Regulatory Information Report

RIRF24077

Fire resistance test for penetrations through the horizontal separating element

Client:	Agnitek Pty Ltd
Test method:	AS1530.4-2014
Report Date:	26/07/2024
Test number:	PF24077

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1.1 Document revision schedule

Revision #	Date	Description
1	26/07/2024	Issued to Client

1.2 Signatories

Report	Name	Signature	Date
Prepared by:	Alexey Kokorin		26/07/2024
Authorised by:	Andrew Bain (Authorized signatory)		26/07/2024

ACCREDITED
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 horizontal separating element consisting of 1 layer of 16mm FR Plasterboard on exposed side (ceiling) and 1 layer of 17mm structural plywood on the unexposed side (floor), fitted to a 190mm (nominal) timber frame.

Specimen #	Service	Actual Integrity (min)	Actual Insulation (min)	FRL
1	DN40 PVC Pipe	60 NF	60 NF	-/60/60
2	25mm Flexible Conduit (Empty)	60 NF	60 NF	-/60/60
3	25mm Flexible Conduit (3 x TPS Cables)	60 NF	60 NF	-/60/60
4	DN80 PVC Pipe	60 NF	60 NF	-/60/60
5	DN65 PVC Pipe	60 NF	60 NF	-/60/60
6	DN50 PVC Pipe	60 NF	60 NF	-/60/60
7	DN100 PVC Pipe	46	46	-/45/45
8	DN100 PVC Pipe	47	47	-/45/45
9	DN80 PVC Pipe	60 NF	60 NF	-/60/60

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

Resistance to the incipient spread of fire (RISF) is excluded from the scope of the test

Departures from Testing Method:

No departures from the testing method

Test conditions:

Conditions complied with the Standard.

3.2 Contact Details

Accredited 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

Client/Applicant:

Agnitek Pty Ltd

8 Clare St, Bayswater, VIC, 3153

Australia

Contact e-mail: info@agnitek.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. Pipes were capped from exposed side only.

Testing date:

18/07/2024

Installation completion date:

12/07/2024

Termination of The Test:

The test was discontinued at 60 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	190mm (nominal) timber frame with 1 layer of 16mm FR Plasterboard fitted to the exposed side of the frame (ceiling) and 1 layer 17mm structural plywood fitted to the unexposed side of the frame (floor).
	Dimensions	Width / Height (W/H): 1200mm × 1200mm

Materials		
1.2	Item / Product Name	Timber Framing
	Dimensions	Width / Height (W/H): 190mm × 45mm (nominal)
	Installation	Used to construct timber frame
1.5	Item / Product Name	Fire rated Plasterboard
	Dimensions	Width / Height (W/H): 1200mm × 1200mm
		Thickness (T): 16mm
	Installation	1 layer fitted to the exposed side of the timber framing (ceiling)
1.6	Item / Product Name	41mm Self Tapping Screw
	Dimensions	6g x 41mm
	Installation	Used to fix plasterboard to timber frame
1.7	Item / Product Name	17mm Structural Plywood
	Dimensions	Width / Height (W/H): 1200mm × 1200mm
		Thickness (T): 17mm
	Installation	1 layer fitted to the unexposed side of the timber framing (floor)

4.2 Specimens

Services		
2.1	Item / Product Name	DN40 PVC-U DWV Pipe
	Dimensions	Inner Diameter (ID): 38.5mm
		Outer Diameter (OD): 43.5mm
		Thickness (T): 2.5mm
2.2	Item / Product Name	PVC 25mm Flexible Conduit
	Dimensions	Inner Diameter (ID): 25mm
		Outer Diameter (OD): 19mm
		Thickness (T): 3mm
2.3	Item / Product Name	$2.5mm^2$ × 2C+E Flat TPS Cable
	Dimensions	Width / Height (W/H): 12mm × 5.5mm
2.4	Item / Product Name	DN80 PVC-U DWV Pipe
	Dimensions	Inner Diameter (ID): 75mm
		Outer Diameter (OD): 82mm
		Thickness (T): 3.5mm
2.5	Item / Product Name	MARLEY OPTIM DN65 PVC-U DWV Pipe
	Dimensions	Inner Diameter (ID): 63mm
		Outer Diameter (OD): 69mm
		Thickness (T): 3mm
2.6	Item / Product Name	DN50 PVC-U DWV Pipe
	Dimensions	Inner Diameter (ID): 52mm
		Outer Diameter (OD): 57mm
		Thickness (T): 2.5mm
2.7	Item / Product Name	DN40 PVC-U DWV Pipe
	Dimensions	Inner Diameter (ID): 38.5mm
		Outer Diameter (OD): 43.5mm
		Thickness (T): 2.5mm
2.8	Item / Product Name	DN100 PVC-U DWV Pipe
	Dimensions	Inner Diameter (ID): 103mm

