Dolphin Fire Engineering Consultants P/L

Fire Engineering Report

Byron Community Hub

10-12 Shirley Street, Byron Bay

Fire Hydrant and Hose Reel Coverage

Prepared for:	**Silvina Medel on behalf of BKA Architecture (Client)**
By:	**Dolphin Fire Engineering Consultants PL**
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Date:	**31st May 2021**

Revision History

Revision Nº	Prepared By	Description	Date
Draft	Rob Dennis	Fire Engineering Report 2021-1054 Draft	28th May 2021
A	Rob Dennis	Fire Engineering Report 2021-1054 Rev A	31st May 2021
B	Rob Dennis	Fire Engineering Report 2021-1054 Rev B	

Document Acceptance

Action	Name	Signed	Date
Prepared by	RD		31st May 2021
Reviewed by	VM		31st May 2021
Approved by	RD		31st May 2021
on behalf of	Dolphin Fire Engineering Consultants P/L		

Stakeholder Sign-off

Name	On Behalf Of	Signed	Date
Silvina Medel	BKA Architecture		
Rob Dennis	Dolphin Fire Engineering Consultants Pty Ltd		31st May 2021

Contents

Executive Summary

This Fire Engineering Report has been prepared by Dolphin Fire Engineering Consultants to outline the proposed changes to existing fire safety measures installed in the building and to provide Performance Solutions to address minor BCA DTS non-compliances to be incorporated into Byron Community Hub located at 10-12 Shirley Street, Byron Bay.

The existing building housed a community hospital, emergency department, and treatment wards for a number of years. It is now under-going a change of use from Class 9a health-care building to a Class 5 (majority of floor area), Class 6 (small café), and Class 8 (community kitchen / food preparation) areas. One section of the building is to be leased to Southern Cross University (SCU); its main use is unknown but assumed to be either Class 5 (offices), Class 9b (class-rooms), or a combination of both.

Based on the plans provided, discussions with stakeholders, and a building inspection conducted on 28th May 2021, it is noted that there are three main issues to be dealt with in this report. They are;

1. Requirements for retaining the existing fire that separate the ward area (SCU lease area) from the remainder of the building, and the smoke compartments within the ward area,
2. Requirements for maintaining all of the installed fire safety measures (including the smoke detection and alarms system, EWIS system, the manual call points, warden intercom point phones (WIPs), and local alarm call points, which were required for the use as a 9a health-care building, but may not be required for a Class 5 / 9b office building, and
3. The location of the current hose reels located throughout the building (noting compliance with the BCA) and the provision of hydrant coverage for the building.

