

**CERTIFICATE OF CLASSIFICATION (Certificate to Allow Occupancy)
Clause 46, Local Government (Approvals) Regulation
Local Government Act 1993
Olympic Co-ordination Authority Act 1995**

Certificate Number: 2/99
Application Reference: Building Application 10/96 - Stadium Australia
Building Area: 211,306 m² **Date of Certificate:** 3 March 1999
Building No. or Name: Stadium Australia
Street: Olympic Boulevard
Village: Homebush Bay **Postcode:** 2127
Lot: Part Lots 101 & 102 **DP:** 849975
Volume: -
County: Cumberland **Parish:** Concord
Site Area: -
Owner's Name: Olympic Co-ordination Authority
Owner's Address: Level 36, Governor Macquarie Tower,
1 Farrer Place, Sydney, NSW, 2000.
Applicant's Name: MTM Stadium Management Ltd
Applicant's Address: Level 3, Western Stand, Stadium Australia,
Olympic Boulevard, Homebush Bay, NSW, 2127.

I certify that the several parts of the building described are classified as follows:

Part	Class	Approved Use
Level 0	7	Carparking
	7	Storage
	9b	Amenities
	5	Offices
Level 1	9b, 6	Stadium, Concourse and Associated Amenities and Food Concessions
Level 2	9b, 6	Stadium, Associated Dining Rooms, Amenities and Food Concessions
	9b	Place of Public Entertainment
Level 3	9b, 6	Private Suites, Associated Bar/Lounges, Amenities and Food Concessions
	5	Administration
Level 4	9b, 6	Stadium, Amenities and Food Concessions
	9b	Banquet Halls (Place of Public Entertainment)
Level 5	9b, 6	Stadium, Associated Restaurants, Amenities and Food Concessions
	9b	Place of Public Entertainment
Level 6	9b, 6	Stadium, Amenities and Food Concessions
Level 7	9b	Stadium, Amenities and Plant Rooms
Level 8	9b	Stadium (upper tier seating level)



**David Richmond
Director-General**



WOLLONGONG CITY COUNCIL

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JBA Urban Planning
 PO Box 375
 NORTH SYDNEY NSW 2059

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APPLICATION DA-2001/682/B

Determination	Conditionally Approved
Approval Authority	Wollongong City Council
Endorsement Date	24 August 2001
Date	29 August 2011

NOTICE OF DETERMINATION OF APPLICATION TO MODIFY DEVELOPMENT CONSENT Issued under Section 96 of the Environmental Planning and Assessment Act 1979

The development application described below has been determined:

Description	Stage 1 - Construction Of Northern Grandstand And Ancillary Function Rooms. Stage 2 - Construction Of Northeastern Wrap-Around Grandstand (On Part Of Lot 94 Andrew Lysaght Park) Modification B - modification to conditions 12, 32, 33, 63 and 64 and additional car parking
Location	Lot 143 DP 786508, Lot 101 DP 872951 WIN Entertainment Centre, 9-11 Crown Street, WOLLONGONG NSW 2500

The application for Modification has been determined by **granting of consent for two (2) stages** subject to the following conditions:

Approved Plans and Specifications

- The development is to be carried out in compliance with the plans and documentation listed below and endorsed with Council's stamp, except where amended by other conditions of this consent:

Plans and Specifications approved by Modification B	Proposed carparking plan - number DA1003-E - dated 15 April 2011 - Allen Jack & Cottier Cover sheet - number 10020-C01-G - sheet 1 of 9 - dated 1 July 2011 - Steve Paul & Partners Civil works plan - number 10020-C02-G - sheet 2 of 9 - dated 1 July 2011 - Steve Paul & Partners Civil works plan - number 10020-C03-G - sheet 3 of 9 - dated 1 July 2011 - Steve Paul & Partners Southern carparks plan - number 10020-C03-G - sheet 4 of 9 - dated 1 July 2011 - Steve Paul & Partners Civil works plan - number 10020-C04-G - sheet 5 of 9 - dated 1 July 2011 - Steve Paul & Partners Civil works plan - number 10020-C05-G - sheet 6 of 9 - dated 1 July 2011 - Steve Paul & Partners Civil works plan - number 10020-C07-G - sheet 8 of 9 - dated 1 July 2011 - Steve Paul & Partners Concept erosion and sediment control plan - number 10020-C08-G - sheet 9 of 9 - dated 1 July 2011 - Steve Paul & Partners
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The plans and specifications approved with Modification B supersede plans and specifications approved by the original development consent where there are any inconsistencies

CONSENT

Plans and Specifications approved as part of original development consent	Drawings ES-00, 01, 02, 03, 04 and 05 preliminary sketch plans - dated 7 May 2001 - Scott Carver Pty Ltd Drawing DA S0, S1, S2, S3, S4, S5 and S6 - Scott Carver Pty Ltd Drawing No. H-01 and 02, Issue D - dated April 2001 - Sparks & Partners Statement of Environmental Effects - dated May 2001 - Scott Carver Pty Ltd Statement of Heritage Impact for north-eastern grandstand WIN Stadium, Wollongong – dated May 2001 - Anne Bickford Heritage Consultants
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STAGE 1

- 1A A construction management plan/report is to be submitted to and approved by Council prior to the release of the **Construction Certificate**. Details to provide but is not limited to:
- Plan of proposed construction/storage area, vehicle parking;
 - Access at each stage for demolition, construction, storage of plant/machinery/equipment, materials;
 - The type of materials/equipment stored and or transported to the site and how is it to be transported?;
 - The proposed access points to the site;
 - Treatment of barricading for construction/and restricting access;
 - Hours of operation;
 - Parking for construction workers, and parking for Entertainment Centre; and
 - Temporary signage and/or linemarking proposed during the construction period.
- 2 The builder shall liaise with Council on at least a fortnightly basis (or as otherwise agreed to by Council) to provide a progress report to Council's Traffic Co-Ordinator and Manager Works covering the following:
- Proposed amendment to traffic management;
 - Construction staging, access, storage and parking arrangements;
 - Proposed road closure; and
 - The impact of the above on bus routes, vehicle, cyclist and pedestrian movements.
- This liaison may also involve other parties undertaking construction/development activities in this area.
- 3 The local Aboriginal community must be notified in writing to ensure Aboriginal heritage issues are addressed prior to the commencement of any construction work on site.

BUILDING

- 4 The proposed development has been assessed under the provisions of the Building Code of Australia as:
- Class - 9a and 7
Rise - 4 Storeys
Type - A Construction
- 5 All building work must be carried out in accordance with the provisions of the Building Code of Australia.
- 6 The developer must submit to the Certifying Authority for approval prior to the issue of the Construction Certificate, a detailed soil and water management plan for the construction period. All works on the site must be in accordance with the approved soil and water management plan for the full duration of construction works.

CONSTRUCTION CERTIFICATES

- 7 A **Construction Certificate** detailing the specific stage of construction must be obtained from Council or an Accredited Certifier prior to work commencing for Stage 1. A construction

certificate certifies that the provisions of Clauses 79A-79H of the Environmental Planning and Assessment Amendment Regulations, 1998 have been satisfied, including compliance with the Building Code of Australia and conditions of Development Consent.

FIRE SAFETY CERTIFICATES

- 8 A **Final Fire Safety Certificate** must be issued for Stage 1 prior to the issue of an **Occupation Certificate**. As soon as practicable after a **Final Fire Safety Certificate** is issued, the owner of the building to which it relates:
- must cause a copy of the certificate (together with a copy of the current fire safety schedule) to be given to the Commissioner of New South Wales Fire Brigades, and
 - must cause a further copy of the certificate (together with a copy of the current fire safety schedule) to be prominently displayed in the building.

INSPECTIONS/CERTIFICATION

- 9 Prior to commencement of work, the person having the benefit of the Development Consent and a Construction Certificate shall:
- appoint a **Principal Certifying Authority** and notify Council of the appointment (if Council is not appointed), and
 - notify Council of their intention to commence the erection of the building (at least 2 days notice is required).

The Principal Certifying Authority shall determine when **inspections and compliance certificates** are required.

OCCUPATION CERTIFICATE

- 10 A final **Occupation Certificate** must be issued by the Principal Certifying Authority prior to occupation/operation of Stage 1. In issuing an occupation certificate, the Principle Certifying Authority must be satisfied that the requirements of section 109H of the Environmental Planning and Assessment Act 1997 have been satisfied.

DISABLED ACCESS AND FACILITIES

- 11 Access for the disabled must be provided to the whole floor in accordance with AS 1428.1 (1998).
- 12 Of the total number of parking spaces, 5 must be provided for the parking of disabled persons. Each disabled persons' car space shall have dimensions in compliance with AS2890 (series) and Australian Standard AS1428.1 (2001) and shall be clearly marked and/or signposted and located to maximise accessibility to the buildings.

Modified—Modification B

- 12A The provision of disabled persons' car parking and access throughout the development is required and shall be in compliance with the Building Code of Australia Part D3 "Access for People with Disabilities", AS 2890 (series) and Australian Standard AS1428.1 (2001) - Design for Access and Mobility – Part 1 General Requirements for Access – Buildings. This requirement shall be reflected on the construction plans.

Added—Modification B

- 13 Toilet accommodation shall be provided for disabled persons in accordance with the design criteria in AS 1428.1 (1998).
- 14 Ramps provided for disabled access shall comply with AS 1428.1 (1998). This includes access from the allocated parking for disabled persons.
- 15 The applicant should be aware of the provisions of the Disability Discrimination Act, which came into force in March 1993.
- 16 Signs incorporating the international symbol of access for disabled persons must be provided to identify each accessible:

- a. entrance; and
- b. sanitary facility.

CONSTRUCTION

- 17 Work shall be confined to normal working hours, namely 7.00 am to 6.00 pm Monday to Friday, and 7.00 am to 6.00 pm Saturdays. (No work is permitted on Sundays or public holidays).
- 18 Demolition shall comply with the requirements of AS 2601-1991.
- 19 The site shall be enclosed with a suitable hoarding (type A or B) or security fence of a type approved by Council. An application shall be lodged with and approved by Council before the erection of any hoarding or fence. Note: No building work or demolition shall commence before the hoarding or fence is erected.
- 20 Any works that penetrate the ground surface outside Stage 1 (Lot 94 and former Lot 95) must be carried out and supervised to the satisfaction of a suitably qualified archaeologist.

SITE MANAGEMENT

- 21 Stockpiles of sand, gravel, soil and the like shall be located to ensure that the material:
 - a. does not spill onto the road pavement; and,
 - b. is not placed in drainage lines or water courses, and cannot be washed into these areas.
 If soil or other materials are spilled accidentally onto the road or gutter, they shall be removed immediately.
- 22 The developer must provide an adequate receptacle to store all waste generated by the development pending disposal. The receptacle must be regularly emptied and waste must not be allowed to lie or accumulate on the property other than in the receptacle. Consideration should be given to the source separation of recyclable and reusable materials.
- 23 Drains, gutters, access ways and roadways shall be maintained free of sediment and any other material. Gutters and roadways shall be swept/scraped regularly to maintain them in a clean state.
- 24 Building operations such as brick cutting, the washing of tools or paint brushes, or other equipment and the mixing of mortar must not be carried out on the roadway or public footpath or any other locations which could lead to the discharge of materials into the stormwater drainage system or natural watercourse.

APPROVAL FROM OTHER AUTHORITIES

- 25 The developer must submit a Compliance certificate pursuant to Section 73 of the Water Board (Corporatisation) Act 1994 with the Construction Certificate Application. Attached is the application form to be submitted to Sydney Water. Sydney Water may require you to construct works and/or pay developer charges. Accordingly, you should make immediate application to Sydney Water to avoid problems in servicing your development.

DRAINAGE

- 26 The developer must ensure there are no adverse effects to adjoining properties or upon the land as a result of flooding and stormwater runoff. Attention must be paid to ensure adequate protection for buildings against the ingress of surface runoff.
- 27 The developer must make allowance for surface water run-off from adjacent properties. Any redirection or treatment of that run-off must not adversely affect any other properties.
- 28 The developer must provide overflow paths to allow for flows of water in excess of the capacity of the *pipe/drainage system* draining the land, as well as from any detention storage on the land. Blocked pipe situations with *1 in 100 year ARI events and/or the Probable Maximum Flood event* with unblocked pipes must also be incorporated in the design. Overflow paths must also be provided in low points and depressions.

- 29 The developer must ascertain the depth and location of all services (ie gas, water, sewer, electricity, telephone, traffic lights, etc) and account for these in the preparation of the working drawings to be submitted.
- 30 The developer must obtain written verification from a suitably qualified civil engineer, stating that all stormwater drainage and related work has been constructed in accordance with the approved plans. In addition, full works-as-executed plans, prepared and signed by a Registered Surveyor must be submitted. These plans must include levels and location for all drainage structures and works, buildings (including floor levels) and finished ground and pavement surface levels. This information must be submitted to the Principal Certifying Authority prior to the issue of the Occupation Certificate and use of Stage 1.

DRAINAGE WORKS ASSOCIATED WITH MODIFICATION B DATED 29 AUGUST 2011

Prior to Works Commencing

- 30A A hob or dish drain to direct surface water flows to the on-site detention facility shall be provided to the edges of all new hardstand areas comprising the car park, driveways and manoeuvring areas. Details are to be submitted to Council prior to works commencing.
Added—Modification B
- 30B Overflow paths must be provided to allow for flows of water in excess of the capacity of the pipe/drainage system draining the land, as well as from any detention storage on the land. Blocked pipe situations with 1 in 100 year ARI events must be incorporated in the design. Overflow paths must also be provided in low points and depressions. Details are to be submitted to Council prior to works commencing.
Added—Modification B
- 30C The depth and location of all services (ie gas, water supply, stormwater, sewer, electricity, telephone, etc) must be ascertained and reflected on the construction plans and supporting documentation.
Added—Modification B
- 30D Details of the proposed method of connection of the On-Site Detention (OSD) facility to Council's drainage system must be provided with the detailed drainage design for the site. The details must be submitted to Council prior to the commencement of works.
Added—Modification B
- 30E The developer must provide on-site detention storage for stormwater runoff from the development. The Site Storage Requirement (SSR) and Permissible Site Discharge (PSD) values for the site must be designed in accordance with Chapter E14 of the Wollongong DCP 2009. Details of the detention facility and SSR/PSD values are to be submitted to Council prior to works commencing.
Added—Modification B
- 30F **On-Site Detention - Maintenance Schedule**
A maintenance schedule for each on-site stormwater detention system must be submitted to Council prior to works commencing. The maintenance schedule must be in accordance with Chapter E14 of the Wollongong DCP 2009.
Added—Modification B
- 30G **Scour Protection**
All stormwater outlets and overland flow paths must incorporate appropriate scour/erosion protection measures. The final details of the proposed scour protection measures shall be submitted to Council prior to works commencing.
Added—Modification B
- 30H **Existing/Proposed Levels**
Existing and proposed levels to Australian Height Datum (AHD), including floor, ground, grate, pipe inverts and pavement levels shall be shown on the detailed drainage design. This requirement shall be reflected on the construction plans and supporting documentation.
Added—Modification B

30I **On-Site Detention – Design Criteria**

The on-site stormwater detention facility must incorporate a minimum 900mm square lockable grate for access and maintenance purposes, provision for step irons where required, provision for safety, debris control screen and a suitably graded invert to the outlet. Also, details of the orifice plate including diameter of orifice and method of fixing shall be provided. These requirements shall be reflected on plans to be submitted to Council prior to works commencing.

Added—Modification B

30J **On-Site Detention - Identification**

Details shall be provided of a corrosion resistant identification plaque for location on or close to the on-site detention (OSD) facility. The plaque shall include the following information:

- The structure is an OSD facility, being part of the stormwater drainage network, and is not to be tampered with;
- identification number [DA2001/682/B];
- any specialist maintenance requirements.

Added—Modification B

30K **Orifice/Weir Calculations**

Orifice and weir calculations for each on-site detention facility must be provided to Council for approval prior to works commencing.

Added—Modification B

During Demolition, Excavation or Construction

30L **Supervision of Engineering Works**

All engineering works associated with the development are to be carried out under the supervision of a practicing civil engineer.

Added—Modification B

30M **Piping of Stormwater to Existing Stormwater Drainage System**

Stormwater for the land must be piped to Council's existing stormwater drainage system. Prior to undertaking the connection the developer shall arrange inspections with Council's Works Division, giving 48 hours prior notice.

Added—Modification B

30N **No Adverse Run-off Impacts on Adjoining Properties**

The design of the development shall ensure there are no adverse effects to adjoining properties or upon the land as a result of flood or stormwater run-off. Attention must be paid to ensure adequate protection for buildings against the ingress of surface run-off.

Added—Modification B

30O **Re-direction or Treatment of Stormwater Run-off**

Allowance must be made for surface run-off from adjoining properties. Any redirection or treatment of that run-off must not adversely affect any other property.

Added—Modification B

30P **Pipe Connection**

All pipe connections to existing pits within the reserve must be constructed flush with the pit wall in accordance with good engineering practice. The developer must ensure that the condition of the pit is not compromised and that the service life of the pit is not reduced as a result of the connection.

Added—Modification B

Prior to Occupation

30Q **Drainage**

The developer must obtain a certificate of Hydraulic Compliance (using Council's M19 form) from a suitably qualified civil engineer, to confirm that all stormwater drainage and on-site detention works have been constructed in accordance with the approved plans. In addition, full

works-as-executed plans, prepared and signed by a Registered Surveyor must be submitted. These plans and certification must satisfy all the stormwater requirements as stated in Chapter E14 of the Wollongong DCP 2009. This information must be submitted to Council prior to final occupation.

Added—Modification B

30R Restriction on use – On-site Detention System

The applicant must create a restriction on use under the Conveyancing Act 1919 over the on-site detention system. The following terms must be included in an appropriate instrument created under the Conveyancing Act 1919 for approval of Council:

“The registered proprietor of the lot burdened must not make or permit or suffer the making of any alterations to any on-site stormwater detention system on the lot(s) burdened without the prior consent in writing of the authority benefited. The expression ‘on-site stormwater detention system’ shall include all ancillary gutters, pipes, drains, walls, kerbs, pits, grates, tanks, chambers, basins and surfaces designed to temporarily detain stormwater as well as all surfaces graded to direct stormwater to those structures.

Name of the authority having the power to release, vary or modify the restriction referred to is Wollongong City Council.”

The instrument, showing the restriction, must be submitted to Council for endorsement prior to the occupation or use of the development.

Added—Modification B

30S Positive Covenant – On-Site Detention Maintenance Schedule

A positive covenant shall be created under the Conveyancing Act 1919, requiring the property owner(s) to undertake maintenance in accordance with the approved On-Site Stormwater Detention System and Maintenance Schedule (application number to be referenced).

The instrument, showing the positive covenant, must be submitted to Council for endorsement prior to the occupation or use of the development.

Added—Modification B

TRAFFIC

- 31 A traffic management plan shall be prepared in consultation with Council, the Police and the RTA and be approved by the Wollongong Local Traffic Committee prior to the occupation/operation of the grandstand and/or conference facilities (Stage 1).

32A Traffic Management - Events up to 15,000 people

A traffic management plan shall be implemented for events likely to attract up to 15,000 people. This TMP shall be reviewed on a regular ongoing basis in consultation with the RTA, Council and NSW Police and be approved by Council. Where necessary, the proponent shall implement any reasonable measures necessary to improve traffic management and road safety.

All costs associated with the implementation of the TMP should be borne by the proponent.

Added—Modification B

32B Traffic Management - Events attracting more than 15,000 people

A large event TMP shall be implemented for events which are likely to attract in excess of 15,000 people. The 15,000 attendees threshold shall be applied to the entertainment precinct in combination and not solely WIN Stadium. That is, where the combined patronage of simultaneous events at the WIN Entertainment Centre (WEC) and WIN Stadium is likely to exceed 15,000, the 'large event' TMP shall be implemented. The 'large event' TMP shall be developed in consultation with the RTA, Council and NSW Police and shall be reviewed post implementation to ensure its adequacy. Where necessary, the proponent shall implement any reasonable measures necessary to improve traffic management and road safety. Once the plan has been established and implemented a number of time, it should be reviewed on an ongoing basis in consultation with the RTA, Council and NSW Police and be approved by Council. Again, where necessary, the proponent shall implement any reasonable measures to improve traffic management and road safety.

All costs associated with the implementation of the TMP should be borne by the proponent.

Added—Modification B

32C Bicycle Spaces

Monitoring of the usage of the 60 bicycle spaces required to be provided in conjunction with DA-2010/574 shall be undertaken by the Illawarra Venues Authority (IVA) during events. If the observed usage during events is greater than 85% of the total number of bicycle spaces, an additional 30 bicycle parking spaces shall be provided within the site by the IVA.

Added—Modification B

- 33 The development shall provide a total of 112 car parking spaces as reflected on Plan DA-1003-E and constructed within 12 months of the date of determination of modification DA-2001/682/B.

Added—Modification B

33A Crime Prevention through Environmental Design (CPTED)

The area of the subject site which can be accessed by the public, including the car parking areas, must have lighting provided in accordance with AS1158 (1999). This requirement shall be reflected on the construction plans.

Added—Modification B

- 33B The development shall incorporate appropriate design measures to minimise any crime risk to patrons or staff and motor vehicles within the car parking areas, including (but not limited to) the following:

- Landscape treatment which allows visibility from the road way and other public areas;
- Landscaping at ground level provided which is difficult or uncomfortable to hide in or traverse,
- Provide clearly marked and sign posted visitor car parking signs (including security/intercom system);

This requirement shall be reflected on the construction plans.

Added—Modification B

FOOD SAFETY

- 34 The premises/food business is to comply with the relevant provisions of the NSW Food Act 1989, Food Safety Regulations 2001 and Food Safety Standards – Parts:

3.1.1 Interpretation and Application

3.2.2 Food Safety Practices and General Requirements

3.2.3 Food Premises and Equipment and Food Standards

Code Part P1 – Alcoholic Beverages – Beer and Beer Products

STAGE 2

- 35 A construction management plan/report is to be submitted to and approved by Council prior to the release of the Construction Certificate. Details to provide but is not limited to:

- a. Plan of proposed construction/storage area, vehicle parking;
- b. Access at each stage for demolition, construction, storage of plant/machinery/equipment, materials;
- c. The type of materials/equipment stored and or transported to the site and how is it to be transported?;
- d. The proposed access points to the site;
- e. Treatment of barricading for construction/and restricting access;
- f. Hours of operation;
- g. Parking for construction workers, and parking for Entertainment Centre; and

- h. Temporary signage and/or linemarking proposed during the construction period.
- 36 The builder shall liaise with Council on at least a fortnightly basis (or as otherwise agreed to by Council) to provide a progress report to Council's Traffic Co-Ordinator and Manager Works covering the following:
- Proposed amendment to traffic management;
 - Construction staging, access, storage and parking arrangements;
 - Proposed road closure; and
 - The impact of the above on bus routes, vehicle, cyclist and pedestrian movements.
- This liaison may also involve other parties undertaking construction/development activities in this area.
- 37 No construction works for the wraparound grandstand shall commence on Lot 94 prior to the adoption by the Minister of the Department of Land and Water Conservation of the Amendment to the City Beach Plan of Management, 1995.
- 38 No construction works for the wraparound shall commence on Lot 94 prior to the revocation of the dedication of that lot, or part thereof, of the rest park (Andrew Lysaght Park).
- 39 A media strategy must be prepared and lodged with both the General Manager of Wollongong Council and the Director of the NSW Heritage Office prior to the commencement of work on site.
- 40 Prior to construction of Stage 2, an excavation permit for the wrap-around grandstand must be provided from the NSW Heritage Office before any excavation can take place. This permit must be determined and a copy of the permit lodged with Council before excavation, construction or any site works take place.
- 41 All excavation work and conditions must be undertaken in accordance with Excavation Permit approved by the NSW Heritage Council.
- 42 For the construction of Stage 2, an archaeologist must be on site during the disturbance of the ground surface in the vicinity of former Lot 95 and Lot 94. The area of the excavation works to be supervised must be determined by the archaeologist in consultation with Council's Heritage Officer.
- 43 The applicant is to submit a finalised Conservation Policy for the burials. This Policy must be submitted for the approval of Council's Heritage Officer prior to the occupation of Stage 2.

BUILDING

- 44 The proposed development has been assessed under the provisions of the Building Code of Australia as:
- Class - 9a and 7
 - Rise - 4 Storeys
 - Type - A Construction.
- 45 All building work must be carried out in accordance with the provisions of the Building Code of Australia.
- 46 Mechanical ventilation shall be provided to all areas as detailed on Fax Sheet Reference No. NSSY237300 by Lincolne Scott dated 5 July 2001.
- 47 The developer must submit to the Certifying Authority for approval prior to the issue of the Construction Certificate, a detailed soil and water management plan for the construction period. All works on the site must be in accordance with the approved soil and water management plan for the full duration of construction works.

CONSTRUCTION CERTIFICATES

- 48 A **Construction Certificate** must be obtained from Council or an Accredited Certifier prior to work commencing for Stage 2. A construction certificate certifies that the provisions of Clauses 79A-79H of the Environmental Planning and Assessment Amendment Regulations, 1998 have been satisfied, including compliance with the Building Code of Australia and conditions of Development Consent.

FIRE SAFETY CERTIFICATES

- 49 A **Final Fire Safety Certificate** must be issued for the whole building which includes Stage 2 prior to the issue of an **Occupation Certificate** for Stage 2. As soon as practicable after a **Final Fire Safety Certificate** is issued, the owner of the building to which it relates:
- must cause a copy of the certificate (together with a copy of the current fire safety schedule) to be given to the Commissioner of New South Wales Fire Brigades, and
 - must cause a further copy of the certificate (together with a copy of the current fire safety schedule) to be prominently displayed in the building.

INSPECTIONS/CERTIFICATION

- 50 Prior to commencement of work for Stage 2, the person having the benefit of the Development Consent and a Construction Certificate shall:
- appoint a **Principal Certifying Authority** and notify Council of the appointment (if Council is not appointed), and
 - notify Council of their intention to commence the erection of the building (at least 2 days notice is required).

The Principal Certifying Authority shall determine when **inspections and compliance certificates** are required.

OCCUPATION CERTIFICATE

- 51 A final **Occupation Certificate** must be issued by the Principal Certifying Authority prior to occupation or use of Stage 2. In issuing an occupation certificate, the Principle Certifying Authority must be satisfied that that the requirements of section 109H of the Environmental Planning and Assessment Act 1997 have been satisfied.

CONSTRUCTION

- 52 Work shall be confined to normal working hours, namely 7.00 am to 6.00 pm Monday to Friday, and 7.00 am to 6.00 pm Saturdays. (No work is permitted on Sundays or public holidays).
- 53 The site shall be enclosed with a suitable hoarding (type A or B) or security fence of a type approved by Council. An application shall be lodged with and approved by Council before the erection of any hoarding or fence. Note: No building work or demolition shall commence before the hoarding or fence is erected.

SITE MANAGEMENT

- 54 Stockpiles of sand, gravel, soil and the like shall be located to ensure that the material:
- does not spill onto the road pavement; and,
 - is not placed in drainage lines or water courses, and cannot be washed into these areas.
- If soil or other materials are spilled accidentally onto the road or gutter, they shall be removed immediately.
- 55 The developer must provide an adequate receptacle to store all waste generated by the development pending disposal. The receptacle must be regularly emptied and waste must not be

allowed to lie or accumulate on the property other than in the receptacle. Consideration should be given to the source separation of recyclable and reusable materials.

- 56 Drains, gutters, access ways and roadways shall be maintained free of sediment and any other material. Gutters and roadways shall be swept/scraped regularly to maintain them in a clean state.
- 57 Building operations such as brick cutting, the washing of tools or paint brushes, or other equipment and the mixing of mortar must not be carried out on the roadway or public footpath or any other locations which could lead to the discharge of materials into the stormwater drainage system or natural watercourse.

DRAINAGE

- 58 The developer must ensure there are no adverse effects to adjoining properties or upon the land as a result of flooding and stormwater runoff. Attention must be paid to ensure adequate protection for buildings against the ingress of surface runoff.
- 59 The developer must make allowance for surface water run-off from adjacent properties. Any redirection or treatment of that run-off must not adversely affect any other properties.
- 60 The developer must provide overflow paths to allow for flows of water in excess of the capacity of the *pipe/drainage system* draining the land, as well as from any detention storage on the land. Blocked pipe situations with *1 in 100 year ARI events and/or the Probable Maximum Flood event* with unblocked pipes must also be incorporated in the design. Overflow paths must also be provided in low points and depressions.
- 61 The developer must ascertain the depth and location of all services (ie gas, water, sewer, electricity, telephone, traffic lights, etc) and account for these in the preparation of the working drawings to be submitted.
- 62 The developer must obtain written verification from a suitably qualified civil engineer, stating that all stormwater drainage and related work has been constructed in accordance with the approved plans. In addition, full works-as-executed plans, prepared and signed by a Registered Surveyor must be submitted. These plans must include levels and location for all drainage structures and works, buildings (including floor levels) and finished ground and pavement surface levels. This information must be submitted to the Principal Certifying Authority prior to the issue of the Occupation Certificate and use of Stage 2.

