

## Regulatory Information Report

**RPF24048**

**Fire resistance test vertically orientated  
rectangular air duct passing through concrete  
slab – Internal fire**

Issued to:	Firestop Centre Ltd
Test method:	AS1530.4-2014
Report Date:	21/05/2024
Valid till:	09/08/2028
Test number:	PF23083



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## 1.1 Document revision schedule

Revision #	Date	Description
1	16/04/2024	Initial issue for Client review
2	21/05/2024	Issued

## 1.2 Signatories

Report	Name	Signature	Date
Prepared by:	Alex Kokorin		21/05/2024
Authorised by:	Andrew Bain (Authorized signatory)		21/05/2024



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

## 2. Report Summary

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A 2400mm long rectangular 1800mm x 410mm (W x H) air duct was installed vertically, penetrating through a 150mm reinforced concrete slab. The penetration through the concrete slab was protected using a combination of the FR board, ceramic fibre and acrylic sealant. The duct was protected using 38mm thick Firestop DuctWrap-38, fixed using duct pins. A rectangular 640mm x 520mm (L x W) Access Hatch and two Stainless Sprinkler Steel Pipes (OD 27mm) were installed on one vertical surface of the duct, sprinkler pipes were installed with a sprinkler head inside the duct

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### Air Duct - Test results

<b>Structural adequacy</b>	<b>No Failure at 126 minutes</b>
<b>Integrity</b>	<b>No Failure at 126 minutes</b>
<b>Insulation</b>	<b>24 minutes</b>
<b>Fire resistance level (FRL)</b>	<b>120/120/-</b>

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### Access Hatch - Test results

<b>Structural adequacy</b>	<b>No Failure at 126 minutes</b>
<b>Integrity</b>	<b>No Failure at 126 minutes</b>
<b>Insulation</b>	<b>71 minutes</b>
<b>Fire resistance level (FRL)</b>	<b>120/120/60</b>

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### Sprinkler Steel Pipe 1 - Test results

<b>Structural adequacy</b>	<b>No Failure at 126 minutes</b>
<b>Integrity</b>	<b>No Failure at 126 minutes</b>
<b>Insulation</b>	<b>38 minutes</b>
<b>Fire resistance level (FRL)</b>	<b>120/120/30</b>

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### Sprinkler Steel Pipe 2 - Test results

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<b>Structural adequacy</b>	<b>No Failure at 126 minutes</b>
<b>Integrity</b>	<b>No Failure at 126 minutes</b>
<b>Insulation</b>	<b>34 minutes</b>
<b>Fire resistance level (FRL)</b>	<b>120/120/30</b>

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The conditions of the test complied with AS1530.4-2014 requirements.

There were no major observations related to the performance criteria during the test.

## 3. General Information

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### 3.1 Testing Scope

**Applicable Standards:**

AS 1530.4-2014 Section 9 Air ducts – Internal fire

AS 1530.4-2014 Section 10 Service penetrations and control joints

**Departures from Testing Method:**

No departures from the testing method.

Conditions of the test complied with AS1530.4-2014 requirements.

### 3.2 Contact Details

**Registered Testing Laboratory**

Fire TS Lab - 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](mailto:tests@firelab.co.nz)

**Issued to:**

Firestop Centre Ltd

657 Great South Rd, Penrose, Auckland, 1061

New Zealand

Contact e-mail: [info@firestopcentre.co.nz](mailto:info@firestopcentre.co.nz)

**Manufacturer:**

Same as Client/Applicant

### 3.3 Timeline

**Testing date:**

10/04/2024

**Installation completion date:**

08/04/2024

#### **Termination of The Test:**

The test was discontinued at 126 minutes.

### 3.4 Use of the Report

Regulatory information report was issued in addition to full test report PF24048. This provides the minimum information required for regulatory compliance.

The report is valid till 09/08/2028.

