

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

Test Report

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Report number: FSP 2188
Date: 27 April 2021
Client: IG6 Pty Ltd as trustee for the IG6 IP Trust

Commercial-in-confidence

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Report Status and Revision History:

VERSION	STATUS	DATE	DISTRIBUTION	ISSUE NUMBER
Revision A	Draft for review	27/04/2021	CSIRO / Client	FSP 2188
Revision B	Final for issue	27/04/2021	CSIRO / Client	FSP 2188

Report Authorisation:

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27 April 2021	27 April 2021	27 April 2021

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Contents

1	Introduction	6
1.1	Identification of specimen	6
1.2	Sponsor	6
1.3	Manufacturer	6
1.4	Test standard	6
1.5	Reference standard.....	6
1.6	Test number.....	7
1.7	Test date	7
2	Description of specimen.....	7
2.1	General.....	7
2.2	Dimensions.....	11
2.3	Orientation.....	11
2.4	Conditioning.....	11
2.5	Selection, construction and installation of the specimen and the supporting construction	11
3	Documentation	11
4	Equipment.....	12
4.1	Furnace	12
4.2	Temperature	12
4.3	Measurement system	12
5	Ambient temperature	12
6	Departure from standard	12
7	Termination of test	12
8	Test results	13
8.1	Critical observations	13
8.2	Furnace temperature.....	14
8.3	Furnace severity.....	14
8.4	Specimen temperature	14
8.5	Performance	14
9	Fire-resistance level (FRL)	16
10	Field of direct application of test results	16
11	Tested by.....	16
	Appendices	17
	Appendix A – Measurement location	17
	Appendix B – Photographs.....	19
	Appendix C – Test data charts.....	26
	Appendix D – Layout and installation drawings.....	36
	Appendix E – Specimen Drawings.....	45
	Appendix F – Certificate(s) of Test	48

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Sponsored Investigation No. FSP 2188

1 Introduction

1.1 Identification of specimen

The sponsor identified the specimen as retrofit fire collars protecting a steel framed plasterboard wall penetrated by three (3) chlorinated polyvinyl chloride (CPVC) pipes, a lagged copper pipe, three cross-linked high-density polyethylene (PE-Xa) pipes and a composite cross-linked high-density polyethylene (PE-Xa/Al/PE) pipe.

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 for 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 5066/4605

1.7 Test date

The fire-resistance test was conducted on 18 March 2021.

2 Description of specimen

2.1 General

The plasterboard wall was constructed in accordance with Boral Firestop system SB60.1 with an established fire resistance level (FRL) of -/60/60 as detailed in the document titled “Plasterboard Fire and Acoustic Systems Australia”, revision UB1231-SYS 12/18, by USG Boral Building Products Pty Ltd.

Construction comprised of 64-mm x 0.55-mm steel studs installed at nominally 600-mm centres, lined on each side with a single layer of 13-mm thick Boral Firestop plasterboard sheets. The plasterboard sheeting was screw fixed to the steel studs using 6-gauge x 32-mm long plasterboard screws at nominally 200-mm centres. The wall cavity was filled with a single layer of 50-mm thick Acoustigard 11 insulation.

For the purpose of the test, the penetrations are referenced as Specimen 1, 2, 3, 4, 5, 6, 7, and 8. Documents containing a complete description of each specimen were supplied by the sponsor and are retained on file.

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

- Copper pipe - AS 1432:2004 Copper tubes for plumbing, gas fitting and drainage applications;
- PE-Xa/Al/PE pipe - AS 4176.1-2010: Multilayer pipes for pressure applications - Multilayer piping systems for hot and cold-water plumbing applications – General.
- PE-Xa pipes - AS/NZS 2492:2007: Cross-linked polyethylene (PE-X) pipes for pressure applications

Specimen 1 - SNAP 32R Retrofit fire collars protecting a nominal 1-inch (33.4-mm OD) CPVC pipe penetrating a 35-mm diameter aperture.

The SNAP 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 which comprised 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 titled “SNAP 32 Retro”, dated 5 October 2017, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the plasterboard wall in a back-to-back configuration using three M4 expandable steel hollow wall anchors with stainless steel washers.

The penetrating service comprised a Blazemaster CPVC 33.44-mm outside diameter pipe, with a wall thickness of 2.88-mm fitted through the collar's sleeve and penetrated the wall through a 35-mm diameter cut-out hole as shown in drawing titled 'Specimen #1, 1in C-PVC Stack & 32R', dated 26 February 2021, provided 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 open at the unexposed end and plugged with ceramic fibre (Superwool) on the exposed end.

Specimen 2 - SNAP MS70R Multi Services Retrofit fire collars protecting a 1-inch copper pipe with 25-mm thick foil faced Sekisui lagging penetrating a 75-mm diameter aperture.

The SNAP MS70R Multi Service Retrofit fire collar comprised a 0.75-mm thick steel casing with a 69-mm inner diameter and a 0.95-mm thick steel base flange with a 162-mm diameter. The 95-mm high collar casing incorporated a 4-mm thick x 90-mm wide x 250-mm long soft Intumesh intumescent wrap lined within the internal circumference of the collar casing. The closing mechanism comprised three stainless steel springs, a nylon fuse link and a 258-mm long x 88-mm wide 316 stainless steel mesh located around the intumescent strip, as shown in drawing titled 'SNAP 70 Multi Service Retro', dated 23 September 2019, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the plasterboard wall in a back-to-back configuration using three M4 expandable steel hollow wall anchors with stainless steel washers.

The penetrating service comprised lagged 25-mm outside diameter copper pipe having a wall thickness of 1.34 mm, lagged with 25-mm thick foil faced Sekisui foam. The lagged pipe was fitted through the collar's sleeve and penetrated the wall through a 75-mm diameter cut-out hole as shown in drawing titled 'Specimen #2 1inch Copper Tube with 25mm Foil Faced Foam Lagging & MS70R Collar', dated 26 February 2021, by Snap Fire Systems Pty Ltd. The lagged pipe projected horizontally, 500-mm away from the unexposed face of the wall and approximately 500-mm into the furnace chamber. The lagged pipe was supported at nominally 500-mm from the unexposed face of the plasterboard wall. The copper pipe was open at the unexposed end and crimped closed on the exposed end.

Specimen 3 - SNAP 32R Retrofit fire collars protecting a nominal 25-mm PE-Xa Rehau Rautitan pipe penetrating a 29-mm diameter aperture.

The SNAP 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 which comprised 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 titled "SNAP 32 Retro", dated 5 October 2017, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the plasterboard wall in a back-to-back configuration using three M4 expandable steel hollow wall anchors with stainless steel washers.

The penetrating service comprised a Rehau Rautitan PE-Xa 25.2-mm outside diameter pipe, with a wall thickness of 3.95-mm fitted through the collar's sleeve and penetrated the wall through a 29-mm diameter cut-out hole as shown in drawing titled 'Specimen #3, 25 Pex-a Stack & 32R', dated 26 February 2021, provided 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 open at the unexposed end and plugged with ceramic fibre (Superwool) on the exposed end.

Specimen 4 - SNAP 50R Retrofit fire collars protecting a nominal 1 1/2-inch (48.2-mm OD) CPVC pipe penetrating a 51-mm diameter aperture.

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 a 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. One collar was fixed to each side of the plasterboard wall in a back-to-back configuration using three M4 expandable steel hollow wall anchors with stainless steel washers.

The penetrating service comprised a Blazemaster CPVC 48.21-mm outside diameter pipe, with a wall thickness of 3.98-mm fitted through the collar's sleeve and penetrated the wall through a 51-mm diameter cut-out hole as shown in drawing titled 'Specimen #4, 1 1/2 in C-PVC Stack & 50R', dated 26 February 2021, provided 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 open at the unexposed end and plugged with ceramic fibre (Superwool) on the exposed end.

Specimen 5 - SNAP 50R Retrofit fire collars protecting a nominal 1 1/4 -inch (42.07-mm OD) CPVC pipe penetrating a 44-mm diameter aperture.

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 a 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. One collar was fixed to each side of the plasterboard wall in a back-to-back configuration using three M4 expandable steel hollow wall anchors with stainless steel washers.

The penetrating service comprised a Blazemaster CPVC 42.07-mm outside diameter pipe, with a wall thickness of 3.59-mm fitted through the collar's sleeve and penetrated the wall through a 44-mm diameter cut-out hole as shown in drawing titled 'Specimen #5, 1 1/4 in C-PVC Stack & 50R', dated 26 February 2021, provided 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 open at the unexposed end and plugged with ceramic fibre (Superwool) on the exposed end.

Specimen 6 - SNAP 32R Retrofit fire collars protecting a nominal 20-mm PE-Xa/Al/PE Rehau Rautitan pipe penetrating a 22-mm diameter aperture.

The SNAP 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 which comprised 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 titled "SNAP 32 Retro", dated 5 October 2017, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the plasterboard wall in a back-to-back configuration using three M4 expandable steel hollow wall anchors with stainless steel washers.

The penetrating service comprised a Rehau Rautitan PE-Xa/Al/PE 19.95-mm outside diameter pipe, with a wall thickness of 3.43-mm fitted through the collar's sleeve and penetrated the wall through a 22-mm diameter cut-out hole as shown in drawing titled 'Specimen #6, 20 Pex-Al-PE Stack & 32R', dated 1 March 2021, provided 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 open at the unexposed end and plugged with ceramic fibre (Superwool) on the exposed end.

Specimen 7 - SNAP 32R Retrofit fire collars protecting a nominal 32-mm PE-Xa Rehau Rautitan pipe penetrating a 35-mm diameter aperture.

The SNAP 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 which comprised 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 titled "SNAP 32 Retro", dated 5 October 2017, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the plasterboard wall in a back-to-back configuration using three M4 expandable steel hollow wall anchors with stainless steel washers.

The penetrating service comprised a Rehau Rautitan PE-Xa 32.06-mm outside diameter pipe, with a wall thickness of 4.67-mm fitted through the collar's sleeve and penetrated the wall through a 35-mm diameter cut-out hole as shown in drawing titled 'Specimen #7, 32 Pex-a Stack & 32R', dated 1 March 2021, provided 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 open at the unexposed end and plugged with ceramic fibre (Superwool) on the exposed end.

Specimen 8 - SNAP 32R Retrofit fire collars protecting a nominal 16-mm PE-Xa Rehau Rautitan pipe penetrating a 35-mm diameter aperture.

The SNAP 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 which comprised 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 titled "SNAP 32 Retro", dated 5 October 2017, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the plasterboard wall in a back-to-back configuration using three M4 expandable steel hollow wall anchors with stainless steel washers.

The penetrating service comprised a Rehau Rautitan PE-Xa 16.2-mm outside diameter pipe, with a wall thickness of 2.54-mm fitted through the collar's sleeve and penetrated the wall through a 20-mm diameter cut-out hole as shown in drawing titled 'Specimen #8, 16 Pex-a Stack & 32R', dated 1 March 2021, provided 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 open at the unexposed end and plugged with ceramic fibre (Superwool) on the exposed end.

2.2 Dimensions

The plasterboard wall was nominally 1150-mm wide x 1150-mm high x 90-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 March 2021 and stored 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:

Documents titled 'Plasterboard Fire and Acoustic Systems Australia', revision UB1231-SYS 12/18, by USG Boral Building Products Pty Ltd.

Drawing titled 'Test Wall W-21-H Layout', dated 1 March 2021, by Snap Fire Systems Pty Ltd.

Drawing titled 'Specimen #1 in C-PVC Stack & 32R', dated 26 February 2021, by Snap Fire Systems Pty Ltd.

Drawing titled 'Specimen #2 1inch Copper Tube with 25mm Foil Faced Foam Lagging & MS70R Collar', dated 26 February 2021, by Snap Fire Systems Pty Ltd.

Drawing titled 'Specimen #3, 25 Pex-a Stack & 32R', dated 26 February 2021, provided by Snap Fire Systems Pty Ltd.

Drawing titled 'Specimen #4 1 ½ in C-PVC Stack & 50R', dated 26 February 2021, provided by Snap Fire Systems Pty Ltd.

Drawing titled 'Specimen #5 1 ¼ in C-PVC Stack & 50R', dated 26 February 2021, provided by Snap Fire Systems Pty Ltd.

Drawing titled 'Specimen #6 20 Pex-Al-PE Stack & 32R', dated 1 March 2021, provided by Snap Fire Systems Pty Ltd.

Drawing titled 'Specimen #7 32 Pex-Al-PE Stack & 32R', dated 1 March 2021, provided by Snap Fire Systems Pty Ltd.

Drawing titled 'Specimen #8 16 Pex-Al-PE Stack & 32R', dated 1 March 2021, provided by Snap Fire Systems Pty Ltd.

Drawing title 'SNAP 32 Retro', dated 5 October 2017, by Snap Fire Systems Pty Ltd.

Drawing titled 'SNAP 70 Multi Service Retro', dated 23 September 2019, by Snap Fire Systems Pty Ltd.

Drawing title 'SNAP 50 Retro', dated 18 January 2019, 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 19°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 91 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 minutes -	Smoke is being emitted between the collar and the pipe of Specimen 4.
2 minutes -	Smoke is being emitted between the collar and the pipe of Specimen 3.
3 minutes -	Smoke is being emitted between the collar and the pipe of Specimens 5 and 7.
4 minutes -	Smoke has begun fluing from the end of the pipe of Specimens 5 and 8.
5 minutes -	Smoke has ceased fluing from the collars of Specimens 3 and 5.
6 minutes -	Smoke has begun fluing from the end of the pipe of Specimen 7. Smoke has ceased fluing from the collars of Specimen 3, 5 and 7.
7 minutes -	Smoke has ceased fluing from the collar of Specimen 7.
10 minutes -	Smoke has resumed fluing between the collar and pipe of specimen 3
12 minutes -	Light smoke is being emitted from the pipes of Specimen 4 and 5.
19 minutes -	Smoke has begun fluing from the end of the pipe of Specimen 4.
20 minutes -	Smoke is being emitted from the joint in the lagging of Specimen 2.
25 minutes -	Smoke has resumed fluing between the collar and the pipe of Specimen 5.
26 minutes -	The smoke level being emitted from the joint in the lagging of Specimen 2 has intensified.
27 minutes -	Smoke is being emitted from the collar of Specimen 2. Light smoke has resumed fluing from the end of the pipe of Specimen 4.
32 minutes -	Smoke is being emitted between the collar and pipe of Specimens 6, 7 and 8.
33 minutes -	Smoke has resumed fluing from the end of the pipe of Specimen 3.
39 minutes -	Smoke has resumed fluing from the end of the pipe of Specimen 8.
45 minutes -	Smoke has resumed fluing from the end of the pipe of Specimen 7.
50 minutes -	Smoke has ceased fluing from the collars of Specimens 4 and 5.
69 minutes -	The foil backed lagging of Specimen 2 has begun to discolour and deform.
71 minutes -	The plasterboard wall has started to discolour, with screw heads visible.
72 minutes -	The discolouration to the plasterboard wall is visible around the base of Specimen 2.
75 minutes -	The pipe at the base of Specimen 4 has discoloured.
75 minutes -	<u>Insulation Failure of Specimen 2</u> – maximum temperature rise of 180K is exceeded on the collar.
77 minutes -	<u>Insulation Failure of Specimen 8</u> – maximum temperature rise of 180K is exceeded on the plasterboard wall 25-mm above the collar.
78 minutes -	<u>Insulation Failure of Specimens 3, 5 and 7</u> – maximum temperature rise of 180K is exceeded on the plasterboard wall, 25-mm from their respective collars.
79 minutes -	<u>Insulation Failure of Specimen 1</u> – maximum temperature rise of 180K is exceeded on the plasterboard wall 25-mm above the collar.
82 minutes -	<u>Insulation Failure of Specimen 4</u> – maximum temperature rise of 180K is exceeded on the plasterboard wall 25-mm above the collar. The plasterboard wall continues to char around specimens.
85 minutes -	<u>Insulation Failure of Specimen 6</u> – maximum temperature rise of 180K is exceeded on the plasterboard wall 25-mm above the collar.
91 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 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.

Figure 9 shows the curve of temperature versus time associated with Specimen 7.

Figure 10 shows the curve of temperature versus time associated with Specimen 8.

