Fire Testing Laboratory

TEST REPORT

PF25012

Fire resistance test for penetration through a vertical separating element

Client:	BOSS Products (Australia) Pty Ltd
Test method:	AS1530.4-2014
Report Date:	17/04/2025
Test number:	PF25012

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Table of Contents

1.1 Document revision schedule

Revision #	Date	Description
1	02/04/2025	Initial issue for Client review
2	17/04/2025	Issued to Client

1.2 Signatories

Report	Name	Signature	Date
Prepared by:	Alexey Kokorin		17/04/2025
Authorised by:	Andrew Bain (Authorized signatory)		17/04/2025

ACCREDITED
IANZ
TESTING LABORATORY

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

2. Report Summary

Service penetrations were tested passing through a 92mm steel frame insulated wall lined with one layer of 13mm fire rated plasterboard on each side.

Specimen #	Service	Actual Integrity (min)	Actual Insulation (min)	FRL*
1	Cable Bundle (8 x CAT6 + 8 x COAX + 8 x Fire Alarm cables)	91NF	91NF	-/60/60
2	32mm Copper Pipe with 13mm thick nitrile insulation	91NF	57	-/60/45
3	20mm PEX Pipe with 13mm thick nitrile insulation	91NF	79	-/60/60
4	25mm PEX Pipe with 13mm thick nitrile insulation	34	34	-/30/30
5	25mm Condensate Pipe with 19mm thick nitrile insulation	91NF	73	-/60/60
6	60mm Steel Pipe with 2 x Alarm cables	91NF	90	-/60/60
7	60mm Steel Pipe	91NF	34	-/60/30
8	Conduit Bundle (1 x 20mm + 1 x 25mm + 1 x 32mm)	91NF	91NF	-/60/60
9	23mm OD Aluminium Cable	91NF	34	-/60/30
10	17mm OD Aluminium Cable	91NF	64	-/60/60

NF – No Failure

* - FRL was reduced to the published performance of the wall.

3. General Information

3.1 Testing Scope

Applicable Standards:

AS 1530.4-2014 Section 10: Service penetrations and control joints

AS 4072.1-2005 (r. 2016) Components for the protection of openings in fire-resistant separating elements. Part 1: Service penetrations and control joints

Departures from Testing Method:

No departures from the testing method

Performance Criteria:

Failure shall be deemed to have occurred when one of the following occurs:

a) The temperature at any location on the unexposed face of the test specimen exceeds the initial temperature by more than 180℃

b) Integrity failure shall be deemed to have occurred upon ignition of the cotton pad when glowing or flaming occurs for a period of 30 seconds.

c) Flaming to the unexposed face for 10 seconds or longer shall be deemed to be an Integrity failure.

Documentation:

Testing products were checked and tested based on the Client description, refer to the Specimens description below. Documents provided by the Client:

- Test 2 – Elevation – Aperture Location Fire Side – Horizontal.pdf
- Test 2 – Elevation – Aperture Location Fire Side – Vertical.pdf
- Test 2 – Elevation – Aperture Size Fire Side.pdf
- Test 2 – Elevation – Fire Side.pdf
- Test 2 – Elevation – Framing Fire Side.pdf
- Test 2 – Elevation – Non Fire Side.pdf
- Test 2 – Section A.pdf
- Test 2 – Specimen Sections V3.pdf

3.2 Contact Details

Accredited Testing Laboratory

FTSL - Passive Fire Inspection and Test Services Ltd

Accreditation Number - 1335

1/113 Pavilion Drive, Mangere, Auckland, 2022

New Zealand

Contact e-mail: tests@firelab.co.nz

Client/Applicant:

BOSS Products (Australia) Pty Ltd

Unit 1, 16 Atkinson Road, Tarren Point 2229, New South Wales

Australia

Contact e-mail: mark.prior@bossfire.com.au

Manufacturer:

Same as Client/Applicant

3.3 Specimen Preparation, Conditioning and Timeline

Specimens conditioning and delivery to Laboratory:

Separating element was built by the Laboratory in line with Client instructions. Installation of fire stopping system was performed by the Client. The Laboratory was not involved in sampling of the materials. The Laboratory checked materials during construction of the specimen. All service were capped on the fire side.

Testing date:

12/03/2025

Installation completion date:

19/02/2025

Termination of The Test:

The test was discontinued at 91 minutes.

3.4 Use of the Report

This report shall not be reproduced, except in full.

This report details the methods of construction, 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 that 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.

The test results relate to the specimens of the product in the form in which they were tested. Differences in the composition or thickness of the product may significantly affect the performance during the test and may therefore invalidate the test results. Care should be taken to ensure that any product, which is supplied or used, is fully represented by the specimens, which were tested.

The specimens were supplied by the sponsor and the Laboratory was not involved in any of selection or sampling procedures.

The results of these fire tests may be used to directly assess fire hazard, but it should be recognized that a single test method will not provide a full assessment of fire hazard under all fire conditions.

4. Specimen Description

4.1 Supporting Construction

Separating element		
1.1	Item	92mm (nominal) steel stud frame insulated wall with one layer of 13mm FR Plasterboard fitted to each side of the frame
	Dimensions	Width x Height: 1200mm × 1200mm

Materials		
1.2	Item	Ramset AnkaScrew AS06075WGM
	Dimensions	6mm x 75mm
	Installation	Fixing top and bottom plates to refractory frame
1.3	Item	Steel Stud 0.50bmt
	Dimensions	Width x Height: 92mm x 1200mm
	Installation	Used to construct studs and nogs in steel frame
1.4	Item	Steel Deflection Head 0.75bmt
	Dimensions	Width x Height: 92mm x 1200mm
	Installation	Used to construct top plate
1.4	Item	Steel Track 0.50bmt
	Dimensions	Width x Height: 92mm x 1200mm
	Installation	Used to construct bottom plate
1.5	Item	Self-Tapping Screw
	Dimensions	10g x 16mm
	Installation	Used to construct steel stud frame
1.6	Item	GIB Fyreline
	Dimensions	Width x Height: 1200mm x 1200mm
		Thickness: 13mm
	Installation	1 layer applied to each face of separating element
1.7	Item	GIB Grabber Self Tapping Screw
	Dimensions	41mm
	Installation	Used to secure GIB Fyreline to frame

1.8	Item	GIB Plus 4 Plaster
	Dimensions	15L Pail
	Installation	Used to cover screw heads on plasterboard
1.9	Item / Product Name	Boss FireMastic-300
	Dimensions	600mL sausage
	Installation	Used to seal between separating element and refractory frame
1.10	Item	Boss Batt
	Dimensions	Width x Height: 600mm x 1200mm
	Installation	Cut to fit flush in studs and nogs between fire cells
1.11	Item	Earthwool insulation – glass wool insulation
	Dimensions	R2.2 90mm thick
	Installation	Insulation in cavity of separating element

4.2 Specimens

Services		
2.1	Item	Firesense TPSLD-1 50-2C-ELV-Fire-Light Duty 2 Core 1.5mm²
	Cable	Overall Diameter: 6.5mm x 3.75mm
		Sheath Material: PVC
		Sheath Thickness: 0.54mm
	Core	Number of Cores: 2 (circular shaped)
		Overall Diameter: 2.62mm
		Conductor Diameter: 0.63mm
		Conductor Material: Copper
		Insulation Material: V-90 PVC
		Insulation Thickness: 0.85mm
2.2	Item	Dynamix UTP CAT6 Blue Solid Cable
	Cable	Overall Diameter: 6.3mm
		Sheath Material: PVC
		Sheath Thickness: 0.5mm

	Core	Overall Diameter: 2.6mm
		Conductor Diameter: 0.24mm
		Conductor Material: Copper
		Insulation Material: V-90 PVC
		Insulation Thickness: 0.65mm
2.3	Item	Belden Coax Cable RG6 2.25GHz Sky Satellite Black
	Cable	Overall Diameter: 6.5mm
		Sheath Material: PVC
		Sheath Thickness: 0.85mm
		Conductor Diameter: 0.12mm
		Conductor Material: Copper Clad Steel
2.4	Item	Kembla NZS3501 2 32x1.22 B 32mm Copper Pipe
	Dimensions	Diameter (OD): 34.2mm
		Diameter (ID): 31.1mm
		Wall Thickness (T): 1.65mm
2.5	Item	K Flex Fire-Retardant Nitrile Insulation 32x13
	Dimensions	Diameter (OD): 58.0mm
		Diameter (ID): 32.0mm
		Insulation Thickness (T): 13.0mm
2.6	Item	Auspex DN20 PN20 SDR9 PE-Xb Pipe
	Dimensions	Diameter (OD): 20.4mm
		Diameter (ID): 14.3mm
		Wall Thickness (T): 3.05mm
2.7	Item	K Flex Fire-Retardant Nitrile Insulation 20x13
	Dimensions	Diameter (OD): 46.0mm
		Diameter (ID): 20.0mm
		Insulation Thickness (T): 13.0mm
2.8	Item	Auspex DN25 PN20 SDR9 PE-Xb Pipe
	Dimensions	Diameter (OD): 25.1mm
		Diameter (ID): 19.2mm

		Wall Thickness (T): 2.95mm
2.9	Item	K Flex Fire-Retardant Nitrile Insulation 25x13
	Dimensions	Diameter (OD): 51.0mm
		Diameter (ID): 25.0mm
		Insulation Thickness (T): 13.0mm
2.10	Item	K Flex Fire-Retardant Nitrile Insulation 20x13
	Dimensions	Diameter (OD): 46.0mm
		Diameter (ID): 20.0mm
		Insulation Thickness (T): 13.0mm
2.11	Item	Marley Pressure Pipe S1 PVC-U DN25 PN15
	Dimensions	Diameter (OD): 33.6mm
		Diameter (ID): 28.3mm
		Wall Thickness (T): 2.65mm
2.12	Item	K Flex Fire-Retardant Nitrile Insulation 25x19
	Dimensions	Diameter (OD): 63.0mm
		Diameter (ID): 25.0mm
		Insulation Thickness (T): 19.0mm
2.13	Item	60mm Steel Pipe
	Dimensions	Diameter (OD): 60.5mm
		Diameter (ID): 53.6mm
		Wall Thickness (T): 3.45mm
2.14	Item	Marley Arma Above Ground uPVC Electrical Conduit 20mm
	Dimensions	Diameter (OD): 20.0mm
		Diameter (ID): 16.0mm
		Wall Thickness (T): 2.0mm
2.15	Item	Marley Arma Above Ground uPVC Electrical Conduit 25mm
	Dimensions	Diameter (OD): 26.9mm
		Diameter (ID): 23.0mm
		Wall Thickness (T): 1.95mm

2.16	Item	Marley Arma Above Ground uPVC Electrical Conduit 32mm
	Dimensions	Diameter (OD): 32.2mm
		Diameter (ID): 26.6mm
		Wall Thickness (T): 2.8mm
2.17	Item	Nexans Cable 185mm² 1C Al PVC XLPE Neutral Screen
	Cable	Overall Diameter: 22.5mm
		Sheath Material: PVC
		Sheath Thickness: 1.4mm
	Core	Number of Cores: 1
		Overall Diameter: 19.8mm
		Conductor Diameter: 2.55mm
		Conductor Material: Aluminium
		Insulation Material: XLPE
		Insulation Thickness: 1.6mm
2.18	Item	Nexans Cable 95mm² 1C Al PVC XLPE Neutral Screen
	Cable	Overall Diameter: 16.95mm
		Sheath Material: PVC
		Sheath Thickness: 1.4mm
	Core	Number of Cores: 1
		Overall Diameter: 13.9mm
		Conductor Diameter: 2.4mm
		Conductor Material: Aluminium
		Insulation Material: XLPE
		Insulation Thickness: 1.6mm

Sealants		
3.1	Item	Boss FireSilicone-EMA
	Dimensions	310mL Cartridge
	Item	Boss FireMastic-300

3.2	Dimensions	600mL sausage
3.3	Item	Boss FireMastic-HPE
	Dimensions	600mL sausage

Collars		
4.1	Item	BOSS Collar Shell 50 (no intumescent included)
	Collar	Height: 30mm Maximum Opening: 58mm Steel Thickness: 0.70BMT
	Fixing Points	3

Fixings		
5.1	Item	Bremick Hex Head Screw Type 17
	Dimensions	12g x 25mm
5.2	Item	Ramset Hollow Wall Anchor 16-24mm Zinc Plated
	Dimensions	M4 x 16-24mm
5.3	Item	Ramset RD16 Steel Discs
	Dimensions	16mm

5. Test Conditions

5.1 Equipment

Furnace:

1200X1200mm Indicative Furnace designed to operate to AS1530.4:2014

Temperature:

Furnace Temperature measurements were controlled with 3mm Type K MIMS thermocouples set within 50-100 mm from the face of the specimens in line with AS1530.4-2014. All thermocouples are calibrated by ISO/IEC 17025 accredited laboratory - a signatory to the International Laboratory Accreditation Corporation (ILAC) through their Mutual Recognition Agreement (MRA) to the accuracy required by AS 1530.4-2014.

Pressure measurement:

Kepware Siemens Data logging system including multi-channel recording data at 5 second intervals. Calibrated by ISO/IEC 17025 accredited laboratory - a signatory to the International Laboratory Accreditation Corporation (ILAC) through their Mutual Recognition Agreement (MRA) to the accuracy required by AS 1530.4-2014.

Ambient Temperature:

Ambient temperature was recorded 15 minutes before the test was commenced, at the start of the test and monitored during the test. All thermocouples are calibrated by ISO/IEC 17025 accredited laboratory - a signatory to the International Laboratory Accreditation Corporation (ILAC) through their Mutual Recognition Agreement (MRA) to the accuracy required by AS 1530.4-2014.

Specimen thermocouples:

Specimen thermocouples were installed to the unexposed face. Type K copper disk thermocouples fixed within the required locations referenced from AS1530.4-2014. Thermocouples are calibrated by ISO/IEC 17025 accredited laboratory - a signatory to the International Laboratory Accreditation Corporation (ILAC) through their Mutual Recognition Agreement (MRA) to the accuracy required by AS 1530.4-2014.

Dimensional measurements:

All linear measurements are made with equipment calibrated by ISO/IEC 17025 accredited laboratory - a signatory to the International Laboratory Accreditation Corporation (ILAC) through their Mutual Recognition Agreement (MRA) to the accuracy required by AS 1530.4-2014.

5.2 Furnace Data

Furnace Temperature:

The furnace was controlled to follow the temperature/time relationship specified in AS 1530.4-2014.

