

The fire resistance of 3M IC 15WB+ sealant protecting cables and metal pipes in walls and floors

Regulatory Information Assessment Report

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1 Introduction

This Regulatory Information Report refers to the assessment report FCO-3219D titled; Assessment of the fire resistance of 3M IC 15WB+ sealant protecting cables and metal pipes in walls and floors in accordance with AS 1530.4-2014 and AS 4072.1-2005.

This report is prepared for the purpose of meeting the Evidence of Suitability Requirements of NCC Volume 1 Specification A2.3 for FRL.

This report reviews and confirms the extent to which the reference combustibility tests listed in section 2 meet the requirements of the test standards listed in section 4 of the report. The proposed variations to the tested construction presented in section 3 are subject to an analysis the referenced assessment report and the conclusions are presented in Section 5 of this report.

2 Supporting Data

This assessment report refers to various test reports to support the analysis and conclusions of this report. They are listed below;

Report Reference	Test Standard	Outline of Test Specimen
BWA2243201	AS 1530.4-2005	Various apertures in a wall including electrical cables protected by 3M IC 15WB+ sealant.
BWA2243202	AS 1530.4-2005	Various apertures in a floor including electrical cables protected by 3M IC 15WB+ sealant.
EWFA 2800000	AS 1530.4-2005	Two pipe penetrations and two cable penetrations in a wall protected by 3M Interam E-5A-4 Endothermic Mat.
WF165863	EN 1363-3:2004	Various apertures in a plasterboard wall penetrated by electrical cables and metal pipes and protected by 3M IC 15WB+ sealant.
WF165864/A	EN 1363-3:2004	Various apertures in a masonry wall penetrated by electrical cables and metal pipes and protected by 3M IC 15WB+ sealant.
EWFA 44065600.1	AS 1530.4-2014	Various core cable services penetrating through a nominally 103mm thick steel stud plasterboard wall. Cables protected with 3M MPP Moldable Putty and 3M Fire Barrier Duct Wrap 615+.
EWFA 44713000	AS 1530.4-2014	Various core cable services penetrating through a nominally 75mm thick AAC wall. Cables protected with combinations of 3M MPP Moldable Putty, 3M Interam Ultra GS Wrap Strip and 3M Fire Barrier Duct Wrap 615+.

The test reports BWA2243201, BWA2243202, EWFA 2800000, EWFA 44065600.1 and EWFA 44713000 were undertaken by Exova Warringtonfire Aus (formally Bodycote Warringtonfire) and sponsored by 3M Australia, Pty Ltd.

Test reports WF165863 and WF165864/A were undertaken by Exova UK (Formally Bodycote Warringtonfire UK) and sponsored by 3M UK Pte.

3 Proposed Variations

The proposed construction for apertures protected with 3M IC 15WB+ sealant shall be as tested in BWA2243201 and BWA2243202 subject to the variations listed below:

Floors

The proposed floor construction shall be as tested in BWA2243202 Service A & B subject to the following variations:

- Increase in floor depth.
- Without services as a blank seal as tested in WF165864/A.
- Cable and pipe penetrations shall be wrapped for a length of 300mm or 600mm each side of the floor construction with 3M Fire Barrier Duct Wrap 615+.
- For D1 and D2 cables with or without cable trays.
- The service penetrations shall be located a minimum of 40mm apart.

Walls

The proposed wall construction shall be as tested in BWA2243201 Service C & D subject to the following variations:

- Without services as a blank seal as tested in WF165864/A and WF165863.
- Inclusion of metal pipes as tested in WF165864/A and WF165863.
- Applicability to solid and hollow core masonry and reinforced concrete walls 116mm wide or wider.
- Applicability of results to lightweight walls 100mm wide or wider and AAC panel walls 75mm thick.
- Cable and pipe penetrations shall be wrapped for a length of 300mm or 600mm each side of the floor construction with 3M Fire Barrier Duct Wrap 615+.
- For D1 and D2 cables with or without cable trays.
- Cables as tested in EWFA 44713000.1 specimens B and D except sealed with 3M IC 15WB+ and wall thickness increased to 100mm.
- The service penetrations shall be located a minimum of 40mm apart.

4 Referenced Standards

Standards:

AS 1530.4-2014	Methods for fire tests on building materials, components and structures Part 4: Fire resistance tests of elements of building construction.
AS 4072-2005	Components for the protection of openings in fire-resistant separating elements Part 1 Service penetrations and control joints

5 Conclusion

On the basis of the analysis presented in this report, it is the opinion of this Testing Authority that the tested prototypes described in Section 2 when varied as described in Section 3 will achieve the performance below when submitted to a test in accordance with the test methods referenced in Section 4.

It is required the systems described below be fitted to supporting wall and floor construction that has been tested or assessed to achieve the required FRL.

Table 1- Specification of items in drawings

ID	Description
	PVC insulated cables as per AS1530.4-2014 D1 Cables. Maximum bundle area no larger than tested (see appendix A for dimensions)
	PVC insulated cables as per AS1530.4-2014 D2 Cables. Maximum bundle area no larger than tested (see appendix A for dimensions)
3	Normal weight concrete floor slab 120mm thick or greater.
4	Steel pipe 114mm x 4.5mm , maximum hole size 152 mm
5	3M IC 15WB+ sealant. Protecting D1 and D2 cables and pipes. Walls ; 20mm deep, 25mm to 60mm wide fixed over mineral wool Item 6. Floors ; 40mm deep, 25mm to 60mm wide fixed over mineral wool Item 6. Protecting Single Cables up to 20mm in diameter (16mm ² 3C+ECable) <ul style="list-style-type: none"> Walls- Minimum 10 mm annular gap , filled to 25 mm + 40mm (wide) × 30mm (high) fillet. Protecting 80mm Cable bundles of cables up to 20mm in diameter (16mm ² 3C+ECable) <ul style="list-style-type: none"> Walls - Minimum 15 mm Annular gap , 25mm deep and all gaps between cables filled full depth of wall
6	Mineral wool (100kg/m ³) Floors - 80mm minimum thickness friction fitted. Walls - 75mm minimum thickness friction fitted.
7	Lightweight wall lined each side with a minimum of 2 layers of 13mm fire grade plasterboard.
8	Solid or hollow masonry and normal weight concrete walls 116mm thick or greater.
9	Copper or ferrous pipes 15mm x 0.19mm , maximum hole size 65mm
10	Mineral wool (140kg/m ³).
11	Steel pipe 34 mm x 3.5 mm, maximum hole size 104 mm
12	3M Fire Barrier Duct Wrap 615+ , terminating at the floor or wall , sealed with 3M 425 Aluminium Foil Tape applied along the edge of the wrap and Filament tape used in a parallel direction to the wall as an assembly aid to hold the 615+ duct wrap in place until the metal straps are installed. The wrap was held in place with metal straps at 200mm centres compressing wrap to 70% of its original thickness.
13	3M IC 15WB+ sealant between 3M Fire Barrier Duct Wrap 615+ and wall.