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	Concrete slab
	Aperture	1805mm x 455mm
	Dimensions	Width / Height (W/H): 4030mm x 3610mm Thickness (T): 150mm

### 4.2 Specimen A - Duct

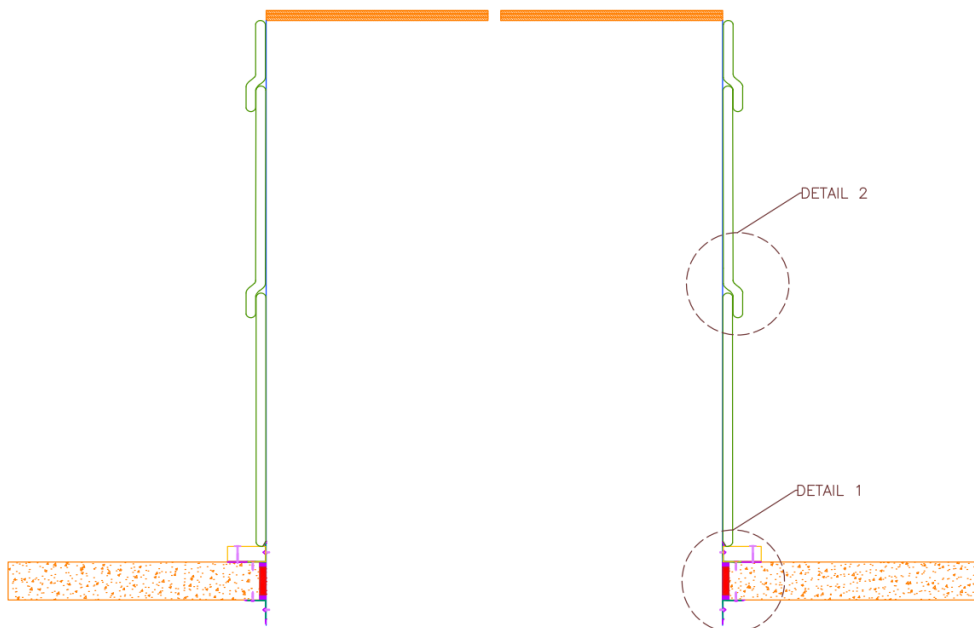
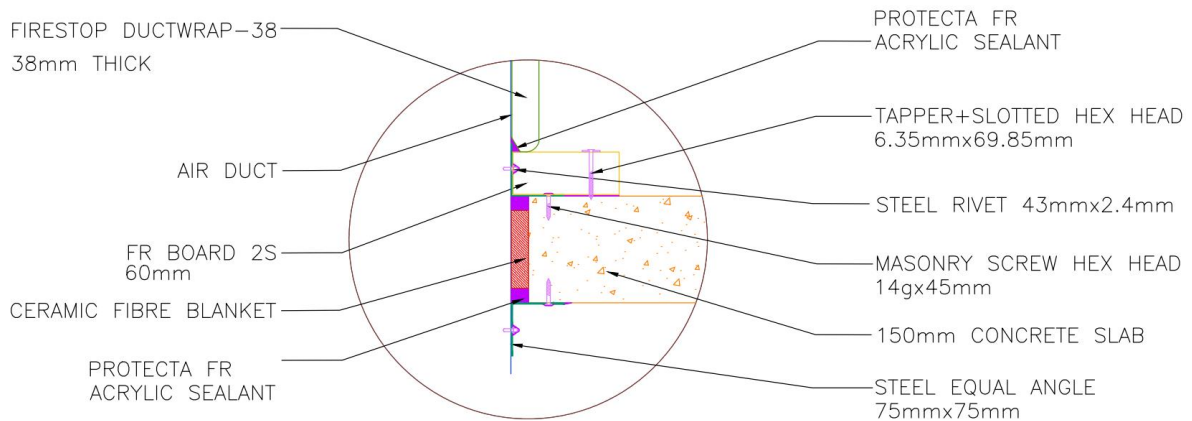
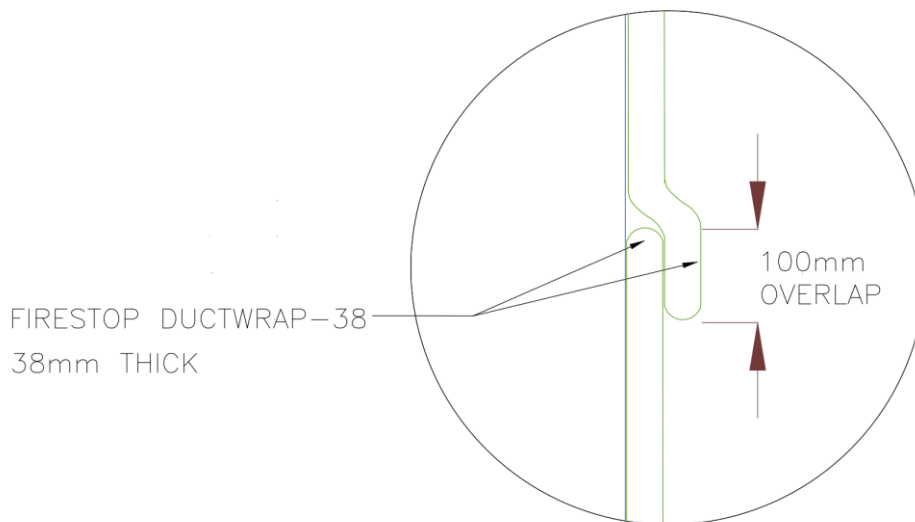


