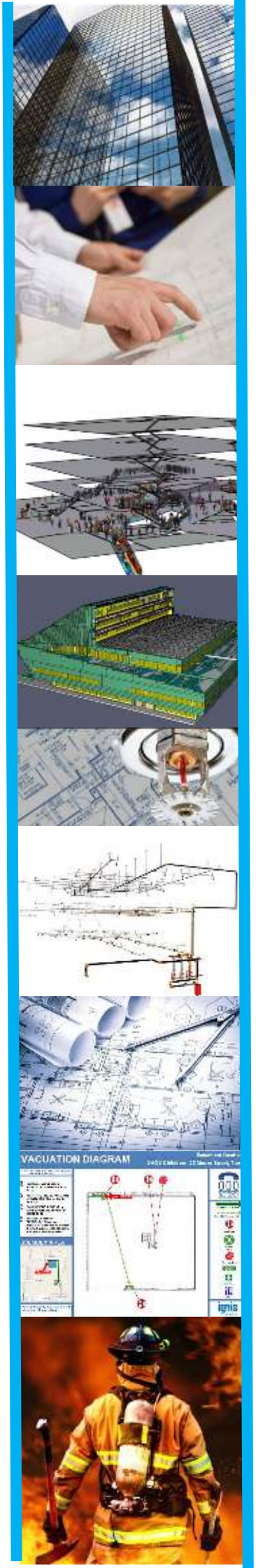

PROFESSIONAL FIRE SAFETY ENGINEERS

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QT PANEL

VERIFICATION METHOD

IGNS-8108 I01 R01

Issued: 13.05.2020

Valid for:

- NCC Vol 1 BCA 2019

DOCUMENT REVISION HISTORY

Issue	Revision	Date	Purpose of Issue	Prepared by	Reviewed by
01	00	09.05.2020	Issued to client	BHB	
01	01	13.05.2020	Revised	BHB	

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Written and Authorised by
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CONDITIONS AND LIMITATIONS

This assessment report does not provide an endorsement by Ignis Solutions Pty Ltd of the actual product evaluated.

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

Because of the nature of fire 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.

The assessment can therefore relate only to the actual prototype test specimens, testing conditions and methodology described in the referenced documents, 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.

This report is prepared in good faith and with due care for information purposes only, and should not be relied upon as providing any warranty or guarantee. In particular, attention is drawn to the nature of the inspection and investigations undertaken and the limitations these impose in determining with accuracy the state of the building, its services or equipment and life safety.

Ignis Solutions' involvement in the Project is limited to the role outlined in section 2 'Scope of Service' of the Letter. This report reflects that role. Any reliance on, or use of, this report for purposes outside the scope of service is at the user's own risk.

Ignis Solutions shall not be held liable for any loss or damage resulting from any defect of the building or its services or equipment or for any non compliance of the building or its services or equipment with any legislative or operational requirement, whether or not such defect or non-compliance is referred to or reported upon in this report, unless such defect or non-compliance should have been apparent to a competent engineer undertaking the evaluation of the type undertaken for the purpose of preparation of this report.

Ignis Solutions has carefully reviewed and applied to the best of our ability the requirements of local Legislation, the NCC and the International Fire Engineering Guidelines.

TABLE OF CONTENTS

1 INTRODUCTION

1.1 General

The purpose of this assessment is to report the applicable use and compliance of the QT Panel external wall board against the requirements of the National Construction Code – Volume One – Building Code of Australia, 2019 (BCA) through Verification Method CV3.

1.2 Product

The QT Panel are constructed of Conpolcrete, a cementitious mixture containing recycled polystyrene. The QT Panel is fixed to a stud frame. The QT Panel is to be rendered by an appropriate and tested render system.

1.3 National Construction Code Clause

The following clauses of the BCA have been evaluated and identified as being complied with:

External wall

External wall fixed to studs

- Performance Requirement CP2
  - Verification Method CV3(b) external wall system
  - AS 5113:2016
    - Sub-clause (a)(ii) ceiling linings that comply with Specification C1.10 Clause 4

QT Panel	
External Wall Classification	EW

1.4 Application and Required Fire Safety Measures

From the above testing the QT Conpolcrete Panel has been evaluated and deemed suitable for use in Australia in Class 2-9 buildings as a rendered external wall panel.

