



**MODIFICATION TO MAJOR PROJECT MP 09_0200
VEHICLE AND PEDESTRIAN SAFETY PROJECT
AT
THE SYDNEY OPERA HOUSE**

ENVIRONMENTAL ASSESSMENT

Prepared on behalf of
The Sydney Opera House Trust
November 2012

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A. Architectural Drawings

Scott Carver Architects

B. Design Report

Scott Carver in Collaboration with Jan Utzon

C. Heritage Impact Statement

Design 5 Architects

List of Abbreviations

BCA	Building Code of Australia
CMP 2003	Conservation Management Plan 2003 (<i>"Sydney Opera House: A Revised Plan for the Conservation of the Sydney Opera House and its Site"</i> (3rd edition 2003) by James Semple Kerr)
DGEARs	Director Generals Environmental Assessment Requirements
EA	Environmental Assessment
EPA Act	Environmental Planning and Assessment Act 1979
SEPP	State Environmental Planning Policy
VAPS	Vehicle and Pedestrian Safety

Certification of Environmental Assessment

Proponent, Site and Project Details

Applicant: Sydney Opera House Trust
Sydney Opera House
GPO Box 4274
Sydney NSW 20001

Site: The Sydney Opera House
Bennelong Point
Lot 5 in Deposited Plan 775888
Lot 4 in Deposited Plan 787933
Lot 101 of DP828892

Proposal: Modification to Major Project MP 09_0200
Sydney Opera House Vehicle and Pedestrian Safety Project
As described in this report and including internal modifications to create an additional pedestrian tunnel at Basement level; modifications the Gate House design; modifications to the balustrading and cladding adjacent to the vehicle entry ramp.

Authorship

This Summary report has been prepared by

Terence P Byrnes

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Declaration

We certify that the contents of the Environmental Assessment to the best of our knowledge, has been prepared in accordance with the requirements of Part 3A of the Environmental Planning and Assessment Act 1979 and that to the best of our knowledge the information contained in this report is neither false nor misleading.



Terence P Byrnes

01/11/2012

1. Introduction and Background

This Environmental Assessment has been prepared on behalf of the Sydney Opera House Trust to accompany an application to the Minister for Planning for a modification under s75W of the Environmental Planning and Assessment Act 1979 to Major Project Approval MP09_0200 relating to The Sydney Opera House Vehicle and Pedestrian Safety (VAPS) Project.

It is proposed to make minor modifications to the approved scheme including:

- An additional pedestrian tunnel at basement level;
- Changes to the balustrading and precast cladding surrounding the vehicle entry ramp and adjacent to the Tarpeian Wall; and
- Changes to the design and location of the Gate House.

On 10 December 2010 the Deputy Director General on behalf of the Minister for Planning approved MP09_0200 for the Vehicle and Pedestrian Safety Project including construction of an underground loading dock; alteration of lifts and stairs and construction of new lift services and corridors; a new opening in the southern forecourt and construction of a vehicle access ramp; removal of recessed vehicle access path, existing guardhouse and construction of a new guardhouse and other forecourt improvement works.

On 20 February 2012 a modification request under s75W of the Act (MP09_0200 MOD1) was approved which included creation of additional levels within the envelope of the loading dock and minor changes to the internal configuration of the loading dock and to the entrance ramp and fire egress. Changes to the Gate House and to balustrading around the vehicle entry ramp were originally sought as part of this application but were withdrawn from the application to allow more detailed design work to be carried out.

Under Schedule 6A to the Environmental Planning & Assessment Act 1979 (the Act), s75W of the Act (as in force immediately before its repeal on 1 October 2011) continues to apply for the purpose of the modification of a project application approved before or after the repeal of part 3A. This modification request is therefore made in accordance with the provisions of s75W.

This Assessment has been prepared in line with parameters of the original Environmental Assessment' (EA) submitted with the original application. However the assessment relates only to the modifications proposed and as these modifications are minor in nature, the extent of this assessment is brief as compared to the original EA. For a full description of the overall proposal, the site and locality, an assessment of the impacts of the proposal and the Statement of Commitments, the original EA report and the 'Response to Submissions' should be referred to.

This report will describe the proposed modifications (**Section 2**); make an assessment of any potential environmental impacts having regard to the original Director General's Environmental Assessment Requirements as relevant, (**Section 3**); and provide a conclusion (**Section 4**).

2. The Proposed Modifications

It is proposed to amend the plans referred to in Condition A2 of the approval. Specifically, it is sought to delete, where relevant, existing plans and replace with the following Architectural plans, sections and elevations by Scott Carver Pty Ltd provided in **Appendix A**:

49-FV-SC001-EA-003	Site Plan	Revision 1
49-FV-SC001-EA-100	Basement Level B4 Plan	Revision 1
49-FV-SC001-EA-140	Forecourt Part Plan	Revision 0
49-FV-SC001-EA-300	Section and Elevation (Forecourt)	Revision 0
49-FV-SC001-EA-304	Cross Tunnel Section	Revision 0
49-FV-SC001-EA-325	Section (Concert Hall Corridor)	Revision 1
49-FV-SC001-EA-900	Photomontage	Revision 0

The proposed modifications include the following elements:

2.1 Addition of a Cross Tunnel at Basement level

It is proposed to incorporate a new pedestrian tunnel linking the Opera Theatre Tunnel and Concert Hall Corridor. Refer to **Figure 1** below. The new tunnel is at level B4, around 9 metres below ground level. It would be around 22m long, 3.2m wide and have a varying height of 2.4 to 4.4m.