8.5 Performance

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

Specimen 1 - SNAP 32R Retrofit fire collars protecting a nominal 1-inch CPVC pipe penetrating a 35-mm diameter aperture

Structural adequacy	-	not applicable
Integrity	-	no failure at 91 minutes
Insulation	-	79 minutes

Specimen 2 - SNAP MS70R Multi Services Retrofit fire collars protecting a 1-inch copper pipe with 25-mm thick foil faced Sekisui lagging penetrating a 75-mm diameter aperture

Structural adequacy	-	not applicable
Integrity	-	no failure at 91 minutes
Insulation	-	75 minutes

Specimen 3 - SNAP 32R Retrofit fire collars protecting a nominal 25-mm PE-Xa pipe protecting a 29-mm diameter aperture

Structural adequacy	-	not applicable
Integrity	-	no failure at 91 minutes
Insulation	-	78 minutes

Specimen 4 - SNAP 50R Retrofit fire collars protecting a nominal 1 ½-inch CPVC pipe penetrating a 51-mm diameter aperture

Structural adequacy	-	not applicable
Integrity	-	no failure at 91 minutes
Insulation	-	82 minutes

Specimen 5 - SNAP 50R Retrofit fire collars protecting a nominal 1 1/4-inch CPVC pipe penetrating a 44-mm diameter aperture

Structural adequacy	-	not applicable
Integrity	-	no failure at 91 minutes
Insulation	-	78 minutes

Specimen 6 - SNAP 32R Retrofit fire collars protecting a nominal 20-mm PE-Xa/Al/PE pipe penetrating a 22-mm diameter aperture

Structural adequacy	-	not applicable
Integrity	-	no failure at 91 minutes
Insulation	-	85 minutes

Specimen 7 - SNAP 32R Retrofit fire collars protecting a nominal 32-mm PE-Xa pipe penetrating a 35-mm diameter aperture

Structural adequacy	-	not applicable
Integrity	-	no failure at 91 minutes
Insulation	-	78 minutes

Specimen 8 SNAP 32R Retrofit fire collars protecting a nominal 16-mm PE-Xa pipe penetrating a 20-mm diameter aperture

Structural adequacy	-	not applicable
Integrity	-	no failure at 91 minutes
Insulation	-	77 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 AS 1530.4. 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	-/60/60
Specimen 2	-/60/60
Specimen 3	-/60/60
Specimen 4	-/60/60
Specimen 5	-/60/60
Specimen 6	-/60/60
Specimen 7	-/60/60
Specimen 8	-/60/60

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 -/60/60. 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



Peter Gordon
Testing Officer

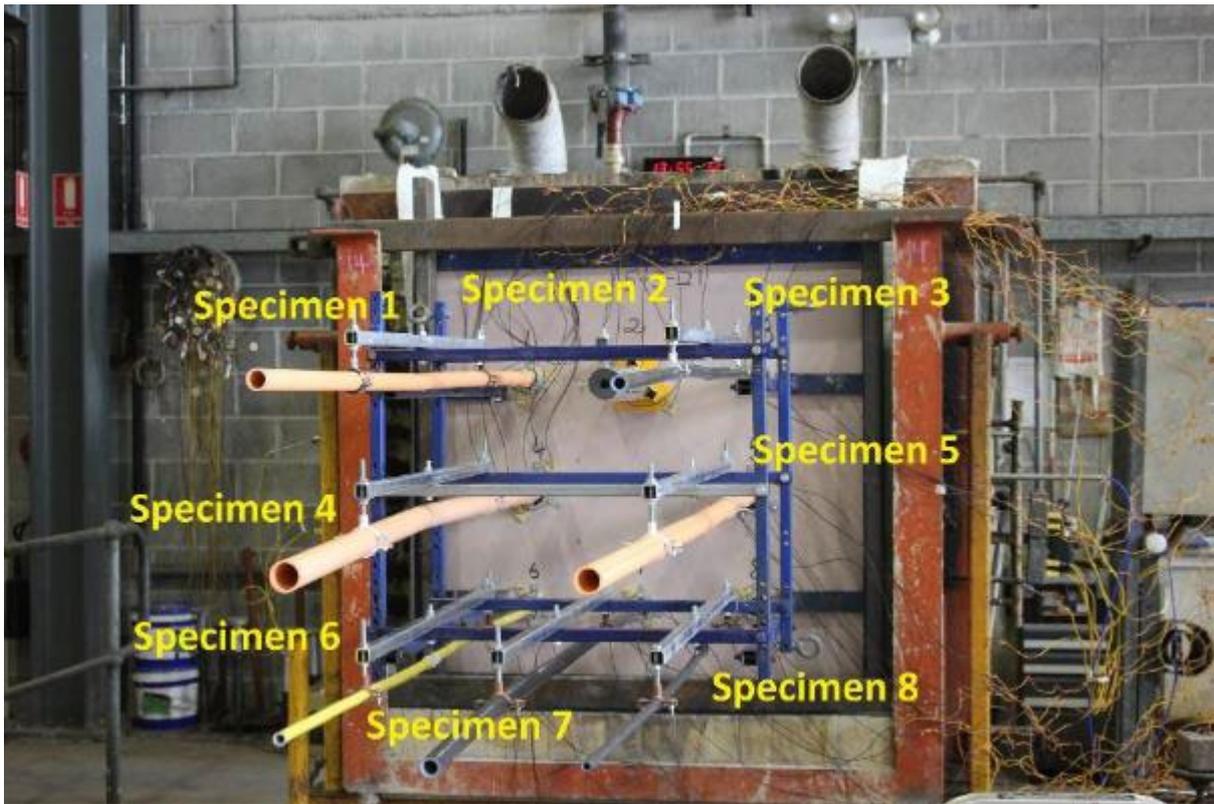
Appendices

Appendix A – Measurement location

SPECIMEN	THERMOCOUPLE POSITION	DESIGNATION
Specimen 1 - SNAP 32R Retrofit fire collars protecting a nominal 1-inch CPVC pipe penetrating a 35-mm diameter aperture.	On P/B wall, 25-mm right of collar	S1
	On P/B wall, 25-mm below of collar	S2
	On collar top right side	S3
	On collar bottom side	S4
	On top of pipe, 25-mm from collar	S5
	On left side of pipe, 25-mm from collar	S6
Specimen 2 SNAP MS70R Multi Services Retrofit fire collars protecting a 1-inch copper pipe with 25-mm thick Sekisui lagging penetrating a 75-mm diameter aperture.	On P/B wall, 25-mm above collar –top right	S7
	On P/B wall, 25-mm below collar bottom left	S8
	On collar top side	S9
	On collar bottom side	S10
	On top of pipe, 25-mm from collar	S11
	On bottom of pipe, 25-mm from collar	S12
Specimen 3 - SNAP 32R Retrofit fire collars protecting a nominal 25-mm PE-Xa pipe protecting a 29-mm diameter aperture.	On P/B wall, 25-mm above collar	S13
	On P/B wall, 25-mm below of collar	S14
	On collar top side	S15
	On collar right side	S16
	On left side of pipe, 25-mm from collar	S17
	On right side of pipe, 25-mm from collar	S18
Specimen 4 - SNAP 50R Retrofit fire collars protecting a nominal 1½-inch CPVC pipe penetrating a 51-mm diameter aperture.	On P/B wall, 25-mm above collar	S19
	On P/B wall, 25-mm below 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
Specimen 5 - SNAP 50R Retrofit fire collars protecting a nominal 1¼-inch CPVC pipe penetrating a 44-mm diameter aperture.	On P/B wall, 25-mm above collar	S25
	On P/B wall, 25-mm below of collar	S26
	On collar top side	S27
	On collar bottom side	S28
	On top of pipe, 25-mm from collar	S29
	On bottom of pipe, 25-mm from collar	S30

SPECIMEN	THERMCOUPLE POSITION	DESIGNATION
Specimen 6 - SNAP 32R Retrofit fire collars protecting a nominal 20-mm PE-Xa/Al/PE pipe penetrating a 22-mm diameter aperture.	On P/B wall, 25-mm above collar	S31
	On P/B wall, 25-mm below of collar	S32
	On collar top side	S33
	On collar bottom side	S34
	On top of pipe, 25-mm from collar	S35
	On bottom of pipe, 25-mm from collar	S36
Specimen 7 - SNAP 32R Retrofit fire collars protecting a nominal 32-mm PE-Xa pipe penetrating a 35-mm diameter aperture.	On P/B wall, 25-mm above collar	S37
	On P/B wall, 25-mm below of collar	S38
	On collar left side	S39
	On collar right side	S40
	On left side of pipe, 25-mm from collar	S41
	On right side of pipe, 25-mm from collar	S42
Specimen 8 SNAP 32R Retrofit fire collars protecting a nominal 16-mm PE-Xa pipe penetrating a 20-mm diameter aperture.	On P/B wall, 25-mm above collar	S43
	On P/B wall, 25-mm below of collar	S44
	On collar left side	S45
	On collar right side	S46
	On top of pipe, 25-mm from collar	S47
	On bottom of pipe, 25-mm from collar	S48
Rover 1		S49
Rover 2		S50
Ambient		S51

