

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

## Test Report

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**Date:** 9 June 2020  
**Client:** IG6 Pty Ltd as trustee for the IG6 IP Trust

Commercial-in-confidence




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

## Sponsored Investigation No. FSP 2090

### 1 Introduction

#### 1.1 Identification of specimen

The sponsor identified the specimens as six (6) retrofit fire collars protecting a plasterboard wall system with service penetrations.

#### 1.2 Sponsor

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

#### 1.3 Manufacturer

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

#### 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 4966/4501

## 1.7 Test date

The fire-resistance test was conducted on 9 March 2020.

# 2 Description of specimen

## 2.1 General

The specimen comprised six (6) retrofit fire collars protecting a plasterboard wall system penetrated by services.

The wall system was described as a 116-mm thick plasterboard lined, steel framed wall comprising two layers of 13-mm thick Firestop plasterboard on each side of 64-mm deep metal studs, (Boral reference SB120.1) with an established FRL of -/120/120 as detailed in Exova Warrington report numbered 27211-00.

For the purpose of the test, the specimens are referenced as Specimen 1, 2, 3, 4, 5 and 6. Documents containing a complete description of each specimen were supplied by the sponsor and are retained on 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 4401 Plastics piping systems for soil and waste discharge (low and high temperature) inside buildings - Polyethylene (PE).

### Specimen 1 - SNAP 50R Retrofit fire collars protecting a 40-mm HDPE (PE80) pipe.

The SNAP Retrofit 50R fire collar comprised a 0.75-mm thick 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 which comprised 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 two intumescent wraps was a layer of 316 grade stainless steel mesh, 210-mm long x 42-mm wide with wire mesh diameter of 0.15-mm, as shown in drawing titled "SNAP 50 Retro", dated 18 January 2019, 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 10-gauge x 38-mm course thread laminating screws.

The penetrating service comprised a 40.32-mm outside diameter Geberit HDPE (PE80) pipe, with a wall thickness of 3.06-mm which penetrated the wall through a 50-mm diameter cut-out hole as shown in drawing titled "Specimen #1 40 HDPE Stack & 50R", dated 29 January 2020, by Snap Fire Systems Pty Ltd. 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 plasterboard wall. The pipe was left open at the unexposed end and plugged with ceramic fibre on the exposed end.

### Specimen 2 - SNAP 50R Retrofit fire collars protecting a nominal 40-mm PVC pipe.

The SNAP Retrofit 50R fire collar comprised a 0.75-mm thick 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 which comprised two soft 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 grade stainless steel mesh 210-mm long x 42-mm wide with wire mesh diameter of 0.15-mm, as shown in drawing titled "SNAP 50 Retro", dated 18 January 2019, 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 10-gauge x 38-mm course thread laminating screws.

The penetrating service comprised a 42.78-mm outside diameter Iplex PVC pipe, with a wall thickness of 2.03-mm which penetrated the wall through a 58-mm diameter cut-out hole as shown in drawing titled "Specimen #2 40 PVC Stack & 50R", dated 29 January 2020, by Snap Fire Systems Pty Ltd. 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 plasterboard wall. The pipe was left open at the unexposed end and capped with a PVC end cap on the exposed end.

### Specimen 3 - SNAP 65-80R Retrofit fire collars protecting a nominal 80-mm PVC pipe incorporating a coupling inside the collar.

The SNAP Retrofit 65-80R fire collar comprised a 0.75-mm steel casing with a 94-mm inner diameter and a 178-mm diameter base flange. The 61.5-mm high collar casing incorporated a closing mechanism that was comprised of two soft 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 titled "SNAP 65-80 Retro" dated 25 March 2019, 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 M4 expandable steel anchors.

The penetrating service comprised an 81.5-mm outside diameter Iplex PVC pipe with 2.88-mm wall thickness and incorporated a PVC coupling with a total wall thickness of 5.76-mm fitted through the collar's sleeve on the exposed face. The pipe penetrated the plasterboard wall through a 87-mm diameter cut-out hole and projected horizontally 2000-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber as shown in drawing titled "Specimen #3 80 PVC Stack + Fitting & 65-80R", dated 29 January 2020, by Snap Fire Systems Pty Ltd. The pipe was supported at nominally 500-mm and 1000-mm from the unexposed face of the plasterboard wall. The pipe was left open at the unexposed end and capped with a PVC end cap on the exposed end.

Specimen 4 - SNAP 50R Retrofit fire collars protecting a nominal 40-mm PVC pipe incorporating a coupling inside the 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 which comprised 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 grade stainless steel mesh 210-mm long x 42-mm wide with wire mesh diameter of 0.15-mm, as shown in drawing titled "SNAP 50 Retro", dated 18 January 2019, 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 10 gauge x 38-mm course thread laminating screws.

The penetrating service comprised a 42.78-mm outside diameter Iplex PVC pipe with a wall thickness of 2.03-mm and a PVC coupling with a total wall thickness of 4.03-mm fitted through the collar's sleeve on the exposed face. The pipe penetrated the plasterboard wall through a 50-mm diameter cut-out hole as shown in drawing titled "Specimen #4, 40 PVC Stack + Fitting & 50R", dated 29 January 2020, by Snap Fire Systems Pty Ltd. 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 plasterboard wall. The pipe was left open at the unexposed end and capped with a PVC end cap on the exposed end.

Specimen 5 - SNAP 110R Retrofit fire collars protecting a nominal 110-mm HDPE (PE100) pipe.

The SNAP Retrofit 110R fire collar comprised a 0.75-mm steel casing with a 122-mm inner diameter and a 206-mm diameter base flange. The 62-mm high collar casing incorporated a closing mechanism that was comprised of three soft Intumesh intumescent wraps and wire meshes lined within the internal circumference of the collar. Intumescent A was 2.5-mm thick x 58-mm wide x 424-mm long, Intumescent B was 2.5-mm thick x 58-mm wide x 407-mm long and Intumescent C was 2.5-mm thick x 58-mm wide x 389-mm long. Between intumescent strips A and B was a layer of 316 stainless steel mesh 415-mm long x 58-mm wide and between intumescent strips B and C was a layer of 316 stainless steel mesh 398-mm long x 58-mm wide both had wire mesh diameters of 0.15-mm, as shown in drawing titled "SNAP 110 Retro", dated 16 January 2019, by Snap Fire Systems Pty Ltd. The Snap fire collars were surface mounted around the pipe on both the exposed and unexposed face of the wall and fixed through 3 mounting brackets using 10 gauge x 38-mm course thread laminating screws.

The penetrating service comprised a 108.68-mm outside diameter Vinidex HDPE (PE100), with a wall thickness of 4.94-mm fitted through the collar's sleeve. The pipe penetrated the wall through a 114-mm diameter opening and 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 plasterboard wall, as shown in drawing titled "Specimen #5 110 HDPE Stack & 110R", dated 29 January 2020, by Snap Fire Systems Pty Ltd. The pipe was left open on the unexposed end and capped with a ceramic fibre plug on the exposed end.

### Specimen 6 - SNAP HP150R Retrofit fire collar protecting a nominal 160-mm polyvinyl chloride sandwich construction (PVC-SC) pipe incorporating a coupling inside the collar.

The SNAP retrofitted HP150R collar comprised a 0.95-mm thick steel casing with a 175-mm inner diameter and a 326-mm base flange. The 117-mm high collar casing incorporated a strip of 570-mm long x 112-mm wide x 8-mm thick Intumescent intumescent material. The closing mechanism comprised four SPR-SS400-102 stainless steel springs bound with nylon fuse links, and a 590-mm x 109-mm 316 stainless steel mesh as shown in drawing titled “SNAP 150 High Profile Retro” dated 5 October 2017, by Snap Fire Systems Pty. The Snap fire collars were surface mounted around the pipe on both the exposed and unexposed face of the wall and fixed through 4 mounting brackets using M4 expandable steel anchors.

The penetrating service comprised a 161.8-mm outside diameter Pipemakers PVC-SC pipe, with a wall thickness of 4.32-mm fitted through the collar’s sleeve on the exposed face. The pipe penetrated the wall through a 168-mm diameter opening and 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 plasterboard wall, as shown in drawing titled “Specimen #6, 150 PVC-SC Stack + Fitting & HP150R”, dated 29 January 2020, by Snap Fire Systems Pty Ltd. The pipe was open on the unexposed end and capped on the exposed end with a PVC end cap.

## 2.2 Dimensions

The wall specimen was nominally 1150-mm wide x 1150-mm high x 116-mm thick.

## 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 10 February 2020 and left under standard laboratory atmospheric conditions until the test date.

## 2.5 Selection, construction and installation of the specimen and the supporting construction

The supporting wall construction and specimen installation was organised by the sponsor. CSIRO was not involved in the selection of the materials.

## 3 Documentation

The following documents were supplied or referenced by the sponsor as a complete description of the specimen and should be read in conjunction with this report:

- Drawing titled “Test Wall W-20-A Layout”, dated 28 January 2020, by Snap Fire Systems Pty Ltd.
- Drawing titled “Specimen #1 40 HDPE Stack & 50R”, dated 29 January 2020, by Snap Fire Systems Pty Ltd.
- Drawing titled “Specimen #2 40 PVC Stack & 50R”, dated 29 January 2020, provided by Snap Fire Systems Pty Ltd.
- Drawing titled “Specimen #3 80 PVC Stack + Fitting & 65-80R”, dated 29 January 2020, provided by Snap Fire Systems Pty Ltd.
- Drawing titled “Specimen #4, 40 PVC Stack + Fitting & 50R”, dated 29 January 2020, provided by Snap Fire Systems Pty Ltd.
- Drawing titled “Specimen #5 110 HDPE Stack & 110R”, dated 29 January 2020, provided by Snap Fire Systems Pty Ltd.
- Drawing titled “Specimen #6, 150 PVC-SC Stack + Fitting & HP150R”, dated 29 January 2020, provided by Snap Fire Systems Pty Ltd.
- Drawing titled “SNAP 50 Retro”, dated 18 January 2019, by Snap Fire Systems Pty Ltd.
- Drawing titled “SNAP 110 Retro”, dated 16 January 2019, by Snap Fire Systems Pty Ltd.
- Drawing titled “SNAP 65-80 Retro” dated 25 March 2019, by Snap Fire Systems Pty Ltd.
- Drawing titled “SNAP 150 High Profile Retro” dated 5 October 2017, 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 22°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
40 seconds -	Smoke is being emitted between the collar and pipe of Specimens 1, 2, 3, 5 and 6.
1 minute -	Smoke is fluing from the end of the large PVC-SC pipe of Specimen 6.
2 minutes -	Black intumescent material is being expelled between the collar and pipe of Specimens 1 and 2. Smoke is fluing from the end of the pipe of Specimen 4.
3 minutes -	Smoke is fluing from the end of the pipe of Specimens 3 and 5. Smoke has ceased being emitted from the specimens except for Specimen 6.
4 minutes -	The level of smoke fluing from the end of the pipe of Specimen 6 has increased.
5 minutes -	The level of smoke fluing from the end of the pipe of Specimens 3 and 6 has reduced.
6 minutes -	The level of smoke fluing from the end of the pipe of Specimen 5 has increased.
8 minutes -	The level of smoke fluing from the end of the pipe of Specimens 5 and 6 has reduced.
14 minutes -	Smoke fluing from the end of the pipe of Specimens 1, 2, 3, 4 and 5 has virtually ceased. Smoke continues to flue from the end of pipe of Specimen 6.
23 minutes -	Smoke has resumed being emitted between the collar and pipe of Specimens 1, 2 and 3.
47 minutes -	The base of the pipe of Specimen 4 has begun to discolour. (Photograph 6).
61 minutes -	The base of the pipe of Specimen 2 continues to discolour. (Photograph 7).

- 65 minutes - Smoke is being emitted at the base of the pipe of Specimen 5.
- 68 minutes - The level of smoke fluing from the end of the pipe of Specimen 6 has increased.
- 72 minutes - Smoke is being emitted between the collar and pipe of all specimens.
- 73 minutes - The level of smoke fluing from the end of the pipe of Specimens 3 and 5 has increased. Liquid has condensed inside the pipe of Specimen 6
- 76 minutes - Faulty thermocouple 19 has been replaced.
- 84 minutes - The top of the pipe inside the collar of Specimen 6 has begun to deform.
- 90 minutes - A gap has formed between the pipe and collar of Specimen 6. Cotton pad test applied above pipe adjacent to the gap – no ignition noted at this time.
- 100 minutes - Black intumescent material is being expelled and filling the gap between the collar and pipe of Specimens 6. The level of smoke fluing between the collar and pipe has increased. Cotton pad test applied above pipe adjacent to the gap – no ignition noted at this time.
- 105 minutes - The top of the pipe inside the collar of Specimen 5 has begun to deform.
- 107 minutes - The top of the pipe inside the collar of Specimen 4 has begun to deform.
- 110 minutes - Smoke has resumed fluing from the end of the pipe of Specimen 2.
- 120 minutes - Smoke is fluing from the end of the of Specimens 3, 4, 5 and 6.
- 128 minutes - Insulation Failure of Specimen 6 – maximum temperature rise of 180K is exceeded on the left side of collar 25-mm from the wall of Specimen 6.
- 141 minutes - Insulation Failure of Specimen 5 – maximum temperature rise of 180K is exceeded on the top of collar 25-mm from the wall of Specimen 5.
- 149 minutes - Insulation Failure of Specimen 4 – maximum temperature rise of 180K is exceeded on the plasterboard wall 25-mm above the collar of Specimen 4.
- 150 minutes - Insulation Failure of Specimen 3 – maximum temperature rise of 180K is exceeded on the top of collar 25-mm from the wall of Specimen 3.
- 155 minutes - The plasterboard wall around the base of Specimen 6 has begun to discolour.
- 161 minutes - The base of the pipes of Specimens 3, 4, and 5 have deformed and detached around the collar.
- 172minutes - Insulation Failure of Specimen 1 – maximum temperature rise of 180K is exceeded on the top of collar 25-mm from the wall of Specimen 1.
- 175 minutes - Intumescent material has filled the inside of collars of all specimens.
- 181 minutes - Insulation Failure of Specimen 2 – maximum temperature rise of 180K is exceeded on the plasterboard wall 25-mm above the collar of Specimen 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 temperature versus time associated with Specimen 1.

