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

Test Report

Author: Peter Gordon
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Client: IG6 Pty Ltd as trustee for the IG6 IP Trust

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

Sponsored Investigation No. FSP 1902

1 Introduction

1.1 Identification of specimen

The sponsor identified the specimen as nine (9) retrofit Fire Collars protecting a steel framed plasterboard wall system.

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 4751/4215

1.7 Test date

The fire-resistance test was conducted on 5 April 2018.

2 Description of specimen

2.1 General

The wall system is described as a 116-mm thick plasterboard lined steel framed wall comprising two layers of 13-mm thick Fyrchek plasterboard on each side of 64-mm deep metal studs, with an established FRL of -/120/120 as detailed in BRANZ report reference FAR2539.

The wall was penetrated by nine (9) services and protected by various first stopping systems.

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

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

- AS/NZS 1260 'PVC-U pipes and fittings for drain, waste and vent application'; and
- AS/NZS 2492:2007 'Cross-linked polyethylene (PE-X) pipes for pressure applications'.
- AS 4176.8-2010 'Multilayer pipes for pressure applications - Multilayer pipe systems for consumer gas installations with a maximum operating pressure up to and including 5 bar (500 kPa) - Specifications for systems'

<u>Specimen 1 – SNAP 50R Retrofit fire collar protecting a nominal 1 ½ inch Chlorinated Polyvinyl Chloride (C-PVC) pipe</u>

The SNAP Retrofit 50R fire collar comprised a 0.75-mm steel casing with a 62-mm inner diameter and a 147-mm diameter base flange. The 47-mm high collar casing incorporated a closing mechanism that was comprised of two soft Intumesh intumescent wraps lined within the internal circumference of the collar. Intumescent A was 4-mm thick x 43-mm wide x 220-mm long, and Intumescent B was 4-mm thick x 43-mm wide x 200-mm long. Between the strips was a layer of 316 stainless steel mesh 210-mm long x 42-mm wide with wire mesh diameter of 0.15-mm, as shown in drawing numbered 50R-T dated 31 March 2017, by Snap Fire Systems Pty Ltd. The Snap collars were surface mounted around the pipe on both the exposed and unexposed face of the wall and fixed through 3 mounting brackets using 38-mm (10g) course thread laminating screws.

The penetrating service comprised a 1 ½ inch (nom 38-mm) C-PVC Pipe, with a wall thickness of 4.1-mm, fitted through the collar's sleeve and penetrating the plasterboard wall through a 54-mm diameter cut-out hole as shown in drawing titled "Specimen # 1, 1 ½ inch C-PVC Pipe & 50R", dated 21 March 2018, provided by Snap Fire Systems Pty Ltd. The pipe projected horizontally, approximately 2000-mm away from the unexposed face of the plasterboard wall and approximately 500-mm into the furnace chamber. The pipe was supported at nominally 500-mm and 1000-mm from the unexposed face of the plasterboard wall. The pipe was open at the unexposed and capped with Superwool plug on the exposed end.

Specimen 2 SNAP 50R Retrofit fire collar protecting a nominal 50-mm Polyvinyl Chloride (PVC) pipe

The SNAP Retrofit 50R fire collar comprised a 0.75-mm steel casing with a 62-mm inner diameter and a 147-mm diameter base flange. The 47-mm high collar casing incorporated a closing mechanism that was comprised of two soft Intumesh intumescent wraps lined within the internal circumference of the collar. Intumescent A was 4-mm thick x 43-mm wide x 220-mm long, and Intumescent B was 4-mm thick x 43-mm wide x 200-mm long. Between the strips was a layer of 316 stainless steel mesh 210-mm long x 42-mm wide with wire mesh diameter of 0.15-mm, as shown in drawing numbered 50R-T dated 31 March 2017, by Snap Fire Systems Pty Ltd. The Snap collars were surface mounted around the pipe on both the exposed and unexposed face of the wall and fixed through 3 mounting brackets using 38-mm (10g) course thread laminating screws.

The penetrating service comprised a 50-mm PVC pipe and a PVC coupling with a total wall thickness of 5.2-mm, fitted through the collar's sleeve and penetrating the plasterboard wall through a 54-mm diameter cut-out hole as shown in drawing titled "Specimen # 2, 50 PVC & 50R", dated 21 March 2018, provided by Snap Fire Systems Pty Ltd. The pipe projected horizontally, approximately 2000-mm away from the unexposed face of the plasterboard wall and approximately 500-mm into the furnace chamber. The pipe was supported at nominally 500-mm and 1000-mm from the unexposed face of the plasterboard wall. The pipe was open at the unexposed and capped with a PVC end cap on the exposed end.

Specimen 3 – SNAP 65-80R Retrofit fire collar protecting a nominal 65-mm Polyvinyl Chloride (PVC) pipe

The SNAP Retrofit 65-80R fire collar comprised a 0.75-mm steel casing with a 942-mm inner diameter and a 179-mm diameter base flange. The 62-mm high collar casing incorporated a closing mechanism that was comprised of two soft Intumesh intumescent wraps lined within the internal circumference of the collar. Intumescent A was 4-mm thick x 55-mm wide x 325-mm long, and Intumescent B was 4-mm thick x 55-mm wide x 300-mm long. Between the strips was a layer of 316 stainless steel mesh 300-mm long x 55-mm wide with wire mesh diameter of 0.15-mm, as shown in drawing numbered 65-80R-T dated 31 March 2017, by Snap Fire Systems Pty Ltd. The Snap collars were surface mounted around the pipe on both the exposed and unexposed face of the wall and fixed through 3 mounting brackets using 38-mm (10g) course thread laminating screws.

The penetrating service comprised a 65-mm diameter PVC pipe and a PVC coupling with a total wall thickness of 5.8-mm fitted through the collar's sleeve and penetrating the plasterboard wall through a 76-mm diameter cut-out hole as shown in drawing titled "Specimen # 3, 65 PVC & 65-80R", dated 21 March 2018, provided by Snap Fire Systems Pty Ltd. The pipe projected horizontally, approximately 2000-mm away from the unexposed face of the plasterboard wall and approximately 500-mm into the furnace chamber. The pipe was supported at nominally 500-mm and 1000-mm from the unexposed face of the plasterboard wall. The pipe was open at the unexposed and capped with a PVC end cap on the exposed end.

Specimen 4 – SNAP 50R Retrofit fire collar protecting two nominal 25-mm and 20-mm Cross-linked polyethylene (PEX) pipes

The SNAP Retrofit 50R fire collar comprised a 0.75-mm steel casing with a 62-mm inner diameter and a 147-mm diameter base flange. The 47-mm high collar casing incorporated a closing mechanism that was comprised of two soft Intumesh intumescent wraps lined within the internal circumference of the collar. Intumescent A was 4-mm thick x 43-mm wide x 220-mm long, and Intumescent B was 4-mm thick x 43-mm wide x 200-mm long. Between the strips was a layer of 316 stainless steel mesh 210-mm long x 42-mm wide with wire mesh diameter of 0.15-mm, as shown in drawing numbered 50R-T dated 31 March 2017, by Snap Fire Systems Pty Ltd. The Snap collars were surface mounted around the pipe on both the exposed and unexposed face of the wall and fixed through 3 mounting brackets using 38-mm (10g) course thread laminating screws.

The penetrating service comprised a 20 PEX-b pipe (wall thickness of 3-mm) and a 25 PE-x/Al/PE-x pipe (wall thickness of 2.3-mm) were fitted through the collar's sleeve which penetrated the plasterboard wall through a 51-mm diameter cut-out hole as shown in drawing titled "Specimen # 4, 20 PEX-b + 25 PE-x/Al/PE-x Pipe & 50R", dated 21 March 2018, provided by Snap Fire Systems Pty Ltd. The pipe projected horizontally, approximately 2000-mm away from the unexposed face of the plasterboard wall and approximately 500-mm into the furnace chamber. The pipe was supported at nominally 500-mm and 1000-mm from the unexposed face of the plasterboard wall. The pipe was open at the unexposed and capped with a Superwool plug on the exposed end.

Specimen 5 – SNAP 32R Retrofit fire collar protecting a Telstra 26.75-mm OD Polyvinyl Chloride – Unplasticized (PVC-U) conduit and 5 x Optical Fibres cables

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 316 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 5 October 2017, by Snap Fire Systems Pty Ltd. The Snap collars were surface mounted around the pipe on both the exposed and unexposed face of the wall and fixed through 3 mounting brackets using 38-mm (10g) course thread laminating screws.

The penetrating service comprised a 20-mm Telstra PVC conduit, with a wall thickness of 1.8-mm penetrating the wall through a 32-mm diameter cut-out hole as shown in drawing titled "Specimen # 5, Telstra 20 PVC Conduit + 5 x Optical Fibre Cables & 32R, dated 21 March 2018", provided by Snap Fire Systems Pty Ltd. 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 1000-mm from the unexposed face of the plasterboard wall. The conduit was open at the unexposed and capped with a Superwool plug on the exposed end. The conduit contained five optical fibre cables .

Specimen 6 - SNAP 32R Retrofit fire collar protecting two cross-linked polyethylene (Pex B) nom, 20-mm OD pipes

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 316 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 5 October 2017, by Snap Fire Systems Pty Ltd. The Snap collars were surface mounted around the pipe on both the exposed and unexposed face of the wall and fixed through 3 mounting brackets using 38-mm (10g) course thread laminating screws.

The penetrating services comprised 2 x 20-mm PEX-b pipes, with a wall thickness of 2.37-mm penetrating the wall through a 44-mm diameter cut-out hole as shown in drawing titled “Specimen # 6, 2 x 20 PEX-b Pipes & 32R, dated 21 March 2018”, provided by Snap Fire Systems Pty Ltd. The pipes projected horizontally, 2000-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber. The pipes were supported at nominally 500-mm and 1000-mm from the unexposed face of the plasterboard wall. The pipes were open at the unexposed and capped with a Superwool plug on the exposed end.

Specimen 9 – SNAP 32R Retrofit fire collar protecting two Cross-linked polyethylene (Pex) pipes nom. 20.2-mm OD

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 316 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 5 October 2017, by Snap Fire Systems Pty Ltd. The Snap collars were surface mounted around the pipe on both the exposed and unexposed face of the wall and fixed through 3 mounting brackets using 38-mm (10g) course thread laminating screws.

The penetrating service comprised a 20 PE-x/Al/PE-x pipe and a 20 PEX-b pipe, with a wall thickness of 2.2-mm and 2.6-mm respectively, penetrating the wall through a 44-mm diameter cut-out hole as shown in drawing titled “Specimen # 9, 20 PE-x/Al/PE-x + 20 PEX-b Pipes & 32R, dated 21 March 2018”, provided by Snap Fire Systems Pty Ltd. The pipes projected horizontally, 2000-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber. The pipes were supported at nominally 500-mm and 1000-mm from the unexposed face of the plasterboard wall. The pipes were open at the unexposed and capped with a Superwool plug on the exposed end.

2.2 Dimensions

The wall specimen was nominally 1150-mm wide x 1150-mm high x 116-mm thick. All dimensions are nominal.

2.3 Orientation

The plasterboard wall was placed vertically against the furnace chamber, and subjected to fire exposure from one side only.

2.4 Conditioning

The specimen was delivered on 27th March 2018 and left under standard laboratory atmospheric conditions until the test date.

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 50R-T dated 31 March 2017, by Snap Fire Systems Pty Ltd.

Drawing numbered 65-80R-T dated 31 March 2017, by Snap Fire Systems Pty Ltd.

Drawing numbered 32R-T dated 5 October 2017, by Snap Fire Systems Pty Ltd.

Drawing titled “Specimen # 1, 1 ½ inch C-PVC Pipe & 50R”, dated 21 March 2018, provided by Snap Fire Systems Pty Ltd.

Drawing titled “Specimen # 2, 50 PVC & 50R”, dated 21 March 2018, provided by Snap Fire Systems Pty Ltd.

Drawing titled “Specimen # 3, 65 PVC & 65-80R”, dated 21 March 2018, provided by Snap Fire Systems Pty Ltd.

Drawing titled “Specimen # 4, 20 PEX-b + 25 PE-x/Al/PE-x Pipe & 50R”, dated 21 March 2018, provided by Snap Fire Systems Pty Ltd.

Drawing titled “Specimen # 5, Telstra 20 PVC Conduit + 5 x Optical Fibre Cables & 32R, dated 21 March 2018”, provided by Snap Fire Systems Pty Ltd.

Drawing titled “Specimen # 6, 2 x 20 PEX-b Pipes & 32R, dated 21 March 2018”, provided by Snap Fire Systems Pty Ltd.

Drawing titled “Specimen # 9, 20 PE-x/Al/PE-x + 20 PEX-b Pipes & 32R, dated 21 March 2018”, 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 26°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 181 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 being emitted from Specimen 3 and Specimen 9.
2 minutes -	Smoke has flued briefly from Specimen 3. Smoke is also fluing from Specimen 2, 3 and 9.
3 minutes -	Smoke is being emitted fromthe collars of Specimen 3 and 9. Smoke is fluing from black pipe of Specimen 4 and also Specimen 2.
4 minutes -	Smoke has diminished from collars of Specimen 9.

5 minutes -	Smoke is fluing from yellow pipe of Specimen 4. Smoke has stopped fluing from Specimen 2 and 3. Smoke is continuing to flue from furnace flues.
6 minutes -	Smoke has ceased fluing from all pipes and has generally diminished from the specimen.
7 minutes -	PVC pipes Specimen 2 and 3 have visibly sagged.
12 minutes -	A small amount of smoke is fluing from Specimen 1.
18 minutes -	Specimen 1 is continuing to flue slightly. Smoke is being emitted from Specimen 1, 2 and 3.
31 minutes -	A small amount of smoke is fluing from Specimen 1, 2 and 3. Smoke is being emitted from the collars of Specimen 1, 2 and 3. Discolouration is evident at the top of PVC pipe Specimen 2.
41 minutes -	A small amount of smoke is fluing from the yellow pipe of Specimen 4. Smoke is being emitted from collars of Specimen 1, 2, 3, 4 and 5.
69 minutes -	Smoke has continued to be emitted from collarsof Specimen 1, 2, 3 and 4. Smoke is fluing from Specimen 1, 3 and 4.
91 minutes -	A small amount of smoke is continuing to flue from the pipes Specimen 1, 2, 3 and 4. A small amount of smoke is being emitte from collars on Specimen 1, 2 and 3.
155 minutes -	Pipes on Specimen 1, 2, 3 and 4 have continued to flue and emit smoke from collars.
167 minutes -	Insulation Failure Penetration 6 – maximum temperature rise of 180K is exceeded on the pipe collar.
170 minutes -	Insulation Failure Penetration 5 – maximum temperature rise of 180K is exceeded on the plasterboard wall 25-mm from the collar. The pipes on Specimen 6 have started to flue. Pipes on Specimen 1, 2, 3 and 4 have continued to flue. Fluid is dripping from the black pipe of Specimen 9.
175 minutes -	Insulation Failure Penetration 4 – maximum temperature rise of 180K is exceeded on the plasterboard 25-mm from the pipe collar.
179 minutes -	Insulation Failure Penetration 9 – maximum temperature rise of 180K is exceeded on the plasterboard 25-mm from the pipe collar.
181 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 Specimen 1.

Figure 4 shows the curve of maximum temperature versus time associated with Specimen 2.

Figure 5 shows the curve of maximum temperature versus time associated with Specimen 3.

Figure 6 shows the curve of maximum temperature versus time associated with Specimen 4.

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

Figure 8 shows the curve of maximum temperature versus time associated with Specimen 6.

Figure 9 shows the curve of maximum temperature versus time associated with Specimen 9.