LANDSCAPING

- 63 For the quality of the pedestrian environment at the base of the north east wrap-around grandstand (Stage 2), a design resolution of a similar high quality is required to maintain the standard of finish achieved to date. In this regard the applicant must liaise with the Landscape Architectural Section in regard to the treatment of this area.

Modified—Modification B

- 64 The applicant must address the siting of the future proposed ticket box in consideration of the proposed foreshore improvements. The pedestrian circulation must be addressed from the foreshore plaza, ticketing box and entry to north-east wrap. The siting of the ticketing box shall not conflict with the existing and proposed shareway in this area. The applicant must liaise with the Landscape Architectural Section in regard to the treatment of this area.

Modified—Modification B

- 65 The applicant must install a minimum of two (2) semi mature Norfolk Island Pines min. pot size shall be 100 litre. The siting of the trees must be approved by the Landscape Architectural Section prior to installation, and contained in the masterplan. The Norfolk Island Pines shall be installed in the presence of a suitably qualified archaeologist, prior to the issue of the Occupation Certificate of Stage 2.

GENERAL CONDITIONS

CONTRIBUTION LIMITATIONS

- 66 Pursuant to Section 94 of the Environmental Planning and Assessment Act 1979 and the Contribution Plan for a Car Parking Facility between Bank and Stewart Streets in the Wollongong Central Business District, the developer make a monetary contribution towards the provision of parking and the amount and terms of the payments be negotiated between Council and the Showground Trust.

WORKS WITHIN COUNCILS ROAD RESERVE OR ON COUNCIL OWNED/MANAGED LAND

- 67 The developer must apply to Wollongong City Council's Works Division for a *Road Opening Permit* prior to the issue of the Construction Certificate(s). The developer must obtain this permit and pay the appropriate fee prior to the commencement of any affected work.
- 68 Should, during the course of this development, the developer require the use of the footpath, road reserve or other Council owned or managed land for hoardings, signs, access, placement of materials/machinery etc, the developer shall obtain, prior to the use of this area, a *Road Opening Permit* from Council's Works Division.
- 69 Should any material be deposited on adjacent public roads or footpaths as a result of this development, the developer must remove this material immediately.
- 70 Andrew Lysaght Park must not be used for any construction activities, vehicular parking, storage, loading, unloading or assembly of construction materials for Stages 1 and 2.
- 71 Any damage arising from the construction activities being undertaken as part of Stages 1 and 2 of this development consent, including but not limited to roads, footpaths, kerb and gutter, stormwater drainage, street furniture, signs and other structures in either:
Wollongong City Council road reserves/other Council property
or
Crown Land
must be repaired in a manner and timeframe agreed to by Council's Manager Works or his nominated representative and in any event, within 6 months of the damage occurring.
- 72 The Trust must not use Lot 96 for any construction purposes unless Council and/or the Department of Land and Water Conservation have granted a licence for such use.
- 73 The Trust must ensure that the existing Norfolk Pine trees along the eastern side of the access road are protected in accordance with Arborist Report contained in the Statement of Environmental Effects for City Beach Foreshore Redevelopment (copy enclosed) to avoid any damage during the construction.

ADVERTISEMENTS

- 74 Any proposed advertising/commercial sign(s) must comply with Council's Code for Outdoor Advertising Signs. In this respect, the developer must submit to Council's Development Assessment and Compliance Division an application for any signage.

MISCELLANEOUS

- 75 A separate development application must be lodged to Council for the Ticket Box south of the Andrew Lysaght Park.
- 76 Safety railings must be constructed of materials that are suitable for the foreshore environment.
- 77 The lighting of the premises must be directed so as not to cause nuisance to the owners or occupiers of adjoining premises or to motorists on adjoining or nearby roads.

PARKING AND VEHICULAR ACCESS

- 78 The car parking area must have parking designed in accordance with Australian Standard 2890.1 Parking Facilities – Off Street Car Parking.
- 79 Goods and/or waste or extraneous material must not be stored in the vehicular manoeuvring and parking areas. Those areas must be kept clear at all times for the free movement of vehicles.
- 80 The loading and/or unloading of all goods and materials used in conjunction with the development must take place only on the land.
- 81 The developer must erect and maintain signs indicating the entrance and exit crossings and must mark directional arrows on the pavement indicating vehicle movement. The sign must be so erected as to be clearly legible by persons using the adjoining road or entering or leaving the land. Signs must –
- be rectangular in shape, having dimensions of 0.45 metres in width and 0.6 metres in height;
 - be two-sided and contain only the word IN or OUT together with a directional arrow indicating the direction of movement;
 - have lettering and directional arrows coloured black and the background coloured white;
 - be reflective; and
 - no part of the sign is to stand at a height greater than 1.2 metres above pavement level.

Reasons

The reasons for the imposition of the conditions are:

- To minimise any likely adverse environmental impact of the proposed development.
- To ensure the protection of the amenity and character of land adjoining and in the locality.
- To ensure the proposed development complies with the provisions of Environmental Planning Instruments and Council's Codes and Policies.
- To ensure the development does not conflict with the public interest.

Notes

- This consent becomes effective and operates from the date shown as **"Endorsement Date"** on the front page of this notice. This consent will lapse unless development is commenced within two years (three years with the approval of Council) from the endorsement date shown on this notice.
- Section 97 of the Environmental Planning and Assessment Act confers on an applicant who is dissatisfied with the determination of a consent authority a right of appeal to the Land and Environment Court exercisable within six months from the date of receipt of this notice.
- This Modified Development Consent supersedes the consent originally given and any subsequent modification thereof. Any references in this consent to "Building Application" or "Building Permit" are to be read as references to "Construction Certificate Application" and "Construction Certificate" pursuant to the provisions of Part 4A of the Environmental Planning and Assessment Act, 1979.
- A Tree Management Order has been proclaimed in the City of Wollongong. Under this order, no tree on the land the subject of this approval may be ringbarked, cut down, topped, lopped or wilfully destroyed except with the prior consent of Council which may be given subject to such conditions as Council considers appropriate. However, unless specified otherwise in this consent, those trees which are specifically designated to be removed on the plans approved under this consent or are within 3 metres of an approved building footprint may be removed, provided that a Construction Certificate has been issued for the development the subject of this consent and a Principal Certifying Authority appointed.

- 5 In this consent the developer means the applicant for development consent and any person or corporation who carries out the development pursuant to that consent.
- 6 Section 82A of the Environmental Planning and Assessment Act confers on an applicant who is dissatisfied with the determination of a consent authority a right to request the consent authority to review the determination.
- The request for review must be made within six (6) months after the date on which the applicant received the notice of determination and must be accompanied by the fee set by the Regulations.
- The request for review does not apply to an application in respect of Designated Development or Integrated Development.
- 7 If the applicant/ developer wishes to have a Construction Zone during the construction of this building, an application is to be lodged with the Traffic Section of the Planning Division of Council seven (7) to eight (8) weeks prior to the commencement of construction. The Application will be referred to the City of Wollongong Traffic Committee for determination. All costs relating to the implementation of signage, etc are to be borne by the Applicant.
- 8 Council recommends that NSW Wildlife Information and Rescue Service (WIRES) be contacted (phone (02) 4285 5630) for assistance in relocating native fauna prior to removal of trees and bushland.
- 9 **Prolonged Rainfall Events**
- The applicant is advised that under existing conditions and during prolonged rainfall events, flooding of the site may occur and it is in the applicant's interest to take all necessary precautions to minimise the risk of property loss and/or damage.

Issue of this document on behalf of Council has been authorised by:

Theresa Whittaker
Senior Development Project Officer
Wollongong City Council
Direct Line (02) 4227 7111

enc

Illawarra Venues Authority
C/- Lipman Pty Ltd
6-66 Berry St
NORTH SYDNEY NSW 2060

CERTIFICATE CC-2016/20

Date 22 September 2016

Certifying Authority Wollongong City Council

FINAL OCCUPATION CERTIFICATE

Issued under Section 109C(1)(c) and 109H of the Environmental Planning and Assessment Act 1979

Location	Lot 143 DP 786508, Lot 106 DP 751299, Lot 101 DP 872951 WIN Entertainment Centre, 9-11 Crown Street, WOLLONGONG NSW 2500, Lot 106 Harbour Street, WOLLONGONG NSW 2500, WIN Entertainment Centre, 49 Harbour Street, WOLLONGONG NSW 2500
Description	WIN Stadium Western Grandstand - construction of four (4) additional braces
Type of Certificate	Final
Building approved for occupation	Whole of building
BCA Building Classification	Class 9b

Wollongong City Council certifies that:

- It has been appointed as the principal certifying authority under s109E of the Environmental Planning and Assessment Act.
- A current development consent or complying development certificate is in force with respect to the building.
- If any building work has been carried out, a current construction certificate (or complying development certificate) has been issued with respect to the plans and specifications for the building.
- The building is suitable for occupation or use in accordance with its classification under the Building Code of Australia.
- Where required, a final fire safety certificate has been issued for the building.
- Where required, a report from the Fire Commissioner has been considered.

This letter is authorised by

Dale Randahl
Senior Development Project Officer
Accreditation No. BPB1086
Wollongong City Council
Telephone (02) 4227 7111

Certification of Building Design

WOLLONGONG ENTERTAINMENT CENTRE

Prepared by:

Lincolne Scott

Consultants A.C.N. 005 113 468
83 Alexander Street
CROWS NEST NSW 2065

For:

**NSW Department of Public Works and
Services**

2-24 Rawson Place
Sydney NSW 2000

1699.AL
May 1998

Lincolne Scott

Management
Technology
and Engineering
in the
Built Environment

Consultants

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	Wellington

BUILDING CERTIFICATION

Pursuant to the provisions of Section 93 of the Local Government Act 1993, Lincolne Scott hereby certify that the building has been designed generally in accordance with the provisions of the Local Government Act 1993 and the Performance Requirements of Building Code of Australia 1996. This certification relies on the attached BCA report, and the Report on an Engineered Approach to Fire and Life Safety and is subject to the conditions as listed in the Attachment.

Certificate Issued to :

State Projects
NSW Department of Public Works
McKell Building
2-24 Rawson Place
SYDNEY NSW 2000

Project Data

Building Name :
Wollongong Entertainment Centre

Address :

Corner Crown and Harbour Streets
WOLLONGONG NSW

Classification :

Whole/Part	Use	BCA Classification
Whole	Place of Public Entertainment	9b

Building Surveyor :

Anthony Martin - MAIBS
BSAP Reg. No. 1865

Signature
Dated 20th May 1998

ATTACHMENT

Schedule of Conditions

1. Compliance must be given to the provisions of the Local Government (Approvals) Regulation 1993 and the BCA.
 2. The whole of the premises is classified as Place of Public Entertainment (POPE)
 3. The population within the Entertainment Centre shall be restricted to the following numbers at all times :
 - Level 4 Tiered Seating - 4800 Patrons and Staff
 - Level 1 Auditorium - 1100 Seated Patrons on retractable seating.
 4. All glazing shall be selected and installed in accordance with the relevant provisions of AS 1288 "Glass Installation Code"
 5. Services passing through floors must either be enclosed in fire rated construction in accordance with Specification C1.1 or protected in accordance with C3.14 of the BCA.
 6. Where lightweight construction is proposed to be used to provide the required FRL, then it shall comply with the requirements of C1.8 of the BCA.
 7. All finishes to be used in the building shall have the required Fire Hazard Properties as required under Specification C1.10. All materials and components used in the building must have:
 - a Spread of Flame Index not more than 9
 - a Smoke Development Index of not more than 8 if the SFI is more than 5

The surface lining to the Auditorium ceiling must have a SFI of not more than 6 and a SDI of not more than 3.

The floor of the Auditorium must have a SFI of not more than 8 and SDI of not more than 7.
 8. The enclosing walls of switchrooms, plantrooms (serving essential services) and the like must be enclosed in construction having a fire resistance level of not less than 120/120/120 in accordance with C2.12 of the BCA. All doorways are to be provided with minimum --/120/30 FRL fire doors.
- All other plantrooms and the like must be enclosed in construction having a fire resistance level of not less than 60/60/60 and doorways with --/60/30 fire doors.

9. All doors in the path of travel must comply with the provisions of D2.19, 2.20 and 2.21 of the BCA. If any of the doors are to be secured, they must be provided with panic bolts.
10. Doorways within sight of the patrons and not intended for egress purposes must be provided with appropriate signage indicating its purpose in accordance with D2.19(e)(iii).
11. All ramps used as part of the paths of travel to a road must have a gradient of not greater than 1:8 in accordance with D2.10 of the BCA
12. Disabled access ramp must be provided with a gradient of not greater than 1:12 in accordance with D2.10 of the BCA and AS1428.1.
13. A stairway must have treads and risers to comply with D2.13 of the BCA.
14. All doorways must be provided with a minimum clear opening width of 2000mm. It is noted that all doors are double leaf with panic bolts fitted.
15. All electrical and communication board cupboards must be enclosed in non-combustible material in accordance with D2.7
16. Where services pass through a floor or wall required to have a FRL the penetrations shall be protected in accordance with C3.15 and Spec C3.15 of the BCA.
17. The fire control room shall be fitted out and have facilities to comply with Spec E1.8.
18. The building's amplification system must be provided with a hearing augmentation - listening system complying with AS1428.1.
19. Portable fire extinguishers must be provided in compliance with E1.6 of the BCA.
20. Details of the following design must be presented to the Building Certifier prior to work commencing:
 - (a) proposed mechanical exhaust ventilation to food preparation
 - (b) layout and disposition of fittings within food preparation areas
21. Signs incorporating the international symbol of access in accordance with AS1428.1 must identify the entrance and toilets.
22. All sliding fire doors on Level 1 to comply with the requirements of C3.6 of the BCA. (ie to be held open by magnematics/fail safe system in the event of power failure/audible and red flashing lights/signs to be installed and smoke detectors and sprinkler system to activate the operation of the door.).

23. During the course of construction, fire fighting equipment must be provided in accordance with the requirements of E1.6 of the BCA.
24. The passenger lift shall be provided with facilities for people with disabilities in accordance with the requirements of E3.6 of the BCA.
25. A warning sign against the use of the lift in a fire shall be displayed at each call button.
26. The lift motor room must be enclosed in construction having a minimum fire resistance level of 120/120/120 with doors having --/120/30 fire rating in accordance with C2.12 of the BCA.
27. Refrigerated rooms of sufficient size for a person to enter must have a door opening width and height of 600X1500mm and be capable of being opened from inside without the need for a key. G1.2 of the BCA.
28. All storerooms are required to be enclosed in construction having a minimum fire resistance level of 60/60/60 in accordance with NSW H101.16. Doorways to the storerooms must be provided with --/60/30 fire doors.
29. Electrical mains installation must comply with the requirements of NSW H101.19 of the BCA.
30. The general lighting within the building must comply with NSW H101.20 of the BCA.
31. Guard rails shall be installed to a height of at least 660mm to the sides of the aisles adjacent to the stepped platform of the retractable seating.
32. Pursuant to the requirements* of Cause 38 of the Local Government (Approvals) Regulations 1993 the operators of the centre shall comply with the provisions of Schedule 2 - Management and Use of Places of Public Entertainment of this regulation.
33. The certification of this application includes the requirements for the provision of essential services which have been outlined in the attached schedule. Pursuant to Clause 27 of the Local Government (Approvals) Regulation 1993 it will be necessary for the owner of the building, on completion of the work contained in this building application to furnish a certificate to the Building Certifier with regard to each essential service included in the schedule. The certificate must state in relation to each essential service mentioned in the certificate:
 - that the service has been inspected and tested by a person who is competent to carry out such an inspection and test; and

- that the service was or was not (as at the date on which it was inspected and tested) found to have been designed and installed, and to be capable of operating, to a standard not less than that required by the Local Government (Approvals) Regulation 1993, as the case may be, with respect to the service.

A copy of the Certificate is to be given to the Commissioner of New South Wales Fire Brigades, and a further copy is to be prominently displayed in the building in a location specified by the ~~Federal~~ Airports Corporation. ??

The essential fire and other safety measures and the standard of design and operation required applicable to this building include:

ESSENTIAL SERVICE

- Hydrant System
- Fire Hose Reels
- Automatic Sprinkler

- Portable Fire Extinguishers
- Smoke Detection System
- EWIS
- Emergency Lighting
- Exit Signs
- Fire Dampers
- Mechanical Ventilation and Smoke Exhaust
- Fire escape doors
- Fire Doors
- Sliding fire doors
- Signage
- Paths of Travel

DESIGN STANDARD TO BCA

Clause E1.3 and AS 2419
Clause E1.4 and AS 2441
Clause E1.5 and AS 2118 and Fire Engineered Report
Clause E1.6 and AS 2444
AS 1670 and Spec E2.2a.
Clause E4.9 and AS 2220
Clause E4.2 and AS 2293.1
Clause E4.5 and AS 2293.1
AS 1668.1 and AS 1682.2
Clause E2.2 and AS 1668.1 and Fire Engineered Report
Clause D2.19, D2.20, D2.21
Spec C3.4
Clause C3.6
Clause D2.23 and Local Government Authority
Local Government Authority

Notes :

- We draw your attention to the provisions of the Disabled Discrimination Act which may require additional facilities and access to the building over and above the BCA.
- At Practical Completion of the project it will be a requirement of Building Approval that the applicant shall:
 - a) apply for a Certificate of Classification and obtain approval to occupy the building.
 - b) apply for a POPE licence from the Department of Local Government to use the building for public entertainment.

BCA Assessment Report

WOLLONGONG ENTERTAINMENT CENTRE

Prepared by:

Lincolne Scott

Consultants A.C.N. 005 113 468
83 Alexander Street
CROWS NEST NSW 2065

For:

**NSW Department of Public Works and
Services**

2-24 Rawson Place
Sydney NSW 2000



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May 1998

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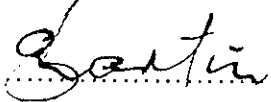
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Attachments:

Annexure A	Documents Assessed
Annexure B	Population and Toilet Accommodation Study
Annexure C	Certifications of Design
Annexure D	Supporting Documents
Annexure E	Report on an Engineered Fire Approach
Annexure F	NSW Fire Brigade Letter of Approval

REVISION STATUS AND APPROVAL					
REVISION	DATE	STATUS	WRITTEN	CHECKED	APPROVED
	21/5/98	FINAL	AJM		

Signed


Anthony J. Martin
Building Surveyor
BSAP Reg. No. 1865

EXECUTIVE SUMMARY

This assessment and report was commissioned by the Department of Public Works and Services to satisfy their responsibility under Section 93 of the Local Government Act 1993.

The building's design complies with the deemed-to-satisfy provisions of the BCA. The automatic sprinkler system and smoke exhaust systems have been designed to comply with the Performance Requirements of Part E with all other services to comply with the Deemed-to-Satisfy provisions.

Conditions of Approval have been appended to our Certification of Building Design under Section 93 of the Local Government Act 1993 which must be complied with prior to the issuance of a Certificate of Classification by the Building Surveyor.

1.0 BASIS OF ASSESSMENT

1.1 Introduction

The building was first assessed and certified on 29th May 1997 under the Deemed-to-Satisfy provisions of the BCA 1990

The Department of Public Works sought deletion of a sprinkler system and smoke exhaust system within the Auditorium and consequently requested the project be reassessed and certified under the Performance Requirements of the BCA 1996 Amendment No.1.

The purpose of this report is to assess the proposed building for compliance with the Building Code of Australia 1996 for use as a Place of Public Entertainment (POPE).

The building is to be home of the Illawarra Hawks Basketball Team and also to be used for a variety of entertainment and sporting events.

This report has been prepared for State Projects under the direction of Department of Public Works and Services.

1.2 BCA Legislation

The report is based on the Building Code of Australia 1996 (BCA) together with Amendment No.1. As it is a new building, full compliance with the BCA and relevant NSW Variations are required.

1.3 Documentation Assessed

The report has been assessed based on the documents as listed in Annexure A.

1.4 POPE Licence

Under the provisions of Section 71 of the Local Government Act the applicant must seek approval to use the building as a Place of Public Entertainment from the Department of Local Government if operated by the Crown or from the Council if operated by other than the Crown.

It is understood that the Wollongong Trust is a Crown authority and consequently a POPE licence will be sought from The Minister, Department of Local Government.

2.0 BUILDING DESCRIPTION

2.1 Proposed Building

The proposed building can be classified as a Place of Public Entertainment - Class 9b and is proposed to be used primarily for basketball matches/other sporting events and public functions.

The ground floor consists of the auditorium/change rooms/loading dock/retractable seating/store rooms and plant rooms.

The first floor consists of foyer/cross over aisles and toilets.

The third floor consists of tiered seating and TV/radio boxes.

2.2 Rise in Storeys (C1.2)

The building has a Rise in Storeys of 3

2.3 Type of Construction (Table C1.1)

The building is required to be of Type A construction

2.4 Effective Height

The building has an effect height of less than 25m.

2.5 Exclusions

Excluded from our assessment are any comments in relation to other Authorities including :

- Development and Town Planning Consent
- Occupational Health and Safety Legislation
- Water, Drainage, Gas and Electrical Supply Authority
- Telecommunications
- Work Cover Authority and
- Disabled Discrimination Act

3.0 BCA ASSESSMENT

Notes :

- ✓ The proposal complies with this clause
- ✗ The proposal does not comply or compliance has not been demonstrated - refer to the conditions of certification or Section 4.0 Alternative Solutions.
- This clause is not applicable to the project

CLAUSE	REFERENCE	COMMENT
<u>Section A</u>	<u>General Provisions</u>	
PART A3.2	CLASSIFICATION	The building is classified as Class 9b
<u>Section B</u>	<u>Structure</u>	
PART B1	STRUCTURAL PROVISIONS	All structural work is to be certified by the Design Engineer.

<u>Section C</u>		<u>Fire Resistance</u>	
PART C1		FIRE RESISTANCE AND STABILITY	
	C1.0	Deemed-to-Satisfy Provisions	Noted
✓	C1.1	Type Of Construction	The building is required to be of Type A construction and complies with this requirement.
×	C1.2	Calculation of Rise in Storeys	The building has a rise in storeys of 3 as determined above street level.
•	C1.3	Buildings of Multiple Classifications	Not applicable
	C1.4	Mixed Types of Construction	Noted
•	C1.5	Two Storey Class 2 or 3 Building	Not applicable
•	C1.6	Class 4 Parts of Buildings	Not applicable
•	C1.7	Open Spectator Stands and Indoor Sports Stadiums	Not applicable
•	C1.8	Lightweight Construction	Not applicable
	C1.9		Repealed
×	C1.10	Early Fire Hazard Indices	Compliance required refer to conditions.
•	C1.11	Performance of External Walls in Fire	Not applicable

PART C2		FIRE RESISTANCE	
	C2.0	Deemed-to-Satisfy Provisions	Noted
	C2.1	Application of Part	Noted
•	C2.2	General Floor Area Limitations	Not applicable
×	C2.3	Large Isolated Buildings	This building is a large isolated building and therefore requires compliance with this clause. A sprinkler system is required to be installed throughout the building with perimeter fire brigade access to be also provided. Building does not comply. Refer to Section 4 Alternate Solution.
×	C2.4	Requirements for Open Space	NSW Fire Brigade vehicular access is provided around 90% of the building. Building does not comply. Refer to Section 4 Alternate Solution.
•	C2.5	Class 9a Buildings	Not applicable
•	C2.6	Vertical Separation of Openings in External Walls	Not applicable
•	C2.7	Separation by Fire walls	Not applicable
•	C2.8	Separation of Classification	Not applicable
•	C2.9	Separation of Classifications in Different Storeys	Not applicable
•	C2.10	Separation of Lift Shafts	Not applicable. Lift serves two levels only.
•	C2.11	Stairways and Lifts in One Shaft	Not applicable
✓	C2.12	Separation of Equipment	The foyer smoke exhaust system is fire separated from the building. Complies.
✓	C2.13	Electricity Supply System	Complies
•	C2.14	Public Corridors in Class 2 & 3 Buildings	Not applicable

PART C3		PROTECTION OF OPENINGS	
	C3.0	Deemed-to-Satisfy Provisions	Noted
	C3.1	Application of Part	Applicable
•	C3.2	Protection of Openings in External walls	Not applicable
•	C3.3	Separation of Openings in Different Fire Compartments	Not applicable
	C3.4	Acceptable Methods of Protection	Noted
✓	C3.5	Doorways in Fire walls	Complies. Fire doors are installed in storerooms, plantrooms and kitchens where required.
×	C3.6	Sliding Fire Doors	Compliance required. Refer to conditions.
•	C3.7	Protection of Doorways in Horizontal Exits	Not applicable
•	C3.8	Openings in Fire Isolated Exits	Not applicable
•	C3.9	Service Penetrations in Fire Isolated Exits	Not applicable
•	C3.10	Openings in Fire Isolated Lift Shafts	Not applicable
•	C3.11	Bounding Construction Class 2, 3 and 4 Buildings	Not applicable
×	C3.12	Openings in Floors for Services	Compliance required. Refer C3.15.
•	C3.13	Openings in Shafts	Not applicable
	C3.14		Repealed
×	C3.15	Openings for Service Installations	Compliance required. Refer to condition.
•	C3.16	Construction Joints	Not applicable
•	C3.17	Columns Protected with Lightweight Construction to Achieve an FRL	Not applicable

	SPEC C1.1	FIRE RESISTING CONSTRUCTION	
	3	Type A Construction	
✓	3.1	Fire resistance of building elements	Building complies
•	3.2	Concessions for floors	Not applicable
•	3.3	Floor loading: concession	Not applicable
•	3.4	Roof on concrete slab: concession	Not applicable
✓	3.5	Roof: concession	Complies
•	3.6	Roof lights	Not applicable
✓	3.7	Internal Columns and Walls: Concession	Complies
✓	3.8	Indoor sports stadium: concession	Complies
•	3.9	Carparks	Not applicable
✓	Table 3	FRL of Building Elements	Building complies
	SPEC C1.8	STRUCTURAL TESTS FOR LIGHTWEIGHT CONSTRUCTION	
	1	Scope	Noted
•	2	Application	Not applicable
	3	Tests	
	4	Test specimens	
	5	Test methods	
	6	Criteria for compliance	
	SPEC C1.10	EARLY FIRE HAZARD INDICES	
	1	Scope	Noted
×	2	Class 2 to 9 buildings: General requirements	Compliance required. Refer to condition.
•	3	Fire-isolated exits	Not applicable
×	4	Class 2,3 & 9 buildings	Compliance required. Refer to condition.
	5	Materials deemed to comply	Noted
	6	Fire-retardant coatings not acceptable	Noted
	7	Exempted building parts and materials	Noted
✓	8	Air-handling ductwork	Complies

SPEC C1.11		PERFORMANCE OF EXTERNAL WALLS IN A FIRE	
	1	Scope	Noted - Not Applicable
SPEC C3.4		FIRE DOORS, SMOKE DOORS, FIRE WINDOWS AND SHUTTERS	
	1	Scope	Noted
✓	2	Fire Doors	Complies
•	3	Smoke Doors	Not applicable
•	4	Fire shutters	Not applicable
•	5	Fire Windows	Not Applicable
SPEC C3.15		PENETRATIONS OF WALLS, FLOORS AND CEILINGS BY SERVICES	
	1	Scope	Noted
	2	Application	Noted
×	3	Metal pipes	Compliance required. Refer to condition.
×	4	Pipes penetrating sanitary compartments	Compliance required. Refer to condition.
×	5	Wires and Cables	Compliance required. Refer to condition.
×	6	Electrical switches and outlets	Compliance required. Refer to condition.
×	7	Fire Stopping	Compliance required. Refer to condition.

