

The fire resistance of 3M MPP Moldable Putty 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-3220 titled; Assessment of the fire resistance of 3M MPP Moldable Putty protecting cables and 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 in 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 MPP Moldable Putty
BWA2243203	AS 1530.4-2005	Various apertures in a floor including electrical cables protected by 3M MPP Moldable Putty
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.
WF155355	EN 1363-3:2004	Various apertures in a masonry wall including electrical cables protected by 3M MPP Moldable Putty
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, BWA2243203, 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 report WF155355 was undertaken by Exova UK (Formally Bodycote Warringtonfire UK) and sponsored by 3M UK Pte.

3 Proposed Variations

The proposed construction shall be as tested in BWA2243201 and BWA2243203 subject to the variations listed below.

Floors

The proposed floor construction shall be as tested in BWA 2243203 subject to the following variations:

- Without services as a blank seal as tested in WF155355.
- Increase in floor depth.
- 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 BWA 2243201 subject to the following variations:

- Without services as a blank seal as tested in WF155355.
- Applicability to solid and hollow core masonry and reinforced concrete walls 100mm 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 and Conduits as tested in EWFA 44713000.1 specimens B, D, G and H.
- The service penetrations shall be located a minimum of 40mm apart.

4 Referenced Standards

Standards:

AS1530.4-2014	Methods for fire tests on building materials, components and structures Part 4: Fire resistance tests of elements of building construction.
AS4072-2005	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 that 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
1	PVC insulated cables as per AS1530.4-2014 D1 Cables. Maximum bundle area no larger than tested (see appendix A for dimensions)
2	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	Service wrapped with one layer of 3M MPP pad for the depth of the wall
5	<p>3M MPP Moldable Putty</p> <p>Protecting D1 and D2 cables and pipes</p> <ul style="list-style-type: none"> Floors - 40mm deep and 25mm to 60mm wide Walls - 20mm deep and 25mm to 60mm wide <p>Protecting Single Cables up to 20mm in diameter (16mm² 3C+ECable)</p> <ul style="list-style-type: none"> Walls - Minimum 10 mm annular gap, filled to 25 mm + 40mm (wide) × 30mm (high) fillet <p>Protecting 80mm Cable bundles of cables up to 20mm in diameter (16mm² 3C+ECable)</p> <ul style="list-style-type: none"> Walls - Minimum 15 mm Annular gap, 25mm deep and all gaps between cables filled full depth of wall <p>Protecting uPVC Conduits empty or with 4 Optic Fibre Cables</p> <ul style="list-style-type: none"> Walls – 15mm fillet penetrating 5mm into wall in addition to 3Mtm Ultra GS intumescent plastic pipe fire stop tape (50mm wide) around conduit on each face of the wall protruding 15mm from face 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	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.
10	3M MPP Moldable Putty or 3M IC 15WB+ sealant between 3M Fire Barrier Duct Wrap 615+ and wall.
11	Copper pipes up to 200mm diameter (max) and 2.05 mm wall thickness (max) . Annular gap max 10 mm
12	20mm UPVC conduit (OD: 26-27mm, ID: 23-24mm) fitted to a 30-40mm hole.
13	3M tm Ultra GS intumescent strip, secured with 3M 425 foil tape.
14	AAC walls 75mm thick or greater.

Floors

The performance of 3M MPP Moldable Putty 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	Wrap on Service	Wrap Length each side	Details	FRL
AS 1530.4-2014 Appendix D1 and D2 Power Supply and communication cables (with or without cable trays)	None	None	Figures 1 and 2	-/180/-
	3M Fire Barrier Duct Wrap 615+	300	Figures 1 and 3	-/180/90
		600		-/180/120
AS 1530.4-2014 Appendix D2 Communication cables only (with or without cable trays)	None	None	Figures 1 and 2	-/240/30
	3M Fire Barrier Duct Wrap 615+	300	Figures 1 and 3 4	-/240/90
		600		-/240/120
Copper pipes up to 200mm in diameter (max) and 2.05mm wall thickness (max)	3M Fire Barrier Duct Wrap 615+	300	Figure 1 and 4	-/120/60
		600		-/120/90

The performance of 3M MPP Moldable Putty protecting blank penetration seals in 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	FRL
100mm (max) diameter full depth of slab	80mm deep (min) friction fitted 100kg/m ³ mineral wool. Top faced sealed with 40mm deep 3M MPP Moldable Putty	Figure 1,2,3 and 5	120mm	-/240/120
			150mm	-/240/180
			170mm	-/240/240