8.5 Performance

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

Specimen 1 – SNAP 50R Retrofit fire collar protecting a nominal 1 ½ inch Chlorinated Polyvinyl Chloride (C-PVC) pipe

Structural adequacy	-	not applicable
Integrity	-	no failure at 181 minutes
Insulation	-	no failure at 181 minutes

Specimen 2 - SNAP 50R Retrofit fire collar protecting a nominal 50-mm Polyvinyl Chloride (PVC) pipe

Structural adequacy	-	not applicable
Integrity	-	no failure at 181 minutes
Insulation	-	no failure at 181 minutes

Specimen 3 – SNAP 65-80R Retrofit fire collar protecting a nominal 65-mm Polyvinyl Chloride (PVC) pipe

Structural adequacy	-	not applicable
Integrity	-	no failure at 181 minutes
Insulation	-	no failure at 181 minutes

Specimen 4 – SNAP 50R Retrofit fire collar protecting two nominal 25-mm and 20-mm Cross-linked polyethylene (PEX) pipes

Structural adequacy	-	not applicable
Integrity	-	no failure at 181 minutes
Insulation	-	175 minutes

Specimen 5 – SNAP 32R Retrofit fire collar protecting a Telstra 26.75-mm OD Polyvinyl Chloride – Unplasticized (PVC-U) conduit and 5 x Optical Fibres cables

Structural adequacy	-	not applicable
Integrity	-	no failure at 181 minutes
Insulation	-	170 minutes

Specimen 6 - SNAP 32R Retrofit fire collar protecting two cross-linked polyethylene (Pex B) nom, 20-mm OD pipes

Structural adequacy	-	not applicable
Integrity	-	no failure at 181 minutes
Insulation	-	167 minutes

Specimen 9 – SNAP 32R Retrofit fire collar protecting two Cross-linked polyethylene (Pex) pipes nom. 20.2-mm OD

Structural adequacy	-	not applicable
Integrity	-	no failure at 181 minutes
Insulation	-	no failure at 179 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:

Specimen 1	-/120/120	Specimen 5 -	-/120/120
Specimen 2 -	-/120/120	Specimen 6 -	-/120/120
Specimen 3 -	-/120/120	Specimen 9 -	-/120/120
Specimen 4 -	-/120/120		

The FRL of the specimen is limited to that of the fire 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 10.11 of AS 1530.4-2014, have been made provided no individual component is removed or reduced.

11 Tested by

Peter Gordon
Testing Officer

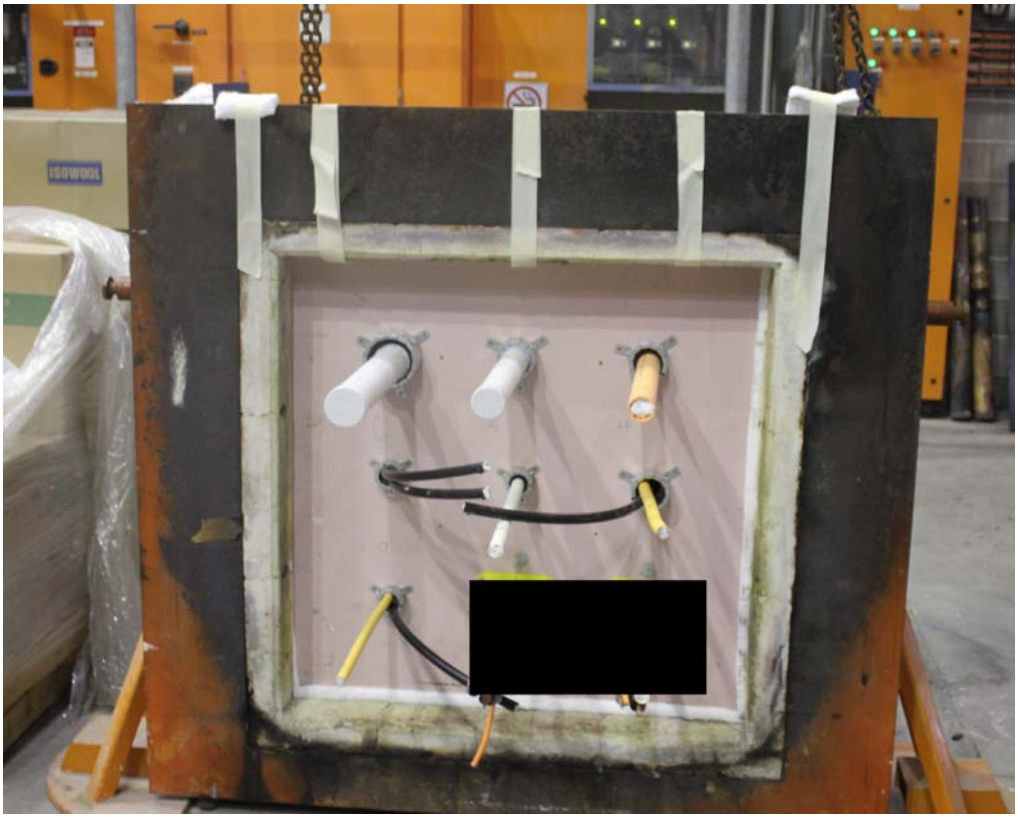
Appendices

Appendix A – Measurement location

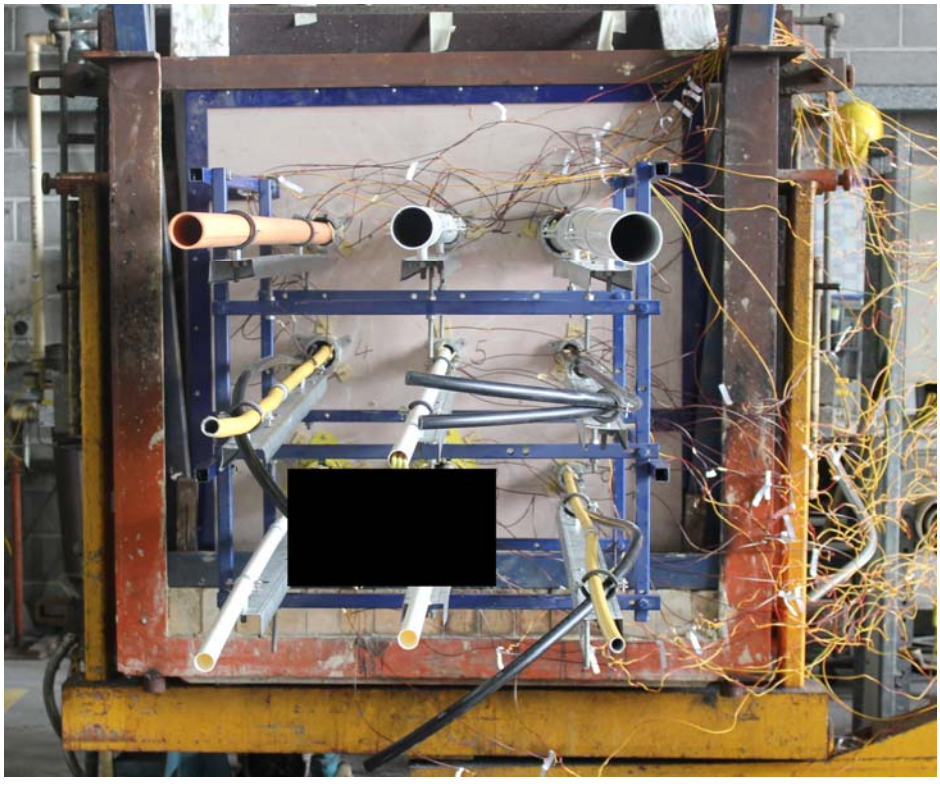
Specimen	T/C Position	T/C designation
Specimen 1 – SNAP 50R Retrofit fire collar protecting a nominal 1 ½ inch Chlorinated Polyvinyl Chloride (C-PVC) pipe	On p/b, 25-mm below collar	S1
	On p/b, 25-mm below collar	S2
	On collar left	S3
	On collar right	S4
	On pipe 25-mm from collar left	S5
	On pipe 25-mm from collar right	S6
Specimen 2 - SNAP 50R Retrofit fire collar protecting a nominal 50 mm Polyvinyl Chloride (PVC) pipe	On p/b, 25-mm below collar	S7
	On p/b, 25-mm below collar	S8
	On collar left	S9
	On collar right	S10
	On pipe 25-mm from collar left	S11
	On pipe 25-mm from collar right	S12
Specimen 3 – SNAP 65-80R Retrofit fire collar protecting a nominal 65 mm Polyvinyl Chloride (PVC) pipe	On p/b, 25-mm below collar	S13
	On p/b, 25-mm below collar	S14
	On collar left	S15
	On collar right	S16
	On pipe 25-mm from collar left	S17
	On pipe 25-mm from collar right	S18
Specimen 4 – SNAP 50R Retrofit fire collar protecting two nominal 25-mm and 20-mm Cross-linked polyethylene (PEX) pipes	On p/b, 25-mm below collar	S19
	On p/b, 25-mm below collar	S20
	On collar left	S21
	On collar right	S22
	On pipe 25-mm from collar left	S23
	On pipe 25-mm from collar right	S24
Specimen 5 – SNAP 32R Retrofit fire collar protecting a Telstra 26.75 mm OD Polyvinyl Chloride – Unplasticized (PVC-U) conduit and 5 x Optical Fibres cables	On p/b, 25-mm below collar	S25
	On p/b, 25-mm below collar	S26
	On collar left	S27
	On collar right	S28
	On pipe 25-mm from collar left	S29
	On pipe 25-mm from collar right	S30
Specimen 6 - SNAP 32R Retrofit fire collar protecting two cross-linked polyethylene (Pex B) nom, 20-mm OD pipes	On p/b, 25-mm below collar	S31
	On p/b, 25-mm below collar	S32
	On collar left	S33
	On collar right	S34
	On pipe 25-mm from collar left	S35
	On pipe 25-mm from collar right	S36

Specimen 9 – SNAP 32R Retrofit fire collar protecting two Cross-linked polyethylene (Pex) pipes nom. 20.2-mm OD	On p/b, 25-mm above collar	S53
	On p/b, 25-mm above collar	S54
	On collar left	S55
	On collar right	S56
	On pipe 25-mm from collar left	S57
	On pipe 25-mm from collar right	S58
Rover		S59
Ambient		S60