Type A Construction

As per NCC Verification Method CV3(c) the subject building is to be protected throughout by a sprinkler system (other than a FPAA101D or FPAA101H system) complying with Specification E1.5 and has the

(i) Sprinkler protection to balconies, patios and terraces, and where overhead sprinkler coverage is not achieved alongside the external wall, sidewall sprinkler heads are provided at the external wall for the extent of the balcony, patio or terrace where overhead sprinkler coverage is not achieved; and

(ii) For a building with an effective height greater than 25m-

a. Monitored stop valves provided at each floor level arranged to allow the isolation of the floor level containing the stop valve while maintaining protection of the reminder of the building; and

b. The sprinkler system being capable of providing sufficient flow to serve the design area required by AS 2118.1 for the relevant hazard class on each floor level plus the design area required by AS 2118.1 for the floor level above, except where the former level is-

i. The floor level below the uppermost roof; or

ii. Any floor level that is wholly below ground.

Type B Construction

As per NCC Verification Method CV3(d) in a building of Type B construction, the building is-

(i) A Class 5, 6, 7 or 8 building or Class 4 part of a building; or

(ii) A Class 2, 3, or 9 building that-

a. Is protected throughout by a sprinkler system (other than a FPAA101D or FPAA101H system) complying with BCA Specification E1.5; or

b. Has any openings in external walls separated by a slab or other horizontal construction complying with BCA C2.6(a)(iv) as if the building were of Type A construction.

This evaluation report relates only to the product and associated installation as described herein and is based on the results evidenced by the accredited test reports as detailed herein.

Ignis Solutions Pty Ltd makes no warranty as to the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship.

2 QT PANEL AS 5113 TEST INSTALLATION

The test included 50mm QT Systems Conpolcrete panels fixed to steel studs with 10mm non-combustible cement render. The QT System was fixed to two layers of 13mm fire grade plasterboard in accordance with Clause 5.4.4 of AS 5113-2016 Amendment 1:2018 which has been used to represent the non-combustible inner leaf.

The wall system consists of the following wall elements from the non-fire affected side. The construction of the wall is detailed below.

- 2 x 13mm Fire rated plasterboard | CSR Fyrecheck (fixed to test wall sub-frame)
- Steel Top hats 20x25x50x25x20 1.15BMT fixed to stud frame through the fire grade plasterboard at 450mm spacings.
- 50mm QT panel horizontally installed with QT Buttons and fixed with 12-14 x 50mm Metal hex screws.
- The vertical joint as well as the horizontal joint located at 2.4m above the combustion chamber were installed as control joints with a 10mm gap. Polyurethane backing rod was installed and the gap sealed with Bostic FireBan One to a depth of 10mm.
- 10mm non-combustible concrete render was installed over the completed QT Conpolcrete wall system.

The TCS render has been tested to AS 1530.1:1994 and deemed not to be combustible. This is documented within report IGNL-2036-01 I02R00 dated 07 March 2020.

FIGURE 1:

QT SYSTEM FIXING SYSTEM

FIGURE 2:

QT SYSTEM INSTALLATION

3 REGULATORY COMPLIANCE

3.1 National Construction Code

The National Construction Code Volume One Building Code of Australia 2019 establishes the requirements of compliance through Provisions A5.1, A5.2 and A5.3 where the evidence of suitability is documented.

3.2 Evidence of Suitability

The Australian Building Codes Board have published a handbook on the provision of evidence of suitability. The Handbook has been developed as a companion document to the evidence of suitability provisions in A5.1, A5.2 and A5.3 of each volume of the National Construction Code (NCC). It addresses the issues in generic terms, and is not a document that sets out specific requirements contained in the NCC, but rather aims to explain their intent.