<u>Section D</u>		<u>Access and Egress</u>	
PART D1		PROVISION FOR ESCAPE	
	D1.0	Deemed-to-Satisfy Provisions	Noted
	D1.1	Application	Applicable
✓	D1.2	Number of Exits Required	Complies
•	D1.3	When Fire Isolated Exits Are Required	Not applicable
✓	D1.4	Exit Travel Distances	Complies
✓	D1.5	Distances Between Alternative Exits	Complies
✓	D1.6	Dimensions of Exits	Complies
•	D1.7	Travel via Fire Isolated Exits	Not applicable
•	D1.8	External Stairways	Not applicable
✓	D1.9	Travel by Non Fire Isolated Stairways or Ramps	Complies
✓	D1.10	Discharge From Exits	Complies
•	D1.11	Horizontal Exits	Not applicable
•	D1.12	Non-Required Stairways ramps and Escalators	Complies
	D1.13	Number of Persons Accommodated	Noted (Refer attached Population and Toilet Study)
	D1.14	Measurement of Distances	Noted
	D1.15	Method of Measurement	Noted
•	D1.16	Plant rooms & lift motor rooms: concession	Not applicable

PART D2		CONSTRUCTION OF EXITS	
	D2.0	Deemed-to-Satisfy Provisions	Noted
	D2.1	Application of Part	Applicable
•	D2.2	Fire-Isolated Stairways & Ramps	Not applicable
✓	D2.3	Non-Fire-Isolated Stairways and Ramps	Complies
•	D2.4	Separation of Rising and Descending Stair Flights	Not applicable
•	D2.5	Open Access Ramps and Balconies	Not applicable
•	D2.6	Smoke Lobbies	Not applicable
✓	D2.7	Installations in Exits and Paths of Travel	Complies
✓	D2.8	Enclosure of Space Under Stairs and Ramps	Complies
	D2.9	Width of Stairways	Noted
×	D2.10	Pedestrian Ramps	Compliance required. Refer to condition.
•	D2.11	Fire Isolated Passageways	Not applicable
•	D2.12	Roof as Open Space	Not applicable
×	D2.13	Treads and Risers	Compliance required. Refer to condition.
✓	D2.14	Landings	Complies
✓	D2.15	Thresholds	Complies
✓	D2.16	Balustrades	Complies
✓	D2.17	Handrails	Complies
•	D2.18	Fixed Platforms, Walkways Stairways and Ladders	Not applicable
•	D2.19	Doorways and Doors	Not applicable

	PART D2	CONSTRUCTION OF EXITS	
✓	D2.20	Swinging Doors	Complies
✓	D2.21	Operation of Latch	Complies
•	D2.22	Re-entry from Fire Isolated Exits	Not applicable
•	D2.23	Signs on Doors	Not applicable
	PART D3	ACCESS FOR PEOPLE WITH DISABILITIES	
	D3.0	Deemed-to-Satisfy Provisions	Noted
	D3.1	Application of part	Noted
✓	D3.2	Access to Building	Complies
✓	D3.3	Parts of Building to be Accessible	Complies
	D3.4	Concessions	Noted
•	D3.5	Car Parking	Not applicable
×	D3.6	Identification of Access Facilities	Compliance required. Refer to conditions.
×	D3.7	Hearing augmentation-listening system	Compliance required. Refer to conditions.
	SPEC D1.12	NON REQUIRED STAIRWAYS RAMPS AND ESCALATORS	
	1	Scope	Noted
	2	Requirements	Noted

<u>Section E</u>		<u>Services and Equipment</u>	
PART E1		FIRE FIGHTING EQUIPMENT	
	E1.0	Deemed-to-Satisfy Provisions	Noted
	E1.1		Repealed
	E1.2		Repealed
✓	E1.3	Fire Hydrants	Complies - Refer to Certification.
✓	E1.4	Hose Reels	Complies - Refer to certification.
x	E1.5	Sprinklers	Does not comply - Refer to Section 4.0 - Alternate Solution.
x	E1.6	Portable Extinguishers	Does not comply - Refer conditions.
	E1.7		Repealed
✓	E1.8	Fire Control Centres	Complies
•	E1.9	Fire Precautions During Construction	Not applicable
•	E1.10	Provision for Special Hazards	Not applicable
SPEC E1.5		FIRE SPRINKLER SYSTEM	
	1	Scope	Noted
x	2	Adoption of AS 2118	Refer to Certification and Sect 4 Alternate Solution

SPEC E1.8		FIRE CONTROL CENTRES	
X	1	Scope	The FCC must comply with the provisions. Refer to Conditions O.
PART E2		SMOKE HAZARD MANAGEMENT	
	E2.0	Deemed-to-Satisfy Provisions	Noted
•	E2.1	Application of Part	Not applicable
X	E2.2	General Requirements(including Tables E2.2a & b)	Does not comply - Refer Section 4.0 - Alternate Solution. Smoke exhaust is provided to the foyers on Level 2.
•	E2.3	Provision for Special Hazard	Not applicable
SPEC E2.2(a)		SMOKE DETECTION AND ALARM SYSTEMS	
	1	Scope	Noted. Refer to Section 4.0 Alternate Solution.
SPEC E2.2(b)		SMOKE EXHAUST SYSTEMS	
	1	Scope	Noted - Refer to Section 4.0 Alternate Solution.
SPEC E2.2(c)		SMOKE AND HEAT VENTS	
•	1	Adoption of AS2665	Not applicable
PART E3		LIFT INSTALLATIONS	
	E3.0	Deemed-to-Satisfy Provisions	Noted
	E3.1		Repealed
•	E3.2	Stretcher Facility in Lifts	Not Applicable
X	E3.3	Warning Against Use of Lifts in Fire	Compliance required. Refer to conditions.
•	E3.4	Emergency Lifts	Not Applicable
✓	E3.5	Landings	Complies
X	E3.6	Facilities for people with disabilities	Compliance required - refer to conditions.

PART E4

**EMERGENCY LIGHTING, EXIT
SIGNS AND WARNING
SYSTEMS**

	E4.0	Deemed-to-Satisfy Provisions	Noted
	E4.1		Repealed
✓	E4.2	Emergency Lighting	Complies
	E4.3	Measurement of Distances	Noted
✓	E4.4	Design and Operation of Emergency Lighting	Complies
✓	E4.5	Exit Signs	Complies
✓	E4.6	Direction Signs	Complies
•	E4.7	Class 2 and 3 Buildings and Class 4 Parts Exemptions	Not applicable
✓	E4.8	Design and Operation of Exit Signs	Complies
✓	E4.9	EWIS System	Complies

	<u>Section F</u>	<u>Health and Amenity</u>	
×	PART F1	DAMP & WEATHER PROOFING	Complies.
	PART F2	SANITARY & OTHER FACILITIES	
	F2.0	Deemed-to-Satisfy Provisions	Noted
•	F2.1	Facilities in Residential Buildings	Not applicable
	F2.2	Calculation of Number of Occupants and Fixtures	Noted - Refer to Population and Toilet Accommodation Study attached.
✓	F2.3	Facilities in Class 3 to 9 Buildings, Table F2.3	Complies - Refer to Population and Toilet Accommodation Study attached.
✓	F2.4	Facilities for People with Disabilities	Complies - Refer to Population and Toilet Accommodation Study attached.
✓	F2.5	Construction of Sanitary Compartments	Complies
	F2.6	Interpretation : Urinals and Wash basins	Noted
	F2.7	Warm water installations	Deleted
•	F2.8	Slop-hoppers	Not applicable
	PART F3	ROOM SIZES	
	F3.0	Deemed-to-Satisfy Provisions	Noted
✓	F3.1	Height of rooms	Complies

	PART F4	LIGHT AND VENTILATION	
	F4.0	Deemed-to-Satisfy Provisions	Noted
•	F4.1	Provision of natural light	Not applicable
•	F4.2	Methods & extent of natural lighting	Not Applicable
•	F4.3	Natural light borrowed from adjoining rooms	Not Applicable
✓	F4.4	Artificial lighting	Complies
✓	F4.5	Ventilation of rooms	Complies - Refer to certification.
•	F4.6	Natural ventilation	Not applicable
•	F4.7	Ventilation borrowed from adjoining room	Not applicable
✓	F4.8	Restriction on position of water closets and urinals	Complies
✓	F4.9	Airlocks	Complies to food areas
	F4.10		Repealed
•	F4.11	Public carparks	Not applicable
×	F4.12	Kitchen local exhaust ventilation	Compliance required - Refer to condition.
	PART F5	NOISE TRANSMISSION AND INSULATION	This part does not apply
	Section G	ANCILLARY PROVISIONS	This Section does not apply

3.1 Section H -- Special Use Buildings

3.1.1 NSW PART H101 PLACES OF PUBLIC ENTERTAINMENT OTHER THAN TEMPORARY STRUCTURES AND DRIVE-IN THEATRES

•	H101.1	Application of Part	The building must comply with this Part
✓	H101.2	Fire Separation	Complies
•	H101.3	Foyer Space	Not applicable
✓	H101.4	Sprinkler System for Common Foyers	Complies
•	H101.5	Conventional Stage	Not applicable
•	H101.6	Non-Conventional Stages	Not applicable
•	H101.7	Flying Scenery	Not applicable
•	H101.8	Load Notices	Not applicable
•	H101.9	Guarding of machinery	Not applicable
•	H101.10	Safety curtains	Not applicable
	H101.11	Seating in rows	
✓	H101.11.1	Number of Seats	Complies
•	H101.11.2	Chairs Used for Seating	Not applicable
•	H101.11.3	Chairs in Auditoriums - Level Floors	Not applicable
•	H101.11.4	Chairs in Auditoriums - Sloping Floors	Not applicable
•	H101.11.5	Radiating Aisles in Seating Areas	Not applicable
✓	H101.11.6	Aisles and Crossovers	Complies
✓	H101.11.7	Platforms and Steps	Complies
•	H101.11.8	Stepped Platforms	Not applicable
•	H101.12	Continental Seating	Not applicable
•	H101.13	Provision of Guardrails	
✓	H101.13.1	Location	Complies
×	H101.13.2	Fixed Back Seats	Does not comply Refer to Section 4 - Alternate Solution
×	H101.13.3	Steps Between Platforms	Does not comply Refer to condition
	H101.14	Guardrails	
•	H101.14.1	Continental Seating	Not applicable
•	H101.14.2	Balconies and Boxes	Not applicable
✓	H101.14.3	Cross overs	Complies

✓	H101.15	Dressing Rooms	Complies
✓	H101.16	Store rooms	Complies
•	H101.17	Projection Suites	Not applicable
•	H101.18	Basement storeys	Not applicable
	H101.19	Electric mains installation	
✓	H101.19.1	Main switchboard	Complies
×	H101.19.2	Circuit Protection	Compliance required - refer to Condition.
•	H101.19.3	Separate submains	Not applicable
	H1101.20	Lighting	
×	H101.20.1	Lighting Switches	Compliance required - refer to Condition.
×	H101.20.2	Lighting Levels	Compliance required. - refer to Condition.
✓	H101.20.3	Provision of Aisle Lighting	Complies
•	H101.20.4	Aisle Lighting Power Supply	Not applicable
✓	H101.20.5	Aisle Lighting Alternative Power Supply	Complies
•	H101.22	Smoke Control Systems for Small Stages	Not applicable
•	H101.23	Solid Fuel Burning Stoves and Open Fire Places	Not applicable
•	H101.24	Fuel Gas Cylinders	Not applicable

4.0 ALTERNATIVE SOLUTIONS

4.1 Scope

The following is a summary of the departures from the DTS provisions identified in the above assessment.

- (a) C2.3 and 2.4 Large isolated building. Requirements for open space.
- (b) E1.5 Sprinklers
- (c) E2.2 Smoke hazard management
- (d) H101.13.2 Provision of Guard rails
- Fixed back seats

4.2 Application

The following assessment of each DTS provision includes:

(a) DTS - C2.3 "Large Isolated Building"

"The size of a fire compartment in a building may exceed:

- (i) the building is Class 5 to 9 and is protected throughout with a sprinkler system complying with Specification E1.5 and perimeter vehicular access complying with C2.4(b) is provided; or*

(b) C2.4 Requirements for open spaces and vehicular access

Vehicular access required by this Part

- (i) must be capable of providing emergency vehicle access and passage from a public road; and*
- (ii) must have a minimum unobstructed width of 6m with no part of its furthest boundary more than 18m from the building and in no part of the 6m width be built upon or used for any purpose other than vehicular or pedestrian movement; and*
- (iii) must provide reasonable pedestrian access from the vehicular access to the building; and*
- (iv) must have a load bearing capacity and unobstructed height to permit the operation and passage of fire brigade vehicles; and*
- (v) where a public road complies with (i), (ii), (iii) and (iv) may serve as the vehicular access or part thereof.*

• Application

Under the provision of C2.3 (ii) a sprinkler system is installed throughout the building in accordance with AS2118.1 with the exception of the ceiling of the Auditorium.

Under the provision of C2.4(b) NSW Fire Brigade vehicular access is provided around the building fronting Harbour and Crown Streets, the driveway between the Entertainment Centre and WIN Stadium and with Lysaght Park to the East.

• Performance Requirements

CP1 *A building must have elements which will, to the degree necessary, maintain structural stability during a fire appropriate to*

- (a) the function or use of the building; and*
- (b) the fire load; and*
- (c) the potential fire intensity; and*
- (d) the fire hazard; and*

- (e) *the height of the building; and*
- (f) *its proximity to other property; and*
- (g) *any active fire safety systems installed in the building;
and*
- (h) *the size of any fire compartment; and*
- (i) *fire brigade intervention; and*
- (j) *other elements they support*

CP2 *A building must have elements which will, to the degree necessary, avoid the spread of fire -*

- (a) *to exits; and*
- (b) *between buildings; and*
- (c) *in a building*

appropriate to -

- (i) *the function 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*

CP9 *Access must be provided to and around a building, to the degree necessary, for fire brigade vehicles and personnel to facilitate fire brigade intervention appropriate to :*

- (a) *the function or use of the building; and*
- (b) *the fire load; and*
- (c) *the potential fire intensity; and*
- (d) *the fire hazard; and*
- (e) *any active fire safety systems installed in the building;
and*
- (f) *the size of any fire compartment.*

- **Alternative Solution - Comparison with DTS provisions/ Verification Method.**

Whilst the building is installed with a sprinkler system, the system is not extended to the Auditorium. This issue is discussed in detail under the alternative solution (b) Sprinklers and based on the verification method.

Perimeter vehicular access complying with C2.4 (b) has been provided to the approval of the NSW Fire Brigade. Refer to NSW Fire Brigade Letter of Approval attached.

- **Recommendation**

It is recommended that the Minister accept the alternate solution.

(b) DTS - E1.5 Sprinklers

"A sprinkler system must

(i) comply with Specification E1.5"

- **Application**

The building will be provided with an automatic fire suppression system to serve all parts of the building with the exception of the Auditorium in compliance with Spec E1.5.

- **Performance Requirements**

"EP1.4 An automatic fire suppression system must be installed to the degree necessary to control the development and spread of fire appropriate to:

(a) the size of the fire compartment; and

(b) the function or use of the building; and

(c) the fire hazard; and

(d) the height of the building.

- **Alternative Solution - Verification Method**

The ceiling of the Auditorium exceeds 16m high. The attached Fire Engineering Report (Report on an Engineered Approach to Fire and Life Safety) examines the means of egress, emergency evacuation procedures, fire and smoke detection and the development of smoke which may affect tenability without activation of an installed sprinkler system.

The computer program Sprinkler was used to determine activation of an installed sprinkler system which predicted the sprinkler system would not operate based on a 7.6 MW fire. The proposal has been approved by the NSW Fire Brigade. Refer to attached letter.

- **Recommendation**

It is recommended that the Minister accept the alternate solution.

(c) DTS - E2.2 Smoke Hazard Management

"(a) A building must comply with (b), (c), (d) and -

(i) Table E2.2a as applicable to Class 2 to 9 buildings such that each separate part complies with the relevant provisions for the classifications; and

(ii) Table E2.2b as applicable to Class 6 and 9b buildings such that each separate part complies with the relevant provisions for the classification."

Table E2.2b

Class 9b - Assembly Buildings

(a) Automatic shutdown:

All air handling systems greater than 1000 l/s and excluding miscellaneous exhaust systems must shut down on activation of a smoke detection system.

Class 9b - Assembly Buildings

(a) Where the floor area exceeds 2000 m² the compartment must be provided with:

(i) an automatic smoke exhaust system complying with Spec E2.2b.

Note: The concession for sporting complexes is not applicable as the building has many uses.

- **Application**

All public areas of the building (foyers) with the exception of the Auditorium is provided with a smoke exhaust system to comply with Spec E2.2b.

The Auditorium is provided with automatic smoke exhaust fans to a total capacity of 150m³/sec in lieu of the deemed-to-satisfy capacity of 300m³/sec.

- **Performance Requirements**

EP2.2 (a) *In the event of a fire in a building the conditions in any evacuation route must be maintained for the period of time occupants take to evacuate the part of the building so that-*

(i) the temperature will not endanger human life; and

(ii) the level of visibility will enable the evacuation route to be determined; and

(iii) the level of toxicity will not endanger human life

- (b) *The period of time occupants take to evacuate referred to in (a) must be appropriate to -*
- (i) *the number, mobility and other characteristics of the occupants; and*
 - (ii) *the function or use of the building; and*
 - (iii) *the travel distance and other characteristics of the building; and*
 - (iv) *the fire load; and*
 - (v) *the potential fire intensity; and*
 - (vi) *the fire hazard, and*
 - (vii) *any active fire safety systems installed in the building; and*
 - (viii) *fire brigade intervention*

- **Alternative Solution - Verification Method**

The fire engineering report has predicted that occupants will be able to evacuate the building well before conditions from any fire situation becomes untenable. The proposal has been approved by the NSW Fire Brigade. Refer to attached letter.

- **Recommendation**

It is recommended that the Minister accept the alternate solution.

(d) DTS - H101.13.2 - Provisions of Guardrails and Fixed back seats

If seats with fixed backs are provided, guardrails that extend for the full width of the seating, must be provided at least 500mm above the platform unless -

- (a) fixed seat backs of the next lower level project at least 500mm above the level of the stepped platform; and*
- (b) there is only one riser between the platform and the next lower cross-over*

• **Application**

Fixed seating within the auditorium accommodates 4496 people. The original design incorporated hand-rails as designed on Sketch 01. (Refer to extract of plan A35). Shop drawings prepared by Siebel also showed the provision of guardrails to a height of 500mm above the stepped platform. (Refer Sketch 02).

The new proposal allows for the deletion of the guardrails behind all seats with the height of the back of the seat above the stepped platform of 300mm. Clearance dimensions between seats are shown on Sketch 02.

All seats are designed to automatically tilt up when not in use maintaining a clearance between the tilt up seat and the back of the seat in front of approximately 687mm.

• **Performance Requirements**

In the absence of specific performance requirements to Part H of the BCA, we have applied the PR of Part D.

DP1 *Access must be provided, to the degree necessary, to enable safe, equitable and dignified movement of people to and within buildings.*

• **Alternative Solution - Evidence to support that the form of construction and design meets the Performance Requirements as described in A2.2(vi), and Expert Judgement**

The minimum deemed-to-satisfy provisions of seating and row clearances are designed to allow for safe and comfortable egress of the patrons of a sporting or other entertainment venue.

When the minimum row clearance of 300mm is applied and patrons wish to move along the row with or without patrons seated there is a preserved danger of falling into the row in front if there is not guardrail.

Guardrails are required when the back of the seat in front does not rise to a height of 500mm from the stepped platform on which the patron walks.

This DTS provision is based on 300mm clearance and fixed seating.

This is not the case within the Wollongong Entertainment Centre where the clearances for patrons to move along the stepped platform have dramatically increased and additional widths have been maintained with the installation of tilt up seats.

Minimum row clearance of 468mm and a maximum row clearance of 687mm will allow patrons to walk normally along the stepped platform and not experience the discomfort or fear of falling over the back of the seat in front.

Further support to the application for removal of the guardrails is the enclosed letter by the Chairman of the Trust dated 6 May, 1998, and the Minister's reply dated 12 May, 1998.

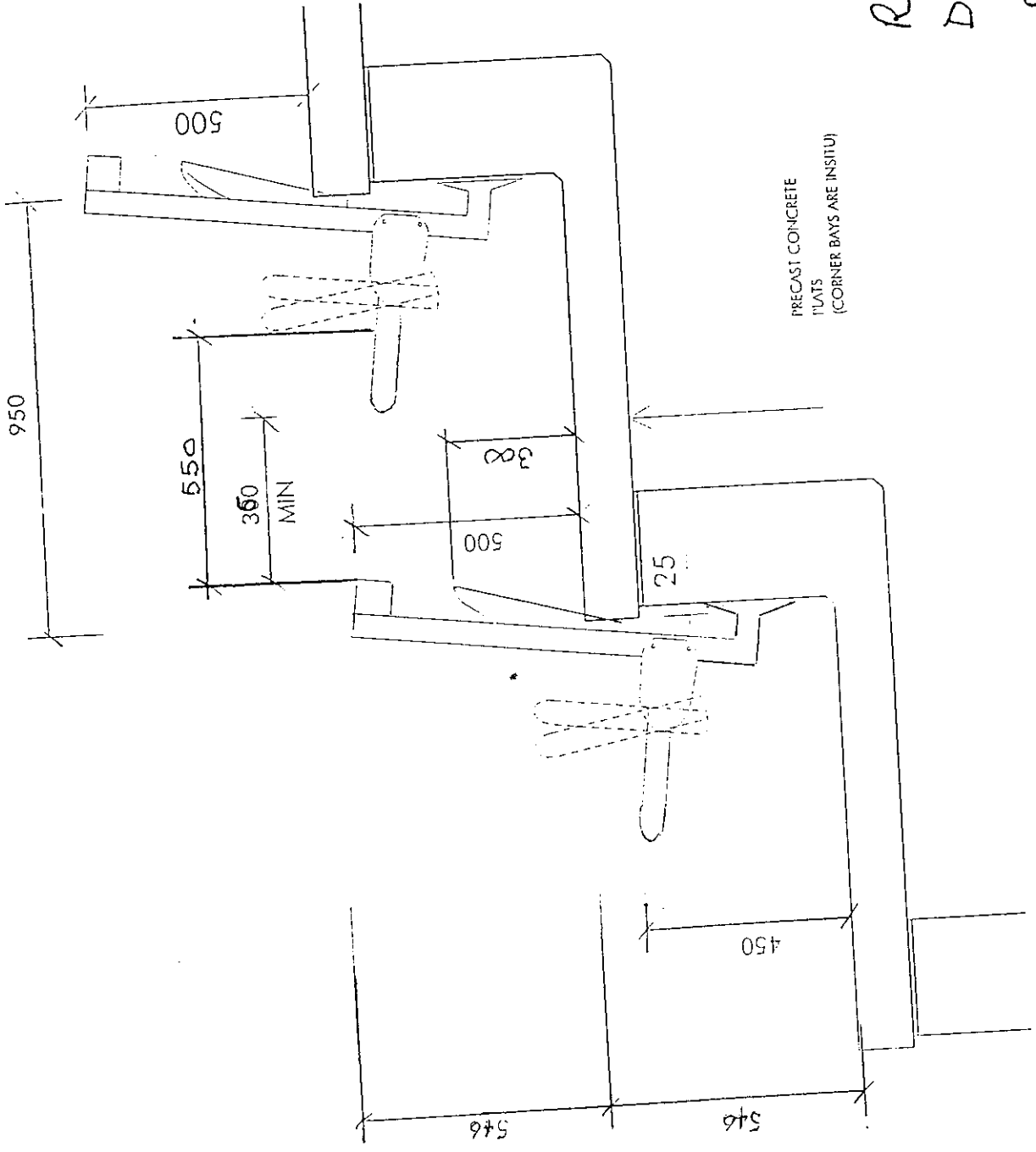
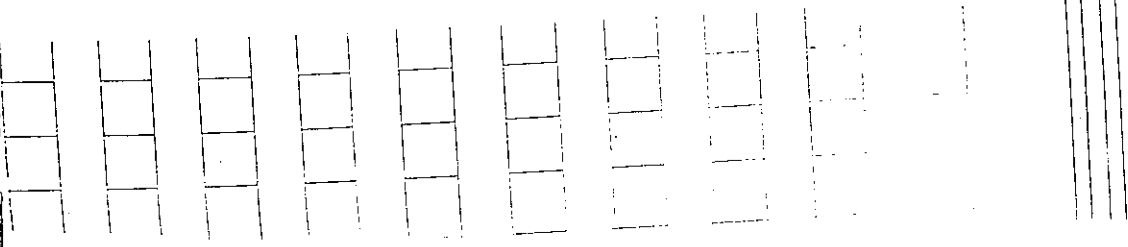
- **Recommendation**

It is recommended that the Minister accept the Alternate Solution.

5.0 ESSENTIAL AND OTHER FIRE SAFETY SERVICES SCHEDULE

The following Essential Services are proposed to be installed within the Wollongong Entertainment Centre :

SERVICE	STANDARD OF PERFORMANCE
• Automatic Sprinkler System	AS 2118 except where varied by the FE Report
• Emergency Lighting	AS 2293 and E4.2
• Emergency Warning and Intercommunications System	AS 2220 and E4.9
• Exit Signs	AS 2293 and E4.5
• Fire and Smoke Alarms	AS 1670 and E2.2
• Fire Dampers	AS 1682 and C3.12
• Fire Doors	AS 1905 and C3.4
• Fire Hydrants	AS 2419 and E1.3
• Hose Reels	AS 2441 and E1.4
• Mechanical Ventilation System	AS 1668 and E2.2
• Mechanical smoke exhaust	AS 1668 and E2.2 except where varied by the FE Report
• Portable Fire Extinguishers	AS 2444 and E1.6
• Paths of Travel to Stairways, Passageways or Ramps	Local Government Act
• Fire Stopping	BCA C3.15



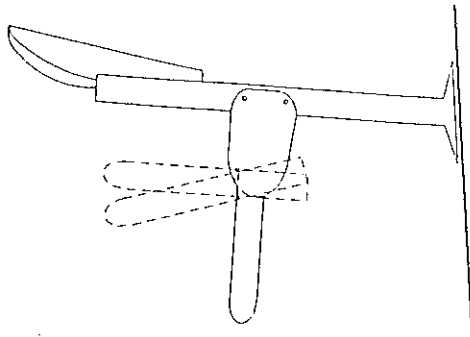
PRECAST CONCRETE
SLABS
(CORNER BAYS ARE INSTIT)

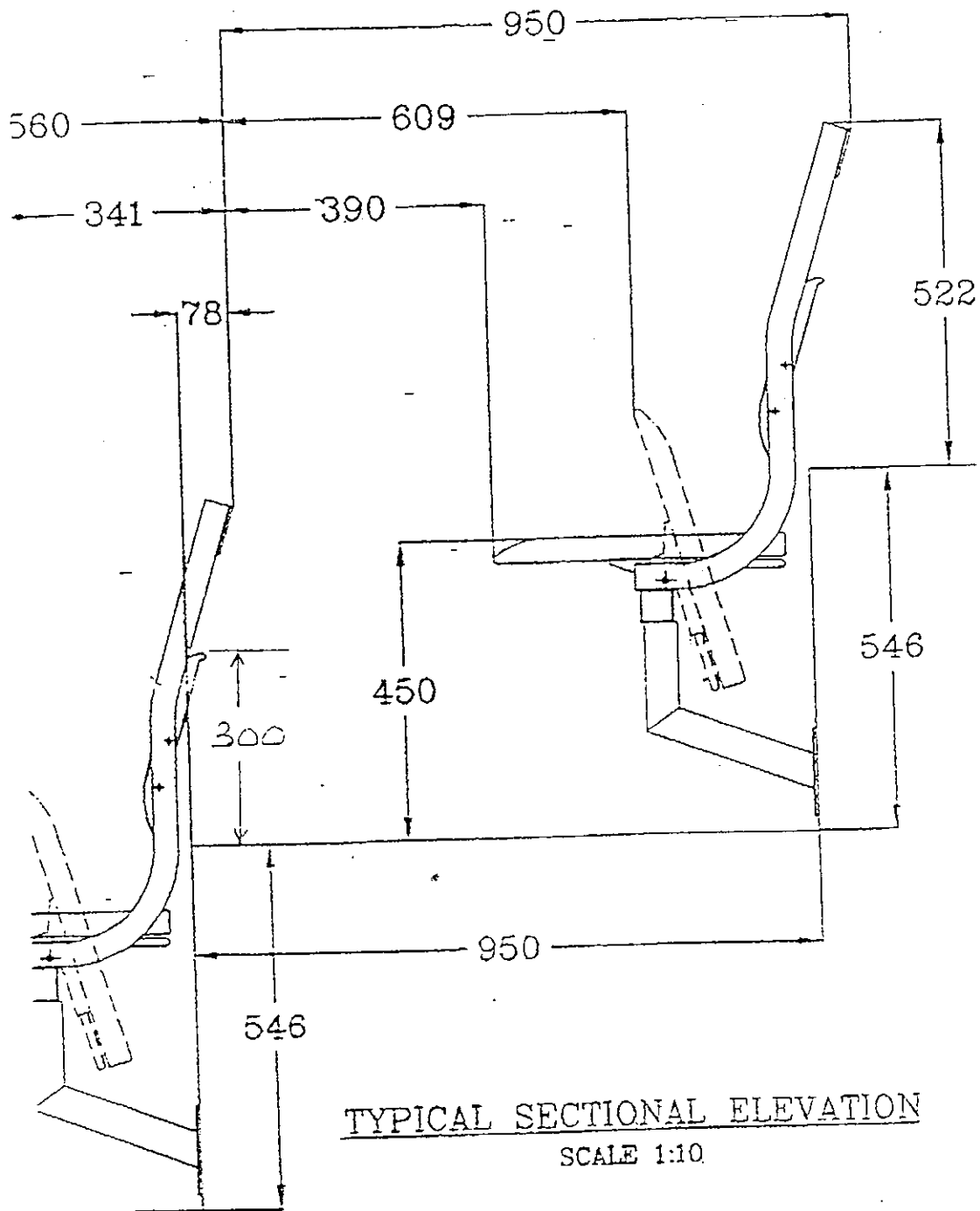
SECTION
TYPE A SEATS 1 : 10

REF. PLAN A35
DESIGN LAYOUT
SK.01
SECTION

TYPE B SEATS FOR CROSS
DISABLED SEATING AREA

LINDSAY DESIGN ENGINEERS	
A.C. PROJECT	
FILE NO	11 MAR 1980
DATE	
DESIGN	
CHECK	
COPIES TO	
ACTION	





STAND SEATING
SEBEL SET-OUT

SK.02

ANNEXURE A

DOCUMENTS ASSESSED

ANNEXURE A

DOCUMENTS ASSESSED

The documents to which this certification refers includes:

Architectural Design Drawings:

A01	A13	A30C	A41C
A03C	A14C	A31C	A42B
A04F	A15B	A32C	A107
A05C	A16C	A35	
A06D	A17B	A37	
A10	A26B	A38A	
A11B	A28B	A39	
A12B	A29	A40	

Certification:

Structural Engineer letter dated:

Mechanical Engineer letter dated:

Electrical Engineer letter dated:

Fire Services Engineer letter dated

Report on Fire Engineered Approach to Fire and Life Safety dated:

ANNEXURE B

POPULATION STUDY AND TOILET ACCOMMODATION

WOOLONGONG ENTERTAINMENT CENTRE
Population and Toilet Accommodation Study

Job No: 1699.AL
Date: 19/5/98

Population		Required Facilities				Actual Facilities				Compliance
Description	Number	WC	Basin	Urinal	Shower	WC	Basin	Urinal	Shower	
<u>Level 1</u>										
Players	27	2	3	3	3	7	9	-	8	Complies
Males	27	3	3	-	3	7	9	-	8	Complies
Females										
Referees	4	1	1	-	1	1	1	-	1	Complies
Males	4	1	1	-	1	1	1	-	1	Complies
Females										
Employees	17	1	1	1	-	Included in Level 2	Included in Level 2	Included in Level 2	-	Complies
Males	17	2	1	-	-				-	Complies
Females										
Disabled										
Unisex	-	2	2	-	-	3	3	-	-	Complies
<u>Level 2</u>										
Spectators	504	37	4	6	-	11	23	33	-	Complies
Males	504	8	4	-	-	41	22	-	-	Complies
Females										
Employees	10	1	1	1	-				-	Complies
Male	10	1	1	-	-				-	Complies
Females										
Disabled										
Unisex		2	2	-	-	3	3	-	-	Complies
<u>Level 4</u>										
Spectators	2242	6	15	23	-	Included in Level 2	Included in Level 2	Included in Level 2	-	Complies
Males	2242	30	15	-	-				-	Complies
Females										

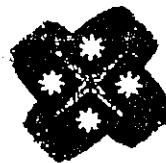
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ANNEXURE C

CERTIFICATION OF DESIGN

29 May, 1997

McKell Building
2-24 Rawson Place
Sydney NSW 2000



NSW DEPARTMENT
OF PUBLIC WORKS
AND SERVICES

Telephone 02 9372 8877

Facsimile 02 9372 7070

Mr T Martin
Lincolne Scott Australia Pty Ltd
63 Alexander St
Crows Nest, 2065

WOLLONGONG ENTERTAINMENT CENTRE
MECHANICAL SERVICES

RECEIVED	
FILE	
No. 1697 AD	
29 MAY 1997	
GET	
LAE	
MR	
AM	
COPIED TO	
ACTION	

We hereby certify that the mechanical services for Wollongong Entertainment Centre have been designed in accordance with AS 1668, Parts 1 & 2, 1991.

