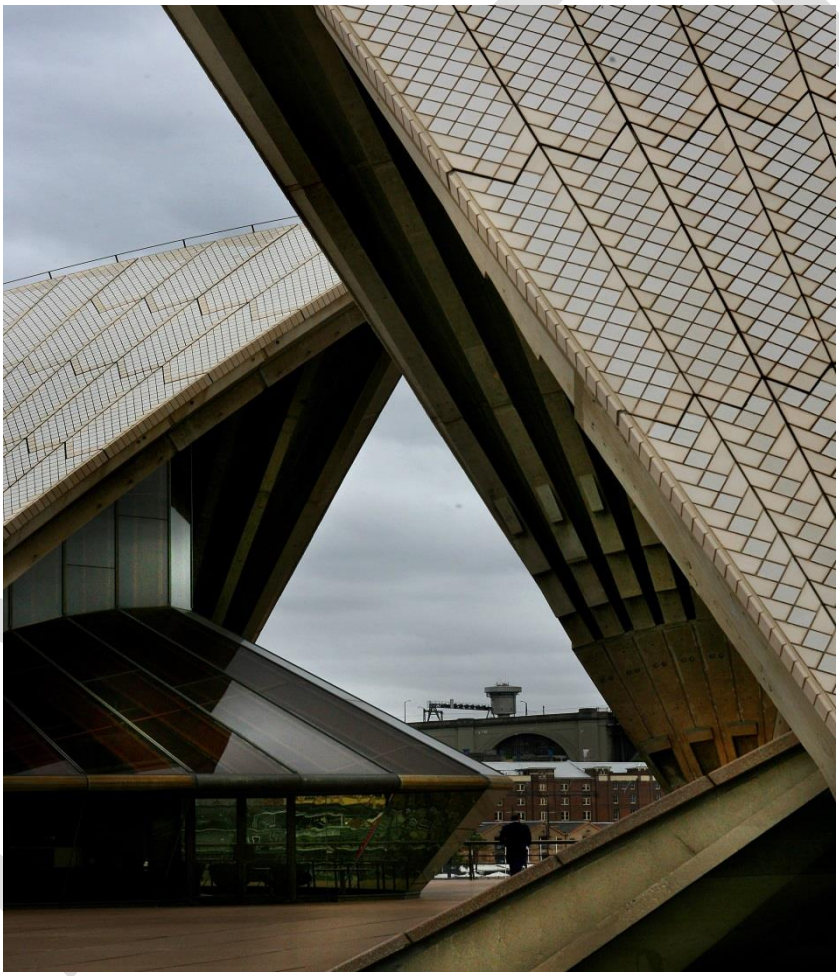
Sydney Opera House

Concert Hall and Creative Learning Centre

DA3 – SSD8663

Draft Construction Management Plan



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Approved

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Project Director, Renewal Delivery

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Date

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1 INTRODUCTION

These projects are part of the Stage 1 Renewal of the Sydney Opera House, and key projects as identified by the NSW Government in conjunction with the Sydney Opera House Trust. They are programmed to be undertaken after the current and proposed upgrade works to the Joan Sutherland Theatre, the Function Centre and the Entry Foyer.

This Draft Construction Management Plan has been developed to support the following projects which are the subject of a State Significant Development application to the NSW Minister for Planning, DA3 – SSD8663:

- Concert Hall Projects
- Creative Learning Centre

This package of works will provide:

- Acoustic, technical and accessibility upgrades to the Concert Hall; and
- Dedicated facilities within the Opera House for creative learning.

The proposed upgrade of the Concert Hall identifies and addresses a number of important deficiencies, summarised as follows:

- To improve patron access to the Concert Hall auditorium and foyers as outlined in the SOH Accessibility Master Plan, 2015.
- To improve performer and operational staff access to the back-stage areas and performer dressing rooms.
- To improve the acoustic performance of the Concert Hall for both acoustic and amplified music performances.
- To improve the technical and operational capability of the Hall to accommodate a greater diversity of performance modes, improve safety for SOH staff and visiting hirers, and reduce the time required for set-up and change over between performance modes.
- To improve patron and performer comfort.

With the creation of the Creative Learning Centre, for the first time children and young people will have a dedicated space at the Opera House to play, experiment and learn in a building that embodies creativity and innovation. The Creative Learning Centre will host workshops, creative-play activities, talks and performances, and will also include a separate space for a permanent digital classroom. The focus is to improve visitor experiences and expand the delivery of learning programs.

This report addresses the key construction activities, waste management and safety aspects of the projects. The identified methodology, procedures and details described in this report are indicative, and will be refined by the Principal Contractor engaged to undertake the project prior to commencing construction. This methodology has been developed to provide a basis for assessment of the environmental impacts of the project.

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2 PROJECT DESCRIPTION

The Sydney Opera House (SOH) is Australia's most significant building, performing arts centre, cultural precinct and meeting point. It is inscribed on the UNESCO World Heritage List as a masterpiece of human creative genius.

In 2013 the Sydney Opera House Trust (SOHT) commenced a ten year program of renewal to ensure that the Sydney Opera House will best utilise its buildings and precinct in order to enhance the performer and visitor experiences, mitigate any safety and operational risks, upgrade equipment, infrastructure and facilities, confirm regulatory compliance and ensure the best and most efficient use of spaces and technology.

The project is part of the Stage 1 Renewal of the Sydney Opera House, and key projects as identified by the NSW Government in conjunction with the Opera House. They are programmed to be undertaken after the proposed upgrade works to the Joan Sutherland Theatre, the Function Centre and the Entry Foyer.

This package of works is collectively being assessed as DA3, part of the Renewal Stage 1 works at the Sydney Opera House.

The proposals vary in their location and scope, as shown below and detailed in Sections 2.4 – 2.6.

2.1 Location

Located on the peninsula of Bennelong Point, the SOH is divided into two sectional halves, (i) the Concert Hall located on the western side and (ii) the Joan Sutherland Theatre (previously known as the Opera Theatre) located on the eastern side. The Opera House is a unique design and incorporates a number of innovative construction techniques. The superstructure of the SOH is predominately precast concrete with internal steel reinforcement. Construction on the SOH commenced in 1959 and was completed in 1973.

The SOH spans Levels -08' to Level +130'. The levels are determined according to height in feet relative to sea level.

The Sydney Opera House is a landmark, skyline-dominating arts centre for opera, theatre, music and dance, plus guided tours.

The address is the northern end of Macquarie Street Bennelong Point Sydney NSW 2000.

Figure 1 - Sydney Opera House Location

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The various venues within the SOH are shown in Figure 2.

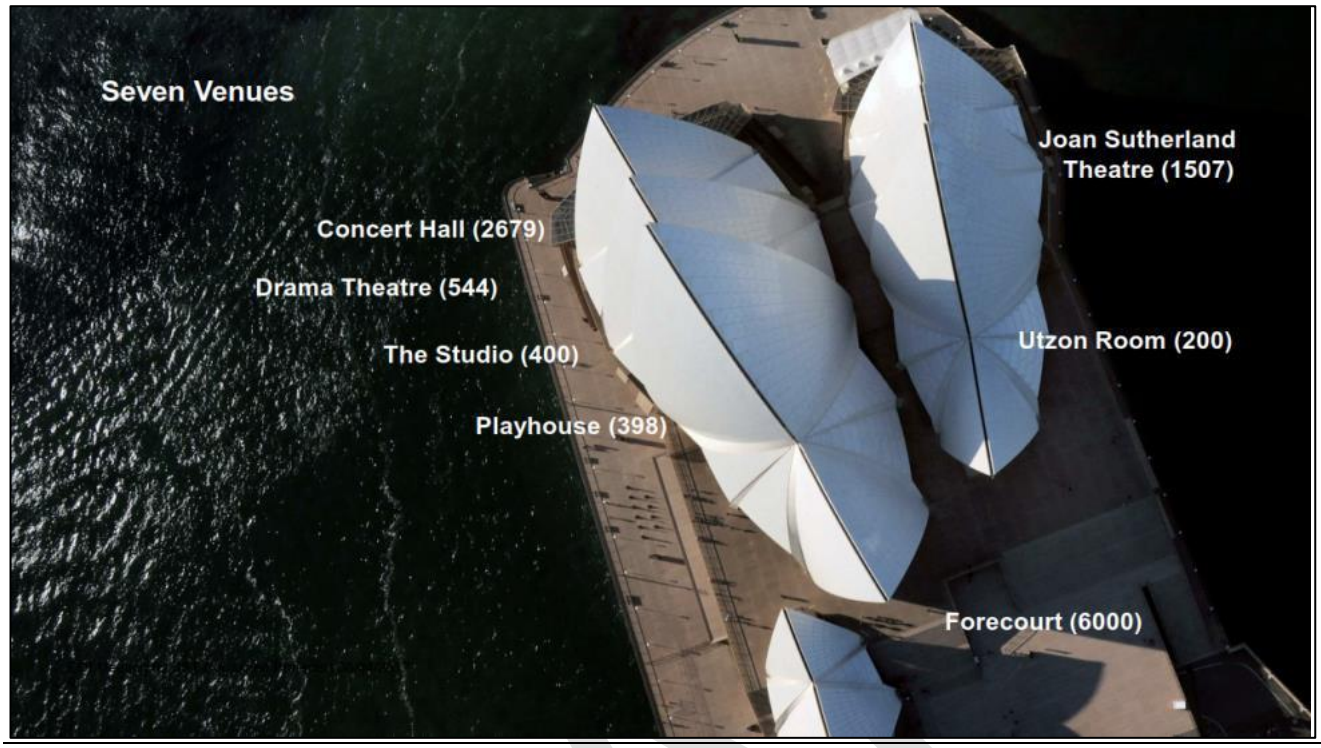

Figure 2 - Venues within the SOH (numbers indicate seating capacity)

The locations of the component renewal projects are shown in Figure 3.

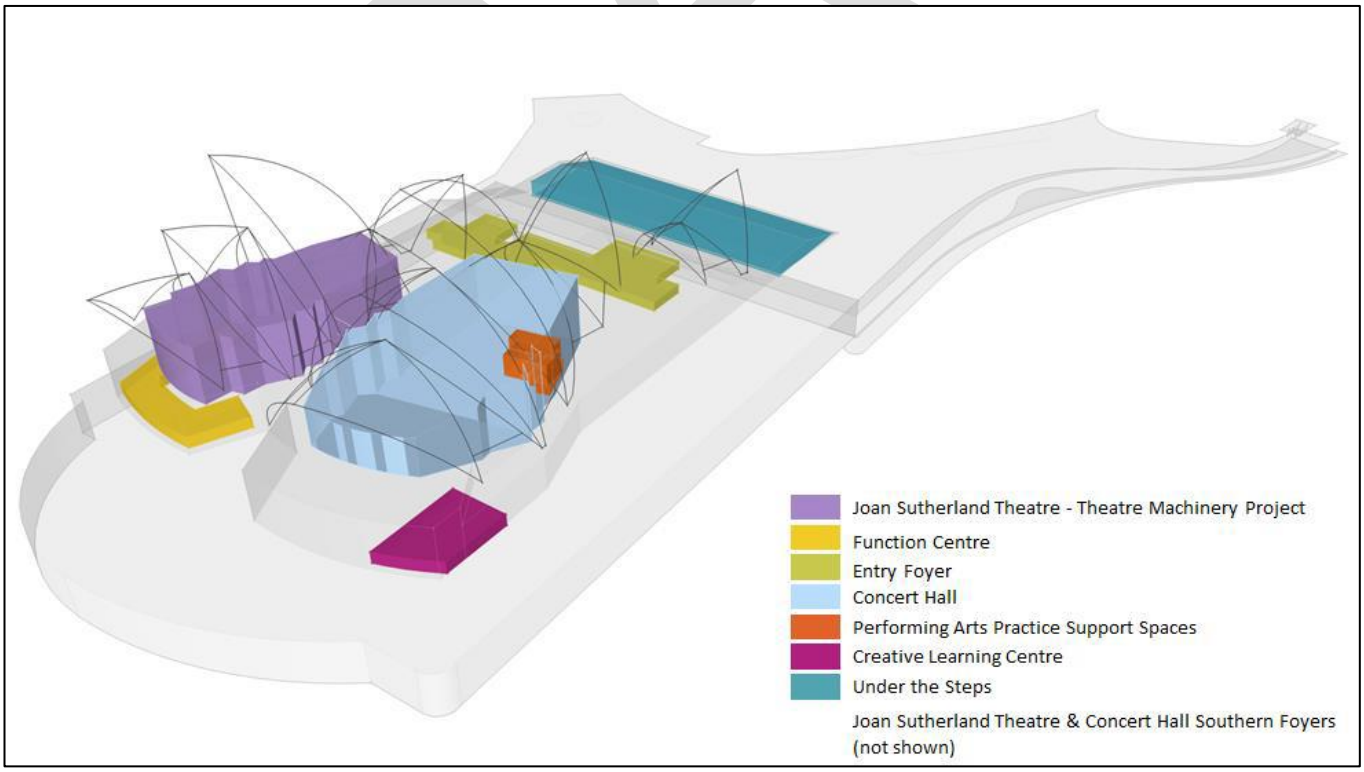

Figure 3 - Project Locations

2.2 Heritage Listings

The Sydney Opera House is provided statutory heritage protection under the following listings:

- World Heritage List (UNESCO) - 28 June 2007. In 2007, the Sydney Opera House was inscribed on UNESCO's World Heritage List (WHL) for its Outstanding Universal Value and as a "masterpiece of human creative genius"
- National Heritage List (Australian Government) – 2005. The following is the Summary Statement of Significance of the National Heritage values of the Sydney Opera House:

  "The Sydney Opera House, constructed between 1957 and 1973, is a masterpiece of modern architectural design, engineering and construction technology in Australia. It exhibits the creative genius of its designer, the Danish architect Jørn Utzon and the contributions to its successful completion by the engineering firm Ove Arup and Partners, the building contractors M.R. Hornibrook, and the architects Hall, Todd and Littlemore. It is an exceptional creative and technical achievement in the national history of building design and construction in Australia".
- Register of the National Estate (Australian Government).
- State Heritage Register (NSW Government) – 2003. The following is the Statement of Significance of the State Heritage values of the Sydney Opera House:

  "The Sydney Opera House is of State significance as a twentieth century architectural masterpiece sited on a prominent peninsular in Sydney Harbour. In association with the Sydney Harbour Bridge it has become an internationally recognised symbol of Sydney and Australia, which is also widely admired by Local citizens. Designed for the NSW Government by renowned Danish architect Jørn Utzon between 1957 and 1966, and completed in 1973 by Hall, Todd and Littlemore, the building has exceptional aesthetic significance because of its quality as a monumental sculpture in the round, both day and night, and because of the appropriateness of its design to its picturesque setting. Its public spaces and promenades have a majestic quality, endowed by powerful structural forms and enhanced by vistas to the Harbour and the city. An icon of modern architecture, the Sydney Opera House uses the precise technology of the machine age to express organic form. It has scientific and technical significance for the ways in which its construction continually pushed engineering and building technologies to the limit. It also has significance for the extensive associations of the site with many famous people and important themes in Australian history. Abutting the site of the first settlement of Europeans in Australia at Sydney Cove, the Sydney Opera House stands on Bennelong Point, Aboriginal land which was named after a Wangal Aboriginal man and which is of significance in the history of the entanglements and interactions between Aboriginal and non-Aboriginal cultures in Australia. Other historic themes associated with the site include the arrival of the First Fleet in Sydney Cove, scientific investigation, Defence, picturesque planning, marine and urban transport and most recently, cultural showcasing. Since its official opening by the Queen in 1973, the Sydney Opera House has been the scene of many notable achievements in the performing arts and has associations with many nationally and internationally renowned artistic performers. The Sydney Opera House provides an outstanding Visual, cultural and tourist focal point for Sydney and Australia".
- State Environmental Planning Policy (Major Development) 2005 (NSW Government)
- State Regional Environmental Plan (Sydney Harbour Catchment) 2005 (NSW Government)
- Sydney Local Environmental Plan 2005 (City of Sydney Council)

2.3 Development Approval

Similar to other projects under the SOH Building Renewals Project, the works associated with the Concert Hall Projects and Creative Learning Centre iwill be considered as a State Significant Development (SSD) and approved under Ministerial consent.

The formal Development Application is yet to be submitted to the Department of Planning and Environment however these works will be considered under DA3 - SSD 8663.

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2.4 Concert Hall Projects

The proposed upgrade of the Concert Hall (Figure 4) identifies and addresses a number of important deficiencies, summarised as follows:

- To improve patron access to the Concert Hall auditorium and foyers as outlined in the SOH Accessibility Master Plan, 2015 and with specific reference to Section 8.4 Concert Hall.
- To improve performer and operational staff access to the back-stage areas and performer dressing rooms.
- To improve the acoustic performance of the Concert Hall for both acoustic and amplified music performances.
- To improve the technical and operational capability of the Hall to accommodate a greater diversity of performance modes, improve safety for SOH staff and visiting hirers, and reduce the time required for set-up and change over between performance modes.
- To improve patron and performer comfort.

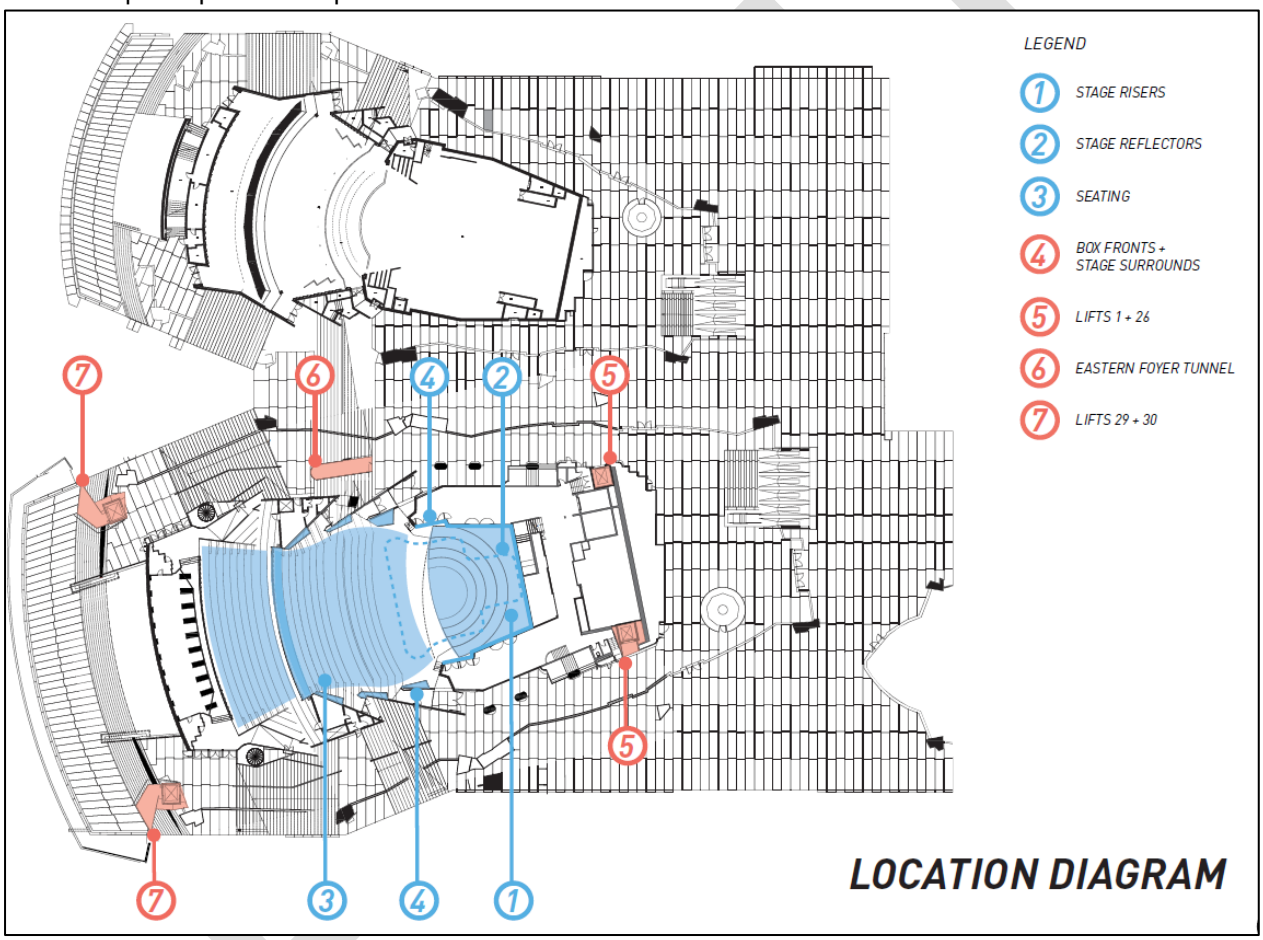

Figure 4 - Concert Hall Upgrades (Source: ARM Architecture)

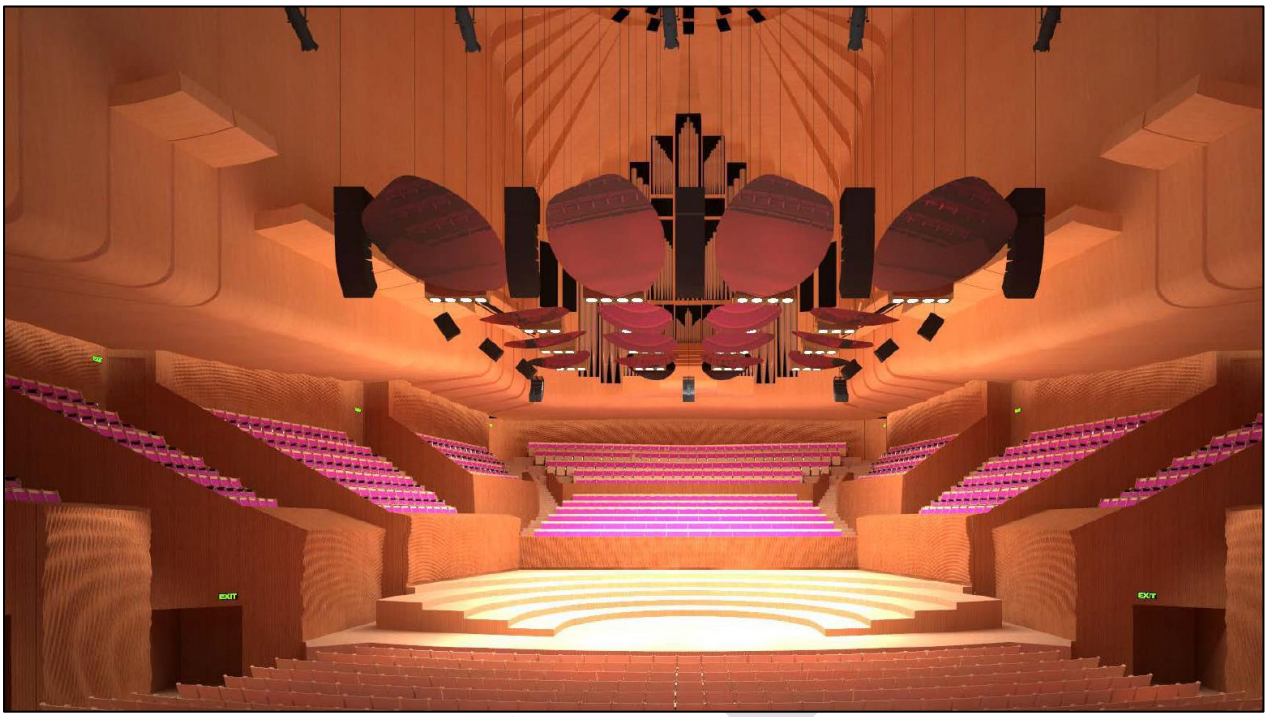

Figure 5 - Concert Hall Interior – new acoustic elements (Source: ARM Architecture)