		Outer Diameter (OD): 110.5mm
		Thickness (T): 3.5mm

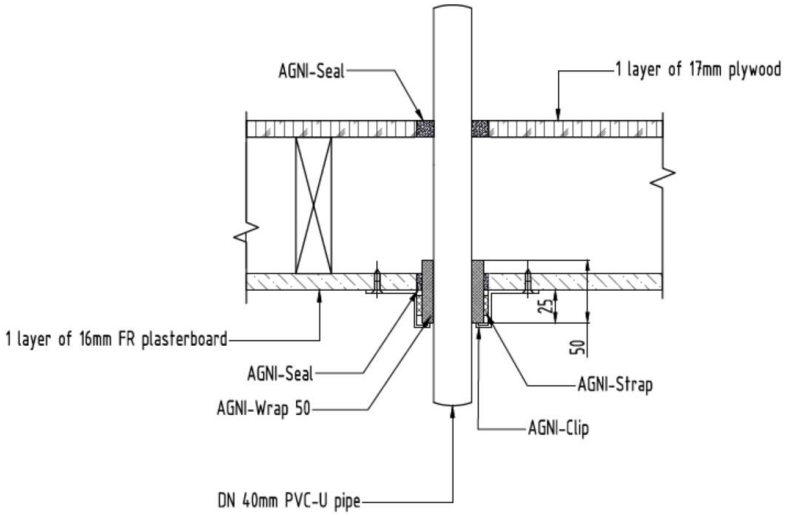
Sealants		
3.1	Item / Product Name	AGNI-Seal
	Dimensions	600mL Sausage
	Installation	Seal between separating element and pipe on unexposed side, seal between separating element and AGNI-Sleeve or AGNI-Wrap joint and AGNI-Sleeve or AGNI-Wrap and pipe

Fixings		
4.1	Item / Product Name	AGNI-Strap - Stainless Steel Tie
	Dimensions	Width / Length (W/L): 4.6mm × 200mm
	Installation	Used to fix AGNI-Sleeve or AGNI-Wrap around pipe on exposed side

Intumescent		
5.1	Item	AGNI-Sleeve
	Dimensions	Width (W): 125mm
		Thickness (T): 3.5mm
	Installation	Installed in aperture and within separating element on exposed side only
5.2	Item	AGNI-Wrap 50
	Dimensions	Width (W): 50mm
		Thickness (T): 3.5mm
	Installation	Installed in aperture and within separating element on exposed side only

5. Test Results

5.1 Specimen 1

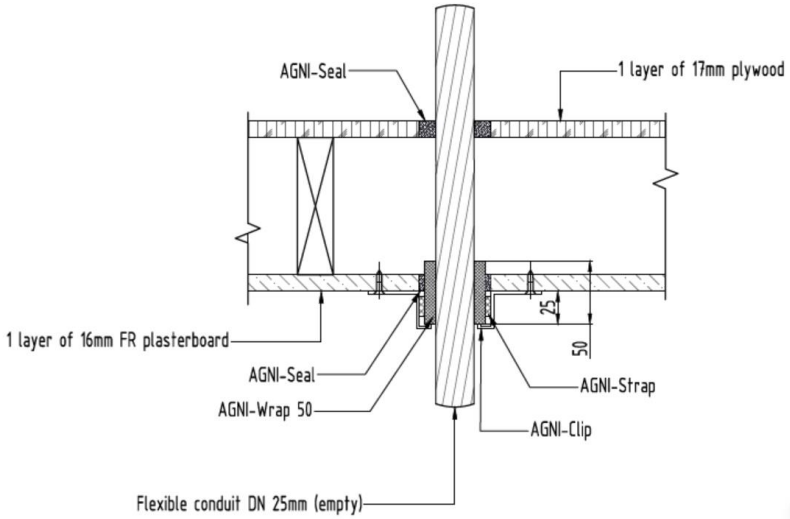


Service penetration details	
Service	MARLEY OPTIM DN40 PVC-U DWV Pipe
Service Support	Unistrut structure at 1570mm
Aperture Diameter	54mm
Annular Spacing	5.5mm

