

Technical Bulletin

Assessment Reports and Evidence of Suitability | Service Penetrations

To comply with the National Construction Code (NCC), a building solution must fulfill the Performance Requirements. This can be accomplished primarily through the following three pathways:

1. Adhering to the Deemed-to-Satisfy Provisions:

These provisions outline specific, pre-approved methods and materials that, when employed, ensure compliance with the Performance Requirements.

2. Developing an Alternative/Performance Solution:

This approach involves developing a unique site-specific solution that either:

- I. Directly meets the Performance Requirements, or
- II. Demonstrates equivalence to or surpasses the level of performance attained by the Deemed-to-Satisfy Provisions. or

3. Combination of 1 & 2

Note on Performance Solutions: A Performance Solution directly addresses the Performance Requirements by using one or more of the Assessment Methods available in the NCC. However, there is no pathway for assessing a non-tested or assessed elements required to have an FRL to AS1530.4 & AS4072.1 ”

In the NCC 2022, D+S solutions provide prescriptive methods for complying with the performance requirements outlined in the code. They act as a simplified approach to ensure that the building design meets essential performance criteria. Part C of NCC 2022 focuses on fire resistance, specifically aiming to minimize the spread of fire within and between the buildings which in turn enhances public safety and protects occupants during fire emergencies. Here, C1P1 to C1P9 establish performance requirements that contribute to achieving the objectives outlined in C1O1.

The NCC also discusses safeguarding against spread of fire within a building through service penetrations or the like by listing performance requirements specifically for this. They are outlined in C1P8. In the context of protecting openings and service penetrations, compliance with the NCC can be achieved by satisfying the performance requirements outlined in C1P8. C1P8 states that,

“Any building element which is provided to resist the spread of fire must be protected to a certain degree depending upon its FRL, so that an adequate level of performance is maintained.

- (a) Where opening, construction joint and the like occur.
- (b) Where penetrations occur for the building service.”

DtS provisions for the above performance requirements have been set in Part C4 of NCC 2022. It covers the protection of openings such as windows, doors, services, and construction joints to reduce the risk of fire spread within or between buildings. C4D1 states that

- (a) “Where a Deemed-to-Satisfy Solution is proposed, Performance Requirements C1P1 to C1P9 are satisfied by complying with—
 - (i) C2D2 to C2D15, C3D2 to C3D15 and C4D2 to C4D17; and
 - (ii) in a building containing an atrium, Part G3; and
 - (iii) for a building containing an occupiable outdoor area, Part G6; and
 - (iv) for additional requirements for Class 9b buildings, Part I1; and
 - (v) for farm sheds, Part I3.

The Performance Requirements of C1P8 that relates to opening and service installations can be met if it complies with (i) of C4D1.

C4D1: Deemed-to-Satisfy Provisions

C4D2: Application of Part

C4D3: Protection of openings in external walls

C4D4: Separation of external walls and associated openings in different fire compartments

C4D5: Acceptable methods of protection

C4D6: Doorways in fire walls

C4D7: Sliding fire doors

C4D8: Protection of doorways in horizontal exits

C4D9: Openings in fire-isolated exits

C4D10: Service penetrations in fire-isolated exits

C4D12: Bounding construction: Class 2 and 3 buildings and Class 4 parts

C4D13: Openings in floors and ceilings for services

C4D14: Openings in shafts

C4D15: Openings for service installations

C4D16: Construction joints

C4D17: Columns protected with lightweight construction to achieve an FRL

Within the Deemed-to-Satisfy (DTS) provisions outlined in the above, three clauses stand out as particularly relevant to openings and service penetrations, C4D13, C4D14 and C4D15.

C4D13 Openings in floors and ceilings for services:

This clause discusses openings for service penetrations through ceilings required to have resistance to incipient spread of fire (RISF) and penetrations through floors required to have an FRL. These penetrations should be protected by a shaft that complies with Specification 5 for type A construction, a shaft that will not reduce the fire performance of the building element for Type B and C construction and should be in accordance with C4D15.

C4D14 Openings in shafts:

In a building of Type A construction, an opening in a wall providing access to a ventilating, pipe, garbage or other service shaft must be protected by

1. —if it is in a sanitary compartment — a door or panel which, together with its frame, is non-combustible or has an FRL of not less than –/30/30; or
2. a self-closing –/60/30 fire door or hopper; or
3. an access panel having an FRL of not less than –/60/30; or
4. if the shaft is a garbage shaft — a door or hopper of non-combustible construction.

C4D15 Openings for service installations:

C4D15 is the most recognized clause in NCC 2022 that contains D-t-S performance requirements and solutions with regards to the protection of different types of service penetrations through building elements including ceilings required to have RISF but excludes external walls and roof. and or through fire resistant building elements.