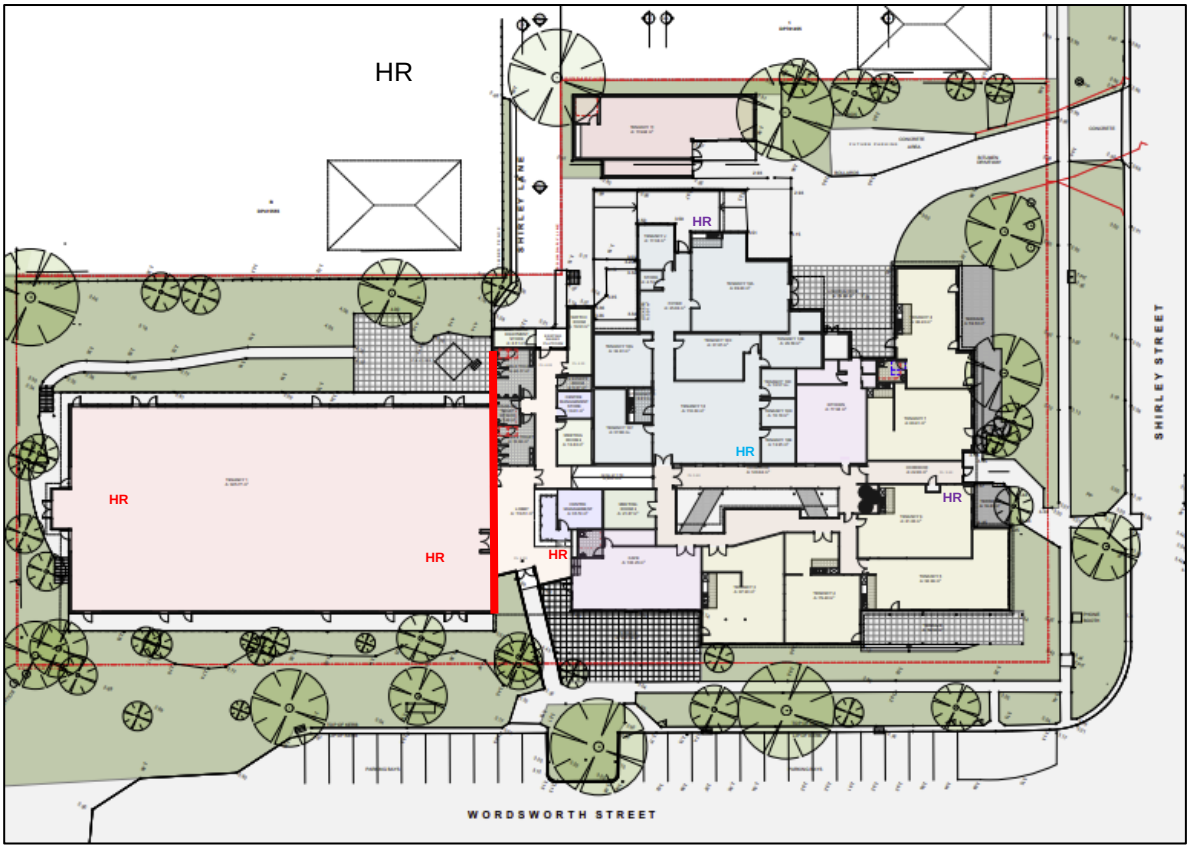
Fire and Smoke Compartments
The building can be considered as two separate fire compartments using the existing fire separation between the foyer and the ward (SCU) areas. The benefits of keeping the two fire compartments are that the building can remain Type C construction, and provides future proofing for later use changes. The fire wall between the fire compartments has two double leaf fire doors that are held in the open position by magnetic devices that release when a fire situation is detected by the fire indicator panel. As it is likely that the fire indicator panel will no longer be needed to provide coverage of the building, an alternative method of closing the fire doors will be necessary. This is usually achieved with simple mechanical self-closing devices. There is no requirement or advantage in keeping the additional smoke compartments located within the ward area. The doors that form the smoke compartmentation can be removed or simply be left in place with no automatic self-closing devices.

Fire Safety Measures
Being a single storey Class 5 / 9b building of Type C construction there is no on-going requirement for the smoke detection and alarm system, the EWIS system, manual call points, WIPs, or local alarm call points. The building is required to have the following fire safety measures installed; portable fire extinguishers, exit signs, emergency lighting, hose reels, and hydrant coverage. The location of these measures shall be addressed based on the final layout of internal walls and barriers.

Hose Reel and Hydrant Coverage
During the building inspection it was noted that three of the hose reels were located more than 4m from a building exit, which contravenes BCA Clause E1.4. Two of the hose reels are within 6m of an exit, and this minor non-compliance is dealt via a performance solution

in this report. The final locations for other hose reels will depend on the final layout of internal walls and shall be consistent with the requirements of BCA Clause E1.4, being located either internally, externally, or a combination of those, within 4m of an exit, and shall not provide coverage by passing through the fire doors forming the fire compartmentation. Possible compliant locations are shown on the drawing below.

Hydrant coverage shall continue to be provided from the street hydrants provided on three separate roads around the building; Shirley Street, Shirley Lane, and Wordsworth Street. Any slight shortfalls in coverage due to changes to the internal layout of the building are addressed via a performance solution in this report. The performance solution cites the FRNSW “Fire Safety Guideline Technical Information – Fire Hydrant Concessions for Existing Buildings” which extends hydrant coverage for existing buildings from 90m from feed hydrant to all parts of the building (via a hardstand area) to 120m from feed hydrant to all parts of a building as long as not more than 70m of coverage is within the building. This design, using external hydrants with coverage provided by an additional length of hose, is supported by FRNSW as well as in Australian Standard 2419.1 Appendix C3.9.



Drawing 1: HR shows location of existing hose reels to be kept. HR is location of hose reel to be removed. HR shows location of two new hose reels required to provide coverage. The red lines shows the location of the firewall to be maintained to provide fire separation between different building classifications.