The additional tunnel is required to improve construction methodology: to allow the tunnelling equipment to cross from the Opera Theatre Corridor to the Concert Hall Corridor, improving and thereby reducing the length of the construction program.

The long-term benefits of maintaining the cross-tunnel post excavation include improvements to safety, by offering an alternate path of egress out of each of the corridors; and improvements to circulation and therefore the efficiency of back-of-house functions particularly during bump in and bump out of events.

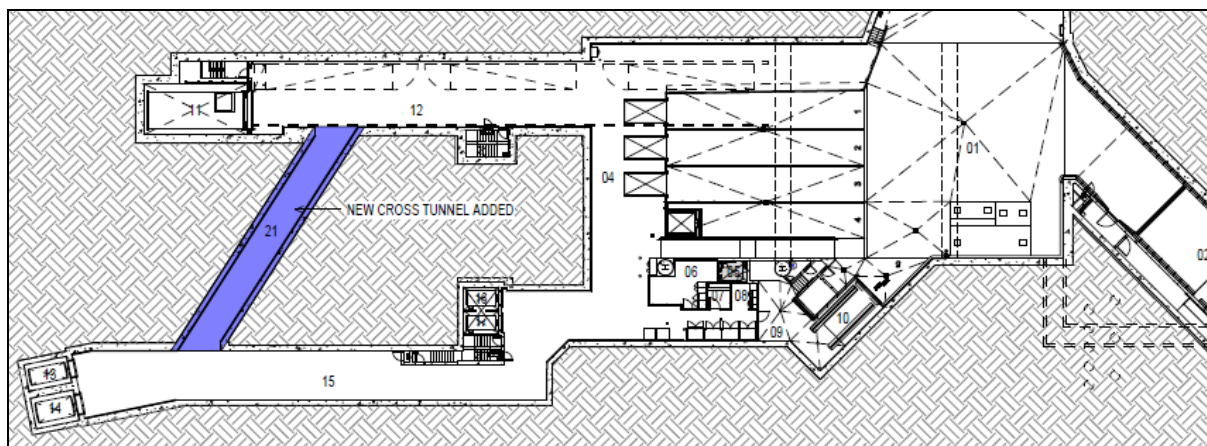


Figure 1: location of pedestrian cross tunnel at basement level.

2.2 Gate House modifications.

It is proposed to change the design of the Gate House and to slightly amend its location. Specifically, it is proposed to:

- Amend the scale and shape of the Gate House;
- Relocate the Gate House slightly to the north;
- Amend the external appearance and material selection.

The functional needs of the Gate House including security and amenity needs have necessitated that its size be increased from that originally proposed. An elliptical shape is proposed, that will have the same width of the approved circular Gate House, and still remains significantly smaller than the existing Gate House to be demolished. **Figures 3 and 4** below provide a comparison between the existing, approved and proposed Gate Houses.

The elliptical shape and the slightly modified location are also a result of detailed testing of vehicle circulation requirements and queuing distances, as well as allowing for maximum security surveillance of the adjoining Forecourt area. Importantly, the modified scheme allows a semi-trailer to stop at the Gate House without obstructing Macquarie Street (as compared to the approved scheme which was limited to a medium rigid truck).

Materials and façade treatment have also been modified. The approved Gate House was to be constructed entirely of bronze or similar material and matching glass. The amended scheme includes crushed granite precast panels at the base in keeping with adjacent panels to the vehicle ramp (refer to discussion below). Bronze framed glazing or bronze cladding to the utility core sits above. A simple roof form incorporates eaves thereby providing shading to the extensive glazing (necessary to permit maximum surveillance as described above).



Figure 2: Proposed Gate House design

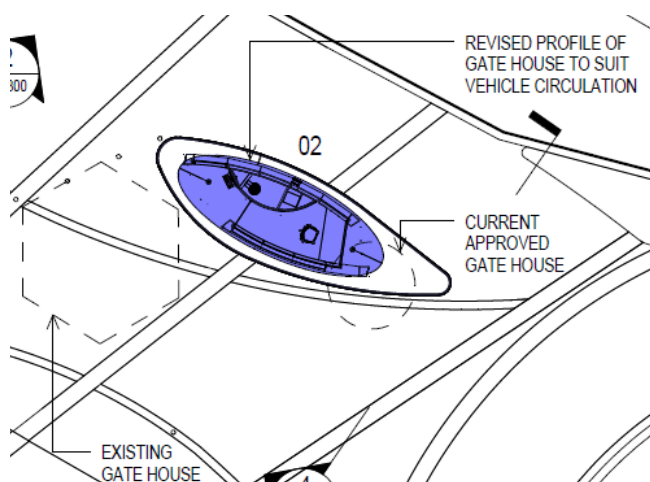


Figure 3: Extract from Plans showing proposed Gate House, with approved and existing Gate Houses outlined.