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

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

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

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

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

## 8.5 Performance

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

### Specimen 1 - SNAP 50R Retrofit fire collars protecting a 40-mm HDPE (PE80) pipe

Structural adequacy	-	not applicable
Integrity	-	no failure at 181 minutes
Insulation	-	172 minutes

### Specimen 2 - SNAP 50R Retrofit fire collars protecting a nominal 40-mm PVC pipe

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

### Specimen 3 - SNAP 65-80R Retrofit fire collars protecting a nominal 80-mm PVC pipe incorporating a coupling inside the collar

Structural adequacy	-	not applicable
Integrity	-	no failure at 181 minutes
Insulation	-	150 minutes

### Specimen 4 - SNAP 50R Retrofit fire collars protecting a nominal 40-mm PVC pipe incorporating a coupling inside the collar

Structural adequacy	-	not applicable
Integrity	-	no failure at 181 minutes
Insulation	-	149 minutes

Specimen 5 - SNAP 110R Retrofit fire collars protecting a nominal 110-mm HDPE (PE100) pipe

Structural adequacy	-	not applicable
Integrity	-	no failure at 181 minutes
Insulation	-	141 minutes

Specimen 6 - SNAP HP150R Retrofit fire collars protecting a nominal 160-mm polyvinyl chloride sandwich construction (PVC-SC) pipe incorporating a coupling inside the collar

Structural adequacy	-	not applicable
Integrity	-	no failure at 181 minutes
Insulation	-	128 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 2	-	-/120/120
Specimen 3	-	-/120/120
Specimen 4	-	-/120/120
Specimen 5	-	-/120/120
Specimen 6	-	-/120/120

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

The test was conducted on a wall system with an established FRL of -/120/120. The maximum FRL of any test specimen cannot exceed the FRL achieved by the wall system in which it was installed.

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

A handwritten signature in blue ink, appearing to read 'Peter Gordon', with a stylized flourish at the end.

Peter Gordon  
Testing Officer

# Appendices

## Appendix A – Measurement location

SPECIMEN	T/C Position	Designation
<b>Specimen 1</b> – 40.32-mm OD Geberit pipe (PE80) with a wall thickness of 3.06-mm protected with Snap 50R Fire collars retro-fitted to both sides of the wall through a 50 mm opening.	On P/B wall, 25-mm above collar	S1
	On P/B wall, 25-mm right of collar	S2
	On collar top	S3
	On collar right side	S4
	On top of pipe, 25-mm from collar	S5
	On bottom of pipe, 25-mm from collar	S6
<b>Specimen 2</b> – 42.78-mm OD Iplex pipe (PVC) with a wall thickness of 2.03-mm protected with Snap 50R Fire collars retro-fitted to both sides of the wall through a 58 mm opening.	On P/B wall, 25-mm above collar	S7
	On P/B wall, 25-mm left of collar	S8
	On collar top	S9
	On collar right side	S10
	On top of pipe, 25-mm from collar	S11
	On right side of pipe, 25-mm from collar	S12
<b>Specimen 3</b> – 81.5-mm OD Iplex pipe (PVC), having a wall thickness of 2.88-mm protected with Snap 65-80R Fire collars retro-fitted to both sides of the wall through a 87 mm opening. With the coupling fitted inside the collar.	On P/B wall, 25-mm above collar	S13
	On P/B wall, 25-mm left of collar	S14
	On collar top	S15
	On collar left side	S16
	On left side of pipe, 25-mm from collar	S17
	On right side of pipe, 25-mm from collar	S18
<b>Specimen 4</b> – 42.78-mm OD Iplex pipe (PVC) with a wall thickness of 2.03-mm protected with Snap 50R Fire collars retro-fitted to both sides of the wall through a 50 mm opening. With the coupling fitted inside the collar.	On P/B wall, 25-mm above collar	S19
	On P/B wall, 25-mm left of collar	S20
	On collar top side	S21
	On collar bottom side	S22
	On top of pipe, 25-mm from collar	S23
	On bottom of pipe, 25-mm from collar	S24
<b>Specimen 5</b> – 108.68-mm OD Vinindex pipe (PE100) having a wall thickness of 4.94-mm protected with Snap 110R Fire collars retro-fitted to both sides of the wall through a 114 mm opening.	On P/B wall, 25-mm above collar	S25
	On P/B wall, 25-mm right of collar	S26
	On collar top side	S27
	On collar bottom side	S28
	On top of pipe, 25-mm from collar	S29
	On pipe left side, 25-mm from collar	S30
<b>Specimen 6</b> – 161.8-mm OD Pipemakers pipe (PVC) having a wall thickness of 4.32-mm protected with Snap HP150R Fire collars retro-fitted to both sides of the wall through a 168-mm opening.	On P/B wall, 25-mm above collar	S31
	On P/B wall, 25-mm left of collar	S32
	On collar top	S33
	On collar left side	S34
	On top of pipe, 25-mm from collar	S35
	On pipe left side, 25-mm from collar	S36
Rover		S37
Ambient		S38

