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

Test Report

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

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15 June 2017	15 June 2017	15 June 2017

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Contents

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

Sponsored Investigation No. FSP 1822

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 one (1) HDPE pipe, two (2) Raupiano pipes, two (2) PVC conduit and three (3) Pex-Al-Pex pipe.

1.2 Sponsor

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

1.3 Manufacturer

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

1.4 Test standard

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

Section 10: Service Penetrations and control joints

1.5 Reference standard

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

1.6 Test number

CSIRO Reference test number: FS 4664/4104

1.7 Test date

The fire-resistance test was conducted on 22 March 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 eight (8) 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 5065:2005 'Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications'
- AS/NZS 7671:2010 'Plastics piping systems for soil and waste discharge (low and high temperature) inside buildings - Polypropylene (PP)(ISO 7671:2003, MOD)'

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

<u>Penetration # 1 – LP65R Retrofit fire collar protecting a 50-mm Raupiano Pipe</u>

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 bound 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 50-mm Raupiano Pipe, with a wall thickness of 1.9-mm penetrating the wall through a 54-mm diameter cut-out hole as shown in drawing titled "Test Wall W-17-A Penetration # 1, 50-mm Raupiano Pipe – LP65R Retrofit Collar, dated 16 May 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 # 2 – GAS32 Retrofit collar protecting a 32-mm diameter CXL Px-Al-Px Pipe

The GAS32 Retrofit collar comprised a 0.95-mm thick galvanised steel casing with a 35-mm inner diameter and a 100-mm diameter base flange. The 63-mm high collar casing incorporated a layer of 140-mm x 55-mm x 4-mm thick Intumescent material and a layer of 120-mm x 55-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 120 x 54-mm as shown in drawing numbered GAS32-T dated 14 September 2016, by Snap Fire Systems Pty Ltd.

The penetrating service comprised a 32-mm CXL Px-Al-Px 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-17-A Penetration # 2, 32-mm Px-Al-Px Pipe – 32Gas Retrofit Collar, dated 16 May 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 # 3 – LP100R-D Retrofit fire collar protecting a nominal 110-mm Raupiano Pipe

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 110-mm OD Raupiano Pipe, with a wall thickness of 3.3-mm penetrating the wall through a 114-mm diameter cut-out hole as shown in drawing titled "Test Wall W-17-A Penetration # 3, 110-mm Raupiano Pipe – LP100R-D Retrofit Collar, dated 16 October 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 # 4 – 32R Retrofit fire collar protecting a 20-mm Telstra PVC Conduit

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 27-mm OD Telstra PVC Conduit, with a wall thickness of 1.9-mm penetrating the wall through a 32-mm diameter cut-out hole as shown in drawing titled "Test Wall W-17-A Penetration # 4, 205-mm Telstra PVC Conduit – 32R Retrofit Collar, dated 16 May 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 # 5 – 32R Retrofit fire collar protecting a 20-mm Telstra PVC Conduit

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 Telstra PVC Conduit, with a wall thickness of 1.9-mm penetrating the wall through a 32-mm diameter cut-out hole as shown in drawing titled "Test Wall W-17-A Penetration # 5, 20-mm Telstra PVC Conduit – 32R Retrofit Collar, dated 16 May 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 # 6 – GAS32 Retrofit collar protecting a 25-mm diameter CXL Px-Al-Px Pipe

The GAS32 Retrofit collar comprised a 0.95-mm thick galvanised steel casing with a 35-mm inner diameter and a 100-mm diameter base flange. The 63-mm high collar casing incorporated a layer of 140-mm x 55-mm x 4-mm thick Intumescent material and a layer of 120-mm x 55-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 120 x 54-mm as shown in drawing numbered GAS32-T dated 14 September 2016, by Snap Fire Systems Pty Ltd.

The penetrating service comprised a 25-mm CXL Px-Al-Px pipe, with a wall thickness of 3.2-mm penetrating the wall through a 29-mm diameter cut-out hole as shown in drawing titled "Test Wall W-17-A Penetration # 6, 25-mm CXL Px-Al-Px Pipe – 32Gas Retrofit Collar, dated 16 May 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 # 7 – GAS32 Retrofit collar protecting a 20-mm diameter CXL Px-Al-Px Pipe

The GAS32 Retrofit collar comprised a 0.95-mm thick galvanised steel casing with a 35-mm inner diameter and a 100-mm diameter base flange. The 63-mm high collar casing incorporated a layer of 140-mm x 55-mm x 4-mm thick Intumescent material and a layer of 120-mm x 55-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 120 x 54-mm as shown in drawing numbered GAS32-T dated 14 September 2016, by Snap Fire Systems Pty Ltd.

The penetrating service comprised a 20-mm CXL Px-Al-Px pipe, with a wall thickness of 2.5-mm penetrating the wall through a 25-mm diameter cut-out hole as shown in drawing titled "Test Wall W-17-A Penetration # 7, 20-mm CXL Px-Al-Px Pipe – 32Gas Retrofit Collar, dated 16 May 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 – HP150R Retrofit fire collar protecting a 160-mm High-density polyethylene (HDPE) Pipe

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 a 162-mm OD HDPE pipe, with a wall thickness of 6.8-mm penetrating the wall through a 168-mm diameter cut-out hole as shown in drawing titled "Test Wall W-17-A Penetration # 8, 160-mm HDPE Pipe – HP150R Retrofit Collar, dated 16 May 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.

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

Drawing numbered GAS32-T dated 14 September 2016, by Snap Fire Systems Pty Ltd.

Drawing numbered LP100R-D-T dated 10 February 2017, by Snap Fire Systems Pty Ltd.

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

Drawing numbered HP 150R-T dated 2 October 2015, by Snap Fire Systems Pty.

Drawing titled “Test Wall W-17-A Penetration # 1, 50-mm Raupiano Pipe – LP65R Retrofit Collar, dated 16 May 2017”.

Drawing titled “Test Wall W-17-A Penetration # 2, 32-mm Px-Al-Px Pipe – 32Gas Retrofit Collar, dated 16 May 2017”.

Drawing titled “Test Wall W-17-A Penetration # 3, 110-mm Raupiano Pipe – LP100R-D Retrofit Collar, dated 16 October 2017”.

Drawing titled “Test Wall W-17-A Penetration # 4, 205-mm Telstra PVC Conduit – 32R Retrofit Collar, dated 16 May 2017”.

Drawing titled “Test Wall W-17-A Penetration # 5, 20-mm Telstra PVC Conduit – 32R Retrofit Collar, dated 16 May 2017”.

Drawing titled “Test Wall W-17-A Penetration # 6, 25-mm CXL Px-Al-Px Pipe – 32Gas Retrofit Collar, dated 16 May 2017”.

Drawing titled “Test Wall W-17-A Penetration # 7, 20-mm CXL Px-Al-Px Pipe – 32Gas Retrofit Collar, dated 16 May 2017”.

Drawing titled “Test Wall W-17-A Penetration # 8, 160-mm HDPE Pipe – HP150R Retrofit Collar, dated 16 May 2017”.

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 28°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 the base of Penetrations 3, 7 and 8.
4 minutes -	Smoke is emitted from inside the collar of Penetration 8.
5 minutes -	Smoke is fluing from the end of Penetration 8.
9 minutes -	Dense smoke is fluing from the end of Penetration 8.
12 minutes -	Smoke is no longer fluing from Penetration 8.
30 minutes -	No smoke is emitting from any specimens.
61 minutes -	Light smoke is emitted from inside the collar of Penetration 8.
70 minutes -	Light smoke is emitted from inside the collar of Penetration 4.
	A vertical crack has developed in the wall between Penetration 7 and 8.
90 minutes -	Smoke emitting from inside collar of Penetration 8 is increasing.
95 minutes -	Smoke is now emitting from inside the collar of Penetration 3.
110 minutes -	More cracks have developed in the wall.
116 minutes -	Insulation failure – Penetration 4.
120 minutes -	Insulation failure – Penetration 5.
121 minutes -	Insulation failure – Penetration 2. 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 # 6.

Figure 9 shows the curve of maximum temperature versus time associated with Penetration # 7.

Figure 10 shows the curve of maximum temperature versus time associated with Penetration # 8.

8.5 Performance

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

Penetration # 1 – LP65R Retrofit fire collar protecting a 50-mm Raupiano Pipe

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

Penetration # 2 – GAS32 Retrofit collar protecting a 32-mm diameter CXL Px-Al-Px Pipe

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

Penetration # 3 – LP100R-D Retrofit fire collar protecting a nominal 110-mm Raupiano Pipe

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

Penetration # 4 – 32R Retrofit fire collar protecting a 20-mm Telstra PVC Conduit

Structural adequacy	-	Not applicable
Integrity	-	No failure at 121 minutes
Insulation	-	116 minutes

Penetration # 5 – 32R Retrofit fire collar protecting a 20-mm Telstra PVC Conduit

Structural adequacy	-	Not applicable
Integrity	-	No failure at 121 minutes
Insulation	-	120 minutes

Penetration # 6 – GAS32 Retrofit collar protecting a 25-mm diameter CXL Px-Al-Px Pipe

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

Penetration # 7 – GAS32 Retrofit collar protecting a 20-mm diameter CXL Px-Al-Px Pipe

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

Penetration # 8 – HP150R Retrofit fire collar protecting a 160-mm High-density polyethylene (HDPE) Pipe

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	-	-/90/90
Penetration # 2	-	-/90/90	Penetration # 6	-	-/90/90
Penetration # 3	-	-/90/90	Penetration # 7	-	-/90/90
Penetration # 4	-	-/90/90	Penetration # 8	-	-/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