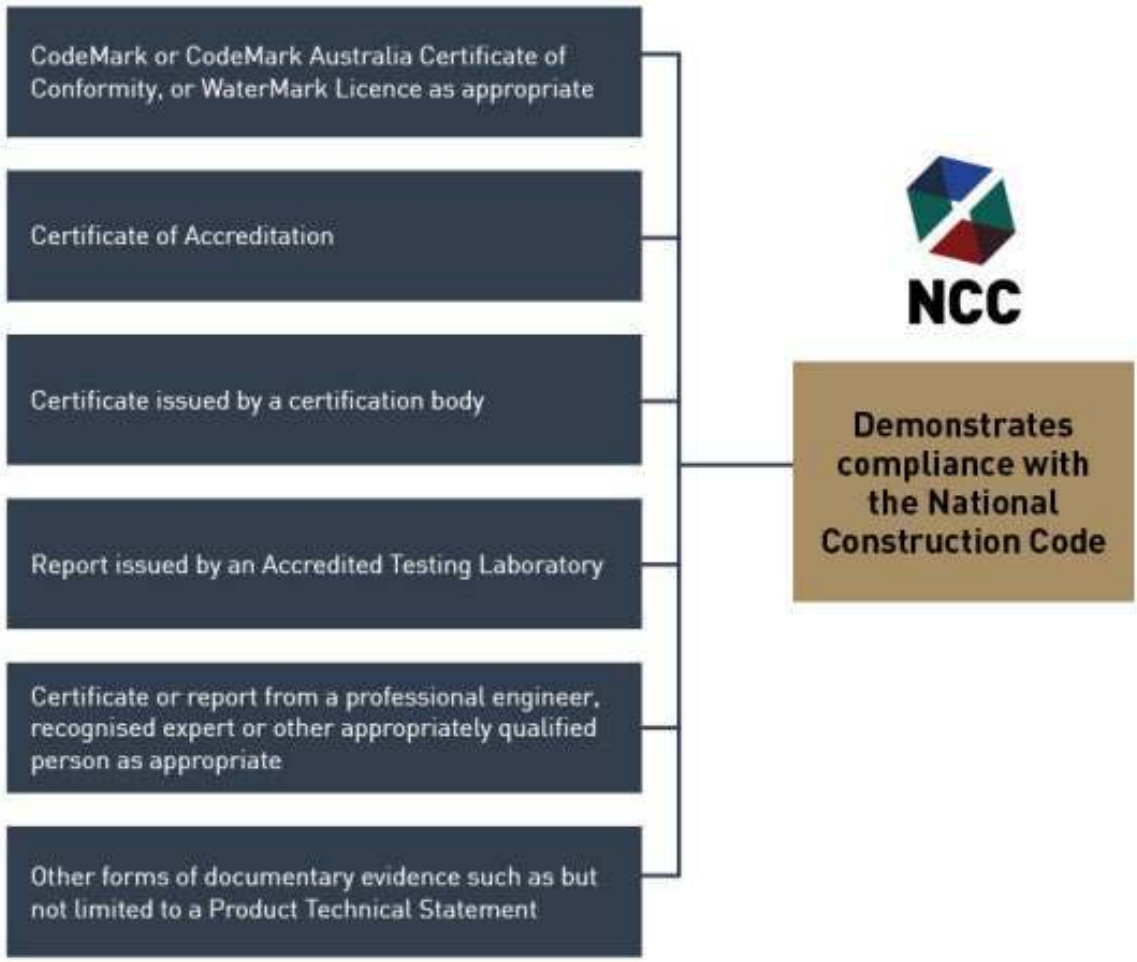
The Handbook includes an evidence of suitability framework and a decision flow chart to assist in the correct use of the evidence of suitability provisions of the NCC.

3.3 Clause A5.2

The most appropriate form of evidence of suitability to be used will vary depending on the specific circumstance. The forms of evidence have been arranged in a framework to reflect a hierarchy of rigour, with the options listed higher providing stronger forms of evidence.

FIGURE 3:

NCC EVIDENCE OF SUITABILITY FRAMEWORK



3.4 Clause A5.2

Ignis Labs follows the requirements of ISO 17025 in its testing procedures. Clause A5.2 of the Building Code of Australia establishes the evidence of suitability for buildings and details that the evidence to support that the use of a material or product meets a Deemed-to-Satisfy Provision may be in the form of any one, or any combination of the following.

- A report issued by an Accredited Testing Laboratory; or
- A certificate or report from a professional engineer.