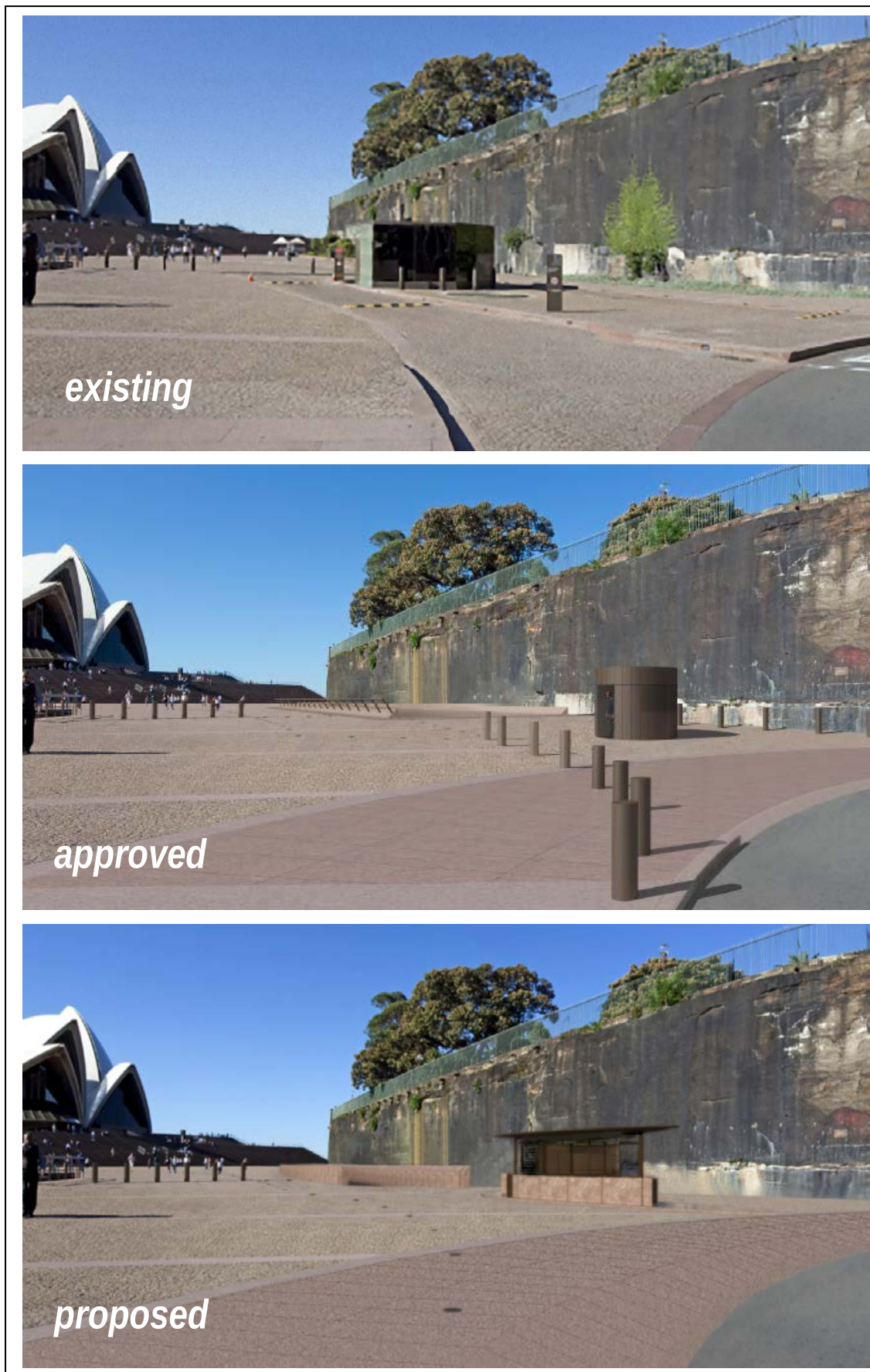


Figure 4: Photomontages comparing existing, approved and proposed Gate House and vehicle entry design.

2.3 Modify balustrading & panels adjacent to Vehicle Entry Ramp.

This change includes:

- Amending the western balustrade from 450mm high precast, with metalwork balustrade above, to a 1200mm high precast balustrade.
- And as a result, adjusting the height of the precast on the eastern side of the vehicle entry ramp (against the Tarpeian Wall) to the same height (1200mm above the forecourt); and
- Deleting a section of precast upstand between the ramp portal and the car park vent structure, where the precast sits against the Tarpeian Wall.

The change is depicted in the photomontages at **Figure 4** above.

Due to safety needs, BCA requirements and crowd loading considerations, a change in the design of the balustrade to the western side of the vehicle entry ramp is required. The approved scheme consists of 450mm high pre-cast up-stand with a metalwork balustrade (in keeping with the western edge of the Forecourt), resulting in a 1000mm high balustrade. However, this design does not comply with BCA standards due to the fall below the balustrading exceeding 4.0 metres in height in some locations. In addition, a 1.2m high balustrade is required to comply with the NSW variations to the BCA requirements for Entertainment Venues if the Forecourt is to be used to hold future public events.

