

TEST REPORT

PF25031

Fire resistance test for penetration through a horizontal separating element

Client:	BOSS Products (Australia) Pty Ltd
Test method:	AS1530.4-2014
Report Date:	06/08/2025
Test number:	PF25031

Table of Contents

1.1	Document revision schedule	4
1.2	Signatories	4
2.	Report Summary	5
3.	General Information	6
3.1	Testing Scope	6
3.2	Contact Details	7
3.3	Specimen Preparation, Conditioning and Timeline	7
3.4	Use of the Report	8
4.	Specimen Description	9
4.1	Supporting Construction	9
4.2	Specimens	9
5.	Test Conditions	16
5.1	Equipment	16
5.2	Furnace Data	17
5.3	Thermocouple locations	19
6.	Test Results	20
6.1	Observations during the test	20
6.2	Specimen 1	22
6.3	Specimen 2	24
6.4	Specimen 3	26
6.5	Specimen 4	28
6.6	Specimen 5	30
6.7	Specimen 6	32
6.8	Specimen 7	34

6.9 Specimen 8	36
6.10 Specimen 9	39
7. Photos	42
7.1 Photos before the test.....	42
7.2 During and after the test	43
8. Appendix	49
8.1 Client supplied drawings.....	49

1.1 Document revision schedule

Revision #	Date	Description
1	01/05/2025	Initial issue for Client review
2	06/08/2025	Issued to Client

1.2 Signatories

Report	Name	Signature	Date
Prepared by:	Alexey Kokorin		06/08/2025
Authorised by:	Andrew Bain (Authorized signatory)		06/08/2025



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 120mm thick concrete slab.

Specimen #	Service	Actual Integrity (min)	Actual Insulation (min)	FRL
1	Cable Bundle – 10 x Alarm + 20 x Data + 15 x TPS + 4 x 16mm ² + 6 x COAX + 10 x 70mm ² Aluminium	132NF	132NF	-/120/120
2	Blank – 32mm Cast-in Conduit	132NF	132NF	-/120/120
3	Cable Bundle – 38 x Data + 22 x TPS	132NF	132NF	-/120/120
4	Blank – 32mm Cast-in Conduit	132NF	132NF	-/120/120
5	Cable Bundle – 38 x Data + 22 x TPS	132NF	132NF	-/120/120
6	Cable Bundle – 10 x Alarm + 20 x Data + 15 x TPS + 4 x 16mm ² + 6 x COAX + 10 x 70mm ² Aluminium	132NF	100	-/120/90
7	Cable Bundle – 10 x Alarm + 20 x Data + 15 x TPS + 4 x 16mm ² + 6 x COAX + 10 x 70mm ² Aluminium	132NF	132NF	-/120/120
8	D1 Cable Configuration on Cable Tray	132NF	132NF	-/120/120
9	D2 Cable Configuration on Cable Tray	132NF	132NF	-/120/120

NF – No Failure

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°C
- 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. The following documentation was provided:

- Test 7 – Elevation – Fire Side V3.pdf
- Test 7 – Aperture Size – Fire Side V3.pdf
- Test 7 – Aperture Location – Fire Side – Vertical V3.pdf
- Test 7 – Aperture Location – Fire Side – Horizontal V3.pdf
- Test Slab – Specimen Sections V3.pdf
- Test Slab – Specimen Sections V3 -8.9.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

Supplier/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 Laboratory in line with Client instructions. The Laboratory was not involved in sampling of the materials. The Laboratory checked materials during construction of the specimen. Services were capped on the fire side.

Testing date:

16/04/2025

Installation completion date:

15/04/2025

Termination of The Test:

The test was discontinued at 132 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 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

1.1	Item	Concrete Slab
	Dimensions	Width x Height: 1400mm x 1400mm
		Slab Thickness: 120mm
		Aperture: 400mm x 600mm

4.2 Specimens

Services		
2.1	Item	Maser 2 Core 0.75mm ² Red Fire Alarm Cable TCW
	Cable	Overall Diameter: 6.95mm
		Sheath Material: 5V-90 PVC
		Sheath Thickness: 1.2mm
	Core	Number of Cores: 2 (circular shaped)
		Overall Diameter: 2.6mm
		Conductor Diameter: 0.24mm
		Conductor Material: Copper
		Insulation Material: V-90 PVC
		Insulation Thickness: 0.65mm
	Specimen #	1, 6, 7
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

	Specimen #	1, 3, 5, 6, 7
2.3	Item	Prysmian Electrical Cable 450/750V 2C + E 2.5mm ²
	Cable	Width x Depth: 12mm x 5.5mm
		Sheath Material: 3V-90 PVC
		Sheath Thickness: 0.92mm
	Core	Number of Cores: 2 (circular shaped)
		Overall Diameter: 3.3mm
		Conductor Diameter: 0.64mm
		Conductor Material: Copper
		Insulation Material: V-90 PVC
		Insulation Thickness: 0.6mm
	Earth	Overall Diameter: 3.2mm
		Wire Diameter: 0.64mm
	Specimen #	1, 3, 5, 6, 7
2.4	Item	APEC 2024 X-90 Electra Cable 0.6/1 kV 3C+E CU
	Cable	Overall Diameter: 18.0mm
		Sheath Material: PVC
		Sheath Thickness: 1.8mm
	Core	Number of Cores: 3 (circular shaped)
		Overall Diameter: 6.6mm
		Conductor Diameter: 1.7mm
		Conductor Material: Copper
		Insulation Material: X-90 PVC
		Insulation Thickness: 1.0mm
	Earth	Overall Diameter: 4.6mm
		Conductor Diameter: 1.0mm
	Specimen #	1, 6, 7
2.5	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
	Specimen #	1, 6, 7
2.6	Item	ICS 2024 x-90 70mm ² Aluminium Electric Cable
	Cable	Overall Diameter: 15.0mm
		Sheath Material: HF-110-Rubber
		Sheath Thickness: 1.3mm
	Core	Number of Cores: 1
		Overall Diameter: 12.5mm
		Conductor Diameter: 2.5mm
		Conductor Material: Aluminium
		Insulation Material: XLPE
		Insulation Thickness: 1.4mm
	Specimen #	1, 6, 7
2.7	Item	Cable Tray
	Dimensions	Height: 1500mm
		Width: 300mm
		Depth: 50mm
	Specimen #	8
2.8	Item	Nexans BZGE94AA001CSNZ Envirolex 630mm ² Single Core Black
	Dimensions	Overall Diameter: 44.0mm
		Sheath Material: HFS-110-TP
		Sheath Thickness: 2.9mm
	Core	Number of Cores: 1 (circular shaped)
		Overall Diameter: 38.0mm
		Conductor Diameter: 3.0mm
		Conductor Material: Copper
		Insulation Material: X-HF-110
		Insulation Thickness: 2.85mm

	Location	1 cable located in position "A" of D1 cable configuration
	Specimen #	8
2.9	Item	APEC 2023 X-90 Electra Cable 0.6/1 kV 3C+E CU
	Cable	Overall Diameter: 53.8mm
		Sheath Material: PVC
		Sheath Thickness: 2.9mm
	Core	Number of Cores: 3 (circular shaped)
		Overall Diameter: 20.6mm
		Conductor Diameter: 2.52mm
		Conductor Material: Copper
		Insulation Material: X-90 PVC
		Insulation Thickness: 1.75mm
	Earth	Overall Diameter: 12.8mm
		Conductor Diameter: 2.1mm
	Location	1 cable located in position "B" of D1 cable configuration
	Specimen #	8
2.10	Item	ICS 3C x 6mm ² + E Cu/PVC/PVC 0.6/1kV AS/NZS 5000.1 Circular Cable
	Cable	Overall Diameter: 15.3mm
		Sheath Material: PVC
		Sheath Thickness: 1.75mm
	Core	Number of Cores: 3 (circular shaped)
		Overall Diameter: 5.04mm
		Conductor Diameter: 1.05mm
		Conductor Material: Copper
		Insulation Material: V-90 PVC
		Insulation Thickness: 0.92mm
	Earth	Overall Diameter: 3.33mm
		Conductor Diameter: 0.65mm

	Location	3 cables located in position "C" of D1 cable configuration
	Specimen #	8
2.11	Item	ICS 3C x 16mm ² + E Cu/PVC/SWA/PVC 0.6/1kV AS/NZS 5000.1
	Cable	Overall Diameter: 19.3mm
		Sheath Material: PVC
		Sheath Thickness: 1.98mm
	Core	Number of Cores: 3 (circular shaped)
		Overall Diameter: 6.64mm
		Conductor Diameter: 1.7mm
		Conductor Material: Copper
		Insulation Material: X-90 PVC
		Insulation Thickness: 1.04mm
	Earth	Overall Diameter: 4.57mm
		Conductor Diameter: 1.01mm
	Location	8 cables located in position "D" of D1 cable configuration
	Specimen #	8
2.12	Item	Cable Tray
	Dimensions	Height: 1500mm
		Width: 150mm
		Depth: 50mm
	Specimen #	9
2.13	Item	GARLAND UTPL350HF 240AWG 50PR LSZH CAT2 Cable
	Cable	Overall Diameter: 16.9mm
		Sheath Material: HFFR
		Sheath Thickness: 1.02mm
	Core	Number of Cores: 100 (50 pairs)
		Overall Diameter: 0.85mm
		Conductor Diameter: 0.5mm

		Conductor Material: Copper
		Insulation Material: PE
		Insulation Thickness: 0.18mm
	Location	60 cables located in D2 cable configuration
	Specimen #	9

Sealants

3.1	Item	Boss FireMastic-HPE
	Dimensions	600mL sausage
3.2	Item	Boss FireMastic-300
	Dimensions	600mL sausage

Insulation

4.1	Item	Boss Thermal Defence Wrap
	Dimensions	Width: 300mm Thickness: 5.0mm
4.2	Item	Boss P40-MAK Wrap
	Dimensions	Width: 300mm Thickness: 40mm
4.3	Item	Boss Batts
	Dimensions	Width x Length: 1200mm x 600mm (cut to size)
		Thickness: 50mm

Collars

5.1	Item	BOSS Collar Shell 80 (no intumescent included)
	Collar	Height: 30mm Maximum Opening: 105mm Steel Thickness: 0.70BMT
	Fixing Points	3

Fixings		
6.1	Item	Ramset Masonry Screw
	Dimensions	7.5 x 40mm
6.2	Item	Wire Tie
	Description	Used to secure wrap around services
6.3	Item	Potter Foil Tape
	Description	Used to seal joins in wrap around services

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:

Keypare 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.

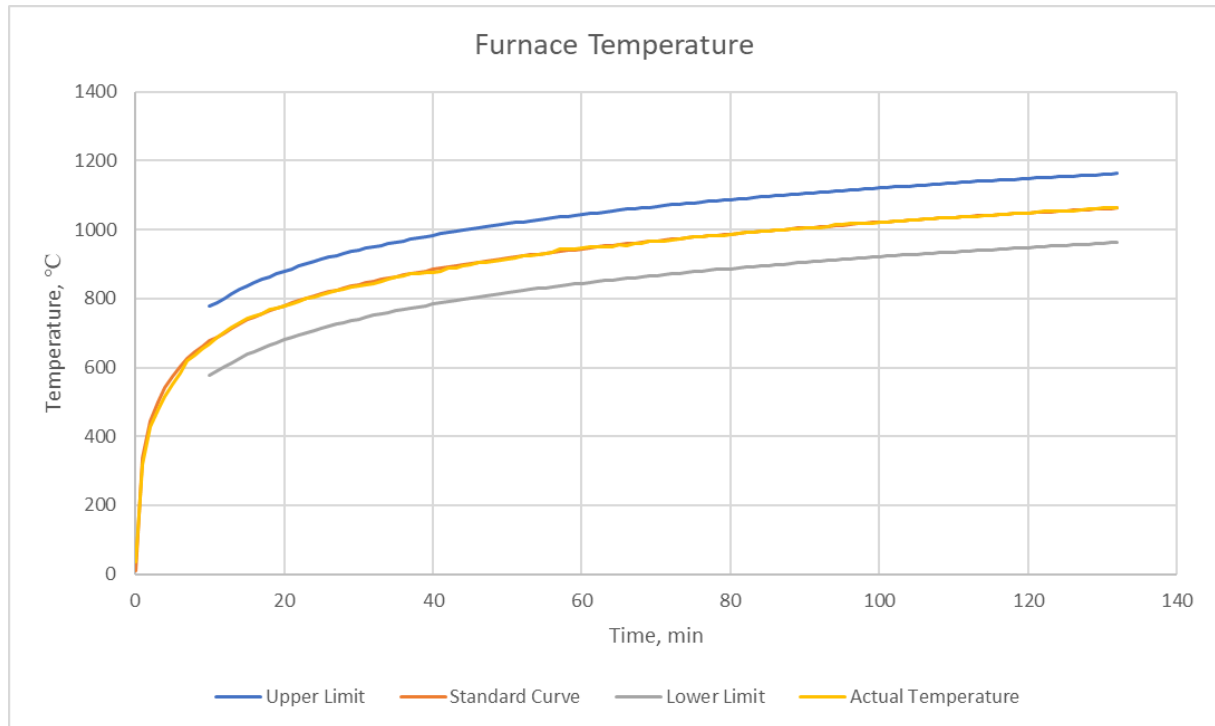


Figure 1 - Furnace Temperature during the test

Ambient Temperature:

The ambient temperature of the test area 15 minutes before the test and at the commencement of the test was 22°C.

Furnace Pressure:

After the first 5 minutes of the test, the furnace pressure was maintained at 20 ± 3 Pa with respect to atmosphere. The probe was located 100mm below the separating element.

