

***MODIFICATION REQUEST:
Barangaroo Concept Plan
Hickson Road, Sydney
(MP 06_0162 MOD 4)***

Modification of the approved Concept Plan, including:

- Reconfiguration of built form blocks and establishment of two new Blocks (X & Y).
- Establishment of a maximum building height of 41.5m for Block X and 170m for Block Y.
- Increase of 59,965 sqm gross floor area (GFA) within approved Blocks 1-4, comprising 45,188 sqm residential and 14,777 sqm commercial GFA.
- Removal of approved 8,500 sqm of passenger terminal GFA and increase in GFA for active and community uses.
- Increase in building height (RL) from 62m to 80m for Block 1.
- Increase in building height (RL) from 112m to 209m for Block 3.
- Increase in building height (RL) from 100m to 175m for Block 4.
- Enlargement of Concept Plan area into Sydney Harbour to accommodate landmark building (hotel) and pier (Block Y).
- Redistribution of land use mix and reconfiguration of public promenade, resulting in a reduction in width of the promenade from 60m to 27m.
- Revisions to built form controls and urban design principles.
- Provision of a cultural centre.

Director-General's
Environmental Assessment Report
Section 75W of the
Environmental Planning and Assessment Act 1979

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EXECUTIVE SUMMARY

Background and Proposal

This is a report on a Modification request/application under Section 75W of the EPA Act 1979, seeking approval to modify the approved Concept Plan for Barangaroo.

The Minister for Planning approved the Barangaroo Concept Plan (MP 06_0162) on 9 February 2007. The Concept Plan approval has been modified 3 times since that approval. The Concept Plan approval, as modified and currently in force, allows for:

1. A mixed use development involving a maximum of 489,500 sqm gross floor area (GFA), comprised of:
 - (a) a maximum of 83,575 sqm and a minimum of 58,245 sqm residential GFA;
 - (b) a maximum of 50,000 sqm GFA for tourist uses;
 - (c) a maximum of 39,000 sqm GFA for retail uses; and
 - (d) a minimum of 2,000 sqm GFA for community uses.
2. Approximately 11 hectares of new public open space/public domain, with a range of formal and informal open spaces serving separate recreational functions and including a 1.4km public foreshore promenade.
3. A maximum of 8,500 sqm GFA for a passenger terminal and a maximum of 3,000 sqm GFA for active uses that support the public domain within the public recreation zone.
4. Built form design principles, maximum building heights and GFA for each development block within the mixed use zone.
5. Public domain landscape concept, including parks, streets and pedestrian connections.
6. Alteration of the existing seawalls and creation of a partial new shoreline to the Harbour.

Note: The maximum residential GFA in 1(a) above has been derived from the table within B4(2) of the Concept Plan approval instrument (as modified).

The current Modification request responds to a requirement of the Concept Plan approval, which required provision of an enlarged Southern Cove. At the same time, the Modification request seeks to both redistribute building bulk (necessary in accommodating an enlarged waterbody) and increase the overall floor space through such redistribution. The proposal seeks to increase the total maximum GFA to 563,965 sqm, a total increase of 120,000 sqm or 31% over the original Concept Plan or 62,965 sqm or 13% compared to the most recent Modification. Of the additional 62,965sqm sought, approximately 87% is accommodated in two new building Blocks (X and Y), with the remaining 13% or 8,000sqm arising from redistributed floorspace within Barangaroo South building blocks.

The proposal also includes changes to the terms of approval to accommodate the increase in GFA and height, revised built form controls and a revised statement of commitments.

As a consequence of the proposed Modification, the total population of Barangaroo is predicted to be 23,598 – 21,123 of which will be workers and 2,475 will be residents.

The Capital Investment Value of the current Modification is \$500 million, to a total value of \$2 billion for the entire Barangaroo Concept Plan, an increase of 33%, if approved. The proposed maximum additional GFA could generate an additional 6,600 operational jobs and an additional 1,000 construction jobs.

An amendment to the Major Development SEPP is being pursued in parallel with consideration of the Concept Plan Modification, and is the subject of separate consideration.

