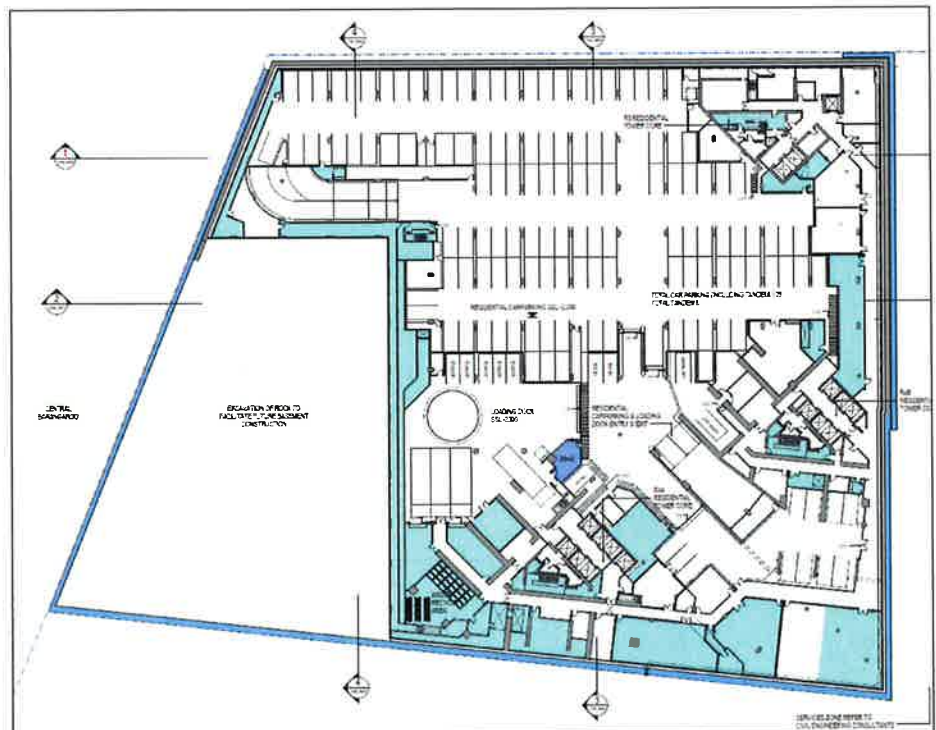


**ASSESSMENT REPORT:  
Stage 1B Basement and Associated  
Works, Barangaroo South (SSD 6960)**



Environmental Assessment Report  
Section 89H of the  
*Environmental Planning and Assessment Act 1979*

January 2017

## ABBREVIATIONS

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Applicant	Lend Lease (Millers Point) Pty Ltd (Lend Lease), or any other person or persons who rely on this consent to carry out the development that is subject to this consent
CIV	Capital Investment Value
Council	The City of Sydney Council
Department	Department of Planning and Environment
EIS	Environmental Impact Statement entitled ' <i>Stage 1B Basement (SSD 6960) Barangaroo South</i> ' prepared by JBA Urban Planning Consultants Pty Ltd and dated November 2015
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000</i>
EPA	Environment Protection Authority
EPI	Environmental Planning Instrument
Minister	Minister for Planning
OEH	Office of Environment and Heritage
RTS	Response to Submissions report entitled ' <i>Response to Submissions – Barangaroo Stage 1B Basement (SSD_6960)</i> ' and accompanying appendices, prepared by JBA Urban Planning Consultants Pty Ltd and dated September 2016
Secretary	Secretary of the Department
SRD SEPP	<i>State Environmental Planning Policy (State and Regional Development) 2011</i>
SSD	State significant development
SWC	Sydney Water Corporation
TNSW	Transport for NSW

Cover Photograph: Stage 1B Basement level B1 (Source: EIS)

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Note: Images are not to scale unless otherwise noted. All images are sourced from the EIS unless otherwise noted.

## EXECUTIVE SUMMARY

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This report assesses a State significant development application (SSD 6960) lodged by Lend Lease Millers Point Pty Ltd (the Applicant) seeking approval to construct a basement car park (Stage 1B basement), interim public domain works, and associated services and infrastructure at Barangaroo South. The basement car park will service the future Stage 1B residential buildings (Residential Buildings R4A, R4B and R5) and provide the structural foundation above where Hickson Park will be constructed.

The development is SSD under clause 3 of Schedule 2 of *State Environmental Planning Policy (State and Regional Development) 2011*, as it is a development at Barangaroo that has a capital investment value of more than \$10 million. Therefore, the Minister for Planning is the consent authority.

The Department of Planning and Environment (the Department) exhibited the Development Application and Environmental Impact Statement for the proposal for 30 days from 10 March 2016 to 8 April 2016. The Department received eight submissions, including seven from government authorities and one from the general public. The City of Sydney Council (Council) objected to the proposal raising concerns regarding permissibility, public domain design, transport and access. No other government authorities objected but some issues of concern were raised (contamination, waste, noise and vibration, air quality, groundwater, fire safety) and recommended conditions for inclusion in the development consent. The public submission objected to the proposal raising concerns regarding potential noise, air quality and contamination impacts.

The Applicant submitted a Response to Submissions report (RTS) to address issues raised in submissions, including minor refinements to the structural grid of the basement, refinement of interim public domain works and provision of indicative drawings for deep soil zones, which is a requirement of the Barangaroo Concept Plan (as modified).

The Department has considered all relevant matters under section 79C of the *Environmental Planning and Assessment Act 1979* (EP&A Act), the objects of the EP&A Act and the principles of ecologically sustainable development. The Department has found the key assessment issues associated with the proposal are potential contamination and waste management, transport and access, noise and vibration and air quality impacts, and consistency with the Barangaroo Concept Plan (as modified) in relation to landscaping and deep soil zones.

All key issues have been assessed, and appropriate conditions recommended, where necessary. The Department is satisfied with the implementation of the recommended conditions of consent, the impacts of the development can be mitigated and/or managed to ensure an acceptable level of environmental performance. The Department is also satisfied the basement car park would not prevent Hickson Park from achieving desired future outcomes (view corridors, landscaping and provision of deep soil zones) set out in the Barangaroo Concept Plan (as modified).

The Department's assessment has concluded the application would facilitate the development of Stage 1B of the Barangaroo site (in particular, the future Stage 1B residential buildings) at significant benefit to the State without prejudicing the delivery of a high quality Hickson Park in accordance with the approved Barangaroo Concept Plan (as modified).

As Council has objected to the proposal, it is being referred to the NSW Planning Assessment Commission for determination.

The Department considers the proposal can be approved, subject to recommended conditions.

# 1. BACKGROUND

## 1.1 Introduction

This report assesses a State significant development application (SSD 6960) lodged by Lend Lease Millers Point Pty Ltd (the Applicant) seeking approval to construct the Stage 1B basement, interim public domain, associated services and infrastructure at Barangaroo South. The basement car park will service the future Stage 1B residential buildings (which comprises Residential Buildings on blocks R4A, R4B and R5) and provide the structural foundation above where Hickson Park will be constructed.

### 1.1.1 The site

Barangaroo is located on the north-western edge of the Sydney CBD and is bounded by the Sydney Harbour foreshore to the north and west, Hickson Road and Millers Point to the east, and Kings Street Wharf/Cockle Bay/Darling Harbour to the south. The Barangaroo precinct is divided into three redevelopment areas (from north to south): Headland Park; Barangaroo Central; and Barangaroo South (Figure 1).



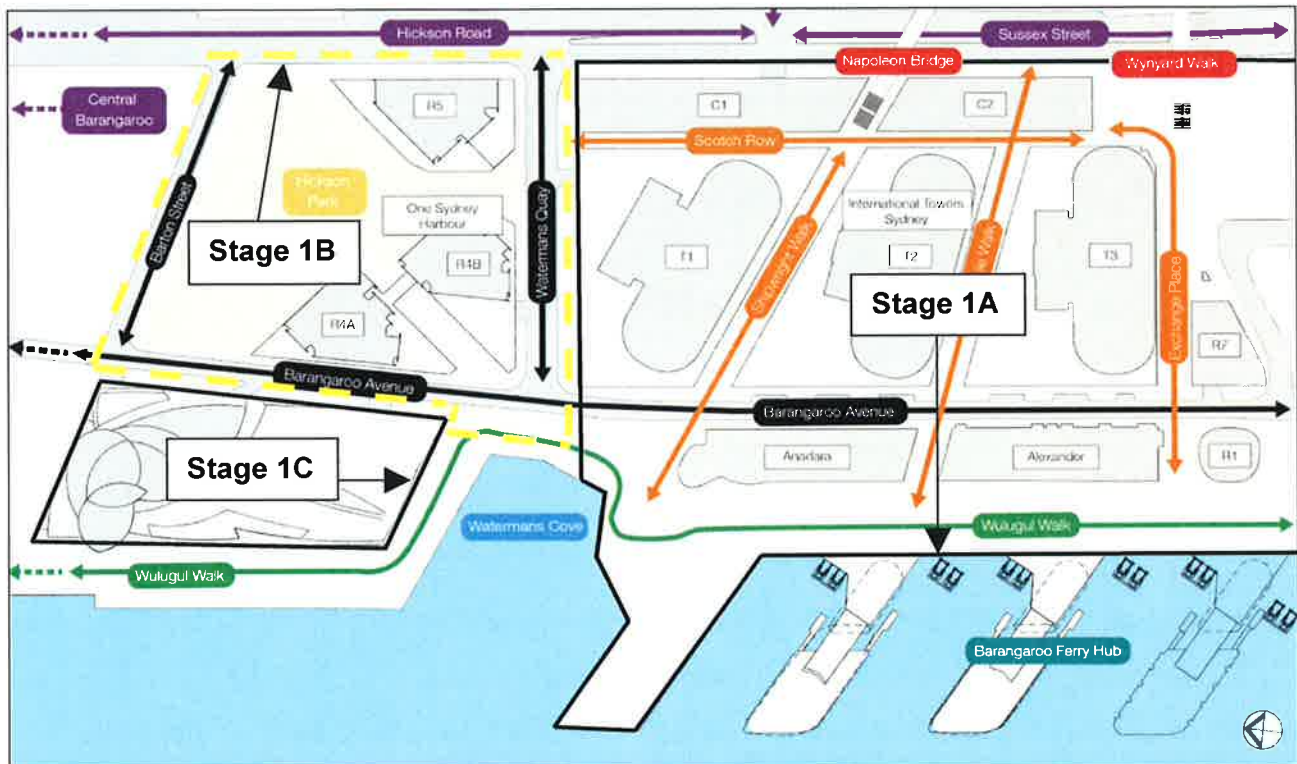
Figure 1: Site context plan (Source: Google)



### 1.1.2 Site context

Barangaroo South has been divided into three construction areas, Stage 1A, 1B and 1C (Figure 2).

Stage 1A refers to the portion of the Barangaroo South site south of Watermans Quay (formerly Globe Street), the majority of which has been constructed. Stage 1B (the site of the subject application) refers to the portion of the Barangaroo South site north of Watermans Quay, with the exception of the area being developed by Crown Resorts, which is referred to as Stage 1C.



**Figure 2:** Barangaroo South development area with Stage 1B site shown dashed in yellow (Source: EIS)

The Stage 1B site incorporates parts of Hickson Road, the future Hickson Park, Watermans Quay and Barangaroo Avenue, as well as the proposed location of the future Stage 1B residential buildings (Figure 2). This site also incorporates development blocks 4A and 4B as identified in the approved Barangaroo Concept Plan (Figure 3) and land to the south-west which forms a part of the Stage 1C Crown Sydney Hotel Resort site (Figure 2). A portion of the Stage 1C Crown Sydney Hotel Resort (SSD 6957) basement structure will be located under Hickson Park within the confines of the Stage 1B site (Figure 6), but is excluded from this SSD application.

The Stage 1B site is generally flat and is currently being remediated (Section 1.3.2), with the exception of some areas to the south and west which are paved with concrete and asphalt.

The closest residents are located approximately 25 m from the site on Hickson Road (Figure 4).

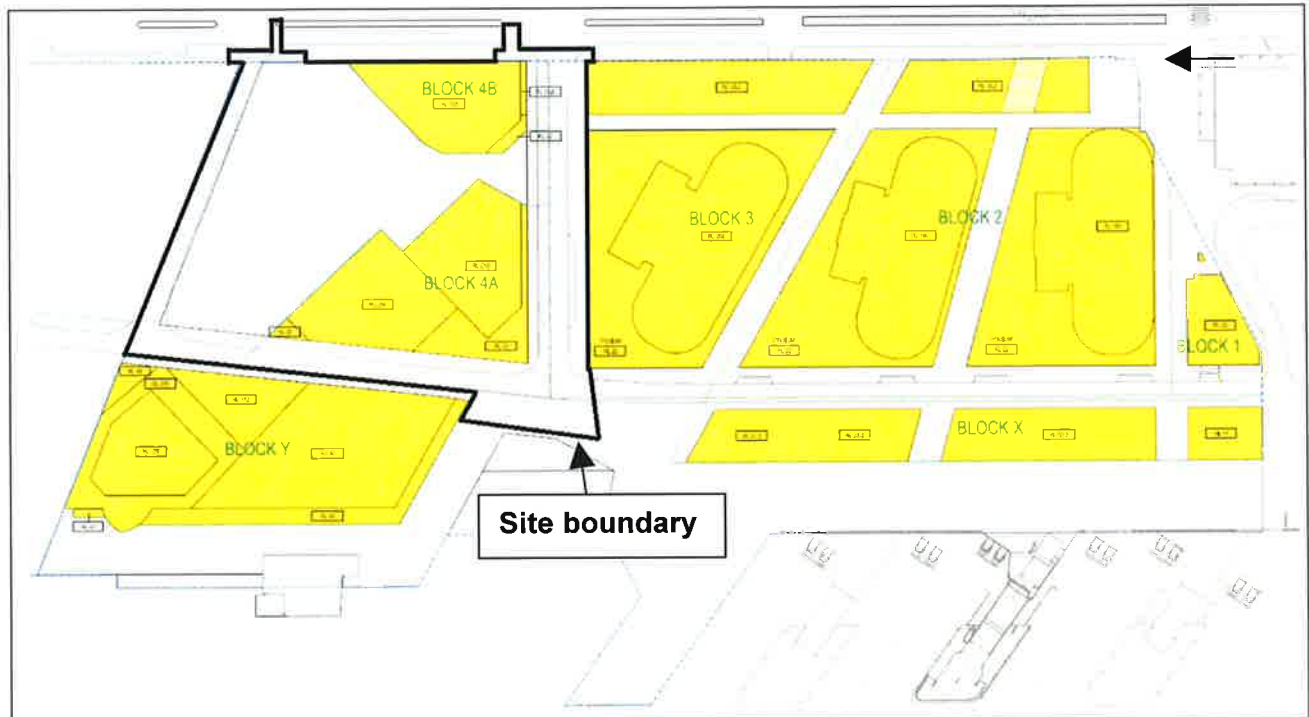
## 1.2 Approval History

### 1.2.1 Barangaroo Concept Plan

On 9 February 2007, the then Minister for Planning approved the Barangaroo Concept Plan (MP 06\_0162) which included a set of built form principles to guide development within the mixed use zone.