Either of the documents listed above are to demonstrate or certify that a material or product fulfils specific requirements of the NCC; and sets out the basis on which it is given and the extent to which relevant standards, specifications, rules, codes of practice or other publications have been relied upon to demonstrate its suitability for use in the building.

It is important to note that the National Association of Testing Authorities (NATA) is not the only accreditation organisation operating in Australia. The criteria is established through the International laboratory Accreditation Cooperation (ILAC) where the Asia Pacific Accreditation Cooperation is the parent organisation where they provide accreditation to the likes of NATA and the Australian Laboratory Accreditation Body (ALAB).

Ignis Labs has completed a peer review, administration review and management review through the NATA accreditation process and are waiting on the final accreditation documentation.

3.5 Summary

This report is issued by Benjamin Hughes-Brown, Chartered Professional Engineer of Ignis Solutions Pty Ltd, Suite 16, 14 Lonsdale Street, Braddon, ACT, 2612 for use under the Deemed-to-Satisfy and Performance Requirements of the National Construction Code Volume One – Building Code of Australia 2016 (BCA). This engineering evaluation serves as a certificate from a professional engineer in accordance with Clause A5.2(1)(e) of Building Code of Australia 2019.

4 TESTING OF MATERIAL

4.1 AS 5113.1:2016

Ignis Labs has undertaken material fire safety testing of the QT Conpolcrete inline with the requirements of BS 8414.2-2015 as modified by AS 5113-2016 and Amendment 1:2018. The following table details the results of the test.

TABLE 1:

SPECIMEN RESULTS AND CLASSIFICATIONS

Classification Criteria	Related Classification Measure	Pass/Fail
5.4.5(a)T_{w5m}	≤600°C	Max 717˚C spike @ 15 min <10s | PASS
5.4.5(b)$T_{Insulation5m}$	≤250°C	Max 55˚C | PASS
5.4.5(b)$T_{Cavity5m}$	≤250°C	Max 101˚C | PASS
5.4.5(c)$T_{unexposedside0.9m}$	≤180°C	Max 27˚C | PASS
5.4.5(d)flaming	No flaming	No flaming | PASS
5.4.5(d)openings	No openings	No openings | PASS
5.4.5(e)spread	No spread beyond specimen	No spread occurred | PASS
5.4.5(f)debris flaming	≤20s	No Flaming debris | PASS
5.4.5(g)debris mass	≤2kg	No debris | PASS
Classification		**EW**

FIGURE 4:

AS 5113 TEST START AND 10 MINUTES

4.2 AS 1530.1-1994

Ignis Labs has undertaken a AS 1530.1:1994 non-combustible test on the cement render as the applied product used as a whole on the tested wall system. The test results are detailed below. The systems compliance under AS 5113 included the cement render.

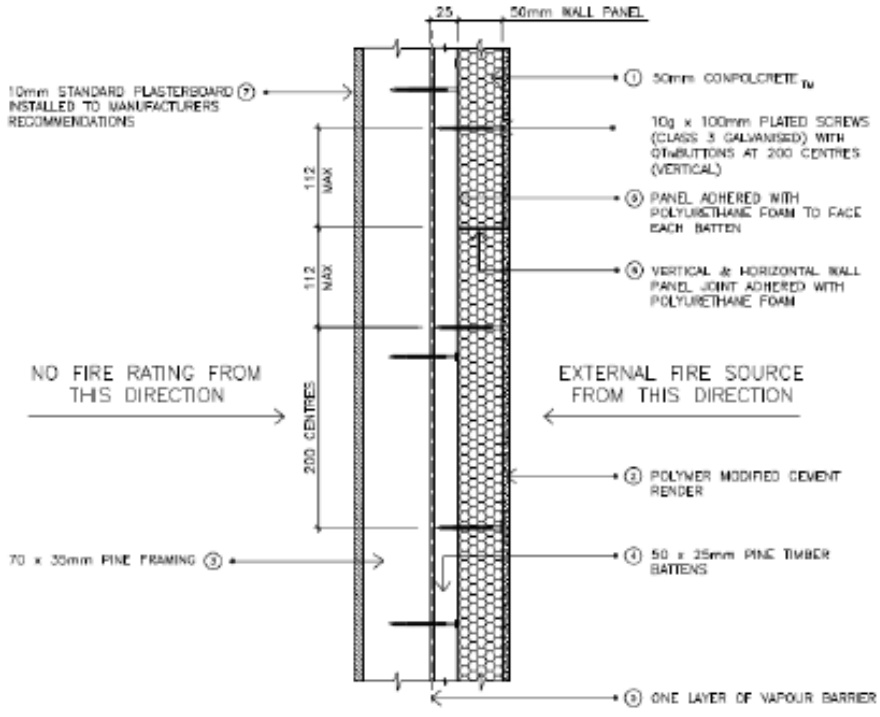
TCS Cement Render	
IGNL 2036-01-01 I02R00	07 March 2020
Furnace temp rise	10.62°C
Mean surface rise	12.3°C
Mean flaming	0 Seconds
Mean mass loss	17.13%
Classification	Non-Combustible