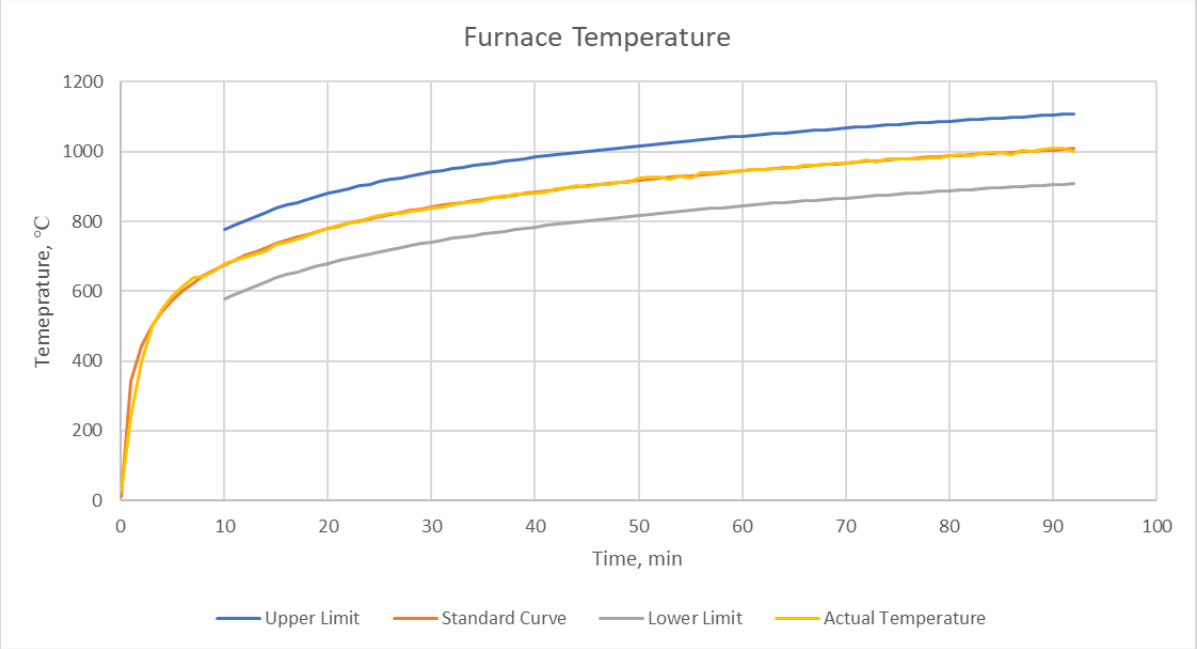


Figure 1 - Furnace Temperature during the test

Ambient Temperature:

The ambient temperature of the test area 15 minutes before the test and at the commencement of the test was 20°C.

Furnace Pressure:

After the first 5 minutes of the test, the furnace pressure was maintained at 15±3 Pa with respect to atmosphere. The probe was located 500mm above the furnace floor.

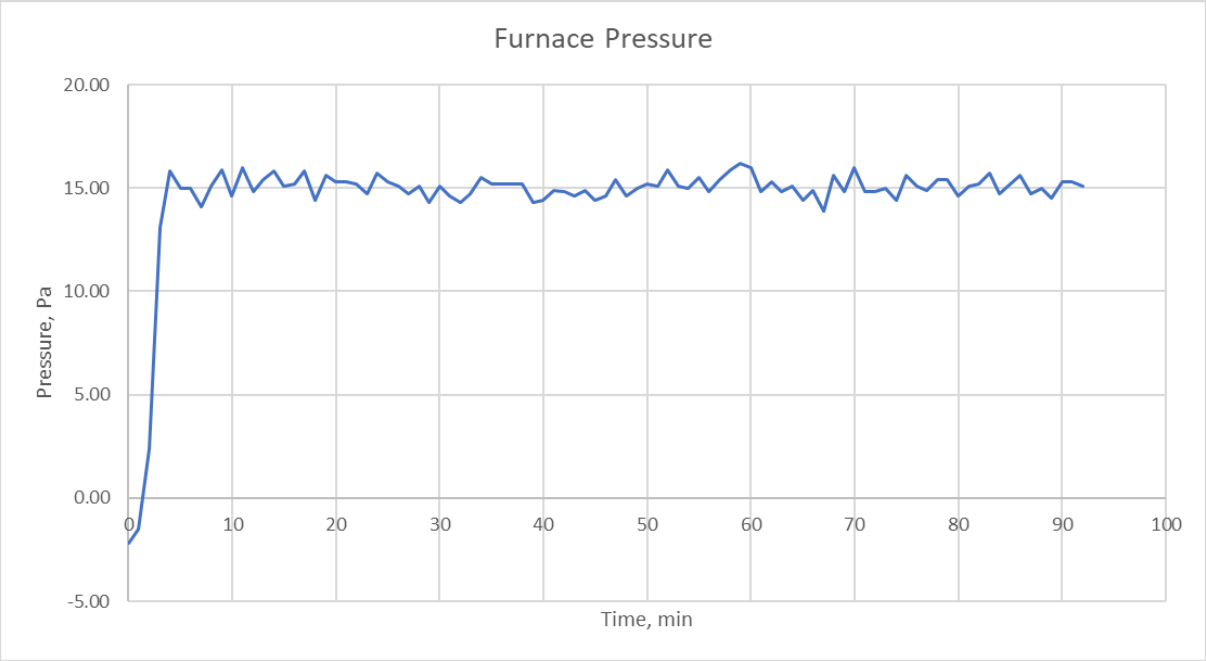
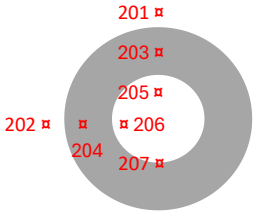
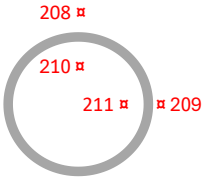
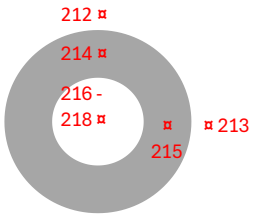
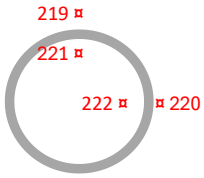
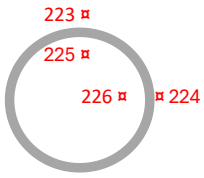
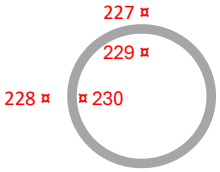


Figure 2 - Furnace Pressure during the test

5.3 Thermocouple locations

Service: OTHER	**Service:** COPPER PIPE - 32	**Service:** OTHER
# of Thermocouples: 7	**# of Thermocouples:** 4	**# of Thermocouples:** 7
Start: TC201 **Finish:** TC207	**Start:** TC208 **Finish:** TC211	**Start:** TC212 **Finish:** TC218
SP6 - Steel Pipe + Alarm Cables	**SP2 -** with 13mm insulation	**SP1 -** Cable Bundle - 8 x Fire Alarm Cable + 8 x CAT6 + 8 x COAX
		
Service: STEEL PIPE - 60	**Service:** PEX PIPE - 20	**Service:** CONDENSATE PIPE - 25
# of Thermocouples: 4	**# of Thermocouples:** 4	**# of Thermocouples:** 4
Start: TC219 **Finish:** TC222	**Start:** TC223 **Finish:** TC226	**Start:** TC227 **Finish:** TC230
SP7 -	**SP3 -** with 13mm insulation	**SP5 -** with 19mm insulation
		

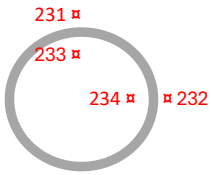
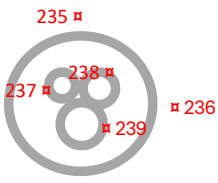
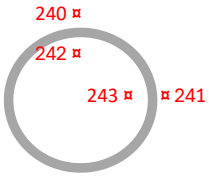
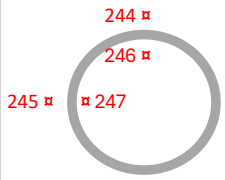
Service: PEX PIPE - 25	**Service:** OTHER	**Service:** BOSS ALUMINIUM CABL	**Service:** BOSS ALUMINIUM CABL
# of Thermocouples: 4	**# of Thermocouples:** 5	**# of Thermocouples:** 4	**# of Thermocouples:** 4
Start: TC231 TC234	**Start:** TC235 TC239	**Start:** TC240 TC243	**Start:** TC244 TC247
SP4 - with 13mm insulation	**SP8 -** 20mm Conduit + 25mm Conduit + 32mm Conduit	**SP9 -**	**SP10 -**
			

Figure 3 - Thermocouple locations

6. Test Results

6.1 Observations during the test

Time min	Test face	SP#	OBSERVATIONS/REMARKS
1	U	1	Smoke coming through from between the cables
3	U	8	Smoke coming through from between the pipes
8	U	8	Pipes dislodged from the separating element
12	U	3	Pipe beginning to distort
12	E	3, 4, 5, 9, 10	Services dislodged from the separating element
14	U	4	Pipe beginning to distort
16	U	2, 3, 4, 5	Pipe insulation expanding and cracking / tearing close to sealant
20	U	7	Sealant beginning to bubble and expand
22	U	2	Smoke coming through from around the service
24	U	3	Crack visible in sealant, smoke coming through
26	U	4	Smoke coming through from around the service
30	U	2, 3, 4	Continual smoke coming through crack in pipe insulation
31	U	4	Crack visible in pipe, red glow visible
34	U	4	Pipe dislodged from the separating element
34	U	4	Cotton pad test - FAIL
37	U	7	Sealant beginning to discolour
39	U	9	Sealant beginning to expand
41	U	2, 10	Sealant beginning to expand
53	U	6	Sealant beginning to bubble and expand
63	U	6	Sealant continues to expand
63	U	8	Sealant cracking, 32mm pipe has visible crack by the separating element
70	U	1, 5, 7, 10	Discolouration visible on the separating element
78	U	8	Sealant beginning to expand

85	U	1	Sealant beginning to expand
91			**TEST DISCONTINUED**

NOTE: E – Exposed Face (inside furnace)

U – Unexposed Face (outside furnace)

SE – Separating element

6.2 Specimen 1

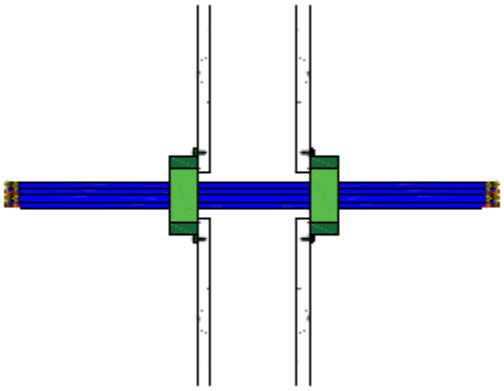


Figure 4 - Specimen 1

Service penetration details	
Service	Cable Bundle (8 x CAT6 + 8 x COAX + 8 x Fire Alarm cables)
Service Support	Exposed Face: 230mm Unexposed Face: 520mm
Aperture Size	52.5mm

Local Fire-stopping system	
Application	Symmetrical – applied to both faces of the separating element
Products	BossCollar shell 50, FireMastic-HPE
Procedure	1. BossCollar wrapped around cables and secured to the separating element in the fixing points with screws and washers. 2. FireMastic-HPE applied to fill inside the collar around cables, finished flush with the top of the collar.

Test results	
Structural adequacy	Not applicable
Integrity	No failure at 91 minutes
Insulation	No failure at 91 minutes

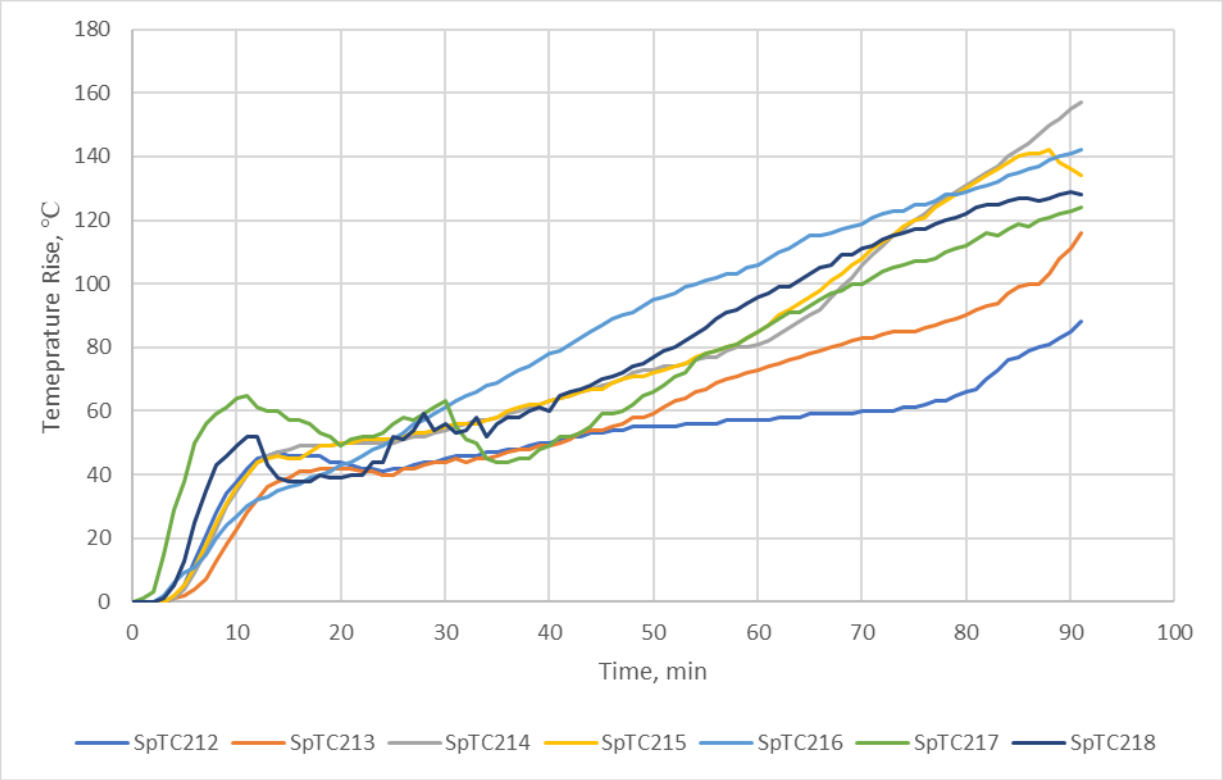


Figure 5 - Specimen 1 thermocouple temperature rise readings

6.3 Specimen 2

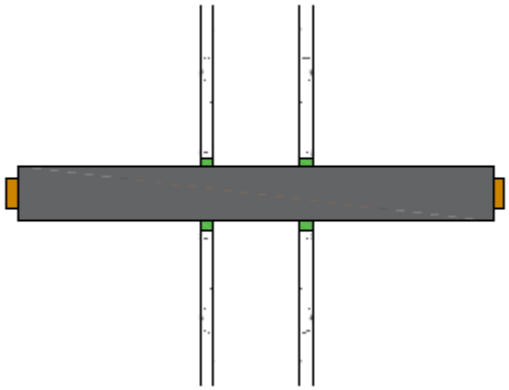


Figure 6 - Specimen 2

Service penetration details	
Service	32mm Copper Pipe with 13mm thick nitrile insulation
Service Support	Exposed Face: 230mm Unexposed Face: 520mm
Aperture Size	79.3mm
Annular Gap	Min: 6.2mm, Max: 14.5mm

Local Fire-stopping system	
Application	Symmetrical – applied to both faces of the separating element
Products	FireMastic-HPE
Procedure	1. FireMastic-HPE applied into the annular gap to the depth of the lining, 13mm (nominal) and finished flush with the separating element.