Floors

The performance of 3M IC 15WB+ sealant protecting cables and pipes in normal weight concrete floors is shown in Table 2 with detailed items specified in Table 1.

Table 2 - Performance of cables and pipes

Penetrating Service	Sealant Details	Wrap on Service	Wrap Length each side	Details	Min Slab Depth	FRL
AS 1530.4-2014 Appendix D1 and D2 Power supply and communication cables (with or without cable trays)	40mm deep, 25-60mm wide fixed over 80mm minimum thickness friction fitted mineral wool 100kg/m ³	None	None	Figures 1 and 2	120	-/120/30
		3M Fire Barrier Duct Wrap 615+	300	Figures 1 and 3		-/120/60
			600			-/120/120
AS 1530.4-2014 Appendix D2 communication cables only (with or without cable trays)	40mm deep, 25-60mm wide fixed over 80mm minimum thickness friction fitted mineral wool 100kg/m ³	None	None	Figures 1 and 2	150	-/180/30
		3M Fire Barrier Duct Wrap 615+	300	Figures 1 and 3		-/180/90
			600			-/180/120

The performance of 3M IC 15WB+ Sealant protecting blank penetration seals normal weight concrete floors is shown in Table 3.

Table 3 - Performance of blank seals in floors

Blank Seal Size	Seal Description	Installation Details	Min. Slab Depth (mm)	FRL
110mm maximum diameter	40mm deep, fixed over 80mm thick friction fitted mineral wool 100kg/m ³	Figure 1 and 4	120mm	-/180/120
			≥150mm	-/180/180