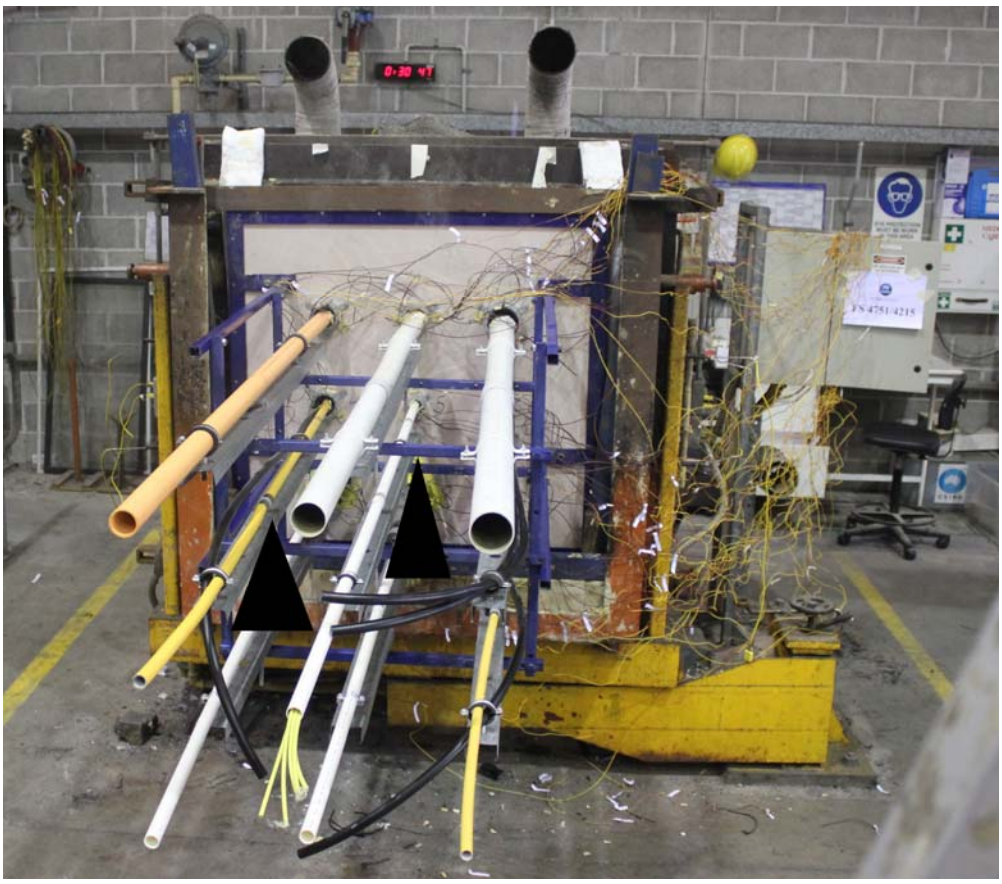
Appendix B – Photographs



PHOTOGRAPH 1 – EXPOSED FACE OF SPECIMENS PRIOR TO TESTING

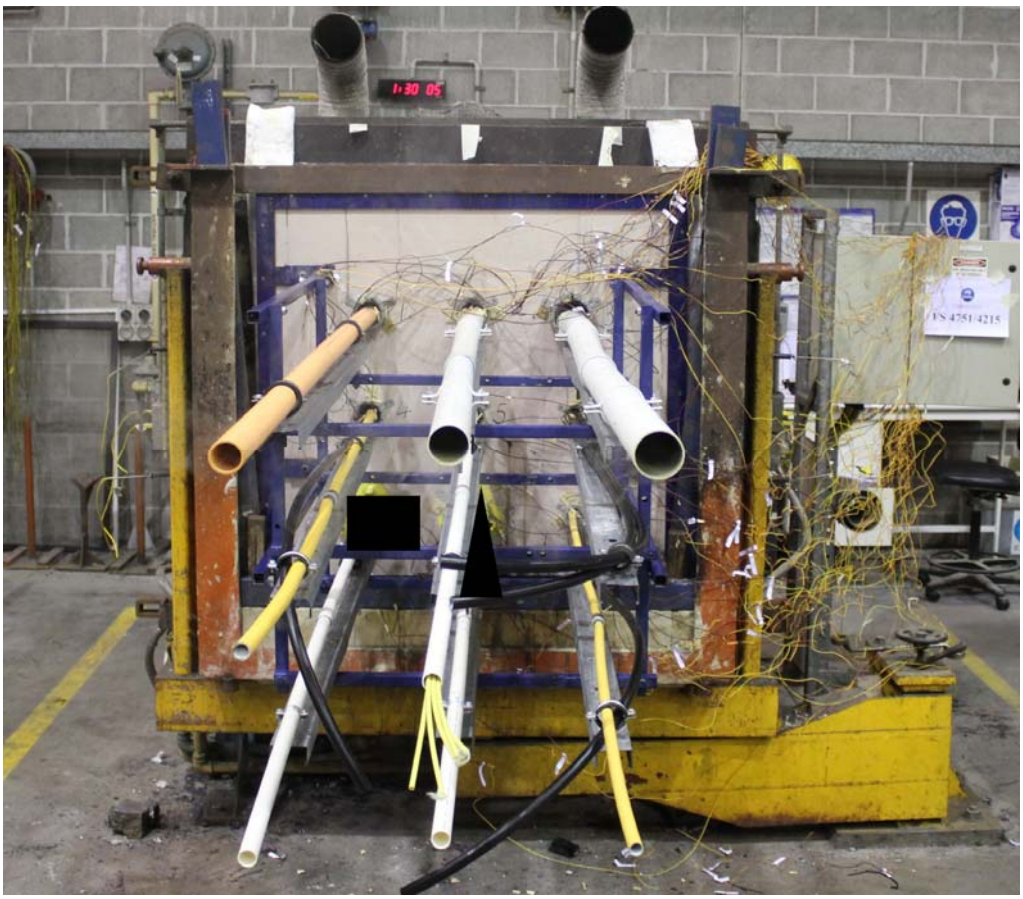


PHOTOGRAPH 2 – UNEXPOSED FACE OF SPECIMENS PRIOR TO TESTING

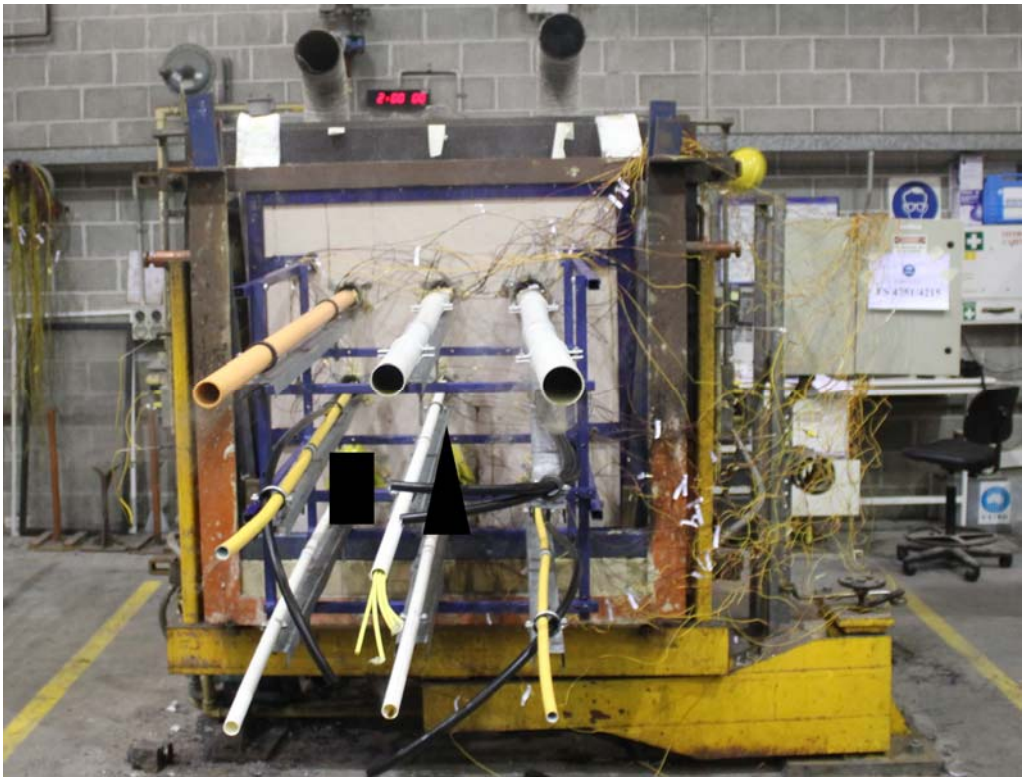


PHOTOGRAPH 3 – SPECIMENS AFTER 30 MINUTES OF TESTING

PHOTOGRAPH 4 – SPECIMENS AFTER 60 MINUTES OF TESTING



PHOTOGRAPH 5 – SPECIMENS AFTER 90 MINUTES OF TESTING



PHOTOGRAPH 6 – SPECIMENS AFTER 120 MINUTES OF TESTING

PHOTOGRAPH 7 – SPECIMENS AFTER 180 MINUTES OF TESTING

PHOTOGRAPH 8 – UNEXPOSED FACE OF SPECIMENS AT THE CONCLUSION OF TESTING