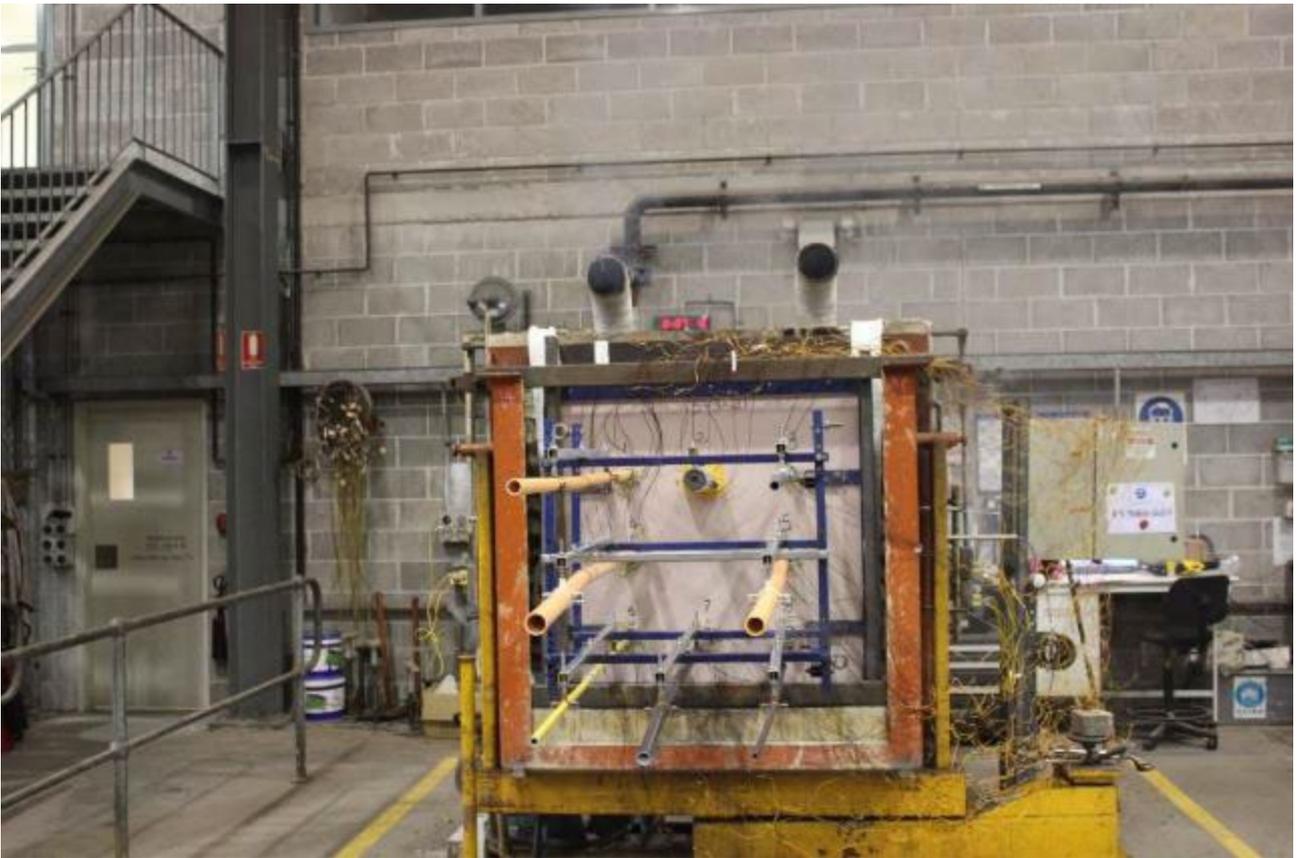
Appendix B – Photographs



PHOTOGRAPH 1 – UNEXPOSED FACE OF SPECIMENS PRIOR TO TESTING



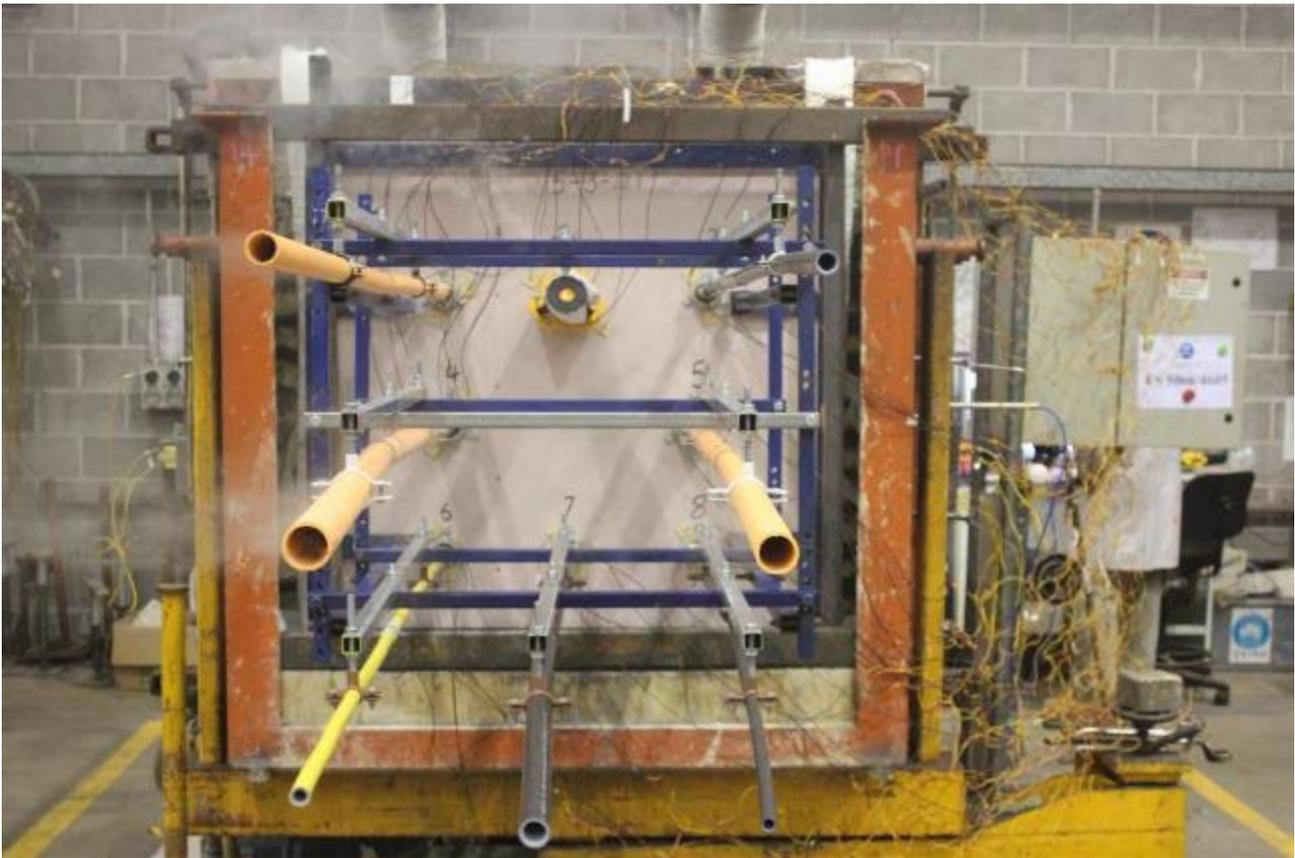
PHOTOGRAPH 2 – EXPOSED FACE OF SPECIMENS PRIOR TO TESTING



PHOTOGRAPH 3 – SPECIMENS AFTER 7 MINUTES OF TESTING



PHOTOGRAPH 4 – SPECIMEN 2 AFTER 21 MINUTES OF TESTING



PHOTOGRAPH 5 – SPECIMENS AFTER 30 MINUTES OF TESTING



PHOTOGRAPH 6 – SPECIMEN 2 AFTER 31 MINUTES OF TESTING



PHOTOGRAPH 7 – SPECIMENS AFTER 60 MINUTES OF TESTING



PHOTOGRAPH 8 – SPECIMEN 2 AFTER 69 MINUTES OF TESTING



PHOTOGRAPH 9 – SPECIMENS AFTER 69 MINUTES OF TESTING



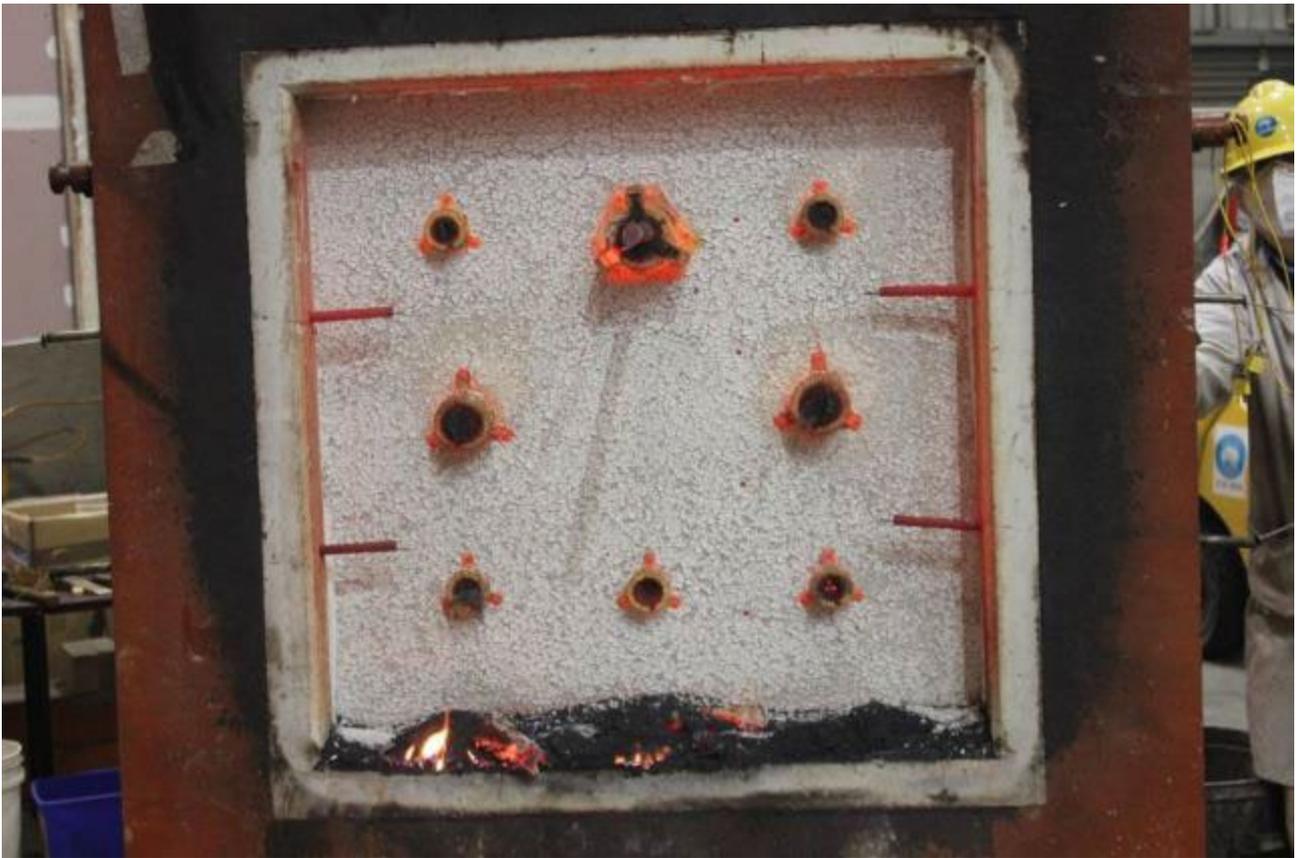
PHOTOGRAPH 10 – SPECIMENS 1, 2 AND 3 AFTER 83 MINUTES OF TESTING



PHOTOGRAPH 11 – SPECIMENS 4, 5, 6, 7, AND 8 AFTER 84 MINUTES OF TESTING