G. Rodwell 29/5/97

G. Rodwell
Senior Mechanical Engineer
M & E Buildings

30 May, 1997

Mr. T. Martin
Lincoln, Scott Australia
83 Alexander Street
CR JWS NEST NSW 2065

McKell Building
2-24 Rawson Place
Sydney NSW 2000



NSW DEPARTMENT
OF PUBLIC WORKS
AND SERVICES

Telephone 02 9372 8201
Facsimile 02 9372 8244

WOLLONGONG ENTERTAINMENT CENTRE ELECTRICAL ENGINEERING INSTALLATION

This is to certify that the above project was designed in accordance with the following:

- (a) Building Code of Australia, Parts E4 and H101.
- (b) Australian Standard 2293 Emergency Lighting.
- (c) Australian Standard 2220 - Emergency Warning System.

Please contact the undersigned for further information.

Tony Aldridge

MEMORANDUM

McKell Building
2-24 Rawson Place
Sydney NSW 2000



NSW DEPARTMENT
OF PUBLIC WORKS
AND SERVICES

Telephone 02 9372 8201
Facsimile 02 9372 8244

TO IAN FERRIER
Level 19 McKell Building

CC Mark Maung

DATE 14 May, 1998

FROM TONY ALDRIDGE
Senior Electrical Engineer
Mechanical & Electrical Engineering Section

SUBJECT WOLLONGONG ENTERTAINMENT CENTRE
ELECTRICAL INSTALLATION

Further to your facsimile of 30/4/98, the following advice is forwarded concerning the electrical design.

- (1) The circuit protection is by circuit breaker, not by fuse.
- (2) The switches controlling the general lighting are not accessible to the public, the panels being fitted with a lockable door.
- (3) The general lighting is mainly fluorescent, with some incandescent lamps for the step lighting. These all possess battery backup and will re-strike within the allowable period. The emergency illumination levels meet those of the statutes.

T Aldridge

Tony Aldridge

Lincolne Scott SYDNEY			
A.C.H.P.E.			
FILE			
No.			
14 MAY 1998			
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MRS			
COMM			
COPIES			
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State Projects

A division of NSW Public Works

FAX MESSAGE

DEPARTMENT OF PUBLIC WORKS AND SERVICES
HYDRAULIC SERVICES SECTION
LEVEL 13, MCKELL BUILDING, 2 - 24 RAWSON PLACE, SYDNEY 2000

To: Mark Maung
Lincolne Scott

Facsimile : (02) 9906 3680

From: Xung Ha

Telephone : (02) 9372 7894

Facsimile : (02) 9372 7890

Subject: Wellongong Entertainment Centre
Hydraulic & fire protection services

No. of pages following :

Dear Mark

As your requested, please find the following information:

1. Fire Hydrant and Fire Hose reel shown on drawing number H04-H07 is designed to the requirements of the BCA, AS 2419.1 for Fire Hydrant, and AS 1221 & AS 2441 for Fire Hose Reel.
2. Fire Sprinkler shown on drawing F1-F6 is designed to AS 2118 & BCA.

Regards

15.5.97

MEMORANDUM

Hydraulic Service Group
Level 13 McKell Building
2-24 Rawson Place
Sydney NSW 2000



NSW DEPARTMENT
OF PUBLIC WORKS
AND SERVICES

Telephone 02 9372 7896

Facsimile 02 9372 7890

TO Ian Ferrier
Level 19 McKell

CC

5-May 1998

FROM Tony Affleck
Hydraulic Services
Level 13 McKell.

SUBJECT Wollongong Entertainment
Centre
BCA Fire Protection Services
Certification

We are in receipt of your memorandum dated the 30-th April 1998 regarding certification of the fire protection services on the above mentioned project.

We advise a letter from the hydraulic services section was sent to Lincolne Scott on the 15-5-1997,(copy enclosed) advising of the design of the Fire Hydrant, Fire Hose Reel, and Fire Sprinkler System have been designed to comply with BCA and the relevant Australian Standard.

However since the letter of the 15 th May, last year approval to delete the fire sprinklers to the ceiling over the auditorium was confirmed by NSW Fire Brigades.

The NSW Fire Brigade (Mr Glen Jacobson) advised the writer verbally today that as the building is under 25 meters in height they would not require copies of our design drawings for comment, records, or approval.

The Fire Sprinkler System for the Wollongong Entertainment Centre as per our drawings F1-F6 (inclusive) is designed to AS 2118 and BCA requirements (excluding fire sprinklers to the ceiling and roof space over the Auditorium approved by NSW Fire Brigade).

The Fire Hydrant and Fire Hose Reel System as shown on our drawings number H04-H07 are designed to the requirements of the BCA, AS2419.1, for the Fire Hydrant, and AS1221 & AS2441 for the Hose Reel System.

We trust the foregoing meets with your approval, and if you require any further information contact the undersigned.

Yours Faithfully

Tony Affleck

Hydraulic Services Section

MEMORANDUM

McKell Building
2-24 Rawson Place
Sydney NSW 2000

TO Tony Martin
Lincolne Scott

CC

DATE 18 May, 1998

FROM Ian Chappel
Hydraulic Services

SUBJECT Wollongong Entertainment
Centre

Facsimiles 15/5/98

BUILDING SAFETY SERVICES			
FILE NO. 1699 AL			
18 MAY 1998			
GDI	WSC		
AGM	MSM		
GDM			
COPIES TO			
ACTION			

NSW DEPARTMENT
OF PUBLIC WORKS
AND SERVICES

Telephone 02 9372 7896
Facsimile 02 9372 7890

Tony
Re: your fax for Gas Service

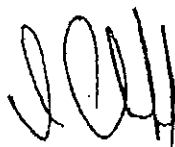
4.01 Type, make model and thermal input rating of each piece of gas burning equipment.
The make and model for the equipment will be selected by the contractor. The allowance that I have made are Gas Boilers for AC are 4320Mj/hr (2- 2160Mj/hr each), Hot water heaters 800Mj/hr (4- 200Mj/hr each), Kitchen allowance 589Mj/hr (6 Burner w/oven 190Mj/hr, Griddle 55Mj/hr, Target top 40Mj/hr, Salamander 46Mj/hr and Frying suite 258Mj/hr).

4.02 Position and housing of any gas meters, including details of ventilation of the housing.
The gas meter housing is external to the building at the south-east corner of the carpark with open mesh front for natural ventilation.

4.03 Details of the capacity, location and enclosure of each liquefied petroleum gas cylinder or tank.

The site is connected to the AGL natural gas service, so I do not have any LP Gas bottles.

If you require any further information contact Ian Chappel on 02 9372-7896.



Ian Chappel
Hydraulic Services Group

ANNEXURE D

SUPPORTING DOCUMENTS

NSW Government Offices
84 Crown Street
Wollongong NSW 2500



NSW DEPARTMENT
OF PUBLIC WORKS
AND SERVICES

Telephone 02 4226 8111
Facsimile 02 4226 8534

13 May, 1998

Lincolne Scott Australia P/L
PO Box 737
CROWS NEST NSW 2065

Attention: Tony Martin

Dear Tony,

Wollongong Entertainment Centre - BCA Certificate

As per your request for details of the retractable seating proposed for installation at the subject Centre, please find attached preliminary shop drawings of the seating layout and typical sections.

As discussed, these seats are now under fabrication without the guard rail behind the seats. The client has obtained approval in principle from the Minister for Local Government to vary the requirements of the Building Code of Australia for all seating. Further correspondence on this matter is being prepared and will be forwarded shortly.

Yours faithfully,

A. J. McCabe

for: C. Summerhayes
Regional Projects Co-ordinator
South Coast Region

BUILDING SAFETY SERVICES A.C.HOF.			
FILE No.			
15 MAY 1998			
GDT			
<u>AJM</u>			
GDM			
COPIES TO			
ACTION			

P:\WEC\CONSTN98\WEC196.DOC

WOLLONGONG SPORTSGROUND TRUST

WOLLONGONG ENTERTAINMENT CENTRE

AVAILABLE SPACE = 32064
32000 ✓

NOTES

ALTERNATIVE LAYOUT

Total No. of Retractable Seats

- 1008 (based on 90 seat centres)

DRAWING CERTIFICATION

This drawing has been reviewed and assessed in compliance with BCA

- ☐ SATISFACTORY
☒ SATISFACTORY WITH CONDITION
☐ NOT SATISFACTORY

This certification does not constitute an approval
Signed: *[Signature]* Date: 25.5.98

BUILDING SAFETY SERVICES
A.C.H.P.F.

FILE No. 1699AL

11 MAY 1998

GDT
AJM
GDM

COPIES TO
ACTION

AVAILABLE SPACE = 16164

1/4/98	Preliminary Issue	GMR	0
Date	Description	Drawn	Rev

CARTY INDUSTRIES

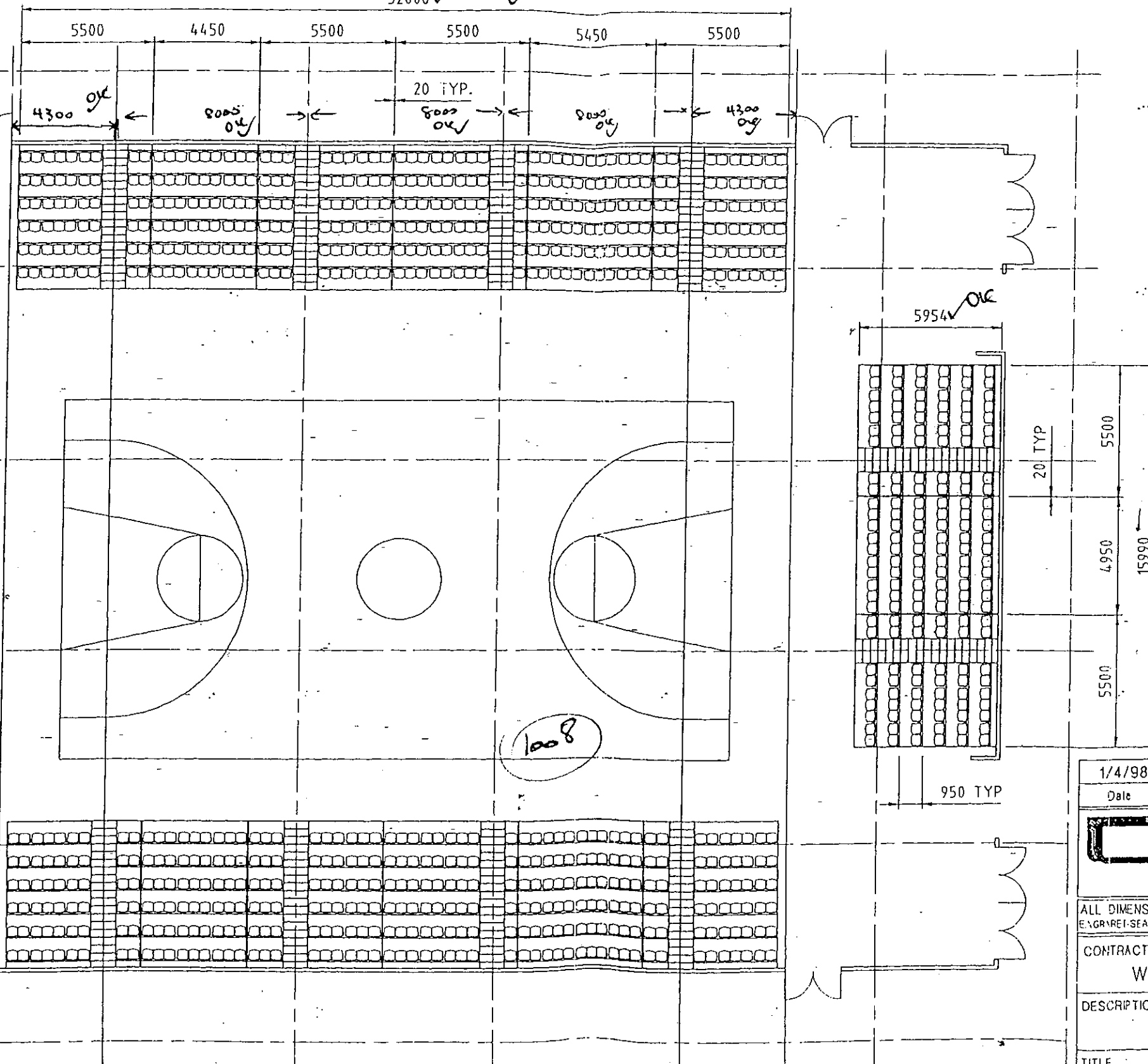
ALL DIMENSIONS IN MILLIMETRES © CARTY INDUSTRIES PTY. LIMITED

CONTRACT
Wollongong Sportsground Trust

DESCRIPTION
Retractable Seating

TITLE
Plan View and Seating Layout

SCALE 1:200
DRAWING No. P1ALT
REVISION 0



WOLLONGONG SPORTSGROUND TRUST

WOLLONGONG ENTERTAINMENT CENTRE

NOTES

ALTERNATIVE LAYOUT

(Based on 490 seat centres)

DRAWING CERTIFICATION

This drawing has been reviewed and assessed in compliance with BCA

- ☐ SATISFACTORY
☒ SATISFACTORY WITH CONDITIONS
☐ NOT SATISFACTORY

NOTE: This certification does not constitute an approval of the design or construction of the building or any part thereof.
 Signed: *[Signature]* Date: 15 May 1998

not checked against BCA reqts.

BUILDING SAFETY SERVICES A.C.H.P.F.

FILE No.

15 MAY 1998

GDT				
AJM				
GDM				

COPIES TO
ACTION

1/5/98	Preliminary Issue	GMR	0
Date	Description	Drawn	Rev

CARTY INDUSTRIES

ALL DIMENSIONS IN MILLIMETRES
 EXCEPT SEAT WIDTHS AND PITCHES
 © CARTY INDUSTRIES PTY. LIMITED

CONTRACT
 Wollongong Sportsground Trust

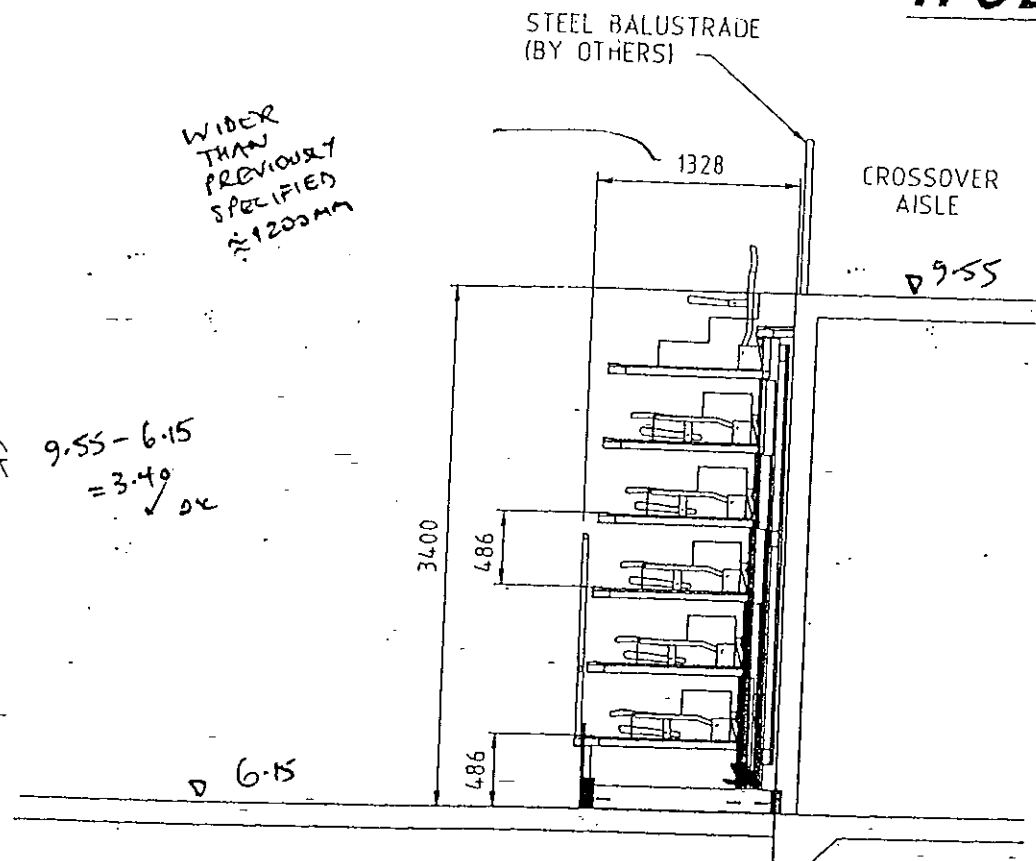
DESCRIPTION
 Retractable Seating

TITLE
 Typical Sections

SCALE 1:50
 DRAWING No. P2ALT
 REVISION 0

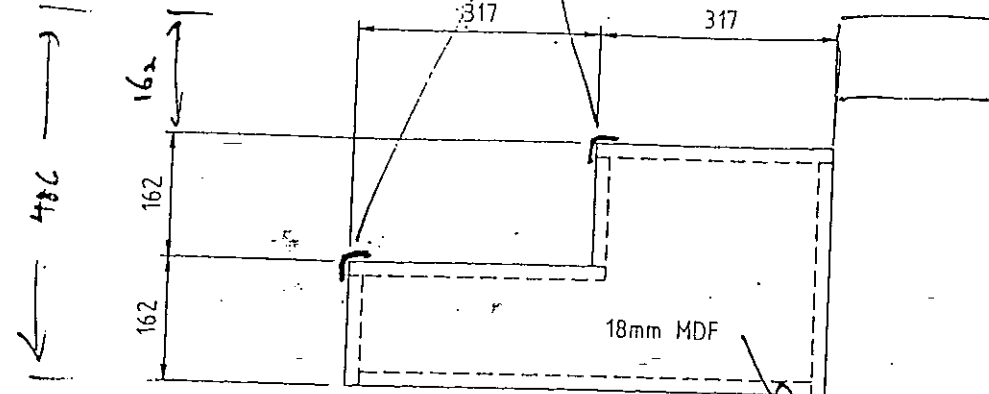
WIDER THAN PREVIOUSLY SPECIFIED
 ~1200mm

DIF 9.55 - 6.15
 = 3.40
 OK



CONSISTENT RISERS, OK

EXTRUDED ALUMINIUM STAIR NOSING PREVIOUSLY SPECIFIED



TYPICAL AISLE STEP

SCALE 1:10

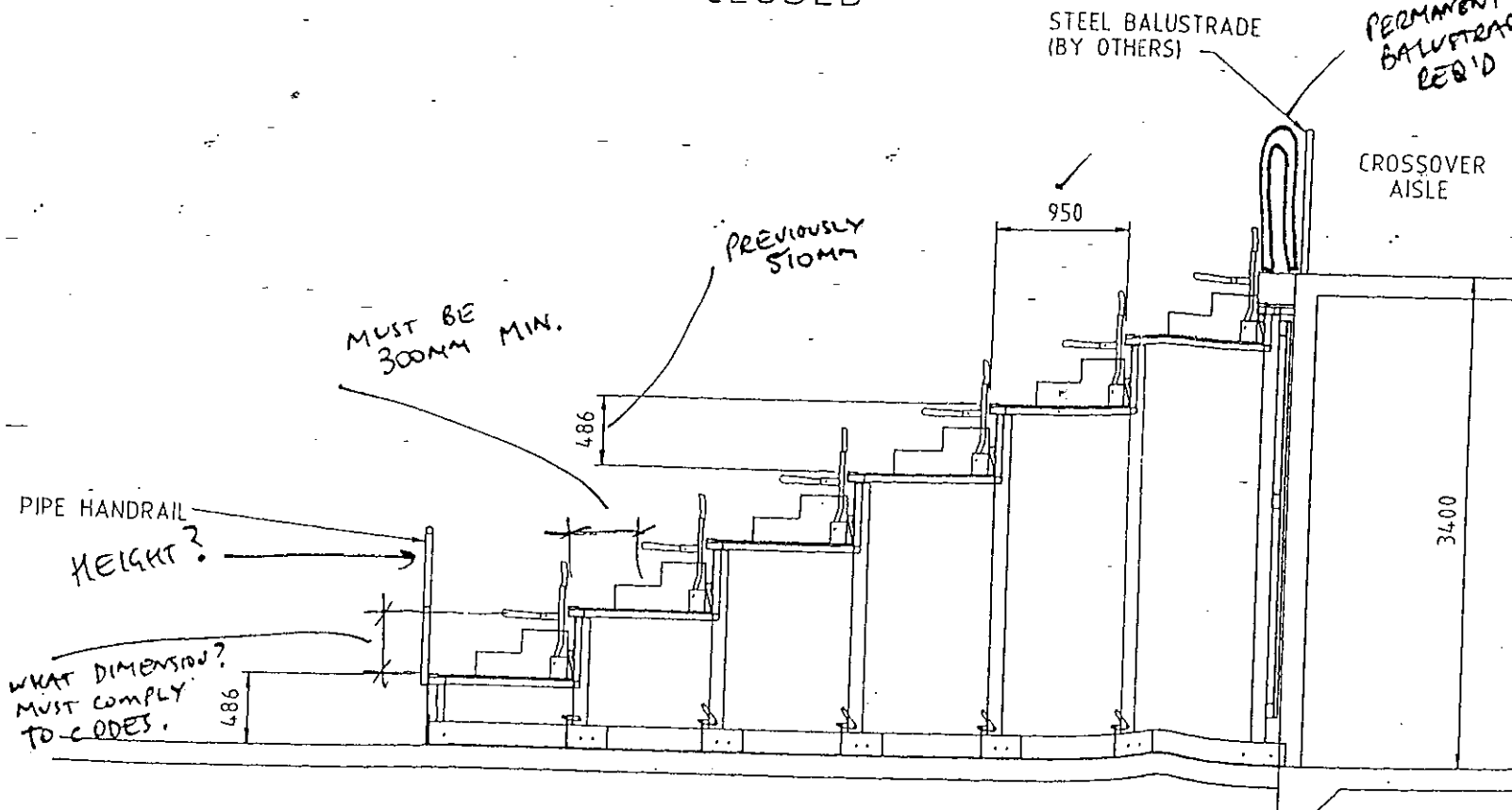
19mm A BOARD PLYWOOD PREVIOUSLY SPECIFIED

TYPICAL SECTION - CLOSED

STEEL BALUSTRADE (BY OTHERS)

PERMANENT BALUSTRADE REQ'D

CROSSOVER AISLE



TYPICAL SECTION - OPEN

WOLLONGONG SPORTSGROUND TRUST

WOLLONGONG ENTERTAINMENT CENTRE

NOTES

ALTERNATIVE LAYOUT

(Based on 490 seat centres)

DRAWING CERTIFICATION

This drawing has been reviewed and assessed in compliance with BCA

- ☐ SATISFACTORY
☒ SATISFACTORY WITH CONDITION
☐ NOT SATISFACTORY

This certification does not constitute an approval
 Signed: *[Signature]* Date: 10.8.98

BUILDING SAFETY SERVICES A.C.H.P.F.

FILE
No.