1 INTRODUCTION

This document constitutes a Fire Engineering Report (FER) in accordance with the International Fire Engineering Guidelines (IFEG 2005) although in a condensed form due to the minor nature of the non-compliances. In conjunction with meetings with relevant stakeholders, this document outlines the proposed fire safety measures to be included in the building to meet the relevant Performance Requirements of the BCA.

1.1 Scope of Project

1.1.1 General

This Fire Engineering Report has been prepared by Dolphin Fire Engineering Consultants to outline the proposed Performance Solutions to be incorporated into Byron Community Hub 10-12 Shirley Street, Byron Bay, NSW.

1.1.2 Contractual Framework

Dolphin Fire Engineering Consultants have been commissioned by Silvina Medel on behalf of BKA Architecture.

1.1.3 Regulatory Framework

The building will predominantly comply with the Deemed to Satisfy (DtS) requirements of the Building Code of Australia 2019 Volume 1 Amendment 1 (the BCA), unless specifically addressed within this Report.

1.2 Project Stakeholders

The relevant project stakeholders for purposes of participating in the fire engineering process are outlined in Table 1.1

Table 1.1 – Relevant Project Stakeholders

Name	Company	Role
Silvina Medel	BKA Architecture	Client
		Certifying Authority
Rob Dennis	Dolphin Fire Engineering Consultants P/L	Fire Engineer

1.3 Documents Considered

The assessment is based on the following documentation:

- Drawings by BKA Architecture.

1.4 Definitions

The following definitions apply to the terminology utilised in the report:

- **AS** – refers to Australian Standards
- **BCA** – refers to the Building Code of Australia 2019 Volume 1 Amendment 1
- **DtS** – refers to the BCA Deemed to Satisfy (DtS) provisions
- **EP&A Regs** – refers to the Environmental Planning and Assessment Regulations 2000
- **FER** – refers to the Fire Engineering Report prepared by Dolphin FEC (this report)

- **FRL** – refers to the fire resistance level of a building element or system

1.5 Validity & Limitations

The reader's attention is drawn to the following limitations with respect to the fire engineering assessment undertaken in this report:

- The report is limited to the assessment of Alternative Solutions for the BCA DtS variations identified in Section 4 of this report for compliance with the relevant BCA Performance Requirements. With the exception of these Alternative Solutions, all other fire safety aspects of the building are to comply with the BCS DtS provisions. It should be noted that identification of BCA non-compliances is the responsibility of the Building Certifier and is beyond the scope of this fire engineering assessment.
- This assessment deals with the fire safety provisions of the BCA only and does not consider amenity or non-fire related matter in the building such as health, amenity, security, energy efficiency, occupational health and safety, compliance with the Disability Discrimination Act (DDA) etc., which may be addressed by others. Consequently, the outcomes of this assessment have not been checked or verified for their fitness for purpose for any non-fire safety related matters including the ones outlined above.
- This assessment is not a full compliance or conformance audit for any fire safety system. Therefore, operational checks of fire safety equipment, verification of construction techniques, fire resistance levels or the witnessing of fire drills or exercises are specifically excluded from the scope of this assessment. The operational status of systems, items of equipment and occupant training should be addressed as part of the inspection, commissioning, enforcement, maintenance, testing, training, and management procedures for the building.
- This assessment will be consistent with the objectives and limitations of the BCA and therefore specifically excludes arson (other than as a source of initial ignition), multiple ignition sources, acts of terrorism, protection of property (other than adjoining property), business interruption or losses, personal or moral obligations of the owner/occupier reputation, environmental impacts, broader community issues etc.
- Egress and fire safety provisions for persons with disabilities have only been considered to the same degree as the BCA DtS provisions, except as expressed in this report.
- Reports marked as 'Draft" are subject to change and Dolphin FEC accepts no liability pending release of the final version of the report.
- The recommendations in this assessment are based on information provided in-part by others. Dolphin FEC has not verified the accuracy and/or completeness of this information and accepts no responsibility or liability for any errors or omissions which may be incorporated into this assessment as a result.
- The recommendations in this assessment specifically apply to the subject building and must not be utilised for any other purpose. Any modifications or changes to the building, fire safety management system, or building usage from that described may invalidate the findings of this assessment necessitating a re-assessment.