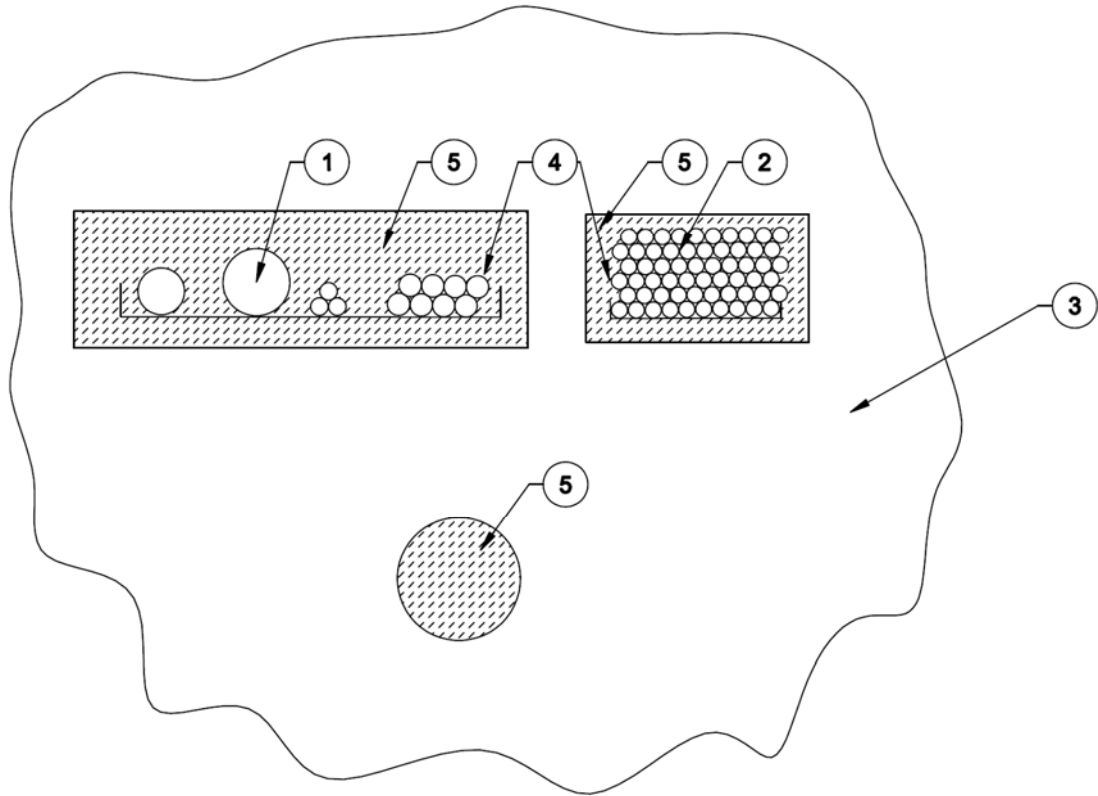


Figure 1– Typical arrangement of 3M IC 15WB+ sealant for floors

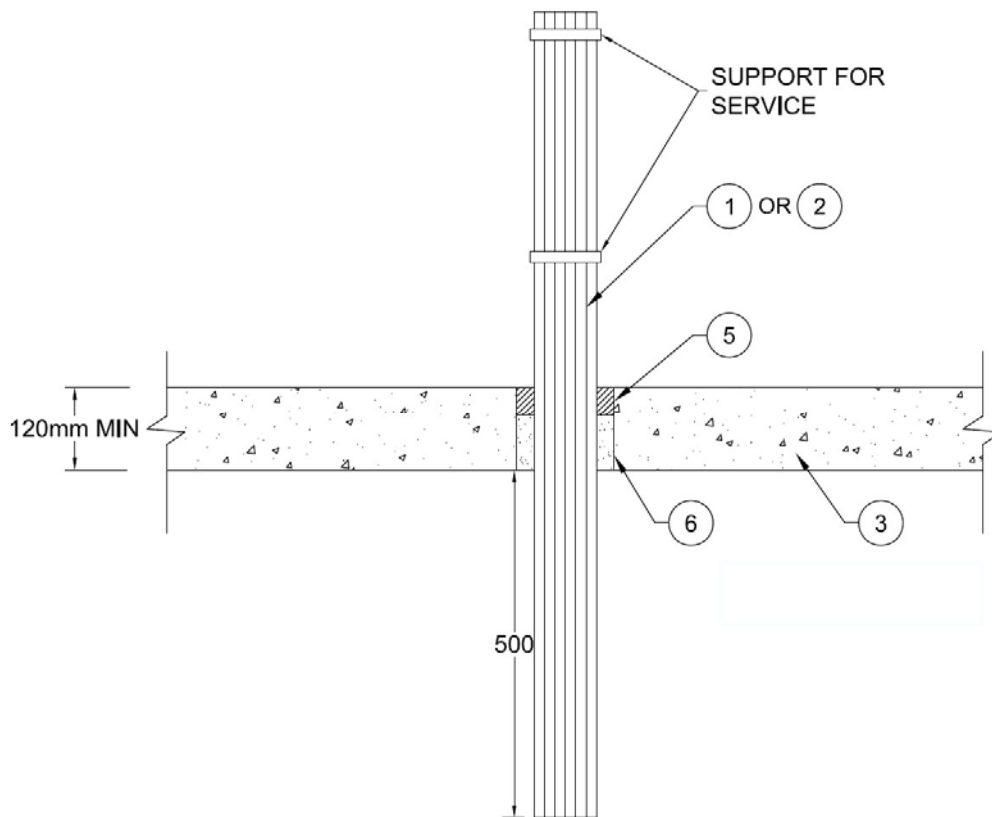


Figure 2– Typical details for cables penetrating floors with 3M IC 15WB+ sealant

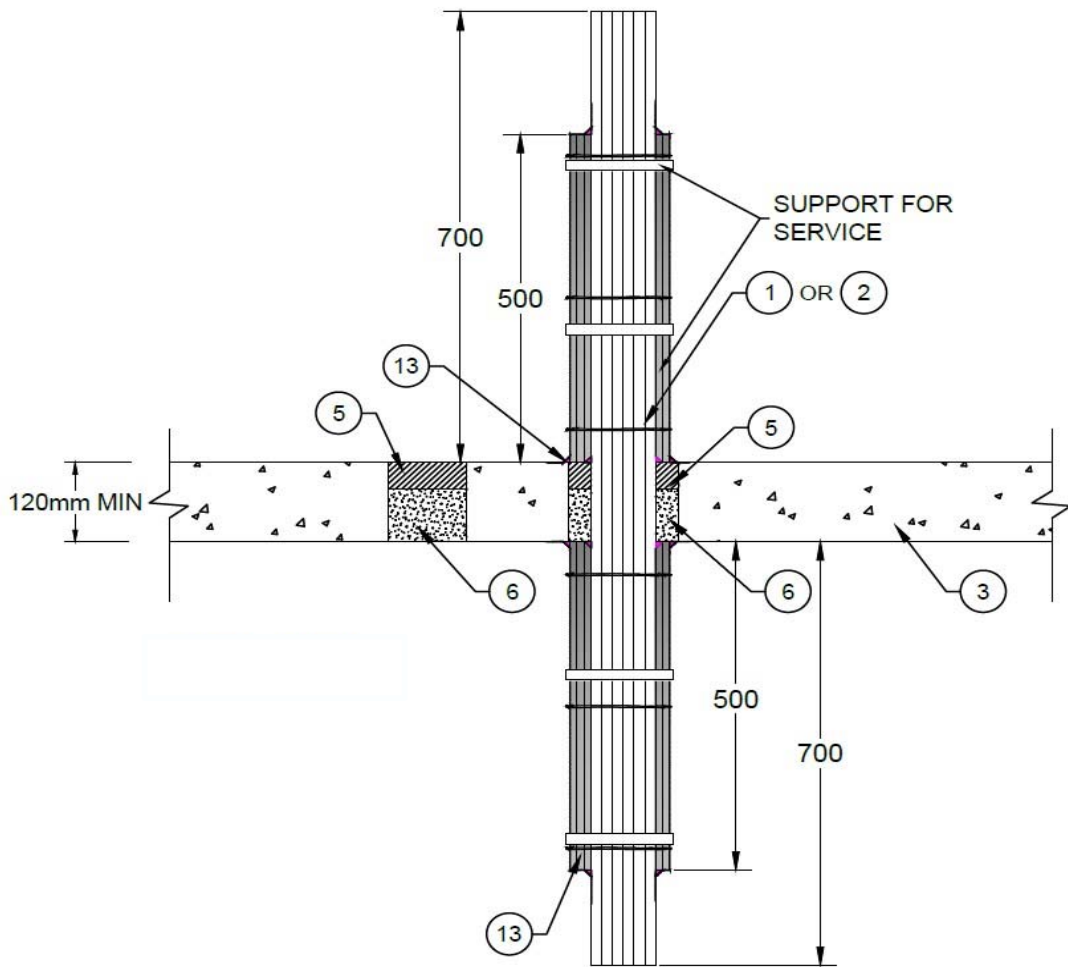


Figure 3– Typical details for wrapped cable penetrating floors with 3M IC 15WB+ sealant

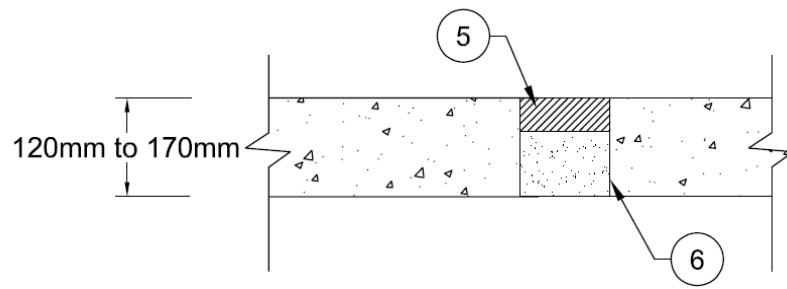


Figure 4– Typical details for blank penetration seals in floors

Wall Penetrations

The performance of 3M IC 15WB+ sealant protecting cables and pipes in various walls is shown in Table 4 and 5.