Local Fire-stopping system	
Application	Asymmetrical
System description	Exposed side – AGNI-Wrap (50mm wide) inserted 25mm into aperture and 25mm within separating element then secured with AGNI-Strap. Bead (5mm deep) of AGNI-Seal used to seal between separating element and AGNI-Wrap and used to fill gap between AGNI-Wrap and Pipe Unexposed side – AGNI-Seal used to seal annular gap – full depth of plywood

Test results	
Structural adequacy	Not applicable
Integrity	No failure at 60 minutes
Insulation	No failure at 60 minutes

5.2 Specimen 2

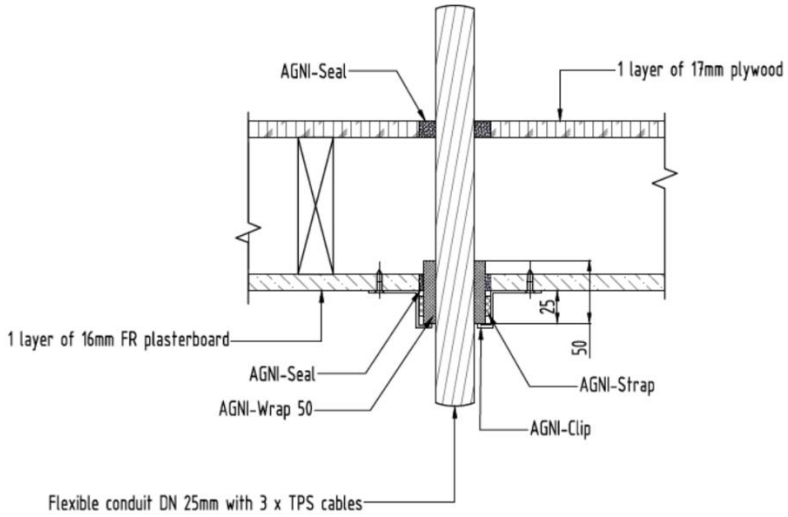


Service penetration details	
Service	25mm Flexible Conduit (empty)
Service Support	Unistrut structure at 1570mm
Aperture Diameter	35mm
Annular Spacing	5mm

Local Fire-stopping system	
Application	Asymmetrical
System description	Exposed side – AGNI-Wrap (50mm wide) inserted 25mm into aperture, 25mm within separating element then secured with AGNI-Strap. Bead (5mm deep) of AGNI-Seal used to seal between separating element and AGNI-Wrap and used to fill gap between AGNI-Wrap and Pipe Unexposed side – AGNI-Seal used to seal annular gap – full depth of plywood

Test results	
Structural adequacy	Not applicable
Integrity	No failure at 60 minutes
Insulation	No failure at 60 minutes

