

Environmental Assessment Report

Concept Plan Modification 8 and Major Development SEPP, State and Regional Development SEPP and Sydney Harbour SREP Amendments

Submitted to the Department of Planning and Environment
On Behalf of Lend Lease (Millers Point) Pty Ltd

10051
March 2015



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Two handwritten signatures in blue ink. The first signature is 'B. Hoskins' and the second is 'Michael Rowe'.

Michael Rowe and Brendan Hoskins

13/03/2015

This report has been reviewed by:

A handwritten signature in blue ink, appearing to be 'Lesley Bull'.

Lesley Bull

13/03/2015

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- M** View and Visual Impact Analysis
JBA
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CPP
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- P** Construction and Operational Noise and Vibration Report
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Royal Haskoning

Statement of Validity

Environmental Assessment prepared by	
Name	Lesley Bull
Qualifications	BTP (Hons) MPIA
Address	Level 7, 77 Berry Street, NORTH SYDNEY
In respect of	Concept Plan Modification 8, Major Development SEPP Amendment and State and Regional Development SEPP Amendment
Concept Plan	
Applicant name	Lend Lease (Millers Point) Pty Ltd
Applicant address	The Bond, 30 Hickson Road, MILLERS POINT
Land to be developed	Barangaroo South – refer to Section 2.2
Proposed development	Mixed Uses
Environmental Assessment	An Environmental Assessment (EA) is attached
Certificate	<p>I certify that I have prepared the content of this Environmental Assessment and to the best of my knowledge:</p> <ul style="list-style-type: none"> ■ It is in accordance with the Environmental Planning and Assessment Act and Regulation. ■ It is true in all material particulars and does not, by its presentation or omission of information, materially mislead.
Signature	
Name	Lesley Bull
Date	13 March 2015

Executive Summary

Background

Concept Plan approval (MP06_162) for the redevelopment of East Darling Harbour (now known as Barangaroo) was granted in February 2007. The approved Concept Plan has been modified six times and the Statement of Commitments has been revised accordingly.

Lend Lease was successfully appointed as the preferred proponent to develop Barangaroo South on 20 December 2009. In May 2011 the Minister for Planning announced a 'Short Sharp Review' (the Review) of the Barangaroo development. A key finding of this review was *“that it would be a significant demonstration of goodwill to relocate the hotel to elsewhere on the site.”*

As such, Lend Lease has embarked on a thorough review of the approved Concept Plan with a particular focus on how the development could be improved and the recommendations of the Review incorporated into the design. As part of the review process, Lend Lease in conjunction with the Barangaroo Delivery Authority, also undertook several consultation sessions with the local community, government agencies and other major stakeholders to ascertain their thoughts and suggestions on the redevelopment of the site, in particular on the relocation of the landmark hotel building elsewhere on the site.

The Proposed Modification

The Concept Plan Modification proposal for Barangaroo South comprises:

- Relocation of the landmark hotel building (Block Y) from extending over the harbour onto land within the site in front of the existing Blocks 4A, B and C and inclusion of the potential use of a gaming facility in part of the hotel development;
- Revision of the layout of Blocks 4A – C;
- Amendment of the size and location of the Southern Cove and public domain;
- Replacement of the previous pier and landmark hotel building with a new public pier and Community Building with an expected maximum floor space of 3,000m² (maximum 2,000m² community uses and 1,000m² retail uses);
- Redistribution of the Gross Floor Area (GFA), public domain and land uses across Development Blocks 1 – 3, 4A – C, X and Y;
- Increase in the maximum GFA on the site to provide for additional GFA within the hotel building;
- Increase in the height of the buildings within modified 'Block 4' and the relocated Block Y;
- Update of the Urban Design Controls to reflect the modified concept design; and
- Amendment of the conditions of the Concept Approval to reflect the modifications to development.

A summary of the changes to the GFA and height by each development block for Barangaroo South are as follow:

Block	Approved (m ²)	Proposed (m ²)	Change (m ²)
Barangaroo South Mixed Uses Precincts			
1	9,400	1,927	-7,473
2	209,213	197,280	-11,933
3	142,669	129,934	-12,735
4A	8,150	86,579	+29,087
4B	29,900	19,558	
4C	39,000	-	
X	18,908	18,908	-
Y	33,000	77,500	+44,500
Subtotal (A)	490,240	531,686	+41,446
Barangaroo Additional Uses (Mixed Uses and Public Recreation Zones)			
Active Uses *	4,500	5,000 Note: Maximum 3,500 in Barangaroo South	+500
Community Uses **	12,000** (included in Block GFA maximum)	Minimum of 12,000 in Barangaroo** (Now included in Block GFA maximum)	-
Subtotal (B)	14,500	3,500 (maximum in Barangaroo South)	+500
OVERALL TOTAL (A + B)	504,740	535,186	+41,946

* Active Uses within the RE1 Public Recreation zone at Barangaroo South are to be counted in addition to the total Block GFAs and are included in the overall total GFA.

** Community Uses GFA within the B4 Mixed Use zone Barangaroo South are counted within the total GFA maximum for the Block (ie: counted as part of, not in addition to, the total Block GFAs).

Use	Approved (m ²)	Proposed (m ²)	Change (m ²) *
Barangaroo South Mixed Use Precincts			
Commercial	No maximum	No maximum	-
Residential	99,763	154,000	+54,237
Retail	34,000	40,000	-4,000
Tourist	33,000	59,000	+26,000
Active**	3500	4000	+500
Community	10,000	10,000	-

* Note the increase in the total maximums by use exceeds the total increase in GFA by block in order to allow for flexibility in the final distribution of land uses

** Active uses within the RE1 Public Recreation zone as defined under the Concept Plan are to be counted in addition to the maximum uses within the B4 Mixed Use Zone

Block	Approved Maximum RL	Proposed Maximum RL	Change
Block 1	80	25	-55
Block 2	180	180	-
Block 3	209	209	-
Block 4A	41.5	250	+208.5
Block 4B	175	107	-68
Block 4C	160	-	-160 (Block Deleted)
Block X	41.5	41.5	-
Block Y	170	275	+105
Public Recreation	N/A	N/A	-

The Concept Plan Modification does not propose any amendments to Barangaroo Central or the Headland Park.

The approved Concept Plan (as modified) is subject to conditions, or terms of approval, which now require amendments as a result of the proposed modified scheme. Changes are required to Conditions A1, A2, B3, B4, B5, B6, B7, B9, C2 and C5. The modified development proposed in Concept Plan (Mod 8) also necessitates changes to the approved Statement of Commitments, which includes amended wording of some commitments and provision of new commitments to ensure the appropriate ongoing management and mitigation of potential impacts.

New Planning Controls – Amendment to Major Development SEPP

The proposed modifications to the Concept Plan depart from the existing development controls for the site, established under *State Environmental Planning Policy (Major Development) 2005* (Major Development SEPP). These components of Lend Lease's scheme consequently require a SEPP Amendment to reconcile the Major Development SEPP planning provisions with the Concept Plan Modification and more specifically to:

- Create new development blocks, redefine the existing development blocks, and reconfigure land uses in accordance with the Concept Plan Modification;
- Redefine the boundary between urban development and public recreation;
- Amend the site boundary to include the proposed public pier and additional foreshore promenade adjacent to the proposed hotel;
- Increase the maximum permissible GFA within the Barangaroo South development blocks to reflect the Concept Plan Modification; and
- Increase the maximum permissible height controls within the Barangaroo South blocks to reflect the changes in configuration of land uses and GFA across the site, whilst allowing flexibility for the design of individual buildings within the certainty of a structured framework.

The proposed modifications to the Concept Plan approval seek to improve on the approved Concept Plan through satisfying the recommendations of the Barangaroo Review by way of redistribution of the built form across the site and the resultant creation of reconfigured public domain areas.

Environmental Assessment

An environmental assessment of proposed Concept Plan (Mod 8) has been undertaken in accordance with the items identified in the Director-General's Requirements (DGRs). The findings of the environmental assessment are summarised below.

Built Form

The amended built form of Concept Plan (Mod 8) remains generally consistent with the key principles of the approved Concept Plan (Mod 7). The amended built form allows for the relocation of the landmark hotel building as recommended by the Barangaroo Review, and provides a well-designed and considered response for the remainder of future buildings within Block 4. The additional GFA and height sought as part of Concept Plan (Mod 8) is required to enable the relocation of the landmark hotel building onto the land as recommended by the Barangaroo Review.

The amended built form has sought to continue to integrate Barangaroo South into the wider context of Sydney's CBD, whilst still achieving the key principles of the approved Concept Plan (Mod 7). The built form will continue to deliver a high quality urban environment which is permeable and appropriate to the site's context.

Streetscape and Public Domain

Concept Plan (Mod 8) will ensure that approximately 50% of the Barangaroo South site will be either public domain or publicly accessible open space, streets and laneways. Key public domain features include the new Northern Park, the waterfront promenade and the new community and retail building on the public pier. These spaces will combine to create an activated, connected and permeable ground plane, which invites users into the precinct and will accommodate a range of different passive and active recreation opportunities and events.

Transport and Accessibility

The expected traffic generation of Concept Plan (Mod 8) has been identified and assessed against the existing operation of the surrounding road network. It has been determined that there will be little difference in the road network performance based on the expected traffic generation and distribution. The key objectives for managing and mitigating any potential traffic impacts under the approved Concept Plan (as modified) are not proposed to be amended.

Social Impact

A range of social benefits and disbenefits are anticipated in association with the proposed casino use that is intended to be included as a potential land use in the landmark hotel building. These benefits and disbenefits will be explored in detail within a Social Impact Assessment for any future application for a casino use at Barangaroo South.

Economic Impact

The increased quantum of GFA and mix of uses proposed in Concept Plan (Mod 8) will result in an increased and significant positive economic benefit to Sydney and NSW. These benefits will include increased jobs, export income, business spending and gaming tax revenue.

Housing Strategy

The proposed modifications will not affect the mix of housing types and tenures provided in Barangaroo South. The existing commitment of a total of 2.3% of all housing to be provided as Key Worker housing will remain. Thus, with the proposed Modification to the Concept Plan to increase the total residential floor space in Barangaroo South, the total amount of Key Worker housing will increase. The Housing Strategy will be updated to reflect the amended maximum residential GFA in Barangaroo South.

Noise, Air and Odour Impacts

An assessment of the potential noise, air and odour impacts has illustrated that there will be some increased impacts due to the increased construction works undertaken to deliver the additional GFA within the area known as Stage 1B, Barangaroo South. The increase in construction works associated with Concept Plan (Mod 8) will take place after the peak construction period. With the continued implementation of the mitigation and management measures already approved and in place on-site, which have been developed to address anticipated potential impacts associated with the peak period, the additional impacts anticipated as a result of Concept Plan (Mod 8) are manageable and acceptable.

Drainage and Stormwater/Utilities

The approved servicing strategy for Barangaroo, and associated water and energy targets of the approved Concept Plan (Mod 7) are not proposed to be modified. Some amendments to the horizontal alignment of utilities and stormwater infrastructure will be necessary to account for the revised built form layout, but these will not alter the approved servicing strategy.

Ecologically Sustainable Development

The approved general ESD commitments and targets outlined in the approved Concept Plan Statement of Commitments are not proposed to be modified.

Contamination

Concept Plan (Mod 8) does not propose to amend the overall remediation strategy as contemplated by the approved Concept Plan (Mod 7). The future works associated with Concept Plan (Mod 8) are generally consistent with what was contemplated by the Remediation Action Plans prepared in relation to Stage 1A and Stage 1B (and that currently being prepared for the remaining area) of Barangaroo South and remediation works that will be required can be appropriately managed by those documents.

Prescribed Airspace for Sydney Airport

The maximum height proposed for Barangaroo as part of Concept Plan (Mod 8) will not result in any change to the existing Instrument Flight Procedures which are currently determined by the height of Sydney Tower. Following an assessment of potential hazards, it has been determined that the proposed Modification will not affect the operations of Sydney Airport or Sydney Harbour aerial tourism activities.

Sydney Observatory Impacts

A detailed analysis has determined that views of four target objects including the Southern Cross, Jewel Box cluster, Omega-Centauri (NGC5139) globular cluster, and The Pointers will be obstructed annually by the proposed Concept Plan (Mod 8) built form for a period of nine weeks during the night viewing hours of the Observatory between the end of August and October. The Sydney Observatory currently operates as a museum for public viewings and no longer functions as an astronomical observatory due to a number of constraints. Having regard to the duration and time of impacts associated with Concept Plan (Mod 8) and the existing context of the Observatory, it has been determined that the impacts on sky views are both minimal and acceptable.

Heritage

Limited impacts have been identified on a number of items and conservation areas in the surrounding area. These are restricted to the setting of these items/areas and do not affect the visual integrity or interpretation of the items. On balance, considering the benefits of the Barangaroo South development, its locational attributes in a global city, and its minimal effect on the interpretation and significance of surrounding heritage items, the proposed Concept Plan Modification is acceptable from a heritage perspective.

Significant potential non-Aboriginal archaeology has been recorded during the carrying out of excavation works associated with the construction of the approved Basement in the area known as Stage 1A, Barangaroo South. Further testing will be carried out on land that has not yet been substantially excavated. Potential Aboriginal archaeology has been recorded and the relevant areas are considered to have no further potential for Aboriginal archaeology.

Staging

The general staging arrangement for completion of development within Barangaroo South is set out in Section 9.22.

Public Benefits

The proposed Concept Plan (Mod 8) will offer significant public benefits both directly and indirectly to the wider community and state of NSW. The public benefits of the approved Concept Plan (Mod 7) generally remain unchanged. The increase in floor space proposed under Concept Plan (Mod 8) is attributed to the landmark hotel building and will facilitate a range of extensive public benefits such as:

- Capitalising on the growth in Asian tourism;

- Assisting the NSW Government in meeting its objective of making Barangaroo an active and vibrant destination;
- Creating approximately 2,300 direct and 3,300 (indirect) additional jobs during construction and 1,250 direct jobs post construction;
- Establishing employment and training opportunities;
- Increasing the attractiveness of Sydney as a location for major domestic and international events;
- Attracting high net worth tourists and encouraging increased visitor spend both within the new development and in Sydney; and
- Establishing a new iconic and defining building on Sydney's waterfront land.

Revised Statement of Commitments

The Statement of Commitments approved under the current Concept Plan (as modified) have been refined and amended based on the environmental assessment for Concept Plan (Mod 8). These refinements include the deletion of commitments no longer relevant to the Barangaroo development and the addition of new commitments to appropriately manage and mitigate potential impacts.

Conclusion

Concept Plan (Mod 8) is the result of a commitment by Lend Lease to deliver a high quality development at Barangaroo South. Concept Plan (Mod 8) is generally consistent with the approved Concept Plan but will ensure that a superior and more sustainable outcome will be achieved. In particular the proposal will deliver:

- A critical mass of overlapping activities and building uses that promote a live-work-leisure-learn and socially and economically diverse community, in one dynamic quarter, and offer a much needed addition to Sydney's urban make up;
- A landmark building on the waterfront that is a focal point for the western edge of the city, defines the cultural and public space at the heart of Barangaroo South, celebrates the Harbour, attracts visitors and makes a statement about Sydney's role as a major South East Asian financial centre and a 21st Century world city;
- Additional housing, new jobs and infrastructure consistent with the aims of the Sydney Metropolitan Strategy;
- An enhanced public domain area for new and existing communities;
- A better integration of Barangaroo South and the existing CBD through the continuation of the 'radial fan' principle and providing the landmark hotel building as a pinnacle to the existing CBD; and
- Continued requirement to achieve sustainability outcomes.

1.0 Introduction

This Environmental Assessment Report (EAR) and State Significant Site study has been prepared to modify the approved Barangaroo Concept Plan (MP 06_0162) as it currently applies to Barangaroo South (referred to herein as Concept Plan (Mod 8) or the Modification). It also seeks to amend the planning controls that apply to Barangaroo South by amending the relevant provisions in Part 12 of Schedule 3 of the State Environmental Planning Policy (Major Development) 2005 (Major Development SEPP) and Schedule 2 of State Environmental Planning Policy (State and Regional Development) 2011 (State and Regional Development SEPP).

This EAR is submitted to the Minister for Planning pursuant to clause 3C(1) of Schedule 6A to the Environmental Planning and Assessment Act 1979 (EP&A Act) that provides for the continued application of the provisions of the now repealed Section 75W of Part 3A of the EP&A Act for the purposes of a modification to the Concept Plan.

This application implements the outcome of negotiations between Lend Lease and the NSW Government, including the Barangaroo Delivery Authority, to relocate the landmark hotel building from a pier in Sydney Harbour to a location on land elsewhere on the Barangaroo South site. It incorporates both the physical relocation of the proposed hotel, along with a number of consequential and related changes to the built form and public domain outcome for the Barangaroo South site.

This EAR has been prepared by JBA, for Lend Lease (Millers Point) Pty Limited (Lend Lease), and is informed by the Master Plan prepared by Rogers Stirk Harbour + Partners and the supporting technical documents provided by the expert consultant team (see Table of Contents). The Barangaroo South Master Plan is provided at **Appendix A** for background information.

This EAR describes the site, its environs and the proposed Concept Plan (Mod 8) and includes an assessment of the proposal in accordance with the Director General's Environmental Assessment Requirements (DGRs) issued for Concept Plan (Mod 8) on 15 April 2014 pursuant to Part 3A of the EP&A Act (**Appendix B**). It should be read in conjunction with the studies and other information appended to this report, including the new Barangaroo South Design Guidelines, Major Development SEPP Amendment and Draft Modified Concept Approval. The studies provide a technical assessment of the environmental impacts of the proposed development, and recommend proposed mitigation measures to manage potential environmental impacts associated with the proposal.

The Modification introduces the Barangaroo South Design Guidelines which will replace the Approved RSH + P Built Form and Urban Design Controls, in order to provide a more streamlined and simple reference document to guide the future development of Barangaroo South.

It should also be read in conjunction with the Concept Plan Instrument of Approval MP06_0162 (as modified) and the original State Significant Site Study prepared by JBA (dated February 2007), the Barangaroo South Concept Plan Modification and Major Development SEPP Amendment Environmental Assessment Report prepared by JBA (dated August 2010), the Barangaroo South Concept Plan Modification Amendment Environmental Assessment Report prepared by JBA (dated June 2013) and the Barangaroo South Concept Plan Modification Amendment Environmental Assessment Report prepared by JBA (dated October 2013).

2.0 Background

2.1 Approved Concept Plan

An international design competition for Barangaroo was held in 2005, attracting 139 entries from around the world. The winning design by Hill Thalys Architecture + Urban Projects, Paul Berkemeier Architects and Jane Irwin Landscape Architecture was announced in March 2006.

A Concept Plan (based on the winning Hill Thalys scheme) was prepared by the Sydney Harbour Foreshore Authority and approved by the Minister for Planning on 9 February 2007.

The approved Concept Plan has been modified six times since originally being approved and the Statement of Commitments has been revised accordingly.

Relevantly, Concept Plan Modification No. 4 (Concept Plan (Mod 4)) was approved on 16 December 2010. Concept Plan (Mod 4) secured approval for a mixed use development involving a maximum of 563,965m² of GFA contained within 7 blocks on a total site area of 22 hectares, an increase in height of a number of the proposed towers within Barangaroo South, the establishment of the new pier and landmark building extending into the Harbour; and reconfiguration and activation of the public waterfront area through the introduction of uses including retail and residential to the west of Globe Street.

The most recent modification is Concept Plan Modification No. 7 (Concept Plan (Mod 7)) which was approved on 11 April 2014. It provides for the use of a temporary concrete batching plant across the whole of the Barangaroo South site. A summary of each of the modifications is provided in **Table 1** below.

Table 1 – Summary of Concept Plan Modifications

Modification	Status	Scope
Modification No. 1	Approved 25/09/2007	Correction of minor typographical errors in the concept plan Instrument of Approval and modification to design excellence requirements.
Modification No. 2	Approved 16/02/2009	Modification to seek an additional 120,000m ² of commercial floor space on the site distributed across Blocks 2, 3, 4 and 5.
Modification No. 3	Approved 11/11/2009	Amended design for the Headland Park and Northern Cove, removal of Block 8 and part Block 7, reduction of floor space by 18,800m ² and removal of the Sydney Ports Harbour Control tower.
Modification No. 4	Approved 16/12/2010	Modification to allow for a mixed use development involving a maximum of 563,965m ² of Gross Floor Area (GFA) contained within 7 blocks on a total site area of 22 hectares, an increase in height of a number of the proposed towers within Barangaroo South, the establishment of the new pier and landmark building extending into the Harbour; and reconfiguration and activation of the public waterfront area through the introduction of uses including retail and residential to the west of Globe Street.

Modification	Status	Scope
Modification No. 5	Withdrawn	Modification to clarify wording within the Concept Plan relating to the distribution of total GFA within the Barangaroo site and to correct a number of minor typographical errors in the approval.
Modification No. 6	Approved 25/03/2014	Modification to realign several block boundaries, revise the approved urban design controls, modify several conditions relating to community floor space, and car and bicycle parking.
Modification No. 7	Approved 11/04/2014	Approval to add a temporary concrete batching plant to the approved range of uses intended for Barangaroo South.

2.1.1 State Environmental Planning Policy (Major Development) Schedule 3 Part 12

To facilitate the redevelopment of the Barangaroo site under the Concept Plan, the site was listed in Part 12 of Schedule 3 of the Major Development SEPP.

The Major Development SEPP zones the Barangaroo site part B4 Mixed Use and part RE1 Public Recreation. It also establishes maximum building heights and GFA restrictions for the nominated development blocks within the B4 Mixed Use zone. There are no maximum building height or specific GFA restrictions imposed by the Major Development SEPP on land within the RE1 Public Recreation Zone.

2.1.2 State Environmental Planning Policy (State and Regional Development) Schedule 2

The Barangaroo site as approved under Concept Plan (Mod 4) is shown on the 'State Significant Development Sites Map – Barangaroo'. By operation of Clause 8 and Schedule 2 of the State and Regional Development SEPP, development identified within the Barangaroo site with a capital investment value over 10 million or subdivision (excluding strata title and community title) is declared State Significant Development.

2.1.3 Other Barangaroo South Applications

The lodgement of Concept Plan (Mod 8) by Lend Lease follows Project / Development Approvals within Barangaroo South for:

- the Bulk Excavation and Basement Car Park (Basement Car Park Approval) (MP10_0023)
- Commercial Building C3 (MP11_0044)
- Commercial Building C4 (MP10_0025)
- Commercial Building C5 (MP10_0227)
- Residential Buildings R8 and R9 (MP11_0002)
- Commercial Building C4 Fitout of Levels 1 – 28 (SSD 12_5582)
- Temporary Concrete Batching Plant (SSD 13_5967)
- Remediation and land forming works (Block 4) - EPA declared area (SSD 5897)
- Stage 1A Public Domain (SSD 13_6303)
- Stage 1A Subdivision (SSD 6381)

State Significant Development Applications within Barangaroo South have also been lodged, but are yet to be determined for:

- Remediation and land forming works (Block 5) - EPA declared area (SSD 6533)
- Retail Building R1 (SSD 6513)
- Retail Building R7 (SSD 6623)
- Commercial Building C2 and C6 (SSD 6425)

A number of modifications to existing approvals are currently under assessment and are yet to be determined.

2.1.4 Other Barangaroo Applications

Wynyard Walk

Following consideration of a Review of Environmental Factors (REF) the Wynyard Walk project was approved by Transport for NSW in July 2012 under Part 5 of the EP&A Act. Wynyard Walk will provide a world class, fully accessible pedestrian link between Wynyard Station and Barangaroo, and includes a pedestrian Bridge across Hickson Road / Sussex Street into the southern end of the Barangaroo site, known as Transport Place.

City Walk Bridge

Following consideration of a REF, the City Walk Bridge project was approved by the Barangaroo Delivery Authority in October 2014 under Part 5 of the EP&A Act. The City Walk Bridge will provide an alternative pedestrian bridge over Hickson Road from Wynyard Walk at Napoleon Street.

Hickson Road Levels

An REF for adjustments to the levels of Hickson Road and associated tree removal and landscaping to address stormwater and interface issues with the Barangaroo South site has been prepared and consultation is currently occurring with key stakeholders. This REF is yet to be determined.

Cassion Wall

Following consideration of a REF, the structural reinforcement of the cassion wall within Barangaroo South was approved by the Barangaroo Delivery Authority in September 2014 under Part 5 of the EP&A Act.

Headland Park and Northern Cove

An early works application for the Headland Park and Northern Cove was approved on 8 November 2010. That application included site clearance and preparation works to facilitate the future redevelopment envisaged under the Concept Plan. On 3 March 2011, the main works Project Application for the Headland Park and Northern Cove (MP10_0048) was approved. That approval included the significant works to shape the future Headland Park, including:

- demolition or modification (yet to be determined) of the Sydney Harbour Control Tower;
- shaping of the shoreline including creation of the Northern Cove; and
- detailed design of the Headland Park including the final landform; landscape design, stormwater strategy, services and infrastructure, pedestrian pathways, Globe Street extension, car park within headland, park amenities and heritage interpretation.

MP10_0048 has been modified on several occasions and works are currently underway pursuant to that approval.

Barangaroo Central

A single application has been approved for development within Barangaroo Central (SSD 5374). SSD 5374 was approved on 11 September 2013 and includes early works, such as demolition and excavation; the construction of a permanent waterfront promenade between Barangaroo South and the Headland Park, and a range of temporary public domain works. The staging of a limited number of major events within Barangaroo Central was also approved.

Barangaroo Ferry Hub / Barangaroo Ferry Terminal

A State Significant Infrastructure application (SSI 6727) has been submitted by Roads and Maritime Services (RMS) and was publicly exhibited in early 2015 for the construction and operation of three new ferry wharves and ancillary landside ferry facilities. The Department is currently in the process of collating submissions.

2.1.5 Concept Plan (Mod 9)

The Barangaroo Delivery Authority is known to be preparing a Planning Application for a further modification to the Concept Plan under Section 75W of the EP&A Act, referred to as Concept Plan (Mod 9), which relates to Barangaroo Central and the Headland Park.

On the basis of information received from the Barangaroo Delivery Authority (at the time of drafting this modification proposal), it is understood that Concept Plan (Mod 9) will:

- Update the Concept Plan as it relates to Barangaroo Central to reflect the master planning being undertaken by Skidmore Owings & Merrill (SOM) and Andersen Hunter Horne.
- Provide for the future use and GFA within the space created within the headland park for a future 'cultural facility'.
- Consider the existing gross floor area of Moores Wharf and the Dalgety Bond Store, not addressed in the maximum GFA calculations included in the Concept Plan.

Where appropriate the environmental assessment that accompanies Concept Plan (Mod 8) has been prepared in the context of the changes being proposed as part of Concept Plan (Mod 9). Notwithstanding this, both applications are completely independent of each other and neither relies on the other in order to be determined.

2.2 The Barangaroo Review and Context for the Modification

In May 2011 the Minister for Planning announced a 'Short Sharp Review' (the Review) of the Barangaroo development. The Review looked at the process that led to the current planning for Barangaroo.

The report outlining the outcomes of the Review was released on 1 August 2011 (Report). A key focus of the Report was the 'Hotel over the Harbour'. The Report concluded that *"While Lend Lease has zoning and Concept approval for the hotel in the harbour, this Review suggests that it would be a significant demonstration of goodwill to relocate the hotel to elsewhere on the site."*

Concept Plan (Mod 8) is the outcome of negotiations between Lend Lease and the NSW Government, including the Barangaroo Delivery Authority, in response to the

findings and recommendations of the Review, in particular the recommendation to relocate the landmark hotel building elsewhere on the site.

Where appropriate the other recommendations of the Report and supplementary Barangaroo 'Snapshot' Design Review have been integrated into the proposed Modification.

2.3 Summary of the Modification

Concept Plan (Mod 8) seeks to relocate the landmark hotel building (Block Y), which is currently approved on a public pier extending into the harbour, back onto the area of the site in front of existing Blocks 4A, B and C, which is currently zoned RE1 Public Domain. The proposed modifications to the Concept Plan for Block Y in response to its proposed new location on the site, include:

- providing for retail and residential uses;
- increasing the amount of tourist uses (including use as a casino);
- increasing the maximum GFA for Block Y to 77,500m²; and
- increasing the maximum height for Block Y to RL 275.

The proposed relocation of the landmark hotel building necessitates, and is accompanied by, the following proposed range of changes to the remainder of the site:

- The total Barangaroo South site area has been reduced from 7.8ha to approximately 7.6ha as a result of:
 - reconfiguration of the hotel pier for public uses; and
 - reconfiguration of the waterfront promenade adjacent to the hotel.
- The size of the Southern Cove has been amended and its location modified. Whilst the total area of the Southern Cove has been reduced, the deep water harbour section remains approximately the same. Concept Plan (Mod 8) also serves to enhance the activation of the Southern Cove area with building frontages now provided on 3 sides.
- The hotel pier approved in Concept Plan (Mod 4) has been reduced in size and relocated such that it extends approximately 15m south of the existing site boundary and is shortened by approximately 20m. The pier is now proposed to accommodate public space and a 2-3 storey community building of approximately 3,000m², with a minimum of 2,000m² of community uses.
- The maximum tourist uses GFA permitted has been increased to 59,000m² and located specifically within the Barangaroo South site.
- The total GFA on the Barangaroo South site has been increased to a new maximum of 535,186m² (an 8.5% increase).
- The total GFA on the entire Barangaroo Concept Plan site has been increased to 605,911m². Noting a further increase is proposed within Barangaroo Central as part of Concept Plan (Mod 9).
- The public domain has been redistributed to continue to provide approximately 50% of the Barangaroo South site as publicly accessible space.
- In order to offset the potential loss of public domain that would otherwise occur as a result of the relocation of the landmark hotel building back on land, the maximum heights of the buildings within the modified 'Block 4' is to be increased and the footprints of those buildings rationalised. Maximum heights within Blocks 1-3 and X remain as per the approved Concept Plan, or are

reduced, while maximum heights in Block 4 are proposed to range from approximately RL107 to RL250 across three residential buildings.

For the entire Barangaroo site, the proposed Concept Plan (Mod 8) will result in:

- a 605,911m² mixed use development across the entire Barangaroo site, comprising:
 - a maximum of 590,911m² mixed uses GFA, including residential, commercial and retail uses which includes;
 - a maximum of 183,031m² of residential uses (a maximum of 154,000m² of which will be in Barangaroo South)¹;
 - a maximum of 76,000m² of tourist uses GFA², 59,000 of which may be in Barangaroo South;
 - a maximum of 34,000m² of retail uses, 30,000 of which may be in Barangaroo South
 - a maximum of 5,000m² of active or community uses GFA (3,500m² of which will be in Barangaroo South); and
 - a minimum of 12,000m² of community uses GFA either in the RE1 or B4 zones;
- approximately 11 hectares of new public open space/public domain, with a range of formal and informal open spaces serving separate recreational function and including a 2.2km public foreshore promenade;
- design guidelines, maximum building heights and GFA for each development block within the mixed use zone;
- an indicative public domain landscape concept, including parks, streets and pedestrian connections;
- alteration of the existing seawalls and creation of a portion of the new shoreline to the Harbour; and
- construction, operation and maintenance of a concrete batching plant to supply concrete for construction of future development under the Concept Plan at Barangaroo South.

The changes described above necessitate modifications to the existing Instrument of Approval and Statement of Commitments for the Concept Plan.

To provide a streamlined assessment framework for the future applications for development on the site the approved Urban Design Controls have been consolidated and integrated with other key elements of the Concept Plan into the 'Barangaroo South Design Guidelines'. The Barangaroo South Design Guidelines will replace the Urban Design Controls in their entirety and incorporate the key elements of the Rogers Stirk Harbour + Partners (RSHP) Master Plan that will be used to guide the detailed design of the future buildings.

Concept Plan (Mod 8) does not propose any amendments to Barangaroo Central or the Headland Park.

¹ Residential uses include residential accommodation, multi unit housing, residential flat buildings, seniors housing, shop top housing and boarding houses, as defined in the Major Development SEPP and the Department Standard LEP Template and includes serviced apartments in separate ownership and titles (strata titled)

² Tourist uses include backpacker's accommodation, bed and breakfast accommodation and, hotel accommodation and serviced apartments, as defined in the Major Development SEPP and the Department Standard LEP Template, but does not include serviced apartments, unless they are in single ownership and title (no strata titling).

The proposed modifications to the Concept Plan depart from the existing development controls for the site established under the Major Development SEPP. A SEPP Amendment is required to reconcile the Major Development SEPP planning provisions with proposed Concept Plan (Mod 8) and, more specifically, to:

- reconfigure the existing development blocks and land uses;
- amend the site boundary to reflect the relocation of the landmark hotel building from over the water onto land within Barangaroo South and the proposed new public pier. This will also require an amendment to the boundary of the Barangaroo site shown on the State and Regional Development SEPP map referred to in Schedule 2 of that SEPP;
- redistribute and increase the maximum permissible GFA within the Barangaroo South development blocks; and
- increase the maximum permissible height controls within some of the Barangaroo South development blocks.

In addition the changes to the site boundary necessitate an update to the Maps included in the State and Regional Development SEPP and Sydney Harbour SREP.

2.4 Project Team

An expert project team has been formed to support Concept Plan (MOD 8) comprising:

Proponent	Lend Lease (Millers Point) Pty Limited
Urban Planning	JBA
Master Plan Designer	Rogers Stirk Harbour + Partners
Landscape Concept	Gustafson Guthrie Nicol
Landscape Design	Aspect Oculus
View / Visual Impact Analysis	Virtual Ideas / JBA
Traffic and Transport	ARUP
Contamination and Remediation	AECOM
Navigation and Marine	Royal Haskoning
Stormwater Management & Drainage	Cardno
Waste Management	ARUP
Air Quality & Odour	AECOM
Noise & Vibration	Wilkinson Murray
Climate Change and Sea Level Rise	ARUP
Heritage	TKD
Non Indigenous Archaeology	Casey & Lowe
Indigenous Heritage and Archaeology	Comber and Stening
Infrastructure & Services Provision	Cardno
Ecologically Sustainable Development	Lend Lease Design

Wind

CPP

Prescribed Airspace for Sydney Airport

AvLaw

Sky View Impact

Lend Lease / UNSW Global

2.5 Director General's Environmental Assessment Requirements

Table 2 provides a detailed summary of the individual matters listed in the DGRs and/or identifies where each of these requirements have been addressed in this report and the accompanying technical studies.

Table 2 – Director General's Environmental Assessment Requirements

Director General's Requirements	Location in Report
General Requirements	
The modification application must include: An executive summary.	Page VII
A description of the existing and surrounding environment.	Section 4.0
A thorough description and justification of the proposal, including: <ul style="list-style-type: none">• A detailed justification for the increases in height, GFA and additional car parking;• Identification and analysis of alternatives, in particular for the hotel, and environmental impacts;• Description of the public benefits arising from the proposal; and• Relationship with the proposed changes to Barangaroo Central and the Headland Park.	Sections 5.0, 9.2.1, 9.23 and 9.3
Consideration of any statutory provisions (see below).	Section 9.1
A detailed assessment of the key issues specified below, including: <ul style="list-style-type: none">• A description of the existing environment; and• An assessment of the potential impacts of the modifications, including cumulative impacts.	Sections 4.0 and 8.0
Consideration of previous reviews, including the Sussex Penn Review into Barangaroo, and Government responses (where relevant).	Section 2.2
An amendment to the approved Statement of Commitments (where relevant).	Section 10.0
A conclusion justifying the proposal, taking into consideration the environmental impacts of the proposal, and the suitability of the site.	Section 11.0
Relevant EPI's, Strategies, Plans and Guidelines	
Address the provisions of State environmental planning policies, strategies, plans and guidelines that would apply as if those provision applied to the carrying out of the project, including the following:	Section 9.1
State Environmental Planning policy (State & Regional Development) 2011;	
State Environmental Planning Policy (Major Development) 2005;	
State Environmental Planning Policy No 55 - Remediation of Land;	
State Environmental Planning Policy (Infrastructure) 2007;	
Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 and Foreshores and Waterways DCP;	
NSW2021;	
Draft Metropolitan Plan for Sydney to 2031;	
Draft Sydney City Sub-Regional Strategy;	
Sydney City Centre Access Strategy 2013; and	
Sydney's Cycling Future 2013.	
Concept Plan and MD SEPP Modifications	
Outline in detail the proposed changes to the terms of approval of the Barangaroo Concept PlanMP06_0162 (as modified) and the MD SEPP, including heights, GFA, zoning, permissibility development blocks, land uses, and any other relevant controls that are being sought to be amended.	Section 5.0
All changes to heights, GFA, blocks, zoning, and public and private open space shall be numerically quantified in table form.	Section 5.1
Urban Design, Development Controls & Land Uses	
Identify the alternative siting options that were considered, particularly for the hotel.	Section 9.2.1

Director General's Requirements		Location in Report
Prepare revised Built Form Principles and Urban Design Controls.		Section 5.1.6
Consider land use, height, density, building blocks and envelopes, setbacks, topography, streetscape, shadowing, view corridors, ground floor permeability and connectivity, façade design, streets and lanes, public open space and private open space, and road hierarchy.		Section 5.1.6
The setbacks for the hotel from Sydney Harbour must be clearly quantified and justified.		Sections 5.1.6 and 9.3
Streetscape and Public Domain		
Outline and justify the changes to the design and use of the streetscape and public domain.		Section 9.3
Detail and justify the changes to the location, design and function of the Southern Cove and its pedestrian bridges.		Sections 5.2 and 9.3
Outline and justify the changes to public spaces, streets and blocks.		Section 9.3
Outline and justify the revised access hierarchy, including the relationship between streets, footpaths and buildings, including Hickson Road, Globe Street, and Transport Place.		Section 9.3
Detail the design and levels of the amended foreshore promenade.		Section 9.15.3
Sydney Harbour		
Detail the impacts on Sydney Harbour as a result of the changes to the foreshore promenade and pier, including its interaction with Barangaroo Central.		Section 9.4
Consider the impacts on boating traffic and safety, and the role of Roads and Maritime Services and the Harbour Master of the Port of Sydney.		Section 9.4
Visual Impact Assessment		
A visual impact assessment must be undertaken. Refer to the attached Plans & Documents Section		Section 9.5
Wind Impact Assessment		
Modelling of the effects of the wind/airflow environment must be undertaken.		Section 9.7
Transport Management, Traffic & Car Parking and Vehicular Access		
Undertake an assessment of the future transport needs associated with Barangaroo South, including a clear understanding of the travel task for all modes at different times of the day (peak, off-peak, and other peak periods relevant to the hotel/casino) and week for the mixed land uses; and confirmation or modification (with justification) to the AM and PM peak commute mode share targets for Barangaroo as outlined in the Barangaroo Integrated Transport Plan 2012.		Section 9.8
Analyse the operation of existing and future transport networks (all modes) to understand the implications for Barangaroo. The analysis of the future road network operations needs to focus on intersections in the north-west quadrant of the CBD in the vicinity of Barangaroo. In particular, address the road network in the King Street Wharf area to ensure that intersections such as Erskine Street and Lime Street and Lime Street itself are modified to cater for the different traffic demands that Barangaroo South will bring to the network.		Section 9.8
Analyse car parking provision and how traffic generation (number of vehicles and time of access) will be managed in response to capacity limitations on the road network. The car parking breakdown shall identify all approved car parking numbers, and all potential car parking numbers across the whole of the Barangaroo site.		Section 9.8
Undertake a corridor model analysis of the road network, including an analysis of traffic generation and circulation, and service vehicle arrangements as a consequence of the modification; and demonstrate the potential to accommodate additional vehicular movements (including private vehicles, buses, commercial traffic and cyclists) in the surrounding road network.		Section 9.8
Undertake an assessment of the public transport network and associated pedestrian linkages and demonstrate that additional people movements can be accommodated by the surrounding public transport network.		Section 9.8.4
Outline late night transport provision to support the hotel and casino.		Section 9.8.4
Outline the timing and responsibility for delivering the transport network to serve Barangaroo.		Section 9.8
Prepare a comprehensive Traffic Management and Accessibility Plan, including an assessment of all of the above matters and: <ul style="list-style-type: none"> • cumulative regional traffic impacts, including but not limited to, local and regional intersections and road improvements, and vehicular access options; • impacts from changes to Barangaroo Central and the Headland Park (Mod 9); • amendments to accommodate future bus service provision on Hickson Road (in consultation with Transport for NSW); 		Section 9.8

Director General's Requirements	Location in Report
<ul style="list-style-type: none"> identify provision for taxi ranks and coach parking on site; the timing and cost of infrastructure works and identification of funding; package of travel demand management measures for workers, residents and visitors; emergency vehicle access arrangements; and proposed loading dock provisions and access arrangements to loading docks and car parks. 	
Outline provisions for water-based transport.	Section 9.8.4
Pedestrian & Cycle Access	
Outline the future cycleway network and demonstrate direct cycle connections between Barangaroo South and the strategic cycleway network as outlined in the Sydney City Centre Access Strategy.	Section 9.9
Outline provisions for walking and demonstrate provision for direct walking connections.	Section 9.9
Land Ownership	
Detail land to be transferred/managed/owned.	Section 9.10
Social Impacts	
Outline the social benefits and dis-benefits of the modification	Section 9.11
Economic Impacts	
Outline the economic benefits and dis-benefits of the modification.	Section 9.12
Housing Strategy	
An amended Housing Strategy is to be provided.	Section 0
Noise, Air and Odour Impacts	
Identify potential air quality, noise and odour impacts, and appropriate mitigation measures.	Section 9.14
Drainage and Stormwater	
Outline drainage and stormwater management issues.	Section 9.15
Utilities	
Outline how the modification will be satisfactorily serviced for utilities.	Section 9.16
ESD	
Identify how the development will incorporate ESD principles.	Section 9.17
Contamination	
Demonstrate compliance with the requirements of SEPP 55. If remediation works are required, the EIS must include a Remedial Action Plan (RAP).	Section 9.18
Prescribed Airspace for Sydney Airport and Sydney Observatory impacts	
Identify any impacts of the proposal on the prescribed airspace for Sydney Airport.	Section 9.19
Undertake an analysis of potential sky view loss and resultant impacts on the functioning of the Sydney Observatory telescopes and astronomical sightlines.	Section 9.20
Heritage	
Undertake an assessment of the likely impacts of the development as modified on surrounding heritage and archaeological items (both on and off the site) and proposed conservation and mitigation measures, including the Millers Point Conservation Special Area, Observatory Hill and Walsh Bay.	Section 9.21
Staging	
Outline the staging of construction for the Barangaroo South project (as modified).	Section 9.22
Consultation	
Undertake an appropriate and justified level of consultation in accordance with Planning & Infrastructure's Major Project Community Consultation Guidelines October 2007. In particular, you should consult with City of Sydney Council, EPA and Sydney Airport.	Section 3.0
Undertake an appropriate and justified level of consultation with Transport for NSW. In particular consultation must include discussions around the timing for the provision of Globe Street and the intended opening of Wynyard Walk, and design, use and timing of Transport Place.	Section 3.0
Updated Statement of Commitments	
An updated Statement of Commitments shall be provided.	Section 10.0

3.0 Consultation

In accordance with the DGRs (refer **Appendix B**), consultation must be undertaken with relevant public authorities, community groups and affected landowners. This section details the consultation undertaken as part of the preparation of this Modification Application.