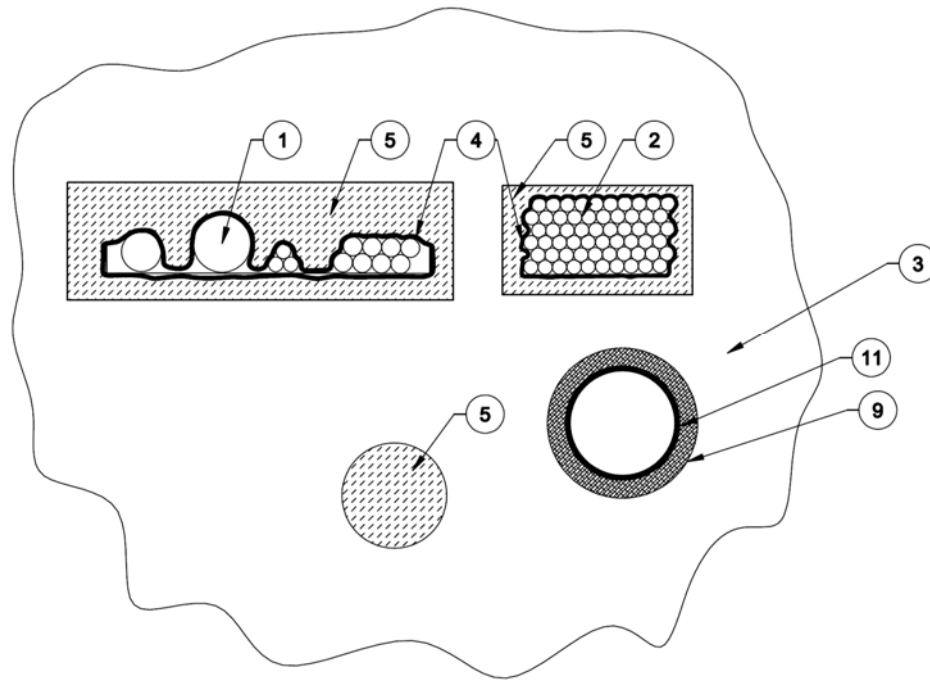


Figure 1- Typical arrangement of Moldable Putty for floors

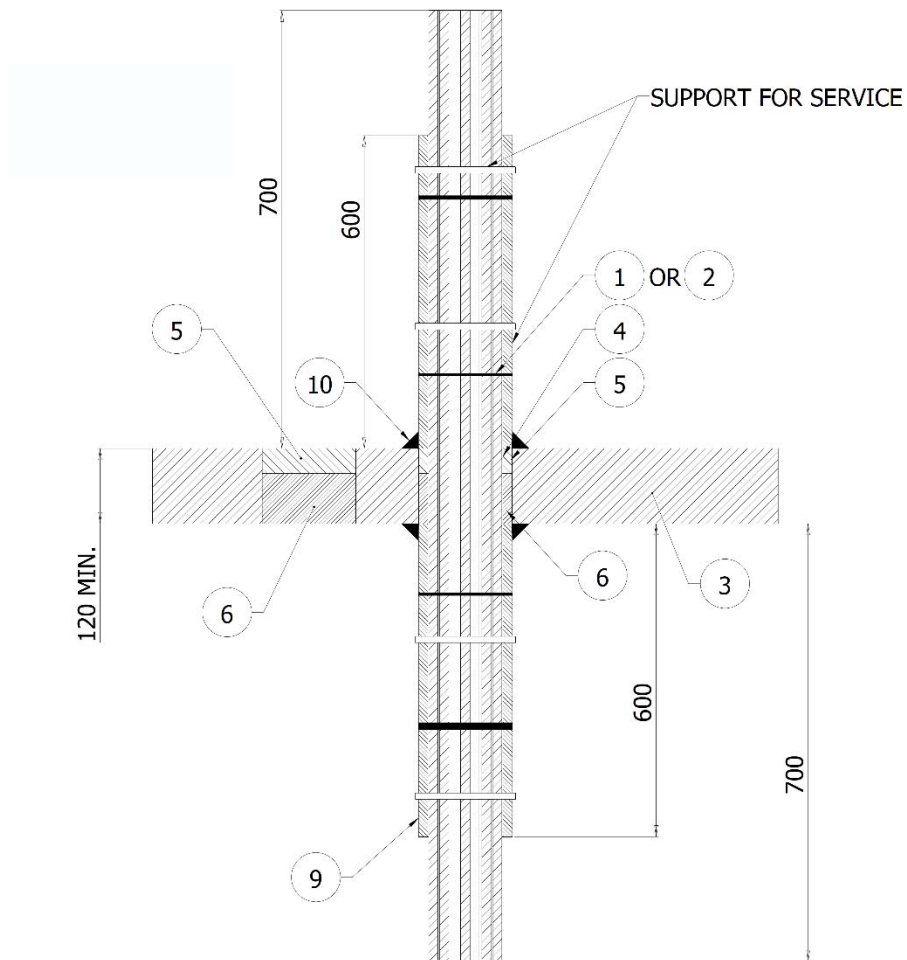


Figure 3- Typical details for wrapped cables penetrating floors

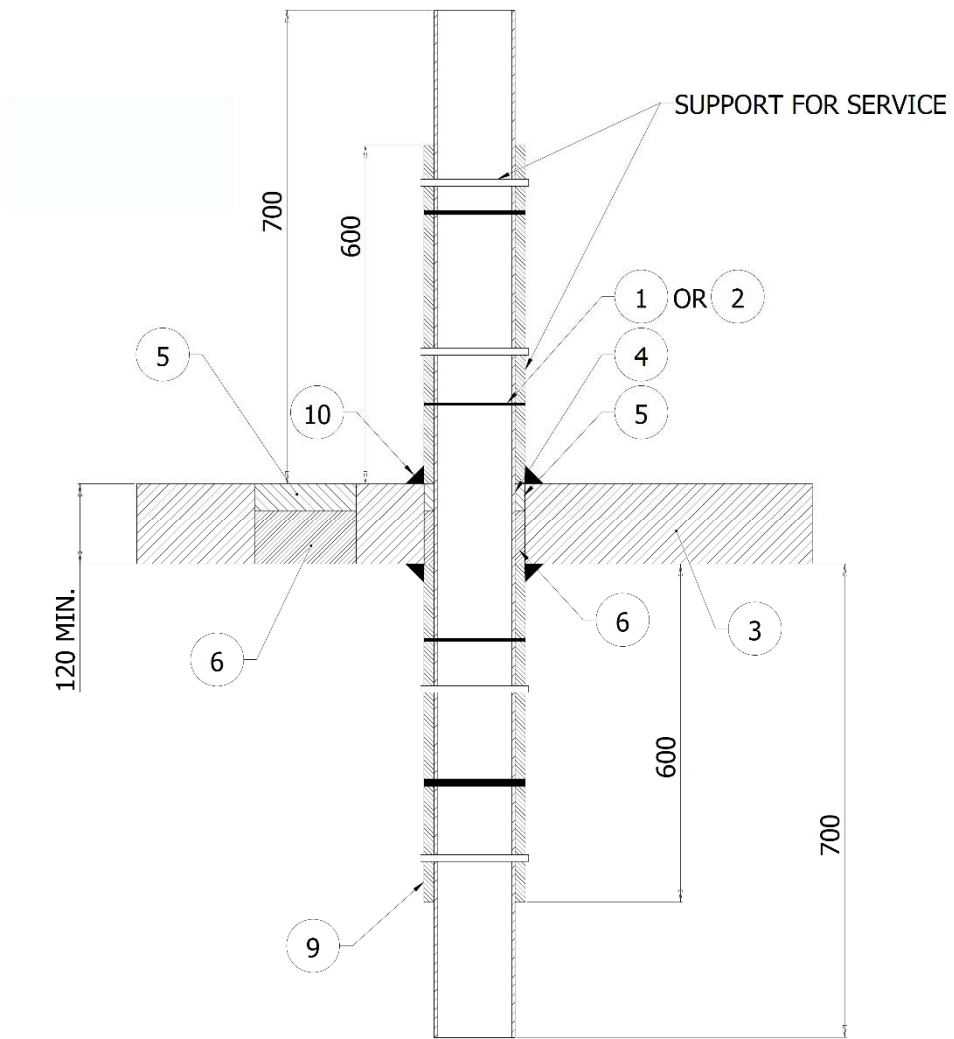


Figure 4- Typical details for wrapped pipe penetrating floors

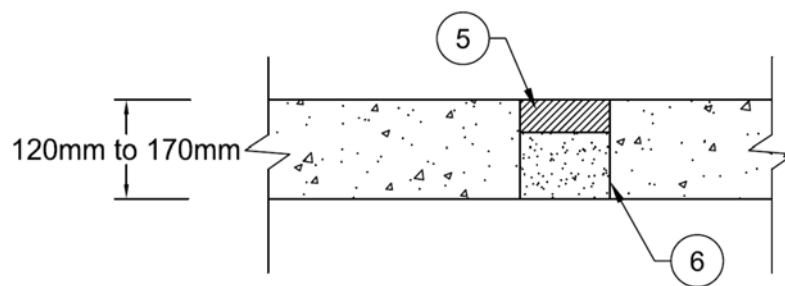


Figure 5 - Typical details for Blank Penetration Seals in floors

Wall Penetrations

The performance of 3M MPP Moldable Putty protecting cables and pipes in various walls is shown in Table 4, 5 and 6.

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 6 and 7	-/120/30
	3M Fire Barrier Duct Wrap 615+	300	100mm	Figure 6 and 8	-/120/60
		600			-/120/120
AS 1530.4-2014 Appendix D1 Power Supply cables only (with or without cable trays)	None	None	116mm	Figure 6 and 7	-/180/30
	3M Fire Barrier Duct Wrap 615+	300	100mm	Figure 6 and 8	-/180/60
		600			-/180/120
Single cables up to 20mm in diam. (16mm ² 3C+ECable)	None	None	75mm	Figure 6 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 6 and 8	-/120/120