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 1 MINUTE OF TESTING**

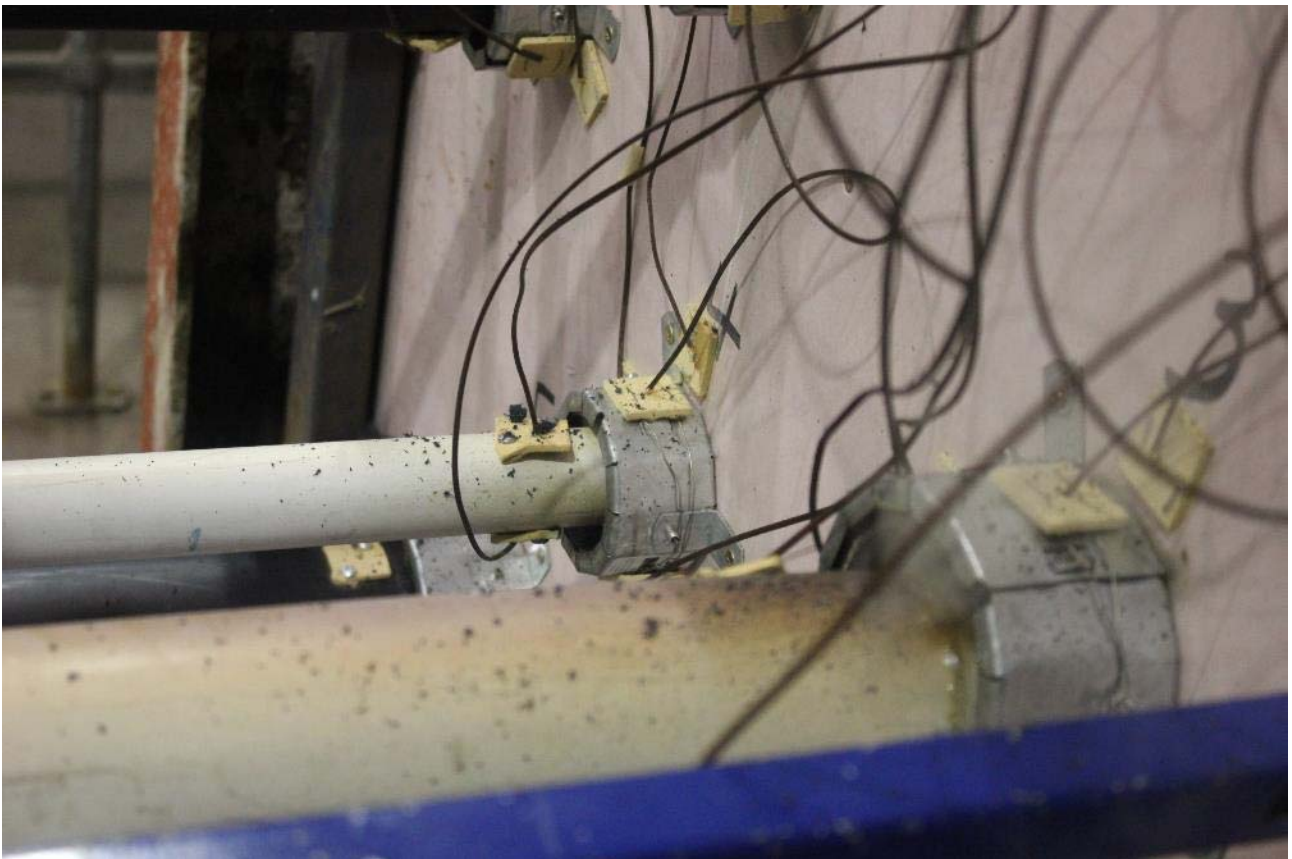


**PHOTOGRAPH 4 – SPECIMENS AFTER 3 MINUTES OF TESTING**





**PHOTOGRAPH 5 – SPECIMENS AFTER 30 MINUTES OF TESTING**



**PHOTOGRAPH 6 – SPECIMENS 3 AND 4 AFTER 49 MINUTES OF TESTING**





**PHOTOGRAPH 7 – SPECIMENS AFTER 60 MINUTES OF TESTING**



**PHOTOGRAPH 8 – SPECIMENS AFTER 90 MINUTES OF TESTING**





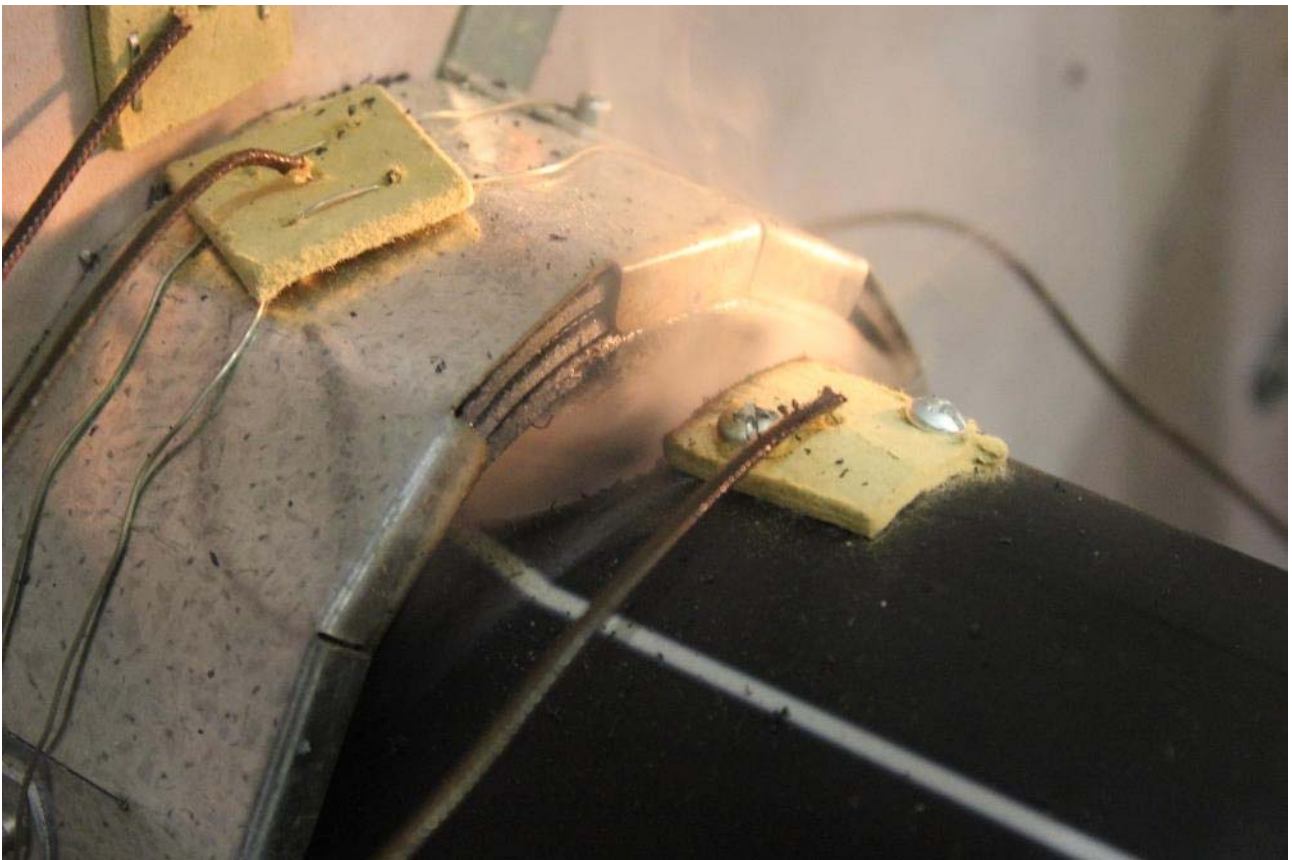
**PHOTOGRAPH 9 – SPECIMEN 6 AFTER 92 MINUTES OF TESTING**



**PHOTOGRAPH 10 – SPECIMEN 6 AFTER 100 MINUTES OF TESTING**



**PHOTOGRAPH 11 – SPECIMEN 5 AFTER 105 MINUTES OF TESTING**



**PHOTOGRAPH 12 – SPECIMEN 4 AFTER 107 MINUTES OF TESTING**





**PHOTOGRAPH 13 – SPECIMENS AFTER 120 MINUTES OF TESTING**



**PHOTOGRAPH 14 – SPECIMENS AFTER 150 MINUTES OF TESTING**





**PHOTOGRAPH 15 – SPECIMENS AFTER 154 