2 Principle Building and Occupant Characteristics

2.1 General Description

The subject site consists of an existing single storey hospital that is being converted into community offices and possible educational rooms. A small café (Class 6) and commercial kitchen (Class 8) are exempt from classification as they occupy less than 10% of the storey.

BCA	Description
Class of Building	Class 5 and Class 9b
Number of Levels	1
Rise in Storeys	1
Type of Construction Required	Type C
Effective Height	0m
Floor area	>500m^2

2.2 Occupant Characteristics

Attribute	Comment
Type and Number	Occupants are expected to be staff or visitors to the building. The number of occupants is expected to be in line with BCA Clause D1.13 based on the use of the building.
Awareness	Building occupants are expected to be awake and aware as this is a workplace building.
Physical and Mental Attributes	Physical and mental attributes are expected to be within the community norms.
Occupant Evacuation Assistance	Mobility may be limited for some occupants. It is assumed that these occupants have plans in place to seek assistance, or provision of other forms of mobility assistance equipment to egress from their dwelling on a day-to-day basis.
Occupant Training	Occupants are considered to have limited training or experience.
Fire Hazards	Kitchen and cafe cooking areas. Electrical appliances as per an average office building.

2.3 International Fire Engineering Guidelines: Fire Safety Sub-Systems

IFEG Sub-Systems	Discussion and Mitigation
A: Fire initiation, Development and Control	Fire loads or heat release rates are not proposed to be in excess of an average Class 5 or Class 9b building and hence fire development will not be abnormally fast.

B: Smoke Development, Spread, and Control	Smoke development and spread will be consistent with that of an average Class 5 / 9b building. 120minute FRL fire wall and doors separating the SCU part of the building and the rest of the building will reduce the extent of smoke spread throughout the building.
C: Fire Spread, Impact, and Control	120minute FRL fire wall and doors separating the SCU part of the building and the rest of the building will reduce the extent of fire spread throughout the building. External walls and window openings are not located near other buildings.
D: Fire Detection, Warning and Suppression	Fire detection is expected to occur via sight, smell, and hearing of fire cues. Portable fire extinguishers, hose reels, and hydrant coverage is available to supress the fire.
E: Occupant Evacuation and Control	Safe evacuation shall be provided for by the egress provisions provided. Exits are spaced around the building. Horizontal exits are available via the fire doors separating the fire compartments.
F: Fire Services Intervention	The building is served by fire services at Byron Bay (~1km away) and therefore fire services intervention is equivalent to most commercial suburban areas.

3 Design Objectives

3.1 General Objectives

The objectives of this Fire Engineering Report are those relating to occupant safety which forms the basis of the BCA. These include the protection of building occupants from the effects of fire, preventing fire spread within buildings and to adjacent buildings, and facilitating the activities of emergency services personnel.

3.2 Fire Safety Objectives

The design objectives for this fire engineering assessment are contained in the relevant BCA performance requirements which may be summarised as:

- Occupant Life Safety – to safeguard people from illness or injury due to a fire in a building and whilst evacuating a building during a fire
- Protection of adjacent property – to avoid the spread of fire between buildings and protect other property from physical damage caused by structural failure of a building as a result of fire
- Fire Brigade Intervention – to facilitate the activities of emergency services personnel.

The fire safety objectives are based on acceptable levels of occupant life safety as absolute fire safety within building is not attainable. Accordingly, the BCA is utilised as a benchmark for establishing an acceptable level of fire safety.

4 Fire Safety Systems

This building will continue to meet the BCA DtS provisions regarding fire safety systems, except as varied in Section 5 of this Report. Those required provisions will incorporate the fire safety systems listed in Table 4.1 below.

Table 5.1 Required Fire Safety Systems

No.	Items	Relevant Standards
1.	Portable fire extinguishers	AS 2444
2.	Hose reels	AS 2441
3.	Fire rated door-sets	AS 1905
4.	Emergency lighting	AS 2293
5.	Exit signs	AS 2293
6.	Hydrants (street hydrant coverage)	AS 2419

5 Fire Engineering Analysis

5.1 Performance Solution 1 – Hydrant and Hose Reel Coverage

5.1.1 BCA DtS Provision

BCA Clause E1.3 Fire hydrants
(a) A fire hydrant system must be provided to serve a building—
(i) having a total floor area greater than 500 m2; and
(b) The fire hydrant system—
(i) must be installed in accordance with AS 2419.1...