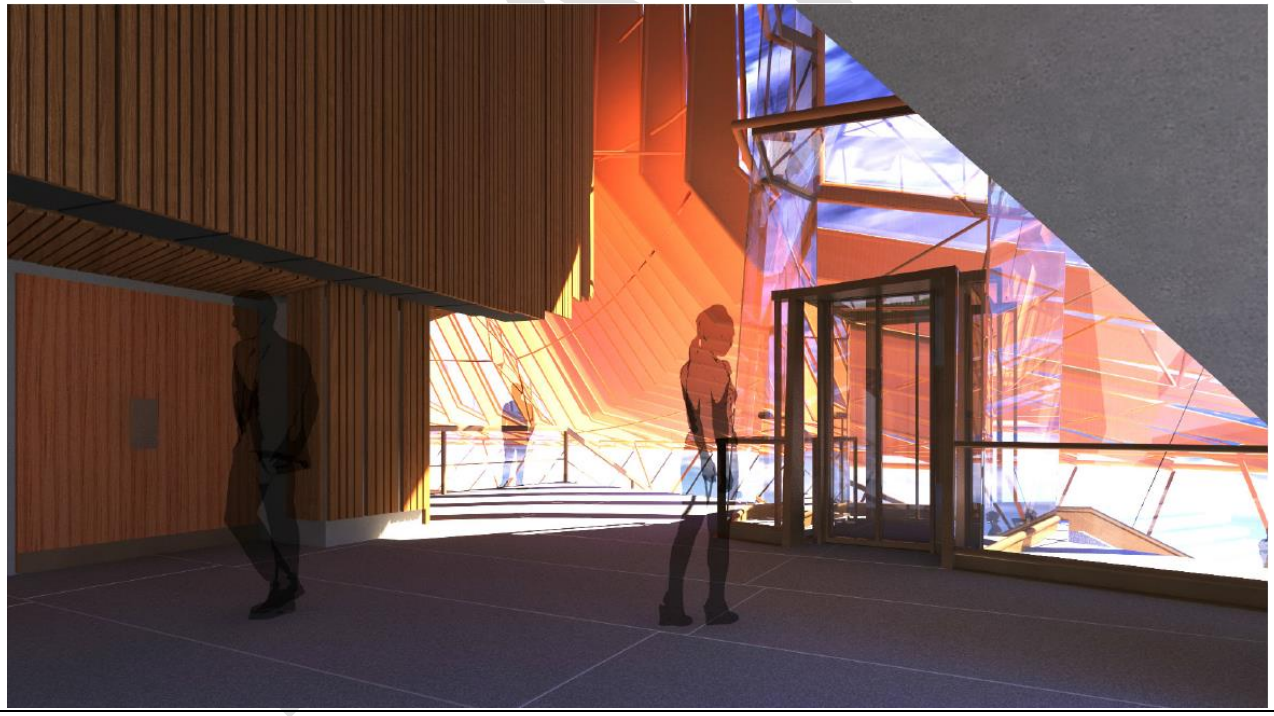

Figure 6 - Level 4 Lift 30 entry (Source: ARM Architecture)

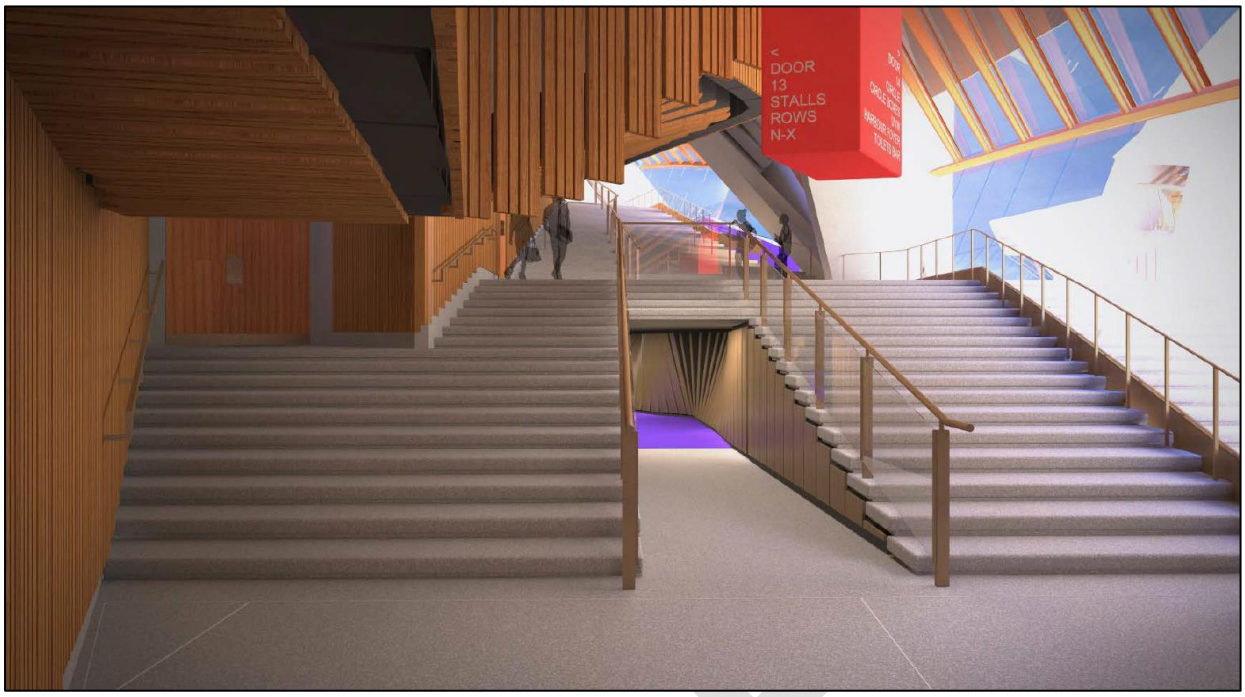

Figure 7 - Eastern Foyer passageway (Source: ARM Architecture)

2.5 Creative Learning Centre

The main Creative Learning Centre (CLC) space (designated previously as offices and meeting rooms) will be configurable into three smaller spaces and take advantage of an adjoining kitchenette, children's toilet facilities and storage. (Figure 8)

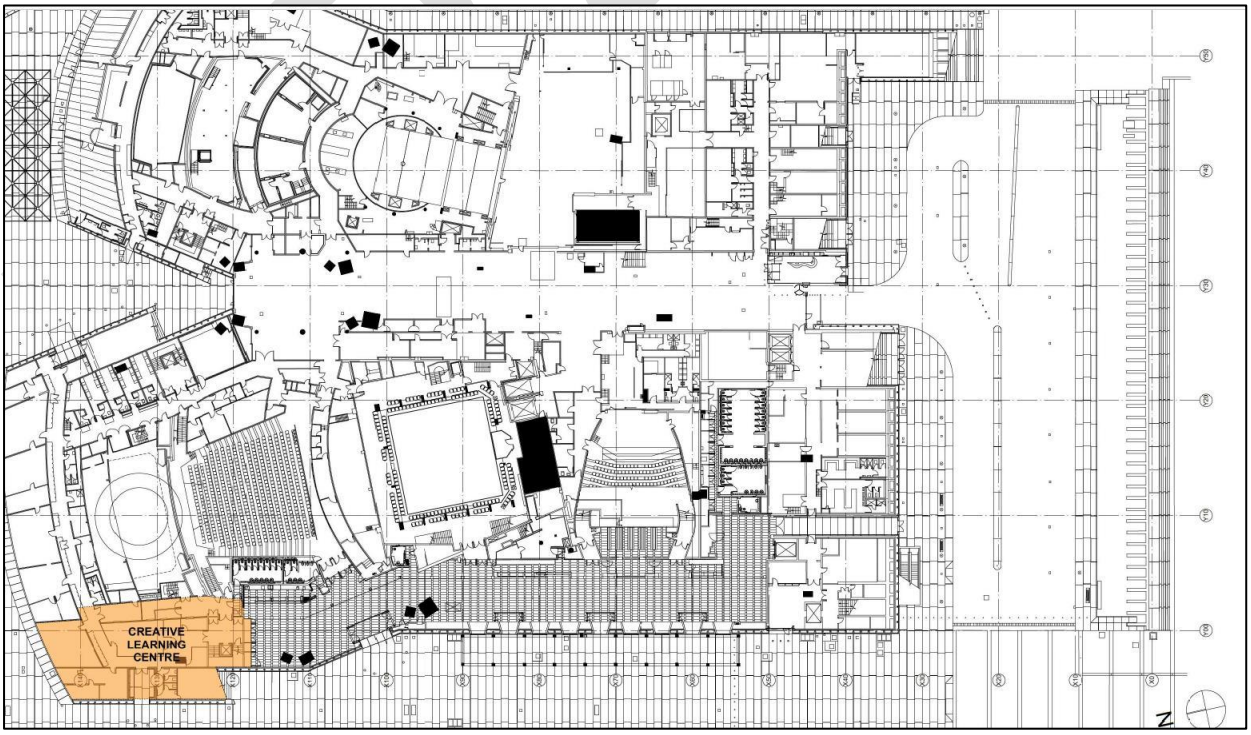

Figure 8 - Creative Learning Centre location plan (Source: TZG Architects)

The CLC will effectively extend the Western Foyer to the north and provide the future possibility of better connection to the front of the building. The project incorporates the following items;

- Transform existing office space in the building's north-western corner into a permanent home for the Opera House's world-renowned Children, Families and Creative Learning Program;
- Host workshops run by artists, Opera House resident companies and creative-learning specialists to inspire young people, from ages five to 18;
- Use the latest digital technology to allow students from Punchbowl to the Pilbara to work with artists in programs spanning drama, music, maths, science, literature, history, Indigenous Australia and other study areas;
- Enable students to work together wherever they are to foster creativity, problem-solving and innovative thinking skills;
- Teach students how to create their own broadcasts; and
- Offer activities for families on weekends with talks, performances and programs designed to give children a rich artistic experience and push their creative boundaries.
- The CLC is located on the north-west corner of the Opera House. The CLC is proposed to have direct access off the Western Broadwalk (as is currently the case) as well as from the Western Foyers.
- The CLC is entirely contained within the existing building with no proposed changes to the façade.

Figure 9 - Creative Learning Centre – external view of digital learning exhibition space (Source: TZG Architects)

3 SITE CONDITIONS

3.1 Existing Buildings & Neighbours

Across the harbour 750 metres to the north is one of the city's most established and affluent neighbourhoods of Kirribilli, which is part of North Sydney Council LGA.

Across the Quay 500 metres west is the overseas passenger terminal and "The Rocks".

To the south 300 metres is Circular Quay, Government House, commercial office space, residential apartments and hotels.

1.2km to the east across the harbour is Garden Island, Woolloomooloo Finger Wharf and Potts Point

RMS, Sydney Ferries and private companies operate within the harbour.

Figure 10 - Map Indicating Location of Neighbours

3.2 Existing Utilities & Providers

In the event that any service is required to be shut down or is damaged, the direct contact for these is the Sydney Opera House Building Operations who are available 24/7 on 02 9250 7979.

(a) Power

Power to the SOH has recently been upgraded inclusive of a new 11kva substation and main switchboard.

The chamber substation is owned by Ausgrid and power reticulation is managed and operated by SOHT.

The reticulation within the SOH precinct is managed by SOHT and metered to all of the various tenants.

The existing power supply capability is sufficient for the intended scope of works inclusive of temporary works.

(b) Water

The incoming main is owned by Sydney Water. The reticulation of water supply is managed and operated by SOHT.

(c) Sewer

The outgoing sewer main is owned by Sydney Water. The discharge of sewer and trade waste is managed and operated by SOHT.

The existing sewer system goes to a number of pumping stations.

(d) Stormwater

The outgoing stormwater main is owned by Sydney Water. The discharge of stormwater to the main is maintained by SOHT.

The existing building rainwater system drains to a central gross pollutant trap (GPT) and then into Sydney Harbour.

(e) Gas

The incoming main is owned by Jemena. The reticulation of gas supply is managed and operated by SOHT within the SOH precinct and is metered to all of the various tenants.

(f) Telecommunication Providers

Telecommunications reticulation is managed and operated by SOHT.

Telecommunications feeds come into a central MDF where it is then reticulated to the various users within the precinct.

3.3 Contamination and Hazardous Materials Risk Assessment

The Sydney Opera House (SOH) was constructed between 1959 and 1973 at a time when it was common for building materials & products to contain some asbestos, PCBs, lead and chromate paints.