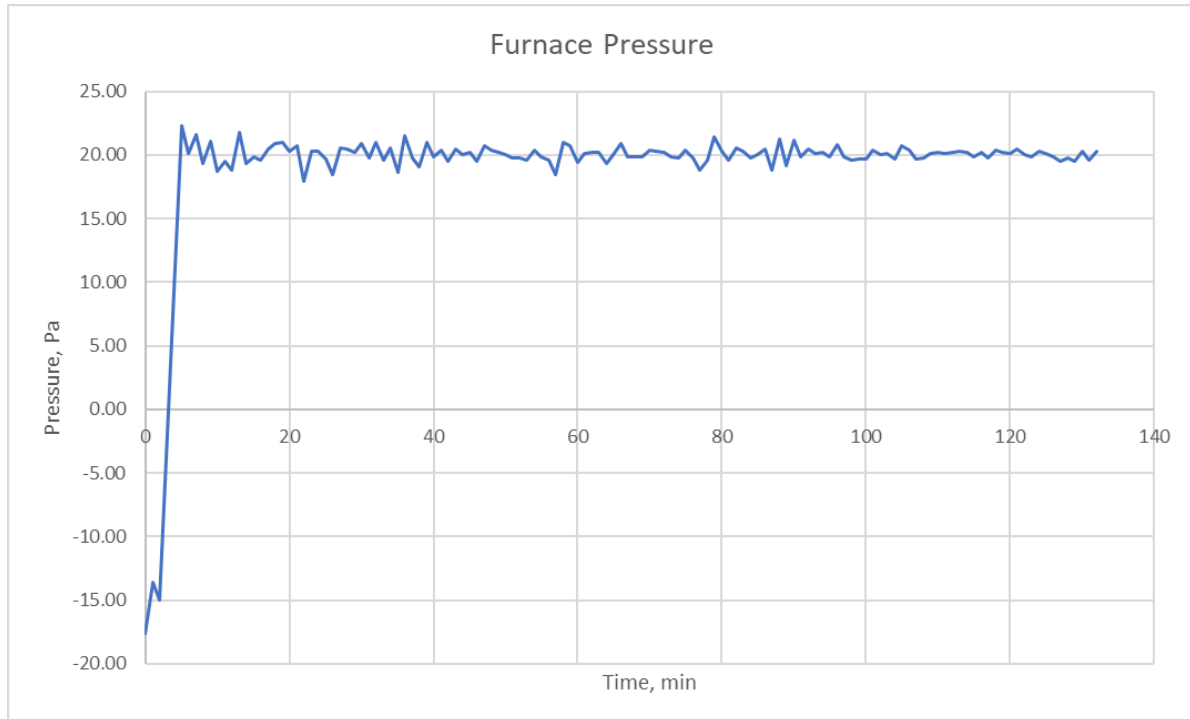


Figure 2 - Furnace Pressure during the test

5.3 Thermocouple locations

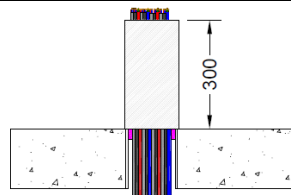
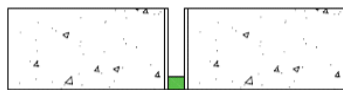
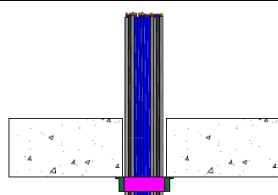
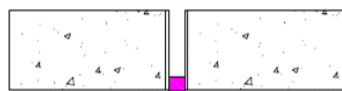
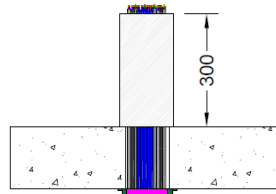
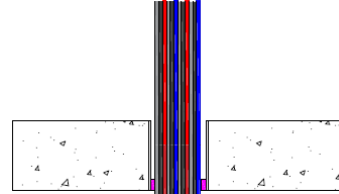
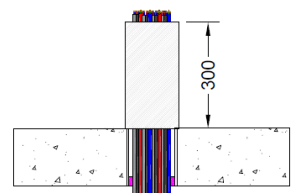
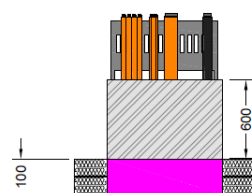
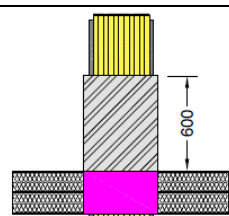
SERVICE: SP1 - CABLE BUNDLE # OF THERMOCOUPLES: 12 START: TC237 FINISH: TC248	SERVICE: SP2 - NO SERVICE # OF THERMOCOUPLES: 2 START: TC201 FINISH: TC202	SERVICE: SP3 - CABLE BUNDLE # OF THERMOCOUPLES: 4 START: TC217 FINISH: TC220
 TC237 & TC238 - CONCRETE SLAB, 25MM FROM APERTURE TC239 & TC240 - WRAP, 25MM FROM BOTTOM OF WRAP TC241 & TC242 - WRAP, 25MM FROM TOP OF WRAP TC243 - CABLE, 16MM CABLE TC244 - CABLE, CONTROL TC245 - CABLE, TPS TC246 - CABLE, FIRE TC247 - CABLE, DATA TC248 - CABLE, ALUMINIUM	 TC201 & TC202 - CONCRETE SLAB, 25MM FROM APERTURE	 TC217 - TC218 - CONCRETE SLAB, 25MM FROM APERTURE TC219 - CABLE, TPS TC220 - CABLE, DATA
SERVICE: SP4 - NO SERVICE # OF THERMOCOUPLES: 2 START: TC203 FINISH: TC204	SERVICE: SP5 - CABLE BUNDLE # OF THERMOCOUPLES: 8 START: TC221 FINISH: TC228	SERVICE: SP6 - CABLE BUNDLE # OF THERMOCOUPLES: 8 START: TC229 FINISH: TC236
 TC203 & TC204 - CONCRETE SLAB, 25MM FROM APERTURE	 TC221 & TC222 - CONCRETE SLAB, 25MM FROM APERTURE TC223 & TC224 - WRAP, 25MM FROM BOTTOM OF WRAP TC225 & TC226 - WRAP, 25MM FROM TOP OF WRAP TC227 - CABLE, TPS TC228 - CABLE, DATA	 TC229 & TC230 - CONCRETE SLAB, 25MM FROM APERTURE TC231 - CABLE, CONTROL TC232 - CABLE, DATA TC233 - CABLE, FIRE TC234 - CABLE, ALUMINIUM TC235 - CABLE, 16MM CABLE TC236 - CABLE, TPS
SERVICE: SP7 - CABLE BUNDLE # OF THERMOCOUPLES: 12 START: TC205 FINISH: TC216	SERVICE: D1 CABLES IN CABLE TRAY # OF THERMOCOUPLES: 24 START: TC21 FINISH: TC44	
 TC205 & TC206 - CONCRETE SLAB, 25MM FROM APERTURE TC207 & TC208 - WRAP, 25MM FROM BOTTOM OF WRAP TC209 & TC210 - WRAP, 25MM FROM TOP OF WRAP TC211 - CABLE, 16MM CABLE TC212 - CABLE, TPS TC213 - CABLE, CONTROL TC214 - CABLE, DATA TC215 - CABLE, FIRE TC216 - CABLE, ALUMINIUM	 TC19 & TC20 - BOSS BATT, 25MM FROM EDGE OF APERTURE TC21 - TC22 - BOSS BATT, 25MM FROM SPECIMEN TC23 - TC25 - SEALANT, BETWEEN WRAP & BATT TC26 - TC28 - WRAP, 25MM FROM BOTTOM OF 300 WRAP TC29 - TC31 - WRAP, 25MM FROM TOP OF 300 WRAP TC32 - TC35 - CABLES, 25MM FROM TOP OF 300 WRAP TC36 - CABLE TRAY, 25MM FROM TOP OF 300 WRAP TC37 - TC39 - WRAP 25MM FROM TOP OF 600 WRAP TC40 - TC43 - CABLES, 25MM FROM TOP OF 600 WRAP TC44 - CABLE TRAY, 25MM FROM TOP OF 600 WRAP	
SERVICE: D2 CABLES IN CABLE TRAY # OF THERMOCOUPLES: 14 START: TC5 FINISH: TC18		
 TC1 - TC4 - CONCRETE SLAB, 25MM FROM APERTURE TC5 & TC6 - BOSS BATT, 25MM FROM SPECIMEN TC7 & TC8 - SEALANT, BETWEEN WRAP & BATT TC9 & TC10 - WRAP, 25MM FROM BOTTOM OF 300 WRAP TC11 & TC12 - WRAP, 25MM FROM TOP OF 300 WRAP TC13 - CABLES - 25MM FROM TOP OF 300 WRAP TC14 - CABLE TRAY, 25MM FROM TOP OF 300 WRAP TC15 & TC16 - WRAP, 25MM FROM TOP OF 600 WRAP TC17 - CABLES - 25MM FROM TOP OF 600 WRAP TC18 - CABLE TRAY, 25MM FROM TOP OF 600 WRAP		

Figure 3 - Thermocouple locations

6. Test Results

6.1 Observations during the test

Time min	Test face	SP#	OBSERVATIONS/REMARKS
2	U	1, 3, 5, 6, 7, 8, 9	Smoke coming through from between and around the cables
7	U	9	Discolouration visible on the cables
9	U	5	Discolouration visible on the wrap
21	U	3	Discolouration visible on the TPS cables
27	U	4	PVC cast in beginning to soften
30	U	2	76°C measured on the top of seal with roving thermocouple
31	U	4	91°C measured on the top of seal with roving thermocouple
31	U	6	PVC cast in beginning to soften
31	U	6	Cable melting, TC236 melted into cables/PVC
31	U	6	16mm Cable showing discolouration
31	U	1, 6, 7	PVC cast in pushing up above the separating element
33	U	8	Cracking visible in the sealant
44	U	6	All cables melting close to the separating element
48	U	6	74°C measured on TPS cables with roving thermocouple
50	U	4	Minor smoke coming through the aperture
50	U	1	PVC continues to push up past the separating element, gap visible between PVC and wrap, cables beginning to melt
52	U	6	110°C measured on TPS cables with roving thermocouple
54	U	8	Cracking visible in the sealant
60	U	2	111°C measured on the top of seal with roving thermocouple
60	U	4	123°C measured on the top of seal with roving thermocouple
60	U	2	Minor smoke coming through the aperture
60	U	1	PVC split above the separating element, cables melting and spilling over the separating element, intumescent expanding
65	U	6	110°C measured on TPS cables with roving thermocouple

69	U	3	Melted PVC pushing up from the aperture, flush with the separating element
75	U	6	110°C measured on TPS cables with roving thermocouple
87	U	7	PVC cast in pushed up from the aperture past the separating element, starting to split
90	U	2	132°C measured on the top of seal with roving thermocouple
91	U	4	146°C measured on the top of seal with roving thermocouple
100	U	1	Wrap beginning to tear
100	U	7	PVC split above the separating element, cables melting and spilling over the separating element, intumescent expanding
100	U	SE	Cracks developing in sides of the separating element
105	U	6	130°C measured on TPS cables with roving thermocouple
119	U	2	158°C measured on the top of seal with roving thermocouple
120	U	4	167°C measured on the top of seal with roving thermocouple
132			TEST DISCONTINUED

NOTE: E – Exposed Face (inside furnace)
U – Unexposed Face (outside furnace)
SE – Separating element

6.2 Specimen 1

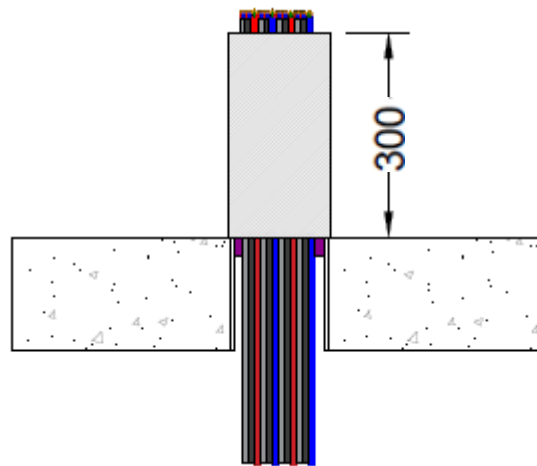


Figure 4 - Specimen 1

Service penetration details	
Service	Cable Bundle – 10 x Fire Alarm + 20 x CAT6 + 15 x TPS + 4 x 16mm ² + 6 x COAX + 70mm ² Aluminium
Service Support	Unexposed Side: 650mm
Aperture Size	111.0mm

Local Fire-stopping system	
Application	Asymmetrical – applied to unexposed side of the separating element
Products	FireMastic-HPE, Thermal Defence Wrap
Procedure	1. 100mm uPVC pipe cast into concrete slab. 2. FireMastic-HPE to annular gap 20mm (nominal) deep and finished flush with the top of the separating element. 3. One revolution of 300mm wide wrap with 50mm overlap wrapped around cables and secured using foil tape and wire.

Test results

Structural adequacy	Not applicable
Integrity	No failure at 132 minutes
Insulation	No failure at 132 minutes

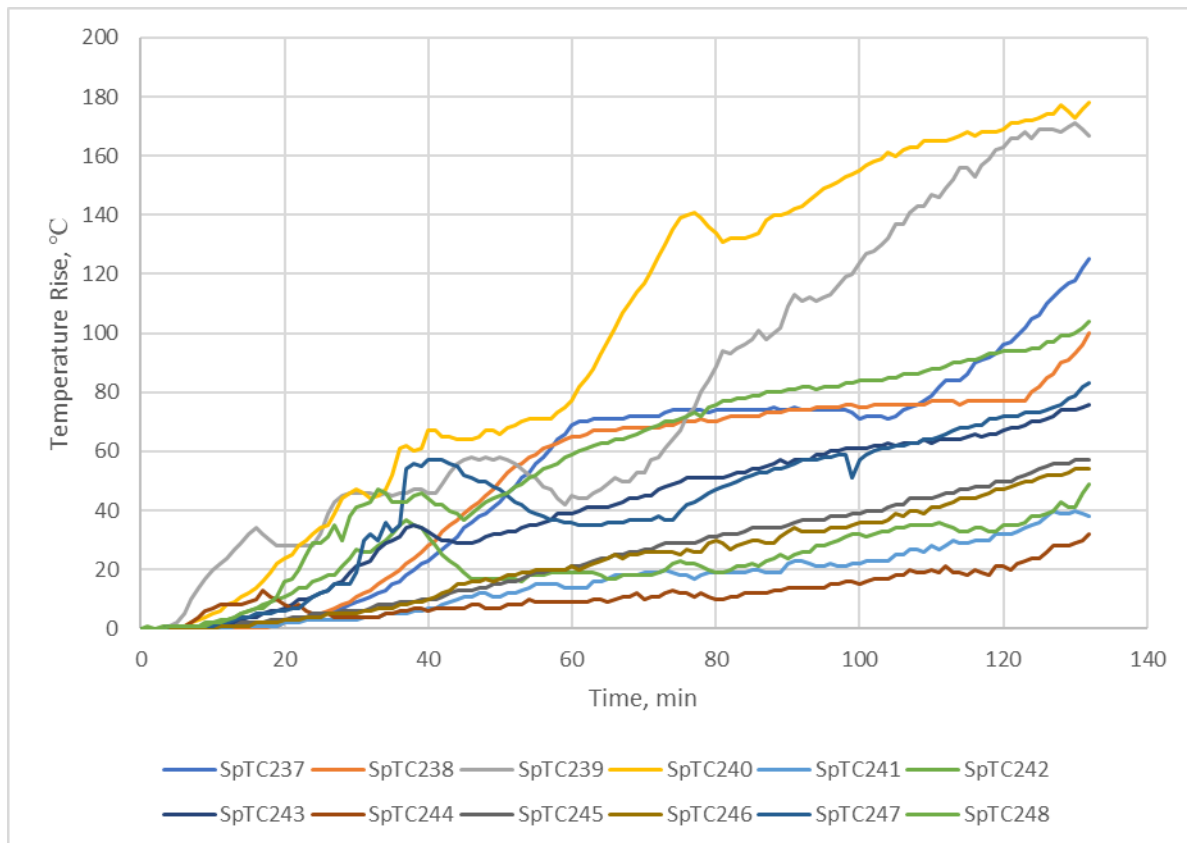


Figure 5 - Specimen 1 thermocouple temperature rise readings

6.3 Specimen 2



Figure 6 - Specimen 2

Service penetration details	
Service	Blank services
Aperture Size	36.8mm

Local Fire-stopping system	
Application	Asymmetrical – applied to exposed side of the separating element
Products	FireMastic-300
Procedure	1. 32mm uPVC pipe cast into concrete slab. 2. FireMastic-300 to annular gap 20mm (nominal) deep and finished flush with the bottom of the separating element.