1. The requirements of (2) apply where an electrical, electronic, plumbing, mechanical ventilation, air-conditioning or other service penetrates a building element (other than an external wall or roof) that is required to have an FRL with respect to integrity or insulation or a resistance to the incipient spread of fire.
2. Installation methods in (1) must comply with any of the following:
 - I. Tested System- the following applies.
 - a. Compliance with this provision mandates testing an identical prototype of the proposed service penetration system to ensure its Fire Resistance Level (FRL) remains uncompromised when exposed to fire. The test must be conducted as per AS1530.4 standards to verify the effectiveness of the penetration protection system in maintaining the element's FRL.
 - b. differs from a prototype assembly of the service, building element and protection method in accordance with Section 4 of AS 4072.1.
 - II. It complies with (1) except for the insulation criteria relating to the service if—
 - a. the service is a pipe system comprised entirely of metal (excluding pipe seals or the like); and
 - b. any combustible building element is not located within 100 mm of the service for 2 m from the penetration; and
 - c. combustible material is not able to be located within 100 mm of the service for 2 m from the penetration; and it is not located in a required exit.
 - III. The determination of the required FRL must be confirmed in a report from an Accredited Testing Laboratory in accordance with Specifications 1 and 2.

1. Ventilation and air-conditioning — in the case of ventilating or air-conditioning ducts or equipment, the installation is in accordance with AS 1668.1.
2. Compliance with Specification 13

To summarise, if we have a report from an accredited Laboratory which meets the requirements of C4D15 (2) Part (a) and (III) or (2) Part (b) and (III) for a particular service passing through a particular substrate and contains construction/firestopping details with the achieved FRL's, compliance has been met with the requirements for the determination of FRL.

Specification 13 provides a prescriptive approach to achieving compliance for diverse service penetrations through various fire-resistant substrates. However, it is crucial to understand that an FRL cannot be assigned to the service penetration via this route. Each section within the specification outlines specific criteria and limitations that must be strictly adhered to for compliance. If any of these criteria cannot be met, specification 13 cannot be used to meet compliance, and the use of a tested system becomes mandatory. As an example, Specification 13 is not suitable for sprinkler or fire hydrant pipes as they are normally filled with water.

Evidence of Suitability

For evidence of FRL, various forms of documented evidence, often referred to as "Evidence of Suitability," must be submitted and utilized. This evidence serves to verify that the openings and service penetrations within a building complies with the NCC requirements.

If under a Deemed-to-Satisfy Provision a building element is required to have an FRL, then A5G3 [2019: A5.2] may be used to provide evidence to show that the FRL has been determined and contains the following:

- (1) **Subject to A5G5, A5G6, A5G7 and A5G9**, evidence to support that the use of a material, product, form of construction or design meets a Performance Requirement, or a Deemed-to-Satisfy Provision may be in the form of anyone, or any combination of the following:
 - (a) CodeMark or CodeMark Australia Certificate of Conformity: provides independent confirmation that a building product or system complies with the NCC. The Certificate of Conformity must outline any conditions or limitations on the use of the building product or system.
 - (b) Certificate of Accreditation: A Certificate of Accreditation is issued by a State or Territory accreditation authority under the applicable State or Territory building legislation. A State or Territory accreditation authority will assess a building component for compliance with the NCC.
 - (c) Certificate issued by a certification body.
 - (d) Report issued by an Accredited Testing Laboratory: Accredited Testing Laboratories issues reports to show that a particular building element has been subjected to a test and shows results as well as other information that proves its suitability.
 - (e) A certificate or report from a professional engineer or other appropriately qualified person
 - (f) Another form of documentary evidence, such as but not limited to a Product Technical Statement.

For Fire resistance Level, A5G3 is subjected to **A5G5**, which trumps all other statements above A5G3. A5G5 states that

“Where a Deemed-to-Satisfy Provision requires a building element to have an FRL, it must be determined in accordance with Specifications 1 and 2”.

Therefore, a building element is required to have an FRL determined in accordance to Specification 1 or Specification 2 given below:

Specification 1 - This Specification sets out the procedures for determining the FRL of building elements

“A building element (not specifically service penetrations) meets the requirements of Specification 1 if—

- (a) It is listed in and complies with Tables S1C2a to S1C2n. These tables describe the FRL’s as a function of material thickness for a range of generic construction materials – such as solid concrete, gypsum blocks and calcium silicate masonry. In this case – no testing is needed, and the FRL is deemed based on the tables.
- (b) It is identical with a prototype that has been submitted to the *AS1530.4* equivalent of more severe fire test and the FRL achieved by the prototype is confirmed in a report from an *Accredited Testing Laboratory*
- (c) It differs in only a minor degree from a prototype tested under (b) above and the FRL attributed to the building element is confirmed in an assessment report from an *Accredited Testing Laboratory*.
- (d) It is designed to achieve the FRL in accordance with—
 - (i) AS/NZS 2327, AS 4100 and AS/NZS 4600 if it is a steel or composite structure; or
 - (ii) AS 3600 if it is a concrete structure; or
 - (iii) AS 1720.4 if it is a timber element other than *fire-protected timber*; or
 - (iv) AS 3700 if it is a masonry structure; or
- (e) the FRL is determined by calculation based on the performance of a prototype in the Standard Fire Test and confirmed in a report in accordance with S1C3; or
- (e) for *fire-protected timber*, it complies with Specification 10 where applicable”.