PHOTOGRAPH 9 – EXPOSED FACE OF SPECIMENS AT CONCLUSION OF TESTING

Appendix C – Furnace Temperature

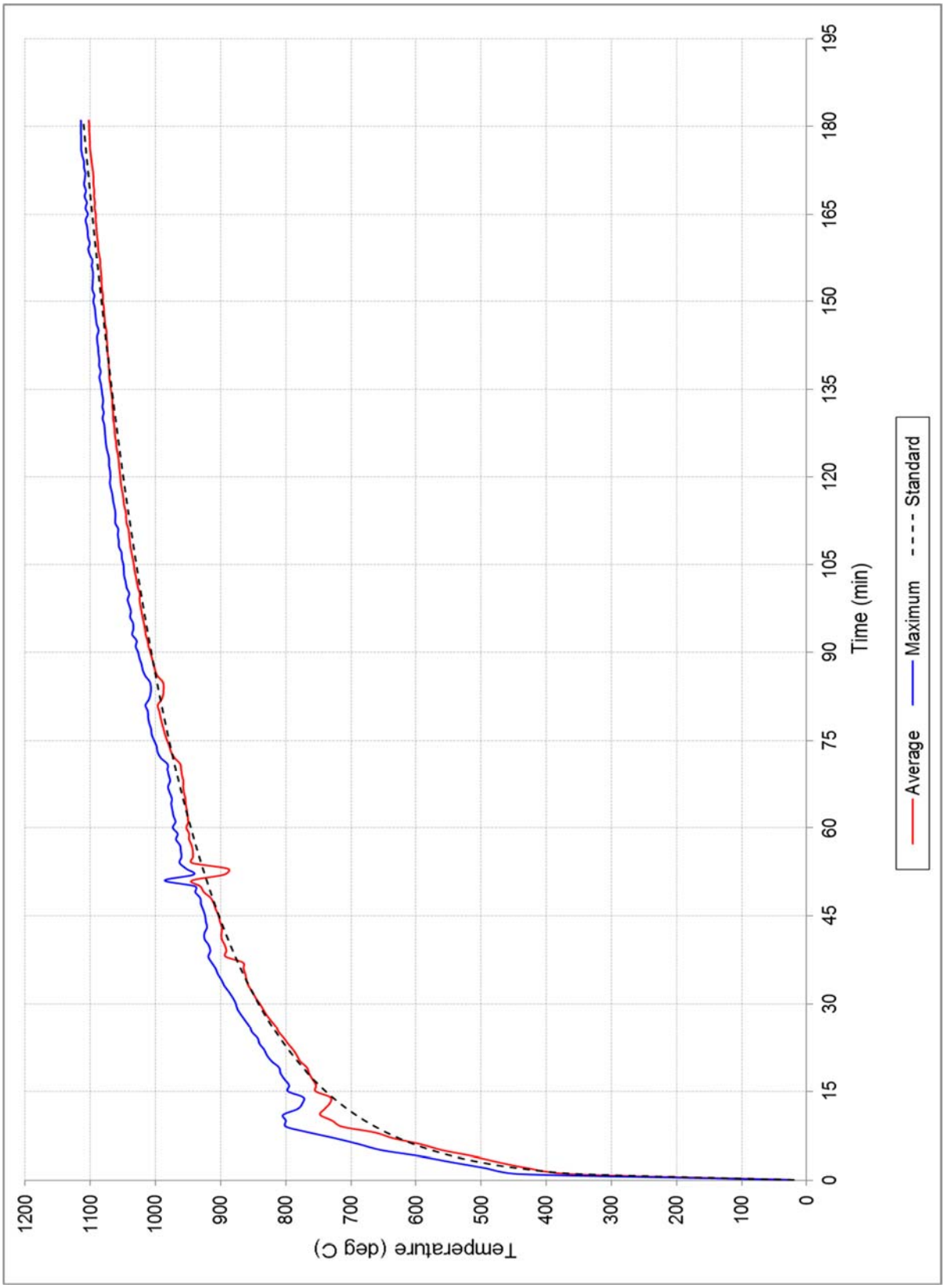


FIGURE 1 – FURNACE TEMPERATURE

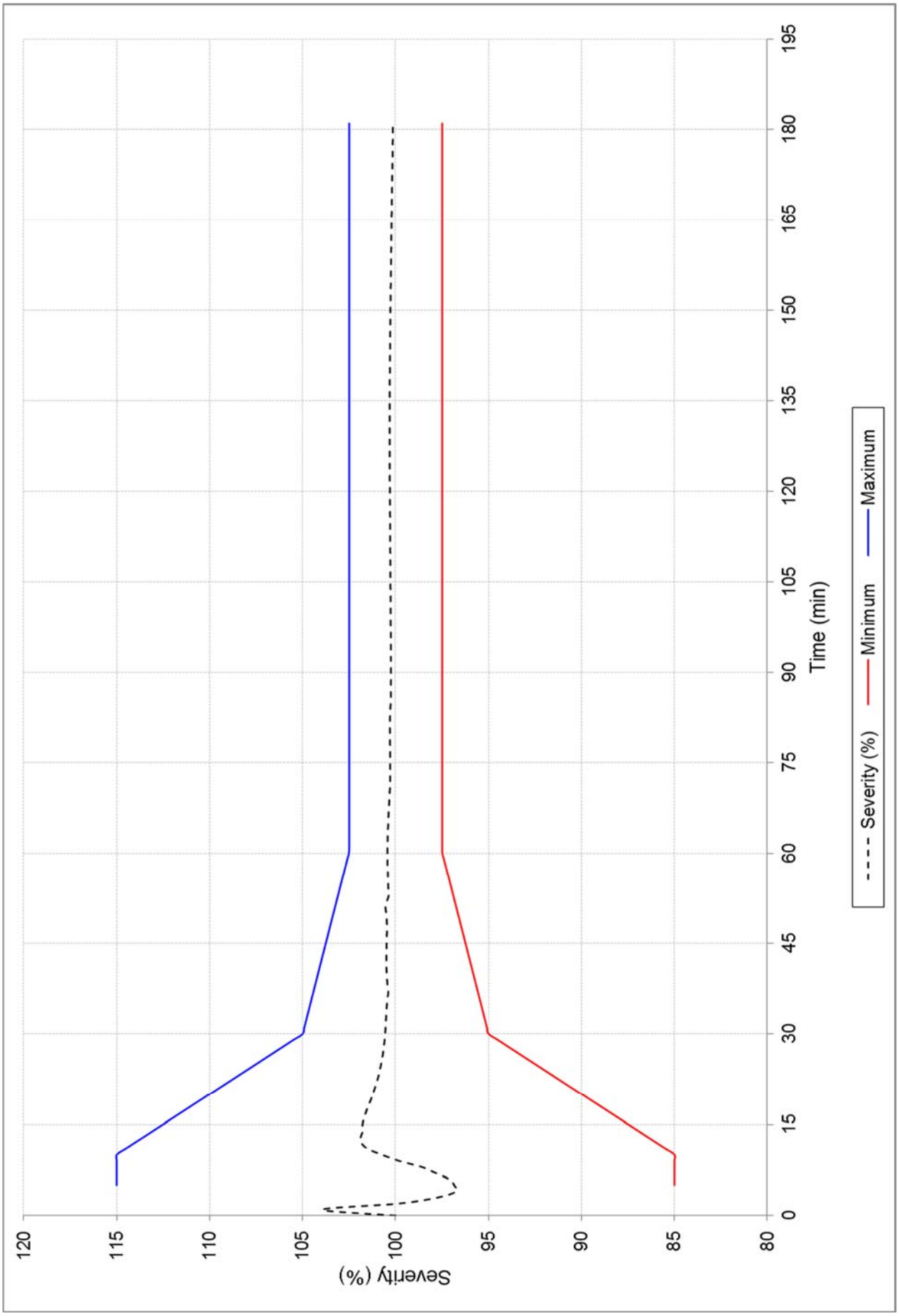


FIGURE 2 – FURNACE SEVERITY

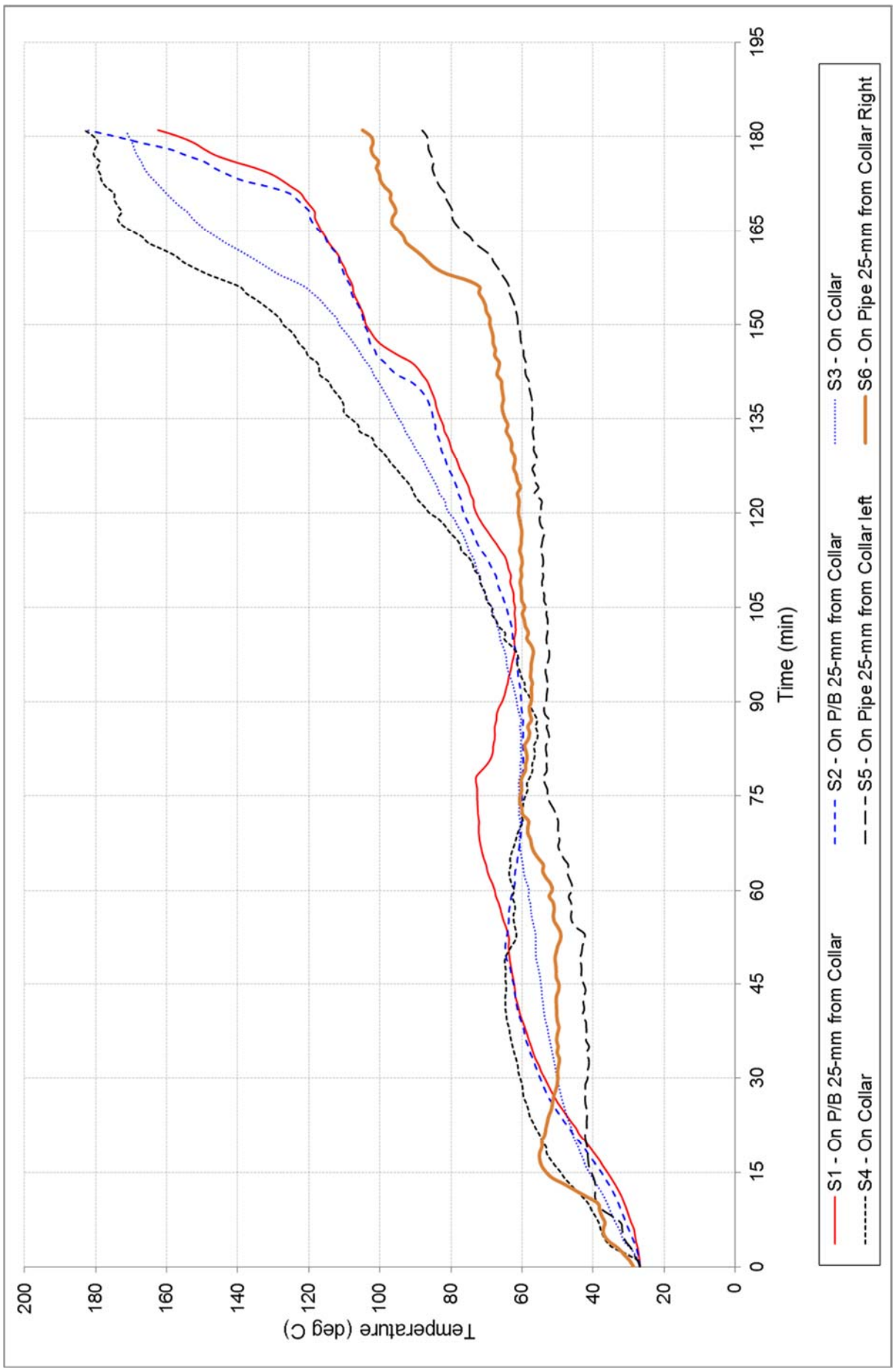


FIGURE 3 SPECIMEN TEMPERATURE – ASSOCIATED WITH SPECIMEN # 1

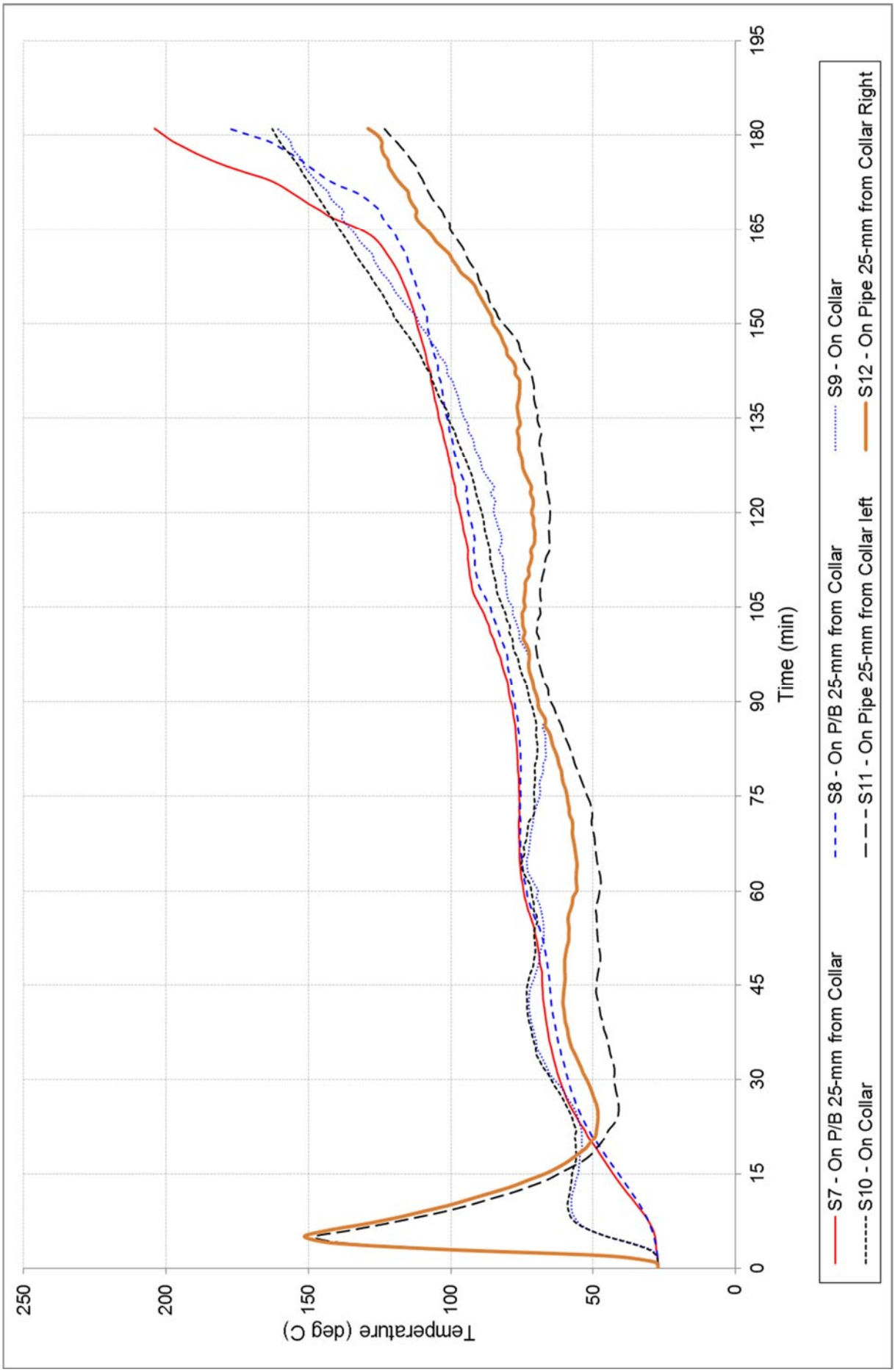


FIGURE 4 SPECIMEN TEMPERATURE – ASSOCIATED WITH SPECIMEN # 2

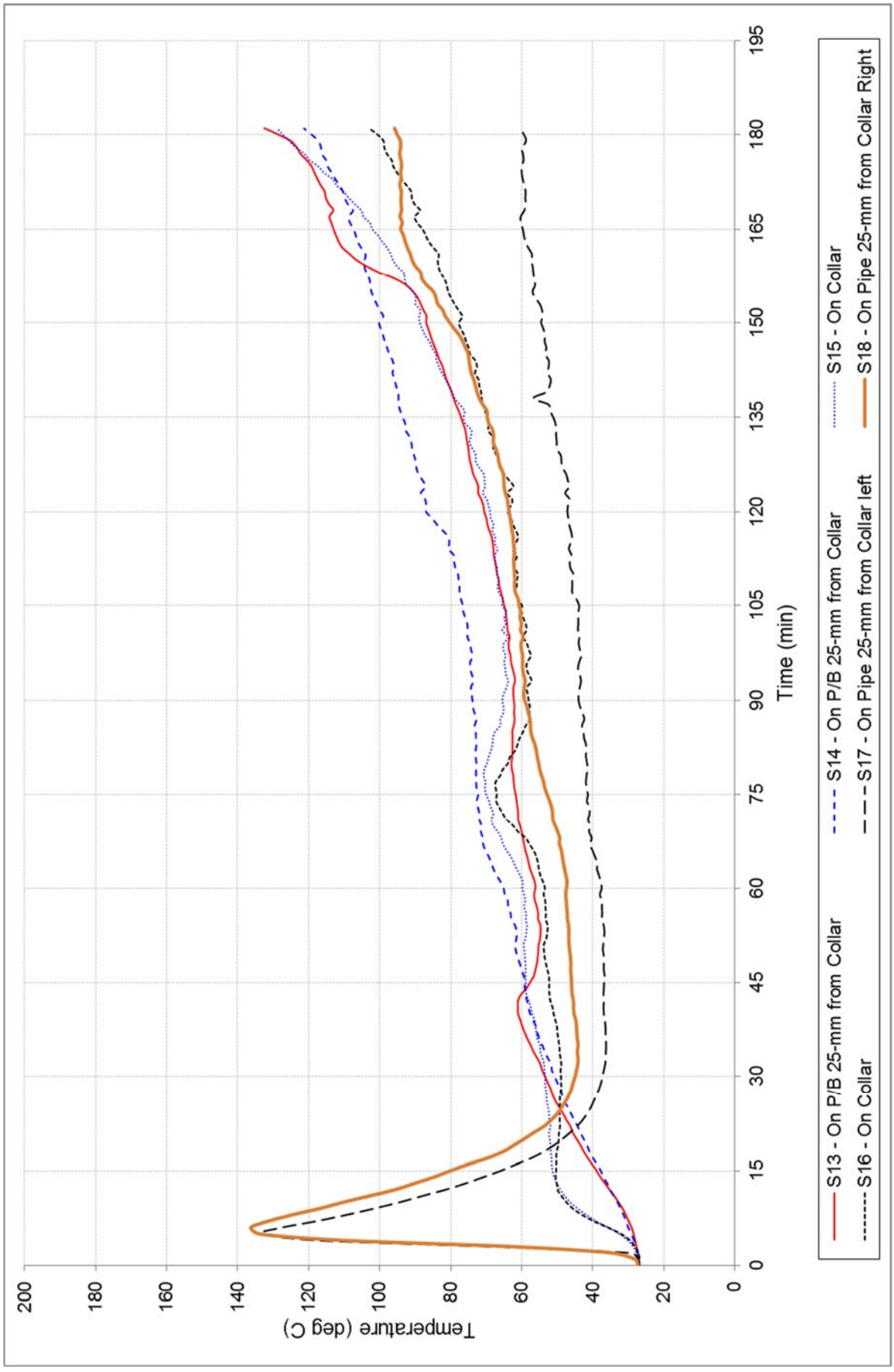


FIGURE 5 SPECIMEN TEMPERATURE – ASSOCIATED WITH SPECIMEN # 3

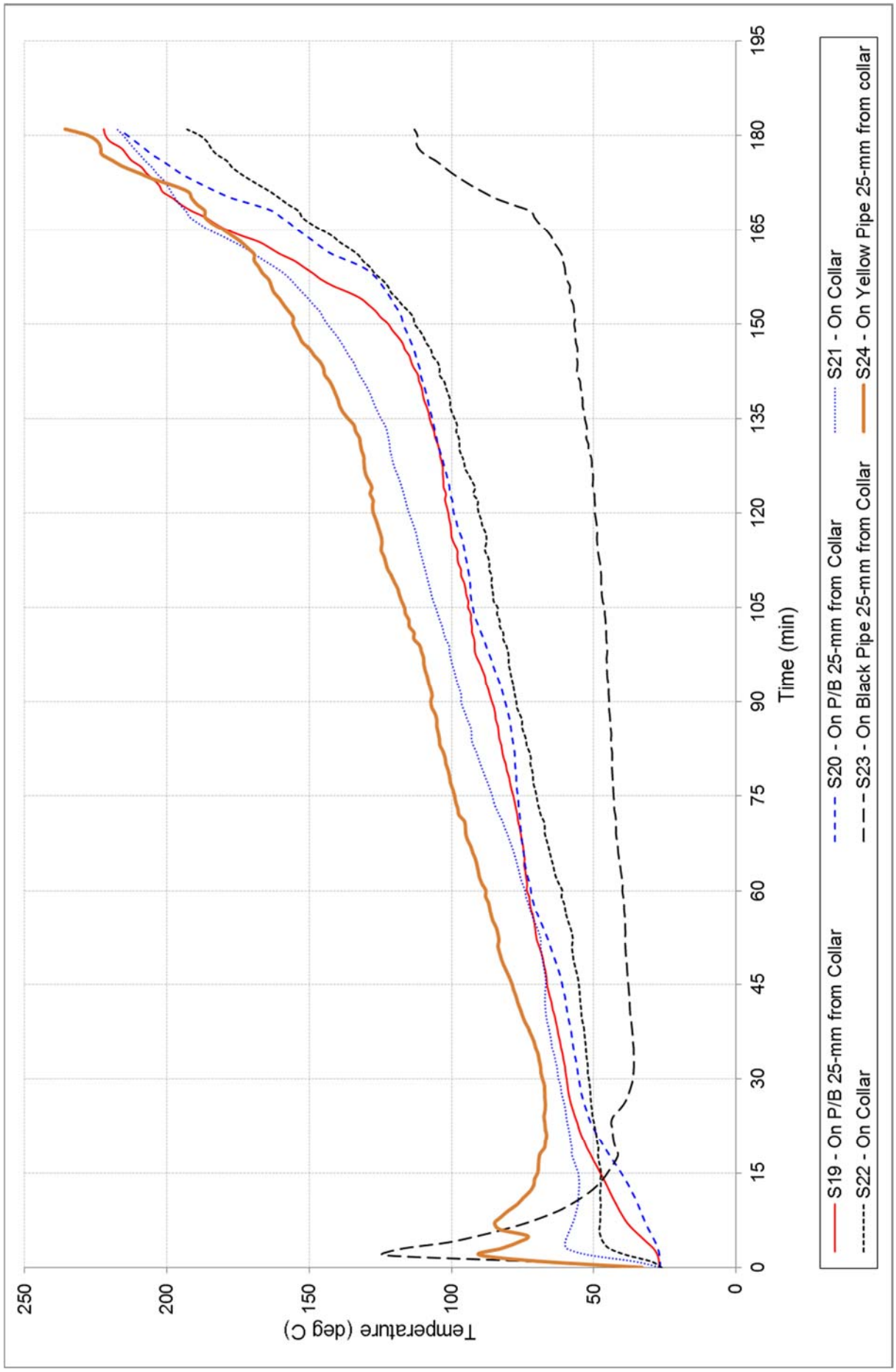


FIGURE 6 SPECIMEN TEMPERATURE – ASSOCIATED WITH SPECIMEN # 4