Detailed consideration was given to potential designs in collaboration with Jan Utzon and Design 5 Architects and further reviewed by the eminent Architects Panel. A 1.2 metre high pre-cast up-stand was chosen as the preferred design solution for 3 reasons: it provides a simple solution architecturally and is less visually apparent than a balustrade incorporating a range of finishes including metal work elements; unlike the western edge of the Forecourt where balustrading is designed to allow a view over the edge, there is no desire to encourage viewing over the edge of the loading dock entrance ramp; and in public event situations where large numbers of patrons may lean against the balustrading, it provides the safest design solution.

To provide a consistent appearance to the vehicle entry ramp, it is proposed to modify the height of the precast cladding on the eastern side of the ramp adjacent to the Tarpeian wall to match the height of the western balustrade. It is proposed to increase the height from 450mm as approved to 1.2 metres to match the increased balustrade height described above.

As a result of the above changes it is also proposed to delete a section of precast cladding adjacent to the Tarpeian Wall between the vehicle entry ramp and the car park air vent. The upstand around the air vent is 450mm high precast. The deletion of the cladding between this vent and the modified vehicle ramp balustrading allows for a clean separation between the two elements which would now be of different heights, and in addition, allows more of the Tarpeian Wall to be exposed.

3. Environmental Assessment

The following provides a brief Environmental Assessment of the proposed modifications against the same parameters applied to the assessment of the original application including the matters set out in the Director General's Environmental Assessment Requirements (DGEARs). However as these modifications are minor in nature, the extent of this assessment is brief as compared to the original EA, which should be referred to for a comprehensive assessment of the entire scheme.

3.1 Statutory and Other Requirements

The DGEARs included a requirement to consider all relevant legislation and planning provisions. The EA gave detailed consideration to the following statutory and other requirements:

- Environment Protection and BioDiversity Conservation Act (CTH) 1999
- Environmental Planning and Assessment Act 1979
- Environmental Planning and Assessment Regulation 2000
- Heritage Act (NSW) 1977
- State Environmental Planning Policy No 55 – Remediation of Land
- State Environmental Planning Policy (Major Developments) 2005
- Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005
- Sydney Local Environmental Plan 2005
- Management Plan for the Sydney Opera House 2005
- Conservation Management Plan (3rd Edition)
- Utzon Design Principles

The proposed modifications do nothing to change the compliance of the overall scheme with these statutory requirements and controls. Many of the provisions of the above documents relate to heritage considerations, urban design considerations, and amenity impacts, all of which are discussed as relevant to the modifications in the following sections. The modifications are also considered against the 3 site-specific documents: The Management Plan (refer **Section 3.2.5**); Conservation Management Plan (**Section 3.2.6**); and Utzon Design Principles (**Section 3.3.3**).

3.2 Heritage and Archaeology

3.2.1 Current Heritage Listings and Heritage Significance

The Sydney Opera House is listed on the following statutory registers:

- World Heritage List (UNESCO)
- National Heritage List (Australian Government)
- Register of the National Estate (Australian Heritage Council)
- State Heritage Register (NSW Government)
- Sydney Local Environmental Plan 2005 (City of Sydney Council)

The Sydney Opera House is listed on the following non-statutory heritage registers:

- National Trust of Australia (NSW) register
- National Register of Significant 20th Century Buildings (Australian Institute of Architects)

2.3.1 Assessment of Impacts on World Heritage Values, National Heritage Values and State Heritage Values

A detailed discussion of the impact of the proposal on the World Heritage Values, the National Heritage Values and the State Heritage Values of the Sydney Opera House was provided in the original Environmental Assessment and the Heritage Impact Statement submitted with the original application. A further assessment specifically in relation to the proposed modifications has been prepared by Design 5 Architects at **Appendix C**. This discussion is exclusive of considerations relating to Archaeological Heritage and Aboriginal Heritage which are discussed separately below.

The set of values for each of the heritage listing are similar, and therefore the assessment of the impacts on each set of values was also similar.

The following key points from the original summary of the heritage impacts of the proposal continue to apply to the proposal and are relevant to the proposed modifications:

- *The proposed Vehicle and Pedestrian Safety Project (VAPS) will have a significant material affect on the Sydney Opera House but apart from the forecourt, these impacts are mainly confined to existing and new underground areas and less significant 'back-of-house' spaces.*
- *On balance, we conclude that these impacts will retain and potentially enhance the World Heritage, National Heritage, and State Heritage values of the Sydney Opera House by removing heavy vehicles and other hazards to pedestrian safety from the forecourt approach to the place, and also by improving the functionality of the Sydney Opera House as a premier performing arts centre of national and international repute. The improvement in pedestrian safety will enhance the visitor and patron experience of approaching the building and permit a safer appreciation of this outstanding architectural icon, "great urban sculpture", from the forecourt.*
- *The project will also remove or replace many of the elements in the forecourt area which have been assessed as intrusive, and thus improve the 'open relationship' of this space with the setting of the Sydney Opera House.*
- *The existing guardhouse, identified as 'intrusive' in the CMP 2003, is reduced in size and re-located in line with the new loading dock entry.*

- *The edge detail around the tunnel entrance is simple and minimal in scale and should not distract from the strength and scale of the Tarpeian Wall, but it will prevent close viewing of this section of the cliff face.*
- *The proposed works for the VAPS project will have only minor impacts on backstage areas and will improve functional flexibility and efficiency.*
- *The most significant impact will be during the construction period, when the facilities, activities and excavation required will have a major impact on the topographic setting. These activities and the movement of trucks carrying excavated material or delivering new materials will be a constant source of intrusive noise and annoyance to patrons and visitors as well as the surrounding areas, and will require careful planning and constant management to ensure the impact is acceptable.*

Those original assessments found that while the proposed works will have a significant material effect on the place, most of the works are confined to underground and overall they will not have a negative impact on the listed heritage values of the Sydney Opera House.