The detailed planning history of modifications to the Concept Plan for Barangaroo is provided at **Appendix H**. In summary, eight modifications have been approved since the Concept Plan was originally approved.

The approximate location of the Stage 1B site relative to the approved configuration of development blocks at Barangaroo South is depicted in **Figure 3**.



**Figure 3:** Approved concept plan block configuration (MOD 8) - Barangaroo South (Source: Lend Lease)

### 1.2.2 EPA Declaration Area

The site incorporates a part of a 'remediation site' as declared by the Environment Protection Authority (EPA) under the *Contaminated Land Management Act 1997*, (EPA Declaration Area 21122). The Declaration Area is to be remediated in three stages:

- Stage 1 involves the remediation of Block 4\* and the adjacent public domain areas (SSD 5897) and was approved by the Department of Planning and Environment (the Department) on 10 November 2014. These works are currently well advanced;
- Stage 2 involves the remediation of Block 5 (SSD 6533) to the north and was approved on 18 December 2015; and
- Stage 3 relates to the remediation of part of Hickson Road (SSD 6617) and was approved on 25 August 2016.

The EPA has indicated the Declaration (no. 21122) will not be lifted until the entire area has been successfully remediated.

The majority of the Stage 1B site is currently being remediated as part of the approved Block 4 remediation works (SSD 5897). The approximate location of the subject site relative to these works is illustrated in **Figure 4**.

\* The extent of the approved Block 4 remediation works (SSD 5897) area is shown hatched in Figure 4 and is different from development blocks 4A and 4B as identified in the Barangaroo Concept Plan (Figure 3).

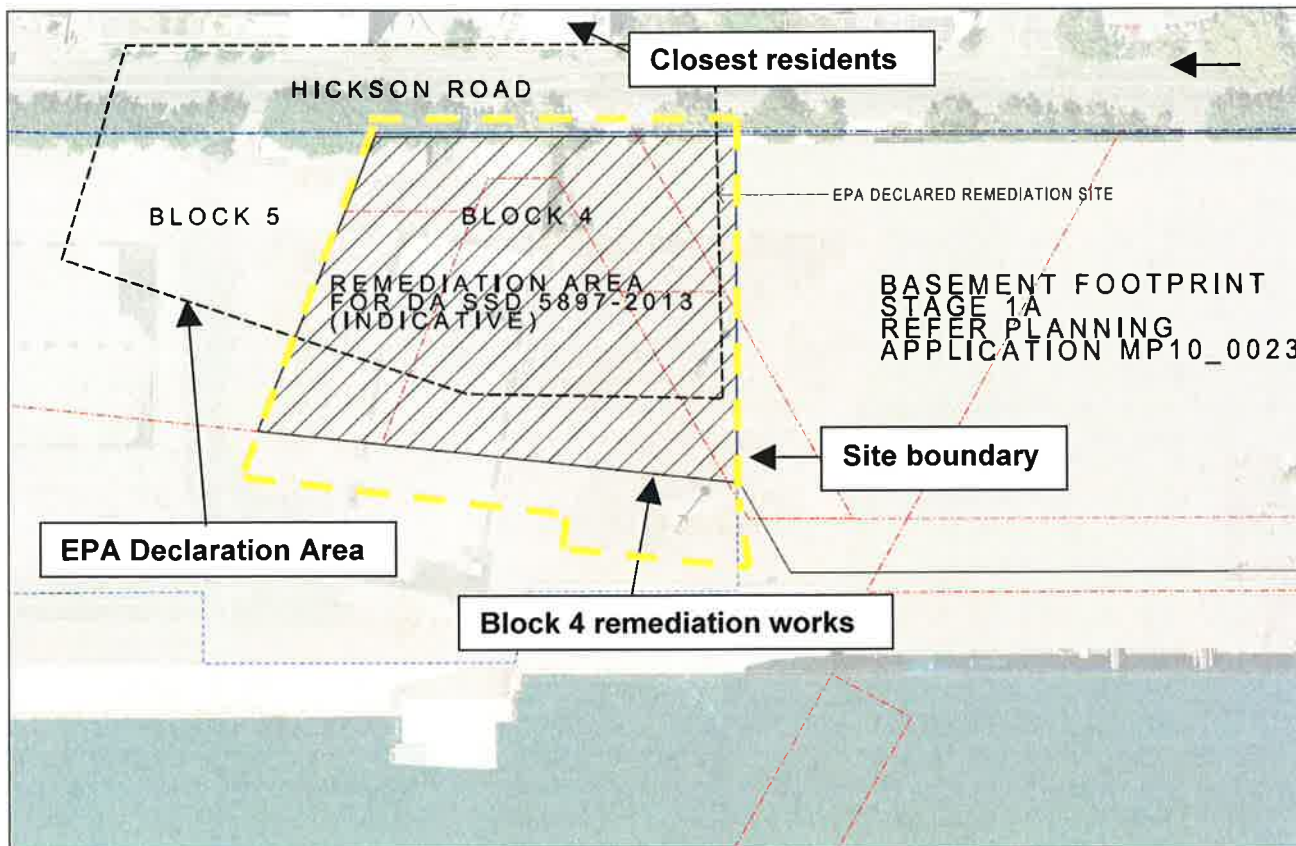


Figure 4: Site boundary in relation to approved remediation works (Base source: EIS)

## 2. PROPOSED DEVELOPMENT

### 2.1 Development Summary

The application seeks approval for construction of the Stage 1B basement, interim public domain, and associated services and infrastructure at Barangaroo South to service the future Stage 1B Residential Buildings (Residential Buildings R4A, R4B and R5).

The major components of the development are summarised in **Table 1** and depicted in **Figures 5 to 7**.

Table 1: Key development components (as amended by the RTS)

Aspect	Description
Excavation and Remediation	<ul style="list-style-type: none"> <li>Excavation (and remediation) beyond a depth approved as part of the Block 4 remediation works (SSD 5897) to enable construction of the Stage 1B basement and a portion of the Stage 1C Crown Sydney Hotel Resort basement</li> <li>Remediation of some parts of the site (i.e. services zones and interim public domain areas) located outside the Block 4 remediation works area (<b>Figure 9</b>).</li> </ul>
Basement	<ul style="list-style-type: none"> <li>Construction of the Stage 1B basement, including basement slabs over 4 levels to accommodate up to 884 car parking spaces to support the Stage 1B residential buildings (<b>Figure 6</b> and <b>Figure 7</b>).</li> </ul>
Fit-out and Use	<ul style="list-style-type: none"> <li>Construction, fit-out and use of the common facilities within the basement, including plant rooms, loading docks, dock-masters office, amenities, waste rooms and storage areas, including the allocation of 26 m<sup>2</sup> of gross floor area (GFA) for basement uses (level B1) within Block 4A (<b>Figure 6</b>). Basement uses includes dock masters and security offices, to support the function and operation of the basement.</li> </ul> <p><i>Note: The allocation of use of car parking spaces within the basement will be the subject of separate future applications for the Stage 1B residential buildings.</i></p>
Structural Cores	<ul style="list-style-type: none"> <li>Construction of the structural cores for the Stage 1B residential buildings and associated building services up to ground level (<b>Figure 6</b> and <b>Figure 12</b>).</li> </ul>



Aspect	Description
Above Ground Structures	<ul style="list-style-type: none"> <li>Construction of above ground basement structures (up to 14 m high) including car park ramps and risers, exhaust stacks, fire stairs and lifts (<b>Figure 8</b> and <b>Figure 12</b>). Above ground elements would be integrated into the future podium/s of the Stage 1B Residential Buildings.</li> </ul>
Interim Public Domain	<ul style="list-style-type: none"> <li>Provision of interim landscaped open space (grassed areas) above the basement where Hickson Park would be located (<b>Figure 12</b>); and</li> <li>interim footpath along the north side of the site adjoining Watermans Quay.</li> </ul> <p><i>Note: interim public domain works are proposed to improve the amenity of the development in the event there are delays in determining the Stage 1B public domain application (SSD 7944) and to allow for the potential staging of the construction and occupation of the future Stage 1B Residential Buildings.</i></p>
Interim Roads	<ul style="list-style-type: none"> <li>Interim construction of the northern section of Barangaroo Avenue including interim footpaths and streetscape and the intersection of Barangaroo Avenue and Watermans Quay (<b>Figure 12</b>) to allow for potential staging of the construction and occupation of the future Stage 1B Residential Buildings.</li> </ul>
Vehicular and Pedestrian Access	<ul style="list-style-type: none"> <li>A vehicular access point to the basement from the south on the future alignment of Watermans Quay (<b>Figure 12</b>); and</li> <li>pedestrian access to the basement via lifts and stairs at ground level (<b>Figure 12</b>).</li> </ul>
Services and Infrastructure	<ul style="list-style-type: none"> <li>Construction of permanent stormwater drainage infrastructure between Hickson Road and Darling Harbour (<b>Figure 5</b>); and</li> <li>provision of services (water, gas, telecommunications etc) and associated infrastructure: <ul style="list-style-type: none"> <li>within the Stage 1B Basement, Hickson Road, the future alignment of Waterman's Quay and part of Barangaroo Avenue (<b>Figure 5</b>); and</li> <li>between the Stage 1A Basement, Stage 1B Basement, the Stage 1C Crown Sydney Hotel Resort site and Barangaroo Central (<b>Figure 5</b>).</li> </ul> </li> </ul>
Tree removal	<ul style="list-style-type: none"> <li>Removal of up to four trees along Hickson Road.</li> </ul>
Hours of Construction	<ul style="list-style-type: none"> <li>7 am to 6 pm (Monday to Friday);</li> <li>7 am to 5 pm (Saturday); and</li> <li>no work Sundays or public holidays.</li> </ul>
Capital Investment Value (CIV)	<ul style="list-style-type: none"> <li>\$272.5 million.</li> </ul>
Employment	<ul style="list-style-type: none"> <li>400 full-time jobs (on site) and 200 full-time jobs (off site) during construction.</li> </ul>
Project Duration	<ul style="list-style-type: none"> <li>July 2017 to 2021.</li> </ul>

The majority of site preparation work including demolition, removal of vegetation, remediation, and construction of retention walls, bulk excavation, and temporary stormwater diversion will be carried out in accordance with the approved Block 4 remediation works (SSD 5897). The extent of the proposed basement and associated works is shown in **Figure 5**.

**Figure 6** illustrates a typical basement level (B1), noting the location of car parking (concentrated to the east), the structural cores of the future Stage 1B residential buildings, shared infrastructure and facilities and the Stage 1C excavation works. **Figure 7** is a north-south cross-section of the proposed basement car park.



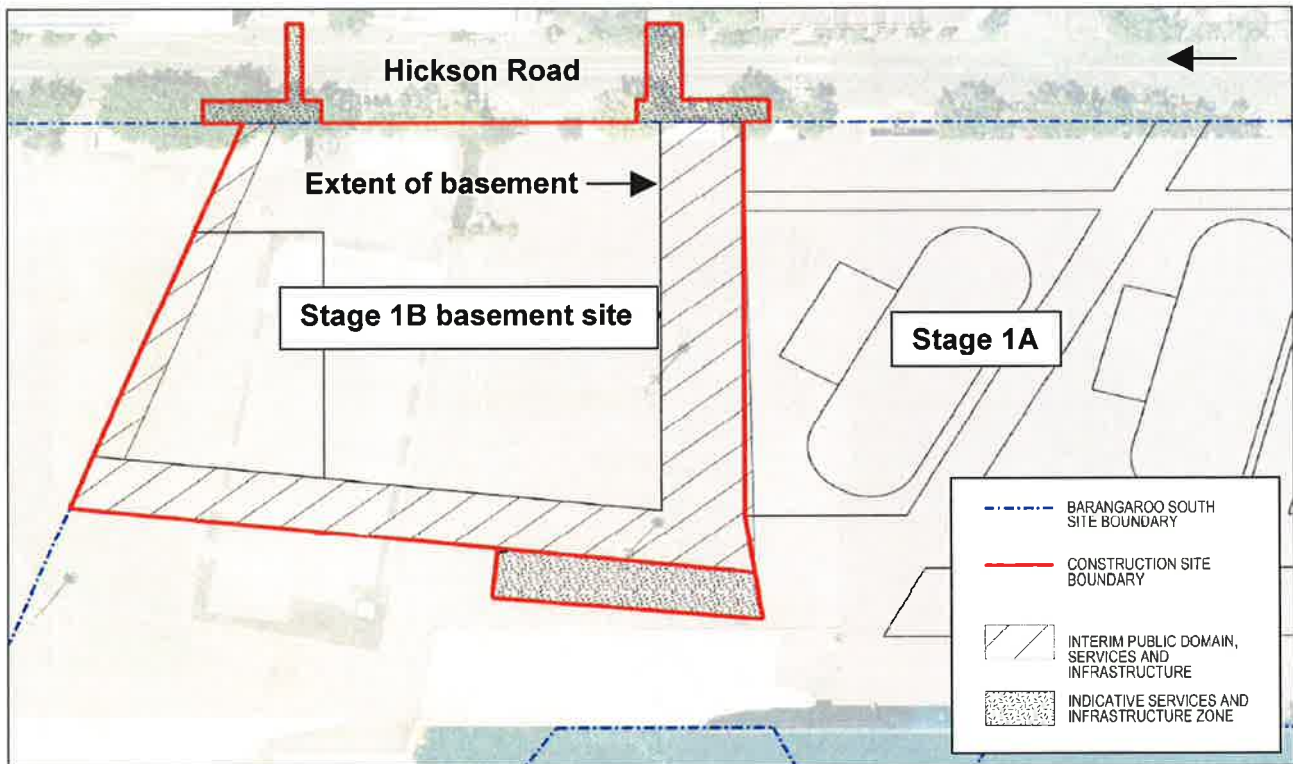


Figure 5: Extent of proposed Stage 1B basement and associated works (Source: EIS)