PHOTOGRAPH 12 – SPECIMENS AFTER 90 MINUTES OF TESTING



PHOTOGRAPH 13 – EXPOSED FACE OF SPECIMENS AT CONCLUSION OF TESTING

Appendix C – Test data charts

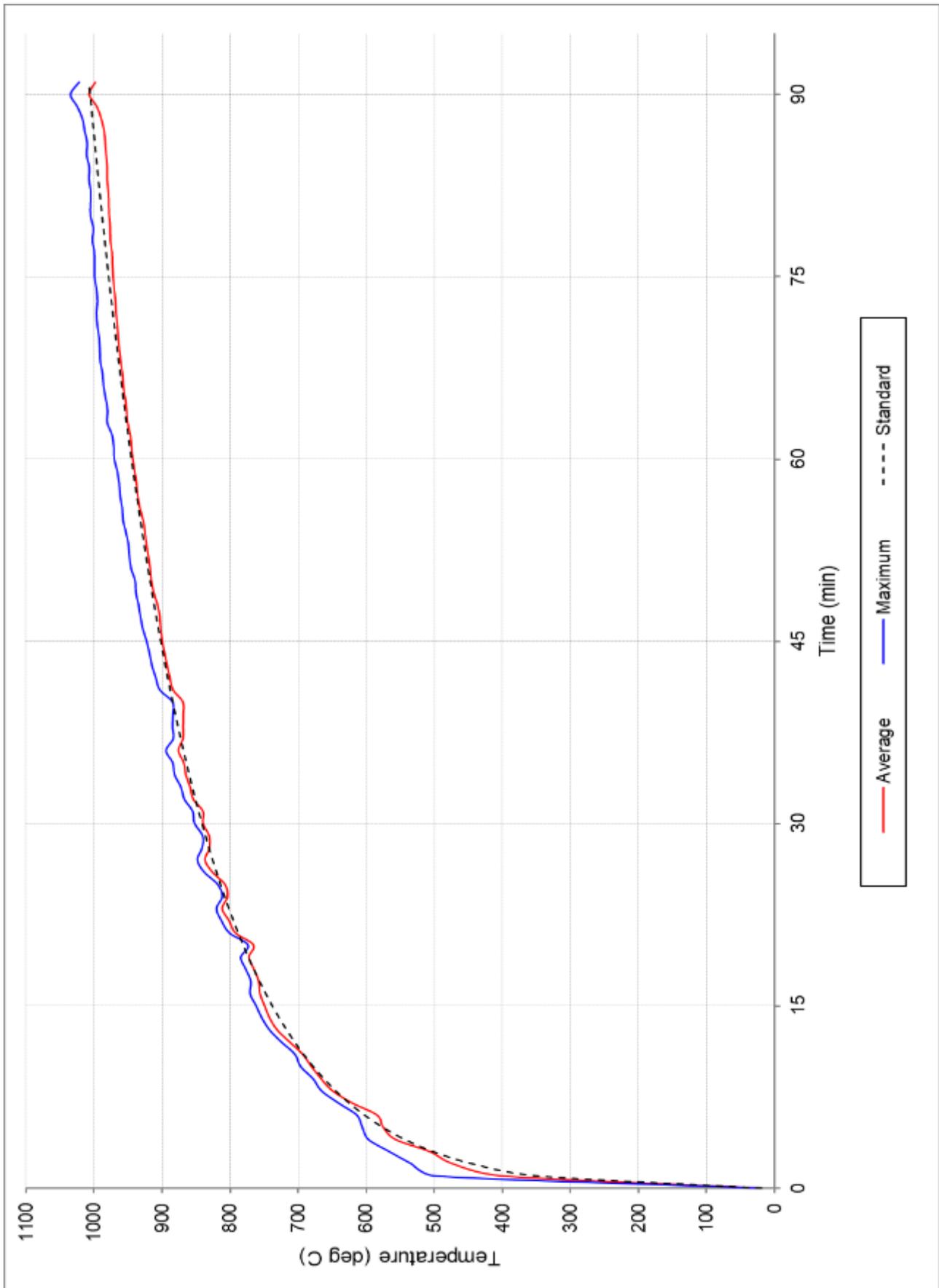


FIGURE 1 – FURNACE TEMPERATURE

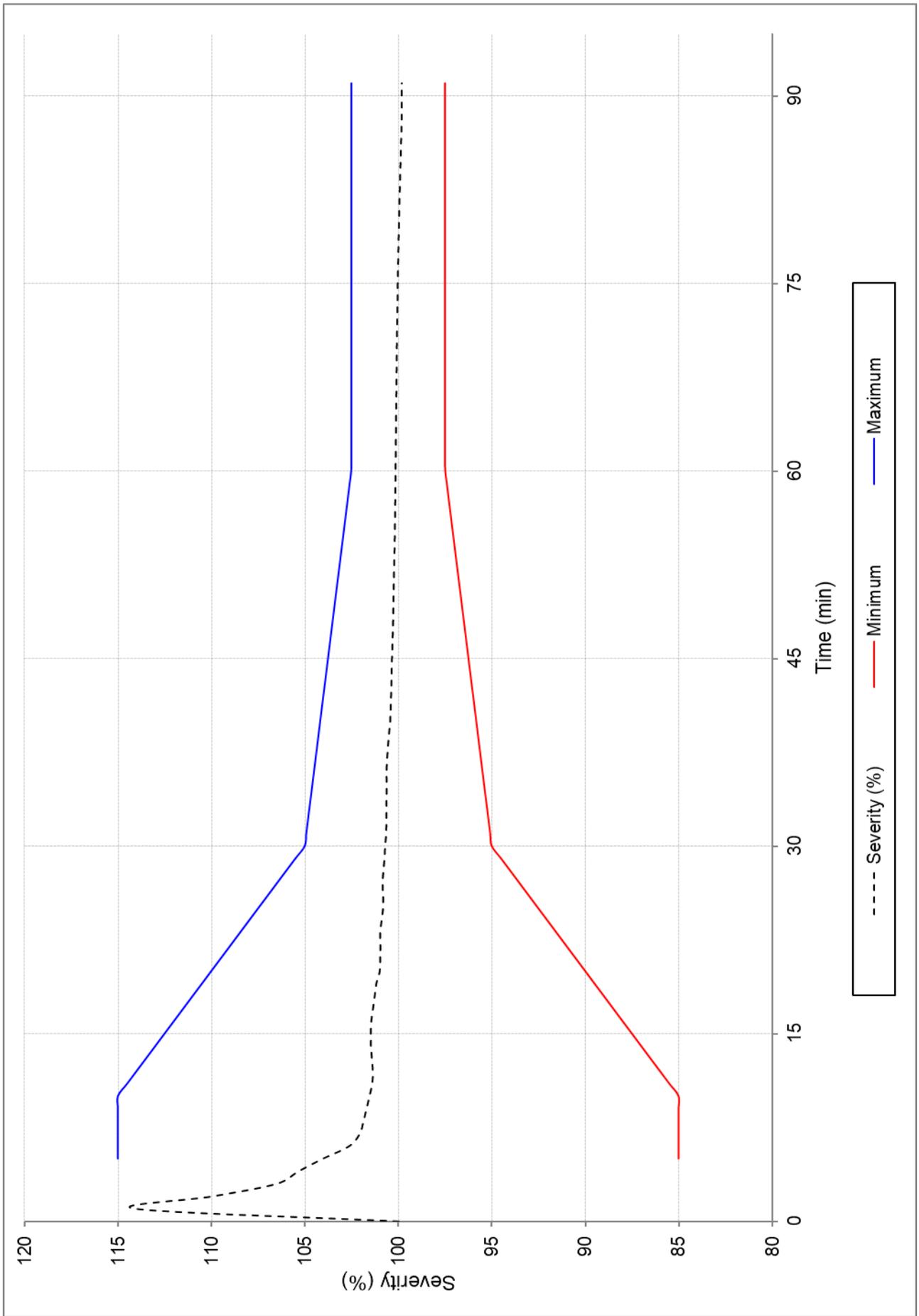


FIGURE 2 – FURNACE SEVERITY

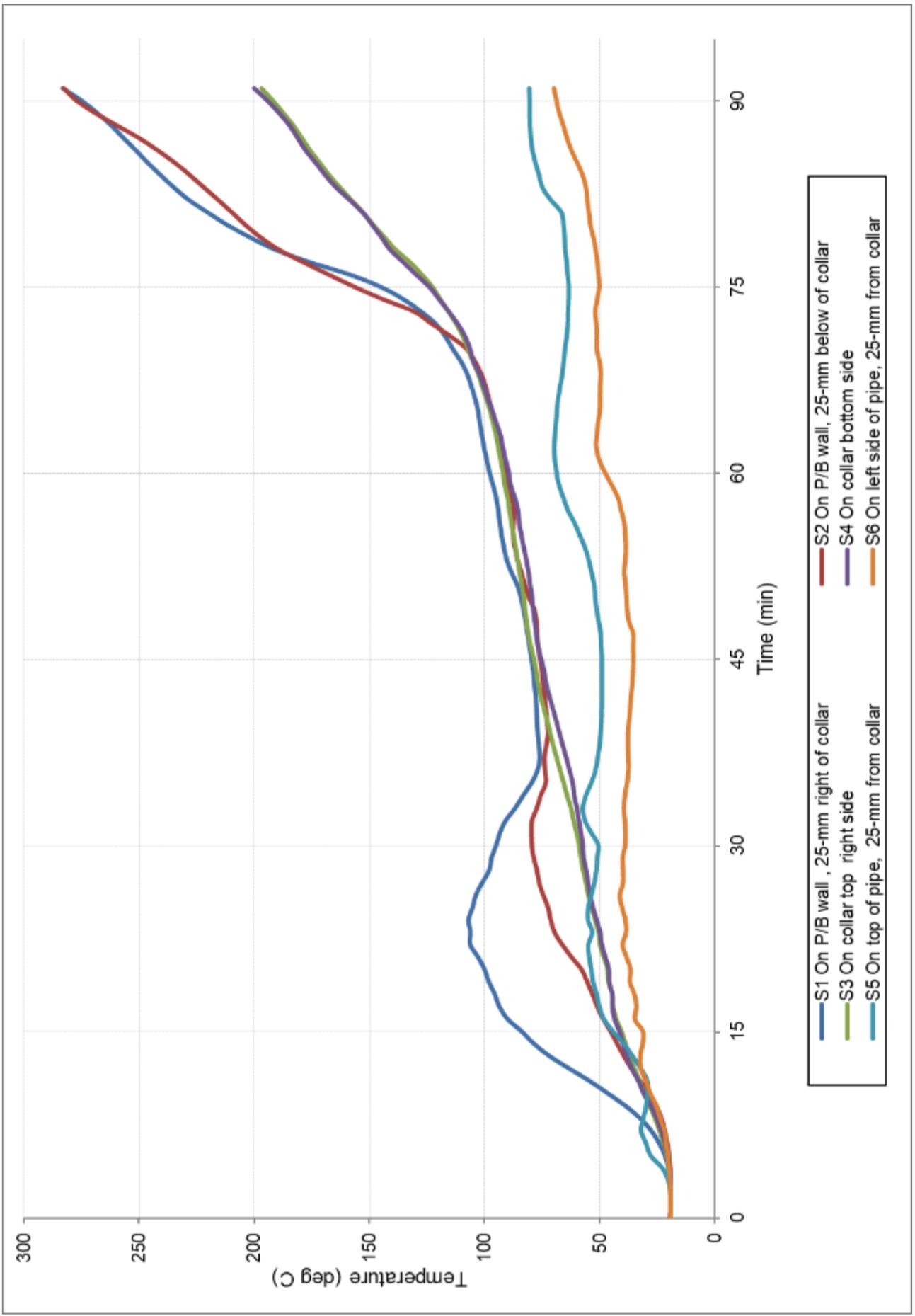


FIGURE 3 - TEMPERATURE VERSUS TIME ASSOCIATED WITH SPECIMEN #1

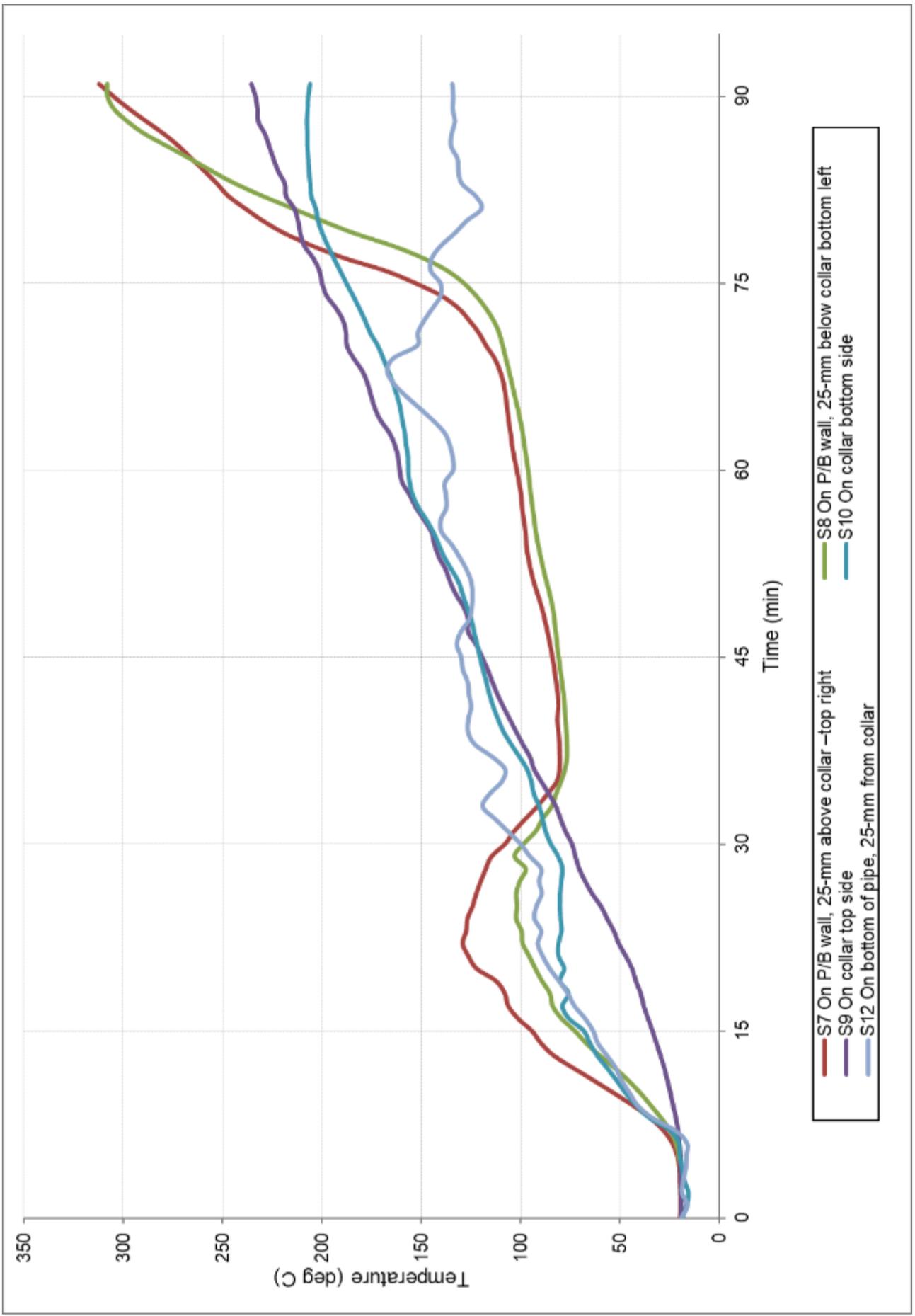


FIGURE 4 - TEMPERATURE VERSUS TIME ASSOCIATED WITH SPECIMEN #2

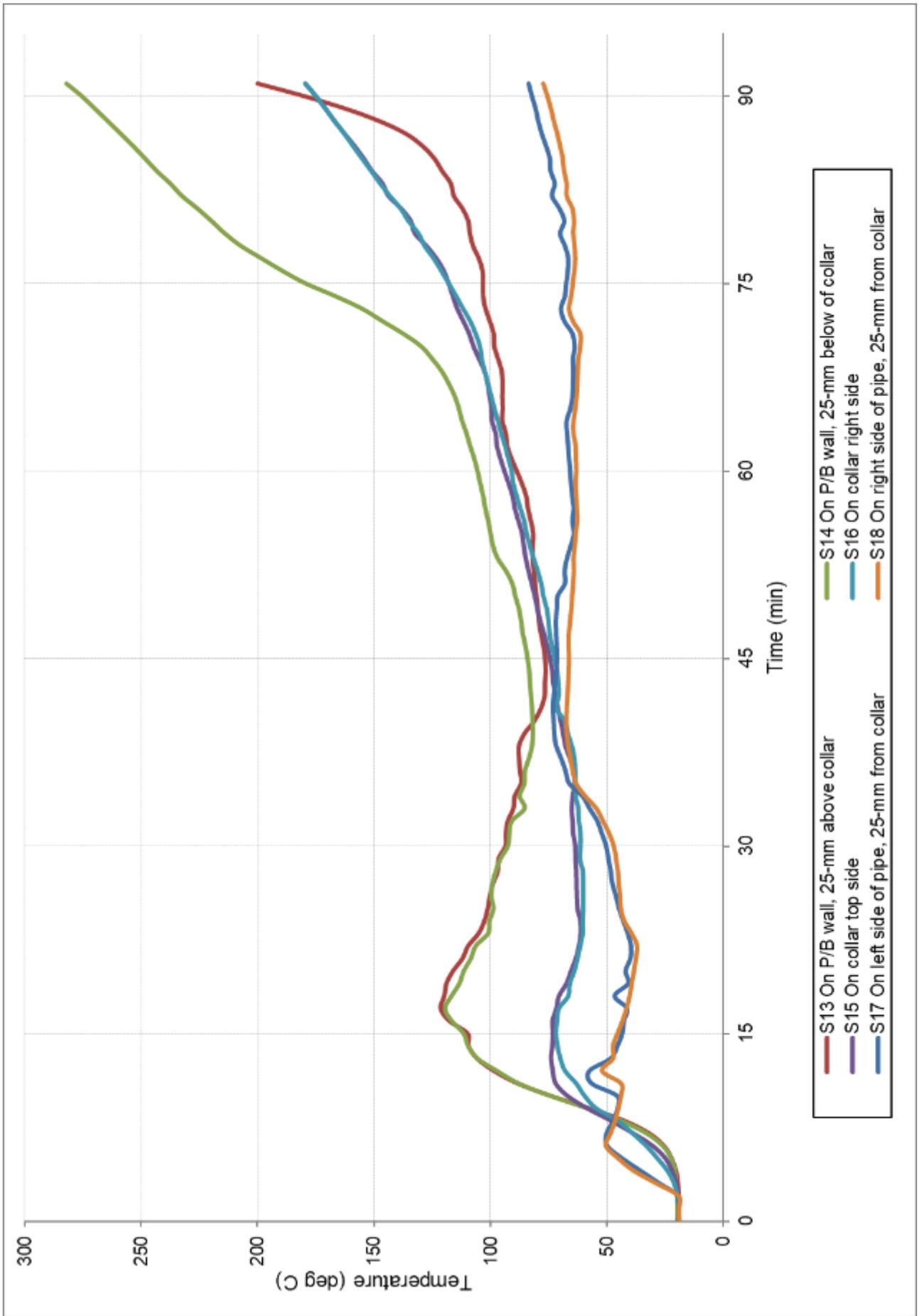


FIGURE 5 - TEMPERATURE VERSUS TIME ASSOCIATED WITH SPECIMEN #3

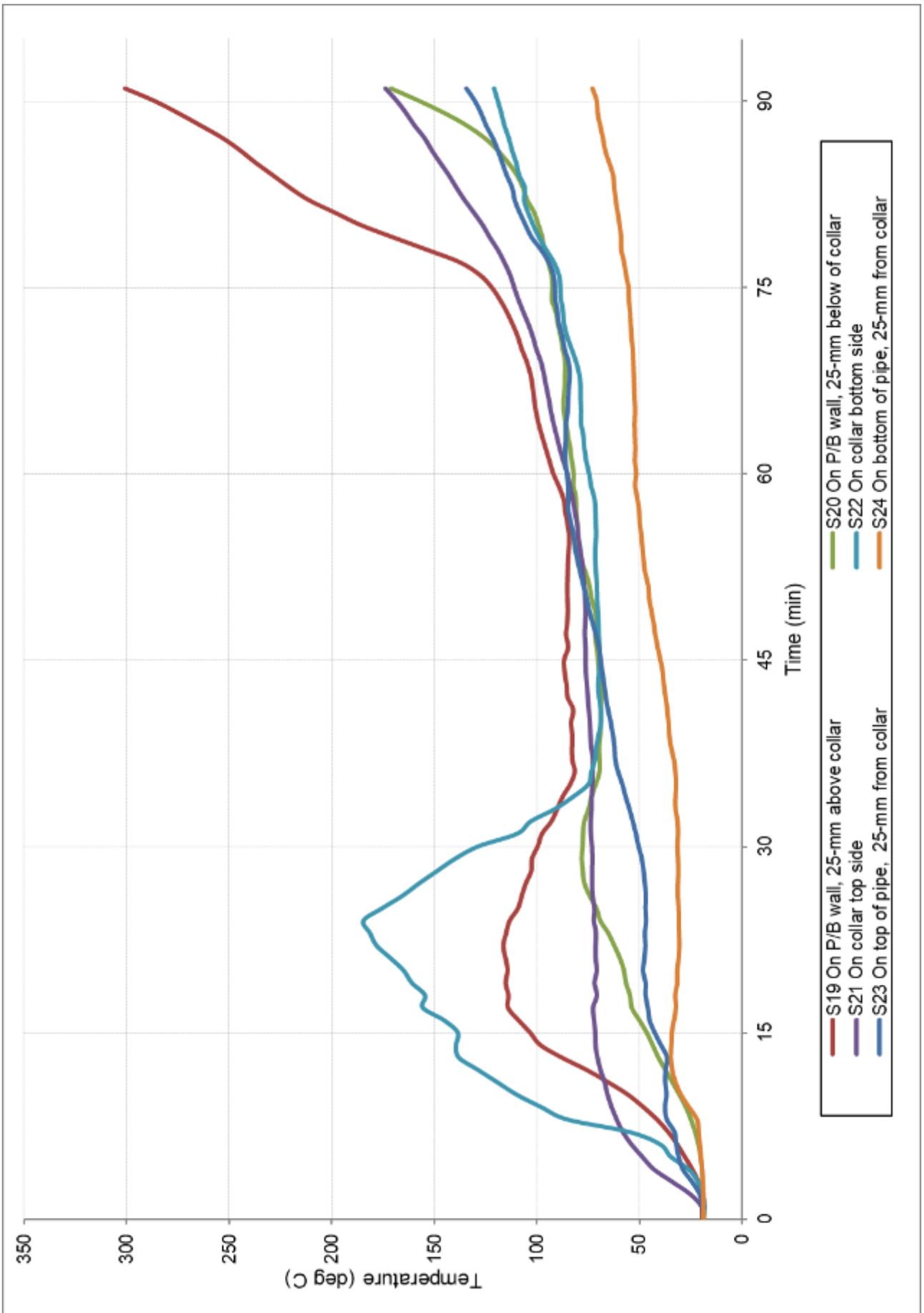


FIGURE 6 - TEMPERATURE VERSUS TIME ASSOCIATED WITH SPECIMEN #4

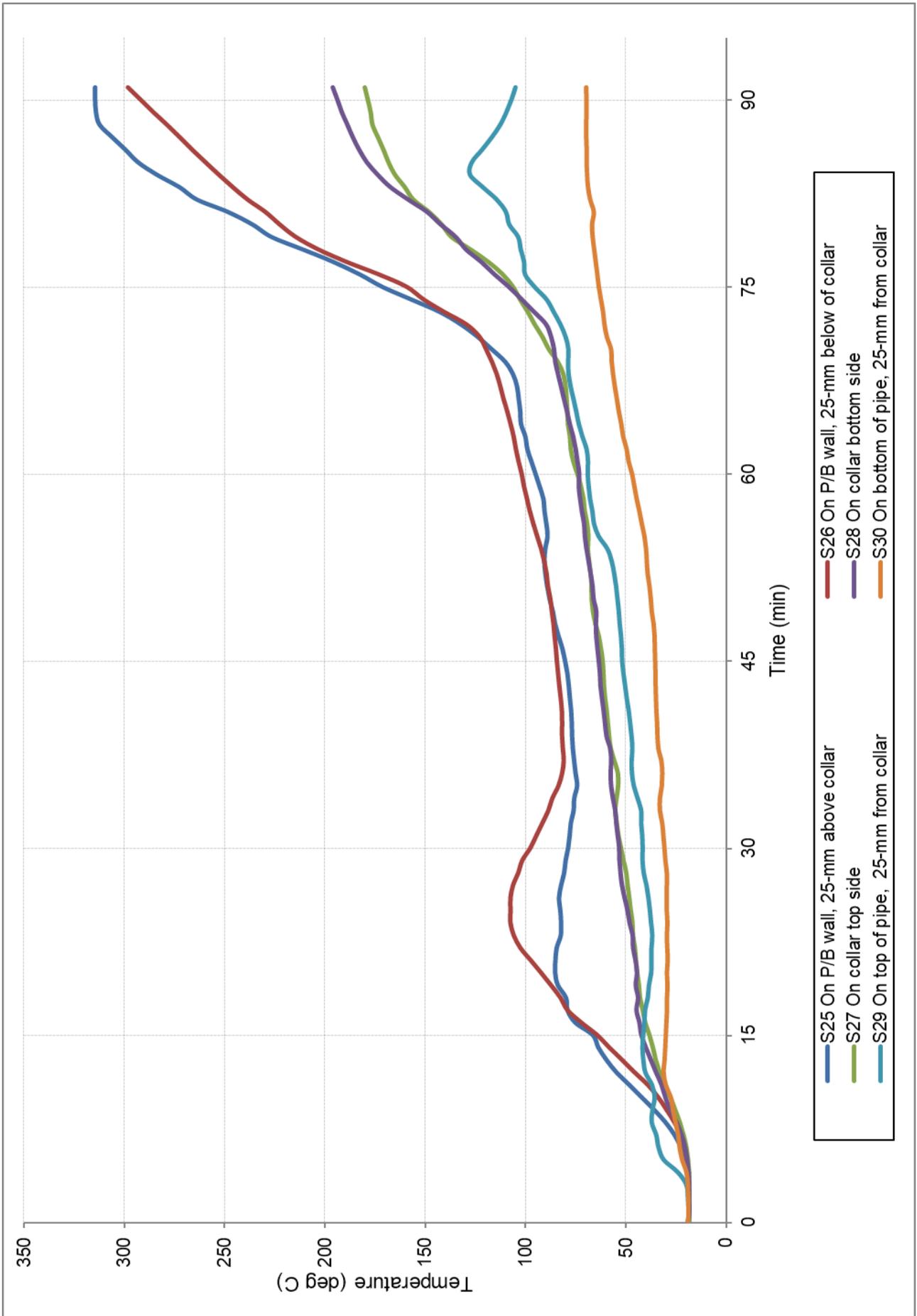


FIGURE 7 - TEMPERATURE VERSUS TIME ASSOCIATED WITH SPECIMEN #5