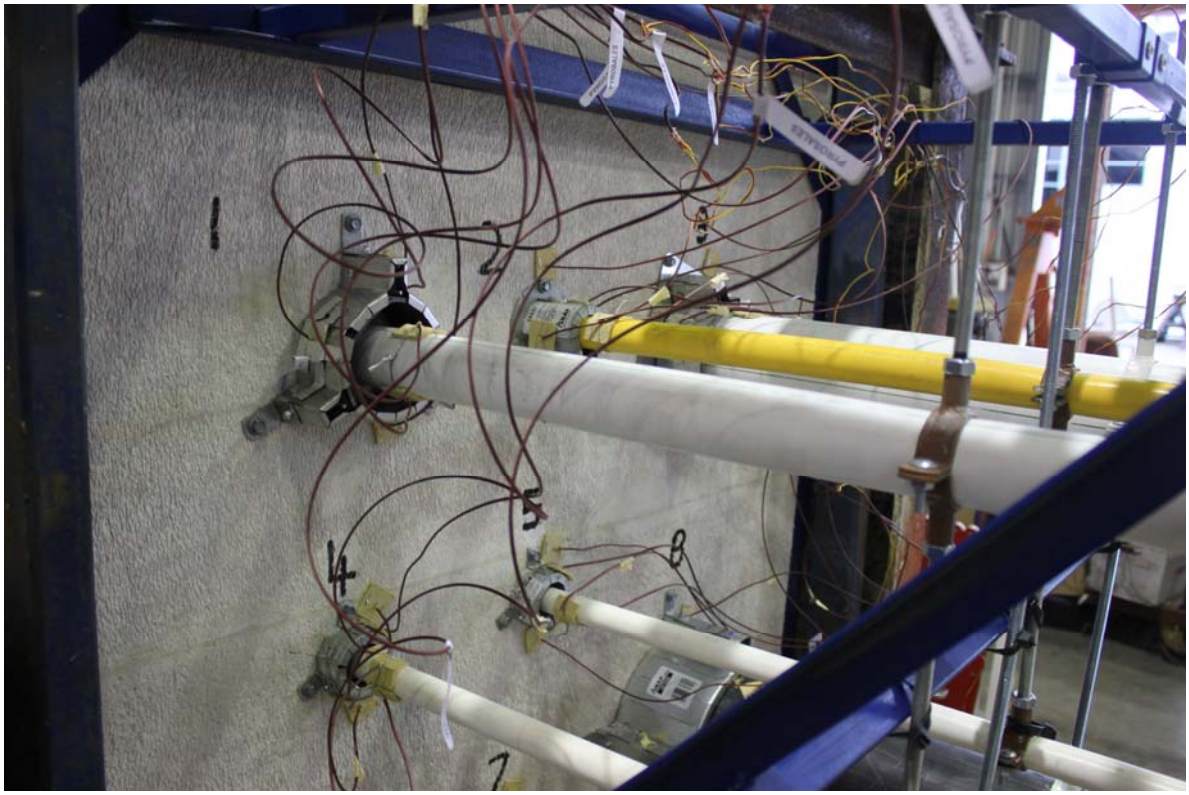
Chris Wojcik
Testing Officer

Appendices

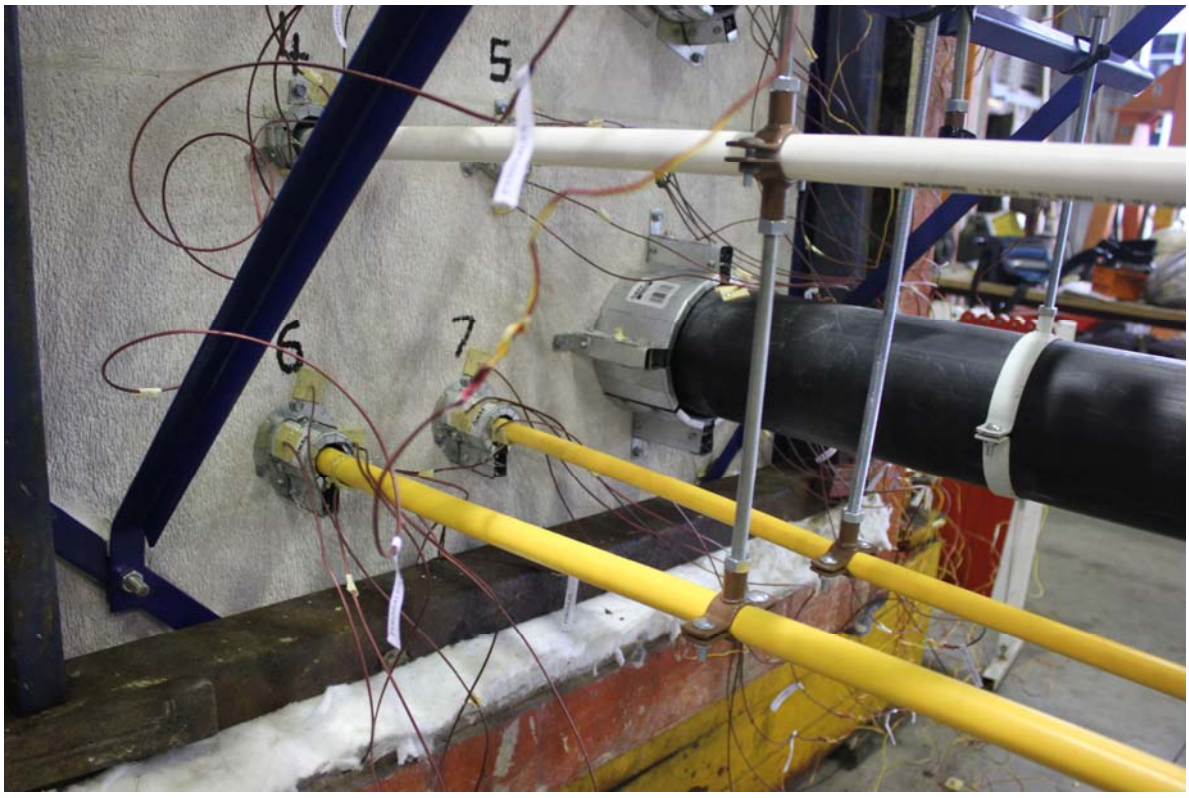
Appendix A – Measurement location

Measurement Location		Data Logger Channel Information
Specimen	**T/C Position**	**T/C designation**
Penetration # 1 – LP65R Retrofit fire collar protecting a 50-mm Raupiano Pipe	On the wall, 25-mm from the collar	S1
	On the wall, 25-mm from the collar	S2
	On top of the fire collar	S3
	On the fire collar	S4
	On top of the pipe – 25-mm from the collar	S5
	On the pipe – 25-mm from the collar	S6
Penetration # 2 – GAS32 Retrofit collar protecting a 32-mm diameter CXL Px-Al-Px Pipe	On the wall, 25-mm from the collar	S7
	On the wall, 25-mm from the collar	S8
	On top of the fire collar	S9
	On the fire collar	S10
	On top of the pipe – 25-mm from the collar	S11
	On the pipe – 25-mm from the collar	S12
Penetration # 3 – LP100R-D Retrofit fire collar protecting a nominal 110-mm Raupiano Pipe	On the wall, 25-mm from the collar	S13
	On the wall, 25-mm from the collar	S14
	On top of the fire collar	S15
	On the fire collar	S16
	On top of the pipe – 25-mm from the collar	S17
	On the pipe – 25-mm from the collar	S18
Penetration # 4 – 32R Retrofit fire collar protecting a 20-mm Telstra PVC Conduit	On the wall, 25-mm from the collar	S19
	On the wall, 25-mm from the collar	S20
	On top of the fire collar	S21
	On the fire collar	S22
	On top of the pipe – 25-mm from the collar	S23
	On the pipe – 25-mm from the collar	S24
Penetration # 5 – 32R Retrofit fire collar protecting a 20-mm Telstra PVC Conduit	On the wall, 25-mm from the collar	S25
	On the wall, 25-mm from the collar	S26
	On top of the fire collar	S27
	On the fire collar	S28
	On top of the pipe – 25-mm from the collar	S29
	On the pipe – 25-mm from the collar	S30
Penetration # 6 – GAS32 Retrofit collar protecting a 25-mm diameter CXL Px-Al-Px Pipe	On the wall, 25-mm from the collar	S31
	On the wall, 25-mm from the collar	S32
	On top of the fire collar	S33
	On the fire collar	S34
	On top of the pipe – 25-mm from the collar	S35
	On the pipe – 25-mm from the collar	S36
Penetration # 7 – GAS32 Retrofit collar protecting a 20-mm diameter CXL Px-Al-Px Pipe	On the wall, 25-mm from the collar	S37
	On the wall, 25-mm from the collar	S38
	On top of the fire collar	S39
	On the fire collar	S40
	On top of the pipe – 25-mm from the collar	S41
	On the pipe – 25-mm from the collar	S42
Penetration # 8 – HP150R Retrofit fire collar protecting a 160-mm High-density polyethylene (HDPE) Pipe	On the wall, 25-mm from the collar	S43
	On the wall, 25-mm from the collar	S44
	On top of the fire collar	S45
	On the fire collar	S46
	On top of the pipe – 25-mm from the collar	S47
	On the pipe – 25-mm from the collar	S48

Appendix B – Photographs



PHOTOGRAPH 1 – UNEXPOSED 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 – EXPOSED FACE OF SPECIMENS AT CONCLUSION OF TESTING