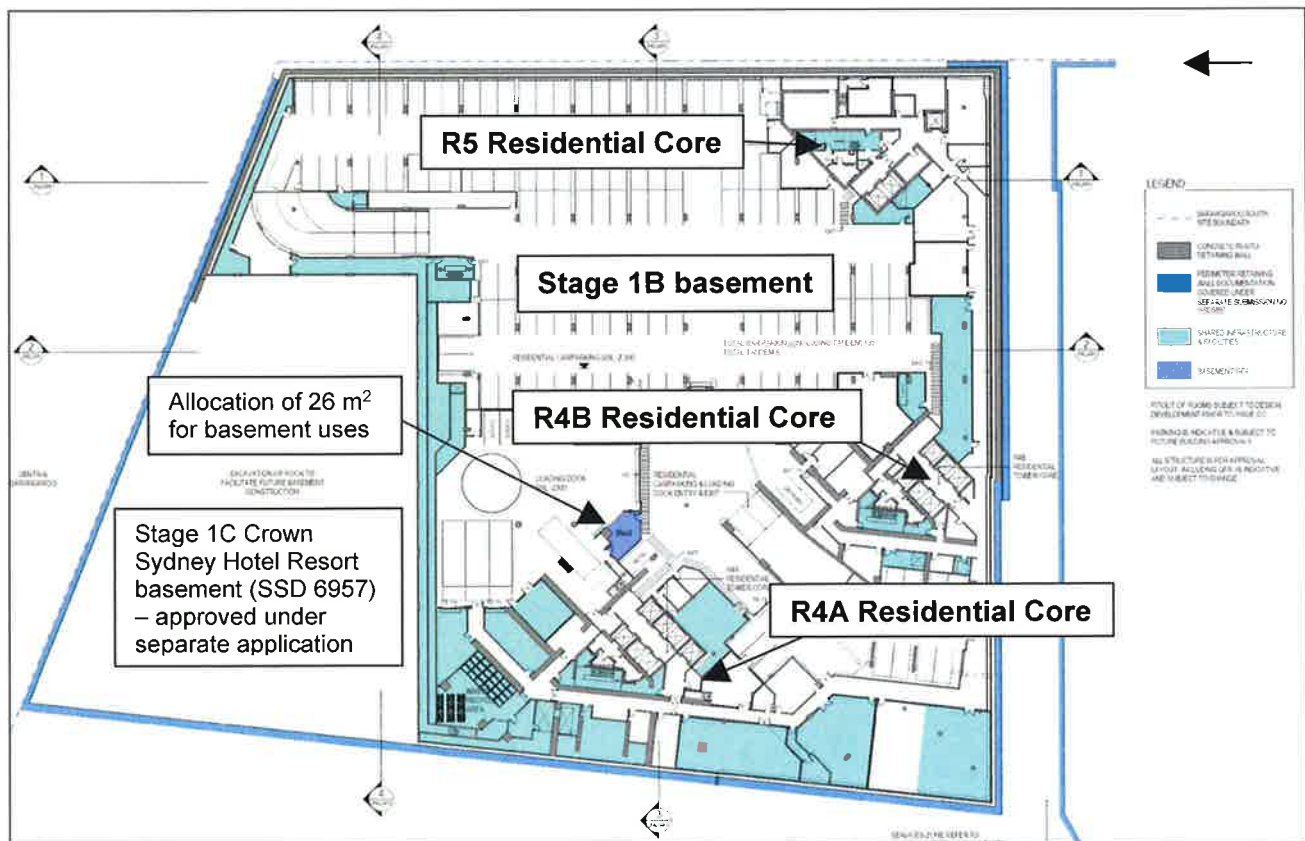


Figure 6: Typical basement car park level - B1 (Source: EIS)

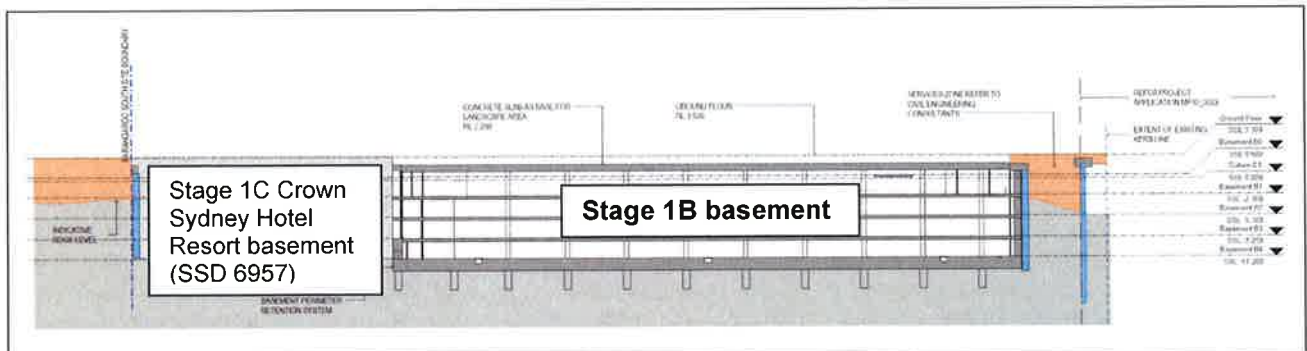


Figure 7: North-south cross section of the proposed basement car park (Source: EIS)

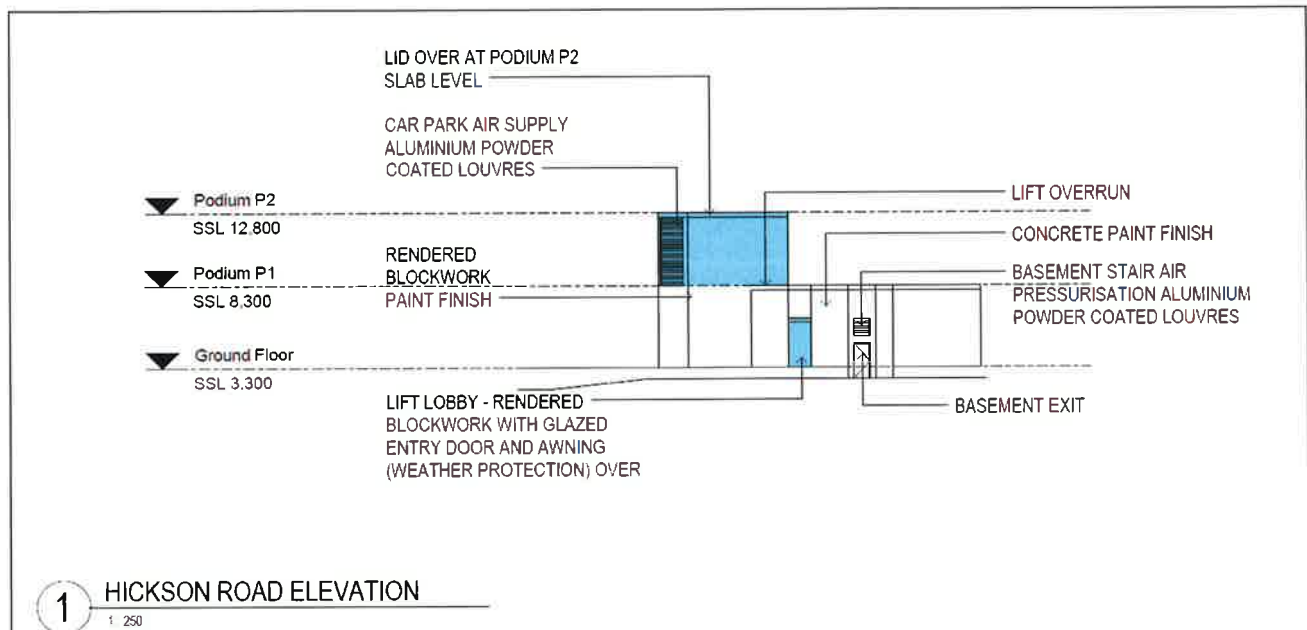


Figure 8: Example elevation of above ground structures when viewed from Hickson Road (Source: EIS)

## 2.2 Staging

The development is proposed to be undertaken in stages with completion anticipated in 2021. The basement would be constructed concurrently with other approved developments at Barangaroo South. As outlined above, the majority of the Stage 1B site is currently being remediated as part of the approved Block 4 remediation works (SSD 5897). The Applicant is proposing to undertake staged validation of contaminated areas to allow excavation (non-remediation) works associated with the development to commence, provided it has (or relevant part) has been:

- endorsed by an EPA-accredited site auditor; and
- successfully remediated and is suitable for the proposed uses.

## 3. STATUTORY CONTEXT

### 3.1 SEPP (State and Regional Development) 2011

The proposal is a SSD pursuant to section 89C of *Environmental Planning and Assessment Act 1979* (EP&A Act) because it is development at Barangaroo with a CIV in excess of \$10 million, under clause 3 of Schedule 2 of *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP). Therefore, the Minister for Planning is the consent authority for the development.

### 3.2 Permissibility

The Barangaroo site is listed as a State Significant Precinct under Part 12 of Schedule 3 of the *State Environmental Planning Policy State Significant Precincts* (SSP SEPP). The SSP SEPP zones the project application site part B4 Mixed Use and part RE1 Public Recreation. The proposed development is permissible with consent in both of these zones.

### 3.3 Delegated Authority

On 14 September 2011, the Minister delegated functions to determine SSD applications to the Planning Assessment Commission (Commission) in cases where an objection has been received from the relevant local council, where the Applicant has provided a political donation disclosure statement, or where there are more than 25 public submissions objecting to the proposal.

As the City of Sydney Council (Council) has objected to the proposal, it is being referred to the Commission for determination.

### 3.4 Environmental Planning Instruments

Under section 79C of the EP&A Act, the consent authority, when determining a development application, must take into consideration the provisions of any environmental planning instruments (EPIs) and draft EPIs (that has been subject to public consultation and notified under the EP&A Act) that apply to the proposal.

The following EPIs apply to the site:

- *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP);
- *State Environmental Planning Policy (State Significant Precincts) 2005* (SSP SEPP);
- *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development*;
- *State Environmental Planning Policy No. 55 – Remediation of Land* (SEPP 55);
- *State Environmental Planning Policy (Infrastructure) 2007*;
- *Sydney Regional Environmental Plan (Sydney Harbour Catchment 2005)*; and
- *Sydney Harbour Foreshores and Waterways Development Control Plan 2005*.

Detailed consideration of the provisions of all EPIs that apply to the proposed development is provided in **Appendix D** of this report. The Department is satisfied the proposed development generally complies with the relevant provisions of these EPIs.

While development control plans (DCPs) do not apply to SSD under clause 11 of the SRD SEPP, consideration has been given to the relevant clauses of the Sydney Harbour Waterways DCP in **Appendix D**.

### 3.5 Objects of the EP&A Act

Decisions made under the EP&A Act must have regard to the objects of the EP&A Act, as set out in section 5 of the Act. The application is considered to be consistent with the objects of the Act as the application would promote the orderly and economic use of the site. The Department has considered the objects of the EP&A Act in **Table 2** below and is satisfied that the proposal complies with all relevant objects.

**Table 2:** Consideration of the proposal against the objects of the EP&A Act

Objects of the EP&A Act	Consideration	Complies?
(a) <i>to encourage:</i>		
(i) <i>the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and</i>	The proposal does not significantly impact on natural and artificial resources, as it involves the construction of an underground basement on a former industrial site, the majority of	Yes

<i>villages for the purpose of promoting the social and economic welfare of the community and a better environment</i>	which is currently being remediated. The proposal will enhance economic and social welfare by facilitating the development of the future Stage 1B residential buildings and Hickson Park, as identified on the Barangaroo Concept Plan (as modified).	
<i>(ii) the promotion and co-ordination of the orderly and economic use and development of land</i>	The proposed land use is permitted and the merits of the proposal are considered in Section 5.	Yes
<i>(iii) the protection, provision and co-ordination of communication and utility services</i>	The proposal includes the provision of services (water, gas etc) and associated infrastructure to facilitate the delivery of Stage 1B of Barangaroo South.	Yes
<i>(iv) the provision of land for public purposes</i>	The proposal would facilitate the delivery of a high quality Hickson Park for public purposes in accordance with the Barangaroo Concept Plan (as modified).	Yes
<i>(v) the provision and co-ordination of community services and facilities</i>	The proposal does not include provision of community services and facilities.	N/A
<i>(vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats</i>	The proposal does not impact on native animals and plants, including threatened species, given the site is a former industrial site, the majority of which is currently being remediated.	Yes
<i>(vii) ecologically sustainable development (ESD)</i>	Section 3.8 of this report considers the proposal against the principles of ESD.	Yes
<i>(viii) the provision and maintenance of affordable housing</i>	The proposal does not include affordable housing provision.	N/A
<i>(b) to promote the sharing of the responsibility for environmental planning between the different levels of government in the State</i>	The proposal is SSD in accordance with the SRD SEPP. The Department consulted with Council and other relevant agencies on the proposal.	Yes
<i>(c) to provide increased opportunity for public involvement and participation in environmental planning and assessment.</i>	Section 4 sets out details of public exhibition on the proposal.	Yes

### 3.6 Compliance with Clause 3B of Schedule 6A of the EP&A Act

Clause 3B(2)(d) of Schedule 6A the EP&A Act specifies that a consent authority must not grant consent under Part 4 unless it is satisfied that a development is consistent with the terms of the approval of a Concept Plan. The Department has considered the proposed development and is of the opinion the proposal is consistent with the Barangaroo Concept Plan as it:

- would not exceed the maximum gross floor area (GFA) or height controls specified in the Concept Plan (as modified);
- complies with all relevant Built Form Principles and Urban Design Controls of the Concept Plan (**Appendix E**);
- would not prejudice the delivery of a high quality Hickson Park, including deep soil zones capable of supporting large mature trees (**Section 5.1**);
- reflects the approved block configuration in the Concept Plan and is permissible with consent on the subject site; and
- would facilitate the development of the future Stage 1B residential buildings within Barangaroo South as identified on the Concept Plan.

The Department concludes that the proposed works are consistent with the terms of the Concept Plan.



### 3.7 Environmental Planning and Assessment Regulation 2000

Subject to any other references to compliance with the EP&A Regulation cited in this report, the requirements for notification (Part 6, Division 6) and fees (Part 15, Division 1AA) have been complied with.

### 3.8 Ecologically Sustainable Development

The EP&A Act adopts the definition of ESD found in the *Protection of the Environment Administration Act 1991* (POEA Act). Section 6(2) of the POEA Act states that ESD requires the effective integration of economic and environmental considerations in decision-making processes.

The Department notes the proposal embodies ESD principles by contributing to meeting precinct-wide sustainability targets for Barangaroo South such as having a carbon neutral footprint, incorporating a recycled water supply system (extended from the Stage 1A basement), energy efficiency measures such as LED lighting and a target diversion of up to 80% of waste from landfill. In addition, the Department considers the precautionary and inter-generational equity principles have been applied in the decision making process via an assessment of the environmental impacts of the proposal, as detailed in section 5 of the Applicant's EIS.

### 3.9 Secretary's Environmental Assessment Requirements

Section 7.1 of the EIS addresses compliance with the Director-General's (now Secretary's) Environmental Assessment Requirements. These matters have been sufficiently addressed in the EIS to enable the Department to undertake a proper assessment of the proposal in accordance with the EP&A Act.

### 3.10 Strategic Context

The Department considers the proposal is consistent with the following State/regional/local strategies:

- the objectives of *NSW 2021* (the State Plan) via the creation of 400 new on site jobs and 200 new off-site jobs during construction;
- the objectives of *Towards our Greater Sydney 2056* and *A Plan for Growing Sydney*, including the following key directions and actions:
  - facilitate the delivery of Barangaroo as an emerging major tourism and entertainment precinct which would expand upon and diversify Sydney's Cultural Ribbon,
  - suitably manage the impacts of development on the environment,
  - promote new development to accommodate an additional 102,000 new jobs within the Sydney Central subregion, and
  - facilitate the delivery of Barangaroo as part of Global Sydney, and
- the relevant priorities and actions of the Greater Sydney Commission's *Draft Central District Plan*, in particular by providing:
  - a 'Productive City' by driving economic growth and contributing to job targets,
  - a 'Liveable City' by facilitating construction of residential development at Barangaroo South improving housing choice and contributing to housing targets, and
  - a 'Sustainable City' by suitably managing the potential impacts of the development on the environment.

## 4. CONSULTATION AND SUBMISSIONS

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### 4.1 Exhibition

As required by section 89F of the EP&A Act, the SSD application and accompanying information was made publicly available in accordance with the EP&A Regulation for at least 30 days following the date of first publication (see **Table 3**).

