

To Whom it May Concern

Level 10 201 Kent Street
PO Box 76 Millers Point
Sydney 2000
Australia

t +61 2 9320 9320

d +61 2 9320 9656

f +61 2 9320 9321

alistair.morrison@arup.com
www.arup.com

30 July 2018

Dear Sir/Madam

**Australia Museum Masterplan Phase 1 - New Touring Exhibition
Fire engineering approach in support of the Development Application submission**

This letter considers the fire safety design of the proposed new Touring Exhibition space and renovation works of the existing Australian Museum premises on the William Street frontage, and specifically those aspects of the fire safety design that impact upon planning related issues for the new works.

The proposed works involve the expansion of the existing Crystal Hall and conversion of the existing Still Addition store on ground and basement levels into a new exhibition/gallery space. In addition, the project involves the rotation of the existing external stair discharging on to William St. with the intent of discharging into a biodiversity garden under Crystal Hall and the introduction of an education space and new cafeteria on Level 2.

A fire engineering review of the conceptual design has been undertaken by Arup on drawings provided by Hames Sharley Architects and feedback on BCA related items by Steve Watson & Partners. Arup have previously been the fire engineer for the integration of the new Crystal Hall entry into the existing building, and the Research and Collection building extension, as well as advising on modifications and refurbishment works throughout the building and are very familiar with the existing building fire strategy, which has helped form this review.

Our review has indicated that the new works will generally satisfy the Performance Requirements of the Building Code of Australia (BCA) by complying with the Deemed-to-Satisfy (DTS) Provisions. However, there are some aspects of the design that are to be developed using performance based fire engineering to achieve compliance with the Performance Requirements of the BCA for the new works and to assess the impact on the existing building. These will be addressed in detail in the future Fire Engineering Brief and Fire Engineering Report.

In addition to satisfying the BCA Performance Requirements, the fire safety strategy aims to be consistent with the existing fire strategy for the building and to maintain an equivalent or greater level of fire safety in the existing building. The fire strategy for the new works also aims to be sympathetic to the heritage fabric of the building.

Structure and Compartmentation

The Still Addition store areas will be undergoing a change in use from store to the new Touring Exhibition space at basement level. This change is likely to reduce the fire load and risk for the space and the required fire rating to the structure. Options for fire separation between areas of new works and existing parts are being investigated, particularly with reference to existing heritage features as well as keeping with the existing 2004 fire upgrade strategy by Steve Watson and Partners and to support the fire strategy for the new exhibition space. New structure will comply with the Performance Requirements of the BCA.

The Ground floor will remain as an exhibition space with retail re-located closer to the Crystal Hall. The changes will require the fire compartmentation to be modified slightly but still in keeping with the existing areas. The Ground Floor Touring Exhibition will remove the secure store area, further reducing fuel load at this level.

Egress

The egress from Level 2 and Ground floor will utilise existing exit paths. The removal of the secure store at the rear of the Touring Exhibition will enhance connection to the rear exit stairs.

Existing basement exits paths will be utilised and a new stair added from the Touring Exhibition space. The existing stair from the Touring Exhibition will discharge half a level up rather than continuing to Lower Ground lobby. Discharge will be into a new fire isolated passage and a newly formed exit under the Crystal Hall. This also helps avoid current discharge into the Lower Ground Lobby.

The new stair will discharge in the Lower ground into a fire isolated portion of corridor and through to the lobby. The converging exits from stair 1 means the final exit doors on this level have been widened to accommodate the new total egress width and will discharge under the Crystal Hall. The exit path leading to the road through the Biodiversity garden under the Crystal Hall will be widened to accommodate all the converging exit paths with the objective that exit systems within the building are not impeded.

All exit systems will be analysed during design development using dynamic egress modelling programs to assess the converging flows and to ensure a safe exit time is achieved. Queuing times from the new Touring Exhibition space at Basement and Ground floor levels will be assessed and compared to smoke modelling to demonstrate that occupants can evacuate safely and the Performance Requirements of the BCA can be satisfied.

Fire Detection and Suppression Systems

As per the existing building, the new elements of the building and the renovated parts will be provided with an automatic sprinkler system to current standards, which is expected to minimise fire sizes and reduce the risk of fire spread between fire compartments.

For the new work areas a fire alarm and detection system will be installed to current standards and interconnected to the existing fire warning system.

The new installation of these systems shall not reduce the performance and compliance of the existing system infrastructure.

Smoke Hazard Management

The existing smoke exhaust system provided in the premises will be utilised to minimise the impact the fire engineering strategy of the redeveloped areas has on the existing parts of the building and the works undertaken to accommodate the new design. Where demonstrated by

the smoke and fire modelling these systems will be upgraded or added to provide smoke exhaust and make up air to current standards and demonstrate that occupants can safely evacuate and that the Performance Requirements of the BCA are satisfied.