Test results

Structural adequacy	Not applicable
Integrity	No failure at 132 minutes
Insulation	No failure at 132 minutes

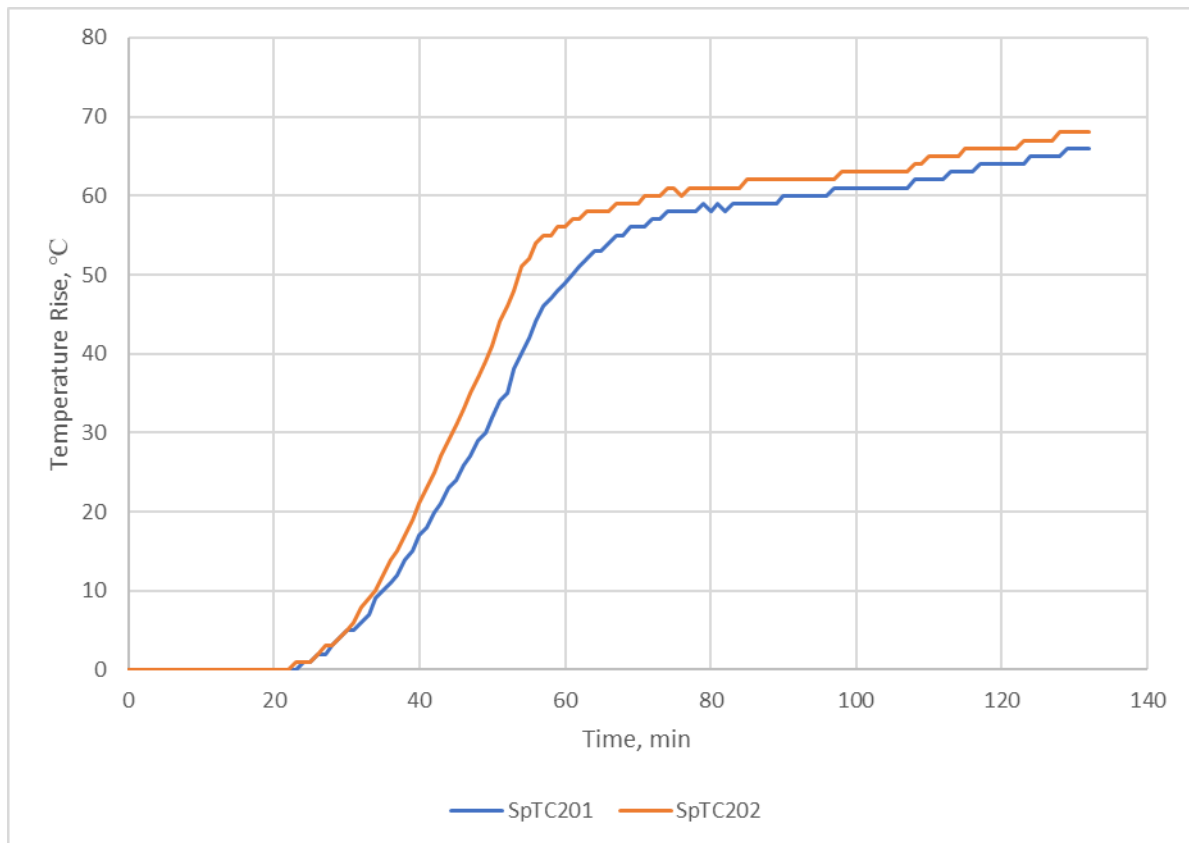


Figure 7 - Specimen 2 thermocouple temperature rise readings

6.4 Specimen 3

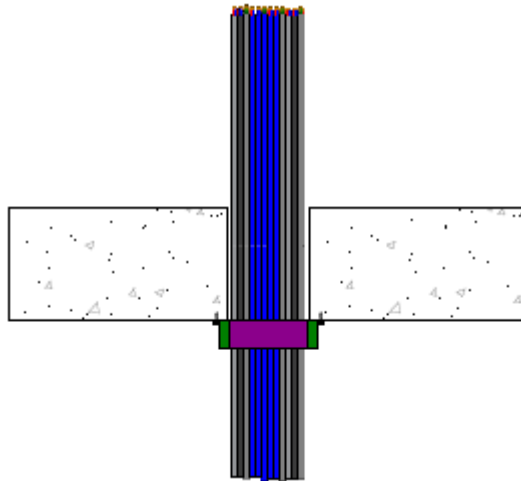


Figure 8 - Specimen 3

Service penetration details	
Service	Cable Bundle – 38 x CAT6 + 22 x TPS
Service Support	Unexposed Side: 650mm
Aperture Size	90.2mm

Local Fire-stopping system	
Application	Asymmetrical – applied to exposed side of the separating element
Products	Boss Collar Shell 80, FireMastic-HPE
Procedure	1. Collar wrapped around services and secured to the separating element in the fixing points with screws and washers. 2. FireMastic-HPE applied in the collar around services, finished flush with the top of the collar.

Test results

Structural adequacy	Not applicable
Integrity	No failure at 132 minutes
Insulation	No failure at 132 minutes

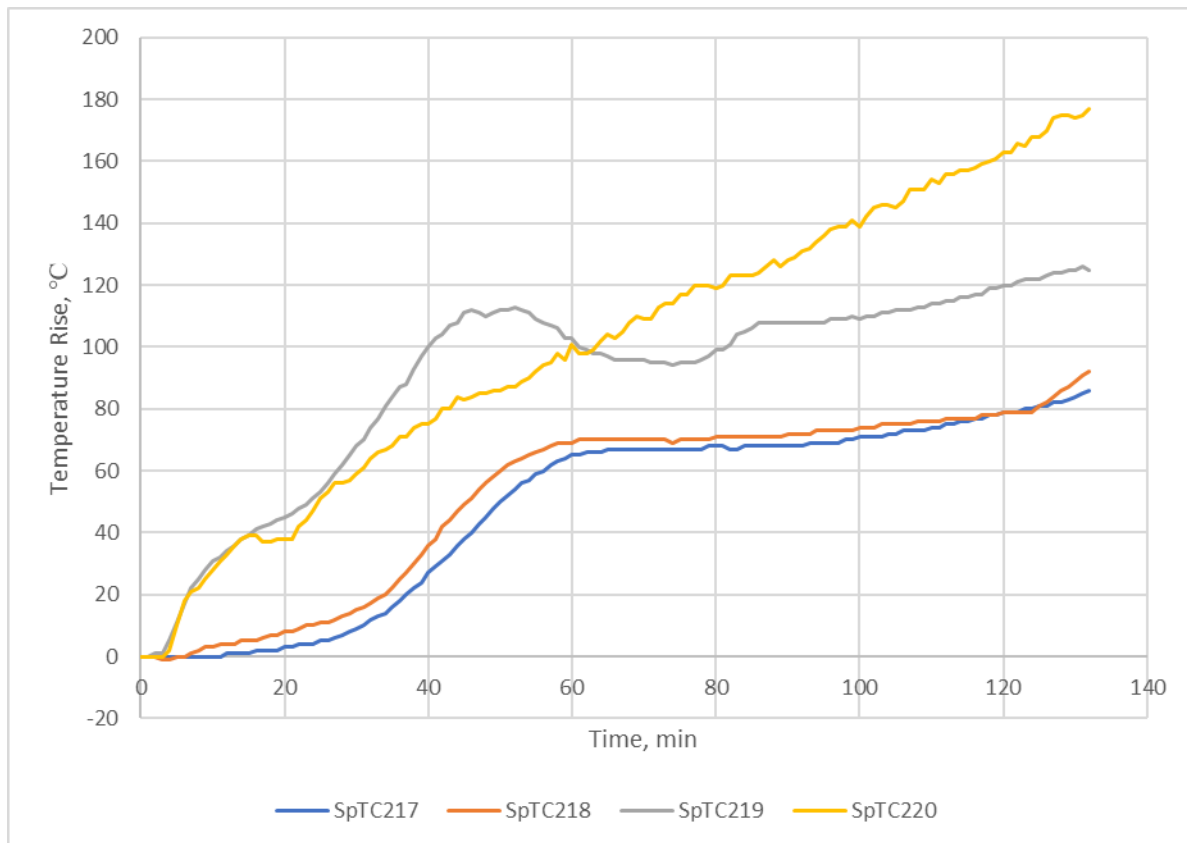


Figure 9 - Specimen 3 thermocouple temperature rise readings

6.5 Specimen 4

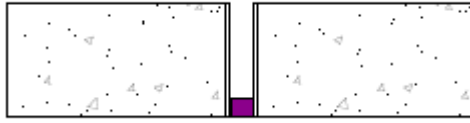


Figure 10 - Specimen 4

Service penetration details	
Service	Blank services
Aperture Size	36.8mm

Local Fire-stopping system	
Application	Asymmetrical – applied to exposed side of the separating element
Products	FireMastic-HPE
Procedure	1. 32mm uPVC pipe cast into concrete slab. 2. FireMastic-HPE to annular gap 20mm (nominal) deep and finished flush with the bottom of the separating element.

Test results

Structural adequacy	Not applicable
Integrity	No failure at 132 minutes
Insulation	No failure at 132 minutes

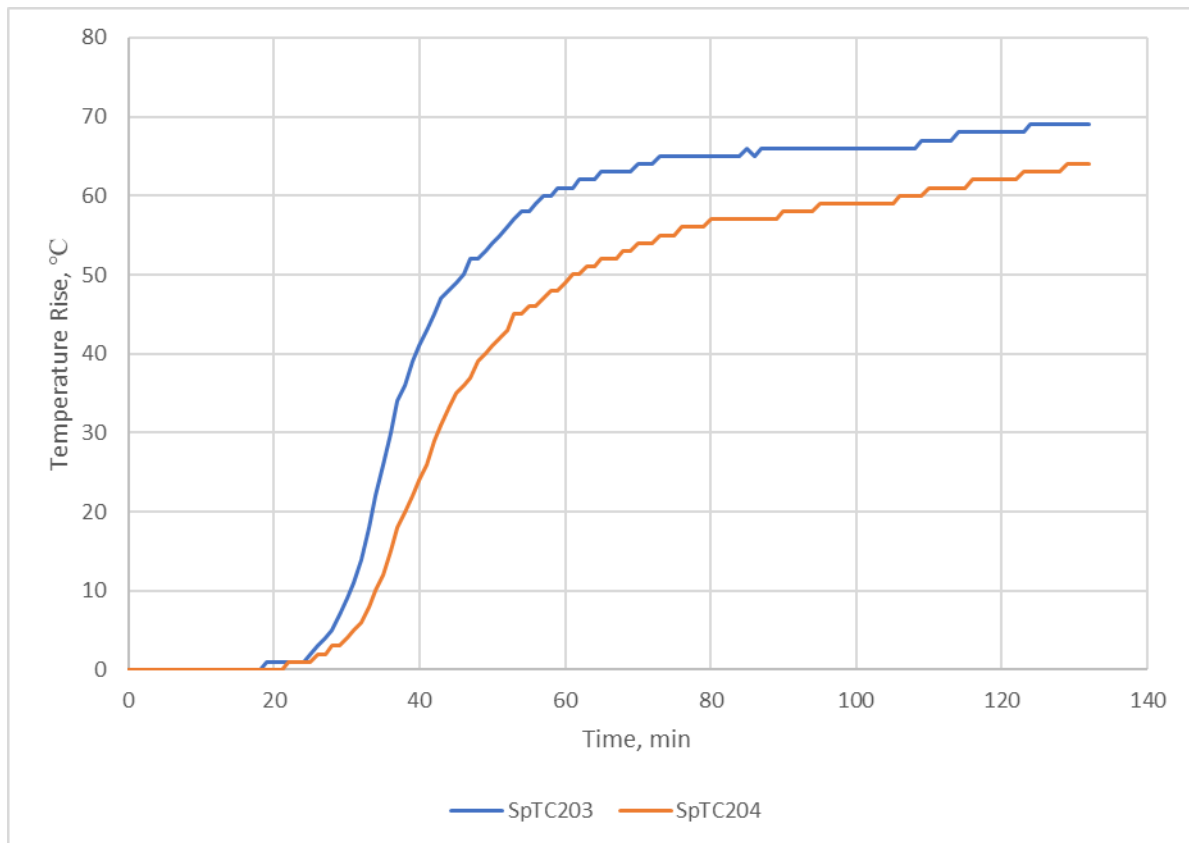


Figure 11 - Specimen 4 thermocouple temperature rise readings

6.6 Specimen 5

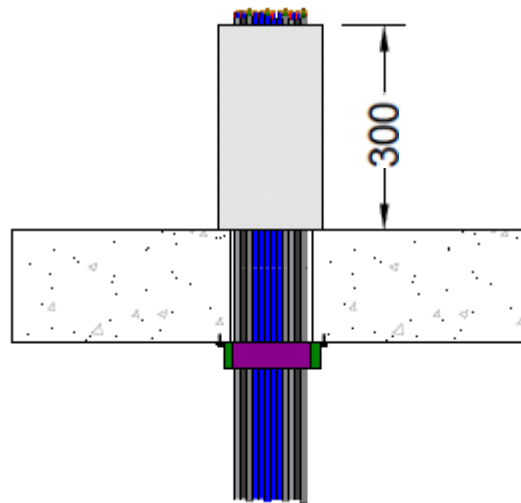


Figure 12 - Specimen 5

Service penetration details	
Service	Cable Bundle – 38 x CAT6 + 22 x TPS
Service Support	Unexposed Side: 650mm
Aperture Size	90.2mm

Local Fire-stopping system	
Application	Asymmetrical – applied to both sides of the separating element
Products	Boss Collar Shell 80, FireMastic-HPE, Thermal Defence Wrap
Procedure	Exposed Side: 1. Collar wrapped around services and secured to the separating element in the fixing points with screws and washers. 2. FireMastic-HPE applied in the collar around services, finished flush with the top of the collar. Unexposed Side: 1. One revolution of 300mm wide wrap with 50mm overlap wrapped around cables and secured using foil tape and wire.