AS 2419 Section 3.5.3.2 External feed fire hydrants
The location of external feed fire hydrants shall be in accordance with the following:
(a) Each external feed fire hydrant shall be located not more than 20 m from a hardstand area.
(b) All portions of a building or open yard that are protected by an external feed fire hydrant shall be within 70 m of a fire brigade pumping appliance connected to the external feed fire hydrant.

BCA Clause E1.4 Hose Reels
(e) In achieving system coverage, one or a combination of the following criteria for individual internally located fire hose reels must be met in determining the layout of any fire hose reel system:
(ii) Fire hose reels must be located within 4 m of an exit.

5.1.2 Variation to BCA DtS Provisions

Hydrant coverage may be slightly greater than 70m due to new internal fitout.
Existing hose reels may be located up to 6m from an exit.

5.1.3 Relevant Performance Requirement

The relevant Performance Requirement is EP1.1 and EP1.3.

5.1.4 Methodology

The methodology for assessing the proposed alternative solution is a qualitative assessment to show compliance with BCA Clause A2.2;

A2.2 Performance Solutions
(1) A Performance Solution is achieved by demonstrating—
(a) compliance with all relevant Performance Requirements; or
(b) the solution is at least equivalent to the Deemed-to-Satisfy Provisions.
(2) A Performance Solution must be shown to comply with the relevant Performance Requirements through one or a combination of the following Assessment Methods:
(a) Evidence of suitability in accordance with Part A5 that shows the use of a material, product, plumbing and drainage product, form of construction or design meets the relevant Performance Requirements.
(b) A Verification Method including the following:
(i) The Verification Methods provided in the NCC.
(ii) Other Verification Methods, accepted by the appropriate authority that show compliance with the relevant Performance Requirements.
(c) Expert Judgement.
(d) Comparison with the Deemed-to-Satisfy Provisions.

For this performance solution, the method of meeting A2.2 shall be via A2.2(1)(a) and (b) and A2.2(2)(b)(ii) and (d).

5.1.5 Acceptance Criteria

The acceptance criterion is a design that allows for effective and efficient use of the hydrant and hose reel systems, and allows for the safe egress of occupants.

5.1.6 Qualitative Assessment Hydrant Coverage

AS 2419 states all portions of a building must be within 70m of a fire appliance hardstand area. This equates to two 30m hose lengths and 10m of spray from the nozzle. The building is served by three street hydrants located in Shirley Street, Shirley Lane, and Wordsworth Street, which would provide coverage of the whole building. However, the hydrant located in Shirley Lane would be very hard to access from a fire appliance due to the narrowness of the lane and the lack of a turning circle. A safe and more efficient strategy is proposed that relies on extended coverage from the hydrant located on Wordsworth Street, close to the main entry point to the building.

All areas of the building can be covered from the street-side hardstand area adjacent to the building entry point with three lengths of hose, with only 70m of the coverage within the building. This strategy is in line with FRNSW “Fire Safety Guideline Technical Information – Fire Hydrant Concessions for Existing Buildings” Section 6.1 which extends hydrant coverage for existing buildings from 90m from a street hydrant to all parts of the building (via a hardstand area) to 120m from feed hydrant to all parts of a building as long as not more than 70m of coverage is within the building. Additional signage is required to be provided at the main entry point to the building as follows;

A fade and weather resistant sign, A3 in size, is to be permanently affixed at the front of the building or premises at the most likely access point, and have uppercase contrasting text which states (see Figure 2):

(a) 'STREET HYDRANT', not less than 30 mm high,

(b) 'HP' or 'HR' depending on whether the street fire hydrant is located on the **R**oad or **P**ath, along with arrows to each side and the respective distance to the nearest street fire hydrant in that direction, and

(c) 'ADDITIONAL HOSE LENGTHS MAY BE REQUIRED', not less than 20 mm high.

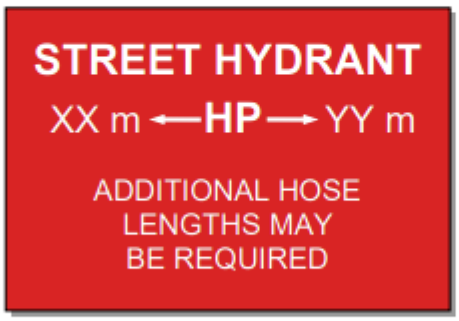


Figure 2 Example of signage required at the front of the building

Note: 'XX' and 'YY' is the distance from the sign to the street fire hydrant in each direction. In cases where multiple access points are likely, a sign should be provided at each access point.