3.1 Council and Agency Consultation

The approved Concept Plan Statement of Commitments requires the establishment of Technical Working Groups to prepare a series of Implementation Plans and Strategies for Barangaroo. These commitments are not proposed to be modified and will continue to be applied through the remainder of the future stages of development.

Nine Technical Working Groups have been established for consultation in the preparation of the various Implementation Plans and Strategies. Since their establishment, the Technical Working Groups have met on numerous occasions and the relevant Implementation Plans/Strategies have been prepared in consultation with these Technical Working Groups.

Consultation with key stakeholders such as the City of Sydney Council has been ongoing in the development of the amended Concept Plan (Mod 8) design. Most recently a briefing was held with the City of Sydney Council on 16 September 2014, following an earlier briefing in the previous six months. Various other briefings and workshops have been held in past months with key stakeholders such as Transport for New South Wales (TfNSW), Roads and Maritime Services (RMS) and the NSW Environment Protection Authority (EPA) as part of the Technical Working Groups.

Further to this consultation, several of the specialists responsible for the preparation of the technical reports that comprise the appendices to this EAR have engaged in various consultations with relevant stakeholders, including the relevant utility providers, Sydney Airport and TfNSW as necessary.

3.2 Community Consultation

Since 2010 consultation on the Barangaroo project, specifically Barangaroo South has been ongoing. Community consultation has taken place in a range of different forums and through various mediums. The following key events have taken place over recent years:

- Regular community meetings and presentations to business and residential stakeholders;
- Industry and community events;
- Contributing to the Barangaroo Review;
- Maintaining and updating a project website specific to Barangaroo South (www.barangaroosouth.com.au);
- Creating information films;
- Development of a Walking Tour App with Sydney Theatre Company;
- Regular community newsletters;
- Barangaroo open day conducted on 22 June 2014 attended by 7,000 people;
- Site and office tours for special interest groups; and

- Advertising campaigns to raise awareness of Barangaroo South (including TV campaign aired in Sydney).

This extensive array of community engagement events has been focused at providing the community with information on the Barangaroo South development and offering them the opportunity to contribute to the ongoing design process for the precinct. The involvement of the general public will enable the community to develop a sense of ownership over the project.

Research undertaken by Lend Lease indicates that 75% of the Sydney population is aware of Barangaroo. This demonstrates that the consultation undertaken to date on the project has been wide reaching and successful in informing the community on the progress of the development.

3.3 Ongoing Consultation

The importance of positive relationships with all stakeholders is recognised by Lend Lease and therefore Lend Lease seeks to continue proactively engaging with all stakeholders. The approved Stakeholder Consultation Strategy will continue to be implemented over the life of the project.

A strong commitment to an inclusive and pro-active community and stakeholder engagement process underpins the approved strategy. Lend Lease's key objective for the ongoing consultation continues to apply.

The following principles will continue to be implemented through the approved communications strategy:

- an inclusive approach – to implement inclusive community engagement processes, stakeholders must be provided with information that enables them to make informed decisions and to contribute in a meaningful (and informed) way. This includes providing the right amount of information in a timely way that is in plain English and consistent;
- transparent processes – engagement processes should be transparent in order to develop trust and build strong relationships with the community. This means that information should be shared openly between stakeholders, where possible; and
- community feedback – engagement activities should be responsive as well as pro-active. This means that feedback should be an integral part of the process. Stakeholders should have the opportunity to provide feedback as part of the consultation process. This will assist in developing trust, ensuring communication flows in and out of the project team and that the community is kept informed of Barangaroo South's progress.
- Lend Lease's Stakeholder Consultation Strategy has been prepared to provide Lend Lease with the opportunity to:
 - be proactive in order to understand the needs of stakeholders and be in a position to respond to these needs and meet them wherever possible;
 - provide accurate, up to date and accessible information to stakeholders as early as possible and at regular intervals throughout the project;
 - be open, honest, fair and realistic in all dealings with stakeholders;
 - treat the communities in which Lend Lease works with respect;
 - recognise diversity and seek to inform all stakeholders of any decisions affecting them;
 - ensure that all stakeholders and affected community members are well informed about the Barangaroo development and can provide input into the project;

- communicate Lend Lease’s intentions transparently in relation to Barangaroo;
- minimise impacts to affected residents and stakeholders;
- reiterate Lend Lease’s commitment to local employment and job creation, revitalised infrastructure and improved quality of life for Sydney residents and visitors to Sydney;
- create a forum for exchange and information flow; and
- evaluate and review the Stakeholder Engagement Strategy at appropriate times.

4.0 Site Analysis

4.1 The Concept Plan Site

Barangaroo is located on the north western edge of the Sydney Central Business District (CBD), bounded by Sydney Harbour to the west and north; the historic precinct of Millers Point for the northern half, The Rocks and the Sydney Harbour Bridge approach to the east; and to the south by a range of new developments dominated by large CBD commercial tenants, and the King Street Wharf / Cockle Bay precinct.

The 22ha Barangaroo site is generally rectangular in shape and has a 1.4 kilometre harbour foreshore frontage with an eastern street frontage to Hickson Road. The Barangaroo Site includes Hickson Road. An aerial photo of Barangaroo and its context is shown at **Figure 1**.

The Barangaroo site has been divided into three distinct redevelopment areas (from north to south) – the Headland Park, Barangaroo Central and Barangaroo South – and has been subject to multiple investigations that detail the physical and natural characteristics of the Barangaroo site.



Site Plan

Figure 1 – Aerial Photo of Barangaroo

4.2 Concept Plan Modification Area

Concept Plan (Mod 8) only relates to Barangaroo South (the site). The site is identified in the approved Concept Plan as Blocks 1 – 4A-C, X and Y, and the immediately adjacent public recreation area. Prior to development commencing, the area predominantly comprised an open concrete apron which was largely reclaimed over water. The site as approved under the Concept Plan also extended beyond the western edge of the existing apron and includes an area within the existing waters of Darling Harbour to enable a public pier and landmark building.

The changes proposed to the site boundary as part of this modification relate to Barangaroo South only and are intended to:

- reduce the size of, and modify the location of, the public pier; and
- extend the site boundary 5m to the west in front of modified Block Y.

The approved and modified site boundary is shown in **Figure 2**.

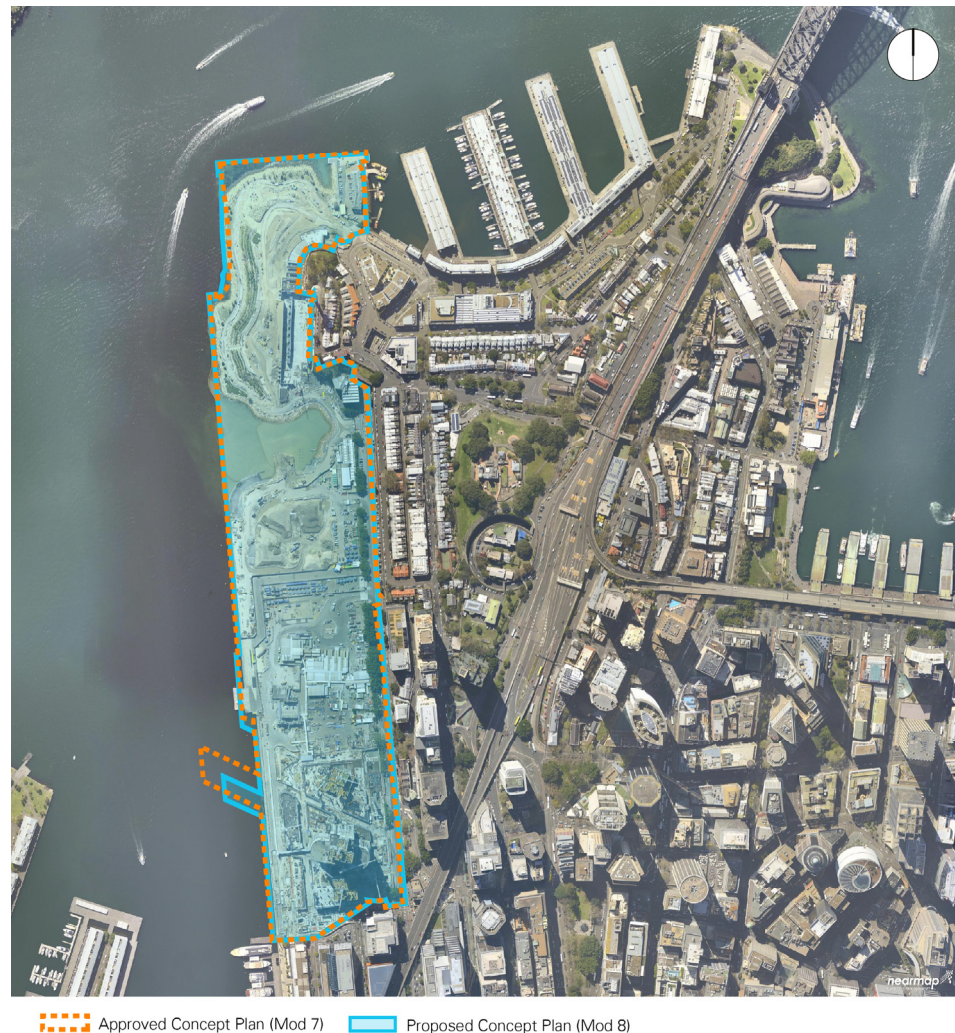


Figure 2 – The approved and modified Concept Plan site boundary

4.3 Legal Description

The Barangaroo site is legally described in the table below. The specific area affected by this modification is Lots 3, 5 and 6 in DP 876514 which are owned by the Barangaroo Delivery Authority and Part of Darling Harbour (Vol 5018 Fol 1) which is owned by Maritime Authority of NSW. A Site Survey is provided at **Appendix L**.

Legal Description	Land Ownership
Lot 1 in DP 876514	Barangaroo Delivery Authority
Lot 2 in DP 876514	Sydney Ports Corporation
Lots 3 in DP 876514	Barangaroo Delivery Authority
Lots 4 in DP 876514	Barangaroo Delivery Authority
Lots 5 in DP 876514	Barangaroo Delivery Authority
Lots 6 in DP 876514	Barangaroo Delivery Authority
Lots 7 in DP 43776 (Munn Street Reserve)	State of NSW
Lot 100 in DP 838323	Barangaroo Delivery Authority
Lot 6 in DP869022	Barangaroo Delivery Authority
Lot 7 in DP869022	State of NSW
Part of Lot 110 DP1061311	Roads and Maritime Services
Part of Darling Harbour (Vol 5018 Fol 1) adjacent to the above listed lots – only the part indicated by the Concept Plan documentation	Maritime Authority of NSW

4.4 Existing Development and Structures

Up until the commencement of construction at Barangaroo South under the Concept Plan, the site was predominantly covered by hardstand areas including concrete and bitumen.

A large part of the Barangaroo South site has now been excavated and is under construction, or is being used for construction activities associated with the approved development currently under construction as shown in **Figure 3**. The Concrete Batching Plant is currently operating to support the construction of the approved buildings. The approved development currently under construction includes:

- Basement Car Park: the common basement servicing the part of the site referred to as 'Stage 1A', comprising car and bicycle parking, loading dock, and plant;
- Commercial Building C3: a 48 storey building with 117,968m² of GFA;
- Commercial Building C4: a 40 storey building with 98,658.6m² of GFA*;
- Commercial Building C5: a 38 storey building with 90,105m² of GFA*;
- Residential Building R8: an 11 storey building comprising 82 apartments and 9,694m² of GFA*; and
- Residential Building R9: a 9 storey building comprising 77 apartments and 8,410m² of GFA.

* proposed GFAs under current Section 75W modifications

Approval is currently being sought for a range of other projects within Barangaroo South which are detailed in Section 2.1.3 and 2.1.4.



Figure 3 – Barangaroo South construction site

4.5 Site Contamination

A number of site history studies and environmental site investigations have been undertaken to assess the extent and nature of contaminants within the Barangaroo site as a whole, as well as within the Barangaroo South precinct.

Investigations have revealed that both the soil and groundwater is contaminated and that the extent of the contaminated materials varies across the site. Concentrations of lead, total petroleum hydrocarbons (TPHs), benzene, xylenes and polycyclic aromatic hydrocarbons (PAHs) in the soil variably exceed accepted Office of Environment and Heritage (OEH) criteria levels. The contamination is largely associated with the operation of the former gasworks and from the importation of materials historically used to fill the site.

In May 2009, OEH (formerly known as DECCW) declared part of the Barangaroo site (Blocks 4 and 5, straddling Barangaroo South and Barangaroo Central) and immediately adjacent land within the Hickson Road reservation to be a remediation site under the Contaminated Land Management Act, 1997 (Declaration No. 21122) (known as the EPA Declaration Area). The EPA Declaration Area is illustrated in **Figure 4**. Details of the remediation strategies that have been prepared for the site and works undertaken to remediate it are provided in Section 9.18.

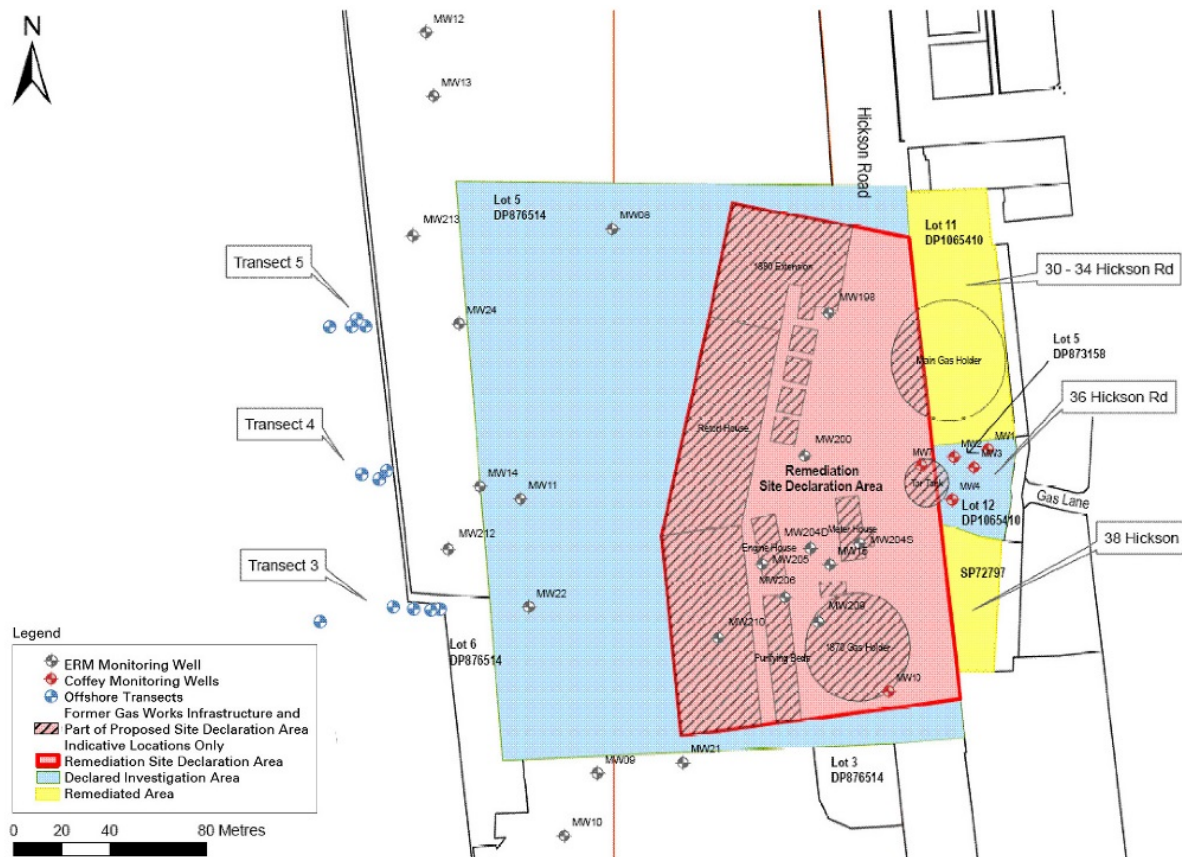


Figure 4 – EPA Declared Remediation Area

4.6 Heritage

There are no listed heritage items within the site. The site is however located in proximity to a number of heritage items. An Aboriginal Archaeological and Cultural Heritage Assessment prepared by Comber Consultants and submitted as part of Concept Plan (Mod 4) confirms that there are no recorded Aboriginal sites within Barangaroo South.

The Non-Indigenous Archaeological Assessment undertaken by Casey & Lowe and submitted with Concept Plan (Mod 4) indicated that there was a moderate to high level of archaeological potential across most of the Barangaroo South site. As part of the subsequent Basement Car Park Application all archaeological remains were removed within the area relating to the Basement Car Park Application known as 'Stage 1A'. An assessment of the heritage impacts of Concept Plan (Mod 8) is provided in Section 9.21.

5.0 Barangaroo South Concept Plan Modification

This section describes the modifications proposed to Barangaroo South under Concept Plan (Mod 8). The proposed modifications are informed by the Barangaroo South Master Plan prepared by RHS + P (included at **Appendix A**). The key provisions of the Master Plan have been translated into the proposed SEPP Amendment, Concept Plan envelopes and Barangaroo South Design Guidelines, as relevant, to guide the future development of buildings at Barangaroo. It is noted that the Master Plan does not form part of the Concept Plan for approval but is provided for information as the background document that informed the Modification.

This Modification seeks to relocate the landmark hotel building (Block Y), which is currently approved to be located on a public pier extending into the harbour, back onto the area of the site in front of the existing Blocks 4A, B and C, which is currently zoned RE1 Public Domain. The proposed modifications to the Concept Plan for Block Y in response to its proposed new location on the site include:

- providing for retail and residential uses;
- increasing the amount of tourist uses (including use as a casino);
- increase the maximum GFA for Block Y to 77,500m²; and
- increasing the maximum height to RL 275.

The proposed relocation of the landmark hotel building and associated updates to the remainder of Barangaroo South, necessitate the following range of changes to the remainder of the site:

- The total Barangaroo site area has been reduced from 7.8ha to approximately 7.6ha as a result of:
 - reconfiguration of the hotel pier for public uses; and
 - reconfiguration of the waterfront promenade adjacent to the hotel.
- The size of the Southern Cove has been amended and its location modified. The total area of the Southern Cove has been reduced, though the deep water harbour section remains approximately the same. The Concept Plan modification also serves to enhance the activation of the Southern Cove area with building frontages now provided on 3 sides.
- The hotel pier approved in Concept Plan (Mod 4) has been reduced in size and relocated such that it extends approximately 15m south of the existing site boundary and is shortened by approximately 20m. The pier is now proposed to accommodate public space and a 2-3 storey community building of approximately 3,000m², with a minimum of 2,000m² of community uses.
- The maximum tourist uses GFA permitted has been increased to 59,000m² and located specifically within the Barangaroo South site.
- The total GFA on the Barangaroo South site has been increased to a new maximum of 535,186m² (an 8.5% increase).
- The total GFA on the entire Barangaroo Concept Plan site has been increased to 605,911m². A further increase to the GFA is to be proposed within Barangaroo Central as part of Concept Plan (Mod 9).
- The public domain has been redistributed to continue to provide approximately 50% of the Barangaroo South site as publicly accessible open space.

- In order to offset the potential loss of public domain that would otherwise occur as a result of the relocation of the landmark hotel building back on to land, the maximum height of the buildings within the modified 'Block 4' is to be increased and the footprints of these buildings rationalised. Maximum heights within Blocks 1-3 and X remain as per the approved Concept Plan, or are reduced, while maximum heights in Block 4 are proposed to range from approximately RL107 to RL250 across three residential buildings.

For the entire Barangaroo site, the Concept Plan (Mod 8) will result in:

- a 605,911m² mixed use development across the entire Barangaroo site, comprising:
 - a maximum of 590,911m² mixed uses GFA, including residential, commercial and retail uses which includes;
 - a maximum of 183,031m² of residential uses (a maximum of 154,000m² of which will be in Barangaroo South)³;
 - a maximum of 76,000m² of tourist uses GFA⁴, 59,000 of which may be in Barangaroo South;
 - a maximum of 34,000m² of retail uses⁵, 30,000 of which may be in Barangaroo South
 - a maximum of 5,000m² of active or community uses GFA (3,500m² of which will be in Barangaroo South); and
 - a minimum of 12,000m² of community uses GFA either in the RE1 or B4 zones;
- approximately 11 hectares of new public open space/public domain, with a range of formal and informal open spaces serving separate recreational function and including a 2.2km public foreshore promenade;
- design guidelines, maximum building heights and GFA for each development block within the mixed use zone;
- public domain landscape concept, including parks, streets and pedestrian connections;
- alteration of the existing seawalls and creation of a portion of the new shoreline to the Harbour; and
- construction, operation and maintenance of a concrete batching plant to supply concrete for construction of future development under this Concept Plan at Barangaroo South.

The changes described above necessitate modifications to the existing Instrument of Approval and Statement of Commitments for the Concept Plan.

³ Residential uses include residential accommodation, multi unit housing, residential flat buildings, seniors housing, shop top housing and boarding houses, as defined in the Major Development SEPP and the Department Standard LEP Template and includes serviced apartments in separate ownership and titles (strata titled)

⁴ Tourist uses include backpacker's accommodation, bed and breakfast accommodation and, hotel accommodation and serviced apartments, as defined in the Major Development SEPP and the Department Standard LEP Template, but does not include serviced apartments, unless they are in single ownership and title (no strata titling).

⁵ Retail uses include food and drink premises, retail premises, markets and pubs and the like as defined in Major Development SEPP and the Department of Planning's Standard LEP Template

To provide a streamlined assessment framework for the future applications for development on the site the approved Urban Design Controls have been consolidated and integrated with other key elements of the Concept Plan into the 'Barangaroo South Design Guidelines'.

Concept Plan (Mod 8) does not propose any amendments to Barangaroo Central or the Headland Park.

5.1 Mixed Use Precinct

5.1.1 The Landmark Hotel Building

The landmark hotel building is a key element of the approved Concept Plan. Under the approved Concept Plan the hotel is a 168m tall building comprising 33,000m² of tourist uses built out over the Harbour. However, as detailed in Section 2.2, this Modification is the outcome of negotiations between Lend Lease and the NSW Government, including the Barangaroo Delivery Authority, in response to the findings and recommendations of the Barangaroo Review, to relocate the landmark hotel building on land within the Barangaroo site.

Whilst being relatively small in scale, the approved location of the hotel building out over the Harbour gave it a landmark status. In order to achieve a similar landmark status for the proposed relocated building, the proposed Modification seeks to increase the size of the hotel building by proposing a maximum height of RL 275 and a maximum GFA of 77,500m². As the tallest tower on the site, its elevated height provides the opportunity to create an articulated pinnacle to Sydney's skyline. A generous pedestrian promenade will continue to be provided along the foreshore to provide for the anticipated pedestrian movements

An exploration of the options considered in the relocation of the landmark hotel building is provided at Section 9.2.1.

In addition to a hotel and associated uses, the Concept Plan seeks to provide for other uses in the building, including residential and retail uses.

Crown Resorts has secured a restricted gaming licence from the NSW Independent Liquor and Gaming Authority and is currently negotiating an agreement with the Barangaroo Delivery Authority and Lend Lease for it to build the landmark hotel building and operate an iconic, world class, luxury six-star hotel resort, which incorporates VIP gaming facilities. The proposed Modification therefore also includes provision for the potential inclusion of a casino use in part of the hotel development in the form of a VIP gaming facility.

An artist's impression, based on Crown Resort's Architectural Design Competition, winning scheme designed by Wilkinson Eyre is provided at **Figure 5**. The illustrated design does not form part of the Concept Plan Modification for which approval is being sought under Section 75W of the EP&A Act, but illustrates the possible design. The detailed design of the landmark hotel building will be the subject of a separate application.



Figure 5 – Artist impression of the landmark hotel building

5.1.2 Urban Structure

The relocation of the landmark hotel building on to the site has necessitated a reconfiguration of the urban structure north of Block 3. Specifically, the following changes are proposed to the approved development blocks:

- **Blocks 4A-C:** Under the approved Concept Plan, Blocks 4A-C form a V-shape around both sides of the Southern Cove. Under the proposed Modification the Southern Cove no longer extends as far east into the site (and is now consistent with the actual extent of water beneath the current concrete apron), which has allowed Blocks 4A and 4B to be located immediately to the north of Block 3 (Globe Street) and for Block 4C to be deleted. These changes enable the park to be relocated where it can provide a green edge to Hickson Road and integrate with the Mixed Use precinct.
- **Block Y** – Under the approved Concept Plan, Block Y is located over the harbour. Under the proposed Modification, Block Y has been relocated to the area previously identified for public open space west of Blocks 4A-C.

No modifications are proposed to the urban structure, extent or configuration of Blocks 1, 2, 3 and X. As outlined in Section 2.1.3, aspects of development have been approved within these blocks and are currently under construction.

5.1.3 Indicative Layout & Land Use Distribution

Concept Plan (Mod 8) retains the approved vision for the site as a mixed use precinct comprising residential, office, retail and tourist uses.

Lend Lease has prepared an updated indicative design to demonstrate how the site may be developed under the proposed Modification. The indicative design does not form part of Concept Plan (Mod 8) for which approval is being sought under Section 75W of the EP&A Act. Rather it illustrates how future development may be pursued within the Development Blocks and in accordance with the proposed development controls (see Section 5.1.6). Future applications will determine the final form and design of buildings and public spaces.

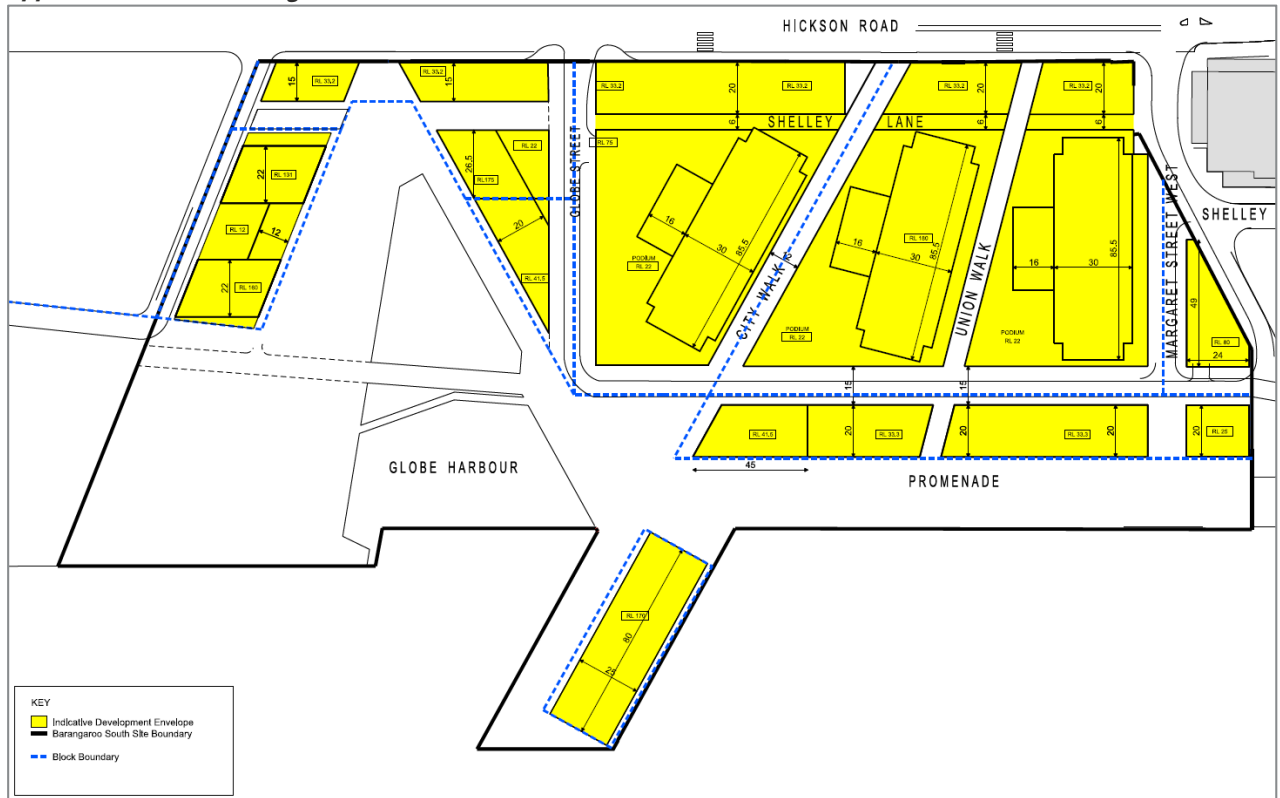
The key changes to the indicative design generally reflects the outcome of the changes to the urban structure described in Section 5.1.1 as a result of the relocation of the landmark hotel building.

The development envisaged for each of the Development Blocks is set out below:

- **Block 1** – Block 1 accommodates a low scale retail building with a small component of commercial uses (R7) intended to form part of the arrival experience to the site.
- **Block 2** – Block 2 (together with Block 3) forms the commercial core of Barangaroo South. Block 2 contains two commercial towers (C4 and C5), a lower scale commercial building fronting Hickson Road (C2) and a kiosk (C6). Retail uses will be provided at the ground level of each of the buildings excluding the kiosk. Hickson Place is intended to be a publically accessible open space provided in Block 2.
- **Block 3** – Block 3 contains one commercial tower (C3) and a lower scale building (C1) fronting Hickson Road. The future use of the remainder of Building C1 is still to be determined, and as such, Concept Plan (Mod 8) proposes flexibility for either commercial, tourist or residential uses. Retail uses will be provided at the ground level of each of the buildings.
- **Block 4A-B** – Block 4A will accommodate the two tallest residential towers (R4A & R4B). Block 4B will accommodate a smaller residential tower (R5) set back from a podium addressing Hickson Road. Retail uses will be provided at the ground level of each of the buildings.
- **Block X** – Block X is envisaged to accommodate two low rise residential buildings (R8 & R9) with retail uses proposed on the ground floor and one retail building (R1) to activate Lime Street and the waterfront promenade.
- **Block Y** – Block Y contains the landmark building providing a new hotel (including a casino). In addition it will have areas of retail within the podium and residential apartments at the upper levels (see further detail in Section 5.1.3).

A comparison of the approved and proposed indicative design is illustrated in **Figure 6**.

Approved Indicative Design



Proposed Indicative Design

Note: Building continue over public domain above Level 1

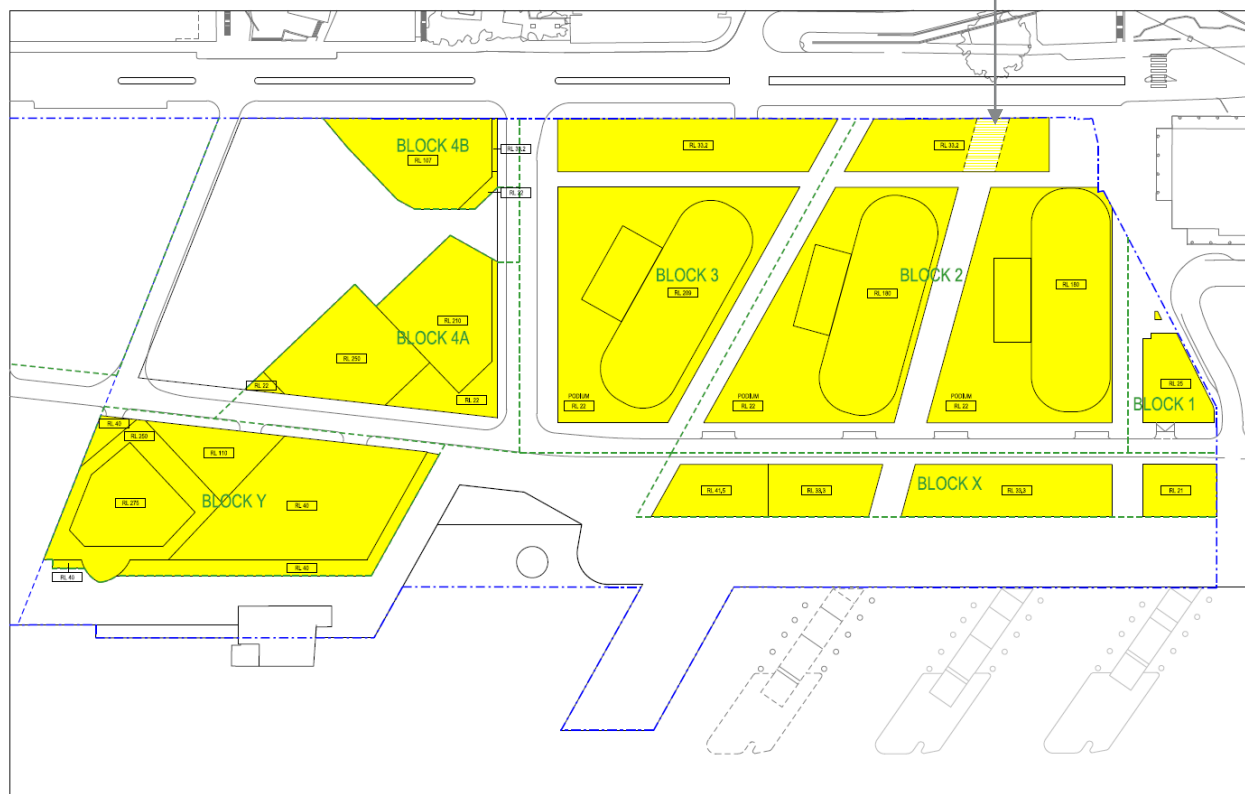


Figure 6 – The approved and proposed Indicative Design

5.1.4 Gross Floor Area

The proposed Modification seeks to increase the maximum GFA at Barangaroo South by 41,946m². A comparison of the approved and proposed GFA is as follows:

- Approved - 493,240m², comprising 490,240m² GFA within the B4 Mixed Use zone development blocks and up to 3,000m² within the RE1 Public Recreation zone.
- Proposed - 535,186m², comprising 531,686m² GFA within the B4 Mixed Use zone development blocks and up to 3,500m² within the RE1 Public Recreation zone (for comprise active and community uses).

This additional GFA represents an increase of 8.5% to the approved maximum GFA at Barangaroo South.

Table 3 provides a comparison of the approved and proposed maximum GFA for each Development Block within Barangaroo South. **Table 4** provides a comparison of the approved and proposed maximum GFA for each use.

Table 3 – Approved and proposed Gross Floor Area in Barangaroo South

Overall Block GFA (m ²)			
Block	Approved	Proposed	Change
Barangaroo South Mixed Uses Precincts			
1	9,400	1,927	-7,473
2	209,213	197,280	-11,933
3	142,669	129,934	-12,735
4A	8,150	86,579	+29,087
4B	29,900	19,558	
4C	39,000	-	
X	18,908	18,908	-
Y	33,000	77,500	+44,500
Subtotal (A)	490,240	531,686	+41,446
Barangaroo Additional Uses (Mixed Uses and Public Recreation Zones)			
Active Uses *	4,500	5,000 Note: Maximum 3,500 in Barangaroo South	+500
Community Uses **	12,000** (included in Block GFA maximum)	Minimum of 12,000 in Barangaroo** (Now included in Block GFA maximum)	-
Subtotal (B)	14,500	3,500 (maximum in Barangaroo South)	+500
OVERALL TOTAL (A + B)	504,740	535,186	+41,946

* Active Uses within the RE1 Public Recreation zone at Barangaroo South are to be counted in addition to the total Block GFAs and are included in the overall total GFA.

