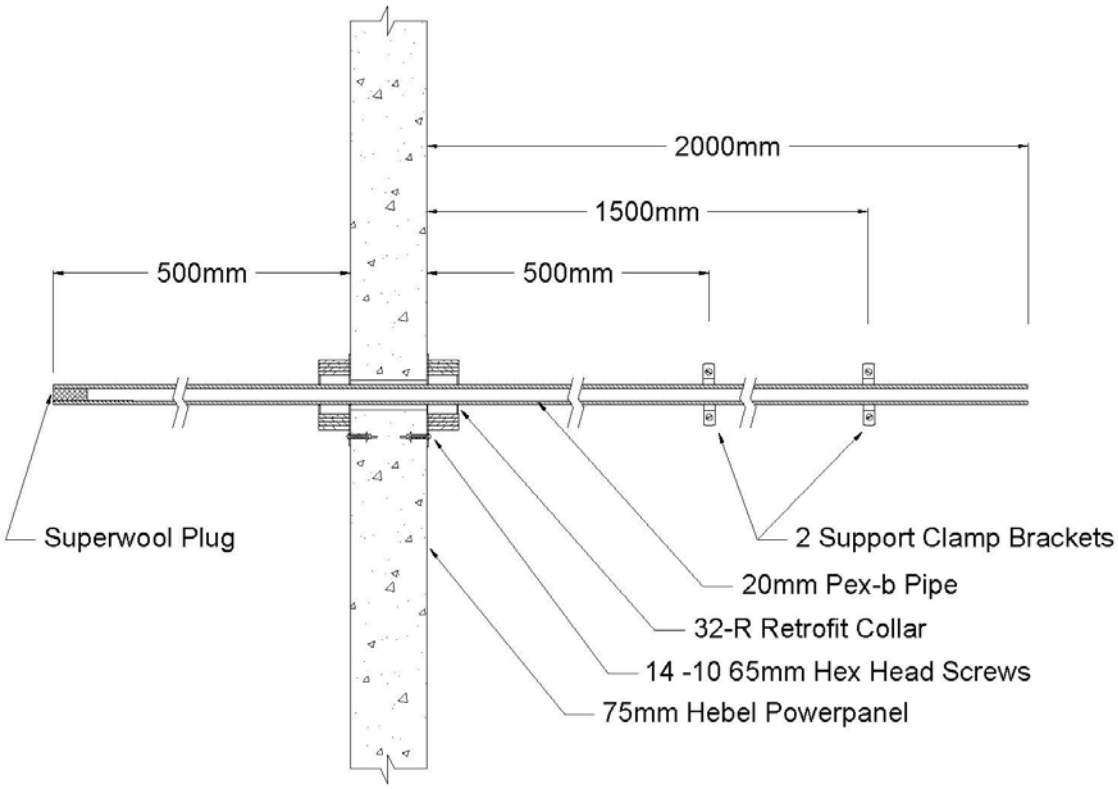
DRAWING TITLED "TEST WALL W-16-D PENETRATION # 5, 50-MM PX-AL-PX PIPE – GAS 50 COLLARS, DATED 6 FEBRUARY 2017", PROVIDED BY SNAP FIRE SYSTEMS PTY LTD.

Test Wall W-16-D Penetration # 7
32mm Pex-b - 32R Retrofit Collar
06 FEB 2017



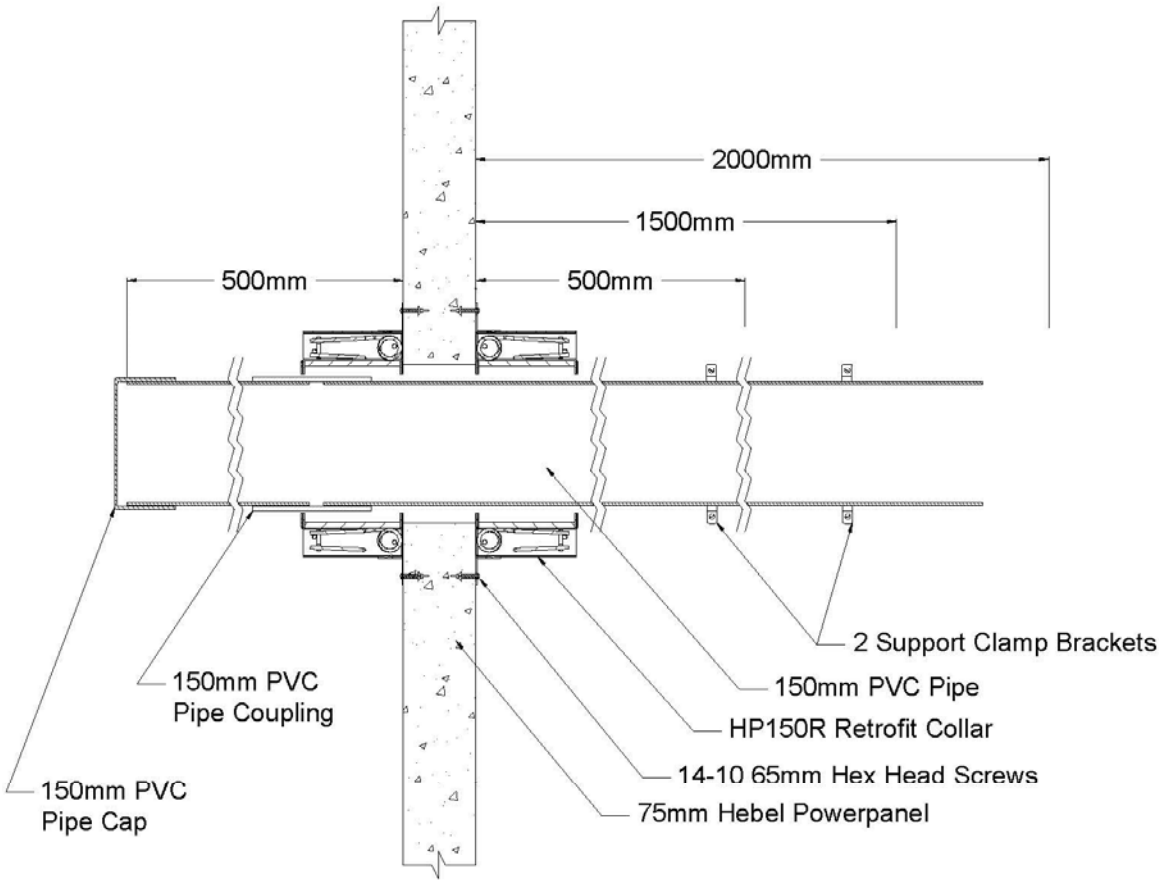
DRAWING TITLED "TEST WALL W-16-D PENETRATION # 7, 32-MM PEX-B PIPE – 32R RETROFIT COLLAR, DATED 6 FEBRUARY 2017", PROVIDED BY SNAP FIRE SYSTEMS PTY LTD.