Likewise, the proposed modifications which relate to minor above-ground variations to the design of the balustrading around the entrance ramp and the Gate House design do nothing to change the overall conclusion that the proposal has an overall positive impact on the heritage values of the place.

The proposal continues to remove the existing Gate House, assessed as an 'intrusive' element in the Forecourt. The proposed modified Gate House retains a position in closer proximity to the Tarpeian Wall than the existing structure, remains smaller than the existing structure, retains simple finishes to match surrounding elements in the Forecourt and has been designed in a slender elliptical shape that will reduce its apparent size as viewed from the main vehicular approach to the site. In relation to this modification, the Heritage Impact Statement concludes that the re-design of the gate house has a very positive impact in heritage terms as it *"extends the Utzon Design Principles to this southern entry to the site in a very refined and elegant manner. This new design introduces an element which is consistent with the quality, form and materiality of Utzon's original work and thus enhances the visitor experience of the place. It also enhances the management, functionality and security of the vehicle entry to the site."*

The small underground modification of the additional pedestrian tunnel will improve operational functional flexibility and efficiency and will also improve the construction methodology making albeit a small contribution to reducing the length of the construction period with its associated adverse heritage impacts. In relation to this modification, the Heritage Impact Statement concludes that *"the proposed cross tunnel could potentially have a positive impact on the amenity and efficiency of the loading dock area, and thus the long term use of the Opera House as a performing arts venue"*

Other external changes to the vehicle entry ramp materials and balustrading are minor in nature and have also been designed to complement the surrounding Forecourt finishes and minimise visual impacts (refer to discussion in Section 3.3.1 below). The increase in the height of the cladding adjacent to the Tarpeian Wall at the vehicle ramp is partially off-set by the removal of the cladding to the north of the ramp area – allowing for close viewing of the Tarpeian Wall at this part of the Forecourt – a positive result in heritage terms. The Heritage Impact Statement concludes that the heritage impacts of this modified parapet have been assessed as acceptable at an aesthetic level and positive at a functional level, particularly in regard to public safety and events on the forecourt.

The original recommendations made to mitigate against impacts to the World, National, and State Heritage values which were incorporated into the Statement of Commitments and the conditions of the approval would

continue to apply to the proposal as modified and thereby continue to ensure no adverse heritage impacts arise, regardless of these proposed modifications.

The Heritage Impact Statement makes three further recommendations in relation to the modifications for consideration as part of the approval conditions. The first of these relates to provision of sufficient space behind the precast panels for access to the Tarpien Wall and associated drainage. In this regard we note the precast panels to the Tarpeian Wall would retain the nominal 300mm offset to the wall, as per the approved scheme. The proposed modifications result in no additional impacts that would justify a further setback from the wall. The other two recommendations relate to ongoing involvement with documentation and advice. These recommendations have already been incorporated into the approval as commitments listed within the 'Statement Of Commitments' which form Schedule 3 to the instrument of approval. It is therefore considered that these additional conditions are not necessary to mitigate against heritage impacts.

2.3.2 Assessment of Archaeological Impacts

It is noted that the National Heritage List and World Heritage List citations for Sydney Opera House do *not* include the site's archaeological potential. Furthermore, The New South Wales State Heritage Register citation also concludes that the contribution of the site's potential relics to the site's overall significance is likely to be low. While the Sydney Opera House is an item of Outstanding Universal Value, the site's potential archaeological remains have no direct association with Sydney Opera House itself or this significant phase of the site's history.

The additional area of excavation relating to the proposed connecting pedestrian tunnel is very minor and relates to a small passage between the Opera Theatre Corridor and the Concert Hall Corridor, with a total footprint of only 75m².

The Archaeological Management Plan and Archaeological Impact Assessment submitted with the original application provide a comprehensive assessment of the Archaeological potential of the site, its significance, and assessment of the impacts of the proposal.

It is noted that the Archaeological Impacts Assessment found that the new basement level would be unlikely to have any major archaeological impacts given that the depth of the basement is below the majority of the site's potential archaeological remains and due to the proposed method of construction (being horizontal drilling rather than excavation). These findings would apply to the proposed minor modifications below ground which are also at the basement level below potential archaeological remains.

The Archaeological Management Plan and Archaeological Impact Assessment submitted with the original application also provide comprehensive recommendations to mitigate against the archaeological impacts of the proposal. These recommendations include an Archaeological Investigation and Archaeological monitoring during the proposed works and have been adopted into the Statement of Commitments and the conditions of the approval. These will continue to apply under the proposed modification. As such it is considered that no significant adverse archaeological impacts would arise from the proposed modifications.