Test results	
Structural adequacy	Not applicable
Integrity	No failure at 91 minutes
Insulation	57 minutes

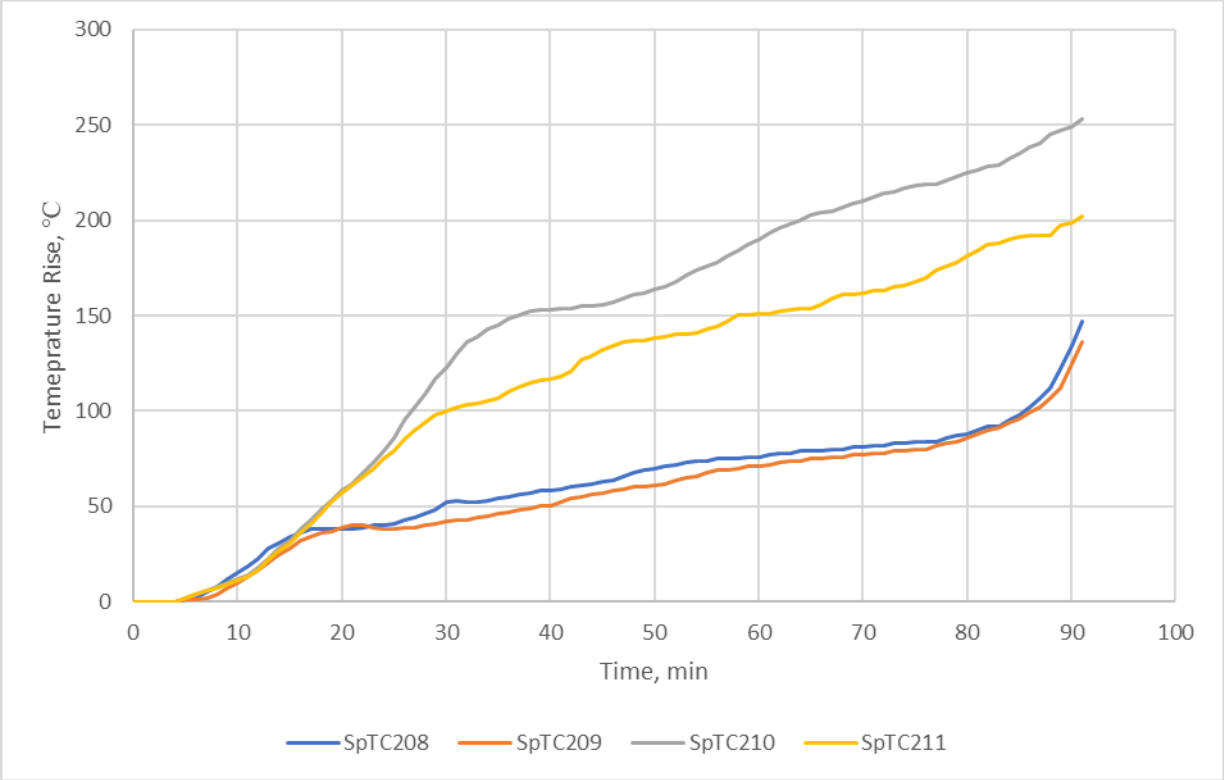


Figure 7 - Specimen 2 thermocouple temperature rise readings

6.4 Specimen 3

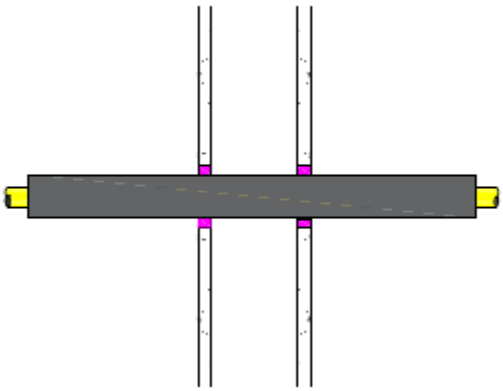


Figure 8 - Specimen 3

Service penetration details	
Service	20mm PEX Pipe with 13mm thick nitrile insulation
Service Support	Exposed Face: 230mm Unexposed Face: 520mm and 1525mm
Aperture Size	60.5mm
Annular Gap	Min: 5.7mm, Max: 8.3mm

Local Fire-stopping system	
Application	Symmetrical – applied to both faces of the separating element
Products	FireMastic-HPE
Procedure	1. FireMastic-HPE applied into the annular gap to the depth of the lining, 13mm (nominal) and finished flush with the separating element.

Test results	
Structural adequacy	Not applicable
Integrity	No failure at 91 minutes
Insulation	79 minutes

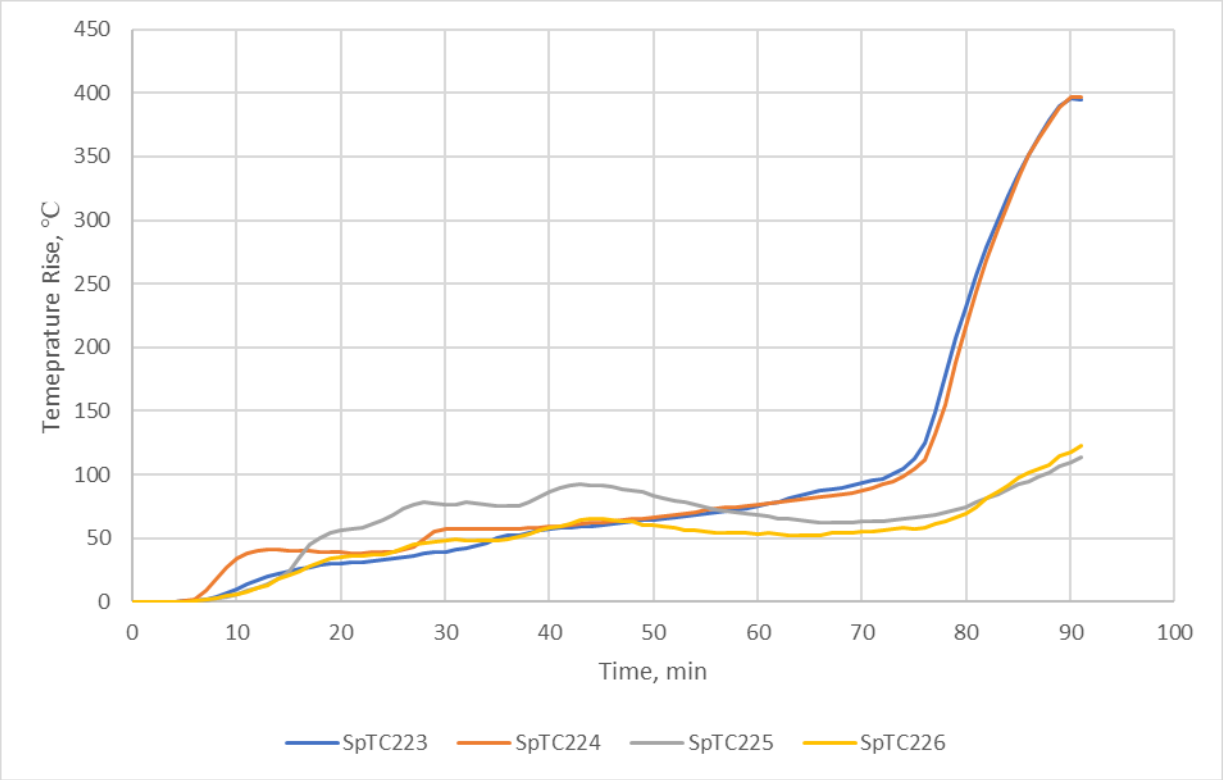


Figure 9 - Specimen 3 thermocouple temperature rise readings

6.5 Specimen 4

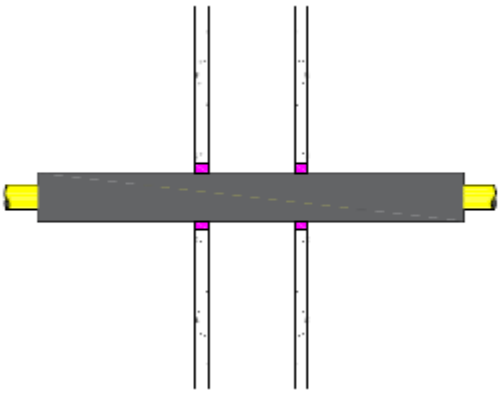


Figure 10 - Specimen 4

Service penetration details	
Service	25mm PEX Pipe with 13mm thick nitrile insulation
Service Support	Exposed Face: 230mm Unexposed Face: 520mm and 1740mm
Aperture Size	70.1mm
Annular Gap	Min: 7.5mm, Max: 11.6mm

Local Fire-stopping system	
Application	Symmetrical – applied to both faces of the separating element
Products	FireMastic-HPE
Procedure	1. FireMastic-HPE applied into the annular gap to the depth of the lining, 13mm (nominal) and finished flush with the separating element.

Test results	
Structural adequacy	Not applicable
Integrity	34 minutes
Insulation	34 minutes

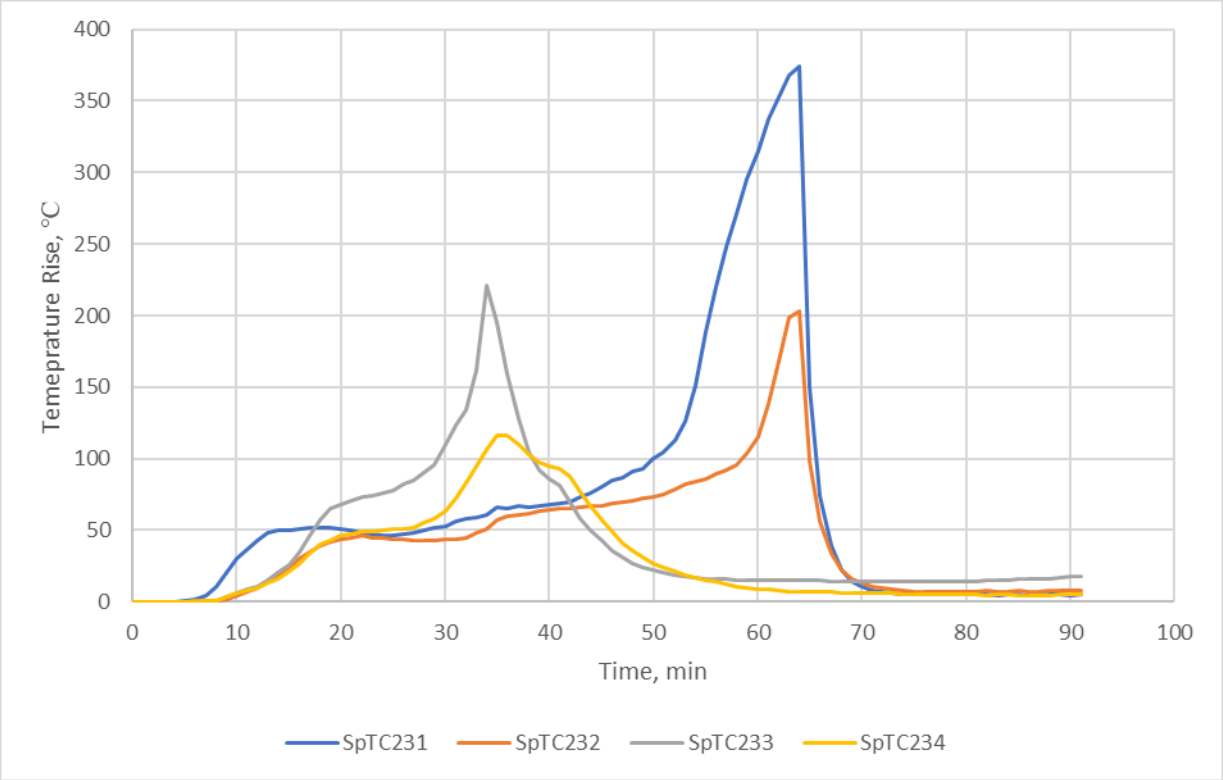


Figure 11 - Specimen 4 thermocouple temperature rise readings

NOTES: Pipe dislodged from separating element at 34 minutes

6.6 Specimen 5

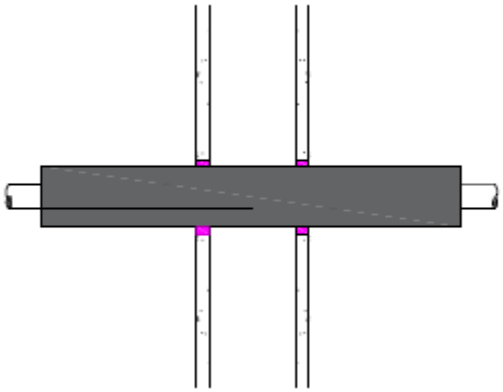


Figure 12 - Specimen 5

Service penetration details	
Service	25mm uPVC Condensate Pipe with 19mm thick nitrile insulation
Service Support	Exposed Face: 230mm Unexposed Face: 520mm and 1525mm
Aperture Size	85.9mm
Annular Gap	Min: 7.8mm, Max: 8.9mm

Local Fire-stopping system	
Application	Symmetrical – applied to both faces of the separating element
Products	FireMastic-HPE
Procedure	1. FireMastic-HPE applied into the annular gap to the depth of the lining, 13mm (nominal) and finished flush with the separating element.

Test results	
Structural adequacy	Not applicable
Integrity	No failure at 91 minutes
Insulation	73 minutes

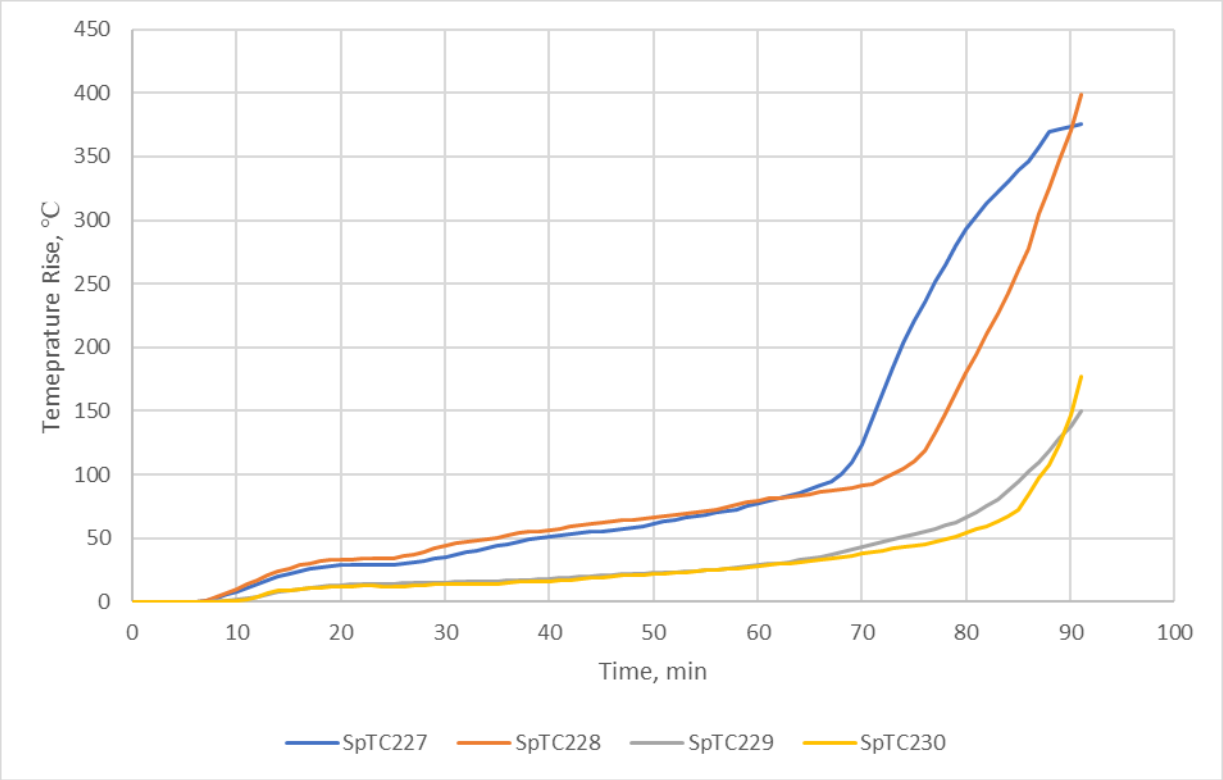


Figure 13 - Specimen 5 thermocouple temperature rise readings

6.7 Specimen 6

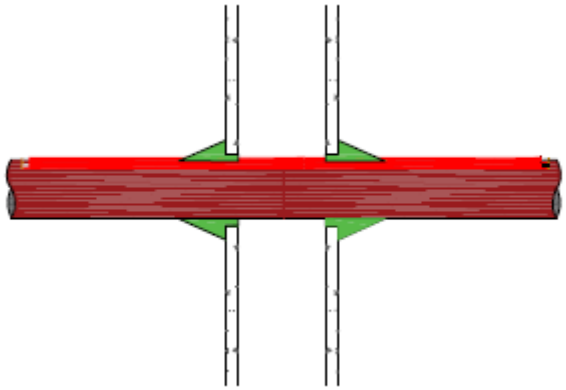


Figure 14 - Specimen 6

Service penetration details	
Service	60mm Steel Pipe with 2 x Alarm cables
Service Support	Exposed Face: 230mm Unexposed Face: 520mm
Aperture Size	73.3mm
Annular Gap	Min: 7.3mm, Max: 12.4mm

Local Fire-stopping system	
Application	Symmetrical – applied to both faces of the separating element
Products	FireMastic-300
Procedure	1. FireMastic-300 applied into the annular gap to the depth of the lining, 13mm (nominal) and finished flush with the separating element. 2. 30mm (wide) x 50mm (high) FireMastic-300 fillet applied around the services.