Test Wall W-16-D Penetration # 8
20mm Pex-b Pipe - 32R Retrofit Collar 06
FEB 2017



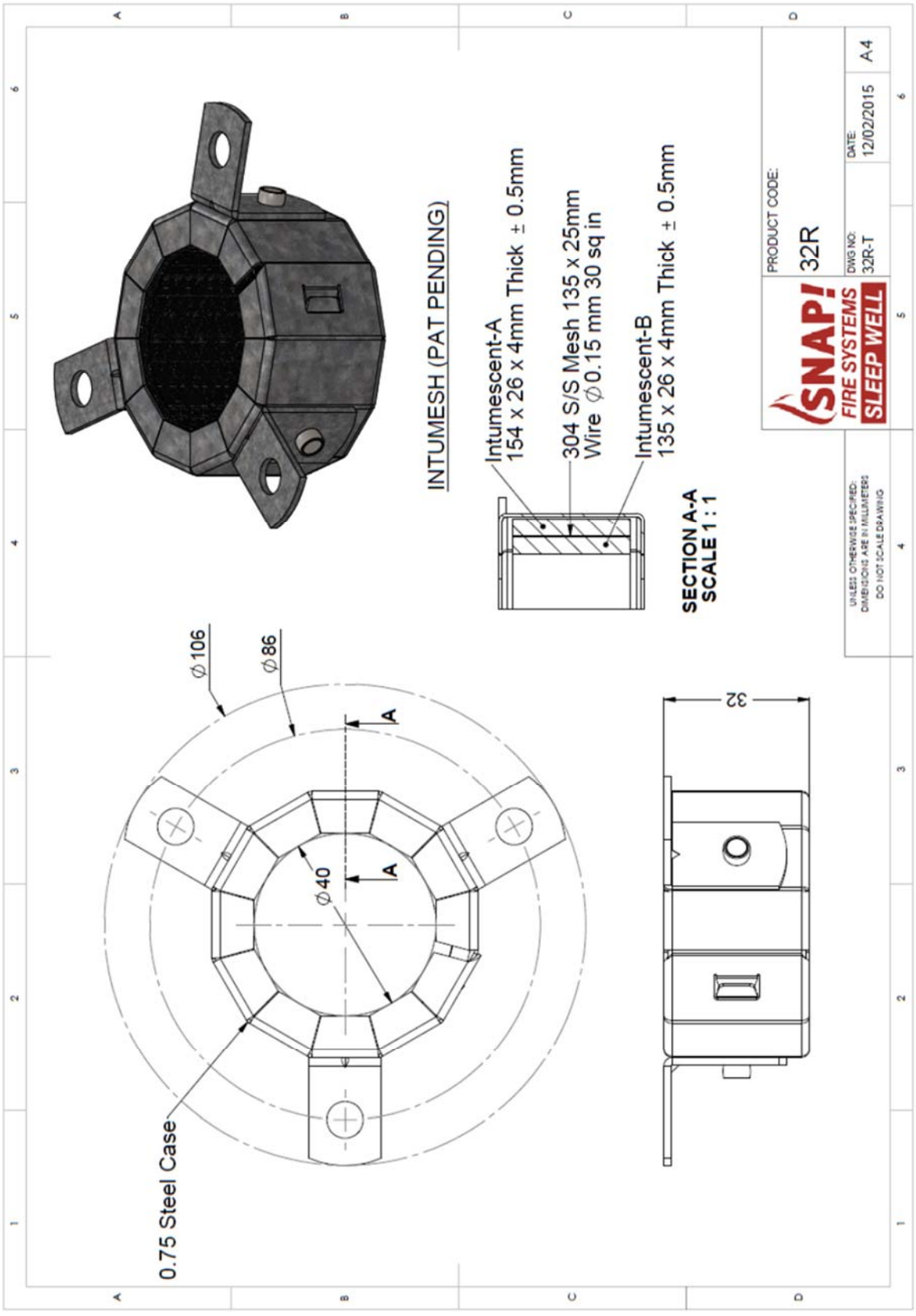
DRAWING TITLED "TEST WALL W-16-D PENETRATION # 8, 20-MM PEX-B PIPE – 32R RETROFIT COLLAR, DATED 6 FEBRUARY 2017", PROVIDED BY SNAP FIRE SYSTEMS PTY LTD.