Appendix C – Furnace Temperature

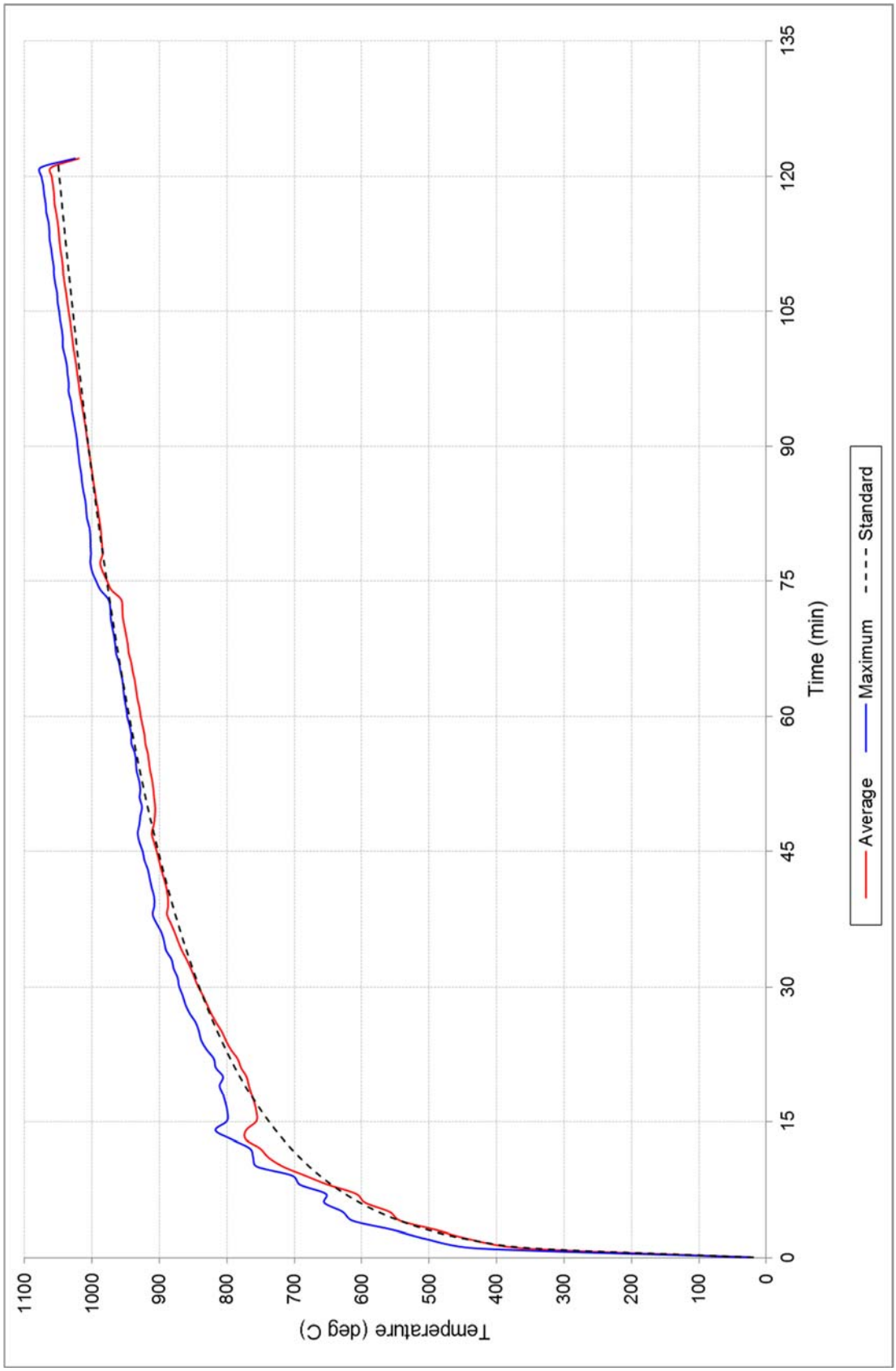


FIGURE 1 – FURNACE TEMPERATURE

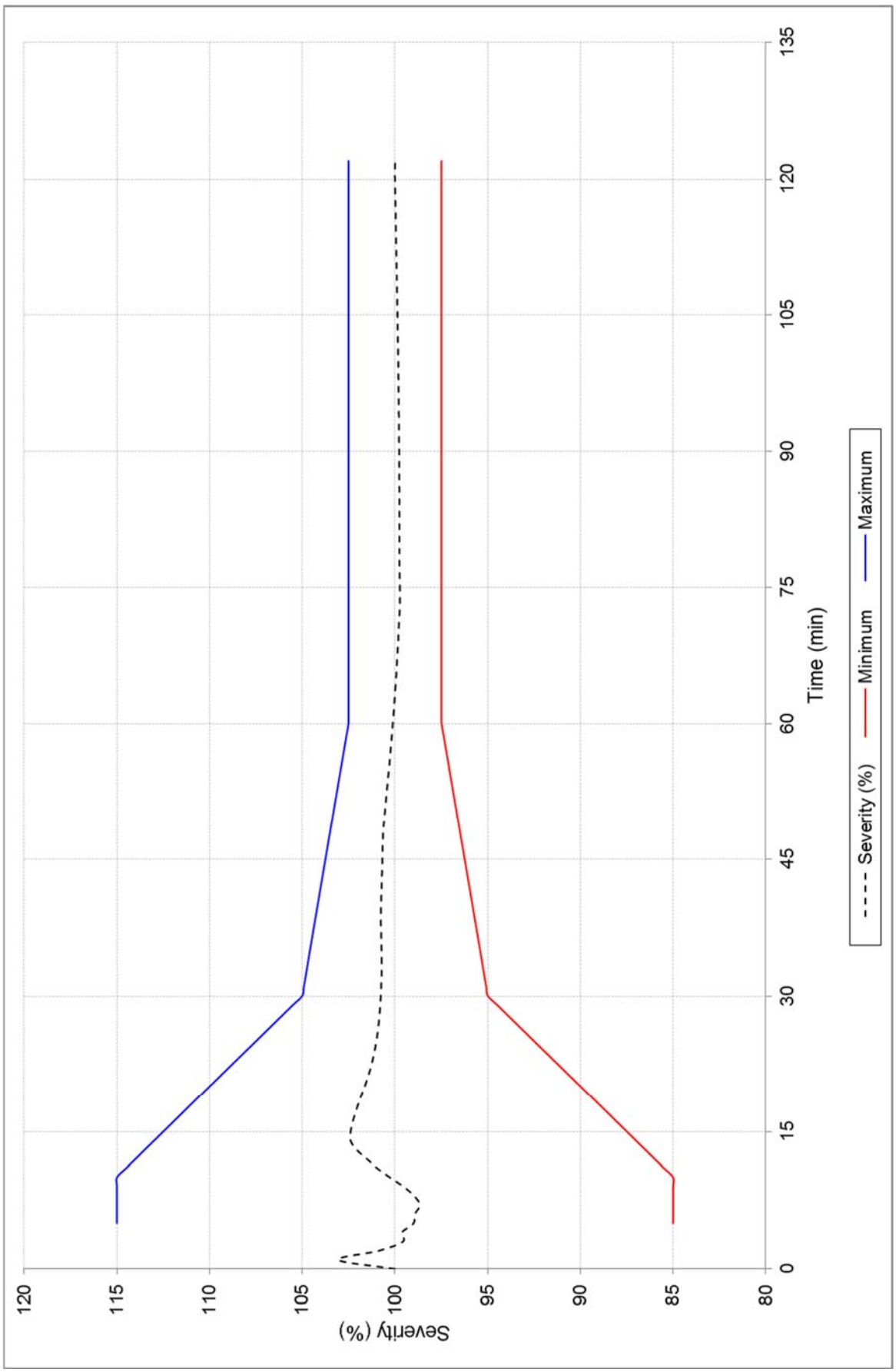


FIGURE 2 – FURNACE SEVERITY

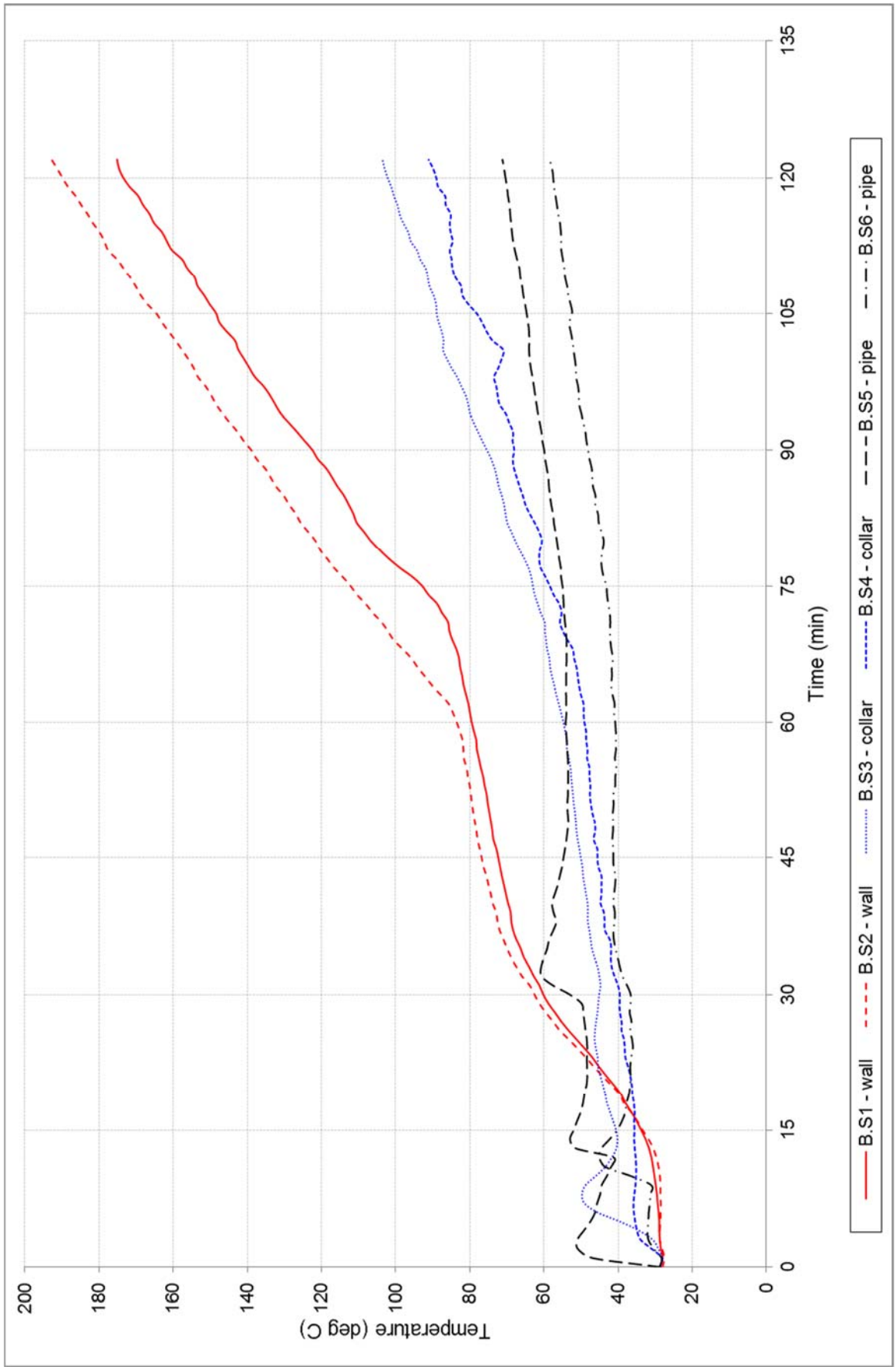


FIGURE 3 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 1

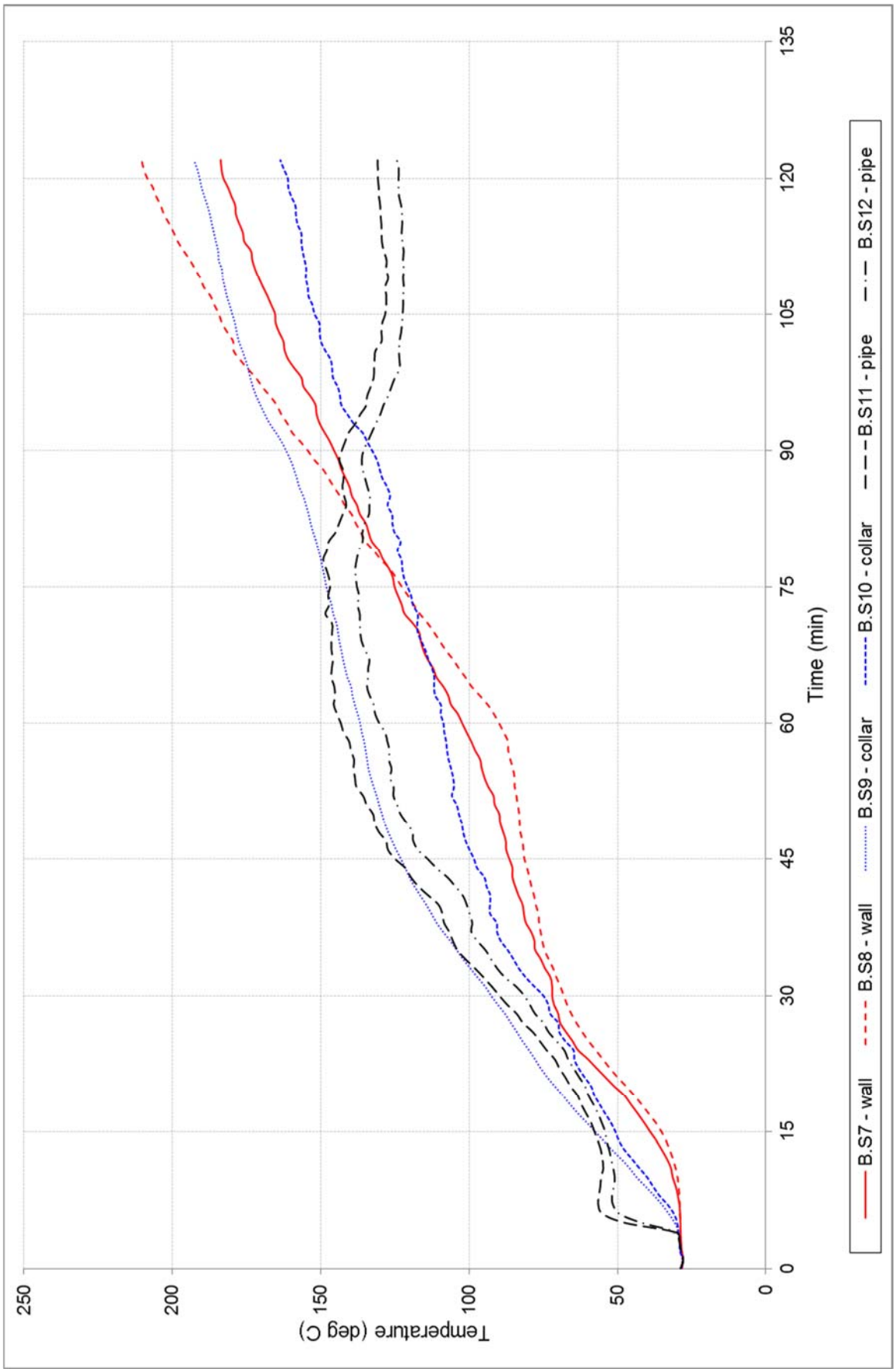


FIGURE 4 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 2

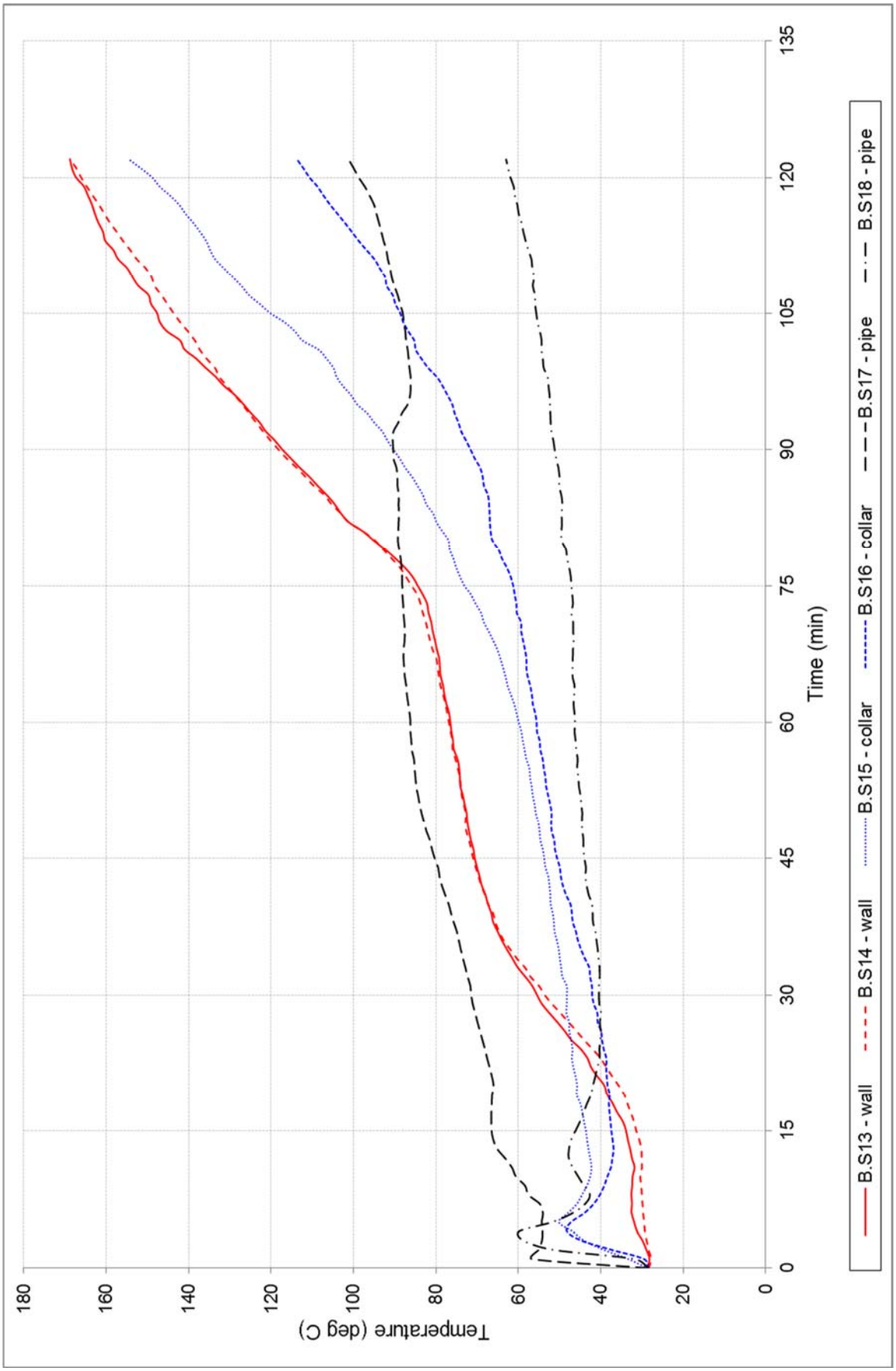


FIGURE 5 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 3