Figure 1 – Duct cross section





**Figure 1a – Detail 1**



**Figure 1b – Detail 2**

Specimen		
2.1	Item	Air Duct (as per AS4254.2)
	Dimensions	1800mm x 410mm x 0.76mm (W x H x T)
	Aperture Size	1850mm x 455mm
	Annular Spacing	20-25mm
	Installation	Asymmetrical – air duct was installed, extending 100mm at exposed side and 2140mm at unexposed side.  One layer of the duct wrap was installed around the duct having nominal 100mm overlap for the vertical and horizontal joints. Vertical joints were staggered

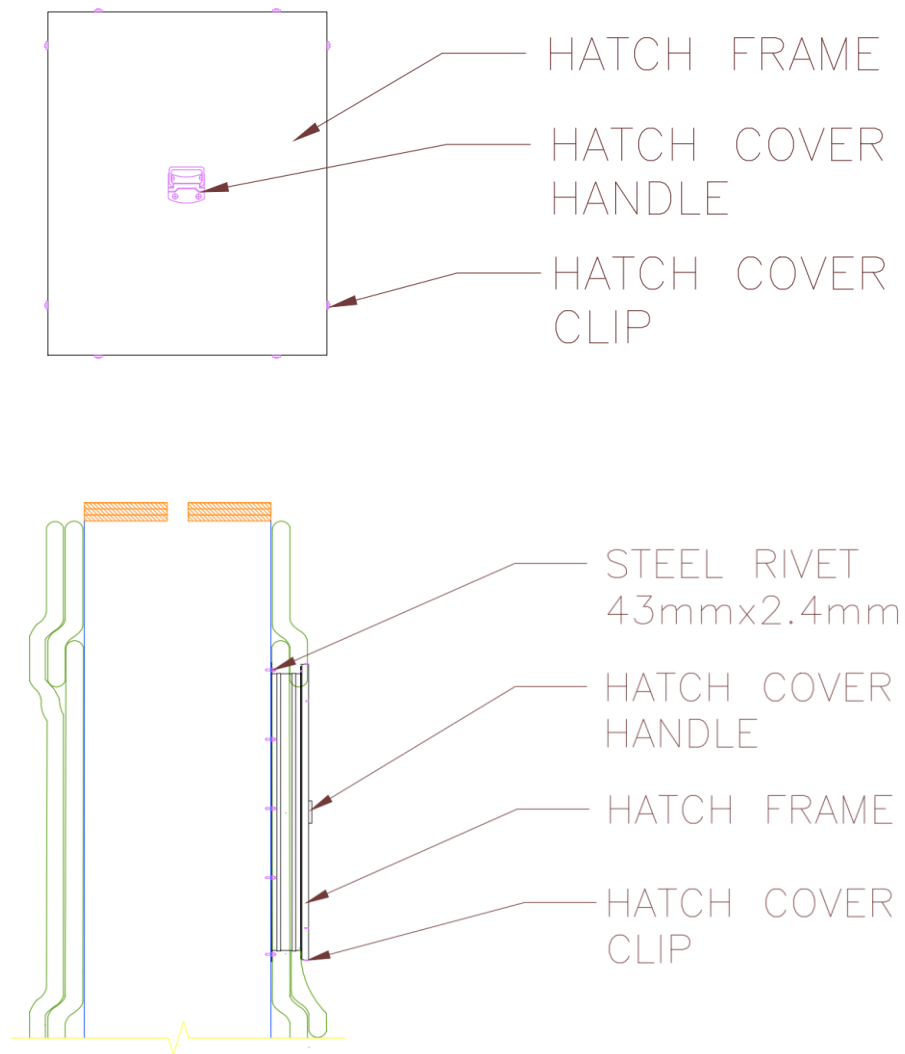
		<p>and located minimum 200mm from the edge of the duct.</p> <p>Second Layer on Elevation B: Additional layer with a width of 1000mm and extends the full length of the duct. The wrap was installed on elevation B, with the right edge of the wrap flush with the right edge of the duct.</p> <p>Third Layer: Additional layer with a width of 200mm and a length of 1000mm. It was installed on top of the second layer, with the right edge of the wrap flush with the right edge of the duct.</p> <p>Duct wrap was fixed with steel pins at 200mm centres.</p>
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<b>Wrap</b>		
3.1	Item	Firestop DuctWrap-38
	Dimensions	Thickness / Width / Length (T/W/L): 38mm x 1000mm x 5000mm
	Thickness	38mm
	Installation	Used to wrap the Air duct on unexposed face.

<b>Sealants / Coatings</b>		
4.1	Item	Protecta FR Acrylic Sealant
	Dimensions	310mL tube
	Installation	Installed to FR Board joints. Installed between separating element and FR Boards, Steel equal angles and Duct.