Copper pipes up to 200mm in diameter (max) and 2.05mm wall thickness (max)	3M Fire Barrier Duct Wrap 615+	300	100mm	Figure 6 and 9	-/120/60
		600			-/120/90

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	None	None	116mm	Figure 6 and 10	-/120/30
	3M Fire Barrier Duct Wrap 615+	300	100mm	Figure 6 and 11	-/120/60
		600			-/120/120
AS1530.4-2014 Appendix D1 Power supply cables only	None	None	116mm	Figure 6 and 10	-/180/30
	3M Fire Barrier Duct Wrap 615+	300	100mm	Figure 6 and 11	-/180/60
		600			-/180/120
Single cables up to 20mm in diam. (16mm ² 3C+ECable)	None	None	100mm	Figure 6 and 10	-/120/120
80mm cable bundles. Cables up to 20mm in diam. (16mm ² 3C+ECable)	3M Fire Barrier Duct Wrap 615+	150mm		Figure 6 and 11	-/120/120
Copper pipes up to 200mm in diameter (max) and 2.05mm wall thickness (max)	3M Fire Barrier Duct Wrap 615+	300	100mm	Figure 6 and 12	-/120/60
		600			-/120/90

The performance of 3M MPP Moldable Putty protecting blank penetration seals in walls is shown in Table 6.