5.3 Specimen 3

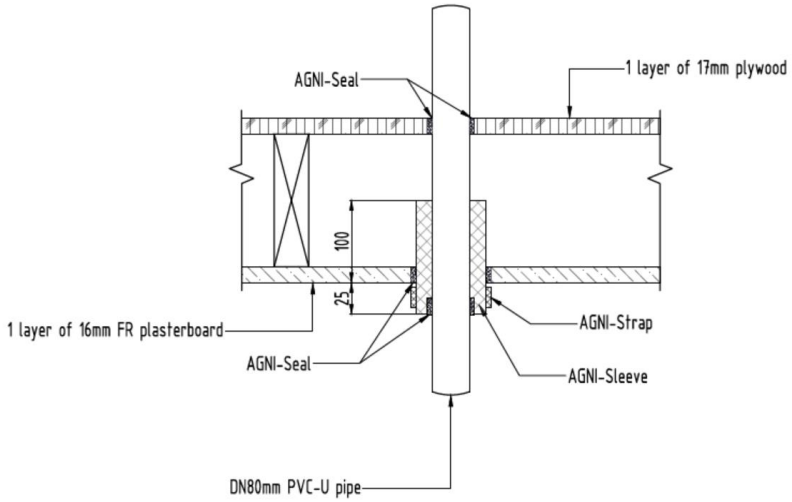


Service penetration details	
Service	25mm Flexible Conduit (filled - 3 x TPS Cables)
Service Support	Unistrut structure at 1570mm
Aperture Diameter	35mm
Annular Spacing	5mm

Local Fire-stopping system	
Application	Asymmetrical
System description	Exposed side – AGNI-Wrap (50mm wide) inserted 25mm into aperture, 25mm within separating element then secured with AGNI-Strap. Bead (5mm deep) of AGNI-Seal used to seal between separating element and AGNI-Wrap and used to fill gap between AGNI-Wrap and Pipe Unexposed side – AGNI-Seal used to seal annular gap – full depth of plywood

Test results	
Structural adequacy	Not applicable
Integrity	No failure at 60 minutes
Insulation	No failure at 60 minutes

5.4 Specimen 4

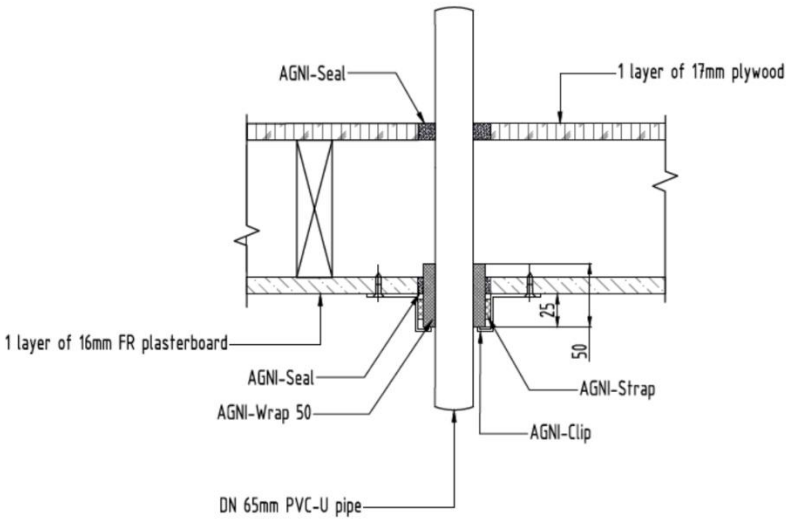


Service penetration details	
Service	MARLEY OPTIM DN80 PVC-U DWV Pipe
Service Support	Unistrut structure at 1560mm
Aperture Diameter	102mm
Annular Spacing	10mm

Local Fire-stopping system	
Application	Asymmetrical
System description	Exposed side – AGNI-Sleeve (125mm wide) inserted 100mm into aperture, 25mm within separating element, secured with AGNI-Strap at each end of the sleeve. Bead (5mm deep) of AGNI-Seal used to seal between separating element and AGNI-Sleeve and used to fill gap between AGNI-Sleeve and Pipe Unexposed side – AGNI-Seal used to seal annular gap – full depth of plywood

Test results	
Structural adequacy	Not applicable
Integrity	No failure at 60 minutes
Insulation	No failure at 60 minutes