Fire Fighting Facilities

The existing hydrant and sprinkler system performance and compliance with installed standards shall not be adversely impacted as a result of the proposed works and therefore the performance of the existing infrastructure will not be addressed by the fire engineering strategy.

The renovated areas will be covered by the existing infrastructure and no works are currently proposed to the hydrant system. Any additional hydrant outlets and sprinkler heads introduced within the renovated parts of the building will be compliant with the current standards. The performance of the system will be assessed by the Fire Services consultant and demonstrated to maintain current system compliance.

Fire Safety during Construction

Based on our experience of the Crystal Hall construction, we will work with the Museum to help ensure a satisfactory level of safety during construction where the Museum wishes to remain operational.

Based on our fire engineering review, it is considered that there are no significant issues that would affect the building layout arising from fire safety and hence no impediments to the issuing of a State Significant Development Approval for the project.

Yours faithfully



Alistair Morrison
Associate Principal | Fire Engineering

cc Greg Murphy - Australian Museum
 Joseph Grech - Joseph Grech Architects
 Rachel Neeson, Hannah Slater - Neeson Murcutt Architects
 Oliver Wellings, Ian Steward - Hames Sharley Architects
 Andrew Rys - Steve Watson & Partners



30th November 2017

The General Manager
Council of the City Of Sydney
GPO Box 1591
SYDNEY NSW 2001

FAX: (02) 9273 7568

Dear Sir/Madam,

**RE: ANNUAL FIRE SAFETY STATEMENT
FOR
1- 43 William Street, Sydney
(6 COLLEGE STREET, DARLINGHURST)
(REF: E/2004/1264)**

Please find details of the Annual Fire Safety Statement for the above property. The following items and issues were noted whilst carrying out the various checks throughout the building:

- The various service contractors have advised that the Standard of Performance is as detailed in the attached submission.
- We have advised the Building Owner that a copy of the Annual Fire Safety Statement should be displayed in a prominent position in accordance with Note 2 of the Annual Fire Safety Statement.
- No original design and installation certifications (plans and specifications) have been made available, thus we have assumed that the services inspected comply with the original design criteria and to the best of our knowledge tried to identify every Essential Service contained there in.
- It is assumed that all building modifications including services if any have been submitted to and approved by Council.

A copy of the submission has been forwarded to the Fire and Rescue NSW and the Building Owner, Australian Museum.

We ask that Council confirm in writing receipt and acceptance of this submission at your earliest convenience.

Should you require any further information on this matter please do not hesitate to contact the undersigned on (02) 9420 9266.

Yours faithfully,

CHRIS ELLIOTT

Encl.

**PREMISES****1- 43 WILLIAM STREET, SYDNEY (6 COLLEGE STREET, DARLINGHURST)****(AUSTRALIAN MUSEUM)**


ITEM No.	MEASURE	STANDARD OF PERFORMANCE
1.	Automatic failsafe devices	BCA Specification. C3.4
2.	Automatic Fire Detection & Alarm System	Ord 70.27.4, AS 1670
3.	Automatic Fire Suppression System (sprinklers)	Ord 70.55.17, 22.4, 26.3, AS CA 16, AS 2118.1.
4.	Emergency Lighting	Ord 70.55.12, AS/NZS 2293.1
5.	Emergency Warning & Intercommunication System	Ord 70.55.16, AS 2220.1&2
6.	Fire Alarm Communication Link or Auto Fire Alarm Monitoring	AS 4428.6
7.	Exit Signs	Ord 70.24.29, AS/NZS 2293.1
8.	Fire Dampers	Ord 70.22.13, Ministerial Specification No.12, AS/NZS 1668.1, AS1668.2. C.S.I.R.O Report 2006
9.	Fire doors	Ord 70.21.1, AS/NZS1905.1 Pawal Consulting Report 2005
10.	Fire Hydrant Systems	Ord 70.27.3, AS 2419.1
11.	Fire seals (protecting openings in fire resisting components of the building)	Ord 70.22.12, AS 4072.1 & installed in accordance with the tested prototype,Pawal Consulting Report
12.	Hose reel system	Ord 70.27.2, Ministerial Specification No 10, AS 2441
13.	Mechanical air handling systems	Ord 70.55.7, Ministerial Spec. Numbers 12 & 13 Steve Watson ,Fire Safety Upgrade Sept 2004 Report 2003/211 R3
14.	Portable fire extinguishers	Ord 70.27.4.1, AS 2444
15.	Smoke Dampers	AS1668.1, AS 1668.2 Steve Watson ,Fire Safety Upgrade Sept 2004 Report 2003/211 R3
16.	Smoke Detectors & Heat Detectors	Ord 70.27.4, AS1670.1
17.	Automatic fire suppression system – Gaseous Systems) Inergen, NAF – S111 (Spirit Store)	AS 4214