Test results	
Structural adequacy	Not applicable
Integrity	No failure at 91 minutes
Insulation	90 minutes

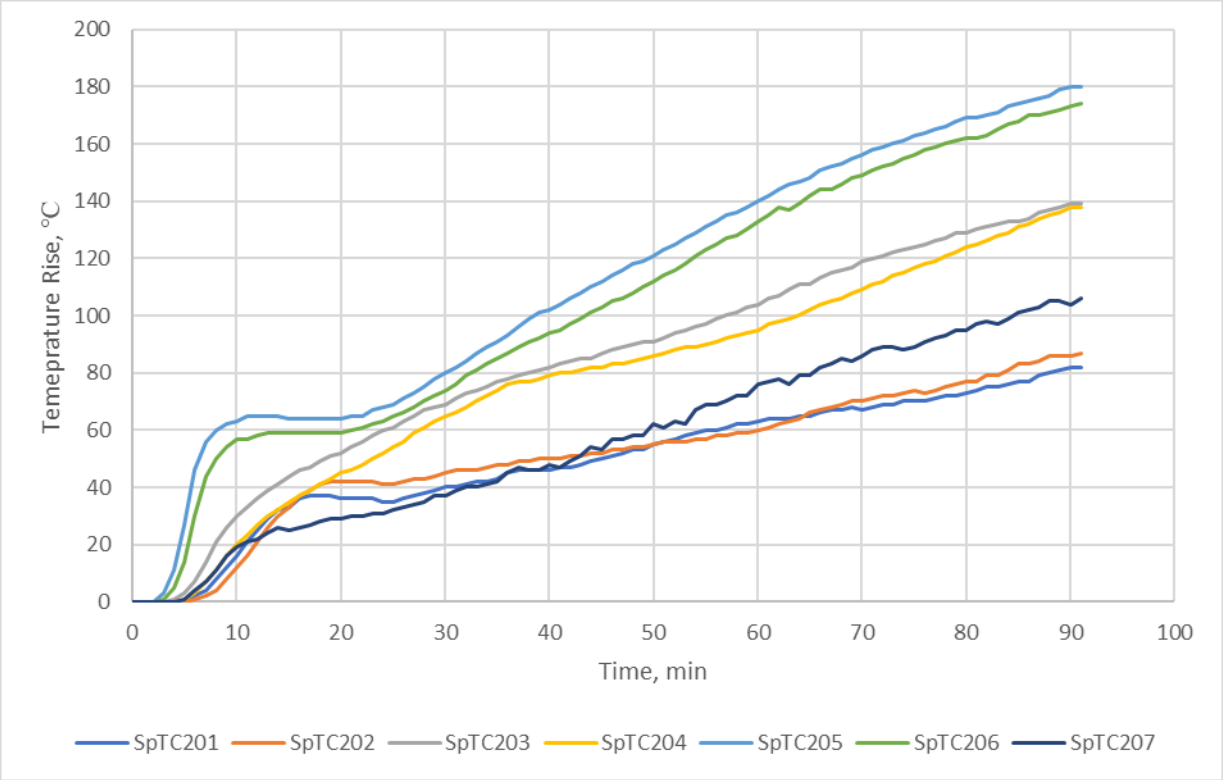


Figure 15 - Specimen 6 thermocouple temperature rise readings

6.8 Specimen 7

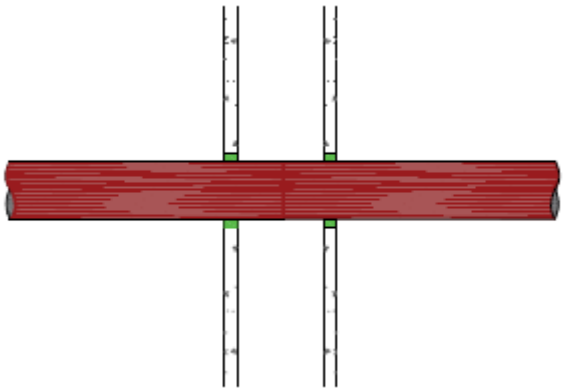


Figure 16 - Specimen 7

Service penetration details	
Service	60mm Steel Pipe
Service Support	Exposed Face: 230mm Unexposed Face: 520mm
Aperture Size	73.3mm
Annular Gap	Min: 8.5mm, Max: 10.8mm

Local Fire-stopping system	
Application	Symmetrical – applied to both faces of the separating element
Products	FireMastic-300
Procedure	1. FireMastic-300 applied into the annular gap to the depth of the lining, 13mm (nominal) and finished flush with the separating element.

Test results	
Structural adequacy	Not applicable
Integrity	No failure at 91 minutes
Insulation	34 minutes

Figure 17 - Specimen 7 thermocouple temperature rise readings

6.9 Specimen 8

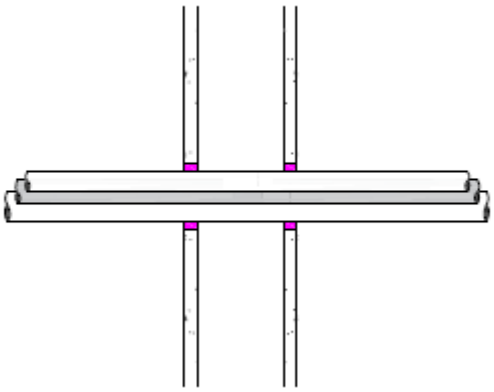


Figure 18 - Specimen 8

Service penetration details	
Service	Conduit Bundle (1 x 20mm + 1 x 25mm + 1 x 32mm)
Service Support	Exposed Face: 230mm Unexposed Face: 520mm and 1740mm
Aperture Size	70.1mm

Local Fire-stopping system	
Application	Symmetrical – applied to both faces of the separating element
Products	FireMastic-HPE
Procedure	1. FireMastic-HPE applied into the annular gap to the depth of the lining, 13mm (nominal) and finished flush with the separating element.

Test results	
Structural adequacy	Not applicable
Integrity	No failure at 91 minutes
Insulation	No failure at 91 minutes

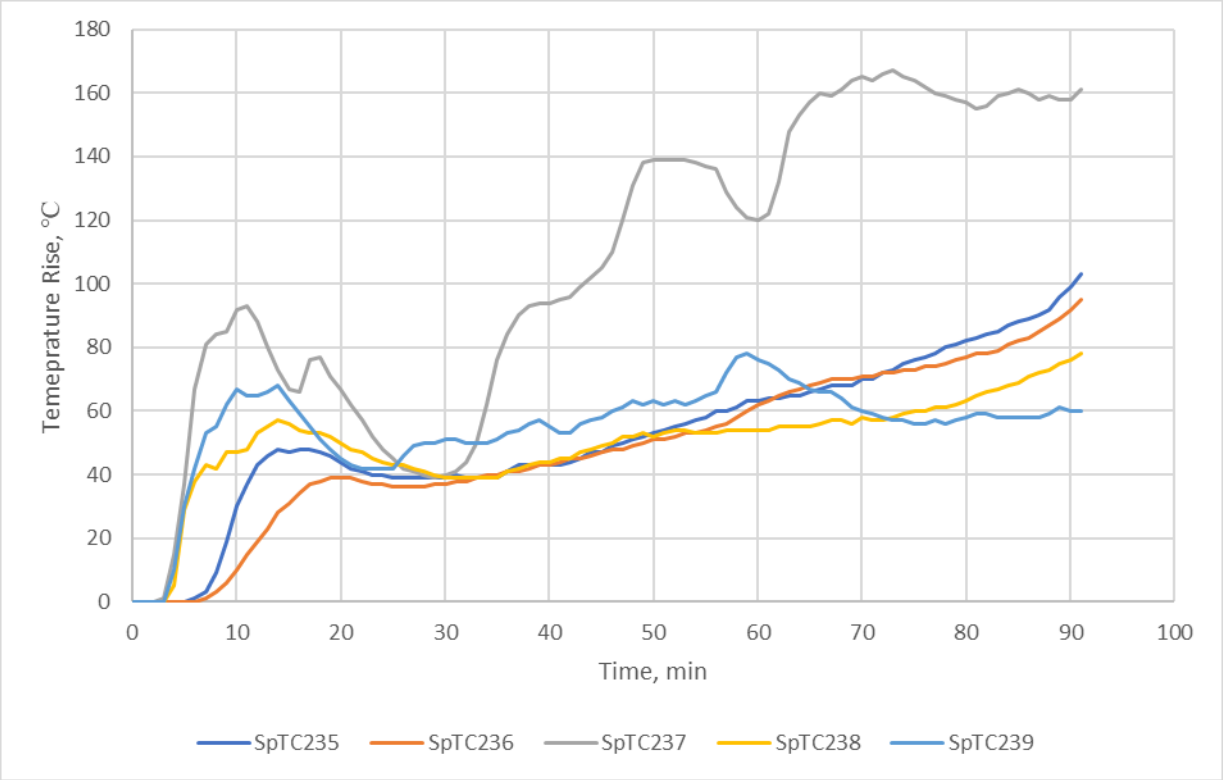


Figure 19 - Specimen 8 thermocouple temperature rise readings

6.10 Specimen 9

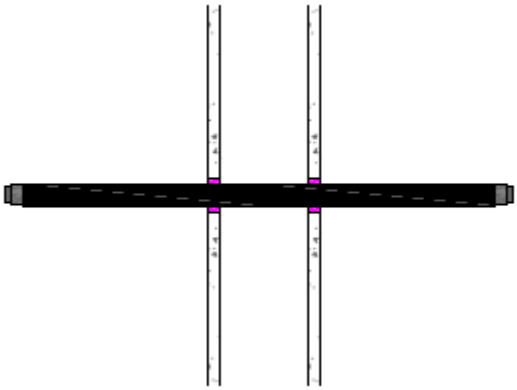


Figure 20 - Specimen 9

Service penetration details	
Service	Nexans Cable 185mm 1C Al PVC XLPE Neutral Screen
Service Support	Exposed Face: 230mm Unexposed Face: 520mm
Aperture Size	34.6mm
Annular Gap	Min: 3.9mm, Max: 8.4mm

Local Fire-stopping system	
Application	Symmetrical – applied to both faces of the separating element
Products	FireMastic-HPE
Procedure	1. FireMastic-HPE applied into the annular gap to the depth of the lining, 13mm (nominal) and finished flush with the separating element.

Test results	
Structural adequacy	Not applicable
Integrity	No failure at 91 minutes
Insulation	34 minutes

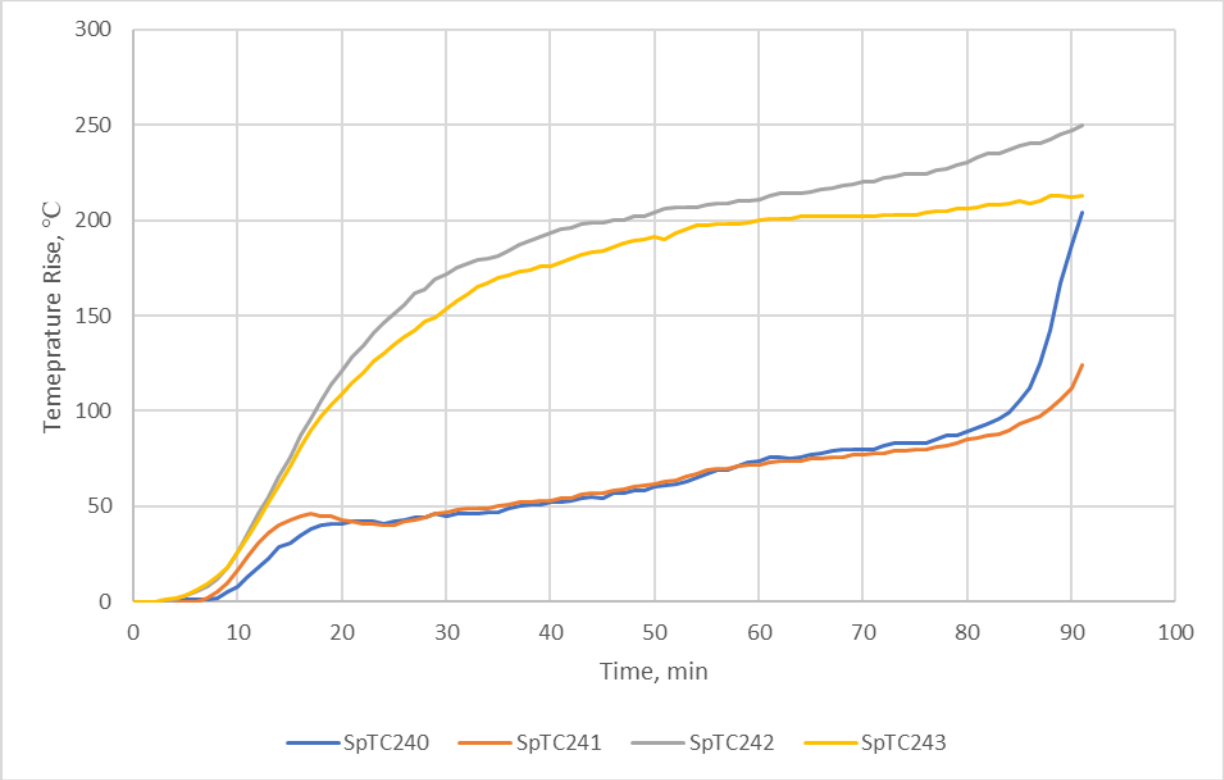


Figure 21 - Specimen 9 thermocouple temperature rise readings

6.11 Specimen 10

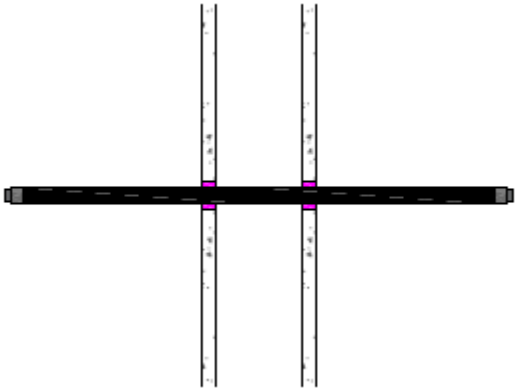


Figure 22 - Specimen 10

Service penetration details	
Service	Nexans Cable 95mm 1C Al PVC XLPE Neutral Screen
Service Support	Exposed Face: 230mm Unexposed Face: 520mm
Aperture Size	29.0mm
Annular Gap	Min: 4.1mm, Max: 7.9mm

Local Fire-stopping system	
Application	Symmetrical – applied to both faces of the separating element
Products	FireMastic-HPE
Procedure	1. FireMastic-HPE applied into the annular gap to the depth of the lining, 13mm (nominal) and finished flush with the separating element.