Test Wall W-16-D Penetration # 9
150mm PVC Pipe w Fitting Inside Collar – HP150R Retrofit Collar
06 FEB 2017

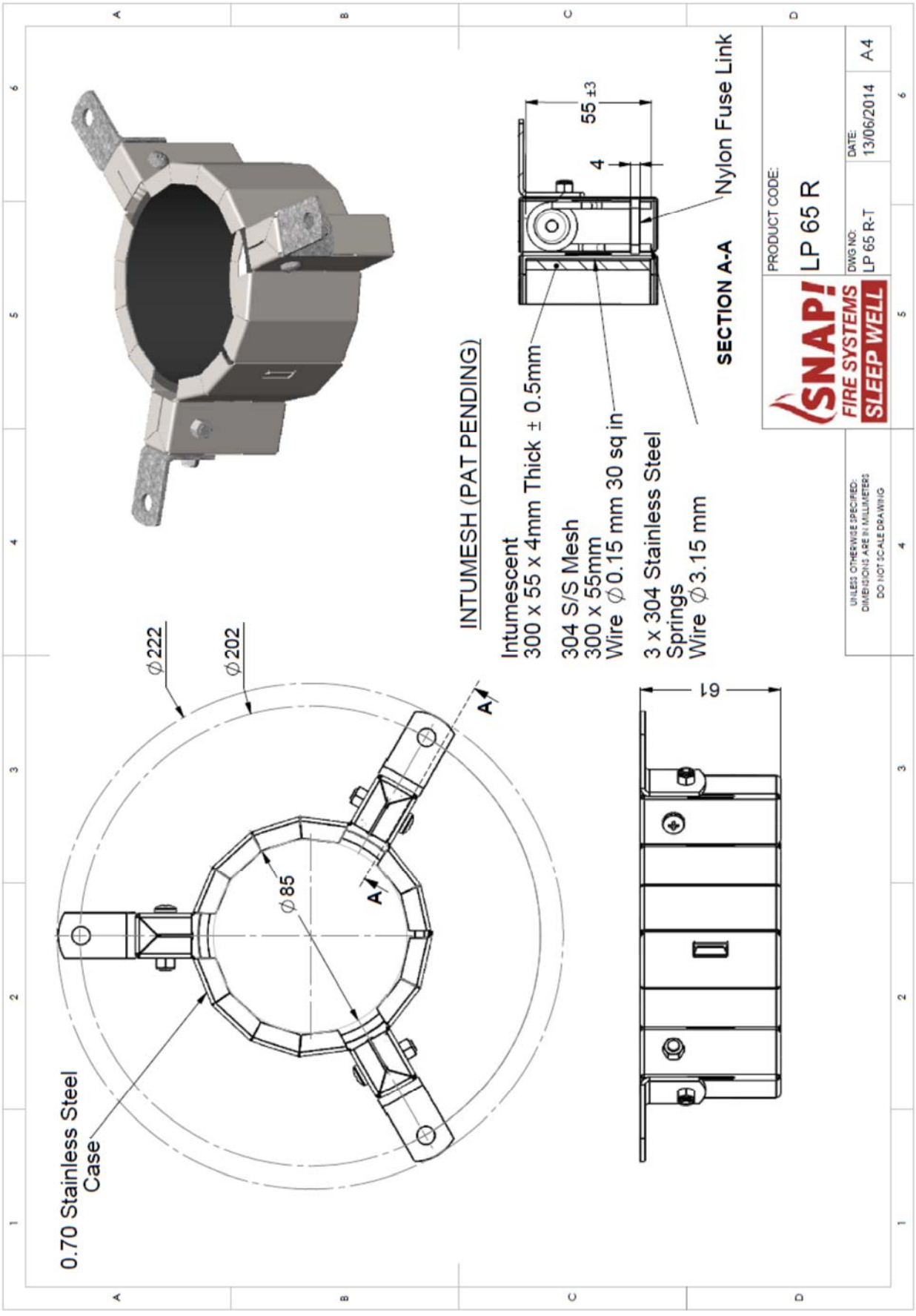


DRAWING TITLED "TEST WALL W-16-D PENETRATION # 9, 150-MM PVC PIPE WITH FITTING INSIDE THE COLLAR – HP150R RETROFIT COLLAR, DATED 6 FEBRUARY 2017", PROVIDED BY SNAP FIRE SYSTEMS PTY LTD.