This design, using external hydrants with coverage provided by an additional length of hose, is also supported by Australian Standard 2419.1 Appendix C3.9, which states "In summary, where possible, when developing a fire hydrant system design, the fire hydrant system designer should consider how the attending fire brigade personnel are going to approach, and move through and around the building as they endeavour to extinguish a fire in any location within the protected building and the risks associated with the building. For low-rise building in particular, where space is available around the building, external fire hydrants should always be installed".

Based on the above, the proposed design of using one street hydrant located adjacent to the building entry to provide hydrant coverage via three hose lengths has been shown to meet, to the degree necessary, the relevant performance requirements EP1.3.

5.1.7 Qualitative Assessment of Hose Reel Locations

BCA Clause E1.4 requires that hose reels are located within 4m of an exit. The reason for this is so that occupants using the hose reels can retrace their way back towards an exit by following the hose reel. Two of the existing hose reels are located slightly more than 4m from the exits. The minor additional distance is not expected to endanger occupants using the hose reels as the exits are clearly visible from the location of the hose reels and the exits are easily identified by the exit signs located above them.

The building shall be required to have an emergency plan in place to meet the requirements of AS 3745 "Planning for Emergencies in Facilities" to address who should use the hose reels and when, with evacuation drills and training for designated staff in the fire safety measures provided in the building.

Based on the above, the location of hose reels up to 6m from an exit has been shown to meet, to the degree necessary, the relevant performance requirement EP1.1.

5.1.8 Compliance with BCA Performance Requirements

The proposed alternative solution was assessed against BCA Performance Requirement EP1.1 and EP1.4. The tables below summarises the discussions of each parameter nominated by Performance Requirement EP1.1 and EP1.4.

Performance Requirement Assessment of EP1.1

Parameter for consideration	Discussion	Parameter Addressed
EP1.1 A fire hose reel system must be installed to the degree necessary to allow occupants to safely undertake initial attack on a fire appropriate to:		
(a) the size of the fire compartment; and	Fire compartment sizes are well below BCA Table C2.2 allows.	✓
(b) the function or use of the building; and	The building will mainly house offices with the possibility of some educational functions.	✓
(c) any other fire safety systems installed in the building; and	The building will have portable fire extinguishers, exit signs, and emergency lighting, as well as hydrant coverage from street hydrants.	✓
(d) the fire hazard.	The fire hazard of the building is considered low due to the use of the building as mainly office space. Being a single storey building with many exits available reduces the fire hazard.	✓

Performance requirement assessment of EP1.3

Parameter for consideration	Discussion	Parameter Addressed
EP1.3 A fire hydrant system must be provided to the degree necessary to facilitate the needs of the fire brigade appropriate to-		
(a) fire-fighting operations; and	The assessment showed that the use of an easily accessible street hydrant with extended coverage and signage would provide effective and efficient means for the fire service to fight a fire.	✓
(b) the floor area of the building; and	Fire compartment sizes are well below BCA Table C2.2 allows.	✓
(c) the fire hazard.	The fire hazard of the building is considered low due to the use of the building as mainly office space. Being a single storey building with many exits available reduces the fire hazard.	✓

5.1.9 Conclusion

The proposed performance solution has been assessed, to the degree necessary, against each of the above individual provisions of Performance Requirement EP1.1 and EP1.4. In accordance with acceptable assessment methods stated in Section 5 of this report, it is our considered opinion that BCA Performance Requirements EP1.1 and EP1.4 have been satisfied.

6 Work Required

The following works are required to be completed to support the findings of the performance solutions used in this report;

1. Signage is required to be provided at the entry point to the building as per FRNSW Hydrant Concessions Section 6.1.8.

Appendix A – Fire Engineers C.V.

Rob Dennis – B.Sc. M.I.Fire.E. Grad Dip Fire Safety Engineering

Principle Fire Engineer - Dolphin Fire Engineering Consultants

Rob has over 30 years' experience in the fire industry, with involvement in fire engineering for over 25 years, including creating and assessing alternative solutions in NSW, Victoria and QLD.