Test results	
Structural adequacy	Not applicable
Integrity	No failure at 91 minutes
Insulation	64 minutes

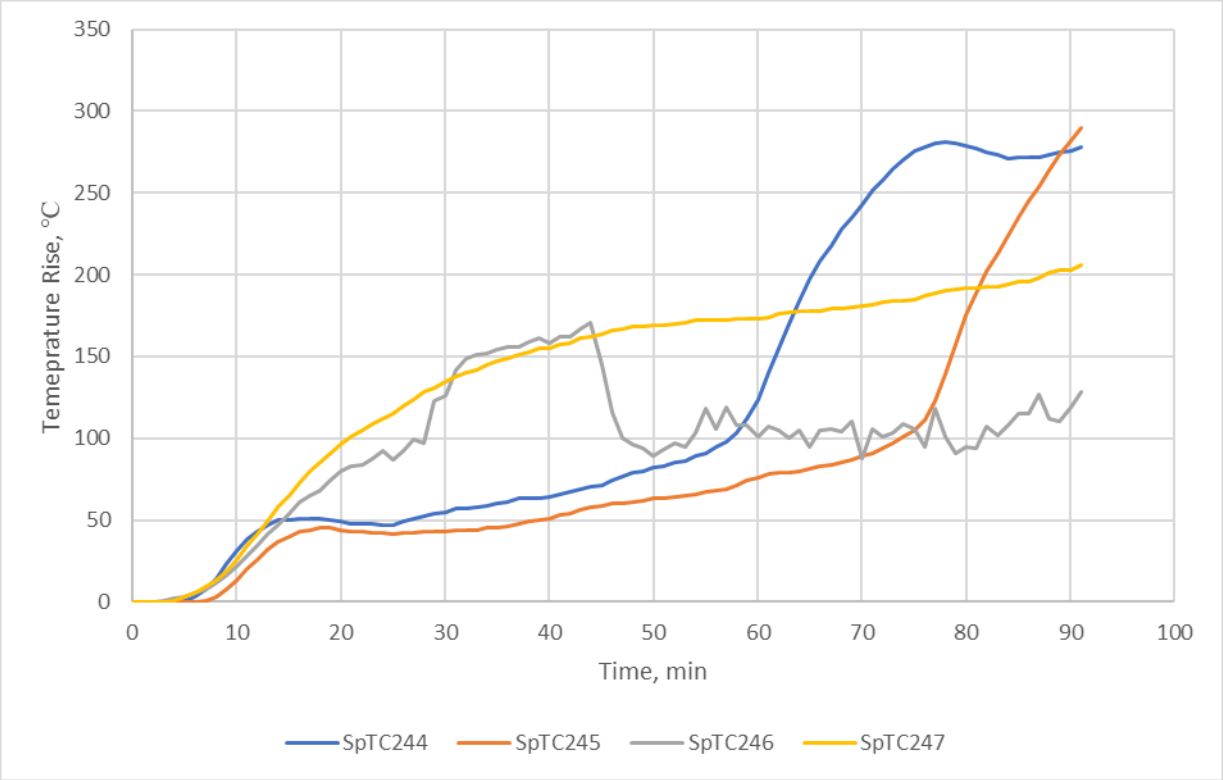


Figure 23 - Specimen 10 thermocouple temperature rise readings

7. Photos

7.1 Photos before the test

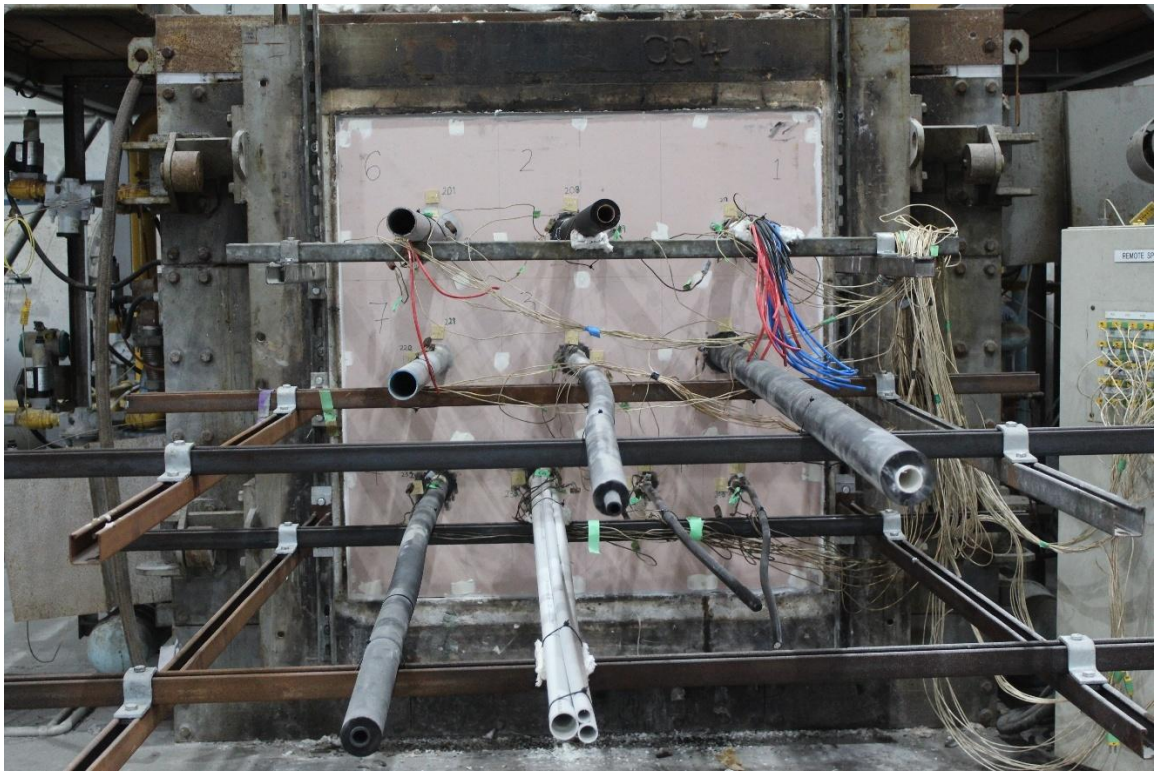


Figure 24 - Unexposed face prior to test commencement

Figure 25 - Exposed face prior to test commencement

7.2 During and after the test

Figure 26 - Unexposed face at 15 minutes