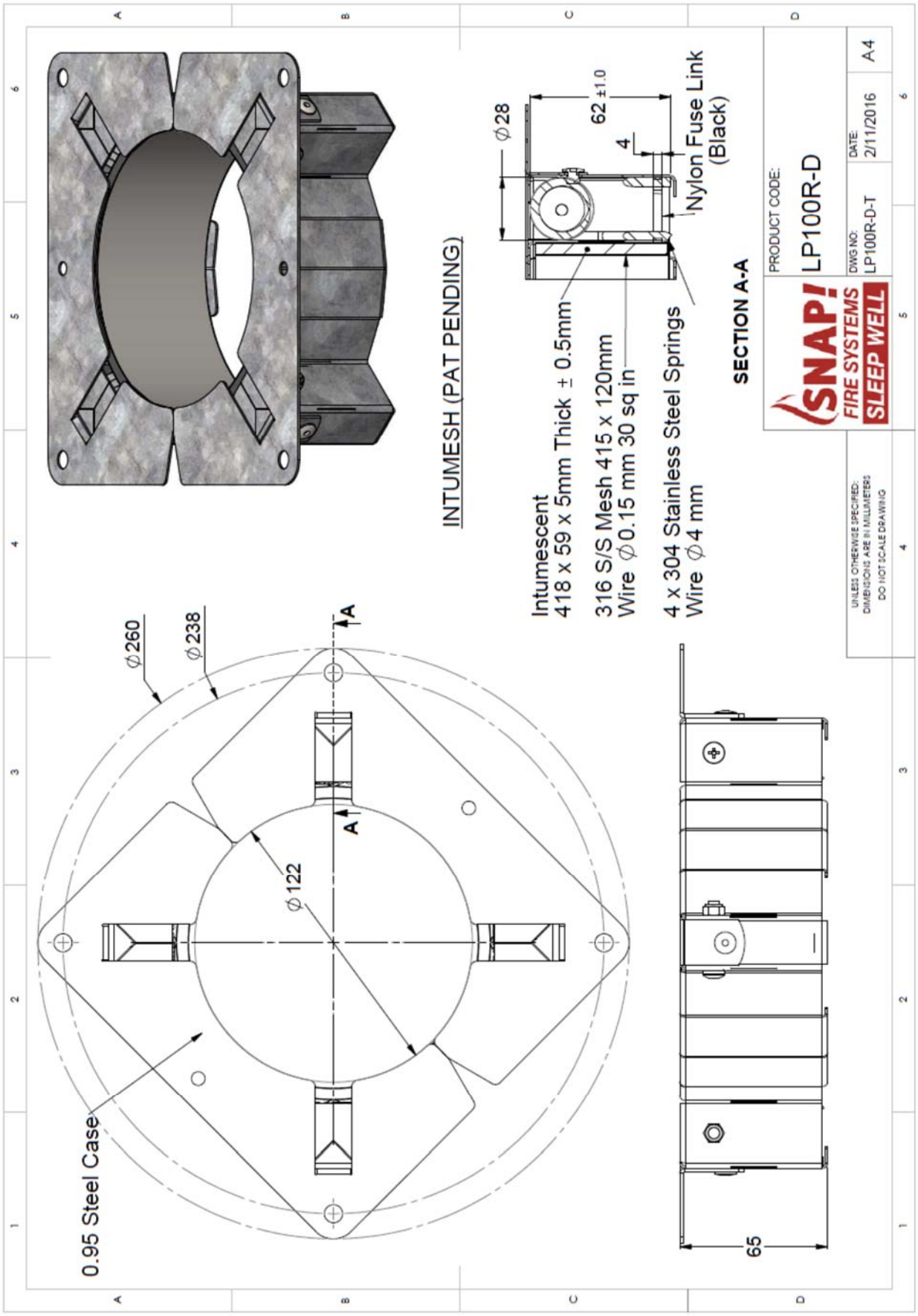
Appendix E – Specimen Drawings



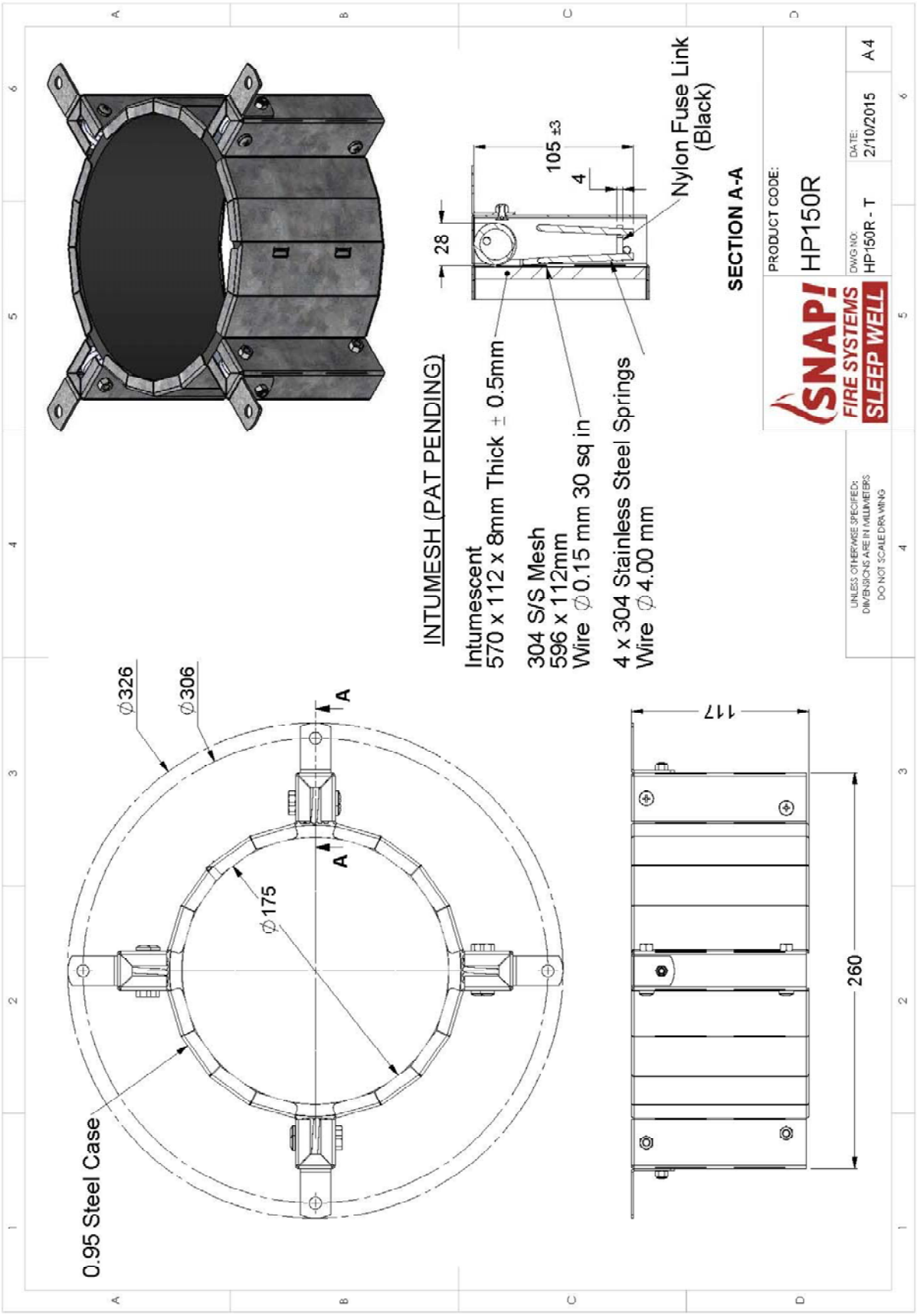
DRAWING NUMBERED 32R-T, DATED 12 FEBRUARY 