15 MAY 1998

GDT			
AJM			
GDM			

COPIES
TO

ACTION

1/5/98	Preliminary Issue	GMR	0
Date	Description	Drawn	Rev

CARTY INDUSTRIES

ALL DIMENSIONS IN MILLIMETRES © CARTY INDUSTRIES PTY. LIMITED
 E:\G\RET-SEAT\WOLLONGONG\338.DWG

CONTRACT
Wollongong Sportsground Trust

DESCRIPTION
Retractable Seating

TITLE
Plan View and Seating Layout
Fixed Units WF1 & WF2

SCALE 1:50 DRAWING No. P3ALT REVISION 0

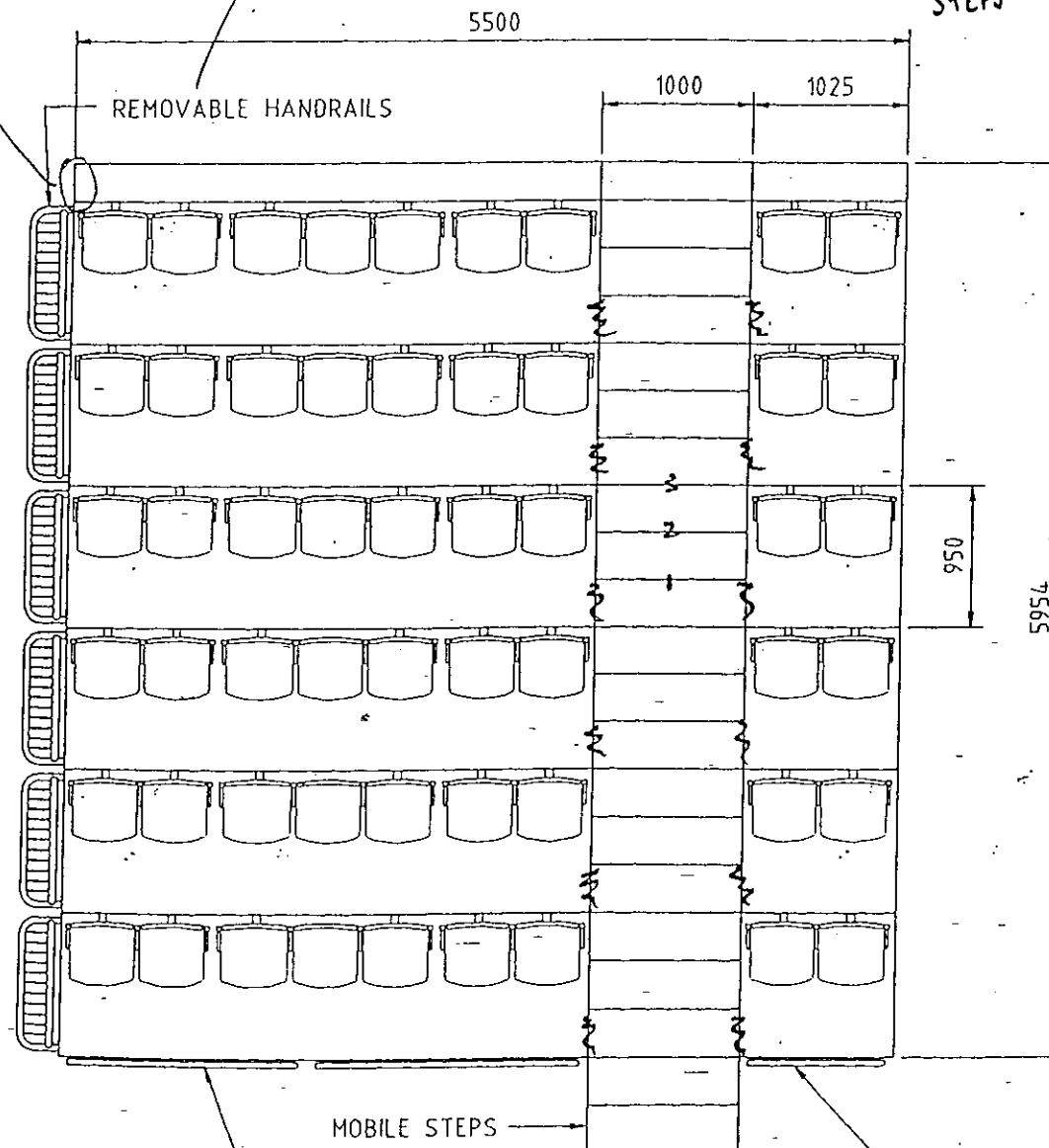
PERMANENT
BALUSTRADE
REQ'D

PREVIOUSLY
PERFORATED
STEEL INFILL

APPLIES
TO ALL
STEPS

HANDBAIL
PREVIOUSLY
SPECIFIED
AS PER
ATTACHED
SKETCH

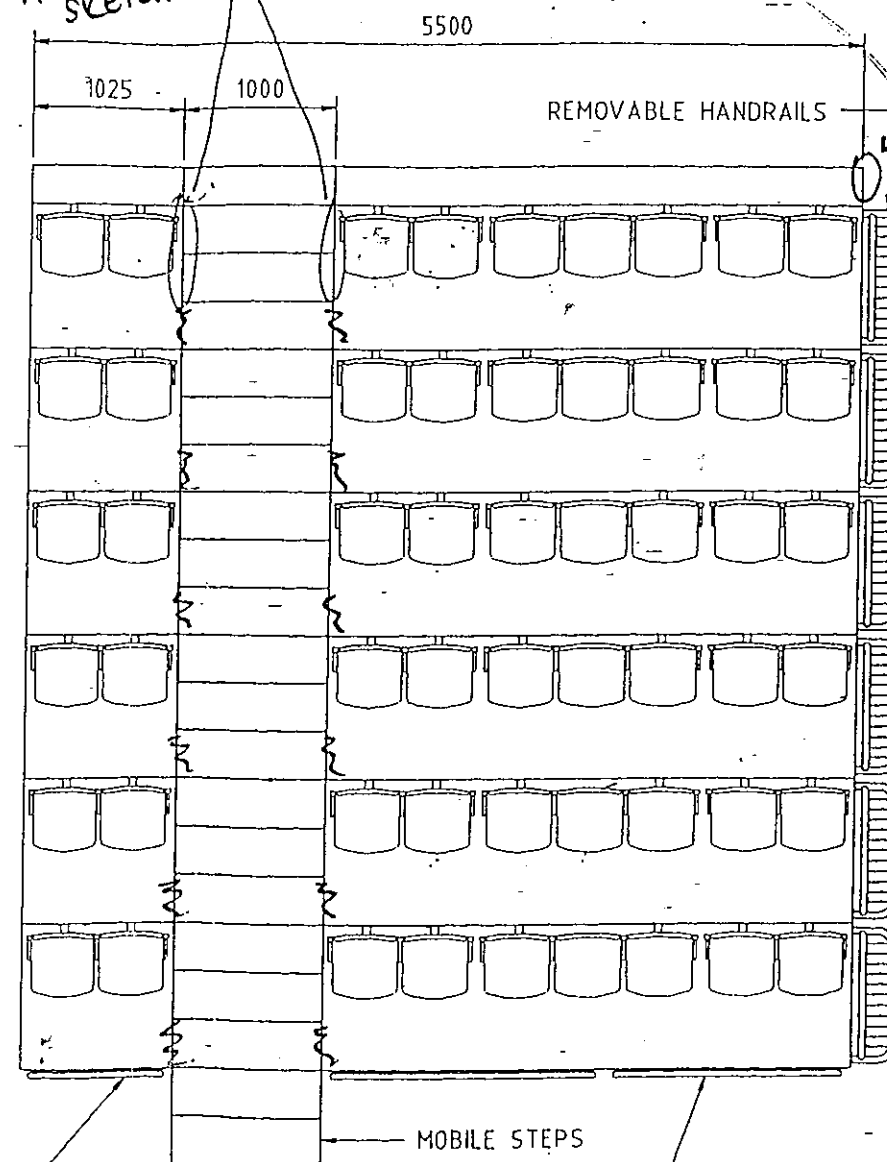
MUST HAVE
1000MM CLEAR
W/IN/A AFTER
INSTALLATION
OF HANDRAILS



FRONT HANDRAILS
(2 No. TYPE A
PER UNIT)

FRONT HANDRAIL
(1 No. TYPE B
PER UNIT)

UNIT WF1



FRONT HANDRAILS
(2 No. TYPE A
PER UNIT)

UNIT WF2



WOLLONGONG SPORTSGROUND TRUST

P.O. BOX 148, WOLLONGONG EAST, N.S.W. 2520

Telephone: (042) 29 1966 Fax: (042) 26 5237

The Hon Ernie Page MP
Minister for Local Government
S Y D N E Y

Dear Minister,

As you are no doubt aware the Sportsground Trust are constructing a 6000 seat stadium/entertainment centre in Wollongong, at a cost in excess of \$17 million. Construction is well under way and the Premier has accepted an invitation to officiate at the opening on 28 August 1998.

Despite a State Government grant of \$15 million there is a significant shortfall in funds for the required infrastructure. To meet the budget limit of \$15 Ml items such as a basketball floor, seating all electrical items, including the need for a new electrical sub station (at a cost of \$250,000) a PBX system, all office requirements ranging from furnishings to computers and a PA system have been deleted from the contract.

In addition to corporate sponsorship and leasing various items I am currently negotiating with Treasury for further funds.

The Trust have now been advised by Public Works that in order to meet the requirements for a License for Public Entertainment from your Department that a guard rail is required for some 4496 seats. The Manufacturer has advised that it will cost \$15 per seat making a total of \$67,440, if done during construction. To construct an assemble after the seats have been installed will cost considerably more.

This requirement is peculiar to NSW. It was brought about by an NSW Amendment to the Building Code of Australia. Currently in NSW, no other Centre has this required guard rail. No other State has this requirement and the Olympic Organising Authority, which is self regulating in these matters, have chosen to exercise their prerogative and deleted this requirement.

Without an exemption the Wollongong Entertainment Centre will be the only Centre I Australia conforming to this requirement.

Given the above circumstances I would request your urgent and favourable consideration in granting an exemption for the need of the guard rail as a requirement for the license.

Yours sincerely

Bill Barnetson
Chairman

6/5/98.

MAY 12 '98 11:12AM MIN FOR LOCAL GOVT 61 2 251 1442

P.2



NEW SOUTH WALES

THE HON ERNIE PAGE, MP
MINISTER FOR LOCAL GOVERNMENT

RML08/P26784
FF98/0208
DTS39902

Mr I McManus MP
Parliamentary Secretary
Member for Bulli
P O Box 111
THIRROUL NSW 2515

8661 MAY 2 1

Dear Mr McManus 

I refer to your personal representations on behalf of Mr Bill Barnetson, Chairman of the Wollongong Sportsground Trust, enquiring as to the possibility of some variation in applying the Building Code of Australia 1996, so as to exempt the need for guard rails for seating in the construction of the Wollongong Entertainment Centre.

As a Crown building project, the Centre will not require building approval from the local council. While section 70 of the Local Government Act 1993 (the Act) requires all new Crown buildings to comply with the State's building laws, the Minister associated with control of the project has certain authority under section 70 of the Act to vary building standards where considered warranted.

I am informed that future use of the Wollongong Entertainment Centre is intended as a place of public entertainment, and therefore it will also require my approval under section 71 of the Local Government Act 1993.

An application for use as a place of public entertainment (POPE) has not yet been made to my Department of Local Government, although telephone enquiries handled to date indicate this might occur in the near future. In terms of variation of provisions of the Building Code of Australia, applicable at the POPE application stage, an opportunity exists for an applicant for such approval to seek a variation under section 82 of the Act to, in effect, set aside particular requirements.

However, a section 82 objection needs to be accompanied by technical substantiation of the basis on which the provisions specified are sought to be set aside.

At this stage it is suggested that the question of a section 82 objection be considered in conjunction with the intended POPE application. I understand that preliminary inquiries have already been made of the Department by technical advisers to the project and a verbal explanation has been provided. An application kit that explains the application process has also been provided for assistance.

MAY 12 '98 11:12AM MIN FOR LOCAL GOV'T 61 2 251 1442

002


2.3

2

In all the circumstances, it would appear beneficial for the various issues involved, including the section 82 situation, to be discussed between the Trust's representatives and technical advisers and officers of my Department at the time the application is being finalised.

I trust that the information provided will be of assistance.

Yours sincerely



E. T. Page B.E., B.Comm., M.P.
Minister for Local Government

Report on An Engineered Approach To Fire and Life Safety

WOLLONGONG ENTERTAINMENT CENTRE

COPY

Prepared by:

Lincolne Scott

Consultants A.C.N. 005 113 468
83 Alexander Street
CROWS NEST NSW 2065

For:

State Projects

McKell Building
2 - 24 Rawson Place
Sydney NSW 2000

Job No. 1699.AF
April, 1997

LINCOLNE SCOTT AUSTRALIA PTY LTD
WOLLONGONG ENTERTAINMENT CENTRE
FOR
FIRE ENGINEERING REPORT
PROJECT No.1699.AF
ADDENDIUM No.1
ISSUED 5 MAY, 1997

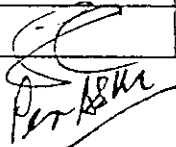
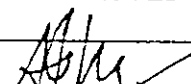
6.0 SUMMARY OF RECOMMENDATIONS

1. Provide automatic sprinklers throughout all areas except the auditorium. In this regard sprinkler protection is not necessary to the ceiling space and auditorium. (Fire Brigades comments to be sought).
2. Provide Beam type smoke detectors in auditorium.
3. Install an Emergency Warning and Intercommunications System (EWIS) as a part of the Public Address system and isolates music systems on operation of EWIS. The power supply (Dedicated DB) to the sound system to be interlocked with the fire alarm system.
4. Develop emergency evacuation plans and a Fire Warden System.
5. Ensure Staff are trained and familiar with the emergency evacuation process.
6. Activate all exhaust fans as one single zone. No smoke baffles are required
7. Additional Emergency Lighting to level 2 egress passageways should be installed. This lighting should be installed at floor level within the Auditorium.
8. Fire retardant to all seating to minimise fire growth. The selection of seating type should achieve:
 - Spread of flame index 0
 - Smoke development index >5 (not greater)
9. The total smoke exhaust capacity can be reduced to 150m³/sec from the auditorium.

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APPENDIX 1

REVISION STATUS AND APPROVAL					
REVISION	DATE	STATUS	AUTHOR	PROJECT ENGINEER	APPROVED
Ø	20/4/97	Final	WSC		

Executive Summary

This analysis and report was commissioned by State Projects to provide a comparison between the prescriptive and performance requirements of the Building Code of Australia as they relate to the proposed Entertainment Centre at Wollongong. Furthermore, there was concern that the sprinkler system identified for the auditorium would be ineffective which was confirmed by the analysis.

This analysis is consistent with the criteria outlined in the Fire Engineering Guidelines of 1996 and has been based on the performance requirements as defined in the BCA 1996.

The conclusions reached in this report provide an alternative proposal to provide the required level of safety for the building which need to be considered by the Fire Brigades.

The review utilises advanced computer modelling techniques to predict human behaviour and anticipated evacuation time in the event of a fire or other emergency within the building.

Based on scientific research and statistical data, a design fire is modelled within the building to determine the anticipated heat and smoke development. This data together with the performance of the installed detection, suppression and management systems determines the effectiveness of the overall fire safety package.

This analysis clearly shows that the fire safety installations combined with the required management systems at the Wollongong Entertainment Centre will provide a satisfactory level of safety for occupants which are commensurate with the performance requirements of the BCA and good management practices.

1.0 INTRODUCTION

1.1 Aim

This report examines and identifies fire safety facilities required and areas of non-compliance or otherwise of the fire and life safety provisions proposed at the Wollongong Entertainment Centre. The fire and life safety installations to be provided have been assessed for compliance with the Deemed to Satisfy and prescriptive provisions of the Building Code of Australia.

Where compliance with the prescriptive requirements are not achieved an engineered approach to fire and life safety has been used to achieve compliance with the performance requirements of the BCA 96.

This assessment predicts that the proposed fire safety systems will allow safe egress for occupants in accordance with the objectives of the BCA. The report will consider fire spread and access for Fire Brigade personnel, but recognises the importance of occupant safety as being paramount.

1.2 Purpose

This study or analysis has been requested by State Projects to determine if Deemed-to-Satisfy provisions of the BCA could be modified or deemed not appropriate for this building

The purpose of the this report is to assess the systems performance based on a Level 2 Evaluation as detailed in the Fire Engineering Guidelines 1996 (FEG), and for this report to supplement a Section 70 Application for Dispensation under the Local Government Act by the Building Certifier.

In particular the report highlights the objectives of Parts C, D and E of the BCA, including:

1. Means of egress
2. Automatic fire detection and suppression systems
3. Automatic smoke detection and control systems, and
4. Emergency Management Systems.

This report also considers the differing effects each of the safety systems have on the total fire safety package as provided within the complex to provide a fire engineered approach to fire safety.

1.3 Standards Adopted by Reference

Reference to standards of construction will be to the Building Code of Australia 1990 Amendment 10 including NSW Variations (BCA) and the relevant Australian Standards adopted under the Specification Part A1.3 as listed below.

Fire Resistance Level (FRL) relates to the Structural Adequacy/Integrity/Insulation in minutes for building elements eg. -/60/30 FRL and able to withstand fire.

AS 1670 Automatic Fire Alarm Systems

AS 1603 Fire Indicator Panels

AS 1668.1 Use of Mechanical Ventilation and Air Conditioning - Fire and Smoke Control

AS 2410 Installation of Fire Hydrants

AS 2441 Installation of Hose Reels

AS 2444 Installation of Portable Extinguishers

AS 1905 Fire Door Installation

AS 2293 Emergency Lighting Code

AS 1735 Lift Installation

AS 2220 Emergency Warning and Intercommunication Systems

AS 3745 Emergency Control Organisations and Procedures in Buildings

AS 2118 Automatic Fire Sprinklers

AS 1851 Maintenance of Fire Protection Equipment

1.4 Reporting Team

The information contained herein has been co-ordinated by Lincolne Scott Australia under the direct involvement of Mr Steve Coombe

1.5 Sources of Data and Limitations

The basis of this report, together with the assumptions contained therein, limit the scope to the findings and recommendations as stated. The plan and drawing numbers DA 02 A to DA11 A dated Feb 97

1.6 Building Description

The proposed building is to cover approximately 7000 m² and will be purpose built to provide an entertainment and sporting centre. The structure is to provide a central playing area for basketball and other sports with tiered seating above service areas and foyer.

The site is located on the SE corner of Harbour and Crown Streets Wollongong. The proposed development consists of a single storey entertainment and sporting centre, Classification 9(b), Place of Entertainment (POPE) and Type 'A' construction as defined by the BCA.

1.7 Building Use

The building is designed and to be constructed to provide four different modes of use:

- Basketball with 6030 seats
- Concert with 5020 seats
- Circus with 5190 seats, and

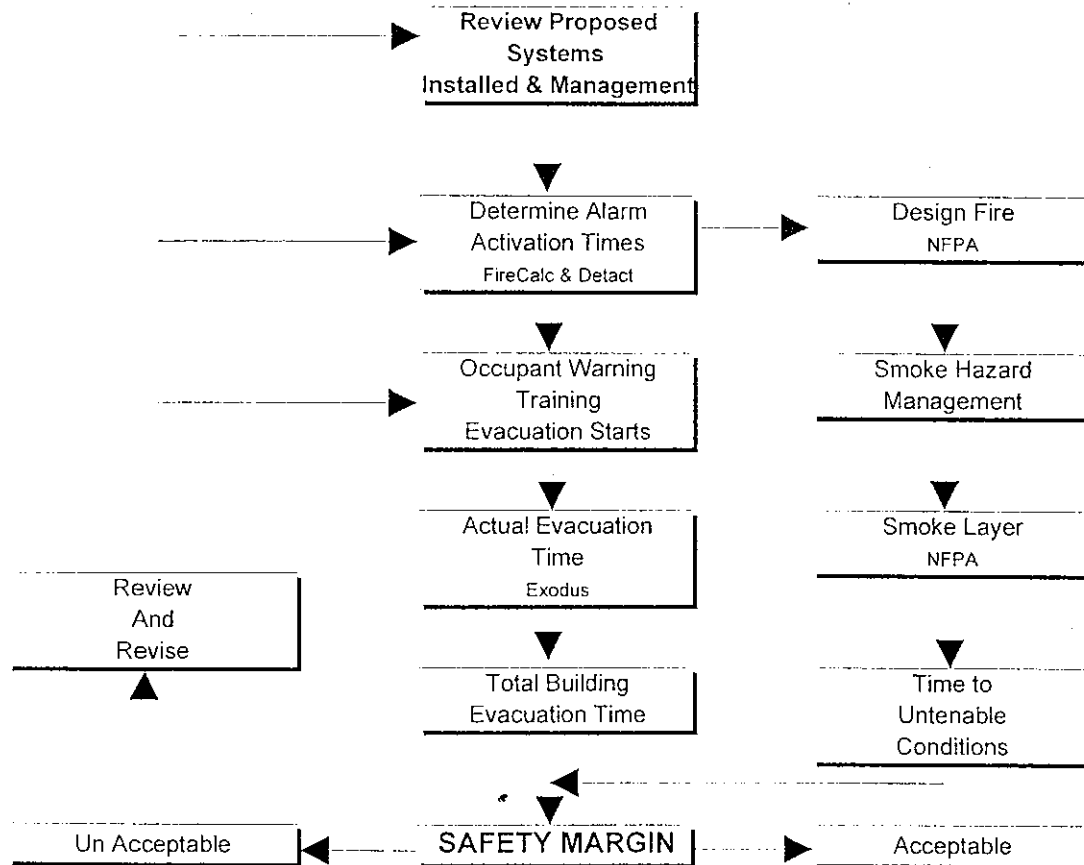
Exhibition with only 300 persons being accommodated, permanent seats not included.

Projection on the likely use of the building are as follows:

Use	Required Seating Capacity	Projected Number of Days per year
Basketball	5500	25
Tennis	4000	7
Netball	4000	2
Boxing	1000	2
Wrestling	1000	2
Gymnastics	1000	2
Motorcross	2000	2
Pop Concerts	4000	51
Conferences	1000	6
Ice Shows	3000	10
Circus	4000	10
Dinner/Dance	1500	2
Ballroom Dancing	2000	5
Orchestral Concerts	2000	2
Exhibitions	5000	15
Other	2000	4

2.0 METHODOLOGY

The following approach has been adopted as a base to form this analysis:



Detailed methodology, approach and process is outlined at provided at appendix 1.

3.0 PERFORMANCE EVALUATION RESULTS BASED ON RECOMMENDED SYSTEMS

While the BCA would require the installation of an Automatic Sprinkler system in this premises (based on floor area) it must be appreciated that due to the building design and high ceiling it would not permit the efficient operation of such system.

Under normal situations automatic sprinklers provide the optimum fire safety for most buildings. However, the expected fire load within this building, in most modes of operation, would not provide sufficient heat to operate the installed sprinkler system due to the ceiling height (refer to section, sprinkler operation).

Further more a number of papers on the research by Factory Mutual in this area determines that in order to achieve complete fire extinguishment, water must be delivered by sprinklers to the burning fuel surface in sufficient volume to disrupt the combustion process. A ceiling height of greater than 16m is considered to be too high to successfully maintain a sprinkler system.

An alternative proposal and the recommended approach is to install sprinklers to all areas within the complex with the exception of the auditorium, as this is the area where sprinklers may not be expected to operate. Alternative detection for this area will require the installation of beam type smoke detectors. Deletion of automatic fire suppression system in this area will not compromise occupant safety or Fire Brigade operations. The proposed egress and smoke management systems provide sufficient time to safely evacuated the building. However, any fire starting in this area will grow unchecked, limited only by available fuel, until Fire Brigade intervention. Sections on Egress, Smoke Hazard Management and the Timeline supports this approach.

The NSW Fire Brigades typically do not accept partial sprinkler protection of buildings. This is due to the fact that small fires in unprotected areas have a tendency to become large fires and the sprinkler system may not have the design capacity to contain the fire when it spreads to the protected area. Additionally, Fire Brigade Personnel may tend to falsely rely on a system that will not fully protect the building or occupants. The Fire Brigade would normally require fire separation between a sprinklered portion and an unsprinklered portion of a building. This is not considered necessary nor is it achievable due to egress requirements. Should automatic sprinklers not be provided, the building occupants will be able to egress the building before conditions become untenable as a result of a fire.

3.1 Means of Egress

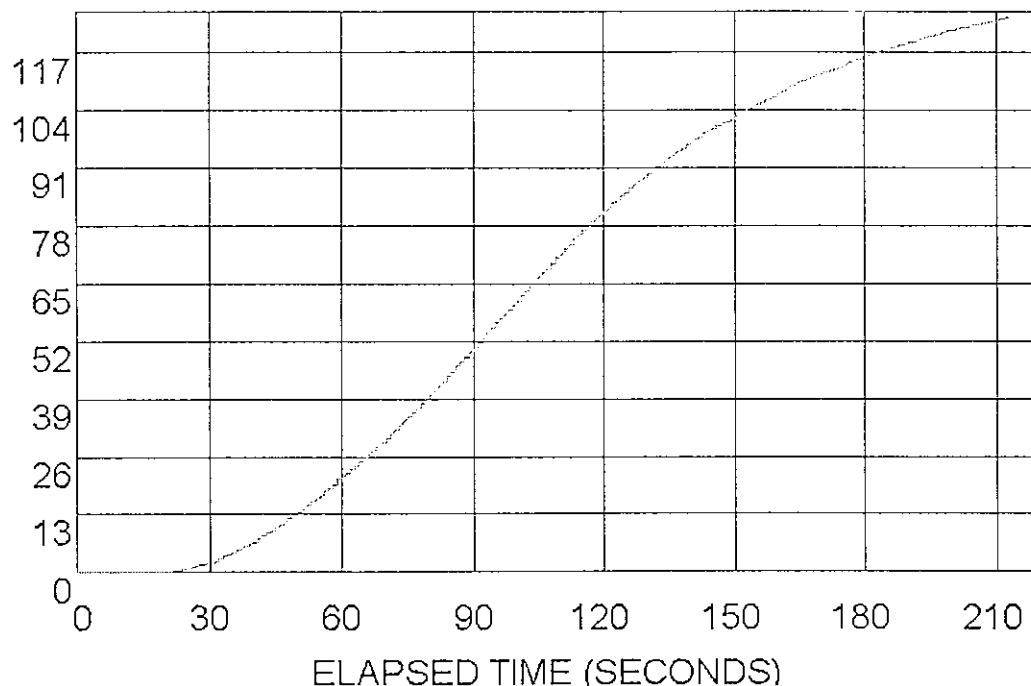
The proposed means of egress from the premises have been designed in accordance with the prescriptive requirements of the BCA.

For the purpose of this study and analysis the seating area was divided into four equal sections and modelled to allow detailed assessment of the proposed egress facilities.

The worst case scenario would be Mode 1 for Basketball activity with the centre filled to maximum capacity of 6100 people, with 5000 of these being located on and above level 2. The following results were obtained using the Exodus program to move the population from a quarter of the seated area to the circulation areas on level two then to outside the building.

Door

Total People Out X10



The total number of persons evacuated was 1250 from the area modelled. Time of first person to exit was 20.46 (s) and the last person was 215.56 (s) say 4 minutes (240 sec).

3.2 Emergency Evacuation Procedures

For this overall concept to be effective it is necessary to have adequate management systems in addition to the installed systems.

Details have not been provided relative to the required emergency plans and procedures. For this proposed development it will be necessary to ensure effective Emergency Evacuation plans are developed in accordance with AS 3745 and maintained.

The Installation of an Emergency Warning and Intercommunication System will be required to ensure early occupant notification and movement to egress. The system will be required to be purpose designed to interrupt any performance in the event an emergency and it initiate immediate evacuation.

3.3 Fire Detection/Suppression

The overall fire detection system recommended for this project should include:

- An automatic sprinkler system in accordance with AS 2118 throughout all areas with the exception of the auditorium.
- Beam type smoke detectors within the auditorium in accordance with AS 1670.

3.4 Smoke Exhaust

It is proposed to install 6 smoke exhaust fans on the roof of the entertainment centre, each fan having a capacity of 50,000 l/s, a total of 300 m³ per second.