** Community Uses GFA within the B4 Mixed Use zone Barangaroo South are counted within the total GFA maximum for the Block (ie: counted as part of, not in addition to, the total Block GFAs).

Table 4 – Approved and proposed maximum Gross Floor Area by uses in Barangaroo South

Use	Approved (m ²)	Proposed (m ²)	Change (m ²) *
Barangaroo South Mixed Use Precincts			
Commercial	No maximum	No maximum	-
Residential	99,763	154,000	+54,237
Retail	34,000	40,000	-4,000
Tourist	33,000	59,000	+26,000
Active**	3500	4000	+500
Community	10,000	10,000	-

* Note the increase in the total maximums by use exceeds the total increase in GFA by block in order to allow for flexibility in the final distribution of land uses

** Active uses within the RE1 Public Recreation zone as defined under the Concept Plan are to be counted in addition to the maximum uses within the B4 Mixed Use Zone

The proposed GFA amendments to the development blocks within the B4 Mixed Use zone involves an increase to the maximum GFA on Block Y by 44,500m², from 33,000m² to 77,500m². A redistribution of GFA in development blocks 1-4 is also proposed, resulting in a reduction of GFA by 3,054m² across blocks 1-3; maintaining the same GFA in Block X; and increasing the GFA within new Block 4 (previously blocks 4a, 4b and 4c).

The additional proposed GFA at Barangaroo South is attributable to the GFA in the landmark hotel building on Block Y being increased together with the proposed 500m² increase to the allowance for Active Uses in the RE1 Public Recreation zone.

The proposed additional GFA for the hotel, and associated height increase will provide for the establishment of a building of landmark status. Having been relocated back on to land from out over the Harbour, these height and GFA increases are necessary to establish the building's landmark status and enable its function as a world class six star hotel. The proposed increase in GFA that is attributable to the landmark hotel site responds directly to the ambition of the new Crown Hotel proposal to be a world class resort.

Community use floor space to be provided within Barangaroo South, both in the B4 Mixed Use and RE1 Public Recreation zones, is included within the overall total of GFA (i.e. is not to be added on top of the maximum total, as per the current Concept Plan Approval). The 3,500m² of active/community uses to be provided in Barangaroo South is counted in addition to the maximum block GFA, as the GFA will be provided outside the development blocks (i.e. within the RE1 Public Recreation zone).

In summary, the key changes to GFA across Barangaroo South are:

- the total maximum GFA will be increased to 535,186m²;
- the maximum tourist uses GFA will be increased from 33,000m² to 59,000m²;
- the maximum residential use GFA will be increased from 99,763m² to 154,000m²;
- the maximum retail uses GFA will decrease from 34,000m² to 30,000m²;
- the maximum GFA of Block Y will increase from 33,000m² to 77,500m²;
- 29,087m² of GFA from Blocks 1-3 will be redistributed to Blocks 4A-B; and
- the inclusion of a maximum of 3,500m² for Active Uses in the Public Domain within the total allowable GFA for the Barangaroo South site.

As a result of the proposed Modification to GFA at Barangaroo South, the total maximum GFA in the Barangaroo Site will increase by 41,946m², from 563,965m² to 605,911m², which represents an overall increase of 7.4%. This Modification (Mod 8), coupled with Concept Plan (Mod 9), which is known to be the next modification currently being proposed by the BDA, will collectively increase the maximum GFA at Barangaroo South to 661,686m².

The wind testing undertaken as part of the design development of the Blocks Y, 4A and 4B residential towers found that because of the location and height of the buildings, the balconies would be wind affected. Accordingly it has been recommended that wintergardens be used to provide a higher level of amenity throughout the year for the future occupants.

However, because of the way GFA is technically defined under the Standard Instrument, wintergardens which have a system such as glass louvres (therefore a 'wall' height greater than 1.4m) could be defined as GFA.

As a result, for clarity, it is sought as part of this Modification that Instrument of Approval be amended so that 'wintergardens', being an enclosable balcony designed and constructed as an external balcony with drainage, natural ventilation and finishes acceptable for an outdoor space, are excluded from the definition of GFA.

It is noted that the issue with the current GFA definition and the need to provide wintergardens in high-rise buildings has been recognised by the City of Sydney, which resolved on 30 October 2014 to amend its LEP and DCP to exclude wintergardens from the calculation of GFA.

Tables 3 and 4 above provides a comparison of the approved and proposed maximum GFA for each Development Block and Land Use within Barangaroo South.

Table 5 identifies the proposed GFA maximum for each Development Block within Barangaroo South and the proposed GFA under Concept Plan (Mod 9) for Development Blocks 5, 6 and 7 within Barangaroo Central. The GFA for Barangaroo Central is shown for reference purposes only, noting that any increase to this area will be the subject of a separate application.

For Block 3, it should be noted that additional capacity has been built into the GFA limits that apply to each use within the maximum total GFA in order to provide flexibility for the future use of Building C1 within that block, which is yet to be determined.

Table 5 – Approved and proposed Gross Floor Area within the Barangaroo Site

Block	Overall Block GFA (m ²)	
	Approved	Proposed
Barangaroo South Mixed Uses Precinct		
1	9,400	1,927
2	209,213	197,280
3	142,669	129,934
4A	8,150	86,579
4B	29,900	19,558
4C	39,000	-
X	18,908	18,908
Y	33,000	77,500
Subtotal (A)	490,240	531,686
Barangaroo Central Mixed Uses Precinct (Showing GFAs as proposed under Mod 9)		
5	41,225	125,000 (including 5,000 community uses)
6	3,000	
7	15,000	
Subtotal (B)	59,225	125,000 (including 5,000 community uses)
Barangaroo Additional Uses (Mixed Uses and Public Recreation Zones)		
Active Uses*	4,500	5,000 Note: Maximum 3,500 in Barangaroo South
Community Uses**	12,000** (Included in Block GFA maximum)	Minimum of 12,000 in Barangaroo** (Included in Block GFA maximum)
Subtotal (C)	14,500	5,000
OVERALL TOTAL (A + B + C)	563,965	661,686
OVERALL CONCEPT PLAN (MOD 8) EXCLUDING (MOD 9) ***	605,911	

*Active Uses within the RE1 Public Recreation zone at Barangaroo South are to be counted in addition to the total Block GFAs and are included in the overall total GFA

** Community Uses GFA within the B4 Mixed Use zone Barangaroo South are counted within the total GFA maximum for the Blocks (i.e. counted as part of, not in addition to, the total Block GFAs).

*** This figure reflects the total GFA for Barangaroo in the event Concept Plan (Mod 8) is approved prior to Concept Plan (Mod 9)

The following range of uses is provided for each category in the approved Concept Plan (Mod 7). These uses are proposed to generally remain unchanged except for minor refinements to clarify the range of uses included within each category and categorise ambiguous uses to avoid future confusion. The proposed uses (as defined in the Major Development SEPP and the Department of Planning's Standard Local Environmental Plan Template) include:

- **Commercial uses** include business premises, office premises, amusement centre and the like;
- **Residential uses** include residential accommodation, multi unit housing, residential flat buildings, seniors housing, shop top housing and boarding houses;
- **Tourist uses** include backpacker's accommodation, bed and breakfast accommodation, hotel accommodation and serviced apartments, and gaming facility. Serviced apartments are only permitted to be included in the 'tourist

uses' GFA if they are in single ownership and are not strata titled (refer to Condition B6(1) of the Barangaroo Concept Plan Determination);

- **Retail uses** include food and drink premises, retail premises, markets and pubs and the like;
- **Community uses** include child care centres, community facilities, educational establishments, entertainment facilities (other than cinemas and amusement centres), information and education facilities, landside ferry facilities, places of public worship, public administration buildings, public halls, recreation areas, recreation facilities (major, outdoor and indoor) and health services facility; and
- **Active uses** include cafe kiosks, retail kiosks, pavilions, ferry ticket office, public convenience (toilet facilities) and small equipment storage spaces and the like.

5.1.5 Height

The proposed maximum building height for each of the Development Blocks is shown in **Figures 7 – 10** and summarised in **Table 6**. The maximum height limit for Blocks Y and 4A-B vary across the development blocks to reflect the intended location of the building massing within the development blocks. It is noted that the depiction of the built form in **Figures 8 -10** is for illustrative purposes only and does not form part of this Modification.

Table 6 – Proposed Building Heights by Block

Area	Approved Maximum RL	Proposed Maximum RL	Change
Block 1	80	25	-55
Block 2	180	180	-
Block 3	209	209	-
Block 4A	41.5	250	+ 208.5
Block 4B	175	107	-68
Block 4C	160	-	-160 (Block Deleted)
Block X	41.5	41.5	-
Block Y	170	275	+ 105
Block 5*	34	34	-
Block 6*	34 and 29	34 and 29	-
Block 7*	35	35	-
Public Recreation	N/A	N/A	-

*Within Barangaroo Central

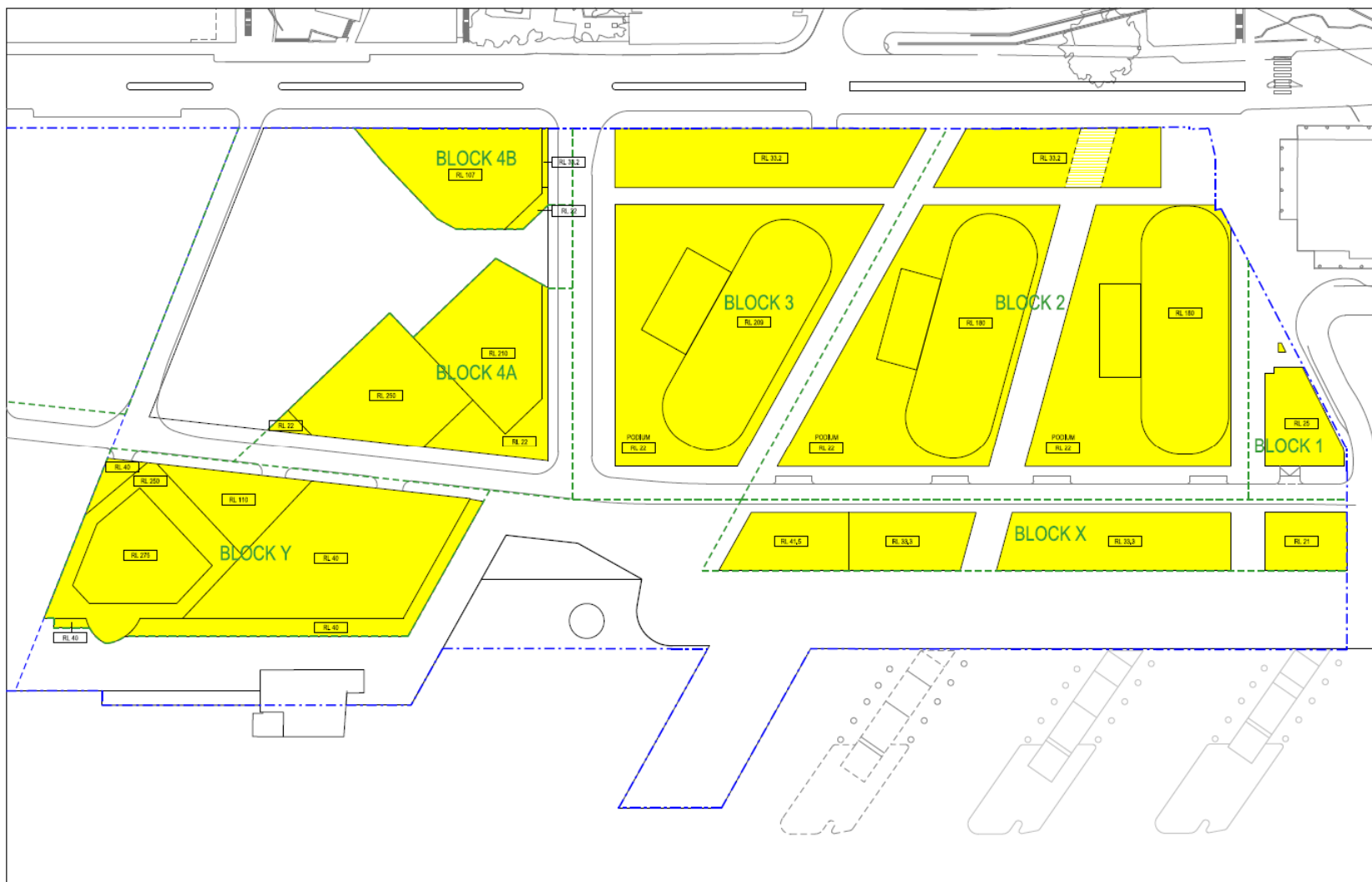


Figure 7 – Proposed building heights

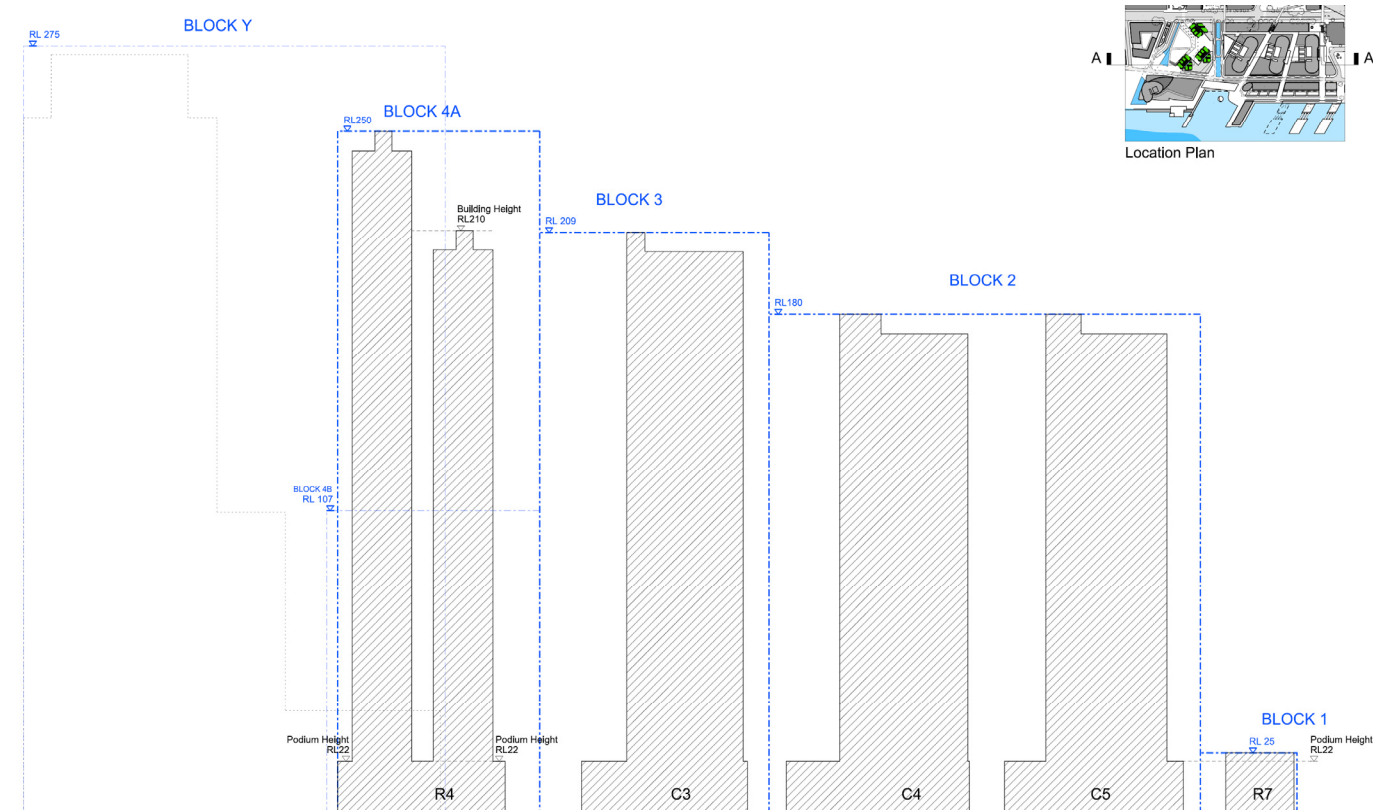


Figure 8 – Proposed building heights – section through waterfront buildings

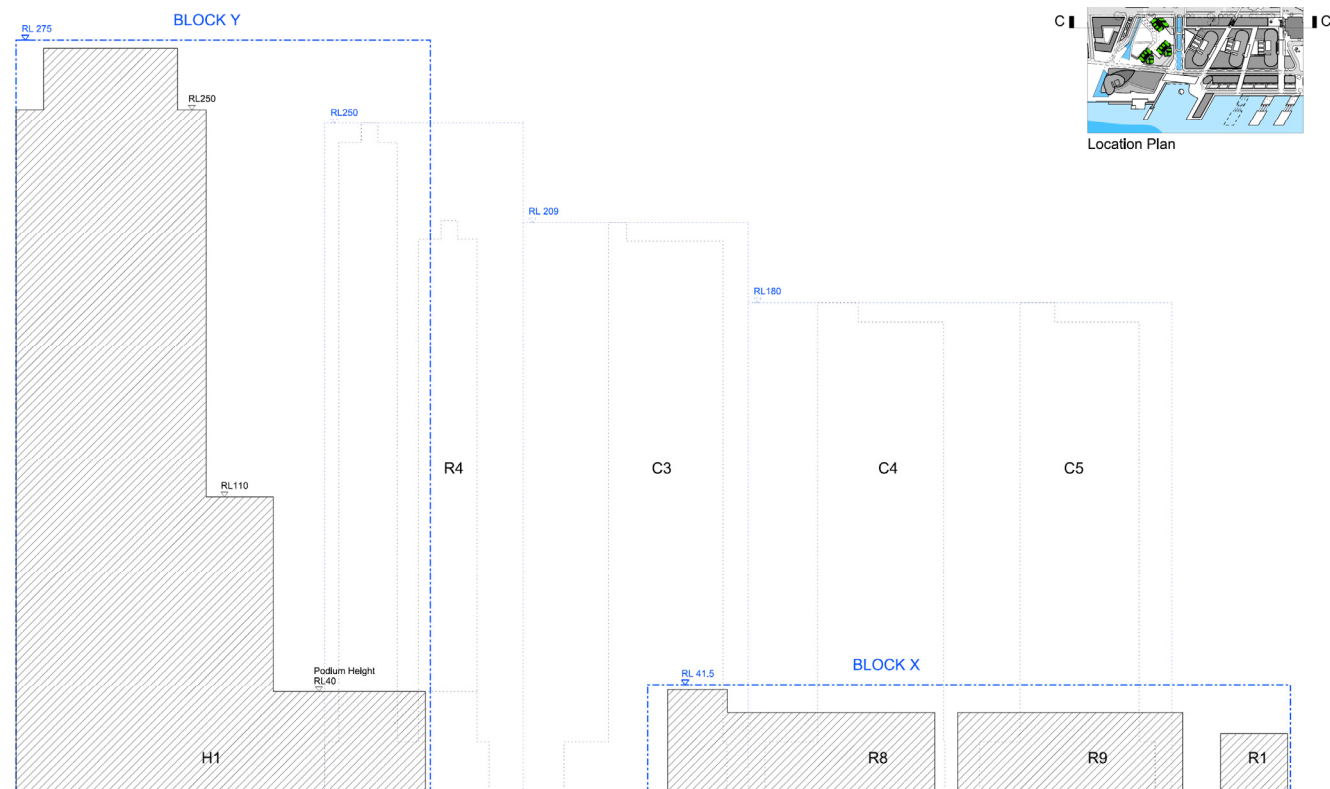


Figure 9 – Proposed building heights – Section 2

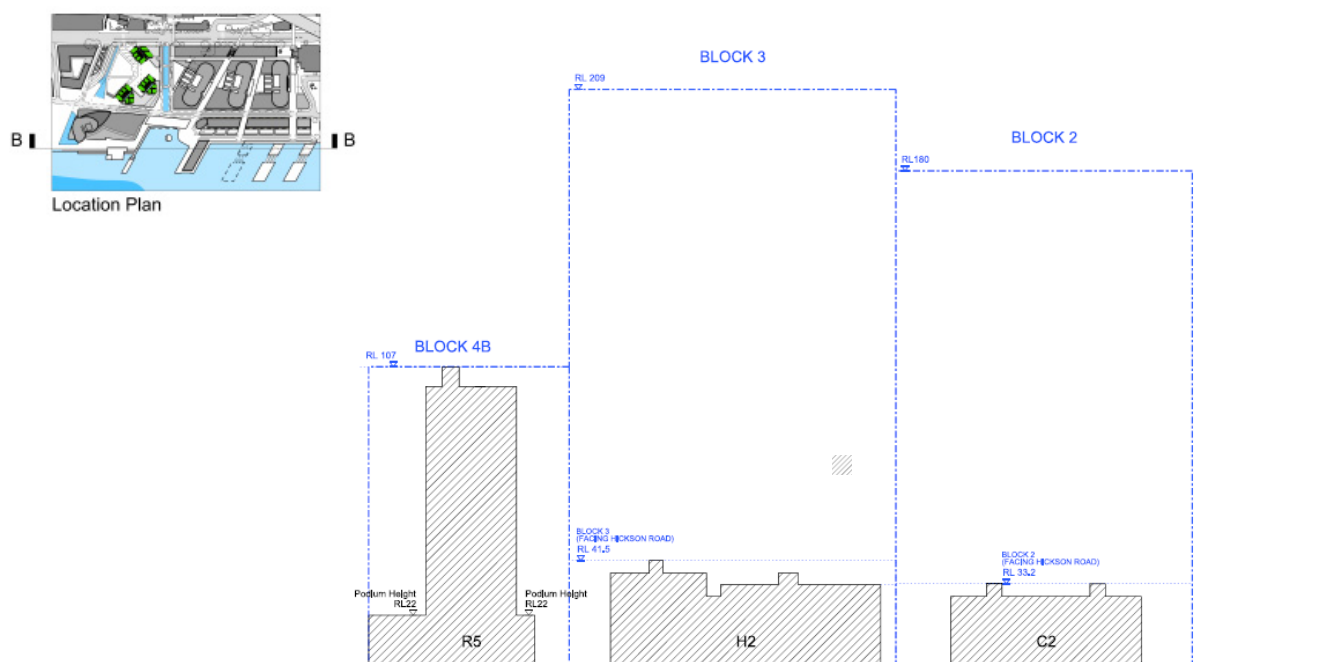


Figure 10 – Proposed building heights – Section 3

5.1.6 Built Form Principles and Urban Design Controls

Condition B5 of the approved Concept Plan requires future development proposals to address their consistency with the Concept Plan Built Form Principles and Urban Design Controls. Consideration of those Principles was required by the Minister for Planning to ensure that the bulk and scale of future buildings on the Development Blocks is acceptable with respect to the relationship between the street wall/podium level and surrounding land uses, and the bulk and scale of buildings.

The current Urban Design Controls were drafted around a particular architectural solution and as such were not able to provide the requisite flexibility to accommodate the current building brief and resultant architecture to better respond to detailed conditions and market.

Concept Plan (Mod 8) retains the intent of Condition B5, however having had the experience of preparing multiple applications under the existing framework, Lend Lease identified the need for, and prepared a more contemporary and outcome based assessment framework for the future applications for development on the site. The Built Form Principles and Urban Design Controls (as modified) have been consolidated and integrated with other key elements of the Concept Plan into the 'Barangaroo South Design Guidelines' (the Design Guidelines).

The Design Guidelines included at **Appendix D** have been informed by the Rogers Stirk Harbour + Partners Master Plan at **Appendix A** and are proposed to replace the approved 'Built Form Principles and Urban Design Controls'. It is intended that all future applications within Barangaroo South will need to have regard to the new proposed Barangaroo South Design Guidelines.

Built Form Principles

The key differences between the approved and proposed Built Form Principles are summarised as follows:

- The built form model within Barangaroo South has been updated.
- Built Form Principle 1 (City's New Western Edge) – The hotel podium is now referenced as part of the development that faces and defines the waterfront.

- Built Form Principle 2 (Hickson Road as a Boulevard) – Now makes provision for the park to the north of Block 4B interfacing with Hickson Road.
- Built Form Principle 5 (Marking the City Frame) – A refinement of the tapering built form principle to allow the tallest buildings at the northern end of Barangaroo South rather than the centre in order to complete the city frame and book end the city's north western edge.

The remaining Built Form Principles are proposed to be retained generally as currently approved.

Urban Design Controls

The key differences between the approved Urban Design Controls and those proposed within the Design Guidelines are summarised as follows:

- Block 1's controls have been revised to reflect the removal of the tower form and replacement with a smaller scale building that relates to the massing of the podium of C5 and R1.
- Block 2, 3 and X generally remain consistent.
- Blocks 4A and B have new guidelines to reflect the change in the urban structure.
- Block Y has new controls to reflect its relocation onto the site and revised form.

5.2 Public Domain Concept

The proposed relocation of the landmark hotel building necessitated a review of the public domain strategy for Barangaroo South. As part of the design review process, a number of opportunities were identified to improve the public domain strategy within Barangaroo South. The key changes which are discussed in detail below include:

- retention of the Waterfront Promenade with improved activation and connectivity;
- relocation of the public open space at the northern end of the site east in order to bring it closer to the city's existing edge;
- reconfiguration of the Southern Cove to provide a more activated, usable and intimate public space;
- relocation of the community facilities on to the publicly accessible pier over the water; and
- revisions to the pedestrian and vehicular connections through the site including provision of a new arrival space at the south eastern entrance of the site known as Hickson Place.

For Blocks 1-3 and X the Modification is generally consistent with the approved Concept Plan (Mod 7) public domain concept. Specifically there are no changes to Union Walk, City Walk, Shelley Lane, the Waterfront Promenade, or Transport Place within those blocks. It is noted that public domain concept has been modified to provide 'Hickson Place' within Block 2 (consistent with the design in the Stage 1 Public Domain DA currently under assessment).

The proposed Modifications to the public domain still result in approximately 50% of the Barangaroo South site being provided as public domain or publicly accessible streets and laneways (excluding Globe Harbour water and areas outside of the site).

An illustration of the public domain concept is shown at **Figure 11** below. The key components of the public domain concept within Barangaroo South are:

- Northern Park;
- Hickson Place;
- Southern Cove;
- Waterfront Promenade;
- Transport Place;
- Shelley Lane;
- City Walk; and
- Union Walk.

Separate and more detailed applications for development will be submitted for the public domain that builds on and refines the concepts outlined in this EAR. As detailed in Section 2.1.3, a DA is currently being assessed by the Department for the Stage 1A Public Domain. The Modification does not change the public domain concept as it relates to the works shown in the Stage 1A Public Domain DA. An extract of the Stage 1A Public Domain, as proposed as part of the DA, is shown at **Figure 12**.



Figure 11 – Public domain context

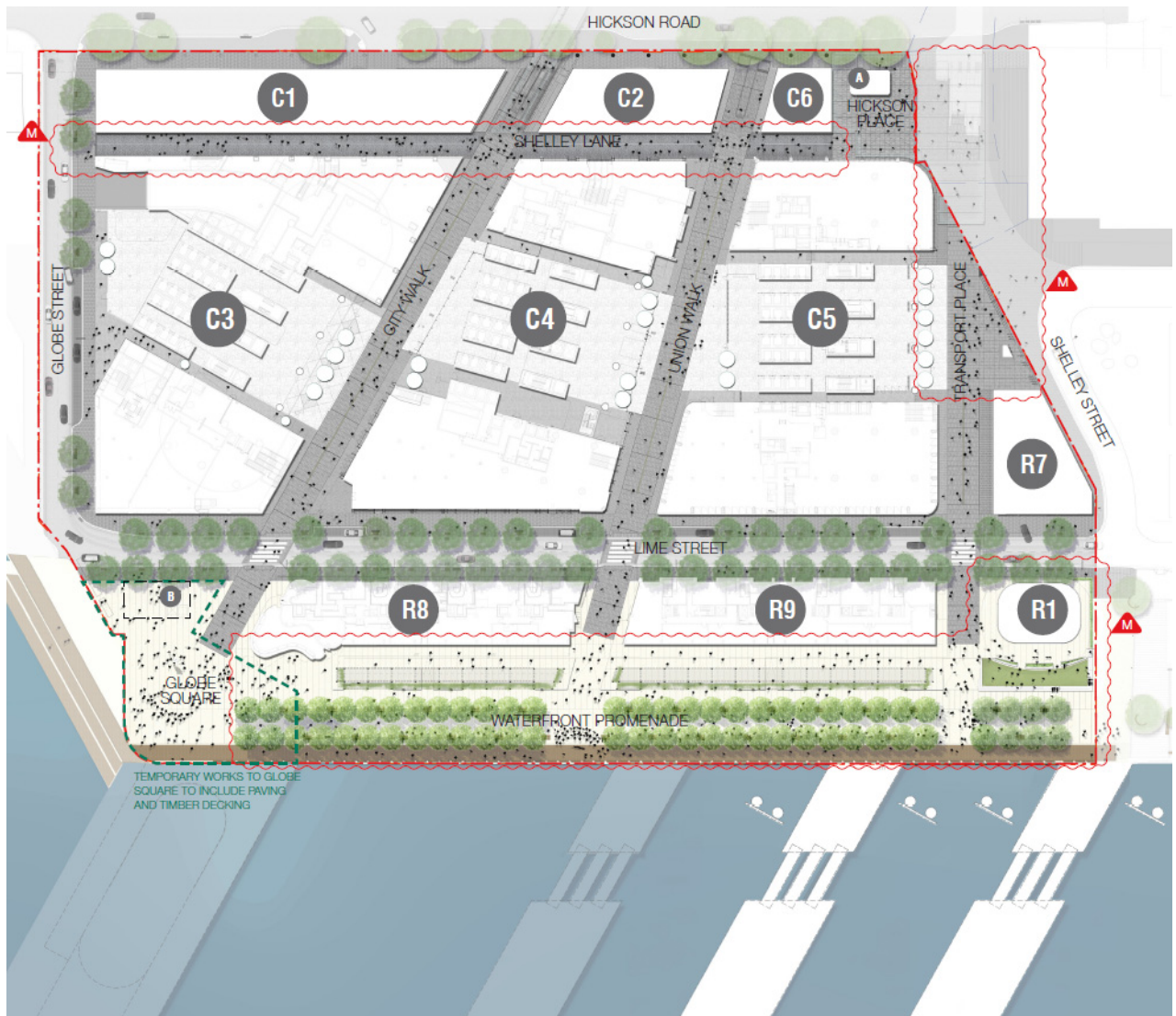


Figure 12 – Stage 1A Public Domain

5.2.1 Waterfront Promenade

Concept Plan (Mod 8) retains the Waterfront Promenade connecting King Street Wharf and Darling Harbour from the south, to Barangaroo Central and Headland Park to the north.

The Waterfront Promenade will continue to extend along the entire western site boundary, tracing the seawall and new foreshore edge around Globe Harbour. It will have a generous width to accommodate pedestrian movements.

The Concept Plan envisages that tree planting, outdoor seating areas associated with the ground floor restaurants, the landmark building's forecourt, programmed events and public art may be provided along the Waterfront Promenade.

5.2.2 Northern Park

The relocation of the landmark hotel building and the consequent re-positioning of the residential towers has presented the opportunity to create a large piece of public open space at the north eastern end of Barangaroo South.

The newly formed 'Northern Park' provides the opportunity to link the Barangaroo Central Parkland to the city and will become a shared amenity between Barangaroo South and Barangaroo Central. It will provide a public domain setting for the surrounding buildings and a visual connection to the Barangaroo Central parklands and potential event spaces and to the harbour beyond.

The park's northern orientation will maximise solar access and the built form around its perimeter will create a more intimate space, and provide protection from westerly winds will have a high level of amenity.

Figure 13 provides an artist impression of the Park. The illustrated design does not form part of this Modification, and is merely intended to illustrate a possible vision for the park.



Figure 13 – Artist's Impression of the future Northern Park (Indicative only)

Source: Lend Lease Design / Virtual Ideas

5.2.3 The Southern Cove

The Southern Cove (also known as Globe Harbour) under the approved Concept Plan contained a deep-water harbour area and separate shallow water harbour area above a basement created by a weir and separated by a pedestrian bridge.

As part of Concept Plan (Mod 8) the size of Globe Harbour has been reduced and its location modified to respond to the relocation of the hotel and creation of the Northern Park, as well as being reflective of the actual extent of water present beneath the current concrete apron. Whilst the total area of the Southern Cove has been reduced, the tidal deep-water harbour section may remain approximately the same.

The proposed changes to the built form will enhance the activation of the Globe Harbour area with building frontages now provided on 3 sides.

There is potential for an open, publicly accessible structure to frame the newly defined Globe Harbour. The potential structure would provide for a transition in scale between the hotel podium and Darling Harbour beyond and also provide a place of focus for events. The potential structure may also act as an element of weather protection within the public domain.

Beneath the potential structure the land begins to step in level, becoming a place where visitors can physically interact with the harbour. The stepped cove will

create an informal array of public seating and provides the opportunity to view events happening on the water such as outdoor stages, film screens etc.

Figure 14 provides an artist impression of Globe Harbour and the structure. The illustrated design does not form part of the Concept Plan Modification, and is merely intended to illustrate the possible vision for Globe Harbour.



Figure 14 – Artists impression of Globe Harbour (Indicative only)

Source: Lend Lease Design / Virtual Ideas

5.2.4 Community Building and the Public Pier

Under the approved Concept Plan a small community building was proposed at the junction of City Walk and the Waterfront Promenade, and the landmark hotel building was located out over the water.

The relocation of the landmark hotel building has provided the opportunity to provide a low scale community focused building on a publicly accessible pier over the water. The building will be two to three storeys in height and comprise a maximum of approximately 2,000m² of community uses and a further 1,000m² of active uses such as food and drink premises.

The pier has been reduced in size and relocated to respond to the changes to Globe Harbour (specifically, the width of Globe Harbour remains consistent with that existing in Mod 7). The pier will form part of an extension to the linear Waterfront Promenade, enhancing the waterside experience, through interacting with the harbour and providing variety along the foreshore. The building also has the potential to mitigate winds from the south.

5.2.5 Pedestrian Connections and Spaces

Concept Plan (Mod 8) retains a hierarchy of east-west and north-south pedestrian streets that provide access and permeability into and within the site (see **Figure 15**).

No changes are proposed to the main pedestrian connections through the site, being Waterfront Promenade (see Section 5.2.1), City Walk, Union Walk, and Transport Place.

The main design change occurs to Shelley Lane. Under the approved Concept Plan Shelley Lane provided a north-south pedestrian connector between

Transport Place and Globe Street before continuing north to Barangaroo Central. Under the proposed Modification, Shelley Lane will continue to provide a fine grain pedestrian connection between Transport Place and Globe Street, however, the reconfiguration of Block 4 and relocation of the Southern Cove means the laneway no longer continues north and has been replaced by a more pronounced pedestrian walk way between Blocks 4A and 4B and through the new Northern Park.

It is also noted that no changes are proposed to the main external access routes or entry points to the site.

The modification proposed to the key pedestrian spaces within the site are detailed in Sections 5.2.1 – 5.2.4 above. In addition to these spaces it is also proposed to provide a new public space, known as Hickson Place. Hickson Place will provide a point of arrival and gathering space for Barangaroo South. The space will be covered by a loggia to mitigate the wind impacts of the C5 tower and achieve a high level of amenity. The space will be activated by retail uses, and as public domain, and will be open to the public 24 hours a day, 7 days a week.

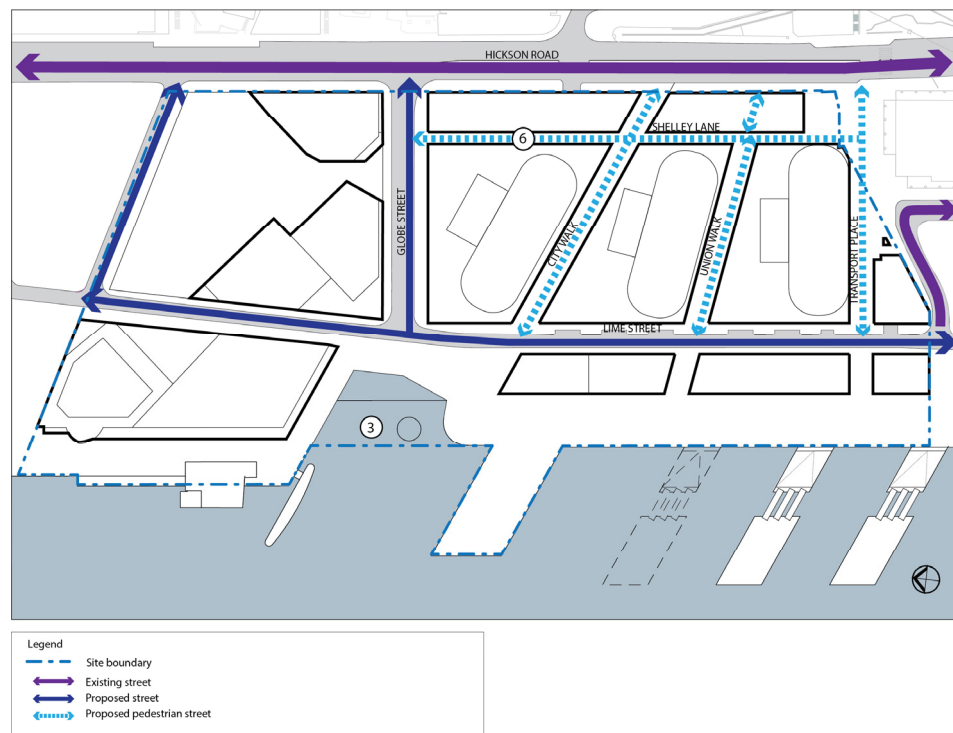


Figure 15 – Proposed street network (development blocks outlined in heavy black line)

Source: *Barangaroo South Design Guidelines*

5.2.6 Vehicular Streets

Concept Plan (Mod 8) retains a hierarchy of east-west and north-south public streets that provide access and permeability into and within the site (**Figure 15**). The key changes to the street layouts / function are as follows:

- **Lime Street** (formerly referred to as Globe Street) will remain Barangaroo South's primary north-south connector. Under the approved Concept Plan, Lime Street terminated at the intersection with Globe Street and a pedestrian only street, known as Bull Street, continued across the Southern Cove north to Barangaroo Central. As a result of the revisions to the Southern Cove, Lime Street can now continue north all the way through Barangaroo South to Barangaroo Central, improving permeability within the Barangaroo site. Lime Street will continue to provide for one lane of vehicular traffic in both directions as well as on-street parking. The extended Lime Street will service / provide

access to the landmark hotel building and its basement as well as continuing to provide an entry to the Stage 1A basement entry near R1.

- **Globe Street** will remain Barangaroo South's main east-west street, linking Lime Street and the waterfront promenade to Hickson Road. Globe Street will provide for one lane of vehicular traffic in both directions as well as provision for on-street parking/taxis. Globe Street will continue to provide an entry/exit to the Stage 1A and Stage 1B basement.