2.3.3 Assessment of Aboriginal Cultural Heritage Impacts

The Aboriginal Cultural Values Assessment submitted with the original application identifies Aboriginal cultural values associated with the place and an assessment of the impacts of the proposal on those values.

Consultation with Aboriginal stakeholders built upon previously documented values and a range of cultural values are set out in the report. Values relate to the association of the site as meeting and gathering place for Aboriginal people, negative associations with the site including the dislike of the Australia Day commemoration in the Botanic Gardens and the slaughtering of Aboriginal people in the early days of settlement. The Tarpeian Wall Project (a planned future mural) is of particular interest to the local Aboriginal communities. The value of the place for performing arts, including Aboriginal performers is also of importance. Surviving middens and physical relics would also have value.

The small area of additional excavation has only a very minor potential for impacts to any physical Aboriginal objects that may survive at the site, due to the depth of the proposed excavation, some 9 metres below ground level.

The report makes a number of recommendations for the mitigation of both physical impacts and for the ongoing management of broader Aboriginal cultural values associated with the Sydney Opera House. These have been adopted into the Statement of Commitments and the conditions of the approval and would continue to apply under the proposed modification. As such it is considered that no significant impact on Aboriginal Cultural Heritage would arise from the proposed modifications.

2.3.4 Compliance with Conservation Management Plan 3rd Edition

Conservation Management Plan—“*Sydney Opera House: A Revised Plan for the Conservation of the Sydney Opera House and its Site*” (3rd edition 2003) (CMP 2003) by James Semple Kerr identifies and defines the significant values of the Sydney Opera House and then formulates policies framed to retain those values. It includes comprehensive policies to guide the long-term conservation of the heritage values of the place and thus is given status through various statutory requirements.

The Heritage Impact Statement by Design 5 Architects at **Appendix C** provides a detailed analysis against CMP 2003, however the following abbreviated assessment demonstrates that the proposed modifications are consistent with the applicable policies:

It is noted that policies 1.5 and 1.6 set out in the CMP 2003 anticipated a project to resolve the heavy vehicle access and loading dock.

Policy 3.3 requires an open and uncluttered setting, with objects in the Forecourt only otherwise permitted if they are absolutely necessary for the safety of visitors. The proposed changes to the balustrading although higher and more solid, are simple in design so that they do not add clutter to the Forecourt, but in addition are absolutely necessary for safety reasons.

Policies 6.1; 6.2; 11.1; 13.1 and 13.2 are relevant in that they relate to the materials and form of external elements. The modifications include amendments to the surface finishes and the size of the balustrading above the tunnel entrance. The proposed finishes however still include precast pink granite panels and sets and are consistent with the existing surface materials and finishes on the Forecourt.

Policy 25.1 relates to the character and treatment of new internal spaces. The policy envisages new underground spaces and provides that where they have a visual relationship with the Hall designed spaces they should correspond with the design regime. However as the proposed pedestrian tunnel has no visual relationship with Hall designed spaces, the policy is not relevant to the proposed modifications.

Policies 39.1 and 39.2 relate to treatment of intrusive items. The present security Gate House is identified as an intrusive item and is approved for removal. The replacement Gate House is modified under the proposal

but will retain a simple oblique shape of reduced volume and dimensions, as compared to the existing structure and will be constructed in precast granite, bronze and matching glass to complement other finishes within the Forecourt.

Policy 53.1 relates to excavation on the site. Archaeological and excavation issues as they relate to the modifications have been addressed above in Section 3.1.3.

The proposed modifications are therefore considered to be compliant with the applicable policies of the CMP.

2.3.5 Compliance with Sydney Opera House Management Plan 2005

The three reports (Heritage, Archaeology, Aboriginal Values) that informed the Environmental Assessment of the original application were prepared to address the heritage impacts of the proposed works in relation to the requirements of the Sydney Opera House Management Plan and to provide supporting documentation for the required statutory approvals. The Heritage Assessments conclude that the proposed works do not include any activities that would have a significant adverse impact on the National and World Heritage values of Sydney Opera House. Those reports also recommend measures to mitigate and protect the National and World Heritage values of Sydney Opera House which were included in the Statement of Commitments and the conditions of approval and will continue to apply to the proposal as modified. As assessed the Heritage Impact Statement at **Appendix C**, the now proposed minor external modifications and internal modification do nothing to change these findings or to result in a significant heritage impact to the site.

3.3 Urban Design and Visual Impacts

The design rationale for the proposed modifications is set out in detail in the Architects Design Report dated 12 September 2012 included at **Appendix B**. The above-ground modifications have been designed through close consultation between Scott Carver Architects as Project Architects and Jan Utzon, and reviewed by 'The Eminent Architect's Panel' – established by the Sydney Opera House Trust and including the Government Architect to ensure the highest quality design outcome. The visual impacts are assessed below:

3.3.1 Urban Design and Impacts of Above-ground Elements

Gate House

The existing Gate House is identified in the CMP 2003 as 'intrusive', impacting on important views of the Sydney Opera House as approaching from the city. The approved replacement Gate House was to be located much closer to the Tarpeian Wall and constructed in bronze and matching glass as a simple cylindrical shape of reduced volume and dimensions. The overall result being a valuable reduction in the visual impact of this necessary functional structure due to its size, colour, location and simplicity of design.