2015, BY SNAP FIRE SYSTEMS PTY LTD.



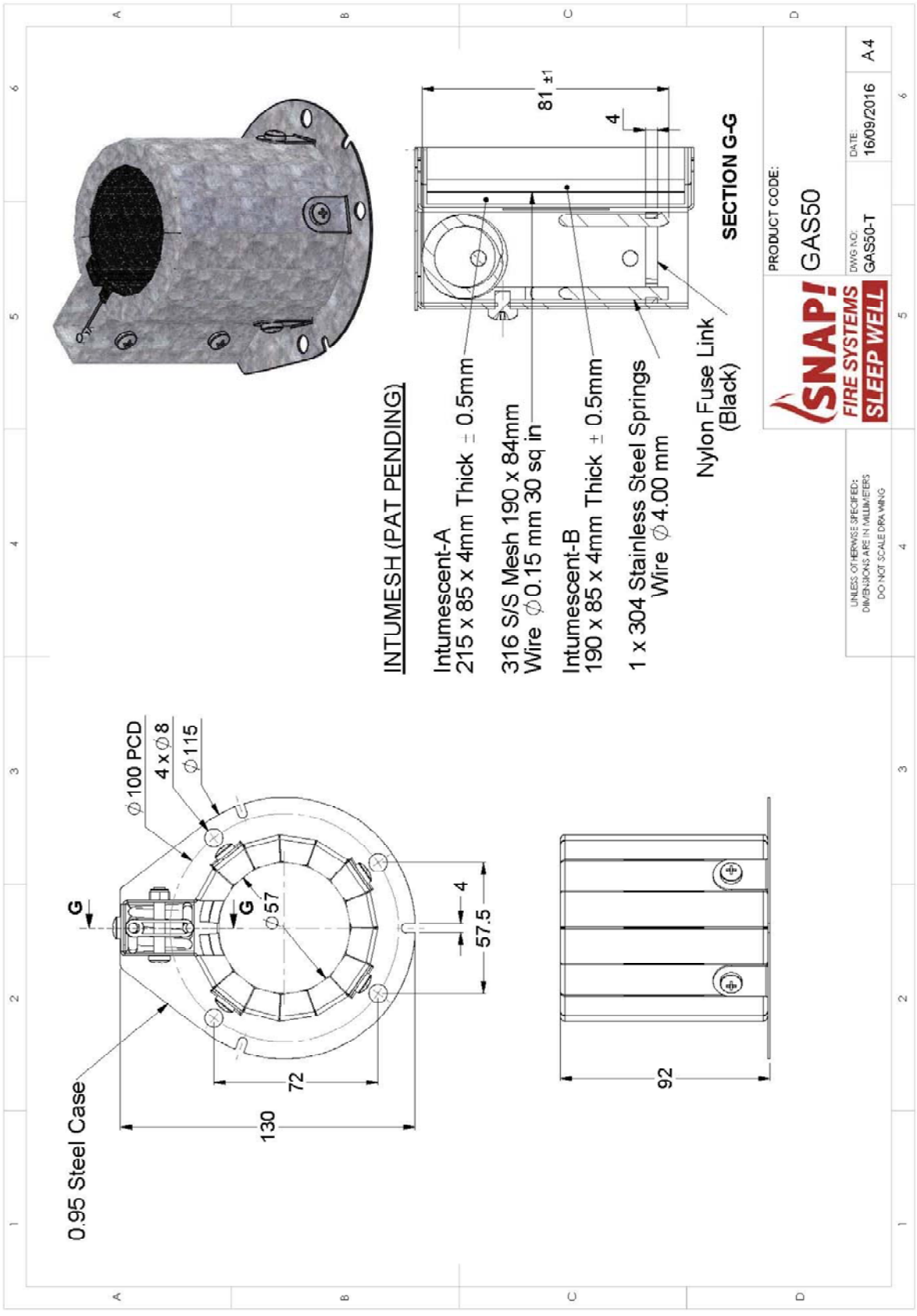
DRAWING NUMBERED LP65R-T, DATED 13 JUNE 2014, BY SNAP FIRE SYSTEMS PTY LTD.