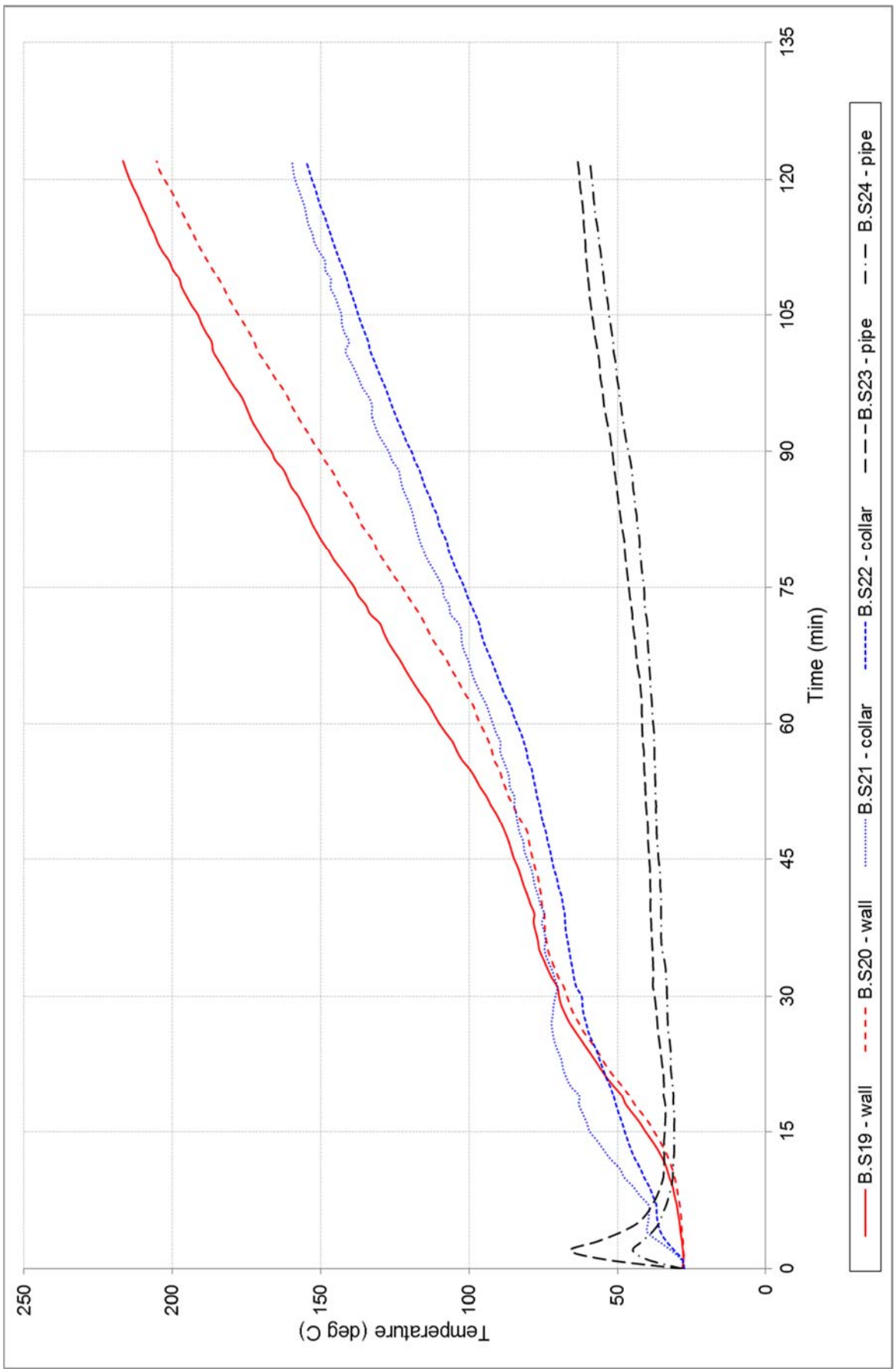


FIGURE 6 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 4

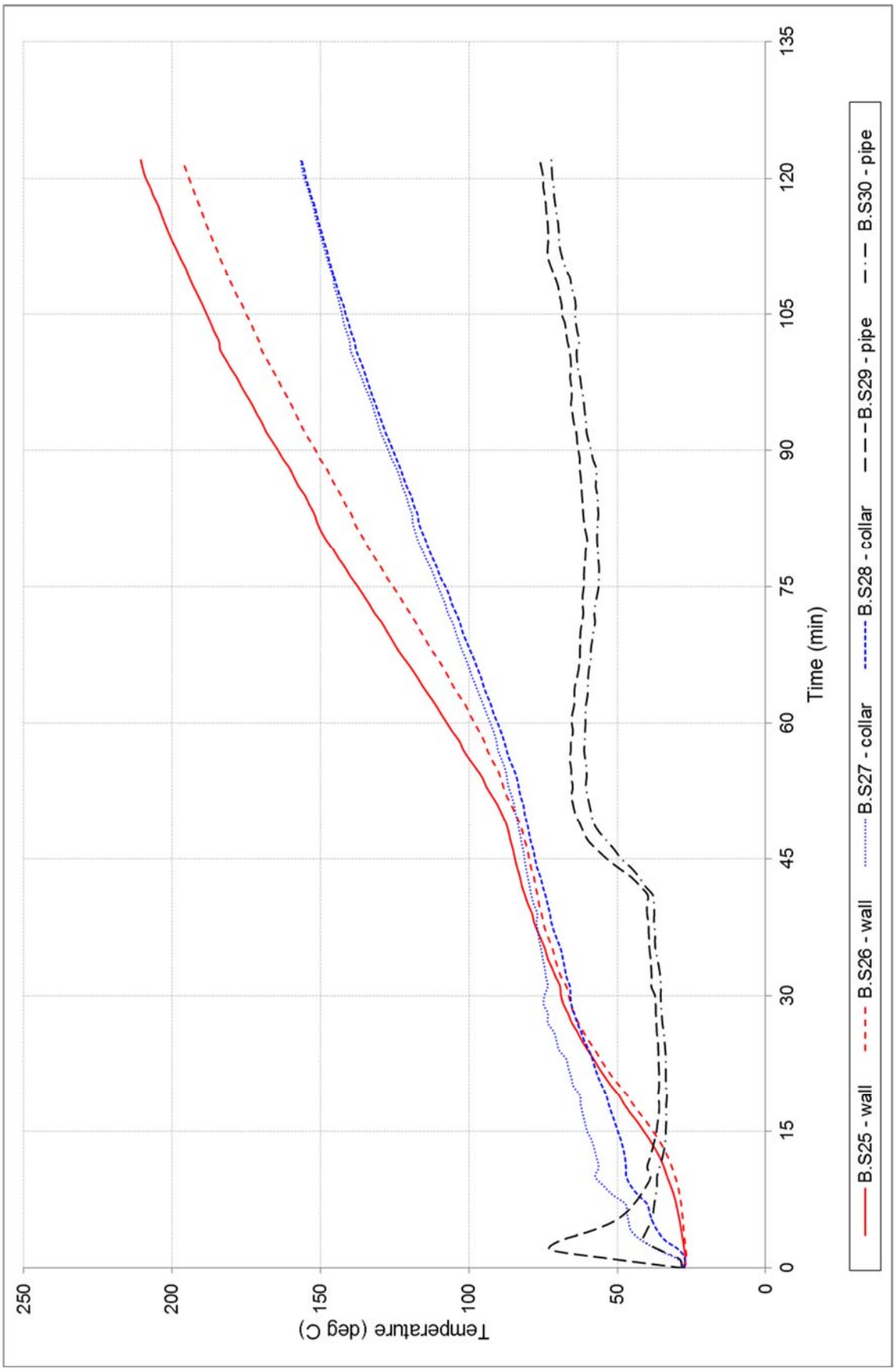


FIGURE 7 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 5

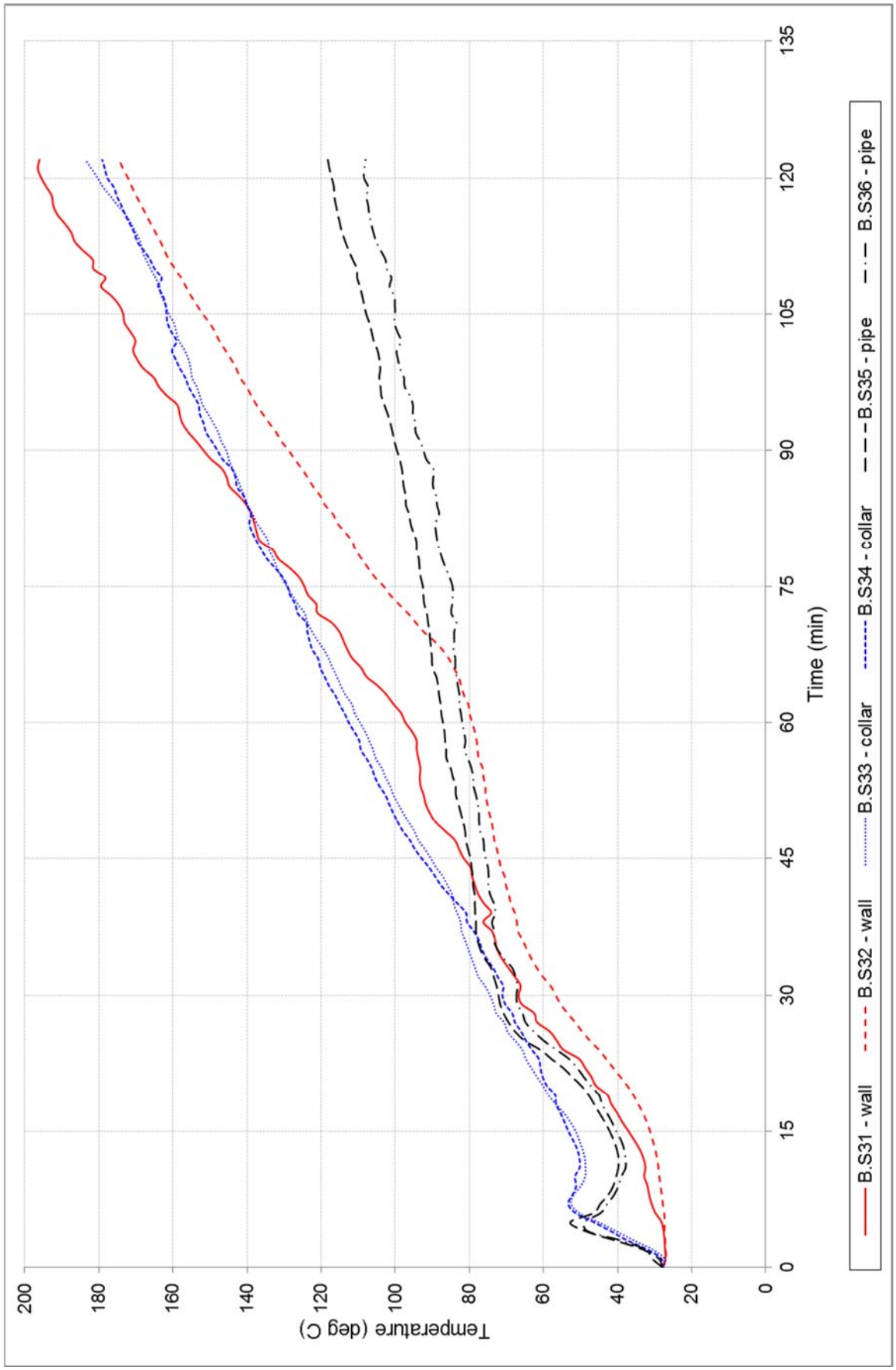


FIGURE 8 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 6

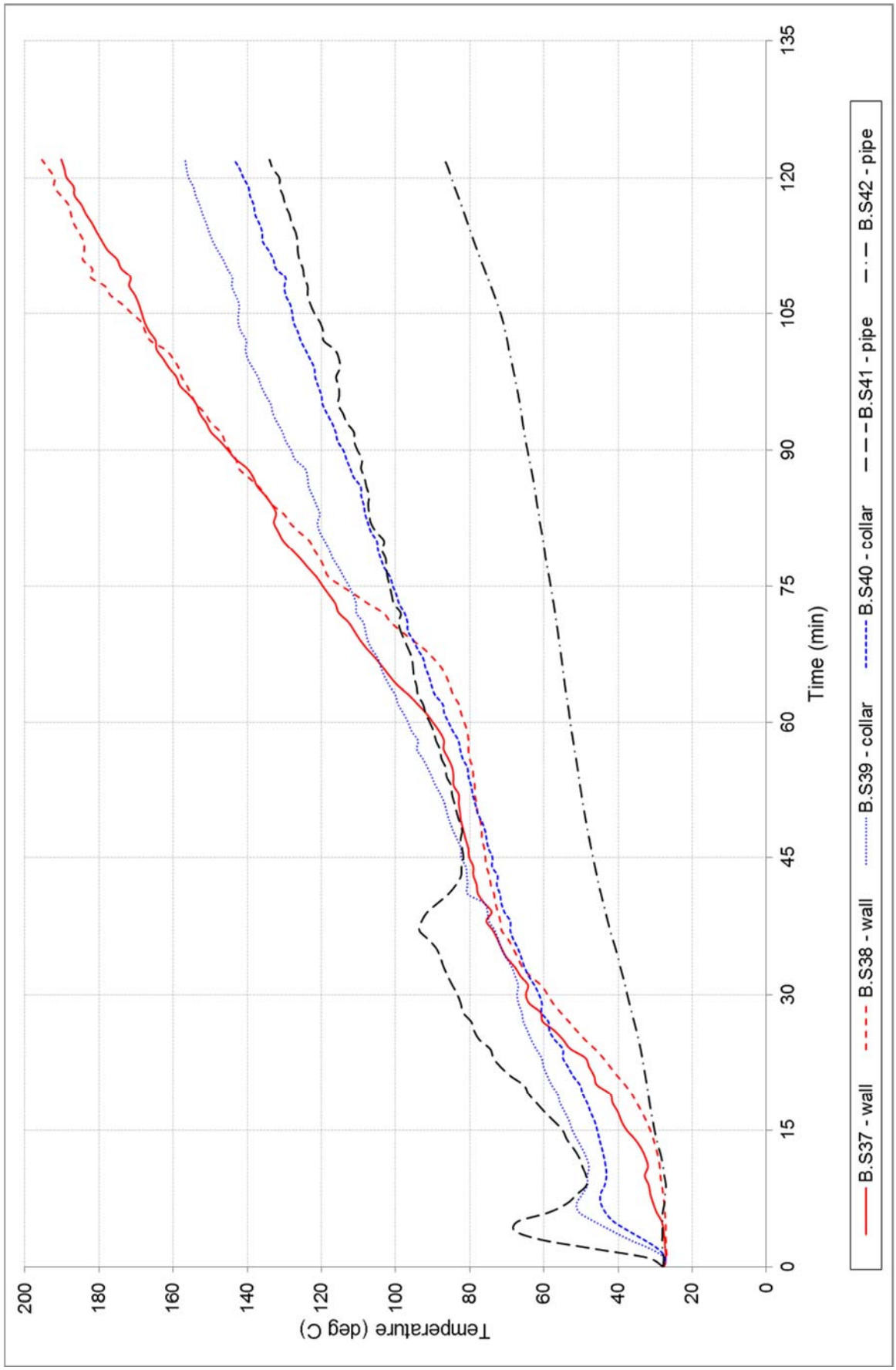


FIGURE 9 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 7

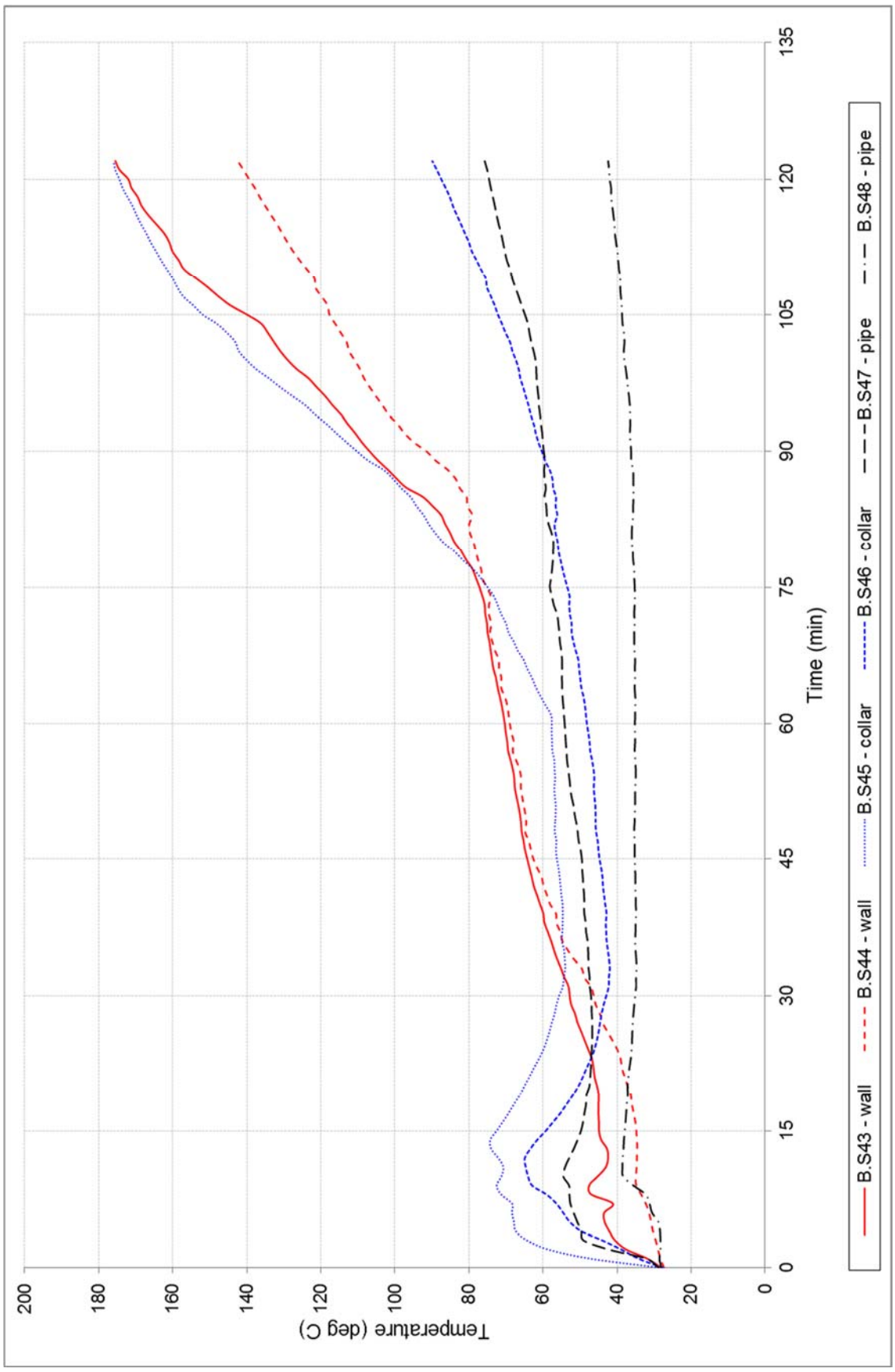
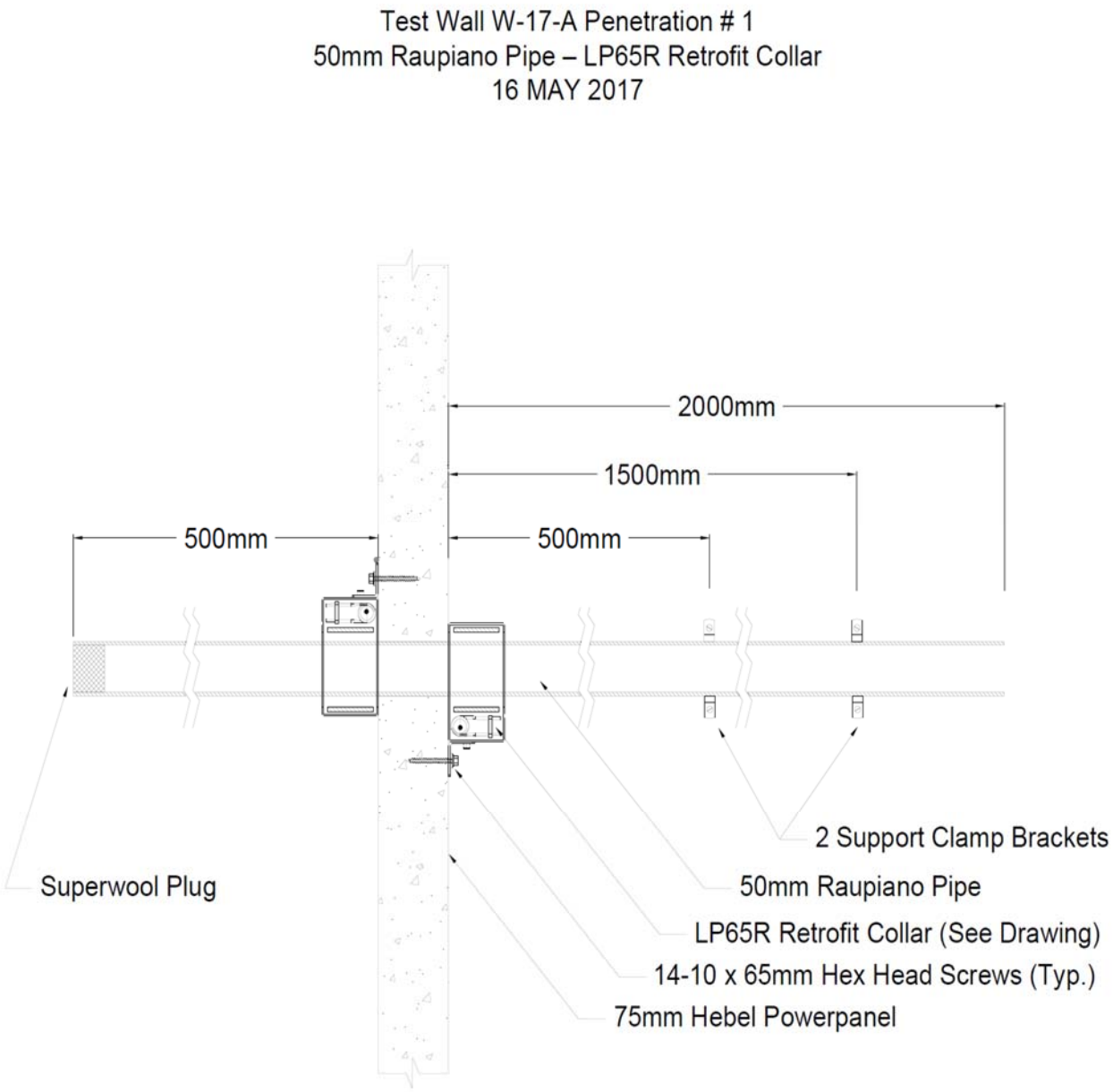