SOH keeps a detailed register of Asbestos, PCB's, lead and chromate paint, which is updated regularly for WHS and compliance purposes.

In 2013, Hibbs & Associates Pty Ltd conducted a “whole of House” survey of the Sydney Opera House (SOH) to identify the typical locations and applications where asbestos products have been used. A further update of this asbestos register was carried out in 2017 for the Concert Hall.

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Further detailed survey work is currently in the planning phase to update the current asbestos register and will include survey results for other hazardous materials such as PCB's, lead and chromate paints specific to the Concert Hall.

A Construction Environmental Management Plan (CEMP) will be prepared prior to the works commencing. This report will include the current Hibbs Report and register.

The Concert Hall is one of two main theatres located on the western side of the Sydney Opera House (SOH). The hazardous material assessment was requested and authorised by Mr Dean Jakubowski of SOHT. The Concert Hall is going to have a major upgrade of the stage area and technical zone above the ceiling, both of which will include removal of services, winches and equipment.

With the knowledge that the Concert Hall has asbestos containing materials and potentially lead and / or chromium paint systems; samples will be collected to determine (i) asbestos, (ii) lead and (iii) hexavalent chromium in settled dust on surfaces. The principal objectives of this assessment will be:

i. To evaluate the potential health risk to the workers and personnel at the SOH during the upgrade works, and

ii. To determine if additional procedures are required either (i) during the demolition/upgrade works or (ii) prior to the demolition and upgrade programme commencing.

This resultant report will contain an updated Asbestos Register and Hazardous Materials Register for details on other asbestos containing materials, polychlorinated biphenyls (PCBs) in light fittings, and lead/chromate paint systems within the Concert Hall.

A current HAZMAT register will be required prior to works commencing.

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4 CONSTRUCTION

The following construction methodology and associated details and procedures are indicative and will be refined by the Principal Contractor(s) engaged to undertake the projects prior to commencing construction. This methodology has been prepared by SOHT to provide a basis for assessment of the environmental impacts of the project.

4.1 Site Delineation and Hoardings

The project will use construction hoardings in order to delineate construction zones and provide a consistent look and feel to works.. Additional hoardings will be provided as required to the external Broadwalks for the Creative Learning Centre works and the southern foyers for the Concert Hall works to separate construction works from members of the general public, and SOH staff, contractors and performers. Where required these hoardings will be acoustic to assist with noise control, this will be determined in consultation with the contractor and the noise impact assessment, undertaken by Arup.

Conditions relating to the use of hoardings at the SOH include:

- No third party advertising permitted on the hoarding/ fencing
- Construction Site Manager shall be responsible for the removal of all graffiti from any construction hoarding/fencing or the like within the construction area within 48 hours of its application.
- Coconut husk colour
- Digi locks and door closers to the hoarding doors
- Maintenance of hoardings on the subcontractor works

The probable location of external hoardings and works areas are shown in Figure 11.

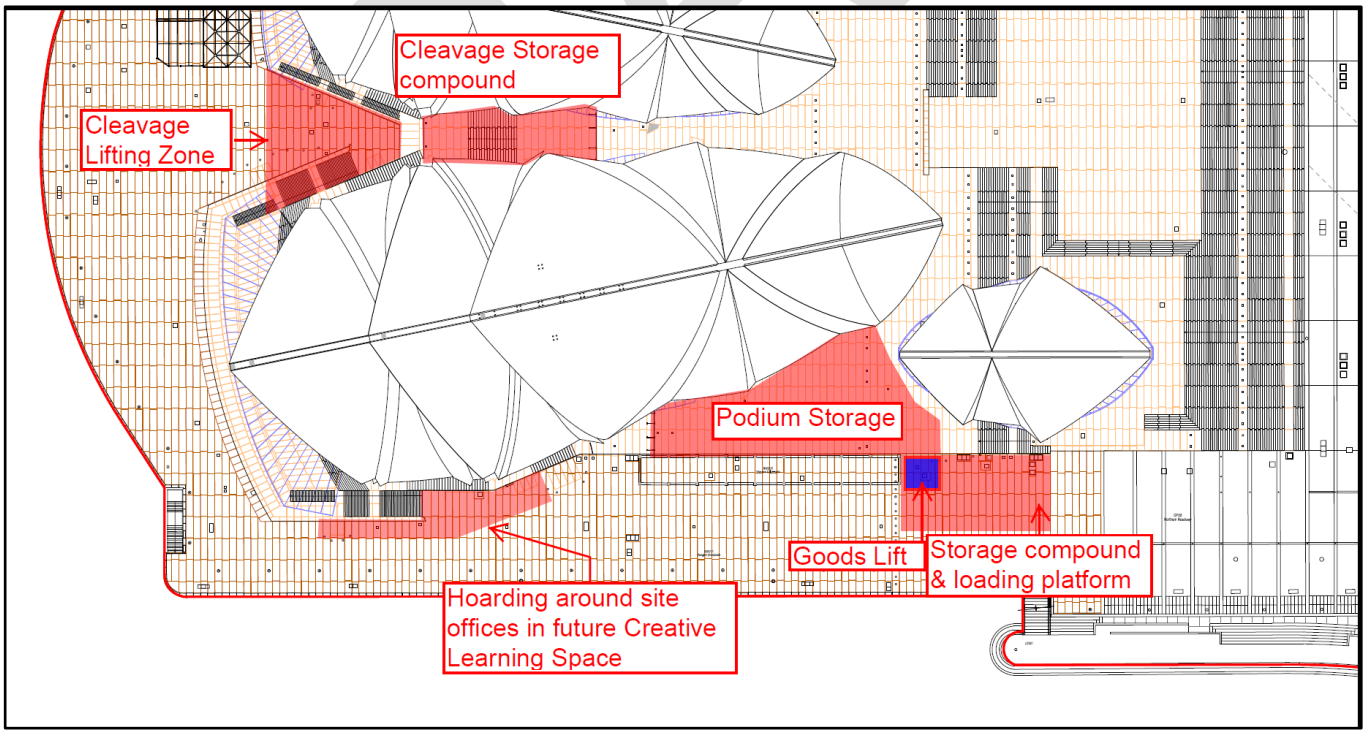

Figure 11 - Location of external works areas and hoardings

4.2 Removal and Protection of the Works

All the finishes within and around the SOH are World Heritage listed. The Building & Heritage Committee (BHC) provides assistance to the SOHT by overseeing and monitoring building, renewal, conservation and heritage matters at the SOH.

A separate temporary protection package is yet to be scoped up and will include the following:

- Floor and wall precast
- Joinery
- Flooring
- Glazing
- Furniture, Fittings & Equipment

(a) General Protection

This section outlines the general protection to the existing finishes and structures of the site. Protection specific to the various Projects will be outlined in each Project's individual scope of works. This protection is required to preserve the nominated heritage finishes and structure that is found omnipresent in all work areas. General Protection, which will be present for all stages of construction during the construction period, is described as follows. All protection specified below is deemed by SOHT as suitable for the protection purposes based on approved measures used for earlier works.

Protection of Level B4 Loading Dock Corridor Walls

- 1200mm high plywood along the length of the corridor

Protection of Lifts

Lifts which will be heavily used during construction will be protected with:

- Plywood hoarding to internal lift walls
- Plywood floor protection
- Plastic Adhesive Layer to lift doors
- Lift Frame Door Bumpers, either plywood or foam bumpers

Protection of Precast Concrete Panels

- Plywood and Rubber Matting and/or Astroturf

Protection of Brush Box Timber Walls

The outer acoustic walls of the Concert Hall are clad with brush box timber finish. These are heritage listed and will not be removed during construction.

- 1800mm high corflute cladding

Construction on trolley way

To prevent general carelessness and bumping of loads into brush box walls and glass panels, the construction of a 2400mm wide trolley way with edging to sit on top of rubber/ astroturf protection.

Protection of Miscellaneous Signs and Doors

Protection of highly trafficked Doors and adjacent signs will have plywood boxing or corflute cladding.

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Protection of Wobbly Panels

Existing "Wobbly" wall Panels shall be protected. As these panels are heritage significant, 1200mm high plywood backed against full height hoarding will be provided. Where appropriate the Wobbly panels will be removed and stored during the construction period.

Protection of Mural in Northern Foyer of Concert Hall

The painted mural in the Northern Foyer of the Concert Hall, *Salute to (Slessor's) Five Bells* (John Olsen, 1973), is a significant heritage artwork in the Sydney Opera House, and must be appropriately protected during the works. The protection must protect the artwork from dust, and also maintain appropriate ventilation and humidity levels. A similar mural in the Northern Foyer of the Joan Sutherland Theatre was protected during the JST works, as shown in Figure 15.

Protection of the Grand Organ in the Concert Hall

The Grand Organ is an important heritage item within the Sydney Opera House. It is believed to be the largest mechanical-action pipe organ in the world. The Sydney Opera House will take advice from its organ maintenance contractor to develop an appropriate protection regime. The regime will be designed to protect the organ from dust ingress and to maintain an appropriate climate to preserve the organ's integrity. It will be the contractors' obligation to ensure that the protection is maintained and not damaged during the Concert Hall works.

4.3 Site Establishment

The Principal Contractor's project office will be located in the northern Ground Floor SOH offices under the Concert Hall, which will be transformed towards the end of the Concert Hall works programme into the Creative Learning Centre. (Figure 12)

The main site compound, housing subcontractor site offices, meeting rooms and welfare facilities, will be situated under the Monumental Steps. This is currently in place for the Joan Sutherland Theatre (JST) projects, but will be removed on completion of these. It will be re-established prior to the commencement of the Concert Hall upgrades. (Figure 13)

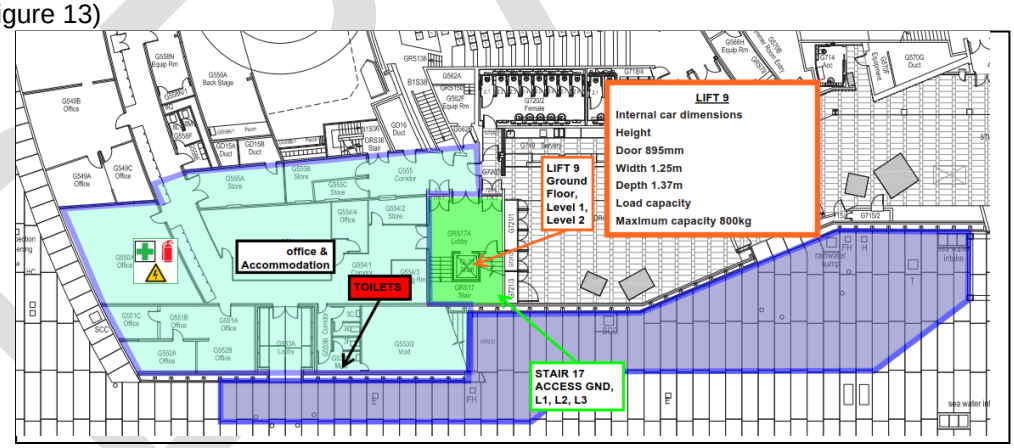

Figure 12 - Ground Floor Site Establishment & Access Plan

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Figure 13 - Proposed Vehicle Concourse Main Site Compound with Lunch Rooms, Change Rooms, Ablutions, First Aid and Decking Area (JST set up shown)

In addition to the above, the Principal Contractor will establish site offices and daily brief prestart area in the Concert Hall Northern Foyers. This will be similar to that established for the JST works as shown in Figure 14 and Figure 15.