5.5 Specimen 5

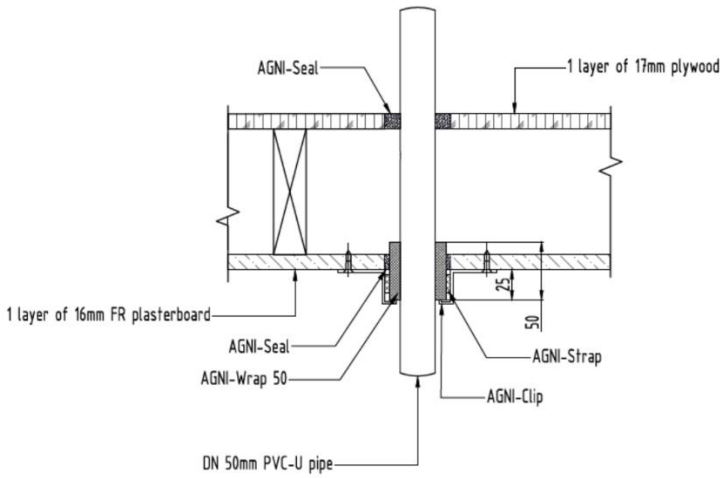


Service penetration details	
Service	MARLEY OPTIM DN65 PVC-U DWV Pipe
Service Support	Unistrut structure at 1560mm
Aperture Diameter	86mm
Annular Spacing	8.5mm

Local Fire-stopping system	
Application	Asymmetrical
System description	Exposed side – AGNI-Wrap (50mm wide) inserted 25mm into aperture, 25mm within separating element then secured with AGNI-Strap. Bead (5mm deep) of AGNI-Seal used to seal between separating element and AGNI-Wrap and used to fill gap between AGNI-Wrap and Pipe Unexposed side – AGNI-Seal used to seal annular gap – full depth of plywood

Test results	
Structural adequacy	Not applicable
Integrity	No failure at 60 minutes
Insulation	No failure at 60 minutes

5.6 Specimen 6

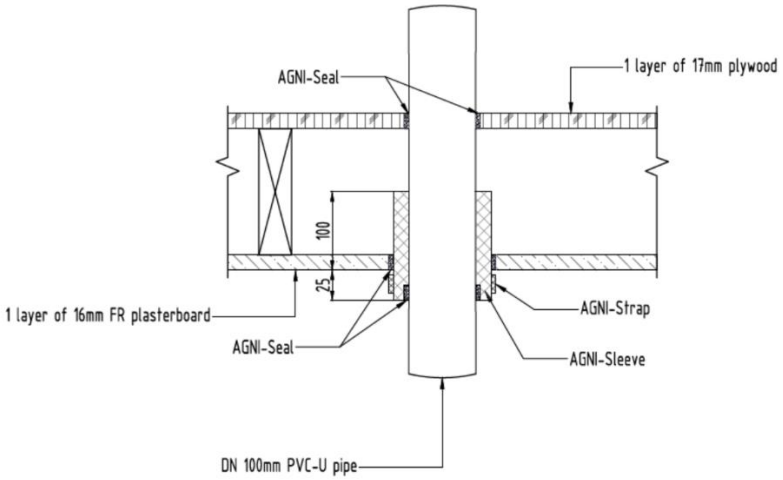


Service penetration details	
Service	MARLEY OPTIM DN50 PVC-U DWV Pipe
Service Support	Unistrut structure at 1560mm
Aperture Diameter	65mm
Annular Spacing	4.5mm

Local Fire-stopping system	
Application	Asymmetrical
System description	Exposed side – AGNI-Wrap (50mm wide) inserted 25mm into aperture, 25mm within separating element then secured with AGNI-Strap. Bead (5mm deep) of AGNI-Seal used to seal between separating element and AGNI-Wrap and used to fill gap between AGNI-Wrap and Pipe Unexposed side – AGNI-Seal used to seal annular gap – full depth of plywood

Test results	
Structural adequacy	Not applicable
Integrity	No failure at 60 minutes
Insulation	No failure at 60 minutes

5.7 Specimen 7

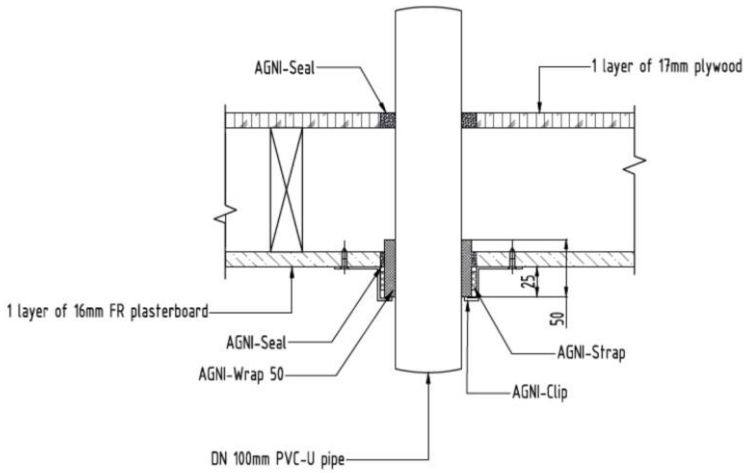


Service penetration details	
Service	MARLEY OPTIM DN100 PVC-U DWV Pipe
Service Support	Unistrut structure at 400mm and 1695mm
Aperture Diameter	121mm
Annular Spacing	5.5mm