**Table 3:** Exhibition details

Exhibition/Notification	Format	Dates
<b>Publicly Exhibited</b>	The Department's Bridge Street office, the City of Sydney Council's One Stop Shop and on the Department's website	10 March 2016 to 8 April 2016 (30 days)
<b>Newspaper Notice</b>	Sydney Morning Herald and Daily Telegraph	9 March 2016
<b>Written Notices</b>	Surrounding landowners, key agencies and City of Sydney Council	3 March 2016 to 8 March 2016

The Department received a total of eight submissions in response to the exhibition, including seven from public authorities and one public submission raising concerns about the proposal. A link to the submissions may be viewed at **Appendix F**.

#### 4.2 Public Authority Submissions

The Department received seven submissions from public authorities which are summarised in **Table 4** below.

**Table 4:** Summary of public authority submissions received during the exhibition

<b>City of Sydney Council (Council)</b>
<p>Council object to the proposal and provided the following comments:</p> <ul style="list-style-type: none"> <li>The proposal is prohibited as it provides for development on land reserved for public open space and has no planning entitlement for building blocks to rely.</li> </ul> <p><u>Open Space and Road Design</u></p> <ul style="list-style-type: none"> <li>The basement design should be informed by a landscape plan to ensure the basement does not limit landscaping (e.g. tree growth), structures and connections in Hickson Park;</li> <li>did not support the interim/temporary approach to planting a large expanse of grass above the basement with no trees;</li> <li>providing turf above the basement for an undefined amount of time ignores the opportunity to give early access to these areas and allow vegetation more time to establish;</li> <li>in the absence of a final landscape plan for Hickson Park, the impact of car park exhaust stacks and service risers cannot be effectively assessed;</li> <li>pedestrian footpaths along Barangaroo Avenue should be continuous;</li> <li>pedestrian footways should be provided around Barton Street; and</li> <li>access controls to the basement risers should be confirmed and assessed.</li> </ul> <p><u>Transport and Access</u></p> <ul style="list-style-type: none"> <li>Car parking rates based on the <i>Sydney Local Environmental Plan 2005</i> are excessive and should be based on the <i>Sydney Local Environmental Plan 2012</i> rates;</li> <li>bicycle parking and end of trip facilities should be clearly identified on the architectural plans, be grouped together in the upper levels of the basement and in accordance with the Sydney Development Control Plan 2012 rates;</li> <li>a swept path analysis is required to demonstrate Council rubbish trucks can sufficiently access loading bays and egress in a forward direction; and</li> <li>the capacity of the basement access ramp to sufficiently accommodate predicted traffic should be demonstrated through queuing analysis.</li> </ul>
<b>Environment Protection Authority (EPA)</b>
<p>The EPA did not object to the proposal and provided the following comments:</p> <p><u>Contamination</u></p> <ul style="list-style-type: none"> <li>Accepted significant contamination is unlikely to be encountered outside the EPA Declaration Area including the service zones to the south and west;</li> <li>considered the method for installation of services (stormwater pipes) on Hickson Road and interim remediation works within the EPA Declaration Area to be appropriate;</li> <li>requested management strategies be developed for confirming remediation works are completed prior to excavation; and</li> <li>requested contingency measures be in place in the event residual contamination (and associated air</li> </ul>

emissions compounds) are exposed during excavation works.

#### Waste

- Requested further detail be provided in the waste management plan for the development regarding waste minimisation, reuse, recycling, classification, handling and disposal.

#### Water Quality

- Recommended conditions for water quality management consistent with other projects at Barangaroo.

#### Air Quality

- Requested the Air Quality Impact Assessment (AQIA) in the EIS be updated to include further analysis of predicted air quality exceedances, including proactive and reactive management to minimise emissions and ensure exceedances do not occur.

#### Noise and Vibration

- Requested increased justification be provided for construction works outside standard hours (e.g. between 1 pm and 5 pm Saturdays); and
- requested the Construction Noise and Vibration Management Plan prepared for previous developments at Barangaroo South be updated to include the mitigation measures contained in the EIS.

#### **Transport for NSW (TNSW)**

TNSW did not object to the proposal and provided the following comments:

- requested the Transport Management and Accessibility Plan in the EIS be updated to address a number of issues (e.g. use recent traffic counts, confirm construction access, correct outdated references, update modelling);
- requested the Statement of Commitments for the development be updated regarding provision of bicycle parking, end of trip facilities and strategies to increase sustainable transport; and
- recommended consent conditions requiring the preparation of a Loading Dock Management Plan and an updated Construction Pedestrian and Traffic Management Plan (TMAP).

#### **Department of Primary Industries (DPI)**

DPI did not object to the proposal and provided the following comments:

- requested clarification on how potential groundwater mounding would be managed during construction;
- requested that a groundwater management plan be prepared in the event that it is not proposed to permanently redirect groundwater flow around the basement;
- advised that the Applicant would need to apply for a temporary Construction Dewatering Licence from DPI; and
- advised that a Water Access License would be required for any on-going groundwater take from the Sydney Central Basin source (if required).

#### **Fire and Rescue NSW (FRNSW)**

FRNSW did not object to the proposal and provided the following comments:

- recommended the Fire Safety Strategy for the basement consider all fire safety requirements of the future Stage 1B residential buildings and measures in addition to the deemed to satisfy provisions of the BCA; and
- recommended FNSW be consulted during the design and construction of buildings and any relevant stages post-construction.

#### **Sydney Water Corporation (SWC)**

SWC did not object to the proposal and noted the water servicing capacity and strategy for the development would need to be confirmed during the Section 73 application phase.

#### **Roads and Maritime (RMS)**

RMS advised it did not wish to make any comments on the proposal and requested TNSW be consulted.

### 4.3 Public Submissions

The Department received one submission from a nearby resident which raised concerns regarding:

- air quality and contamination management; and
- the implementation of adequate mitigation measures to control construction noise and vibration, particularly from equipment operating at night.

#### 4.4 Response to Submissions

Following determination of MOD 8 to the Barangaroo Concept Plan which required design changes to Hickson Park (under which the proposed basement would be located), the Applicant lodged its Response to Submissions report (RTS) for the proposal on 6 September 2016 to address issues raised in submissions. The RTS proposed the following key changes to the proposal:

- minor refinements to the structural grid of the basement;
- refinement of interim public domain works including:
  - deletion of Barton Street and replacement with turf;
  - extension of the interim section of Barangaroo Avenue to its intersection with Watermans Quay; and
  - provision of continuous streetscape and footpaths along Barangaroo Avenue.
- provision of indicative drawings showing how the requirements of MOD 8 to the Concept Plan to provide deep soil zones in Hickson Park to support large mature trees could be satisfied by amending the basement design (i.e. by lowering/folding the uppermost level of the basement slab).

A link to the RTS may be viewed at **Appendix G**.

#### 4.5 Submissions on the RTS

The application (as amended by the RTS) was referred to Council, EPA, TNSW, DPI and FRNSW for comment. A summary of the submissions received from these agencies on the RTS is provided in **Table 5** below.

**Table 5:** Summary of public authority submissions on the RTS

<p><b>Council</b></p> <p>Council maintained its objection to the proposal and provided the following comments:</p> <ul style="list-style-type: none"> <li>• there is too much uncertainty with the proposal in the absence of a final design for Hickson Park, as the basement design has significant impacts on Hickson Park and its ability to achieve desired future outcomes set out in the Concept Plan;</li> <li>• deferring consideration of the basement design (by condition) for provision of deep soil zones to the construction certificate stage defers the assessment of environmental impacts beyond determination and lacks transparency;</li> <li>• the application is inconsistent with documentation provided for the Stage 1B residential buildings as it relies on the provision of mature trees at the base of those towers and should be withdrawn and re-lodged once the design of the Stage 1B basement, Stage 1C basement, Stage 1B residential buildings and Hickson Park are all designed and coordinated in a holistic manner;</li> <li>• providing interim landscaping for an undefined amount of time ignores the opportunity to implement permanent landscaping in Hickson Park early; and</li> <li>• the final design for Hickson Park is likely to be dictated by the basement construction.</li> </ul>
<p><b>EPA</b></p> <p>The EPA provided the following comments:</p> <p><u>Contamination</u></p> <ul style="list-style-type: none"> <li>• Considered contamination should be deemed to be successfully remediated before non-remediation excavation activities commence.</li> </ul> <p><u>Air Quality</u></p> <ul style="list-style-type: none"> <li>• Noted it has reviewed the revised AQIA which includes additional analysis of predicted exceedences and generally address comments on reactive management.</li> </ul> <p><u>Noise and Vibration</u></p> <ul style="list-style-type: none"> <li>• Considered the response does not adequately justify the extended construction hours because it does not demonstrate community consultation or support.</li> </ul> <p>The EPA recommended conditions requiring the preparation of an Air Quality Management Plan, controls for particulate matter mitigation and for all remediation works to be undertaken in enclosures.</p>



<b>TNSW</b>
TNSW did not raise any issues of concern and recommended an additional consent condition requiring the Applicant to obtain Road Occupancy Licences for the development.
<b>DPI</b>
DPI considered the issues raised in their original submission had been addressed.
<b>FRNSW</b>
FRNSW did not make a submission on the RTS.

The Applicant also subsequently provided additional information to the Department, including additional indicative deep soil zone drawings, a response to outstanding noise issues raised by the EPA in its RTS submission and a response to Council's RTS submission.

This assessment report considers the Applicant's proposal as put forward in the RTS and considers each of the public authorities' final position on the proposal following review of the RTS. The Department is satisfied the RTS and subsequent information satisfactorily addresses those issues raised in the submissions. Key issues are further considered in **Section 5** of this report and/or addressed by way of recommended conditions at **Appendix A**.

## 5. ASSESSMENT

### 5.1 Considerations under section 79C of the EP&A Act

**Table 6** identifies the matters for consideration under section 79(C) of the EP&A Act that apply to SSD. The EIS has been prepared by the Applicant to consider these matters and those matters detailed in the SEARs.

**Table 6:** Section 79C(1) Matters for Consideration

<b>Section 79C(1) Evaluation</b>	<b>Consideration in this Report</b>
(a)(i) any environmental planning instrument	The Department's consideration of the relevant EPIs is provided in <b>Section 3.4</b> and <b>Appendix D</b> of this report.
(a)(ii) any proposed instrument	Not applicable.
(a)(iii) any development control plan (not applicable to SSD)	Under clause 11 of the SRD SEPP, DCPs do not apply to SSD. However, consideration has been given to the Sydney Harbour Foreshores and Waterways Area DCP at <b>Appendix D</b> .
(a)(iiia) any planning agreement	Not applicable.
(a)(iv) the regulations	The development application meets the relevant requirements of the EP&A Regulation. The procedures relating to development applications (Part 6 of the EP&A Regulation), public participation procedures for SSDs, and Schedule 2 of the EP&A Regulation relating to environmental impact statements have been satisfied.
(a)(v) any coastal zone management plan	Not applicable.
(b) the likely impacts of that development	Impacts of the development are considered in <b>Section 5</b> of this report
(c) the suitability of the site for the development	<b>Section 3.2</b> and <b>Section 3.6</b> .
(d) any submissions	Consideration has been given to submissions received in <b>Section 4</b> of this report. Key issues raised in submissions have been considered further in <b>Section 5</b> of this report.
(e) the public interest.	The application is considered to be in the public interest as it would facilitate the development of Stage 1B of the Barangaroo site (in particular, the future Stage 1B residential buildings) at significant benefit to the State.

Biodiversity values exempt if:	
(a) On biodiversity certified land?	Not applicable.
(b) Biobanking Statement exists?	Not applicable.

## 5.2 Key Assessment Issues

The Department has considered the EIS, the issues raised in submissions, the Applicant's RTS, and subsequent information provided by the Applicant in its assessment of the proposal. The Department considers the key issues to be:

- contamination and waste management;
- public domain, deep soil zones and landscaping;
- transport and access;
- noise and vibration; and
- air quality.

All other environmental impacts are considered to be minor and the Department's assessment of these issues is provided in **Section 5.8**.

## 5.3 Contamination and Waste Management

The site incorporates a part of a 'remediation site' as declared by the EPA under the *Contaminated Land Management Act 1997* (Declaration Area No. 21122). The Declaration Area is proposed to be remediated in three stages, all of which have been approved by the Department (i.e. remediation of Block 4, Block 5 and Hickson Road).

The majority of the Stage 1B basement site is currently being remediated as part of the approved Stage 1, Block 4 remediation works (SSD 5897). The approved remediation method involves excavation of contaminated material in enclosures to an indicative depth of up to approximately RL -16.5 and transport of contaminated waste off-site by truck for treatment and disposal. These works are being undertaken in accordance with a site specific *NSW Declared Remediation Site No. 21122 Remedial Action Plan* (Declaration Area RAP).

Given the site is located both within and adjacent to the Declaration Area, the EIS includes a contamination assessment. Contamination management was also an issue of concern raised in public submissions.

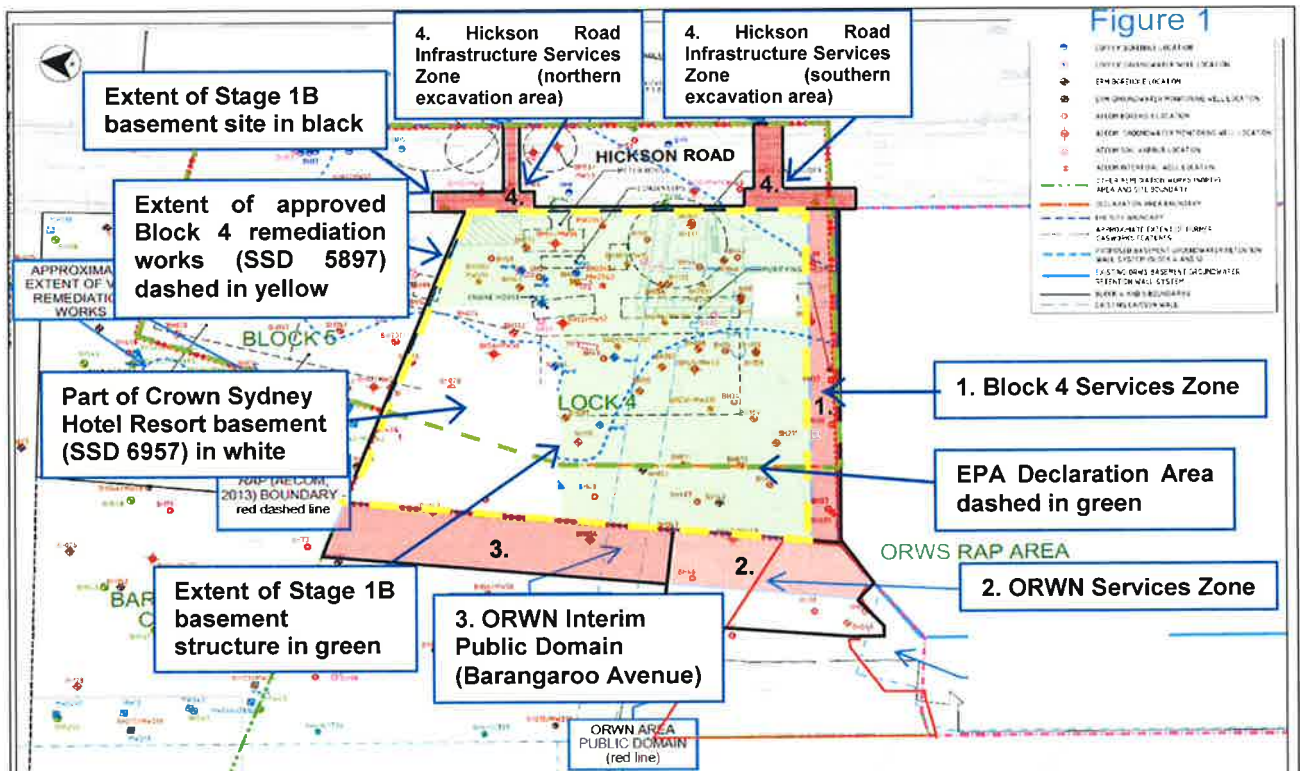
The application proposes excavation beyond the indicative depth approved as part of the Block 4 remediation works (SSD 5897) to enable construction of the basement. Additional excavations would extend an additional 0.4 m depth to approximately RL -16.9 (as required for tower lift pits, hydrostatic slabs and blinding) and further for piling works. The additional bulk excavation required to construct the basement was considered in the Declaration Area RAP which confirms these works are consistent with the preferred remediation strategy (as above). The depth of significantly contaminated material (typically present at depths shallower than 8 m below ground level) is less than the proposed basement depth and would therefore be removed as part of the Block 4 remediation works (SSD 5897). Materials below a depth of around 8 m below ground level are comprised of natural bedrock and marine sediments which are unlikely to be contaminated in such a way that requires remediation. As such, the contamination assessment concludes the additional basement excavation works can be appropriately managed in accordance with the Declaration Area RAP. This RAP has been approved by an independent EPA-accredited Site Auditor who has issued Section B Site Audit Statements verifying the RAP would ensure the Stage 1B development area is made suitable for intended future uses.