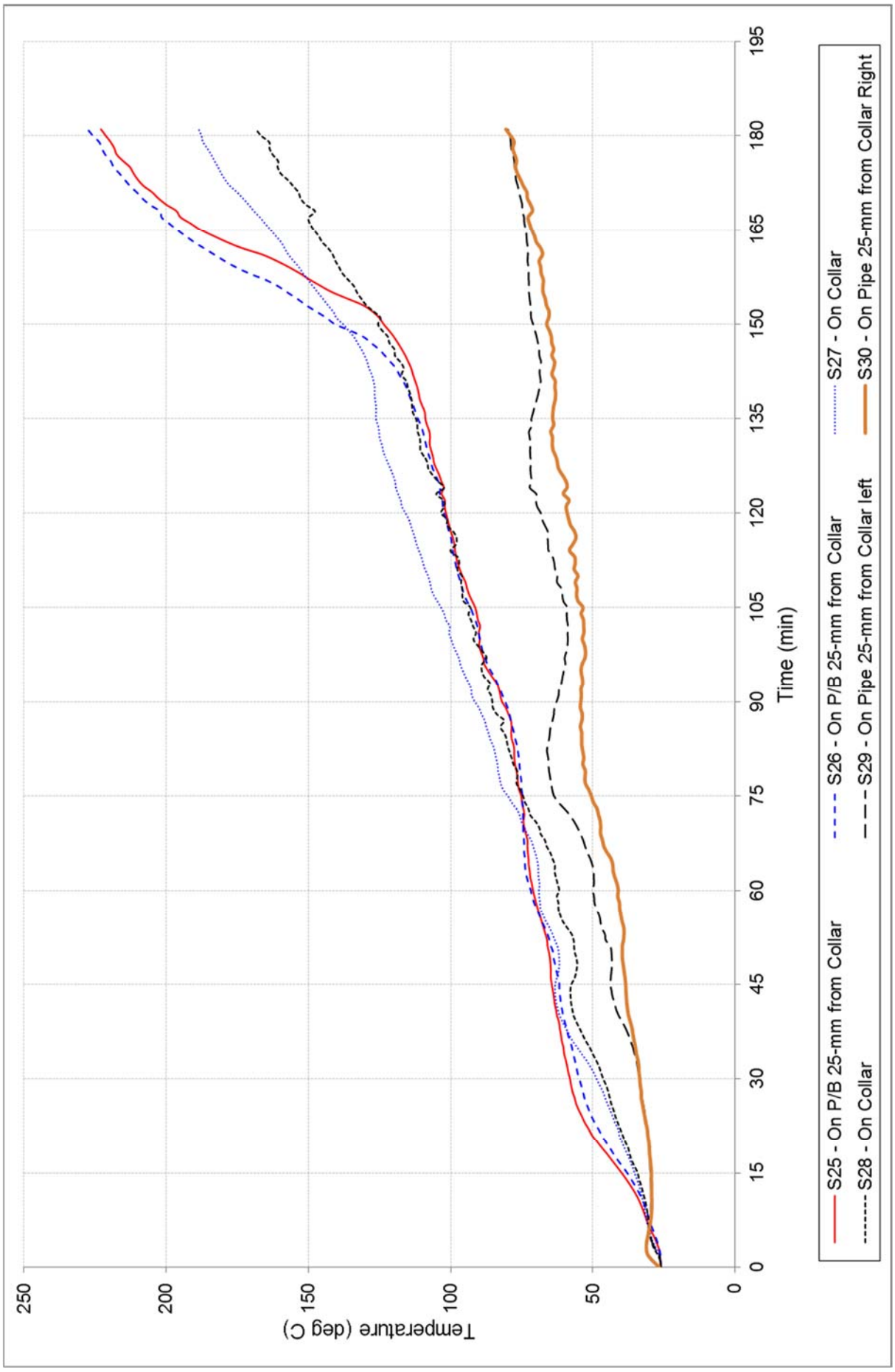


FIGURE 7 SPECIMEN TEMPERATURE – ASSOCIATED WITH SPECIMEN # 5

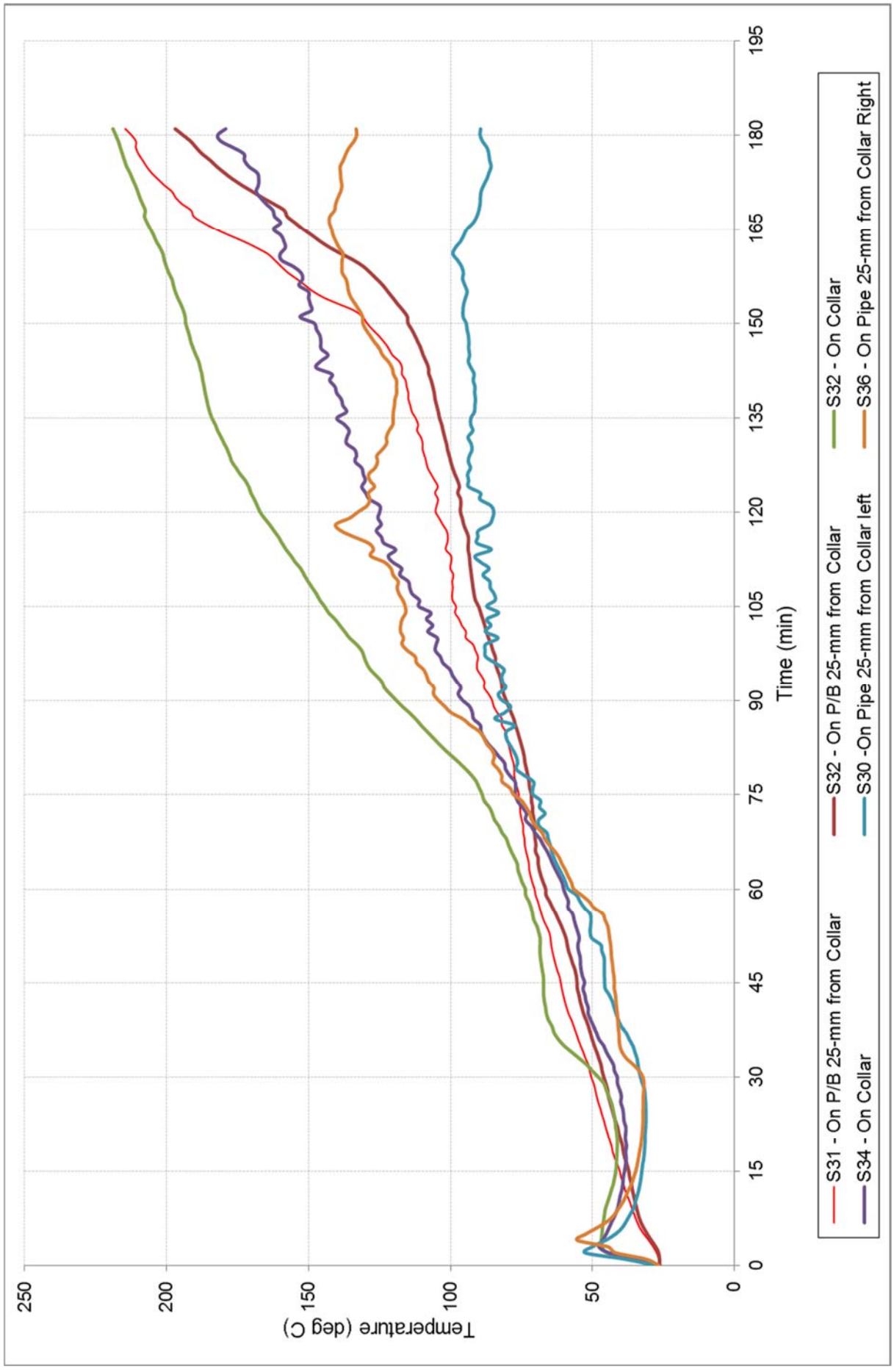


FIGURE 8 SPECIMEN TEMPERATURE – ASSOCIATED WITH SPECIMEN # 6

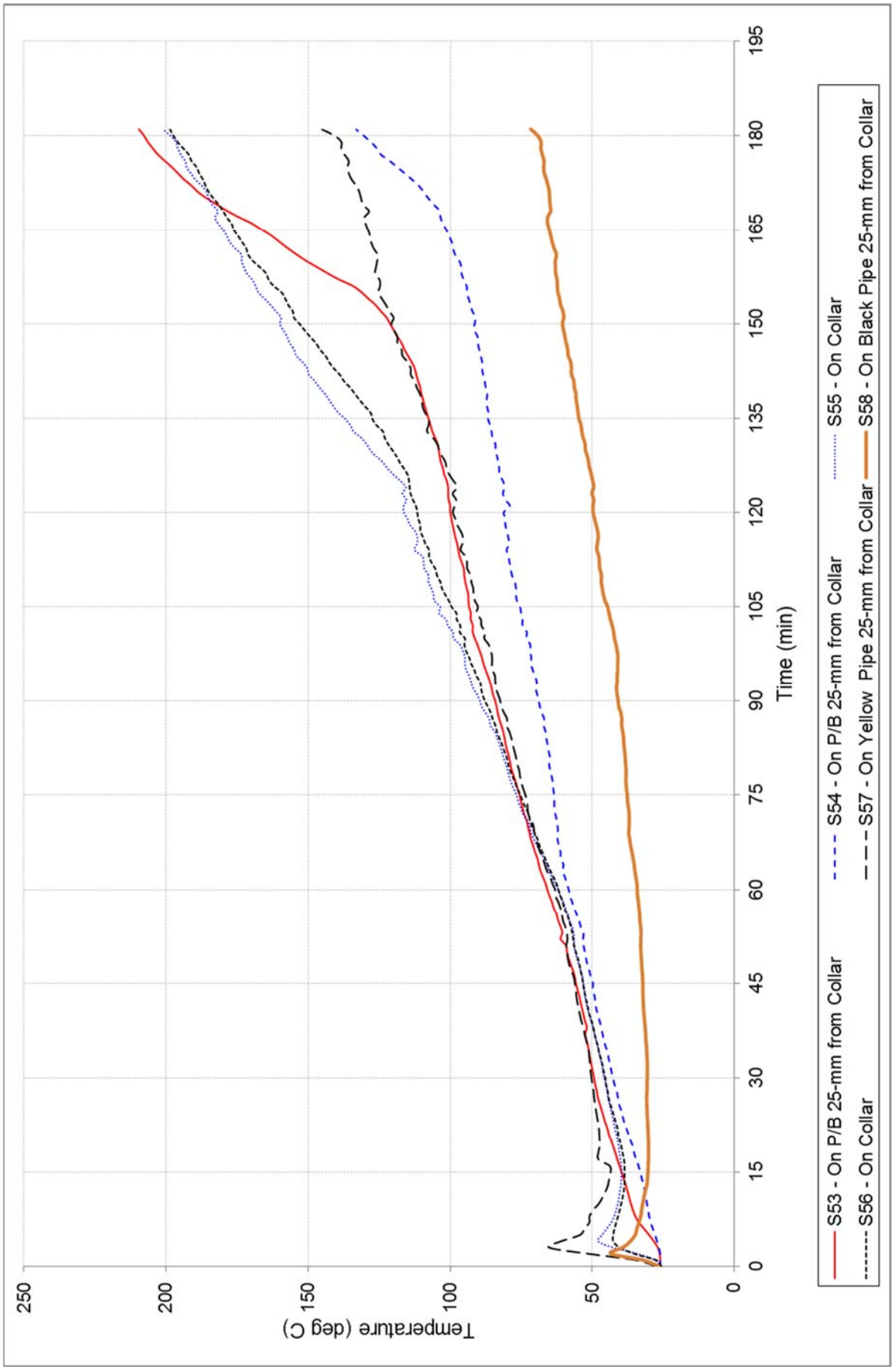
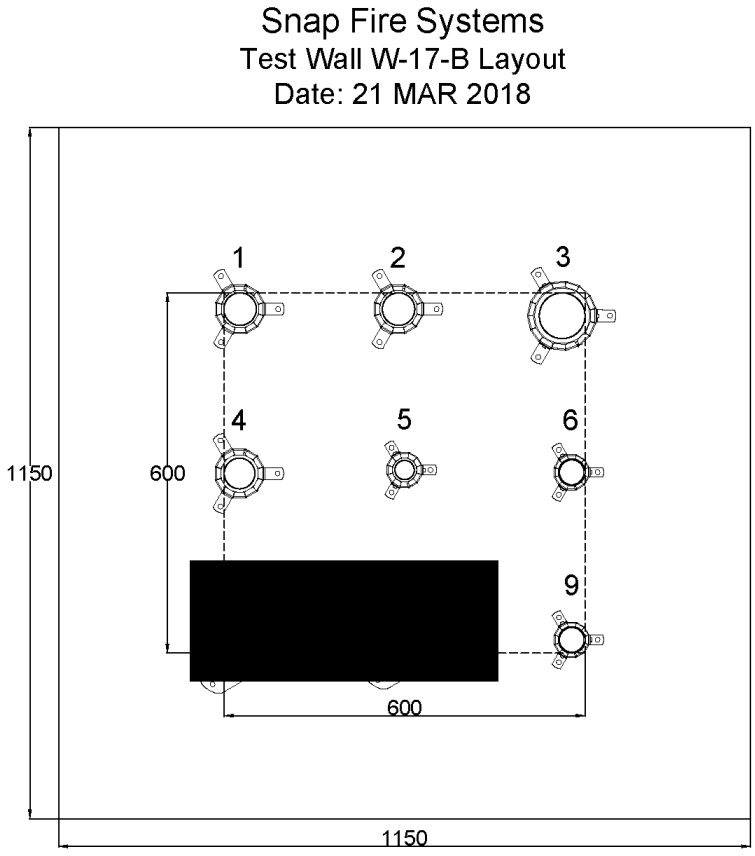
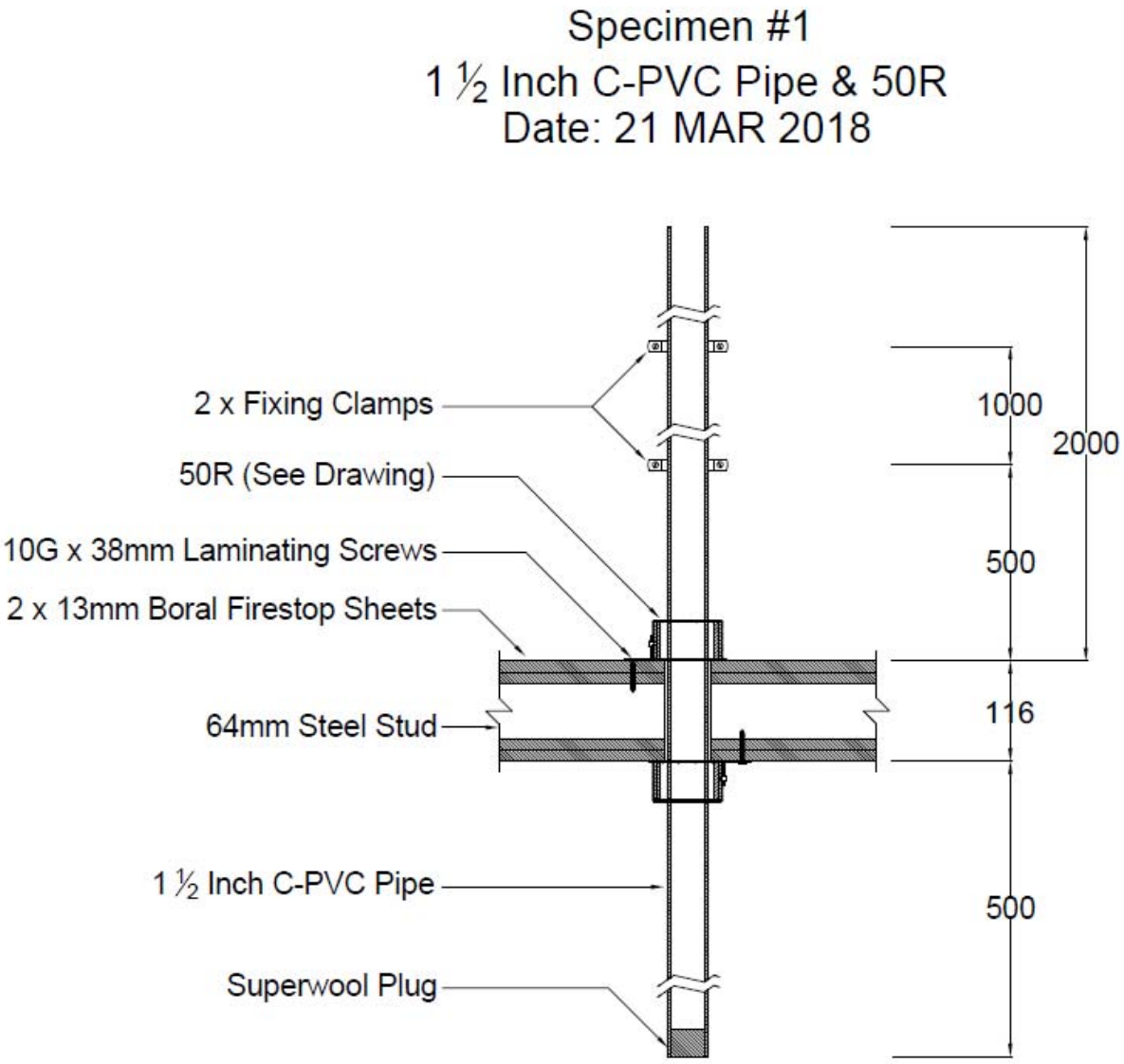


FIGURE 9 SPECIMEN TEMPERATURE – ASSOCIATED WITH SPECIMEN # 9

Appendix D – Layout and installation drawings

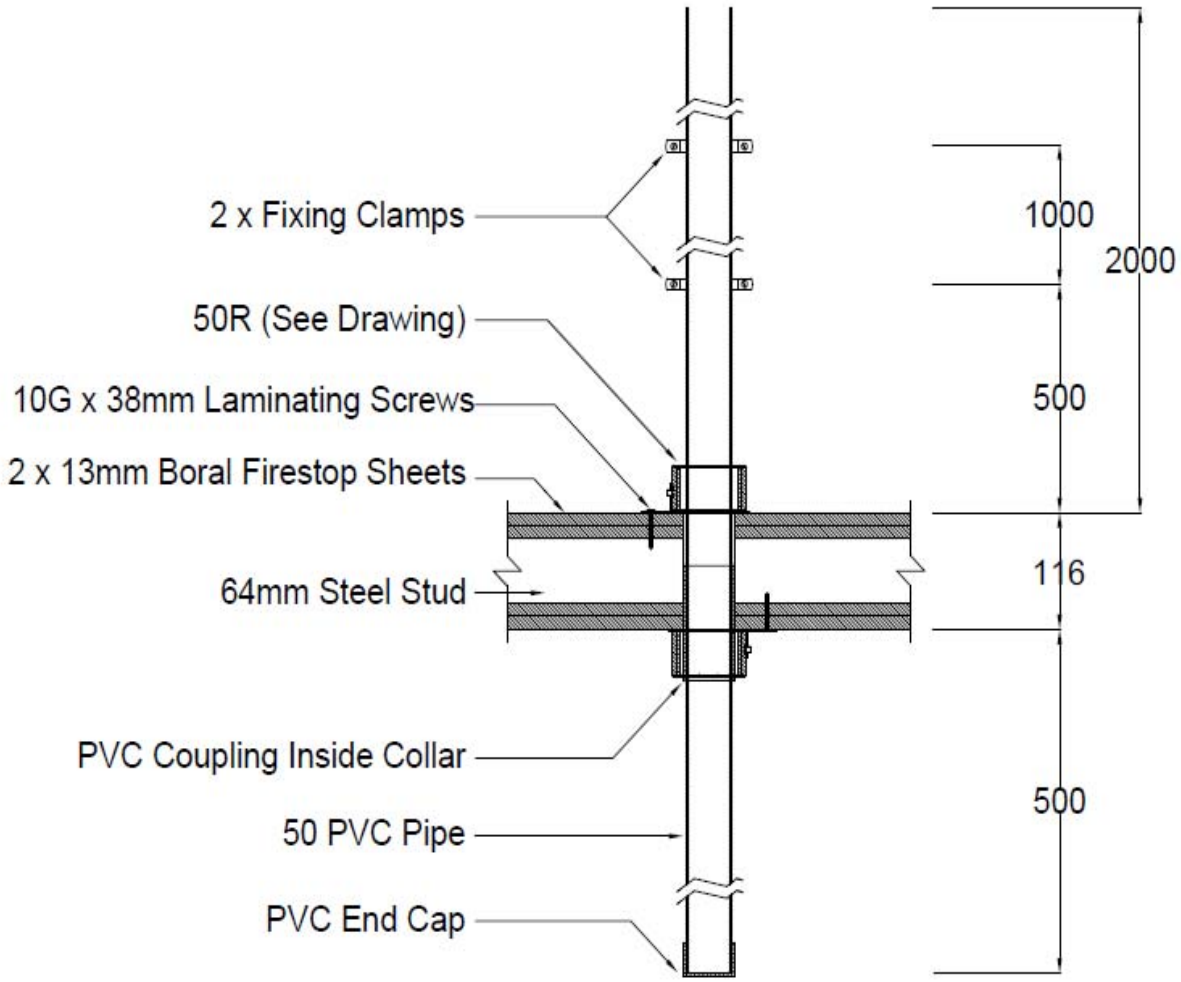


DRAWING TITLED "TEST WALL W-17-B LAYOUT, DATED 21 MARCH 2018, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD.