No modifications are proposed to the design or intent for Hickson Road which runs along the eastern boundary of the site, or Healy Street, which runs along the northern boundary of the site with Barangaroo Central.

5.3 Water Cycle Management

This Modification continues to achieve the benchmarks established by the approved Concept Plan to showcase best practice in ecologically sustainable design.

Cardno has updated the Integrated Water Strategy for Barangaroo South (refer to **Appendix F**). The Strategy establishes water quality targets for Barangaroo South and addresses opportunities for maximising stormwater reuse and methods which can be implemented to achieve these targets.

The balance of water in Barangaroo South will be achieved through a site wide approach that focuses on:

- Potable water demand reduction including:
 - Achieve a reduction in potable water consumption compared to a standard practice development.
- Water balance modelling including:
 - Review of potential sources of water;
 - Investigation of sewer mining;
 - Assessment of appropriate treatment measures; and
 - Further development of existing conceptual water balance model.

This Strategy will be further detailed and developed as part of the separate future applications in Barangaroo South.

5.4 Infrastructure Servicing

An updated Infrastructure Concept Plan has been prepared by Cardno and is provided at **Appendix E**. The Infrastructure Concept Plan outlines the existing and proposed services and describes the changes which have occurred as a result of the proposed Modification.

The elements addressed within the Infrastructure Concept Plan include stormwater, potable water, recycled water, wastewater, electrical, telecommunication, natural gas and chilled water. Where relevant, Cardno has identified which infrastructure works have already been approved under separate applications and those works which have been completed since the original Concept Plan Approval. A summary of the infrastructure works to be completed as part of the Concept Plan is outlined below.

5.4.1 Stormwater

The following stormwater works are to be completed as part of the development of Barangaroo South:

- **Stage 1A Permanent (Complete):** A concrete pipe and box culvert diversion with 100 year ARI capacity to improve existing flooding to Hickson Road in the vicinity of the Sussex Hotel.
- **Stage 1B Interim:** A 1350mm diversion pipe to the south of Stage 1B (Block 4A & 4B) allowing progress of basement construction works on site. The 1350mm diversion pipe will form part of the Stage 1B permanent drainage network.
- **Stage 1B Permanent:** Connection to the existing 1800mm diameter pipe located under the proposed Globe Street, between Stage 1A and Stage 1B Residential. Details of any necessary further works will be provided in separate application(s) for the development of Stage 1B.

Details of these works will be provided during the ongoing stages of development with the relevant application. The stormwater works for Stage 1A have been approved and completed as part of earlier applications for development at Barangaroo South.

5.4.2 Potable Water

Connection will be made to the existing 300mm water main. From this connection, a 250mm potable water main will be constructed along Shelley Street, Lime Street, and Globe Street to provide potable water supply to the Barangaroo South development.

5.4.3 Recycled Water

The recycled water sources for Barangaroo South will be supplied from a central Recycled Water Treatment Plant (RWTP) treating waste water from Barangaroo South and waste water produced through mining Sydney Water sewer in Hickson Road.

The recycled water mains are generally to be located within the Barangaroo South Basement; reticulating to customer recycled water meters located within the basement and extending to a termination point at the northern boundary which allows for future extension to service the Barangaroo Central development.

5.4.4 Wastewater

The following controls will be implemented to manage wastewater across the Barangaroo Site:

- Establishment of criteria for wastewater or effluent reuse for either contaminated or clean sources of water; and
- Management practices for reuse of treated wastewater from contaminated areas.

These management practices for the reuse of treated wastewater may include recycled water/treatment devices which fall under separate approvals to the Concept Plan.

5.4.5 Electrical

Lend Lease will own and operate a 33kV network and substations on site as a private embedded network. This will be configured in a triplex configuration and will provide a similar level of redundancy to an 11kV CBD system.

The feeders from Pymont Switching Station will be a combination of new and existing feeders. New Ausgrid feeders will be run from Slip St to the Barangaroo South development where they will terminate on switchgear which demarcates

the Ausgrid network from the private embedded network. At Slip Street the new feeders will be jointed to existing feeders which run to Pyrmont. These feeders were recently in service but were decommissioned when the new City North Zone substation was brought on line. These arrangements are subject to ongoing negotiations with Ausgrid.

On site, private embedded network cabling and substations will be established to service the building and other site loads.

5.4.6 Telecommunications

Existing pit and pipe infrastructure will be extended to the site to allow multiple providers to access the site at two diverse entry points; from Shelley Street at the south and from Hickson Road at the north. It is expected that incoming telecommunications cables will be optic fibre.

Reticulation within the site will generally be in cable trays at a high level in the basement and will provide diverse paths from site entry points to individual buildings to allow for a high level of network resilience.

5.4.7 Natural Gas

The current preferred strategy is a low pressure 7kPa gas service. If necessary, the Barangaroo South site could be connected to a high pressure service.

5.4.8 Chilled Water

A centralised chiller plant and harbour heat rejection system will be constructed to provide reticulated chilled water to the Barangaroo South development. Chilled water will be reticulated throughout the Barangaroo South development within a privately owned network. The Harbour Heat Rejection plant, and associated reticulation of chilled water, was approved in August 2013 under MP10_0023 (MOD5).

5.4.9 Changes to Infrastructure and Servicing Provision

With each of the above infrastructure elements, Cardno has described that the changes to the built form of the Concept Plan have resulted in adjustments to the proposed infrastructure network horizontal alignment. The intent of the servicing strategy for Barangaroo South remains unchanged. The adjustments to the horizontal alignment of the infrastructure networks are illustrated in the Conceptual Infrastructure Drawings provided at **Appendix E**.

5.5 Proposed Modifications to Instrument of Approval

The proposed modifications to the Concept Plan detailed above require amendments to the Terms of Approval in Schedule 2 of the Instrument of Approval. **Appendix X** includes a marked up version of the Instrument of Approval and provides an explanation for each proposed change. A summary of the proposed changes is provided in **Table 7** below.

Table 7 – Summary of modifications to the Concept Plan Instrument

Condition	Summary of Modification and Reason
A1. Development Description	Updates the condition to reference the Concept Plan (Mod 8) application and modified GFAs.
A2. Development in Accordance with Plans and Documentation	Updates the condition to reference the Concept Plan (Mod 8) Environmental Assessment Report.
B3. Southern Cove	Deletes the condition requiring the provision of the Southern Cove east of Globe Street (now referred to as Lime Street). The Modification still provides a

Condition	Summary of Modification and Reason
	water intrusion north of Napoleon Street (see Section 5.2.3) as envisaged in the original Jury Report, however the Barangaroo Review, which was undertaken following Concept Plan (Mod 4) made a series of recommendations, such as the relocation of the hotel, which result in the design no longer providing the water component east of Lime Street. As the findings of the Barangaroo Review supersede those of the original jury report this condition is proposed to be deleted. An assessment of the modified design of the Southern Cove is provided in Section 9.3.
B4. Built Form	Updates the condition to reflect the modifications to the built form being proposed under Concept Plan (Mod 8).
B5. Revised Design Principles	Revises the condition requiring applications in Barangaroo South to demonstrate consistency with the Built Form Principles and Urban Design Controls to now demonstrate consistency with the new Barangaroo South Design Guidelines (see Section 5.1.6).
B6. Tourist Uses	Updated the condition to reflect the increase in tourist uses proposed.
B7. Community Uses	<p>Part (1) has been updated to reflect the modifications to the provision of community uses, specifically the provision of 2,000sqm of community uses on the public pier. As a result of the time it will take to construct the public pier and associated building, the provision of the community uses has been tied to the Occupation Certificate of any building in Stage 1B and not the commercial buildings.</p> <p>Part (2) has been updated to remove the reference to the now out-dated report and require further consultation with Council regarding the new community building.</p>
B9. Envelope Amendments and Built Form Controls	Deletes the condition as the Supplementary Urban Design Statement as amended by the Urban Design Controls has been updated and consolidated into the new Barangaroo South Design Guidelines, therefore the condition is now redundant.
C2. Design Excellence	Updates the previous reference to the indicative building controls in the Concept Plan EAR to refer to the new Barangaroo South Design Guidelines.
C5. Marine Ecology	Corrects a minor error in the condition which refers to the ferry wharves which do not form part of the Barangaroo site.
C8. Gross Floor Area	Excludes winter gardens from the calculation of GFA for the purposes of future development under the Concept Plan.

6.0 Major Development SEPP Amendment

The Barangaroo site is listed as a State Significant Site in Part 12 of Schedule 3 of the Major Development SEPP. The Major Development SEPP zones the land part B4 Mixed Use and part RE1 Public Recreation.

Maximum building heights and GFA restrictions are established for nominated development blocks within the B4 Mixed Use zone under the Major Development SEPP. There are currently no maximum building heights or specific GFA restrictions imposed by the Major Development SEPP on land within the RE1 Public Recreation Zone.

As outlined above, relocating the landmark hotel building, which is currently approved on a public pier extending into the harbour, back onto another part of the site has resulted in a number of departures from the existing Major Development SEPP controls. These components of Lend Lease's scheme consequently require a SEPP Amendment to reconcile the Major Development SEPP planning provisions with this Modification and more specifically to:

- redefine the existing development blocks and reconfigure the land uses;
- redefine the delineation between mixed use development and public recreation;
- amend the site boundary to reflect:
 - the modified size and location for the proposed public pier; and
 - widening the Waterfront Promenade adjacent to a section of Block Y;
- redistribute the maximum permissible GFA within the Barangaroo South development Blocks 1-4 and increase the maximum GFA for Block Y;
- increase (and in some cases decrease) the maximum permissible height controls within the Barangaroo South development blocks to reflect the changes in configuration of land uses and GFA across the site.

The SEPP Amendment proposes amendments to the gazetted Major Development SEPP maps including the Land Application Map, Land Zoning Map, Gross Floor Area Map, Height of Buildings Map and Heritage Map. The amended SEPP Maps and an Explanation of Intended Effects have been prepared and are included at **Appendices H and I**.

The SEPP Amendment can be supported on the basis that:

- the redevelopment of Barangaroo South will enhance the growth and positioning of Sydney as the premier cultural and living centre of the Asia-Pacific region;
- the site is of regional and State importance due to its strategic location, its ability to deliver significant public outcomes in the form of public open space, infrastructure and public domain improvements, its contribution to the economic growth of Sydney and its importance in achieving State Government objectives with respect to tourism, commerce, employment and housing; and
- the Modification is the outcome the NSW Government requesting that Lend Lease relocate the landmark hotel building back on to the site and increase its GFA and height following the Barangaroo Review.

7.0 State and Regional Development SEPP Amendment

The Barangaroo site is shown on the 'State Significant Development Sites Map – Barangaroo' declared in Schedule 2 of the State and Regional Development SEPP.

As the modification involves relocating the hotel out of the water and will change the Concept Plan site boundary (see Section 4.2), the boundary of the site shown on the 'State Significant Development Sites Map – Barangaroo' in the State and Regional SEPP will need to be modified to reflect the amended boundary. An Explanation of Intended Effects is included at **Appendix H**.

No other modifications are proposed to the State and Regional Development SEPP.

8.0 Sydney Harbour SREP Amendment

Barangaroo is located within the boundaries of the Sydney Harbour Catchment and as such is subject to the provisions of Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (Sydney Harbour SREP).

The Barangaroo site is included in the following SREP Maps:

- Sydney Harbour Catchment Map
- Foreshores and Waterways Area Map
- Strategic Foreshore Sites (Sheet 3)
- Zoning Map (Sheet 10)
- Strategic Foreshore Sites (Sheet 1 - City Foreshores Area) Map
- Wetlands Protection Area Map
- Heritage Map

The Barangaroo Concept Plan site (as approved) involves a hotel out over Sydney Harbour is not reflected on the current SREP maps, noting that the Major Development SEPP prevails to the extent of any inconsistency. However in the interest of ensuring the SREP is consistent with the SEPP and Concept Plan it is proposed to amend the boundary of the site as shown on the SREP maps, to reflect the change to the boundary proposed as part of this Concept Plan Modification.

The SREP zones the part of Sydney Harbour adjacent to Barangaroo 'W1 Maritime Waters'. The proposed amendment to the site boundary will require the location of the zone boundary to also be amended. The part of Sydney Harbour that will form part of the Barangaroo site will now be zone RE1 Public Recreation under the Major Development SEPP.

No modifications are proposed to the written instrument. An Explanation of Intended Effects is included at **Appendix H**.

9.0 Environmental Assessment

This section of the report assesses and responds to the environmental impacts of the Concept Plan (MOD 8) proposal. It addresses the matters for consideration set out in the Director-General's Environmental Assessment Requirements (DGRs), and compliance with the approved Concept Plan (as modified) including the relevant Statements of Commitments.

A draft revised Statement of Commitments complements the findings of this section and is provided at **Appendix X**.

9.1 Relevant EPIs, Strategies, Plans and Guidelines

The relevant strategies, environmental planning instruments, policies and guidelines as set out in the DGRs are addressed in **Table 8**.

Table 8 – Summary of consistency with relevant Strategies, EPIs, Policies and Guidelines

Instrument/Strategy	Comments
Strategic Plans	
NSW 2021	<p>NSW 2021 is a 10 year plan to rebuild the economy, provide quality services, renovate infrastructure, restore government accountability, and strengthen our local environment and communities.</p> <p>The proposed Modification is consistent with the NSW 2021 Plan in that it will significantly contribute to:</p> <ul style="list-style-type: none"> – improving the performance of the NSW economy; – driving economic growth and prosperity in NSW; – increasing the competitiveness of doing business in NSW; and – placing downward pressure on the cost of living.
Draft Metropolitan Plan for Sydney to 2031	<p>The Draft Metropolitan Plan for Sydney to 2031 is the most up-to-date strategic planning for Sydney up until 2031. The proposed Modification is consistent with the Draft Metropolitan Plan as it will:</p> <ul style="list-style-type: none"> – contribute to achieving the concept of 'Global Sydney', with Barangaroo being an identified area for regeneration; – encourage and facilitate the regeneration of waterfront land, enhancing Sydney's setting and status on the global stage; – support Sydney as the premier visitor destination by showcasing cultural and recreational facilities and venues for international events with a day and night economy; – contribute to the strengthening of transport connections through Sydney's CBD, in particular along Sydney's waterfront land; – facilitate more jobs in Sydney, contributing to the need for 2.8 million jobs in 2031; and – accommodate more of the 5.6 million people expected in Sydney by 2031, satisfying a portion of the demand for 2.2 million homes.
Draft Sydney City Subregional Strategy	<p>The Draft Sydney City Subregional Strategy is the subregional strategic planning document which seeks to outline how the future of Sydney should progress in the context of a broad range of business, recreation and other activities and considerations. The proposed Modification is consistent with this strategy in that it will:</p> <ul style="list-style-type: none"> – directly facilitate the fulfilment of the redevelopment opportunity which is Barangaroo as identified in the strategy; – foster economic competitiveness and employment growth, contributing to Sydney as Australia's premier city on the global stage; – ensure adequate capacity for new office floor space and hotel rooms; – facilitate the sustainable development of the Barangaroo major urban renewal project; – contribute to the achievement of additional dwellings within Sydney's CBD to house the expected population; – continue to provide a diverse mix of apartment types and sizes, satisfying the need for housing choice in Sydney; and – improve transport interchanges with potential for enhanced transport connections.

Instrument/Strategy	Comments	
Sydney City Centre Access Strategy	<p>The Sydney City Centre Access Strategy establishes a framework and plan for transforming and improving Sydney's transport system to enable easy access to Sydney's centre and make the city centre more attractive and a place where people wish to spend more time. The Modification is consistent with this strategy in that it:</p> <ul style="list-style-type: none"> – locates employment within proximity to residential apartments, minimising the need for extensive travel; – provides residential uses in close proximity to other high employment areas, increasing the number of people living in close proximity to their place of work; – provides potential for key transport connections such as pedestrian and cycle networks; – includes maximum restrictions on the number of car parking spaces, reducing congestion within Sydney's centre; and – supports the provision of more public transport services along the western fringe of Sydney's CBD. 	
Sydney's Cycling Future 2013	<p>Sydney's Cycling Future outlined the way the NSW Government seeks to plan, prioritise and provide for cycling in Sydney. The proposed Modification continues to support the intent and values of Sydney's Cycling Future by:</p> <ul style="list-style-type: none"> – providing a link in the wider Sydney region of a safe, connected and highly utilised cycle network; – supporting cycling initiative by providing a significant amount of bicycle parking within the public domain and individual buildings; and – encouraging cycling through providing end-of-trip facilities within the future buildings. 	
State Planning Instruments and Controls		
Stage and Regional Development SEPP	<p>Barangaroo is identified as a State Significant Site under Schedule 2 of the State and Regional Development SEPP. A minor change to the State Significant Development Sites Map for the Barangaroo Site is proposed as part of this modification (refer to Section 7.0). This relates to the replacement of the previous landmark hotel protrusion into Darling Harbour with the new public pier. The relevant provisions of the State and Regional Development SEPP including those contained within Schedule 2 will continue to apply.</p>	
Major Development SEPP	<p>Barangaroo is identified as a State Significant Site under Schedule 3 of the Major Development SEPP. A number of provisions relating to the Barangaroo site are included in Schedule 3 of the SEPP. The proposed modifications necessitate changes to the Major Development SEPP (refer to Section 6.0). These changes to the Major Development SEPP and the associated amendments to the SEPP maps are included at Appendix H and I respectively.</p>	
Infrastructure SEPP	<p>The State Environmental Planning Policy (Infrastructure) 2007 (Infrastructure SEPP) applies to the whole of NSW and is relevant to development on the Barangaroo Site. The proposed modifications do not alter the application of the Infrastructure SEPP to the Barangaroo Site. Future applications for development will need to be assessed against the relevant provisions of the Infrastructure SEPP which may include an assessment of any potential impacts to the interim Metro Corridor or assessment by RMS for traffic generating development.</p>	
SEPP 55	<p>Section 9.18 and Appendix S demonstrate that the provisions of State Environmental Planning Policy No. 55 – Remediation of Land (SEPP 55) and the contaminated land planning guidelines have been appropriately satisfied as is relevant to the purpose of the Concept Plan Modification.</p>	
Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005	<p>Barangaroo is located within the boundaries of the Sydney Harbour Catchment and as such is subject to the provisions of Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (Sydney Harbour REP).</p> <p>Within the Sydney Harbour REP, Barangaroo is identified as being within the Foreshores & Waterways Area Boundary.</p> <p>Part 3, Division 2 (Clause 20-27) of the Sydney Harbour REP refers to matters which are to be taken into consideration by consent authorities before granting consent for development.</p>	
	<table> <tr> <td data-bbox="395 1874 703 1957">Clause 20 General</td><td data-bbox="708 1874 1171 1957">The matters referred to in Division 2 are addressed below to assist the consent authority with its assessment.</td></tr> </table>	Clause 20 General
Clause 20 General	The matters referred to in Division 2 are addressed below to assist the consent authority with its assessment.	

Instrument/Strategy	Comments
	<p>Clause 21 Biodiversity, ecology and environment protection</p> <p>The proposed modifications do not result in any biodiversity, ecology and environment protection considerations not already assessed and deemed appropriate under the approved Concept Plan (as modified). The potential impacts to Sydney Harbour as a result of the proposed modifications are reduced from those previously assessed in the Concept Plan (Mod 4) application (see Section 9.4). It has been determined that the mitigation measures currently approved in Concept Plan (Mod 7) will continue to apply and will manage any potential impacts.</p>
	<p>Clause 22 Public access to, and use of foreshores and waterways</p> <p>The proposal seeks to enhance public access to, and the use of, the foreshore and waterway. The proposed modifications to the built form layout will facilitate improved access and circulation around the foreshore.</p> <p>The redevelopment of Barangaroo will provide public access to the foreshore that was not previously accessible.</p>
	<p>Clause 23 Maintenance of a working harbour</p> <p>The redevelopment of the wider Barangaroo site for mixed uses was assessed as part of the original Concept Plan. The proposed modifications are consistent with the original Concept Plan and do not seek to alter the mixed use nature of the site.</p>
	<p>Clause 24 Interrelationship of water and foreshore uses</p> <p>The proposed modifications do not alter the consistency of the Concept Plan (as modified) with the original assessment of this matter for consideration. The modified built form and corresponding mix of uses will not conflict with uses in the waterways. The Navigation Report prepared by Royal Haskoning has determined that there will not be any adverse impact on navigation in the surrounding waterways (refer to Appendix K).</p>
	<p>Clause 25 Foreshore and waterways scenic quality</p> <p>The proposed modifications will not result in any adverse impact to the scenic quality of the foreshore. The scale, form, design and siting of the building envelopes have taken into account the Barangaroo site, land adjoining Barangaroo and the future character of the locality. The modifications will maintain, protect and enhance the visual qualities of Sydney Harbour, its islands and foreshores. The buildings have been setback sufficiently from the waterfront to allow for views of the foreshore and the wider context of Sydney Harbour. A detailed assessment of views and visual impact is provided at Appendix M.</p>
	<p>Clause 26 Maintenance, protection and enhancement of views</p> <p>The modifications to the built form, in particular building siting, form and massing, have been determined following a detailed analysis of the Barangaroo site and its surrounds, including Sydney Harbour (Refer to the relevant extracts from the Barangaroo South Master Plan at Appendix A and Section 9.2.1).</p> <p>The modified design has sought to minimise any visual impacts and maintain, protect and enhance views and vistas where possible. A detailed assessment of views and visual impact is provided at Appendix M.</p>
	<p>Clause 27 Boat storage facilities</p> <p>N/A. No boat storage facilities are proposed.</p>

Instrument/Strategy	Comments	
Sydney Harbour Foreshores and Waterways Area Development Control Plan 2005	Ecological Assessment.	Concept Plan (Mod 8) will not have any impacts on the ecological qualities of the waterway beyond those assessed under the approved Concept Plan (Mod 7).
	Landscape Assessment	Concept Plan (Mod 8) continues to provide for a landscaped setting along the waterfront.
	Design Guidelines for Water-Based and Land/Water Interface Developments	Concept Plan (Mod 8) will avoid any conflicts between land uses and the waterways and continues to provide public access along the foreshore. The Modification continues to provide a positive interface with Sydney Harbour.
	Design Guidelines for Land-Based Developments	Concept Plan (Mod 8) will continue to facilitate public access along the foreshore, and provides a considered approach to building siting and the general built forms relationship with Sydney Harbour.

9.2 Urban Design, Development Controls and Land Uses

9.2.1 Analysis of Alternatives

In May 2011, the newly elected NSW Government announced an independent review of the Barangaroo (Lend Lease) development's compliance with relevant planning approval processes. In August 2011, the Sussex-Penn Barangaroo Review reported noted that Lend Lease had a valid approval for the landmark hotel on the pier, but stated that it was 'not good public policy' to develop the subject hotel on a pier over the harbour.

The Sussex-Penn Barangaroo Review recommended the government should re-engage with Lend Lease to consider alternative hotel locations. Lend Lease agreed to undertake a review of alternative hotel locations on the basis that it would not affect time, quality of design outcome, cost or value to Lend Lease, including the fact that Lend Lease had invested significant cost and time in securing the approvals to date.

The proposed Concept Plan (Mod 8) is the outcome of over two years of master planning that has involved consideration of a wide range of alternative designs to allow for the relocation of the approved landmark hotel building elsewhere on the Barangaroo site. The following section provides a summary of the three main options considered and the process and analysis that led to the current preferred concept.

The Do Nothing Option

As detailed in Section 2.2, a key focus of the Barangaroo Review was the 'Hotel over the Harbour'. The Report concluded that "While Lend Lease has zoning and Concept approval for the hotel in the harbour, this Review suggests that it would be a significant demonstration of goodwill to relocate the hotel to elsewhere on the site."

The 'Do Nothing' alternative, would be to continue to develop the Concept Plan with the hotel out over the Harbour as approved and to ignore the findings and recommendations of the Review to relocate the landmark hotel building elsewhere on the site. Considering the importance of the Review it is not considered an appropriate alternative to ignore its findings and not investigate and execute an alternative option.

Hotel Relocation Options

Five sites were initially identified in September 2011 by the Barangaroo Delivery Authority and Lend Lease for consideration of the relocated landmark hotel building:

- Barangaroo Central – north
- Barangaroo Central – south
- Recreation Zone – north west (Barangaroo South)
- Hickson Road –mid zone north east (Barangaroo South)
- C3 Tower (Barangaroo South)

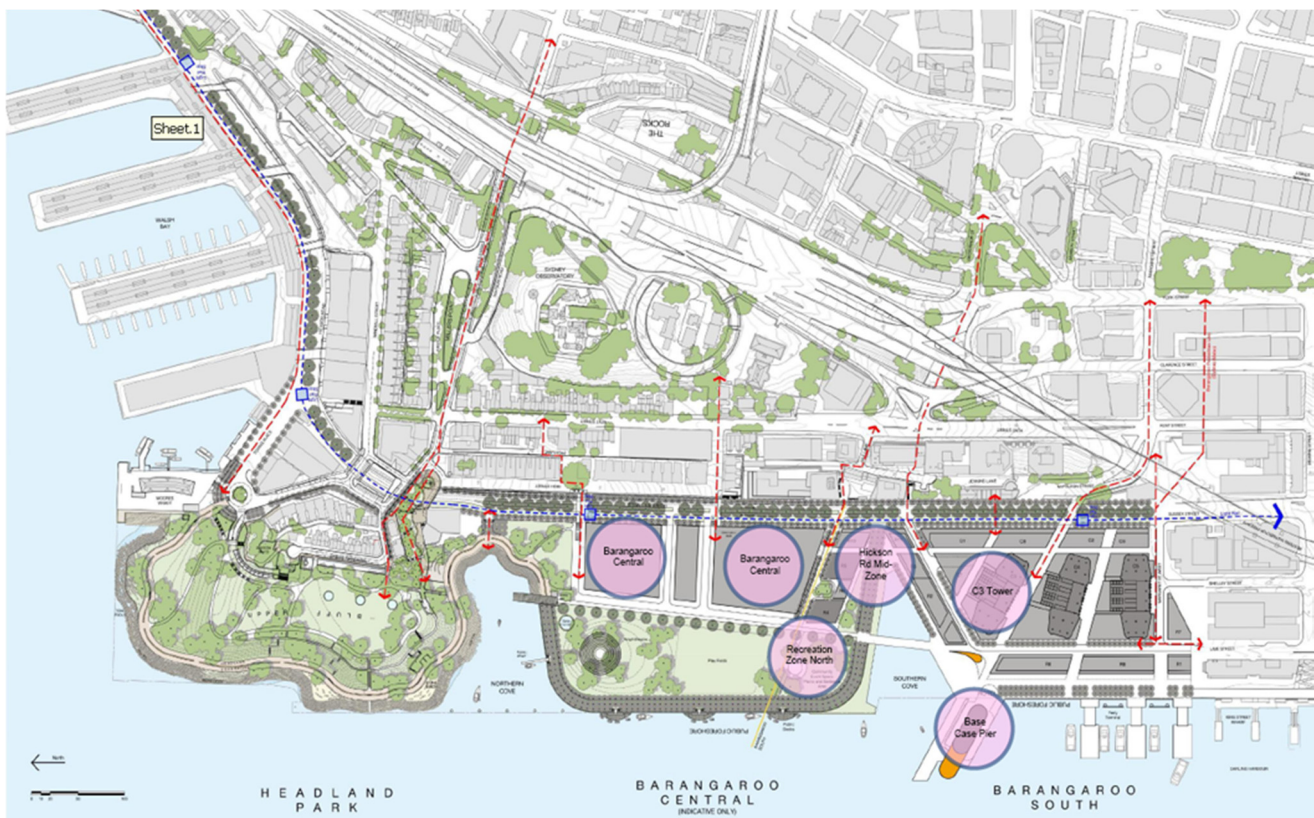


Figure 16 – Hotel relocation options

Lend Lease engaged Hassell architects to provide initial planning studies, including massing models, area programs and public realm, supported by scaled block models for all of the above site options. In October 2011, the Barangaroo Delivery Authority advised Lend Lease that the subject hotel could not be relocated anywhere in Barangaroo Central.

Lend Lease also advised the Barangaroo Delivery Authority that investigations had ruled out Building C3 as a suitable location for the hotel, given conflicts with existing commercial tower planning applications and approvals; design and structural issues; basement constraints; and adverse impacts with investor / tenant negotiations.

The potential location of Building C7 was also considered by Lend Lease and subsequently ruled out due to the physical constraints of the site, a mismatch with hotel operator criteria and a range of development factors.

After extensive analysis three hotel site locations were identified for further detailed assessment:

- Recreation Zone – north
- Recreation Zone – mid (a new location within the area of the proposed Southern Cove)
- Hickson Road – mid

Lend Lease subsequently engaged Master Plan architects RSHP to develop these options further and to identify a preferred option, building on the previous analysis work. The brief was to develop a scheme that responded to, or enhanced, the existing layout principles embodied within the approved Concept Plan.

The development of each of the three options required consideration of a range urban design principles as well as site constraints / opportunities. These key considerations are set out below:

- Existing approvals/applications
- Existing lot boundaries
- DECCW land (land contamination and remediation issues)
- Revetment Wall and Caisson Wall locations
- Foreshore setbacks
- Foreshore public pedestrian access
- View corridors north / south
- Globe Street View corridor to Headland Park
- Shelley Street / Hickson road connection to Barangaroo Central
- Kent Street residents' view corridors
- Public domain amenity
- Shadowing
- Barangaroo South internal staged boundaries
- Road access to the Hotel
- Maintaining an equitable balance of area between Public Recreation and Mixed Use zoned lands.
- Staging program
- Barangaroo Central planning approvals
- Traffic conditions, signal spacing, basement entry / exits

Each of the schemes investigated maintained the arrangement of buildings in the southern part of Barangaroo South, so given the opportunity; some changes were investigated in order to improve the overall amenity of the site. In this respect, Building C6 was proposed to change in each option, to a smaller pavilion type building providing ground level retail, a portal for future Metro Station and a civic statement or “front door” address for the development. Additionally, and while their footprints were to be maintained, the R1 and R7 buildings are proposed to become smaller and more in keeping with the increased importance of Transport Place as a southern entry and key pedestrian link. The former residential use of the R7 building was transferred to the northern part of the site. All other buildings north of the Building C3 location have been amended and/or relocated as a result of the landmark hotel building relocation.

Evaluation Criteria

In order to determine the merits of each option, the same assessment criteria used under the original Stage 1 developer selection bid process in 2009 were adopted. These criteria covered:

- Capability
- Design
- Financial Return and Risk
- Marketing and Promotions
- Sustainability
- Delivery and Planning

Each of the three site options were also compared against the current approved Concept Plan (Mod 4) at the time.

Preferred Location

The assessment provided considerable clarity on the location of the landmark hotel building, with a clear preference for a waterfront location at the north-western end of Barangaroo South; being the Foreshore Zone – north. In general terms, this location provides excellent opportunities for design enhancement, development and operational / marketing advantages for the Hotel. However, the scheme was not considered to have fully satisfied some of the urban design principles that impact value. As a result, Lend Lease embarked on further design work to resolve a range of issues including hotel operations, residential planning and public realm structure, that ultimately became resolved in the current Concept Plan (Mod 8) design and RSH + P's Indicative Master Plan Design.

The proposed modification in respect of the hotel was selected following significant analysis because it represented the best possible outcome for the site that balances the wide range of competing urban design, environmental, economic and social considerations.

Furthermore, the modified location and development block envelope of the landmark hotel building will allow for the delivery of an iconic building which achieves the established principles of the Concept Plan.

The proposed location and form of the modified landmark hotel building also allows for an appropriate response to be achieved across the remainder of the Barangaroo South site, in particular in Block 4 through the reconfiguration of the open space area and rationalisation of buildings. The amended design of Block 4 will provide a high quality park which achieves considerable amenity and provides a positive interface with Barangaroo Central.

Connectivity will be promoted through the siting of the landmark hotel building, with an opportunity for a continuous green spine to link from the Headland Park, through Barangaroo Central, and into Barangaroo South before reaching Hickson Road. The setbacks of the landmark hotel building from the foreshore will also allow for the up to 30 metre wide waterfront promenade which includes a potential 17m wide pedestrian movement zone, enabling a waterfront connection through the entire Barangaroo site.

9.2.2 Built Form

Whilst modifications are made to the urban structure as part of the Modification, as detailed in Section 5.1.6, the Built Form Principles of the approved Concept Plan have been retained, specifically:

- Principle 1 City's New Western Façade: The Modification still provides the western frontage to the city centre, with slender buildings orientated to the waterfront and a ribbon of development facing the waterfront to mediate the scale.
- Principle 2 Hickson Road as a Boulevard: The Modification still promotes the scale of Hickson Road as a grand boulevard by providing a consistent street wall. The design also further enhances Hickson Road's role by introducing a connection with the park.
- Principle 3 Buildings Defining Streets: All building facades continue to be set to the street alignments.
- Principle 4 North South Pedestrian Connections: A high level of pedestrian permeability following pedestrian desire lines continue to be provided.
- Principle 6 Open Space within Blocks: The Modification still provides open space within the blocks, creating a fine grain structure of laneways and streets as well as open space at podium level between tower forms.
- Principle 7 View Sharing: The modified urban structure still delivers equitable access to views towards the harbour, with the built form arranged to define the street corridors and to allow view corridors from the existing private buildings to the east.
- Principle 8 Orientation of Buildings: The long façades of tower forms continue to be oriented to the north and on Hickson Road and the waterfront promenade, the long façades are orientated to the east to define the linear nature of this road and promenade.

The only material change to the principles occurs to Built Form Principle 5 (Marking the City Frame), which represents a refinement of the 'tapering built form' principle. This change is intended to allow the tallest buildings to be located at the northern end of Barangaroo South rather than the centre as it will complete the city frame and book end the city's north western edge.

The various components of the amended built form in Concept Plan (Mod 8) are explored below.

Landmark Hotel

The landmark hotel building was a key element of the approved Concept Plan. Under Concept Plan (Mod 7) the hotel is a 168m (RL170) tall building comprising 33,000m² of tourist uses built out over the Harbour. However, as detailed in Section 2.2, this Modification is the outcome of negotiations between Lend Lease and the NSW Government, including the Barangaroo Delivery Authority, in response to the findings and recommendations of the Barangaroo Review, to relocate the landmark hotel building elsewhere on the site.

Whilst being relatively small in scale, the approved location of the hotel building out over the Harbour gave it a landmark status. In order to achieve a similar landmark status for the relocated building and to provide for the potential Crown Hotel brief, the proposed Modification seeks to significantly increase the size of the hotel building by proposing a maximum height of RL 275 and a maximum GFA of 77,500m².

As the tallest tower on the site, its elevated height provides the opportunity to create an articulated pinnacle to Sydney's skyline. The setbacks of the landmark hotel building from the residential buildings within Block 4 allow it to be viewed as a standalone building which book-ends the grid pattern of Sydney's CBD (refer to **Figure 17**).



Figure 17 – Separation of landmark hotel building to allow for iconic status

Source: RSH+P

The positioning and scale of the landmark hotel building allows it to fulfil key urban objectives such as creating a premier address and sense of arrival and creating a destination on the waterfront promenade. The setback of the landmark hotel building from the foreshore will continue to allow for an up to 30 metre wide promenade is provided at ground level. The positioning of the building to facilitate this continuous promenade will assist in retaining key pedestrian desire lines through the entire Barangaroo site, connecting from the Headland Park to Barangaroo Central and on through Barangaroo South (refer to **Figure 18**).



Figure 18 – Pedestrian desire line along the foreshore promenade (indicative hotel form only)

Source: RSH+P

The built form of the landmark hotel building is acceptable and provides the following key benefits:

- maximised vistas towards the Harbour Bridge and Opera House through its siting on the north-west of the Barangaroo South site;
- minimised overshadowing of the Southern Cove and surrounding public realm due to the massing being concentrated toward the north-west of the Barangaroo South site;
- integration of the podium into the urban fabric to ensure active vibrant edges;
- respecting and enhancing the public waterfront promenade by providing a varied character and scale as it traverses towards the Headland Park;

- establishment of a strong anchor to Barangaroo Central and the Headland Park, providing a key marker for the precinct; and
- formation of a book-end to the city grid at the pinnacle of the northern most point of Barangaroo South.

Residential Towers (R4a, R4b and R5)

The Residential Towers within Block 4 have been modified to respond to the shift of the landmark hotel building from the water to the land. The positioning, massing and number of towers is sought to be amended in part to better respond to the location of the landmark hotel building and ensure that an appropriate public domain, as well as built form, outcome is achieved.

The Residential Buildings in Block 4 are partly increased in height, but are afforded slimmer tower parameters which will in turn allow for more elegant and slender forms. The increased height of the buildings is appropriate in light of the surrounding context, particularly of the landmark hotel building which establishes a maximum height of RL275 for the site. The height of the towers has been stepped from the landmark hotel building to provide an appropriate transition through the site.

The towers also continue a built form dialogue with the adjoining CBD, with the highest form at the northern end of the precinct to complete the city frame and book-end the city's north western edge (see **Figure 19**).

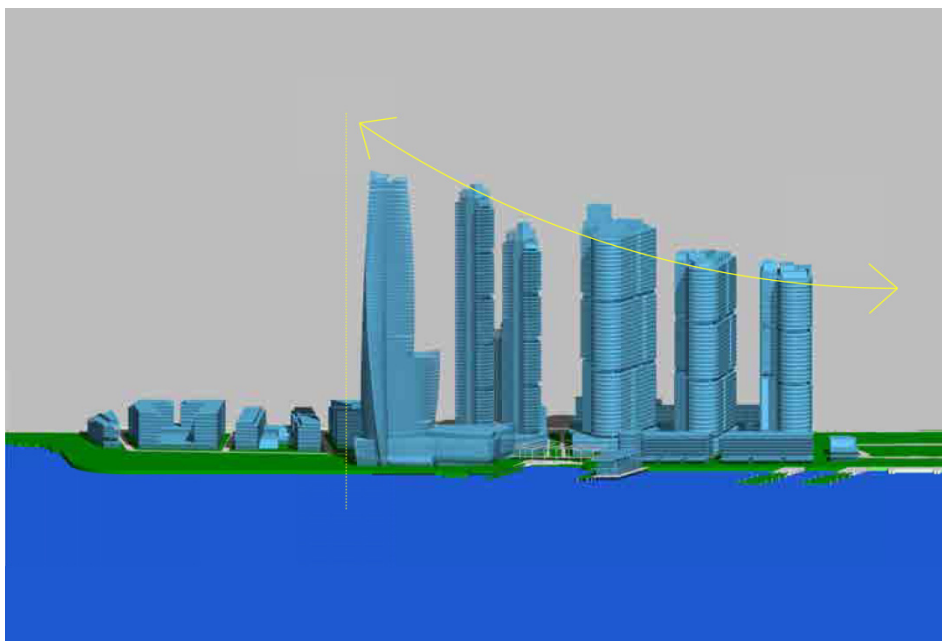


Figure 19 – Transition of heights through Barangaroo South

Source: RSH+P

The reconfiguration and rationalisation of the remaining buildings within Block 4 has seen a shift of the buildings to the south of a new park. The siting of the buildings to the south of this public space will enhance the amenity of the space, allowing for increased solar access and wind protection from the buildings.

In addition to the creation of a significant and high amenity public space, a primary driver behind the positioning and form of these buildings has been the achievement and maximisation of views, both through the Barangaroo South site and from the buildings themselves.