Local Fire-stopping system	
Application	Asymmetrical
System description	Exposed side – AGNI-Sleeve (125mm wide) inserted 100mm into aperture, 25mm within separating element then secured with AGNI-Strap at each end of the sleeve. Bead (5mm deep) of AGNI-Seal used to seal between separating element and AGNI-Sleeve and used to fill gap between AGNI-Sleeve and Pipe Unexposed side – AGNI-Seal used to seal annular gap – full depth of plywood

Test results	
Structural adequacy	Not applicable
Integrity	46 minutes
Insulation	46 minutes

5.8 Specimen 8

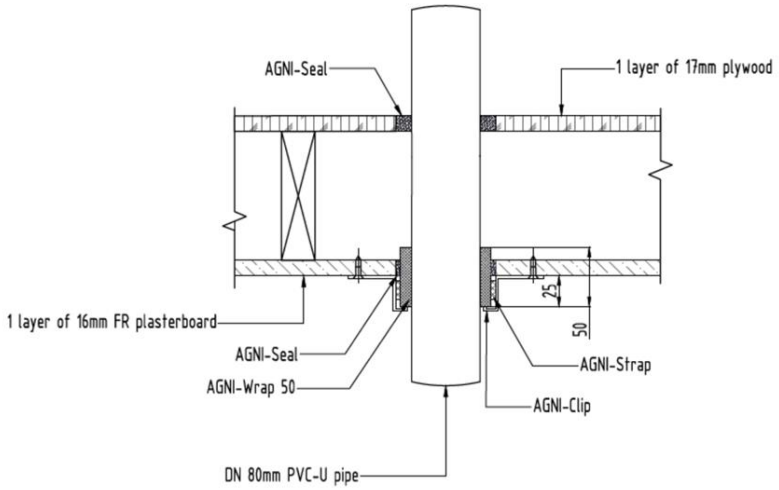


Service penetration details	
Service	MARLEY OPTIM DN100 PVC-U DWV Pipe
Service Support	Unistrut structure at 400mm and 1695mm
Aperture Diameter	121mm
Annular Spacing	5.5mm

Local Fire-stopping system	
Application	Asymmetrical
System description	Exposed side – AGNI-Wrap (50mm wide) inserted 25mm into aperture, 25mm within separating element then secured with AGNI-Strap. Bead (5mm deep) of AGNI-Seal used to seal between separating element and AGNI-Wrap and used to fill gap between AGNI-Wrap and Pipe Unexposed side – AGNI-Seal used to seal annular gap – full depth of plywood

Test results	
Structural adequacy	Not applicable
Integrity	47 minutes
Insulation	47 minutes

5.9 Specimen 9



Service penetration details	
Service	MARLEY OPTIM DN80 PVC-U DWV Pipe
Service Support	Unistrut structure at 400mm and 1695mm
Aperture Diameter	102mm
Annular Spacing	10mm

Local Fire-stopping system	
Application	Asymmetrical
System description	Exposed side – AGNI-Wrap (50mm wide) inserted 25mm into aperture, 25mm within separating element then secured with AGNI-Strap. Bead (5mm deep) of AGNI-Seal used to seal between separating element and AGNI-Wrap and used to fill gap between AGNI-Wrap and Pipe Unexposed side – AGNI-Seal used to seal annular gap – full depth of plywood

Test results	
Structural adequacy	Not applicable
Integrity	No failure at 60 minutes
Insulation	No failure at 60 minutes