Figure 27 - Exposed face at 15 minutes

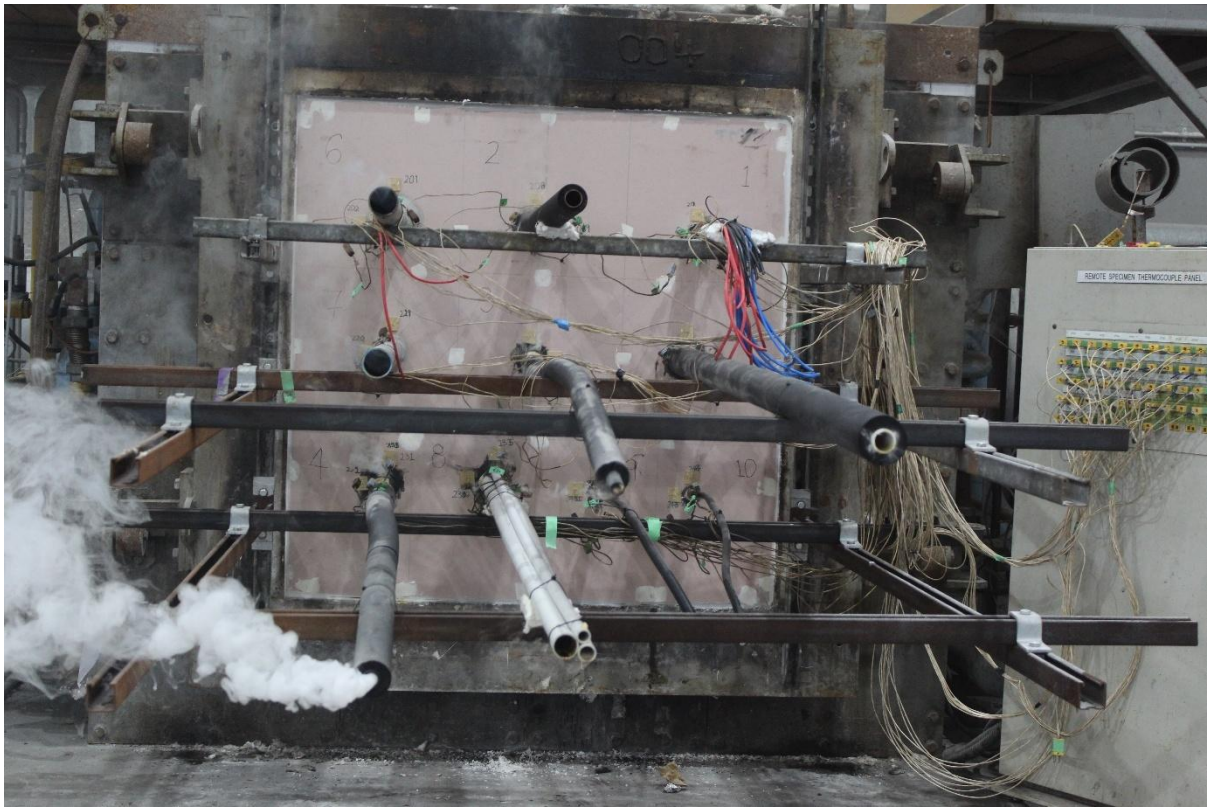


Figure 28 - Unexposed face at 30 minutes

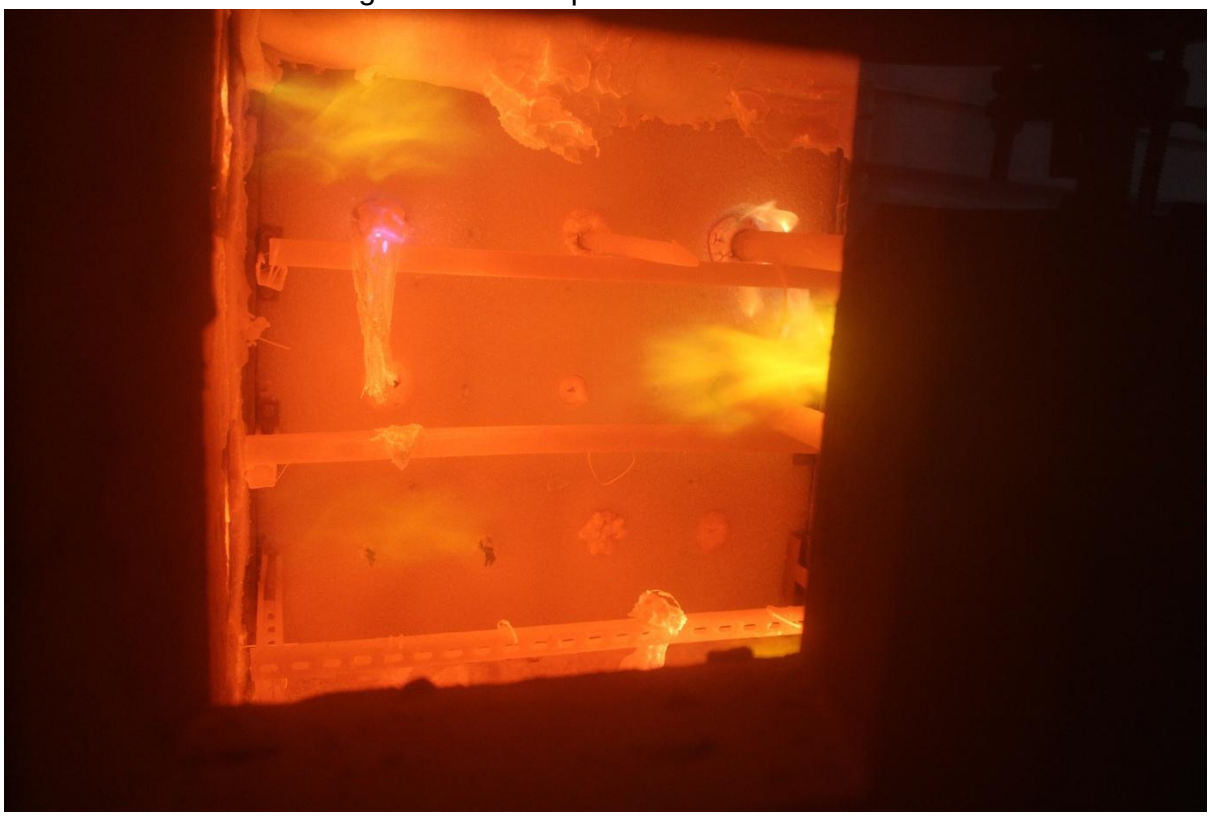


Figure 29 - Exposed face at 30 minutes

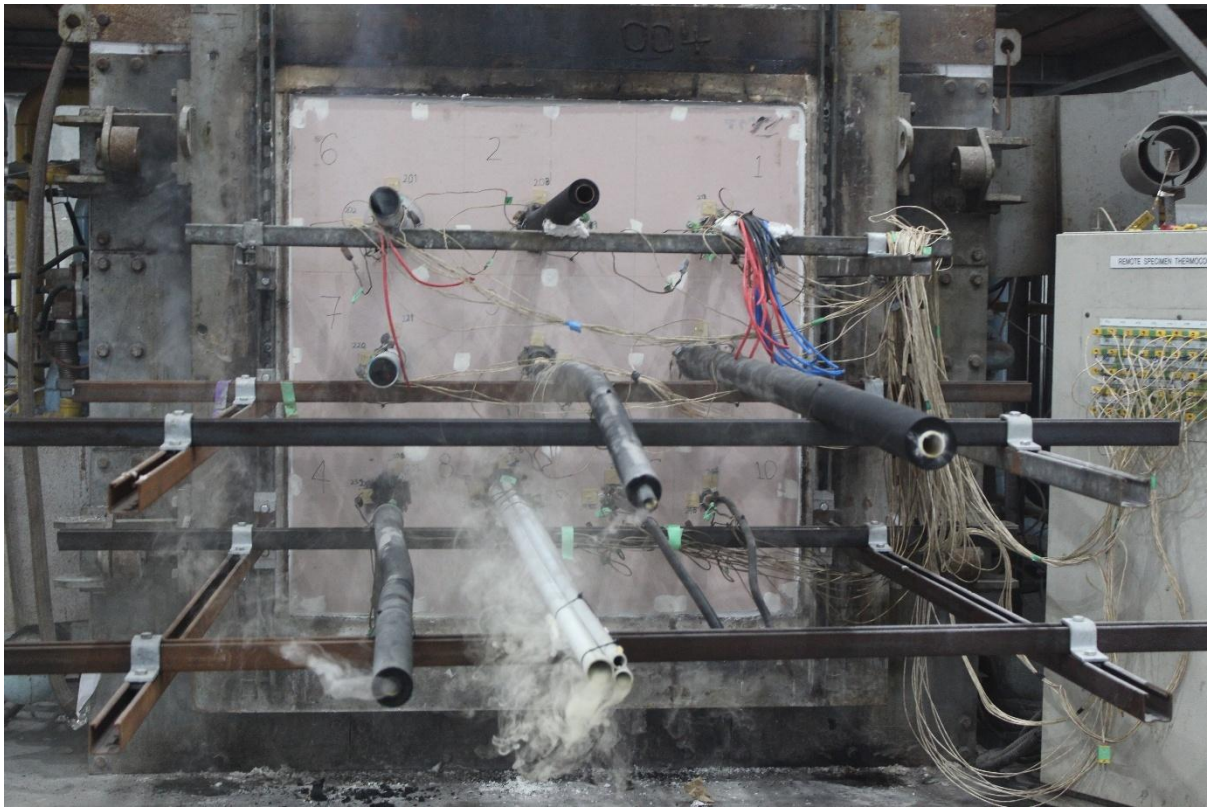


Figure 30 - Unexposed face at 45 minutes

Figure 31 - Exposed face at 45 minutes

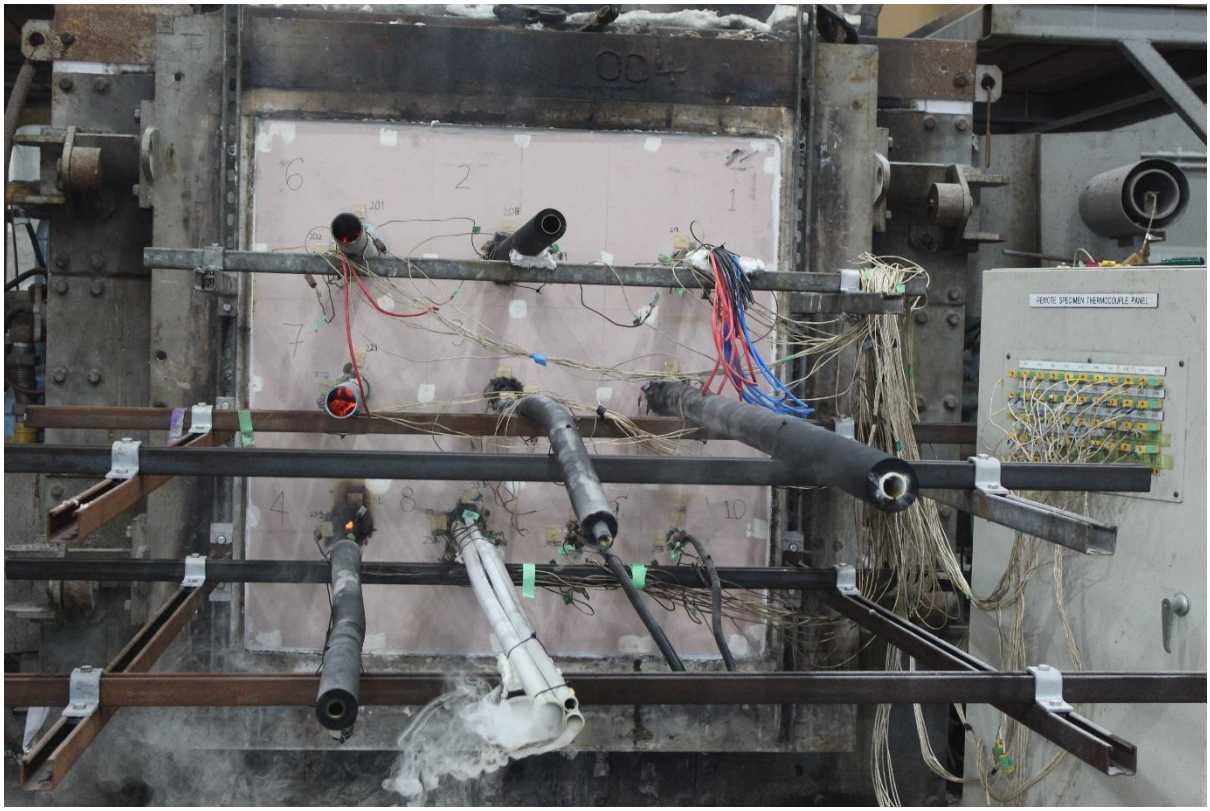


Figure 32 - Unexposed face at 60 minutes

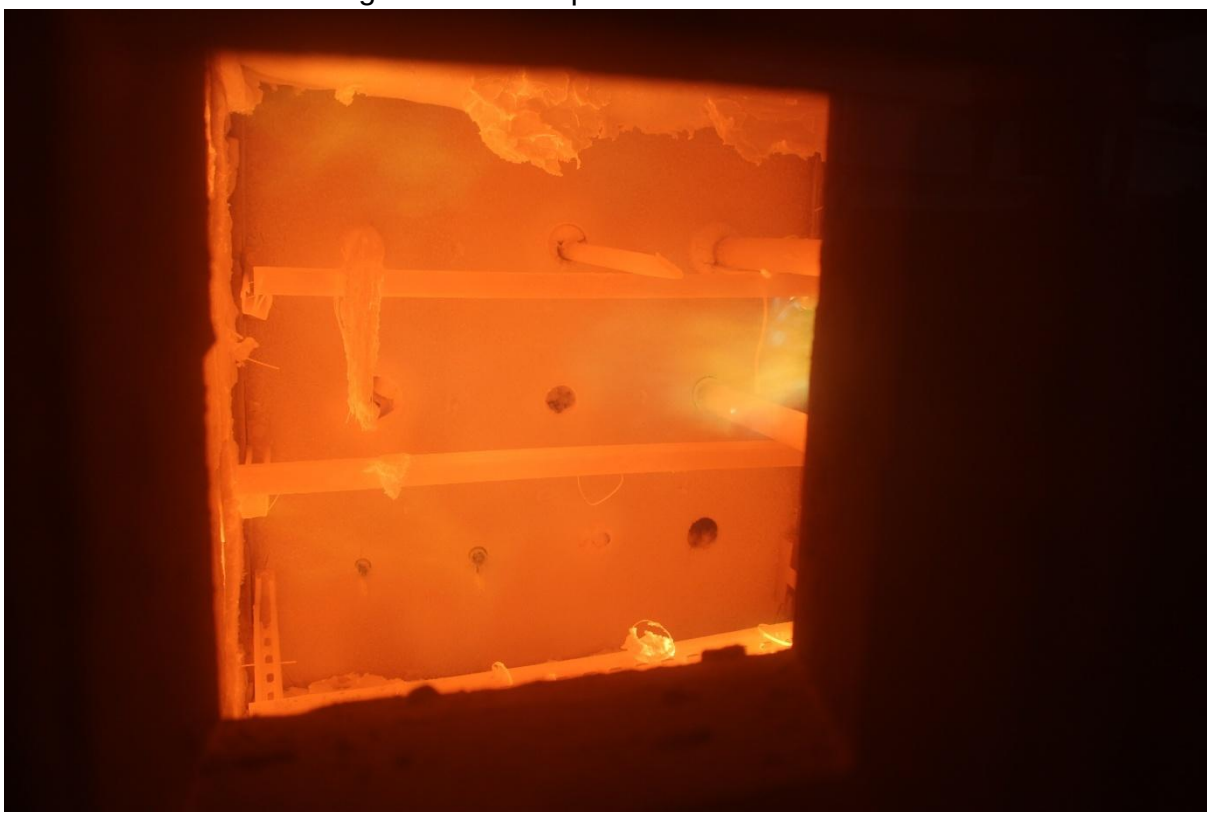


Figure 33 - Exposed face at 60 minutes