MINUTES OF TESTING**



**PHOTOGRAPH 16 – SPECIMENS AFTER 180 MINUTES OF TESTING**





**PHOTOGRAPH 17 – SPECIMENS AT CONCLUSION OF TESTING**



**PHOTOGRAPH 18 – EXPOSED FACE OF SPECIMENS AT CONCLUSION OF TESTING**

Appendix C – Furnace Temperature

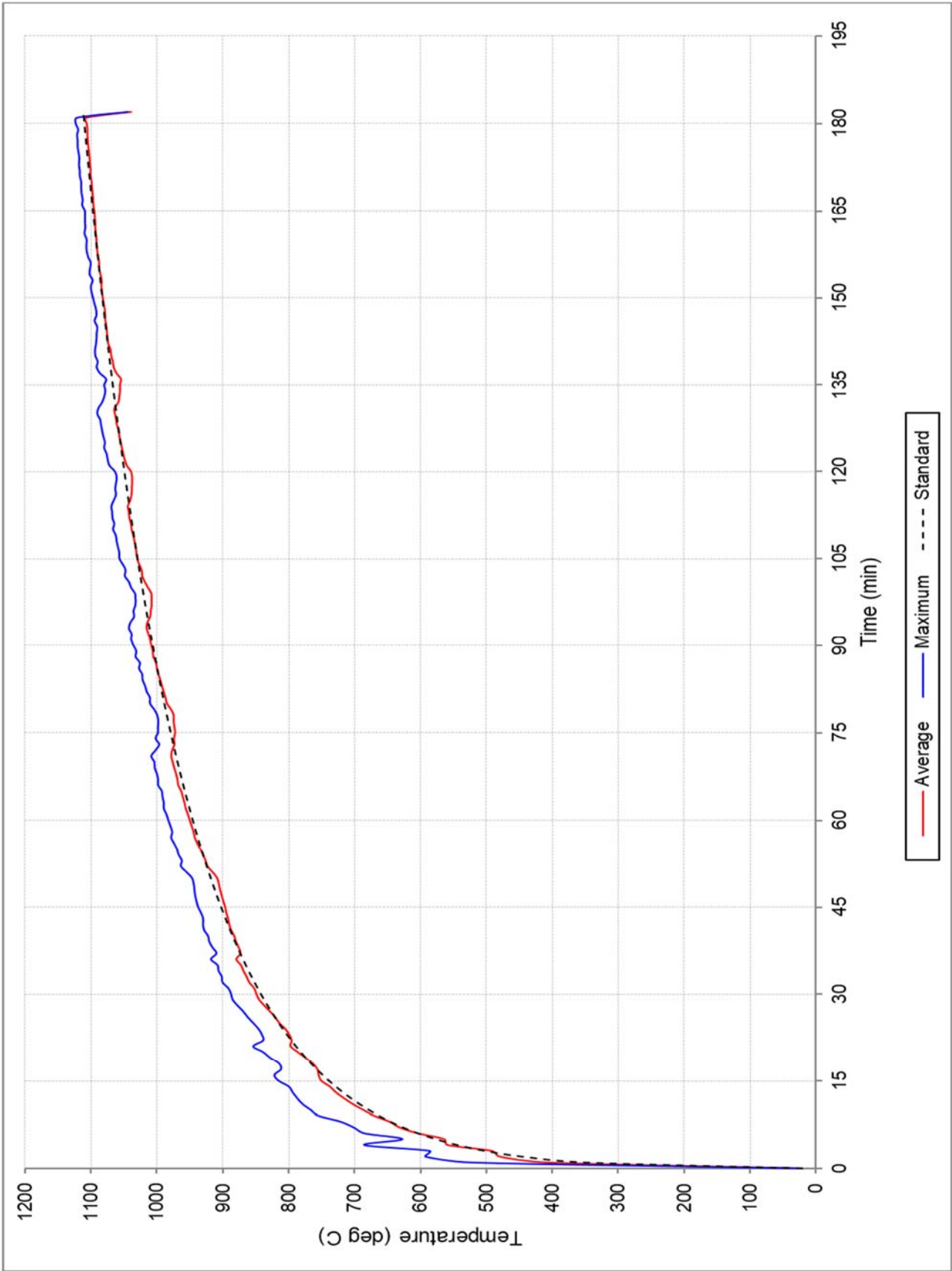


FIGURE 1 – FURNACE TEMPERATURE

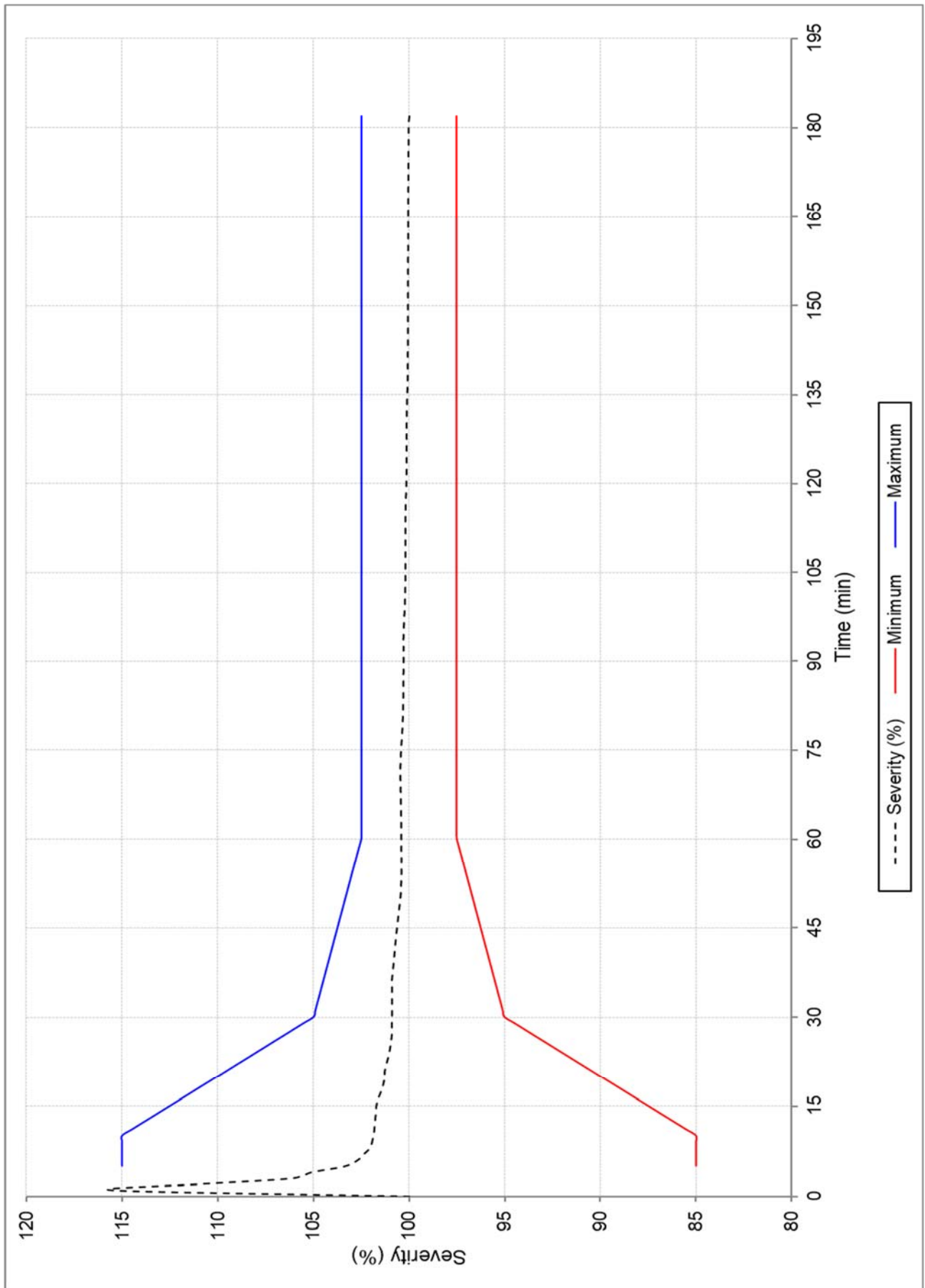


FIGURE 2 – FURNACE SEVERITY



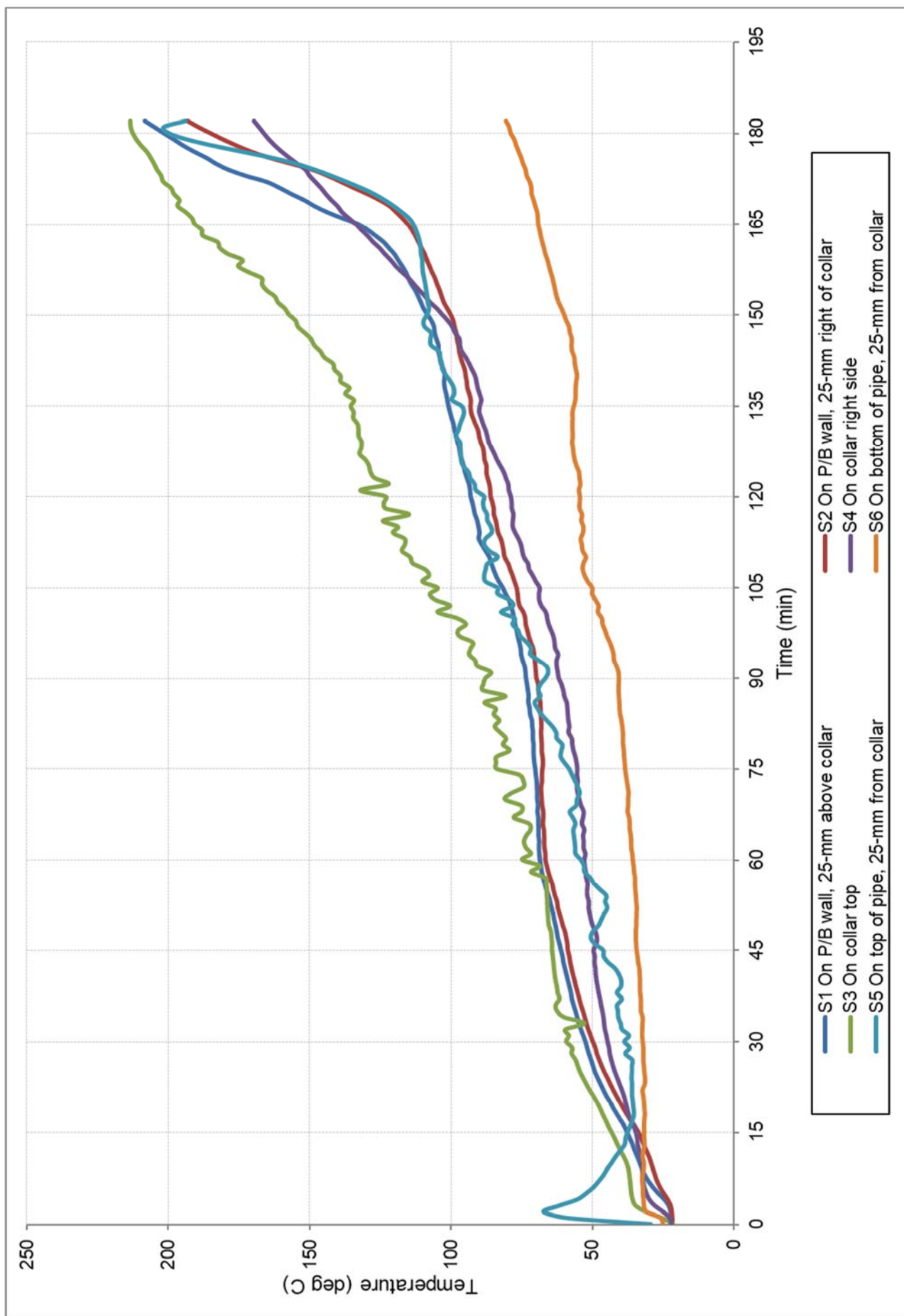


FIGURE 3 - TEMPERATURE VERSUS TIME ASSOCIATED WITH SPECIMEN #1



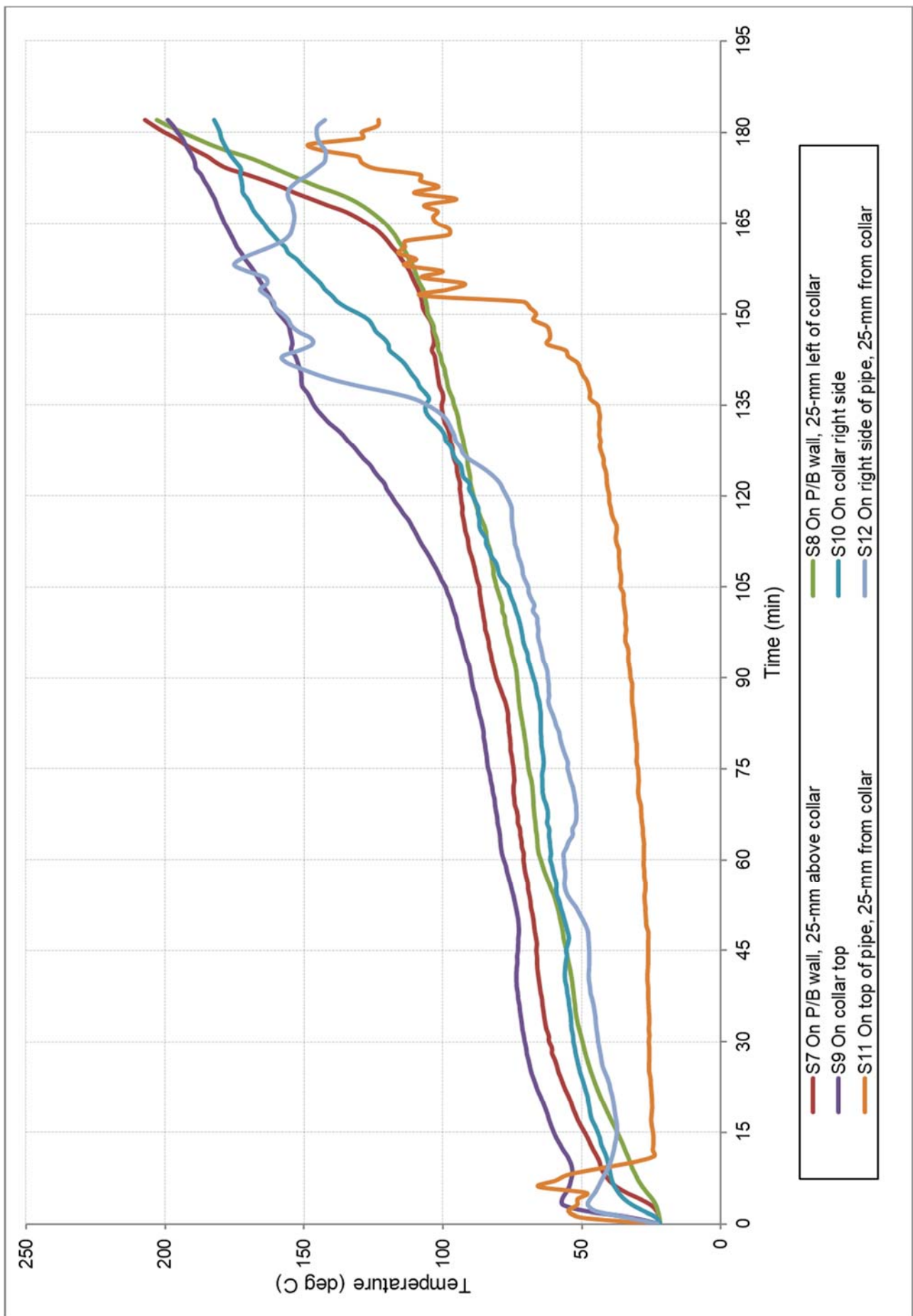


FIGURE 4 - TEMPERATURE VERSUS TIME ASSOCIATED WITH SPECIMEN #2

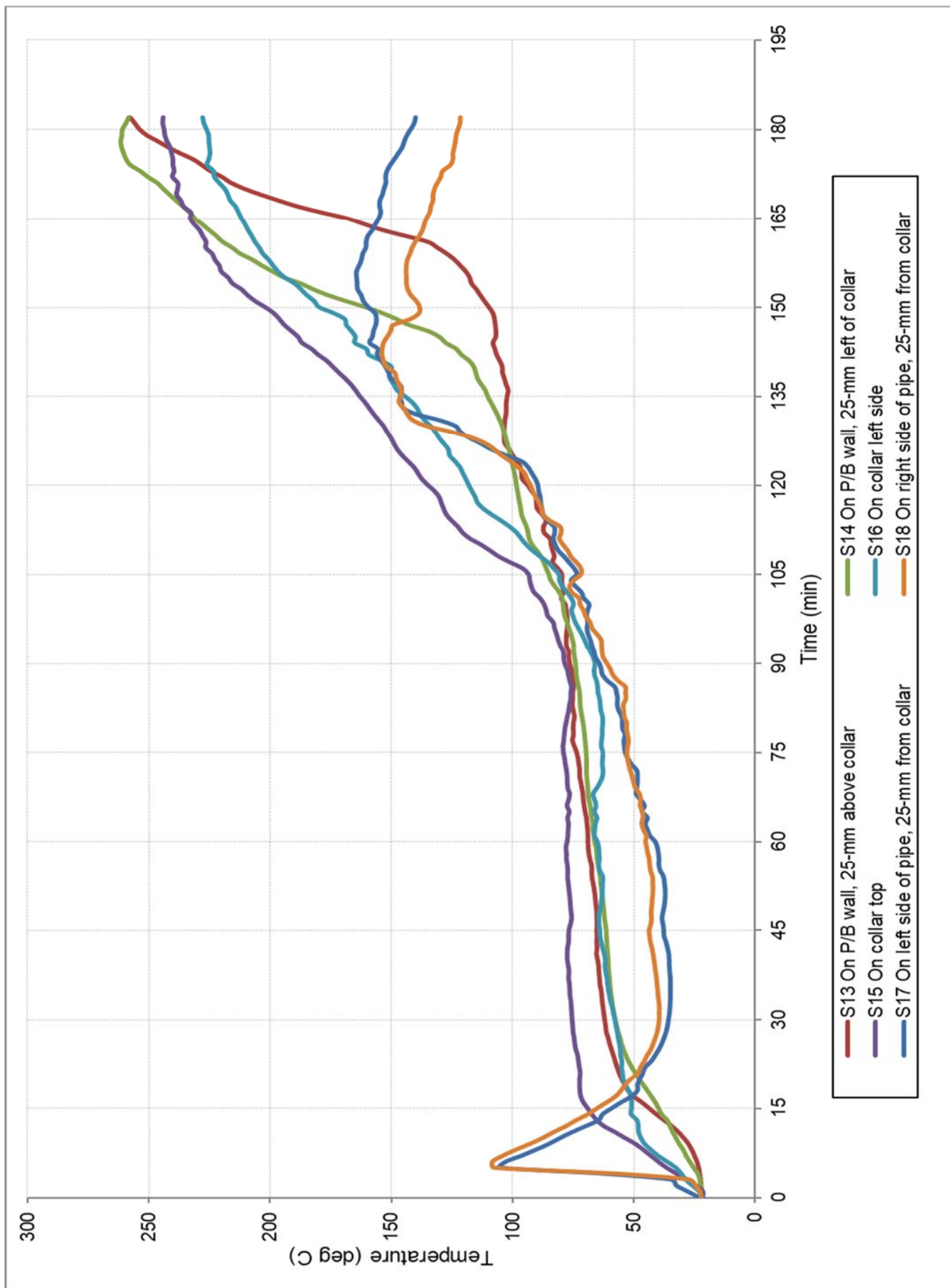


FIGURE 5 - TEMPERATURE VERSUS TIME ASSOCIATED WITH SPECIMEN #3

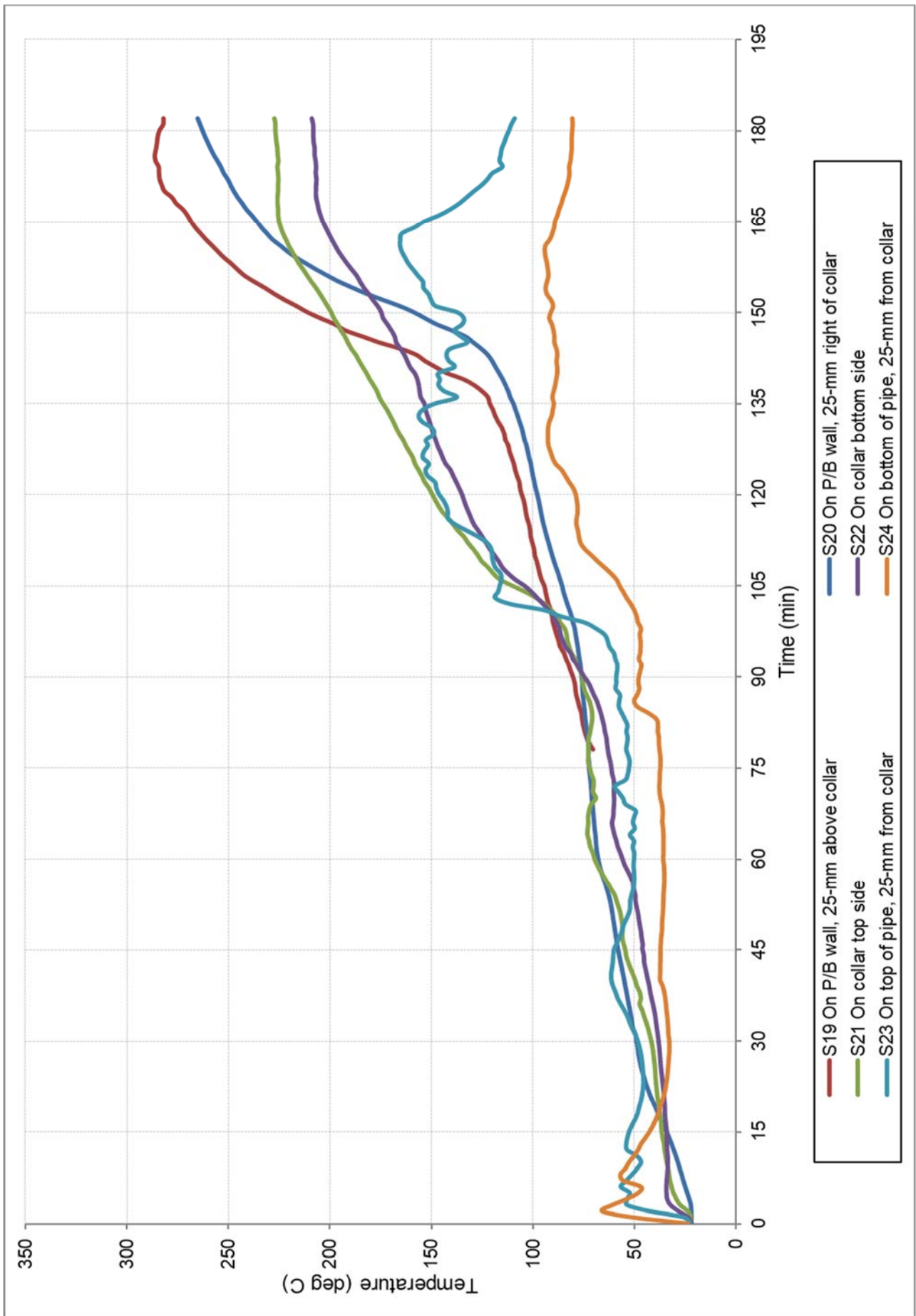


FIGURE 6 - TEMPERATURE VERSUS TIME ASSOCIATED WITH SPECIMEN #4

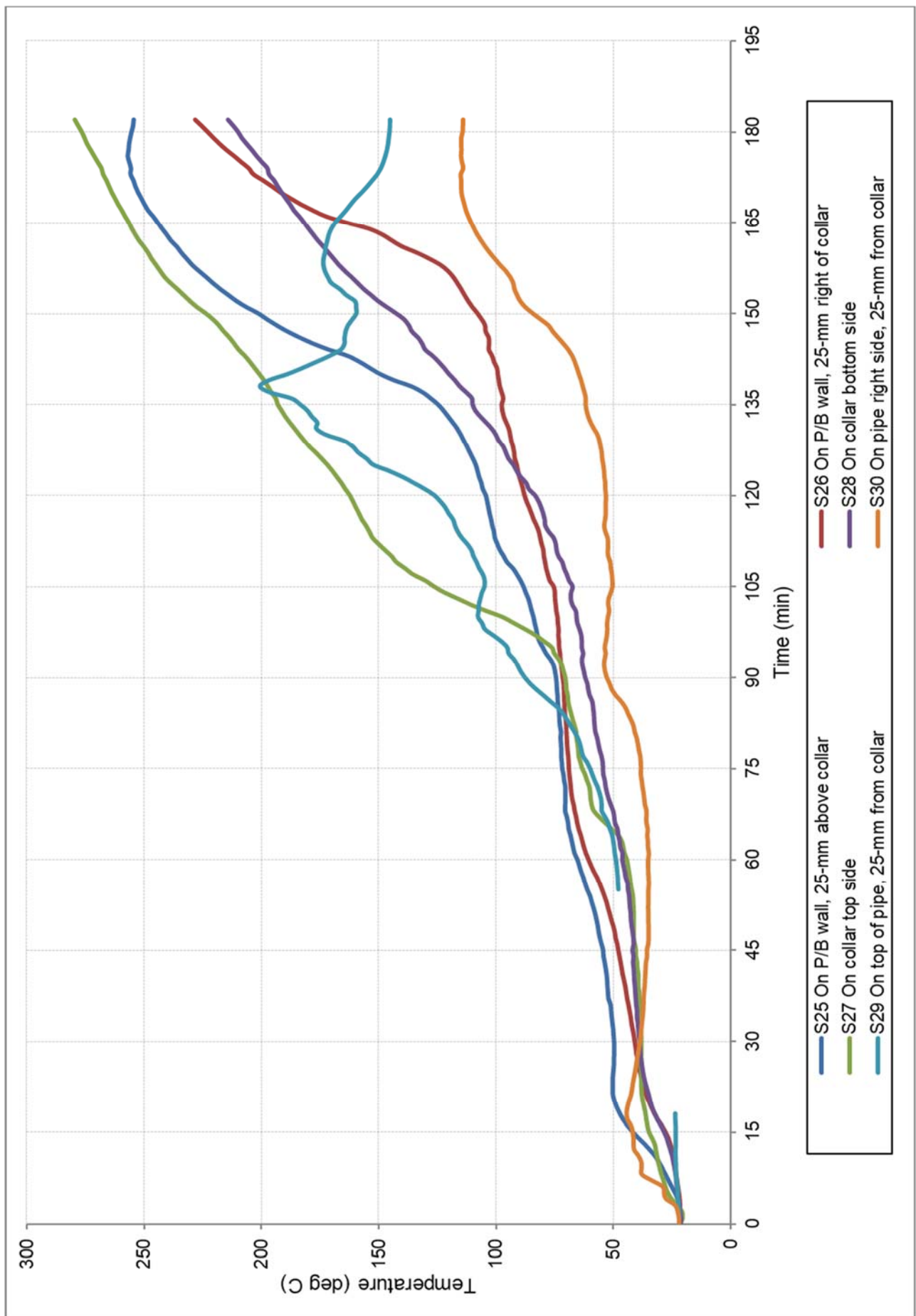


