

Ziptrack
FIRE ASSESSMENT REPORT

IGNL-8291-13R I01R01

Issued: 12.05.2025

Valid until: 29.04.2029

DOCUMENT REVISION HISTORY

Issue	Revision	Date	Purpose of Issue	Prepared by	Reviewed by
01	00 D01	27.11.2024	Issued internally for review	TL	BHB
01	00	10.12.2024	Issued to client	TL	BHB
01	01	12.05.2025	Updates to balustrade details	TL	BHB


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1 INTRODUCTION

1.1 General

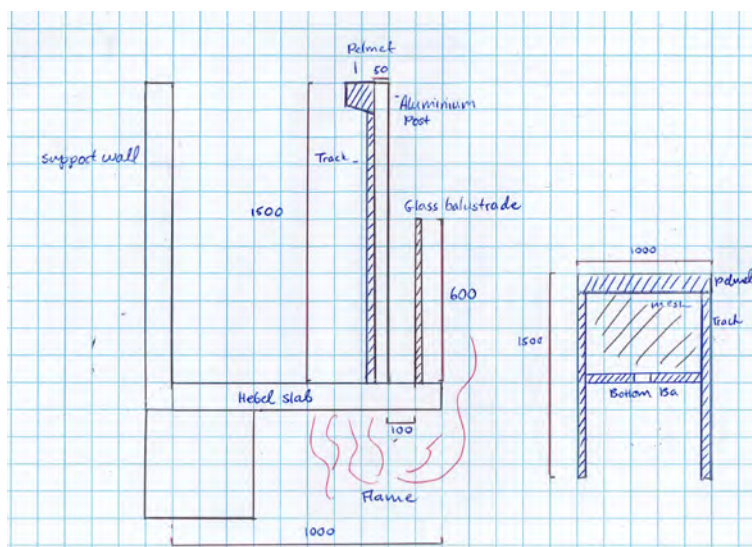
The purpose of this assessment is to report the applicable use and compliance of the Ziptrak and Vistaweave Polyester mesh used within an external blind application.

The National Construction Code Volume One Building Code of Australia 2022 Clause C2D14 establishes the criteria for external blinds. In accordance with Clause C2D14 blinds are to be non-combustible unless located at ground level or the level immediately above ground level.

The Ziptrak and Vistaweave Polyester mesh blind is an external venetian blind where the head box is made of steel with internal motor and winding system. The steel head box is a non-combustible material. The blind assembly includes the Vistaweave Polyester mesh material as well as side guides with nylon inserts. The blind installed in a working order with the blind fully deployed. The installation simulated an equivalent installation proposed within buildings balconies where the blind is to be installed in the order of 100 mm behind a glass balustrade. A gas burner and main wall assembly in accordance with ISO 13785-1 was used with a three stage flame impact being 10 minutes of 100 kW followed by 10 minutes of 300kW and 5 minutes of 400kW. The test burn exceeded the requirements of ISO 13785-1. An image of the test assembly is provided below.

FIGURE 1:

SPECIMEN INSTALLATION FOR INTERMEDIATE FIRE SPREAD TEST



The majority of the blind's elements are identified to be non-combustible material. Some of the blind's components are combustible, such as electrical components and wires within the head box for cables and the blind guides which are nylon. The Vistaweave material satisfies the National Construction Code Volume One Building Code of Australia Fire hazard properties being a flammability index of 2 with a spread of flame index of 0 and smoke developed index of 7.

The following analysis confirms that whilst the Ziptrak external venetian blind containing combustible components and a combustible Vistaweave fabric, they do not contribute or create an undue risk of fire spread and therefore satisfies the Performance Requirement of BCA Clause C1P2 in relation to spread.

This report serves as a report from professional engineer in accordance with Clause A5G3(1)(e) of the BCA. Compliance with Clause A5G3(1)(e) relates to evidence of suitability. A report from a professional engineer certifies, in accordance with the BCA, that a product fulfils specific requirements of the BCA and sets out the tests the product has been subjected to and the results of those tests and any other relevant information that has been relied upon to demonstrate it fulfils specific requirements of the BCA. In addition to being a report from a professional engineer,

The testing considered fire impact as it would be installed as well as under direct fire impact. In both situations, the Ziptrak blinds, incorporating the Vistaweave material, has not demonstrated to spread fire or cause debris from the impact of fire as demonstrated in the intermediate testing and as such has the capacity to satisfy the requirements of BCA Performance Requirement of C1P2.