In addition to the above, four areas of works proposed as part of this application are located outside of the approved Block 4 remediation works area, including the Block 4 services zone, the

Other Remediation Works North (ORWN) services zone, the ORWN interim public domain (Barangaroo Avenue) and the Hickson Road infrastructure services zones. Careful consideration has therefore been given separately to the potential presence of contaminated material in each of these areas to ensure (if present) it is effectively managed. These four areas are labelled in **Figure 9** below.

**Block 4 Services Zone**

The Block 4 Services Zone is located on the southern boundary of the site and will involve excavation up to 2.7 m below existing ground level within an 8 m wide corridor to provide underground services infrastructure. The Block 4 services zone is also located predominantly within the Declaration Area (**Figure 9**). As such, an addendum to the Declaration Area RAP was submitted as part of the RTS which recommends additional validation sampling be undertaken to confirm the presence (or not) of contaminated material. Contingent on the results, the RAP Addendum found the area may require remediation in accordance with preferred strategy for Block 4 (as above) in the Declaration Area RAP which would make the area suitable for the proposed use.



**Figure 9:** Proposed work areas located outside the approved Block 4 remediation area (Source: EIS)

**Other Remediation Works North Services Zone**

The Other Remediation Works North (ORWN) Services Zone is located on the south-west corner of the site and will involve excavation up to 6 m deep within a 30 m wide corridor to provide underground services infrastructure. The contamination assessment found, based on available soil and groundwater samples, the area is unlikely to be contaminated and would be suitable for the proposed use.

Notwithstanding this, the southern portion of the zone is located within the area contemplated by the Stage 1B Waterfront Public Domain RAP (Public Domain RAP) prepared for the proposed Stage 1B Public Domain Works (SSD 7944). As such, the contamination assessment considered the conclusions of this RAP should be applied to this zone. The RAP recommends additional validation sampling be undertaken to confirm the presence (or not) of contaminated material. Contingent on the results, the RAP found the area may require remediation in accordance with the

preferred strategy (i.e. excavation, ex-situ treatment and off-site disposal to a licensed facility) which would make the area suitable for the proposed use.

The Site Auditor has issued a Section B Site Audit Statement verifying the nature and extent of the contamination has been appropriately determined and the Public Domain RAP would ensure the area is made suitable for the intended future uses of the land.

#### ORWN Interim Public Domain (Barangaroo Avenue)

The ORWN Interim Public Domain (i.e. Barangaroo Avenue) is located on the western boundary of the site and would involve shallow excavation up to 0.5 m deep within an approximately 15 m wide corridor to provide underground services infrastructure and interim construction of the northern section of Barangaroo Avenue. The ORWN interim public domain is located outside the Block 4 remediation works area (SSD 5897) and the area contemplated by the Public Domain RAP. The contamination assessment therefore reviewed available soil and groundwater samples which found the area is unlikely to be contaminated and would be suitable for the proposed public domain (roadway) use and no remediation would be required. In the event contaminated material is encountered, an Unexpected Finds Protocol (UFP) and Asbestos Management Plan (AMP) would be implemented to mitigate against potential risks to human health and the environment (see detail below).

#### Hickson Road Infrastructure Services Zones

These zones are located within and form part of the Declaration Area (**Figure 9**). The Hickson Road Infrastructure Services Zones are located to the east of the site and would involve excavation up to 2 m deep to provide underground services infrastructure. The contamination assessment of soil and groundwater conditions found the southern excavation area is unlikely to be contaminated and therefore would be suitable for the proposed use. However, the assessment found the northern excavation area is likely to be contaminated requiring remediation in accordance with the preferred methodology approved for the Hickson Road remediation works (SSD 6617).

Interim remediation works are proposed as part of this application (i.e. lining excavations with High Density Polyethylene (HDPE) liner, backfilling with suitable validated fill material and preparing a validation report for the approval of an EPA-accredited site auditor) until such time as the final remediation of Hickson Road is undertaken in accordance with SSD 6617. These interim works would ensure Hickson Road excavation areas are suitable for the provision of infrastructure services.

To manage the potential for exposure of unexpected contaminated material and to mitigate against potential risks to human health and the environment, the Applicant proposes to implement an UFP during excavation works. This would involve inspection of excavations by a qualified environmental scientist, additional validation sampling (where required) based on observations, assessment if material can remain in-situ, remediation and validation (where deemed necessary) and backfilling trenches with clean fill. It is also proposed to implement an AMP to ensure any asbestos impacted materials encountered are appropriately managed and disposed of at a licensed facility.

The Site Auditor who prepared the Declaration Area RAP has endorsed the contamination assessment. The Site Auditor found the assessment is adequate to demonstrate land outside of the Block 4 remediation area (as approved under SSD 5897) can be made suitable for the proposed infrastructure and the interim public domain uses subject to implementation of:

- an UFP and AMP during all works, in particular in the ORWN Services Zone and ORWN Interim Public Domain (Barangaroo Avenue);
- the Declaration Area RAP, the Declaration Area RAP addendum and the Public Domain RAP (where relevant); and
- interim remediation works within the northern excavation area of the Hickson Road Infrastructure and Services Zone (in the event these works occur before the final remediation of Hickson Road is undertaken in accordance with SSD 6617).



The EPA noted the remediation of the majority of the site has been approved as part of SSD 5897. The EPA considered the contamination assessment to be adequate and proposed works located outside the Declaration Area are unlikely to encounter significant contamination. The EPA also considered interim remediation measures proposed in the Hickson Road Infrastructure Services Zone to be appropriate.

The EPA recommended no excavation (non-remediation) activities be undertaken until contamination has been deemed to be successfully remediated and recommended a condition requiring all remediation works to be undertaken in enclosures. The EPA also initially raised a number of issues with the Construction Waste Management Plan (WMP) provided in the EIS to support the management and disposal of contaminated materials. However, the Applicant provided a revised WMP in the RTS to address these issues and, the EPA raised no further issues.

The Department notes the majority of site contamination would be removed as part of the approved Block 4 remediation works (SSD 5897). While the proposed works do present some risk of harm to human health and the environment, the Department's assessment concludes remediation documentation submitted in support of the application can be relied upon to ensure that where land is contaminated, it would be remediated in accordance with the requirements of SEPP 55 the land is made suitable for its intended future uses. The Department has recommended the imposition of key conditions requiring the Applicant to:

- implement an UFP, AMP and WMP during all works;
- where required, ensure all remediation works to be undertaken in accordance with the relevant RAP;
- where necessary, ensure all remediation works are undertaken in enclosures fitted with suitable air emissions control systems designed in consultation with the EPA and approved by the Secretary;
- ensure no excavation (non-remediation) works are undertaken until contaminated parts of the site have been validated by a suitably qualified expert and endorsed by an EPA-accredited site auditor to confirm the site has been successfully remediated. Validation may occur progressively in parts to allow excavation (non-remediation) works to commence, prior to validation of the site as a whole;
- prepare an excavation and remediation works program prior to construction which has been endorsed by an EPA-accredited site auditor and reviewed by the EPA to reduce the risk of inadvertent disturbance of contaminated material during no excavation (non-remediation) works; and
- notification of Council once the remediation works have been completed, as per the requirements of Clauses 17 and 18 of SEPP 55.

With these conditions in place, the Department concludes:

- suitable management strategies would be in place for progressively confirming remediation is complete prior to undertaking excavation activities;
- suitable contingency measures in place in the event residual contamination is exposed during the excavation works; and
- where required, contaminated material would be successfully remediated and validated in accordance with the relevant legislation.

## 5.4 Public Domain

### 5.4.1 Interim public domain

The application proposes interim public domain including landscaping, footpaths, roadway and streetscape as outlined in **Table 1**. In particular, landscaped open space is proposed above the basement where Hickson Park will be located. Interim public domain works are proposed to improve the amenity of the development in the event there are delays in determining the Stage 1B public domain application (SSD 7944) and to allow for the potential staging of the construction and occupation of the future Stage 1B Residential Buildings.

The permanent landscaping design for Hickson Park will be delivered through SSD 7944 and will include all permanent public domain features such as open space, mature trees, street furniture, paving, lighting and wayfinding signage. As such, should SSD 7944 be approved prior to the completion of construction of the proposed basement, it is anticipated the interim public domain proposed as part of this application may not commence or be completed as they would be superseded by the permanent works.

The proposed interim public domain is illustrated in **Figure 12** of this report.

Council did not support the interim/temporary approach to planting a large expanse of grass above the basement without trees. Council considered providing turf above the basement for an undefined amount of time ignores the opportunity to give early access to these areas and allow vegetation more time to establish. In the absence of a final landscape plan for Hickson Park, Council considered the impact of car park exhaust stacks and service risers could not be effectively assessed.

The proposed public domain will offer an interim solution until the design of the permanent Stage 1B public domain including Hickson Park is finalised. The Applicant has advised the detailed design of the permanent public domain is progressing as part of the Stage 1B public domain application (SSD 7944) but noted there are still a number of key stakeholders who must be consulted to ensure a high quality outcome is achieved. The Applicant therefore considered the design of these areas should not be rushed, however noted the orderly and timely development Stage 1B of Barangaroo South must occur consistent with the desired outcomes of the approved Concept Plan.

The Applicant noted the interim public domain proposed has been designed by Grant Associates who is also designing the permanent Stage 1B public domain, including Hickson Park. The basement design, including exhaust stacks and service risers, has therefore been developed considering the future design of Hickson Park. As such, the Applicant considered these elements would not prevent the attainment of a high quality public domain.

The Department supports the Applicant's proposed interim public domain and is satisfied with the temporary design until such time as the permanent Stage 1B public domain is finalised. The location of service risers and exhaust stacks are generally within the building footprints approved under the Concept Plan for the proposed R4A, R4B and R5 buildings and would be integrated into the future podiums of these buildings. Further, it is noted the Stage 1B public domain application (SSD 7944) is expected to be lodged with the Department shortly and therefore it's possible that the proposed 'interim' public domain would not be realised given the basement would take over four years to construct.

#### **5.4.2 Deep soil zones and landscaping**

In addition to the Stage 1B public domain application (SSD 7944), a number of other applications including the subject application, the Stage 1C basement and the Stage 1B residential buildings (R4A, R4B and R5) are located within and adjacent to footprint of Hickson Park and have synergies with its landscape design.

Council's key concerns therefore relate to ensuring these applications are designed and coordinated in a holistic manner and do not impact on the ability of Hickson Park to achieve the desired future outcomes and broader landscaping strategy set out in MOD 8.

MOD 8 to the Barangaroo Concept Plan sets out the desired future outcomes and broader landscaping strategy for Hickson Park (with regards to view corridors, deep soil zones, overshadowing and soft landscaping) by requiring specific design changes.

Modification B3(1)(b) and (c) of MOD 8 requires Hickson Park to provide view corridors and support large mature trees, including the provision of at least 2,000 m<sup>2</sup> of deep soil with a depth of at least 3 m. Modifications B3(1)(d) and (e) require Hickson Park not to be overshadowed more

than an average area of 2,500 m<sup>2</sup> between 12 midday and 4 pm on 21 June every year, and be primarily comprised of soft landscaping, including extensive areas of grass.

Additionally, future environmental assessment requirement C11 of MOD 8 states that where landscaped areas involving the planting of trees are proposed above basement car parking, adequate soil depth to support medium and large trees to a height of at least 15 m must be provided.

These matters are considered separately below.

#### Deep soil zones

The application originally proposed basement levels that would allow for a minimum soil depth of approximately 1.3 m in Hickson Park.

In response to the Commission's determination of MOD 8 to the Concept Plan and the specific requirement to provide deep soil zones (DSZs) in Hickson Park, the Applicant has provided indicative deep soil zone drawings to demonstrate that 2,000 m<sup>2</sup> of DSZ with a depth of 3 m can be achieved by lowering (folding down) a section of the basement slab at ground level by approximately 2.4 m to Structural Slab Level (SSL) 1.10 (**Figure 10** and **Figure 11**). However, the Applicant noted the final location, size and scale of the DSZ and its relationship with the basement would be determined by the Stage 1B public domain application (SSD 7944). As such, the Applicant requested a condition be imposed requiring the submission of amended basement design plans showing any adjustments required to accommodate DSZ to the Secretary for approval, prior to the issue of the relevant Construction Certificate for the basement (SSD 6960).

Council raised concern with deferring consideration of the basement design for the DSZ provision to the Construction Certificate stage as it would defer the assessment of environmental impacts beyond determination and lacks transparency.

The Applicant has responded by noting the basement slab to provide the DSZ would only affect part of the uppermost level (B1) of the basement. This would reduce the floor to ceiling clearance of the affected area of the basement to 2500 mm with no changes to the lower three levels of the basement (i.e. the entire basement would not be lowered).

The Department supports the justification provided by the Applicant and based on the information provided, is satisfied that lowering the uppermost basement slab level would not increase the environmental impacts of the proposal. Furthermore, the Department does not consider it necessary to delay the Stage 1B basement application (SSD 6960) if it can be demonstrated the basement will allow for delivery of the desired future outcomes for Hickson Park.

The Department considers the provision of 2000 m<sup>2</sup> of DSZs to a depth of 3 m as shown in the indicative drawings demonstrates the development is capable of satisfying the DSZ requirements of the Concept Plan. To ensure this, the Department has recommended a condition requiring the basement plans to be amended to provide a DSZ as per the requirements of the Concept Plan, prior to the issue of any Construction Certificate for the basement structure. The amended plans must provide a reduced basement slab level to facilitate a deep soil zone with an area of at least 2,000 m<sup>2</sup> of soil with a depth of at least 3 m to support large mature trees in Hickson Park. Further, the condition requires the location of the deep soil zone reflect the final location of large mature trees in Hickson Park as determined by the Stage 1B Public Domain Works application (SSD 7944).