Table 4 - Performance of cables and pipes in concrete and masonry walls

Penetrating Service	Wrap on Service	Wrap Length each side	Min Wall Width	Details	FRL
AS 1530.4-2014 Appendix D1 and D2 Power supply and communication cables (with or without cable trays)	None	None	116mm	Figure 5 and 6	-/120/30
	3M Fire Barrier Duct Wrap 615+	300	100mm	Figure 5 and 7	-/120/60
		600			-/120/120
AS 1530.4-2014 Appendix D1 Power supply cables only (with or without cable trays)	None	None	116mm	Figure 5 and 6	-/120/30
	3M Fire Barrier Duct Wrap 615+	300	100mm	Figure 5 and 7	-/120/60
		600			-/120/120
Copper pipes up to 200mm in diameter (max) and 2.05mm wall thickness (max)	3M Fire Barrier Duct Wrap 615+	300	150mm	Figure 5 and 9	-/120/60
		600			-/120/90
<i>Copper or ferrous pipes</i> <ul style="list-style-type: none"> Up to 15mm x 0.91mm or <i>Steel pipes</i> <ul style="list-style-type: none"> Maximum 34mm-114mm in diameter or 3.5mm-4.5mm wall thickness 	None	None	116mm	Figure 5 and 6	-/120/30
	3M Fire Barrier Duct Wrap 615+	300	100mm	Figure 5 and 7	-/120/60
		600			Figure 5 and 7
	None	None	None	150mm	Figure 5 and 8
3M Fire Barrier Duct Wrap 615+		600	Figure 5 and 9		-/240/120
Single cables up to 20mm in diam. (16mm ² 3C+ECable)	None	None	75mm	Figure 1 and 7	-/120/120
80mm cable bundles. Cables up to 20mm in diam. (16mm ² 3C+ECable)	3M Fire Barrier Duct Wrap 615+	150mm		Figure 1 and 8	-/120/120

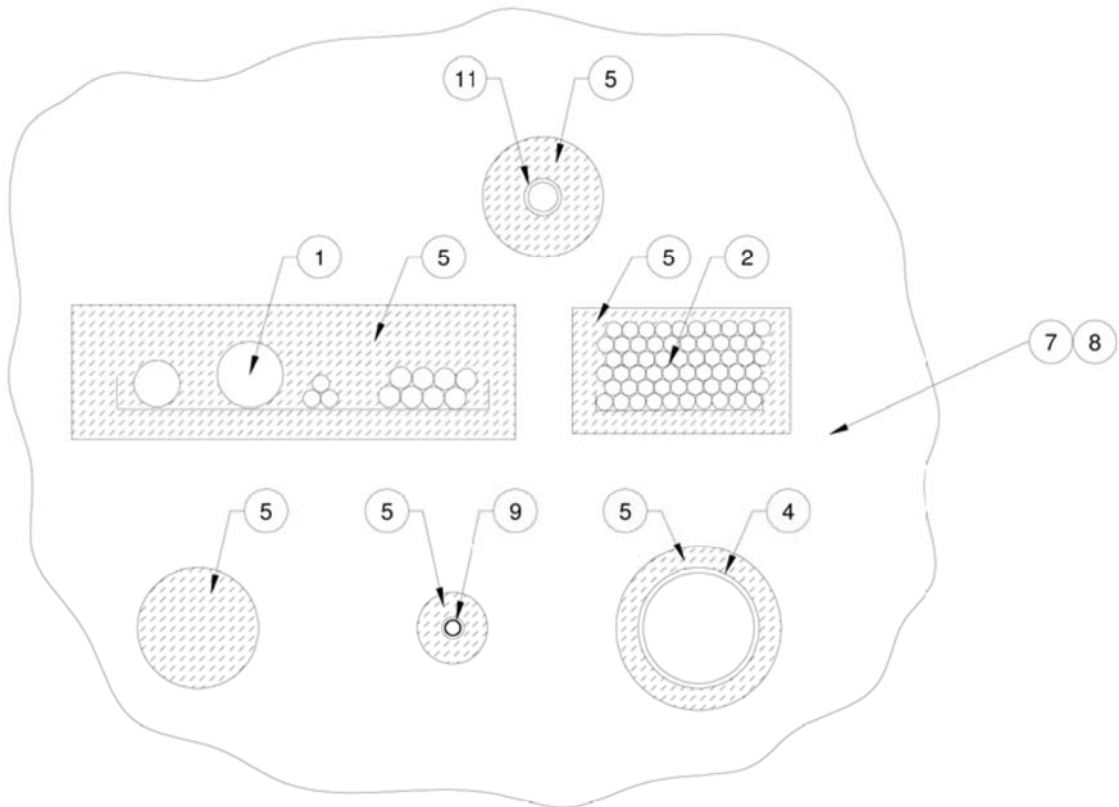


Figure 5– Typical arrangement of 3M IC 15WB+ sealant in walls

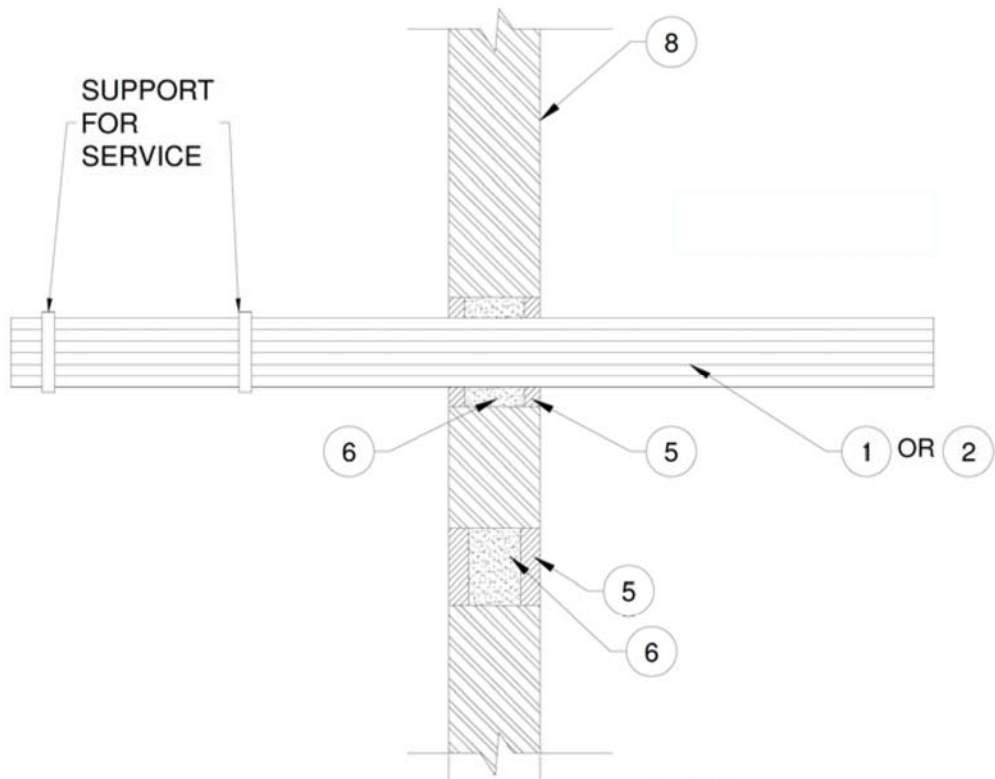


Figure 6– Typical details for cables protected with 3M IC 15WB+ sealant for masonry walls