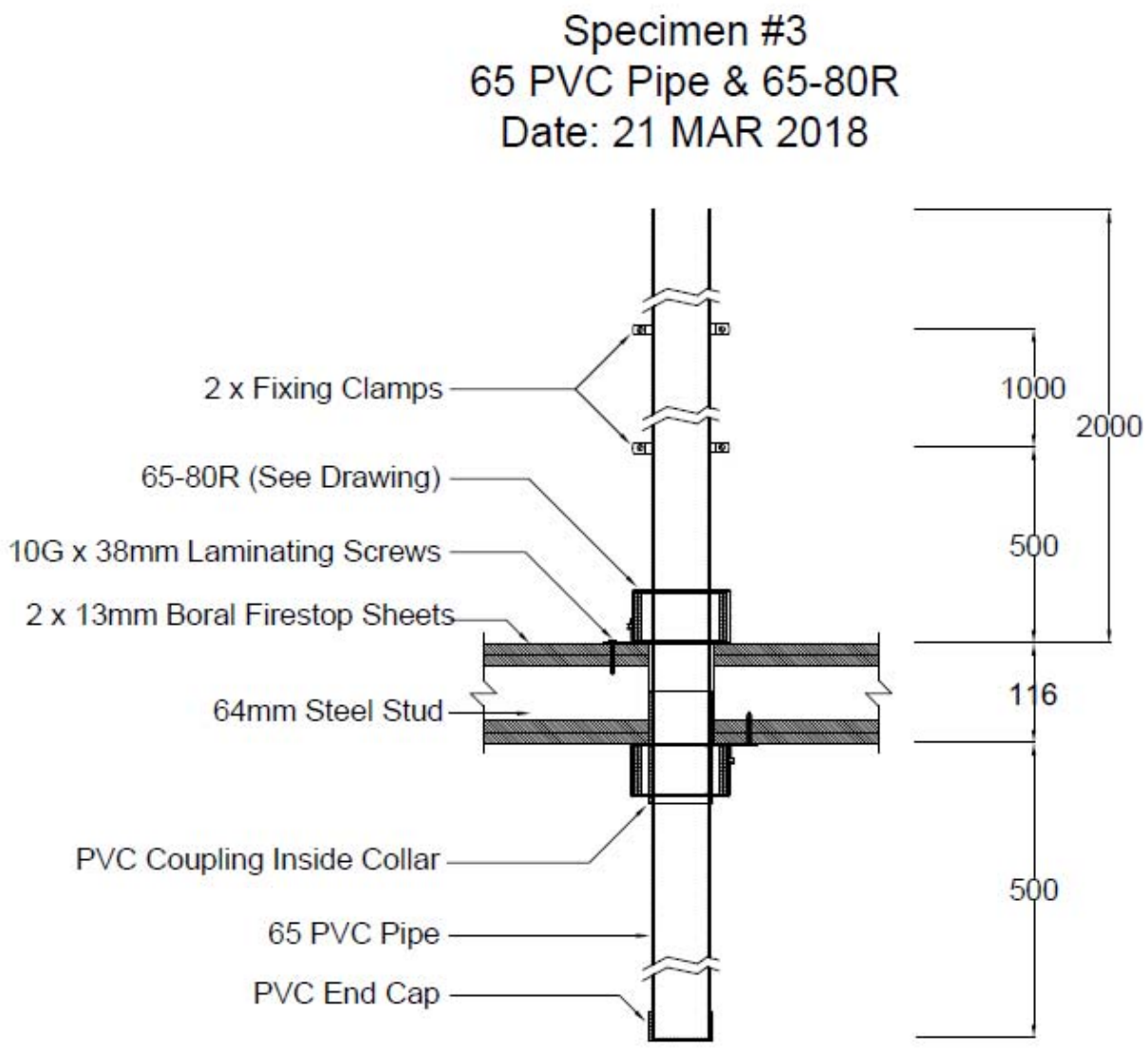


DRAWING TITLED "SPECIMEN #1 1 ½ INCH C-PVC PIPE & 50R" DATED 21 MARCH 2018, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD.

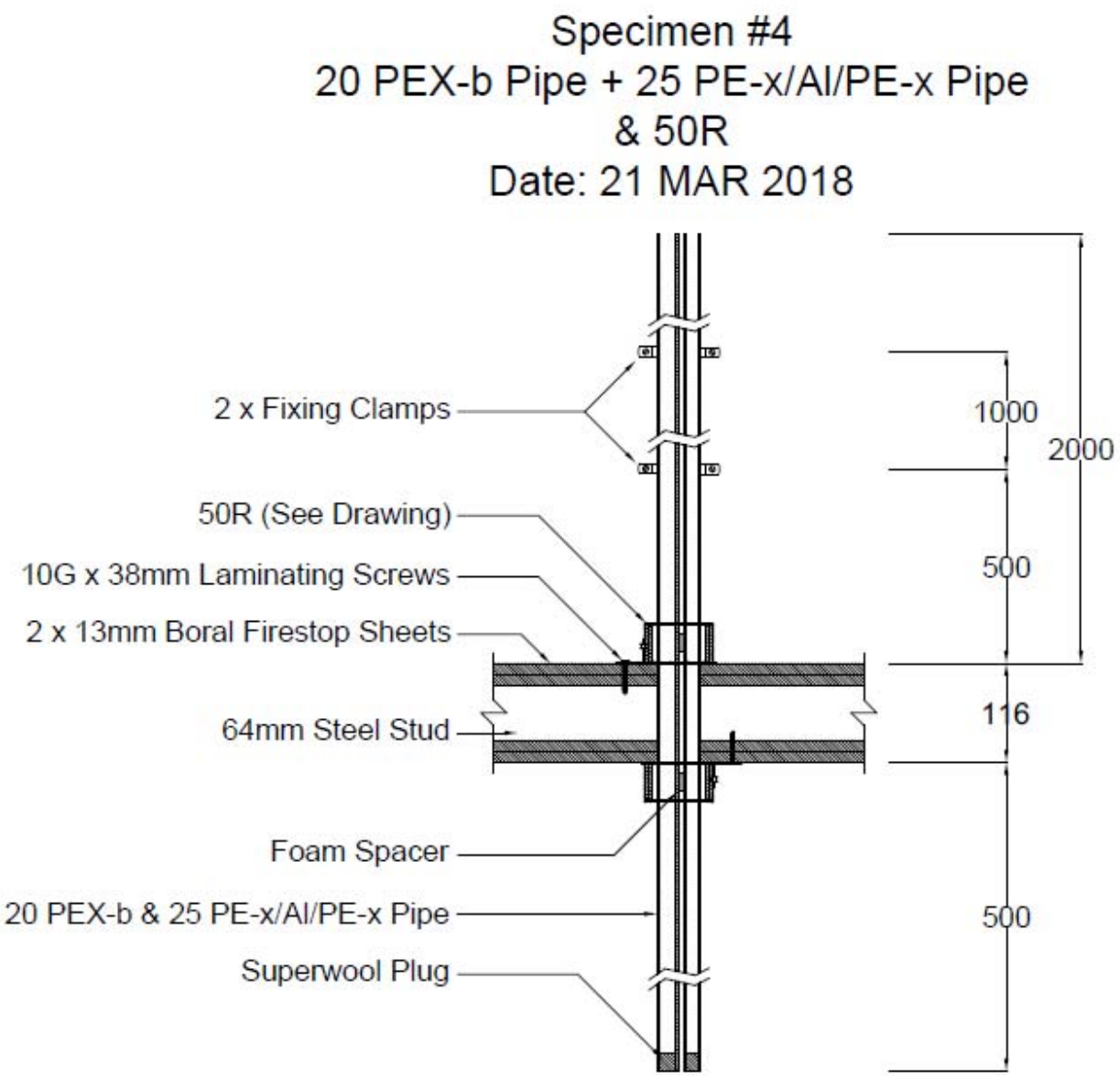
Specimen #2
50 PVC Pipe & 50R
Date: 21 MAR 2018



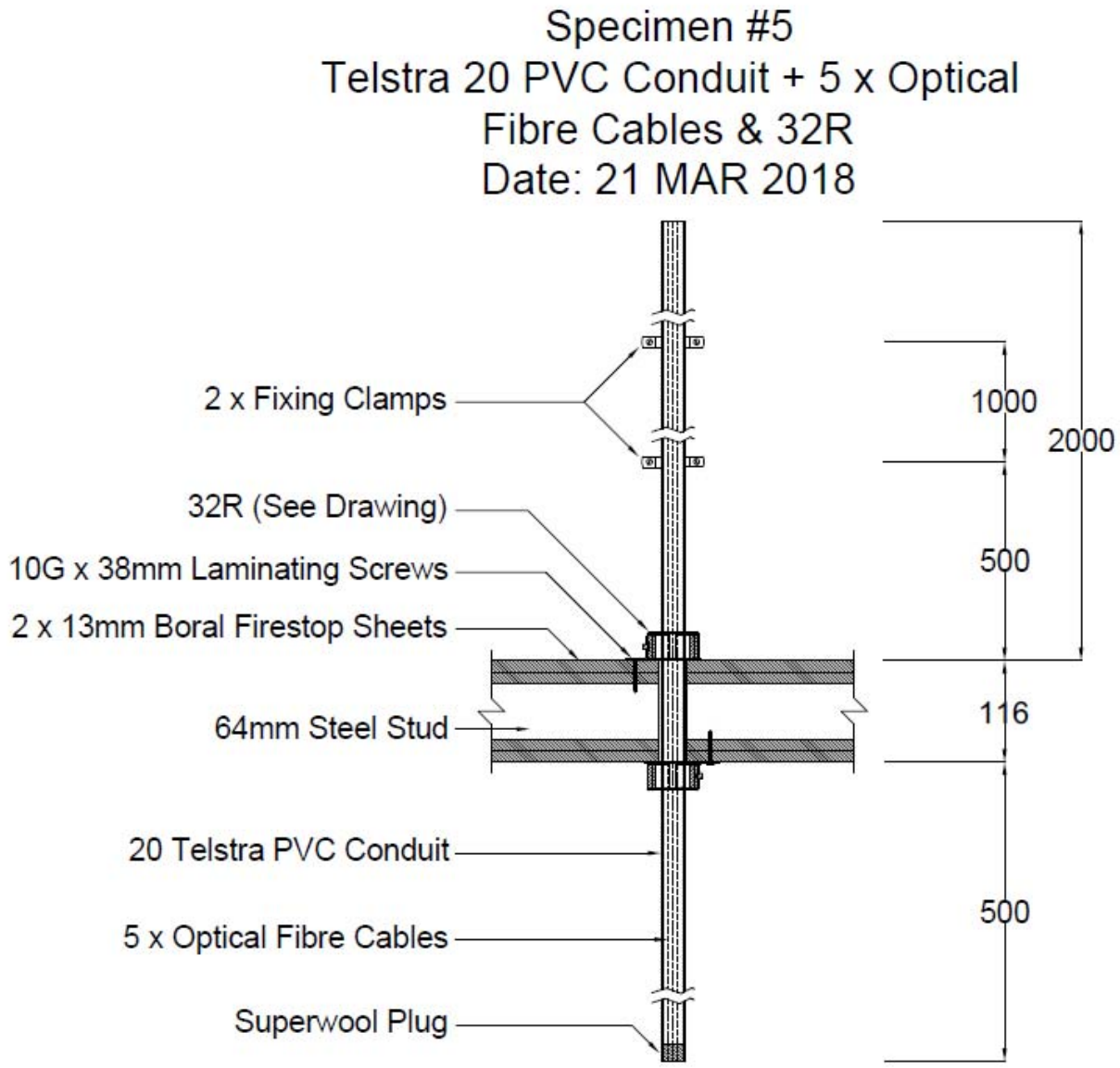
DRAWING TITLED "SPECIMEN #2 50 PVC PIPE & 50R" DATED 21 MARCH 2018, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD.



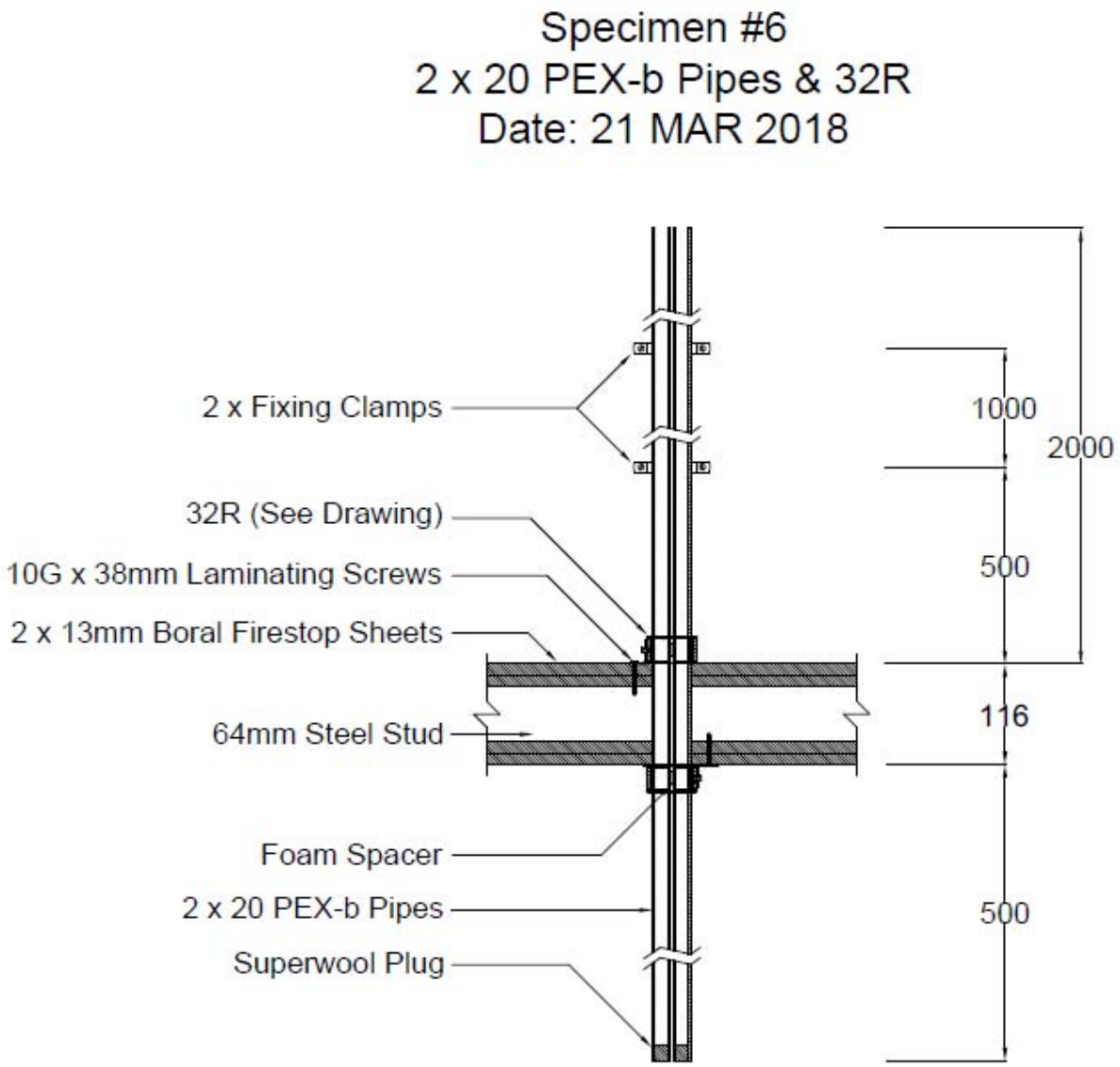
DRAWING TITLED "SPECIMEN #3 65 PVC PIPE & 65-80R" DATED 21 MARCH 2018, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD.