Notwithstanding this, following the determination of MOD 8 to the Concept Plan and throughout the assessment of this application, the Applicant has maintained a 3 m DSZ is not required in order to provide large mature trees in Hickson Park and achieve the objectives of the Concept Plan. The Applicant intends to submit information to support this argument as part of the Stage 1B Public Domain Works application (SSD 7944) recognising the final levels and resultant soil depth/s across Hickson Park would be determined by SSD 7944.

The Department has therefore recommended an additional condition which would allow the Applicant to submit alternative basement design drawings (or other documentation) to the Secretary for approval prior to the issue of any Construction Certificate for the basement structure which reflects the final form of DSZs in Hickson Park as determined by SSD 7944. The Department notes the ability to exercise this option would be dependent on the outcomes of SSD 7944 and would require a concurrent modification to the Barangaroo Concept Plan if the DSZ provision is not consistent with the requirements of the Concept Plan.



Figure 10: Indicative DSZ drawing (Source: Lend Lease)

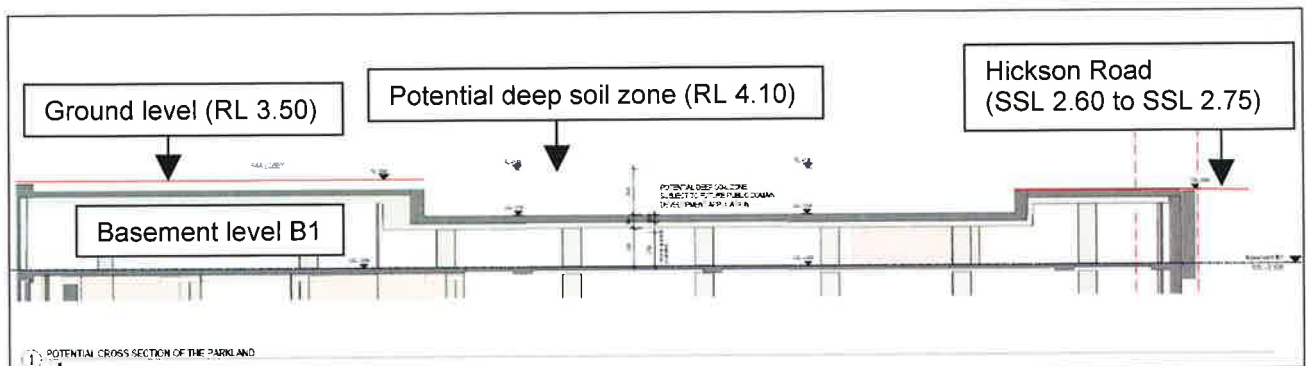


Figure 11: Indicative DSZ part east-west section (Source: Lend Lease)

**View corridors and landscaping**

The Concept Plan requires the design of Hickson Park to provide view corridors from Hickson Road through to Sydney Harbour. The current level on Hickson Road varies from SSL 2.6 to SSL 2.75. Provision of the indicative DSZ would require 0.6 m contouring in Hickson Park from RL 3.5 at ground level to a height of RL 4.1 (Figure 11). This represents very gentle grading across Hickson Park and is typical for a city park. Further, it provides a level that would allow views to be enjoyed across the park from Hickson Road toward the water. The Department is therefore satisfied provision of the DSZ would not block view corridors/connections across the park to the harbour. The Department also recognises that contouring is an essential part of the landscape design for any park (activation, drainage, natural seating etc) and notes the Barangaroo Delivery



Authority intends to raise the level on Hickson Road in the near future which would further enhance these view corridors. This will be undertaken via a Part 5 approval pathway.

Council raised concern the basement design is incompatible with the Stage 1B residential buildings as it relies on the provision of mature trees in Hickson Park which are required to achieve an acceptable wind environment at the base of those towers, thus resulting in the basement and Hickson Park not being designed in a coordinated manner.

The Applicant has confirmed the basement and other future related applications (Stage 1B residential buildings, Stage 1C basement etc) which have synergies with the landscape design of Hickson Park and have been designed and coordinated in a holistic manner. Specifically, the basement would not preclude the provision of mature trees in Hickson Park, the details of which will be provided in the Stage 1B Public Domain Works application (SSD 7944).

The Department supports the Applicant's justification and is satisfied the basement (and associated applications) are being designed and coordinated in a holistic manner as part of the broader landscaping strategy for Hickson Park. Minimum soil standards specified in the Department's *Apartment Design Guide 2015*, are approximately 1.2 m in depth and therefore, at 1.3 m the Department is satisfied the minimum soil depth for the remainder of the site (outside the indicative DSZ) in Hickson Park is capable of being landscaped with mature medium and large trees to a height of at least 15 m. It is noted this soil depth may also increase as a result of the final levels for Hickson Park through the Stage 1B public domain application (SSD 7944). As such, the Department concludes the proposal would not prevent delivery of medium and large mature trees in Hickson Park to a height of at least 15 m, consistent with Concept Plan requirements and as necessary to achieve an acceptable wind environment at the base of the Stage 1B residential buildings.

In relation to the soft landscaping requirements of the Concept Plan, the Department notes the proposed interim public domain (**Figure 12**) is consistent with the requirements of the Concept Plan as it mainly comprises extensive grassed areas around above ground basement structures.

#### Overshadowing

The Department notes the overshadowing requirements of the Concept Plan for Hickson Park will be achieved as above ground structures (**Figure 8**) which are located outside of the public domain area are to the south of Hickson Park. Overshadowing impacts will be appropriately assessed during the consideration of all future development at Barangaroo which has the potential to overshadow Hickson Park including the Stage 1B residential buildings (R4A, R4B and R5). Further consideration of the potential view impacts of above ground structures (basement risers, remediation enclosures, fire stairs, lifts etc) is provided in **Section 5.8**.

The Department is therefore satisfied the application demonstrates a suitable level of certainty regarding the achievement of desired future outcomes for Hickson Park consistent with the Concept Plan. The Department is also satisfied the final design of Hickson Park would not be dictated by the basement construction.

## **5.5 Traffic, Car Parking and Access**

### **5.5.1 Traffic generation**

The proposed development would generate increased traffic during construction and operation which has the potential to impact on the surrounding road network. As such, a Transport Management and Accessibility Plan (TMAP) was prepared which outlines the traffic impacts of the Stage 1B basement.

#### Construction

The TMAP conservatively considers the number of construction vehicles generated by all existing construction works at Barangaroo South (e.g. the Block 4 and 5 Remediation Works, Crown

Sydney Hotel Resort, Stage 1C Remediation and Earthworks and Stage 1B residential buildings) and the occupation of developments at Barangaroo South (e.g. C3, C4, C5, R1, R7, R8 and R9).

The modelling in the TMAP indicates that traffic generation from construction of the Stage 1B basement alone would be up to 50 traffic movements generated during the AM construction peak hour (9 am to 10 am). The peak cumulative traffic generation from the construction and operation of developments at Barangaroo South and the proposed basement would occur between October and December 2020, with 433 traffic movements generated during the AM construction peak hour (9 am to 10 am). The TMAP found the majority of vehicle activity at the Barangaroo site occurs outside the commuter peak hours of 8 am to 9 am and 5 pm to 6 pm. The TMAP also found that construction traffic decreases significantly after 3pm, with only 5% of the daily heavy vehicles (trucks) arriving after this time.

Based on the predicted traffic movements, the TMAP modelled the impact of the development on the Level of Service (LOS) of key intersections that would be utilised by construction vehicles during the AM peak period. The TMAP found that traffic generated by the proposed development would not change the LOS rating of key intersections surrounding the site. All intersections would operate with a reasonable LOS (A to D), with the exception of the intersection of Hickson Road/Napoleon Street which would be at or close to capacity with an LOS of E. The TMAP therefore concludes the construction of the proposed development would have a negligible impact on forecast road network performance.

TNSW did not raise any concerns in relation to construction traffic but requested that the TMAP be updated to use recent traffic counts, confirm the construction access and correct outdated/incorrect references. TNSW also requested the Applicant prepare a Construction Traffic Management Plan (CTMP) for the development. In the RTS, the Applicant updated the TMAP and committed to preparing a CTMP for the development. Upon review of the RTS, TNSW raised no further issues.

The Department is satisfied the surrounding road network would be able to safely accommodate traffic generated by the construction of the proposed development, particularly given traffic generation rates would not change the LOS of surrounding intersections and would generally occur outside peak commuter periods. To ensure construction traffic is effectively managed, the Department has included a condition requiring the Applicant to prepare a CTMP for the development in consultation with TNSW, Council and the Barangaroo Delivery Authority.

### Operation

The application seeks approval for the basement structure to provide up to 884 car parking spaces based on the anticipated uses within the Stage 1B residential buildings, applying the approved car parking rates in the Concept Plan. The application does not seek consent for the operation or commencement of parking within the basement and as such, there would be limited vehicle movements until the future Stage 1B residential buildings (subject to separate approvals) are constructed and occupied.

Despite this, the TMAP predicts operational traffic considering the proposed development and the operation of the remainder of the Barangaroo precinct. The modelling is based upon the anticipated uses (retail and residential) proposed within the future Stage 1B residential buildings, the level of car ownership and trip generation expected.

The modelling indicates the proposed development would generate up to 109 traffic movements during the AM peak period (23 in and 86 out) and 70 traffic movements during the PM peak period (55 in and 15 out).

The TMAP found key intersections surrounding the site can accommodate traffic generated by the operation of the proposed development. There would be minimal changes to the operation of the local road network as a result of the proposed development. All key intersections would operate with a reasonable LOS (A to D), with the exception of the intersections of Hickson Road/Napoleon Street and Sussex Street/Erskine Street which would be at or close to capacity with an LOS of E.

TNSW did not raise any concerns in relation to the impacts of operational traffic on the local road network. Council raised concern that the quantum of car parking spaces accommodated by the basement would cause additional vehicle queuing on the local road network affecting vehicles existing the basement.

On review of the indicative modelling, the Department concludes the proposed development would operate without overloading the local road network. Notwithstanding this, the Department acknowledges that some intersections surrounding the site are at or are approaching capacity and may need to be upgraded in the future. In this regard, the final traffic numbers and potential need for local intersection upgrades would be confirmed in traffic assessments required as part of future applications (e.g. for the Stage 1B residential buildings).

### 5.5.2 Car Parking

The application seeks approval for a basement car park to support up to 884 spaces. Council considered the applied car parking rates are excessive and should be based on the *Sydney Local Environmental Plan 2012* which has lower rates to reduce traffic generation and encourage sustainable and active transport use. Council raised concern the quantum of car parking spaces accommodated by the basement would cause additional vehicle queuing on the local road network affecting vehicles existing the basement.

The number of spaces (884) represents the maximum quantum of car parking permitted with the approved rates under the Concept Plan (**Table 7**). The final number of car parking spaces, their allocation to specific uses/buildings, and impact on the local road network, would be assessed and determined as part of future applications for the Stage 1B residential buildings (R4A, R4B and R5). Each future application would seek approval to operate a specific number of car spaces within the basement.

**Table 7:** Breakdown of maximum quantum of car parking permitted under the Concept Plan

Proposed Development	Max. spaces permitted under Concept Plan		Total	Compliance with Concept Plan
	Residential uses	Retail Uses		
R4A	391	1	392	Yes
R4B	320	1	321	Yes
R5	170	1	171	Yes
<b>Total</b>	<b>881</b>	<b>3</b>	<b>884</b>	<b>Yes</b>

The proposed car parking spaces would not be utilised for residential or other parking purposes until the construction and/or occupation of the Stage 1B residential buildings.

Given the above, the Department's assessment concludes that the proposed basement would be of a sufficient size to accommodate a satisfactory quantum of car parking.

### 5.5.3 Vehicular access

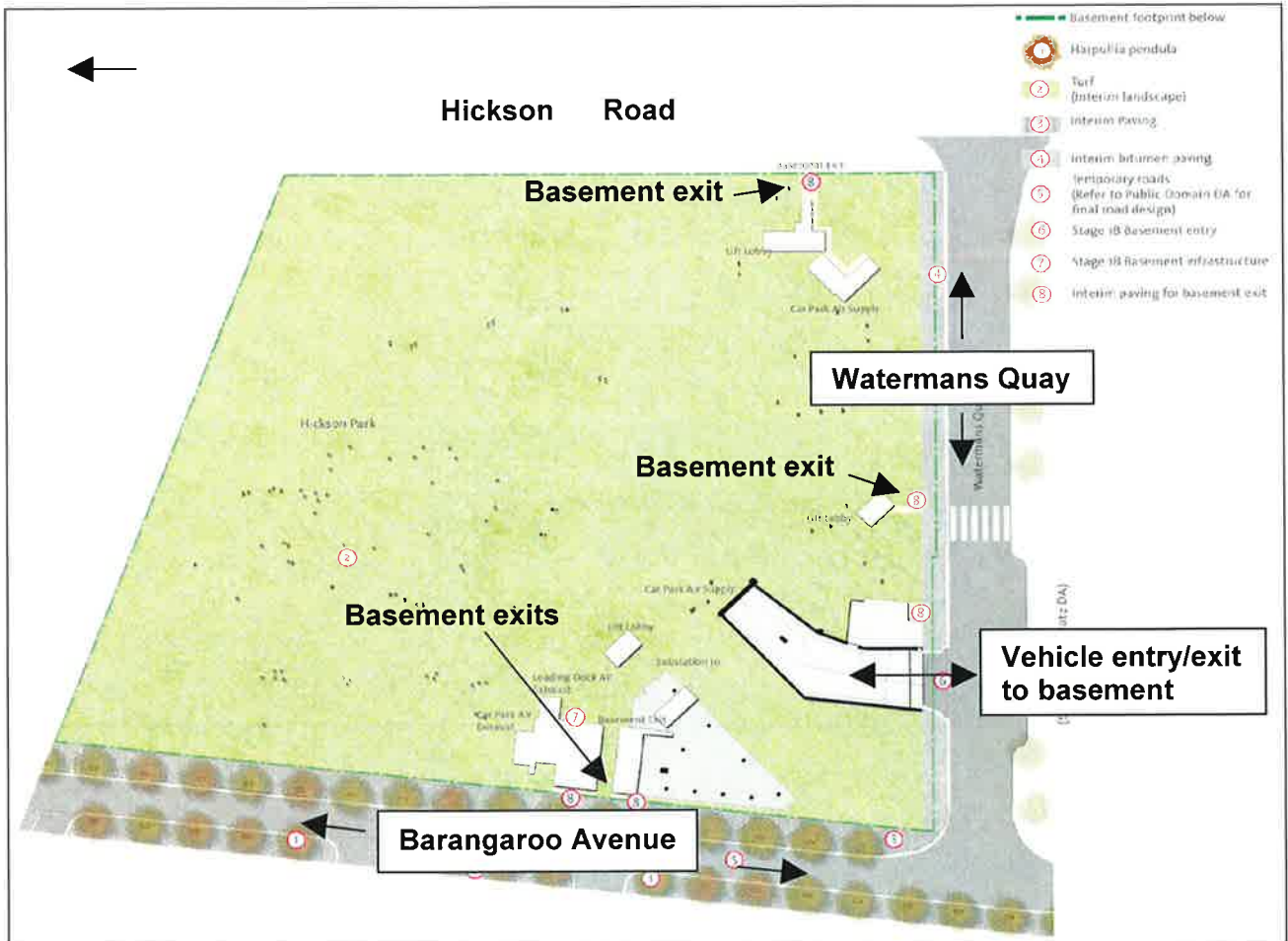
During construction, vehicles would access the site via Hickson Road at the existing gatehouse, approximately 350 m north of the Sussex Street/Napoleon Street intersection. This site access would be utilised until January 2019, after which time it will move approximately 25 m south along Hickson Road for the remainder of construction.