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 100 kg/m ³ mineral wool. Sealed side with 20mm deep 3M MPP Moldable Putty	Figure 6,7,8, 10 and 11	100mm Plasterboard Masonry and Concrete	-/120/120
		Figure 6,7 and 8	150mm Masonry and concrete	-/180/180
			170mm Masonry and concrete	-/240/240

Table 7 – Performance of conduits in 75 mm or greater solid walls, 100 mm or greater hollow masonry and plasterboard lined walls protected with 3M™ Ultra GS

Penetrating Service	Seal Description	Length of Duct Wrap 615+ each side	Details	FRL
Empty uPVC conduit (OD: 26-27mm, ID: 23-24mm)	Two 50mm wide 3Mtm Ultra GS intumescent strips, secured with 3M 425 foil tape. Strips positioned on each face of the wall protruding 25mm from face of wall. 15mm fillet of 3M MPP Moldable Putty penetrating 5mm into wall	None	Figure 13, 14 and 15	-/120/120
uPVC conduit with 4 optic fibre cables (OD: 26-27mm, ID: 23-24mm)			Figure 13, 14 and 15	-/120/120

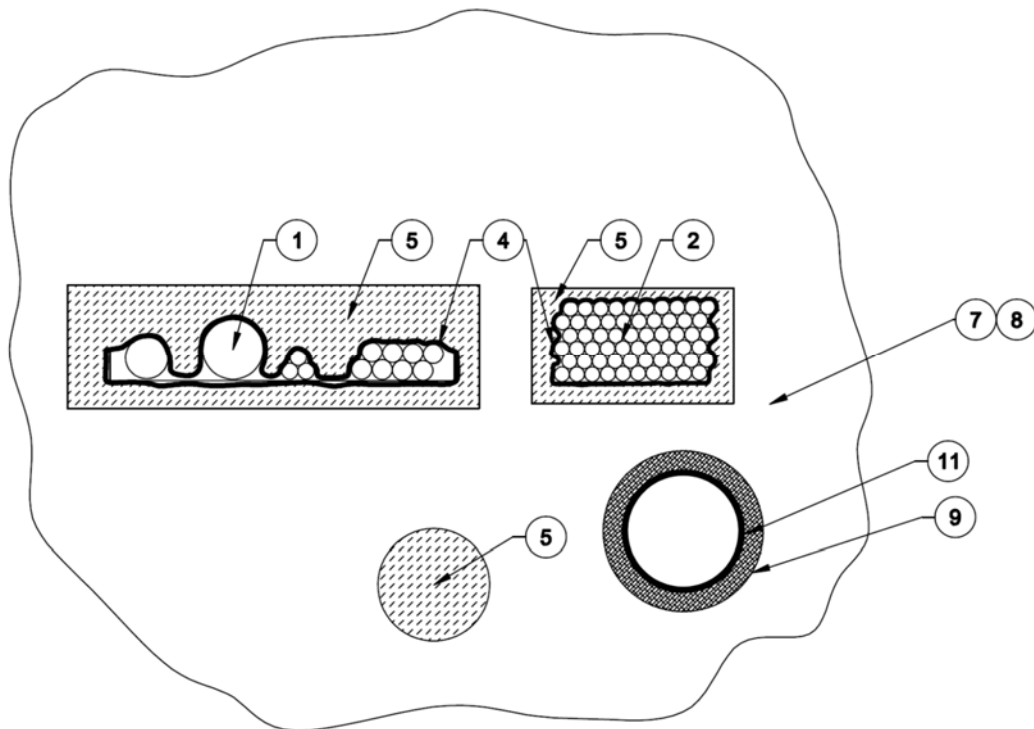


Figure 6- Typical arrangement of 3M Moldable Putty for walls

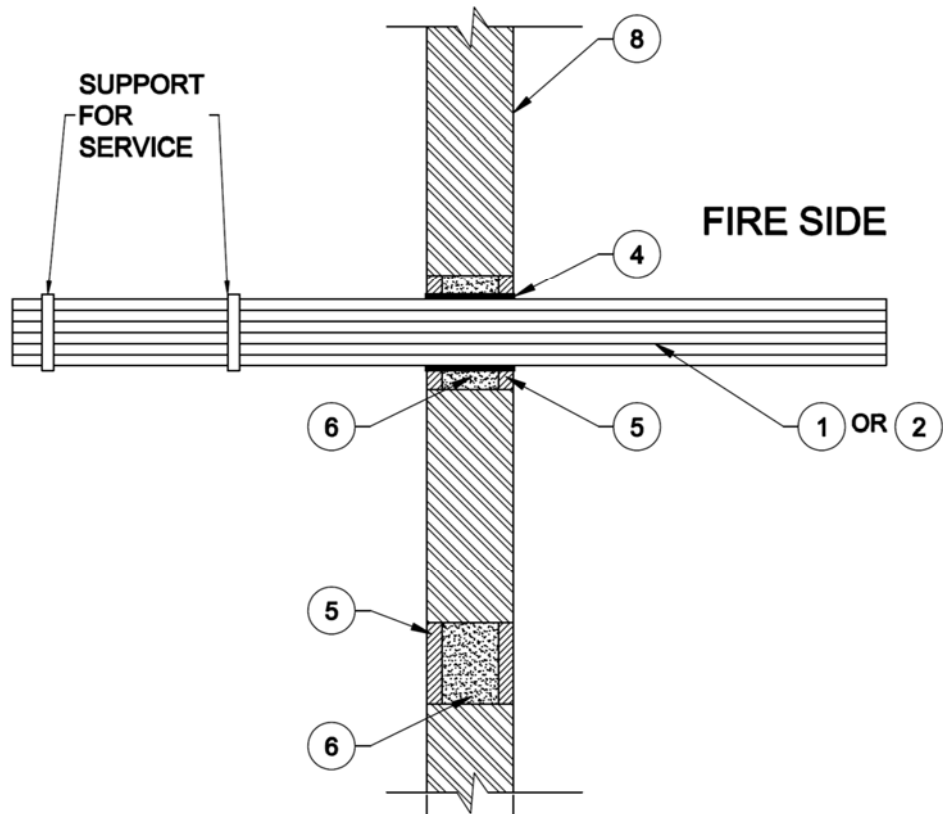


Figure 7- Typical details for unwrapped cables and blank penetration seals in masonry walls