4.3 AS 1530.4-2005

Warringtonfire research has undertaken a AS 5113.1:2016 testing in accordance with Clause 5.2(b)(i) exposed to 80kW/m^2. The test was documented in report 44388000.1 dated 25 November 2016.

The wall was constructed from 50mm thick QT exterior wall panel installed in the horizontal orientation that were rendered to the exposed side and fixed to the exposed side of a timber frame wall that was faced with 10mm thick plasterboard to the unexposed side.

The test satisfied the requirement of BB80 in accordance with AS 5113.1:2016. The following image is of the test specimen.



5 DEFINITION AND REFERENCES

5.1 Definitions

Within the BCA a hierarchy of defined terms is established. The first level is defined terms as per Clause A1.1 of the BCA. The second level is the reference standard and the third is the Australian Macquarie Dictionary.

Flammability Index means the index number as determined by AS 1530.2.

Fire hazard properties means the following properties of a material or assembly that indicate how they behave under specific fire test conditions:

(a) Average specific extinction area, critical radiant flux and Flammability Index, determined as defined in A1.1.

(b) Smoke-Developed Index, smoke development rate and Spread-of-Flame Index, determined in accordance with Specification A2.4.

(c) Group number and smoke growth rate index ($SMOGRA_{RC}$), determined in accordance with Specification C1.10.

Group number means the number of one of four groups of materials used in the regulation of fire hazard properties and applied to materials used as a finish, surface, lining, or attachment to a wall or ceiling.

Insulation, in relation to an FRL, means the ability to maintain a temperature on the surface not exposed to the furnace below the limits specified in AS 1530.4.

Reflective insulation means a building membrane with a reflective surface such as a reflective foil laminate, reflective barrier, foil batt or the like capable of reducing radiant heat flow.

Sarking-type material means a material such as a reflective insulation or other flexible membrane of a type normally used for a purpose such as water proofing, vapour proofing or thermal reflectance.

Smoke-Developed Index means the index number for smoke as determined by AS/NZS 1530.3.

Smoke growth rate index ($SMOGRA_{RC}$) means the index number for smoke used in the regulation of fire hazard properties and applied to materials used as a finish, surface, lining or attachment to a wall or ceiling.

Spread-of-Flame Index means the index number for spread of flame as determined by AS/NZS 1530.3.

5.2 References

The following information sources were used in the evaluation of the product. These references should be read in conjunction with this report.

[1] National Construction Code – 2016 – Volume One – Building Code of Australia Class 2 to 9 Buildings, 2016.
[2] Guide to the Building Code of Australia 2016 – Volume One, Class 2 to Class 9 Buildings', Australian Building Codes Board, 2016 (the Guide).
[3] International Fire Engineering Guidelines, Australian Building Codes Board, Canberra, 2005
[4] AS 5637.1:2015 Determination of fire hazard properties – wall and ceiling linings
[5] AS ISO 9705:2003 Fire tests – full scale room test for surface products
[6] AS/NZS 3837:1998 Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter.
[7] Ignis Labs AS 5113 report IGNL-3282-08 I02 R00 dated 07 March 2020
[8] Ignis Labs non-combustible test certificate AS 1530.1:1994 IGNL-2036-01-01 I02R00 dated 07 March 2020.
[9] Warringtonfire AS 5113 report 44388000.1 dated 25 November 2016

6 EXTERNAL WALL APPLICATION

6.1 Introduction

Compliance with CP2 to avoid the spread of fire via the external wall of a building is verified through CV3. The details of CP2 and CV3 are detailed below. In accordance with NCC 2019 Schedule 7. The fire safety verification method provides a process for engineering the design of fire safety Performance Solutions.