Benjamin Hughes-Brown is a Chartered Professional Engineer and Fellow of Engineers Australia with over 15 years experience in fire safety engineering. Benjamin satisfies the criteria established by BCA Clause A5G3 being a professional engineer. This is a report from a professional engineer and applies as evidence of suitability for compliance to the Performance Provisions of the BCA.

2 FIRE TESTING

2.1 Introduction

The Ziptrak external blind, incorporating the Vistaweave material has been subjected to a number of fire tests. This includes ISO 13785-1, AS 1530.2 and AS/NZS 1530.3.

The large scale testing to ISO 13785-2 is referenced within AS 5113 as a suitable wall test to determine fire spread. ISO 13785-1 specifies a screening method for determining the reaction to fire performance of products and constructions of facades or cladding when exposed to heat from a simulated external fire with flames impinging directly upon a façade. It is intended that this test method is used by the construction industry to reduce the burden of testing to large scale external wall testing such as those referenced within AS 5113 being BS 8414 and ISO 13785-2. This test method is applicable to facades and claddings that are used on an existing external wall system. The test method is applicable to vertical elements and not applicable to determine the structural strength of the façade or cladding.

The details of each test is detailed below. Both tests have confirmed that the Ziptrak external blind incorporating the Vistaweave material does not create an undue risk of fire spread.

2.2 Vistaweave AS 1530.2 and AS/NZS 1530.3 Testing

Testing in accordance with AS 1530.2 requires specimens to be 535 mm long x 75 mm wide. Nine specimens were tested by AWTa Product Testing report 18-007149 dated 13/12/2018. The following outlines the test results.

Date Tested	12/12/2018
Flammability Index	2

Testing in accordance with AS/NZS 1530.3 requires specimens to be 450 mm wide x 600 mm high. Six specimens were tested. The specimen was fixed to a fibre cement sheet with wire mesh and four screws holding the specimen between the mesh and fibre cement. The fixing system is in accordance with the requirements of AS/NZS 1530.3. The following outlines the test results from AWTa Product Testing report 18-007472 dated 14.01.2019.

Regulatory Indices:	
Ignitability Index	16 Range 0-20
Spread of Flame Index	0 Range 0-10
Heat Evolved Index	3 Range 0-10
Smoke Developed Index	7 Range 0-10

2.3 ISO 13785-1 Testing

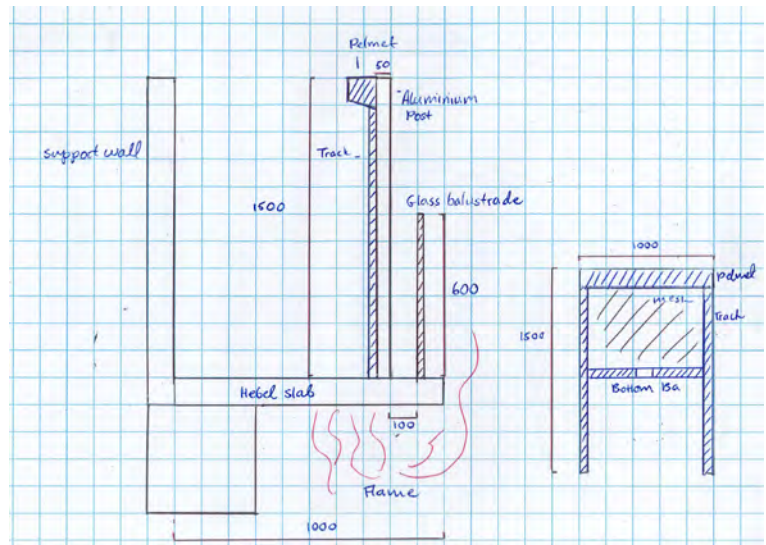
2.3.1 General

A test in accordance with ISO 13785-1 has been undertaken on the Ziptrak external blind, incorporating the Vistaweave material provided by the Nolan Group. The methodology has been deviated from in that no heat flux meter was installed at the top of the specimen and the side wall was not installed as required by ISO 13785-1. Ignis Labs was not responsible for the sampling stage. All specimens were sampled by the test sponsor. The test results apply to the specimens as received. The specimens were prefabricated and were mounted to the specifications of the sponsor.