Memberships

Member Institution of Fire Engineering since 1992 (M.I.F.E.)

Accredited Certifier C10 – Fire Safety Engineering with NSW Building Professionals Board - Registration No. BPB1794

Registered Building Practitioner – Fire Safety Engineer – with Victorian Building Commission 2010 - 2011

Member of Society of Fire Safety 2010 – present.

Special competencies

An intimate knowledge of how fires, buildings, occupants, and fire-fighting operations interact during fires.

Producing safe, cost effective fire engineered solutions.

Background

2012 – now	Dolphin Fire Engineering Consultants
2010 – 2012	Beca Pty Ltd, Australia
2008 – 2010	Bassett Consulting Engineers / Aecom
2003 – 2008	Structural Fire Safety Unit, NSW Fire Brigades
1986 – 2008	NSW Fire Brigades

Relevant Education:

Graduate Exams - Institution of Fire Engineers, 1991
Member Exams - Institution of Fire Engineers, 1993
Bachelor of Science - University of New England - 2001
Graduate Diploma - Fire Safety Engineering - UWS, 2004

NSW Land and Housing Commission – Fire Safety Audits and Fire Engineering Analysis
Fire Engineer – Fire Safety Audits, Alternative Solutions, and Fire Engineering Reports for numerous (70+) Class 1 – Class 9 buildings under contract to the LAHC.
NSW Police - Essential Fire Safety Measures inspections, reports and advice.
Fire Engineer - Contracted to undertake fire safety audits of various Police Stations throughout NSW including the NSW Police Academy in Goulburn, plus Wollongong and Albion Park Police Stations.
NSW Sugar Milling Cooperative - Broadwater and Condong Sugar Mills
Fire Engineer - Conduct Fire Safety assessments of the 2 plants to reduce false alarms. Prepare Fire Engineering Strategies and Reports.
Vast Solar – Forbes Solar Power Plant
Fire Engineer - Produce fire safety strategy and fire engineering reports for special hazards, (molten Sodium storage).
La La Land - Byron Bay - Post fire analysis of nightclub
Fire Engineer - Fire safety audit of entire building to enable an economical rebuild using existing building elements.
Harvest Cafe, Bangalow - Single storey multiple use commercial building

Fire Engineer - Testing and specifying changes to the external wall-wetting sprinkler system to gain occupation certificate for the building.

Drydock Rd, Tweed Heads - 4 storey Class 3 residential building (units)

Fire Engineer - Alternative solution and design of smoke detection and alarm system, showing that a simpler and cheaper method of protection will provide more occupant safety than the existing design costing $10,000 more.

Paradiso Resort, Kingscliff - 4 storey holiday resort

Fire Engineer - Provide Alternative solution to prevent on-going false alarms and allow a change from radiant heat shields at the front of units to interlinked thermal alarms, providing a more aesthetic design whilst still keeping occupants safe.

Robb College - University of New England - 4 student accommodation blocks and dining hall Building C10 Certifier - Provide peer review and C10 Certification for Junior Fire Engineer for fire safety up-grade of student accommodation facility.

Chevron Point, Surfers Paradise - 6 level commercial, office and residential building

Fire Engineer - Fire safety advice to improve occupant safety whilst maintaining building security.

Artisan Air, Byron Bay - Large Class 6 workshop and showroom with Class 4 residential part

Fire Engineer - Provide cost-effective design for a Council ordered fire safety up-grade. Alternative Solutions for fire separation, extended travel distances, reduced exit widths, etc., plus design of fire hose-reel system and exit signs and emergency lighting.

Extreme Mixed Martial Arts, Byron Bay - Gymnasium and associated reception, offices, and amenities

Fire Engineer - Provide Alternative Solution for egress due to security doors.

Granuaille Rd, Bangalow - Residential dual occupancy

Fire Engineer - Provide Alternative Solution for fire separation of dual occupancy project.

Dress Circle Rd, Lennox Head - Residential dual occupancy

Fire Engineer - Provide Alternative Solution for fire separation of dual occupancy project.

Byron Bay Juice Bar - Change of Use, Class 6 building

Lead Fire Engineer – Fire safety audit and up-grade including alternative solution to address egress widths, which provided the store owner with more store flexibility than the previous design.