Public Exhibition

The current Modification was referred to public agencies and placed on public exhibition from 11 August 2010 until 10 September 2010. A total of 224 public submissions (and two petitions presented to the Legislative Assembly) were received (including community groups) during the exhibition period and up to the writing of this report, and 10 submissions were received from public agencies. Key issues included:

- Loss of public open space.
- The built form.
- Traffic, public transport and car parking.
- Heritage.
- View loss.

- Overshadowing.
- Social impacts.
- Increased demand on utilities and services.
- Mix of uses.
- Amenity impacts.
- Economic considerations.
- Ecologically sustainable development.
- Consultation process.

Preferred Project Report (PPR)

On 12 November 2010 a PPR was submitted by the Proponent to address issues raised by the Department and public authorities, and to provide a response to the public submissions.

Key Issues

The Department considers the key environmental issues for the modification to be:

- urban design and built form (including height, bulk, scale and visual impact);
- new public pier and landmark hotel building in terms of appropriateness, location and potential impacts;
- amenity impacts such as view loss and overshadowing;
- contamination, remediation and waste management;
- water management and quality;
- transport and access;
- pedestrian permeability and public domain (including harbour foreshore access);
- environmental sustainability; and
- the public interest.

The Department has assessed the merits of the project and is satisfied that the impacts of the proposed Modification have been addressed via the Statement of Commitments and Modifications to the application recommended by the Department, particularly modifications to the envelopes sought for two of the building Blocks (X and Y), additional built form and public domain controls to ensure an appropriate pedestrian environment, full waterfront foreshore access, an appropriate relationship at street wall / podium level with the surrounding land uses and appropriate final building forms

The Department is also satisfied that the impacts of additional GFA and building height, in particular the bulk and scale, can be suitably mitigated and/or managed through the design excellence process required by the SEPP, and through the imposition of additional built form controls. The proposed redevelopment establishes a sound framework for the public domain and foreshore open space and access, and the provision of Ecologically Sustainable Development (ESD) outcomes on the site.

The Department is satisfied that the delivery of the Government's public transport objectives for Sydney and the CBD, as relevant to the Barangaroo-Wynyard precinct, coupled with the implementation of the Transport Management and Accessibility Plan for Barangaroo will be sufficient to absorb the travel demand created by the ongoing development of Barangaroo.

Despite the changes sought through the proposed Modification, the development remains a mixed use proposal, albeit there have been some changes to elements of the proposal and some new elements introduced (i.e. public pier and landmark hotel building). The modifications responds to market demands, the original concept plan approval and the design excellence process.

The Department considers the Minister can reasonably form the view that the modification request is within the scope of section 75W of the EP&A Act and is capable of being approved as a modification under section 75W of the EP&A Act.

On these grounds, and subject to amendments to ensure design excellence, appropriate built form and high pedestrian amenity outcomes for the site, the Department is satisfied that the current Modification is acceptable.

Council has recommended a number of modifications to the proposed concept plan amendment, which have been included in the recommended modifications where appropriate.

It is noted that approval of the Concept Plan Modification does not authorise the carrying out of development and future project applications for development within Barangaroo will be subject to full merit assessment.

Assessment Outcomes

The following key outcomes would be achieved by the proposed amendments to the approved Concept Plan and associated modifications recommended by this report:

- provides an enlarged Southern Cove in accordance with the requirements of the existing Concept Plan approval, with greater opportunities for enjoyment of the public domain and celebration of water;
- reconnection of the western edge of the City with the Harbour waterfront and adjoining city network;
- sustainable urban design outcomes and commitments;
- viable and useable commercial floor space, suitable for globally-oriented businesses;
- appropriate building separation to ensure an acceptable relationship between the towers and an appropriate level of amenity in terms of daylight, outlook, view sharing, ventilation, wind mitigation, privacy, and an appropriate scale to the street and public domain areas;
- an unobstructed publically accessible Harbour foreshore;
- a total length of foreshore access of approximately 2.2km, around 50% greater than the existing seawall edge;
- requirements to amend and reduce the building envelopes for Blocks X and Y to give greater certainty and an acceptable building outcome;
- requirements to ensure there is no conflict between pedestrians and vehicles along the 27m wide north-south promenade leading to King Street Wharf;
- appropriate activation of the ground level by providing for retailing uses in Barangaroo South, and appropriate uses such as increased residential uses and a prominent hotel which will add activity and surveillance to the public domain area, thereby making the precinct more attractive to visitors;
- built form controls so that the building massing within envelopes are appropriately articulated;
- controls to ensure appropriate public access around the new public pier; and
- a process to achieve and realise design excellence for future development of the site.