Views have been enhanced by the following features:

- adoption of the radial fan principle, positioning and orienting the buildings to allow for diagonal view corridors through the Barangaroo South site;
- development of the towers to be slimmer and taller in part, therefore increasing building separation and enhancing the opportunity for view corridors through the buildings; and
- orientation of the subject buildings and surrounding buildings to facilitate shared views for future building users.

Figure 20 illustrates the view corridors through the proposed Residential Buildings and the views attainable from within these buildings due to the positioning of the remainder of the built form in Concept Plan (Mod 8).

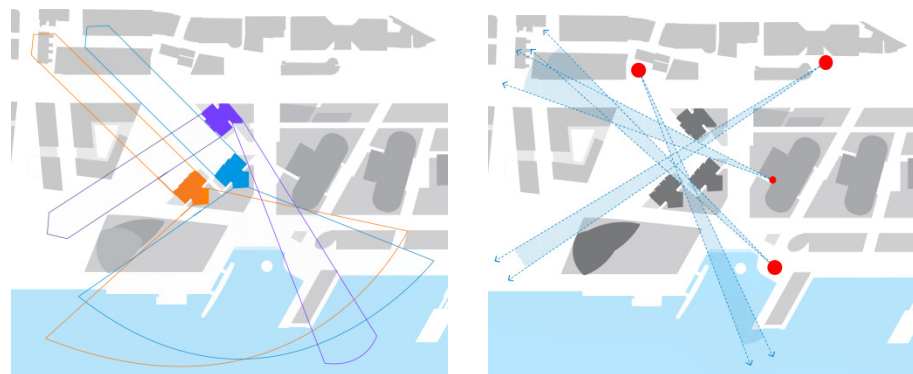


Figure 20 – Enhancement of views by the Residential Buildings

Source: RSH + P

Community Building and Public Pier

The community building and public pier have been designed to follow the established principles for Barangaroo South and respond positively to the relocation of the landmark hotel building. The slight relocation of the pier to the south ensures a minimum 80 metre wide body of water is retained for the Southern Cove. The public pier will act as an extension of the land, framing and sculpting the refined Southern Cove.

The community building on the public pier will be a low scale building which is inviting and attractive to visitors to the Barangaroo precinct. The following key opportunities and principles have informed the siting and development parameters of the community building:

- building form to be orientated on the radial grid to achieve the fanning principle for Barangaroo South;
- building to extend the line of City Walk which enables its processional nature to the water to be fully realised;
- opportunity to act as a counterpoint to the sculptural form of the landmark hotel building;
- opportunity for a public viewing platform beyond the line of the promenade to experience Darling Harbour and views to the Headland Park;
- maximise the public use of prime waterfront land;
- enhances the mix of uses and diversity of building forms within the Barangaroo South precinct; and
- opportunity to provide passive wind protection on the pier and to the refined Southern Cove.

The opportunities available to the public pier and community building are illustrated in **Figure 21**.

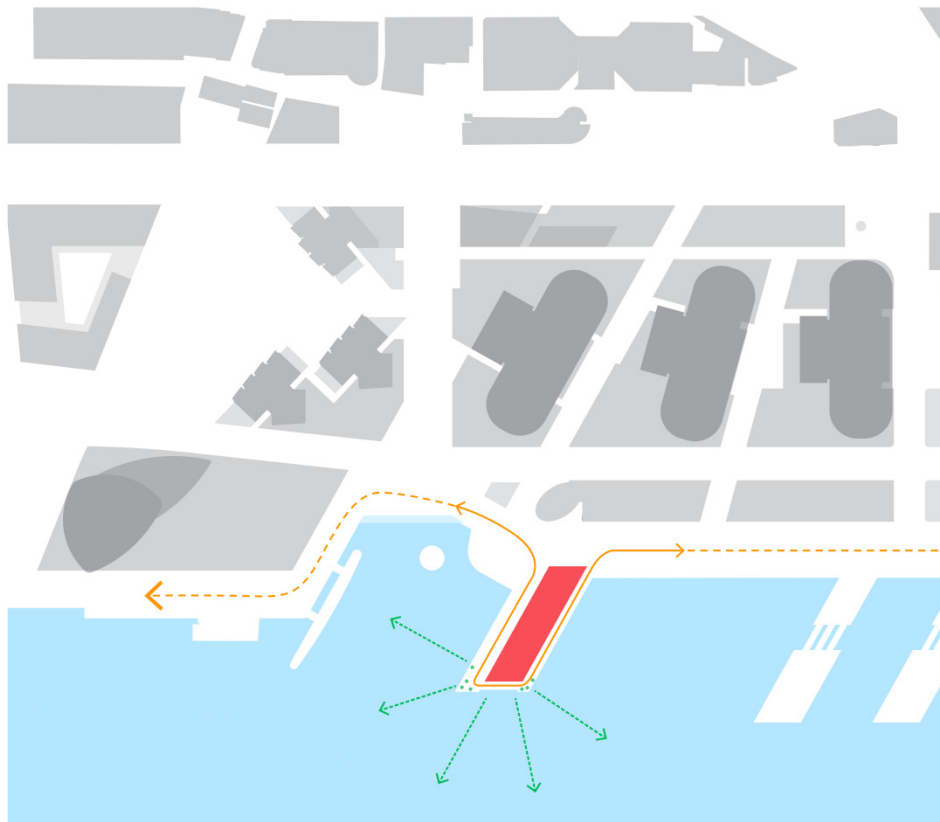


Figure 21 – View and pedestrian desire line opportunities for the public pier and community building

Source: RSH+P

Summary

The proposed Concept Plan (Mod 8) satisfies the approved Concept Plan's built form objectives as it continues to ensure that future built form will:

- achieve the radial fan layout which in turn maximises views through the Barangaroo South site, enhances solar access between the future buildings and frames key public spaces;
- be of an appropriate density to capitalise on the site's attributes;
- concentrate taller buildings at the northern end of Barangaroo South, where they mark the north western corner of the city and complete the city frame;
- reinforce the landmark significance of the site;
- maintain significant view corridors within the site and from the public domain surrounding the site towards Sydney Harbour;
- achieve view sharing principles from existing surrounding development;
- ensure permeability throughout the site, with pedestrian through-site-links; and
- allow creativity in built form, whilst providing certainty over the bulk and scale of development.

9.2.3 Gross Floor Area

The proposed modification seeks to increase the GFA on the Barangaroo South site by 41,946m², from 493,240m² (including community floor space) to 535,186m² which equates to a 8.5% increase. This additional GFA is a direct result of the GFA in the landmark hotel building being increased by 44,500m² from 33,000m² to 77,500m², which was necessary in establishing the building's landmark status having been relocated back on to the site from out over the Harbour.

The modification also includes the redistribution of GFA around development Blocks 1-4 (A-B), and results in a reduction of floor space across these combined development blocks, including Block X.

An assessment of the proposed modifications to GFA is considered below.

Additional GFA in Block Y

The additional GFA in Block Y and an assessment of those uses is provided below:

- Tourism GFA: 15,200m² (34%) of the proposed increase will be Tourism GFA. As assessed in Sections 9.11-12, the increase in Tourism GFA will have a significant positive social and economic impact, attracting a large number of additional tourist and business visitors to the site and NSW more broadly.
- Retail GFA: Commensurate with its aspirations for an iconic, world class, luxury six-star hotel resort the proposed Modification will provide approximately 6,700m² of retail GFA. The retail GFA will be predominantly food and drink premises that contribute to the landmark hotel building's status as a global tourist attraction which generates significant economic and social benefits for NSW.
- Residential GFA: The height of the landmark hotel building and already large size of the hotel provided the opportunity to also provide high quality residential apartments on the top levels. The additional residential GFA will contribute to the vitality of Barangaroo and support the other uses proposed on the site. As per Condition B6 of the terms of approval of the Concept Plan, any proposed serviced apartments that are strata titled and not in single ownership will be included in the allocation of residential GFA.

The quantum of additional GFA is directly associated with the landmark hotel building and is considered appropriate as the following urban design and public benefit outcomes will be achieved and/or protected:

- the GFA contributes to achievement of the strategic objectives and targets in the Draft Metropolitan Plan, particularly in relation to tourism, recreation, employment and housing;
- the proposed increase in GFA reinforces the hotel building's status as a landmark and will assist in the achievement of the RHS + P Master Plan Built Form Principles of marking the city's north-western corner and completing the city frame;
- significant benefits arise from the increased tourism and retail uses and increased activity and vibrancy created from an increased residential community; and
- existing view corridors and new major view corridors to the water will be protected and facilitated, allowing visual permeability of the site to and from the water.

Redistribution of GFA in Blocks 1 – 4(A-B)

The proposed Modification seeks to redistribute 32,141m² of GFA currently within Blocks 1-3 into Blocks 4(A-B). The reasons for the redistribution are set out below:

- Block 1: Following approval of Concept Plan (Mod 4) Margaret Street West evolved into Transport Place, the primary pedestrian entry to the Barangaroo site. In response to this, it became apparent that a smaller scaled building would be more appropriate at the entrance to the site and therefore a much lesser GFA is proposed than the original GFA.

Furthermore, Block 1 was intended to be a residential building, however the location to the south of Commercial Building C5 would have made achieving a high level of solar access and corresponding amenity difficult to achieve. Therefore redistributing this GFA to Block 4, which has unobstructed northern sun and views over the park to Harbour Bridge is a much superior outcome.
- Block 2: Consistent with the aspiration to improve the primary entry to the site, it is proposed to provide a plaza referred to as 'Hickson Place' within Block 2 adjacent to the Wynyard Walk Bridge. Under the Modification, Building C2 and C6 have been merged to create a larger C2 building and a publicly accessible plaza (with a small retail pavilion previously in the location of C6). The provision of this additional area of public space at the entry to the site result in Block 2 having surplus GFA which has been relocated to Block 4.
- Block 3: The GFA transferred from Block 3 is a consequence of the changes to the block boundaries as part of Concept Plan (Mod 6), which did not include a corresponding change to the maximum GFAs despite decreasing the size of Block 3 (deleting Building C7 and reducing the size of C1) and increasing the size of Block 4. This redistribution therefore seeks to reconcile the GFA with the design changes made as part of Concept Plan (Mod 6).

Additional Residential GFA

The increase in residential GFA represents up to a potential 54% increase on the approved quantum of proposed residential uses (28% of the total GFA in Barangaroo South), which will significantly increase the vibrancy of Barangaroo South through the larger residential population (particularly outside of business hours). The additional residential GFA and commensurate increase in residents will also benefit the proposed retail, community and active uses, and support public transport, by reinforcing demand and critical mass.

Exclusion of Wintergardens from GFA

Wind testing undertaken for the Blocks 4A and 4B residential towers found that because of the location and height of the buildings, the balconies would be wind affected. Accordingly it was recommended that wintergardens be used to provide a higher level of amenity throughout the year for the future occupants.

However, because of the way GFA is technically defined under the Standard Instrument, wintergardens which have a system such as glass louvres (therefore a 'wall' height greater than 1.4m) could be defined as GFA.

Notwithstanding the technical definition for GFA under the Standard Instrument LEP, it is clearly not the intention of the maximum GFA controls to limit the provision of balconies to individual apartments nor is it the intention of the definition to disincentivise the provision of higher amenity units.

As a result, for clarity, it is sought as part of this Modification that Instrument of Approval be amended so that 'wintergardens', being an enclosable balcony designed and constructed as an external balcony with drainage, natural ventilation and finishes acceptable for an outdoor space, are excluded from the definition of GFA.

It is noted that the issue with the current GFA definition and the need to provide wintergardens in high-rise buildings has been recognised by the City of Sydney, which resolved on 30 October 2014 to amend its LEP and DCP to exclude wintergardens from the calculation of GFA.

As the wintergardens effectively equate to the areas that would otherwise be provided as open balconies, and therefore excluded from GFA, it will not result in any additional environmental impacts. Specifically it will not:

- result in any intensity of the uses / additional resident population on the site;
- result in any additional traffic generation or parking requirements;
- add to the bulk and scale of the buildings.

9.2.4 Building Height

The proposed building heights have been determined to respond positively to the key urban design principles underpinning the approved Concept Plan and are consistent with the massing of the remainder of the City.

Table 9 compares the approved and proposed building heights. Only two development blocks, Blocks 4A and Y increase in height as a result of the Modification. Blocks 1 and 4B propose less height than is permitted under the current Concept Plan and Block 4C has been deleted altogether. An assessment of each of these key changes is provided below.

A further assessment of the modified building heights' visual impact, view loss and overshadowing is considered in Sections 9.5 and Section 9.2.5.

Table 9 – Comparison of approved and proposed building heights

Block	Approved Maximum Height (RL)	Proposed Maximum Height (RL)	Difference (m)
1	80	25	- 55
2	180	180	No change
3	209	209	No change
4A *	41.5	250	+ 208.5
4B *	175	107	- 68
4C	160	-	Removed
X	41.5	41.5	No change
Y *	170	275	+ 105

* Note: This block is in a different location on the site

Block Y

As discussed previously, whilst being relatively small in scale, the approved location of the hotel building out over the Harbour gave it a landmark status. In order to achieve a similar landmark status for the relocated building, the proposed Modification seeks to increase the height of the hotel building by 105 metres, proposing a maximum height of RL 275.

The modification will make the landmark hotel building the tallest tower on the site, and one of the tallest buildings in Sydney. By locating the highest form at the north western end of the site, the proposed height completes the city frame and marks the City's north western edge.

Block 4A

The increase in the height of Block 4A is necessary to redistribute the existing GFA potential on the site that was displaced by the relocation of the hotel whilst maintaining an equivalent allocation of public space.

The maximum height, at RL 250, responds to the new maximum height of the landmark hotel building of RL 275 and the built form principle of 'marking the city frame'. Buildings then step downwards toward Hickson Road.

The modified urban structure, means the taller residential buildings are now located further south on the site, increasing their separation from the residential buildings on Kent Street. The location of the Block to the south of the park will maximise the amenity of the dwellings by enhancing their outlook and solar access whilst minimising the impacts of shadows, which largely fall on the facade of Commercial Building C3.

Block 4B

Whilst technically a reduction in the maximum height of Block 4B, the Modification will result in an increase in height on the Hickson Road frontage. The proposed height is consistent with predominant height of the residential buildings on Kent Street, providing a transition between the existing buildings and the taller towers in Block 4A and Y. The additional height in this location assists in marking the entry to the Northern Park on Hickson Road and with Block 4A frames the southern side of the park.

Block 1

The maximum height of Block 1 has been reduced by 55m to RL 25. This reduction reflects the relocation of the residential floor space into Blocks 4A and 4B discussed above. The reduction in height will provide a smaller scale building that references the height of the adjacent Commercial Building C5 podium and creates a more welcoming entry to the Barangaroo site for visitors arriving from the south or via Wynyard Walk.

9.2.5 Solar Access & Shadowing

A shadowing analysis for the proposed Modification is included at **Appendix J**. The shadowing analysis has been prepared for hourly intervals between 9am and 3pm at the solstice (June 21) and the equinoxes (March 21 and September 21) and compares the existing CBD, approved Concept Plan (Mod 6) and proposed Concept Plan (Mod 8) shadows. Concept Plan (Mod 6) is used as a comparison due to this modification altering the built form of the precinct, whilst Concept Plan (Mod 7) did not alter any built form parameters or require further shadow analysis.

Shadowing from existing CBD buildings is shown in grey and the shadow cast by the approved Concept Plan maximum development block envelopes is shown in yellow.

To provide a conservative indication of the potential shadowing impacts, the shadowing analysis identifies the maximum area within which shadows may potentially be cast by buildings within the Development Blocks from the maximum development block envelopes. This area is outlined in red on the shadow diagrams at **Appendix J**. The maximum potential extent of shadowing shown in the red outline can never be realised, as the maximum GFA for each Development Block contained within the Concept Plan does not allow for an end building design to fill the maximum permitted envelopes.

An additional set of shadow diagrams have been provided at **Appendix J** illustrating the expected shadow cast by the indicative design scheme of both approved Concept Plan (Mod 6) and proposed Concept Plan (Mod 8). This reflects

a more realistic overshadowing situation with the fulfilment of the future building envelopes.

June 21

The shadow analysis indicates that some additional shadowing will occur on Sydney Wharf and Darling Island (including Ballaarat Park and Metcalfe Park) between 9am and 10am. The shadow over these locations is fast moving, and by 10am Darling Island and the water of Pyrmont Bay will be free of shadow. As such, the park areas will be provided with solar access during the majority of the day.

The majority of shadow falling onto Sydney Wharf, which includes the Australian Maritime Museum on its eastern side and some upper level residential uses, will be largely within the shadow of the approved Concept Plan (Mod 6), with some additional shadow from the proposed Modification. An additional portion of the northern end of the wharf will be in shadow from the landmark hotel building for a short period after 10am. The extent of this shadowing period is minor, and these buildings will continue to receive high levels of solar access throughout the rest of the day.

By 12pm, the majority of the shadow from proposed Concept Plan (Mod 8) will be on land and contained within the Barangaroo South site. The shadow cast outside the Barangaroo site from 1pm will either be contained within the shadow of the approved Concept Plan (Mod 6) or will fall within shadow cast by existing buildings in Sydney's CBD.

From 12:15pm all shadow cast by the built form of Concept Plan (Mod 8) will be on land and removed from the waters of Darling Harbour, allowing for direct sunlight during the lunch time period of 12pm to 2pm. This is an improvement from approved Concept Plan (Mod 6) where shadow was cast on the waters of Darling Harbour throughout the entire day.

Significant improvements to solar access in public spaces within Barangaroo South will be a benefit of the proposed Concept Plan (Mod 8) built form. The majority of Northern Park will receive unimpeded solar access on June 21, including during the key lunch time period (12pm to 2pm) where activity levels are expected to be higher. A small portion will be overshadowed between 2pm and 3pm, but the majority will remain free of shadow.

The shadow cast by the indicative design scheme will be far less than the development block envelopes, improving the level of solar access to key areas such as open space and the water of Darling Harbour.

March 21

The shadow analysis indicates that between 9am and 10am some additional shadowing will be experienced on Darling Island, Sydney Wharf and Jones Bay Wharf. This shadow would be cast on existing commercial buildings and in part on Ballaarat Park. The shadow will substantially have moved from these wharves before 10am, before falling progressively less on the water of Darling Harbour between 10am to 12pm.

The shadow cast from 12pm to 1pm will be closer to the foreshore of the Barangaroo site than the shadow expected in the approved Concept Plan (Mod 6). As such, this will allow for more open water receiving higher solar access. Limited to no shadow will be cast on the water of Darling Harbour from 1pm, providing an improvement of solar access when compared to the approved Concept Plan (Mod 6). Solar access during the key lunch time period associated with the peak demand for recreational boating activity will be improved in the proposed Concept Plan (Mod 8).

The remainder of the shadow cast from 1pm to 3pm will be contained within the Barangaroo South site or largely within the shadow of the approved Concept Plan (Mod 6).

September 21 and December 21

The September and December shadow diagrams demonstrate some additional shadowing of the waters of Darling Harbour from the maximum development block envelopes, however, again a significant portion of the waters also receive direct sunlight throughout the day for use by recreational boat users. As per the June and March dates, the shadow over the water of Darling Harbour will largely be diminished in September and December, offering an improvement compared to the approved Concept Plan (Mod 6).

All shadow cast by the maximum development block envelopes during the afternoon period will be contained within the shadow expected in the approved Concept Plan (Mod 6), or will fall within the shadow cast by existing buildings in Sydney's CBD. As such, there are no additional shadowing impacts from the proposed built form in Concept Plan (Mod 8).

Summary and Conclusion

Overall, it is considered that the shadowing impacts of proposed Concept Plan (Mod 8) are acceptable and not significantly greater than Concept Plan (Mod 6) given that:

- the water of Darling Harbour maintains significant direct daylight hours during the key recreational middle of the day boating period, with an improvement of solar access compared to Concept Plan (Mod 6);
- solar access to open space within the Barangaroo South site is enhanced through the relocation of buildings in Block 4 to the south of Northern Park;
- properties to the east and west are largely unaffected by additional shadowing and are not expected to experience any more shadowing for significant periods than envisaged by the approved Concept Plan (Mod 7);
- the extent of additional shadowing to properties to the west falls mainly over buildings, and where shadows fall on parks, it is for a short period of time in the morning and the critical lunch time period (12pm to 2pm) is protected;
- the afternoon shadow cast by the built form of proposed Concept Plan (Mod 8) will largely fall within the shadow of the approved Concept Plan (Mod 6) or within existing shadows cast by buildings in Sydney's CBD; and
- the shadow analysis of the indicative design scheme illustrates that the shadow cast by the maximum development block envelopes will not ever be realised and represent a conservative assessment. There is potential for improved solar access when the detailed designs of the buildings within the envelopes are progressed.

9.2.6 Internal Residential Amenity

The modified configuration of Blocks 4A-B and Block Y provides for residential development that is orientated to the north east and north west to take advantage of the high level of internal amenity derived from the Harbour outlook. This will also ensure excellent light and solar access to the residential floor space.

To ensure high quality residential buildings all new residential buildings will be designed in accordance with the design quality principles State Environmental Planning Policy 65 – Design Quality of Residential Flat Buildings (SEPP 65) and have regard to the Residential Flat Design Code (RFDC).

9.3 Streetscape and Public Domain

Overall Provision of Open Space / Public Domain

The proportion of publically accessible open spaces at the Barangaroo South site has remained generally consistent with approved Concept Plan (Mod 7). The Public Domain Analysis at **Figure 22** below illustrates that approximately 50% of the Barangaroo South site will be either public domain or publicly accessible spaces, streets and laneways (excluding Globe Harbour water and areas outside of the site).

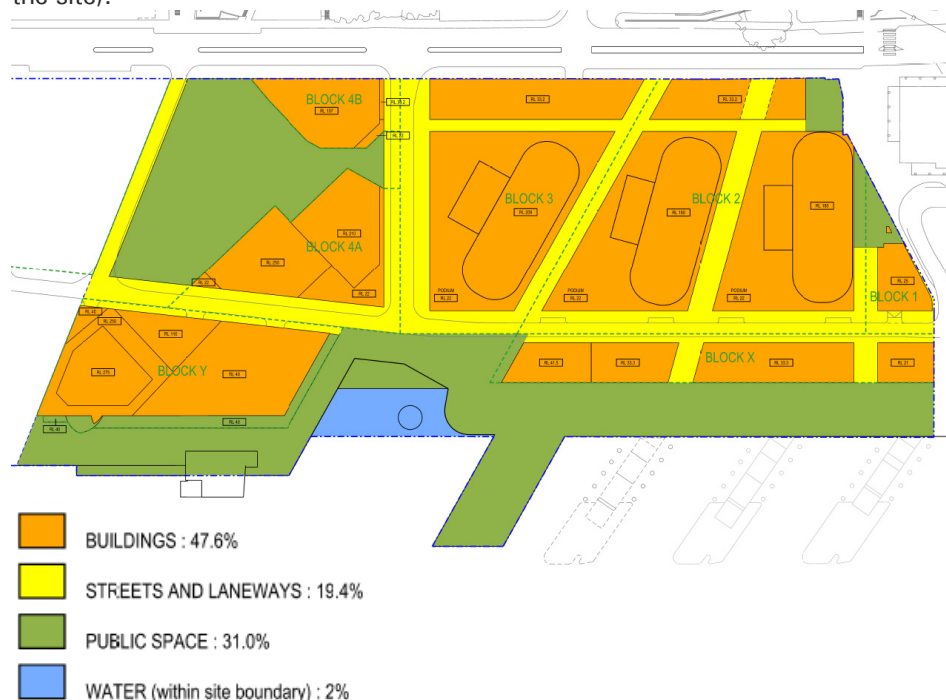


Figure 22 – Public Domain Analysis

Source: RSH+P

It is noted that the area zoned RE1 Public Recreation has been reduced in order to accommodate the landmark hotel footprint. However, in percentage terms the change is not considered significant or unacceptable by virtue of the fact that the site has reduced in overall area and that Public Recreation zoned area remains at close to the 50% objective for the entire Barangaroo site.

Relocation of the Waterfront Park

As discussed in Section 9.2.1, this Modification is the result of over two years of master planning that has involved consideration of a wide range of alternative designs to allow for the relocation of the hotel elsewhere on the site. The outcome of that process determined that the best location for the landmark hotel building was where the 'waterfront park' was located, and for the park to be relocated to the east where the Block 4 residential towers were approved.

The desire for a highly usable space and seamless connections of parkland throughout the entire Barangaroo site has driven the modified location of buildings with Block 4 and Block Y. The positioning of the landmark hotel building and Residential Buildings in Block 4 has allowed for the continuation of the northern park from Barangaroo Central to Hickson Road (see **Figure 23**). Opportunities for access paths through this parkland will encourage pedestrian movements through the site and will encourage high levels of pedestrian activity instead of vehicle intense activity.

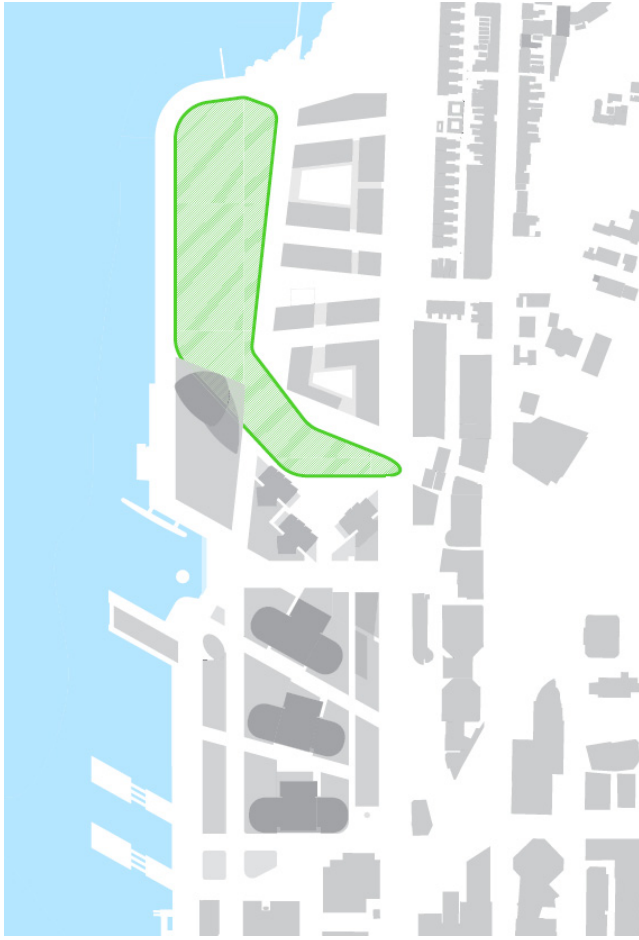


Figure 23 – Bringing the parkland to Hickson Road

Source: RHS+P

The relocation from the waterfront to the east of the landmark hotel building is considered appropriate as there are already significant areas of park provided along the waterfront within Barangaroo Central and the Headland Park, and the up to 30m wide Waterfront Promenade is still provided within Barangaroo South.

The positioning of the modified built form in Block 4 to the south of Northern Park will enhance the amenity of the park with improved solar access and wind protection. The location of the park adjoining Barangaroo Central will encourage dual usage of the space, improving the activity occurring within the park and providing an attractive transfer between the two precincts.

The size and orientation of the parkland areas will cater to the future function of the spaces. The wide expansive open space located between the built form of Barangaroo Central and the foreshore will act as an event space, capable of holding larger crowds. The park is located in the RE1 Public Recreation zone immediately to the north of Block 4 and will provide opportunities for relaxation and general breakout areas, with good solar access and vistas to Darling Harbour.

The relationship of the built form with the open space is positive, with the future buildings shaping the park. The focus of the parkland between the landmark hotel building and built form within Block 5 of Barangaroo Central will establish a key focal point of the public domain, providing a more intimate space.

Changes to the Southern Cove

The Southern Cove under the approved Concept Plan contained a deep water harbour area and separate shallow water harbour area above a basement created by a weir and separated by a pedestrian bridge.

As part of the Concept Plan (Mod 8) the size of Southern Cove has been reduced in area and its location modified to respond to the relocation of the hotel and creation of the Northern Park while still maintaining the area of useable public spaces on the site.

Whilst the total area of the Southern Cove has been reduced, the area of the tidal deep water harbour section remains approximately the same and the Cove width of 80m has also been retained. To mitigate the reduction in size, the new pier and potential water taxi wharf (which does not form part of the Concept Plan) will frame the Cove, serving to visually and perceptually enclose the space to a similar dimension of the approved Concept Plan.

The proposed changes to the built form will enhance the activation of the Southern Cove with building frontages now provided on 3 sides.

The Southern Cove will be a more intimate and focused space with a stronger urban character and is now a better location for holding events and other public focused activities.

The Waterfront Promenade

Consistent with the approved Concept Plan, an up to 30m wide public domain area with a potential 17m wide pedestrian movement zone will be provided along the entire western frontage of the site. The required setback of the landmark hotel building from Sydney Harbour is provided in the proposed Barangaroo South Design Guidelines. The public domain area will include licensed seating areas within the promenade in front of the Landmark Hotel Building consistent with the approved approach for the Waterfront Promenade in front of R8 and R9. The continuation of this approach along the waterfront north of the Southern Cove will provide improved activation and animation, as per one of the conclusion in the DRP 48 Snapshot Design Review which was undertaken as part of the Barangaroo Review:

Activation of the water's edge promenade by restaurant and café seating, and the inclusion of substantial landscaping with trees of an appropriate scale is supported as a means of ordering the pedestrian space. It allows significant breadth, while providing shade, scale, activation and animation;

Provision of the Community Building and Public Pier

Under the approved Concept Plan a small community building was to be located at the junction of City Walk and the Waterfront Promenade, and the landmark hotel building was to be located out over the water. A community use was also envisaged to be provided on the public pier.

The proposed relocation of the landmark hotel building has provided the opportunity to provide a low scale community focused building on a publicly accessible pier over the water. The building will be two to three storeys in height and comprise approximately 2,000m² of community uses and a further 1,000m² of active uses such as food and drink premises.

The pier has been reduced in size and relocated to respond to the changes to Globe Harbour. The pier will form part of an extension to the linear Waterfront Promenade, enhancing the waterside experience, through interacting with the harbour and providing variety along the foreshore.

9.4 Sydney Harbour

9.4.1 Navigation Impacts

Royal Haskoning has undertaken a Navigation Impact Assessment to determine the potential impacts of Concept Plan (Mod 8) on navigation within Darling Harbour (**Appendix N**). The Concept Plan (Mod 8) proposal has been compared to the approved Concept Plan (Mod 7), with the conclusion that the proposed amendments result in a reduced impact on navigation.

Royal Haskoning note that the Community Building and public pier components of Concept Plan (Mod 8) will be sited near the location of the former cruise ship terminal (Berth 8) which ceased operations in June 2010. The terminal comprised a 40m berth box plus a 30m waterside restricted zone when a cruise liner was berthed, which was a greater restriction on navigation than Concept Plan (Mod 8). **Figure 24** shows the relevant elements of the proposed Barangaroo South Concept Plan amendment overlaid on the existing navigation layouts for Darling Harbour.

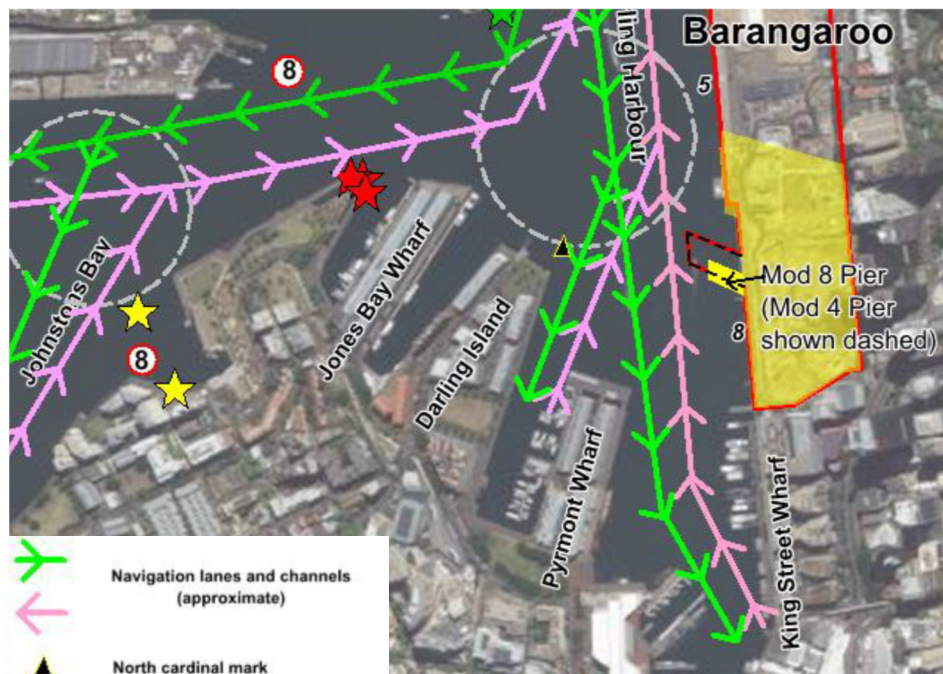


Figure 24 – Existing navigation layouts

Public Pier and Community Building

Concept Plan (Mod 8) seeks to rationalise the approved public pier to a shorter pier which will include a lower scale community building. Royal Haskoning has noted that the pier now protrudes approximately 40 metres less into Darling Harbour. The pier will protrude less into Darling Harbour than the existing King Street Wharf piers to the south.

Based on the rationalisation of the pier and the reduced size of the building over the pier, Royal Haskoning has determined that the potential navigation impact would be reduced, both during the construction and operational phases, compared to the impact assessed for the Concept Plan (Mod 4) application. A review of the existing channel widths has identified that the navigation paths of vessels would not need to be deviated more than is currently required due to the existing environment.

Globe Harbour

Globe Harbour (also known as the Southern Cove) has been rationalised from the area of Southern Cove approved under Modification 4 to the Concept Plan. This results in the harbour extending approximately 20m landward of the existing foreshore edge. The indicative design scheme includes the provision of a floating water taxi dock. Other than the indicative water taxi dock, Globe Harbour does not include any facilities to encourage the set-down/drop-off, mooring or general use of the water within the harbour by any vessels. The rationalised extent of Globe Harbour will result in reduced construction undertaken largely from land. Accordingly, Royal Haskoning has determined that there will not be any adverse impact on navigation in Darling Harbour.

Floating Water Taxi Dock

The indicative water taxi dock would not impact on navigation as it does not extend as far offshore as the Public Pier and would be located in a wider navigation channel area. The potential dock would not encroach within the maximum turning basin required by Sydney Ports Corporation at the junction of Darling Harbour and Johnstons Bay, therefore resulting in no impacts to vessels.

Summary

Based on the comparative analysis undertaken by Royal Haskoning of Concept Plan (Mod 8) and Concept Plan (Mod 7), it has been determined that there will be reduced impacts on navigation as part of Concept Plan (Mod 8). As any impacts are reduced, Concept Plan (Mod 8) is acceptable from a navigation perspective.

9.4.2 Marine Ecology

The future construction works under applications made pursuant to Concept Plan (Mod 8) that have the potential to impact on water quality in Darling Harbour include:

- piling associated with construction of the public pier which has the capacity to generate localised short term increases in turbidity through resuspension of sediments which causes the remobilisation of any associated heavy metals and other contaminants into the water column; and
- excavation of the Southern Cove has the potential to release contaminated land-based sediments and groundwater into the marine environment, impacting on water quality and aquatic ecology if not appropriately controlled.

An assessment of potential impacts on Sydney Harbour resulting from the Barangaroo South development was undertaken by Worley Parsons with the Concept Plan (Mod 4) application. That assessment determined that with the implementation of a number of mitigation measures, any potential impacts on Sydney Harbour would be appropriately managed.

Worley Parsons identified a lack of aquatic vegetation in the vicinity of Barangaroo South, and described that impacts would not be expected on:

- Benthic habitat – as the seabed comprises clayey, silty, sandy sediments and exhibits considerable bioturbation and accordingly does not have habitat value;
- Seagrass / Mangroves / Saltmarsh – as no seagrass was observed during spot dives, or on the video transects undertaken for the site;
- Wetland Areas – as a result of the sandstone seawall which extends for several hundred metres along the foreshore; and
- Introduced Marine Flora – which were not observed during spot dives or on video transects undertaken for the site.

This previous assessment focused on the potential impacts of constructing the pier and landmark hotel building over the water, and the potential impacts over the life of the development. It was identified that the construction phase of these elements would be the most critical in terms of requiring mitigation measures to avoid adverse impacts.

Worley Parsons determined that any water quality and aquatic ecology impacts would be mitigated using industry standard methods and techniques. Statement of Commitment No. 126 requires the detailed design of Barangaroo South to be consistent with this previous assessment, including the recommendation mitigation measures. Concept Plan Condition C5 was also imposed to ensure that any future Applications adequately address the environmental impact of any future works on marine ecology.

A Marine Ecology, Water Quality and Contaminated Sediment Impact Assessment prepared by Royal Haskoning is provided at **Appendix Z** which considers the potential impacts in detail and measures to mitigate those impacts as part of the future applications.

Royal Haskoning has identified that the level of construction carried out over the water of Darling Harbour would be significantly reduced in Concept Plan (Mod 8) compared to that considered in the Concept Plan (Mod 4) application. This reduced construction involves:

- reduced extent and timeframe of constructing the public pier compared to the original pier which was proposed to accommodate the landmark hotel building;
- no construction required for a submerged basement;
- reduced and on-land construction of the community building on the public pier compared to the construction of the previous landmark hotel building; and
- reduced and on-land construction of the refined Globe Harbour compared to the previous Southern Cove.

Based on the reduced construction associated with Concept Plan (Mod 8) compared to Concept Plan (Mod 4) over the water of Darling Harbour, it can be expected that there is reduced potential for impacts. The mitigation measures of the previous Worley Parsons assessment and requirements of Statement of Commitment No. 126 will continue to apply to the future development of Barangaroo South as well as Condition C5. As such, Concept Plan (Mod 8) is acceptable from a perspective of any effects on Sydney Harbour.

9.5 Visual Impact Assessment

A View and Visual Impact Analysis has been prepared by JBA and is attached at **Appendix M**. In relation to the visual impact assessment it is based upon and should be read in conjunction with the Barangaroo Concept Plan Mod 8 Visual Impact Report prepared by Virtual Ideas appended to **Appendix M**. It should also be read in conjunction with the Visual and View Impact Analysis material that was prepared, publicly exhibited and assessed as part of Concept Plan Modification 4 and the subsequent Concept Plan Modification 6 which establish the benchmark for consideration of the current proposal against the existing approval in relation to visual and view impacts.

The visual analysis is made in comparison to those impacts previously analysed and approved as part of the approved Barangaroo Concept Plan, and sets out the overall impact of the Barangaroo Concept Plan as proposed to be modified.

To support the visual analysis, the relevant visual catchment of the Barangaroo site has been defined and key public domain views, view corridors and public vantage points within and surrounding the site have been identified.

The key public domain views generally accord with the public domain views that were selected and analysed as part of Concept Plan (Mod 4), and later Concept Plan (Mod 6) with some minor adjustments to take into consideration the most relevant view and vantage points arising with respect to the specific Modification 8 proposal, and also with the inclusion of 7 additional view / vantage points.