DRAWING NUMBERED LP100R-D, DATED 2 NOVEMBER 2016, BY SNAP FIRE SYSTEMS PTY LTD.



DRAWING NUMBERED HP 150R-T DATED 2 OCTOBER 2015, BY SNAP FIRE SYSTEMS PTY LTD.



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

Appendix F – Certificates

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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. 2925

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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 1807.

Product Name: Penetration # 1 – LP100R-D Retrofit fire collar protecting a nominal 75-mm High-density polyethylene (HDPE) Pipe

Description: The SNAP Retrofit LP100R-D collar comprised a 0.95-mm thick steel casing with a 122-mm inner diameter and a 195-mm x 195-mm square base flange. The 65-mm high collar casing incorporated a layer of 418-mm x 59-mm x 5-mm thick Intumescent material. The closing mechanism comprised 4 x 304 stainless steel springs bound with black nylon fuse links and 316 stainless steel mesh measuring 415 x 120-mm as shown in drawing numbered LP100R-D-T dated 10 February 2017, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in a back-to-back configuration using 14-10 65-mm Hex Head Screws. The penetrating service comprised a 75-mm HDPE Pipe, with a wall thickness of 3.5-mm penetrating the wall through a 79-mm diameter cut-out hole as shown in drawing titled "Test Wall W-16-D Penetration # 1, 75-mm HDPE Pipe – LP100R-D Retrofit Collar, dated 6 February 2017", by Snap Fire Systems Pty Ltd. The pipe incorporated a HDPE Coupling located on the exposed side of the wall. The pipe projected horizontally, 2000-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber. The pipe was supported at nominally 500-mm and 1500-mm from the unexposed face of the wall by two support clamps spaced apart at nominally 1000-mm. The pipe was open at the unexposed end and capped on the exposed end with a ceramic fibre (Superwool) plug.

Structural Adequacy	not applicable
Integrity	no failure at 121 minutes
Insulation	no failure at 121 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/90/90. The fire-resistance level of the wall system is applicable when the system is exposed to fire from either direction. The fire-resistance level (FRL) is 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: Chris Wojcik Date of Test: 18 January 2017

Issued on the 23rd day of March 2017 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

NATA

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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 1807.

Product Name: Penetration # 2 – LP65R Retrofit fire collar protecting a 63-mm High-density polyethylene (HDPE) Pipe

Description: The SNAP Retrofit LP65R fire collar comprised a 0.7-mm stainless steel casing with a 85-mm inner diameter and a 222-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 LP65R-T dated 13 June 2014, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in a back-to-back configuration using 14-10 65-mm Hex Head Screws. The penetrating service comprised a 63-mm HDPE Pipe, with a wall thickness of 3.5-mm penetrating the wall through a 67-mm diameter cut-out hole as shown in drawing titled "Test Wall W-16-D Penetration # 2, 63-mm HDPE Pipe – LP65R Retrofit Collar, dated 6 February 2017". The pipe incorporated a HDPE Coupling located on the exposed side of the wall. The pipe projected horizontally, 2000-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber. The pipe was supported at nominally 500-mm and 1500-mm from the unexposed face of the wall by two support clamps spaced apart at nominally 1000-mm. The pipe was open at the unexposed end and capped on the exposed end with a ceramic fibre (Superwool) plug.

Structural Adequacy	not applicable
Integrity	no failure at 121 minutes
Insulation	91 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/90/90. The fire-resistance level of the wall system is applicable when the system is exposed to fire from either direction. The fire-resistance level (FRL) is 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: Chris Wojcik Date of Test: 18 January 2017

Issued on the 23rd day of March 2017 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

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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 1807.