6. Observations during the test

Time min	Test face	SP#	OBSERVATIONS/REMARKS
2	U	7	Smoke escaping between SE and pipe
11	U	7	Pipe starting to deform
11	U	4, 7	Sealant expanding
14	U	8	Sealant cracking, smoke escaping between SE and pipe
15	U	5, 6	Pipe dropping into SE
26	U	3	Sealant cracking, smoke escaping between SE and pipe
26	U	8	Discolouration of sealant
28	U	5	Sealant cracking, smoke escaping between SE and pipe
31	U	8	Pipe starting to deform
38	U	4	Smoke escaping between SE and pipe
41	U	8	Pipe has considerable deformation
41	U	8	TC207 detaching from pipe
41	U	8	Sealant cracking expanding
42	U	7	Pipe continuing to deform
42	U	7	Sealant cracking, smoke escaping between SE and pipe
42	U	7	TC206 detaching from pipe
46	U	8	Crack in pipe can be seen, cotton pad test – FAIL
46	U	7	Fire can be seen coming up from SE cavity
47	U	7	Fire escaping past SE more than 30 seconds – FAIL
49	U	3	Crack in sealant
50	U	9	Sealant expanded
54	U	9	Pipe starting to deform
57	U	4	Sealant expanding and starting to discolour
60			**TEST DISCONTINUED**

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

7. Photos

7.1 Photos before the test

Figure 21 – Exposed face prior to test commencement

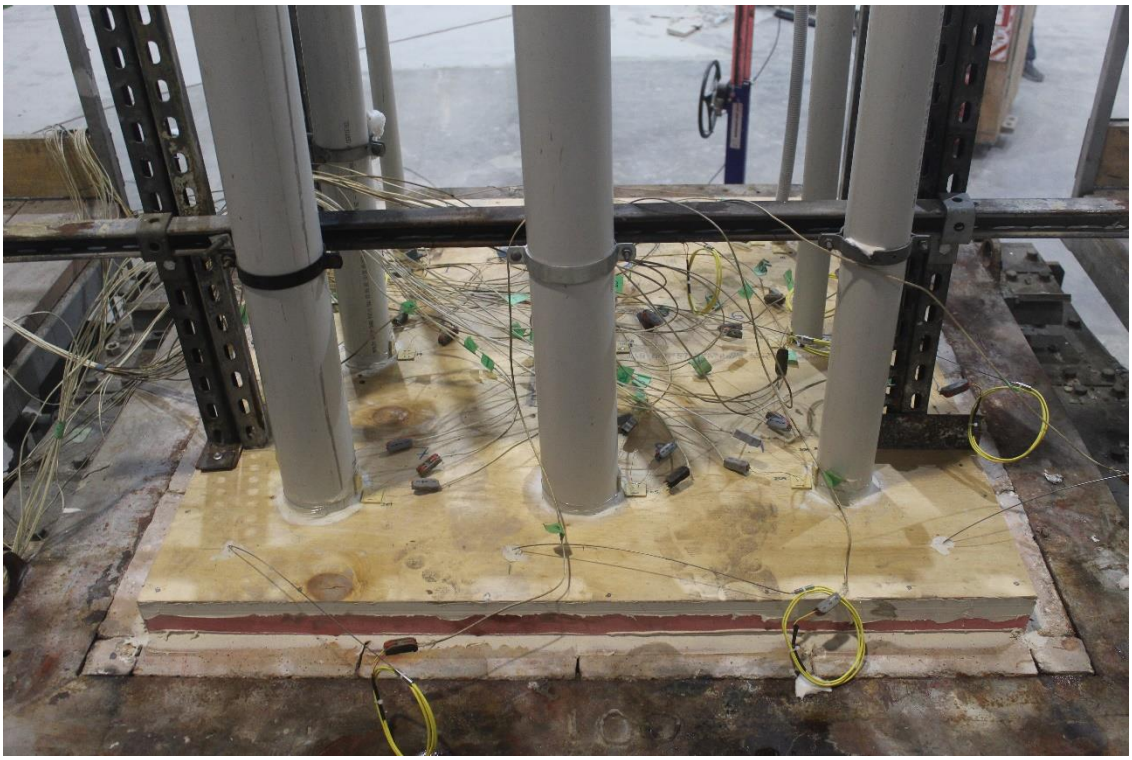


Figure 22 – Unexposed face prior to test commencement