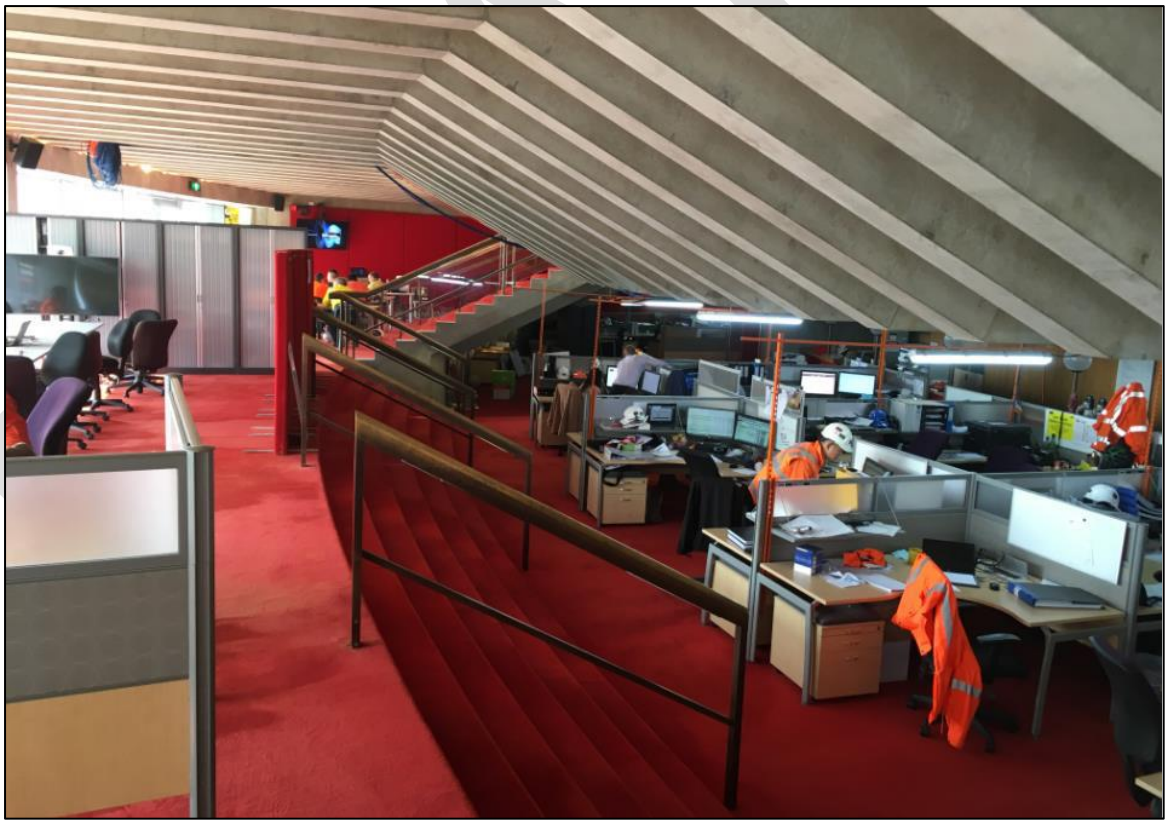

Figure 14 - Laing O'Rourke (JST) Site Office Located Level 2 Northern Foyer

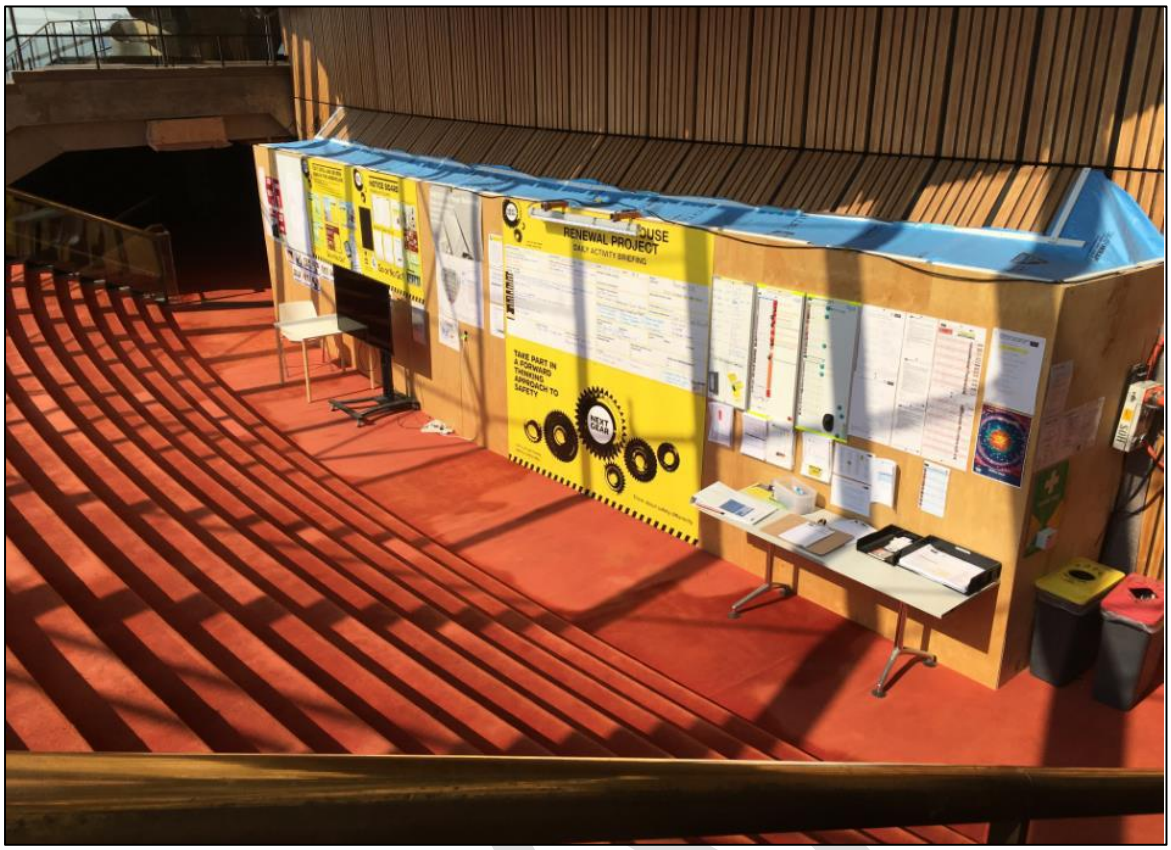

Figure 15 - Laing O'Rourke (JST) Daily Prestart Briefing Area in the Northern Foyer

4.4 Mobilisation, Enabling & Early Works

Initially, this will involve the modification and use of existing office spaces in the north-west corner of the Opera House (the future Creative Learning Centre). The ground level offices will be fitted out for the Principal Contractor's site office, a lunch room, change room and toilets. This will be a shared space between the Principal Contractor site staff and construction workforce for a short period until the main site compound under the Monumental Stairs is operational.

Access to the Principal Contractor's site office will be via the Western Broadwalk or, during adverse weather conditions and by exception, via the revolving door through G533 corridor adjacent to Stage door and along the marked route through Central Passage to LiftZ 22. It is noted that the Central Passageway must not be used as workforce path of travel as a normal course of construction.

These facilities will cater for the enabling and "Early Works" trades, potentially including:

- Hoardings & sheds
- HAZMAT removal, wipe down and clearance certificates
- Demolition, winch removal & services strip out
- Temporary services & diversions
- Temporary protection works
- Steel strengthening

Estimated resources:

- 40 workforce over 2 shifts

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- 24 staff based within the Principal Contractor's site office

4.5 Hours of Work

The hours of work shall be confirmed upon approval of the separate Development Application (DA3 - SSD 8663) for these projects. There are separate DA approvals for earlier and current projects. The DA consent has been obtained for the JST SAVE projects (DA2 – SSD7665), and for the Ballet Rehearsal Room and Function Centre (DA2a – SSD7881), and for the purpose of this draft CMP, it has been assumed that similar conditions will apply regarding hours of work.

The DA's state work can be carried out within the confines of the SOH 24hrs a day 7 days per week however the following has to be considered:

Currently the delivery teams will consist of 2 shifts as follows:

- Day Shift - starts at 6:30am and finishes at 6:00pm
- Night Shift - starts at 10:30pm and finishes at 8:00am

Within these shifts noisy work patterns are as follows:

- 18:00-23:30 – Planning and quiet activities which are compatible with live performances occurring in other venues within the site;
- 23:30-10:30 – Noisier works which will otherwise be disruptive to Opera House operations but not audible outside of the building; and
- 10:30-18:00 – General construction/no major noise generating activities.

The above work day breakdown is reflected in the following diagram. Within these shifts noisy work patterns activities must be adhered to unless otherwise authorised by SOHT and the Principal Contractor.

Any changes to hours of work as per DA3 –SSD8663 will be updated upon notification by the SOHT of confirmed receipt of the Development Approval (SSD 8663).

The work pattern is also described in the following figure:

Sydney Opera House Renewal Project

WORK DAY BREAKDOWN

HRS	23:30	00:30	01:30	02:30	03:30	04:30	05:30	06:30	07:30	08:30	09:30	10:30	11:30	12:30	13:30	14:30	15:30	16:30	17:30	18:30	19:30	20:30	21:30	22:30	23:30
SHIFT RESTRICTIONS	23:30 - 10:30 Noisier works which will otherwise be disruptive to Opera House operations but not audible outside of the building, major materials handling, dust & vibration											10:30 - 18:00 General construction/no major noise generating activities								18:00 - 23:30 Planning and quiet activities which are compatible with live performances occurring in other venues within the site					
MONDAY																				NO WORK					
TUESDAY																									
WEDNESDAY																									
THURSDAY																									
FRIDAY																									
SATURDAY																									
SUNDAY	NO WORK																								

Figure 16 - Work Day Breakdown

Events

Due to the fact that the SOH has over 40 events a week occurring through the various venues there is a requirement for the principal contractor and SOHT to work closely when scheduling the construction works.

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All events, and the coordination of works are to be discussed at the weekly Operations meeting between SOHT Project managers, SOHT Business Integration Manager (BIM) and the principal contractor's Construction Manager.

Construction Works occurring within the work package will be communicated to SOHT via a Notification of Disruption (NOD), Contractor Access Form (CAF), weekly meetings or as otherwise required.

A NOD or CAF shall be submitted for all works to the SOHT's BIM and or Events Manager for approval a minimum of 7 days prior to the works commencing. Major events can be planned further out.

The BIM/ Events Manager shall notify all user groups of the intended works and then approve the works to proceed.

Special consideration is given to the NSW Government who can overlay events on short notice with no right of veto from the SOHT

Major events that need coordinating and close monitoring within the "dark period" will be planned in advance in accordance with scheduling similar to that adopted for the JST Theatre Machinery Project.

SOHT will provide weekly to the principal contractor an Activity Schedule for events being held within the house and a summary of notes.

4.6 Traffic and Pedestrian Management

SOHT has prepared a Construction Pedestrian & Traffic Management Plan (CPTMP) for the renewal projects undertaken so far. This plan will be reviewed and updated where necessary for the projects subject of DA3 – SSD8663.

The CPTMP will include the following parameters.

Any public road surrounding the SOH precinct used by construction traffic must not be used as a waiting area for vehicles delivering to or awaiting collection of any persons, materials or plant.

Traffic and pedestrian management strategies, as communicated through the CPTMP, will need to be approved by the Certifying Authority prior to the Crown Building Works Certificate(s) being issued for the works. Whilst there are no conditions for DA3 works at this stage, it is implicit that the same conditions of approval for earlier approved projects regarding traffic and pedestrian management will be applicable to the DA3 works.

Site access, construction zones, truck movements and other particulars of the traffic management for the project will be discussed in the CTMP.

Key points to note are:

- Work zones will be established on the Northern and Western Broadwalks, and the Vehicle Concourse;
- The main access into site will be via Macquarie Street.
- Truck movements are restricted to designated truck routes to the basement and across the Forecourt;
- Access to neighbouring properties will be maintained at all times;
- Traffic controllers will be in place to direct construction traffic to and from the site; and
- All signage fencing, overhead protection, safety barriers and line marking details will be in accordance with Australian Standards and the Roads and Maritime Services' Manual for Traffic Control at Work Sites.

The Sydney Opera House maintains defined area loading limits for both external and internal areas. Vehicular traffic to each of the construction zones will need to be managed in accordance with these limits. The event loading diagrams are shown in Figure 17 (Podium Level) and in Figure 18 (Ground Level).