Test results

Structural adequacy	Not applicable
Integrity	No failure at 132 minutes
Insulation	No failure at 132 minutes

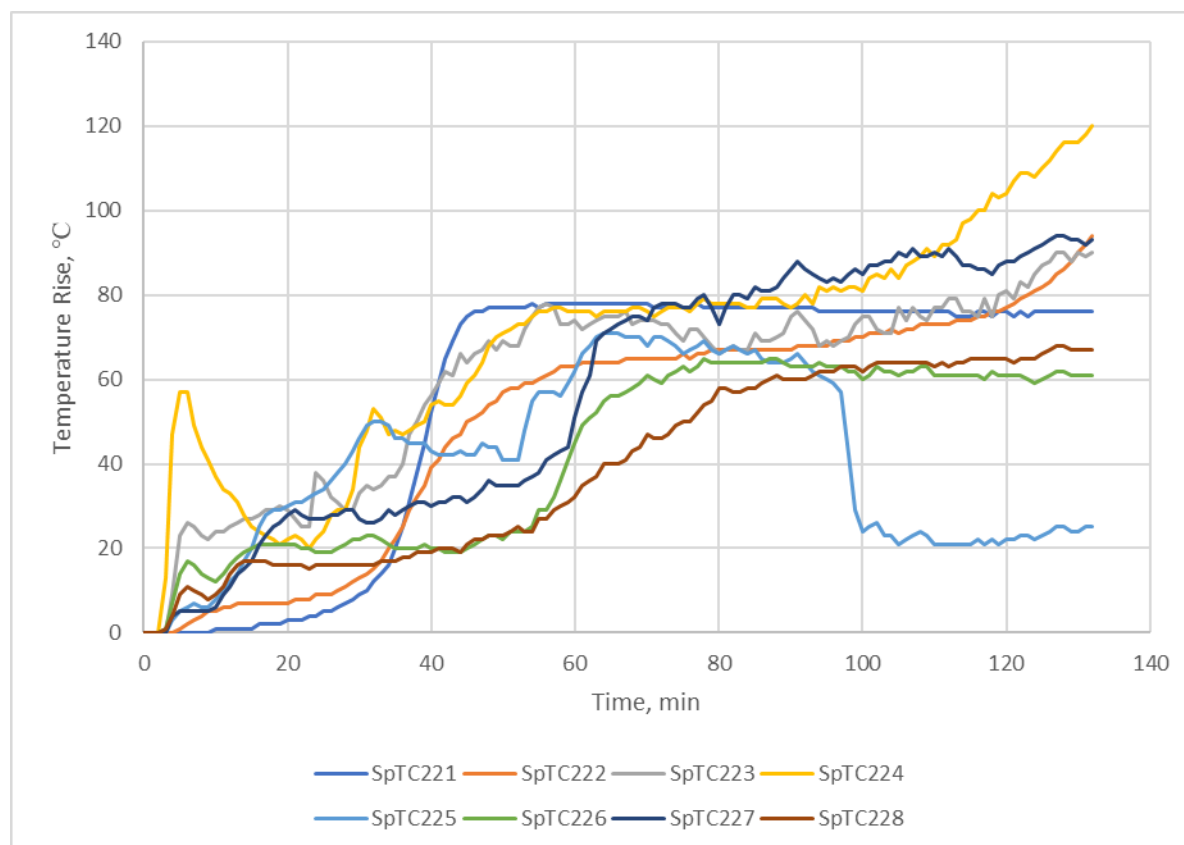


Figure 13 - Specimen 5 thermocouple temperature rise readings

6.7 Specimen 6

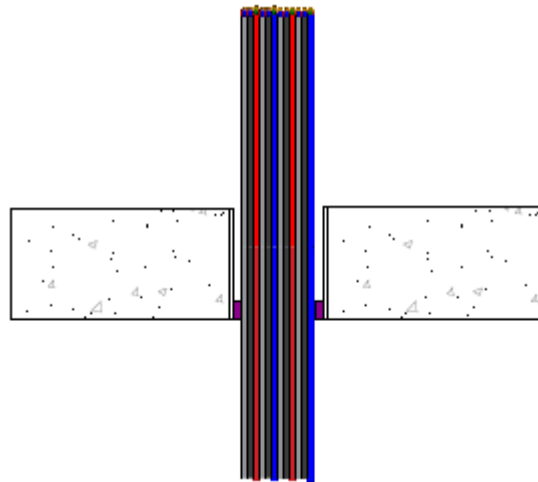


Figure 14 - Specimen 6

Service penetration details	
Service	Cable Bundle – 10 x Fire Alarm + 20 x CAT6 + 15 x TPS + 4 x 16mm ² + 6 x COAX + 70mm ² Aluminium
Service Support	Unexposed Side: 650mm
Aperture Size	111.0mm

Local Fire-stopping system	
Application	Asymmetrical – applied to exposed side of the separating element
Products	FireMastic-HPE
Procedure	1. 100mm uPVC pipe cast into concrete slab. 2. FireMastic-HPE to annular gap 20mm (nominal) deep and finished flush with the bottom of the separating element.

Test results

Structural adequacy	Not applicable
Integrity	No failure at 132 minutes
Insulation	100 minutes

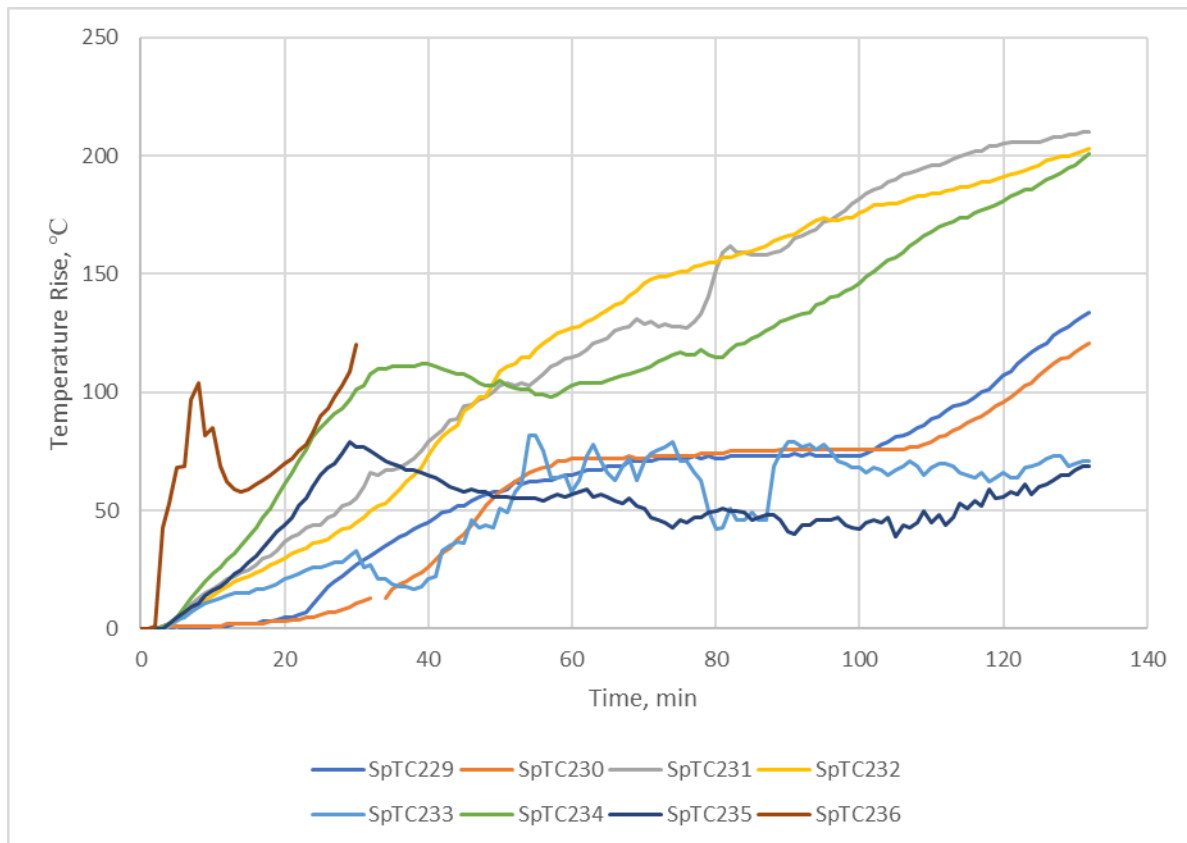


Figure 15 - Specimen 6 thermocouple temperature rise readings

NOTES:

- Specimen thermocouple 236 was damaged during the test and discontinued at 31 minutes

6.8 Specimen 7

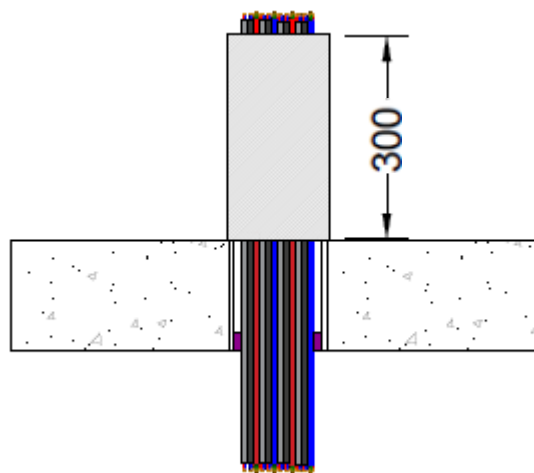


Figure 16 - Specimen 7

Service penetration details	
Service	Cable Bundle – 10 x Fire Alarm + 20 x CAT6 + 15 x TPS + 4 x 16mm ² + 6 x COAX + 70mm ² Aluminium
Service Support	Unexposed Side: 650mm
Aperture Size	111.0mm

Local Fire-stopping system	
Application	Asymmetrical – applied to both sides of the separating element
Products	FireMastic-HPE, Thermal Defence Wrap
Procedure	1. 100mm uPVC pipe cast into concrete slab. Exposed Side: 1. FireMastic-HPE to annular gap 20mm (nominal) deep and finished flush with the top of the separating element. Unexposed Side: 1. One revolution of 300mm wide wrap with 50mm overlap wrapped around cables and secured using foil tape and wire.

Test results

Structural adequacy	Not applicable
Integrity	No failure at 132 minutes
Insulation	No failure at 132 minutes

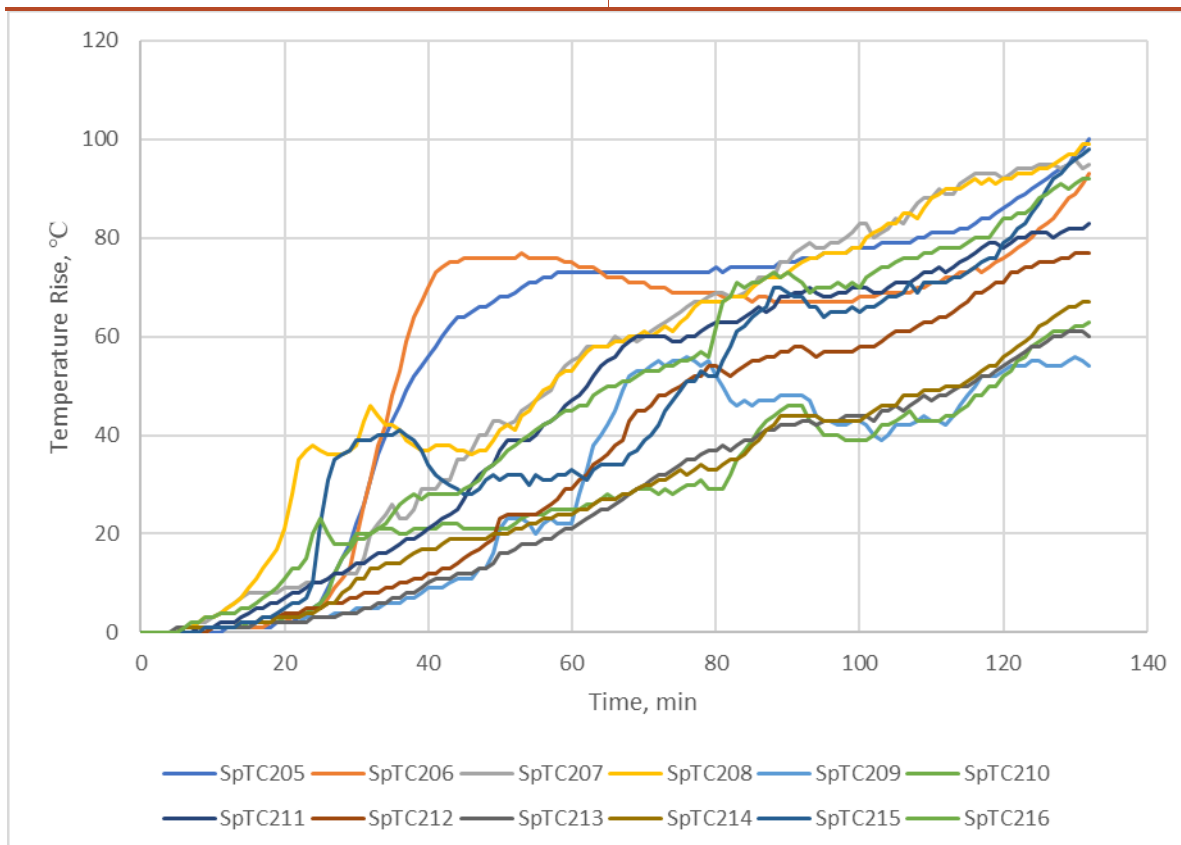


Figure 17 - Specimen 7 thermocouple temperature rise readings

6.9 Specimen 8

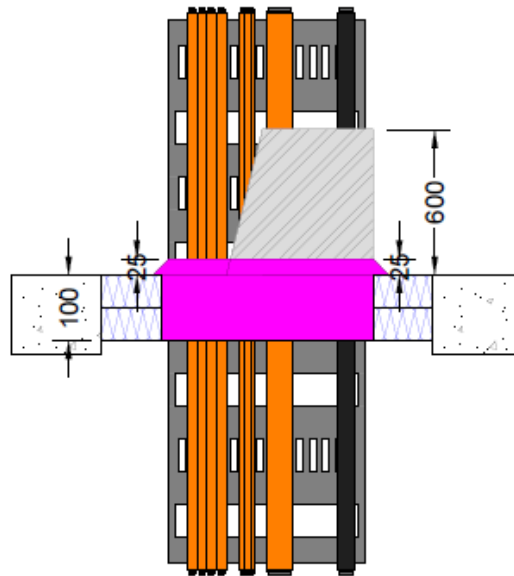


Figure 18 - Specimen 8

Service penetration details	
Service	D1 Cable Configuration on a 300mm Cable Tray
Service Support	Unexposed Side: 650mm
Aperture Size	400mm x 600mm Boss Batt cut around service

Local Fire-stopping system	
Application	Asymmetrical – applied to unexposed side of the separating element
Products	Boss Batts, FireMastic-300, P40-MAK Wrap
Procedure	1. Two layers of Boss Batts installed into the aperture around the service and sealed at all joins and edges using FireMastic-300. 2. FireMastic-300 to annular gap to the depth of the batt and finished flush with the top of the batt. 3. A 25mm FireMastic-300 fillet applied around the service. 4. One revolution of 300mm wide wrap with 50mm overlap wrapped around cables and secured using foil tape and wire. 5. One revolution of 300mm wide wrap with 50mm overlap butt joined into existing bottom layer and wrapped around cables, secured using foil tape and wire.