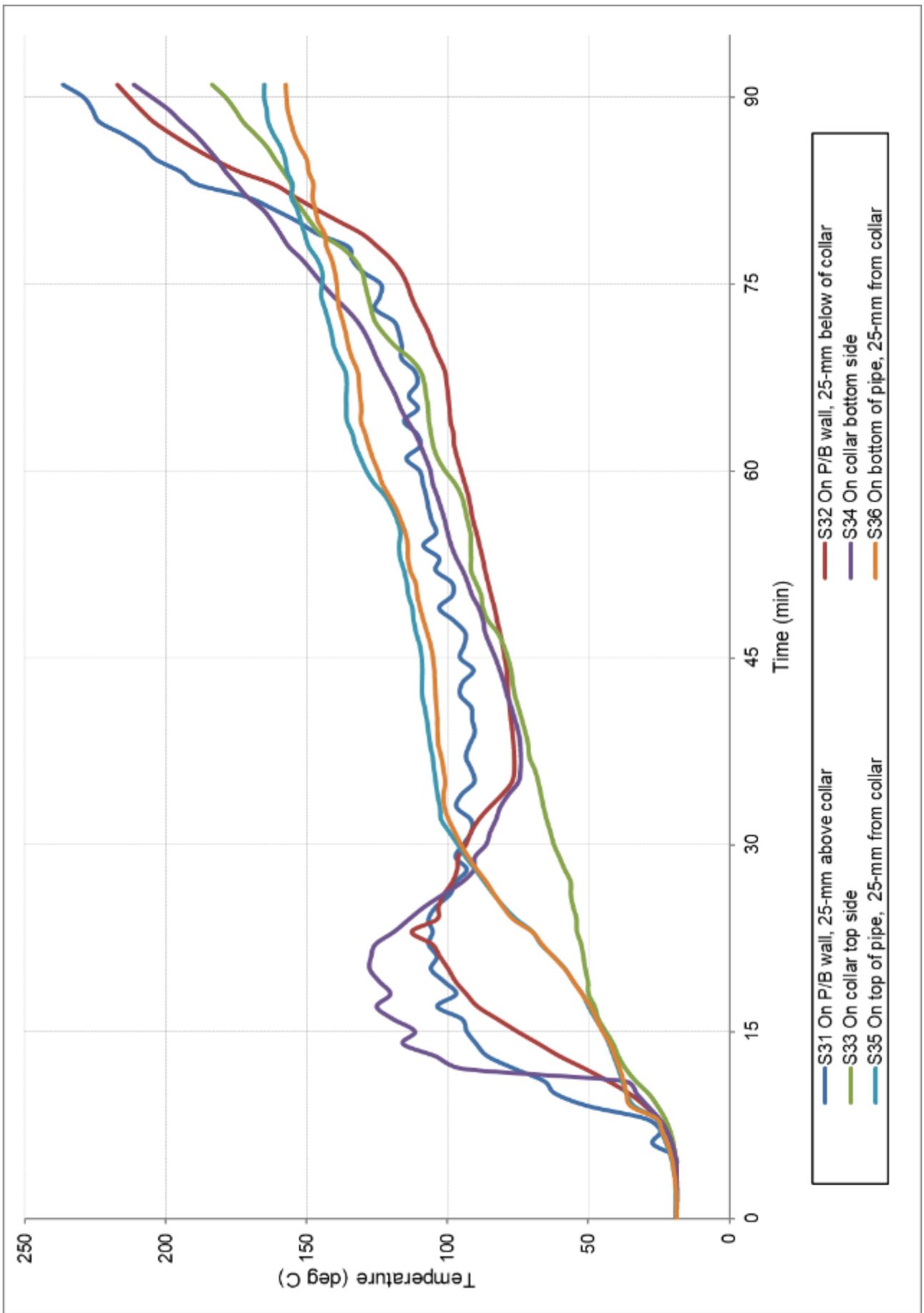


FIGURE 8 - TEMPERATURE VERSUS TIME ASSOCIATED WITH SPECIMEN #6

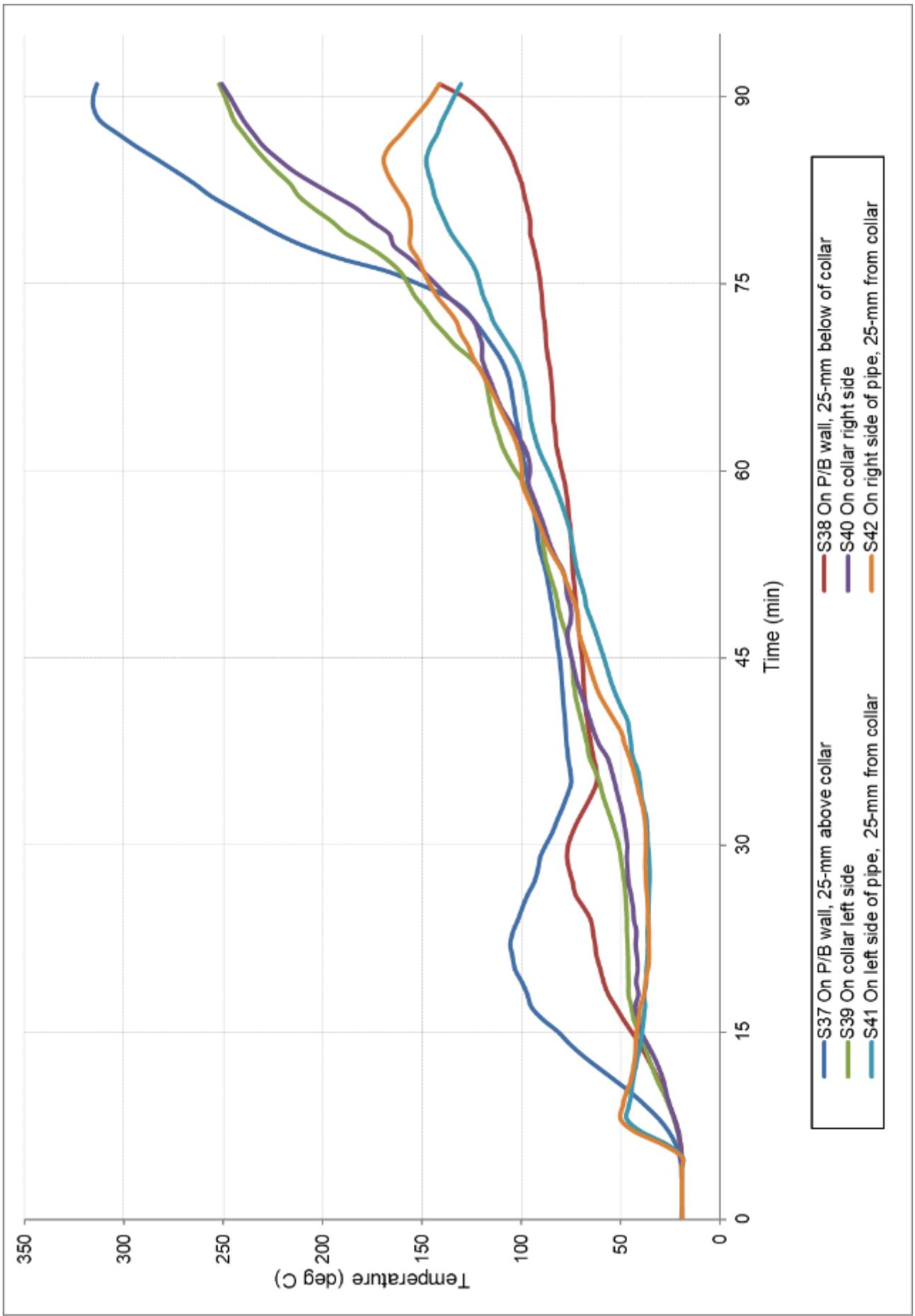


FIGURE 9 - TEMPERATURE VERSUS TIME ASSOCIATED WITH SPECIMEN #7

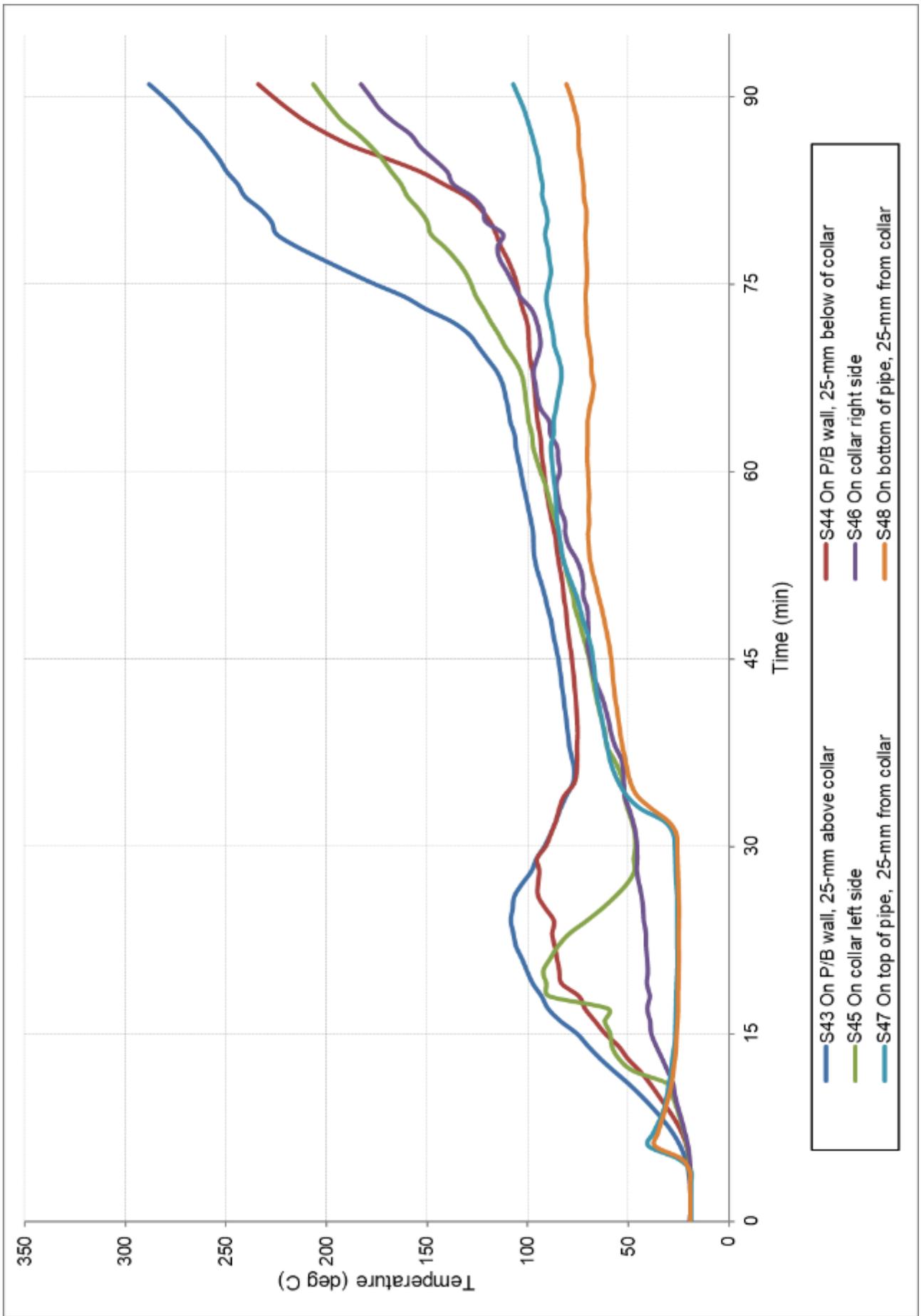


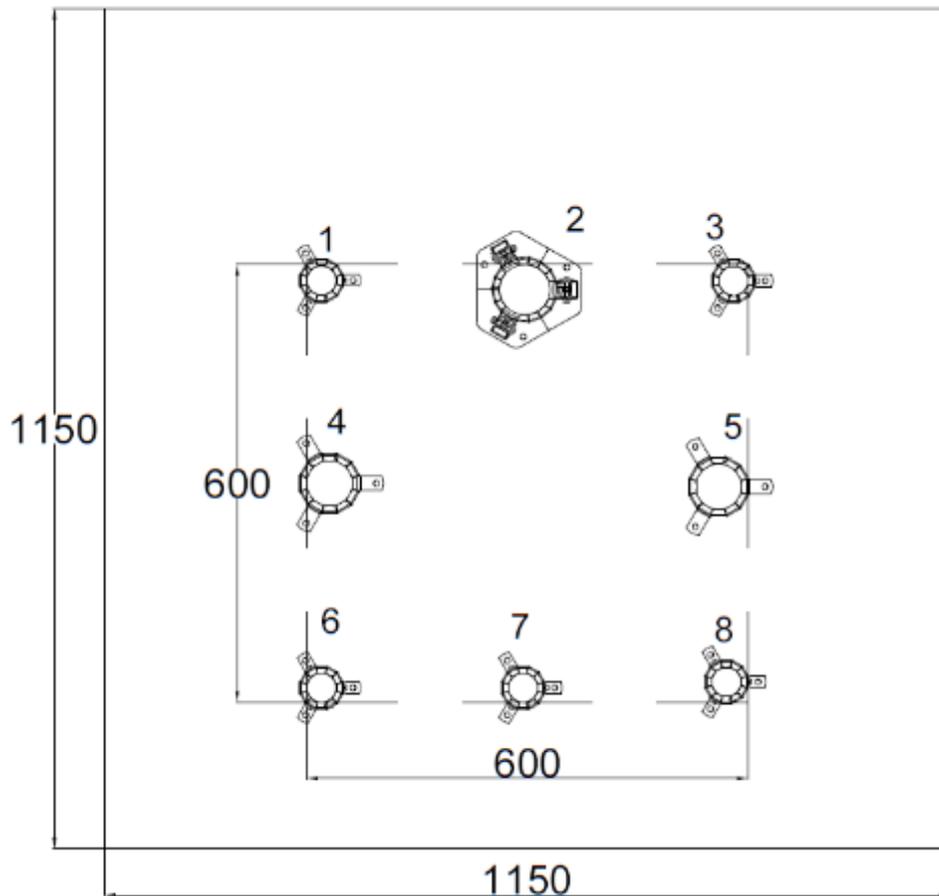
FIGURE 10 - TEMPERATURE VERSUS TIME ASSOCIATED WITH SPECIMEN #8

Appendix D – Layout and installation drawings

Snap Fire Systems Pty Ltd

Test Wall W-21-H Layout

Date: 01 MAR 2021



Penetration	Collar Code	Pipe Type	Pipe Diameter
1	32R	C-PVC	1 in
2	MS70R	Copper Tube, Foil Faced Lagging	1in (25mm Lagging)
3	32R	PEX-a	25
4	50R	C-PVC	1 ½ in
5	50R	C-PVC	1 ¼ in
6	32R	PEX-Al-PE	20
7	32R	PEX-a	32
8	32R	PEX-a	16

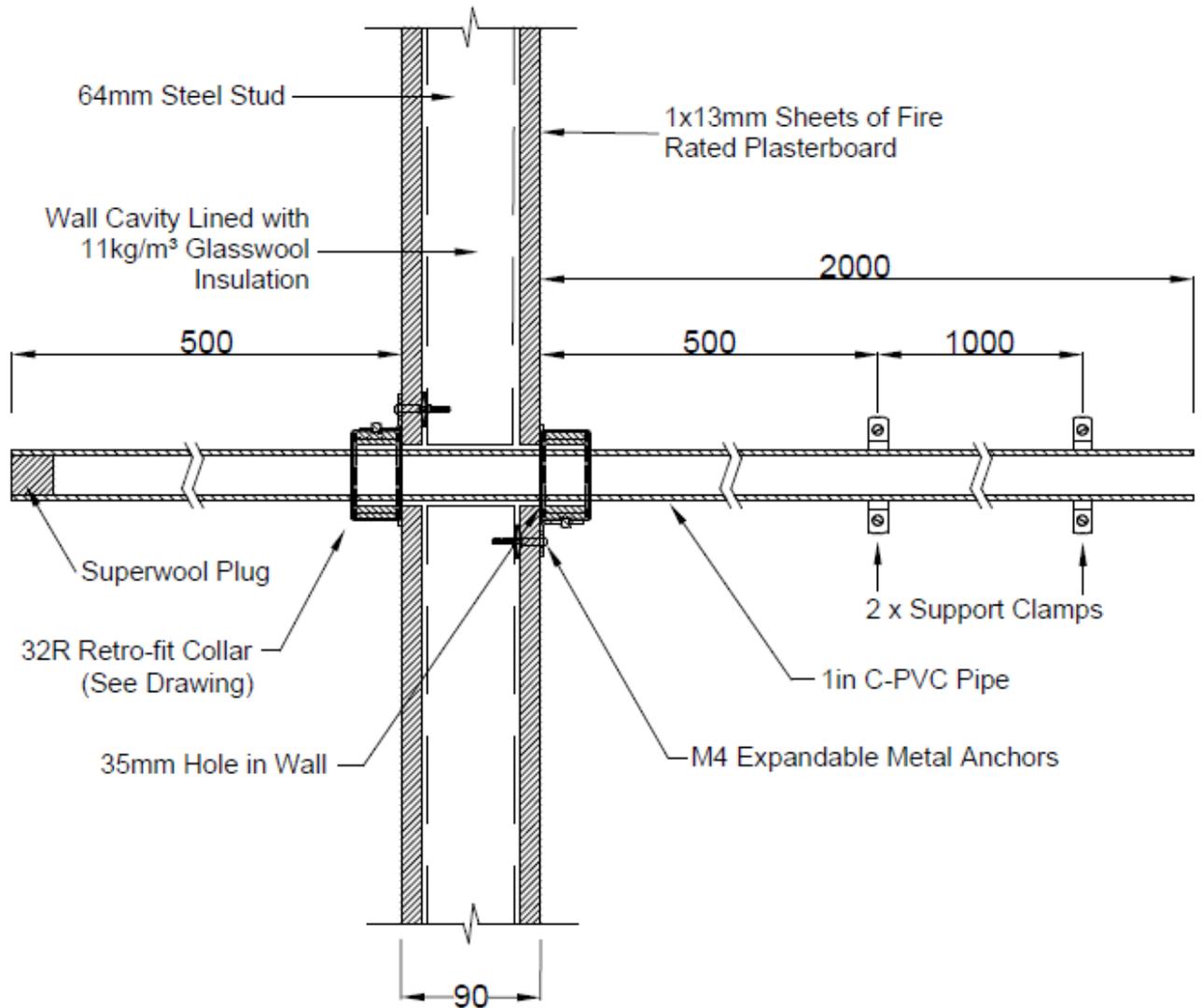
DRAWING TITLED 'TEST WALL W-21-H LAYOUT, DATED 1 MARCH 2021, BY SNAP FIRE SYSTEMS PTY LTD.