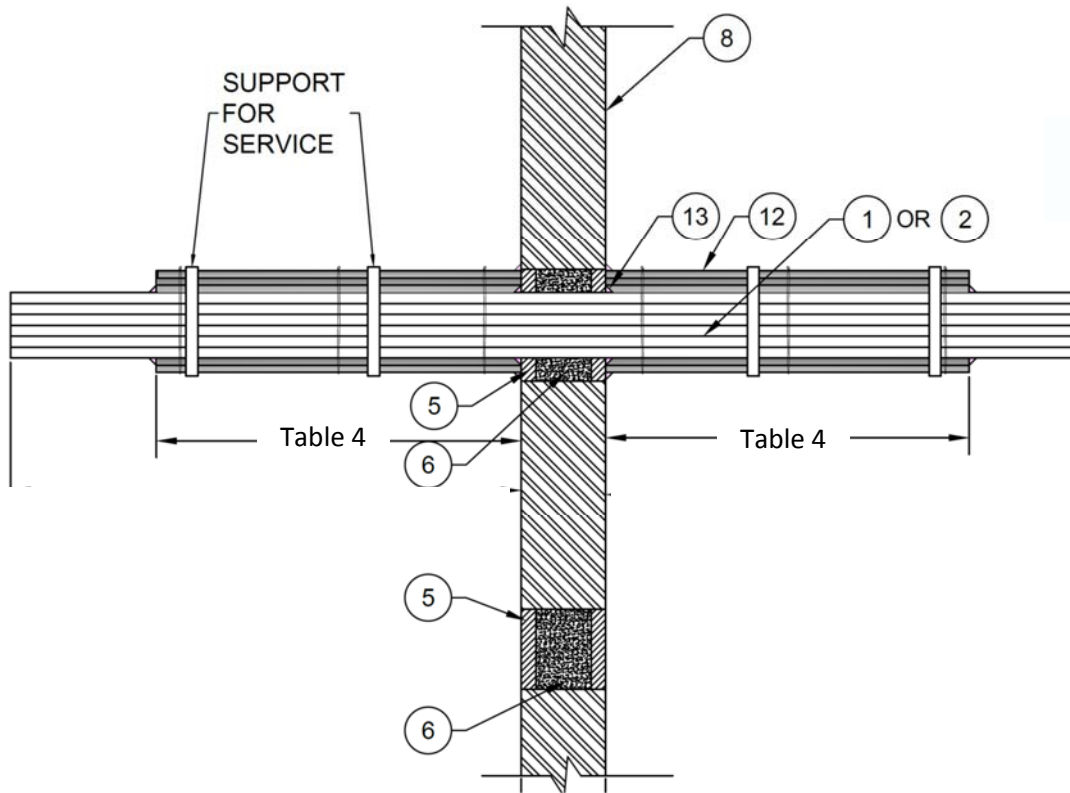


Figure 7– Typical details for wrapped cables for masonry walls

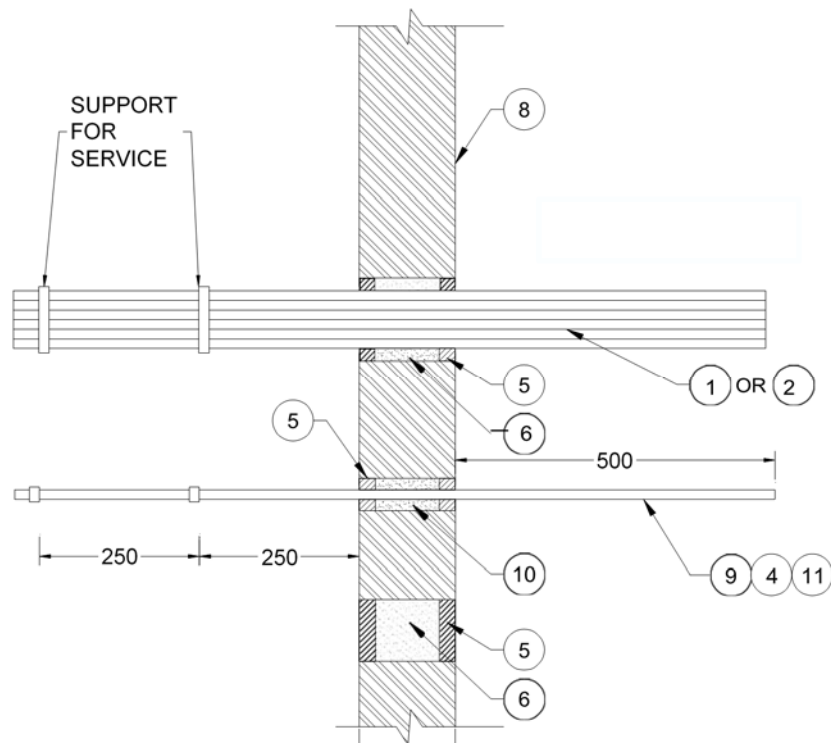


Figure 8 – Typical details for cables and metal pipes protected with 3M IC 15WB+ sealant for masonry walls 150mm thick