Test results

Structural adequacy	Not applicable
Integrity	No failure at 132 minutes
Insulation	No failure at 132 minutes

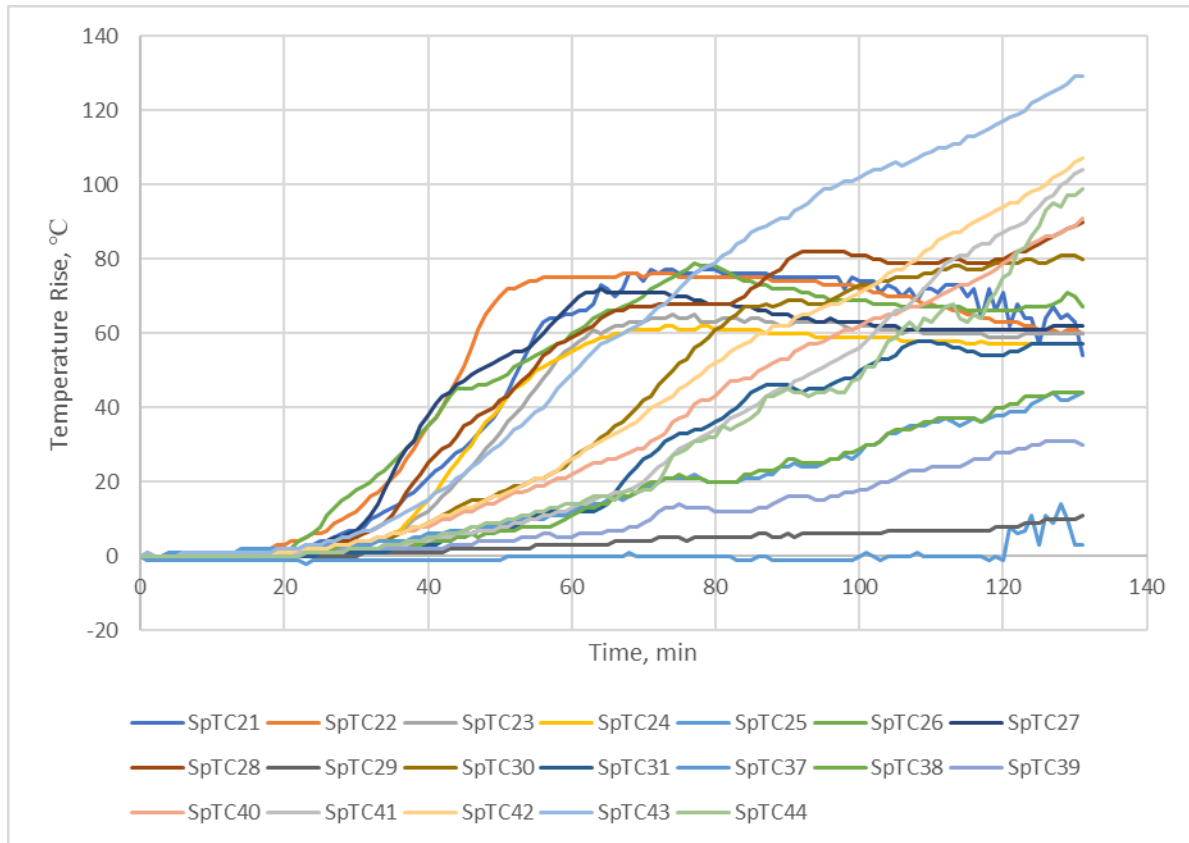


Figure 19 - Specimen 8 thermocouple temperature rise readings

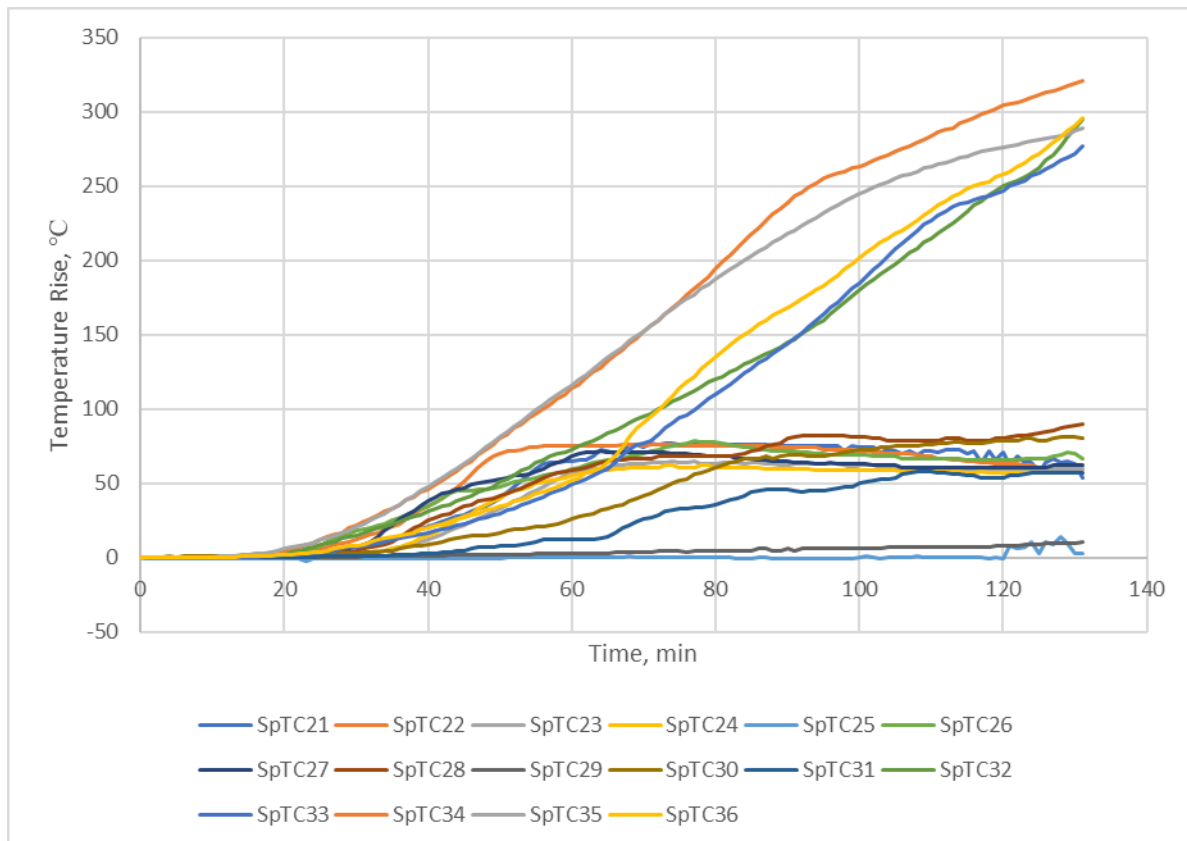


Figure 20 - Specimen 8 (only including up to 300mm wrap) thermocouple temperature rise readings - including internal thermocouples on cables and cable tray at 325mm from the separating element – ***for information purposes only***

NOTES:

- Internal thermocouples exceeded 180°C temperature rise at 77 minutes

6.10 Specimen 9

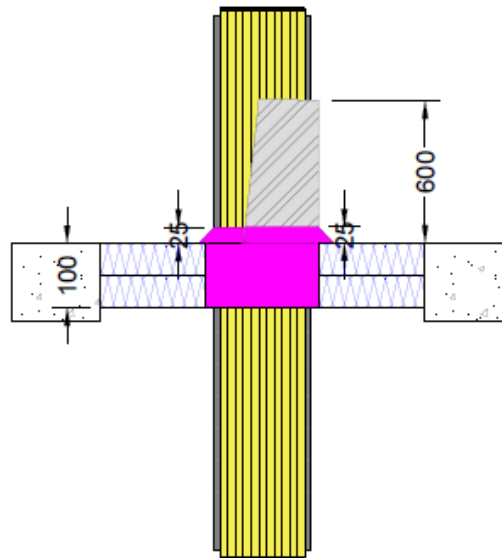


Figure 21 - Specimen 9

Service penetration details	
Service	D2 Cable Configuration on a 150mm Cable Tray
Service Support	Unexposed Side: 650mm
Aperture Size	400mm x 600mm Boss Batt cut around service

Local Fire-stopping system	
Application	Asymmetrical – applied to unexposed side of the separating element
Products	Boss Batts, FireMastic-300, P40-MAK Wrap
Procedure	1. Two layers of Boss Batts installed into the aperture around the service and sealed at all joins and edges using FireMastic-300. 2. FireMastic-300 to annular gap to the depth of the batt and finished flush with the top of the batt. 3. A 25mm FireMastic-300 fillet applied around the service. 4. One revolution of 300mm wide wrap with 50mm overlap wrapped around cables and secured using foil tape and wire. 5. One revolution of 300mm wide wrap with 50mm overlap butt joined into existing bottom layer and wrapped around cables, secured using foil tape and wire.

Test results

Structural adequacy	Not applicable
Integrity	No failure at 132 minutes
Insulation	No failure at 132 minutes

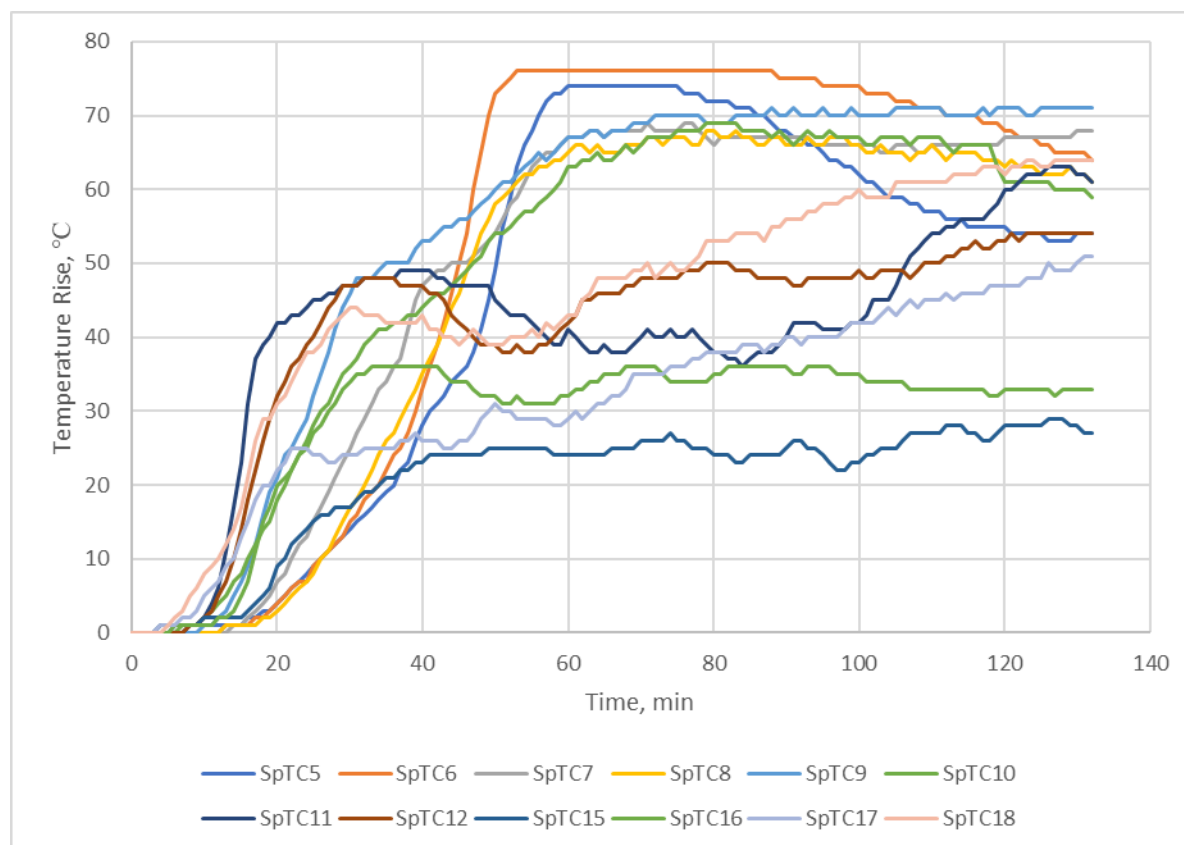


Figure 22 - Specimen 9 thermocouple temperature rise readings

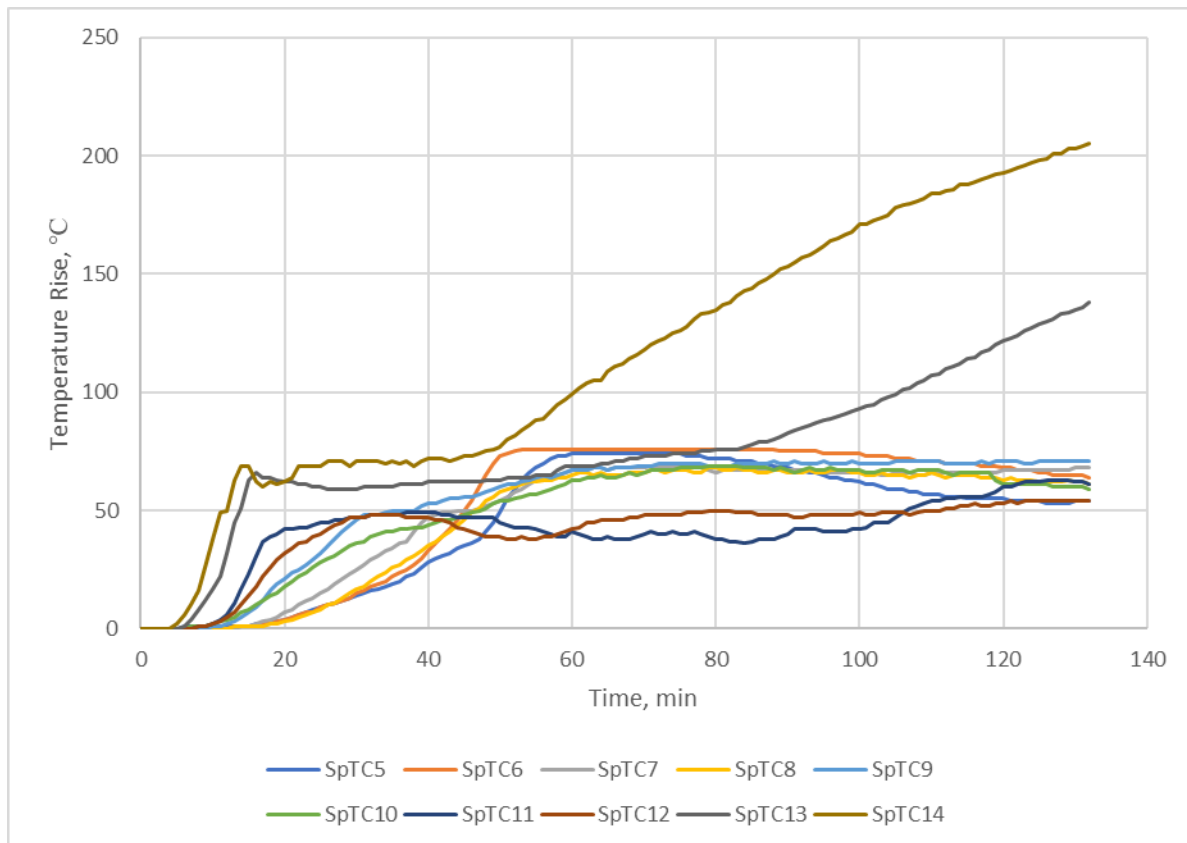


Figure 23 - Specimen 9 (only including up to 300mm wrap) thermocouple temperature rise readings - including internal thermocouples on cables and cable tray at 325mm from the separating element – ***for information purposes only***

NOTES:

- Internal thermocouples exceeded 180°C temperature rise at 107 minutes

7. Photos

7.1 Photos before the test



Figure 24 - Unexposed face prior to test commencement

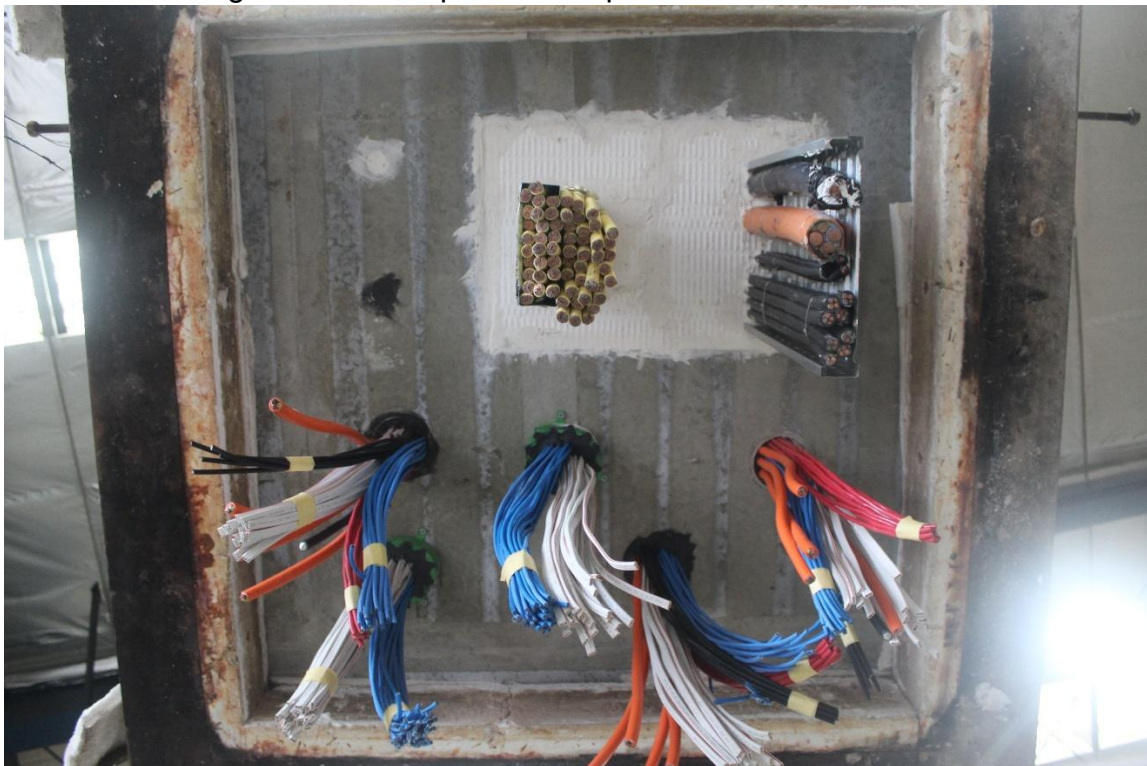


Figure 25 - Exposed face prior to test commencement

7.2 During and after the test

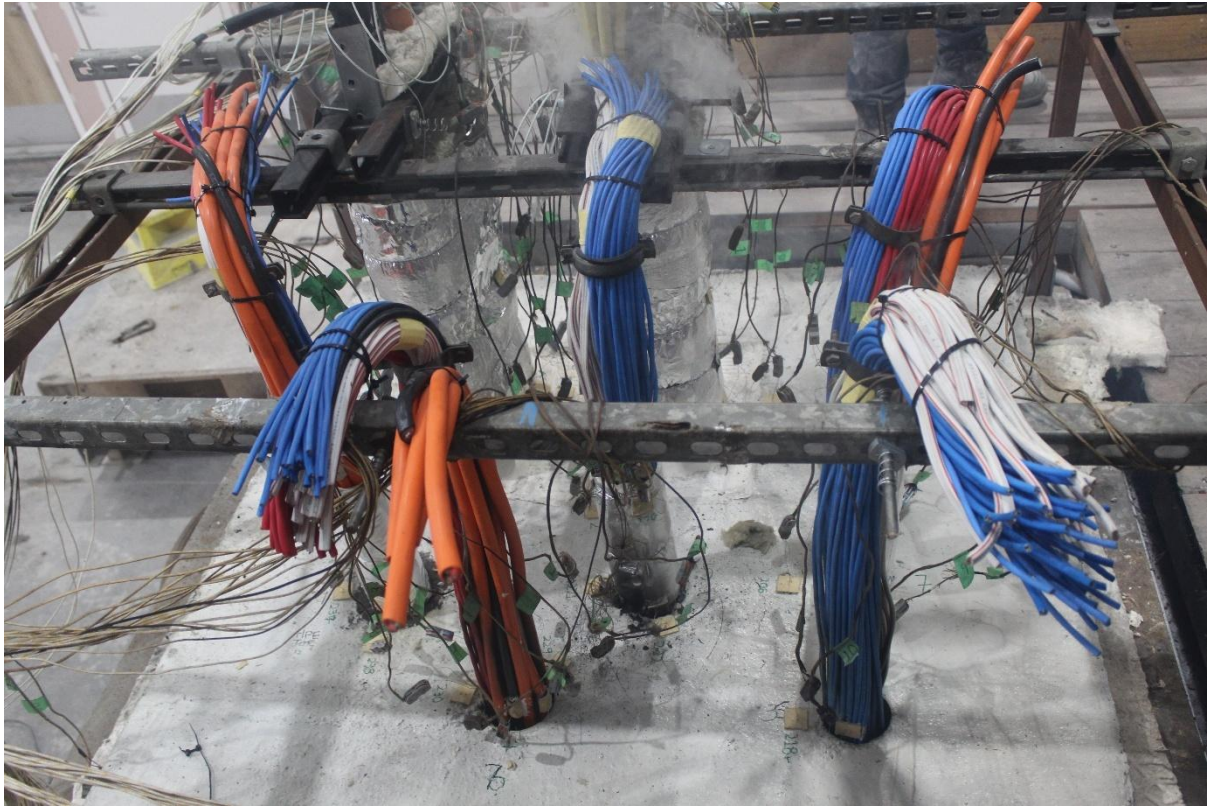


Figure 26 - Unexposed face at 15 minutes

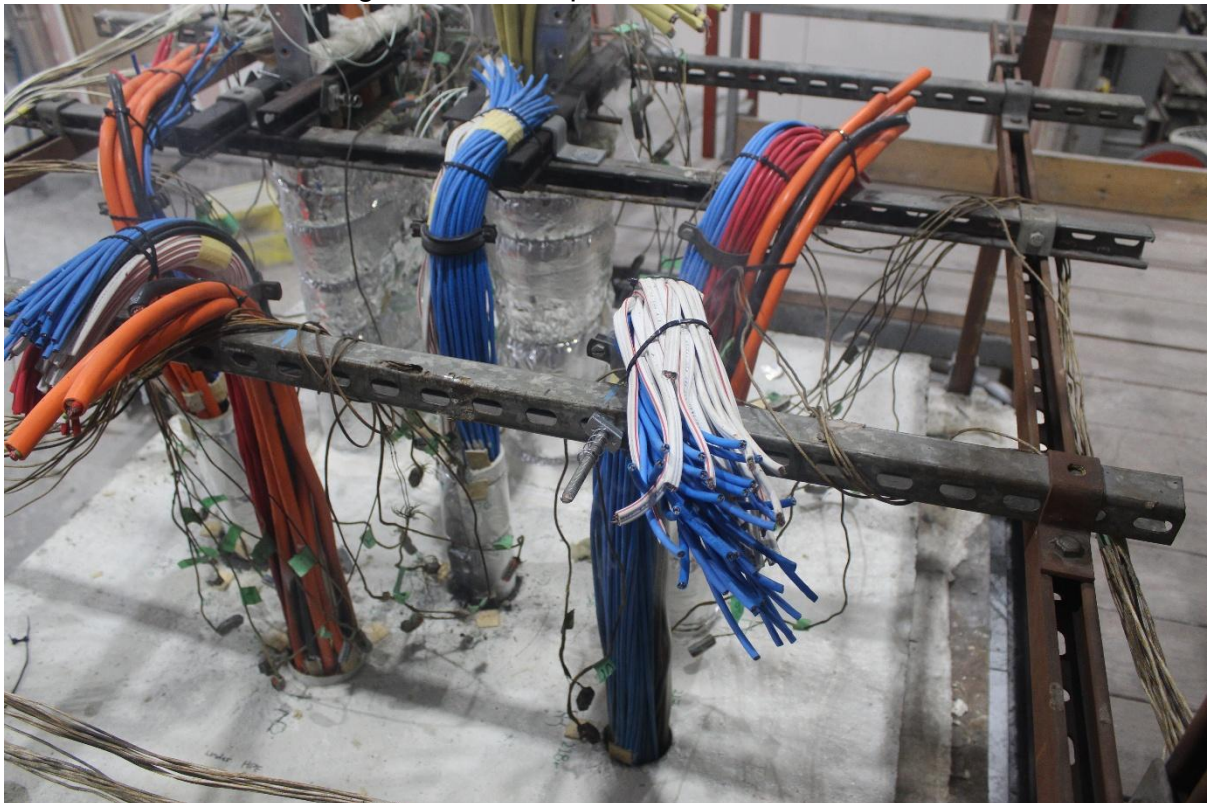


Figure 27 - Unexposed face at 30 minutes



Figure 28 - Exposed face at 30 minutes

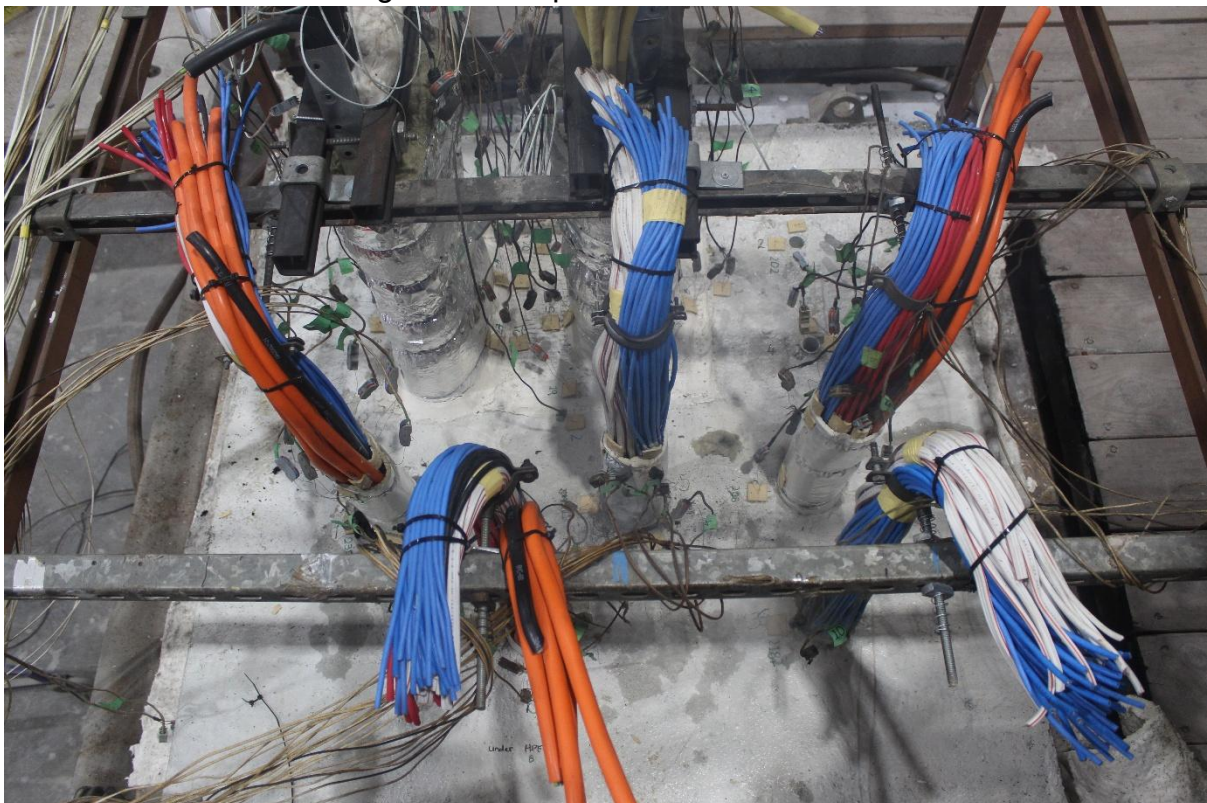


Figure 29 - Unexposed face at 45 minutes



Figure 30 - Exposed face at 45 minutes



Figure 31 - Unexposed face at 60 minutes



Figure 32 - Exposed face at 60 minutes



Figure 33 - Unexposed face at 90 minutes

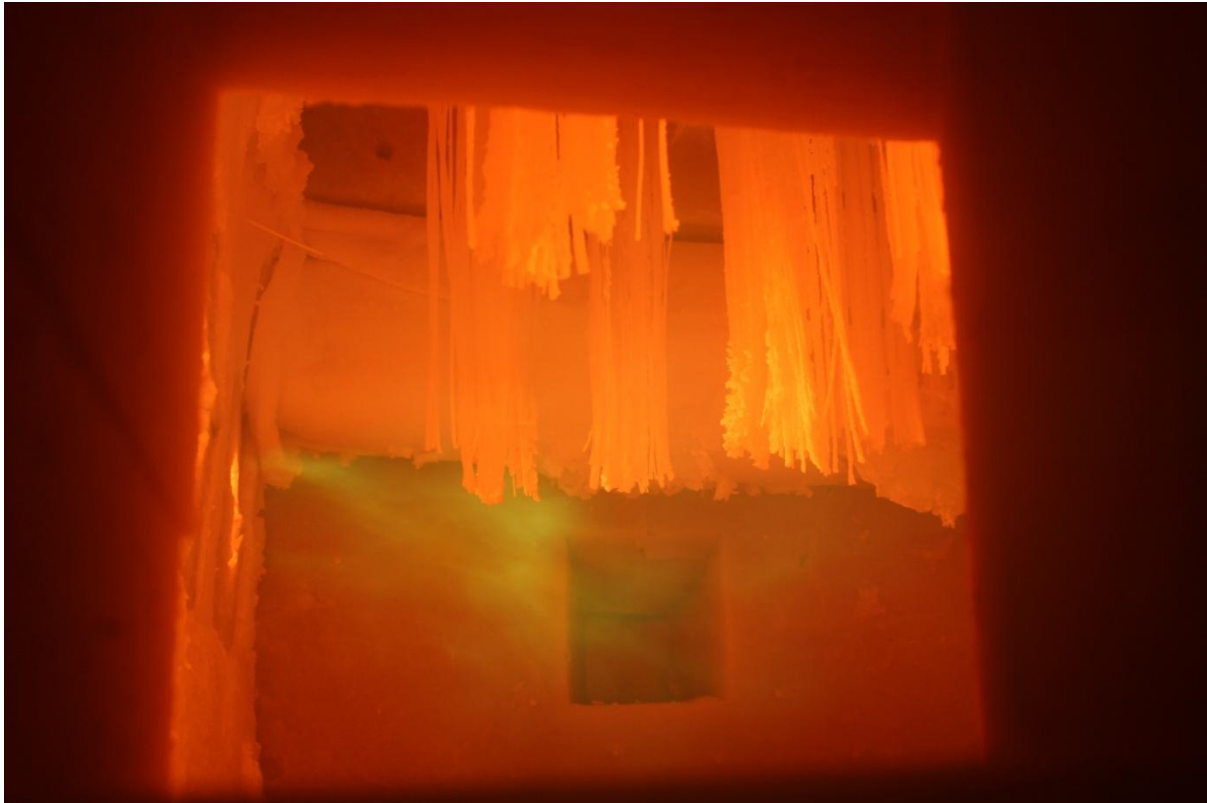


Figure 34 - Exposed face at 90 minutes

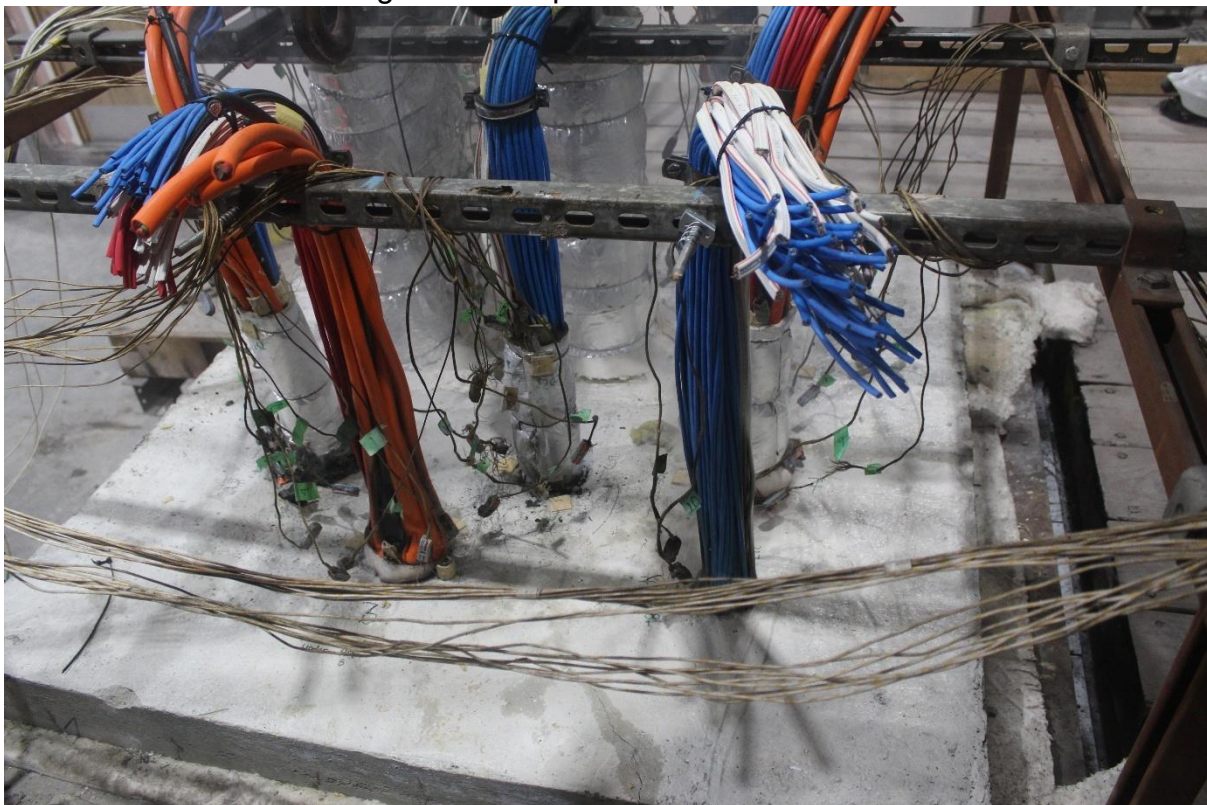


Figure 35 - Unexposed face at 120 minutes



Figure 36 - Exposed face after the test

8. Appendix

8.1 Client supplied drawings

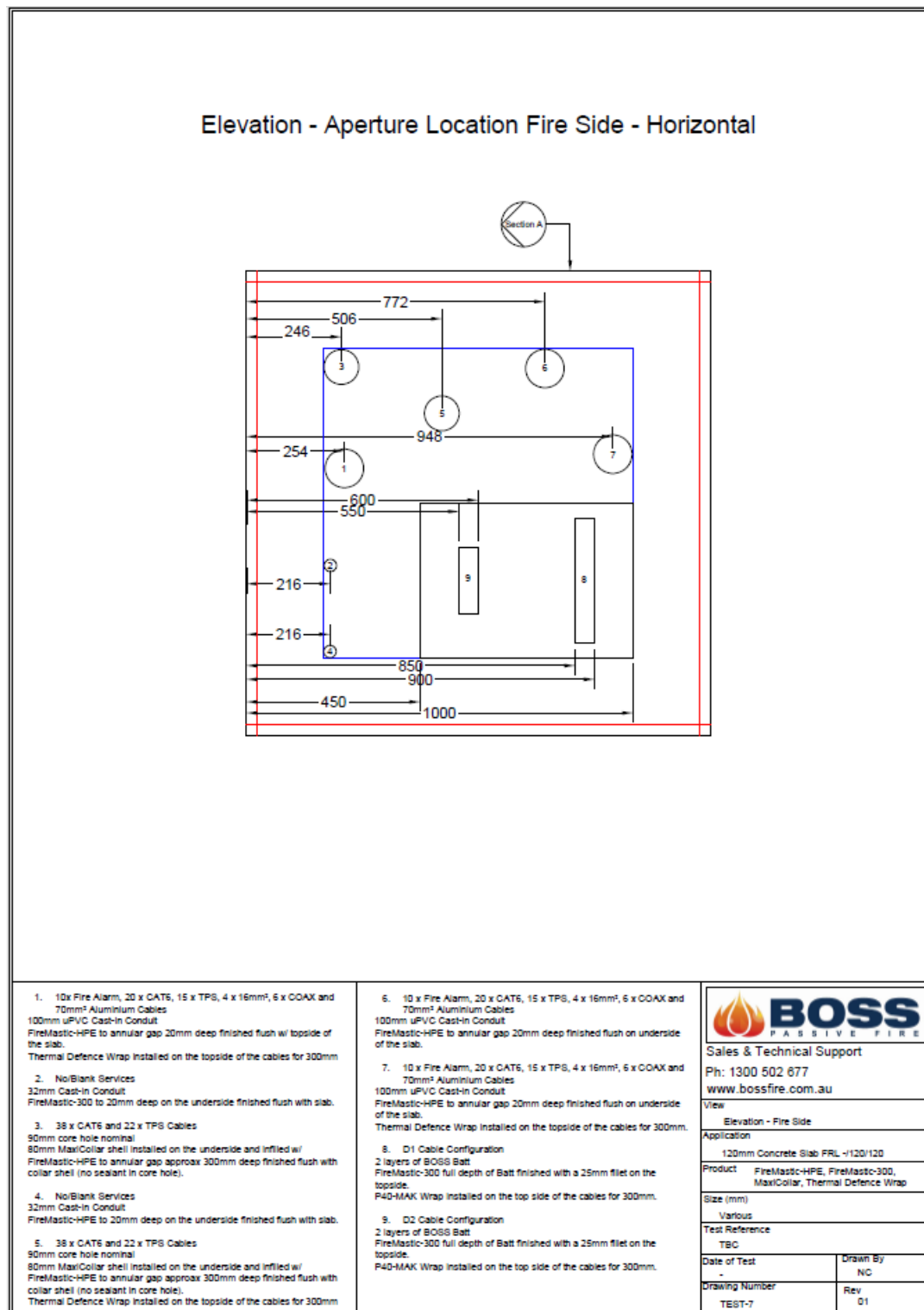
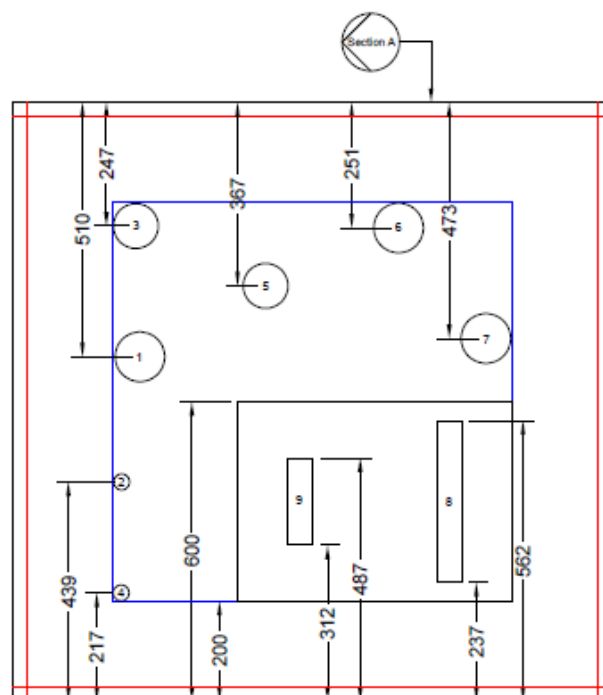


Figure 37 - Test 7 – Aperture Location – Fire Side – Horizontal V3.pdf

Elevation - Aperture Location Fire Side - Vertical



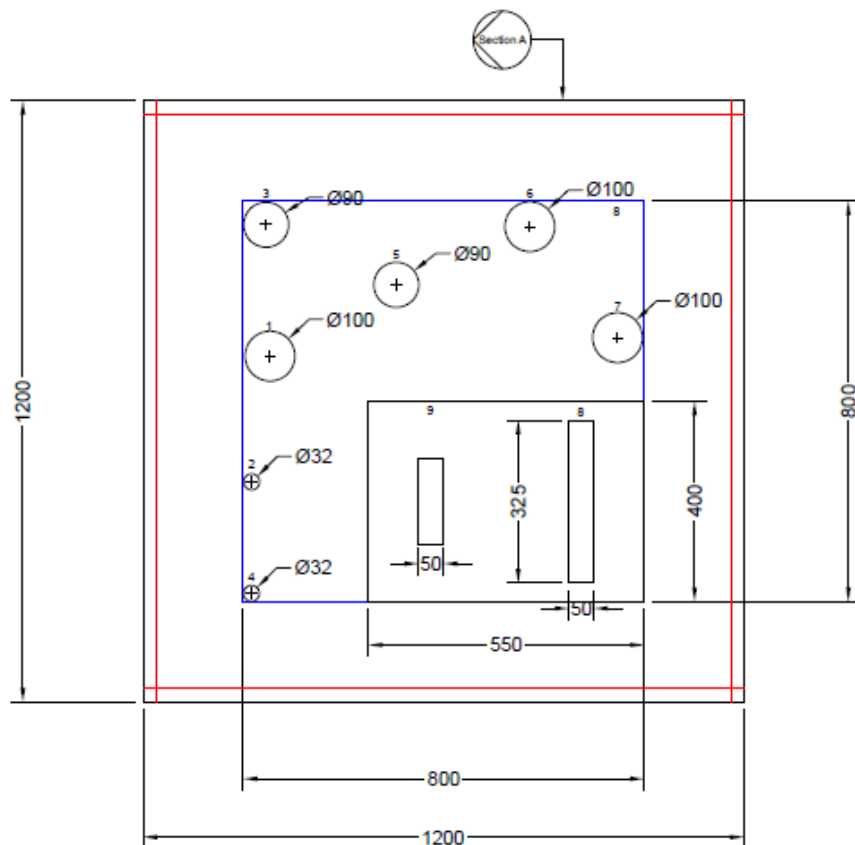
1. 10x Fire Alarm, 20 x CAT5, 15 x TPS, 4 x 16mm², 6 x COAX and 70mm² Aluminium Cables
100mm uPVC Cast-In Conduit
FireMastic-HPE to annular gap 20mm deep finished flush w/ topside of the slab.
Thermal Defence Wrap installed on the topside of the cables for 300mm
2. No/Blank Services
32mm Cast-In Conduit
FireMastic-300 to 20mm deep on the underside finished flush with slab.
3. 38 x CAT5 and 22 x TPS Cables
90mm core hole nominal
80mm MaxiCollar shell installed on the underside and infilled w/ FireMastic-HPE to annular gap approx 300mm deep finished flush with collar shell (no sealant in core hole).
4. No/Blank Services
32mm Cast-In Conduit
FireMastic-HPE to 20mm deep on the underside finished flush with slab.
5. 38 x CAT5 and 22 x TPS Cables
90mm core hole nominal
80mm MaxiCollar shell installed on the underside and infilled w/ FireMastic-HPE to annular gap approx 300mm deep finished flush with collar shell (no sealant in core hole).
Thermal Defence Wrap installed on the topside of the cables for 300mm