The following represents a detailed analysis of the fire and smoke modelling:

Wollongong Entertainment Centre

DATE

03-04-97

Auditorium

0.00

FIRE No.1

Actuation of smoke alarm system

Sprinkler operation

Normal R/A

Time for smoke exhaust start up

Smoke exhaust rate

Floor Area

ceiling height

Fire Type

78.0	secs
6000.0	secs
0.000	cub. m/sec
30.0	secs
300	cub.m/sec
3000	sq.m.
17.500	meters
0.1876	Ultra Fast

Efficiency factor for smoke removal

Non
operational

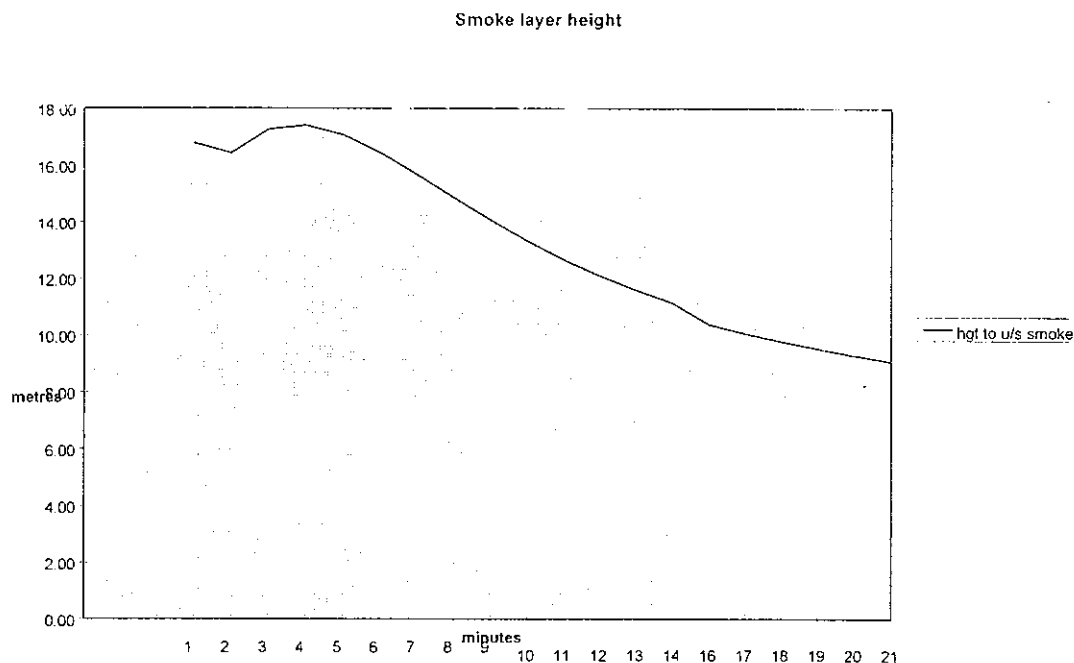
75%

Time (mins)	Q Fire Size	Ms	Vs cub m/sec	smoke removed cub m	new residue smoke vol m	nett smoke depth	hgt to u/s smoke 17.50
1	675	62.76	58.22	0.00	2198.99	0.73	16.77
2	2701	95.82	88.88	150.00	3244.29	1.08	16.42
3	6078	136.46	126.58	150.00	761.43	0.25	17.25
4	10806	167.95	155.80	150.00	295.96	0.10	17.40
5	16884	188.90	175.23	150.00	1284.32	0.43	17.07
6	24313	200.50	185.99	150.00	3164.70	1.05	16.45
7	33093	205.13	190.28	150.00	5481.57	1.83	15.67
8	43223	205.22	190.37	150.00	7917.20	2.64	14.86
9	54704	202.74	188.07	150.00	10277.56	3.43	14.07
10	67536	199.06	184.66	150.00	12460.99	4.15	13.35
11	81719	195.03	180.92	150.00	14426.74	4.81	12.69
12	97252	191.13	177.30	150.00	16170.23	5.39	12.11
13	114136	187.58	174.01	150.00	17705.92	5.90	11.60
14	132371	184.48	171.13	150.00	19056.63	6.35	11.15
16	172892	179.57	166.58	150.00	21301.82	7.10	10.40
17	195179	177.67	164.82	150.00	22241.34	7.41	10.09

20/05/98

1699.AFI0\2\WSC70410\jmh

18	218817	176.08	163.34	150.00	23084.03	7.69	9.81
19	243805	174.73	162.09	150.00	23845.06	7.95	9.55
20	270144	173.58	161.02	150.00	24536.90	8.18	9.32
21	297834	172.60	160.11	150.00	25169.77	8.39	9.11



The same area was modelled using the similar input with the exception of the smoke exhaust rate which was reduced to 150 m³ per second with the following result

Wollongong Entertainment Centre

DATE

03-04-97

Auditorium

0.00

FIRE No.2

Actuation of smoke alarm system

78.0 secs

Sprinkler operation

6000.0 secs

Normal R/A

0.000 cub. m/sec

Time for smoke exhaust start up

30.0 secs

Smoke exhaust rate

150 cub.m/sec

Floor Area

3000 sq.m.

ceiling height

17.500 Meters

Fire Type

0.1876 Ultra Fast

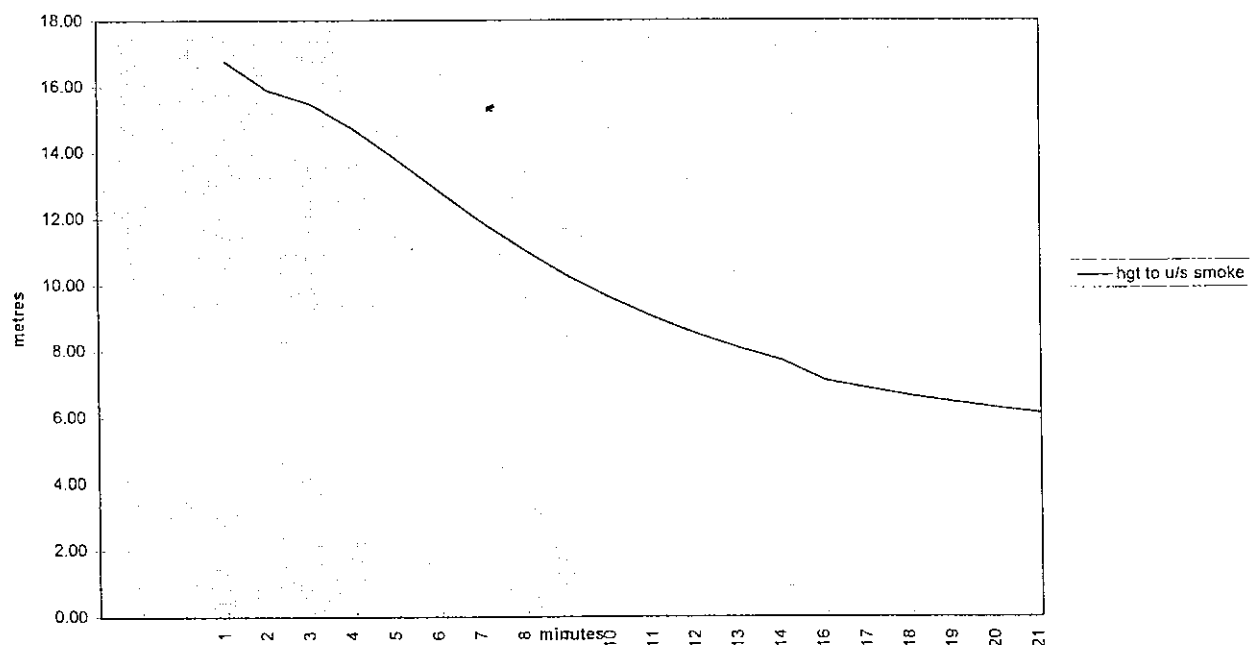
Efficiency factor for smoke removal

Non
Operational

75%

Time (mins)	Q Fire Size	Ms	Vs cub m/sec	smoke removed cub m	new residue smoke vol m	nett smoke depth	hgt to u/s smoke 17.50
1	675	62.76	58.22	0.00	2198.99	0.73	16.77
2	2701	90.90	84.32	75.00	4845.66	1.62	15.88
3	6078	113.99	105.74	75.00	6108.10	2.04	15.46
4	10806	127.13	117.93	75.00	8365.98	2.79	14.71
5	16884	132.52	122.93	75.00	11124.58	3.71	13.79
6	24313	132.61	123.02	75.00	14022.15	4.67	12.83
7	33093	129.55	120.18	75.00	16826.93	5.61	11.89
8	43223	124.92	115.89	75.00	19411.07	6.47	11.03
9	54704	119.78	111.11	75.00	21719.20	7.24	10.26
10	67536	114.72	106.42	75.00	23741.26	7.91	9.59
11	81719	110.07	102.11	75.00	25492.54	8.50	9.00
12	97252	105.98	98.31	75.00	27000.58	9.00	8.50
13	114136	102.46	95.05	75.00	28297.11	9.43	8.07
14	132371	99.49	92.29	75.00	29413.51	9.80	7.70
16	172892	94.94	88.07	75.00	31217.55	10.41	7.09
17	195179	93.23	86.48	75.00	31951.87	10.65	6.85
18	218817	91.81	85.17	75.00	32599.43	10.87	6.63
19	243805	90.63	84.07	75.00	33174.98	11.06	6.44
20	270144	89.64	83.16	75.00	33690.55	11.23	6.27
21	297834	88.82	82.39	75.00	34155.89	11.39	6.11

Smoke layer height



The prescriptive requirements of the BCA (Spec E2.2) require that these fans be zoned to operate in two reservoirs with at least one fan in each reservoir.

Fire modelling suggests that it is possible to maintain the smoke level above Level 1 at 6.1 m or 2.1 m above level 2 for more than 21 minutes at 300 m³/sec smoke exhaust or more than six times the total evacuation time. Therefore it is suggested that only 150 m³/sec of smoke exhaust is considered necessary.

3.5 Sprinkler Operation

The computer program Sprinkler in the package Firecal by CSIRO has been used to determine the predicted sprinkler operation times.

An Ultra Fast fire on the ground level (Level 1) will activate the sprinkler (15 meters above the floor) in about 300 seconds where a smaller fire would not activate the same sprinkler.

4.0 FIRE MODELLING

4.1 Design Fire

An Ultra Fast fire in accordance with Appendix 1 was modelled for this project within the main auditorium which is considered to be the worst case scenario.

4.2 Smoke Hazard Management

For the purpose of this model all smoke exhaust fans were required to run provide the necessary smoke exhaust.

4.3 Fire and Smoke Detection

Using the computer programs DETACT-QS to calculate the activation time of smoke detectors and Sprinkler-FIRECALC to calculate the activation time of sprinklers the following times are anticipated;

- Smoke detector 78 Seconds
- Sprinkler 295 Seconds

4.4 Occupant Notification and Egress

It is proposed to install an Emergency Warning and Intercommunications System throughout the complex in accordance with AS 2220. A separate Public Address and sound system is to be provided for the main auditorium only. It is strongly recommended that these two systems be the same to maintain integrity.

The Draft Design Brief suggests that this system be provided with an override facility so that it can be heard during loud concerts. It is recommended that a facility be provided to isolate sound equipment in the event of this system being required.

4.5 Egress Lighting

Considering that the main lighting to the Auditorium will be provided at the ceiling, due to obscuration from smoke development, additional emergency lighting should be provided at Level 2 public walkways.

4.6 Building Fabrics

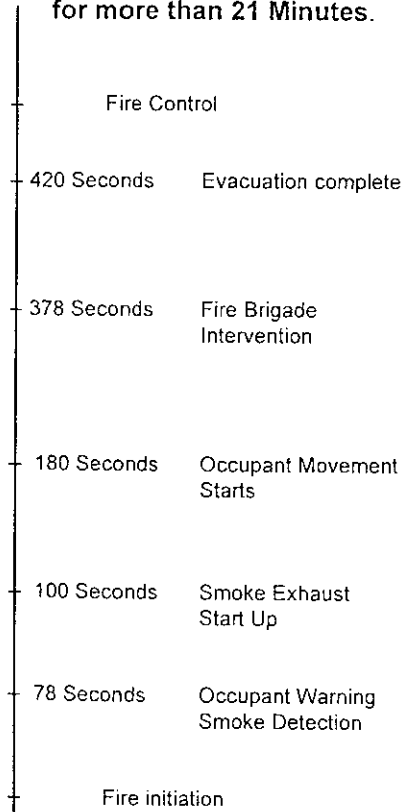
The early fire hazard indices for fittings and surfaces in a POPE are detailed in Spec C1.10. In particular this rating must be extended to the auditorium seating to minimise fire load.

4.7 Modelling Results - Timeline based on 150 m³/sec smoke exhaust fans

Fire No. 1

Main Auditorium

Tenable Conditions maintained
for more than 21 Minutes.



SYNOPSIS SHEET 1

AREA Main Auditorium

Modelled Fire Growth Rate Ultra Fast

Predicted Maximum Size $Q(MW) \approx 7.6$

Hardware	Type/Quality	Predicted Activation Time
Detection	Smoke Detector	78 seconds
Alarm	Directional/Informative	Upon detection
Suppression	Nil	

Managerial

Evacuation/emergency plans	Required
Wardens	Required
Maintenance	Required
Training	Required

Egress

Population	5000
Predicted Response Time	100 seconds
Predicted Egress Time	240 seconds
Predicted Evacuation Time from area	400 seconds 7 Minutes
Predicted Time of Untenability	More than 14 minutes
Predicted Margin of Safety	More than 17 minutes

6.0 SUMMARY OF RECOMMENDATIONS

1. Provide automatic sprinklers throughout all areas except the auditorium (Fire Brigades comments to be sought)
2. Provide Beam type smoke detectors in auditorium.
3. Install an Emergency Warning and Intercommunications System (EWIS) as a part of the Public Address system and isolates music systems on operation of EWIS
4. Develop emergency evacuation plans and a Fire Warden System.
5. Ensure Staff are trained and familiar with the emergency evacuation process
6. Activate all exhaust fans as one single zone
7. Additional Emergency Lighting to level 2
8. Fire retardant to all seating to minimise fire growth

7.0 CONCLUSION

The above analysis clearly demonstrates that

- occupants will be able to evacuate the premises well before conditions from any fire situation become untenable
- installed fire safety systems provide an acceptable level of protection for the complex

and are commensurate with the performance requirements of the BCA 96 and good management and fire prevention practices.

Appendix 1

METHODOLOGY

1. Fire Science

The building analysis is based largely on fire science; that developing body of knowledge of fire behaviour, physics, systems design and behavioural science used to model fire behaviour and that of people involved in fire. Fire science is not different to other branches of science such as structural engineering, geotechnical or mechanical engineering, in that it postulates a 'design condition' on which an analysis of expected performance is based.

The analysis is conducted using 'models' of expected behaviour of fire, smoke, systems and people - much as a building is modelled to assess its likely resistance to wind or live loadings in structural engineering.

Fire science is developing presently and it is not as mature as say structural engineering. Nonetheless most of the significant models used here have been verified by experimental work. Several different models have been developed for particular situations to exhaustively examine the consequences of various fires.

The 'design conditions' used are derived from statistics, which in themselves are not fully detailed (eg. the expected rate of fire starts) and a 'model fire' (similar to a 'design day' for an air conditioning design or windloading is for structural design).

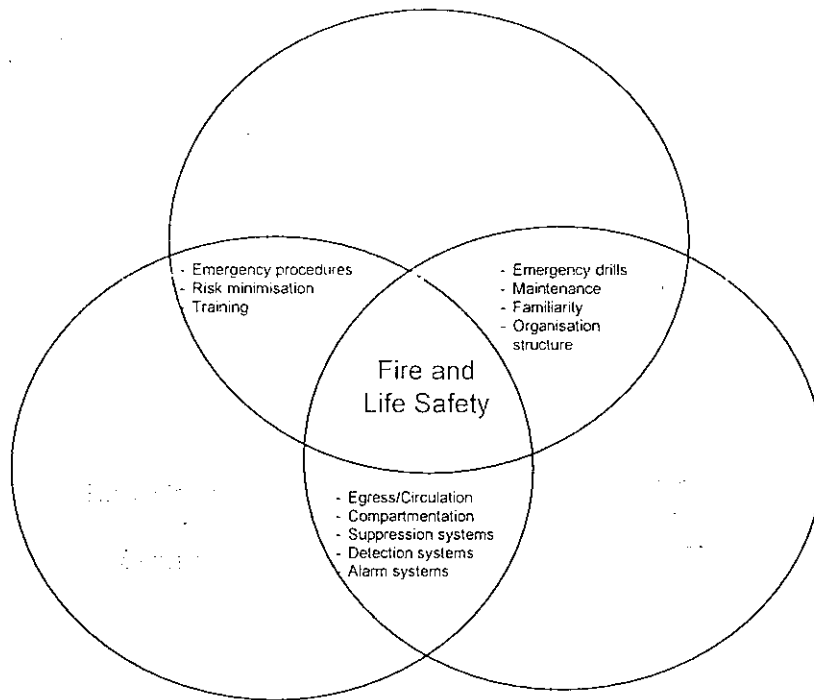
This approach of using 'models' is adopted in the Building Code of Australia for both structural design and for the mechanical design parts relating to Smoke Control (Part E2 and Part G3). Unfortunately the models used in the BCA Part G3 are 'old technology' and do not represent the likely site conditions well. (ie. they may be open to challenge from a technological point of view).

This report and the investigations described herein represent an advance in the area of fire modelling, using formulae from the National Fire Protection Association Handbook have been used for heat and smoke produced. Exodus and Evacnet have been used to predict people movement.

Lincolne Scott in house models use recognised formula to predict heat development and smoke production based on anticipated fire size, area and ceiling height. It recognises efficiency of smoke exhaust systems and calculates the predicted effective height of smoke layer.

The use of models usually requires assumptions to be made, especially with regard to the fire type or likely egress choices undertaken by the individual occupants. In order for the results and conclusions to err on the side of safety, worst case scenario have been used throughout the modelling process.

The behaviour of people in fire situations has been considered throughout this study. In evaluating their behaviour the paper "Assessing Occupant Response Time" by Johathan D Sime BA MSc PhD C.Psycol. has been used in the calculation of response time of occupants to start the evacuation process.



An Engineered Approach to Fire Safety

Figure 1.

An Engineered approach to fire and life safety requires comprehensive emergency management systems and plans for the effective operation of the building.

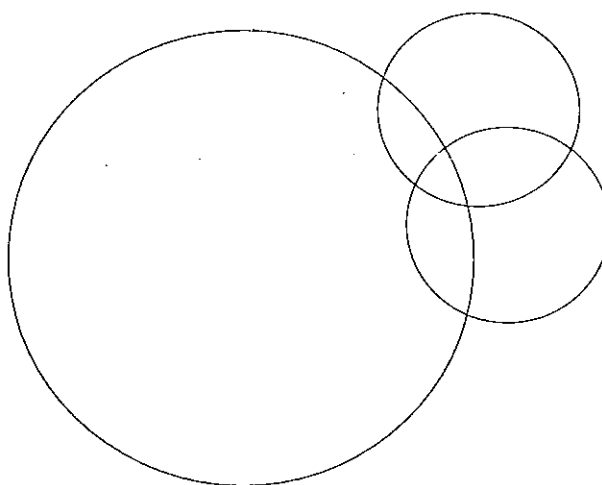
2. The Building Code of Australia

Generally the proposed building complies with the intent of the Deemed - to - Satisfy aspects of the Building Code of Australia - such compliance does not guarantee safety nor does failure mean the building is unsafe.

The BCA provides for the installation of fire sprinkler systems to be installed within the building. It does not require provisions for emergency management systems to be implemented for the effective operation of the building under emergency conditions.

The following diagram highlights this situation.

BCA Systems



The BCA specifies Built Safety Systems
Figure 2.

3. Systems Based Approach

The Building Code of Australia deals with safety issues independently, as if each consideration was in a 'box'.

The Fire Engineering Guidelines of the Fire Code Reform Centre Limited and the Performance requirements of the BCA endeavours to provide an integrated or systems approach, whereby each measure or system may have a range of effects. Those codes utilise time as the link between related issues or actions in the pursuit of safety.

The Guidelines and Code are used in the analysis of and for the development of the designs on which this report is based which determines the time of evacuation, including alarm time, response time and actual evacuation time as they relate to the fire and smoke development and the untenable conditions as a result of a fire in the building. This system based approach is adopted to extend the analysis. It is used as a design tool to integrate the operation of building systems in a fire safety role.

Hence the detection, warning and messaging, fire management and smoke management systems are integrated with the aim of enhancing the safety of occupants.

Adequate redundancy is provided within sub-systems or by providing backup systems - eg. duplicate emergency egress routes.

This approach is considered consistent with and produces an outcome which is seen to comply with the objective of the Building Code of Australia and the performance requirements of the BCA "96".

4. Target Outcomes

Achievement of the objectives of the BCA does not necessarily result in a safe outcome. The objectives adopted for the performance presented herein are:

- Occupants* - to provide for the safety and amenity of occupants of the building
- Adjoining Owners* - not to cause a hazard to adjoining owners
- Fire Fighters* - to facilitate access for and the conduct of fire fighting operations.

The measure of performance of occupant safety is that under a design analysis, there is an adequate time margin between egress of a particular area being completed and the arrival of visible or temperature conditions deemed to cause injury or death, in that particular area. Performance measurements derived from such analysis would form the basis of acceptance of the completed installation.

The present BCA does not specify performance directly, only by implication. The outcomes achieved throughout this building are that installations meet the intent of the performance based BCA and that actual performances can be predicted.

5. Fire Engineering Modelling

The Fire Engineering assessment utilises models to predict conditions within the building during the worst probable fire scenarios in the office and storage areas in their various configurations. The method is built around a time line comparison of critical events. The time taken for smoke to cause untenable conditions is compared with the time required for occupants to escape before the onset of the untenable conditions

Generally, tenability limits as described in the BCA Clause E2.2(a) are used as a minimum where the smoke layer must be at least 2.1m above the floor so that the temperature or toxicity of the smoke will not endanger human life and the level of visibility will enable the escape route to be determined

6. Fire Growth

To evaluate the behaviour of fire after it has started, a model of the expected fire must be developed. The two most commonly used model fire types are:

- ❖ Steady Fire
- ❖ Unsteady Fire

The steady fire model assumes a maximum heat output and disregards the growth of the fire and time, i.e., a step function. A steady fire is often used to broadly group an expected hazard and to establish a constant base for fire protection systems designs. This approach is presently used in the Building Code of Australia. The steady fire model is considered to be an unrealistic representation of real fires.

The unsteady fire model considers the fuel type and the growth rate of fire over time. The temperature of the gases is a function of time. Experimental fires confirm this relationship which forms the basis of the standard temperature curve in fire resistance tests. For this reason this report will consider unsteady fires only.

Furniture colorimeter tests on combustible materials confirm that the heat release rate of most materials can be modelled by a power law curve. This type of fire is commonly known as the t-squared fire and is described by the equation

$$Q = \dot{a}t^2$$

where Q is the rate of heat release (kW), t is time (s) and \dot{a} is a constant governing the speed of growth (kW/s²).

Although some fires may not actually produce a t-squared curve, the assumption is however that the t-squared approximation is sufficiently close to enable design decisions to be based on it. (A design fire)

Frequently, t-squared fires are classed by speed of growth into ultra-fast, fast, medium and slow. Where these classes are defined, they are based on the time required for the fire to grow to a rate of heat release of 1050 kW (1000BTU/sec):

Ultra-fast	75 sec	$\dot{a} = 0.1876$	(typical material - upholstered furniture)
Fast	150 sec	$\dot{a} = 0.04609$	(typical material - 1.5m high wood pallets)
Medium	300 sec	$\dot{a} = 0.01172$	(typical material - cotton/polyester innerspring mattress)
Slow	600 sec	$\dot{a} = 0.00293$	(typical material - chair, wood frame with latex foam cushion)

The t-squared fires have been widely used as design fires in many computer modelling programmes including FIRECALC (CSIRO), FPETOOL (NIST), HAZARD 1 (NIST), and Lincoln Scott Fire Modelling process as used in this study.

They are more accurate than the models used in the BCA and can be more conservative. To model the worst case scenario it is proposed to use the Ultra Fast fire for all fires in this study.

7. Smoke Hazard Management

The purpose of smoke hazard management is to

- ❖ avoid smoke travel to sections of the building remote from a fire, to the extent, that hazard to occupants is minimised
- ❖ maintain egress routes clear of smoke for at least the period of egress.
- ❖ minimise smoke damage.

8. Detection and Suppression Response Times

Extensive research has been undertaken on the response characteristics of sprinklers and smoke detectors. The computer programs DETACT-QS calculate the activation time of smoke detectors and Sprinkler-FIRECALC has been used to calculate the activation time of sprinklers, assuming an unconfined ceiling. In a small room, where a significant hot layer builds up prior to detector operation, these programmes will indicate a longer time than that which would actually occur and thus err on the safe side.

The required programme inputs are the ceiling height above the fuel, the distance of the detector device from the axis of the fire, the activation temperature of the detector device, the response time index (RTI) of the device, and the rate of heat release of the fire. The smoke detector response is modelled by an activation temperature of 13°C above the ambient with an RTI of 0.5m^{0.5}s^{0.5}.

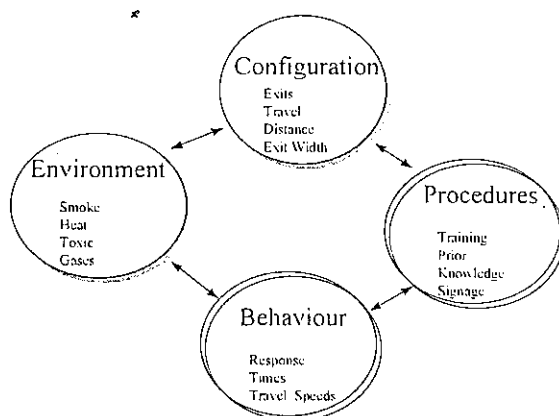
9. Evacuation Modelling

It is possible to determine the anticipated evacuation time of a building by holding an actual trial evacuation. However, the results of these evacuations can alter depending on the time of day or week and advance knowledge of occupants.

Considerable research has been conducted both in Australia and Overseas to develop appropriate and accurate evacuation models to predict actual evacuation times of building by occupants.

Lincolne Scott have adopted the evacuation model Exodus which has been developed by the University of Greenwich, UK. This program has been developed to integrate realistic prediction of building evacuation and advances proven methods already in use.

Exodus is the only program that provides a final analysis of the building circulation system produced graphically to allow effective appraisal of the overall building systems.



10. Smoke Generation

Based on the available statistics (Australian National Fire Incident Statistics 1989-1990, CSIRO) and formulas from the National Fire Protection Association (NFPA) Handbook the following has been used in Lincolne Scott processes to model the smoke production rates.

$$m_s = 0.18Q^{1/3} p_x^{2/3} C_p^{-1/3} T_x^{-1/3} g^{1/3} Y^{5/3}$$

Where

m_s = Rate of smoke filled gas production (kg/sec)

Q = total heat release rate kJ/s or kW (From NFPA)

p_x = density of air kg/m³

C_p = specific heat of air at constant pressure {(kJ/kg)/K}

T_x = ambient gas temperature (K)

g = acceleration of gravity (m/sec²)

Y = distance from the virtual point source for the fire to bottom of smoke layer (m)

Assuming an ambient air temperature of 21°C the above was reduced to

$$m_s = 0.065Q^{1/3} Y^{5/3}$$

Generally the modelling process assumes the fires have allowed the fire to develop in accordance with the above formulae until such time as the closest sprinkler has operated. At this time the model assumes that the heat and smoke developed is constant, it does not increase.

In reality there would be a slight increase in the smoke produced and steam and the heat produced would decrease. In addition the smoke would cool and tend to descend slightly.

To further support this process it is considered that by the time a sprinkler operates the occupants in the immediate area would be well clear of the fire and to an area of safety.

Other systems and outputs are modelled using available and accepted technology

- ◇ Firecalc - published by CSIRO.
- ◇ Sprinkler design Hyena published by ACADS.
- ◇ Evacnet for Egress modelling

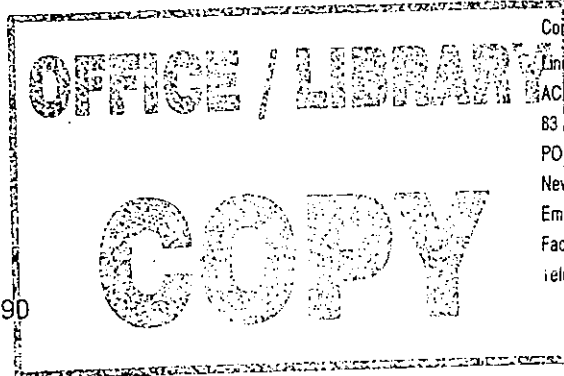
These are the techniques and technologies adopted for use in the Building Code of Australia except that document does not use a time dependant fire (which fire more closely models reality). Time dependent fires have been shown to provide a closer approximation to reality.

Lincolne Scott

Management
Technology
and Engineering
in the
Built Environment

30 May, 1997

NSW Fire Brigades
Fire Prevention
Amarina Avenue
GREENACRE NSW 2190



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	Wellington

Attention: Insp. Glen Jacobson

Dear Sir,

Re: **STATE PROJECTS - WOLLONGONG ENTERTAINMENT CENTRE
SECT 44 APPLICATION FOR DISPENSATION**

We act as the building certifiers to the Department of Public Works and Services for the proposed development on behalf of the Wollongong Sports Ground Trust.

As a result of our BCA assessment the client has identified a number of deemed-to-satisfy design features which they seek modification to the technical provisions of the BCA. Consequently we propose to make application to the Minister under Sect 70 "Compliance by the Crown with Building Standards" of the Local Government Act that the following technical provisions does apply, but with such exceptions or modifications as the case may be:

- To exclude automatic sprinkler protection to the roof of the Auditorium
- To reduce the total smoke exhaust capacity in the Auditorium from 300,000 l/s to 150,000 l/s and
- modify the prescriptive Fire Brigade vehicle access to the building.

To support this application to the Minister we formally seek your concurrence under the provisions of Sect 44 (4) of the Local Government (Approvals) Regulations that the building should be exempted from these requirements.

Building Description

The Wollongong Entertainment Centre is approximately 11000 sq.m. and is purpose built for entertainment and indoor sporting fixtures.

The structure is to provide a central playing area for basketball and other sports with tiered seating above service areas and foyer.

The site is located on the SE corner of Harbour and Crown Streets, Wollongong. The proposed development has a Classification 9(b), Place of Public Entertainment (POPE) and Type 'A' construction as defined by the BCA.

The building's use is detailed within the fire engineering report attached.

BCA Assessment Report (Annexure A)

The BCA assessment report is enclosed to support our application. This report is based on the building being designed to fully comply with the deemed-to-satisfy provisions of the BCA.