4.2	Item	Protecta FR Coating
	Dimensions	8 Litres bucket
	Installation	Applied on uncoated edges of FR Boards.
	Item	Protecta FR Board 2S
	Dimensions	Thickness / Width / Length (T/W/L): 60mm x 600mm x 1200mm
	Installation	100mm strips installed on top of Steel equal angle at the unexposed face.

Fixings		
5.1	Item	Masonry Screw Hex Head
	Dimensions	14G x 45mm
	Installation	Used to fix steel angle to concrete slab at 100mm centres
	Item	Slotted Hex Head concrete screws
	Dimensions	6.35mm x 70mm
	Installation	Used to fix FR Board to concrete slab at 100mm centres
5.2	Item	Stainless Steel Blind Rivets
	Dimensions	Length / Diameter (L/D): 7.6mm x 4.8mm
	Installation	Used to fix the steel angle to duct at 100mm centres
5.3	Item	Steel Equal Angle
	Dimensions	75mm x 75mm
	Installation	Used to fix the duct to concrete slab. Installed around perimeter of duct on both faces
5.4	Item	38mm Duct Pin
	Dimensions	Length (L): 38mm
	Installation	Used to fix single layers of duct wrap to the duct. Pins were attached to the duct using Capacitive Discharge Welder. Pins were located 50mm from the ends of each wrap, and 200mm centres around the both width and length of the duct.
	Item	70mm Duct Pin
	Measurements	Length: 70mm
	Installation	Used to fix double layers of duct wrap to the duct. Pins were attached to the duct using Capacitive Discharge Welder. Pins were located 50mm from the ends of each wrap, and 200mm centres around the both width and length of the duct.