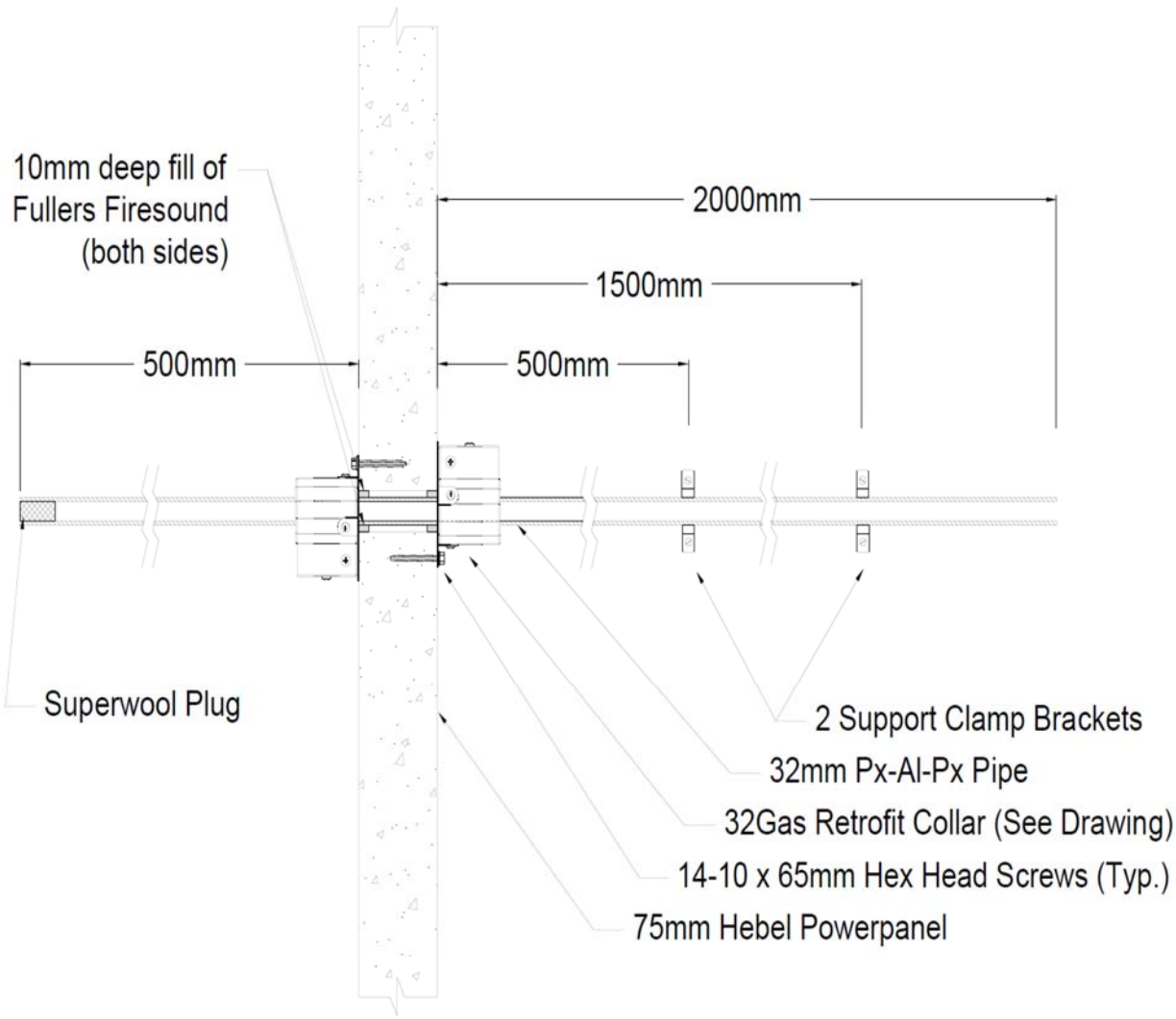
FIGURE 10 – SPECIMEN TEMPERATURE – ASSOCIATED WITH PENETRATION # 8

Appendix D – Installation drawings



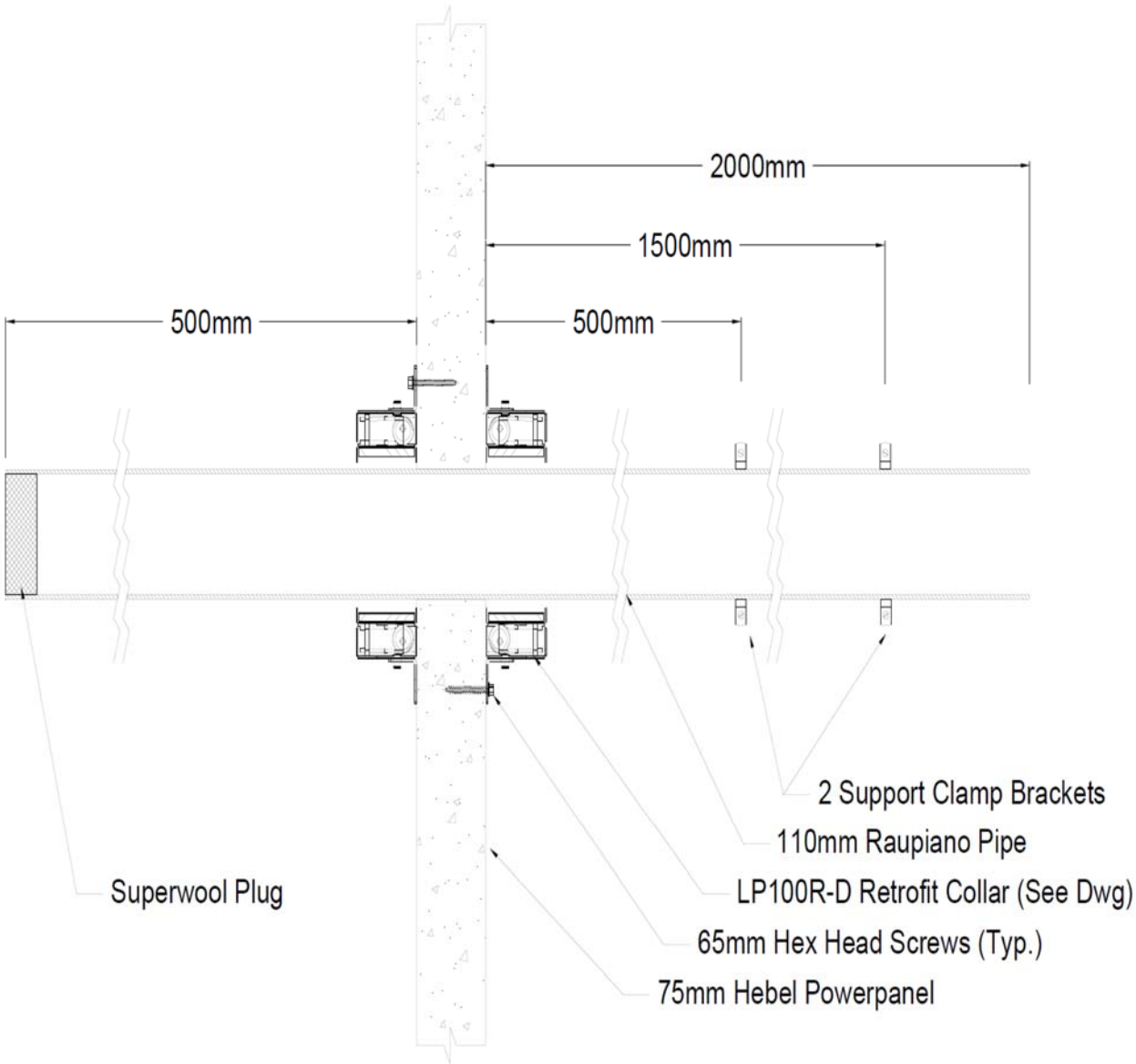
DRAWING TITLED "TEST WALL W-17-A PENETRATION # 1, 50-MM RAUPIANO PIPE – LP65R RETROFIT COLLAR, DATED 16 MAY 2017".

Test Wall W-17-A Penetration # 2
32mm Px-Al-Px Pipe – 32Gas Retrofit Collar
16 MAY 2017



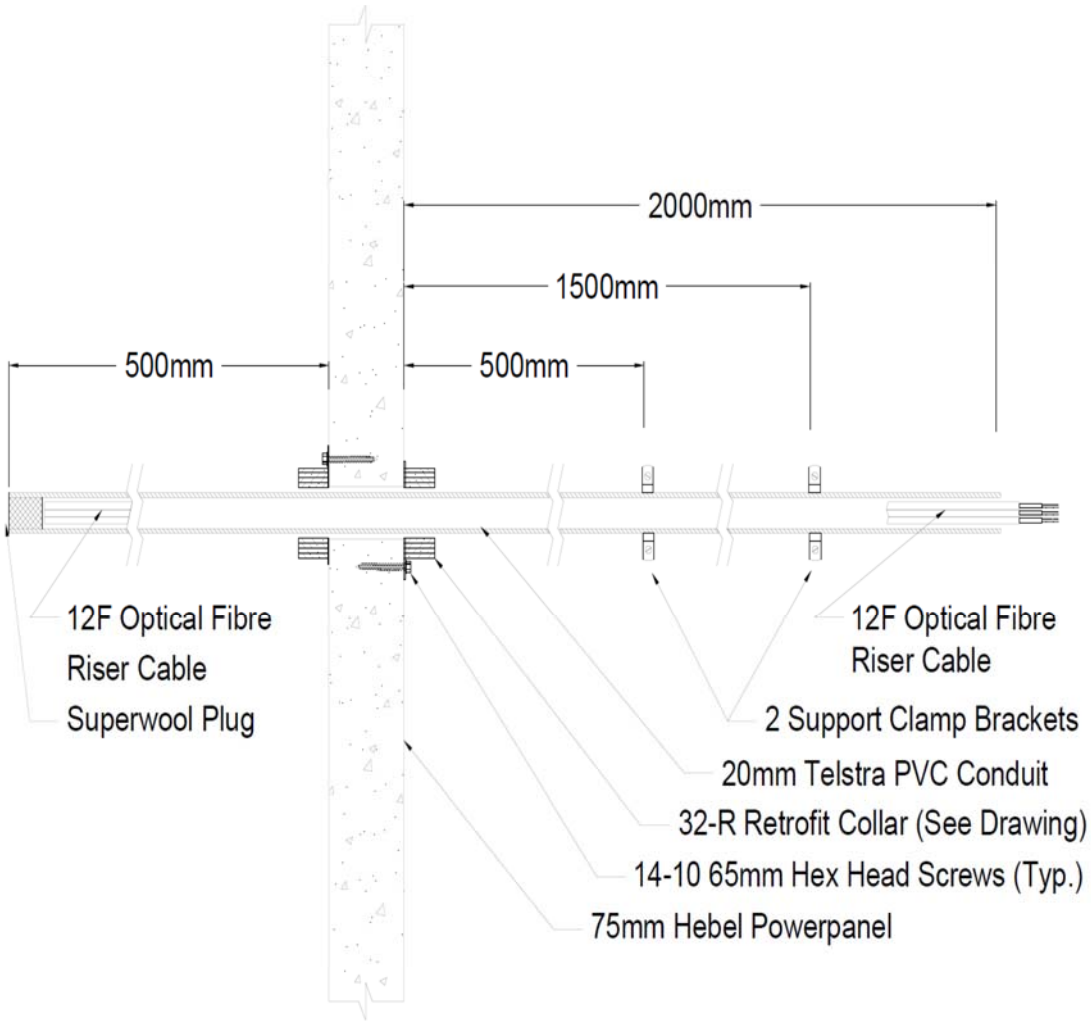
DRAWING TITLED "TEST WALL W-17-A PENETRATION # 2, 32-MM PX-AL-PX PIPE – 32GAS RETROFIT COLLAR, DATED 16 MAY 2017".