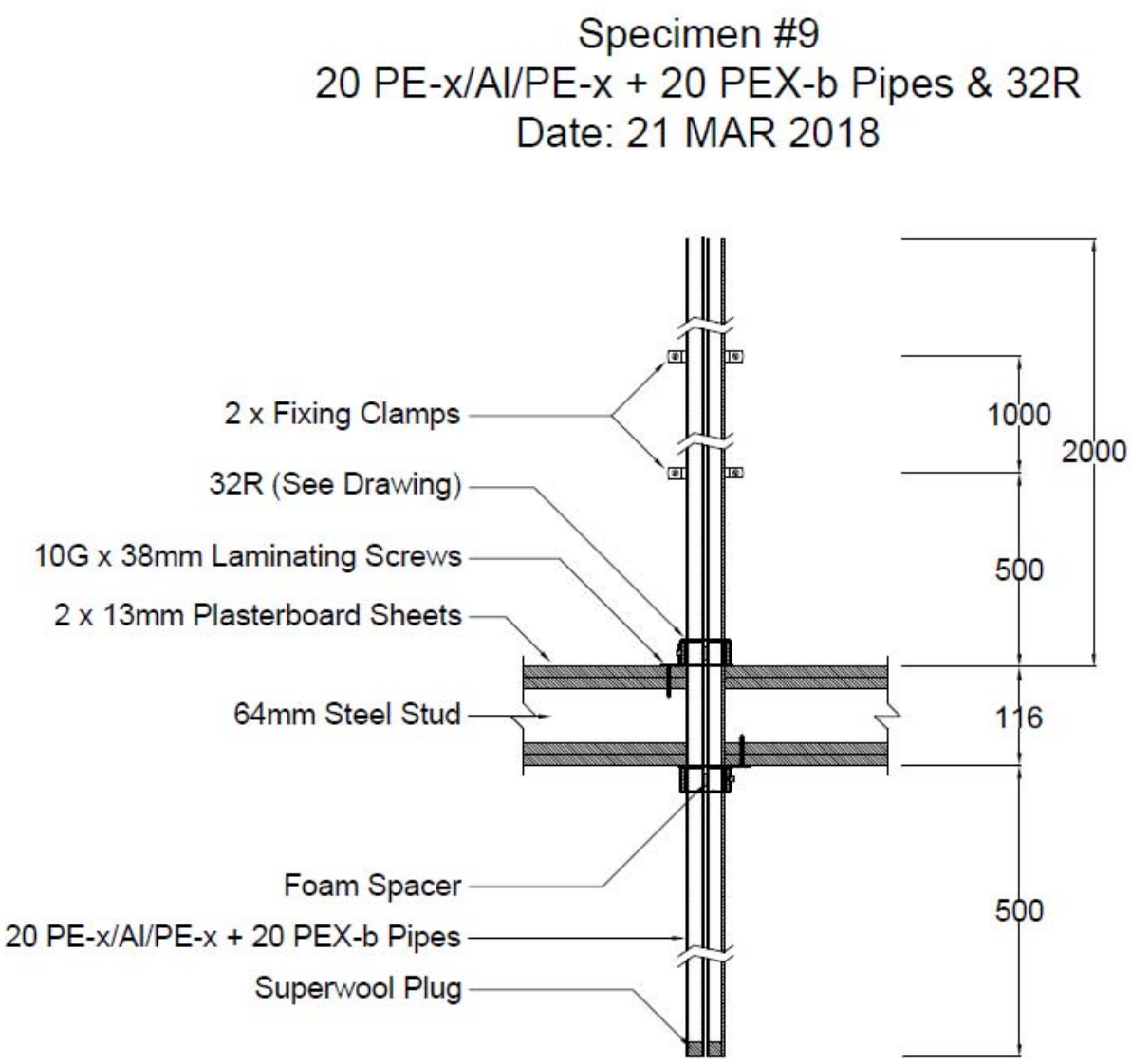
DRAWING TITLED "SPECIMEN #4 20 PEX B PIPE & 25 PE-X/AL/PE-X PIPE & 50R" DATED 21 MARCH 2018, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD.



DRAWING TITLED "SPECIMEN #5 TELSTRA 20 PVC CONDUIT & 5 X OPTICAL FIBRE CABLES & 32R" DATED 21 MARCH 2018, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD.

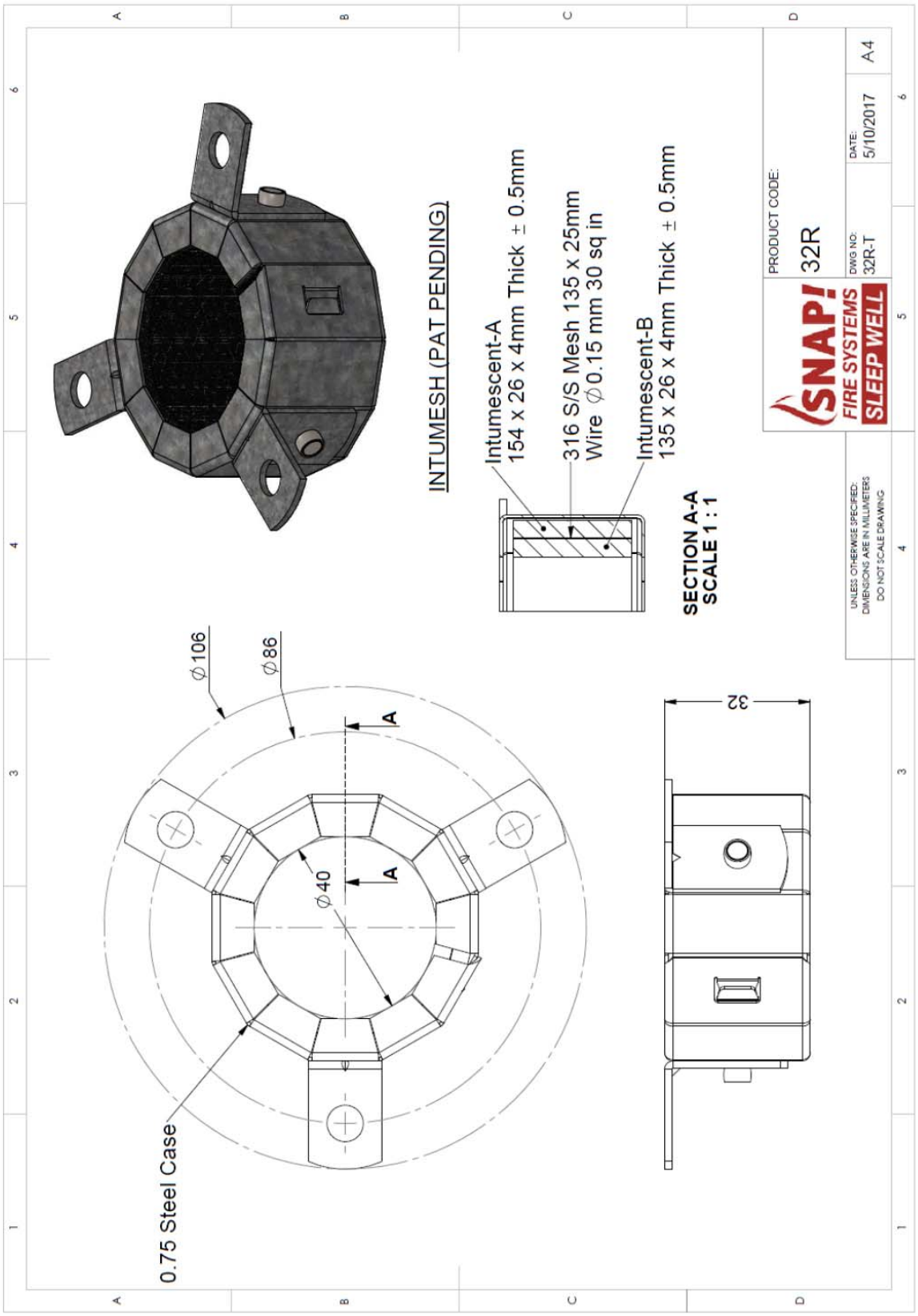


DRAWING TITLED "SPECIMEN #6 2 X 20 PEX B PIPES & 32R" DATED 21 MARCH 2018, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD.

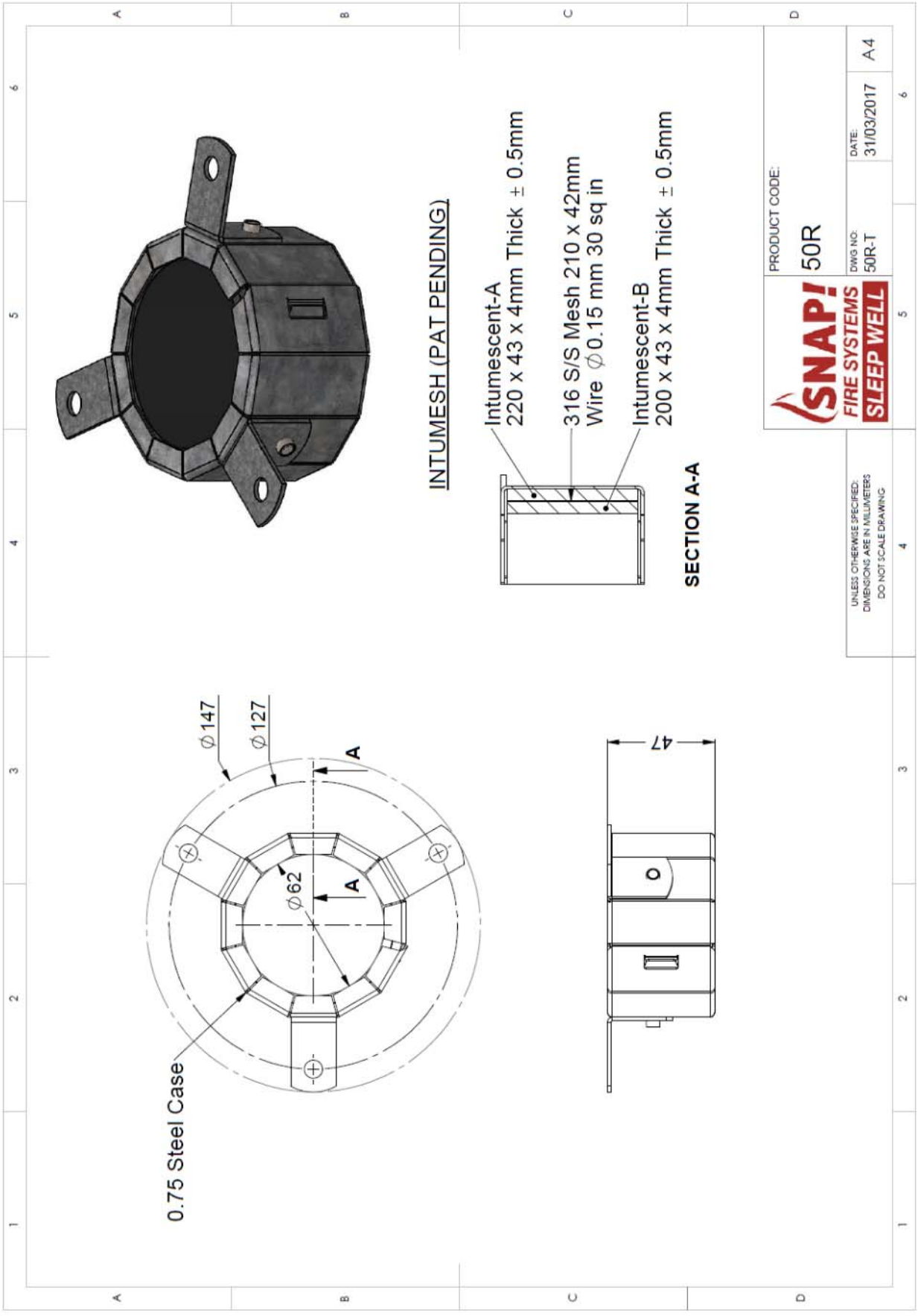


DRAWING TITLED "SPECIMEN #9 20 PE-X/AL/PE-X + 20 PEX B PIPES & 32R" DATED 21 MARCH 2018, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD.

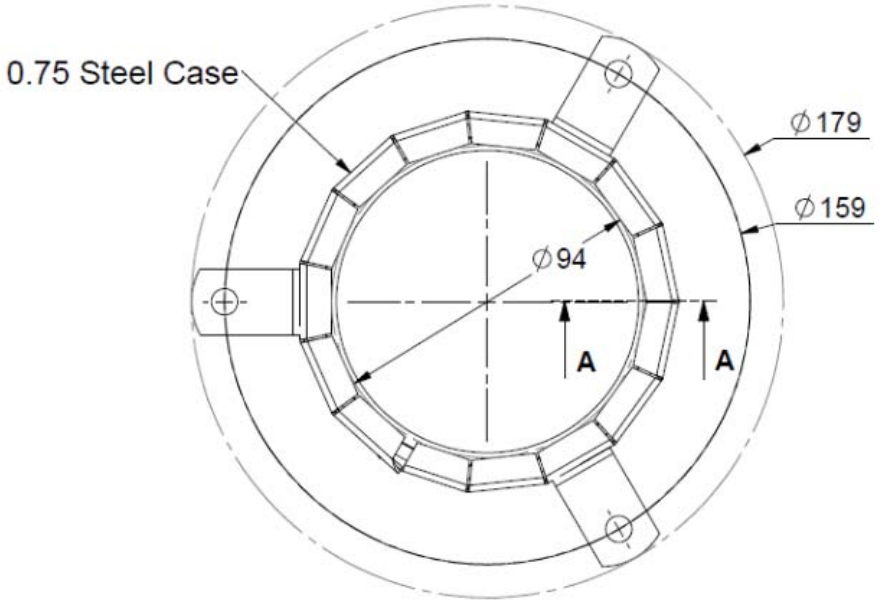
Appendix E – Specimen Drawings

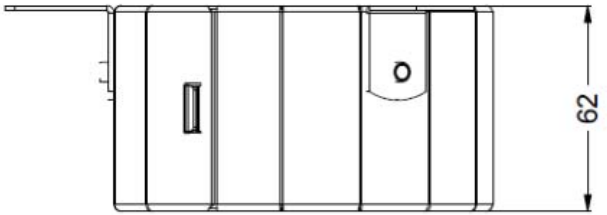


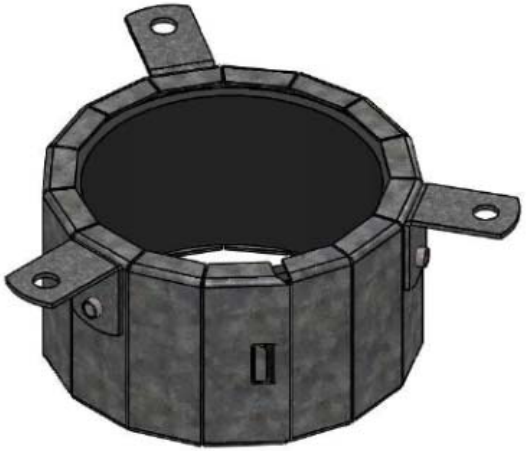
DRAWING NUMBERED 32R-T DATED 5 OCTOBER 2017, BY SNAP FIRE SYSTEMS PTY LTD.



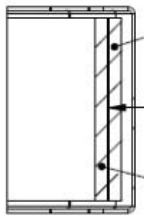
DRAWING NUMBERED 50 R-T DATED 31 MARCH 2017, BY SNAP FIRE SYSTEMS PTY LTD.