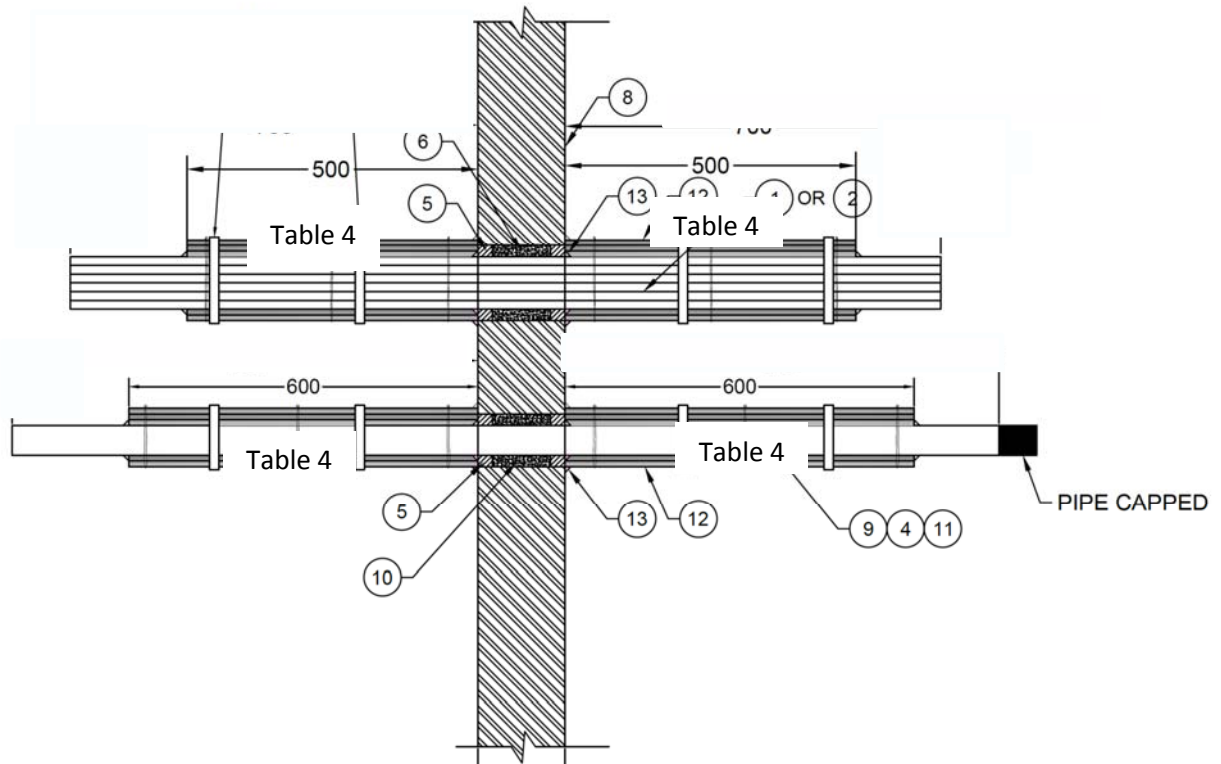


Figure 9 – Typical details for wrapped cables and metal pipes for masonry walls 150mm thick

Table 5 - Performance of cables and pipes in plasterboard lined walls

Penetrating Service	Wrap on Service	Wrap Length each side	Min Wall Width	Details	FRL
AS 1530.4-2014 Appendix D1 and D2 Power supply and communication cables (with or without cable trays)	None	None	116mm	Figure 1 and 10	-/120/30
	3M Fire Barrier Duct Wrap 615+	300	100mm	Figure 1 and 11	-/120/60
		600			-/120/120
AS 1530.4-2014 Appendix D1 Power supply cables only (with or without cable trays)	None	None	116mm	Figure 1 and 10	-/180/30
	3M Fire Barrier Duct Wrap 615+	300	100mm	Figure 1 and 11	-/180/60
		600			-/180/120
Single cables up to 20mm in diam. (16mm ² 3C+ECable)	None	None	100mm	Figure 1 and 7	-/120/120
80mm Cable bundles. Cables up to 20mm in diam. (16mm ² 3C+ECable)	3M Fire Barrier Duct Wrap 615+	150mm		Figure 1 and 8	-/120/120
Copper pipes up to 200mm in diameter (max) and 2.05mm wall thickness (max)	3M Interam E-5A-4 Endothermic Mat (Emat), or 3M Fire Barrier Duct Wrap 615+	300	150mm	Figure 1 and 12	-/120/60
		600			-/120/90

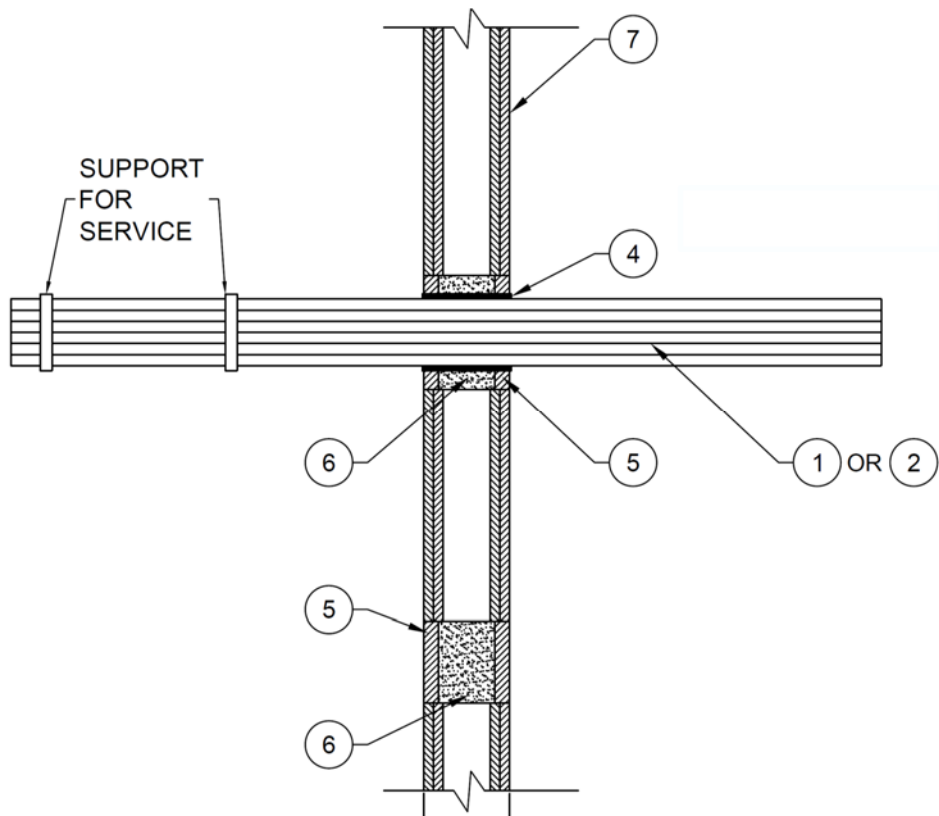


Figure 10 – Typical details for cables protected with 3M IC 15WB+ sealant for plasterboard lined walls