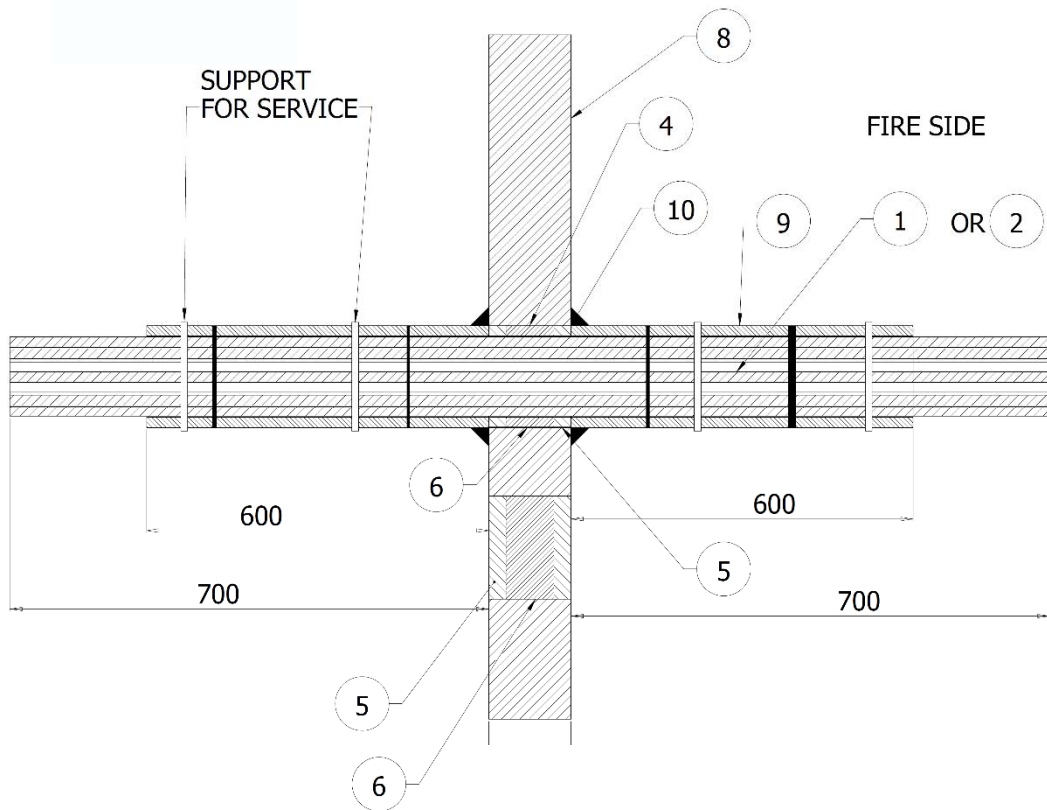


Figure 8- Typical details for wrapped cables in masonry walls

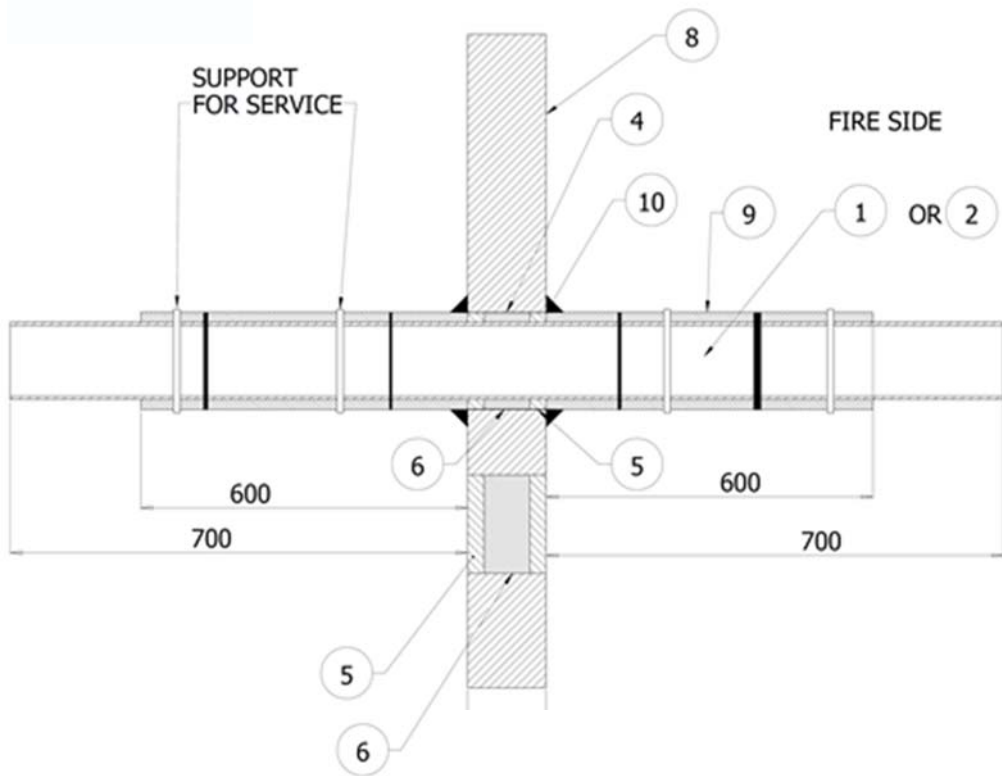


Figure 9- Typical details for wrapped pipe in masonry walls

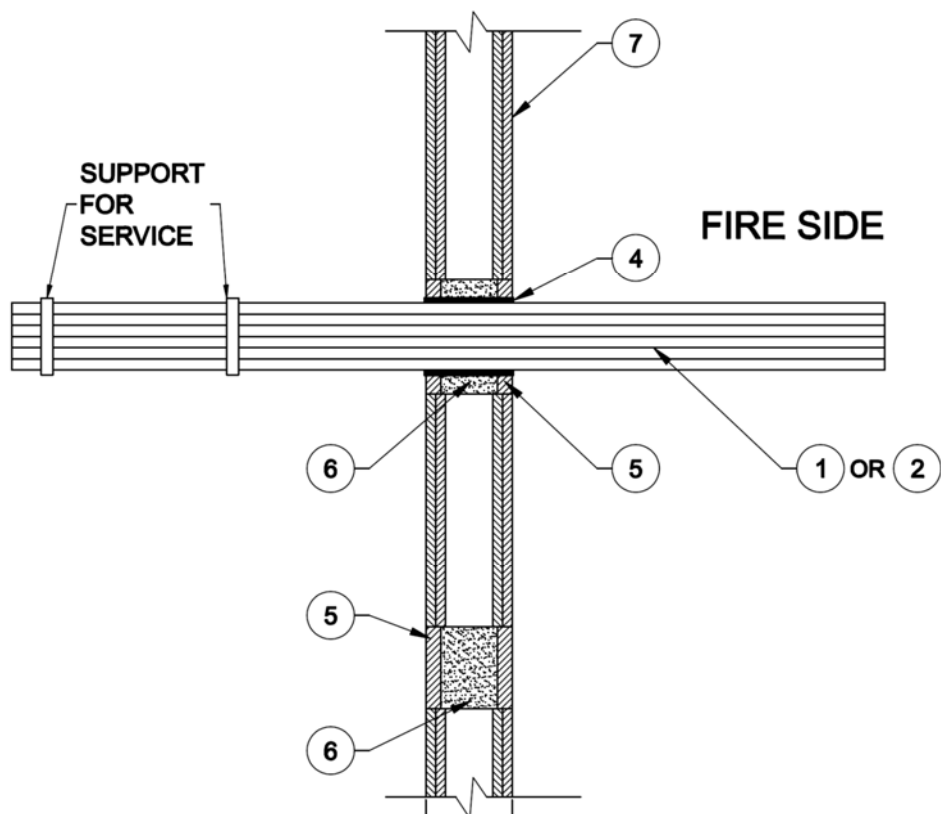


Figure 10 – Typical detail for unwrapped cables and blank penetration seals in plasterboard walls