The key public domain views are also in accordance with the potential visual catchment and view locations identified in the DGRs.

Photomontages of the proposed development have been prepared for a total of 21 public domain views and vantage points (as compared to 17 vantage points assessed at the time of analysis of Concept Plan (Mod 4) and Concept Plan (Mod 6)).

The public domain vantage points selected for analysis provide representative views for 3 categories of views as follows:

- **From the water:** Vantage points 11 (Darling Harbour (Pyrmont Bridge), 12 (Ballarat Park), 13 (Pyrmont Park Pier Jones Bay Wharf), 14 (Balmain East), 15 (Darling Harbour), 16 (Blues Point), 17 (Opera House Western Forecourt), 18 (Cremorne Point);
- **From public open space:** As above, in addition Vantage points 7 (Millers Point Observatory Hill), 8 (Clyne Reserve), 9 (Munn Reserve), 20 (Watsons Bay), 21 (Sydney Observatory); and
- **From key streets:** Vantage points 1 (Hickson Road), 2 (Ken Street, 3 (Shelly Street), 4 (Lime Street), 5 (High Street), 6 (Gas Lane), 10 (Sydney Harbour Bridge), 11 (Pyrmont Bridge), 19 (Gladesville Bridge).
- The vantage points selected for analysis in each of the categories of views provide representative views from all relevant directions, and from several positions within the visual catchment in relation to each category of view. They also provide for close as well as distant views.

The photomontage images for each of the identified public domain views were taken at ground level (pedestrian eye level) to indicate what a pedestrian will see when travelling through or within the general vicinity of the site.

Photomontage images have been produced using a range of lens sizes between 17 and 40mm. Overlays (crop markers) showing longer lenses (35 mm and 50mm) have been included for each photomontage image to illustrate the effect of a longer lens. Using a 50mm lens as stated in the DGRs has the same effect as cropping the image presented using the selected lens.

It is not effective to use 50mm lenses in all circumstances as this would not produce a result where the buildings can be evaluated in respect to their surroundings. In addition, in most cases it has not been possible to take medium range and long range options for each view given the topography, vegetation and surrounding built form.

The Visual Impact Photomontage Methodology Report prepared by Virtual Ideas concludes that the methodology adopted during the preparation of the exhibited photomontages is considered acceptable practice; and it is consistent with the methodology used in the visual impact photomontage images submitted and approved as part of Concept Plan Modification 4 and 6.

The methodology and reasons for selection of lens sizes was considered in detail by the Department at the time of determination of Concept Plan Modification 4, and a consistent methodology was adopted for the visual and view analysis provided as part of Concept Plan Modification 6.

The Director General's Environmental Assessment Report in relation to Modification 4 concluded (p.54) that *"the approach, rational and methodology in the analysis undertaken and presented in the PPR are considered sound."* A visual impact assessment matrix summarised the distance of view, extent of view, number of viewers and period of view has been prepared to assist in the determination of potential impact.

The urban design principles for Barangaroo have sought, from the beginning, to preserve significant public domain street corridors, as well as to protect and reinforce views to and from key public domain spaces, and significant heritage buildings and structures within the public domain.

Consistent with these principles, the proposed Concept Plan (Mod 8) has been developed with a number of view principles in mind:

- views to Sydney Harbour and parks are to be maintained from as many points as possible at street level;
- new significant views should be opened-up where possible including those that terminate at Sydney Harbour, parklands, low level sky, or a publicly significant object;
- vistas along streets that are terminated by buildings, can be emphasised with design of the visually prominent buildings that terminate them;
- the siting and design of new buildings should maintain existing vistas along streets to places of architectural, landscape, or cultural significance; and
- support view sharing for buildings with a western outlook from Kent Street by proposing taller buildings than the Concept Plan as modified, with larger spaces between them, achieving oblique views and additional view corridors.

To support these principles, further consideration was given to:

- retaining significant views across the site to the waterfront;
- allowing for public views across the Harbour from Millers Point (the northernmost part of the site) and Observatory Hill;
- consideration of the high visibility of the site from public places including the waterway, harbour edge parks, Sydney Harbour Bridge and Anzac Bridge;
- protection of local views to the site and adjoining waterways from public domain areas in Millers Point and the western side of the city;
- the primacy of axial views along streets to the waterfront; and
- allowing views from the site and adjoining waterways and foreshores to natural features including the High Street / Hickson Road cliff faces and retaining walls and significant cultural or heritage items at Millers Point and Observatory Hill (where they are visible and discernible).

Consistent with the above, and with the approved scheme, Mod 8 will deliver a built form that is appropriate to the site's context and to the desired urban form and scale for the western part of the Sydney CBD and is of an appropriate density and height to support the City's growth and to capitalise on the site's attributes/opportunities. As detailed at **Appendix M**, in summary the visual impact assessment concludes the following with respect to the Mod 8 proposal (as compared to the approved development):

- With the concentration of taller, slimmer tower forms at the northern end of Barangaroo South there will be more space between built form elements providing sightlines through to the south;
- Views through the site will continue to be provided via the circulation network including the Margaret Street West extension, City Walk, and Globe Street and across Globe Harbour;
- View corridors will be maintained to the west and north-west towards the harbour and to Pyrmont and Balmain East beyond;
- Views along Hickson Road through to the southern CBD and the Darling Park development will be retained;
- The additional built form will have minimal impact on the Kent Street view corridor;
- Significant water views, and view from White Bay around to the north, will not be altered;
- From Millers Point, Sydney Observatory, Clyne Reserve and Munn Reserve, the taller building forms are more visible due to their increased height, however as the towers are also slimmer, breaks/gaps between buildings are supported enabling view corridors through the site. The essence of the visual impact and view corridors is retained and the relationship between the Sydney Observatory and the historic Millers Point housing will remain;
- The proposed hotel building, which will bookend the group of buildings which now increases in height from south to north will redefine the western face of the CBD as viewed from Ballarat Park, Pyrmont Pier Park and Balmain East, and present a new silhouette whilst continuing to provide for view corridors through the site to the remainder of the CBD in a manner similar to the approved scheme.

It is considered that the visual impact of the proposed modified development when viewed from Hickson Road, Kent Street, Shelley Street, High Street, Gas Lane, Munn Reserve, Sydney Harbour Bridge, Darling Harbour and Pyrmont Bridge, Blues Point, the Opera House forecourt, Cremorne Point and Watsons Bay is generally the same as that of the approved development.

Whilst a number of the built form elements are taller, and the proposed hotel building is a more dominant element (particularly in the foreground when viewed from some vantage points), the proposed massing will result in a similar overall visual impact arises as compared to the approved development with the creation of a new, dense western edge to the CBD. The placement of buildings seeks to achieve sky views between buildings and break up the massing of the development. Where changes in sky or water views arise, they are generally balanced by increases in sky views and corridors through to the water elsewhere.

The proposed hotel building will be highly visible, but well separated in terms of massing from the remainder of the development providing key view corridors through the site.

Views across and through the site will be provided as a result of the articulation of the hotel's built form above the podium level, which will also allow for sky views, and view corridors to be maintained to the west and north-west towards the harbour and to Pyrmont and Balmain East beyond.

Where the hotel development will alter views, and terminate view corridors (eg from Hickson Road, Gas Lane, Lime Street) the iconic form of the building is considered to have a positive visual impact in so far as it provides a new, significant element in the streetscape / skyline. The hotel development will be a new landmark building providing a marker to the southern end of the Barangaroo

site and distinguishing Barangaroo South from Barangaroo Central and the Headland Park, views to which will not be altered by the proposal.

Where the proposed new modified built form does encroach within or reduce partial existing public domain views as compared to the approved development under the concept plan, these impacts are considered to be minor and acceptable. They will not detract from the overall visual connectivity for pedestrians in the public domain nor result in any significant adverse impact. Generally, the wide range of different viewing points available within the precinct and its approaches will continue to provide for variety and interest in the different views, vistas and sightlines available to pedestrians approaching and moving through the precinct from the north, south, east and west.

The proposed built form reinforces the landmark significance of the site, maintains significant view corridors within the site and from the public domain surrounding the site towards Sydney Harbour, and applies view sharing principles with respect to existing surrounding development.

Future Project Applications will also need to consider the potential impacts on public and private views and apply the principles established within this report. The urban structure of the site, including the street layout and urban form, has been designed to reflect the surrounding street pattern and 'urban grain', and to preserve existing view corridors to the water from key vantage points and public domain.

9.6 View Impact Assessment

The key buildings that are impacted or potentially impacted by the development in terms of private views are:

- Observatory Tower (168 Kent Street);
- Westpac Place;
- Highgate (127 Kent Street);
- Georgia at (155 Kent Street);
- Stamford Marque at (161 Kent Street); and
- Stamford on Kent at (187 Kent Street).

There is a range of other buildings on Kent Street, and within the King Street Wharf and Shelley / Lime Street precincts that will also have some impact in terms of views and outlook.

The key buildings were selected based on the sensitivity of land use, and on the basis of both proximity to the site and the extent to which existing views, vistas and outlook are likely to be affected by the project. The analytical process in selecting the key buildings took into account the height and orientation of the existing buildings, their location and available view corridors down streets and/or across the top of other foreground development towards the Sydney CBD, Darling Harbour or Sydney Harbour.

The four selected residential buildings are the same four residential buildings for which a detailed view impact analysis was undertaken as part of Concept Plan (Mod 4) and Concept Plan (Mod 6), as agreed by the Department. No new residential buildings that were not previously assessed will be impacted upon by the proposed modified development.

Consistent with the view impact methodology used in the assessment of Concept Plan (Mod 4) and Concept Plan (Mod 6), orthogonal and oblique analysis has been

undertaken by Rogers Stirk Harbour + Partners to determine view impacts on Kent Street residential buildings (see **Appendix B** of this report). In summary:

- Orthogonal – the projection of uninterrupted views were taken from the west looking east as orthogonal to the residential buildings to establish which views would be affected; and
- Oblique – the orthogonal assessment methodology is a simplistic method of assessing the views, and as such, a more comprehensive assessment of view sharing has been considered, using an oblique methodology.

Two heights were taken as a source for views from each of the residential buildings at levels of RL59 and RL90. To measure a reasonable level of uninterrupted views and no loss of amenity from the residential buildings, an angle that matched the view angles of the Approved Concept Plan (as modified) were used, which is an angle of 54° or greater than.

This analysis demonstrates:

- change in views compared to the approved Concept Plan (as modified);
- retention of the views as established in the approved Concept Plan (as modified); and
- gain in views compared to the approved Concept Plan (as modified).

In summary the view impact analysis concludes the following with respect to the Mod 8 proposal:

- While the oblique views for Highgate, Georgia and Stamford Marque have decreased, the increased distance between these buildings and the proposed development provides a significantly improved wider field of view;
- For Stamford on Kent, the proposal increases the oblique views, improving the outlook for residents;
- The original Concept Plan approved established a benchmark viewing angle that was considered to offer a reasonable level of uninterrupted views with no loss of amenity, at 54°. All buildings have view angles greater than the benchmark viewing angle;
- The consolidation of building form at the northern end of Barangaroo South results in the replacement of the singular view corridor between the residential towers in the approved development with broader oblique views across Barangaroo Central towards the water. The distance between the proposed tower forms to Highgate, Georgia and Stamford Marque has also increased from 100m to 192 m thus significantly improving each tower's wider field of view;
- The increased distance between the built form of the western edge of the CBD and the proposed development provides a significantly improved wider field of view, which benefits Observatory Tower and views west from its north western and south western elevations;
- Westpac Place will lose views to the north west, however significant westerly views will be retained and the impact is not considered to be such that a significant loss in amenity to this commercial development will result

In this regard, the built form continues to reinforce the landmark significance of the site, whilst also having regard to view sharing principles with respect to existing surrounding development.

The Concept Plan (Mod 8) seeks to meet a variety of planning and urban design objectives and can therefore be accommodated without resulting in unacceptable

view impacts beyond those impacts recognised (and approved) under the approved Concept Plan (as modified).

Overall, the View and Visual Impact Analysis concludes that Concept Plan (Mod 8) achieves a reasonable balance between the protection of private views and the protection of public domain views in the delivery of a new urban precinct on the foreshore of Sydney Harbour.

9.7 Wind

A Wind Impact Assessment has been prepared by Cermak Peterka Petersen (CPP) and is provided at **Appendix N**. This assessment identifies the prevailing winds affecting the Barangaroo South site; the relevant assessment criteria; and is informed by wind tunnel testing of the modified built form. CPP has concluded that generally the proposed modifications to the built form are acceptable from a wind perspective subject to the future investigation of mitigation measures in the detailed stages of development.

Wind Context

CPP identifies that Barangaroo South experiences prevailing winds from the south, and to a lesser extent, the west and north-east. A number of locations were tested around the development site and were shown to be susceptible to winds from different directions, depending on the relative location of the point tested to the geometry of development. Generally, the winds from the north-east, south, and west quadrants had the most pronounced effect on these locations as higher level winds were brought to street level as downwash and channelled between large buildings.

Assessment Criteria

CPP has adopted the Lawson assessment criteria to identify the suitability of the built form in regard to pedestrian wind comfort. The Lawson criteria are those used in the previous assessment of the original Concept Plan and subsequent modifications where relevant. **Table 10** lists the relevant criteria used in the assessment of the proposed modifications.

Table 10 – Pedestrian wind comfort criteria

Wind Speed	Activity
Comfort (maximum wind speed exceeded 5% of the time)	
< 4 m/s	Pedestrian sitting (considered to be of long duration)
4 – 6 m/s	Pedestrian standing (or sitting for short term exposure)
6 – 8 m/s	Pedestrian walking
8 – 10 m/s	Business walking (objective to walk from A to B or for cycling)
> 10 m/s	Uncomfortable
Distress (maximum wind speed exceeded 0.022% of the time, twice per annum)	
< 15 m/s	Not to be exceeded more than two times per year (or one time per season) for general access area
< 20 m/s	Not to be exceeded more than two times per year (or one time per season) where only able bodied people would be expected; frail or cyclists would not be expected

Results

The Wind Impact Assessment results indicate:

- No locations exceeded the nominated pedestrian wind comfort criteria.

- Except for an area to the north-west of the hotel, the wind comfort environment is generally satisfactory for pedestrian standing or walking. Further mitigation strategies for this area should be designed and implemented in the future individual stage of development to ensure an appropriate wind environment is achieved.
- All locations which achieved the criteria for pedestrian or business walking are intended to be used for pedestrian movement corridors rather than recreational spaces.
- The general wind environment of Barangaroo South is similar to nearby locations in Central Sydney, resulting in the development maintaining similar pedestrian wind conditions already experienced in Sydney's CBD.
- Some surrounding locations are influenced by the scale of the Barangaroo South development and wind conditions are slightly improved compared with existing conditions, due to the additional shielding provided by the future buildings in Barangaroo South.
- In general, all locations south of Globe Street are suitable for, at a minimum, pedestrian walking, with many locations suitable for pedestrian standing and sitting. A single location to the south-west of building C5 did not pass the safety criterion and as such a mitigation measure is required for this location. The envisaged mitigation measure is the introduction of a loggia structure to the south-east of Building C5, which will have a substantial positive impact on the wind environment.
- The relocation of the hotel from the edge of Globe Harbour to a northern inland location has slightly increased wind speed conditions along the Waterfront Promenade. This slight increase in wind speed will be mitigated with the inclusion of landscaping along the promenade and is therefore acceptable.
- In general, testing of the locations south of Globe Street indicate that if outdoor dining or café-style activities are to be implemented, additional temporary or permanent localised mitigation measures may be implemented to improve the wind amenity. Wind conditions are calmer closer to the buildings. A single location at the base of Building C2 was identified as suitable for outdoor dining.
- The southern side of Globe Street has been classified as suitable for pedestrian sitting or standing, and the northern side has been classified as suitable for pedestrian walking. The variation in wind speed on different sides of Globe Street is due to channelling of winds from the south-west quadrant between Building C3, the hotel, and the R4 residential towers. All locations on Globe Street passed the distress criterion.
- The northern section of Lime Street between the hotel and Building R4A experiences instances of very strong winds due to the channelling of winds between the towers. Some locations are classified for pedestrian walking, whilst others in this section of Lime Street are pedestrian walking only for able-bodied people. However, as the northern section of Lime Street is intended to be used as a pedestrian movement corridor rather than a location where pedestrians relax, the wind speeds are acceptable. Mitigation measures to explore any further improvements in the pedestrian wind comfort conditions will be further explored in the detailed stages of the development.
- Generally, wind conditions along the foreshore are classified as suitable for pedestrian sitting or standing. Where not classified as suitable, the provision of landscaping will mitigate wind impacts to be acceptable.
- The locations at the north-west corner of the hotel are most exposed to prevailing wind directions and are the windiest parts of Barangaroo South. These locations are classified as suitable for business walking and able-bodied persons only from a comfort and distress perspective respectively. These

locations are exposed to downwash from the hotel tower accelerating around the north-west corner, and winds from the south being accelerated along the west façade of the tall commercial buildings before interacting with the hotel tower. Local mitigation strategies could be adopted during the detailed design to improve wind conditions and ensure an acceptable wind environment.

- Wind speeds around the residential towers in Stage 1B and within Northern Park are generally classified as pedestrian sitting or standing and pass the distress criterion. The wind tunnel testing has identified that a suitable wind environment will be achieved within Northern Park, including closer to the tower podiums where there will be calmer conditions.

When compared to the approved Concept Plan (Mod 7), the wind conditions are generally similar. CPP has determined that the building massing and layout plan generally provides suitable wind conditions for the intended use of the outdoor spaces between buildings.

It is anticipated that any possible exceedances of the distress criterion can be mitigated during the detailed design investigations. Further mitigation strategies can readily be designed and detailed and will be implemented for the future individual stages of development to ensure an appropriate wind environment is achieved. On balance, the wind impacts of Concept Plan (Mod 8) are not significantly greater than those contemplated in the approved Concept Plan (Mod 7) and are as capable of being mitigated through appropriate measures to ensure an acceptable wind environment. The existing requirements in the Statement of Commitments related to further wind tunnel testing and development of mitigation measures are not proposed to be modified.

9.8 Transport Management and Accessibility

A Transport Management and Accessibility Plan (TMAP) was prepared in September 2008 by the NSW Government, which has subsequently been amended with previous Project Applications. ARUP has prepared a revised TMAP to accompany this Modification and address the key DGRs related to transport and accessibility (**Appendix B**).

For the purposes of modelling a transport scenario for Concept Plan (Mod 8), ARUP assumed 534,966m² of commercial and mixed use spaces including the tourist floor space (**Appendix O**). Accepted assumptions adopted in earlier versions of the TMAP and the indicative layout have also been relied upon to provide an indication of likely traffic generation associated with the proposed scope of Concept Plan (Mod 8).

Expected changes to Barangaroo Central being progressed in Concept Plan (Mod 9) by the Barangaroo Delivery Authority have been included in the modelling scenario to ensure a cumulative assessment is provided. It is expected that Concept Plan (Mod 9) will propose an increase in the floor space of Barangaroo Central to 125,000m², resulting in a cumulative total floor space area of 659,966m².

9.8.1 Assessment Methodology

Any traffic impact of Barangaroo South will occur when the combination of traffic from the proposed development and traffic already in existence on the road network are at their greatest. To determine the traffic effects of Concept Plan (Mod 8) an estimate of the number of vehicles trips associated with the particular land uses within the site was forecast.

9.8.2 Traffic Generation and Car Parking

Traffic Generation

ARUP has identified the expected traffic generation and parking spaces required for Concept Plan (Mod 8), as well as the cumulative generation of Concept Plan (Mod 8 + Mod 9). The expected trip rates have been maintained from those previously adopted, except for the tourist floor space within the landmark hotel building which has been assessed based on a comprehensive review of similar operations. **Table 11** provides a comparison of the identified traffic generation figures and those provided in the original TMAP (submitted with MOD 4 to the Concept Plan).

Table 11 – Comparison of traffic generation

Time period	TMAP (Mod 2)	TMAP (Mod 4)	Concept Plan (Mod 8)	Concept Plan (Mod 8 + 9)
AM Peak Hour	608	614	653	718
PM Peak Hour	751	736	779	821

It is expected that the mix of uses will generate trips during both the traditional commuter peak hours (i.e. 7am-10am and 4pm-7pm) and other times of the day such as the lunchtime peak and evening peak. Traffic generation for the landmark hotel building is expected to be highest in the evening after 7pm and on weekends, therefore not coinciding with the surrounding road network peak periods.

The increase of 45 movements in the AM peak and 28 movements in the PM peak demonstrate that the expected increase in traffic generation is minor. Cumulatively, the Concept Plan (Mod 8 + Mod 9) increase will be 110 movements in the AM peak and 70 movements in the PM peak. Based on the anticipated distribution of traffic it is expected that there will be little difference in the road network performance.

Car Parking Provision

To minimise site traffic generation in peak periods Concept Plan (Mod 8) does not propose to amend the parking supply rates established for the majority of land uses in the approved Concept Plan (Mod 7). Due to the unique nature of the expected operations within the landmark hotel building, standard parking rates have not been identified, rather an indicative number of car spaces reflective of other similar operations has been adopted, as detailed below.

ARUP has undertaken a detailed review of the forecast demand for the hotel operation based on a similar operation at the Crown resort in Melbourne. A review of video surveillance footage and entry/exit data from Crown Melbourne's car parking areas has identified an anticipated maximum demand of 800 cars and a minimum demand of approximately 100 cars. As such, a total provision of 500 spaces is proposed to be provided for the hotel use to accommodate the majority of this expected demand.

Some of the remainder of the vehicles associated with the hotel use are expected to be accommodated in off-street car parks in the vicinity of the site. These car parks are anticipated to have spare capacity during the evenings when the peak parking demand is highest, being outside typical office hours of most uses in the Sydney CBD. ARUP has discussed potential opportunities for the future hotel operator to organise shared parking arrangements with nearby car park operators. This method of managing parking requirements has been used in similar instances such as The Star. Approval for the construction and use of these spaces will be the subject of a future separate application.

During the ongoing planning of the Barangaroo South precinct, on-street parking has been reduced from 275 spaces to 40 spaces. This is due to the design development of both Lime Street and Globe Street and conversion of internal roads previously envisaged as vehicular thoroughfares to dedicated pedestrian routes. This should further discourage the use of vehicles as a mode of travel to the Barangaroo site.

The objective to introduce Travel Plans to reduce the need to travel and promotion of sustainable means of transport is not proposed to be modified. These Travel Plans will involve the detailing of site-specific information regarding alternative and more sustainable methods of travel than private vehicle use. Green Travel Plans for employees and residents for both intra and inter-site travel will be developed.

9.8.3 Local Intersection Operation

ARUP has developed a corridor traffic model to assess the future road network performance arising from Concept Plan (Mod 8). This modelling software allows intersections to be modelled in a single network and provides signal optimisation to reflect future traffic conditions within the Barangaroo precinct. Lane capacity at a number of locations was manually reduced to reflect queue spillback from downstream and upstream intersections that currently occurs during peak hours.

The road network performance has been measured against three parameters, being: Level of Service (LOS), Degree of Saturation (DOS) and Average Vehicle Delay (AVD). The following intersections were assessed for TMAP (Mod 8) and compared to TMAP (Mod 4):

- Sussex Street / Erskine Street;
- Hickson Road / Napoleon Street;
- Kent Street / Margaret Street; and
- Hickson Road / Globe Street.

Despite the minor increase in traffic generation, local traffic modelling indicates that there is no significant change expected to the surrounding street network performance. Changes in vehicle delays are relatively minor in both the AM and PM commuter peak hours.

In both the Concept Plan (Mod 2) and Concept Plan (Mod 8) situation, the queue length at the northern approach of the Hickson Road / Sussex Street intersection is forecast to spill back to the Hickson Road / Globe Street intersection.

The existing situation on Sussex Street in the PM Peak is significant vehicle queuing as a result of congested traffic conditions in the vicinity of the cross traffic movements at the King Street/Market Street intersections. As such, the operation of the intersections on Hickson Road will be dependent on the King Street/Market Street intersection. In light of the existing situation, the proposed Concept Plan (Mod 8) traffic generation into the road network would be modest.

9.8.4 Public Transport Services

The Concept Plan (Mod 8) continues to support the provision for new direct and high quality pedestrian connections to rail and bus services at Wynyard. The following services are generally located beyond the Barangaroo site and any improvements will be the subject of further negotiations and discussions between the relevant stakeholders.

Bus Services

The Sydney City Centre Access Strategy outlines a redesigned bus network which improves bus reliability and addresses congestion and capacity constraints. There are several proposals within this Strategy relevant to Barangaroo, including:

- new bus routes will run to Barangaroo and Walsh Bay via the city centre, Napoleon Street and Hickson Road;
- Erskine Street to act as a key east-west bus corridor in the northern CBD;
- the major bus stop precinct serving Barangaroo will be in the area surrounding Wynyard Station on York, Clarence and Kent Streets;
- approximately every second bus service on key Inner West bus routes entering the city centre via Broadway will only operate to Central. This will reduce the number of buses unnecessarily entering the city centre. The remaining services will continue to the northern end of the city centre via Elizabeth Street northbound and Castlereagh Street southbound; and
- bus routes servicing the Eastern Suburbs will utilise Elizabeth Street. Passengers travelling to Barangaroo will alight at Martin Place and walk through the city and across Wynyard Walk.

Locations for new bus stops to serve the future routes along Hickson Road and Sussex Street outside of Barangaroo South are currently being investigated by Transport for NSW. These stops would be in close proximity to Barangaroo South. The Barangaroo Integrated Transport Plan envisages two pairs of bus stops would be provided on Hickson Road to serve Barangaroo South and Central Barangaroo/Headland Park. The final location and provision of these bus stops will be determined by Transport for NSW.

Ferry Services

A State Significant Infrastructure application (SSI 6727) has been submitted by RMS for the construction and operation of three new ferry wharves and ancillary landside ferry facilities.

The new wharves will support the commercial development of Barangaroo South, with new ferry services anticipated from the east and north, as well as the existing western ferry catchments. This additional ferry hub will reduce capacity constraints on the Circular Quay terminal. The indicative location of the ferry wharves has not been amended in Concept Plan (Mod 8) and are generally consistent with those proposed in SSI 6727. The ferry wharves is outside the Barangaroo site and the provision of the wharves will be completed by the relevant government agencies.

Coaches

Kerbside space in the vicinity of the landmark hotel building for coach set down / pick up is planned within the Concept Plan (Mod 8) layout. This will service tour groups travelling to and from the hotel to other areas of Sydney.

Heavy Rail

A range of heavy rail services are available to the Barangaroo site, particularly through the nearby hub of Wynyard Station. Upgrades to Wynyard Station and the new planned pedestrian connections from Wynyard to Barangaroo South will enhance the attractiveness of heavy rail services. Planned extensions to the rail network, including the north west and south west rail links will increase the accessibility of Barangaroo. The implementation of initiatives such as rapid transit services will also reduce travel times. These upgrades and initiatives are being explored and ultimately undertaken outside of the scope of the Barangaroo project.

Light Rail

Expected public transport patronage to Barangaroo from the inner west is likely to shift mode from bus and rail to light rail as a result of the inn-west extension from Lilyfield to Dulwich Hill. Opportunities to further increase modal split to light rail are capable of occurring with the planned CBD and South East light rail link. These new light rail links are beyond the scope of the Barangaroo project.

Taxis

A number of taxi ranks are proposed throughout the Barangaroo South precinct to service the commercial, resident and visitor population. These will be strategically located to serve major buildings including the hotel, residential buildings and commercial towers, in line with the objectives outlined in the Barangaroo Integrated Transport Plan (see **Figure 25**).

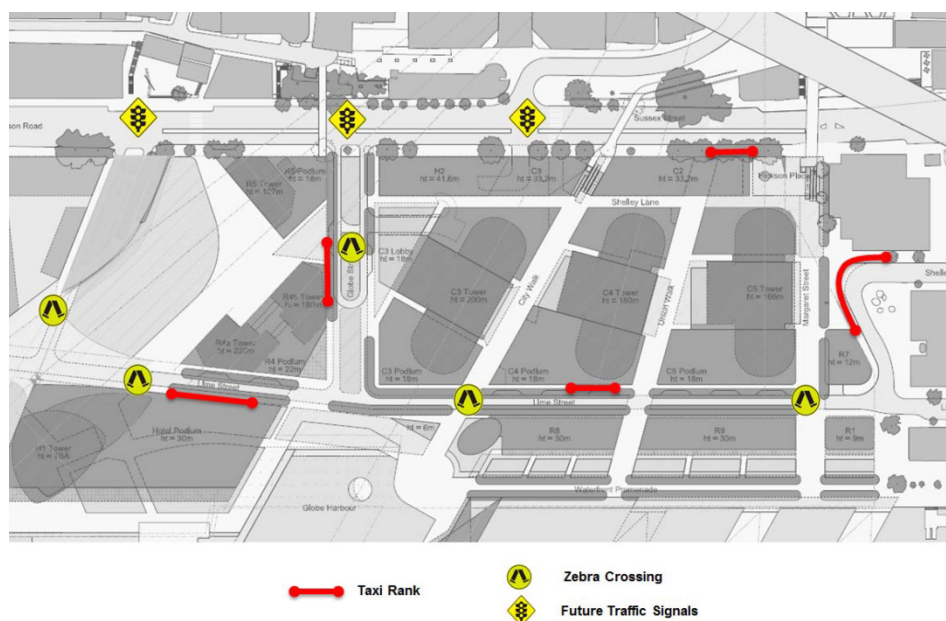


Figure 25 – Taxi rank locations

Source: Arup

Late Night Transport

The desire to facilitate a day time and night time economy at Barangaroo South results in the need for evening and late night transport services. A number of transport alternatives are envisaged to be available at these times in the surrounding locality, including:

- train services from Wynyard until 1am on weeknights on several routes, resuming again at 4.30am. On weekends the last train service departs Wynyard at 1.41am;
- ferry services at the future Barangaroo Ferry Hub are expected to run until midnight seven days a week;
- taxi services will provide an important form of late night transport for users, as they currently do in similar surrounding areas. Taxis will be available at all hours of the night at the strategic taxi ranks identified in **Figure 25**.

The availability of buses as a late night transport option is still to be confirmed by Transport for NSW with the ongoing refinement of bus services to the Barangaroo site. The final strategy for late night bus servicing will be the subject of further discussions between the relevant stakeholders.

9.8.5 Recommendations

The TMAP (Supplementary) identifies extensive transport commitments including:

Road network

- The mode share targets including the low share for car travel must be implemented;
- Supporting policies including stringent parking requirements must be provided;
- The proposed road transport infrastructure must be based on the road network modelling;
- The proposed network must provide cohesive connections from Barangaroo to CBD streets and regional roads with minimal alterations to the existing network;
- Timely delivery and funding of the required road and intersection upgrades is essential; and
- All proposed road network changes and improvements are subject to approval by the RMS

Car parking

- The parking provision rates adopted in this TMAP based on an assumed land use mix are to be applied;
- On-street parking supply must be short stay only and limited in number; and
- Limited parking is to be provided at Headland Park by the Sydney Harbour Foreshore Authority to cater for leisure and tourist requirements

Pedestrian connections

- Pedestrian links must be upgraded for transport mode share targets to be achieved;
- The main route to Wynyard Station will be facilitated via the Wynyard Walk – a high quality pedestrian connection which provides direct access to Barangaroo;
- Design and delivery of the Wynyard Walk is to be undertaken by the NSW Government; and
- Other grade separated connections between existing streets and Barangaroo will be implemented

Rail services

- Improvements to Wynyard Station are proposed by the NSW Government to accommodate the significant increase in passenger throughput over the short and long term; and
- The construction of the North West Rail Link and South West Rail Link will improve rail access for those travelling to Barangaroo.

Bus services

- The Sydney City Centre Access Strategy outlines a redesigned bus network which improves bus reliability and addresses congestion and capacity constraints;
- New bus routes will run to Barangaroo and Walsh Bay via the city centre, Napoleon Street and Hickson Road; and

- Bus stops must be provided on Hickson Road to service new bus routes into Barangaroo.

Ferry

- The introduction of a new ferry wharf at Barangaroo will improve accessibility via this mode of transport

Cycling

- Measures to be taken to increase the use of cycling to ensure mode share targets are met;
- The inclusion of connections to local cycle networks, and CBD and regional connections, including the development of the cycle network as outlined in the Sydney City Centre Access Strategy;
- The inclusion of facilities for cyclists within the development in Barangaroo.

Light rail

- Design and delivery of light rail through the CBD and inner west by the NSW Government has the potential to shift mode from bus and rail as a result of these extensions.

Travel Planning

- A series of Travel Demand Management Plans for the commercial and residential buildings in Barangaroo South have already been prepared in previous project applications. These plans outline measures to support sustainable modes of travel to Barangaroo and reduce car dependency.

The above recommendations have been incorporated into the draft revised Statement of Commitments through an updated reference to the TMAP (refer to **Appendix X**).

9.9 Pedestrian and Cycle Access

Pedestrian Access

The Barangaroo South development provides for a number of new pedestrian connections to the surrounding local area, particularly to create safe and convenient connections to Wynyard Station. Internally, the Concept Plan (Mod 8) will continue to provide for a generous foreshore walkway with a width of 30 metres, as well as a network of north-south and east-west road and footpath connections.

Proposals beyond the Barangaroo site that have been further defined in a conceptual manner as part of Concept Plan (Mod 8) are as follows:

- **Wynyard Walk:** a new high-volume pedestrian tunnel from Barangaroo to the frequent rail and bus services at Wynyard Station and George Street.
- **City Walk Wynyard Connection:** a new pedestrian link bridge over Sussex Street/Hickson Road located close to the intersection of Hickson Road and Napoleon Street which links into the Barangaroo Pedestrian Link.
- **189 Kent Connection:** a new pedestrian link bridge over Hickson Road potentially to be constructed and coordinated with the future development of 189 Kent Street.

- **Maritime Staircase:** a new staircase at the junction of Napoleon Street and Hickson Road which connects to the Maritime Centre providing a link to Kent Street.

The outcomes of a previous pedestrian demand analysis suggested that volumes of pedestrians travelling to and within the Barangaroo South will be comparable to existing movements along some of the key pedestrian corridors in the Sydney CBD. The strategy identified high pedestrian activity at all times of the day travelling along two major corridors, those being:

- From Wynyard Station, across the Wynyard Walk bridge and through to the Barangaroo Ferry Hub and waterfront promenade; and
- From Wynyard Station, across City Walk bridge and through to Lime Street and the waterfront promenade.

Outside peak periods it is expected that pedestrians will focus more strongly on access to Walsh Bay and King Street wharf areas along the waterfront promenade through the Barangaroo site.

Foreshore walkways and links within the Barangaroo site are proposed to adjoining areas such as King Street Wharf and Millers Point. Appropriate at-grade pedestrian crossing facilities are also planned throughout Barangaroo South to ensure safe and efficient road crossing opportunities along key desire lines (see **Figure 26**).

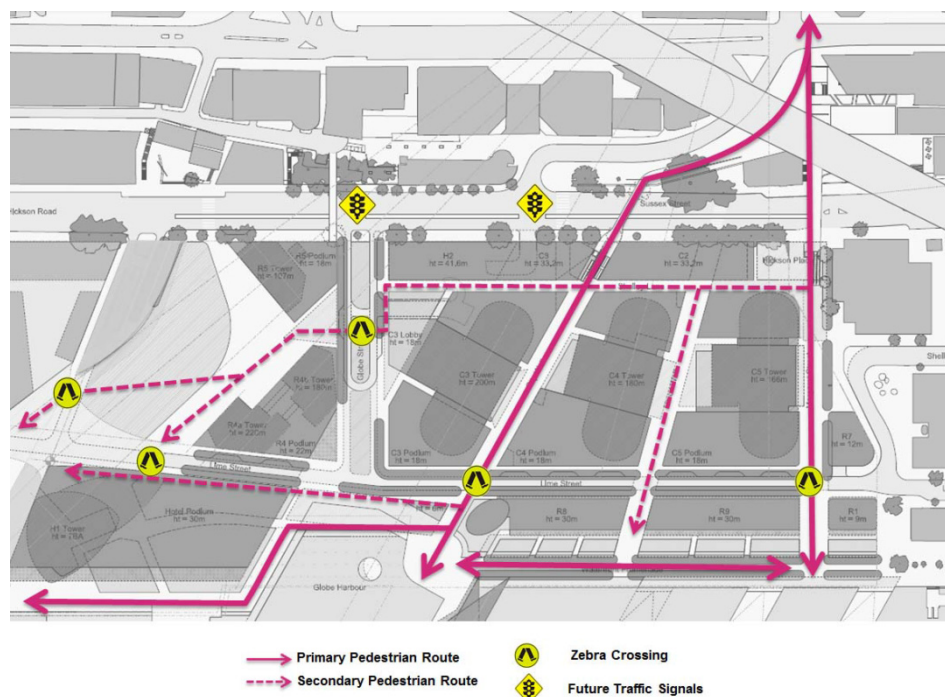


Figure 26 – Key pedestrian routes and crossings

Source: Arup

Cycle Access

The Sydney City Centre Access Strategy outlines the future city centre cycleway network to encourage growth in cycling and reduce pressure on the public transport system. Measures proposed in the Strategy include:

- extending the Kent Street cycleway south to Liverpool Street;
- construction of a bi-directional cycleway on Liverpool Street;
- construction of a bi-directional cycleway on Castlereagh Street and Pitt Street, providing a new north-south connection through the CBD;

- extending the existing King Street cycleway to Castlereagh Street; and
- extending the east- west cycleway along Park Street to Castlereagh Street.

The Strategy also identified potential for investigations into additional connections to areas such as Barangaroo. An excerpt of the strategic cycleway map is illustrated in **Figure 27**, identifying potential connections into Barangaroo.

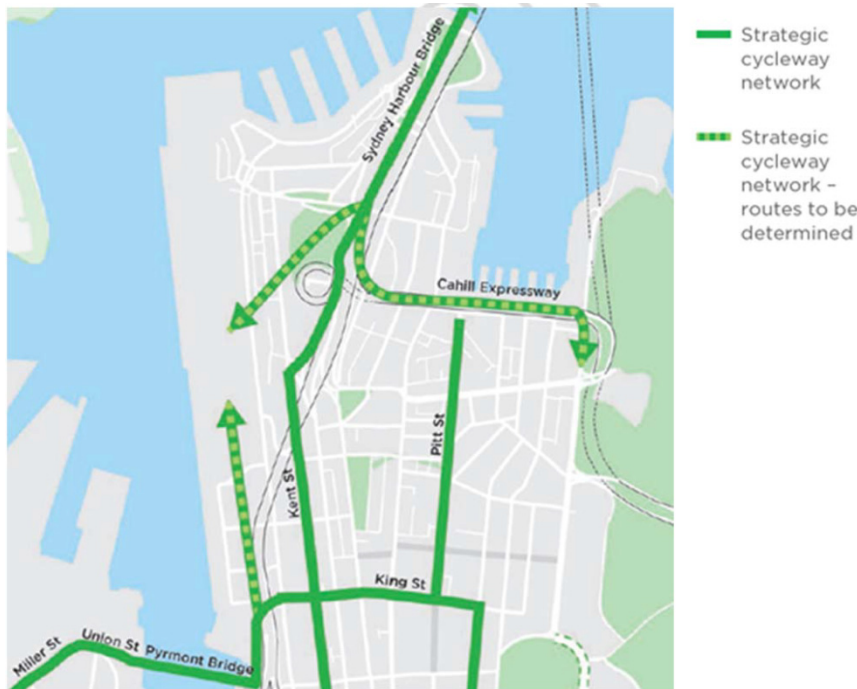


Figure 27 – Strategic Cycleway Network Map

Source: Sydney City Centre Access Strategy (NSW Government, 2013)

Cyclists travelling from the Sydney Harbour Bridge cycleway can either travel along an envisaged new cycleway along Napoleon Street or on an alternate route via Argyle Street, Dalgety Road and Hickson Road.