### 4.3 Specimen B – Access Hatch



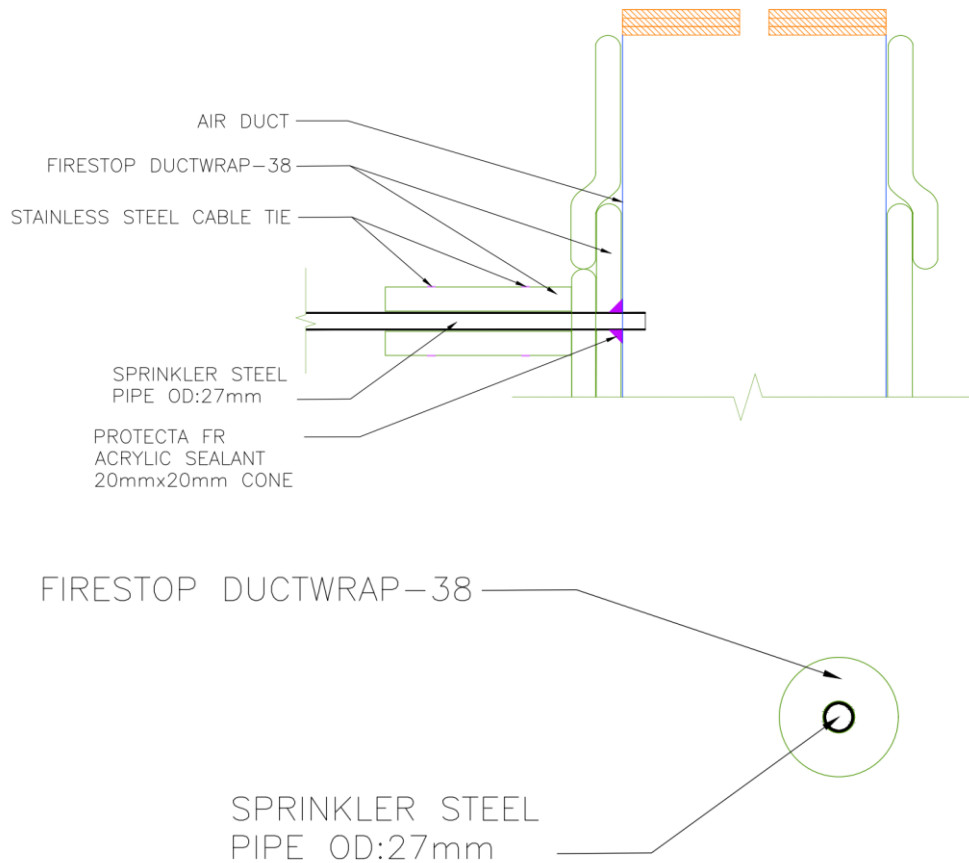
**Figure 2 - Hatch**

Specimen		
2.1	Item	Access Hatch
	Dimensions	640mm x 520mm
	Aperture Size	440mm x 320mm
	Installation	<p>The hatch aperture was cut from the duct, located 1330mm from the separating element and 200mm from the left edge of the duct. The hatch was fixed over the aperture, with the edges of the hatch no less than 100mm from any edges of the duct.</p> <p>The hatch was fixed to the duct using rivets at approximately 150mm centres around the hatch.</p>

Wrap		
3.1	Item	Firestop Duct Wrap – 38
	Measurements	Thickness / Width / Length (T/W/L): 38mm x 1000mm x 5000mm
	Installation	Used to wrap around the hatch on unexposed face. One layer of duct wrap was installed around the hatch, butting into the hatch webbing. An additional layer of wrap was installed around the perimeter of the hatch, measuring 200mm from all edges of the hatch. The first and second layers of wrap were fixed at 200mm centres using duct pins and.