Snap Fire Systems Pty Ltd

Specimen #1

1in C-PVC Stack & 32R

Date: 26 FEB 2021



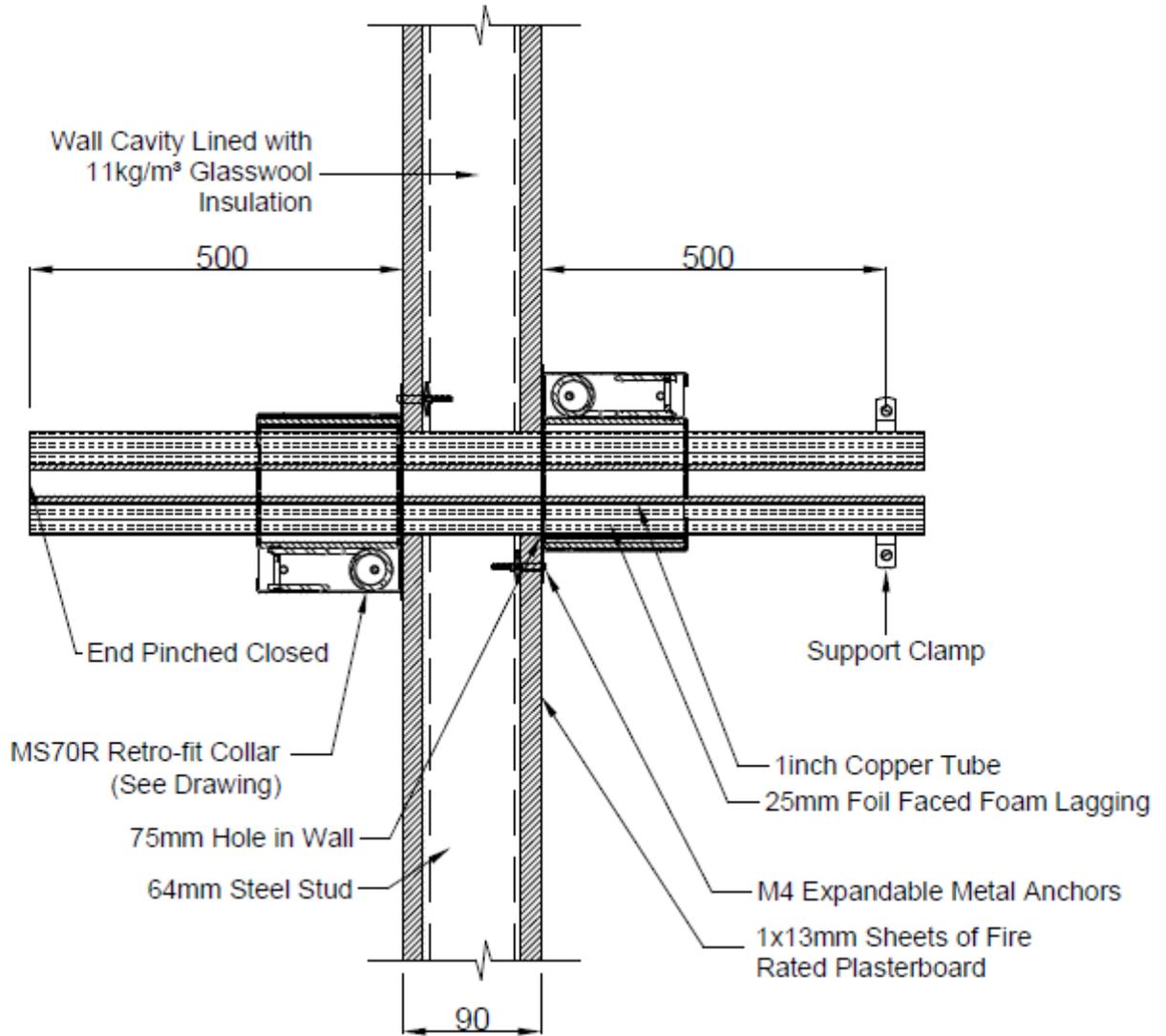
DRAWING TITLED 'SPECIMEN # 1 1IN C-PVC STACK & 32R', DATED 26 FEBRUARY 2021, BY SNAP FIRE SYSTEMS PTY LTD

Snap Fire Systems Pty Ltd

Specimen #2

1inch Copper Tube with 25mm Foil Faced Foam Lagging & MS70R Collar

Date: 26 FEB 2021



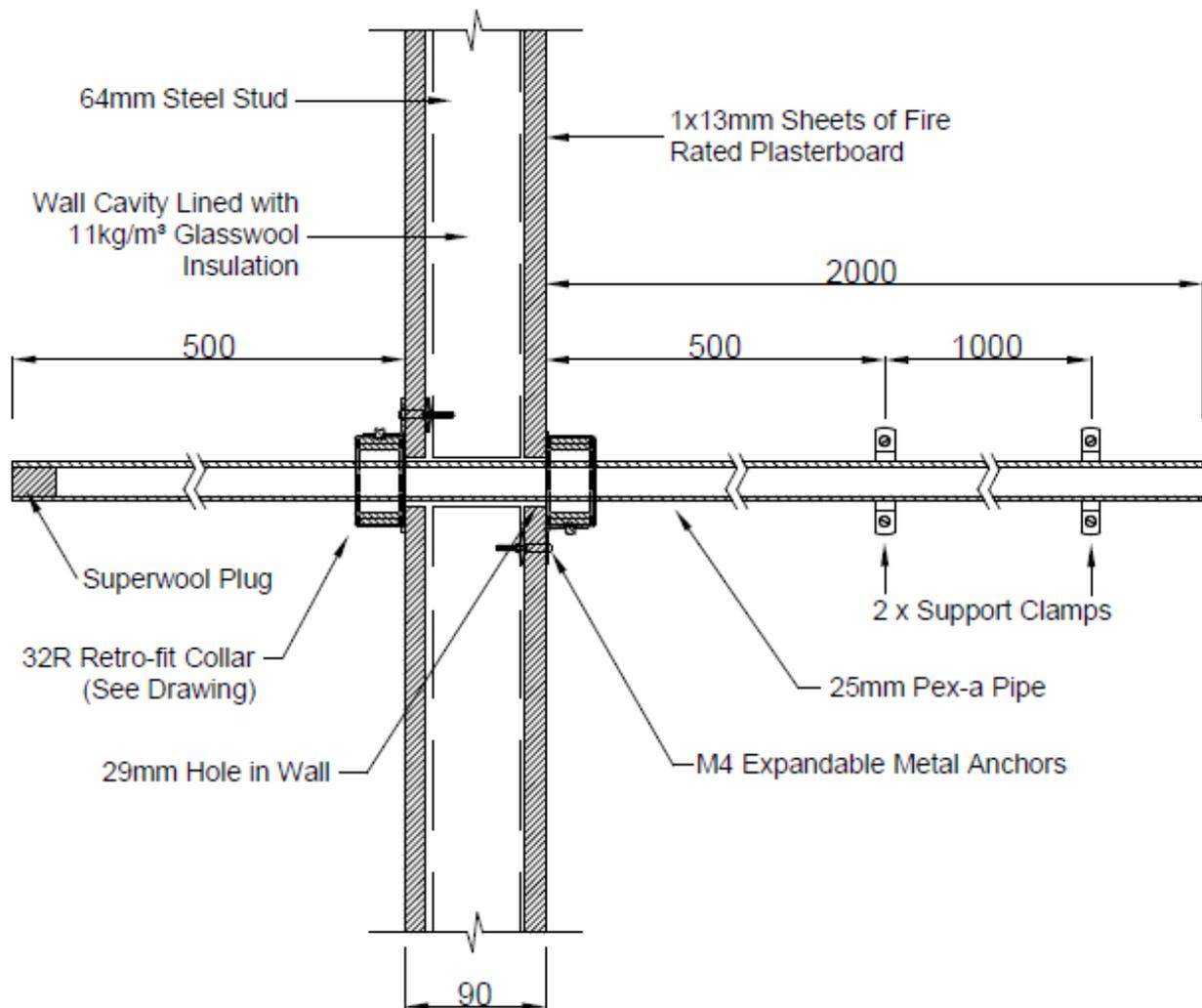
DRAWING TITLED 'SPECIMEN #2 1IN COPPER TUBE WITH 25MM FOILFACED FOAM LAGGING & MS70R COLLAR', DATED 26 FEBRUARY 2021, BY SNAP FIRE SYSTEMS PTY LTD

Snap Fire Systems Pty Ltd

Specimen #3

25 Pex-a Stack & 32R

Date: 26 FEB 2021



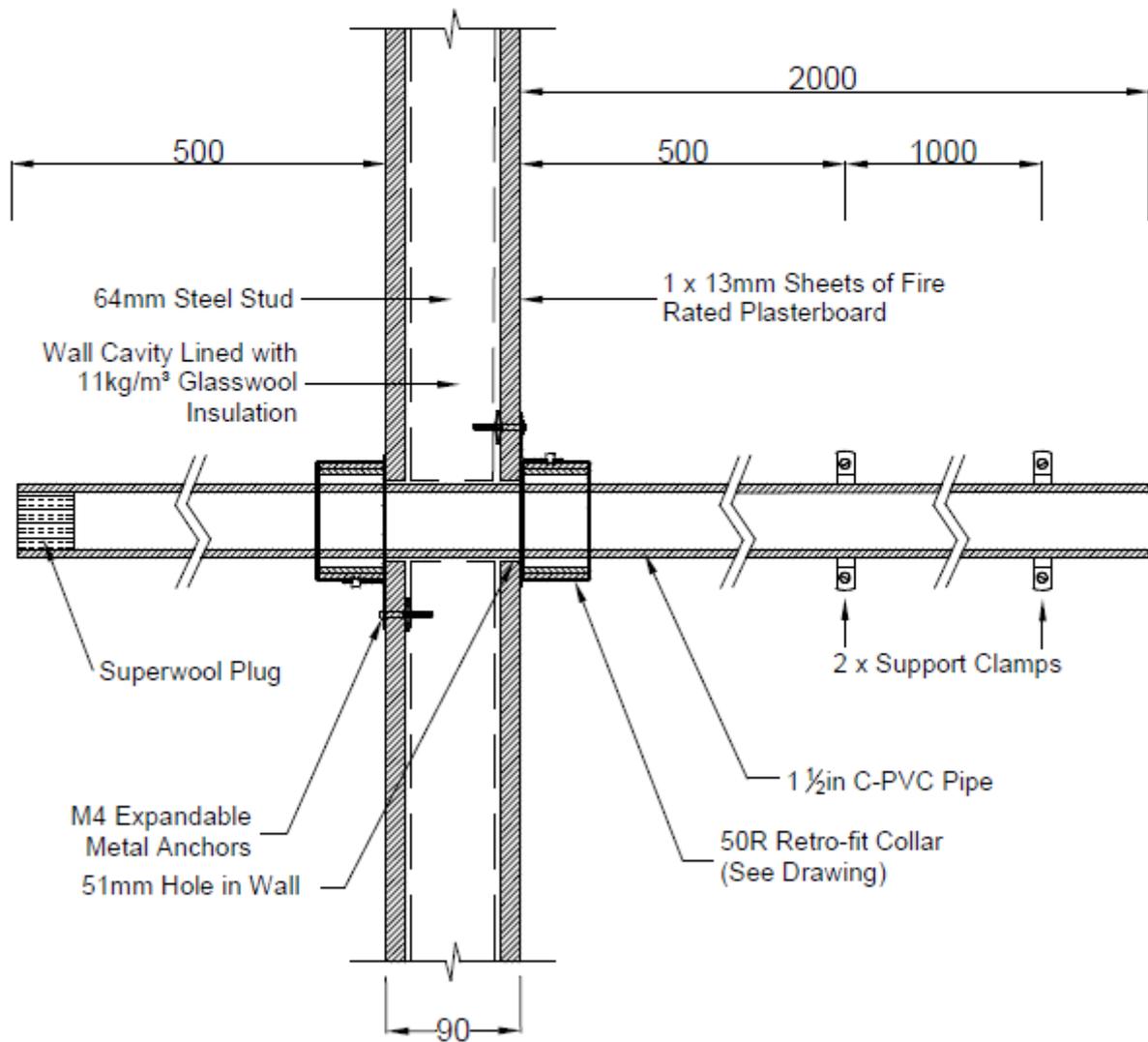
DRAWING TITLED 'SPECIMEN #3 25 PEX-A STACK & 32R', DATED 26 FEBRUARY 2021, BY SNAP FIRE SNAP FIRE SYSTEMS PTY LTD

Snap Fire Systems Pty Ltd

Specimen #4

1 1/2in C-PVC Stack & 50R

Date: 26 FEB 2021



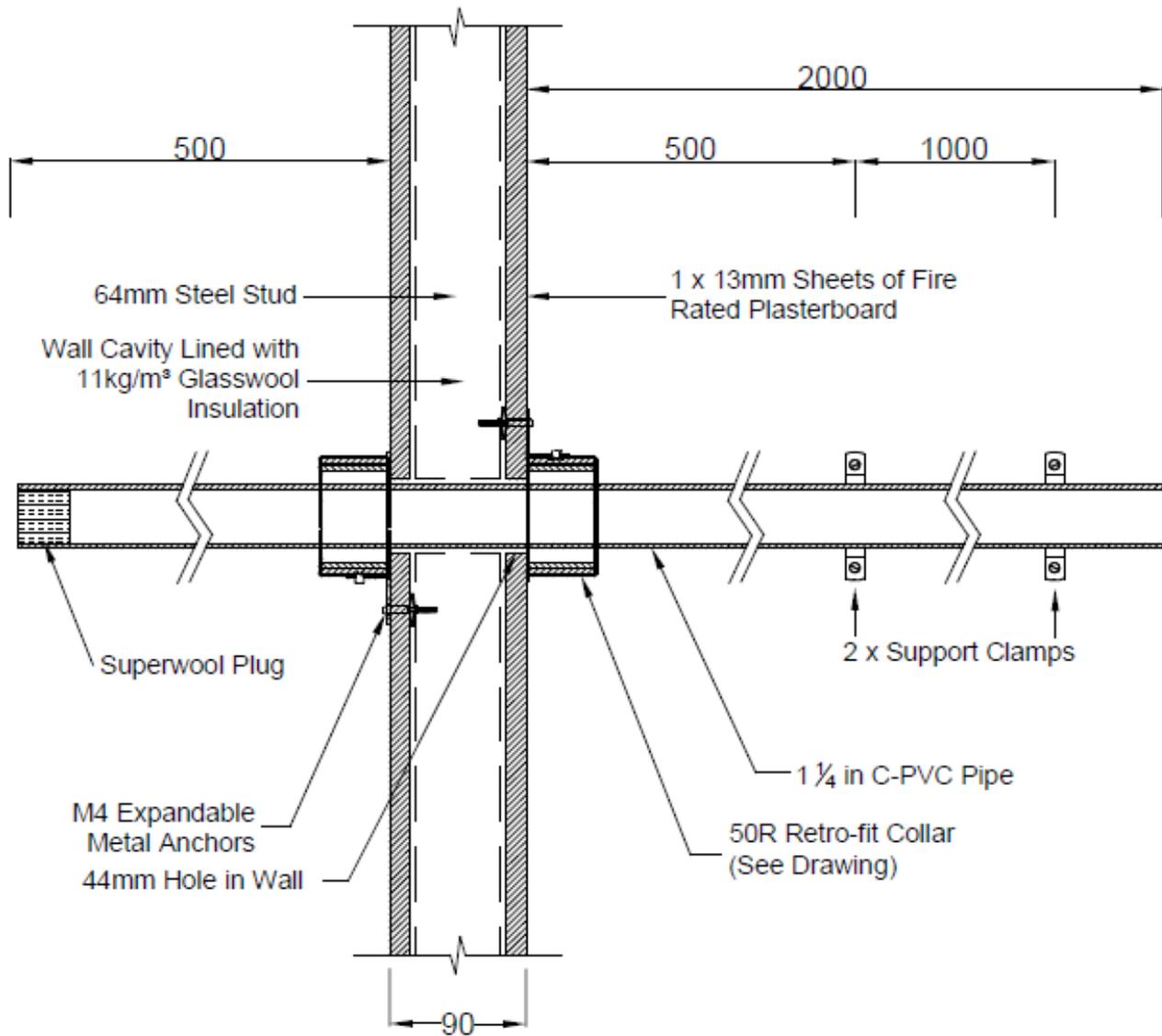
DRAWING TITLED 'SPECIMEN #4 1 1/2 IN C-PVC STACK & 50R', DATED 26 FEBRUARY 2021, BY SNAP FIRE SYSTEMS PTY LTD