In accordance with Design Scenario (VS – Vertical fire spread involving external cladding or external opening), the required outcome is to demonstrate that the buildings external cladding / façade and arrangement of openings in the building do not increase the risk of life resulting from a fire beyond that for a similar building complying with the Deemed-to-Satisfy Provisions.

As per Clause 2.6.2 of the fire safety verification method, satisfying the design scenario is achieved through demonstrating compliance with CV3.

6.2 BCA Performance Requirement, Verification Method and Methodology

The relevant BCA Performance Requirement is CP2 through Verification Method CV3 as detailed below:

FIGURE 5:

NCC – VOL 1 – PERFORMANCE REQUIREMENT CP2

CP2

(a) A building must have elements which will, to the degree necessary, avoid the spread of fire—

- (i) to *exits*; and
- (ii) to *sole-occupancy units* and *public corridors*; and

Application:
CP2(a)(ii) only applies to a Class 2 or 3 building or Class 4 part of a building.

- (iii) between buildings; and
- (iv) in a building.

(b) Avoidance of the spread of fire referred to in (a) must be appropriate to—

- (i) the function or use of the building; and
- (ii) the *fire load*; and
- (iii) the potential *fire intensity*; and
- (iv) the *fire hazard*; and
- (v) the number of *storeys* in the building; and
- (vi) its proximity to *other property*; and
- (vii) any active *fire safety systems* installed in the building; and
- (viii) the size of any *fire compartment*; and
- (ix) *fire brigade* intervention; and
- (x) other elements they support; and
- (xi) the *evacuation time*.

Source: ABCB NCC Volume One – Building Code of Australia

FIGURE 6:

NCC BCA VERIFICATION METHOD CV3

CV3 Fire spread via external walls

Compliance with CP2 to avoid the spread of fire via the *external wall* of a building is verified when—

(a) compliance with CP2(a)(iii) to avoid the spread of fire between buildings, where applicable, is verified in accordance with CV1 or CV2, as appropriate; and

(b) the *external wall* system—

(i) has been tested for external wall (EW) performance in accordance with AS 5113; and

(ii) has achieved the classification EW; and

(iii) if containing a cavity, incorporates cavity barriers and these cavity barriers have been included in the test performed under (i) at the perimeter of each floor; and

(c) in a building of Type A construction, the building is protected throughout by a sprinkler system (other than a FPAA101D or FPAA101H system) complying with Specification E1.5 and has—

(i) sprinkler protection to balconies, patios and terraces, and where overhead sprinkler coverage is not achieved alongside the *external wall*, sidewall sprinkler heads are provided at the *external wall* for the extent of the balcony, patio or terrace where overhead sprinkler coverage is not achieved; and

(ii) for a building with an *effective height* greater than 25 m—

(A) monitored stop valves provided at each floor level arranged to allow the isolation of the floor level containing the stop valve while maintaining protection to the remainder of the building; and

(B) the sprinkler system being capable of providing sufficient flow to serve the design area required by AS 2118.1 for the relevant hazard class on each floor level plus the design area required by AS 2118.1 for the floor level above, except where the former level is—

(aa) the floor level below the uppermost roof; or

(bb) any floor level that is wholly below ground; and

(d) in a building of Type B construction, the building is—

(i) a Class 5, 6, 7 or 8 building or Class 4 part of a building; or

(ii) a Class 2, 3 or 9 building that—

(A) is protected throughout by a sprinkler system (other than a FPAA101D or FPAA101H system) complying with Specification E1.5; or

(B) has any openings in *external walls* separated by a slab or other horizontal construction complying with C2.6(a)(iv) as if the building were of Type A construction.