Product Name: Penetration # 3 – 32R Retrofit fire collar protecting a nominal 25-mm Polyvinyl Chloride (PVC) Conduit with 3-Core Cable

Description: The 32R Retrofit collar comprised a 0.75-mm steel casing with a 40-mm inner dia. and a 106-mm dia. base flange. The 32-mm high collar casing incorporated a closing mechanism that was comprised of two soft Intumesh intumescent strips lined within the internal circumference of the collar. The inner and outer strips were 4-mm thick x 26-mm wide x 135-mm long, and 4-mm thick x 26-mm wide x 154-mm long, respectively. Between the strips was a layer of 304 stainless steel mesh 135 mm long x 25-mm wide with wire mesh dia. of 0.15-mm, as shown in drawing # 32R-T dated 12 February 2015, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in back-to-back configuration using 14-10 65-mm Hex Head Screws. The penetrating service comprised a 25-mm PVC Conduit with 3-Core Cable, with a wall thickness of 1.8-mm penetrating the wall through a 29-mm dia. cut-out hole as shown in drawing "Test Wall W-16-D Penetration # 3, 25-mm PVC Conduit with 3-Core Cable – 32R Retrofit Collar, dated 6 February 2017". The conduit projected horizontally, 2000-mm away from the unexposed face of the wall and approx. 500-mm into furnace chamber. Conduit was supported at nominally 500-mm and 1500-mm from unexposed face of wall by two support clamps spaced apart at nominally 1000-mm. The conduit was open at the unexposed end and capped on the exposed end with a ceramic fibre (Superwool) plug.

Structural Adequacy	not applicable
Integrity	no failure at 121 minutes
Insulation	no failure at 121 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/90/90. The fire-resistance level of the wall system is applicable when the system is exposed to fire from either direction. The fire-resistance level (FRL) is 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: Chris Wojcik Date of Test: 18 January 2017

Issued on the 23rd day of March 2017 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

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Certificate of Test

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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 1807.

Product Name: Penetration # 4 – LP100R-D Retrofit fire collar protecting a nominal 80-mm Polyvinyl Chloride (PVC) Pipe with a fitting inside the collar

Description: The SNAP Retrofit LP100R-D collar comprised a 0.95-mm thick steel casing with a 122-mm inner dia. and a 195-mm x 195-mm square base flange. The 65-mm high collar casing incorporated a layer of 418-mm x 59-mm x 5-mm thick Intumescent material. The closing mechanism comprised 4 x 304 stainless steel springs bound with black nylon fuse links and 316 stainless steel mesh measuring 415 x 120-mm as shown in drawing # LP100R-D-T dated 10 February 2017, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in a back-to-back configuration using 14-10 65-mm Hex Head Screws. The penetrating service comprised an 82-mm OD PVC Pipe, with a wall thickness of 3-mm fitted through the collar's sleeve and penetrating the wall through a 89-mm dia. cut-out hole as shown in drawing "Test Wall W-16-D Penetration # 4, 80-mm PVC Pipe with fitting inside the collar – LP100R-D Retrofit Collar, dated 6 February 2017". The pipe projected horizontally, 2000-mm away from the unexposed face of wall and approximately 500-mm into furnace chamber. The pipe incorporated an 80-mm PVC Coupling inside the collar located on the exposed side of the wall. The pipe was supported at nominally 500-mm and 1500-mm from the unexposed face of the wall by two support clamps spaced apart at nominally 1000-mm. The pipe was open at the unexposed end and capped on the exposed end with an 80-mm PVC End Cap.

Structural Adequacy	not applicable
Integrity	no failure at 121 minutes
Insulation	114 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/90/90. The fire-resistance level of the wall system is applicable when the system is exposed to fire from either direction. The fire-resistance level (FRL) is 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: Chris Wojcik Date of Test: 18 January 2017

Issued on the 23rd day of March 2017 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

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Certificate of Test

No. 2929

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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 1807.

Product Name: Penetration # 5 – GAS50 collar protecting a 50-mm Px-Al-Px Pipe

Description: The SNAP Retrofit GAS50 collar comprised a 0.95-mm thick steel casing with a 57-mm inner diameter and a 130-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 50-mm OD Px-Al-Px Pipe, with a wall thickness of 5-mm fitted through the collar's sleeve and penetrating the wall through a 56-mm diameter cut-out hole as shown in drawing titled "Test Wall W-16-D Penetration # 5, 50-mm Px-Al-Px Pipe – Gas 50 Collar, dated 6 February 2017". The annular gap between the pipe and opening was sealed with a 10-mm bead of fire rated sealant on both sides of the wall. The pipe projected horizontally, 2000-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber. The pipe was supported at nominally 500-mm and 1500-mm from the unexposed face of the wall by two support clamps spaced apart at nominally 1000-mm. The pipe was open at the unexposed end and capped on the exposed end with a ceramic fibre (Superwool) plug. A 10-mm bead of fire rated sealant was used around both sides of the pipe.

Structural Adequacy	not applicable
Integrity	no failure at 121 minutes
Insulation	79 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/90/60. The fire-resistance level of the wall system is applicable when the system is exposed to fire from either direction. The fire-resistance level (FRL) is 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: Chris Wojcik Date of Test: 18 January 2017

Issued on the 23rd day of March 2017 without alterations or additions.

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Manager, Fire Testing and Assessments

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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 1807.