2.3.2 Specimen Description

The test was conducted on the supplied external blind system. The headbox includes a 240V motor mechanism and houses the blind when retracted. The installation of the specimens is detailed in the figure below.

FIGURE 2:
SPECIMEN INSTALLATION



2.3.3 System Variations

The blind system was tested with a glass balustrade to represent the worst-case scenario of a range of suitable balustrade options. The following balustrade constructions have been evaluated for use with the Ziptrack external blind system, provided they have a minimum height of 600 mm.

- Masonry or concrete balustrades
- Metal balustrades
- Stainless steel cable balustrades

It was observed in testing that the flame did not impede the face of the external blind system above the slab with a minimum setback of 100 mm from the balustrade. Additionally, the blind material having a spread of flame index of 2 demonstrates the inability of stray embers or flames causing a risk of propagation of a flame front up the face of the blind.

As such, it is deemed that the above variations to the balustrade material would not impact the results of the test as undertaken with the fire source located below the slab and the blind system set back a minimum of 100 mm from the balustrade.

2.3.4 Test Method

The test was performance in accordance with the requirements of ISO 13785-1 as appropriate for an external blind system. The variations to the methodology include no heat flux meter being installed at the top of the specimen and the side wall was not installed.

An overview of the test procedure is as follows; the sandbox burner is ignited and set to 100kW for a duration of 30 minutes. Ten thermocouples arranged as described in Clause 8.1 of ISO 13785-1 were used to measure the temperature at different locations on the specimen face over the duration of the test. The test procedure was adjusted to include a 100kW for a duration of 10 minutes, 300 kW for a duration of 10 minutes and 400kW minutes for a duration of 5 minutes.

2.4 Observations

The observations of the Specimen are detailed below along with images over the test period.

FIGURE 3:

SPECIMEN AT START AND 4 MINUTES OF TEST



FIGURE 4:
SPECIMEN AT 6 AND 8 MINUTES OF TEST

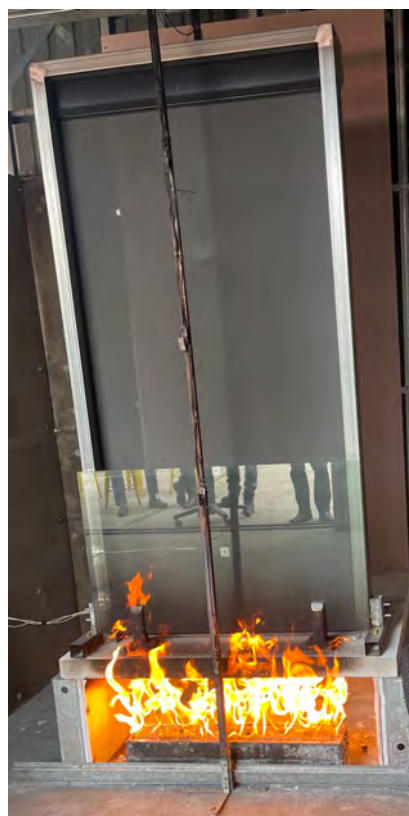


FIGURE 5:
SPECIMEN AT 10 AND 12 MINUTES OF TEST



FIGURE 6:
SPECIMEN AT 13 AND 15 MINUTES OF TEST



FIGURE 7:
SPECIMEN AT 18 AND 20 MINUTES OF TEST



FIGURE 8:
SPECIMEN AT 22 AND 24 MINUTES OF TEST



FIGURE 9:
SPECIMEN AT 26 AND 27 MINUTES OF TEST



TABLE 1:

TEST OBSERVATIONS

Time	Event	Observation
00:00	Ignition	100kW flaming
	Flame Spread to 0.5m	Flames from burner only, specimen did not ignite.
	Flame Spread to 1.0m	Flames from burner only, specimen did not ignite.
	Flame Spread to 1.5m	Flames from burner only, specimen did not ignite.
	Flame Spread to 2.0m	Did not occur.
	Flame Spread to top of specimen	Did not occur.
12:00	Increase flaming	300kW flaming
13:00	Glass crack	The bottom left part of the glazing cracked but did not fail.
22:00	Increase flaming	400kW flaming

Following the install test, the burner was moved directly adjacent to the Vistaweave material to evaluate the impact a fire may have on the blind installation. The following figures show the additional testing results on the material and reaction of the Vistaweave. It is important to note that the material reacts to the fire but does not present a risk of fire spread or debris.