FIGURE 7 - TEMPERATURE VERSUS TIME ASSOCIATED WITH SPECIMEN #5

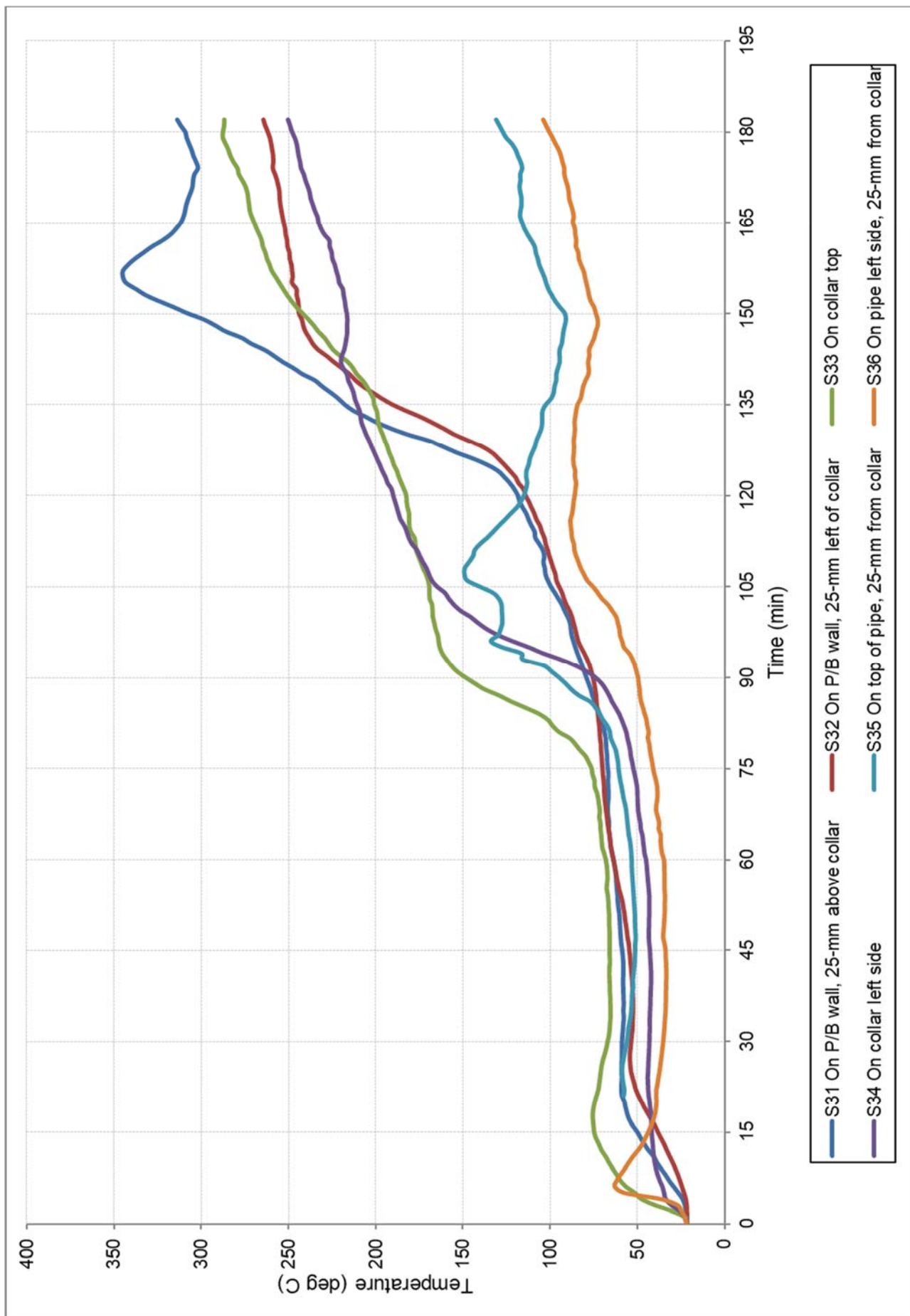


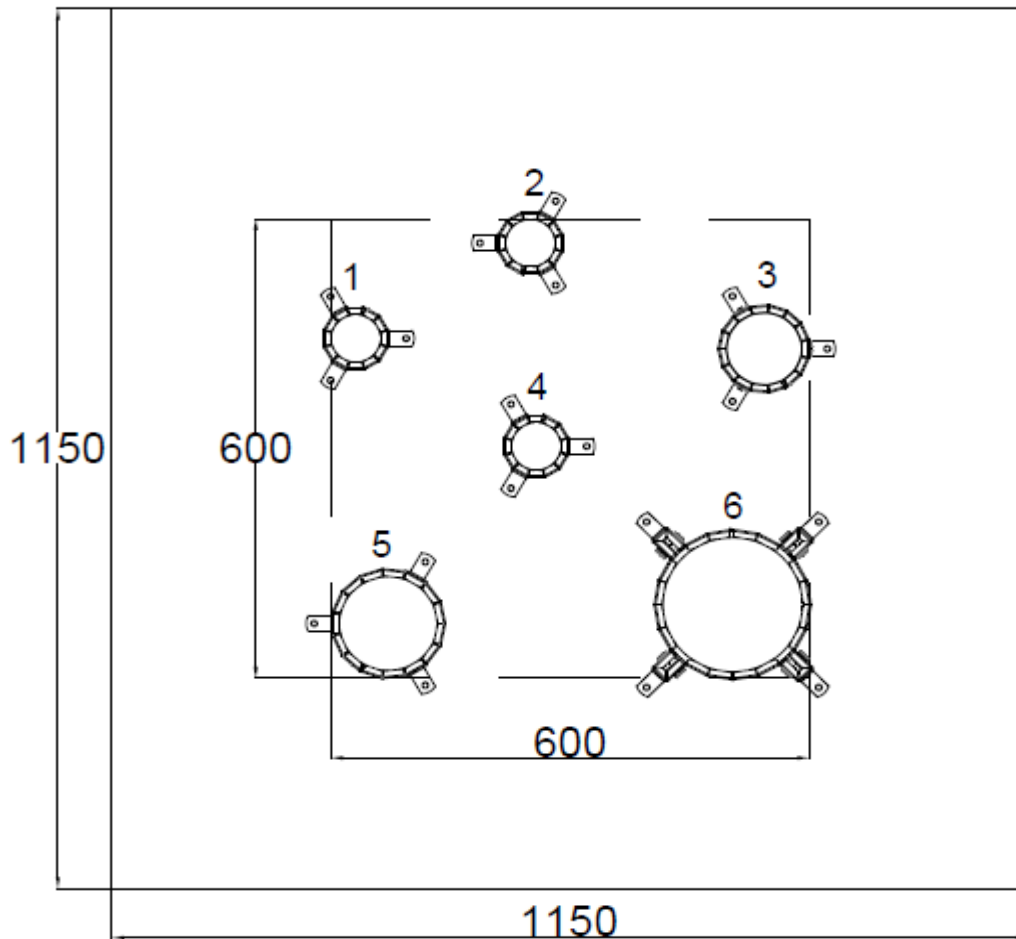
FIGURE 8 - TEMPERATURE VERSUS TIME ASSOCIATED WITH SPECIMEN #6

## Appendix D – Layout and installation drawings

### Snap Fire Systems Pty Ltd

Test Wall W-20-A Layout

Date: 28 Jan 2020



Penetration	Collar Code	Pipe Type	Pipe Diameter (mm)
1	50R	HDPE	40
2	50R	PVC	40
3	65-80R	PVC	80
4	50R	PVC	40
5	110R	HDPE	110
6	HP150R	PVC-SC	150

**DRAWING TITLED "TEST WALL W-20-A LAYOUT, DATED 28 JANUARY 2020, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD.**

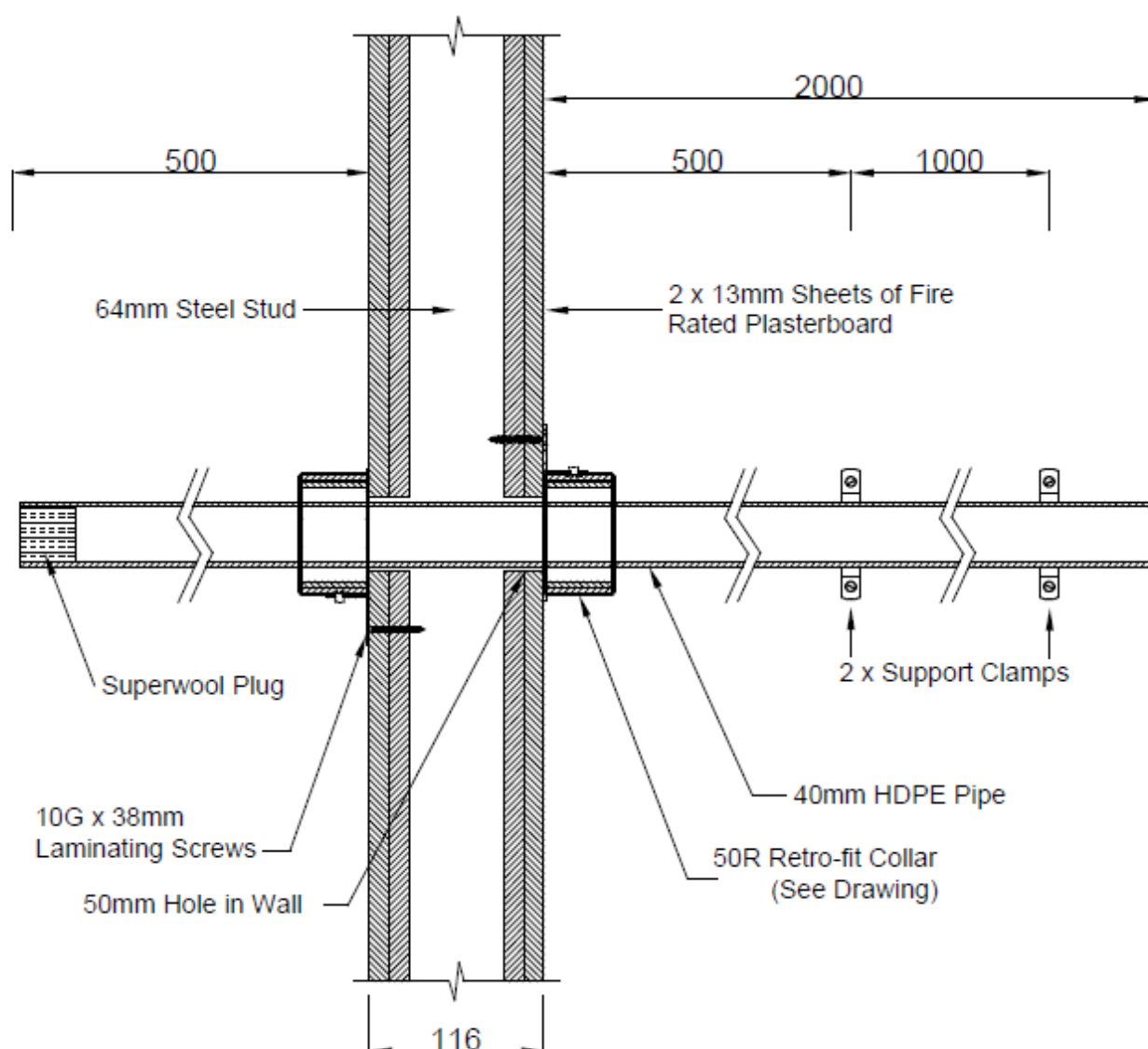


# Snap Fire Systems Pty Ltd

Specimen #1

40 HDPE Stack & 50R

Date: 29 JAN 2020



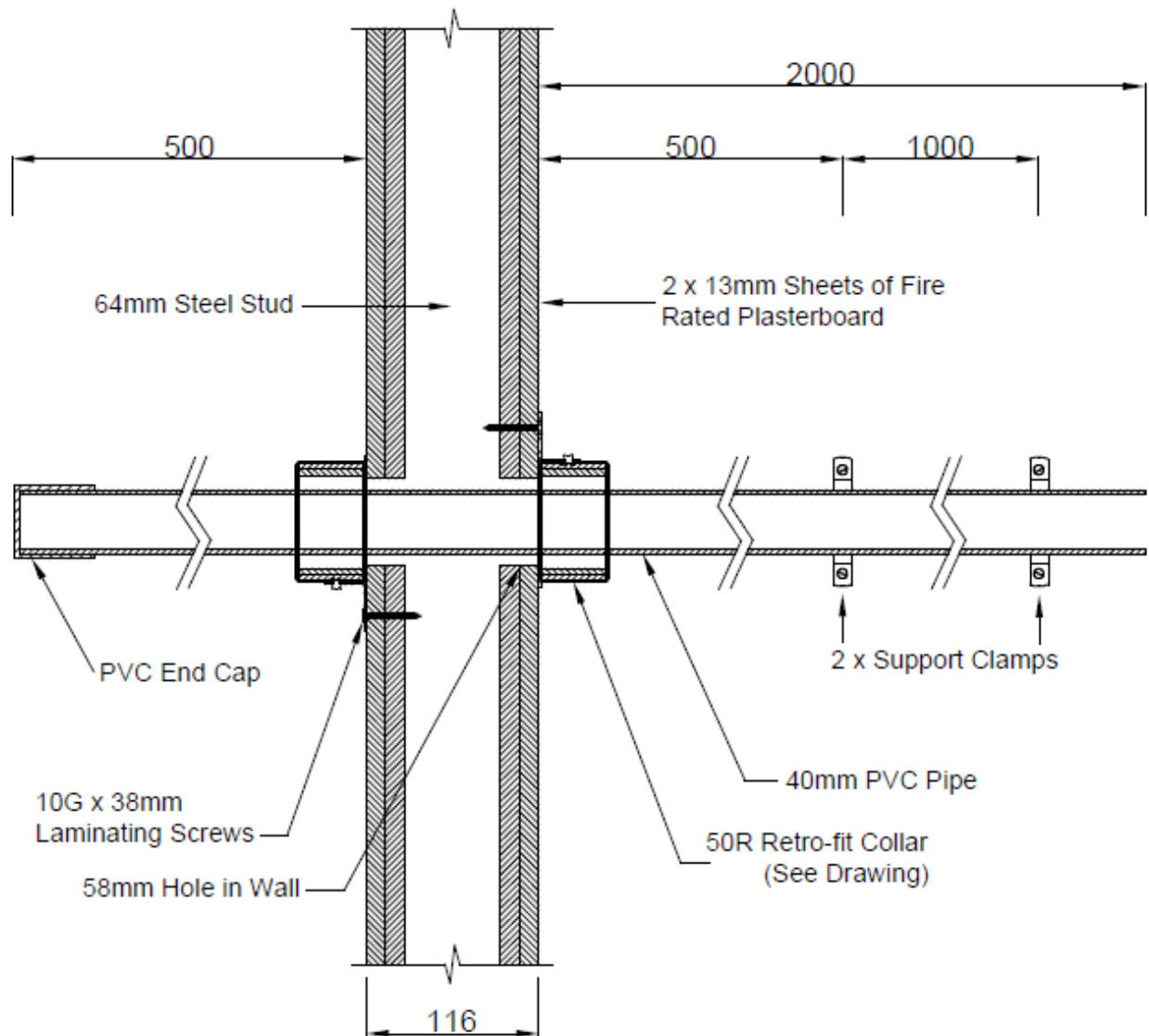
DRAWING TITLED "SPECIMEN #1, 40 HDPE STACK & 50R", DATED 29 JANUARY 2020, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD

# Snap Fire Systems Pty Ltd

Specimen #2

40 PVC Stack & 50R

Date: 29 JAN 2020



DRAWING TITLED "SPECIMEN #2, 40 PVC STACK PIPE & 50R", DATED 29 JANUARY 2020, PROVIDED BY SNAP FIRE SYSTEMS PTY LTD

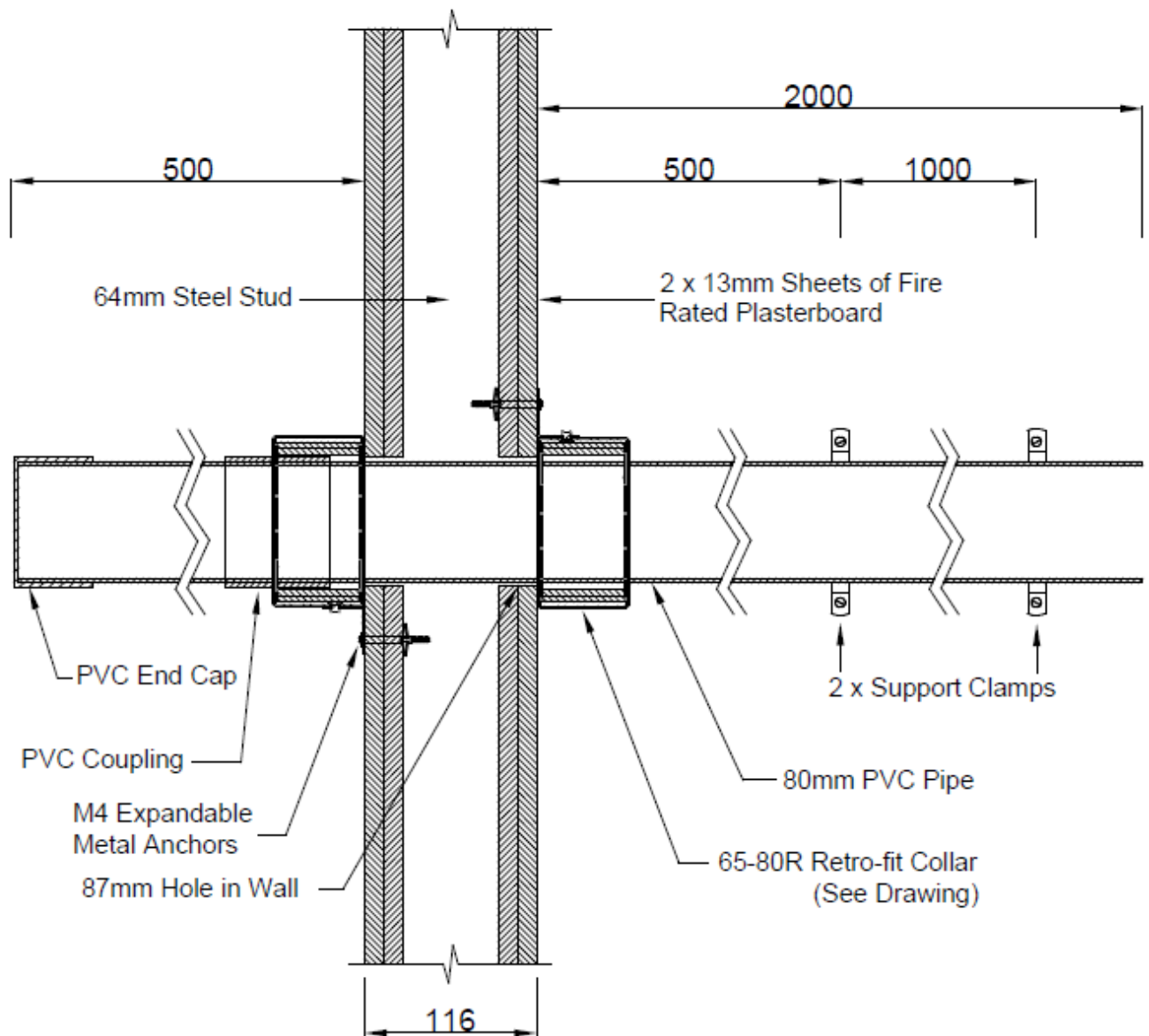


# Snap Fire Systems Pty Ltd

Specimen #3

80 PVC Stack + Fitting & 65-80R

Date: 29 JAN 2020



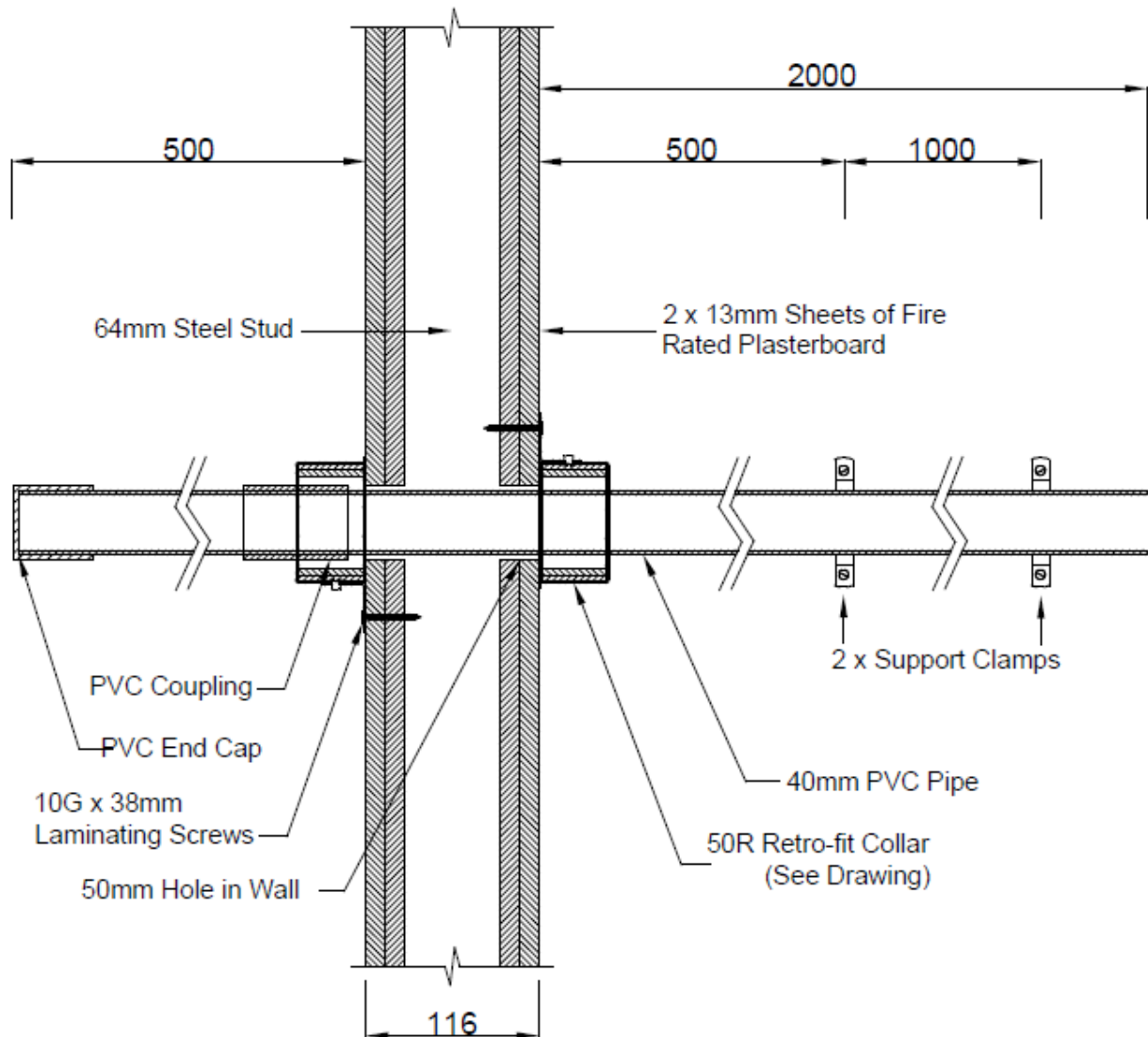
DRAWING TITLED "SPECIMEN #3 80 PVC STACK + FITTING & 65-80R", DATED 29 JANUARY 2020, PROVIDED BY  
SNAP FIRE SYSTEMS PTY LTD

# Snap Fire Systems Pty Ltd

Specimen #4

40 PVC Stack + Fitting & 50R

Date: 29 JAN 2020



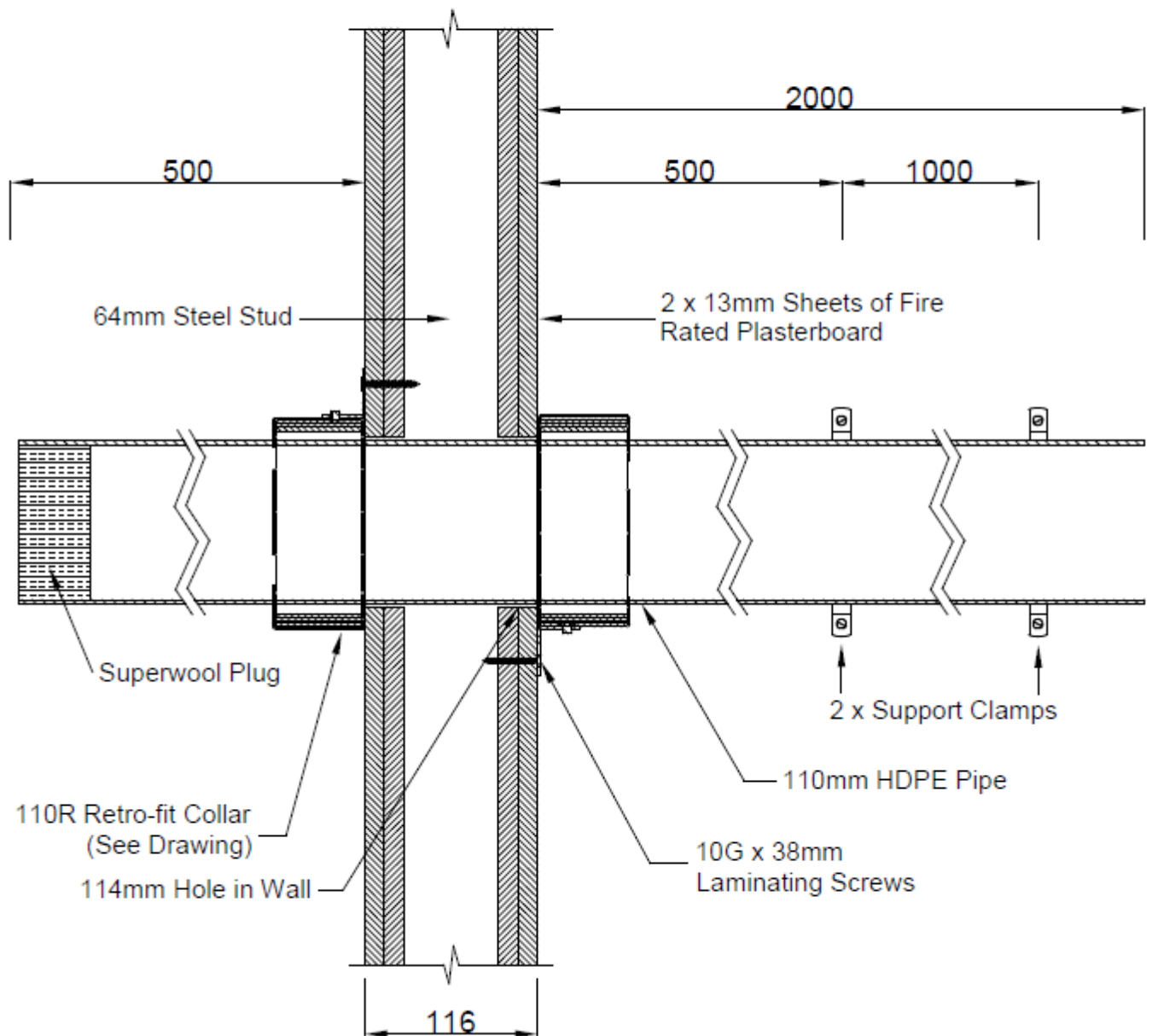
DRAWING TITLED "SPECIMEN #4, 40 PVC STACK + FITTING & 50R", DATED 29 JANUARY 2020, PROVIDED BY  
SNAP FIRE SYSTEMS PTY LTD