Fixings		
	Item	Stainless Steel Blind Rivets (STST 6-2)
	Measurements	Length / Diameter (L/D): 7.6mm x 4.8mm
	Installation	Used to fix the Access Hatch to duct at 150mm centres
	Item	38mm Duct Pin
	Measurements	Length: 38mm
	Installation	Used to fix single layers of duct wrap to the duct. Pins were attached to the duct using Capacitive Discharge Welder. Pins were located 50mm from the ends of each wrap, and 200mm centres around the both width and length of the duct.
	Item	70mm Duct Pin
	Measurements	Length: 70mm
	Installation	Used to fix double layers of duct wrap to the duct. Pins were attached to the duct using Capacitive Discharge Welder. Pins were located 50mm from the ends of each wrap, and 200mm centres around the both width and length of the duct.

#### 4.4 Specimen C – Stainless Sprinkler Steel Pipe 1



**Figure 3 –Stainless Sprinkler Steel Pipe**

Specimen		
2.1	Item	Stainless Sprinkler Steel Pipe with sprinkler head
	Dimensions	OD: 27mm
	Aperture Size	40mm
	Annular Spacing	6.5mm
	Installation	Asymmetrical – Pipe was installed, extending 35mm at exposed side and 950 mm at unexposed side. The pipe was located 1700mm from separating element and 200mm from the centre line of the duct.

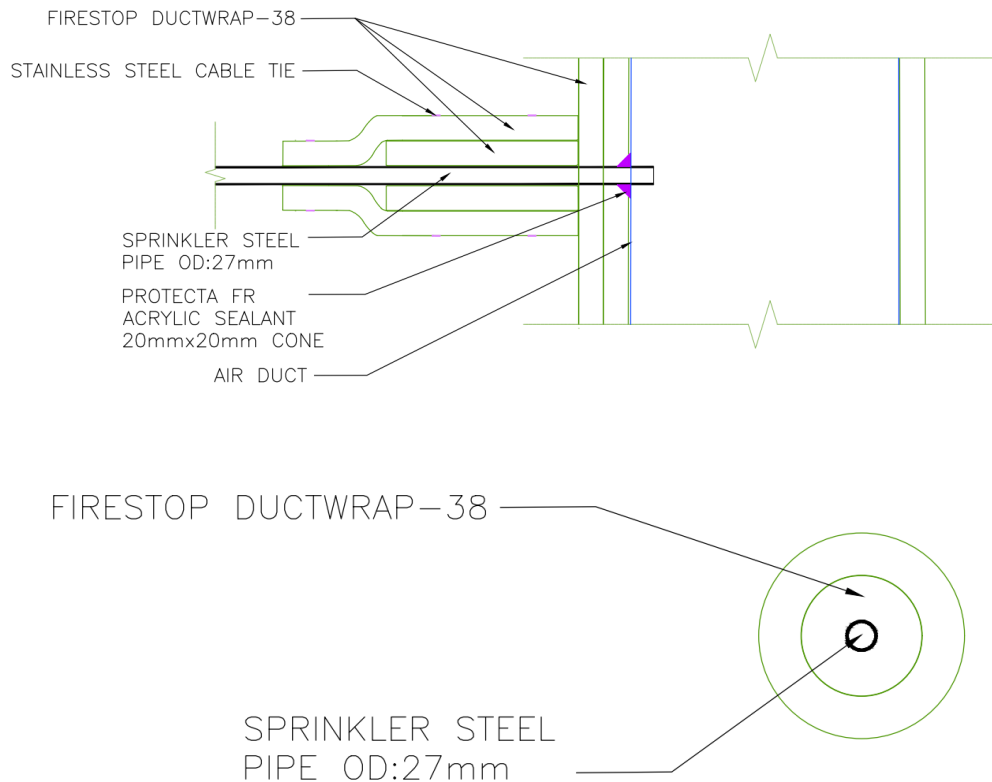
		A 20mm acrylic sealant cone was installed around the pipe at external surface of duct. The pipe penetrated through two layers of duct wrap, then wrapped with 1 revolution of 300mm wide duct wrap. The wrap was secured by Stainless Steel Cable Ties.
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<b>Wrap</b>		
3.1	Item	Firestop Duct Wrap – 38
	Measurements	Thickness / Width / Length (T/W/L): 38mm x 1000mm x 5000mm
	Installation	Trimmed to 300mm width and wrapped around the steel pipe, one revolution with 100mm overlap