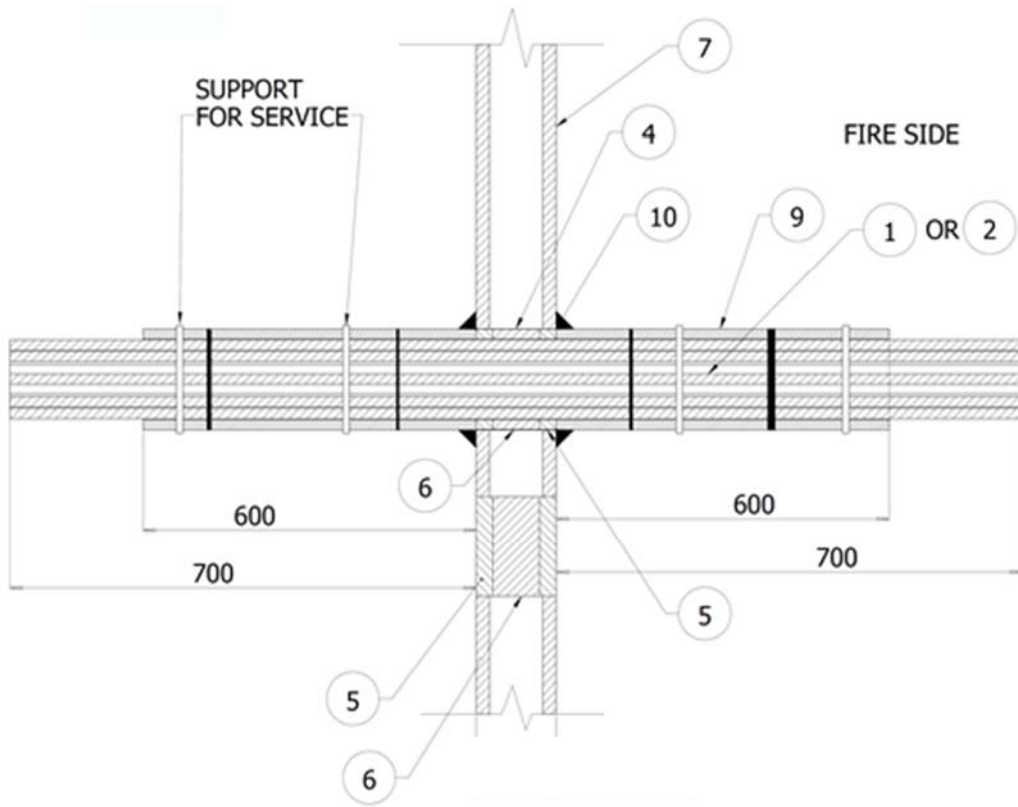


Figure 11 - Typical detail for wrapped cables in plasterboard lined walls

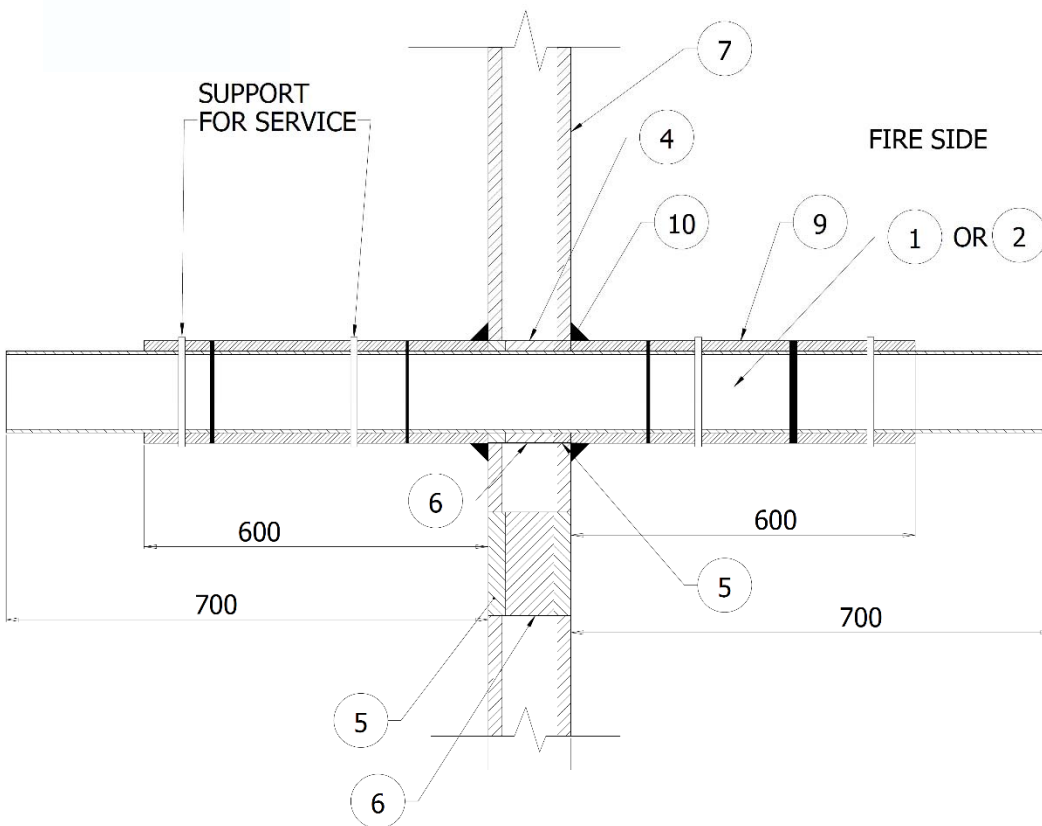


Figure 12 - Typical detail for wrapped pipes for plasterboard lined walls

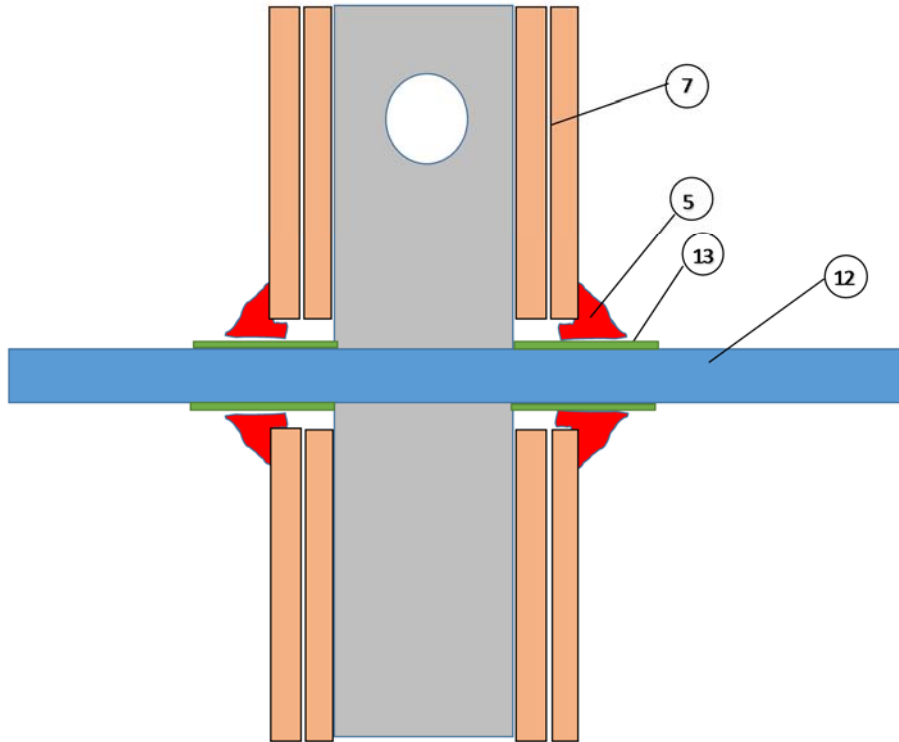


Figure 13 - Typical detail for wrapped conduits for plasterboard lined walls

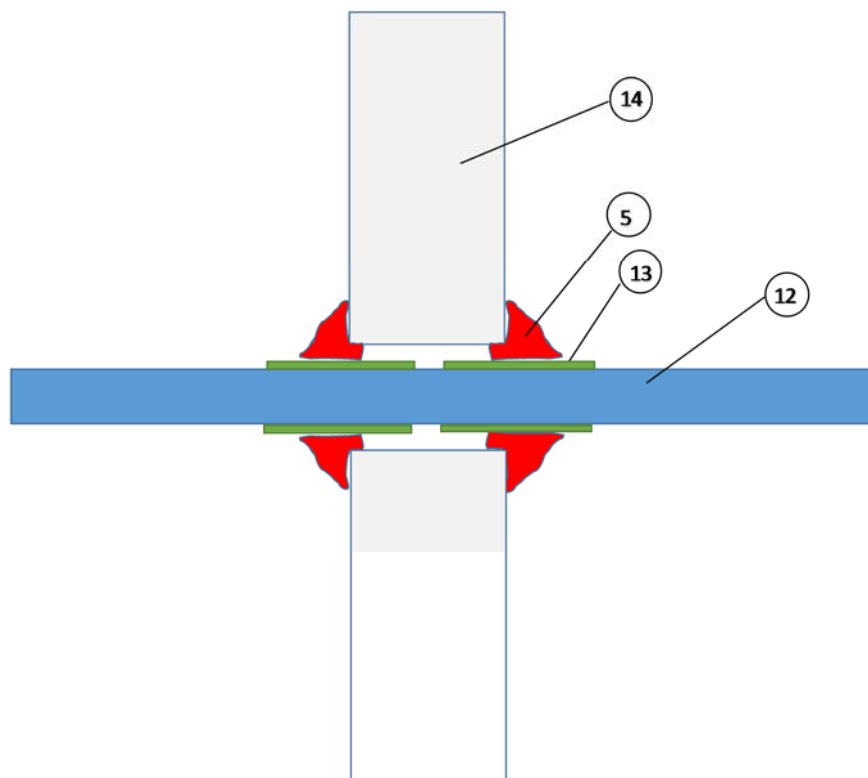