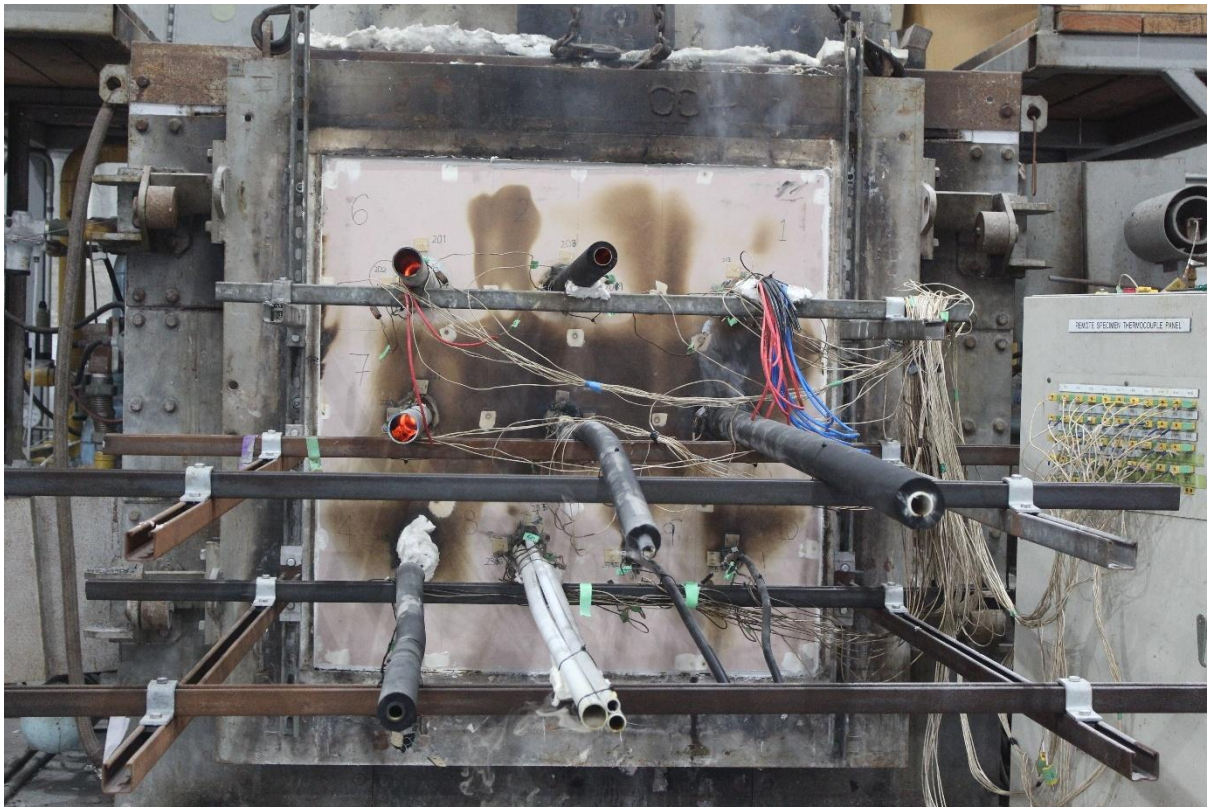


Figure 34 - Unexposed face at 90 minutes

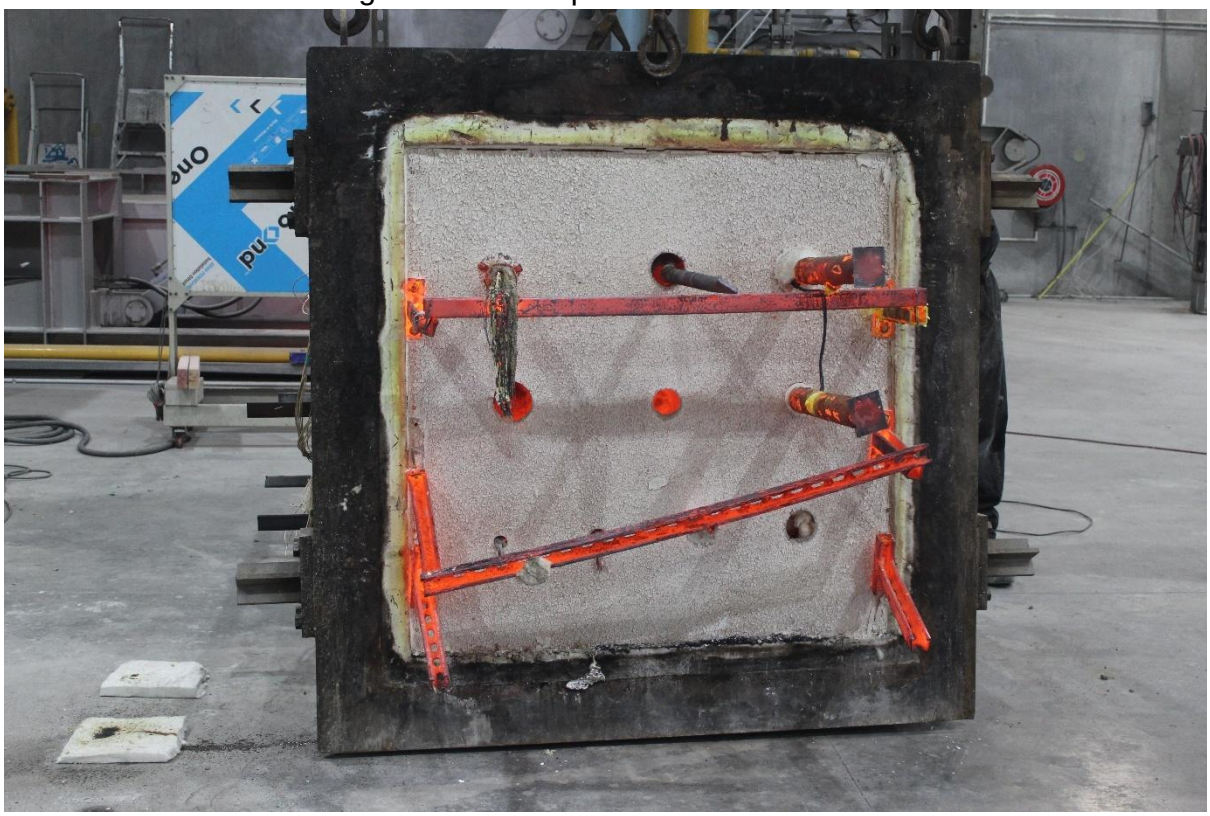


Figure 35 - Exposed face after test

8. Appendix

8.1 Client supplied drawings

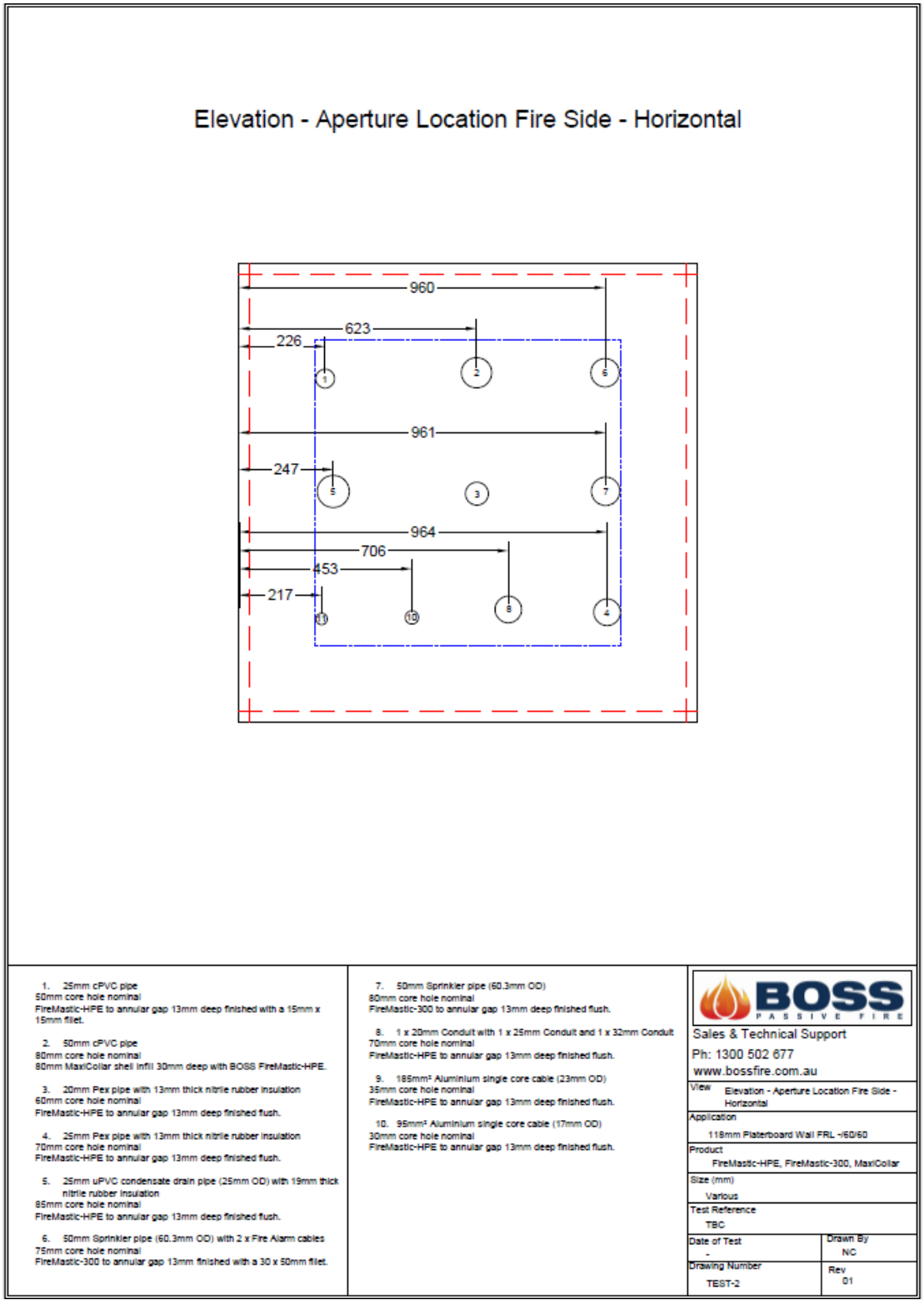


Figure 36 - Test 2 – Elevation – Aperture Location Fire Side – Horizontal.pdf

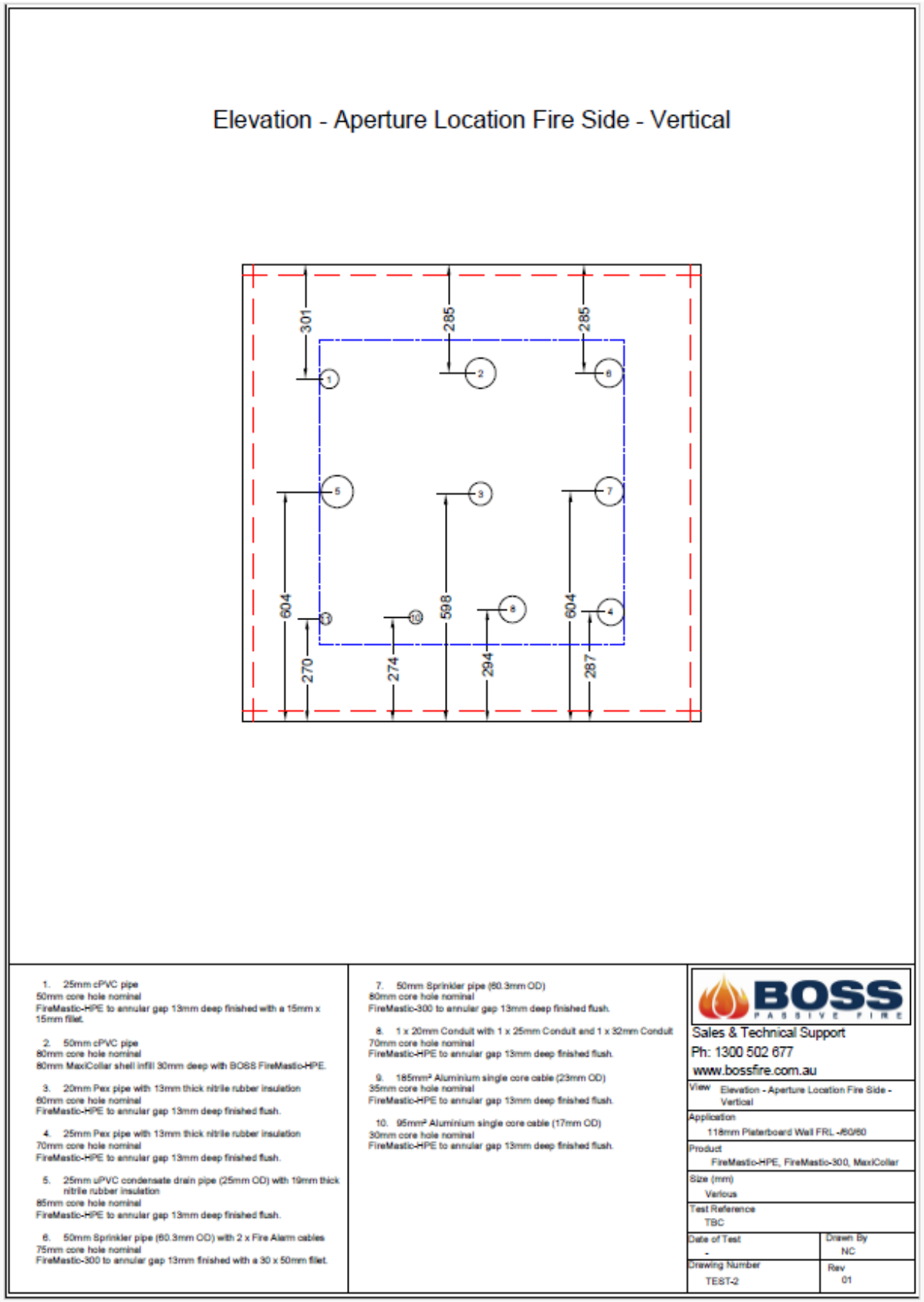


Figure 37 - Test 2 – Elevation – Aperture Location Fire Side – Vertical.pdf

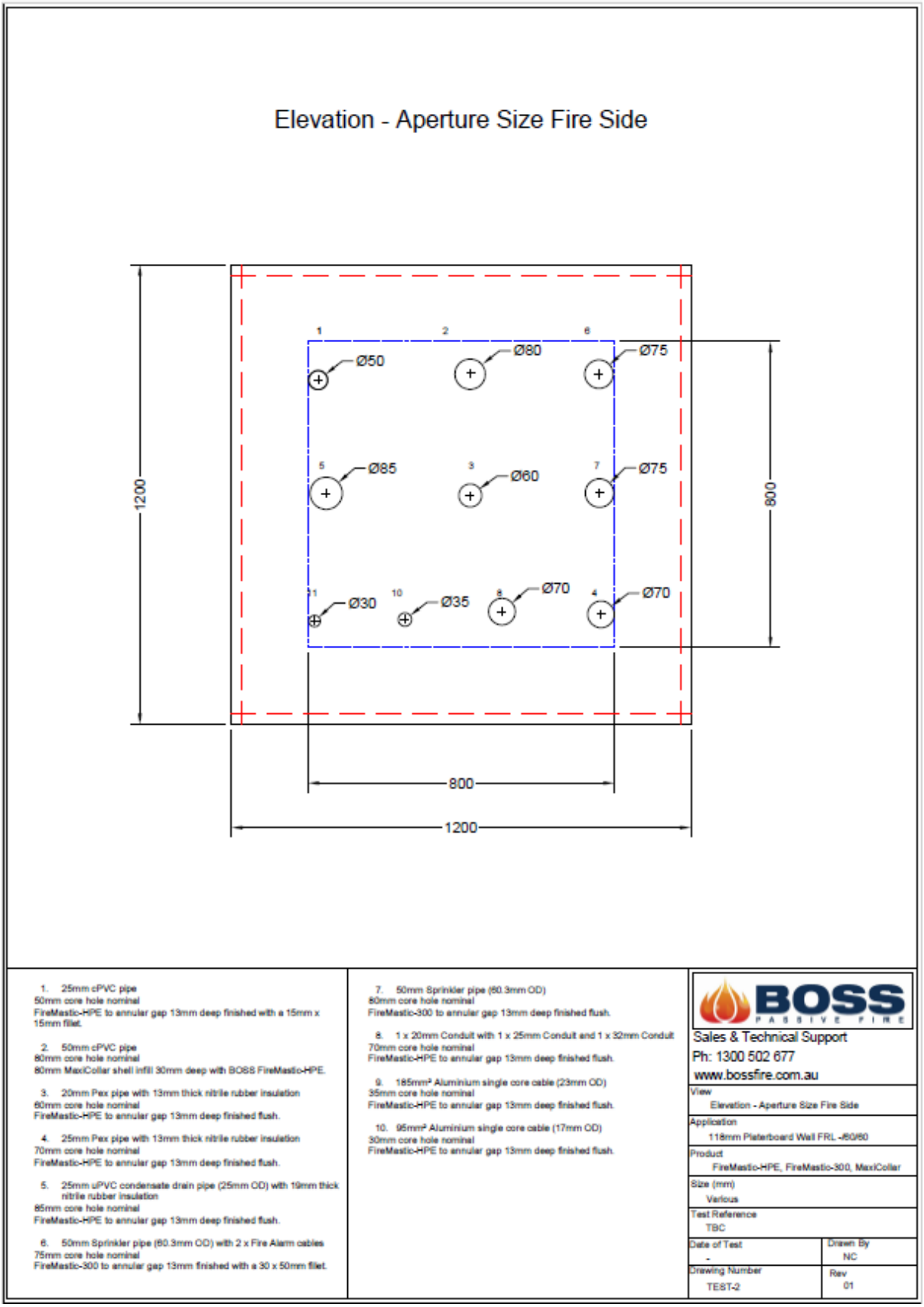