Test Wall W-17-A Penetration # 3
110mm Raupiano Pipe – LP100R-D Retrofit Collar
16 OCT 2017



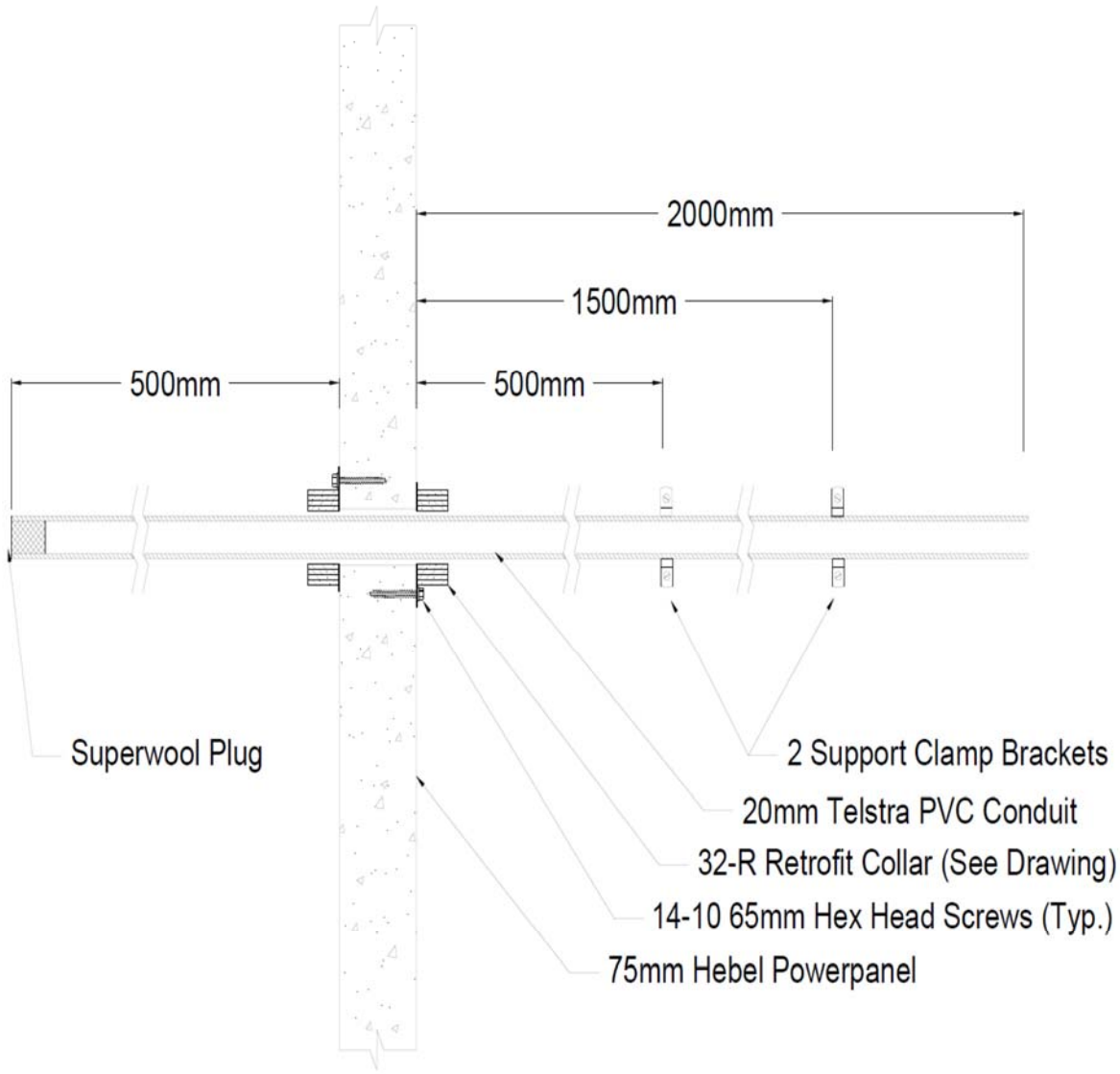
DRAWING TITLED "TEST WALL W-17-A PENETRATION # 3, 110-MM RAUPIANO PIPE – LP100R-D RETROFIT COLLAR, DATED 16 OCTOBER 2017".

Test Wall W-17-A Penetration # 4
20mm Telstra PVC Conduit – 32R Retrofit Collar
12F Optical Fibre Riser Cable Filled
16 MAY 2017



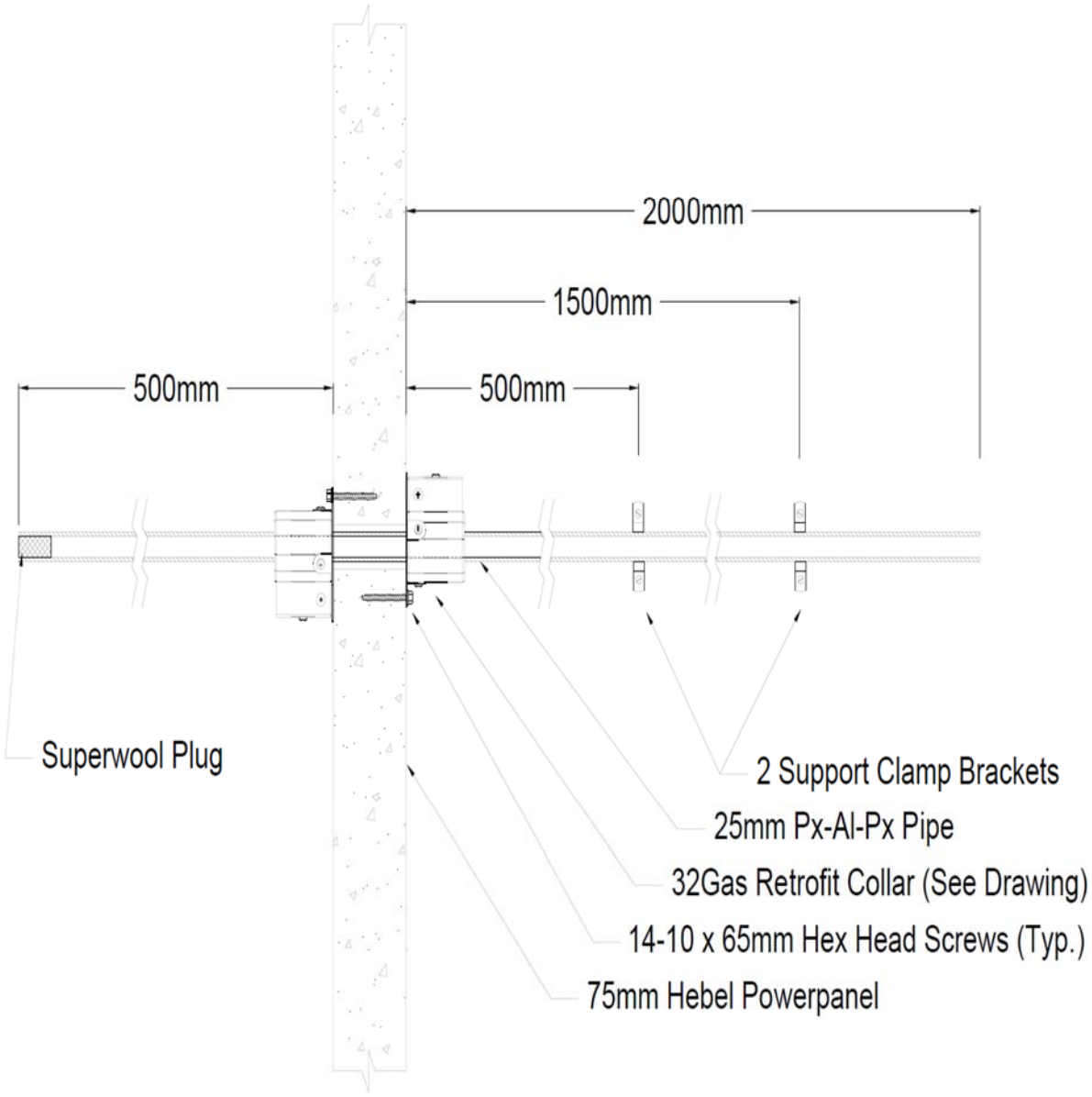
DRAWING TITLED "TEST WALL W-17-A PENETRATION # 4, 205-MM TELSTRA PVC CONDUIT – 32R RETROFIT COLLAR, DATED 16 MAY 2017".

Test Wall W-17-A Penetration # 5 20mm
Telstra PVC Conduit - 32R Retrofit collar
16 MAY 2017



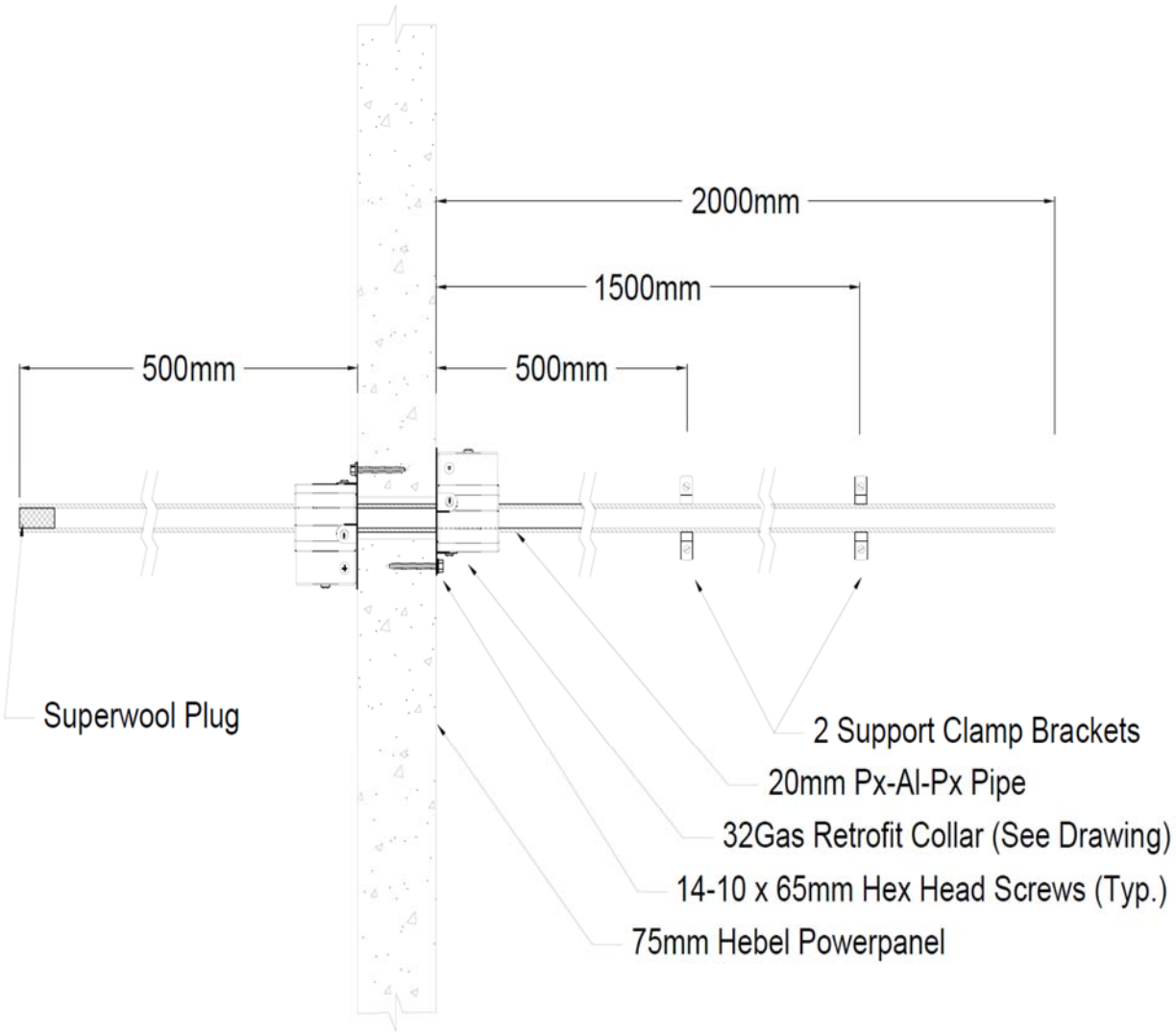
DRAWING TITLED "TEST WALL W-17-A PENETRATION # 5, 20-MM TELSTRA PVC CONDUIT – 32R RETROFIT COLLAR, DATED 16 MAY 2017".

Test Wall W-17-A Penetration # 6
25mm Px-Al-Px Pipe – 32Gas Retrofit Collar
16 MAY 2017



DRAWING TITLED "TEST WALL W-17-A PENETRATION # 6, 25-MM CXL PX-AL-PX PIPE – 32GAS RETROFIT COLLAR, DATED 16 MAY 2017".

Test Wall W-17-A Penetration # 7
20mm Px-Al-Px Pipe – 32Gas Retrofit Collar
16 MAY 2017