I, Chris Elliott of EngTec Pty. Limited**Certify that the information contained in this Schedule to be correct and accurate.**.....
Signed – Agent**Date: 30th November, 2017**



ANNUAL FIRE SAFETY STATEMENT

Under the Environmental Planning & Assessment Regulation 2000

TYPE OF STATEMENT	✓ ANNUAL	
*ANNUAL STATEMENT NAME/ AGENT ADDRESS	I Chris Elliott of EngTec Pty. Limited, Unit 22 A, 2-4 Chaplin Drive, Lane Cove West, NSW 2066 Certify: (a) That each essential fire safety measure specified in this statement has been assessed by a competent fire safety practitioner and was found, when it was assessed, to be capable of performing: i) in the case of an essential fire safety measure applicable by virtue of a fire safety schedule, to a standard no less than that specified in the schedule; or ii) in the case of an essential fire safety measure applicable otherwise than by virtue of a fire safety schedule, to a standard no less than that to which the measure was originally designed and implemented, and (b) That a competent fire safety practitioner (whether the person referred to in paragraph (a) or another person) has inspected the building and has certified that, as at the date of the inspection, the condition of the building did not disclose any grounds for a prosecution under Division 7 of Part 9 of the Environmental Planning & Assessment Regulation 2000, and (c) The information contained in this certificate is, to the best of my knowledge and belief, true and accurate based upon our visual observation of the essential services excluding all latent defects, if any.	
IDENTIFICATION OF BUILDING WHOLE OF BUILDING	Street Side of Street House/Unit No. or Name	William Street. (6 COLLEGE STREET, DARLINGHURST) Southern. Australian Museum
DATE OF ASSESSMENT	Dated this 20 th November, 2017.	
OWNER'S DETAILS	Name Australian Museum Trust. 6-8 College Street. Sydney, NSW, 2000.	
ESSENTIAL/CRITICAL FIRE SAFETY MEASURES	Measure 1. Automatic fail safe devices 2. Automatic Fire Detection & Alarm System 3. Automatic Fire Suppression System (sprinklers) 4. Emergency lighting 5. Emergency Warning & Intercom System 6. Exit Signs 7. Fire Alarm Communication Link or Auto Fire Alarm Monitoring 8. Fire Dampers 9. 10. Fire Doors 11. Fire Hydrants 12. Fire seals (protecting openings in fire resisting components of the building) 13. Hose reel system 14. Mechanical Air Handling System 15. Portable fire extinguishers 16. Smoke Dampers 17. Smoke and Heat Detectors 18. Gaseous Systems (Spirit House) (Inergen, NAF – S111)	Standard of performance BCA Spec.C3.4 Ord 70.27.4, AS 1670 Ord 70.55.17, 22.4, 26.3, AS CA 16, AS 2118.1 Ord 70.55.12, AS/NZS 2293.1 Ord 70.55.16, AS 2220.1&2 Ord 70.24.29, AS/NZS 2293.1 AS 4428.6 Ord 70.22.13, Ministerial Specification No.12, AS 1668.1, AS1668.2 C.S.I.R.O Report 2006 Ord 70.21.1, AS/NZS 1905.1 Pawal Consulting Report 2005 Ord 70.27.3, AS/NZS 2419.1 Ord 70.22.12, AS 4072.1 & installed in accordance with the tested prototype Pawal Consulting Report 2005 Ord 70.27.2, Min. Spec No. 10, AS 2441 Ord 70.55.7, Ministerial Specification numbers 12 & 13, Steve Watson Fire Safety Upgrade Report Sept 2004 Report 2003/211 R3 Ord 70.27.4.1, AS 2444, AS 1668.1, AS 1668.2. Steve Watson Fire Safety Upgrade Report Sept 2004 Report 2003/211 R3 Ord 70.27.4, AS1670.1 AS 4214
DATE OF STATEMENT	Dated this 30 th November 2017.	
AUTHORISATION	Name Agent <div style="text-align: center;">  Signature </div>	Certified by: Chris Elliott, M. Des. Sc. Bld. Services EngTec Pty Limited Inspected by: Richard George EngTec Pty Limited

Notes:

1. A copy of this certificate together with the relevant fire safety schedule has been forwarded to the Council and the Commissioner of the Fire and Rescue NSW.
2. A copy of this certificate together with the relevant fire safety schedule must be prominently displayed in the building.
3. EngTec Consulting have been appointed by the owner's Agent to co-ordinate the Annual Fire Safety Statement. We have extrapolated the standards for performance from the various certificates supplied by the nominated service contractors and inserted onto this certificate. No liability for negligence or otherwise is assumed by EngTec Pty. Limited for any loss or damage suffered by any party resulting from their use of this statement. The whole or any part of this statement shall not be produced or copied or provided to any party to whom it is not addressed without EngTec Pty. Limited's written consent.
4. All codes nominated are versions applicable at the time of construction.