Specification 2 - Description of elements referred to in Specification 1

“This Specification sets out the descriptions of generic elements referred to in Tables S1C2a to S1C2j, S1C2l and S1C2m of Specification 1. However, they are not directly relevant to fire stopping penetrations.

For Evidence of suitability reports issued by Registered Testing Authorities can take various forms: Test Reports and Regulatory Information Reports (RIR). The information in RIR is based on testing and assessment permitted with NCC referenced Australian standards). These reports invariably contain, but are not limited to, the following crucial information:

Compatible Substrates: This details the types of surfaces (e.g., Speed panel walls, FR plasterboard walls, block walls, Hebel, concrete floors, FR plasterboard ceilings) to which the primary fire stopping product can be securely adhered, along with specific construction details for each application.

Maximum Opening Size: This specifies the maximum allowable opening size in each compatible substrate that the main fire stopping product can effectively protect.

Product Orientation: This clarifies whether the primary fire stopping product is intended for horizontal or vertical installation.

Permitted Services and Local Fire Stopping: This identifies the services permitted to pass through the main fire stopping seal and outlines the specific products or systems required for their local fire protection.

It's important to note that while Test Reports have indefinite validity, Formal Opinions, Regulatory Information Reports (RIR), are subject to a 10-year expiration period from their date of issue, as stipulated in Section 4.2 subsection (c) (ix) of AS4072.1-2005.

AS 4072.1-2005 is an Australian Standard that sets out the requirements for the testing, interpretation of test results, and installation of penetration sealing systems and control joints sealing systems in fire-resistant elements of construction. The standard is based on the testing of standard configurations and provides minimum requirements for these fire-stopping systems. It is to be read in conjunction with the testing standard set out in AS 1530.4.

FIREFLY's RIRs are either tested to AS1530.4 (2014) or assessed to AS4072.1 (2005) and meet the requirements of the NCC for evidence of Suitability. For user's convenience, we have divided our RIR reports into the following three categories.

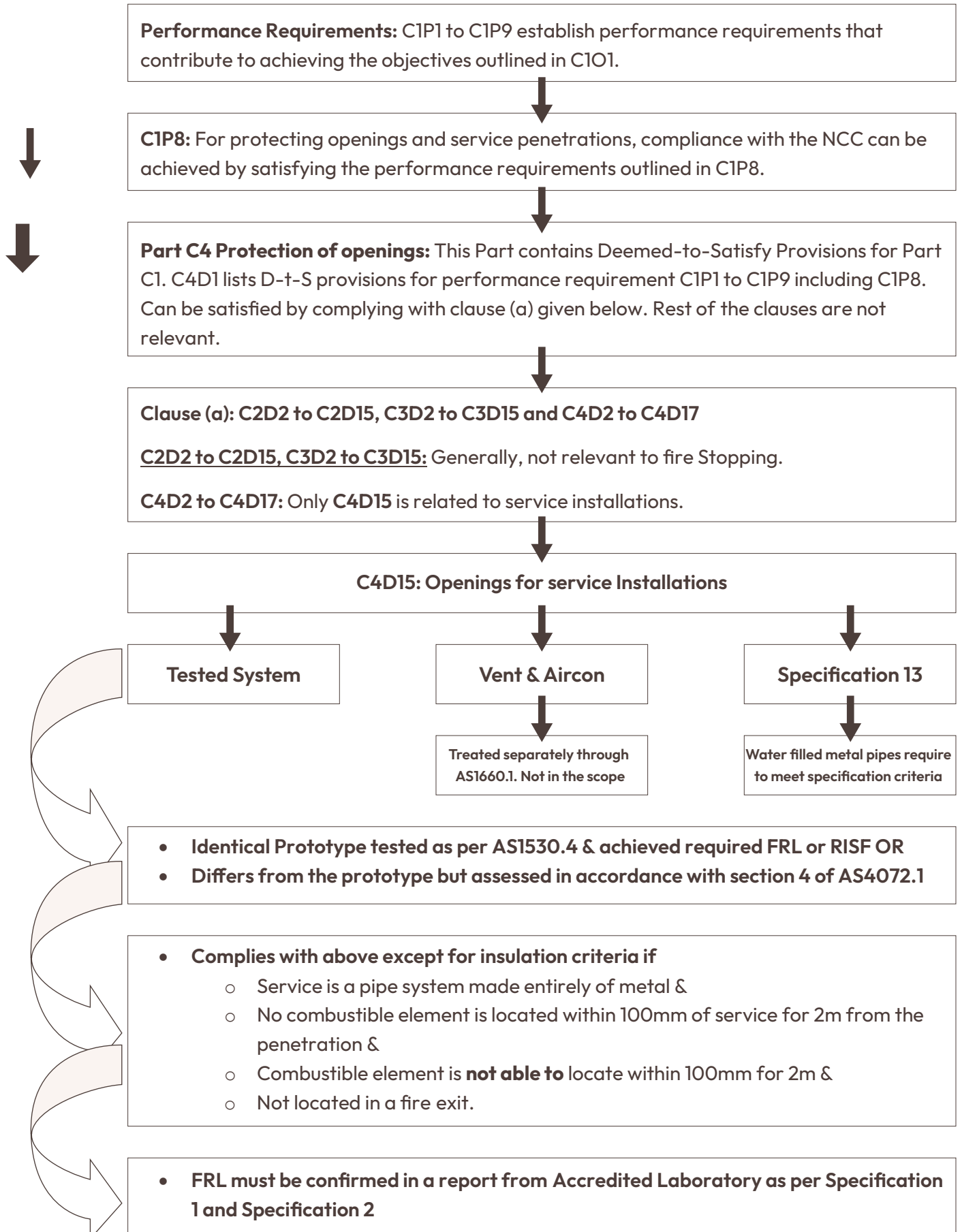
FAS190234: FIREFLY BATT SUBSTRATE REPORT