Figure 38 - Test 2 – Elevation – Aperture Size Fire Side.pdf

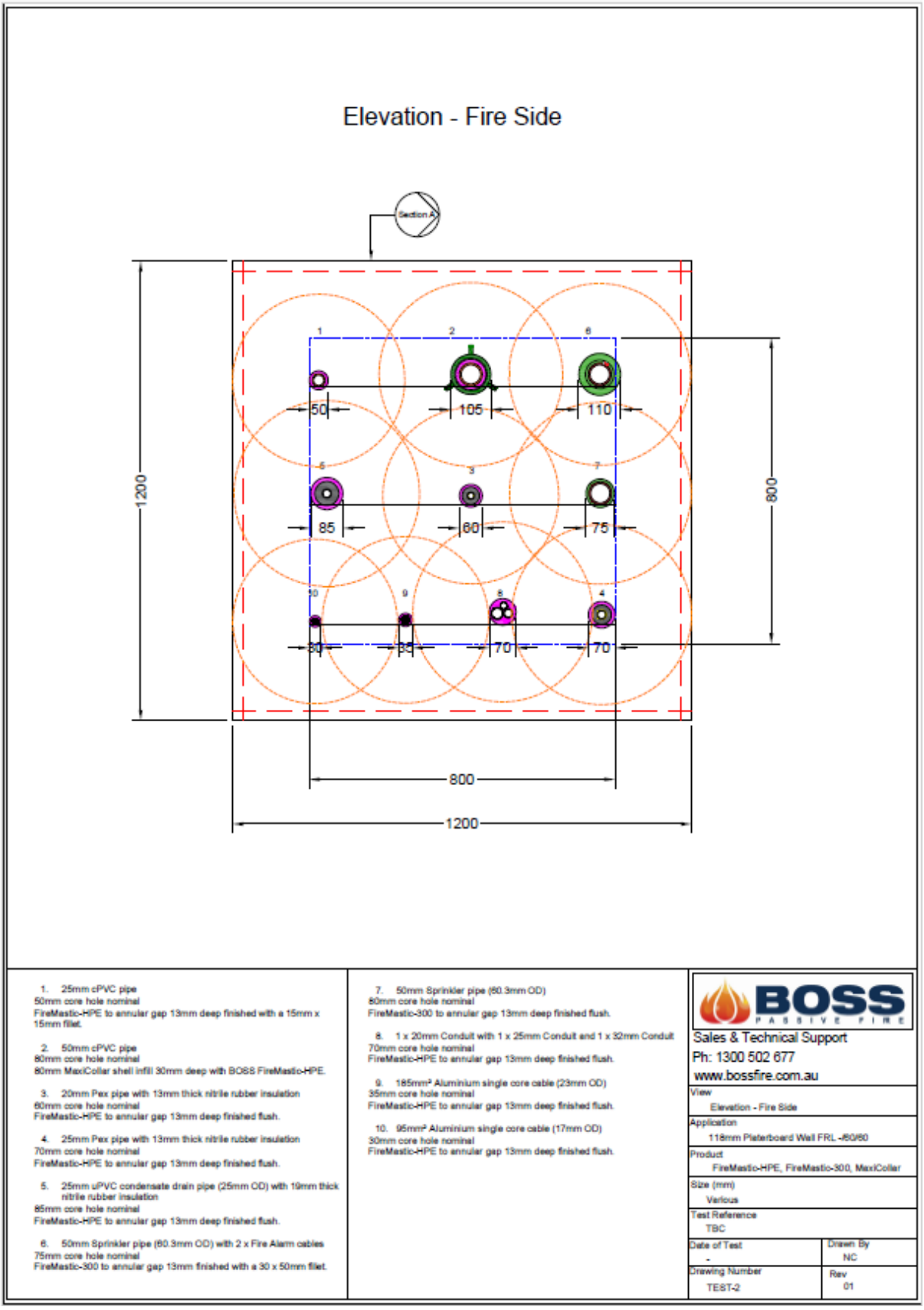


Figure 39 - Test 2 – Elevation – Fire Side.pdf

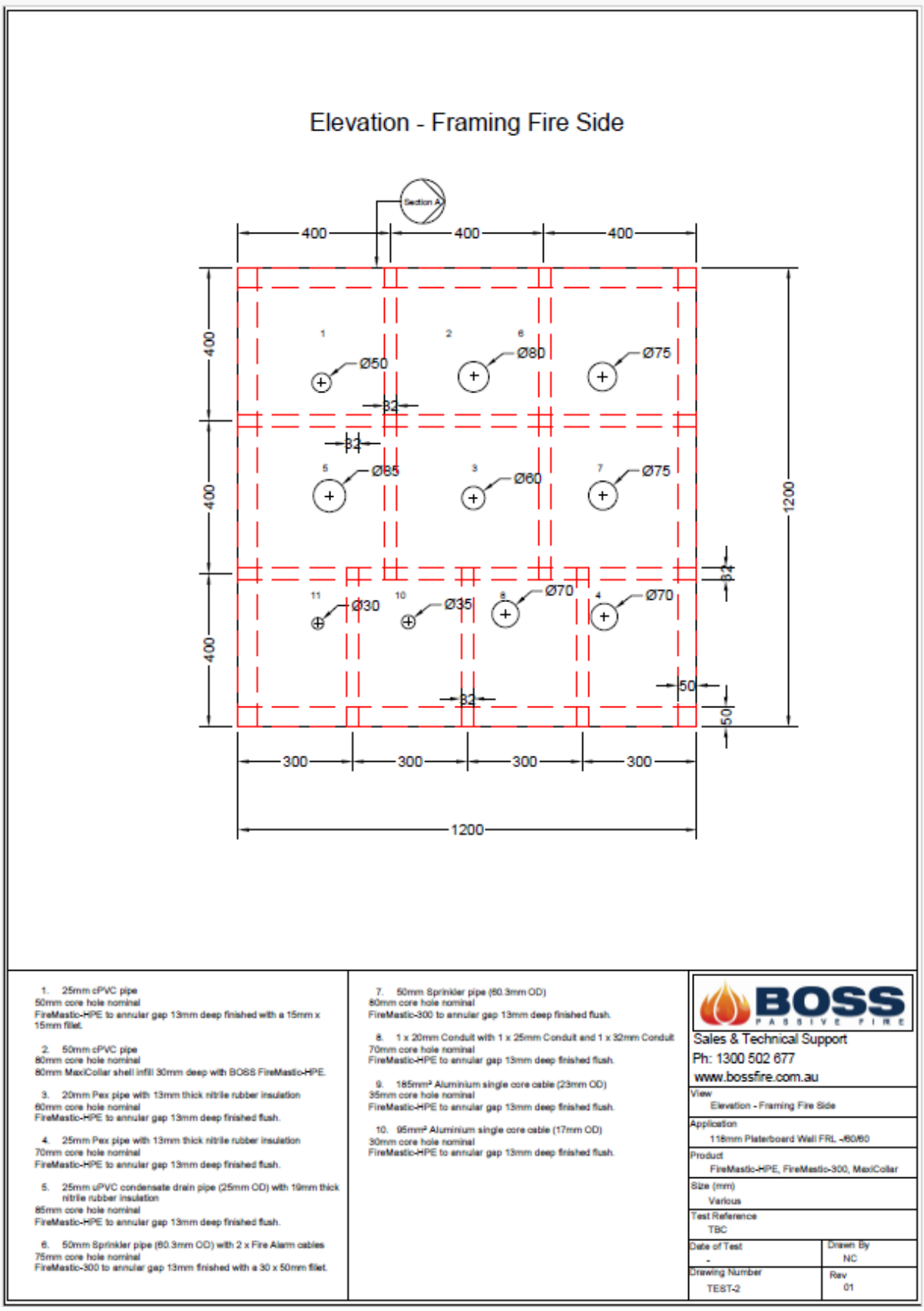


Figure 40 - Test 2 – Elevation – Framing Fire Side.pdf

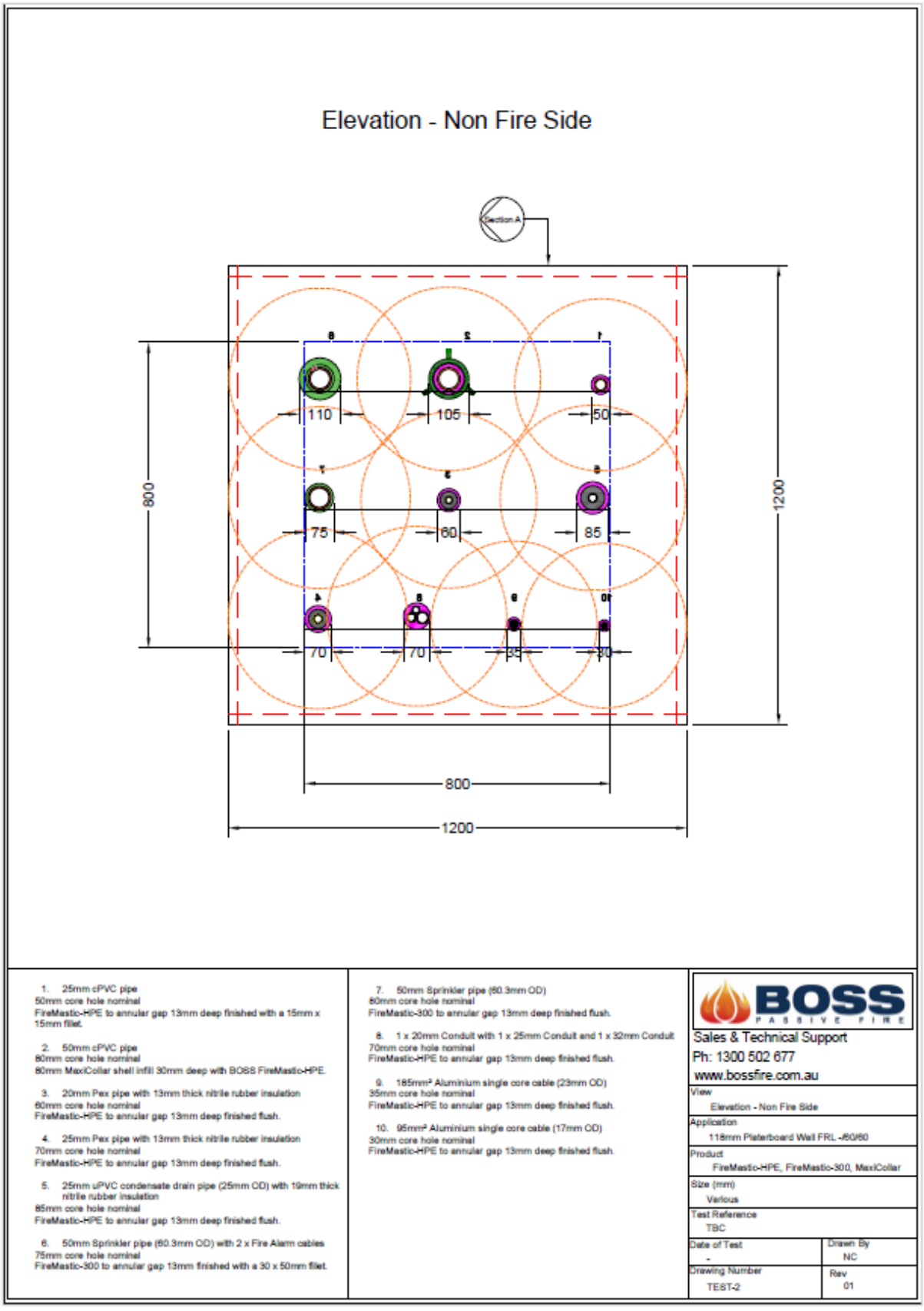


Figure 41 - Test 2 – Elevation – Non Fire Side.pdf

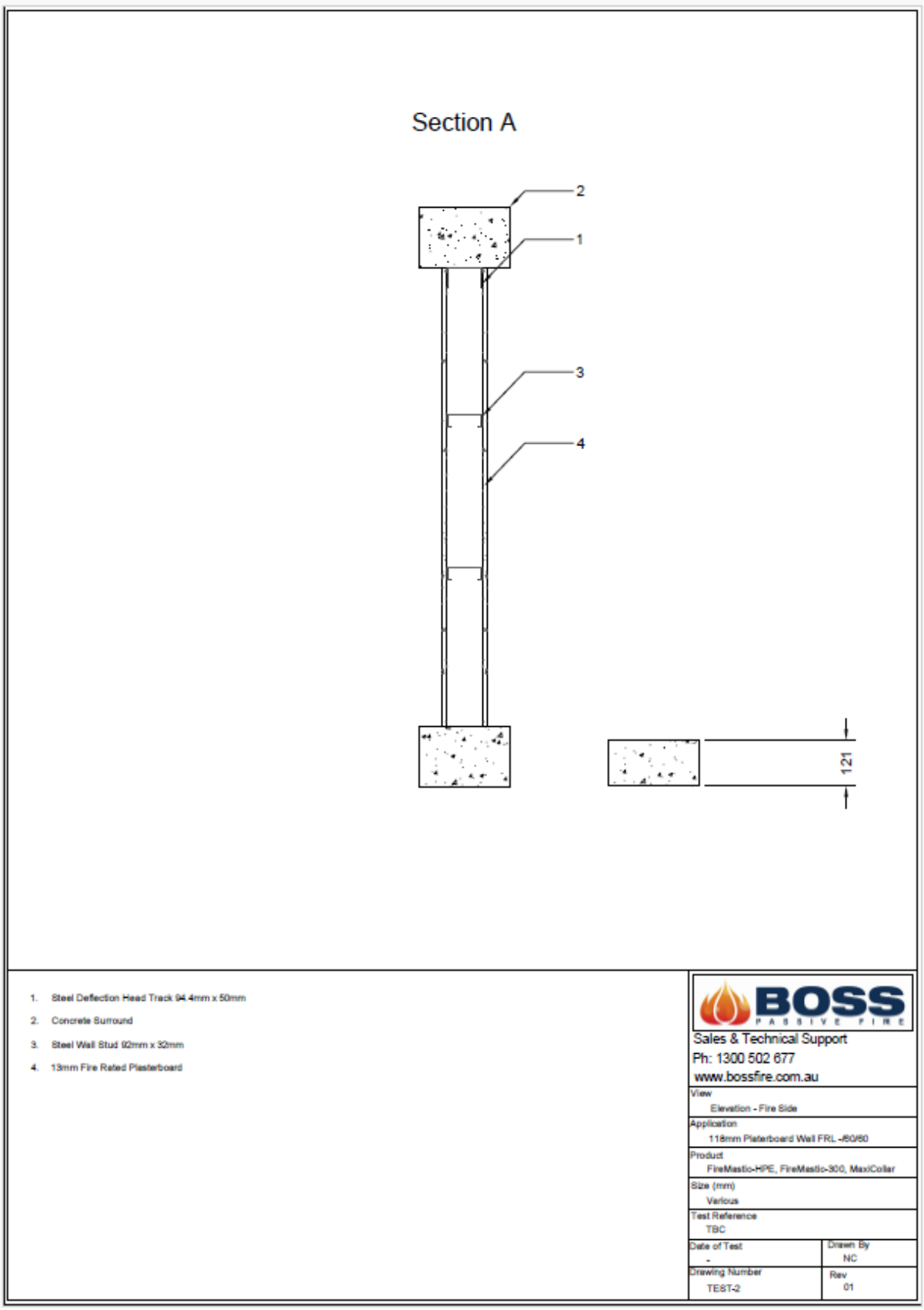


Figure 42 - Elevation – Section A.pdf

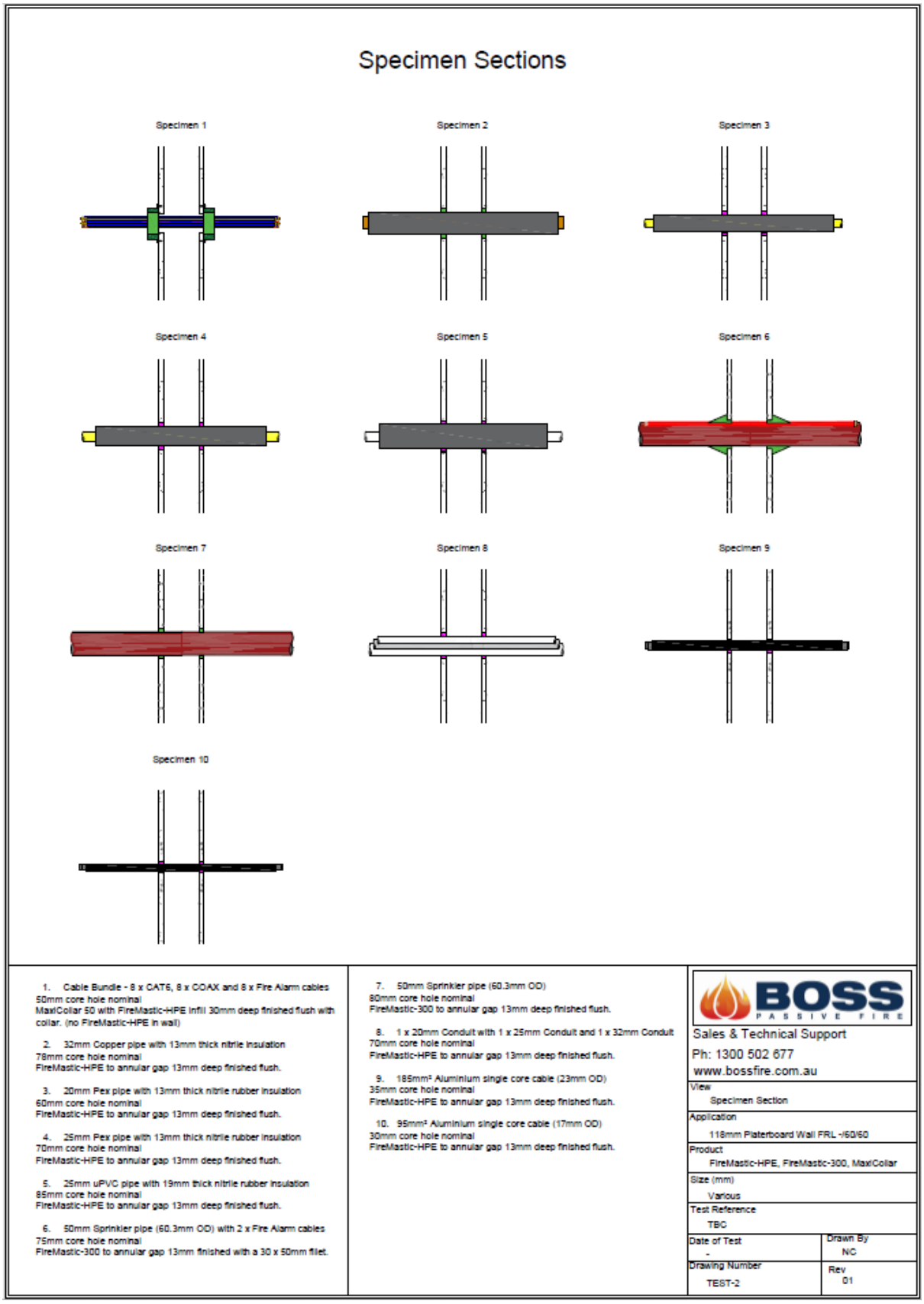


Figure 43 - Test 2 – Specimen Sections V3.pdf