Snap Fire Systems Pty Ltd

Specimen #5

1 ¼in C-PVC & 50R

Date: 26 FEB 2021



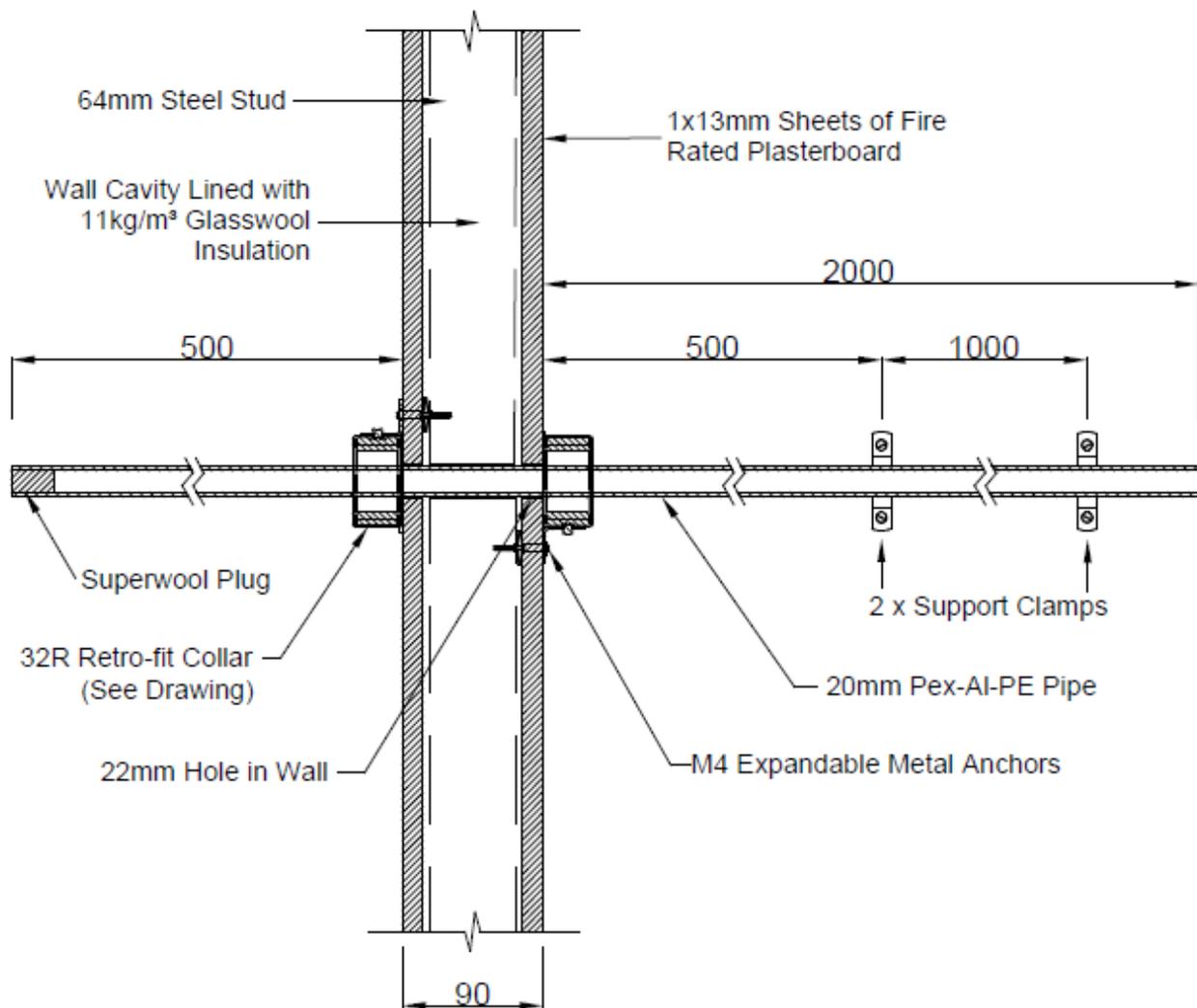
DRAWING TITLED 'SPECIMEN #5 1 ¼ IN C-PVC & 50R', DATED 26 FEBRUARY 2021, BY SNAP FIRE SYSTEMS PTY LTD

Snap Fire Systems Pty Ltd

Specimen #6

20 Pex-Al-PE Stack & 32R

Date: 01 MAR 2021



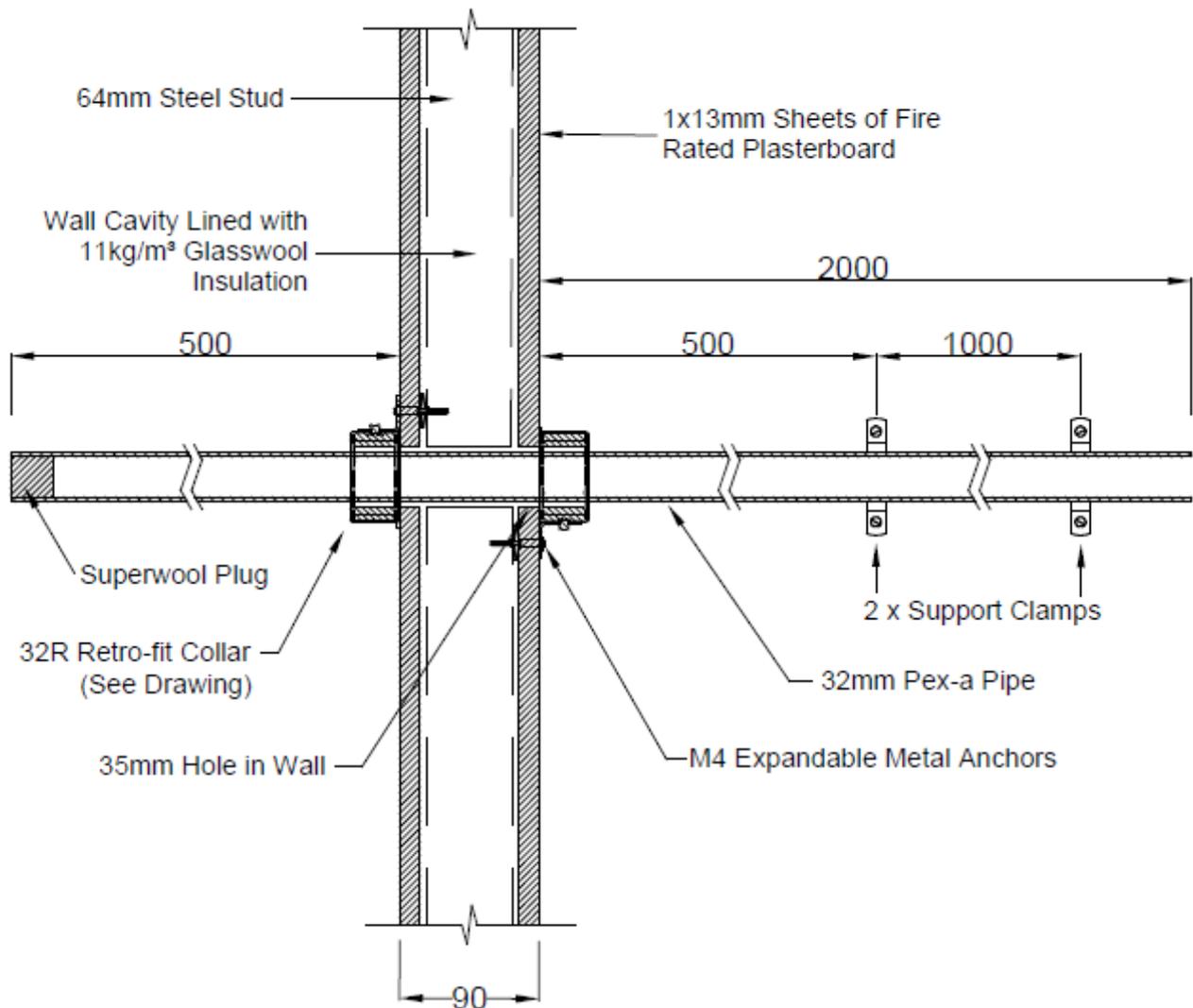
DRAWING TITLED 'SPECIMEN #6 20 PEX-AL-PE STACK & 32R', DATED 1 MARCH 2021, BY SNAP FIRE SNAP FIRE SYSTEMS PTY LTD

Snap Fire Systems Pty Ltd

Specimen #7

32 Pex-a Stack & 32R

Date: 01 MAR 2021



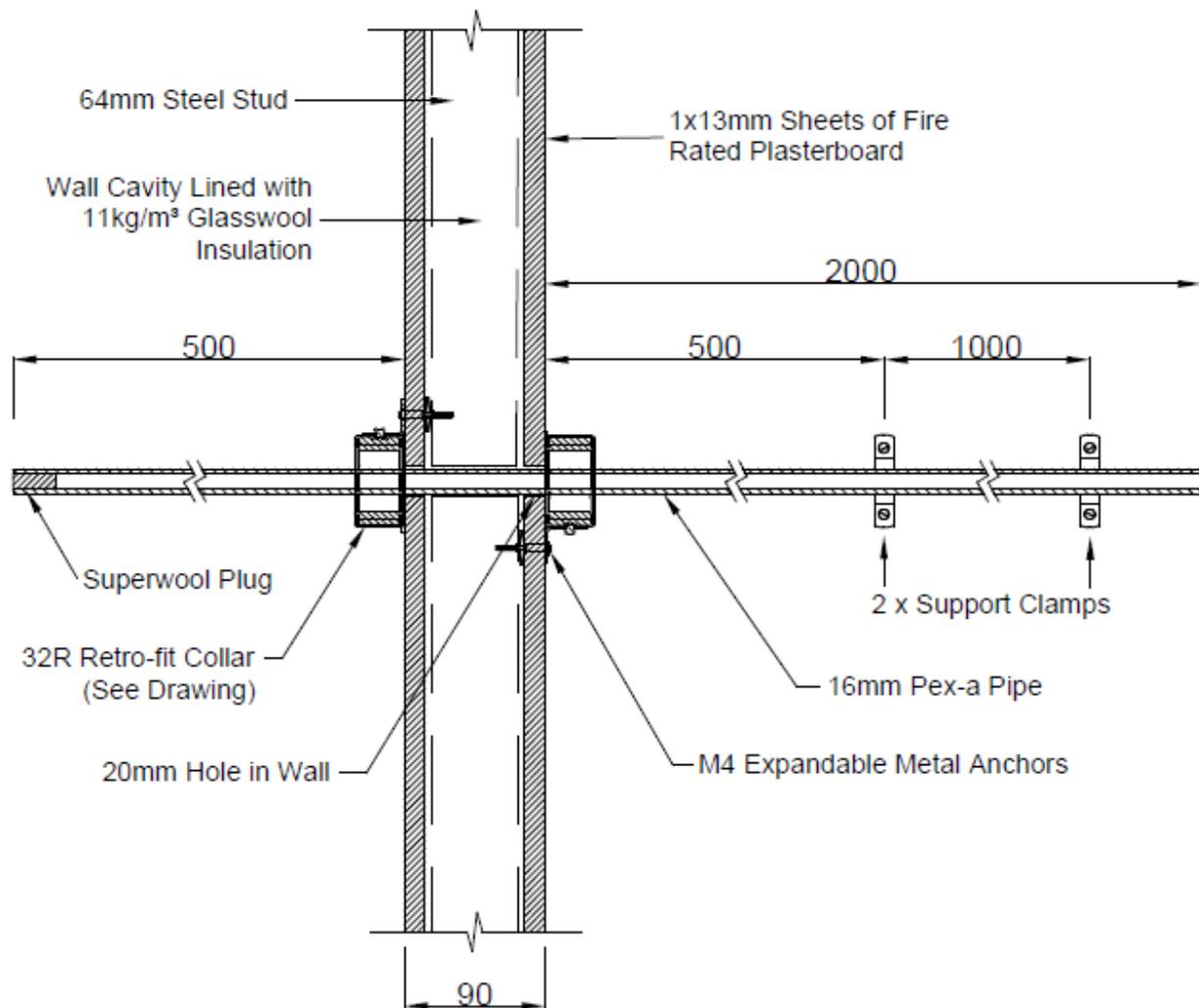
DRAWING TITLED 'SPECIMEN #7 32 PEX-A STACK & 32R', DATED 1 MARCH 2021, BY SNAP FIRE SNAP FIRE SYSTEMS PTY LTD