FAS190235: SERVICES THROUGH FIREFLY BATT

FAS190236: SERVICES THROUGH CORE HOLE REPORT



These Systems in the report are tested and assessed to AS1530.4:2014 and AS4072.1:2005 with report from a NATA Accredited Testing Laboratory and sets a benchmark for excellence in testing and assessments. The reports combine rigorous testing and assessment process to ensure compliant fire protection solutions and align with NCC 2022 requirements, enhancing regulatory compliance.



A5G3: Evidence of Suitability- Vol 1 and 2

(1) Subject to **A5G5**, **A5G6**, **A5G7** and **A5G9**, evidence to support that the use of a material, product, form of construction or design meets a Performance Requirement, or a Deemed-to-Satisfy Provision may be in the form of any one, or any combination of the following:

- a) A current CodeMark Australia or CodeMark Certificate of Conformity.

A5G3 is subjected to **A5G5** which trumps all statements below (1). Where an FRL is required, go directly to **A5G5** for further evidence.

A5G5: Fire-resistance of building elements

Where a Deemed-to-Satisfy Provision requires a building element to have an FRL, it must be determined in accordance with Specifications 1 and 2.

Specification 1

A building element meets the requirements of this Specification if—

- (a) it is listed in, and complies with Tables S1C2a, S1C2b, S1C2c, S1C2d, S1C2e, S1C2f, S1C2g, S1C2h, S1C2i, S1C2j, S1C2k, S1C2l, S1C2m or S1C2n of this Specification as applicable; or
- (b) it is identical with a prototype that has been submitted to the Standard Fire Test, or an equivalent or more severe test, and the FRL achieved by the prototype without the assistance of an active fire suppression system is confirmed in a report from an Accredited Testing Laboratory which—
 - i. describes the method and conditions of the test and the form of construction of the tested prototype in full; and
 - ii. certifies that the application of restraint to the prototype complied with the Standard Fire Test; or
- (c) it differs in only a minor degree from a prototype tested under (b) and the FRL attributed to the building element is confirmed in a report from an Accredited Testing Laboratory which—
 - i. certifies that the building element is capable of achieving the FRL despite the minor departures from the tested prototype; and
 - ii. describes the materials, construction and conditions of restraint which are necessary to achieve the FR;

Standard materials such as brick & concrete etc

Tested Systems as per AS1530.4

Assessment report as per AS4072.1

Specification 2: Description of elements in Spec 1

S2C1

This Specification sets out the descriptions of elements referred to in Tables S1C2a, S1C2b, S1C2c, S1C2e, S1C2f, S1C2g, S1C2h, S1C2i, S1C2j, S1C2l and S1C2m of Specification 1.

S2C2: Mortar for masonry

S2C3: Gypsum blocks

S2C4: Gypsum-sand mortar and plaster

S2C5: Gypsum-perlite and gypsum-vermiculite plaster

S2C6: Plaster of cement and sand or cement, lime and sand

S2C7: Plaster reinforcement

S2C8: Ashlar stone masonry

S2C9: Dimensions of masonry

S2C27: Measurement of thickness of column and beam protection

Not relevant to Fire Stopping of Penetration services