6. 10 x Fire Alarm, 20 x CAT5, 15 x TPS, 4 x 16mm², 6 x COAX and 70mm² Aluminium Cables
100mm uPVC Cast-In Conduit
FireMastic-HPE to annular gap 20mm deep finished flush on underside of the slab.
7. 10 x Fire Alarm, 20 x CAT5, 15 x TPS, 4 x 16mm², 6 x COAX and 70mm² Aluminium Cables
100mm uPVC Cast-In Conduit
FireMastic-HPE to annular gap 20mm deep finished flush on underside of the slab.
Thermal Defence Wrap installed on the topside of the cables for 300mm.
8. D1 Cable Configuration
2 layers of BOSS Batt
FireMastic-300 full depth of Batt finished with a 25mm fillet on the topside.
P40-MAK Wrap installed on the top side of the cables for 300mm.
9. D2 Cable Configuration
2 layers of BOSS Batt
FireMastic-300 full depth of Batt finished with a 25mm fillet on the topside.
P40-MAK Wrap installed on the top side of the cables for 300mm.

	
Sales & Technical Support	
Ph: 1300 502 677	
www.bossfire.com.au	
View	
Elevation - Fire Side	
Application	
120mm Concrete Slab FRL -/120/120	
Product	
FireMastic-HPE, FireMastic-300, MaxiCollar, Thermal Defence Wrap	
Size (mm)	
Various	
Test Reference	
TBC	
Date of Test	Drawn By
-	NC
Drawing Number	Rev
TEST-7	01

Figure 38 - Test 7 – Aperture Location – Fire Side – Vertical V3.pdf

Elevation - Aperture Size Fire Side



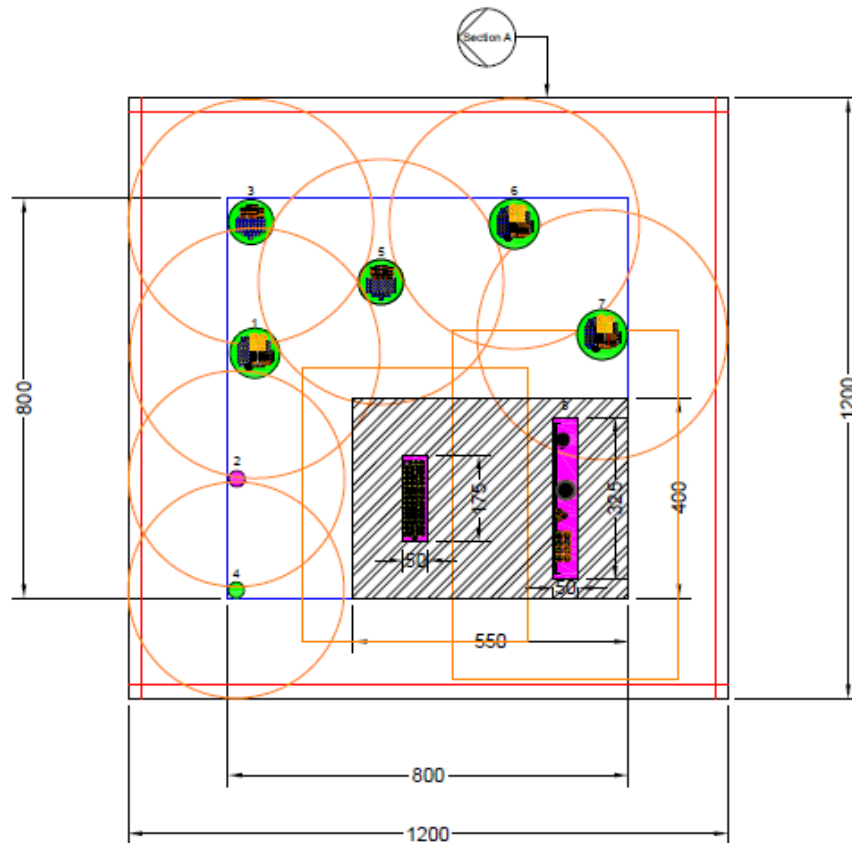
1. 10x Fire Alarm, 20 x CAT5, 15 x TPS, 4 x 16mm², 6 x COAX and 70mm² Aluminium Cables
100mm uPVC Cast-In Conduit
FireMastic-HPE to annular gap 20mm deep finished flush w/ topside of the slab.
Thermal Defence Wrap installed on the topside of the cables for 300mm.
2. No/Blank Services
32mm Cast-In Conduit
FireMastic-300 to 20mm deep on the underside finished flush with slab.
3. 38 x CAT6 and 22 x TPS Cables
90mm core hole nominal
80mm MaxiCollar shell installed on the underside and infilled w/ FireMastic-HPE to annular gap approx 300mm deep finished flush with collar shell (no sealant in core hole).
4. No/Blank Services
32mm Cast-In Conduit
FireMastic-HPE to 20mm deep on the underside finished flush with slab.
5. 38 x CAT5 and 22 x TPS Cables
90mm core hole nominal
80mm MaxiCollar shell installed on the underside and infilled w/ FireMastic-HPE to annular gap approx 300mm deep finished flush with collar shell (no sealant in core hole).
Thermal Defence Wrap installed on the topside of the cables for 300mm.