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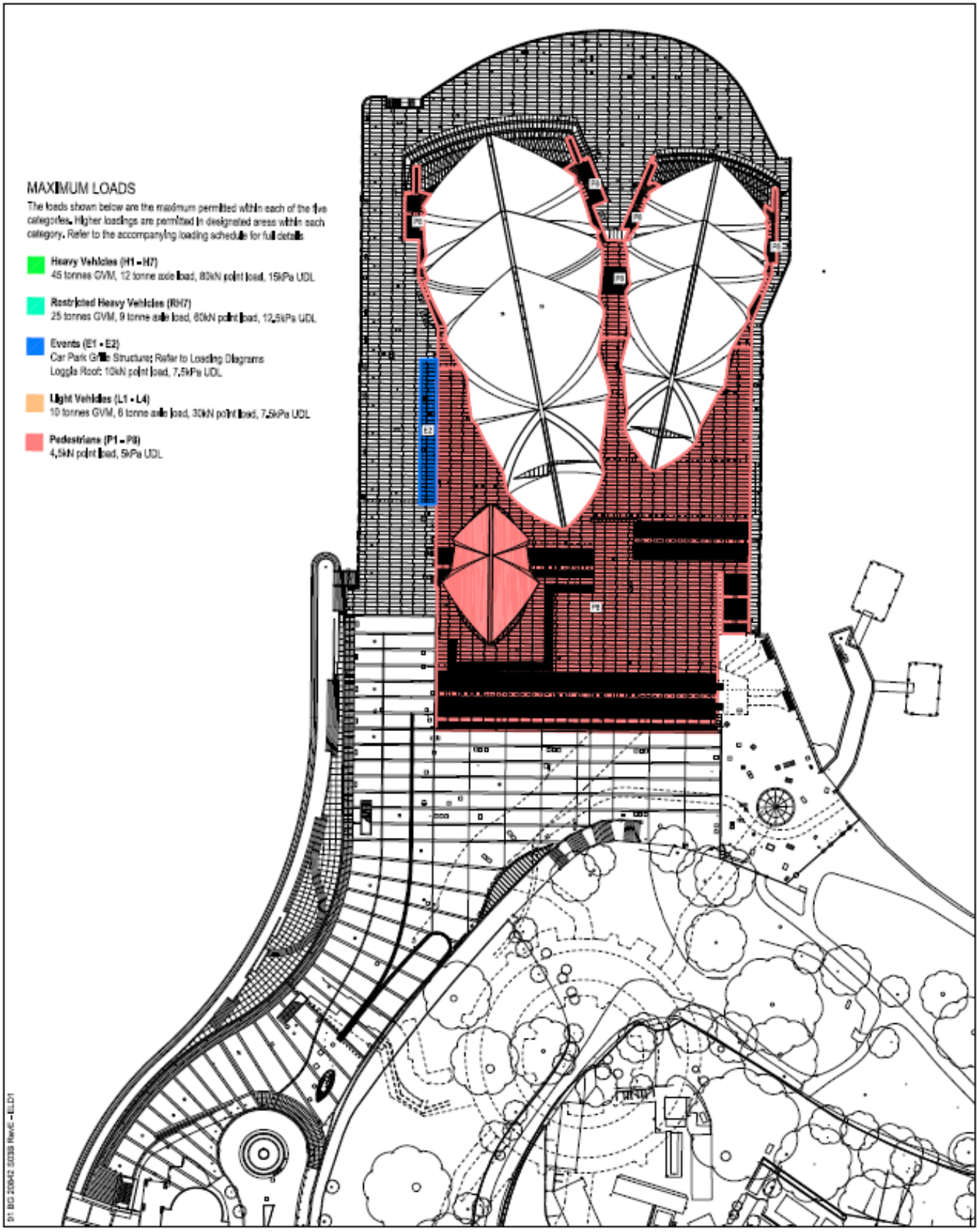

Figure 17 – Event Loading Diagram – Podium Level

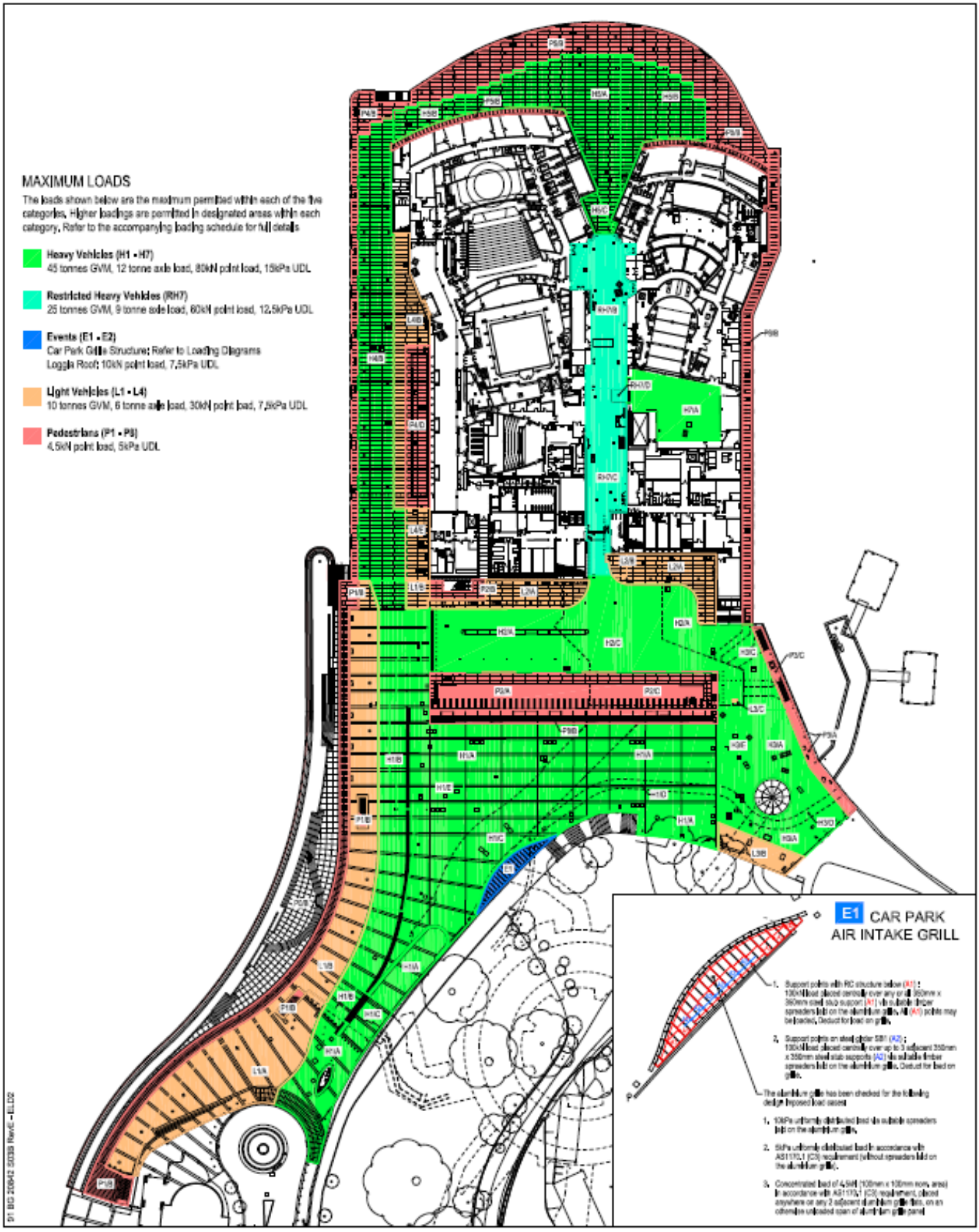

Figure 18 – Event Loading Diagram – Ground Level

Due to the close proximity of a variety of public transport modes to the site and the constrained nature of the work space no parking will be provided on site for staff at any time. Space will be provided for the storage of tools and materials required by trades and as such staff will be encouraged to deliver tools to site initially and then travel to site by bus, train or ferry. Site staff and sub-contractors will not be permitted to utilise parking in the immediate vicinity of the site to reduce impact on the local community.

Traffic Control Plans (TCP) will be developed in line with the intent and direction of the CPTMP and specific to the activities occurring while the TCP is in place.

4.7 Construction Methodology

The project works are described in the following components:

- Concert Hall Upgrades
- Creative Learning Centre

(a) Concert Hall Upgrades

The various components of the Concert Hall project are outlined within this section with the following summary programme showing the various phases of construction and the programmed duration for each phase.

The Concert Hall Upgrades project has the renewal of the overhead theatre machinery system and acoustic upgrade to the hall as it primary focus. Implementation of these highly specialised components will require closure of the Concert Hall for a period of approximately 18-24 months; therefore the following describes the proposed scope of works during the closure (or dark) period:

- *Acoustic upgrade (unamplified)*
    - Adjustable over stage and downstage reflectors
    - Adjustable side wall reflectors
    - Profiled stage surround, box fronts and circle front
    - Upgrade to air conditioning within the Concert Hall to provide quieter background acoustic levels and improved thermal comfort to the audience and musicians on stage
- *Acoustic upgrade (amplified)*
    - Automated absorption (curtains / drapes) over the stage, and box fronts, and manually applied to the stage surround, the side walls and to the rear walls.
    - New sound system.
- *Concert Hall stage and back stage*
    - Lowered stage height and alignment of stage and rear stage floor level
    - Enlarged stage area
    - Automated and adjustable stage risers
    - Enlarged prompt and off-prompt wings
    - Additional downstage wing entries
    - Enlarge rear stage assembly area
    - Removable stalls level to stage stair access
    - Part removable and part automatic stair access from stage to choir stalls
    - Automated removal and under stage storage of forestage seating (rows A & B)

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- Creation of two new musician rehearsal rooms at Ground Mezzanine level

- *Concert Hall accessibility*
  - On-grade access from Level 2 Southern Foyer to Level 2 Northern Concert Hall Foyer via new passageway within the Eastern Foyer stairs
  - Wheelchair accessible lifts from the east and west at Level 2 of the Northern Foyer to Level 4 Concert Hall entries including access to the intermediate levels of the Northern Foyer (Levels 2A, 3 and 3A) (Lifts 29 & 30)
  - Increased number of available wheelchair positions (up to 34 in total) within the Concert Hall located at stalls level (up to 14), rear of the circle (up to 6) and rear of side boxes A, B, C, U,V & W (up to 14).
  - Improved mobility access and wet area facilities to the performer dressing rooms at Level 1
  - Introduction of two new accessible toilet facilities at Level 3 in the Northern Foyer
  - Additional handrails proposed to the centre of the Eastern and Western Foyer stairs
- *Concert Hall technical upgrade*

  To accommodate a wider range of acoustic and amplified music performances the following upgrades are planned:
  - Expansion and consolidation of the available winching capacity within a dedicated winch room above the Concert Hall ceiling
  - An expanded theatre technical zone above the Concert Hall ceiling to allow improved and safer access to implement and adjust technical equipment required to operate the greater variety of performance modes
  - All new winches, theatre equipment and control systems
- *Regulatory improvements*
  - Upgrade of the smoke exhaust capacity for the Concert Hall
  - Refurbishment of some of the existing seats to ensure compliance with statutory fire indices
- *General builders work*
  - Works to the following areas including removal of hazardous material, demolition, removal of redundant services, temporary structural propping, modifications to existing structure and installation of new structure, alteration of existing services and installation of new services and making good finishes:
  - Upgrade of existing steel structure above ceiling and conversion of existing Plant Room 21 into the new winch room to support and house the new theatre machinery and relocated HVAC equipment;
  - Reconstruction of the existing stage, stage wings and choir stalls;
  - Creation of the Level 2 Eastern tunnel and Northern Foyer lifts
  - Miscellaneous areas such as toilets, dressing & rehearsal room upgrades. The majority of the upgrades must be completed within the closure “dark” period for the Concert Hall (currently planned for February 2020 for 18 to 24 months). It is acknowledged that it may be beneficial for some works to be carried out during an Early Works period prior to closure and certain elements of theatre system commissioning may continue post “dark” period.
- *Access & Establishment*

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- Materials access into the work area for the Concert Hall will be primarily via the B4 loading dock to lift 22
- Secondary material access will be via the western podium and northern cleavage area

- *Materials Handling Access*
  - Currently it is planned to have the following types of external materials handling access:
  - Crane Lift Zone – North and West within agreed locations lifting to the upper podium (L2), cleavage area (L2) and northern loading platforms (L3 & 4).
  - Existing Internal lifts 22, 09, 07, 01
  - Electric forklifts, electric pallet trolleys to all areas.
  - New bespoke materials hoists on both the eastern and western sides accessing from Level 2 foyers up to the Plantroom 21 level utilising existing guide rails.
  - Full birdcage scaffold within the auditorium with internal man & materials hoist access from the stage to the tech zone
  - Various rolling beams and powered hoists at various positions within the auditorium and technical zone
  - Conveyor belts to remove demolition materials to external areas for removal

(b) Creative Learning Centre

As an overview these works include:

- Typically medium/ light demolition works will be undertaken to remove the internal dividing walls within existing offices spaces. This also includes introduction of set downs in concrete slabs for inclusion of wet areas.
- Any existing heritage items, such as the Peter Hall 'wobblies', will be retained in order to be re-used as part of the fit out works and also other Renewal projects.
- Typically light construction of new space locations therefore no heavy machinery required, i.e. mobile accessible work platforms etc required.
- Services will be required to penetrate the structure to service re-configured wet areas however this is generally small in nature and low impact.
- The existing entry lobby on the western façade will be retained however the granite pavers regraded and doors relocated to create an entry lobby.
- Existing fit out items and original structure will be retained or reused to take into consideration heritage requirements.