FIGURE 10:
SPECIMEN AT START OF TEST AND PEAK FIRE SIZE



FIGURE 11:
MATERIAL REACTION DURING DIRECT FLAME IMPACT



2.5 Results

The following images detail the results of the fire test. After the installation test as well as after the direct fire impact test. During the installation test the flames were drawn towards the Vistaweave fabric resulting in thermal impact but not direct flame impact. The following figures show the impact, the end conditions at the end of the installation test as well as the direct flame test.

The result of the testing included no debris, the material shrank back away from the fire to the height of the fire. The side guide nylon presented flaming to the height of the fire event and self extinguished shortly after the primary fire was extinguished.

FIGURE 12:

SPECIMEN FABRIC IMPACT DURING TESTING



FIGURE 13:

SPECIMEN AT END OF INSTALLATION TEST AND END OF DIRECT FLAME TEST



The following figures show the thermal impact on the specimen during the second phase of testing as well as behind the glass balustrade. The specimen was exposed to high temperatures during the test as detailed below. The specimen reacted to the fire but did not spread fire or maintain excessive temperatures. The glazing insulated against the direct impact of fire.

FIGURE 14:

FIRE INPUT TEMPERATURE

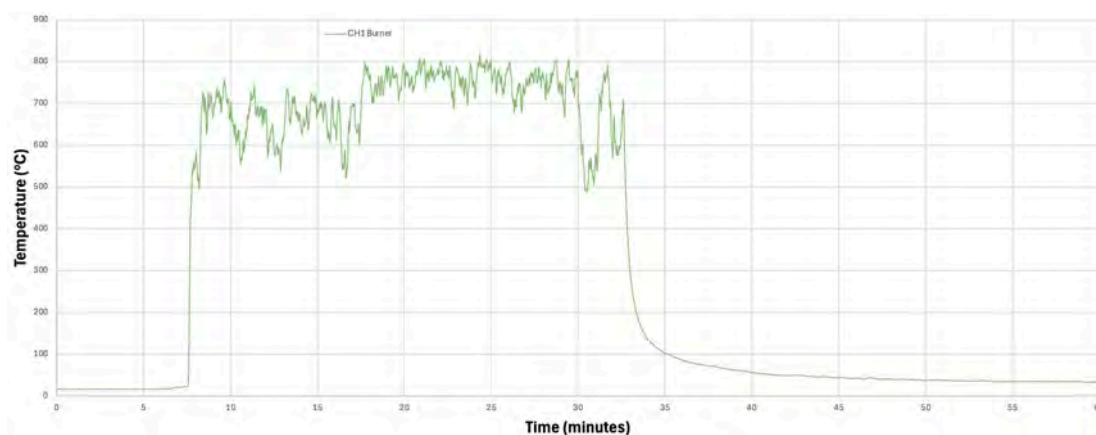


FIGURE 15:

SPECIMEN THERMOCOUPLES IN FRONT OF SPECIMEN

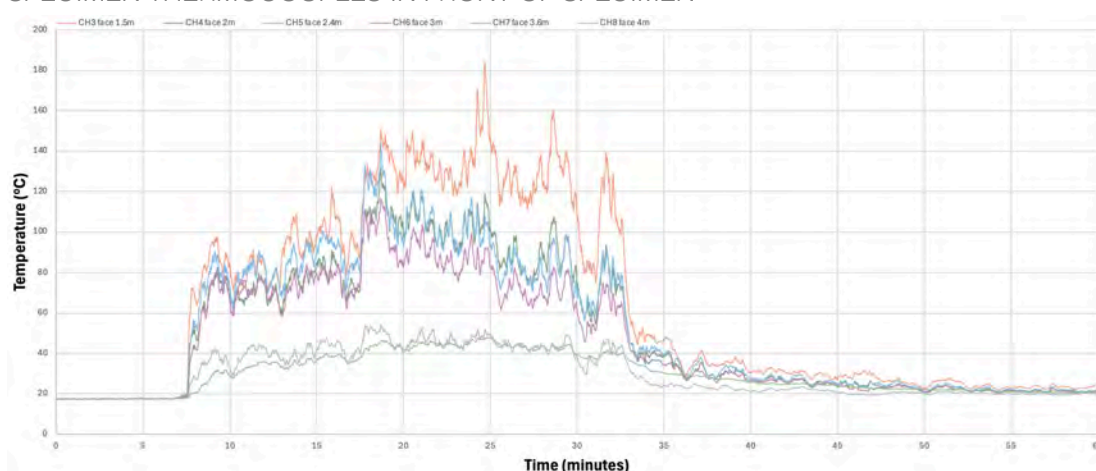


FIGURE 16:

SPECIMEN THERMOCOUPLES BEHIND SPECIMEN

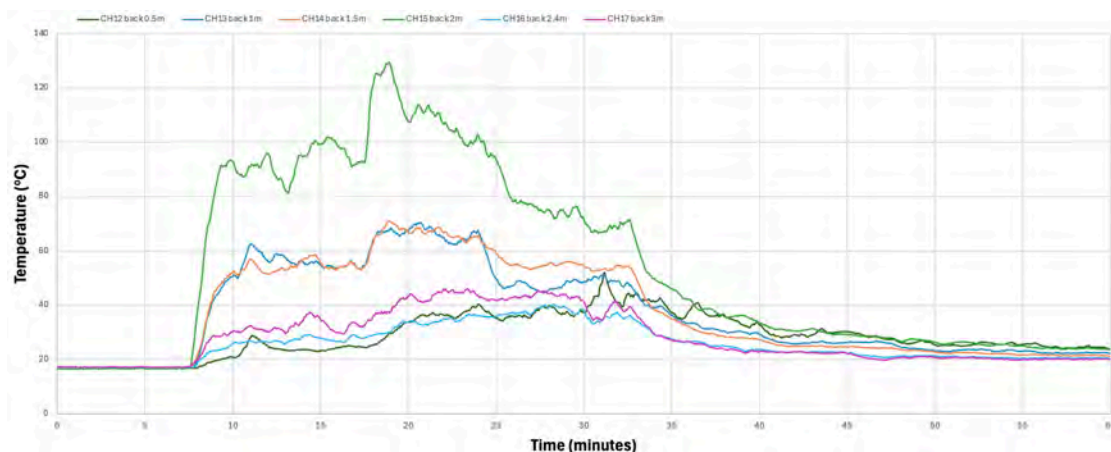
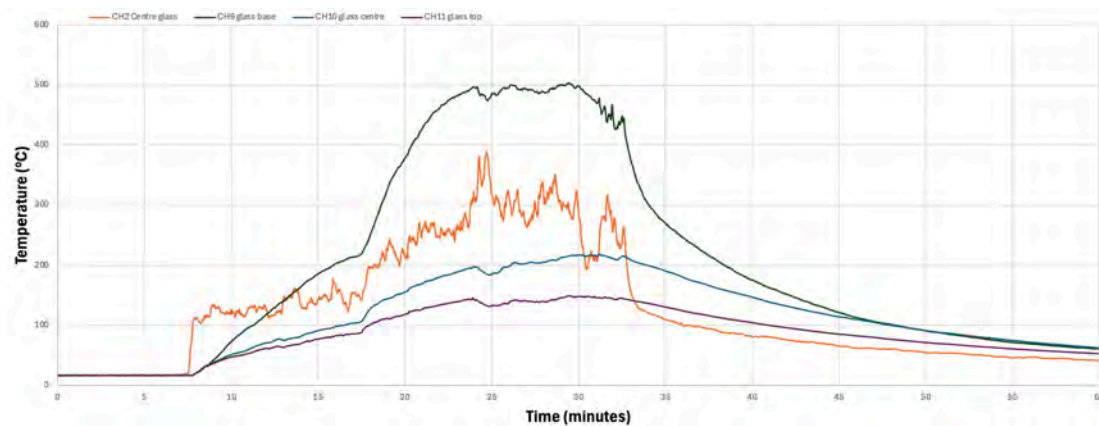


FIGURE 17:
GLASS THERMOCOUPLES



2.5.1 AS 5113 comparison and summary

The AS5113:2016 classification indices are detailed below. The AS 5113 test is in the order of four times that of the ISO 13785 intermediate test. Based on the requirements of AS 5113, the following comments are made in relation to the testing undertaken. It is noted that the intermediate test is a scale version and that limited correlation studies have been undertaken.