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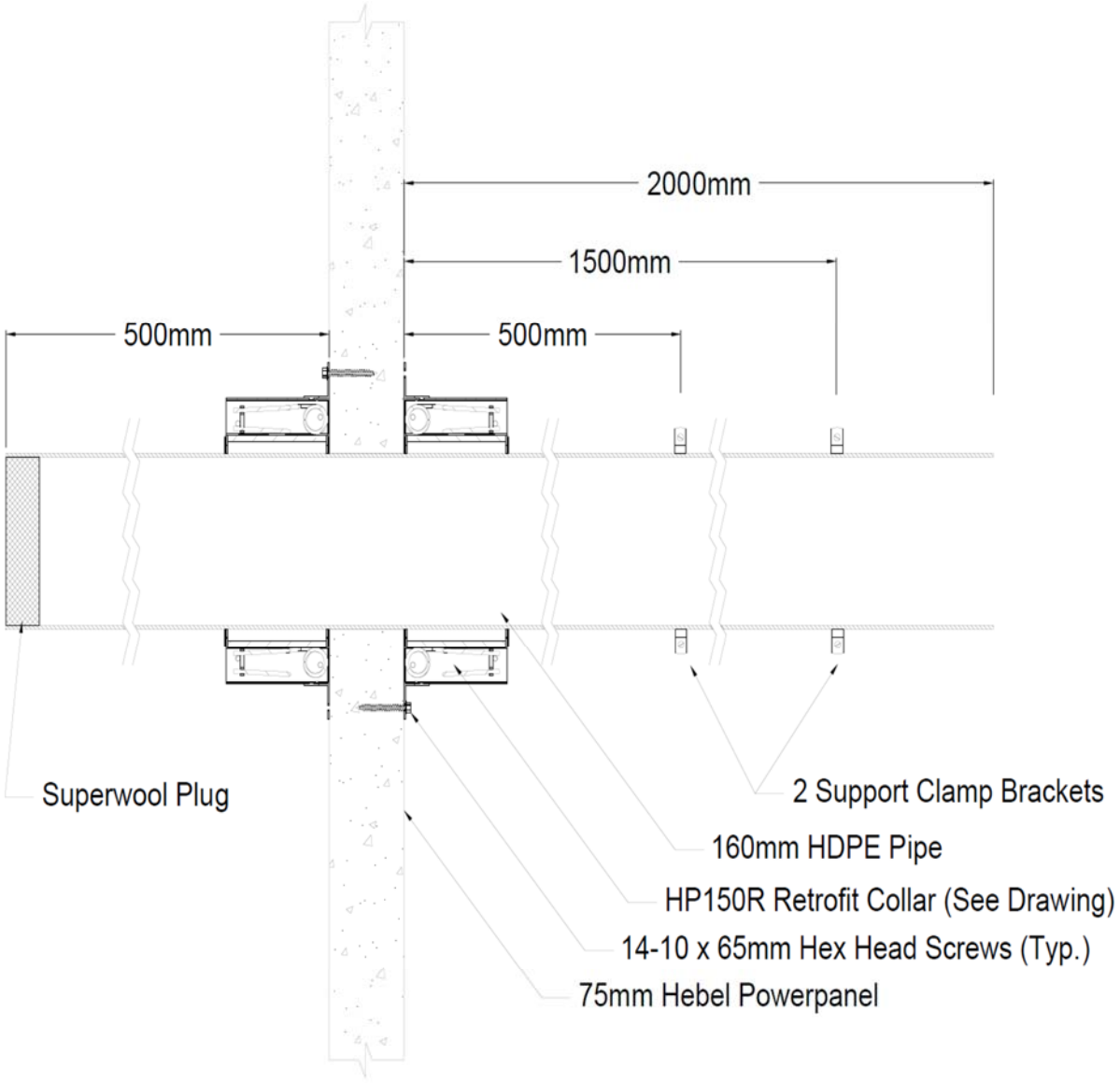
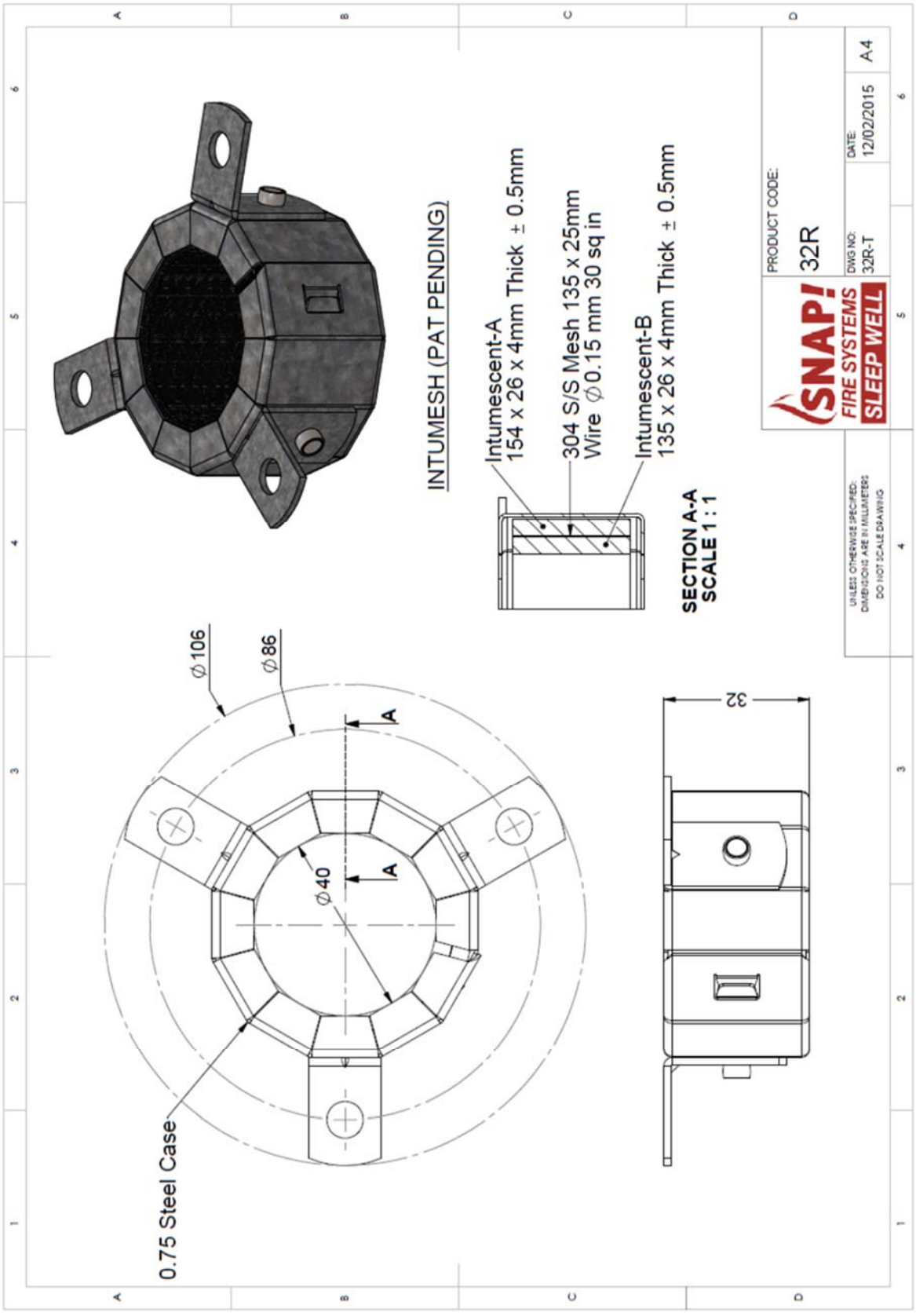
Test Wall W-17-A Penetration # 8
160mm HDPE Pipe - HP150R Retrofit collar
16 MAY 2017

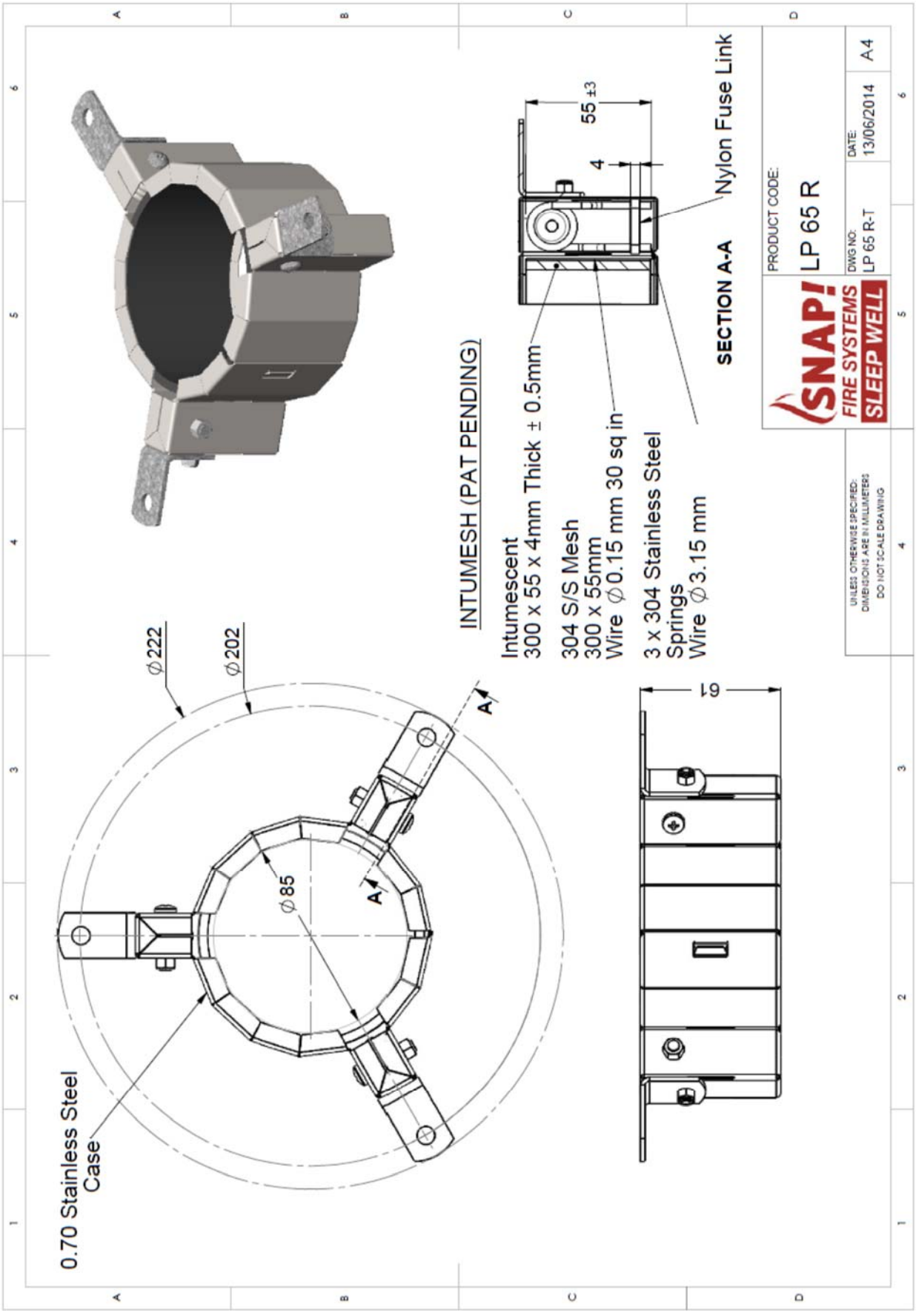


DRAWING TITLED "TEST WALL W-17-A PENETRATION # 8, 160-MM HDPE PIPE – HP150R RETROFIT COLLAR, DATED 16 MAY 2017".