Fire Engineering Report (Annexure B)

To support the proposed modifications to the technical provisions of the BCA, we have undertaken a Fire Engineering study based on the criteria outlined in the Fire Engineering Guidelines of 1996.

The conclusions reached in this report provide an alternative proposal to satisfy the required level of safety for the building.

Variation of BCA Requirements

(a) BCA Clause E1.5 Sprinklers

- Clause Requirement

This clause requires large isolated buildings exceeding the floor area and volume limitation of C1.1 but not to exceed the floor area limitations of C2.3 to be sprinklered in accordance with E1.5.

- Objective

The objective of this Section is to:

- (a) safeguard people from illness or injury due to a fire in a building; and
- (b) safeguard occupants from illness or injury while evacuating a building during a fire; and
- (c) facilitate the activities of emergency services personnel; and
- (d) avoid the spread of fire between buildings; and
- (e) protect other property from physical damage caused by structural failure of a building as a result of fire

- Design Proposal

For the reasons outlined within the Fire Emergency Report it is proposed to provide sprinkler protection throughout the whole building with the only exception being the roof of the Auditorium.

The computer modelling with a designed fire will not activate sprinklers in the roof of the Auditorium.

Furthermore, as an additional safeguard we have conditioned our assessment for the installation of fixed seating to achieve the fire hazard properties in compliance with Spec C1.10 Cl 4 (d) having Spread of Flame Index of 0 and a Smoke Development Index of not more than 5.

This is a more stringent requirement to that prescribed under the NSW Variation of a Spread-of-Flame Index not more than 9; and a Smoke-Developed Index not more than 8 if the Spread-of-Flame Index is more than 5.

We have recently been advised that there is no local manufacturer of seats to meet the stringent requirements of Spec C1.10.4 (d) and consequently we may approve a less stringent seating flammability index.

- Conclusions and Recommendation

Having consideration of the above and the Fire Engineering Report it is recommended that the NSW Fire Brigade approve modifying the sprinkler protection to the building to exclude protection to the roof area of the Auditorium.

(b) BCA Clause E2.2 Table E2.2

- Clause Requirement

This clause requires the provision of adequate smoke control in compliance with the requirements of Spec E2.2.

With the deletion of the sprinkler system to the Auditorium the capacity of the exhaust system is required to be 300,000 l/s (refer to 96 BCA Spec E2.2b).

- Objectives

The objectives of this part of the Code include:

In the event of a fire in a building, the conditions in any escape route must be maintained for a height of not less than 2.1 metres above the floor level so that:

- (A) the temperature will not endanger human life; and
- (B) the level of visibility will enable the escape route to be determined; and
- (C) the level of toxicity will not endanger human life,

for the period of time the occupants would take to evacuate that part of the building.

The period of time to evacuate must take account of the nature of the building and mobility of the occupants.

- Design Proposal

As detailed within the fire engineering report it is recommended that the total smoke exhaust capacity can be reduced to 150,000 l/s.

The computer modelling has indicated that the objectives of this part of the Code have been met based on the reduced fan capacity and satisfactory limits of tenability being maintained for total building evacuation and fire brigade attendance.

The four smoke exhaust fans and controls will satisfy all requirements of Spec C2.2 with manual override for Fire Brigade use in the FCR.

- Conclusion and Recommendation

Having consideration of the above and the results obtained from our Fire Engineering Assessment, it is recommended that the NSW Fire Brigade approve modification to the capacity of the smoke exhaust system to 150,000 l/s.

(c) BCA Clause 2.4 (b) (ii)

- Clause Requirement

This clause requires vehicular access having a minimum width of 6m with no part more than 18m from the building.

- Objective

The objection of this part is to enable fire fighting vehicles to position themselves close enough to the building to fight a fire externally.

- Design Proposals

The site plan drawing No. A02 indicate the route of fire brigade and heavy vehicular access around the building.

Harbour and Miller Streets bound two sides of the building whilst a car park and vehicular access ramp bound the south boundary with access from the Harbour Street.

Lysaght Park has been modified to widen and extend the vehicular access from the ramp around to Crown Street.

Although the access through Lysaght Park is further than 18m from the building, alternate hard standing is available for emergency vehicles close to the building.

- Conclusion and Recommendation

Having consideration of the above it is recommended that the NSW Fire Brigade approve modification to the prescriptive requirements of the BCA to permit vehicular access on the east boundary greater than 18m.

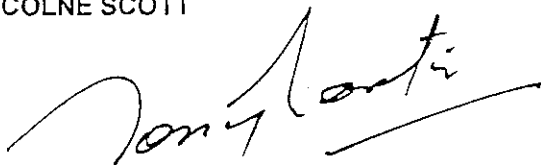
In support of our documentation enclosed is a copy of:

- Section 93 Certification and BCA Assessment for the deemed-to-satisfy design
- Fire Engineering Report
- Architectural Drawings

The drawings enclosed, we request you endorse and return with your comments.

Thank you for your cooperation and we await your formal response.

Yours faithfully,
LINCOLNE SCOTT



A. J. MARTIN

cc: DPW & S - Attn: Mr I Ferrier

ANNEXURE F

NSW FIRE BRIGADE LETTER OF APPROVAL

New South Wales Fire Brigades

Fire Prevention

Incorporating Fire Safety
Fire Investigation
Public Education



Telephone: (02) 742 7400

All communications to be addressed to the Commissioner
NSW Fire Brigades
Locked Bag 12
P.O. GREENACRE NSW 2190

Facsimile:

Fire Prevention (02) 742-7486
Fire Safety (02) 742-7483
Fire Investigation (02) 742-7385
Public Education (02) 742-7486

Amarina Avenue
CHULLORA NSW 2190

Lincoln Scott Australia Pty Limited
PO Box 737
CROWS NEST NSW 2065

Your Ref:
Our Ref: FSD/TPH/127835

Contact: B Waite / jc

18 JUN 1997

Lincoln Scott Australia Pty Limited
PO Box 737
CROWS NEST NSW 2065

ATTENTION: Mr A Martin

Dear Sir

Wollongong Entertainment Centre
Cnr Crown & Harbour Streets
WOLLONGONG

I refer to your correspondence dated 30 May 1997, seeking the Brigades' comments / approval on exemptions from certain requirements of the Building Code of Australia, under the provisions of Clause 44.4 of the Local Government (Approvals) Regulations.

The exemption for the exclusion of automatic sprinkler protection for the roof of the auditorium, as required by the Building Code of Australia, Clause C2.3, Inter Alia Clause C2.2, in accordance with Clause E 1.5 is supported in this instance.

In relation to the other matters requiring the Brigades support these are not covered by Clause 44.4 however, the Brigades would support the variations listed below.

The reduction of total smoke exhaust capacity for the auditorium from 300,000 litres per second to 150,000 litres per second as required by the Building Code of Australia Clause E2.2 Inter Alia Specification E2.2.

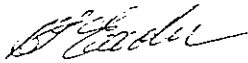
A relaxation of Clause C2.4(b)(ii) of the Building Code of Australia concerning Emergency Vehicle Access around the site not complying with the furthest boundary being more than eighteen metres from the building.

The Brigades' support the reduction of smoke exhaust capacity in this instance, based on the computer analysis provided within the submission. Finally, in relation to the exemption from Clause C 2.4 Emergency Vehicle Access, the Brigades, in this instance support the exemption for the following reasons:

- The building is a Type A construction and is basically fully sprinkled; and
- Emergency vehicular access is provided on all sides with the exception of the eastern end as outlined in the submission.

The submitted drawings are enclosed herewith.

Yours faithfully

A handwritten signature in dark ink, appearing to be 'G. E. ...', written in a cursive style.

For Commissioner

Encl.

ANNEXURE E

REPORT ON AN ENGINEERED FIRE APPROACH

PART C

LEVEL 1

OFFICE/KITCHEN

AMENDMENTS

Lincolne Scott

Management
Technology
and Engineering
in the
Built Environment

22 July, 1998

NSW Department of Public Works & Services
84 Crown Street
WOLLONGONG NSW 2500

Consultants
Lincolne Scott Australia Pty Ltd
ACN 005 113 468
83 Alexander Street
PO Box 737 Crows Nest
New South Wales 2065 Australia
Email lssydney@lincolne.com.au
Facsimile 02 9906 3680
Telephone 02 9906 3166

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Brisbane Bangkok
Cairns Honolulu
Canberra Jakarta
Gold Coast Kuala Lumpur
Melbourne Manila
Perth Singapore
Sydney Suva
Sunshine Taipei
Coast Wellington

Attention: Mr. Anthony McCabe

Dear Sir,

Re: **WOLLONGONG ENTERTAINMENT CENTRE
BCA CERTIFICATION - PROPOSED AMENDMENTS**

Please find enclosed Certificate of Compliance under the provisions of the BCA for the general amendments and kitchen layouts to the Entertainment Centre.

This certificate is to be read in conjunction with our Building Certificate dated 20 May, 1998.

The following conditions of our certification dated 20 May, 1998, have been amended due to the DPW+S submission:

- Condition No.3 - population restrictions
- Condition No.14 - minimum clear width of the doorways.

One (1) copy of the stamped certified drawings is enclosed together with our certification for your submission to the Minister for approval.

Yours faithfully,
LINCOLNE SCOTT


A. J. MARTIN

Encl.

cc: NSW Dept of Public Works & Services Attention: Mr Ian Ferrier

Lincolne Scott

Management
Technology
and Engineering
in the
Built Environment

Consultants

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Cairns	Honolulu
Canberra	Jakarta
Gold Coast	Kuala Lumpur
Melbourne	Manila
Perth	Singapore
Sydney	Suva
Sunshine Coast	Taipei
	Wellington

BUILDING CERTIFICATION

Pursuant to the provisions of Section 93 of the Local Government Act 1993, Lincolne Scott hereby certify that the building and the proposed amendments have been designed generally in accordance with the provisions of the Building Code of Australia 1996, Amendment No.2 (NSW Variation). This certification in association with our Certificate dated 20 May, 1998, for the base building design is subject to the conditions as listed in the Attachment and relies on the attached document and drawing schedule.

Certificate Issued to:

State Projects
NSW Department of Public Works
McKell Building
2-24 Rawson Place
SYDNEY NSW 2000

Project Data

Building Name:

Wollongong Entertainment Centre

Address:

Corner Crown and Harbour Streets
WOLLONGONG NSW 2500

Classification:

Whole/Part	Use	BCA Classification
Whole	Place of Public Entertainment	9b

Building Surveyor:

Anthony Martin
Building Safety Services
BSAP Reg No. 1865

Signature
Dated 22 July, 1998



**WOLLONGONG ENTERTAINMENT CENTRE WOLLONGONG
GENERAL AMENDMENTS**

CERTIFICATE OF COMPLIANCE WITH BUILDING STANDARDS

DRAWING SCHEDULE

The following documentation has been presented for certification and approval:

A03F	Level 1	Modification to Stage Store (128), General Office (121), General Store (125A), tactile surfaces, kitchen layout, new Stair 9
A04H	Level 2	New kitchen (222), additional toilets (235, 239, 233)
A16D	Section F.F	Details Stair 9
A17D	Section D.D	Modified suspended ceiling in Foyer, details of retractable seating
A35B	Seating & Broadcast Boxes	Amendments to TV and Radio Box
A37C	External Stairs	Details of external stairs
A40B	Signage	New

Supporting Documents

- NSW DPWS Memorandum dated 20 July, 1998
- LSA Memorandum dated 21 July, 1998
- Lincolne Scott Memo dated 22 July 1998

WOLLONGONG ENTERTAINMENT CENTRE WOLLONGONG
GENERAL AMENDMENTS NA DKITCHEN LAYOUTS

CERTIFICATE OF COMPLIANCE WITH BUILDING STANDARDS

CONDITIONS OF APPROVAL

- A. This certification is issued conditional upon satisfactory approval being obtained from the Minister. The Building Surveyor or the company cannot accept any responsibility for changes to the design, construction or alterations to the construction or design subsequent to this approval or resulting from a determination or direction from any controlling authority.
- B. The proposal is satisfactory conditional upon the following works being undertaken in compliance with the relevant parts of the BCA-96 Amendment No.2.

GENERAL

- 1) All structural alterations shall be certified by a Structural Engineer to resist loads determined in accordance with AS 1170.1.
- 2) The population within the Entertainment Centre based on a total aggregate exit width of 75.3m, shall be restricted to the following:
 - Basketball mode - 6000 (including staff)
 - Circus mode - 5000 (including staff)
 - Concert mode - 5200 (including staff)
 - Standing concert mode - 5600 (including staff)
- 3) The width of the required exits or path of travel used by the public and the width of each doorway must not be less than 1000mm and not more than 3000mm.
- 4) The walls surrounding the Level 2 kitchen shall be extended to the underside of the roof in 60//60/60 FRL construction with all penetrations fire stopped or alternatively the kitchen hood shall be fitted with an automatic gas suppression system.
- 5) The access doors to the kitchens shall be fire doors in compliance with AS 1905.
- 6) Where fire doors are required to be held open (Level 1 kitchen) the automatic closing operation must be initiated by the activation of a smoke detector, or a heat detector if a smoke detector is unsuitable in the atmosphere, installed in accordance with the relevant provisions of AS 1670, and located on each side of the fire door not more than 1500mm from the door. Activation of the system must also be initiated through operation of the sprinkler system.
- 7) All store rooms shall be enclosed in construction having a minimum fire resistance level of 60/60/60 and having access doors to achieve --/60/30 FRL construction.
- 8) All doorways within sight of the public and not intended for egress purposes must be provided with appropriate signage indicating its purpose.

- 9) The new extensions shall be fully protected by an automatic sprinkler system in compliance with AS 2118 and being extended into the kitchen exhaust ductwork systems.
- 10) The hydrant and hose reel system shall be capable of extending to all parts of the building to include the new store rooms.
- 11) Emergency lighting shall be installed in any room exceeding 100sqm in floor area and to the new stairway in accordance with the provisions of BCA Part E4.2 and 4.4.

FOOD PREPARATION AND STORAGE AREAS

- 12) The construction and fitout of the food preparation and storage areas shall comply with the requirements of the NSW Food Premises Code.
- 13) The floors shall be coved to walls and plinths within all food preparation and store rooms.
- 14) The walls shall be tiled from the floor to the ceiling within the food preparation rooms.
- 15) The ceiling of the food preparation and storage areas shall be smooth faced and impervious. All light fittings shall be flush with the ceiling.
- 16) All services and conduits within the food preparation areas shall be chased into the walls or alternatively kept 10mm clear of the walls fixed to stainless steel saddles.
- 17) All shelving within storage areas shall be metal construction free standing or alternatively fixed 25mm from the wall.
- 18) Emergency lighting and exit signs shall be provided within the Level 1 kitchen.
- 19) Portable fire extinguishers and fire blankets shall be provided in compliance with AS 2444 within the kitchens.
- 20) Override controls for the operation of the kitchen exhaust ventilation system in fire mode shall be provided in the Fire Control Room or alternatively in a position approved by the NSW Fire Brigades, properly identified in bold traffolyte labels.
- 21) Plans and specifications showing details of the proposed mechanical ventilation and kitchen exhaust system to the Level 2 kitchen shall be submitted to the building certifier prior to commencement of work.

PART D

BRASSERIE/SNACK BARS EXHAUST AMENDMENTS

Lincolne Scott

Management
Technology
and Engineering
in the
Built Environment

25th August 1998

NSW Department of Public Works & Services
84 Crown Street
WOLLONGONG NSW 2500

Consultants
Lincolne Scott Australia Pty Ltd
ACN 005 113 468
83 Alexander Street
PO Box 737, Crows Nest
New South Wales, 2065 Australia
Email lssydney@lincolne.com.au
Telephone 02 9906 3166
Facsimile 02 9906 3680

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Cairns	Honolulu
Melbourne	Manila
Perth	Singapore
Sydney	Suva
Sunshine Coast	Taipei
	Wellington

Attention: Mr. Anthony McCabe

Dear Sir,

Re: **WOLLONGONG ENTERTAINMENT CENTRE
BCA CERTIFICATION - KITCHEN EXHAUST PROPOSED AMENDMENTS**

Please find enclosed Certificate of Compliance under the provisions of the BCA for the amendments to the kitchen exhaust systems to the Entertainment Centre.

This certificate is to be read in conjunction with our Building Certificates dated 20 May and 22 July 1998.

One (1) copy of the stamped certified drawings is enclosed together with our certification for your submission to the Minister for approval.

Yours faithfully,
LINCOLNE SCOTT



A. J. MARTIN

Encl.

cc: NSW Dept of Public Works & Services Attention: Mr Ian Ferrier

Copy sent to NEL
27/8
H

Lincolne Scott

Management
Technology
and Engineering
in the
Built Environment

Consultants

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Cairns	H
Melbourne	M
Perth	S
Sydney	S
Sunshine Coast	T

BUILDING CERTIFICATION

Pursuant to the provisions of Section 93 of the Local Government Act 1993, Lincolne Scott hereby certify that proposed mechanical exhaust ventilation systems to the Level 2, Snack Bar No 2 and Brasserie Kitchen have been designed generally in accordance with the provisions of the Building Code of Australia 1996, Amendment No.2 (NSW Variation). This certification in association with our Certificates dated 20 May and 22 July 1998, for the base building design is subject to the conditions as listed in the Attachment and relies on the attached document and drawing schedule.

Certificate Issued to:

State Projects
NSW Department of Public Works
McKell Building
2-24 Rawson Place
SYDNEY NSW 2000

Project Data

Building Name:

Wollongong Entertainment Centre

Address:

Corner Crown and Harbour Streets
WOLLONGONG NSW 2500

Classification:

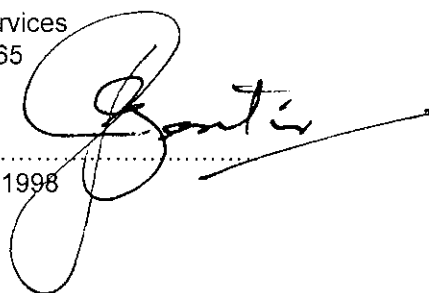
Whole/Part	Use	BCA Classification
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Whole	Place of Public Entertainment	9b
-------	-------------------------------	----

Building Surveyor:

Anthony Martin
Building Safety Services
BSAP Reg No. 1865

Signature
Dated 25th August 1998



**WOLLONGONG ENTERTAINMENT CENTRE, WOLLONGONG
AMENDMENTS TO KITCHEN EXHAUST SYSTEMS**

CERTIFICATE OF COMPLIANCE WITH BUILDING STANDARDS

DRAWING SCHEDULE

The following documentation has been presented for certification and approval:

Mechanical Drawings No 98066 - M01, M2 and M3 dated 19th August 1998

Consulting Engineers - Adams Thomas & Brown - Telephone 042 266646

**WOLLONGONG ENTERTAINMENT CENTRE, WOLLONGONG
AMENDMENTS TO KITCHEN EXHAUST SYSTEMS**

CERTIFICATE OF COMPLIANCE WITH BUILDING STANDARDS

CONDITIONS OF APPROVAL

- A. This certification is issued conditional upon satisfactory approval being obtained from the Minister. The Building Surveyor or the company cannot accept any responsibility for changes to the design, construction or alterations to the construction or design subsequent to this approval or resulting from a determination or direction from any controlling authority.
- B. The proposal is satisfactory conditional upon the following works being undertaken in compliance with the relevant parts of the BCA-96 Amendment No.2.

GENERAL

- 1) The kitchen exhaust systems shall be designed in accordance with AS 1668.1 and 2.
- 2) The design of the exhaust hoods and the capacity of the exhaust system shall comply with AS 1668.2 Appendix E and F.
- 3) The installation of the hood and ductwork sprinkler system shall comply with AS 2118. No exposed pipework shall be installed within the exhaust hoods.
- 4) The kitchen exhaust system shall be designed to discharge the effluent vertically through the roof at least 6m from the cooling towers and outside air intake vents.
- 5) The make-up system to the Level 2 kitchen shall be designed to prevent backflow of air into the outside air plenum.
- 6) Commissioning test figures shall be submitted to Lincolne Scott Pty Ltd prior to practical completion.



PART E

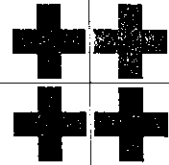
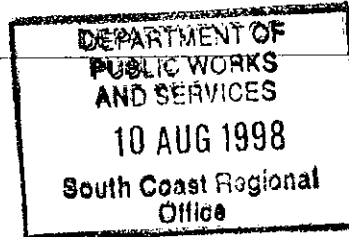
GUARD

RAILS/HANDRAILS

AMENDMENTS

Building Safety Services

6 August, 1998



NSW Department of Public Works & Services
84 Crown Street
WOLLONGONG NSW 2500

Building Safety Services Pty Ltd
ACN 076 694 883
83 Alexander Street
PO Box 737 Crows Nest
New South Wales 2065 Australia
Email bsssyd@lincolne.com.au
Telephone 61 2 9437 0533
Facsimile 61 2 9906 3680

Fire Engineering
Building Codes
Egress Simulation
Safety Management

A Business Enterprise
of Lincolne Scott

Attention: Mr. Anthony McCabe

Dear Sir,

**Re: WOLLONGONG ENTERTAINMENT CENTRE
GUARD RAILS/HAND RAILS**

We respond to your memo dated 9th July 1998 in which you seek determination of handrail heights.

Our comments are referenced in BCA 96 Amendment No 2 (NSW Variation) Part D2.16 and Part H101 for Places of Public Entertainment Class 9b:

1. Level 4 Seating and Crossover Aisles

The guard rail provided along the edge of a crossover on the stepped floor must be at least 750mm high (Ref H101.14.3) (Refer to Plan 'B' attached).

This application, because of sight lines, has been extended to the crossover aisles in front of the fixed disabled seating Level 3 which in our opinion is an extension of Part H101.14.3 (Ref to Plan 'A' attached)

2. Crossover Aisles Level 2

A balustrade is required along the side of any floor, corridor, hallway or the like where its floor is more than 1m above the floor beneath (Ref Part D1.16 (a))

Where no seating is installed the height of the handrail must be 1m above the floor (Ref Part D2.16 (f) (v)).

It is our opinion that the balustrade along the crossover aisle where not in front of fixed seating must be 1m in height, irrespective of retractable seating. (Refer to Plan A).

3. Stairs to Level 4 Crossover Aisle

The height of balustrades above the nosing of stair treads is required to be 1m. (Ref Part D2.16 (f) (v)).

This is deemed-to-satisfy provision of the BCA. To satisfy the performance requirements DP3 (Refer to copy enclosed) we would need to obtain comment and opinion by Expert Judgement (Ref Part A0.9).

I am not in a position to give this opinion.

Should the client wish to pursue this matter, I believe we need to find someone with experience in human behaviour. We are prepared to take this matter to the University of Sydney or maybe the University of Wollongong?

Yours faithfully,
LINCOLNE SCOTT

A. J. MARTIN

Encls:

A handwritten signature in black ink, appearing to read "Tony Martin", written over a horizontal line.

*Deemed-to-Satisfy Provisions*A0.6 inserted by
Amdt No. 1**A0.6 Objectives and Functional Statements**

The *Objectives and Functional Statements* may be used as an aid to interpretation.

A0.7 inserted by
Amdt No. 1**A0.7 Deemed-to-Satisfy Provisions**

A *Building Solution* which complies with the *Deemed-to-Satisfy Provisions* is deemed to comply with the *Performance Requirements*.

A0.8 inserted by
Amdt No. 1**A0.8 Alternative Solutions**

- (a) An *Alternative Solution* must be assessed according to one or more of the *Assessment Methods*.
- (b) An *Alternative Solution* will only comply with the BCA if the *Assessment Methods* used to determine compliance with the *Performance Requirements* have been satisfied.

A0.9 insert by
Amdt No. 1**A0.9 Assessment Methods**

The following *Assessment Methods*, or any combination of them, can be used to determine that a *Building Solution* complies the *Performance Requirements*:

- (a) Evidence to support that the use of a material, form of construction or design meets a *Performance Requirement* or a *Deemed-to-Satisfy Provision* as described in A2.2.
- (b) *Verification Methods* such as—
 - (i) the *Verification Methods* in the BCA; or
 - (ii) such other *Verification Methods* as the appropriate authority accepts for determining compliance with the *Performance Requirements*.
- (c) Comparison with the *Deemed-to-Satisfy Provisions*.
- (d) *Expert Judgement*.

- (b) A horizontal exit or a fire-isolated passageway leading to a horizontal exit.

Expert Judgement means the judgement of an expert who has the qualifications and experience to determine whether a *Building Solution* complies with the *Performance Requirements*.

"Expert
Judgement"
inserted by
Amdt No. 1

External wall means an outer wall of a building which is not a common wall.

Fire brigade means a statutory authority constituted under an Act of Parliament for the protection of life and property from fire and other emergencies.

Fire compartment means-

- (a) the total space of a building; or
- (b) when referred to in-
 - (i) the Objectives, Functional Statements or Performance requirements- any part of a building separated from the remainder by barriers to fire such as walls and/or floors having an appropriate resistance to the spread of fire with any openings adequately protected; or
 - (ii) the Deemed-to-Satisfy Provisions- any part of a building separated from the remainder by walls and/or floors each having an FRL not less than that *required* for a *fire wall* for that type of construction and where all openings in the separating construction are protected in accordance with the deemed-to-satisfy provisions of the relevant Part.

Fire hazard means the danger in terms of potential harm and degree of exposure arising from the start and spread of fire and the smoke and gases that are thereby generated.

Fire intensity means the rate release of calorific energy in watts, determined either theoretically or empirically, as applicable.

Fire-isolated passageway means a corridor, hallway or the like, of *fire-resisting construction*, which provides egress to or from a *fire-isolated stairway* or *fire-isolated ramp* or to a road or open space.

Fire-isolated ramp means a ramp within a *fire-resisting* enclosure which provides egress from a *storey*.

Fire-isolated stairway means a stairway within a *fire-resisting*

Deemed-to-Satisfy Provisions

D2.16 Balustrades

Delete D2.16(f)(iv) and insert NSW D2.16(f)(v) as follows:

NSW D2.16 Balustrades

(f) (iv) deleted

* Note: See NSW H101.13 Provision of Guardrails
NSW H101.14 Guardrails
NSW H102.9 Guardrails

* (v) For a balustrade in a Class 9b building used as a *place of public entertainment*, the height above the nosings of the stair treads and the floors of ramps, and the floor of any access path, balcony, landing or the like, is not less than-

- (A) 1 m when provided inside the building; and
- (B) 1200 mm when provided externally to the building.

*Deemed-to-Satisfy Provisions***D2.16 Balustrades**

- (a) A continuous balustrade must be provided along the side of any roof to which public access is provided, any stairway or ramp, any floor, corridor, hallway, balcony, verandah, *mezzanine*, access bridge or the like and along the side of any path of access to a building, if-
- (i) it is not bounded by a wall; and
 - (ii) its level is more than 1 m above the floor or ground surface beneath,
- except at the perimeter of a *stage*, rigging loft, loading dock or area accessible only to maintenance staff or the like.
- (b) A balustrade in-
- (i) *fire-isolated stairways*, *fire-isolated ramps* and other areas used primarily for emergency purposes, excluding external stairways and external ramps; and
 - (ii) Class 7 (other than *carparks*) and Class 8 buildings and parts of buildings containing those classes,
- must comply with (f) and (g)(i).
- (c) A balustrade in stairways and ramps, other than those covered in (b), must comply with (f) and (g)(ii).
- (d) A balustrade along the side of a horizontal or near horizontal surface such as a-
- (i) roof to which public access is provided and any path of access to a building; and
 - (ii) floor, corridor, hallway, balcony, verandah, *mezzanine*, access bridge or the like,
- must comply with (f) and (g)(ii).
- (e) A balustrade or other barrier in front of fixed seating on a *mezzanine* or balcony within an auditorium in a Class 9b building must comply with (f)(iv) and (g)(ii).
- (f) The height of a balustrade must be constructed in accordance with the following:
- (i) The height is not less than 865 mm above the nosings of the stair treads or the floor of a ramp.
 - (ii) The height is not less than-
 - (A) 1 m above the floor of any access path, balcony, landing or the like; or

Qld D2.16(f)(ii)

Deemed-to-Satisfy Provisions

NSW D2.16(f)(iv)

- (B) 865 mm above the floor of a landing to a stair or ramp where the balustrade is provided along the inside edge of the landing and does not exceed a length of 500 mm.
- (iii) A transition zone may be incorporated where the balustrade height changes from 865 mm on the stair flight or ramp to 1 m at the landing.
- (iv) For a balustrade provided under (e), the height above the floor must be not less than-
 - (A) 1 m; or
 - (B) 700 mm and a horizontal projection extends not less than 1 m outwards from the top of the balustrade.