Byron Bay Community Centre – 2 storey Class 9b and Class 6 – Auditorium and shops and offices

Lead Fire Engineer – Alternative solution to prevent false alarms during concerts and shows using pyrotechnics whilst maintaining occupant safety.

122 Lighthouse Road, Byron Bay – 4 storey Class 3 residential

Lead Fire Engineer – Alternative solution regarding use of AS 3786 system in lieu of an AS1670 system, plus egress analysis of a non-compliant basement car-park.

Coffs Harbour Ex-Services Club – 6 storey Class 9b, 7a, 6, and 5 – Bowling Club

Fire Engineering Review and C10 Certification for oversized fire compartments, egress analysis, and BCA audit.

Transgrid / Alstom Rookwood Rd and Holroyd Substations, Sydney.

Lead Fire Engineer – Fire engineering analysis of explosion and fire risks from 330kV transformers to adjacent buildings and other critical infrastructure.

Qantas Catering Facility, Brisbane Airport

Lead Fire Engineer - Produce alternative solutions for, and analysis of, egress, compartmentation, suppression systems, alarm and detection, internal and external fire spread using computer fire modelling (FDS models). Produce and present Fire Engineering Report for approval by Brisbane Airport Commission and Airport Rescue and Fire Fighting Service.

Rockhampton Hospital, QLD

Fire Safety Audit and produce a fire safety strategy for the up-grade of their nursing home buildings.

Bunnings Warehouse, Maribyrnong, Victoria

Fire engineering advice and computer analysis of fire growth and smoke spread for the design and construction of the 2 storey warehouse building.

Regent Tower Development – Queens Street, Brisbane. (40+ story office building)

Lead Fire Engineer – Created alternative solutions for, and analysis of, egress, compartmentation (Cardington method), suppression, alarm and detection, internal and external fire spread using computer fire modeling (FDS and zone models). Produce and present Fire Engineering Brief and Fire Engineering Reports for approval by local authorities.

Zillmere Joint Contact Centre – Brisbane. (4 storey Class 5 and 7a - 6 star greenstar)

Lead Fire Engineer – Created alternative solutions for, and analysis of, egress, compartmentation, suppression, alarm and detection, internal and external fire spread. Produce and present Fire Engineering Brief and Fire Engineering Reports for approval by local authorities. The first approved 6 Star Green Star Office building in Queensland.

Defence Infrastructure

RAAF Amberley Airfield - Super Hornets,

Provide FDS expertise for fire modelling of aircraft hangers.

Provide evidence for ventilation requirements and compartmentation.

Pearce RAAF Base,

Provide FDS expertise for fire modelling of aircraft hangers.

ELF – Enoggora

Provide specialist fire engineering advice for many special use buildings.

Healthcare facilities

Queensland Institute of Medical Research Smart State Medical Research Centre

Detailed fire engineering report including FDS and zone modelling of the 9 level research centre to meet research requirements including the Australian bio-security response facility.

Queensland's Prince Charles Hospital Orthopaedic Unit,

Analysis of egress requirements for Fire Engineering Report

Queensland Children's Hospital,

Produce Fire Engineering Brief for design stage of the hospital, including FDS modelling of twin atriums up to 8 levels.

NSW Fire Brigades – Structural Fire Safety Unit 2003 - 2008

Alternative Solutions Fire Safety Officer - provided fire safety and regulatory advice, approval, and compliance inspections, building surveys, hospital audits, and post fire investigations for many projects throughout NSW, including;

Hazardous industries and storage, Industrial, Warehouses, Commercial, Shops and Shopping centres, Health care, High-rise and Low-rise Residential, Backpackers, Hotels, Motels, Schools, and Public Entertainment venues.

NSW Fire Brigades – 1986 – 2008

Senior Firefighter, Pump and Aerial Appliance Operator, Accredited Land Rescue Operator, Primary Rescue Unit Trainer, Category 2 Urban Search and Rescue Operator.

Engaged in fire-fighting and rescue at various fire stations throughout NSW. Heavily involved in fire protection of heavy industrial areas of Sydney such as I.C.I. (Orica), Port Botany Bulk Liquids Berth, Caltex Oil Terminal, Bulk Storage and Handling of Flammable Liquids, as well as life and property protection of residential, commercial, health-care, and industrial facilities.