TABLE 1:
SPECIMEN RESULTS AND CLASSIFICATIONS

AS 5113 Classification Criteria	Related Classification Measure	Comment
5.4.5(a) T_{w5m}	$\leq 600^{\circ}\text{C}$	Considered likely to pass under full scale test conditions. The thermocouples measured the test fire as limited reaction from the blind material
5.4.5(b) $T_{\text{Insulation}5m}$	$\leq 250^{\circ}\text{C}$	Not applicable
5.4.5(b) $T_{\text{Cavity}5m}$	$\leq 250^{\circ}\text{C}$	Not applicable
5.4.5(c) $T_{\text{unexposedside}0.9m}$	$\leq 180^{\circ}\text{C}$	Not applicable
5.4.5(d) flaming	No flaming	No flaming of the wall system occurred. Considered likely to pass under full scale test conditions.
5.4.5(d) openings	No openings	The specimen is not a wall system. Openings are not applicable as the specimen is applied to building openings
5.4.5(e) spread	No spread beyond specimen	PASS Considered likely to pass under full scale test conditions.
5.4.5(f) debris flaming	$\leq 20s$	No flaming debris occurred
5.4.5(g) debris mass	$\leq 2kg$	No debris occurred
Classification		-

From the above table, and testing, it is considered that the subject blinds do not present an increased risk of fire spread for buildings they are applied to.

2.6 Test Summary

From the above fire testing of the specimen, the Ziptrak external blind, incorporating the Vistaweave material has demonstrated to not ignite or spread fire.

Accordingly, it is deemed that the Ziptrak external blind, incorporating the Vistaweave material do not present an undue risk of fire spread.

3 NATIONAL CONSTRUCTION CODE COMPLIANCE

3.1 General

It has been considered by others that the Ziptrak external blind, incorporating the Vistaweave material includes combustible components including the Vistaweave material.

The Ziptrak external blind, is predominantly made from aluminium being the head track, side guides and bottom track. The side guides incorporate nylon runners as well as the main blind being the Vistaweave. The Vistaweave material has been tested to AS 1530.2 as well as AS/NZS 1530.3 and satisfies the requirements for fire hazard properties set by the BCA. It is considered important to note that the BCA does not provide for components within systems.

The testing considered fire impact as it would be installed as well as under direct fire impact. In both situations, the Ziptrak blinds, incorporating the Vistaweave material, has not demonstrated to spread fire or cause debris from the impact of fire as demonstrated in the intermediate testing and as such has the capacity to satisfy the requirements of BCA Performance Requirement of C1P2.

4 DIRECT FIELD OF APPLICATION

The results of the fire test contained in this test report are directly applicable to similar constructions of the installation. Variations in building elements that are not minor will require re-testing. Increasing the size of the blind is an acceptable variation.

4.1 Limitations

Any variations with respect to the size or construction detail other than those identified in this report may invalidate the conclusions drawn.

CONDITIONS AND LIMITATIONS

This assessment report does not provide an endorsement by Ignis Labs 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 only relate 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 Labs involvement in the Project is limited to the role outlined in our 'Scope of Service' of the quote. 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 Labs 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 Labs has carefully reviewed and applied to the best of our ability the requirements of local Legislation, the current NCC and the Australian Fire Engineering Guidelines. Any changes to the reference documents including the NCC should warrant a review of this report.

This report is provided to the client at their request to evaluate the product performance under fire safety performance analysis. Ignis Labs provides no warranty that this report will be approved by building authorities, future legislation or changes to the building code that would impact this evaluation where a deemed to satisfy solution may be required, further evaluation is needed or be subject to a fire order or new legislation for its design.

Ignis Labs has relied upon the information provided by the client such as the architectural plans, building photos and construction detail. Ignis Labs has not audited these documents or the building and assumes the information provided by the client on these documents is accurate. Ignis Labs cannot provide any warranty that our report accuracy is maintained should the information provided have errors.



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