The modified Gate House retains a position in closer proximity to the Tarpeian Wall than the existing structure. It has been slightly increased in size for functional reasons and to meet security and amenity needs. Nevertheless, the modified structure remains smaller than the existing structure (floor area of around 9m² as compared to 20m² existing), retains simple finishes of precast granite, bronze and glass to complement the materials of the forecourt and has been designed in a slender elliptical shape that will reduce its apparent size and visual impact as viewed from the main vehicular approach to the site. In addition, the design better relates to other elements within the forecourt, and as concluded in the Heritage Impact Statement, it is "consistent with the quality, form and materiality of Utzon's original work and thus enhances the visitor experience of the place".

Vehicle Entry Ramp Balustrading and cladding adjacent to Tarpeian Wall

Visual impacts of the proposed ramp entry are minimised by ensuring that new works are integrated into the forecourt through geometry, material, module and detail. Important aspects of the *original* design included *"Sloping wall up-stand constructed of precast granite to match exiting podium cladding and western parapet edge of the Forecourt; as with angled parapet and bronze handrail and balustrade detail"*.

The balustrade upstand will continue to be of precast granite but will be increased in height and will no longer incorporate metal handrails to match the western edge of the Forecourt. Nevertheless, the proposed balustrading will retain a simple appearance and incorporate materials to complement surrounding finishes. As the modifications have been carefully designed to integrate with the design of the proposed ramp, the materials of the Forecourt and other surrounding existing structures, no adverse visual impacts arise from the proposed modifications to materials and finishes. Furthermore, within the context of the overall scale of the Forecourt, the change in balustrade detailing results in no significant apparent impact in terms of scale. Any minor visual impact is more than off-set by and justified by the safety and BCA compliance advantages.

The increase in height of the cladding adjacent to the Tarpeian Wall is necessary in order to provide a continuous and integrated appearance to the ramp structure. In terms of visual impacts to the Tarpeian Wall, the increase in height in this location is off-set by the proposed deletion of cladding adjacent to the wall between the entry ramp and the air vent, thereby ensuring a positive urban design result: both for the geometry of the entry ramp and the integration of the Forecourt with the Tarpeian Wall.

3.3.2 Design and Impacts of Below Ground Elements

The modifications result in no impacts to any of the existing internal spaces of the Sydney Opera House. The pedestrian tunnel has no visual relationship with spaces designed by Hall or Utzon, will not be visible to the Public, and therefore its appearance is of little consequence. Regardless, it will be constructed to match the appearance and finishes of the approved adjacent tunnels and therefore results in no adverse visual impacts and no material design issues arise.

3.3.3 Utzon Design Principles

The 2002 Utzon Design Principles are a record of Jørn Utzon's vision for the building and his comments on the future as his legacy, they are intended as a reference for the management of proposals for change. Together with the Conservation Management Plan, they have been formally endorsed by the then Heritage Office and the Management Plan for the Sydney Opera House as the guiding policy documents for the on-going conservation of the Sydney Opera House.

Of most relevance to the proposed modifications are the following comments and principles:

Keep the approach, the openness and fluidity of movement

"One of the great features of the Opera House is the approach, the openness, the fluidity of people's movements through the house, and once you clutter this you have a problem."

New structures close to Sydney Opera House diminish its role as icon/landmark

"One adverse effect could be from placing large new structures closer and closer to the Opera House, thereby diminishing its value as an icon for Sydney and Australia."

"If you clutter the new spaces around such a significant building then you obscure the building, and can obscure it to an extent that it no longer retains its value in the city or its character... it will lose its importance as an icon or as a landmark for the city."

New structures placed close to the Sydney Opera House will diminish its value as an icon by disturbing its chief characteristics of being free in the centre of Sydney Harbour.

Forecourt should not be cluttered

"Forecourt should not be cluttered with new buildings at any size."

Nature's colours

"I had what you would call nature's colours on the exterior. That was the general idea - concrete, granite and ceramics."

Accommodate new approach and back of house for events under Forecourt

"It might still be possible to locate functions underground under the eastern part of the forecourt."

"If needed some functions could be sunk below the forecourt level, in such a way as to be accessible from the forecourt, but without disturbing the visual impact of the original layout."

"...an approach from the underground parking in the Botanical Garden could emerge via an opening in or near the Tarpian wall. Facilities like dressing rooms or rooms for temporary catering for activities in the forecourt could be placed under the forecourt surface"

Access from carpark through a hole in the forecourt. Space could accommodate back of house and storage for outdoor events.