1. BACKGROUND

1.1 The Site

Barangaroo is located on the north western edge of the Sydney CBD. The site is bounded by the Sydney Harbour foreshore to the west and north, Hickson Road and Millers Point to the east and Kings Street Wharf / Cockle Bay / Darling Harbour to the south (see **Figure 1**). Barangaroo has a site area of 22 hectares and a 1.4 kilometre Harbour foreshore frontage. It is a flat and long site, being a reclaimed concrete slab, and is largely devoid of buildings.



Figure 1: Site Location

There are a number of structures on the site, including a disused office building, gate house and substation in the southern portion of the site, the Sydney Ports Corporation Harbour Control Tower and a Port Authority workshop building in the northeast part of the site. A temporary Cruise Passenger Terminal currently exists in the central part of the site.

The level of the site is approximately 2m above mid-tide level (2m AHD), and gently rises up by a further 1.5m to Hickson Road to the east, to 3.5m AHD. The site is largely reclaimed, with man-made fill in parts of the site, over a base of Hawkesbury Sandstone.

Barangaroo has been divided into three distinct redevelopment areas (from north to south) – the Headland Park, Barangaroo Central and Barangaroo South. The subject proposed Modification to the approved Concept Plan (MOD 4) relates only to Barangaroo South (see **Figure 2**).

Barangaroo South predominantly comprises an open concrete apron which is largely reclaimed over water and identified in the existing approved Concept Plan as Blocks 1-4, and the immediately adjacent public foreshore recreation area. Part of the proposal includes an extension beyond the western edge of the existing concrete apron and includes a north-west oriented structure into the existing waters of Darling Harbour to enable the proposed public pier (85m long) and landmark building, to be used as a hotel/serviced apartments.

The planning controls for the Barangaroo site are contained in Schedule 3 Part 12 of the Major Development SEPP 2005. Maximum building heights and gross floor area (GFA) restrictions are established for nominated development blocks within the B4 Mixed Use Zone, while there are no development standards applying to land within the RE1 Public Recreation Zone, other than an allowance for “active uses” complementary to the public domain.

The extent of Barangaroo South can be seen in **Figure 2**, while the approved Concept Plan Blocks and corresponding zones and development standards for Blocks 1-4 can be seen in **Figure 3**.



Figure 2: Barangaroo Precincts (Barangaroo South outlined in red)