6. 10 x Fire Alarm, 20 x CAT5, 15 x TPS, 4 x 16mm², 6 x COAX and 70mm² Aluminium Cables
100mm uPVC Cast-In Conduit
FireMastic-HPE to annular gap 20mm deep finished flush on underside of the slab.
7. 10 x Fire Alarm, 20 x CAT5, 15 x TPS, 4 x 16mm², 6 x COAX and 70mm² Aluminium Cables
100mm uPVC Cast-In Conduit
FireMastic-HPE to annular gap 20mm deep finished flush on underside of the slab.
Thermal Defence Wrap installed on the topside of the cables for 300mm.
8. D1 Cable Configuration
2 layers of BOSS Batt
FireMastic-300 full depth of Batt finished with a 25mm fillet on the topside.
P40-MAK Wrap installed on the top side of the cables for 300mm.
9. D2 Cable Configuration
2 layers of BOSS Batt
FireMastic-300 full depth of Batt finished with a 25mm fillet on the topside.
P40-MAK Wrap installed on the top side of the cables for 300mm.

	
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View	
Elevation - Fire Side	
Application	
120mm Concrete Slab FRL -120/120	
Product	
FireMastic-HPE, FireMastic-300, MaxiCollar, Thermal Defence Wrap	
Size (mm)	
Various	
Test Reference	
TBC	
Date of Test	Drawn By
-	NC
Drawing Number	Rev
TEST-7	01

Figure 39 - Test 7 – Aperture Size – Fire Side V3.pdf

Elevation - Non Fire Side



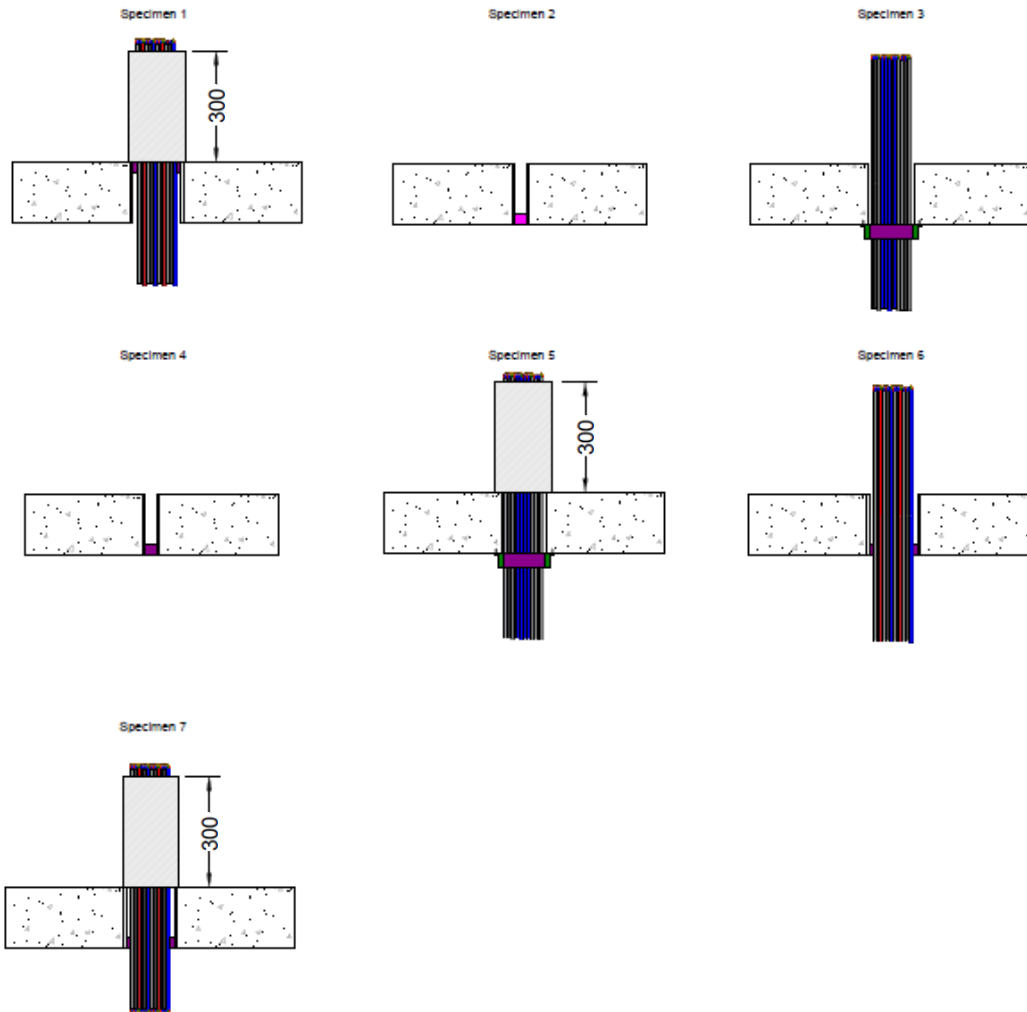
1. 10x Fire Alarm, 20 x CAT6, 15 x TPS, 4 x 16mm², 6 x COAX and 70mm² Aluminium Cables
100mm uPVC Cast-In Conduit
FireMastic-HPE to annular gap 20mm deep finished flush w/ topside of the slab.
Thermal Defence Wrap installed on the topside of the cables for 300mm.
2. No/Blank Services
32mm Cast-In Conduit
FireMastic-300 to 20mm deep on the underside finished flush with slab.
3. 38 x CAT6 and 22 x TPS Cables
90mm core hole nominal
80mm MaxiCollar shell installed on the underside and infilled w/ FireMastic-HPE to annular gap approx 300mm deep finished flush with collar shell (no sealant in core hole).
4. No/Blank Services
32mm Cast-In Conduit
FireMastic-HPE to 20mm deep on the underside finished flush with slab.
5. 38 x CAT6 and 22 x TPS Cables
90mm core hole nominal
80mm MaxiCollar shell installed on the underside and infilled w/ FireMastic-HPE to annular gap approx 300mm deep finished flush with collar shell (no sealant in core hole).
Thermal Defence Wrap installed on the topside of the cables for 300mm.

6. 10 x Fire Alarm, 20 x CAT6, 15 x TPS, 4 x 16mm², 6 x COAX and 70mm² Aluminium Cables
100mm uPVC Cast-In Conduit
FireMastic-HPE to annular gap 20mm deep finished flush on underside of the slab.
7. 10 x Fire Alarm, 20 x CAT6, 15 x TPS, 4 x 16mm², 6 x COAX and 70mm² Aluminium Cables
100mm uPVC Cast-In Conduit
FireMastic-HPE to annular gap 20mm deep finished flush on underside of the slab.
Thermal Defence Wrap installed on the topside of the cables for 300mm.
8. D1 Cable Configuration
2 layers of BOSS Batt
FireMastic-300 full depth of Batt finished with a 25mm fillet on the topside.
P40-MAK Wrap installed on the top side of the cables for 300mm.
9. D2 Cable Configuration
2 layers of BOSS Batt
FireMastic-300 full depth of Batt finished with a 25mm fillet on the topside.
P40-MAK Wrap installed on the top side of the cables for 300mm.

	
Sales & Technical Support	
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View	
Elevation - Fire Side	
Application	
120mm Concrete Slab FRL -120/120	
Product	
FireMastic-HPE, FireMastic-300, MaxiCollar, Thermal Defence Wrap	
Size (mm)	
Various	
Test Reference	
TBC	
Date of Test	Drawn By
-	NC
Drawing Number	Rev
TEST-7	01

Figure 40 - Test 7 – Elevation – Fire Side V3.pdf

Specimen Sections



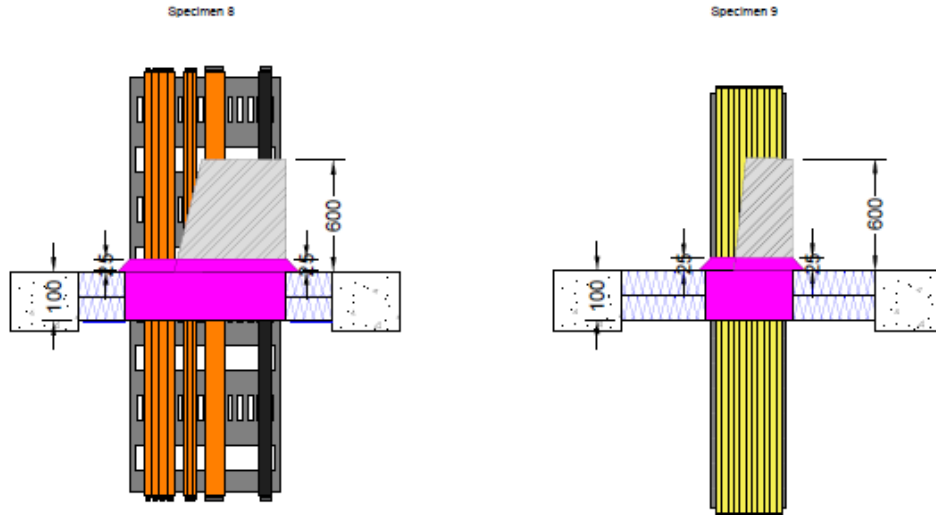
1. 10x Fire Alarm, 20 x CAT5, 15 x TPS, 4 x 16mm², 6 x COAX and 70mm² Aluminium Cables
100mm uPVC Cast-In Conduit
FireMastic-HPE to annular gap 20mm deep finished flush w/ topside of the slab.
Thermal Defence Wrap installed on the topside of the cables for 600mm.
2. No/Blank Services
32mm Cast-In Conduit
FireMastic-300 to 20mm deep on the underside finished flush with slab.
3. 38 x CAT5 and 22 x TPS Cables
90mm core hole nominal
80mm MaxiCollar shell installed on the underside and infilled w/ FireMastic-HPE to annular gap approx 30mm deep finished flush with collar shell (no sealant in core hole).
4. No/Blank Services
32mm Cast-In Conduit
FireMastic-HPE to 20mm deep on the underside finished flush with slab.
5. 38 x CAT5 and 22 x TPS Cables
90mm core hole nominal
80mm MaxiCollar shell installed on the underside and infilled w/ FireMastic-HPE to annular gap approx 30mm deep finished flush with collar shell (no sealant in core hole).
Thermal Defence Wrap installed on the topside of the cables for 600mm.

6. 10 x Fire Alarm, 20 x CAT5, 15 x TPS, 4 x 16mm², 6 x COAX and 70mm² Aluminium Cables
100mm uPVC Cast-In Conduit
FireMastic-HPE to annular gap 20mm deep finished flush on underside of the slab.
7. 10 x Fire Alarm, 20 x CAT5, 15 x TPS, 4 x 16mm², 6 x COAX and 70mm² Aluminium Cables
100mm uPVC Cast-In Conduit
FireMastic-HPE to annular gap 20mm deep finished flush on underside of the slab.
Thermal Defence Wrap installed on the topside of the cables for 600mm.
8. D1 Cable Configuration
2 layers of BOSS Batt
FireMastic-300 full depth of Batt (100mm) finished with a 25mm fillet on the topside.
P40-MAK Wrap installed on the top side of the cables for 600mm and a 25mm fillet of FireMastic-300.
9. D2 Cable Configuration
2 layers of BOSS Batt
FireMastic-300 full depth of Batt (100mm) finished with a 25mm fillet on the topside.
P40-MAK Wrap installed on the top side of the cables for 600mm and a 25mm fillet of FireMastic-300.

	
Sales & Technical Support	
Ph: 1300 502 677	
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View	Specimen Sections
Application	120mm Concrete Slab FRL -120/120
Product	FireMastic-HPE, FireMastic-300, MaxiCollar, Thermal Defence Wrap
Size (mm)	Various
Test Reference	TBC
Date of Test	Drawn By
-	NC
Drawing Number	Rev
TEST-7	02

Figure 41 - Test Slab – Specimen Sections V3.pdf

Specimen Sections



1. 10x Fire Alarm, 20 x CAT6, 15 x TP6, 4 x 16mm², 6 x COAX and 70mm² Aluminium Cables
100mm uPVC Cast-in Conduit
FireMastic-HPE to annular gap 20mm deep finished flush w/ topside of the slab.
Thermal Defence Wrap installed on the topside of the cables for 600mm
2. No/Blank Services
32mm Cast-in Conduit
FireMastic-300 to 20mm deep on the underside finished flush with slab.
3. 38 x CAT6 and 22 x TP6 Cables
90mm core hole nominal
80mm MaxiCollar shell installed on the underside and infilled w/ FireMastic-HPE to annular gap approx 30mm deep finished flush with collar shell (no sealant in core hole).
4. No/Blank Services
32mm Cast-in Conduit
FireMastic-HPE to 20mm deep on the underside finished flush with slab.
5. 38 x CAT6 and 22 x TP6 Cables
90mm core hole nominal
80mm MaxiCollar shell installed on the underside and infilled w/ FireMastic-HPE to annular gap approx 30mm deep finished flush with collar shell (no sealant in core hole).
Thermal Defence Wrap installed on the topside of the cables for 600mm

6. 10 x Fire Alarm, 20 x CAT6, 15 x TP6, 4 x 16mm², 6 x COAX and 70mm² Aluminium Cables
100mm uPVC Cast-in Conduit
FireMastic-HPE to annular gap 20mm deep finished flush on underside of the slab.
7. 10 x Fire Alarm, 20 x CAT6, 15 x TP6, 4 x 16mm², 6 x COAX and 70mm² Aluminium Cables
100mm uPVC Cast-in Conduit
FireMastic-HPE to annular gap 20mm deep finished flush on underside of the slab.
Thermal Defence Wrap installed on the topside of the cables for 600mm.
8. D1 Cable Configuration
2 layers of BOSS Batt
FireMastic-300 full depth of Batt (100mm) finished with a 25mm fillet on the topside.
P40-MAK Wrap installed on the top side of the cables for 600mm and a 25mm fillet of FireMastic-300.
9. D2 Cable Configuration
2 layers of BOSS Batt
FireMastic-300 full depth of Batt (100mm) finished with a 25mm fillet on the topside.
P40-MAK Wrap installed on the top side of the cables for 600mm and a 25mm fillet of FireMastic-300.

	
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View Specimen Sections	
Application	
120mm Concrete Slab FRL -/120/120	
Product	
FireMastic-HPE, FireMastic-300, MaxiCollar, Thermal Defence Wrap	
Size (mm)	
Various	
Test Reference	
TBC	
Date of Test	Drawn By
-	NC
Drawing Number	Rev
TEST-7	02

Figure 42 - Test Slab – Specimen Sections V3 -8.9.pdf