The proposed modifications are consistent with these principles in that:

- The amended Gate House is as small as it can possibly be while still accommodating the basic amenity needs for security personnel. It results in a positive impact for the openness of the Forecourt

and the approach to the Opera House in that it is significantly smaller than the existing structure, is located closer to the Tarpeian wall and is therefore less prominent, and is oriented in such a way that its visual impacts are minimised as viewed from the approach to the site. Furthermore, as assessed by the heritage architects, it *“extends the Utzon Design Principles to this southern entry to the site in a very refined and elegant manner. This new design introduces an element which is consistent with the quality, form and materiality of Utzon’s original work and thus enhances the visitor experience of the place”*;

- Use of pre-cast granite for the balustrading, cladding and the base of the Gate House is consistent with the materials and nature’s colours envisaged by Utzon; and
- The modifications will allow for access to the loading dock and back of house areas “through a hole in the forecourt” that complies with BCA and safety requirements.

3.4 Traffic and Vehicular Access

There will be no material change to vehicles numbers, vehicle movements or pedestrian safety as a result of the proposed modifications, other than allowing semi-trailers to stop at the Gate House without obstructing traffic on the Macquarie Street round-a-bout: a positive outcome in traffic and vehicular access terms.

3.5 Noise and Vibration

As above, operational noise impacts would be unchanged by the proposed modifications which do not result in any material change to the day to day operation of the site. Any impacts to construction noise as a result of minor amendments in the scope of construction work would be marginal and as with all construction noise on the site, would be managed through The Construction Environmental Management Plan required under Condition C1 and appropriate conditions D1 and D6 relating to hours of operation and noise emissions from the site.

3.6 Geotechnical and Structural Stability Impacts

It is unlikely that any geotechnical impacts could be expected to arise from the construction of the relatively small pedestrian tunnel. Nevertheless, the detailed geotechnical investigation required to be carried out in accordance with condition G7, will take into account the additional areas of excavation proposed under these modifications, and any resulting recommendations from that report will be implemented during the course of the works.

Likewise, the minor nature of the proposed modifications are unlikely to result in any structural stability issues beyond those already considered in the original assessment of the application. Conditions B1, B8 and E1 of the approval which require structural drawings, a structural peer review and a structural inspection certificate will apply to the works as modified to safeguard against any structural stability impacts.

3.7 Excavation and Construction Impacts

The proposed construction methodology generally remains unaltered from that originally proposed, although the addition of the pedestrian tunnel will allow tunnelling equipment to cross from the Opera Theatre corridor to the Concert Hall corridor, prior to excavation is complete in the main dock volume, which results in some improvements to the construction program.

Construction traffic impacts and noise and vibration impacts were considered in the preceding discussions. Other matters associated with outcomes generated by the excavation process were considered in the original assessment and included acid sulfate soils; contamination; waste management; erosion and sediment control; air quality; safety and heritage protection.

The original assessment found that that any potential impacts could be appropriately managed and mitigated on site. There is nothing particular about the proposed modifications that would result in any changes to those findings.

In addition, appropriate conditions on the approval will ensure no unacceptable impacts arise during the excavation or construction stage and would continue to apply to the modifications proposed.

3.8 Infrastructure Impacts

The minor modifications have no impact on Infrastructure provision. Approved diversions of existing in-ground services will not be affected by the proposed modifications and will continue to be carried out in accordance with the approval conditions applied to an approval, and the requirements of the responsible authorities. Likewise the modifications result in no impact on infrastructure off-site in the immediate locality.

3.9 Remaining Matters for Consideration

In addition to the matters already assessed above, the Director General's Environmental Assessment Requirements for the original application required that the following matters be given consideration:

- Odour and Air Impacts;
- Water Quality;
- Climate Change and Sea Level Rise

The proposed internal and minor external modifications result in no additional odour or air impacts; no changes to water quality or stormwater management on the site and no change to sea level rise impacts and as such no further assessment with regard to these issues is considered necessary.

4. Conclusion

The modifications proposed as part of this application relate to the creation of an additional basement level pedestrian tunnel; modifications to the design of the Gate House; and balustrading and cladding surrounding the vehicle entry ramp.

When considered against the parameters used to assess the original application, the proposed modifications are shown to be minor in nature and result in no adverse impacts in terms of traffic and vehicular access, noise, geotechnical or structural stability impacts, excavation and construction impacts, infrastructure or other environmental considerations.

The only remaining matters of relevance to the assessment of the modifications are heritage impacts and urban design considerations.

In terms of heritage and urban design, the proposed underground pedestrian tunnel will not be visible from any public place; does not impact on any of the existing parts of the Sydney Opera House, and has no visual relationship with Hall designed spaces, such that no adverse visual impacts arise. Given that existing conditions of consent will continue to ensure that heritage values, archaeological values, and Aboriginal values on the site will be protected, no heritage concerns arise from this element either.

Above ground modifications to the Gate House and vehicle entrance ramp balustrading are also relatively minor in nature. Changes to the Gate House are essential for security purposes. The proposal still removes the intrusive Gate House element and replaces it with a smaller structure, simple in design and less visually apparent than the existing structure. Changes to the balustrade height are unavoidable due to safety and BCA requirements, but the retention of the pink granite finish to match surrounding elements and the simple design of the upstand will ensure that no unacceptable impacts arise in terms of either heritage or visual impacts.

The proposed modifications therefore result in no unacceptable environmental impacts and result in a development that will continue to serve the coincident needs of safety, security, servicing and aesthetics and is a practical solution to the servicing needs of the Opera House functions.