Source: ABCB NCC Volume One – Building Code of Australia

6.2.1 Assessment Method

BCA Clause A2.2 (2)(b)(i) The Verification Methods provided in the NCC.

The following methodologies will be applied to the evaluation:

☑ Absolute	☑ Quantitative	☑ Deterministic
☐ Comparative	☑ Qualitative	☐ Probabilistic

Absolute approach

As outlined in the International Fire Engineering Guideline an absolute approach is typically when an evaluation is carried out on an absolute basis, the results of the analysis of the trial design are matched, using the agreed acceptance criteria against the objectives or performance requirements without comparison to deemed-to-satisfy or prescriptive or “benchmark” designs.

Comparative approach

As outlined in the International Fire Engineering Guideline a comparative approach is typically, the fire safety provided by one element, or a sub-system, or the complete fire safety system, is compared to the level of fire safety that would be achieved in an identical building in which that element, sub-system or system is designed in compliance with the deemed-to-satisfy provisions. The analysis involves the same assumptions, models, calculations and input data for the proposed trial design and the deemed-to-satisfy design.

The comparative approach aims to determine whether the alternative solution is equivalent to (or better than) the deemed-to-satisfy or prescriptive design.

Quantitative approach

A quantitative approach refers to an analysis that involves numerical evaluation of an identified process. The quantitative approach includes detailed mathematical and engineering calculations.

Qualitative approach

A qualitative approach refers to descriptions or distinctions based on a quality or characteristic rather than on a quantity or measures value. The qualitative approach includes structured arguments to demonstrate compliance.

Deterministic approach

A deterministic approach is a methodology based on physical relationships derived from scientific theories and empirical results that for a given set of conditions will always produce the same outcome.

6.3 Acceptance Criteria

The acceptance criteria for this performance solution is as following:

The use of the QT Conpolcrete Panel as an element on an external wall is based on the following method and assessment to Deemed-to-Satisfy provisions of the BCA:

Fire Scenario:	A fire source exposed to the insulation material
Performance Requirement:	CP2(a)(iii) and CV3
Required outcome:	Demonstrate that the building's proposed external wall system does not contribute to excessive fire spread through compliance with AS 5113.1:2016 where an EW classification is achieved.

6.4 Verification Method

Compliance with NCC Verification Method CV3 requires a number of key items to be satisfied. A summary is detailed below:

- CV3(a) – Avoid spread of fire between buildings
- CV3(b) – External wall system test and cavity design.
- CV3(c) – Type A building protected by automatic fire sprinkler system throughout, balconies, monitored stop valves, two storey flow demand.
- CV3(d) – Type B construction protected by automatic fire sprinkler system or other horizontal construction.

6.4.1 CV3(a) – Avoid spread of fire between buildings

The compliance with CV3 is verified with CV1 and CV2 which is to demonstrate the avoidance of the spread of fire between buildings.

Warringtonfire research has undertaken a AS 5113.1:2016 testing in accordance with Clause 5.2(b)(i) exposed to 80kW/m^2. The test was documented in report 44388000.1 dated 25 November 2016.

The wall was constructed from 50mm thick QT exterior wall panel installed in the horizontal orientation that were rendered to the exposed side and fixed to the exposed side of a timber frame wall that was faced with 10mm thick plasterboard to the unexposed side.

The test satisfied the requirement of BB80 in accordance with AS 5113.1:2016. The following image is of the test specimen.

6.4.2 CV3(b) – External wall system test and cavity design

As per NCC Verification Method CV3(b) the QT Conpolcrete panel has been tested to AS 5113:2016 Amendment 1:2018 with the classification indices detailed below. QT Conpolcrete wall system did not include any wall cavity barriers. The QT Conpolcrete panel system has achieved the classification EW.