Product Name: Penetration # 7 – 32R Retrofit fire collar protecting a nominal 32-mm Pex-b pipe

Description: The 32R Retrofit collar comprised a 0.75-mm steel casing with a 40-mm inner diameter and a 106-mm diameter base flange. The 32-mm high collar casing incorporated a closing mechanism that was comprised of two soft Intumesh intumescent strips lined within the internal circumference of the collar. The inner and outer strips were 4-mm thick x 26-mm wide x 135-mm long, and 4-mm thick x 26-mm wide x 154-mm long, respectively. Between the strips was a layer of 304 stainless steel mesh 135 mm long x 25-mm wide with wire mesh diameter of 0.15-mm, as shown in drawing numbered 32R-T dated 12 February 2015, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in a back-to-back configuration using 14-10 65-mm Hex Head Screws. The penetrating service comprised a 32-mm Pex-b pipe, with a wall thickness of 3.2-mm penetrating the wall through a 35-mm diameter cut-out hole as shown in drawing titled "Test Wall W-16-D Penetration # 7, 32-mm Pex-b pipe – 32R Retrofit Collar, dated 6 February 2017". The pipe projected horizontally, 2000-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber. The pipe was supported at nominally 500-mm and 1500-mm from the unexposed face of the wall by two support clamps spaced apart at nominally 1000-mm. The pipe was open at the unexposed end and capped on the exposed end with a ceramic fibre (Superwool) plug.

Structural Adequacy	not applicable
Integrity	no failure at 121 minutes
Insulation	no failure at 121 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/90/90. The fire-resistance level of the wall system is applicable when the system is exposed to fire from either direction. The fire-resistance level (FRL) is 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: Chris Wojcik Date of Test: 18 January 2017

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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 1807.

Product Name: Penetration # 8 – 32R Retrofit fire collar protecting a nominal 20-mm Pex-b pipe

Description: The 32R Retrofit collar comprised a 0.75-mm steel casing with a 40-mm inner diameter and a 106-mm diameter base flange. The 32-mm high collar casing incorporated a closing mechanism that was comprised of two soft Intumesh intumescent strips lined within the internal circumference of the collar. The inner and outer strips were 4-mm thick x 26-mm wide x 135-mm long, and 4-mm thick x 26-mm wide x 154-mm long, respectively. Between the strips was a layer of 304 stainless steel mesh 135 mm long x 25-mm wide with wire mesh diameter of 0.15-mm, as shown in drawing numbered 32R-T dated 12 February 2015, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the wall in a back-to-back configuration using 14-10 65-mm Hex Head Screws. The penetrating service comprised a 20-mm Pex-b pipe, with a wall thickness of 2-mm penetrating the wall through a 25-mm diameter cut-out hole as shown in drawing titled "Test Wall W-16-D Penetration # 8, 20-mm Pex-b pipe – 32R Retrofit Collar, dated 6 February 2017". The pipe projected horizontally, 2000-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber. The pipe was supported at nominally 500-mm and 1500-mm from the unexposed face of the wall by two support clamps spaced apart at nominally 1000-mm. The pipe was open at the unexposed end and capped on the exposed end with a ceramic fibre (Superwool) plug.

Structural Adequacy	not applicable
Integrity	no failure at 121 minutes
Insulation	no failure at 121 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/90/90. The fire-resistance level of the wall system is applicable when the system is exposed to fire from either direction. The fire-resistance level (FRL) is 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: Chris Wojcik Date of Test: 18 January 2017

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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 1807.

Product Name: Penetration # 9 – HP150R Retrofit fire collar protecting a nominal 150-mm Polyvinyl Chloride (PVC) Pipe with a fitting inside the collar

Description: The SNAP retrofitted HP150R collar comprised a 0.95-mm thick steel casing with a 175-mm inner dia. and a 326-mm base flange. The 117-mm high collar casing incorporated a strip of 570-mm x 112-mm x 8-mm thick Intumesh intumescent material. The closing mechanism comprised four 304 stainless steel springs bound with nylon fuse links, and a 596-mm x 112-mm stainless steel mesh as shown in drawing # HP 150R-T dated 2 October 2015, by Snap Fire Systems Pty. One collar was fixed to each side of the wall in a back-to-back configuration using 14-10 65-mm Hex Head Screws. The penetrating service comprised a 160-mm OD PVC Pipe, with wall thickness of 4-mm fitted through the collar's sleeve and penetrating the wall through a 168-mm diameter cut-out hole as shown in drawing titled "Test Wall W-16-D Penetration # 9, 150-mm PVC Pipe with fitting inside the collar – HP150R Retrofit Collar, dated 6 February 2017". The pipe projected horizontally, 2000-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber. The pipe incorporated an 150-mm PVC Coupling located inside the collar on the exposed side of the wall. The pipe was supported at nominally 500-mm and 1500-mm from the unexposed face of the wall by two support clamps spaced apart at nominally 1000-mm. The pipe was open at the unexposed end and capped on the exposed end with a 150-mm PVC End Cap.

Structural Adequacy	not applicable
Integrity	no failure at 121 minutes
Insulation	no failure at 121 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/90/90. The fire-resistance level of the wall system is applicable when the system is exposed to fire from either direction. The fire-resistance level (FRL) is 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: Chris Wojcik Date of Test: 18 January 2017

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References

The following informative documents are referred to in this Report:

AS 1530.4-2014	Methods for fire tests on building materials, components and structures part 4: fire-resistance tests of elements of building construction.
AS 4072.1-2005	Components for the protection of openings in fire-resistant separating elements. Part 1: service penetrations and control joints.

----end of report----

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