Figure 14 - Typical detail for wrapped conduits for AAC walls

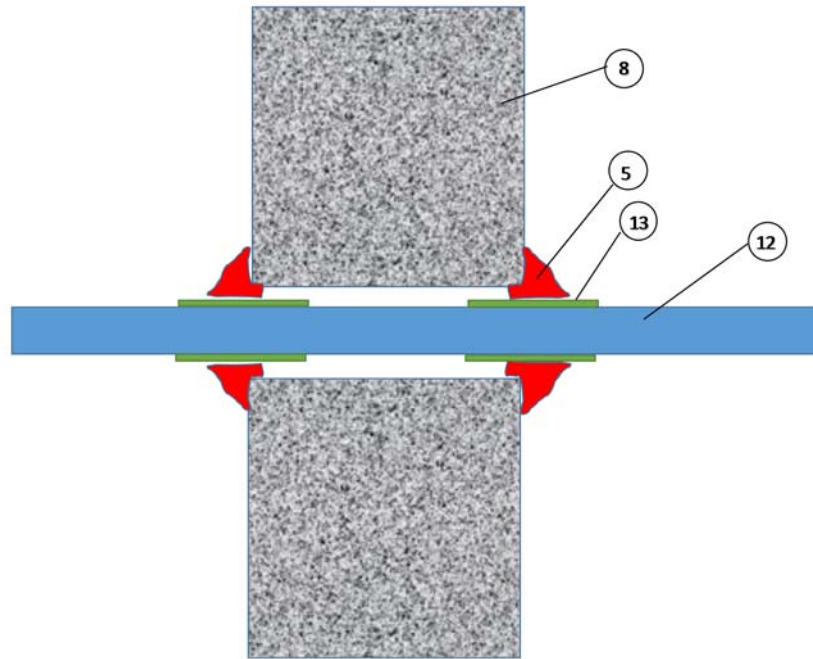


Figure 15 - Typical detail for wrapped conduits for concrete or masonry

6 Term of Validity

This assessment report will lapse on 31st January 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.

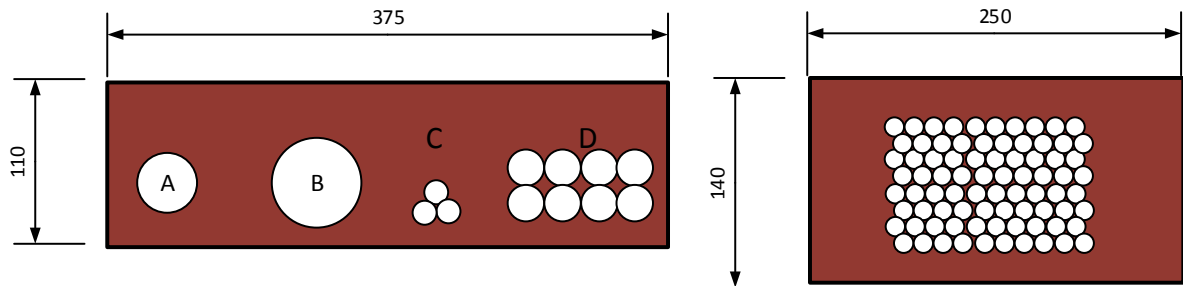
This assessment report does not provide an endorsement by CSIRO of the actual products supplied to industry. The referenced assessment can therefore only relate only to the actual prototype test specimens, testing conditions and methodology described in the supporting data, and does not imply any performance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

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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