(g) Openings in a balustrade must be constructed in accordance with the following:

- (i) For balustrades provided under (b)-
 - (A) the space between balusters or the width of any opening in the balustrade (including any openable *window* or panel) must not be more than 300 mm; or
 - (B) where rails are used, a rail must be provided at a height of not more than 150 mm above the nosings of the stair treads or the floor of the landing, balcony or the like and the space between rails must not be more than 460 mm.
- (ii) For balustrades other than those provided under (b), any opening does not permit a 125 mm sphere to pass through it and for stairs, the space is measured above the nosings.

Qld D2.16(g)(ii)

D2.17 Handrails

- (a) Except for handrails referred to in D2.18, handrails must be-
 - (i) located along at least one side of the ramp or flight of stairs; and
 - (ii) located along each side if the total width of the stairway or ramp is 2 m or more; and
 - (iii) not more than 2 m apart in the case of intermediate handrails; and

Deemed-to-Satisfy Provisions

- * [
- (iv) in a Class 9b building used as a primary school, fixed at a height of not less than 865 mm with a second rail fixed at a height of not less than 700 mm; and
 - (v) in any other case, fixed at a height of not less than 865 mm above the nosings of stair treads and the floor surface of the ramp, landing, or the like; and
 - (vi) continuous between stair flight landings and have no obstruction on or above them that will tend to break a hand-hold.
- (b) Handrails in a Class 9a building must be provided along at least one side of every passageway or corridor used by patients, and must be-
 - (i) fixed not less than 50 mm clear of the wall; and
 - (ii) where practicable, continuous for their full length.
 - (c) Provisions for handrails to assist people with disabilities must be provided in accordance with D3.3(a)(ii).

D2.18 Fixed platforms, walkways, stairways and ladders

In machinery rooms, boiler houses, lift-motor rooms, plant-rooms and the like, fixed platforms, walkways, stairways and ladders and any tread and riser, landing, balustrade or handrail attached thereto, must comply with AS 1657.

D2.19 Doorways and doors

A doorway in any building serving as a *required exit* or forming part of a *required exit*, or any doorway in a *patient care area* of a Class 9a building-

- (a) must not be fitted with a revolving door; and
- (b) must not be fitted with a roller shutter or tilt-up door unless-
 - (i) it serves a Class 6, 7 or 8 building or part with a *floor area* not more than 200 m²; and
 - (ii) the doorway is the only *required exit* from the building or part; and
 - (iii) it is held in the open position while the building or part is lawfully occupied; and
- (c) must not be fitted with a sliding door unless-
 - (i) it leads directly to a road or *open space*; and

NSW H101.12.9 Doors

A door fitted to the egress doorway in the wall of an *auditorium* must comply with NSW D2.15 and NSW D2.19.

Table H101.12
SPACING OF AUDITORIUM SEATING

Column 1	Column 2	Column 3
Number of seats in Rows	Depth of Rows (mm)	Clearance between Rows (mm)
Not exceeding 16	950	300
17 - 30	975	325
31 - 45	1000	350
46 - 60	1025	375
61 - 75	1050	400
76 - 90	1075	425
91 - 105	1100	450
106 - 120	1125	475

NSW H101.13 Provision of guardrails**NSW H101.13.1 Location**

Guardrails must be provided-

- (a) along the fascia of each balcony or box;
- (b) if there is a stepped floor, along the front edge of each *cross-over*, and
- (c) where NSW H101.13.2 and NSW H101.13.3 apply.

NSW H101.13.2 Fixed back seats

If seats with fixed backs are provided, guardrails that extend for the full width of the seating, must be provided at least 500 mm above the platform unless-

- (a) fixed seat backs of the next lower level project at least 500 mm above the level of the stepped platform; and
- (b) there is only one riser between the platform and the next lower *cross-over*.

NSW H101.13.3 Steps between platforms

If-

- (a) there is more than one intervening step in an *aisle* between levels of platforms, a guardrail must be provided (at a vertical height of at least 660 mm measured above the nosing of each tread and of the upper platform) to the sides of the *aisle* adjacent to those steps; and
- (b) there is more than one intervening step in an *aisle* between levels of platforms and that *aisle* is along a wall, a continuous guardrail must be affixed to that wall at a height of at least 865 mm above the nosing of each tread; and
- (c) the end of a platform or the back of the highest platform does not abut a wall that extends at least 660 mm above the floor level of the platform, a guard rail not less than 660 mm high must be provided-
 - (i) at the ends of the platform, extending from the front of the first riser to the back of the highest platform; and
 - (ii) at the back of the highest platform, extending the full width of the platform; and
- (d) there is an inclined floor, the raised section of which is not bounded by walls at least 660 mm high, a guard rail must be provided that extends around the perimeter of the raised section at a height of at least 660 mm above the inclined floor level; and
- (e) seating at tables is provided on a stepped platform, a guardrail at least 500 mm high must be provided along the front edge of the platform.

NSW H101.14 Guardrails

This clause applies to seating areas.

NSW H101.14.1 Continental seating

Where a guardrail is provided in front of a row of chairs-

- (a) the distance between the back of each chair in that row, and the guardrail must be not less than the distance specified in Column 2 of Table H101.12 for the number of chairs in that row;
- (b) the *minimum lateral clearance* between the front of each chair in that row and the guardrail must be not less than the clearance specified in Column 3 of Table H101.12 for the number of chairs in that row.

NSW H101.14.2 Balconies and boxes

A guardrail provided along the fascia of a balcony or box-

- (a) if it is located at the foot of a stepped *aisle*, must have its top surface at least 900 mm above the floor of the balcony or box; and
- (b) if it is not located at the foot of a stepped *aisle*, must have its top surface at least 750 mm above the floor; and
- (c) if it has a ledge more than 70 mm wide, must have the top surface of the ledge sloping downwards towards the floor of the balcony or box at an angle of at least 30 degrees from the horizontal; and
- (d) must have an unperforated kerb or toe guard extending for at least 300 mm above the floor.

NSW H101.14.3 Cross-overs

A guardrail provided along the front edge of a *cross-over* on a stepped floor-

- (a) must be at least 750 mm high; and
- (b) must extend for the full distance between *aisles*, or between a wall and an *aisle*, or for such other distance as considered necessary.

NSW H101.15 Dressing rooms

A dressing room or 2 or more adjoining dressing rooms, having a total *floor area* of more than 50 m², must-

- (a) be separated from other parts of the building by construction having an FRL of not less than 60/60/60;
- (b) have at least 2 means of egress as remote from each other as possible, one of which must discharge-
 - (i) directly to a road or *open space*; or
 - (ii) through a *fire-isolated exit* to a road or *open space*.

NSW H101.16 Storerooms

A storeroom must be separated from other parts of the building by construction having an FRL of not less than 60/60/60.

NSW H101.17 Projection suites

This clause applies to *projection suites*.

PART F

STORE ROOMS AMENDMENTS

Lincolne Scott

Management
Technology
and Engineering
in the
Built Environment

3 August 1998

NSW Department of Public Works & Services
84 Crown Street
WOLLONGONG NSW 2500

Consultants

Lincolne Scott Australia Pty Ltd
ACN 005 113 468
83 Alexander Street
PO Box 737 Crows Nest
New South Wales 2065 Australia
Email lssydney@lincolne.com.au
Facsimile 02 9906 3680
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Canberra	Jakarta
Gold Coast	Kuala Lumpur
Melbourne	Manila
Perth	Singapore
Sydney	Suva
Sunshine Coast	Taipei
	Wellington

Attention: Mr. Anthony McCabe

Dear Sir,

**Re: WOLLONGONG ENTERTAINMENT CENTRE
STORE ROOMS**

We respond to your application for Lincolne Scott to consider solid core doors in lieu of fire doors fitted to store rooms as indicated on the attached memo.

1.0 BCA REQUIREMENTS

The building is classified 9b Place of Public Entertainment. Under the deemed-to-satisfy provisions of the BCA Part H101.16 requires "storerooms to be separated from other parts of the building by construction having a FRL of not less than 60/60/60."

2.0 APPLICATION

As indicated on the Level Plan No 2 AO4F various spaces under the concrete tiered seating are identified Duct Rm No 207, 212, 213, 221, 229, 234 and behind toilets.

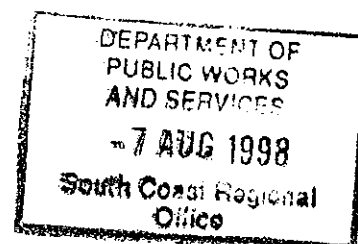
The floor and roof of these rooms are reinforced concrete and the walls are masonry blockwork which will achieve a FRL greater than 60/60/60.

Each room is fitted with a solid core door fitted within a steel door frame and protected by an automatic sprinkler system designed in compliance with AS2118.

These rooms were not originally designed as store rooms.

3.0 PROPOSAL

That all doors to each room be 820mm blockboard (solid core) door.



4.0 COMMENT

The provisions of the BCA for the construction of store rooms does not account for the type of construction of the building and whether the building is sprinkler protected or not.

The building is provided with a sprinkler system, active fire fighting systems (hosereel and portable extinguishers) smoke control and EWIS. These systems provide a safe building and it is considered that the automatic sprinkler system will suppress any fire within a store room with the alarm providing early warning for occupant attendance to fight a fire or evacuate the building.

Note:

The store rooms do not require the installation of emergency lighting or EWIS speakers unless the room exceeds 300m² in floor area.

5.0 RECOMMENDATION

The proposal to install solid core doors to each store room is satisfactory conditional upon either a self closer being fitted to each door or the door being key lockable and adequately signed.

We recommend where appropriate the Minister approve the application.

Yours faithfully,
LINCOLNE SCOTT

A. J. MARTIN

A handwritten signature in black ink, appearing to read 'A. J. Martin', with a long horizontal flourish extending to the right.

FACSIMILE

TO Tony Martin
Lincolne Scott

CC

FACSIMILE 02 99063680

DATE 27 July, 1998

FROM Anthony McCabe
Direct Phone: 02 42268542

PAGES SENT 3 (INCLUDING THIS ONE)

☐ URGENT ☒ FOR REPLY ☐ FOR INFORMATION ☐ FOR DIARY NOTE ☐ AS REQUESTED ☐ ORIGINAL TO BE MAILED

NSW Government Offices
84 Crown Street
Wollongong NSW 2500



NSW DEPARTMENT
OF PUBLIC WORKS
AND SERVICES

Telephone 02 4226 8111
Facsimile 02 4226 8534

SUBJECT: WOLLONGONG ENTERTAINMENT CENTRE

As discussed onsite on 22 July 1998 with Stuart Barnes of the Wollongong Entertainment Centre, the nine duct areas on Level 2 as shown on the attached sketches are proposed for use as storage areas.

Your consideration to the use of these areas previously designated as ducts is requested. Each duct is accessible via a 820mm leaf blockboard core door, and are serviced with lights, EWIS speaker and sprinklers.

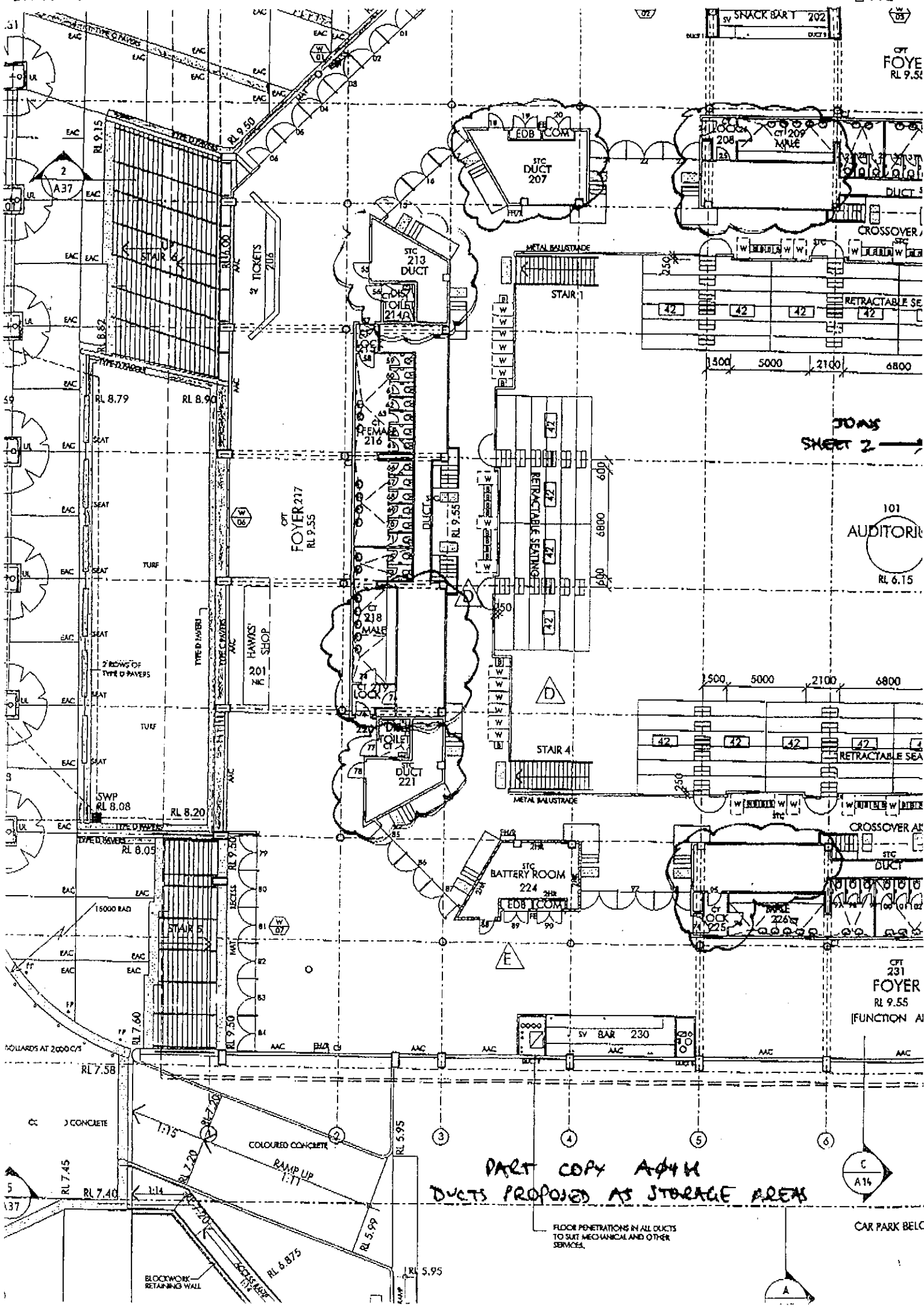
Please advise if acceptable.

A. J. McCabe

Anthony McCabe
Project Manager

PAWEC\CONSTN98\WEC363.FAX

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PART G

RETRACTABLE SEATING AMENDMENTS

Lincolne Scott

Fax/Memo

Consultants

Lincolne Scott Australia Pty Ltd
ACN 005 113 468
83 Alexander Street
PO Box 737 Crows Nest
New South Wales 2065 Australia
Email lssydney@lincolne.com.au
Facsimile 02 9906 3680
Telephone 02 9906 3166

To NSW DEPT. OF PUBLIC WORKS + SERVICES

Attention ANTHONY MCCABE

Date 22/7/98

From TONY MARTIN

Fax No 02-42268534

Project WOLLONGONG ENTERTAINMENT CENTRE

Project No NSSY1699.AL

Subject RETRACTABLE SEATING - AISLE RAILS

No of Pages 1

Copies

We respond to your memo dated 20th July seeking modifications to the aisle handrails fitted to the retractable seating.

The provisions of the BCA NSW Variation Part H101.131.3 requires guardrails (at a vertical height of at least 660mm measured above the nosing of each tread) to be installed to the sides of the aisle.

The proposal seeks removal of the handrail at the side of the aisle next to the seat, but retaining the handrail on the outer edge of the aisle. The VRS submission determines that the inclusion of the handrail will impede sight lines and operation of the retractable seating.

Based on the minimum rooms of seating and the width of the aisle within the retractable seating bank we recommend that approval be granted to maintain one handrail to a height of 660mm at the side of the aisles.

Regards,



Tony Martin



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Venue
Revenue
Services
Pty Limited

15 July 1998

ref:rob0960

Wollongong Entertainment Centre
PO Box 3100
Wollongong East NSW 2520

Attn: Mr Stuart Barnes

Dear Stuart,

Re: Aisle Rails

Following my site inspection of last week, I noted that all of the fixed seating areas are fitted with an aisle rail on either side of each aisle step throughout the facility.

The original Telescopic Seating specification called for an aisle rail to be supplied, and an allowance for a single aisle rail only to each step was provided for in our original tender submission.

The reasoning for the single aisle rail in our proposal is as follows-

1. Ease of operation - Only one rail per step to remove prior to retracting the system.
2. Specification- Calls for aisle rails, but does not specify a rail on each side of the aisle step.
3. Precedence- In our previous installations, we have only come across one similar installation in NSW where two aisle steps were required between platforms, and therefore aisle rails were required. The council concerned (Wyang Council) accepted one rail only per step.
4. Sight Lines- The aisle rails impede sightlines slightly, and therefore we have attempted to minimise there use.

Our concern is that you are not aware of this, as the aisle rails are not detailed on the drawings, and the difference between the fixed seating and the retractable seating aisle rails may provide a visual variation between the areas.

- Prescription Athletic Turf
Turf Consultancy
Terraplas Turf Protection

- Telescopic Seating
Theatre and Auditorium Seating
Stadia Seating

- Timber Sports Floors
Protective Floor Covers

- Portable Staging Systems
Crowd Control Systems
Turnstiles

- Giant Video Screens
Electronic Scoreboards
Electronic Marquee Signs

*Received in hand
4/11/98*

You may also wish to discuss this issue with Tony McCabe of public works relative to what they are prepare to accept as far as code is concerned. As stated, in our previous experience, councils have accepted this situation, however, Public works may take a stricter interpretation of the code. It is our opinion that the safety of patrons would not be compromised by the use of one rail only per aisle step.


Should additional rails be required, we feel that it would be appropriate that given our level of support to the facility to date, and our commitment to a long term support approach, any cost variations should be minimised as much as possible. We have therefore calculated the cost variation for the supply of additional rails on a cost only basis, exclusive of installation. This would be in the amount of \$ 5,000.00 for the supply of additional rails.

Could you please review the above on an urgent basis and advise so that we can coordinate our approach on this issue.

Thank you for your assistance with the above. If you require any additional information, please do not hesitate to contact me.

Best Regards

Venue Revenue Services



Robert Lee

Project Manager

PART H

POPULATION DENSITIES

Lincolne Scott

Fax/Memo

Consultants

To NSW DEPT. OF PUBLIC WORKS + SERVICES

Attention ANTHONY MCCABE

Date 21/7/98

From TONY MARTIN

Fax No 02 42268534

Project WOLLONGONG ENTERTAINMENT CENTRE

Project No NSSY1699.AL

Subject POPULATION

No of Pages 2

Copies

Lincolne Scott Australia Pty Ltd
ACN 005 113 468
83 Alexander Street
PO Box 737 Crows Nest
New South Wales 2065 Australia
Email lssydney@lincolne.com.au
Facsimile 02 9906 3680
Telephone 02 9906 3166

We respond to your memo dated 20th July setting forth your proposed population densities for the various mode of operations of the Entertainment Centre.

It is to be noted that the appropriate total fire exit width from the various levels are:

Level 1

- 14 double doors each 2000mm wide
- total 28.0m

Level 2

- 12 double doors each 2000mm wide and 12 double doors each 1943mm
- total 47.3m

It is noted that your proposal details the following population:

Exit Level	Basketball	Circus	Concert	Standing Concert
Level 1	1028	-	1729	2158
Level 2	4907	4907	3378	3378
Total	5935	4907	5107	5536
Assumed Staff	65	93	93	64
Grand Total	6000	5000	5200	5600



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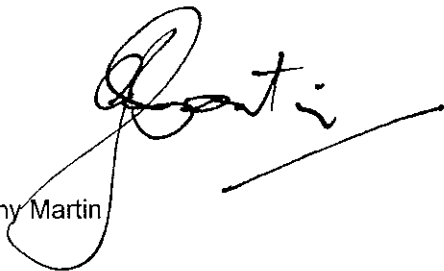
Note:

Four stairs each ^{1500mm}2000mm wide provide alternate egress from Level 1 to Level 2 crossover.

Based on the provisions of BCA D1.6(h) (NSW Variation) the total aggregate exit width permits the nominated population densities to be maintained.

The appropriate condition of certification will be amended to reflect this population.

Regards,


Tony Martin

FACSIMILE

BUILDING SAFETY SERVICES

TO Tony Martin
Lincolne Scott

FILE NO. 1699.AL

20 JUL 1998

CC

FACSIMILE 02 99063680

DATE 20 July, 1998

FROM Anthony McCabe
Direct Phone: 02 42268542

GDT

AMT

GDM

COPIES AM
TO

ACTION

02 42268542

NSW Government Offices
84 Crown Street
Wollongong NSW 2500NSW DEPARTMENT
OF PUBLIC WORKS
AND SERVICESTelephone 02 4226 8111
Facsimile 02 4226 8534

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☐ URGENT ☐ FOR REPLY ☒ FOR INFORMATION ☐ FOR DIARY NOTE ☐ AS REQUESTED ☐ ORIGINAL TO BE MAILED

SUBJECT: WOLLONGONG ENTERTAINMENT CENTRE

1. Population Densities

As discussed, the client wishes to include in the POPE licence conditions a further mode of use for the Centre. The mode is for a concert with normal fixed and retractable seating available but instead of linked seating on the Auditorium floor, the floor would be available for standing/dancing eg a rock concert.

Ian Ferrier, the Project Architect has advised that the number of persons who could be accommodated is obviously limited to the aggregate width of the exit doorways from the Auditorium on Level 1 which are accessible for emergency egress.

If all exit doors are accessible, the aggregate width on Level 1 is 28000mm. This width provides a means of escape for 2800 people.

Allowing for 600 persons to escape from level 2 via Level 1, the total number who could be accommodated on Level 1 is 2200. Note, this only applies if all Level 2 - 4 seats occupied.

The retractable seating in concert mode provides 714 seats with a further 119 interlocking seats also available immediately in front of the first row of seats. This number has been reduced from the original design as retractable seating ordered by the client are 500mm centre to centre and includes arm rests. (Note, total number of retractable seats in basketball mode is 960).

Therefore, in a "standing concert" the maximum number of people allowed to occupy the floor would be $2200 - 714 - 119 = 1367$. Allowing for performers and technicians and staff, the number would be reduced to say 1325.

Attached then is a table outlining proposed populations in the four main modes.

-2-

Wollongong Entertainment Centre

2. Retractable seating

As mentioned above, the client has ordered 500mm centre seating for the retractable seating from Venue Revenue Services P/L.

As detailed on the attached letter from VRS, only one aisle handrail has been included. The statement that only one rail was specified was incorrect as this was modified in an Addendum which clearly identified two rails were required.

Nevertheless, your consideration to the request from VRS that given the precedence of no other installation in NSW having the two rails, that the Wollongong Entertainment Centre also only have a handrail on only one side of each aisle.

A. J. McCabe

Anthony McCabe
Project Manager

P:\WEC\CONSTN98\WEC337.FAX

WOLLONGONG ENTERTAINMENT CENTRE
SEATING CAPACITIES

MODE	BASKETBALL	CIRCUS	CONCERT	STANDING CONCERT
LEVEL 1				
Retractable	960	0	714	714
Front of retractable (either WC or seats)	68	0	119	119
Interlocking Chairs on Floor	0	0	896	0
Standing only on Floor	0	0	0	1325
LEVEL 2				
WC or seats	140	140	140	140
LEVEL 4				
Fixed	4767	4767	3238	3238
TOTAL	5935	4907	5107	5536

Note: Numbers given for Front of retractable and Level 2 cross over aisle are maximum assuming no wheelchair (WC) spaces booked and seats only used. If wheelchair spaces booked, number reduced.

**DEPARTMENT OF LAND AND
WATER CONSERVATION**

SYDNEY/SOUTH COAST REGION



LOCAL GOVERNMENT ACT 1993

**Approval for a Place
of Public Entertainment**

Local Authority: Wollongong City Council

Name of Building: Wollongong Entertainment Centre

Address of Building: Cnr. Crown and Harbour Streets, Wollongong

Owner's Name: Wollongong Sportsground Trust

Owner's Address: Cnr. Crown and Harbour Streets, Wollongong NSW 2500

User's Name: Wollongong Sportsground Trust

User's Address: Cnr. Crown and Harbour Streets, Wollongong NSW 2500

This place of public entertainment is interpreted as incorporating the whole of the Wollongong Entertainment Centre.

The maximum approved capacity (including staff/performers) of the total complex is:

- *Basketball Mode* - 6000
- *Circus Mode* - 5000
- *Concert Mode* - 5200
- *Standing Concert Mode* - 5600

A COPY OF THE APPROVAL MUST BE CONSPICUOUSLY DISPLAYED AT THE VENUE AT ALL TIMES (LOCAL GOVERNMENT (APPROVALS) REGULATION, 1993 SCHEDULE 2, CLAUSE 13).

Determination Date: 5 September 1998

Operational Date: 5 September 1998

Expiry Date 5 September 1999

This approval is issued subject to the conditions attached.

Conditions of Approval

Wollongong Entertainment Centre

1. Schedule 2 of the Local Government (Approvals) Regulation, 1993, "Management and Use of Places of Public Entertainment", provides for public safety in approved premises and must be complied with. In particular, attention is drawn to Clause 5 and the need to obtain the permission of the Minister for Local Government prior to the use of naked flames, including pyrotechnics, for the purpose of a performance being conducted. (Clause 38, Local Government (Approvals) Regulation, 1993).
2. The premises must be maintained in a fit and proper condition for use as a place of public entertainment to ensure they are safe and healthy for public use.
3. The relevant parts of Building Code of Australia (B.C.A.) NSW H101.11 (Seating in Rows) must be complied with to provide for access to and egress from seats in the auditorium at any time. In addition, if ever such seating is accommodated on stepped platforms, an aisle lighting system complying with NSW BCA Clauses H101.20.4 and 5 must be provided to illuminate the length of each aisle and the tread of each step therein.
4. The essential fire and other safety measures listed below must be maintained to ensure that, in an emergency, they are capable of performing to the standard specified.

Schedule

Measure	Standard of Performance
Automatic Sprinkler System	AS 2118, BCA E1.5 and EP1.4
Emergency Lighting	AS 2293, BCA E4.2, 4.4, H101.20
Emergency Warning and Intercommunication System	AS 2220, BCA E4.9
Exit Signs	AS 2293, BCA E4.5, 4.8
Fire and Smoke Alarms	AS 1670, BCA E2.2, Spec E2.2a
Fire Dampers	AS 1668.1, AS 1682.2
Fire Doors	AS 1905, BCA Spec C3.4
Fire Hydrants	AS 2419, BCA E1.3
Fire Mains and Water Supply Services	AS 2419, BCA E1.3
Hearing Augmentation Listening System	AS 1428.1, BCA D3.7
Hose Reels	AS 2441, BCA E1.4
Mechanical Ventilation System	AS 1668.1 & 2, BCA E2.2 F4.5
Portable Fire Extinguishers	AS 2444, BCA E1.6
Smoke Control Systems	AS 1668.1, BCA E2.2 Spec E2.2b and EP 2.2
Smoke Doors	BCA D2.7 and Spec C3.4
Solid Core Doors	AS 2689
Paths of Travel Stairways, Passageways or Ramps	BCA D1.6 LGA Sect 655
Fire Stopping	BCA C3.15 Spec C3.15
Sliding Fire Doors	AS 1905
Signage	BCA D2.23, D2.19
Emergency Evacuation Plan	AS 3745, LG Approval & Reg. Schedule 2
Exit Doors - panic bars	BCA D2.15, D2.19 & D2.21
Curtains	BCA C1.10 & Spec C1.10

5. In accordance with Clauses 6H and 6I of Part 2A of the Local Government (General) Regulation 1993, an annual fire safety statement in a form acceptable to the Department of Local Government, must be given annually to the Department or to an Authorised Delegate of the Minister for Local Government by the owner or owner's agent prior to each anniversary of the date of issue of this Approval. Such statement, in respect to each essential fire and other safety measure listed above in Item No. 4, is to state:
- a) that the essential fire or other safety measure:
 - i) has been assessed by a person (chosen by the building owner) who is properly qualified to do so; and
 - ii) at the date of the assessment, was found to be capable of performing to a standard not less than the relevant standard prescribed in the list.
 - b) that a person (chosen by the owner of the building) who is properly qualified to do so has inspected the building and has certified that, at the date of the inspection, the condition of the building does not disclose any grounds for a prosecution under sections 654-657 of the Act.
6. Except for changes of scenery within the stage area, the premises must not be altered in any way without the approval of the Minister for Local Government or his authorised delegate.

Signature: _____

B T Dooley
Manager Resource Access Works and Services
Department of Land and Water Conservation
being Authorised Delegate of the Minister for
Local Government

5 September 1998