INTUMESH (PAT PENDING)



Intumescent-A
325 x 55 x 4mm Thick ± 0.5mm

316 S/S Mesh 300 x 55mm
Wire ∅0.15 mm 30 sq in

Intumescent-B
300 x 55 x 4mm Thick ± 0.5mm

SECTION A-A

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS
DO NOT SCALE DRAWING

SNAP! FIRE SYSTEMS SLEEP WELL

PRODUCT CODE:
65-80 R

DWG NO:	DATE:	
65-80R-T	31/03/2017	A4

Appendix F – Certificate(s) of Test

INFRASTRUCTURE TECHNOLOGIES
www.csiro.au

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

Certificate of Test

No. 3139

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 (Section 10, Service penetrations and control joints), 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 1902.

Product Name: SNAP 50R Retrofit fire collar protecting a nominal 1 ½ inch Chlorinated Polyvinyl Chloride (C-PVC) pipe

Description: The specimen comprised an 116-mm thick plasterboard lined steel framed wall comprising two layers of 13-mm thick Fyrchek plasterboard on each side of 64-mm deep metal studs, with an established FRL of -/120/120 (refer BRANZ report # FAR2539). The wall was penetrated by a nominal 1 ½ inch C-PVC pipe protected by SNAP 50R Retrofit fire collar. The SNAP Retrofit 50R fire collar comprised a 0.75-mm steel casing with a 62 mm inner diameter and a 147-mm dia. base flange. The 47-mm high collar casing incorporated a closing mechanism that was comprised of two soft Intumesh intumescent wraps lined within the internal circumference of the collar. Intumescent A was 4-mm thick x 43-mm wide x 220-mm long, and Intumescent B was 4-mm thick x 43-mm wide x 200-mm long. Between the strips was a layer of 316 stainless steel mesh 210-mm long x 42-mm wide with wire mesh dia. of 0.15-mm (refer drawing "50R-1" dated 31/03/17, by Snap Fire Systems Pty Ltd). The Snap collars were surface mounted around the pipe on both the exposed and unexposed face of the wall and fixed through 3 mounting brackets using 38-mm (10g) course thread laminating screws. The penetrating service comprised a 1 ½ inch (nom 38-mm) C-PVC Pipe, with a wall thickness of 4.1-mm, fitted through the collar's sleeve and penetrating the plasterboard wall through a 54-mm dia. cut-out hole (refer drawing "Specimen # 1, 1 ½ inch C-PVC Pipe & 50R", dated 21/03/18, provided by Snap Fire Systems Pty Ltd). Pipe projected horizontally, approximately 2000-mm away from unexposed face of plasterboard wall and approximately 500-mm into furnace chamber. The pipe was supported at nominally 500-mm and 1000-mm from the unexposed face of the plasterboard wall. The pipe was open at the unexposed and capped with Superwool plug on the exposed end.

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

Structural Adequacy	not applicable
Integrity	no failure at 181 minutes
Insulation	no failure at 181 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/120/120. The FRL of the specimen is limited to that of the fire 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 recognized that a single test method will not provide a full assessment of fire hazard under all fire conditions. This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Peter Gordon Date of Test: 5 April 2018

Issued on the 10th day of September 2018 without alterations or additions.

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. 3139

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www.csiro.au

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

Certificate of Test

No. 3140

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 (Section 10, Service penetrations and control joints), 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 1902.

Product Name: SNAP 50R Retrofit fire collar protecting a nominal 50 mm Polyvinyl Chloride (PVC) pipe

Description: The specimen comprised an 116-mm thick plasterboard lined steel framed wall comprising two layers of 13-mm thick Fyrchek plasterboard on each side of 64-mm deep metal studs, with an established FRL of -/120/120 (refer BRANZ report # FAR2539). The wall was penetrated by a nominal 50 mm PVC pipe protected SNAP 50R Retrofit fire collar. The SNAP Retrofit 50R fire collar comprised a 0.75-mm steel casing with a 62-mm inner diameter and a 147-mm diameter base flange. The 47-mm high collar casing incorporated a closing mechanism that was comprised of two soft Intumesh intumescent wraps lined within the internal circumference of the collar. Intumescent A was 4-mm thick x 43-mm wide x 220-mm long, and Intumescent B was 4-mm thick x 43-mm wide x 200-mm long. Between the strips was a layer of 316 stainless steel mesh 210-mm long x 42-mm wide with wire mesh dia. of 0.15-mm, as shown in drawing 50R-T dated 31/03/17, by Snap Fire Systems Pty Ltd. The Snap collars were surface mounted around the pipe on both the exposed and unexposed face of the wall and fixed through 3 mounting brackets using 38-mm (10g) course thread laminating screws. The penetrating service comprised a 50-mm PVC pipe and coupling with a total wall thickness of 5.2-mm, fitted through the collar's sleeve and penetrating the plasterboard wall through a 54-mm dia. cut-out hole as shown in drawing "Specimen # 2, 50 PVC & 50R", dated 21/03/18, provided by Snap Fire Systems Pty Ltd. The pipe projected horizontally, approximately 2000-mm away from the unexposed face of the plasterboard wall and approximately 500-mm into the furnace chamber. The pipe was supported at nominally 500-mm and 1000-mm from the unexposed face of the plasterboard wall. The pipe was open at the unexposed and capped with a PVC end cap on the exposed end.

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

Structural Adequacy	not applicable
Integrity	no failure at 181 minutes
Insulation	no failure at 181 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/120/120. The FRL of the specimen is limited to that of the fire 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 recognized that a single test method will not provide a full assessment of fire hazard under all fire conditions. This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Peter Gordon Date of Test: 5 April 2018

Issued on the 10th day of September 2018 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

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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. 3141

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 (Section 10, Service penetrations and control joints), 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 1902.

Product Name: SNAP 65-80R Retrofit fire collar protecting a nominal 65 mm Polyvinyl Chloride (PVC) pipe

Description: The specimen comprised an 116-mm thick plasterboard lined steel framed wall comprising two layers of 13-mm thick Fyrchek plasterboard on each side of 64-mm deep metal studs, with an established FRL of -/120/120 (refer BRANZ report # FAR2539). The wall was penetrated by a nominal 65 mm PVC pipe protected by a SNAP 65-80R Retrofit fire collar. The SNAP Retrofit 65-80R fire collar comprised a 0.75-mm steel casing with a 942-mm inner dia. and a 179-mm dia. base flange. The 62-mm high collar casing incorporated a closing mechanism that was comprised of two soft Intumesh intumescent wraps lined within the internal circumference of the collar. Intumescent A was 4-mm thick x 55-mm wide x 325-mm long, and Intumescent B was 4-mm thick x 55-mm wide x 300-mm long. Between the strips was a layer of 316 stainless steel mesh 300-mm long x 55-mm wide with wire mesh dia. of 0.15-mm (refer drawing # 65-80R-T dated 31/03/17, by Snap Fire Systems Pty Ltd). The Snap collars were surface mounted around the pipe on both the exposed and unexposed face of the wall and fixed through 3 mounting brackets using 38-mm (10g) course thread laminating screws. The penetrating service comprised a 65-mm dia. PVC pipe and coupling with a total wall thickness of 5.8-mm fitted through the collar's sleeve and penetrating the plasterboard wall through a 76-mm dia. cut-out hole (refer drawing "Specimen # 3, 65 PVC & 65-80R", dated 21/03/18), provided by Snap Fire Systems Pty Ltd. The pipe projected horizontally, approximately 2000-mm away from the unexposed face of the plasterboard wall and approximately 500-mm into furnace chamber. Pipe was supported at nominally 500-mm and 1000-mm from unexposed face of the plasterboard wall. The pipe was open at unexposed and capped with a PVC end cap on the exposed end.

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

Structural Adequacy	not applicable
Integrity	no failure at 181 minutes
Insulation	no failure at 181 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/120/120. The FRL of the specimen is limited to that of the fire 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 recognized that a single test method will not provide a full assessment of fire hazard under all fire conditions. This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Peter Gordon Date of Test: 5 April 2018

Issued on the 10th day of September 2018 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

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Accreditation No. 165 – Corporate Site No. 3625
Accredited for compliance with ISO/IEC 17025 - Testing

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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. 3142

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 (Section 10, Service penetrations and control joints), 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 1902.

Product Name: SNAP 50R Retrofit fire collar protecting two nominal 25-mm and 20-mm Cross-linked polyethylene (PEX) pipes

Description: The specimen comprised an 116-mm thick plasterboard lined steel framed wall comprising two layers of 13-mm thick Fyrchek plasterboard on each side of 64-mm deep metal studs, with an established FRL of -/120/120 (refer BRANZ report # FAR2539). The wall was penetrated by two nominal 25-mm and 20-mm PEX pipes protected by a SNAP 50R Retrofit fire collar. The SNAP Retrofit 50R fire collar comprised a 0.75-mm steel casing with a 62-mm inner dia. and a 147-mm dia. base flange. The 47-mm high collar casing incorporated a closing mechanism that was comprised of two soft Intumesh intumescent wraps lined within internal circumference of the collar. Intumescent A was 4-mm thick x 43-mm wide x 220-mm long, and Intumescent B was 4-mm thick x 43-mm wide x 200-mm long. Between strips was a layer of 316 stainless steel mesh 210-mm long x 42-mm wide with wire mesh dia. of 0.15-mm (refer drawing # 50R-T dated 31/03/17, by Snap Fire Systems Pty Ltd). Snap collars were surface mounted around the pipe on both exposed and unexposed face of wall and fixed through 3 mounting brackets using 38-mm (10g) course thread laminating screws. The penetrating service comprised a 20 PEX-b pipe (wall thickness of 3-mm) and a 25 PE-x/Al/PE-x pipe (wall thickness of 2.3-mm) were fitted through collar's sleeve which penetrated plasterboard wall through a 51-mm dia. cut-out hole (refer drawing "Specimen # 4, 20 PEX-b + 25 PE-x/Al/PE-x Pipe & 50R", dated 21/03/18, provided by Snap Fire Systems Pty Ltd). The pipe projected horizontally, approx. 2000-mm away from unexposed face of plasterboard wall and approx. 500-mm into the furnace chamber. The pipe was supported at nominally 500-mm and 1000-mm from the unexposed face of the plasterboard wall. The pipe was open at unexposed and capped with a Superwool plug on exposed end.

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

Structural Adequacy	not applicable
Integrity	no failure at 181 minutes
Insulation	175 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/120/120. The FRL of the specimen is limited to that of the fire 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 recognized that a single test method will not provide a full assessment of fire hazard under all fire conditions. This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Peter Gordon Date of Test: 5 April 2018

Issued on the 10th day of September 2018 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

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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. 3143

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 (Section 10, Service penetrations and control joints), 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 1902.

Product Name: SNAP 32R Retrofit fire collar protecting a Telstra 26.75 mm OD Polyvinyl Chloride – Unplasticized (PVC-U) conduit and 5 x Optical Fibres cables

Description: The specimen comprised an 116-mm thick plasterboard lined steel framed wall comprising two layers of 13-mm thick Fyrchek plasterboard on each side of 64-mm deep metal studs, with an established FRL of -/120/120 (refer BRANZ report # FAR2539). The wall was penetrated by Telstra 26.75 mm OD PVC-U conduit and 5 x Optical Fibres cables protected by a SNAP 32R Retrofit fire collar. 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 316 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 5/10/17, by Snap Fire Systems Pty Ltd. Snap collars were surface mounted around the pipe on both exposed and unexposed face of wall and fixed through 3 mounting brackets using 38-mm (10g) course thread laminating screws. The penetrating service comprised a 20-mm Telstra PVC conduit, with a wall thickness of 1.8-mm penetrating wall through a 32-mm dia. cut-out hole as shown in drawing "Specimen # 5, Telstra 20 PVC Conduit + 5 x Optical Fibre Cables & 32R, dated 21/03/18", provided by Snap Fire Systems Pty Ltd. The conduit projected horizontally, 2000-mm away from unexposed face of wall and approx. 500-mm into furnace chamber. The conduit was supported at nominally 500-mm and 1000-mm from unexposed face of the plasterboard wall. The conduit was open at the unexposed and capped with a Superwool plug on the exposed end. The conduit contained five optical fibre cables.

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

Structural Adequacy	not applicable
Integrity	no failure at 181 minutes
Insulation	170 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/120/120. The FRL of the specimen is limited to that of the fire 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 recognized that a single test method will not provide a full assessment of fire hazard under all fire conditions. This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Peter Gordon Date of Test: 5 April 2018

Issued on the 10th day of September 2018 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. 3143

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Certificate of Test

No. 3144

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 (Section 10, Service penetrations and control joints), 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 1902.

Product Name: SNAP 32R Retrofit fire collar protecting two cross-linked polyethylene (Pex B) nom, 20-mm OD pipes

Description: The specimen comprised an 116-mm thick plasterboard lined steel framed wall comprising two layers of 13-mm thick Fyrchek plasterboard on each side of 64-mm deep metal studs, with an established FRL of -/120/120 (refer BRANZ report # FAR2539). The wall was penetrated by two cross-linked polyethylene (Pex B) nom, 20-mm OD pipes protected by a SNAP 32R Retrofit fire collar. 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 316 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 5 October 2017, by Snap Fire Systems Pty Ltd. The Snap collars were surface mounted around the pipe on both the exposed and unexposed face of the wall and fixed through 3 mounting brackets using 38-mm (10g) course thread laminating screws. The penetrating services comprised 2 x 20-mm PEX-b pipes, with a wall thickness of 2.37-mm penetrating the wall through a 44-mm diameter cut-out hole as shown in drawing titled "Specimen # 6, 2 x 20 PEX-b Pipes & 32R, dated 21 March 2018", provided by Snap Fire Systems Pty Ltd. The pipes projected horizontally, 2000-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber. The pipes were supported at nominally 500-mm and 1000-mm from the unexposed face of the plasterboard wall. The pipes were open at the unexposed and capped with a Superwool plug on the exposed end.

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

Structural Adequacy	not applicable
Integrity	no failure at 181 minutes
Insulation	167 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/120/120. The FRL of the specimen is limited to that of the fire 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 recognized that a single test method will not provide a full assessment of fire hazard under all fire conditions. This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Peter Gordon Date of Test: 5 April 2018

Issued on the 10th day of September 2018 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

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Certificate of Test

No. 3145

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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 1902.

Product Name: SNAP 32R Retrofit fire collar protecting two Cross-linked polyethylene (Pex) pipes nom. 20.2-mm OD

Description: The specimen comprised an 116-mm thick plasterboard lined steel framed wall comprising two layers of 13-mm thick Fyrchek plasterboard on each side of 64-mm deep metal studs, with an established FRL of -/120/120 (refer BRANZ report # FAR2539). The wall was penetrated by two Cross-linked polyethylene (Pex) pipes nom. 20.2-mm OD protected by a SNAP 32R Retrofit fire collar. 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 316 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 5 October 2017, by Snap Fire Systems Pty Ltd. The Snap collars were surface mounted around the pipe on both the exposed and unexposed face of the wall and fixed through 3 mounting brackets using 38-mm (10g) course thread laminating screws. The penetrating service comprised a 20 PE-x/Al/PE-x pipe and a 20 PEX-b pipe, with a wall thickness of 2.2-mm and 2.6-mm respectively, penetrating the wall through a 44-mm diameter cut-out hole as shown in drawing titled "Specimen # 9, 20 PE-x/Al/PE-x + 20 PEX-b Pipes & 32R, dated 21 March 2018", provided by Snap Fire Systems Pty Ltd. The pipes projected horizontally, 2000-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber. The pipes were supported at nominally 500-mm and 1000-mm from the unexposed face of the plasterboard wall. The pipes were open at the unexposed and capped with a Superwool plug on the exposed end.

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

Structural Adequacy	not applicable
Integrity	no failure at 181 minutes
Insulation	no failure at 179 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/120/120. The FRL of the specimen is limited to that of the fire 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 recognized that a single test method will not provide a full assessment of fire hazard under all fire conditions. This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.

Testing Officer: Peter Gordon Date of Test: 5 April 2018

Issued on the 10th day of September 2018 without alterations or additions.

B. Roddy

Brett Roddy
Manager, Fire Testing and Assessments

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COPY OF CERTIFICATE OF TEST – NO. 3145

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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