During on-going operation, one vehicular access ramp is proposed to the Stage 1B Basement from the future alignment of Watermans Quay to the south of the site (**Figure 12**) located beneath building R4B. Watermans Quay (formerly Globe Street) is currently under construction as part of the approved Stage 1A Public Domain Works (SSD 6303). Watermans Quay connects to Hickson Road to the east and Barangaroo Avenue to the west.

A large loading dock is proposed to service the basement with multiple points of vertical lift connection to both ground level and to each of the future buildings above the basement. Four loading bays are to be provided which may accommodate the largest design vehicle (i.e. Council's garbage vehicle) along with additional service bays for smaller vans and couriers. This would

enable good efficiency in terms of the layout, manoeuvring space and the ability for different sized trucks. The loading dock would be accessed via the vehicle access ramp on Watermans Quay and controlled by a dock manager who would monitor and manage delivery vehicles on entering the site.

The application also proposes the interim construction of the northern section of Barangaroo Avenue along the western boundary of the site (**Figure 12**) and its intersection with Waterman's Quay to provide temporary vehicular access. This access would be in place for the duration of construction (i.e. approximately four years and 6 months). The orientation of the road would be consistent with the final alignment envisaged in the approved Barangaroo Concept Plan. The final design of these roads would be determined by the permanent Stage 1B public domain application (SSD 7944).



**Figure 12:** Interim public domain plan including vehicular access (Source: EIS)

Council requested a swept path analysis to demonstrate Council rubbish trucks can sufficiently access loading bays and egress in a forward direction. Council also requested the Applicant demonstrate the basement access ramp has adequate capacity to accommodate predicted traffic through queuing analysis. TNSW recommended a consent condition requiring the preparation of a Loading Dock Management Plan (LDMP) for the basement.

In the RTS, the Applicant provided a swept path analysis which confirms vehicle manoeuvrability within the loading dock would comply with the relevant Australian Standards (*AS 2890.2-2002 - Parking facilities - Off-street commercial vehicle facilities*) and a queuing analysis which confirms the basement access ramp has adequate capacity to accommodate predicted traffic. The Applicant also committed to preparing a LDMP. Upon review of the RTS, Council and TNSW raised no further concerns.

The Department is satisfied the proposed vehicle access and loading arrangements are appropriate. To ensure the safe and efficient operation of the basement access and loading dock, and to ensure temporary road infrastructure is delivered to a high standard, the Department has recommended conditions requiring the Applicant to:

- prepare a LDMP for the basement, prior to construction;
- ensure the general design of car parking meets the relevant Australian Standards;
- ensure the swept path of the longest vehicle entering the basement and manoeuvrability is in accordance with AUSTRROADS;
- ensure the design of driveway crossovers is in accordance with the Building Code of Australia (BCA), AUSTRROADS and the relevant Australian Standards; and
- ensure all roads and intersections meet the relevant design requirements/specifications of Roads and Maritime Services and TNSW.

## 5.6 Noise and Vibration

### 5.6.1 Construction noise

The EIS contains a Construction Noise and Vibration Assessment (CNVA) which confirmed the construction of the Stage 1B Basement would take over four years to complete and is proposed to be undertaken from 7 am to 6 pm (Monday to Friday) and from 7 am to 5 pm on Saturdays. Council's standard construction hours for projects in the city centre are from 7 am to 7 pm (Monday to Friday) and from 7 am and 5 pm on Saturdays. The proposed hours of construction would therefore comply with Council's standard hours but on Saturdays would be outside of the EPA's standard hours which are from 8 am to 1 pm.

The key noise sources identified include excavators, front end loaders, rock breakers, dozers, trucks and piling rigs. Construction works would be undertaken during the day-time only but some minor activities would also occur 24 hours, 7 days-a-week such as essential maintenance (e.g. dust suppression), operation of the water treatment plant (WTP), odour control/air extraction systems and generators for remediation enclosures. The CNVA monitored background noise and presented applicable noise criteria at off-site residential, commercial and pre-school receivers in the vicinity of Barangaroo. The key noise receivers are presented in **Figure 13**.

Noise emissions were modelled to predict noise levels from basement works at the various construction stages and to identify if the predicted noise levels exceed the relevant NMLs at various receivers. Modelling was presented in five different scenarios including:

- Scenario 1 – excavation and remediation;
- Scenario 2 – rock excavation;
- Scenario 3 - piling works;
- Scenario 4 - structure construction; and
- Scenario 5 – cumulative works.

The cumulative scenario takes into account construction noise from the Stage 1B basement works and all other works surrounding the site (from a point in the middle of 2018). This includes construction noise from the Block 4 remediation works, Block 5 remediation works, Hickson Road remediation works and operation of the on-site water treatment plant. The EPA did not raise any concerns in relation to the approach to modelling presented in the CNVA.

The worst-case construction noise levels from the proposed development would occur during Scenario 5 (cumulative works). The CNVA found the most affected residences would be those located 25 m to the east at 38 Hickson Road comprising residential apartments. The daytime noise management level (NML) from Monday to Friday is 63 dBA at these residences. Predicted worst-case construction noise levels of up to 71 dBA would exceed the NML by 8 dBA at this receiver. The daytime NML for Saturdays is more stringent at 56 dBA. Predicted worst-case construction noise levels of up to 71 dBA would exceed the NML by 15 dBA at these residences.



Exceedances of the NML ranging from 11 dBA to 12 dBA are also predicted at residences on High Street and new residences occupying residential building R8 at Barangaroo South on Saturdays (**Figure 13**).



**Figure 13:** Key noise receivers (Source: Nearmaps)

The proposed development would comply with the relevant construction noise criteria during all periods at all other residential receivers. Importantly, noise levels are not predicted to exceed relevant criteria during the evening and night-time due to limited construction activities occurring at this time. No adverse noise impacts are predicted at nearby commercial premises or the KU-Lance pre-school on High Street as a result of the proposed development. This includes commercial properties on at 30 Hickson Road located to the immediate north-east of the site (**Figure 13**) where compliance with the relevant NML is predicted.

The EPA requested the Construction Noise and Vibration Management Plan (CNVMP) for the development include the mitigation measures contained in the EIS. The Applicant has therefore committed to updating the CNVM Sub-Plan for Barangaroo South to include these measures. Although there may be some worst-case exceedances of the relevant construction noise criteria in the order of 4 dBA to 15 dBA on Saturdays at the closest residents, the Department recognises:

- noise modelling is conservative and likely to be less than predicted when considering the 'shielding effects' provided by excavation walls;
- noise levels will not exceed the highly affected NML of 75 dBA which is the level likely to cause an adverse community reaction;
- the Applicant has committed to implementing all reasonable and feasible noise mitigation measures;
- the construction works would be undertaken during the day-time only;

- the Applicant has committed to preparing an updated CNVMP with a focus on community consultation including a community liaison (e.g. early notification procedures), complaints and response mechanism for critical stages of the works; and
- the Applicant will undertake real-time noise monitoring which would ensure corrective actions are implemented prior to exceedances of the relevant NMLs.

The potential for increased construction noise and vibration, particularly from equipment such as generators operating at night, was raised in the public submission by a nearby resident. However, given only minor activities would occur at night, night-time noise levels are predicted to meet the relevant NML at all residential receivers, provided odour ventilation equipment is acoustically treated and reduced in speed at night. To ensure the night-time criteria are achieved and to protect the amenity of nearby residents, the Department has incorporated these requirements into the recommended conditions along with an additional condition for power to be supplied to the site by the grid (where feasible).

The Department's assessment concludes the potential noise impacts can be effectively managed and has recommended key conditions of consent that would require the Applicant to:

- comply with the proposed extended day-time construction hours but restrict noisy activities (e.g. rock hammering) to the EPA's standard construction hours and in no more than 3 hour blocks;
- comply with the 75 dBA NML at the nearest residential receiver; and
- implement all noise controls outlined in the CNVA in an updated CNVMP with a focus on community consultation, real-time noise monitoring, early warning and reactive management to ensure the above NML is not exceeded.

By restricting noise intensive works to short periods, implementing all reasonable and feasible noise controls and an updated CNVMP, the Department is confident the Applicant can readily comply with the 75 dBA NML and ensure the construction noise impacts of the development are minimised as far as reasonably practicable.

### 5.6.2 Construction hours

The EPA requested further justification be provided for proposed construction works outside standard hours (i.e. between 1 pm and 5 pm Saturdays). The EPA considered the Applicant should demonstrate it has the support of the community for the extended construction hours on Saturdays.

The Applicant has advised mobilisation of works on a site of this size requires a full day of work (8 am to 5 pm) to be effective and compliance with the standard Saturday hours (8 am to 1 pm) would extend the construction period by six to seven months, resulting in nearby residents being subjected to construction noise impacts for a longer period. The Applicant also advised less than 1% of all of complaints over the past five years at Barangaroo South have been generated on a Saturday which demonstrates the extended hours are largely accepted by surrounding residents.

Although the Applicant would not comply with the EPA's standard construction hours, the Department recognises that:

- the proposed construction hours are consistent with other approvals and Council's standard construction hours for other developments in the city centre;
- the extended hours would enable the major noise generating activities to be carried out in a more efficient manner, thereby shortening the overall construction period to which surrounding residents would be exposed to noise by approximately six to seven months; and
- there have been a negligible number of noise complaints from works undertaken on Saturdays in the last five years which demonstrates construction noise at Barangaroo South is being effectively managed by the Applicant and/or some level of community acceptance.

Given the above, the Department's assessment concludes the proposed construction hours are appropriate and would not result in adverse amenity impacts to nearby residents.

### 5.6.3 Construction vibration

Due to the close proximity of residence on Hickson Road (~25 m to the east), the use of vibratory rollers and rock breakers on the eastern boundary of the site has the potential to generate vibration which could transmit to nearby buildings and impact human comfort or cause structural damage. The impact of vibration on residential amenity was an issue of concern raised in the public submission.

To minimise potential impacts, the Applicant has committed to updating the CNVM Sub-Plan for Barangaroo South to include procedures for undertaking trial testing of vibration intensive equipment at the closest buildings to ensure the relevant vibration criteria is not exceeded during works and vibration monitoring in response to any complaints received. The Department has incorporated the requirement for a CNVMP in the recommended conditions including additional requirements for notification of residents prior to vibration intensive works and use of the smallest practical size vibratory rollers where possible during works.

With recommended conditions in place, the Department concludes potential vibration impacts during construction can be effectively managed so that they do not impact on residential amenity or cause structural damage to nearby buildings.

## 5.7 Air Quality

The EIS contains an Air Quality Impact Assessment (AQIA) which models air emissions from all construction activities likely to be undertaken concurrently at Barangaroo South such as the construction of the Crown Sydney Hotel Resort, the Block 5 Remediation Works and the Hickson Road Remediation Works to present a conservative worst-case scenario. The primary pollutants of concern for the proposed works include:

- dust (PM<sub>10</sub>) from site preparation, excavation, truck movements, stockpiling and wind erosion;
- NO<sub>2</sub> from combustion of diesel fuel in plant and equipment; and
- Volatile Organic Compounds (VOCs) such as Benzene, Toluene, Etylbenzene and Xylenes (BTEX) from combustion activities (e.g. operation of truck engines).

Emissions of contaminants other than those listed above, were not considered likely to occur during the majority of the Stage 1B basement works and as such, pollutants and odour from contaminated soil were not assessed in the AQIA. As discussed in **Section 5.3**, the majority of significantly contaminated material (and associated air pollutants including odour) would be removed as part of the Block 4 remediation works (SSD 5897). The EPA raised no concerns with this approach to air modelling.

Predicted air emissions were assessed at a total of 111 receptors identified as the most representative sensitive receivers located in proximity to the works (including residential buildings R8 and R9 at Barangaroo South), predominantly along the eastern side of Hickson Road. The closest residents are located approximately 25 m from the site on Hickson Road. The maximum pollutant concentrations predicted at any of the 111 receptor locations were presented to show a worst-case scenario.

The results of the modelling found that while the development would comply with the relevant EPA air criteria for BTEX emissions from combustion activities, it would result in some limited exceedances of the EPA's relevant criteria for NO<sub>2</sub> (1 hour average), PM<sub>10</sub> (annual and 24 hour average) and TSP (annual average) at the closest residents. However, despite predicted exceedances, the AQIA advised the actual air emissions from the development would be much lower than predicted because the modelling is highly conservative and assumes all sources would operate in the south-east corner of the site (closest to residents) with plant operating for at least 80% of the time, from 7 am to 6 pm, every day of the year. This level of construction is only expected to occur for a period of three months. In addition, the model does not take into account hoardings and wind limiting structures erected around excavation pits. Given the above, it is unlikely the proposed development would result in adverse air impacts (including on human health) to nearby sensitive receivers.

The EPA requested the AQIA be updated to include further analysis of predicted air quality exceedances, including options for proactive and reactive management to minimise particulate emissions and ensure exceedances do not occur. The EPA also noted air emissions associated with contamination were not assessed, and therefore recommended strategies be developed for confirming remediation is complete prior to undertaking excavation activities, and contingency measures be in place in the event residual contamination (and associated emissions compounds) are exposed during excavation works.

The Applicant provided a revised AQIA in the RTS to address the EPA’s concerns. The revised AQIA predicted NO<sub>2</sub> and PM<sub>10</sub> exceedences over a full year and shows the majority (approximately 85%) of cumulative NO<sub>2</sub> and PM<sub>10</sub> concentrations would comply with the relevant EPA air criteria. The AQIA also includes a proactive and reactive management strategy which the EPA considered to address its concerns regarding reduced cumulative particulate impacts.

To manage the potential for exposure of unexpected contaminated material and associated air emissions, the Applicant proposes to implement an UFP which is described in detail in **Section 5.2.1** of this report. The Applicant is also proposing to undertake staged validation of contaminated areas to verify they have been successfully remediated and endorsed by an EPA-accredited site auditor, prior to excavation. Upon review of the RTS, the EPA was able to recommend conditions of approval for an Air Quality Management Plan (AQMP) and particulate matter mitigation which have been incorporated into the consent.

The Department is satisfied the modelling presented in the AQIA represents a highly conservative scenario such that predicted exceedances of the relevant EPA air criteria are unlikely to occur in practice. In the event air emissions are found to be approaching the relevant limits, the Department is satisfied suitable measures would be place in the form of real-time monitoring, and proactive and reactive management strategies to ensure that appropriate mitigation would be implemented to minimise exceedances of the relevant EPA air criteria. These measures would be formalised in the AQMP for the development.