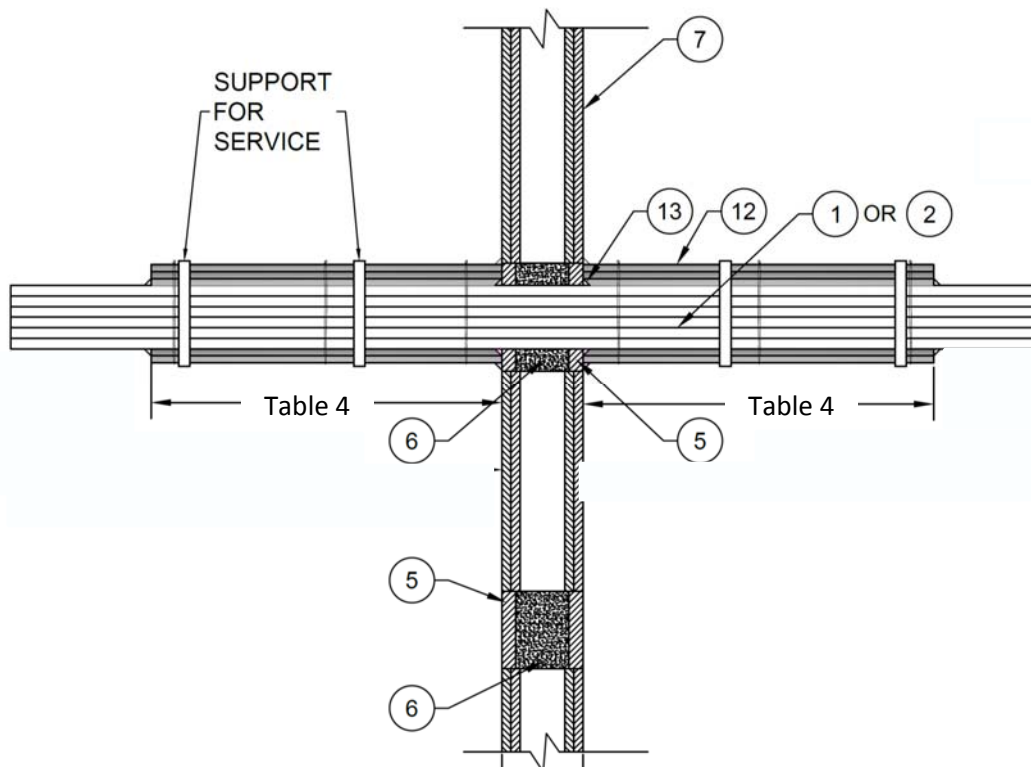


Figure 11 – Typical details for wrapped cables in plasterboard lined walls

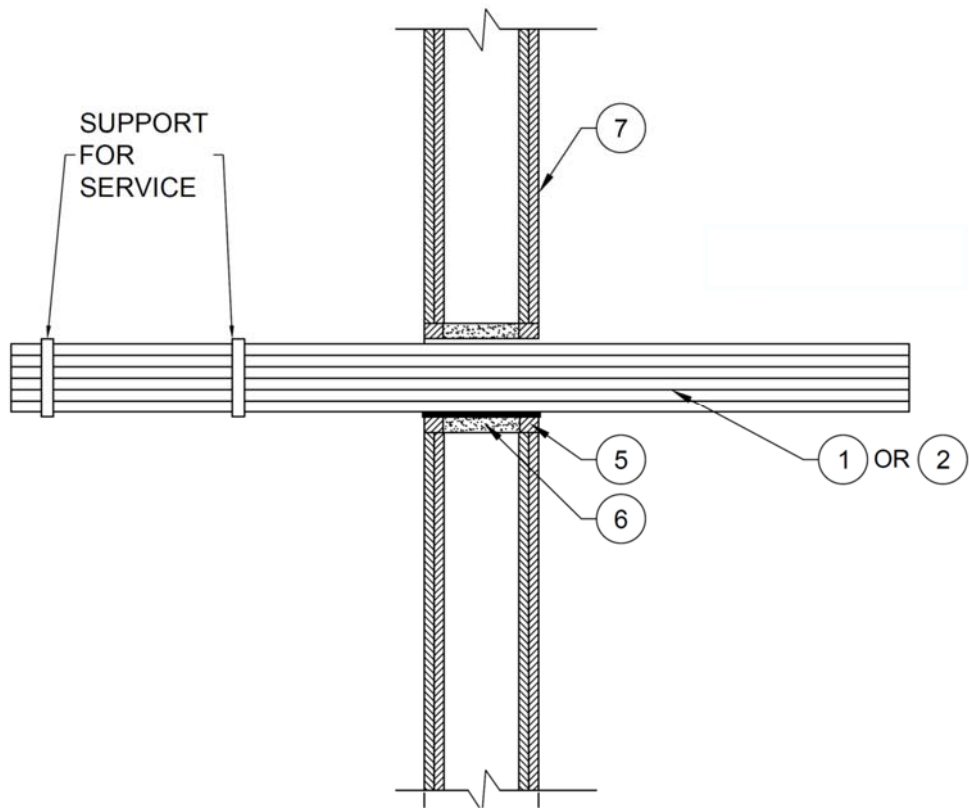


Figure 12 – Typical details for cables and metal pipes protected with 3M IC 15WB+ sealant for plasterboard lined walls 150mm thick