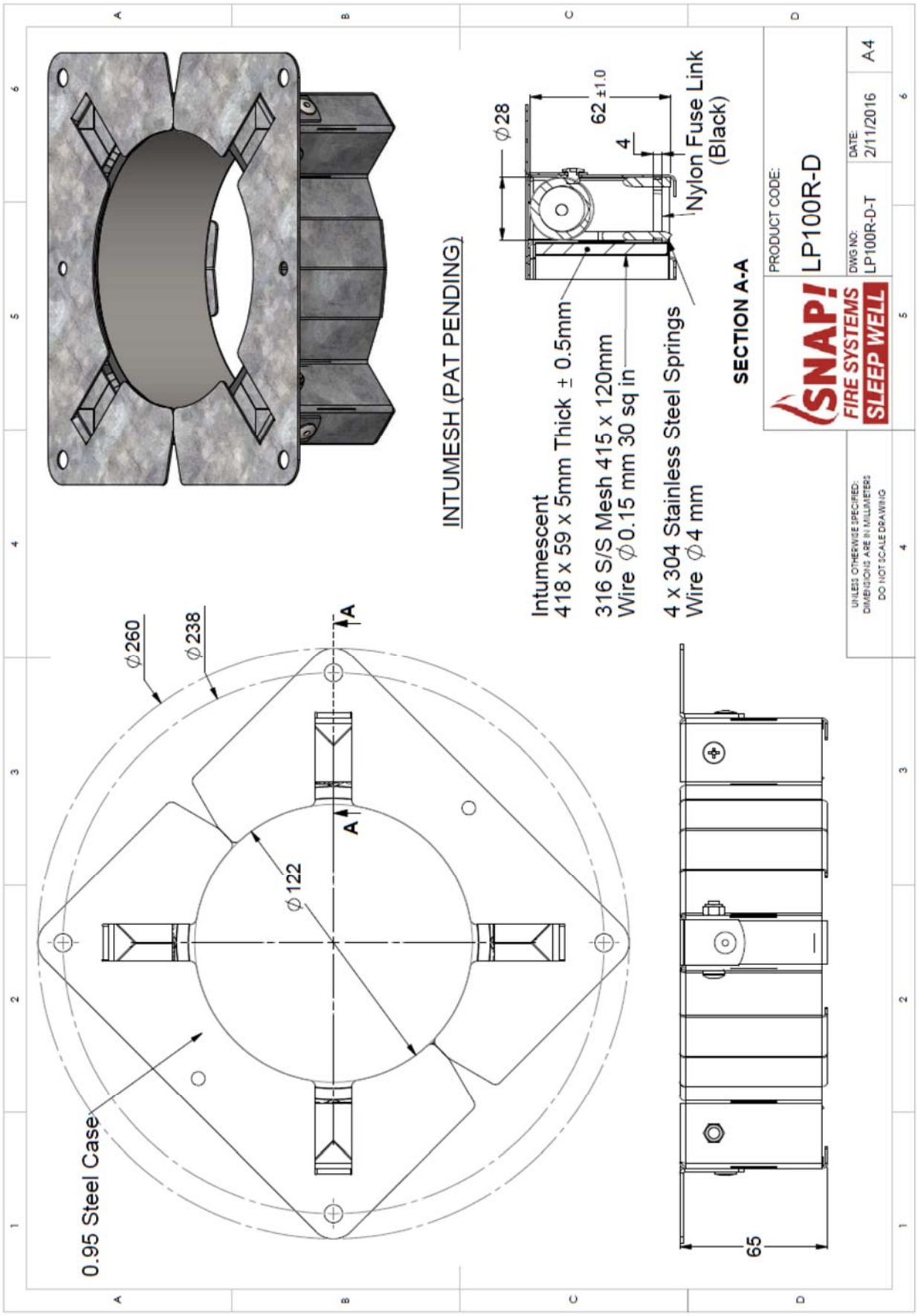
Appendix E – Specimen Drawings



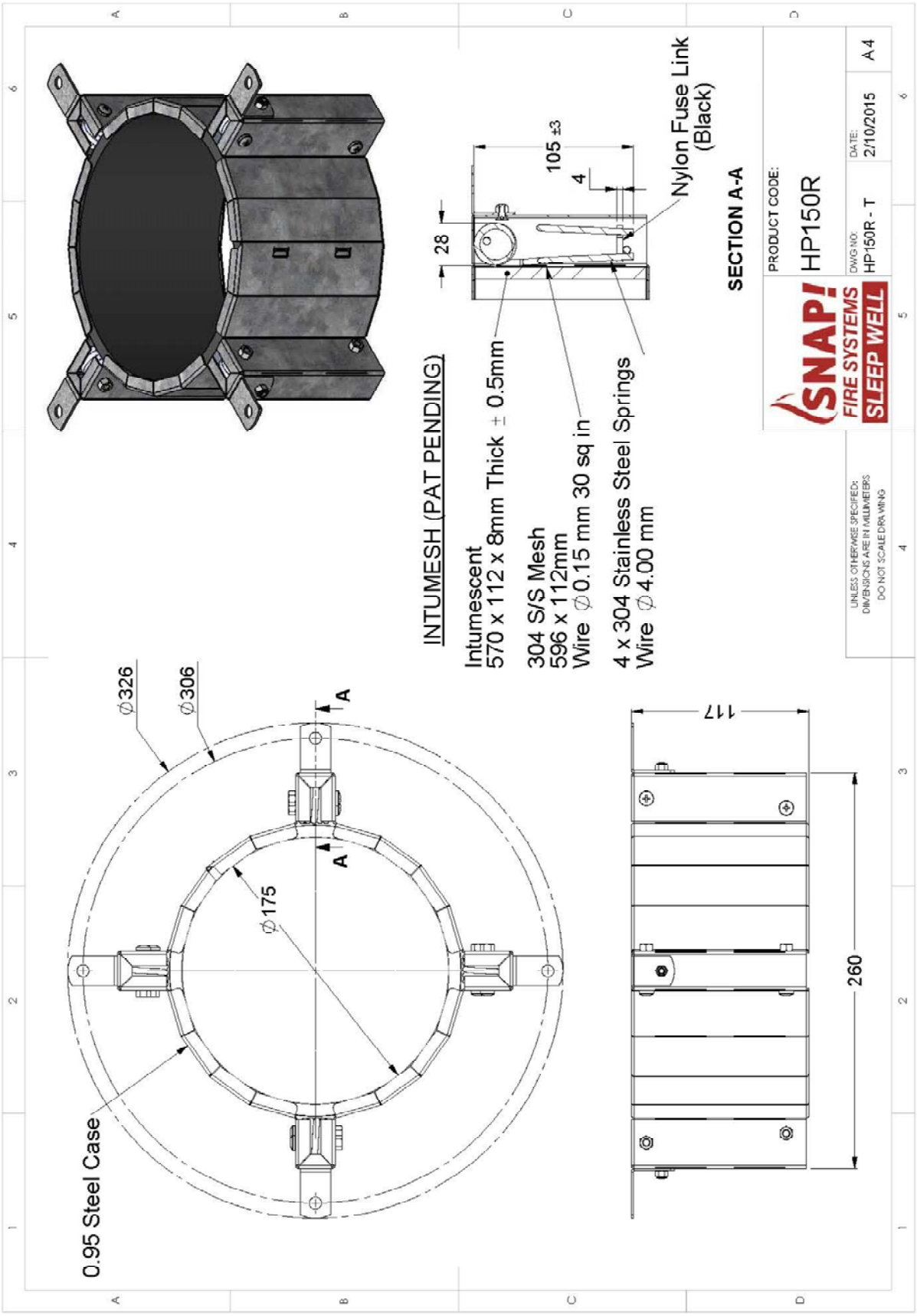
DRAWING NUMBERED 32R-T, DATED 12 FEBRUARY 2015, BY SNAP FIRE SYSTEMS PTY LTD.



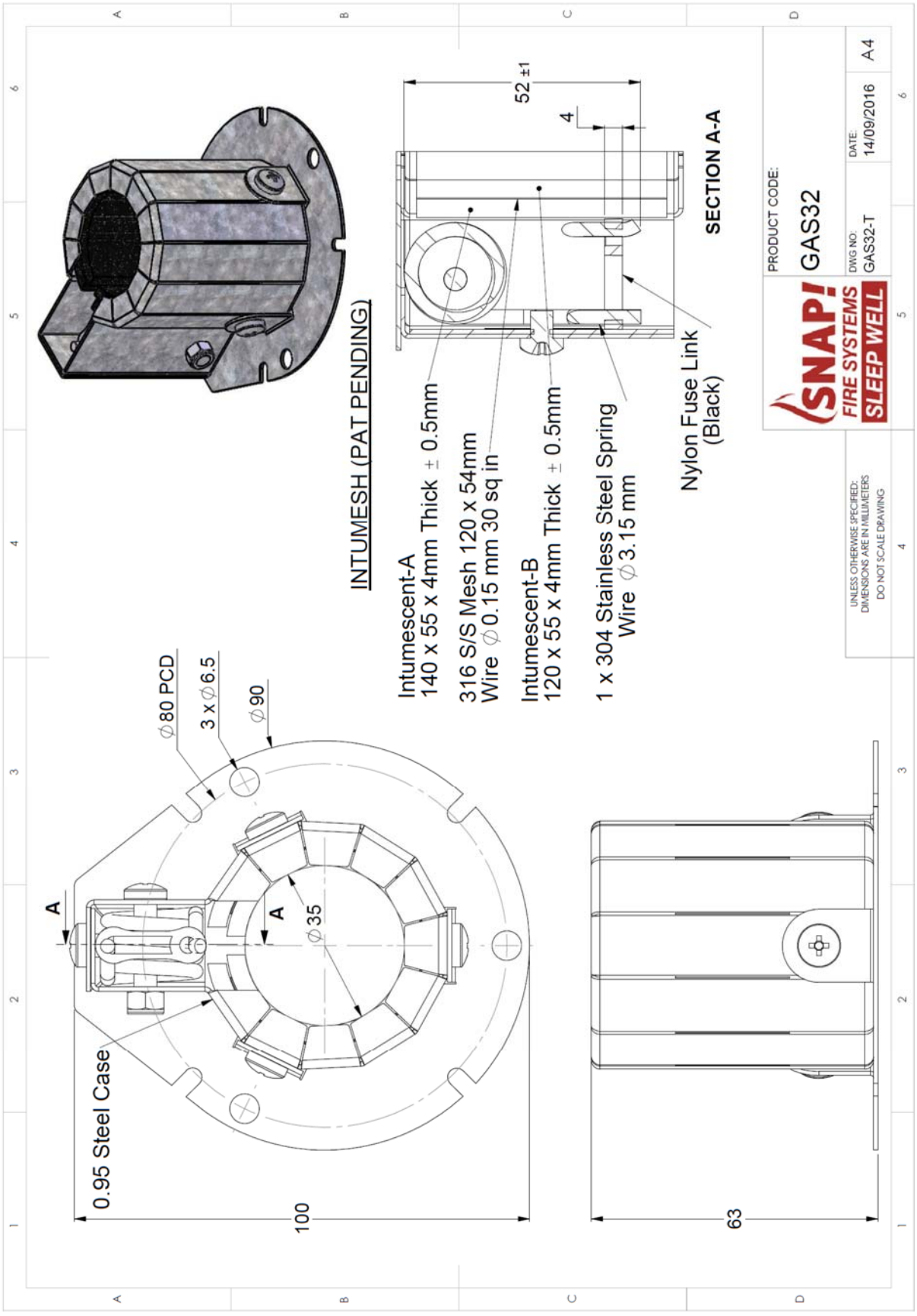
DRAWING NUMBERED LP65R-T, DATED 13 JUNE 2014, BY SNAP FIRE SYSTEMS PTY LTD.



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 GAS32-T DATED 14 SEPTEMBER 2016, BY SNAP FIRE SYSTEMS PTY LTD.

Appendix F – Certificate(s)

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PO Box 52, North Ryde NSW 1670, Australia
T (02) 9490 5444 • **ABN** 41 687 119 230

Certificate of Test

No. 2959

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:

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

A full description of the test specimen and the complete test results are detailed in the Division's Sponsored Investigation report numbered FSP 1822.

Product Name: Penetration # 1 – LP65R Retrofit fire collar protecting a 50-mm Raupiano Pipe

Description: The SNAP Retrofit LP65R fire collar comprised a 0.7-mm stainless steel casing with an 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 bound 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 50-mm Raupiano Pipe, with a wall thickness of 1.9-mm penetrating the wall through a 54-mm diameter cut-out hole as shown in drawing titled "Test Wall W-17-A Penetration # 1, 50-mm Raupiano Pipe – LP65R Retrofit Collar, dated 16 May 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) are limited to that of the separating element. This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Chris Wojcik Date of Test: 22 March 2017

Issued on the 15th day of June 2017 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

This document is issued in accordance with NATA's accreditation requirements.
Accreditation No. 165 – Corporate Site No. 3625
Accredited for compliance with ISO/IEC 17025 - Testing

COPY OF CERTIFICATE OF TEST – NO. 2959

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PO Box 52, North Ryde NSW 1670, Australia
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Certificate of Test

No. 2960

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:

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

A full description of the test specimen and the complete test results are detailed in the Division's Sponsored Investigation report numbered FSP 1822.

Product Name: Penetration # 2 – GAS32 Retrofit collar protecting a 32-mm diameter CXL Px-Al-Px Pipe

Description: The GAS32 Retrofit collar comprised a 0.95-mm thick galvanised steel casing with a 35-mm inner diameter and a 100-mm diameter base flange. The 63-mm high collar casing incorporated a layer of 140-mm x 55-mm x 4-mm thick Intumescent material and a layer of 120-mm x 55-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 120 x 54-mm as shown in drawing numbered GAS32-T dated 14 September 2016, by Snap Fire Systems Pty Ltd. The penetrating service comprised a 32-mm CXL Px-Al-Px 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-17-A Penetration # 2, 32-mm Px-Al-Px Pipe – 32Gas Retrofit Collar, dated 16 May 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	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) are limited to that of the separating element. This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Chris Wojcik Date of Test: 22 March 2017

Issued on the 15th day of June 2017 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

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Certificate of Test

No. 2961

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

A full description of the test specimen and the complete test results are detailed in the Division's Sponsored Investigation report numbered FSP 1822.

Product Name: Penetration # 3 – LP100R-D Retrofit fire collar protecting a nominal 110-mm Raupiano 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 an 110-mm OD Raupiano Pipe, with a wall thickness of 3.3-mm penetrating the wall through a 114-mm diameter cut-out hole as shown in drawing titled "Test Wall W-17-A Penetration # 3, 110-mm Raupiano Pipe – LP100R-D Retrofit Collar, dated 16 October 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) are limited to that of the separating element. This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Chris Wojcik Date of Test: 22 March 2017

Issued on the 15th day of June 2017 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

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Certificate of Test

No. 2962

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:

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

A full description of the test specimen and the complete test results are detailed in the Division's Sponsored Investigation report numbered FSP 1822.

Product Name: Penetration # 4 – 32R Retrofit fire collar protecting a 20-mm Telstra PVC Conduit

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 27-mm OD Telstra PVC Conduit, with a wall thickness of 1.9-mm penetrating the wall through a 32-mm diameter cut-out hole as shown in drawing titled "Test Wall W-17-A Penetration # 4, 205-mm Telstra PVC Conduit – 32R Retrofit Collar, dated 16 May 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.

Structural Adequacy	not applicable
Integrity	no failure at 121 minutes
Insulation	116 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) are limited to that of the separating element. This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Chris Wojcik Date of Test: 22 March 2017

Issued on the 15th day of June 2017 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

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Certificate of Test

No. 2963

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:

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

A full description of the test specimen and the complete test results are detailed in the Division's Sponsored Investigation report numbered FSP 1822.

Product Name: Penetration # 5 – 32R Retrofit fire collar protecting a 20-mm Telstra PVC Conduit

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 Telstra PVC Conduit, with a wall thickness of 1.9-mm penetrating the wall through a 32-mm diameter cut-out hole as shown in drawing titled "Test Wall W-17-A Penetration # 5, 20-mm Telstra PVC Conduit – 32R Retrofit Collar, dated 16 May 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.

Structural Adequacy	not applicable
Integrity	no failure at 121 minutes
Insulation	120 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) are limited to that of the separating element. This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Chris Wojcik Date of Test: 22 March 2017

Issued on the 15th day of June 2017 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

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Certificate of Test

No. 2964

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:

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

A full description of the test specimen and the complete test results are detailed in the Division's Sponsored Investigation report numbered FSP 1822.

Product Name: Penetration # 6 – GAS32 Retrofit collar protecting a 25-mm diameter CXL Px-Al-Px Pipe

Description: The GAS32 Retrofit collar comprised a 0.95-mm thick galvanised steel casing with a 35-mm inner diameter and a 100-mm diameter base flange. The 63-mm high collar casing incorporated a layer of 140-mm x 55-mm x 4-mm thick Intumescent material and a layer of 120-mm x 55-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 120 x 54-mm as shown in drawing numbered GAS32-T dated 14 September 2016, by Snap Fire Systems Pty Ltd. The penetrating service comprised a 25-mm CXL Px-Al-Px pipe, with a wall thickness of 3.2-mm penetrating the wall through a 29-mm diameter cut-out hole as shown in drawing titled "Test Wall W-17-A Penetration # 6, 25-mm CXL Px-Al-Px Pipe – 32Gas Retrofit Collar, dated 16 May 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) are limited to that of the separating element. This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Chris Wojcik Date of Test: 22 March 2017

Issued on the 15th day of June 2017 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

This document is issued in accordance with NATA's accreditation requirements.
Accreditation No. 165 – Corporate Site No. 3625
Accredited for compliance with ISO/IEC 17025 - Testing

COPY OF CERTIFICATE OF TEST – NO. 2964

INFRASTRUCTURE TECHNOLOGIES
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14 Julius Avenue, North Ryde NSW 2113
PO Box 52, North Ryde NSW 1670, Australia
T (02) 9490 5444 • **ABN** 41 687 119 230

Certificate of Test

No. 2965

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

A full description of the test specimen and the complete test results are detailed in the Division's Sponsored Investigation report numbered FSP 1822.

Product Name: Penetration # 7 – GAS32 Retrofit collar protecting a 20-mm diameter CXL Px-Al-Px Pipe

Description: The GAS32 Retrofit collar comprised a 0.95-mm thick galvanised steel casing with a 35-mm inner diameter and a 100-mm diameter base flange. The 63-mm high collar casing incorporated a layer of 140-mm x 55-mm x 4-mm thick Intumescent material and a layer of 120-mm x 55-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 120 x 54-mm as shown in drawing numbered GAS32-T dated 14 September 2016, by Snap Fire Systems Pty Ltd. The penetrating service comprised a 20-mm CXL Px-Al-Px pipe, with a wall thickness of 2.5-mm penetrating the wall through a 25-mm diameter cut-out hole as shown in drawing titled "Test Wall W-17-A Penetration # 7, 20-mm CXL Px-Al-Px Pipe – 32Gas Retrofit Collar, dated 16 May 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) are limited to that of the separating element. This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Chris Wojcik Date of Test: 22 March 2017

Issued on the 15th day of June 2017 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

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A full description of the test specimen and the complete test results are detailed in the Division's Sponsored Investigation report numbered FSP 1822.

Product Name: Penetration # 8 – HP150R Retrofit fire collar protecting a 160-mm High-density polyethylene (HDPE) Pipe

Description: 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 a 162-mm OD HDPE pipe, with a wall thickness of 6.8-mm penetrating the wall through a 168-mm diameter cut-out hole as shown in drawing titled "Test Wall W-17-A Penetration # 8, 160-mm HDPE Pipe – HP150R Retrofit Collar, dated 16 May 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) are limited to that of the separating element. This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Chris Wojcik Date of Test: 22 March 2017

Issued on the 15th day of June 2017 without alterations or additions.

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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.

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Australia is founding its future on science and innovation. Its national science agency, CSIRO, is a powerhouse of ideas, technologies and skills for building prosperity, growth, health and sustainability. It serves governments, industries, business and communities across the nation.

FOR FURTHER INFORMATION

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