To ensure suitable contingencies are in place to manage potential air emissions from unexpected contamination (particularly odour), the Department has recommended key conditions requiring the Applicant to:

- implement the UFP during all works;
- carry out all remediation works in accordance with the relevant RAP (and RAP Addendums) and associated environmental controls;
- ensure the AQMP is reviewed by the EPA and includes:
  - suitable contingency measures for the control and management of air emissions (including odour) in the event unexpected contaminated/odorous material is encountered during construction; and
  - odour control measures for the transport of untreated contaminated material off-site including (but not limited to) the use of odour suppressants, sealed trucks etc.
- where necessary, ensure all remediation works are undertaken in enclosures fitted with suitable air emissions control systems designed in consultation with the EPA and approved by the Secretary; and
- ensure no excavation (non-remediation) works are undertaken until contaminated parts of the site have been validated by a suitably qualified expert and endorsed by an EPA-accredited site auditor to confirm the site has been successfully remediated.

The Department’s assessment concludes the potential air quality impacts of the proposed development would be effectively managed with recommended conditions in place.

**5.8 Other Issues**

**Table 8:** Assessment of other issues

Issue	Consideration	Recommendation
Water	• Existing stormwater drainage infrastructure would be	Recommended conditions

Issue	Consideration	Recommendation
	<p>diverted around the basement to ensure no net increase in flood levels on Hickson Road.</p> <ul style="list-style-type: none"> <li>• Stormwater on site would be collected via a pit and pipe network for flows during and up to the 100 year ARI storm event. Flows (up to a 3 month ARI event) would be diverted for treatment to tree pits, roof gardens and Gross Pollutant Traps.</li> <li>• Proposed landscaping would reduce impervious surface areas at the site, ensuring post-development surface water flows are not increased.</li> <li>• No major impact on groundwater flow or quality given the site is already being excavated as part of the approved Block 4 remediation works (SSD 5897).</li> <li>• DPI requested a Groundwater Management Plan be prepared to monitor and manage potential mounding. A groundwater hydrology and mounding assessment was therefore provided in the RTS which found mounding is unlikely.</li> <li>• The Applicant proposes to include a suitable monitoring and management program in an updated version of the Water and Stormwater Management Sub-Plan for Barangaroo South. Upon review of the RTS, DPI raised no further issues.</li> <li>• The EPA recommended standard conditions for water quality management.</li> <li>• The Department concludes soil and water impacts would be effectively managed, subject to conditions.</li> </ul>	<p>would require the Applicant to:</p> <ul style="list-style-type: none"> <li>• prepare an updated Water and Stormwater Management Sub-Plan for Barangaroo South in consultation with the EPA and DPI; and</li> <li>• ensure surface water discharges comply with Section 120 of the <i>Protection of the Environment Operations Act 1997</i> and the Environment Protection License for the site.</li> </ul>
Above ground structures	<ul style="list-style-type: none"> <li>• The application proposes construction of above ground basement structures up to 14 m high. These are located within the B4 Mixed Use zone and are intended to be integrated into the future podium/s of the R4A, R4B and R5 residential buildings (<b>Figure 8</b> and <b>Figure 12</b>).</li> <li>• The Department considers the visual impact of these structures would be minimal as these elements would only be exposed temporarily until the Stage 1B residential buildings are developed. Further, proposed interim public domain and landscaping would reduce the visual impacts.</li> <li>• Temporary enclosures (tent like structures) would be used to mitigate air emissions during remediation works. The enclosures would be similar to existing enclosures on site for the Block 4 remediation works (SSD 5897) which are up to 8 m in height and vary in size depending on the scale of excavation.</li> <li>• The Department considers the visual impacts of any remediation works would be minimal as the impacts would be temporary (including the bulk height and scale of enclosures and stockpiles).</li> </ul>	<ul style="list-style-type: none"> <li>• Recommended conditions requiring the Applicant to submit final detailed design plans of the enclosures to the Secretary for approval, prior to the issue of the relevant Construction Certificate.</li> </ul>
Bicycle Parking	<ul style="list-style-type: none"> <li>• Council requested bicycle parking and end of trip facilities be clearly identified on the architectural plans, grouped together in the upper levels of the basement and in accordance with the <i>Sydney Development Control Plan 2002</i> rates.</li> <li>• TNSW also requested the Applicant commit to ensuring these facilities are provided in convenient, accessible areas close to main entries.</li> <li>• The application does not seek approval for bicycle parking or end-of-trip facilities but has been sized to accommodate these facilities in accordance with the rates in the Barangaroo Concept Plan.</li> <li>• The allocation and use of bicycle parking spaces and end-of-trip facilities would form part of future applications for the</li> </ul>	<ul style="list-style-type: none"> <li>• Recommended a condition requiring the Applicant to provide bicycle parking and end-of-trip facilities grouped together in the upper levels of the basement in convenient, accessible areas close to main entries.</li> </ul>



Issue	Consideration	Recommendation
	<p>Stage 1B residential buildings.</p> <ul style="list-style-type: none"> <li>The Department acknowledges the final numbers of bicycle parking and end-of-trip facilities would be determined as part of future applications for the Stage 1B residential buildings, however concurs with Council and TNSW regarding the location of these facilities.</li> </ul>	
Utility Servicing	<ul style="list-style-type: none"> <li>The proposed development seeks approval for the provision of utilities and associated infrastructure as outlined in detail in <b>Table 1</b> of this report.</li> <li>The EIS includes a Services Report which confirms the basement can be adequately serviced from connections to existing Stage 1A infrastructure and/or new dedicated connections from external utility providers.</li> <li>SWC did not object to the proposal and noted that the water servicing capacity and strategy for the development would need to be confirmed during the Section 73 application phase.</li> </ul>	<ul style="list-style-type: none"> <li>Recommended conditions requiring the Applicant to comply with the requirements of all relevant public authorities for connection of services and obtain a Section 73 certificate from SWC, prior to occupation.</li> </ul>
Heritage	<ul style="list-style-type: none"> <li>The Archaeological Statement in the EIS concludes all significant archaeological potential would be removed from the site as a result of the approved Block 4 remediation works (SSD 5897).</li> <li>Parts of the site (i.e. interim public domain, services and infrastructure zones) located outside the area of these works are highly disturbed and the potential for significant archaeological potential is low.</li> <li>The Department is satisfied the heritage impacts of the proposal would be negligible, subject to conditions.</li> </ul>	<ul style="list-style-type: none"> <li>Recommended standard conditions to deal with unexpected heritage finds.</li> </ul>
Diesel Filling and Fire Safety	<ul style="list-style-type: none"> <li>The application seeks approval for a 5,000 litre diesel storage tank within the basement to supply fuel to backup generators for emergency electricity supply to the future Stage 1B residential buildings.</li> <li>The EIS concludes the stored diesel would not be classified as a Dangerous Good and a Preliminary Hazards Analysis is not required for the proposed development.</li> <li>FRNSW recommended the Fire Safety Strategy (FSS) for the basement consider all fire safety requirements of the future Stage 1B residential buildings and measures in addition to the deemed-to-satisfy provisions of the BCA.</li> <li>The Department has recommended conditions safe procedures are followed during diesel tank filling and FSS be prepared for the development to the satisfaction of FRNSW.</li> </ul>	<p>Recommended conditions requiring the Applicant to:</p> <ul style="list-style-type: none"> <li>prepare of a Diesel Filling Management Plan to the satisfaction of FRNSW and TNSW; and</li> <li>prepare a FSS to the satisfaction of FRNSW.</li> </ul>
Tree Removal	<ul style="list-style-type: none"> <li>The basement works would require the removal of up to four trees (Hills Weeping Figs) along Hickson Road.</li> <li>Five trees of the same species in good condition 6 m to 9 m in height would be retained and subject to the tree protection measures outlined in the Arboricultural Report in the EIS.</li> <li>Council did not raise any concerns in relation to tree removal.</li> <li>The Department concludes tree removal is necessary to facilitate construction of the basement, however, the impacts can be balanced by maximising the retention of trees on site and where trees must be removed by providing appropriate replacement trees at the completion of the works.</li> </ul>	<ul style="list-style-type: none"> <li>Recommended a condition requiring the Applicant to prepare a Tree Management Plan in consultation with Council consistent with the Arboricultural Report and including measures to provide replacement trees.</li> </ul>

## 5.9 Consideration of key issues raised in submissions from Council and the public

**Table 9** presents the key issues raised in the public and Council submissions (as summarised in **Section 4**), and how the Department has considered each issue.

**Table 9:** Consideration of key issues raised in submissions from Council and the public

Concerns raised	Department's comments
<ul style="list-style-type: none"> <li>The proposal is prohibited as it provides for development on land reserved for public open space and has no planning entitlement for building blocks to rely.</li> </ul>	<p>The Department concludes the proposal is permissible because:</p> <ul style="list-style-type: none"> <li>Since Council made its original submission in May 2016, MOD 8 to the Barangaroo Concept Plan was approved which (among other things) reconfigured Blocks 4A, 4B and adjacent public domain consistent with the proposed development; and</li> <li><i>State Environmental Planning Policy (State Significant Precincts) 2005</i> was also concurrently amended to align with the changes approved in MOD 8 to the Concept Plan with respect to the site area, zoning, height and gross floor area. As a result, development for the purposes of underground car parks is permissible with consent in both the B4 Mixed Use and RE1 Public Recreation zones.</li> </ul>
<ul style="list-style-type: none"> <li>Uncertainty of the proposal without a final design for Hickson Park, given the basement design has impacts on Hickson Park and its ability to achieve future outcomes set out in MOD 8 to the Concept Plan.</li> <li>Basement construction would restrict provision of mature trees in Hickson Park at the base of the Stage 1B residential buildings.</li> </ul> <p>(Council submission)</p>	<p>The Department concludes the proposal would not impact on the ability of Hickson Park to achieve desired future outcomes because:</p> <ul style="list-style-type: none"> <li>The Applicant has provided indicative drawings which demonstrate development is capable of satisfying the deep soil zone (DSZ) requirements of the Concept Plan;</li> <li>provision of the DSZ would not block view corridors/connections from Hickson Road across Hickson Park to Sydney Harbour;</li> <li>the minimum soil depth (1.3 m) for the remainder of the site (outside the DSZ) above the basement in Hickson Park and its interface with adjacent future buildings is capable of being landscaped with medium and large matures trees;</li> <li>the proposed interim public domain is consistent with the soft landscaping requirements of the Concept Plan as it mainly comprises extensive grassed areas around above ground basement structures; and</li> <li>the overshadowing requirements of the Concept Plan will be achieved as above ground basement structures would be located to the south of Hickson Park.</li> </ul>
<ul style="list-style-type: none"> <li>Deferring consideration of basement design for DSZ provision defers assessment of environmental impacts and lacks transparency.</li> </ul> <p>(Council submission)</p>	<ul style="list-style-type: none"> <li>The Applicant has demonstrated the DSZ can be achieved by lowering (folding down) the uppermost level of the basement. This would only affect the uppermost level (B1) with no requirements to lower the entire basement;</li> <li>the Department is satisfied lowering the uppermost basement slab level would not increase the environmental impacts of the proposal. Further, the Department is satisfied this will allow for the delivery of DSZs in Hickson Park consistent with the desired future landscaping outcomes of the Concept Plan; and</li> <li>to ensure this, the Department has recommended key conditions requiring the basement plans be amended prior to the issue of a Construction Certificate for the basement structure to provide DSZs as per the requirements of the Concept Plan.</li> </ul>
<ul style="list-style-type: none"> <li>Interim landscaping is not supported and ignores an opportunity to implement permanent public domain in Hickson Park early.</li> </ul> <p>(Council submission)</p>	<p>The Department concludes the proposed interim public domain would be acceptable given:</p> <ul style="list-style-type: none"> <li>The detailed design of the permanent Stage 1B public domain is still being finalised in consultation with key stakeholders and should not be rushed to ensure a high quality outcome is achieved;</li> <li>the Department recognises the orderly and timely development of Stage 1B of Barangaroo South must occur;</li> <li>the interim public domain has been designed by the same consultant designing the permanent public domain and has been developed considering the future design of Hickson Park; and</li> <li>the interim public domain is a temporary solution only and are proposed in the event there are delays in determining the Stage 1B public domain application (SSD 7944) which is expected to be lodged with the Department shortly.</li> </ul>
<ul style="list-style-type: none"> <li>Air quality and contamination</li> </ul>	<ul style="list-style-type: none"> <li>The Department has recommended conditions to ensure potential air quality impacts and contamination are effectively managed including the</li> </ul>

Concerns raised	Department's comments
<p>management; and</p> <ul style="list-style-type: none"> <li>• control of construction noise and vibration, particularly from equipment operating at night.</li> </ul> <p>(Public submission)</p>	<p>requirement for the Applicant to:</p> <ul style="list-style-type: none"> <li>○ carry out all remediation works in enclosures and in accordance with the relevant RAP;</li> <li>○ implement an UFP during all works; and</li> <li>○ prepare an AQMP in consultation with the EPA.</li> </ul> <ul style="list-style-type: none"> <li>• construction would be undertaken during the day with limited activities occurring at night. The proposal is therefore predicted comply with the relevant night-time noise criteria; and</li> <li>• the Department has recommended conditions to ensure equipment operating at night (e.g. odour ventilation equipment for the remediation enclosures) is acoustically treated, reduced in speed and (where feasible) powered by the grid.</li> </ul>

## 6. CONCLUSION

The Department has carefully assessed the merits of the proposal, taking into consideration the issues raised in submissions, and is satisfied that impacts of the proposal are satisfactorily addressed in the Applicant's EIS, RTS or through the Department's recommended conditions.

The Department has found the key assessment issues associated with the proposal are potential contamination and waste management, interim public domain, transport and access, noise and vibration and air quality impacts.

All key issues associated with the proposal have been assessed, and appropriate conditions recommended, where necessary. Key conditions of consent would require the Applicant to:

- ensure all remediation works to be undertaken in accordance with the relevant RAP;
- ensure the basement is constructed so Hickson Park can meet desired future outcomes set out in the Barangaroo Concept Plan (as modified); and
- prepare a suite of updated environmental management plans addressing construction, noise and vibration, air quality, traffic and water management.

The Department is satisfied that, with the implementation of the recommended conditions of consent, the impacts of the development can be mitigated and/or managed to ensure an acceptable level of environmental performance.

The Department's assessment has concluded the application would facilitate the development of Stage 1B of the Barangaroo site (in particular, the future R4A, R4B and R5 residential buildings) at significant benefit to the State without prejudicing the delivery of a high quality Hickson Park in accordance with the approved Concept Plan.

The Department considers the application can be approved, subject to the recommended conditions.

## 7. RECOMMENDATION

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It is recommended that the Planning Assessment Commission, as delegate of the Minister for Planning:

- **considers** the findings and recommendations of this report, noting the Department considers the application is approvable, subject to conditions; and
- if the Commission determines to grant consent to the application, **signs** the attached development consent (**Attachment A**).

Andrew Hartcher  
Key Sites Assessments

Endorsed by:



Cameron Sargent  
**Team Leader**  
**Key Sites Assessments**

Endorsed by:



Ben Lusher  
**Director**  
**Key Sites Assessment**

Endorsed by:



Anthea Sargeant 9/2/17  
**Executive Director**  
**Key Sites and Industry Assessments**