# Snap Fire Systems Pty Ltd

## Specimen #5

## 110 HDPE Stack & 110R

Date: 29 JAN 2020|



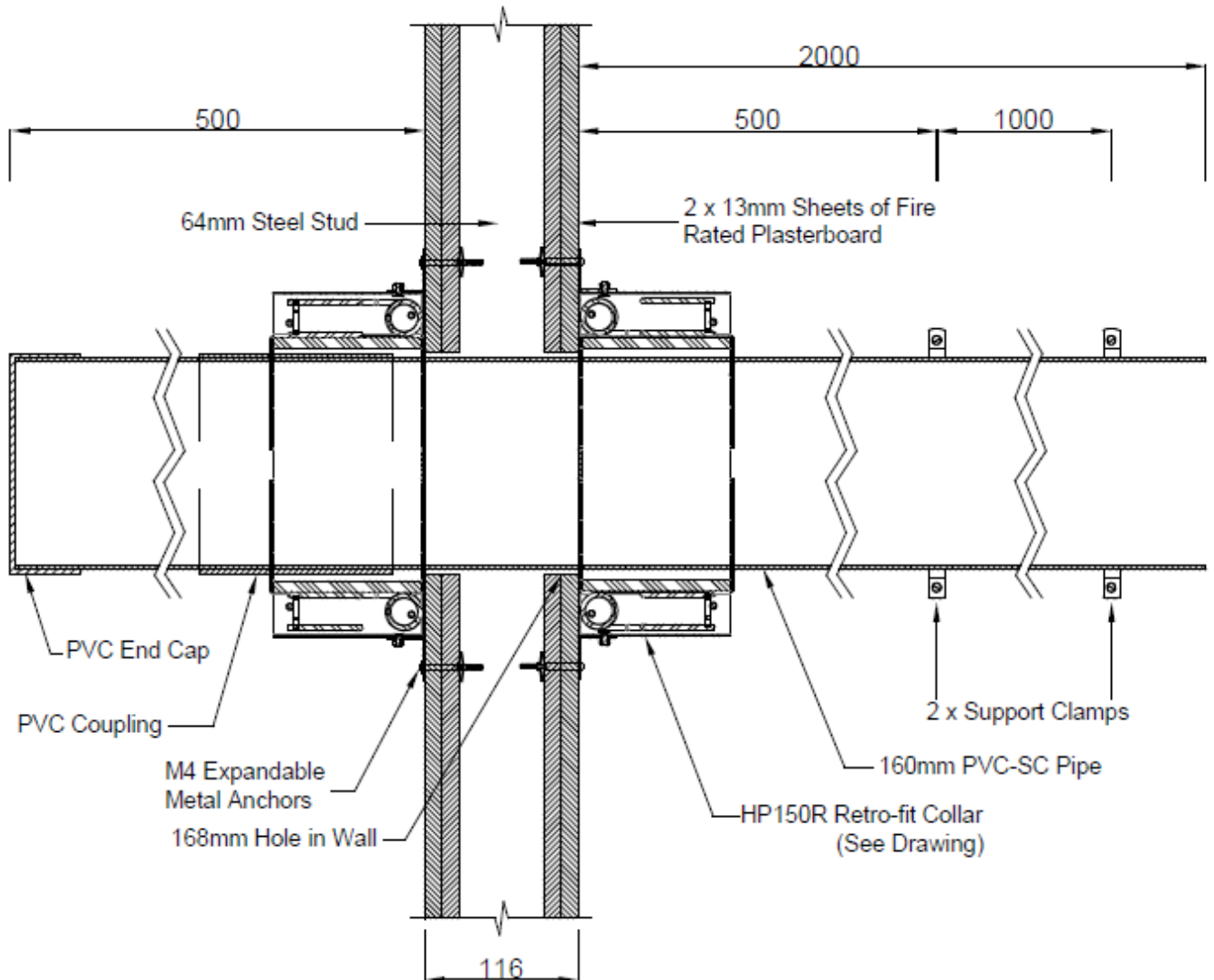
**DRAWING TITLED "SPECIMEN #5, 110 HDPE STACK & 110R", DATED 29 JANUARY 2020, PROVIDED BY SNAP  
FIRE SYSTEMS PTY LTD**

# Snap Fire Systems Pty Ltd

Specimen #6

150 PVC-SC Stack + Fitting & HP150R

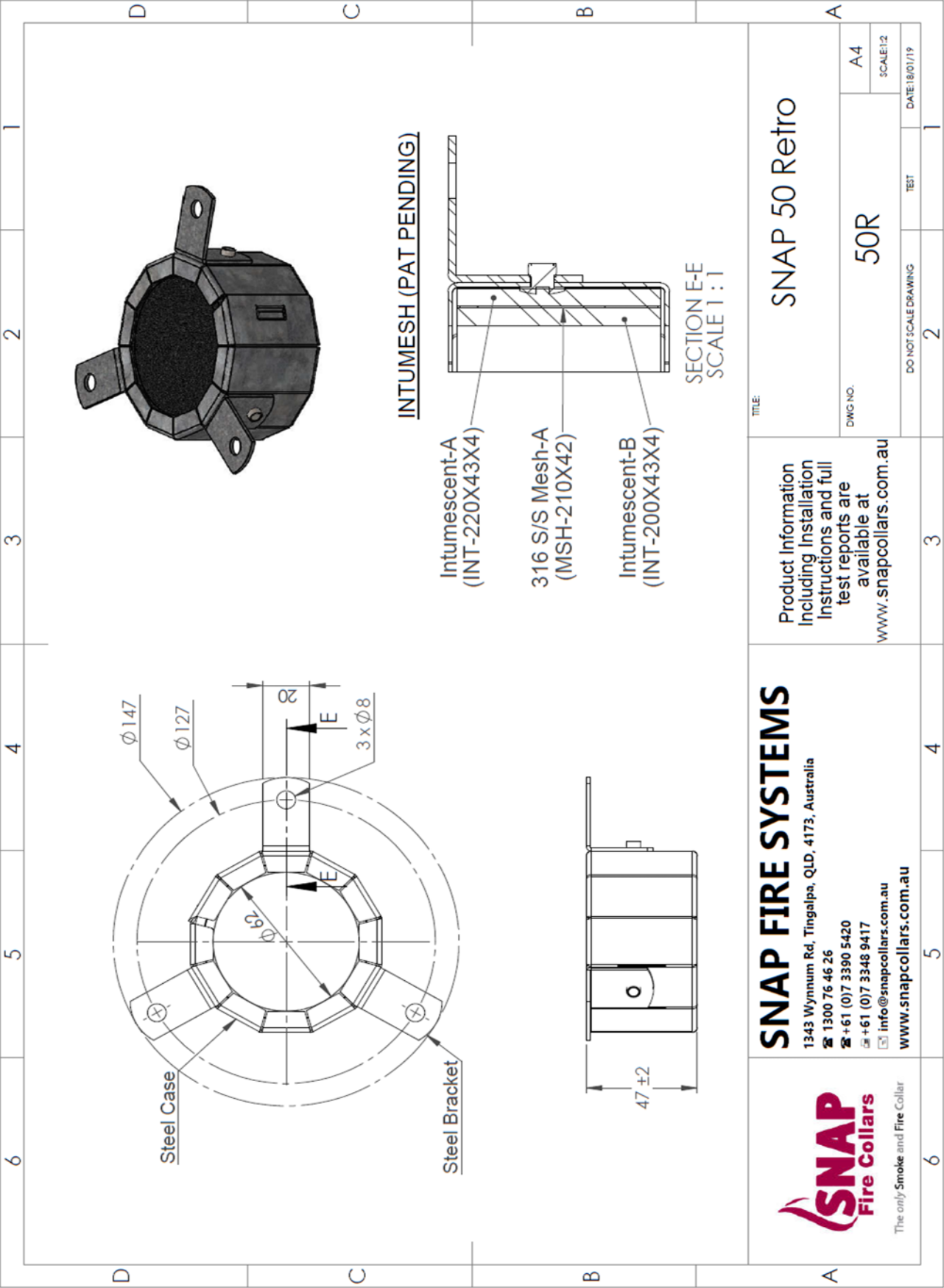
Date: 29 JAN 2020



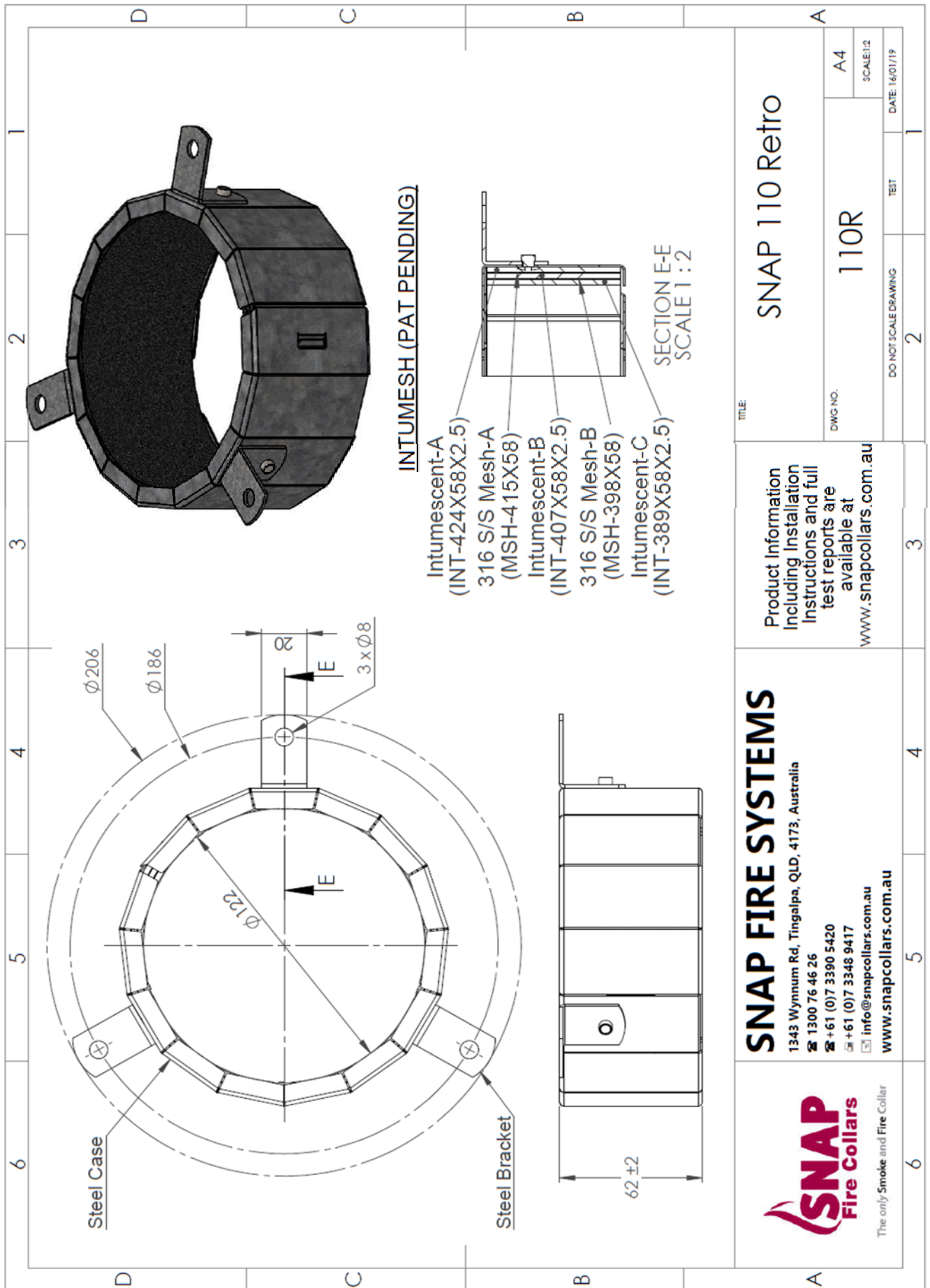
DRAWING TITLED "SPECIMEN #6, 150 PVC-SC STACK + FITTING & HP150R", DATED 29 JANUARY 2020,  
PROVIDED BY SNAP FIRE SYSTEMS PTY LTD



# Appendix E – Specimen Drawings

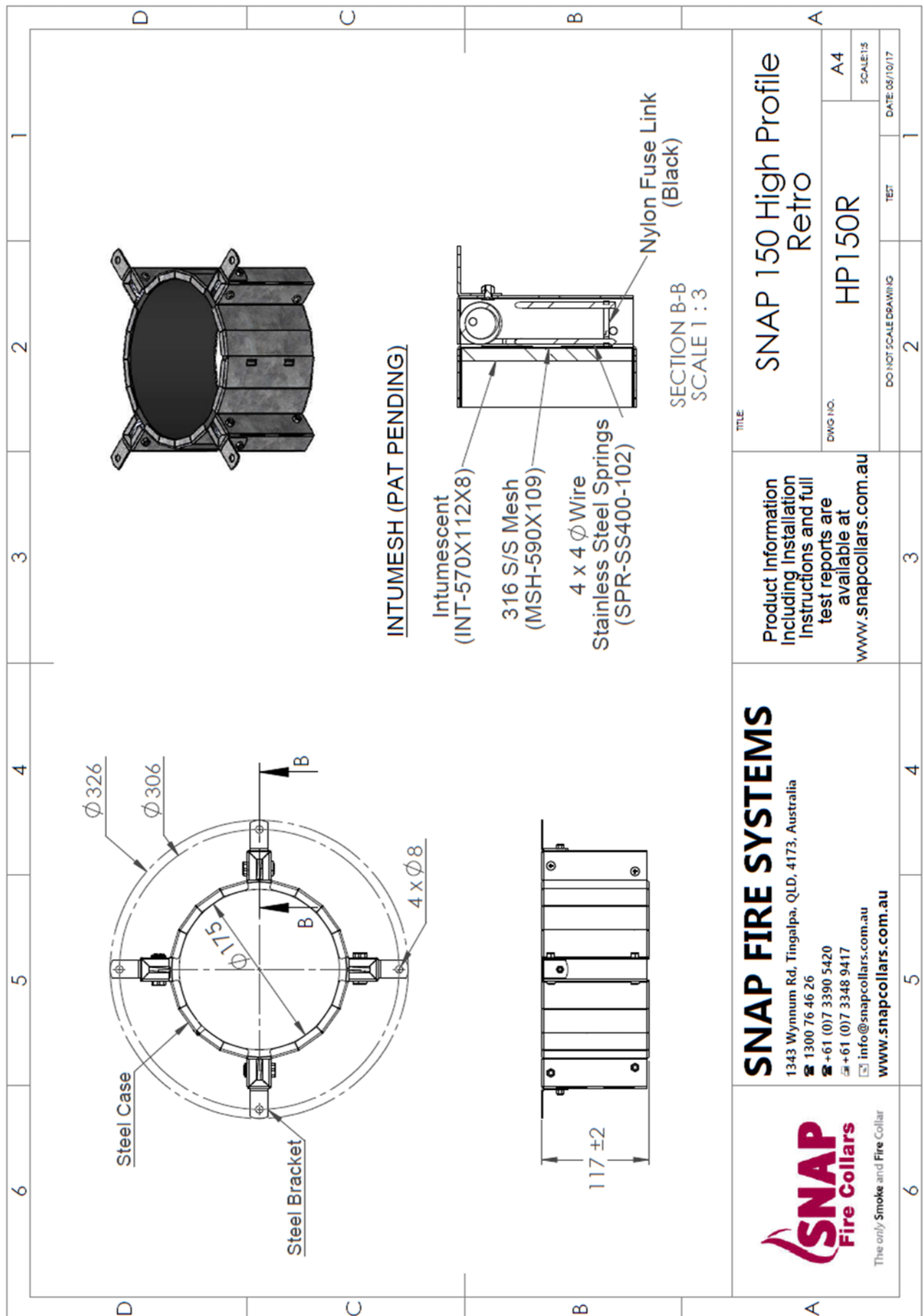


DRAWING NUMBERED 50R, SNAP 50 RETRO, DATED 18 JANUARY 2019, BY SNAP FIRE SYSTEMS PTY LTD.