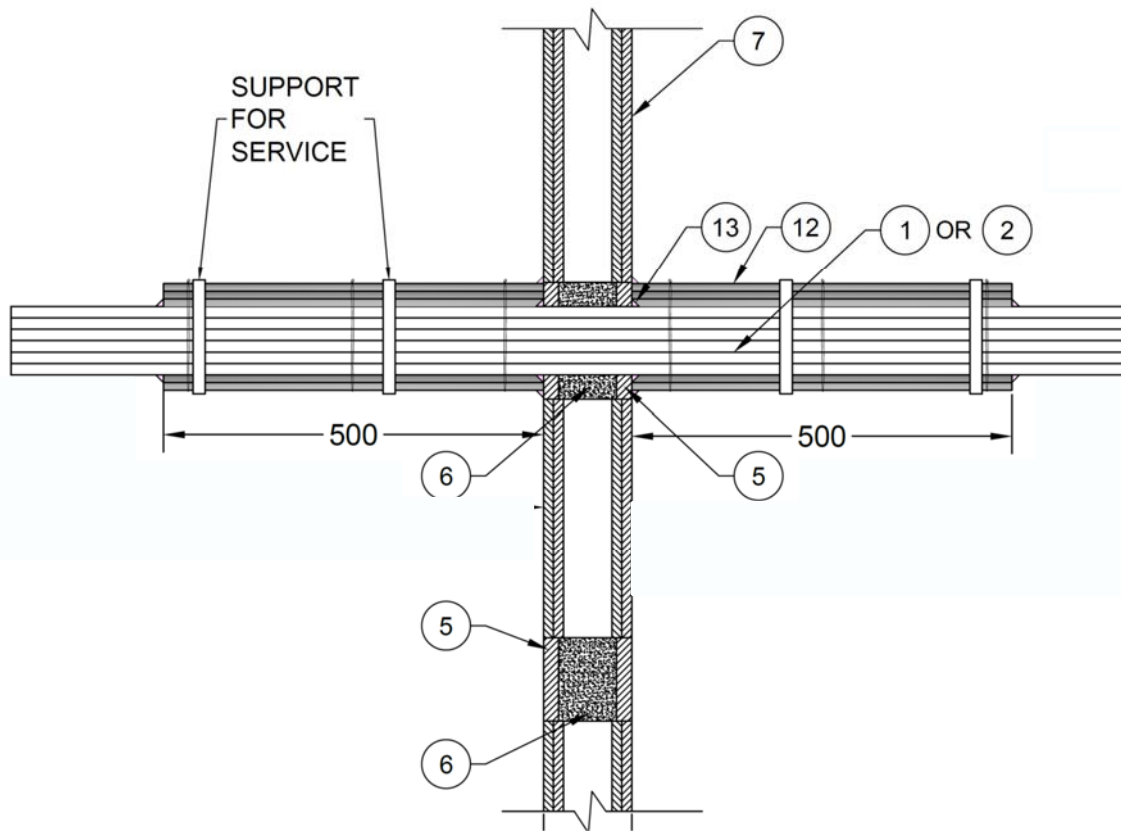


Figure 13 – Typical details for Cables and Metal Pipes wrapped with Emat for plasterboard lined walls 150mm thick

Table 6 - Performance of blank seals concrete, masonry and plasterboard lined walls

Blank Seal Size	Seal Description	Installation Details	Minimum Wall thickness	FRL
100mm (max) diameter full depth of Wall	75mm deep (min) friction fitted 100kg/m ³ mineral wool. Sealed side with 20mm deep 3M MPP Moldable Putty	Figure 5, 10 , 11 and 13	100mm plasterboard masonry and concrete	-/120/120
		Figure 5, 6,7 and 8	150mm masonry and concrete	-/180/180
			170mm masonry and concrete	-/240/240

6 Term of Validity

This assessment report will lapse on 31st July 2022. Should you wish us to re-examine this report with a view to the possible extension of its term of validity, would you please apply to us three to four months before the date of expiry. This Division reserves the right at any time to amend or withdraw this assessment in the light of new knowledge.

7 Limitations

The conclusions of this assessment report may be used to directly assess the fire resistance performance under such conditions, but it should be recognised that a single test method will not provide a full assessment of the fire hazard under all fire conditions.

Because of the nature of fire resistance testing, and the consequent difficulty in quantifying the uncertainty of measurement, it is not possible to provide a stated degree of accuracy. The inherent variability in test procedures, materials and methods of construction, and installation may lead to variations in performance between elements of similar construction.

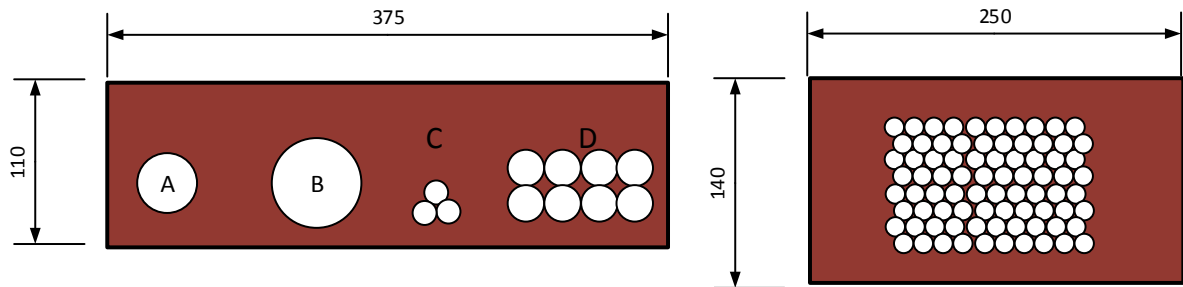
This assessment report does not provide an endorsement by CSIRO of the actual products supplied to industry. The referenced assessment can therefore only relate only to the actual prototype test specimens, testing conditions and methodology described in the supporting data, and does not imply any performance abilities of constructions of subsequent manufacture.

This assessment is based on information and experience available at the time of preparation. The published procedures for the conduct of tests and the assessment of test results are the subject of constant review and improvement and it is recommended that this report is reviewed on or, before, the stated expiry date.

The information contained in this assessment report shall not be used for the assessment of variations other than those stated in the conclusions above. The assessment is valid provided no modifications are made to the systems detailed in this report. All details of construction should be consistent with the requirements stated in the relevant test reports and all referenced documents.

Appendix A

D1 & D2 Cable Configurations as Tested



- D1 :**
- (A) = One single-core PVC insulated, PVC sheathed for 0.6/1 kV copper conductors complying with [AS 5000.1](#) - 630 mm² (127 × 2.52 mm conductors, insulation 2.4 mm thick, OD 41.4 mm).
 - (B) = One three-core plus earth PVC insulated, PVC sheathed for 0.6/1 kV copper conductors complying with [AS 5000.1](#) - 185 mm² (32 × 2.52 mm conductors, OD 53.8 mm).
 - (C) = Three three-core plus earth PVC insulated, PVC sheathed for 0.6/1 kV copper conductors complying with [AS 5000.1](#) - 6 mm² (7 × 1.04 mm conductors OD 16 mm).
 - (D) = Eight three-core plus earth PVC insulated, PVC sheathed for 0.6/1 kV copper conductors complying with [AS 5000.1](#) - 16 mm² (7 × 1.7 mm conductors, OD 20.4 mm).
- D2 :** Pack of 60 (10 × 6) 50 pair telecommunication cables. 100 wires, each wire, OD 0.5mm.

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