Typically works will be carried out with light/ medium construction methods to protect the façade and other internal elements. Externally works will be limited to amendments to the western entry lobby, the only interface point with the general public.

4.8 Construction Duration and Timing

Work elements will be completed during other concurrent works (associated with Renewal);

- Concert Hall Upgrades are proposed to be built after the Joan Sutherland Theatre works and Function Centre works are complete (early 2019) and will commence in February 2020.
- Stage 1 of the Creative Learning Centre construction (demolition and structural) is proposed to be built prior to the Concert Hall works commencing.

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- The fitout of the Creative Learning Centre (Stage 2) will be undertaken after the Concert Hall is complete.

Throughout the construction of these works it is proposed that the other functions around the House continue to function with as little disruption as possible. To facilitate the daily operations of SOH noisy work shifts will be scheduled overnight, wherever possible.

To achieve the works within planned closure periods for the theatre and to mitigate disruption to the ongoing operations of the Opera House the works will be undertaken 24 hours a day 6 days a week (and up to 7 days a week if required) in the following shift pattern:

- 17:30-23:30 – planning and quiet activities which are compatible with live performances occurring in other venues within the site
- 23:30-10:30 – works which would otherwise be disruptive to SOH operations
- 10:30-17:30 – no major noise but general construction, allowing daily SOH operations (i.e. matinee's)

This proposal to work 24/7 in controlled shifts, outside standard construction hours, is consistent with previous approvals granted for works on the site and is crucial to the delivery of the project within the closure timeframe.

The delivery and collection of building materials and equipment will be managed so as not to unreasonably impact on the amenity of the patrons of SOH and the surrounding neighbours. The works will be completed in accordance with City of Sydney Code of Practice for Construction Hours/Noise 1992 and Australian Standard 2436-2010 Guide to Noise Control on Construction, Maintenance and Demolition Sites.

4.9 Construction Noise Management Plan (CNMP)

The SOHT recognises noise issues affecting nearby neighbours during external works. Therefore Arup have been engaged to provide direction during the design phase on the implications of construction works on nearby neighbours, refer to the Noise Impact Assessment completed by Arup.

The Opera House will enforce that the Principal Contractor identifies mitigation measures for external construction work in a Construction Noise Management Plan (CNMP) prior to works commencing on site.

Noise Mitigation:

This CNMP will consider, as a minimum, all mitigation proposed by Arup in their Noise Impact Assessment. This includes:

- CNMP to be reviewed by SOHT and their noise consultants prior to approval and implementation on site
- CNMP will be audited by SOHT during construction
- The Principal Contractor will also be required to coordinate the Renewal Program to avoid cumulative effects of concurrent construction projects
- The Contract with the Principal Contractor will include a clause allowing SOHT to disallow any equipment that it considers to be excessively noisy
- Where the Arup Noise Impact Assessment identifies potential exceedances of the Noise Affected Level (NAL) the Principal Contractor will be required to develop mitigation measures which reduce the NAL or program the works, around SOH daily activities in order to remain within the proposed noise affected level
- Only in extreme circumstances will SOHT allow exceedances of the proposed noise affected level, as allowed in the *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009)

Noise Monitoring

A noise logger will be installed and maintained which can be interrogated remotely by SOHT staff as well as SOHT's Contractor. The logger will also be required to automatically send a text message to SOHT's Contractor's representative on site once the 'warning' threshold is breached. The SOHT representative on site during the works will also be copied in with the warning texts.

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The following noise limits will be applied:

Receiver	Time Period	Warning level, $L_{Aeq(15min)}$	Maximum Level, $L_{Aeq(15min)}$
Bennelong Apartments	Day (standard hours)	65 dB	68 dB
	Day (outside hours)	60 dB	63 dB
	Evening	59 dB	62 dB
	Night	50 dB	53 dB
Kirribilli	Day (standard hours)	61 dB	64 dB
	Day (outside hours)	56 dB	59 dB
	Evening	54 dB	57 dB
	Night	48 dB	51 dB
Potts Point	Day (standard hours)	58 dB	61 dB
	Day (outside hours)	53 dB	56 dB
	Evening	53 dB	56 dB
	Night	47 dB	50 dB

The maximum level has been developed by Arup (Refer Noise Impact Assessment May 2018) though the process outlined by the Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009), as applicable for State Significant Developments.

Should any complaints be received that cannot be resolved by cessation of works, attended acoustic monitoring will be undertaken to validate the remote logger data and address specific work practices and locations to better alleviate noise complaints from that particular activity. Following identification that all noise levels have returned to being below the above maximum levels the monitoring will revert back to remote monitoring.

Notification to Residents

The SOHT will manage the notification of nearby residents which informs them of the nature of the works, the duration and the extent of works being undertaken. 24hr contact details will be provided to allow complaints to be logged and addressed as soon as possible by the SOHT and the Principal Contractor.

4.10 Workforce

The size of the workforce is dependent on the specific construction methodology and sequencing employed by the Principal Contractor engaged to undertake the works and is unable to be identified at this stage. An indicative peak construction workforce is estimated to be approximately 200 persons.

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4.11 Construction Equipment

A definitive list of proposed construction equipment is not currently available as this would be dependent on the specific methodology and sequencing used by the Principal Contractor engaged to undertake the works. The following is an indicative list of the equipment that may be used during construction:

- Jackhammers
- Concrete saws
- 2.5 tonne electric forklifts
- Mobile cranes:
  - 130t all terrain mobile crane
  - 40t mobile crane
  - 22t mobile city crane
- Semi-trailers for delivery of materials and removal of redundant equipment
- Dump trucks for removal of rubble
- Concrete trucks
- Concrete pumps
  - Concrete will be pumped horizontally and vertically using a mobile line.
  - The line will run to the following locations:
    - Central Passage to the various work faces
    - Northern and Western Broadwalk to level 2 tunnel via concrete boom pump
    - Monumental Steps
    - Vehicle Concourse
  - Notification of concrete pumping needs to be given to SOHT so it can be communicated to the user groups.
  - Concrete pumping shall be done after hours. The pump would be set up within Central Passage with the northern and southern roller doors opened for ventilation. A security guard would be in place at each of these roller doors.
  - For the cleanup for concrete pumping a service such as Pumperdump will be utilised. No concrete pump washout is to be done on site.
- Concrete vibrators
- Cherry pickers and elevated work platforms
- Hand power tools
- Elevated work platforms

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4.12 Construction Impacts

(a) Safety and the Public

The Opera House is to continue operations as normal during the construction period. The majority of the works will be confined within the building envelope. Where public areas are affected by the works such as on the Northern Broadwalk with the Creative Learning Centre they will be enclosed by construction hoardings and sealed off from public access.

The successful contractor will be required to address the detailed requirements of circulation and pedestrian interfaces with the construction work faces throughout the program of works.

(b) Circulation Impacts

This package of works is largely contained within building envelope and therefore interface and effect on circulation for the general public should be minimal. It is a priority of the Opera House to ensure the public, SOH staff and performers are safe throughout and will be a key factor in the staging and planning of construction activities.

Deliveries and removal of materials will be mainly via the new underground loading dock, which will not be affected by the proposed works. It is envisaged that wherever possible the loading dock will be used for construction deliveries and to supply the site with materials/ equipment. The exception to this approach will be for oversized items which will be managed via delivery across the Forecourt. In order to limit the impact on circulation and pedestrians it is anticipated that these works will be completed overnight.

(c) Pedestrian Access

Ensuring the safety of the public, SOH staff and performers will be a key factor in the staging and planning of construction activities. The works are largely internal and therefore the interface with pedestrians should be minimal.

The Western Broadwalk is likely to be affected by the installation of the western entry doors into the Creative Learning Centre. It is proposed that appropriate hoardings will be installed to ensure ongoing access to these areas of the Opera House. It is however anticipated that the Northern and Western Broadwalks may need to be closed for safety reasons at some stage of the construction. These closures will be kept to a minimum and/or done overnight to facilitate public access around the building.

Prior to commencing construction the Principal Contractor engaged to undertake the works will prepare a fully detailed works staging strategy which addresses appropriate access and circulation impacts which ensures safety of public and patrons.

(d) Noise and Vibration

Noise and vibration associated from the works will be mitigated in consultation with the Principal Contractor and the acoustic consultant (Arup), and measures such as discrete construction techniques (i.e. cutting rooms), isolation by acoustic hoardings and off site manufacture will all be explored to limit impacts of noise and vibration on the SOH site or its neighbours.

An initial assessment of the construction noise impacts associated with the works has been completed by Arup in August 2016. It proposed the following mitigation measures;

- Regularly train workers and contractors (such as at toolbox talks) to use equipment in ways to minimise noise
- Ensure site managers periodically check the site and nearby residences for noise problems so that solutions can be quickly applied
- Avoid the use of radios or stereos outdoors during works

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- Avoid the overuse of public address systems
- Avoid shouting, and minimise talking loudly and slamming vehicle doors, especially during night time works
- Use non-“beeper” reversing/movement alarms such as broadband (non-tonal) alarms or ambient noise-sensing alarms
- Turn off all vehicles, plant and equipment when not in use
- Use residential-grade mufflers on plant
- Ensure all doors/hatches are shut
- Conduct work behind temporary hoardings/screens wherever possible. Site hoardings should be located as close to the noise source as possible, and should be as high as feasible considering the structural support of the hoarding. Site hoardings may not be effective at screening noise to upper floors of sensitive receivers, but can be an effective noise mitigation measure for receivers located on lower floors.
- Provide resilient damping material on bin trucks or receptacles to minimise impact noise from materials loaded on truck
- Avoid metal-to-metal contact on equipment wherever possible
- Fit mufflers/silencers to pneumatic tools (e.g. breakers)
- Use dampened bits on impulsive tools such as jackhammers to avoid “ringing” noise
- Avoid dropping materials from height
- Use of concrete pulverisers or “munchers” as a lower-noise alternative to concrete breakers

These measures are considered reasonable and prior to commencing construction the Principal Contractor will be required to prepare a Construction Noise and Vibration Management Plan and determine where noise and vibration loggers will need to be placed to monitor construction activity. The engagement of a consultant will be considered to provide ongoing monitoring throughout the construction.

(e) Access and Traffic

Vehicle movements will be within standard construction hours (7am-6pm), however some vehicle movements may occur outside of these times. The impact of traffic on Macquarie Street being limited to construction deliveries and removals. There will be no contractor parking provided on site, with contractors directed to public transport or the nearby Opera House carpark. Note there will be no standing of construction vehicles along Macquarie Street; this will be monitored by the Opera House gatehouse.

All deliveries and removals from site will be via the underground loading dock, accessed from Macquarie Street, with the exception of oversized items. Oversized items which will be delivered to the site will be undertaken at off peak periods (i.e. overnight) at time periods agreed with the contractor and the SOH facilities.

The Principal Contractor will be required to produce and adhere to a Traffic Management Plan which will have the following headline requirements;

- Vehicle movements on the Forecourt will be managed by accredited traffic controllers.
- Vehicle movements will be separated from the general public to ensure minimal interface with pedestrians across the site.
- Large deliveries and vehicle movements will be managed through a process, such as disruption notice, which is to be approved by SOHT prior to large vehicle movements/ deliveries. This will also help to coordinate ongoing activities within the House.