DRAWING NUMBERED 110R, SNAP 110 RETRO, DATED 16 JANUARY 2019, BY SNAP FIRE SYSTEMS PTY LTD.










DRAWING TITLED "SNAP 150 HIGH PROFILE RETRO", DATED 5 OCTOBER 2017, BY SNAP FIRE SYSTEMS PTY LTD.



## 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													
<h3>Certificate of Test</h3>		No. 3434											
<p>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:</p> <p>IG6 Pty Ltd as trustee for the IG6 IP Trust 3 Skirmish Court Victoria Point Qld 4165</p> <p>A full description of the test specimen and the complete test results are detailed in the Division's report numbered FSP 2090.</p> <p>Product Name: SNAP 50R Retrofit fire collars protecting a 40-mm HDPE (PE80) pipe (Specimen 1)</p> <p>Description: The specimen comprised a retrofit fire collar protecting a plasterboard wall system penetrated by a service. The wall system was described as a 116 mm thick plasterboard lined, steel framed wall comprising two layers of 13-mm thick Firestop plasterboard on each side of 64 mm deep metal studs, (Boral reference SB120.1) with an established FRL of -/120/120 as detailed in Exova Warrington report numbered 27211-00. The SNAP Retrofit 50R fire collar comprised a 0.75-mm thick 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 which comprised two soft Intumescent 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 two intumescent wraps was a layer of 316 grade stainless steel mesh, 210-mm long x 42-mm wide with wire mesh diameter of 0.15-mm. 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 10-gauge x 38-mm course thread laminating screws. The penetrating service comprised a 40.32-mm outside diameter Geberit HDPE (PE80) pipe, with a wall thickness of 3.06 mm which penetrated the wall through a 50-mm diameter cut-out hole. 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 plasterboard wall. The pipe was left open at the unexposed end and plugged with ceramic fibre on exposed end.</p> <p>Performance observed in respect of the following AS 1530.4-2014 criteria</p> <table><tbody><tr><td>Structural Adequacy</td><td>-</td><td>not applicable</td></tr><tr><td>Integrity</td><td>-</td><td>no failure at 181 minutes</td></tr><tr><td>Insulation</td><td>-</td><td>172 minutes</td></tr></tbody></table> <p>and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/120/120.</p> <p>The fire-resistance level is applicable when the system is exposed to fire from either direction. The maximum FRL of any test specimen cannot exceed the FRL achieved by the wall system in which it was installed. 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. This certificate is provided for general information only and does not comply with regulatory requirements for evidence of compliance.</p> <p>Testing Officer: Peter Gordon      Date of Test: 9 March 2020</p> <p>Issued on the 9<sup>th</sup> day of June 2020 without alterations or additions.</p> <p> Brett Roddy   Manager, Fire Testing and Assessments</p> <p>"Copyright CSIRO 2020 ©" Copying or alteration of this report without written authorisation from CSIRO is forbidden</p> <table border="1"><tbody><tr><td></td><td>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</td></tr></tbody></table>			Structural Adequacy	-	not applicable	Integrity	-	no failure at 181 minutes	Insulation	-	172 minutes		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
Structural Adequacy	-	not applicable											
Integrity	-	no failure at 181 minutes											
Insulation	-	172 minutes											
	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. 3434**



## Certificate of Test

No. 3435

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 report numbered FSP 2090.

Product Name: SNAP 50R Retrofit fire collars protecting a nominal 40-mm PVC pipe (Specimen 2)

Description: The specimen comprised a retrofit fire collar protecting a plasterboard wall system penetrated by a service. The wall system was described as a 116 mm thick plasterboard lined, steel framed wall comprising two layers of 13-mm thick Firestop plasterboard on each side of 64 mm deep metal studs, (Boral reference SB120.1) with an established FRL of -/120/120 as detailed in Exova Warrington report numbered 27211-00. The SNAP Retrofit 50R fire collar comprised a 0.75-mm thick 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 which comprised two soft 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 grade stainless steel mesh 210-mm long x 42-mm wide with wire mesh diameter of 0.15-mm. 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 10-gauge x 38-mm course thread laminating screws. The penetrating service comprised a 42.78-mm outside diameter Iplex PVC pipe, with a wall thickness of 2.03 mm which penetrated the wall through a 58-mm diameter cut-out hole. 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 plasterboard wall. The pipe was left open at the unexposed end 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	-	181 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/120/120.

The fire-resistance level is applicable when the system is exposed to fire from either direction. The maximum FRL of any test specimen cannot exceed the FRL achieved by the wall system in which it was installed. 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. 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: 9 March 2020

Issued on the 9<sup>th</sup> day of June 2020 without alterations or additions.

Brett Roddy | Manager, Fire Testing and Assessments

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**COPY OF CERTIFICATE OF TEST – NO. 3435**



## Certificate of Test

No. 3436

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 report numbered FSP 2090.

Product Name: SNAP 65-80R Retrofit fire collars protecting a nominal 80-mm PVC pipe + coupling inside the collar (Specimen 3)

Description: The specimen comprised a retrofit fire collar protecting a plasterboard wall system penetrated by a service. The wall system was described as a 116 mm thick plasterboard lined, steel framed wall comprising two layers of 13-mm thick Firestop plasterboard on each side of 64 mm deep metal studs, (Boral reference SB120.1) with an established FRL of -/120/120 as detailed in Exova Warrington report numbered 27211-00. The SNAP Retrofit 65-80R fire collar comprised a 0.75-mm steel casing with a 94-mm inner diameter and a 178-mm diameter base flange. The 61.5-mm high collar casing incorporated a closing mechanism that was comprised of two soft Intumescent 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. 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 M4 expandable steel anchors. The penetrating service comprised an 81.5-mm outside diameter Iplex PVC pipe with 2.88-mm wall thickness and incorporated a PVC coupling with a total wall thickness of 5.76-mm fitted through the collar's sleeve on the exposed face. The pipe penetrated the plasterboard wall through an 87 mm diameter cut-out hole and 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 1000-mm from the unexposed face of the plasterboard wall. The pipe was left 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	-	150 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/120/120.

The fire-resistance level is applicable when the system is exposed to fire from either direction. The maximum FRL of any test specimen cannot exceed the FRL achieved by the wall system in which it was installed. 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. 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: 9 March 2020

Issued on the 9<sup>th</sup> day of June 2020 without alterations or additions.

*B. Roddy*

Brett Roddy | Manager, Fire Testing and Assessments

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## Certificate of Test

No. 3437

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 report numbered FSP 2090.

Product Name: SNAP 50R Retrofit fire collars protecting a nominal 40-mm PVC pipe + coupling inside the collar (Specimen 4)

Description: The specimen comprised a retrofit fire collar protecting a plasterboard wall system penetrated by a service. The wall system was described as a 116 mm thick plasterboard lined, steel framed wall comprising two layers of 13-mm thick Firestop plasterboard on each side of 64 mm deep metal studs, (Boral reference SB120.1) with an established FRL of -/120/120 as detailed in Exova Warrington report numbered 27211-00. 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 which comprised two soft 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 grade stainless steel mesh 210-mm long x 42-mm wide with wire mesh diameter of 0.15-mm. 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 10 gauge x 38-mm course thread laminating screws. The penetrating service comprised a 42.78-mm outside diameter Iplex PVC pipe with a wall thickness of 2.03-mm and a PVC coupling with a total wall thickness of 4.03-mm fitted through the collar's sleeve on the exposed face. The pipe penetrated the plasterboard wall through a 50-mm diameter cut-out hole. 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 plasterboard wall. The pipe was left open at the unexposed end 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	-	149 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/120/120.

The fire-resistance level is applicable when the system is exposed to fire from either direction. The maximum FRL of any test specimen cannot exceed the FRL achieved by the wall system in which it was installed. 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. 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: 9 March 2020

Issued on the 9<sup>th</sup> day of June 2020 without alterations or additions.

Brett Roddy | Manager, Fire Testing and Assessments

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**COPY OF CERTIFICATE OF TEST – NO. 3437**





## Certificate of Test

No. 3438

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 report numbered FSP 2090.

Product Name: SNAP 110R Retrofit fire collars protecting a nominal 110-mm HDPE (PE100) pipe (Specimen 5)

Description: The specimen comprised a retrofit fire collar protecting a plasterboard wall system penetrated by a service. The wall system was described as a 116 mm thick plasterboard lined, steel framed wall comprising two layers of 13-mm thick Firestop plasterboard on each side of 64 mm deep metal studs, (Boral reference SB120.1) with an established FRL of -/120/120 as detailed in Exova Warrington report numbered 27211-00. The SNAP Retrofit 110R fire collar comprised a 0.75-mm steel casing with a 122 mm inner diameter and a 206-mm diameter base flange. The 62-mm high collar casing incorporated a closing mechanism that was comprised of three soft Intumescent wraps and wire meshes lined within the internal circumference of the collar. Intumescent A was 2.5-mm thick x 58-mm wide x 424-mm long, Intumescent B was 2.5-mm thick x 58-mm wide x 407-mm long and Intumescent C was 2.5-mm thick x 58-mm wide x 389-mm long. Between intumescent strips A and B was a layer of 316 stainless steel mesh 415-mm long x 58-mm wide and between intumescent strips B and C was a layer of 316 stainless steel mesh 398-mm long x 58-mm wide both had wire mesh diameters of 0.15-mm. The Snap fire collars were surface mounted around the pipe on both the exposed and unexposed face of the wall and fixed through 3 mounting brackets using 10 gauge x 38-mm course thread laminating screws. The penetrating service comprised a 108.68-mm outside diameter Vinidex HDPE (PE100), with a wall thickness of 4.94 mm fitted through the collar's sleeve. The pipe penetrated the wall through a 114 mm diameter opening and 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 plasterboard wall. The pipe was left open on the unexposed end and capped with a ceramic fibre 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	-	141 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/120/120.

The fire-resistance level is applicable when the system is exposed to fire from either direction. The maximum FRL of any test specimen cannot exceed the FRL achieved by the wall system in which it was installed. 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. 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: 9 March 2020

Issued on the 9<sup>th</sup> day of June 2020 without alterations or additions.

Brett Roddy | Manager, Fire Testing and Assessments

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## Certificate of Test

No. 3439

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 report numbered FSP 2090.

**Product Name:** SNAP HP150R Retrofit fire collar protecting a nominal 160-mm polyvinyl chloride sandwich construction (PVC-SC) pipe incorporating a coupling inside the collar (Specimen 6)

**Description:** The specimen comprised a retrofit fire collar protecting a plasterboard wall system penetrated by a service. The wall system was described as a 116 mm thick plasterboard lined, steel framed wall comprising two layers of 13-mm thick Firestop plasterboard on each side of 64 mm deep metal studs, (Boral reference SB120.1) with an established FRL of -/120/120 as detailed in Exova Warrington report numbered 27211-00. 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 long x 112-mm wide x 8-mm thick Intumesh intumescent material. The closing mechanism comprised four SPR-SS400-102 stainless steel springs bound with nylon fuse links, and a 590-mm x 109 mm 316 stainless steel mesh. The Snap fire collars were surface mounted around the pipe on both the exposed and unexposed face of the wall and fixed through 4 mounting brackets using M4 expandable steel anchors. The penetrating service comprised a 161.8-mm outside diameter Pipemakers PVC-SC pipe, with a wall thickness of 4.32 mm fitted through the collar's sleeve on the exposed face. The pipe penetrated the wall through a 168 mm diameter opening and 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 plasterboard wall. The pipe was open on the unexposed end and capped on the exposed end with a PVC end cap.

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

Structural Adequacy	-	not applicable
Integrity	-	no failure at 181 minutes
Insulation	-	128 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/120/120.

The fire-resistance level is applicable when the system is exposed to fire from either direction. The maximum FRL of any test specimen cannot exceed the FRL achieved by the wall system in which it was installed. 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. 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: 9 March 2020

Issued on the 9<sup>th</sup> day of June 2020 without alterations or additions.

Brett Roddy | Manager, Fire Testing and Assessments

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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. 3439**

# 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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#### FOR FURTHER INFORMATION

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