Snap Fire Systems Pty Ltd

Specimen #8

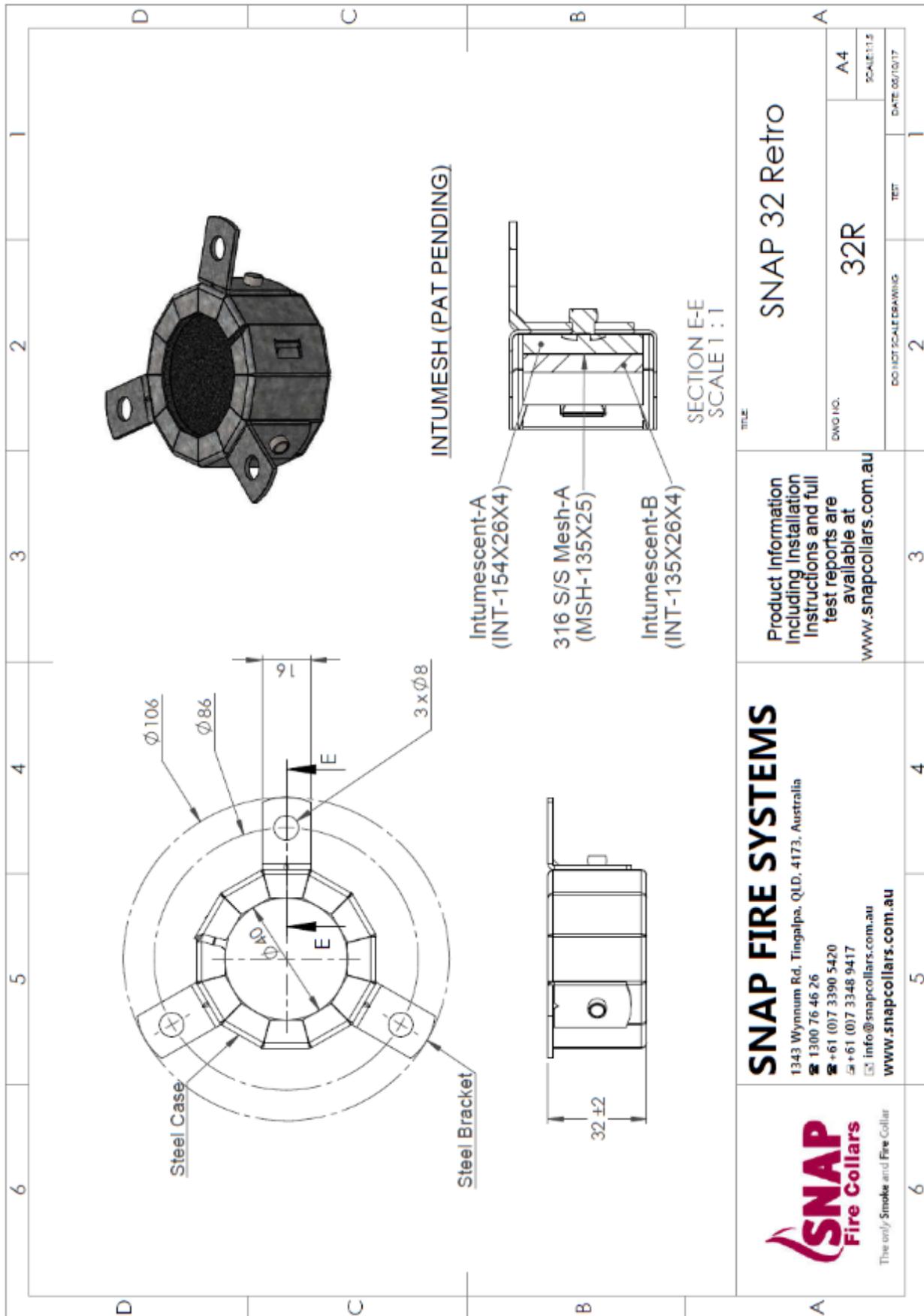
16 Pex-a Stack & 32R

Date: 01 MAR 2021

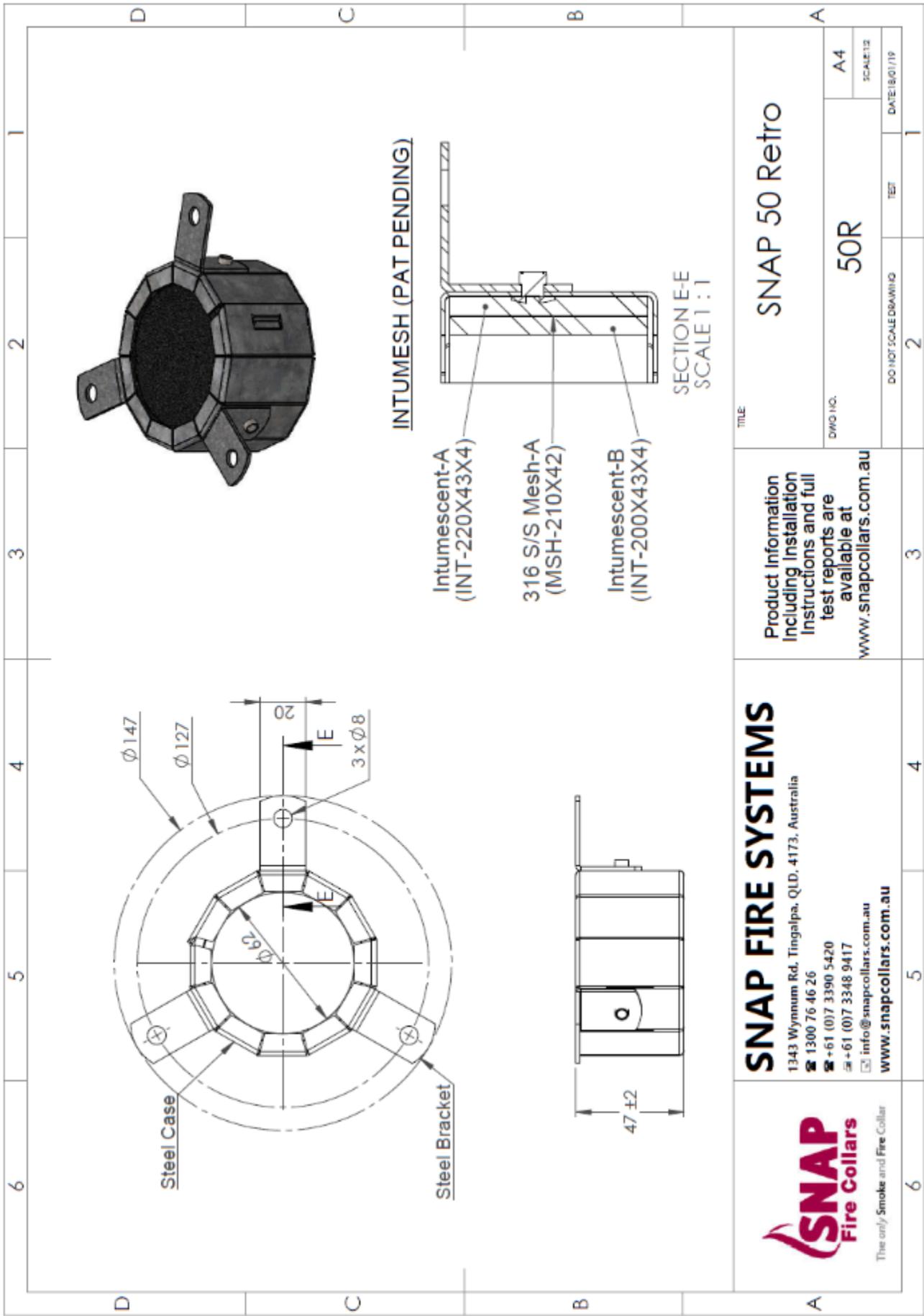


DRAWING TITLED 'SPECIMEN #8 16 PEX-A STACK & 32R', DATED 1 MARCH 2021, BY SNAP FIRE SNAP FIRE SYSTEMS PTY LTD

Appendix E – Specimen Drawings



DRAWING TITLED 'SNAP 32 RETRO', DATED 5 OCTOBER 2017, BY SNAP FIRE SYSTEMS.



TITLE		SNAP 50 Retro	
DWG NO.	50R	SCALE	A4
DATE	18/01/19	TEST	
DO NOT SCALE DRAWING			

Product Information including installation instructions and full test reports are available at www.snapcollars.com.au

SNAP FIRE SYSTEMS
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 ☎ 1300 76 46 26
 ☎ +61 (0)7 3390 5420
 ☎ +61 (0)7 3348 9417
 ✉ info@snapcollars.com.au
www.snapcollars.com.au



DRAWING TITLED 'SNAP 50 RETRO', DATED 18 JANUARY 2019, BY SNAP FIRE SYSTEMS.



Certificate of Test

No. 3566

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 2188.

Product Name: SNAP MS70R Multi Services Retrofit fire collars protecting a 1-inch copper pipe with 25-mm thick foil faced Sekisui lagging penetrating a 75-mm diameter aperture (Specimen 2)

Description: The sponsor identified the specimen as SNAP MS70R Multi Services Retrofit fire collars protecting a steel framed plasterboard wall penetrated by a 1 inch copper pipe with 25-mm thick foil faced Sekisui lagging penetrating a 75 mm diameter aperture. The plasterboard wall was constructed in accordance with Boral Firestop system SB60.1 with an established fire resistance level (FRL) of -/60/60 as detailed in the document titled "Plasterboard Fire and Acoustic Systems Australia", revision UB1231-SYS 12/18, by USC Boral Building Products Pty Ltd. The SNAP MS70R Multi Service Retrofit fire collar comprised a 0.75-mm thick steel casing with a 63-mm inner diameter and a 0.95-mm thick steel base flange with a 162-mm diameter. The 95 mm high collar casing incorporated a 4-mm thick x 90-mm wide x 250-mm long soft Intumesh intumescent wrap lined within the internal circumference of the collar casing. The closing mechanism comprised three stainless steel springs, a nylon fuse link and a 258-mm long x 88-mm wide 316 stainless steel mesh located around the intumescent strip, as shown in drawing titled 'SNAP 70 Multi Service Retro', dated 23 September 2019, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the plasterboard wall in a back-to-back configuration using three M4 expandable steel hollow wall anchors with stainless steel washers. The penetrating service comprised lagged 25-mm outside diameter copper pipe having a wall thickness of 1.34 mm, lagged with 25-mm thick foil faced Sekisui foam. The lagged pipe was fitted through the collar's sleeve and penetrated the wall through a 75-mm diameter cut-out hole as shown in drawing titled 'Specimen #2 1inch Copper Tube with 25mm Foil Faced Foam Lagging & MS70R Collar', dated 26 February 2021, by Snap Fire Systems Pty Ltd. The lagged pipe projected horizontally, 500 mm away from the unexposed face of the wall and approximately 500 mm into the furnace chamber. The lagged pipe was supported at nominally 500 mm from the unexposed face of the plasterboard wall. The copper pipe was open at the unexposed end and crimped closed on the exposed end.

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

Structural Adequacy	-	not applicable
Integrity	-	no failure at 91 minutes
Insulation	-	75 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/60/60.

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 -/60/60. 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: 18 March 2021

Issued on the 27th day of April 2021 without alterations or additions.

Brett Roddy | Manager, Fire Testing and Assessments

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Certificate of Test

No. 3567

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 2188.

Product Name: SNAP 32R Retrofit fire collars protecting a nominal 25-mm PE-Xa Rehau Rautitan pipe penetrating a 29-mm diameter aperture (Specimen #3)

Description: The sponsor identified the specimen as SNAP 32R Retrofit fire collars protecting a steel framed plasterboard wall penetrated by a nominal 25-mm PE-Xa Rehau Rautitan pipe penetrating a 29-mm diameter aperture. The plasterboard wall was constructed in accordance with Boral Firestop system SB60.1 with an established fire resistance level (FRL) of ~/60/60 as detailed in the document titled "Plasterboard Fire and Acoustic Systems Australia", revision UB1231-SYS 12/18, by USG Boral Building Products Pty Ltd. The SNAP 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 which comprised two soft 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 titled "SNAP 32 Retro", dated 5 October 2017, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the plasterboard wall in a back-to-back configuration using three M4 expandable steel hollow wall anchors with stainless steel washers. The penetrating service comprised a Rehau Rautitan PE-Xa 25.2-mm outside diameter pipe, with a wall thickness of 3.95-mm fitted through the collar's sleeve and penetrated the wall through a 29 mm diameter cut-out hole as shown in drawing titled "Specimen #3, 25 Pex-a Stack & 32R", dated 26 February 2021, provided 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 open at the unexposed end and plugged with ceramic fibre (Superwool) on the exposed end.

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

Structural Adequacy	-	not applicable
Integrity	-	no failure at 91 minutes
Insulation	-	78 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of ~/60/60.

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 ~/60/60. 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: 18 March 2021

Issued on the 17th day of April 2021 without alterations or additions.

Brett Roddy | Manager, Fire Testing and Assessments

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Certificate of Test

No. 3568

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 2188.

Product Name: SNAP 50R Retrofit fire collars protecting a nominal 1 1/4 -inch (48.2-mm OD) CPVC pipe penetrating a 51-mm diameter aperture (Specimen 4)

Description: The sponsor identified the specimen as SNAP 50R Retrofit fire collars protecting a steel framed plasterboard wall penetrated by a nominal 1 1/4 -inch (48.2 mm OD) CPVC pipe penetrating a 51-mm diameter aperture. The plasterboard wall was constructed in accordance with Boral Firestop system SB60.1 with an established fire resistance level (FRL) of ~/60/60 as detailed in the document titled "Plasterboard Fire and Acoustic Systems Australia", revision UB1231-SYS 12/18, by USC Boral Building Products Pty Ltd. The SNAP Retrofit 50R fire collar comprised a 0.75-mm steel casing with a 52 mm inner diameter and a 117-mm diameter base flange. The 17-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 a 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. One collar was fixed to each side of the plasterboard wall in a back-to-back configuration using three M4 expandable steel hollow wall anchors with stainless steel washers. The penetrating service comprised a Blazemaster CPVC 48.21-mm outside diameter pipe, with a wall thickness of 3.98-mm fitted through the collar's sleeve and penetrated the wall through a 51 mm diameter cut-out hole as shown in drawing titled "Specimen #4, 1 1/4 in CPVC Stack & 50R", dated 26 February 2021, provided 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 open at the unexposed end and plugged with ceramic fibre (Superwool) on the exposed end.

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

Structural Adequacy	-	not applicable
Integrity	-	no failure at 91 minutes
Insulation	-	82 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of ~/60/60.

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 ~/60/60. 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: 18 March 2021

Issued on the 17th day of April 2021 without alterations or additions.

Brett Roddy | Manager, Fire Testing and Assessments

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Certificate of Test

No. 3569

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 2188.

Product Name: SNAP 50R Retrofit fire collars protecting a nominal 1 3/4-inch (42.07-mm OD) CPVC pipe penetrating a 44-mm diameter aperture (Specimen 5)

Description: The sponsor identified the specimen as SNAP 50R Retrofit fire collars protecting a steel framed plasterboard wall penetrated by a nominal 1 3/4-inch (42.07-mm OD) CPVC pipe penetrating a 44-mm diameter aperture. The plasterboard wall was constructed in accordance with Boral Firestop system SB60.1 with an established fire resistance level (FRL) of ~/60/60 as detailed in the document titled "Plasterboard Fire and Acoustic Systems Australia", revision UB1231-SYS 12/18, by USC Boral Building Products Pty Ltd. 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 a 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. One collar was fixed to each side of the plasterboard wall in a back-to-back configuration using three M4 expandable steel hollow wall anchors with stainless steel washers. The penetrating service comprised a Blazemaster CPVC 42.07-mm outside diameter pipe, with a wall thickness of 3.59-mm fitted through the collar's sleeve and penetrated the wall through a 44 mm diameter cut-out hole as shown in drawing titled "Specimen #5, 1 3/4 in CPVC Stack & 50R", dated 26 February 2021, provided 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 open at the unexposed end and plugged with ceramic fibre (Superwool) on the exposed end.

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

Structural Adequacy	-	not applicable
Integrity	-	no failure at 91 minutes
Insulation	-	78 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of ~/60/60.

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 ~/60/60. 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: 18 March 2021

Issued on the 27th day of April 2021 without alterations or additions.

Brett Roddy | Manager, Fire Testing and Assessments

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Certificate of Test

No. 3570

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 2188.

Product Name: SNAP 32R Retrofit fire collars protecting a nominal 20-mm PE-Xa/AI/PE Rehau Rautitan pipe penetrating a 22-mm diameter aperture (Specimen G)

Description: The sponsor identified the specimen as SNAP 32R Retrofit fire collars protecting a steel framed plasterboard wall penetrated by a nominal 20-mm PE-Xa/AI/PE Rehau Rautitan pipe penetrating a 22-mm diameter aperture. The plasterboard wall was constructed in accordance with Boral Firestop system S660.1 with an established fire resistance level (FRL) of -/60/60 as detailed in the document titled "Plasterboard Fire and Acoustic Systems Australia", revision UB2231-SYS 12/18, by JSG Boral Building Products Pty Ltd. The SNAP 32R Retrofit collar comprised a 0.75-mm steel casing with a 10-mm inner diameter and a 106 mm diameter base flange. The 32-mm high collar casing incorporated a closing mechanism which comprised two soft intumescent strips lined with 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 titled "SNAP 32 Retro", dated 5 October 2017, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the plasterboard wall in a back-to-back configuration using three M4 expandable steel hollow wall anchors with stainless steel washers. The penetrating service comprised a Rehau Rautitan PE-Xa/AI/PE 19.95-mm outside diameter pipe, with a wall thickness of 3.43-mm fitted through the collar's sleeve and penetrated the wall through a 22-mm diameter cut-out hole as shown in drawing titled "Specimen #6, 20 Pex-AI-PE Stack & 32R", dated 1 March 2021, provided 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 open at the unexposed end and plugged with ceramic fibre (Superwool) on the exposed end.

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

Structural Adequacy	-	not applicable
Integrity	-	no failure at 91 minutes
Insulation	-	85 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/60/60.

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 -/60/60. 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: 18 March 2021

Issued on the 17th day of April 2021 without alterations or additions.

Brett Roddy | Manager, Fire Testing and Assessments

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Certificate of Test

No. 3571

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 2188.

Product Name: SNAP 32R Retrofit fire collars protecting a nominal 32-mm PE-Xa Rehau Rautitan pipe penetrating a 35-mm diameter aperture (Specimen 7)

Description: The sponsor identified the specimen as SNAP 32R Retrofit fire collars protecting a steel framed plasterboard wall penetrated by a nominal 32-mm PE-Xa Rehau Rautitan pipe penetrating a 35-mm diameter aperture. The plasterboard wall was constructed in accordance with Boral Firestop system SB60.1 with an established fire resistance level (FRL) of ~/60/60 as detailed in the document titled "Plasterboard Fire and Acoustic Systems Australia", revision UB1231-SYS 12/18, by USC Boral Building Products Pty Ltd. The SNAP 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 which comprised two soft 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 titled "SNAP 32 Retro", dated 5 October 2017, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the plasterboard wall in a bank-to-back configuration using three M4 expandable steel hollow wall anchors with stainless steel washers. The penetrating service comprised a Rehau Rautitan PE-Xa 32.08-mm outside diameter pipe, with a wall thickness of 4.57-mm fitted through the collar's sleeve and penetrated the wall through a 35-mm diameter cut-out hole as shown in drawing titled "Specimen #7, 32 Pex-a Stack & 32R", dated 1 March 2021, provided 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 open at the unexposed end and plugged with ceramic fibre (Superwool) on the exposed end.

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

Structural Adequacy	-	not applicable
Integrity	-	no failure at 91 minutes
Insulation	-	78 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of ~/60/60.

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 ~/60/60. 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: 18 March 2021

Issued on the 17th day of April 2021 without alterations or additions.

Brett Roddy | Manager, Fire Testing and Assessments

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Certificate of Test

No. 3572

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 2188.

Product Name: SNAP 32R Retrofit fire collars protecting a nominal 16-mm PE-Xa Rehau Rautitan pipe penetrating a 35-mm diameter aperture (Specimen 8)

Description: The sponsor identified the specimen as SNAP 32R Retrofit fire collars protecting a steel framed plasterboard wall penetrated by a nominal 16-mm PE-Xa Rehau Rautitan pipe penetrating a 35-mm diameter aperture. The plasterboard wall was constructed in accordance with Boral Firestop system SB60.1 with an established fire resistance level (FRL) of ~/60/60 as detailed in the document titled "Plasterboard Fire and Acoustic Systems Australia", revision UB1231-SYS 12/18, by USC Boral Building Products Pty Ltd. The SNAP 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 which comprised two soft 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 titled "SNAP 32 Retro", dated 5 October 2017, by Snap Fire Systems Pty Ltd. One collar was fixed to each side of the plasterboard wall in a back-to-back configuration using three M4 expandable steel hollow wall anchors with stainless steel washers. The penetrating service comprised a Rehau Rautitan PE-Xa 16.2-mm outside diameter pipe, with a wall thickness of 2.54-mm fitted through the collar's sleeve and penetrated the wall through a 20 mm diameter cut-out hole as shown in drawing titled "Specimen #8, 16 Pex-a Stack & 32R", dated 1 March 2021, provided 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 open at the unexposed end and plugged with ceramic fibre (Superwool) on the exposed end.

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

Structural Adequacy	-	not applicable
Integrity	-	no failure at 91 minutes
Insulation	-	77 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of ~/60/60.

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 ~/60/60. 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: 18 March 2021

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Brett Roddy | Manager, Fire Testing and Assessments

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References

The following informative documents are referred to in this Report:

- | | |
|----------------|--|
| AS 1530.4-2014 | Methods for fire tests on building materials, components and structures Part 4: Fire-resistance tests for 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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