TABLE 1:

SPECIMEN RESULTS AND CLASSIFICATIONS

Classification Criteria	Related Classification Measure	Pass/Fail
5.4.5(a)T_{w5m}	≤600°C	Max 717˚C spike @ 15 min <10s | PASS
5.4.5(b)$T_{Insulation5m}$	≤250°C	Max 55˚C | PASS
5.4.5(b)$T_{Cavity5m}$	≤250°C	Max 101˚C | PASS
5.4.5(c)$T_{unexposedside0.9m}$	≤180°C	Max 27˚C | PASS
5.4.5(d)flaming	No flaming	No flaming | PASS
5.4.5(d)openings	No openings	No openings | PASS
5.4.5(e)spread	No spread beyond specimen	No spread occurred | PASS
5.4.5(f)debris flaming	≤20s	No Flaming debris | PASS
5.4.5(g)debris mass	≤2kg	No debris | PASS
Classification		**EW**

FIGURE 7:

AS 5113 TEST START AND 10 MINUTES

6.4.3 CV3(c) – External wall system test and cavity design

As per NCC Verification Method CV3(c) the subject building is to be protected throughout by a sprinkler system (other than a FPAA101D or FPAA101H system) complying with Specification E1.5 and has the following:

(i) Sprinkler protection to balconies, patios and terraces, and where overhead sprinkler coverage is not achieved alongside the external wall, sidewall sprinkler heads are provided at the external wall for the extent of the balcony, patio or terrace where overhead sprinkler coverage is not achieved; and

(ii) For a building with an effective height greater than 25m-

a. Monitored stop valves provided at each floor level arranged to allow the isolation of the floor level containing the stop valve while maintaining protection of the reminder of the building; and

b. The sprinkler system being capable of providing sufficient flow to serve the design area required by AS 2118.1 for the relevant hazard class on each floor level plus the design area required by AS 2118.1 for the floor level above, except where the former level is-

i. The floor level below the uppermost roof; or

ii. Any floor level that is wholly below ground.

6.4.4 CV3(d) – External wall system test and cavity design

As per NCC Verification Method CV3(d) in a building of Type B construction, the building is-

(i) A Class 5, 6, 7 or 8 building or Class 4 part of a building; or

(ii) A Class 2, 3, or 9 building that-

a. Is protected throughout by a sprinkler system (other than a FPAA101D or FPAA101H system) complying with BCA Specification E1.5; or

b. Has any openings in external walls separated by a slab or other horizontal construction complying with BCA C2.6(a)(iv) as if the building were of Type A construction.

6.5 Evaluation Summary

In the opinion of Ignis Solutions, the evaluation and associated testing has demonstrated that the proposed Performance Solution for the installation of PIRMAX ISO3 Insulation Panel in an external wall does not increase the risk of fire spread and as such satisfies BCA Performance Requirements CP2 and CP4.

7 FIRE SAFETY SUMMARY

The above evaluation has considered the use of the QT Conpolcrete Panel in accordance with CP2 and CV3 of the NCC following testing to AS 5113 where an EW has been achieved. The following applies to buildings of Type A and B construction.

7.1.1 Type A Construction

As per NCC Verification Method CV3(c) the subject building is to be protected throughout by a sprinkler system (other than a FPAA101D or FPAA101H system) complying with Specification E1.5 and has the

(iii) Sprinkler protection to balconies, patios and terraces, and where overhead sprinkler coverage is not achieved alongside the external wall, sidewall sprinkler heads are provided at the external wall for the extent of the balcony, patio or terrace where overhead sprinkler coverage is not achieved; and

(iv) For a building with an effective height greater than 25m-

a. Monitored stop valves provided at each floor level arranged to allow the isolation of the floor level containing the stop valve while maintaining protection of the reminder of the building; and

b. The sprinkler system being capable of providing sufficient flow to serve the design area required by AS 2118.1 for the relevant hazard class on each floor level plus the design area required by AS 2118.1 for the floor level above, except where the former level is-

i. The floor level below the uppermost roof; or

ii. Any floor level that is wholly below ground.

7.1.2 Type B Construction

As per NCC Verification Method CV3(d) in a building of Type B construction, the building is-

(iii) A Class 5, 6, 7 or 8 building or Class 4 part of a building; or

(iv) A Class 2, 3, or 9 building that-

a. Is protected throughout by a sprinkler system (other than a FPAA101D or FPAA101H system) complying with BCA Specification E1.5; or

b. Has any openings in external walls separated by a slab or other horizontal construction complying with BCA C2.6(a)(iv) as if the building were of Type A construction.