Napoleon Street will form a key link for cyclists travelling between Barangaroo South and the existing separated cycleway on Kent Street. Discussions are ongoing between Lend Lease and the road authority regarding the most appropriate facility to be provided along Napoleon Street. A cycleway in this location will satisfy the objectives of the Sydney City Centre Access Strategy.

A bi-directional separated cycleway is also envisaged on the eastern side of Hickson Road, up to the intersection with Towns Place. This cycleway is not currently proposed under Concept Plan (Mod 8) and will be the subject of further investigations. Beyond Towns Place, the existing single direction on-road cycle lane will facilitate the movement of cyclists onwards towards The Rocks and Circular Quay. It is assumed the cycleway will commence at Shelley Street, which will provide a link to the new Transport Place. This cycleway would satisfy the objectives of the Sydney City Centre Access Strategy.

Cycling within the Barangaroo South site will be confined to the internal road network, along Globe Street and Lime Street. The route along Lime Street will connect with a recreational cycle route which continues through Barangaroo Central and into Headland Park.

Given the high level of pedestrian movement on other streets within Barangaroo South, cycling will not be permitted along these paths to avoid conflicts. **Figure 28**

illustrates the cycle movements through, and within the vicinity of, the Barangaroo South site.

Bicycle parking and shower facilities will be provided with each respective building as required. Bicycle parking will also be extensively provided within the public domain.

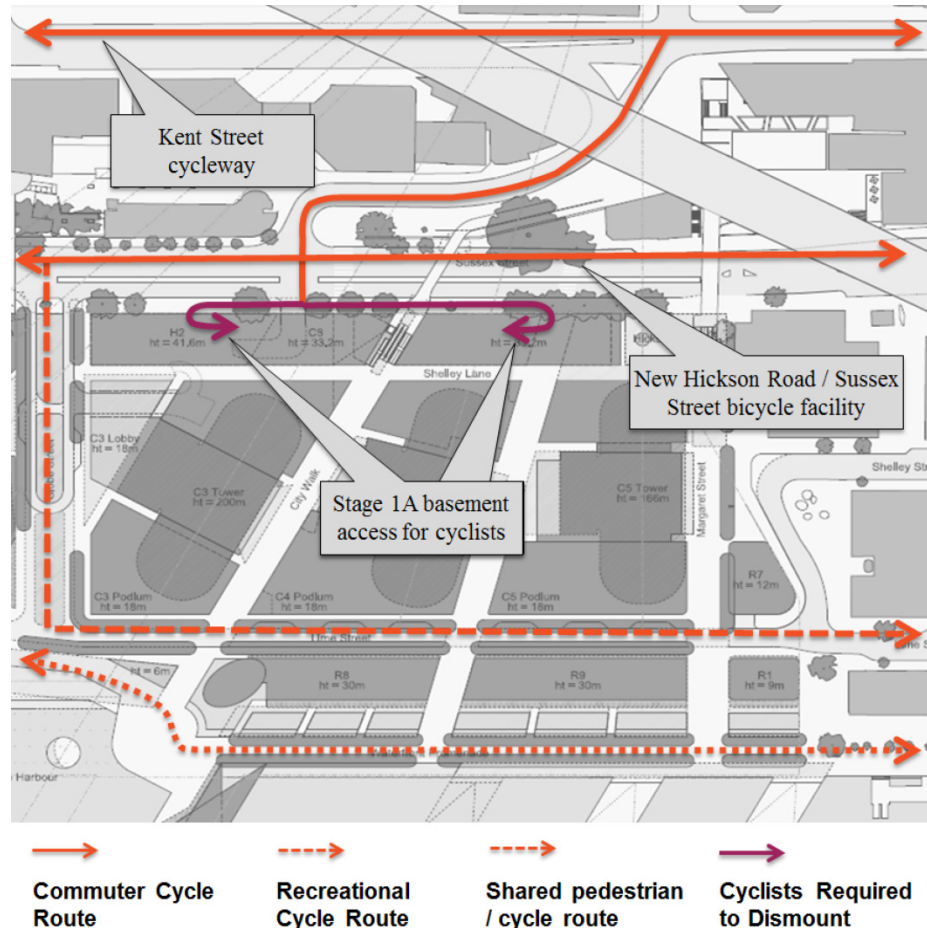


Figure 28 – Cycleway routes within and in the vicinity of Barangaroo South

Source: ARUP

9.10 Land Ownership

The entire Barangaroo South site is owned by the NSW State Government through the Barangaroo Delivery Authority. Arrangements for the future ownership of the site are administered through the Project Development Agreement established for the site between Lend Lease (Millers Point) and The Barangaroo Delivery Authority. A summary of the arrangements is as follows:

- All future “private” ownerships are 99 year leasehold only;
- At the time of practical completion of each building, the 99 year leasehold lot specific to that building only will be transferred to the owner of the building (Lend Lease or other);
- The remaining lands remain within a residual lot that continues to be owned by the NSW State Government; and

- At the stage of all buildings being completed on the site, 99 year leasehold lots will have been established for each building. The remaining area is retained by the NSW State Government as publicly owned public domain.

9.11 Social Impact

The Barangaroo South development will continue to provide a quality living and working environment accommodating a range of facilities benefiting the social, health, cultural and recreational needs of the existing and future communities.

A number of social considerations were addressed as part of the original assessment of the Concept Plan and subsequent modification applications as necessary. The outcomes of these assessments are largely unchanged for this modification, yet new considerations have been addressed below where necessary.

Land Use Mix

The proposed Modification results in increases in the amount of tourist and residential uses on the site and a reduction in the commercial and retail uses. The increase in tourist uses and reduction in retail and commercial uses will have a negligible social impact on the Barangaroo South precinct considering there is already a large quantum of these uses being provided. The increase in residential uses will have a positive social impact as it will provide:

- more housing close to employment and infrastructure with high amenity;
- greater activation of Barangaroo outside of business hours; and
- increased provision of key worker housing (see Section 9.12).

There are no negative social impacts associated with the proposed modifications to the land use mix.

Modified Built Form Layout

The modified built form layout proposed in Concept Plan (Mod 8) continues to provide appropriate and significant areas of open space and public domain. The up to 30 metre wide waterfront promenade is maintained in the amended design and generous areas of open space will be provided around the Southern Cove and in the Northern Park. The siting, orientation and layout of these spaces will allow for the focused use of the public domain for community events. The Barangaroo parklands are better connected with the existing City, providing greater connectivity to the waterfront and enhancing the experience of residents, workers and visitors to Barangaroo South and wider Sydney.

As part of Concept Plan (Mod 8) a 3,000m² Community Building is proposed on the public pier with approximately 2,000m² of community uses (see Section 5.2). The ultimate use of the Community Building is yet to be determined, but this will be led by Lend Lease in consultation with the City of Sydney Council to provide the best possible community use for the location. The modified location of the Community Building has a range of positive social benefits as it will:

- prioritise public use of a prime waterfront site;
- take publically-minded activities onto the water; and
- provide a viewing platform for everyone to experience Darling Harbour.

Landmark Hotel Building

The retention of the Landmark Hotel Building, although in a different location on the site, will ensure that the important social benefits of creating an iconic building and tourist attraction for Barangaroo and Sydney are maintained.

The Modification also includes provision for the potential inclusion of a casino use in part of the hotel development in the form of a VIP gaming facility. The appropriateness of this use was determined through a rigorous assessment of the potential social benefits and disbenefits by the NSW State Government as part of the Unsolicited Proposal which led to the NSW Independent Liquor and Gaming Authority issuing a restricted gaming licence.

The anticipated social benefits/disbenefits include:

- Social Benefits
 - Potential social benefits will be available through increased gaming tax revenue and licence fees which is expected to exceed \$1 billion over the first 15 years of full operation.
 - Increased direct and indirect employment and job creation, with an estimated increase of between 2,300 and 3,300 jobs during construction and 1,250 direct jobs post construction.
 - Establishment of training colleges in Penrith and Redfern, offering employment and training opportunities to residents of Western Sydney and Indigenous Australians from the inner city and throughout NSW.
 - Association with the following development partners to ensure social benefits are achieved across a range of stakeholders The United Voice Union, The National Centre of Indigenous Excellence, Penrith Panthers Rugby League Club, Mission Australia, South Sydney Rabbitohs and the Australian Rugby League Commission.
- Social disbenefits
 - Potential social disbenefits associated with the provision of gaming facilities. Potential problems associated with gambling conditions are expected to be managed and minimised through Crown Resorts strong relationship and partnership with different partners such as Mission Australia.

VIP smoking exemptions to ensure international competitiveness.

The Assessment Report for the Unsolicited Proposal determined that social impacts would be dependent on the nature of the facilities, conditions for entry, responsible gaming programs and smoking legislation. The Assessment Report for the Unsolicited Proposal concluded:

Provided appropriate conditions are locked in, including a commitment to develop third party exclusion procedures to protect families, Crown's proposal is not expected to significantly increase social harm arising from problem gambling.

Based on that Assessment Report and the above considerations, the social impact of the potential inclusion of a gaming facility in the landmark hotel building is acceptable subject to appropriate conditions. A more detailed assessment of this use will be undertaken during the assessment of a formal application which seeks to secure approval for the operation of the integrated hotel and casino use. A Statement of Commitment has been included in this Modification requiring submission of a Social Impact Assessment with any future application for a casino use at Barangaroo South.

9.12 Economic Impact

Barangaroo South will continue to generate significant economic and employment opportunities during and post construction, and will provide significant new commercial, residential, tourist, and retail floor space in the western part of the CBD.

The increased quantum of GFA and mix of uses proposed in the Modification will result in an increased and significant positive economic benefit to Sydney and NSW.

As demonstrated in Section 9.1, the economic and employment benefits of Barangaroo South will continue to contribute to the achievement of targets established in the relevant strategic documents prepared for NSW and Sydney.

Specifically in regard to the increased floor space of the landmark hotel building, there will be direct benefits through increased tourism, economic activity and employment. When compared against the approved landmark hotel building, the additional floor space sought as part of the Modification amplifies each of the economic benefits originally envisaged to be provided through the development.

The operation of the landmark hotel building will result in the creation (direct and indirect) of approximately 2,300 and 3,300 additional jobs during construction and 1,250 direct jobs post construction. This will have significant benefits for the tourism industry in NSW, noting that the tourism industry is a significant contributor to the NSW economy, as seen in 2012/2013 where it contributed 267,000 jobs (direct and indirect) and \$12 billion (Destination NSW).

Other benefits to the NSW economy include increased export income, business spending, licensing fees and gaming tax revenue. The following economic benefits are expected during the construction and operation phases of the hotel / landmark building:

- boost to the NSW export income by an estimated \$513 million in 2021;
- growth in business spending and investment from \$28 million in 2012/13 to \$151 million in 2021/22; and
- increased gaming tax revenue and licence fees, which are combined expected to exceed \$1 billion over the first 15 years of full operation.

The increased floor space of the landmark hotel building in the Modification will also directly contribute to addressing the undersupply of hotel rooms within Sydney. The provision of world-class convention facilities will address an identified need in Sydney, and will ensure that NSW is made more attractive for international events.

In addition, the landmark hotel building will integrate first-class restaurants, bars, retail outlets, pool and spa facilities, conference rooms and VIP gaming facilities, presenting an attractive offering to the tourism and convention industries. The provision of a world-class six star hotel resort incorporating VIP gaming facilities will attract higher net value international visitors with greater opportunities for visitor spend than currently exists in NSW, or Australia more broadly.

The Modification will reduce the quantum of commercial GFA. This reduction is in response to the large amount of commercial GFA in the pipeline across Sydney, including the provision of over 300,000m² in Barangaroo South alone. The redistribution of the commercial GFA to residential is therefore considered appropriate as there is more than sufficient commercial GFA to support Sydney's future economic growth and the residential development proposed is complimentary to the commercial and retail uses proposed on the site and in the City more broadly.

9.13 Housing Strategy

The proposed Modifications will not affect the mix of housing types and tenures provided in Barangaroo South. The Modifications will continue to provide benefits through the inclusion of socially sustainable non-market housing. These benefits include:

- social equity and inclusion;
- social mix and diversity;
- housing the global city workforce; and
- international best practice in medium and high density housing design.

Lend Lease will deliver intermediate housing for essential and key workers employed within the Barangaroo South precinct and the wider Sydney CBD area via the Australian Affordable Housing Partnership (AAHP), which is a collaborative partnership between Lend Lease and the public, private and community sectors. As a founding partner of AAHP, Lend Lease delivers origination, development, sales and marketing expertise across all AAHP projects.

The intermediate housing offer Lend Lease will deliver includes the following benefits:

- social equity and inclusion by providing a mix of housing tenures for essential and key workers in the Barangaroo precinct and wider Sydney CBD area;
- social mix and diversity by targeting a range of households including singles, families and retirees; and
- international best practice by working with Community Housing Providers (CHPs) to deliver asset and tenancy management of affordable rental accommodation.

The intermediate housing component will offer a range of tenures including rentals and sales to households with incomes \pm 50% of median income via the AAHP. The framework for providing intermediate housing is not proposed to be amended in Concept Plan (Mod 8).

A Housing Strategy has been prepared by the Barangaroo Delivery Authority for the Barangaroo site in accordance with Statement of Commitment No. 29. This Strategy includes discussion on key worker housing, and requires 2.3% of the total proposed residential GFA in Barangaroo South to be provided as key worker housing in accordance with Statement of Commitment No. 34. The methodology for procuring and managing this key worker housing is included in the Housing Strategy.

The basis of the Housing Strategy, which uses a percentage rate to determine the amount of key worker housing, does not need to be amended as part of the Modification, as the amount of key worker housing will increase corresponding to the amount of additional residential floor space. The Housing Strategy will be updated to reflect the amended maximum residential GFA in Barangaroo South. Based on the proposed maximum residential GFA of 154,000m², a total of up to 3,542m² (approximately 60-70 one bedroom dwellings) of intermediate housing could be provided at Barangaroo South.

9.14 Noise, Air and Odour Impacts

9.14.1 Noise and Vibration Impacts

A Construction and Operational Noise and Vibration Report for Concept Plan (Mod 8) has been prepared by Wilkinson Murray and is provided at **Appendix P**. This report considers the potential construction and operational noise and vibration impacts of the proposal and provides recommendations to mitigate and manage any potential impacts.

Concept Plan (Mod 8) does not propose any works and as such, the assessment of the Construction and Operational Noise and Vibration Report is based on the envisaged staging of the Barangaroo South development. Further detailed assessment will be carried out during the relevant applications for development.

The Report divides potential noise and vibration impacts into two categories:

- noise and vibration impacts to surrounding receivers; and
- noise and vibration impacts on site.

Noise and Vibration Impacts to Surrounding Receivers

Construction

The Modification proposes a reduction in the size of the Southern Cove, the removal of residential towers on the northern perimeter and the reduction in length of the buildings on the eastern perimeter, all of which will reduce noise and vibration impacts to surrounding receivers.

The relocation of the landmark hotel building, while resulting in a reduced noise impact to some surrounding receivers, will produce an increased noise impact to residences to the east and north of the site. However, the increase in construction noise will not be greater than 2 dBA which is considered minor. In addition, vibration will be imperceptible at all receivers.

Traffic generated by construction of the development envisaged under the Modification is expected to be similar or slightly less than the that generated by the approved Concept Plan. Accordingly, no intensification of traffic noise is expected.

Operation

The Modification proposes a reduction in residential buildings adjacent to Hickson Road and the relocation of the landmark hotel building, neither of which present a significant acoustic change to noise emissions from Barangaroo South when compared to the approved Concept Plan.

Traffic generated by operation of the development envisaged under Concept Plan (Mod 8) is expected to be similar or slightly less than that generated by the approved Concept Plan (Mod 7). Accordingly, no intensification of traffic noise is expected.

Noise and Vibration Impacts on Site

Commercial Developments

The commercial development on site will have fixed glazing which is expected to provide a reduction in noise such that internal noise levels are well below the Australian Standard requirement for general office areas. Accordingly, specialist glazing will not be required.

Residential Receivers

The most sensitive noise receivers on site will be residential. Noise sources that have the potential to impact on the acoustic amenity of residents are:

- Mechanical Services
 - Given residential buildings are generally proposed to be at least 10m from mechanical plant and/or louvres, the internal noise levels will be below the satisfactory levels recommended by the relevant Australian Standard.
 - Mechanical services noise is not expected to exceed anticipated future background noise levels.
- Harbour Activities
 - The noise levels that may potentially impact on the western facades of residences will be similar to noise levels measured at Circular Quay. Accordingly, the façade design should consider those noise levels identified in the Wilkinson Murray Report (**Appendix P**) impacting on the facade of the residential development.
- Entertainment, Cafes and Bars
 - Noise from patrons should not exceed the background noise level by more than 5 dBA up to midnight and not exceed the background noise level after midnight at the façade of the nearest residence.
 - Noise from amplified music should be controlled to ensure that the above criteria are achieved at residences, and noise within the residence should be free of any frequency component characteristic such as low bass sound.
 - Where entertainment venues are located below residences, the ceiling between any venue and residence should be treated to ensure that noise from entertainment, patrons or amplified music is inaudible when the windows and door of the residence are closed.

Management Strategies and Recommendations

The Report concludes:

- The current mitigation measures adopted in the site environmental management plan will be adequate to manage emissions from the site.
- Quantitative assessment of individual and cumulative impacts of each component of the development will be conducted at the development application stage for each of the identified developments on the site.
- Standard engineering noise control measures can be adopted where necessary to control noise emissions from the site.
- Any premises with the potential to generate significant noise levels should be required to carry out assessment of their noise emissions and potential impacts to residences. Operators of these premises should be responsible for providing appropriate noise controls to manage noise emissions to within acceptable levels.
- The internal noise objectives, determined as a result of an Acoustic Benchmarking Study, to ensure the acoustic amenity of the future Barangaroo site must be adhered to.
- The Modification will not result in intensification of construction or operational noise and vibration at surrounding receivers, than that generated by the approved Concept Plan, subject to the imposition of appropriate planning conditions and controls on the construction and operation of new development.

The above recommendations have been incorporated into the draft revised Statement of Commitments provided at **Appendix X**. Overall, the noise and

vibration impacts of Concept Plan (Mod 8) are acceptable and can be managed in accordance with the current mitigation measures adopted in the site environmental management plan.

9.14.2 Air Quality and Odour Impacts

An Air Quality Impact Assessment (AQIA) has been prepared by AECOM to determine the potential air quality and odour impacts arising from future development as envisaged by Concept Plan MOD 8 (**Appendix Q**). The AQIA has considered all construction activities on the Barangaroo site including works currently being undertaken on the Headland Park and within Stage 1A of Barangaroo South. An overview of the AQIA is provided below.

Sensitive Receptors

A total of 103 receptors were assessed in this cumulative impact assessment. The sensitive receptors are largely unchanged since the approval of the Concept Plan (Mod 7) and are predominately located along the eastern side of Hickson Road.

The closest receptors are located approximately 25 metres to the east of Barangaroo South, on Hickson Road and consist of residential and commercial properties. A number of finger wharves containing a mixture of residential and commercial developments are located directly opposite Barangaroo South, the closest at approximately 250 metres to the west. The residential suburb of Balmain East is located approximately 400 metres to the west of the northern end of Barangaroo South.

Assessment

AECOM has identified the relevant pollutants of interest, as well as impact assessment criteria. The criteria adopted by AECOM is consistent with the original and ongoing assessment of the Concept Plan and subsequent modifications. The dispersion modelling has also remained consistent with previous assessments to ensure a meaningful comparison is able to be completed.

A single scenario has been modelled by AECOM, representing the time in which the highest expected activity levels of construction will occur. The scenario includes the following construction activities:

- Stage 1B Basement (Block 4) remediation and excavation activities;
- Construction works associated with Commercial and Residential Buildings C2/C6, C3, C4, C5, R8 and R9;
- Operation of the on-site concrete batching plant; and
- Operation of the on-site water treatment plant.

Whilst the Stage 1A basement works will be ongoing during this period, the works relate to minor servicing and finishing works and therefore will not significantly contribute to any air quality impacts. AECOM has acknowledged that the staging of works may alter, and any further required analysis will be undertaken in the individual assessment of applications for development. One key assumption in the modelling has been that all emissions associated with the Block 4 remediation works will be contained within odour control structures with the exception of trucks hauling materials for off-site disposal.

The Stage 1B works, being those associated with this Modification, are scheduled to occur after the worst-case construction period. As such, the air emissions associated with the Modification would be expected to be lower than the air emissions occurring during the peak construction period.

In light of the above, the concentrations of air pollutants associated with the Modification are expected to be lower.

The modelling has identified two exceedances of the established criteria, relating to NO₂ and PM₁₀ during the one hour and 24 hour period respectively. AECOM has confirmed that the primary source of the PM₁₀ exceedances is due to the operation of the concrete batching plant. Emissions from this activity are expected to be manageable through operational practices and reactive management strategies which are currently employed at Barangaroo South.

A comparison of Concept Plan (Mod 8) to the approved Concept Plan (Mod 7) demonstrates that the maximum predicted concentrations for Concept Plan (Mod 8) are lower than the maximum concentrations previously predicted.

AECOM has also conducted a separate assessment which includes the works at the Barangaroo Central Waterfront Promenade and Interim Public Domain and Headland Park works. These works are likely to be undertaken concurrently with the above scenario, and therefore a cumulative assessment of the entire Barangaroo Site was undertaken.

The cumulative impact of works on the entire Barangaroo site shows exceedances of the PM₁₀ criteria, with potentially very high hourly concentrations experienced occasionally. AECOM has outlined that this situation may be unlikely and due to slight differences in modelling of the Barangaroo South and remainder of Barangaroo works, these findings may not represent a realistic situation. In any event, the findings of this cumulative assessment represent a worst case predication which demonstrates that appropriate management and mitigation of emissions is required for all works associated with the Barangaroo site.

An extensive reactive air quality management plan has been implemented for the Stage 1A excavation works. The objective of this plan is to enable the ongoing monitoring of emissions and potential impacts and, where exceedances occur, enable the relevant emission sources to be proactively managed. Due to the generally conservative nature of dispersion modelling, extension of the existing monitoring and reactive management plan to incorporate additional monitoring sites located close to the future stages of development is expected to be a viable method for addressing the predicted exceedances of PM₁₀.

Recommended Mitigation Measures

AECOM has outlined recommended air quality management and mitigation measures to be implemented during the future stages of development at Barangaroo South (refer to **Appendix Q**). These measures encompass the following categories:

- Pollutant minimisation strategies;
- Contingency measures; and
- An air quality monitoring program.

These recommendations are generally consistent with the approved Concept Plan (Mod 7) and Statements of Commitment (as modified) and are in response to this Modification's known scope of air quality and odour impacts. Accordingly the updated AQIA has been incorporated into the Draft Statement of Commitments and will provide an acceptable solution in managing air quality impacts. Overall, the potential air quality and odour impacts are acceptable as they are not greater than the peak expected impact and can be adequately managed.

9.15 Drainage and Stormwater

The Stormwater Concept Plan prepared by Cardno addresses the water quality management and stormwater drainage procedures which will be adopted on the site (refer to **Appendix F**). The overarching stormwater strategy for Barangaroo

South and all the established water quality targets remain unchanged from the approved Concept Plan.

9.15.1 Integrated Water Strategy

The Integrated Water Strategy does not seek to modify the established targets for Barangaroo South. The Strategy sets out conceptual measures for the established targets to be achieved.

9.15.2 Stormwater Management

Cardno has outlined the internal and external catchments of Barangaroo South which have been further refined as part of the proposed Modification due to greater access to detailed ground surveys, Airborne Laser Scanning (ALS) data and further site inspections. These catchments have been divided into Stage 1A and Stage 1B, with a range of works already approved and completed as part of the detailed approvals for development within Stage 1A.

The Infrastructure Concept Drawings provided at **Appendix E** outline the location and type of infrastructure required, including overland flow paths, to manage stormwater from both the Stage 1A and Stage 1B catchments.

Internal Catchment Stormwater Strategy

The Stormwater Strategy for managing stormwater has been updated from the approved Concept Plan which included capacity in the pit and pipe network for the 20 year ARI flows. The pit and pipe network will now have capacity for the 100 year ARI flows. Appropriate Water Sensitive Urban Design (WSUD) measures will be incorporated into the detailed development to ensure the achievement of water quality targets.

Amendments to the Stage 1B stormwater strategy are proposed in light of the progression of the stormwater infrastructure design in Barangaroo South. The approved stormwater concept for Stage 1B provided for a future connection to the Central Parkland. The modified stormwater concept does not incorporate a connection to the Central Parkland, yet it is noted by Cardno that this option may be further explored in the future detailed applications for development.

Stormwater from Stage 1B is now intended to connect to an existing 1,800mm diameter pipe located under Globe Street between Stage 1A and Stage 1B. The stormwater will be diverted to a Gross Pollutant Trap (GPT), tertiary treatment units and/or other WSUD measures as required.

The waterfront promenade in front of the Stage 1B hotel is intended to contain tree pits to treat stormwater runoff before discharging into Darling Harbour. Water from the Stage 1B hotel will be captured and transported via a 600mm diameter stormwater pipe to the north west corner of the site. This water will be appropriately treated to meet the established water quality targets.

External Catchment Stormwater Strategy

The permanent external stormwater works for Stage 1A have been completed and the Stage 1B temporary and permanent diversion has been approved by Sydney Water with detailed design set to commence. As such, the external stormwater strategy remains consistent with the approved strategy and will be suitably implemented.

Overland Flow Paths

Cardno has identified that the proposed site levels preclude overland flow through the development from existing low points in Hickson Road. In light of the existing levels in Hickson Road, the overland flow route from the existing low point will be

relocated to a new flow path north of the development site and then into the Harbour.

The completed external stormwater drainage network for Stage 1A has been designed to convey the 100 year ARI flows. Capture pits will be provided along Hickson Road to capture and divert overland flows to the external stormwater drainage network. These capture pit locations are subject to the final design of Hickson Road and formal approval.

The conceptual design for Stage 1B is to provide a stormwater drainage network including capture pits in front of the Bond Residential building to capture and divert the overland flow around the site before discharge to Darling Harbour. This network will be designed to maintain existing flood levels along Hickson Road and ensure no net adverse flooding impact on the adjacent properties.

This strategy ensures that existing overland flow paths are adequately dealt with and stormwater is channelled through other means.

9.15.3 Climate Change

The mitigation measures adopted within the approved Concept Plan are not proposed to be amended. The recommended seawall level for the Barangaroo South site will continue to be a minimum RL2.5m AHD, ensuring the expected sea level rise of between 0.26m and 2m by 2100 is mitigated. As such, the future development will continue to mitigate any potential impacts of climate change induced sea level rise.

9.15.4 Erosion and Sediment Controls

The proposed Modification does not alter the current strategy for implementing sediment and erosion controls. A number of strategies and site specific measures have been developed as part of the Stage 1A works and will continue to be implemented, ensuring the achievement of the approved erosion and sediment control strategy.

9.15.5 Water and Stormwater Management Plan

No change is proposed to the commitment to provide a Water and Stormwater Management Plan. This plan will address water volumes, water monitoring, stormwater and sediment controls, construction operational procedures and wastewater and effluent reuse on the site. This plan will seek to fulfil the targets of the established Integrated Water Strategy.

9.16 Utilities

The Infrastructure Concept Plan prepared by Cardno outlines the existing utility services and infrastructure available to the site and the required upgrades which need to occur in order to service the future development of Barangaroo South (refer to **Appendix E**). Cardno has confirmed that Barangaroo South can be adequately serviced and the current servicing strategy under the approved Concept Plan remains largely unchanged.

Due to the proposed modifications to the built form layout within Barangaroo South, some changes to the horizontal network alignments are required. This does not alter the approved servicing strategy. Whilst some of the required infrastructure works have been completed to date under previous approvals, the remaining works will be undertaken with the future detailed development of different blocks within the modified Concept Plan. Approval for these works will be obtained at the appropriate time subject to consultation with the relevant service providers.

9.17 Ecologically Sustainable Development

Lend Lease has prepared an updated Sustainability Report (**Appendix R**) outlining the sustainability initiatives and general ESD commitments to be incorporated into Barangaroo South. The precinct initiatives outlined in the ESD Report are wide ranging, covering areas such as:

- Healthy buildings;
- Energy and carbon;
- Water positive;
- Zero waste;
- Sustainable transport; and
- Landscape and biodiversity.

A comparison has been undertaken by Lend Lease of the approved Concept Plan Statement of Commitments relating to sustainability and their replication in Concept Plan (Mod 8). This comparison illustrates that the Modification will continue to implement the sustainability commitments outlined in the approved Concept Plan Statement of Commitments.

The EP&A Regulation also lists four principles of ecologically sustainable development to be considered as part of an Environmental Impact Statement. They are:

- the precautionary principle;
- intergenerational equity;
- conservation of biological diversity and ecological integrity; and
- improved valuation and pricing of environmental resources.

Whilst the Regulation does not specifically apply to an EAR under Part 3A of the EP&A Act, an analysis of these principles has been provided as follows.

Precautionary Principle

The precautionary principle is utilised when uncertainty exists about potential environmental impacts. It provides that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. The precautionary principle requires careful evaluation of potential environmental impacts in order to avoid, wherever practicable, serious or irreversible damage to the environment.

This EAR has not identified any uncertain and serious threat of irreversible damage to the environment.

Intergenerational Equity

Inter-generational equity is concerned with ensuring that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations. The Modification has been designed to benefit both the existing and future generations by:

- enhancing the experience of residents, workers and visitors to Barangaroo South by delivering an improved built form and public domain outcome; and
- implementing safeguards and management measures to protect environmental values.

The modification has integrated short and long-term social, financial and environmental considerations so that any foreseeable impacts are not left to be addressed by future generations. Issues with potential long term implications such as climate change will be avoided and/or minimised by design and through the application of safeguards and management measures described in this EAR and included in the Statement of Commitments.

Conservation of biological diversity and ecological integrity

The principle of biological diversity upholds that the conservation of biological diversity and ecological integrity should be a fundamental consideration.

This EIS has demonstrated that the proposal will not have any significant effect on the biological diversity and ecological integrity of the site and surrounding area.

Improved valuation, pricing and incentive mechanisms

The principles of improved valuation and pricing of environmental resources requires consideration of all environmental resources which may be affected by a proposal, including air, water, land and living things. Mitigation measures for avoiding, reusing, recycling and managing waste during construction and operation would be implemented to ensure resources are used responsibly in the first instance.

Additional measures will be implemented to ensure no environmental resources in the locality are adversely impacted during the construction or operational phases as part of the detailed applications for those works.

9.18 Contamination

The Modification does not propose a change to the overall remediation strategy for the site as contemplated by the approved Concept Plan. An *Overarching Remedial Action Plan* (Overarching RAP) for all of Barangaroo was prepared by ERM and requires subsequent RAPs to accompany future applications for development.

Table 12 – Remediation Documentation Timeline

Title	Author	Date (and application if appropriate)
Overarching Remedial Action Plan for Barangaroo	ERM	1/6/2010 (submitted with Concept Plan)
Site Audit Report, Overarching Remedial Action Plan, Barangaroo	Environ	2/6/2010
Remedial Action Plan Other Remediation Works (South)(OWRS) Area	AECOM	2/6/2010 (submitted with MP10_0023 for Stage 1A Bulk Excavation and Basement Car Parking at Blocks 1, 2 and 3, Barangaroo South)
Human Health and Ecological Risk Assessment Addendum Other Remediation Works (South) Area, Barangaroo	AECOM	4/7/2011 (submitted with Mod 3 to MP10_0023)
Amended Remedial Action Plan Barangaroo - ORWS Area	AECOM	7/7/2011 (submitted with Mod 3 to MP10_0023, which was approved in April 2012)
Site Audit Report – Remedial Action Plan, ORWS, Barangaroo	Environ	14/7/2011 (deals with the 2/6/2010 OWRS RAP and the 7/7/2011 Amended ORWS RAP)
HHERA Harbour Hear Rejection System Inlet Area, Barangaroo South	AECOM	28/9/2012 (submitted with Mod 5 to MP10_0023 relating to the Harbour Hear Rejection System Inlet Area, which was approved in August 2013)
Addendum to Amended Remedial Action Plan Barangaroo – ORWS Area, Harbour Hear Rejection System Inlet Area, Barangaroo South	AECOM	
Remedial Action Plan: NSW EPA Declared Remediation Site 2112 and Block 4 (Stage 1B) Development Works.	AECOM	Submitted as part of SSD 5897-2013 for Block 4 remediation works, Stage 1B landforming works and installation of a groundwater retention wall system. Currently under
VMP Remediation Extent: VMP Remediation	AECOM	

Title	Author	Date (and application if appropriate)
Works Area (Parts of Barangaroo and Hickson Road).		assessment by Department of Planning and Environment.
VMP Remediation Works Human Health and Ecological Risk Assessment	AECOM	
Declaration Site (Development Works) Remediation Works Area Human Health and Ecological Risk Assessment	AECOM	

Barangaroo South (Blocks 1, 2 and 3)

The *Remedial Action Plan – Other Remediation Works (South) Area* (ORWS RAP) prepared by AECOM was submitted in support of the Bulk Excavation and Basement Car Parking Project Application and establishes the first phase of the endorsed remediation activities for Barangaroo, being for Blocks 1, 2 and 3 at Barangaroo South.

The remediation criteria for Barangaroo South (Blocks 1, 2, and 3) have been determined through the preparation of a *HHERA Addendum Other Remediation Works (South) Area*, prepared by AECOM. An *Amended Remedial Action Plan Barangaroo - ORWS Area* was prepared and submitted (accompanied by the *HHERA Addendum Other Remediation Works (South) Area*) as part of Modification 3 to the Bulk Excavation and Basement Car Parking Project Approval.

Modification 5 to the Bulk Excavation and Basement Car Parking Project Approval, relating to the harbour heat rejection system, was accompanied by supplementary remediation documentation including:

- HHERA Harbour Heat Rejection System Inlet Area, Barangaroo South; and
- Addendum to Amended Remedial Action Plan Barangaroo - ORWS Area.

Remediation works at Block 1, 2 and 3 are approved and mostly complete. This Modification does not require any re-investigation of contamination or remediation at Blocks 1, 2 and 3 (see **Appendix S** for AECOM letter).

EPA Declaration Area (Block 4)

Part of Barangaroo South (i.e. Block 4), as well as parts of Hickson Road and Barangaroo Central, are covered by a Declaration as a Remediation Site made by the EPA under the *Contaminated Land Management Act 1997* and are the subject of an approved Voluntary Management Proposal (VMP). Remediation of the EPA Declaration Area is the subject of a RAP and Human Health and Ecological Risk Assessment (HHERA) which defines the remediation required to remove the EPA Declaration and to make Block 4 suitable for proposed future uses (which comprise a basement underneath a mix of commercial, retail, high density residential and public open space land uses).

Importantly, a separate HHERA has been prepared which ensures the site is suitable for proposed future uses, over and above the remediation required to remove the EPA Declaration.

The following remediation documents have been submitted as part of State Significant Development Application SSD 5897-2013 for the Block 4 remediation works, Stage 1B landforming works and installation of a groundwater retention wall system:

- Remedial Action Plan: NSW EPA Declared Remediation Site 2112 and Block 4 (Stage 1B) Development Works.
- VMP Remediation Extent: VMP Remediation Works Area (Parts of Barangaroo and Hickson Road).

- VMP Remediation Works Human Health and Ecological Risk Assessment.
- Declaration Site (Development Works) Remediation Works Area Human Health and Ecological Risk Assessment.

SSD 5897-2013 is currently under assessment by the Department of Planning and Environment. If SSD 5897-2013 is approved then it would provide for remediation of Block 4 in a manner that will make the site suitable for the future intended uses for that Block under this Concept Plan Modification (see **Appendix X**).

State Significant Development Applications are currently in preparation for remediation of the Block 5 (Barangaroo Central) and Hickson Road parts of the EPA Declaration Area.

Landmark Hotel Building (Block Y)

A RAP is currently being prepared for the landmark hotel building (Block Y) in accordance with the requirements of the Overarching RAP, and will be submitted as part of a future State Significant Development Application for the works associated with the site.

This RAP will allow for the mix of uses, including the hotel (incorporating high density residential with minimal access to soil), commercial / retail (with minimal access to soil) and public open space and will be endorsed by the NSW EPA accredited site auditor prior to the commencement of any development works in this part of the site.

Based on the available soil and groundwater analytical results in this part of the Site and the extent of remedial works already proposed by the *VMP/Block 4 RAP* (AECOM, 2013c) remediation of the soils and/or groundwater in this area is not anticipated to be required.

Residual Land and the Southern Cove

It is noted that a RAP is yet to be prepared for the area west and south of the landmark hotel building, on land that intended to be used for public domain and the future Southern Cove. A RAP will be prepared for Lend Lease in accordance with the requirements of the Overarching RAP and be provided to the NSW EPA accredited site auditor for endorsement prior to the commencement of any development works in this part of the site. Based on the available soil and groundwater analytical results in this part of the site and the extent of remedial works already proposed by the *VMP/Block 4 RAP* (AECOM, 2013c) remediation of the soils and/or groundwater in this area is not anticipated to be required.

Site Auditor

All RAPs prepared to date have been reviewed by accredited Site Auditor and will ultimately be subject of a Site Audit Report and appropriate Site Audit Statement(s) by an accredited Site Auditor. The Site Auditor has concluded that the remediation and validation approach set out in the RAPs is generally appropriate and the implementation of the RAPs will ensure that the site can be made suitable for the proposed (or approved) future land uses.

The future works envisaged under the proposed Modification are generally consistent with what was contemplated with the RAPs prepared in relation to Stage 1A and 1B of Barangaroo South and can be appropriately managed by those documents without any amendments required to those documents.

9.19 Prescribed Airspace for Sydney Airport

An assessment of the proposal's potential impact on the prescribed airspace for Sydney Airport has been undertaken by AvLaw and a report detailing this assessment and findings is provided at **Appendix T**. AvLaw has identified the Sydney Airport prescribed airspace, the requirements for airspace envelopes and the relevant flight procedures. An assessment of the proposed modifications has then been carried out in light of these requirements and procedures.

Sydney Airport Airspace

The airspace for Sydney Airport is defined by a number of regulations including the *Airports (Protection of Airspace) Regulations 1996*, and *Civil Aviation Safety Regulations (CASR) Part 139 Aerodromes*, *Civil Aviation Safety Regulations Part 172 Air Traffic Service Providers*, *Civil Aviation Safety Regulations Part 173 Instrument Flight Procedure Design*, and *Manual of Standards (MOS) 173*. The airspace includes the space above any part of either an obstacle limitation surface (OLS) or procedure for air navigation services-aircraft operations surfaces (PANS-OPS).