<b>Fixings</b>		
5.1	Item	Stainless Steel Cable Ties
	Dimensions	12mm x 1000mm
	Installation	Used to fix duct wrap on the steel pipe.

<b>Sealants / Coatings</b>		
4.1	Item	Protecta FR Acrylic Sealant
	Dimensions	310mL tube
	Installation	Installed as a 20mm cone to protect aperture

## 4.5 Specimen D – Stainless Sprinkler Steel Pipe 2



**Figure 4 –Stainless Sprinkler Steel Pipe**

Specimen		
2.1	Item	Stainless Sprinkler Steel Pipe with sprinkler head
	Dimensions	OD: 27mm
	Aperture Size	40mm
	Annular Spacing	6.5mm
	Installation	Asymmetrical – Pipe was installed, extending 35mm at exposed side and 1150 mm at unexposed side. The pipe was located 1425mm from separating element and 200mm from the centre line of the duct.  A 20mm acrylic sealant cone was installed around the pipe at external surface of duct. The pipe penetrated through two layers of duct wrap, then wrapped with 1 revolution of 300mm wide duct wrap. The wrap was secured by Stainless Steel Cable Ties. Additionally, 1 revolution of 500mm wide duct wrap



		was layered on the top of 300mm wide duct. These wraps were secured by Stainless Steel Cable Ties.
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### Wrap

3.1	Item	Firestop Duct Wrap – 38
	Measurements	Thickness / Width / Length (T/W/L): 38mm x 1000mm x 5000mm
	Installation	Trimmed to 500mm width and wrapped around the steel pipe

### Fixings

5.1	Item	Stainless Steel Cable Ties
	Dimensions	12 x 1000
	Installation	Used to fix duct wrap on the steel pipe.

### Sealants / Coatings

4.1	Item	Protecta FR Acrylic Sealant
	Dimensions	310mL tube
	Installation	Installed as a 20mm cone to protect aperture

## 5. Additional temperature measurements

Additional thermocouples were installed to assess the performance of the duct wrap protection at different distances from the floor.

Layers of wrap	From the floor, mm	Maximum temperature rise, deg C			
		30 min	60 min	90 min	120 min
1	25	157	265	320	356
	400	245	281	318	344
	660	252	316	334	367
	860	239	313	346	374
	980	89	175	200	218
	1200	176	246	285	300
	1440	165	235	249	259
	1660	171	231	272	289
	1780	68	157	175	181
	2040	112	167	190	206
2	25	35	101	147	193
	400	37	184	228	259
	660	31	163	202	231
	860	47	190	236	273
	980	22	120	164	186
	1200	48	165	202	230
	1440	49	175	211	237
	1660	33	128	154	168
	1780	22	122	162	176
	2040	25	84	110	123
3	25	12	61	97	128
	400	7	76	133	154
	860	7	81	148	174

## 6. Permissible variations to the tested specimen

A test result obtained for the largest air duct in the range may be applied to all air ducts of the same type (including any aspect ratio), provided the maximum dimensions do not exceed those tested and that the components remain in the same orientation as that tested.