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General public access will still be maintained via the vehicle concourse, via controlled entry at the gatehouse, for the duration of the works to provide less mobile person's access to the site.

A breakdown of the forecast construction vehicle movements for the project is included below in Figure 19.

TIME OF DAY	ICNG TIME OF DAY		Proposed Construction Traffic (note traffic movements are not cumulative)
22:00	**NIGHT** OUTSIDE HOURS 22:00-07:00		Approximate Traffic Movements: 1-3 Limited to oversize deliveries, to accept deliveries onto SOH Forecourt where vehicles are Oversize/ Overmass (in accordance with RMS requirements) ***Mitigation:*** - Bennelong Apartment residents to be notified as part of construction consultation meetings and via existing communications forums. - Vehicle movements limited to oversized vehicles and craneage movements for oversized items onto the podium. - Noise mitigation measures on construction vehicles ('quackers' not beepers- as per ICNG guidelines) - No contractor personal vehicle parking provided on site. - Vehicles booked through SOH loading dock platform Mobiledock . This prevents large quantities of vehicle movements concurrently.
23:00			
00:00			
01:00			
02:00			
03:00			
04:00			
05:00			
06:00			
07:00	**STANDARD** HOURS 07:00-18:00	Morning	Approximate Traffic Movements: 5-20 (throughout morning and afternoon) Typical Construction Traffic; deliveries (materials & equipment), rubbish removal ***Mitigation:*** - Typically vehicles and materials will be received in the underground loading dock - Bulk of vehicles moving in standard construction hours (residents not trying to sleep) - No contractor personal vehicle parking provided on site. - Noise mitigation measures on construction vehicles ('quackers' not beepers- as per ICNG guidelines) - Vehicles booked through SOH loading dock platform Mobiledock . This prevents large quantities of vehicle movements concurrently.
08:00			
09:00			
10:00			
11:00			
12:00		Afternoon	
13:00			
14:00			
15:00			
16:00			
17:00			
18:00	**EVENING** HOURS 18:00-22:00		Approximate Traffic Movements: 1-5 Limited Construction Traffic; limited deliveries (materials & equipment), limited rubbish removal ***Mitigation:*** - Typically vehicles and materials will be received in the underground loading dock in standard construction hours to service the evening/ night construction shifts. - Bulk of vehicles moving in standard construction hours - No contractor personal vehicle parking provided on site. - Noise mitigation measures on construction vehicles (quackers not beepers- as per ICNG guidelines) - Vehicles booked through SOH loading dock platform Mobiledock . This prevents large quantities of vehicle movements concurrently.
19:00			
20:00			
21:00			

Figure 19- Predicted Construction Vehicle Movements

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(f) Air Quality

The project has the potential to generate dust from demolition works. Measures will be taken to ensure that the dust is localised within the construction zone. A dust management plan will be prepared by the Principal Contractor engaged to undertake the works prior to commencing construction. Refer also to section (h) Waste for the management of asbestos and associated dust control methods.

Construction plant and equipment selected will be suitable for an internal construction environment to ensure no impact on air quality within the work site, or the Opera House.

(g) Water Quality

All necessary measures will be taken to control potential impacts from external works on Sydney Harbour. This will be managed by the development of a Construction Environmental Management Plan by the Principal Contractor which will be reviewed and approved by the SOH. The Principal Contractor will be required to carefully consider the construction technique to avoid potentially affecting the water quality of the harbour, the proposed works do not pose a major threat to the harbour however.

Where work is required adjacent to the harbour the practices will be highlighted in the Construction Environmental Management Plan. Appropriate controls, monitoring and mitigation measures, such as sediment controls, 'wet-vacuuming' or off-site removal of the item to undertake the works. will be investigated to limit the possibility of contamination of groundwater/ harbour as a result of the construction works.

(h) Waste

It is expected that the following waste will be generated during construction:

- Brick / concrete materials
- Steel
- Lighting, fittings and electrical equipment
- Redundant control equipment, plant and electrical boards
- Services waste such as wiring, pipe cut offs and sheet metal cut offs
- General waste from construction activities such as packaging, scraps and paper

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The management of waste will be in accordance with relevant NSW legislation, the principles of the waste management hierarchy as set out in the NSW 'Waste Avoidance and Resource Recovery Strategy 2014-21', and the Council of the City of Sydney's 'Policy for Waste Minimisation in New Developments'. The figure below illustrates the hierarchy for management of wastes.

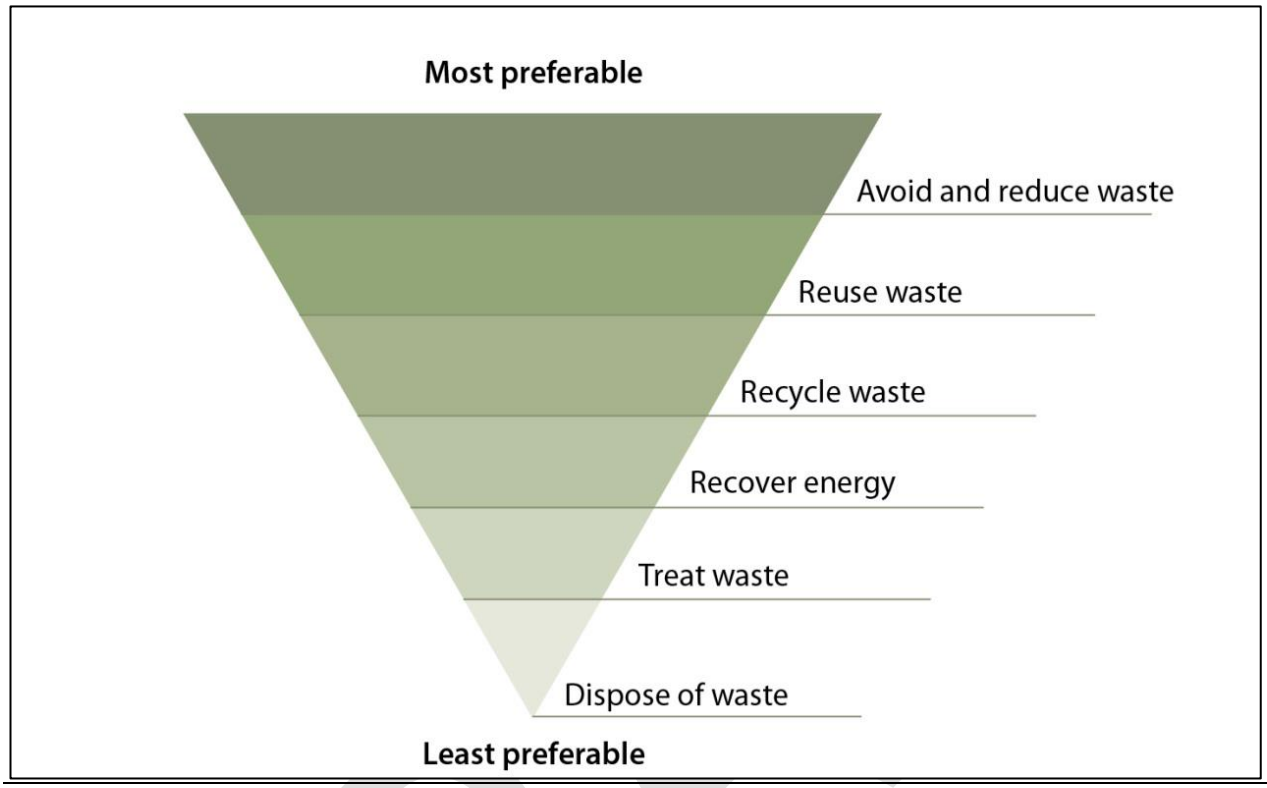

Figure 20- Waste Management Hierarchy

The proposed waste management measures for the project are as follows:

- Concrete materials – recycle materials and/ or dispose to appropriately licensed landfill
- Steel and steel cable – recyclable materials will be collected separately and recycled
- Redundant winches and control equipment – recyclable materials will be collected separately and recycled
- Services waste – Recycling bins will be provided on site. Recyclable materials will be collected separately and recycled
- General waste – Recycling bins will be provided on site. Recyclable materials will be collected separately and recycled

A fully detailed Waste Management Plan will be developed by the Principal Contractor engaged to undertake the project. The plan will be framed using the waste management hierarchy principles outlined above. The plan will be prepared prior to construction commencing and will be consistent with the Waste Avoidance and Resource Recovery Act 2001 and the 'Waste Classification Guidelines', and with the Council Policy.

The plan will:

- Identify requirements for waste avoidance, reduction, reuse and recycling
- Provide procedures for handling, stockpiling and reuse of wastes
- Provide procedures for disposal of hazardous materials

- Identify disposal sites as well as transport options

(i) Hazardous Materials

SOHT maintains an Asbestos Management Procedure to which the Principal Contractor will be required to also adhere, or build upon.

As part of this procedure the SOHT maintains a Hazardous Materials Register which documents all asbestos contaminated materials (ACM), hexavalent chromium and lead paints within the building. The hazardous materials are managed by the Sydney Opera House Asbestos Risk Management Plan (Hibbs & Associates Pty Ltd 2013) and the Sydney Opera House Hazardous Materials Action Plan (2015).

As well as the SOHT documentation the removal and disposal of any hazardous materials must comply with all relevant laws, regulations and guidelines including, but not limited to, Protection of the Environment Operations Act 1997, Protection of the Environment Operations (Waste) Regulation 2014 and Protection of the Environment Operations (Illegal Waste Disposal) Act 2013.

4.13 Other Construction Plans

Prior to commencing construction the Principal Contractor engaged to undertake the works will prepare in conjunction with SOHT the following documents:

- Construction Environmental Management Plan
- All relevant safety documentation, including Safe Work Method Statements

(a) Construction Environmental Management Plan

A Construction Environmental Management Plan will be prepared and implemented. The plan will outline environmental management practices and procedures to be followed during site preparation and construction. The plan will cover the environmental protection practices, resources and sequence of activities required to comply with relevant environmental legislation, conditions of any applicable licences, approvals and permits.

The plan will be prepared in accordance with Guideline for Preparation of Environmental Management Plans (DIPNR 2004) and include:

- A description of activities to be undertaken on the site during site preparation and construction stages of the project
- Details of construction impacts as per section 4.12 Construction Impacts.
- Statutory approvals and other obligations that would be fulfilled during site preparation and construction
- Details of how the environmental performance of the site preparation and construction works will be monitored, and what actions will be taken to address adverse environmental impacts. In particular the following environmental performance issues will be addressed:
    - Measures to minimise impacts to heritage
    - Measures to minimise the discharge of sediment and other pollutants to land and/or water drainage systems during construction
    - Measures to monitor and control noise emissions during construction and commissioning
    - Measures to manage traffic and site access during construction
- A description of roles and responsibilities for all relevant employees involved in the construction of the project

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- Complaints handling procedures during construction

(b) Safety Documentation

A Safety Management Plan and Safe Work Method Statements will be provided explaining the delivery and installation of the project whilst ensuring the surrounding heritage fabric. An indicative description of the methodology likely to be adopted to construct the works is provided in this report and referred documentation. This is based on the available stage of the design documents.

Once the detailed schematic documentation is complete the Principal Contractor engaged to undertake the works will develop detailed safe work method statements which address the various activities to be undertaken during the construction phase, and ensures the safety of the site fabric, construction personnel and all relevant stakeholders.

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5 CONCLUSION

This report provides an indicative construction methodology and associated procedures, which identify how the projects may be constructed and how the various environmental issues may be addressed.

This document outlines the minimum requirements for the construction of the works associated with DA3 – SSD8663 and will be expanded upon by the successful Principal Contractor(s) for the works on site. Largely these works are contained within the building footprint and can be serviced via the underground loading dock, reducing impacts on the general public and SOH patrons, throughout their construction.

This document coupled with contractor involvement and development of plans such as Construction Environmental Management Plan, Safety Management Plan, Noise & Vibration Construction Plan, Construction Pedestrian and Traffic Management Plan, and Waste Management Plan will provide a robust framework from which to deliver the proposed works.

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