Barangaroo is located in the outer horizontal surface of the OLS with a limit of 156 metres AHD. The Barangaroo site is under airspace that is administered by Airservices Australia and is deemed controlled airspace defined as the Sydney Control Zone. Barangaroo is also located within the non-circling PANS-OPS area.

There are some 43 prescribed instrument flight procedures published for Sydney Airport which cover all runways. These flight procedures are designed to allow for safe processing of air traffic into and from Sydney Airport using radio navigation and radar surveillance systems. The majority of these procedures are clear of the Barangaroo site, but some were identified to be potentially affected by the modified development. These potential impacts are assessed further below.

Instrument Flight Procedures Assessment

A number of building envelopes included in the proposed Modification will breach the OLS.

AvLaw has discussed the ability for infringements of the protective airspace subject to an assessment confirming that there will not be any degradation in safety or new hazards to aviation created during and post construction. Separate to the proposed modification, AvLaw has sought aviation acceptance on two occasions for the maximum heights for the landmark hotel building (H1) and commercial building C3 with Sydney Airport Corporation Limited (SACL). The application for the landmark hotel building seeks a maximum height of RL275m (333m for a crane during construction). The aviation acceptance for C3 seeks to allow for an increase in the crane height during construction from 256m to 286m.

Through detailed analyses and hazard identification workshops, the safety of some published arrivals and departures instrument flight procedures were potentially affected. The first procedure of concern was thought to require a revision of the descent step. A workshop revealed, however, that this procedure would only be affected to the same extent as the current situation in Sydney due to the height of Sydney Tower (formerly known as Centrepont Tower). As such, the maximum height of Barangaroo would not be considered a new hazard. Furthermore, this procedure is likely to be rarely used due to the impacts it would have on traffic flows at Sydney Airport.

As with all other potentially affected procedures, the maximum height proposed for Barangaroo as part of this Modification would not result in any change to the existing situation which is determined by the height of Sydney Tower.

Airservices Australia agreed with this finding in regard to the current application for the Hotel and C3, recommending:

*With respect to procedures promulgated by Airservices in accordance with ICAO PANS-OPS and Document 9905, at the maximum heights mentioned above, the tower crane operations will **not affect** any sector or circling altitude, nor any instrument approach or departure procedure at Sydney Airport."*

(emphasis added)

Shielding Assessment

Based on the above assessment and advice from Airservices Australia, the maximum height of 333m at Barangaroo is able to be supported and will not impact on the prescribed airspace for Sydney Airport or any relevant flight procedures in excess of the current situation.

AvLaw has then determined that providing no buildings or cranes are located further west than currently indicated in the proposed Modification and the maximum building height in this Modification is not altered, the above assessment of the instrument flight procedures may be applied to the entire of Barangaroo South. Although the Stage 1B Residential buildings will also penetrate the OLS, the principle of 'shielding' will come into effect.

Shielding is applied in instances where obstacles are in close proximity to other obstacles. If Stage 1B does not penetrate a conical downward slope of 10% from the top of H1, these buildings would not be considered an obstacle for air navigation purposes as they would be 'shielded' by the Hotel. As such, the Stage 1B residential buildings will have no impact on the prescribed airspace of Sydney Airport.

Hazard Identification

AvLaw has undertaken a hazard identification and risk assessment using the following methodology:

- A detailed analysis of all prescribed departure and arrival procedures for Sydney Airport and Sydney Harbour aerial tourism activities was required to consider safety or operational impact of the building height and crane operation. The analysis included the assessment of climb gradients for departures and missed approaches for arrivals.
- Independent modelling analysis of all the prescribed Departure and Approach Procedures (DAP) for Sydney was conducted by airspace and operations specialists.
- Hazard identification workshop to refine the independent analyses and to seek further technical input to Concept Plan (Mod 8) revised proposal to building and crane siting and activity height.

During the hazard identification workshop, discussion on the relationship of the maximum proposed height and the height of Sydney Tower was conducted. It was determined that the relevant procedures have been amended in the past to incorporate Sydney Tower which is the highest structure in the Sydney CBD. The height is rounded up to the nearest 100 feet delivering an obstruction height of 1100 feet. When a 1000 feet separation buffer is added, a maximum obstruction height of 2100 feet for aircraft separation aspects is required over the Sydney CBD.

The maximum height at Barangaroo will be associated with the crane used to construct H1 at 333m or 1092 feet (rounded to 1100 feet). With the addition of the 1000 feet separation buffer, the lowest useable safe level for aircraft operations over the Sydney CBD remains the same as the current situation. The

permanent situation of a maximum height of RL275m for H1 will be below the current useable safe level for aircrafts established by Sydney Tower.

In light of the above, it has been determined by AvLaw that there are no hazards which will affect the operations of Sydney Airport or Sydney Harbour aerial tourism activities. The requirement for separate approvals covering crane activity and any necessary lighting on the building or crane is a routine practice and is therefore not required to be addressed during this Concept Plan stage of the Barangaroo development. As such, proposed Concept Plan (Mod 8) is acceptable from a safety perspective in regard to Sydney Airports prescribed airspace.

9.20 Sydney Observatory Impacts

Lend Lease and UNSW Global has undertaken an analysis of potential sky view loss and resultant impacts resulting from Concept Plan (Mod 8) and the potential impact on the functioning of the Sydney Observatory astronomical sightlines (refer to **Appendix Y**). This analysis identifies the astronomical sightlines and functions of Sydney Observatory, and then provides an assessment of the Concept Plan (Mod 8) built form and the potential impact on these sightlines. The heritage significance of the Sydney Observatory has been addressed separately in Section 9.20.

Consultation with the Sydney Observatory has been undertaken to determine the most important astronomical sightlines and major concerns. These can be summarised as the sky view loss of key target objects in the western sky and the increase of light spill. The Sydney Observatory has concerns that these two elements would affect the operation and the functioning of the site as an astronomical observatory.

9.20.1 Functioning of Sydney Observatory

The Sydney Observatory was historically important to navigation, meteorology, timekeeping and star studies in the 19th and 20th Centuries. Astronomers worked and lived in the building until 1982. The Sydney Observatory no longer functions as an astronomical observatory. The Observatory is now associated with the Powerhouse Museum and provides astronomy education and public sky viewing.

Astronomical observations in NSW are now carried out at the Australian Astronomical Observatory at Coonabarabran, between the Central West and North West Slopes of regional NSW.

The location and context of the Sydney Observatory in the Sydney CBD is not ideal for making astronomical observations due to light glare, smog, pollution and sky view constraints. The location of the Observatory adjacent to the Sydney Harbour Bridge, in particular, is also a considerable constraint due to the amount of light spill from the Bridge.

The astronomical viewing times for the Sydney Observatory are defined as:

- Monday to Saturday (6 days) during school term, 7 days outside of school term, excluding Christmas, Boxing Day and Easter Friday;
- 1 February to 5 April - 8.15pm to 9.45pm;
- 6 April to 4 October - 6.15pm to 7.45pm, and 8.15pm to 9.45pm;
- 5 October to 31 November - 8.15pm to 9.45pm, and;
- 1 December to 31 January - 8.30pm to 10:00pm.

The number of viewing days, sessions and hours on an annual basis would total approximately 326 nights, 491 viewing sessions and 737 viewing hours.

9.20.2 Astronomical Sightlines

Important astronomical sightlines determined with Sydney Observatory include:

Sun, Moon and Planets:

- The Sun:
 - Winter solstice - 298° Azimuth⁶, and;
 - Summer solstice - 241° Azimuth.
- The Moon: +/- 5° further North or South of the Sun (i.e. between 236° and 303° Azimuth).
- The Solar System Planets: Less than 5° from the Sun at Sunset (i.e. between 236° and 303° Azimuth).

The Southern Cross and nearby objects (Jewel Box, Alf-Cen, Omega-Cen [NGC5139]):

- The Southern Cross (Crux), Jewel Box cluster (Kappa Crucis Cluster [NGC4755]), and Pointers (Alpha-Centauri and Beta-Centauri): From 225° up to 210° Azimuth.
- Omega-Centauri (NGC5139) globular cluster: Up to 298° Azimuth at 18° altitude.

Ring Nebula and Star Albireo:

- To the North the Ring Nebula (M57, a dead star) and Albireo (Beta Cygni, a multi-coloured twin star): From 303° Azimuth at 15° altitude.

Based on the above key target objects, there are two key astronomical view corridors:

1. Between 210° and 225° Azimuth at 18° altitude.
2. Between 236° and 303° Azimuth.

9.20.3 Light Spill

As outlined above, the positioning of the Sydney Observatory in the Sydney CBD is not ideal for astronomical observations due to the presence of smog, pollution and other sky view constraints such as light glare, in particular the Sydney Harbour Bridge.

Concept Plan (Mod 8) is not expected to result in an increased light spill effect on the Observatory given the existing surrounding environment. The principles for lighting are to minimise additional night glow through consistency with the requirements of AS4282 and the requirements of EMI-7 Green Star Light Pollution Credit. Further conceptual details on how light spill is to be minimised is provided in the Sky View Loss Report at **Appendix Y**. The lighting design will continue to be refined through the future stages of development, however, is not considered to pose an unacceptable impact.

9.20.4 Existing Constraints of the Sydney Observatory

Important to the assessment of sky view impacts are the existing contextual factors of the Sydney Observatory and the context of sky viewing. There are many factors that affect the ability to conduct these night viewing sessions, as summarised below and further outlined in **Appendix Y**.

⁶ 'Azimuth' is the angle measured from North to East

- The low altitude of the Observatory and proximity to Sydney Harbour results in increased light glare;
- It can be assumed (based on meteorological evidence) that there is a 50% chance of cloud cover to disrupt astronomical observations;
- Astronomical observations will be more greatly affected by smog, bushfire smoke, light spill and contrast when observing at low altitudes;
- Increase of air mass affecting observations at low altitudes (scintillation); and
- Viewing from the observatory is constrained due to current tree and building locations around Observatory Hill.

9.20.5 Sky View Assessment

Relationship of View Corridors to Concept Plan (Mod 8)

The Sky View Assessment has assessed the Concept Plan (Mod 8) built form against the two identified astronomical view corridors. It has been determined that the development will not have any impact on the view corridor to the Sun, Moon, Planets, Ring Nebula and Star Albireo as the landmark hotel building is south of 236° Azimuth.

Figure 29 illustrates the view corridor compared to the Barangaroo South development.

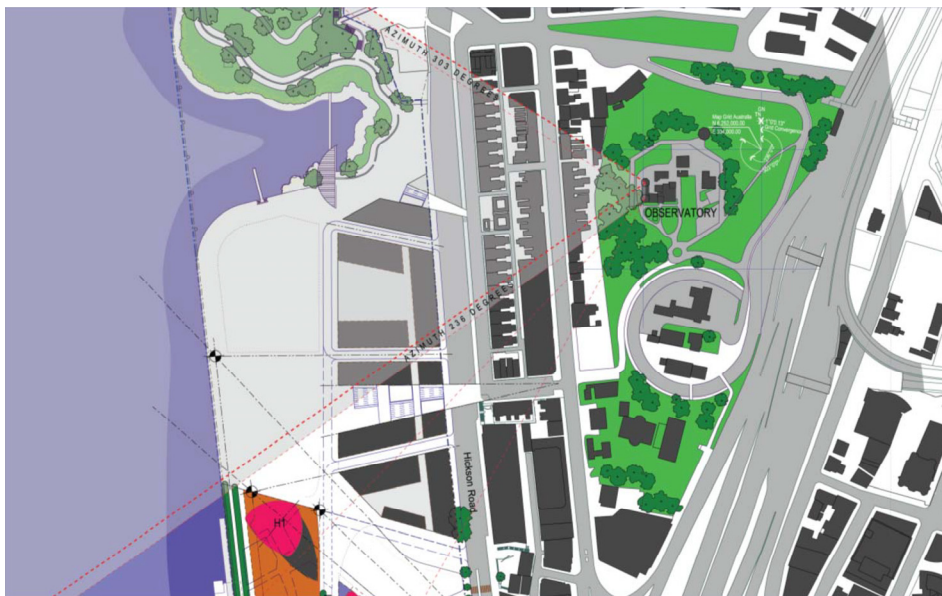


Figure 29 – Sun, Moon, Planets, Ring Nebula and Star Albireo view corridor

Source: Lend Lease and UNSW Global

Two buildings (R4A and R4B) will be located within the second view corridor (see **Figure 30**). Building R4A will affect views at 213.4° and 218° Azimuth between an altitude of 18° up to 26°. Building R4B will affect views at 210° and 212.5° Azimuth between an altitude of 18° up to 21°. The landmark hotel building and R5 will not be within the view corridor. The affected objects will include the Southern Cross, Jewel Box cluster, Omega-Centauri (NGC5139) globular cluster, and The Pointers.

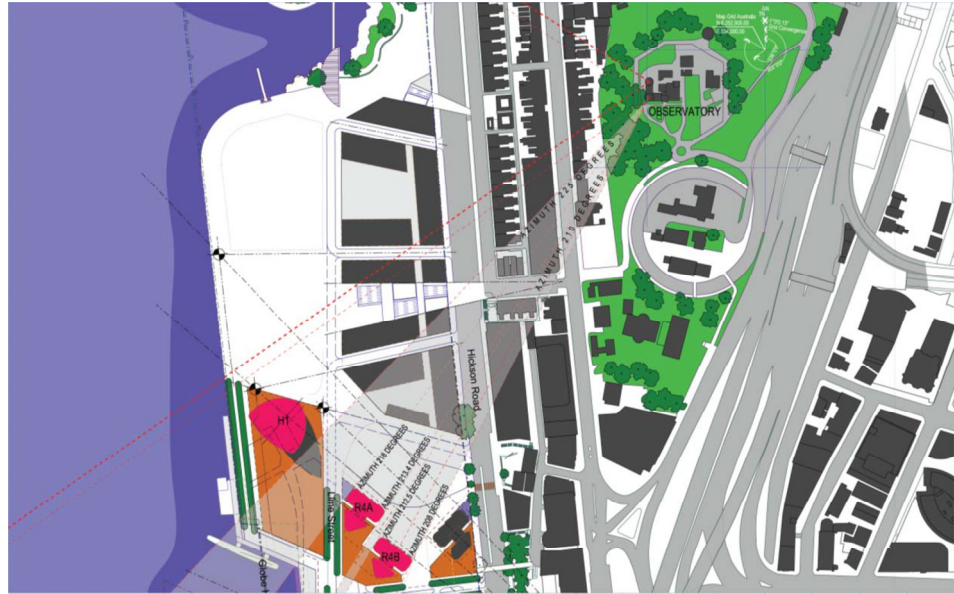


Figure 30 – Southern Cross and Nearby Objects view corridor

Source: Lend Lease and UNSW Global

Assessment of Affected Objects

A detailed analysis has determined that views of the four target objects are obstructed annually by the proposed Concept Plan (Mod 8) built form for a period of time during the night viewing hours between the end of August and October. A conservative assessment has been undertaken through not including any meteorology conditions such as cloud cover, smog and pollution. As such, a worst case scenario for each object is presented, not reflecting the likely real situation where meteorological conditions will already affects views.

The affected viewing times of each of the four target objects are outlined below. The current affected viewing times due to existing buildings and trees on Observatory Hill are described in **Appendix Y**.

Southern Cross

- Partial obstruction of any of the five stars of The Southern Cross due to the Concept Plan (Mod 8) buildings occurs between 4 August and 29 September.
- Approximate loss of viewing hours due to the Concept Plan (Mod 8) is 116 minutes per night for a total of 63 viewing nights out of 326 annual viewing nights.
- It is anticipated that a worse-case total of 46 viewing sessions (the 2nd Session between 25 August and 6 October, and the 1st Session of the week commencing 29 September) out of a total of 494 annual viewing sessions will occur where it will not be possible to view the full five stars of the Southern Cross.

Jewel Box Cluster

- Obstruction of the Jewel Box cluster due to the Concept Plan (Mod 8) buildings occurs between 11 August and 6 October.
- Approximate loss of viewing hours due to the Concept Plan (Mod 8) is 40 minutes per night for a total of 57 viewing nights out of 326 annual viewing nights.

- It is anticipated that there will be no viewing sessions where it will not be possible to view the Jewel Box cluster due to the Mod 8 Concept Plan (Mod 8) buildings locations if the target viewing schedule is arranged appropriately.

Omega-Centauri (NGC5139) globular cluster

- Obstruction of Omega-Centauri due to the Concept Plan (Mod 8) buildings occurs between 25 August and 6 October.
- Approximate loss of viewing hours due to the Concept Plan (Mod 8) is 105 minutes per night for a total of 51 viewing nights out of 326 annual viewing nights.
- It is anticipated that a worse-case total of 27 viewing sessions (the 2nd Session between 15 September and 6 October) out of a total of 494 annual viewing sessions will occur where it will not be possible to view Omega-Centauri due to the Concept Plan (Mod 8) buildings.

The Pointers (Alpha-Centauri and Beta-Centauri)

- Partial obstruction of both of The Pointers due to the Concept Plan (Mod 8) buildings occurs between 1 September and 6 October.
- Approximate loss of viewing hours due to the Concept Plan (Mod 8) is 64 minutes per night for a total of 39 viewing nights out of 326 annual viewing nights.
- It is anticipated that there will be no viewing sessions where it will not be possible to view The Pointers due to the Concept Plan (Mod 8) if the target viewing schedule is arranged appropriately.

Conclusions

Based on the existing conditions of the Sydney Observatory; the functioning of the Observatory; and the affected viewing times due to the Concept Plan (Mod 8) buildings, it has been determined that the potential impacts are minor and acceptable.

The greatest sky view impacts occur to views to The Southern Cross and Omega-Centauri for a proportion of established viewing times within a 9 week period. Other potential impacts to target objects can be appropriately mitigated by scheduling viewing times to focus on better located targets at certain time periods. In light of the number of viewing nights and minutes affected by Concept Plan (Mod 8) compared to the overall viewing opportunities and minutes, the impact is considered minor.

The likelihood of meteorological conditions and the location of Sydney Observatory with its existing contextual constraints further decreases the impacts of Concept Plan (Mod 8) as viewing times are already affected. As such, the proposed Concept Plan (Mod 8) built form is appropriate and any impacts are negligible on the functioning of the Sydney Observatory.

9.21 Heritage

9.21.1 European Heritage

A Statement of Heritage Impact (SoHI) has been prepared by TKD Architects to identify any potential impacts of the proposed modifications on the significance of identified heritage items (refer to **Appendix U**). An overview of the assessment and findings of the SoHI is provided below.

Heritage Context

TKD Architects have described the surrounding heritage context of Barangaroo South, identifying heritage items on the State Heritage Register, locally listed under the Sydney LEP 2012 and items listed on Section 170 Registers. The Barangaroo South site does not contain any items of heritage significance.

Assessment

Based on the significance of surrounding heritage items and in light of the proposed Modification, TKD Architects have determined there are two elements of the proposed modifications that may have potential heritage impacts:

- The relocation of buildings in Block 4 to the southern section of the block and associated increases in height; and
- The revised location and increased height of the hotel.

TKD Architects have individually assessed these two potential impacts against each of the surrounding heritage items. The findings of this assessment are provided in **Table 13**.

Table 13 – Assessment of heritage impact on surrounding heritage items

Heritage Item	Impact Assessment
Grafton Bond Store and Sandstone wall	Minimal impact due to the location of revised building footprints and envelopes relative to the Bond Store's site. The Bond Store is close to the approved International Towers (C3, C4 and C5). There will be no impacts on views to the building within the public realm including views available from the north and north west along Hickson Road.
Millers Point and Dawes Point Village Precinct	Minimal to no impact on the Precinct due to the distances between the Precinct and Barangaroo South. Any potential impacts will be ameliorated by the topography and built form of Miller's Point. Significant contributory buildings on Kent Street will be shielded by recent development along the western side of the street.
And	
Millers Point Conservation Area	Some impacts may occur on the setting of the Precinct when parts are viewed from vantage points on the western side of Millers Point and in views towards Millers and Dawes Point from the north and northwest.
MSB Stores Complex and MSB Stores Complex Building 1	Some impact may occur on the western setting of the MSB group. This is likely to be ameliorated to some extent by open space to the east of the proposed hotel. Existing views to the buildings along Hickson Road will not be impacted due to existing large scale developments to the north, south and east of the Complex.
Sydney Observatory, Upper Fort Street, Millers Point	The proposed modifications will have some impact on the setting of the Observatory, though it is noted impacts already exist by virtue of the existing approved buildings. This setting is also already affected to some extent by existing development in the northern section of Central Sydney, but the relative proximity of the Observatory to Barangaroo South and the increased scale and height of the proposed buildings will impact views to the Observatory from the south and south west or from the Observatory in the opposite direction. Existing mature trees on Observatory Hill in the vicinity of the Observatory will ameliorate some of these impacts. Other aspects of the Observatory's heritage significance will not be affected.
Walsh Bay Wharfs Precinct, Hickson Road Millers Point	Any potential impacts on the Walsh Bay Wharfs Precinct will be ameliorated by the location of Barangaroo South relative to the Precinct and the topography and character of development between the two locations.
Bureau of Meteorology and Fort Street Primary School site	Large scale development in the northern section of Central Sydney forms part of the setting of these items. The Modification will have little impact on these items due to the character of the existing setting and will not affect other aspects of the items heritage significance.
National Trust Centre	It is unlikely the Modification will have a significant impact on the National Trust Centre. The items eastern, southern and south western settings are already characterised by large office and apartment buildings in the northern section of Central Sydney.

Heritage Item	Impact Assessment
Observatory Park, and Sydney Observatory Group (including Messenger's Cottages for Fort Phillip and Sydney Observatory)	The northern component of the Modification will be visible from the western side of the Park. There will be some impact on the setting of the Park and other items. This impact will be partly ameliorated by mature trees in the Park and existing residential towers along Kent Street. Other aspects of heritage significance will not be adversely affected.

An assessment against the model questions provided in the NSW Heritage Office's publication *'Statements of Heritage Impacts'* has also been undertaken by TKD Architects. Those questions of relevance to the category 'New development adjacent to a heritage item' have been addressed. The findings of this assessment are largely consistent with the individual assessment undertaken for each surrounding item outlined in **Table 13**. TKD Architects has also provided an assessment of the proposed Modifications against the relevant heritage provisions of the Sydney LEP 2012 and the Sydney DCP 2012, despite these instruments not applying to the site.

Based on the extensive assessment undertaken of the proposal and its relationship with surrounding heritage items and conservation areas, TKD Architects have determined:

- There are no physical impacts on identified heritage items and conservation areas in the vicinity of the proposed Modification.
- Minimal to no impacts will occur to the Grafton Bond Store and Sandstone wall, Walsh Bay Wharfs Precinct, Bureau of Meteorology and Fort Street Primary School site and the National Trust Centre.
- Some impacts will occur to the setting of Millers Point and Dawes Point Village Precinct, Millers Point Conservation Area, MSB Stores Complex and MSB Stores Complex Building 1, Sydney Observatory, Upper Fort Street, Millers Point, Observatory Park, and Sydney Observatory Group (including Messenger's Cottages for Fort Phillip and Sydney Observatory).
- Impacts to most affected items will be lessened due to the distance of Barangaroo South from these items. These items include the Millers Point and Dawes Point Precinct, Sydney Observatory, and the Walsh Bay Precinct.
- A number of the affected items and the conservation areas are currently impacted by development in the northern section of Central Sydney. Impacts from the Modification are partly ameliorated by existing tall buildings, particularly those in Kent Street.
- Existing trees in Observatory Park will reduce the impact of the Modification to some extent and assist in minimising impacts of development at Barangaroo on views to the Observatory from northerly vantage points and from the from the Observatory to the south and south west given that they partially obscure these views.
- The existing curtilage around all heritage items and conservation areas is largely unaffected, allowing for the ongoing appreciation of heritage significance and interpretations of the place and individual items. The visual integrity and heritage significance of all items will be unaffected.
- The identified impacts can be minimised further by carefully designed massing and the detailed design of external components and façade treatments.

Whilst limited impacts have been identified on a number of items and conservation areas in the surrounding area, these are restricted to the setting of these items/areas and do not affect the visual integrity or interpretation of the items. This form of impact can be expected in a global city such as Sydney, and is largely evident in the existing situation with tall buildings located in the northern section of Central Sydney. On balance, considering the benefits of the Barangaroo South

development, its locational attributes in a global city, and its minimal effect on the interpretation and significance of surrounding heritage items, the Modification is acceptable from a heritage perspective.

9.21.2 Archaeology

Casey & Lowe has undertaken a review of the Aboriginal and Non-Aboriginal Archaeology assessments previously completed for Barangaroo South (refer to **Appendix V**). A summary of this review is provided further below.

Non-Indigenous Archaeology

A Non-Indigenous Archaeological Assessment was undertaken by Casey & Lowe as part of the approved Concept Plan. The Assessment identified that the archaeological issues were restricted to the eastern 70m of Barangaroo South and that no significant archaeological remains were considered likely to survive to the west of the 70m zone as this area was under water until wharfage was constructed in the 1960s.

In August 2010 Casey & Lowe undertook archaeological testing to refine the extent of archaeological potential within Barangaroo South. This testing refined the archaeology zone within Blocks 1 to 4 to be only within the eastern 40m zone.

During 2011 and 2012 Casey & Lowe undertook a detailed staged archaeological excavation of Blocks 2 and 3 as part of the Basement Car Parking Approval. All non-indigenous archaeological fieldwork has been completed for Blocks 2 and 3. Archaeological reporting and cataloguing is ongoing for this work and will be completed in 2014.

Casey & Lowe undertook a further assessment for non-indigenous archaeology within the area previously referred to as Block 4 (now Blocks 4A – B and Y) as part of the DECCW Remediation and Excavation Application. The report identified that while Australia's first gas works had potential to be of a high level of significance, the extensive contamination of the site meant that it was extremely difficult to recover the significance of this resource. The DECCW Remediation and Excavation Application sets out alternative remediation strategies to deal with the remediation based on the outcome of the testing proposed. Accordingly, the Non-Indigenous Archaeology Assessment makes recommendations that will be the subject of the outcome of the testing.

Casey & Lowe's overview of Aboriginal and Non-Aboriginal Archaeology provided at **Appendix V** supports the above conclusions, in particular that significant potential non-Aboriginal archaeology has been recorded; that recommendations in relation to potential archaeology within the remediation zone will be the subject of future testing; that there are no archaeological issues involved with the construction of the hotel; and that the archaeological impacts associated with the proposed towers on Block 4 have been assessed and approved as part of the current Concept Plan.

Indigenous Archaeology

An Aboriginal Cultural Heritage Assessment was prepared by Comber Consultants for Barangaroo South as part of Concept Plan (MOD 4). The Assessment identified that the significant archaeological resource was limited to segments of the original foreshore likely to survive in the eastern 10 to 30m of Blocks 2 and 3.

All Aboriginal excavation and reporting has now been completed for Blocks 2 and 3 as part of the Basement Car Parking Approval. No substantial Aboriginal remains were found given there was little surviving foreshore within the study area and what was found had been previously disturbed by quarrying.

No Aboriginal archaeological or cultural heritage was considered to be located within the area previously referred to as Block 4 (now Blocks 4A – B and Y) as part of Concept Plan (MOD 4). Notwithstanding this, additional reporting was undertaken as part of the State Significant Development Application for remediation and excavation of part of the EPA declared site. The additional reporting confirmed the previous Report's conclusion, finding that the subject site had no Aboriginal archaeological or cultural heritage potential and that no further Aboriginal archaeological assessment, excavation or testing is required.

Casey& Lowe's overview of Aboriginal and Non-Aboriginal Archaeology provided at **Appendix V** supports the above conclusions, in particular that potential Aboriginal archaeology has been recorded and the relevant areas are considered to have no further potential for Aboriginal archaeology.

9.22 Indicative Staging

The strategy for the development of Barangaroo South is to lodge a series of individual applications for site works, remediation, basement car parking, public domain and individual buildings as relevant. A number of applications have been lodged and approved within Barangaroo South (refer to **Section 2.0**). Future applications for separate components of the development at Barangaroo South will continue to be lodged on a staged basis.

The general staging arrangement for completion of development within Barangaroo South is as follows:

- R8, R9 and C4 – Late 2015;
- C3, C5, R1 and R7 – Early 2016;
- C2 – Mid 2016;
- Stage 1A Public Domain – Late 2016
- C1 – Early 2017;
- Pier Community Building – Late 2017;
- Globe Harbour, Remainder of Globe Street/Lime Street and Landmark Hotel Building – Late 2019;
- Hickson Park, R4A and R4B – Late 2020; and
- R5 – Early 2021.

The above timeframe is illustrated in the indicative staging plan at **Figure 31**. This strategy is indicative and subject to further refinement during the detailed design of each stage.

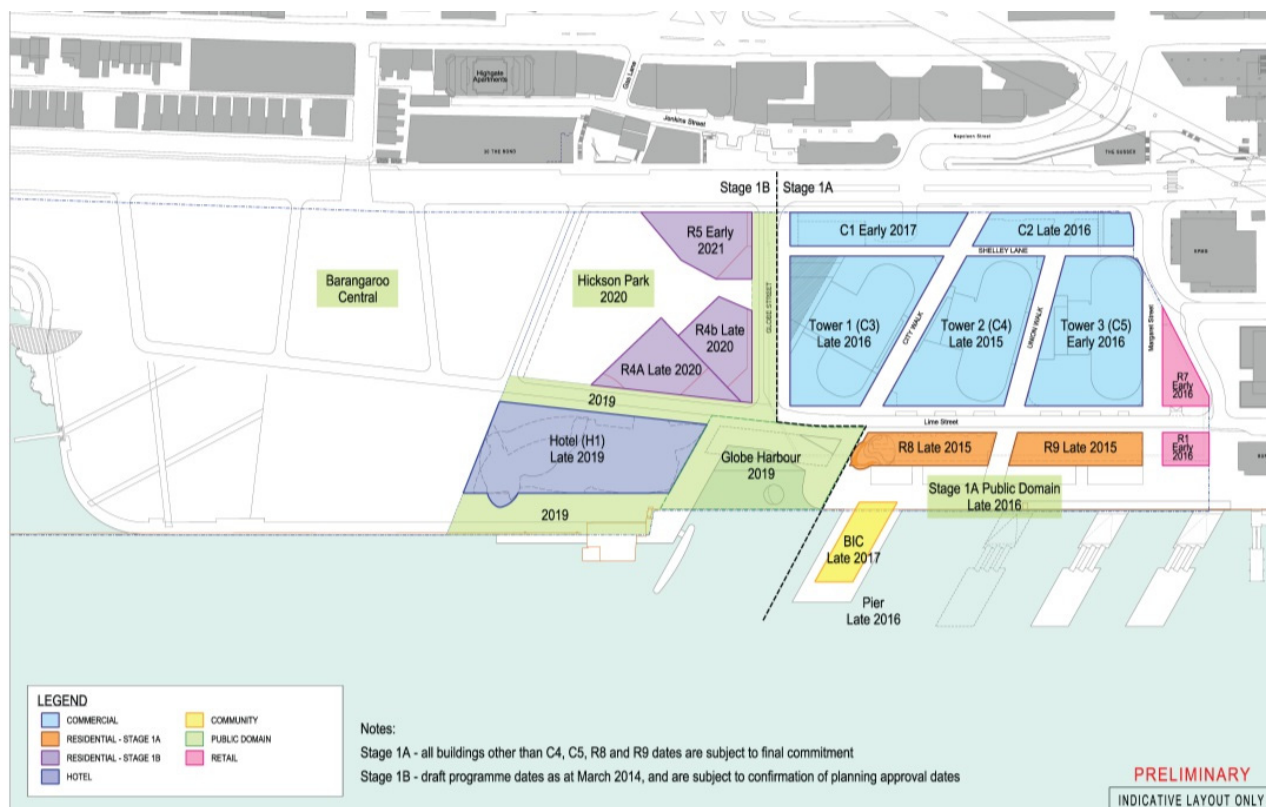


Figure 31 – Indicative staging plan of Barangaroo South

Source: Lend Lease Design

9.23 Public Benefits

The proposed Concept Plan (Mod 8) will offer significant public benefits both directly and indirectly to the wider community, the State of NSW and the Nation as a whole. The overall redevelopment of Barangaroo is a rare opportunity to renew a key area of Sydney's waterfront land.

Barangaroo South is the southern 7.5 hectares of the Barangaroo site which is destined to become the most advanced financial district and the first large scale, carbon neutral precinct in Australia. The mix of uses in Barangaroo South will offer a model for sustainable living, with high quality residential apartments, commercial floor space responsive to current market demands and extensive areas of public domain and open space. These uses will combine to create a vibrant and lively hub on the edge of Darling Harbour, directly enhancing the attractiveness of Sydney as a global destination.

The public benefits of the approved Concept Plan (Mod 7) generally remain unchanged. The extensive benefits outlined in the original assessment of the Concept Plan and subsequent modifications will still be realised. The increase in floor space proposed under the Modification is attributed to the landmark hotel building. The H1 Hotel building is intended to be operated by Crown Resorts as a world class six-star hotel resort. This building will also incorporate world-class VIP gaming facilities in addition to luxury apartments, first-class restaurants, bars, retail outlets, pool and spa facilities and conference rooms. The iconic building will be a new landmark for Sydney and will significantly contribute to the NSW and Sydney tourism economy.

There is expected to be flow on public benefits of this contribution to the tourism economy, with direct increases in employment and training opportunities. Other

less tangible benefits will also result from the establishment of a new iconic building on Sydney's waterfront which provides new definition to Sydney's CBD.

A summary of the benefits of the new iconic hotel development are provided below:

- Enable Sydney to capitalise on the growth in Asian tourism, particularly high net worth and luxury focused tourists from China;
- Assist the NSW Government in meeting its objective of making Barangaroo an active and vibrant destination, with both a daytime and at night-time economy;
- The operation of the hotel will result in the creation (direct and indirect) of approximately 2,300 and 3,300 additional jobs during construction and 1,250 direct jobs post construction;
- Employment and training opportunities to be established in Western Sydney and the inner city to offer staff targeted training. These training opportunities will include apprenticeship and schools-based traineeship programs and training for Indigenous Australians;
- Increasing the attractiveness of Sydney as a location for major domestic and international events;
- Attract high net worth tourists and encourage increased visitor spend both within the new development and in Sydney;
- Attract a greater share of international VIP gaming players;
- Contribute to the identified shortage in hotel accommodation in Sydney through directly increasing the number of available rooms;
- Establishment of a new iconic and defining building on Sydney's waterfront land, contributing to redefining the world perception of Sydney and offering the community a stronger sense of place and pride in Sydney as a global city.

The full range of public benefits to be provided through the delivery of the iconic hotel development will be outlined in any future application which seeks approval for the construction and operation of the hotel and any VIP gaming facilities. The preceding assessment has demonstrated that the Modification will generally continue to provide similar public benefits, except for the achievement of several additional benefits directly associated with the landmark hotel building.

10.0 Revised Statement of Commitments

The Statement of Commitments approved under the current Concept Plan (as modified) have been refined and amended based on the environmental assessment undertaken in the preparation of this Environmental Assessment Report. They provide a commitment by Lend Lease indicating the responsibilities and timing to implement measures to prevent potential environmental impacts that have been identified and to ensure that the project is environmentally, socially and economically sustainable.

The draft revised Statement of Commitments are provided at **Appendix X**.

11.0 Conclusion

Barangaroo South, by virtue of its size and access to infrastructure, presents a rare and a significant opportunity to create a new mixed use precinct in the Sydney CBD.

Concept Plan (Mod 8) is the result of a commitment by Lend Lease to deliver a high quality development. The proposed Modification is generally consistent with the approved Concept Plan as it:

- Provides the more focused and shaped Globe Harbour (also known as Southern Cove);
- Reconnects the western edge of the City with the waterfront;
- Creates a variety of experiences along the foreshore that contribute to the liveliness of the area, protects the scenic qualities of Sydney Harbour and differs from the more naturalistic parkland experiences to the north;
- Provides unobstructed public access around the entire perimeter of Globe Harbour and along the foreshore;
- Continues to provide a mix of uses to achieve a vibrant, lively and attractive mixed use precinct;
- Provides for a landmark hotel building which will be an icon in Sydney, recognisable for both its height and future built form which will be guided by the proposed Barangaroo South Design Guidelines;
- Preserves key pedestrian desire lines along the foreshore by retention of the Waterfront Promenade; and
- Provides high quality architecture and urban design underpinned by new guidelines which continues to promote the engagement of world-renowned architects and requirement to achieve design excellence.

To demonstrate the strong design commitment to deliver the development, several internationally and locally renowned and respected architects have been commissioned to design the urban structure, public domain and individual buildings on the site. The ideas and thoughts of those architects, the local community and relevant stakeholders have been considered during the review of the approved Concept Plan and many suggestions have been incorporated into the amendments that are now proposed.

Concept Plan (Mod 8) and supporting the Major Development SEPP amendment will:

- provide for the relocation of the landmark hotel from the water and facilitate the achievement of a landmark hotel through increased height and GFA allocation to the building;
- appropriately redistribute the built form on Block 4 to better respond to the relocation of the landmark hotel building;
- improve the mix of uses which will ensure the achievement of a daytime and night time economy at Barangaroo and provide significant economic benefits to Sydney and NSW;
- improve public amenity within Barangaroo South, maximising solar penetration to new public spaces through locating taller building heights to the south of the park and further west of the waterfront;
- enhance the public use of the waterfront with the shaped and focused Globe Harbour and the provision of the community focused building on the public pier promoting activation and enjoyment of the space;

- provide appropriately scaled retail spaces throughout Barangaroo South to ensure activation and a balanced provision of uses; and
- establish guideline based controls to provide certainty on the outcome of future buildings whilst allowing flexibility for appropriate design solutions.

Concept Plan (Mod 8), the Major Development SEPP amendment and the State and Regional SEPP amendment enable the ongoing development of Barangaroo South as a world class mixed use precinct on prime waterfront land. Concept Plan (Mod 8) seeks to satisfy the findings of the Barangaroo Review, particularly through the relocation of the landmark hotel building from the pier on the water onto land within Barangaroo South. The modified design presents an appropriate built form and public domain outcome for the Barangaroo South site.

The proposal will deliver a refined public domain and southern cove, both shaped to cater for special events. Concept Plan (Mod 8) increases the amount of open space on the waterfront, enhancing the usability of the space and the attraction of the waterfront for public uses. The community building, to be located on the public pier, will further reinforce the public ownership of the waterfront through providing 2,000m² of community floor space.

This Environmental Assessment Report has demonstrated that the Concept Plan, including the amendments proposed as part of this Modification, will remain consistent with the relevant provisions of the State Plan, the Sydney Metropolitan Strategy and the State Environmental Planning Policies (as amended) applying to the site.

Based on the preceding assessment within this Environmental Assessment Report and the accompanying technical reports, it has been determined that on balance there are limited environmental impacts beyond those originally assessed and determined to be acceptable in the approved Concept Plan (Mod 7). The potential environmental impacts associated with Concept Plan (Mod 8) are manageable and where necessary, appropriate mitigation measures can be provided in the detailed stages of development for Barangaroo South.

In light of these planning merits, it is recommended that the project be approved in accordance with the submitted plans and revised Statement of Commitments.