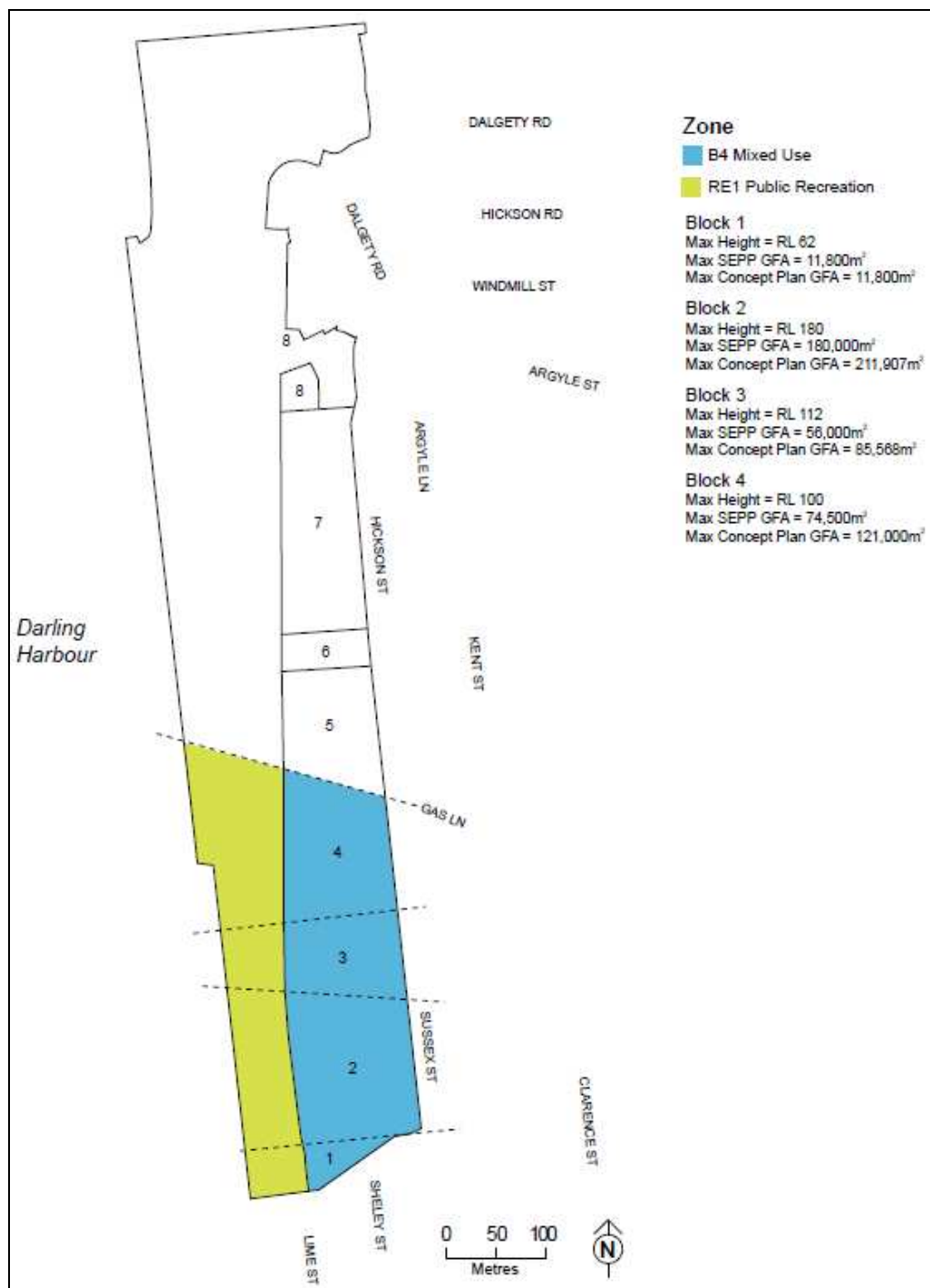


Figure 3: Zoning and Development Standards for Blocks 1-4 in Schedule 3 of the Major Development SEPP 2005

1.2 Planning History

Barangaroo Concept Plan MP 06_0162

The Minister for Planning approved the Barangaroo Concept Plan (MP 06_0162) on 9 February 2007. The Concept Plan approval allowed for:

- a mixed use development involving a maximum of 388,300 sqm of gross floor area (GFA) contained within 8 blocks on a total site area of 22 hectares;
- approximately 11 hectares of new public open space/public domain, including a 1.4km public foreshore promenade;
- a maximum of 8,500 sqm GFA for a passenger terminal and a maximum of 3,000 sqm GFA for

- active uses that support the public domain within the public recreation zone;
- built form design principles, maximum building heights and maximum GFA for each development block within the mixed use zone;
- alteration of the existing seawalls and creation of a partial new shoreline to the Harbour;
- retention of the existing Sydney Ports Corporation Port Safety Operations and Harbour Tower Control Operations including employee parking; and
- an underground car park beneath the northern headland, containing approximately 300 car parking spaces.

The Capital Investment Value of the approved Concept Plan was \$1.5 billion with up to 16,000 operational jobs. The approved layout is shown in **Figure 4** below.

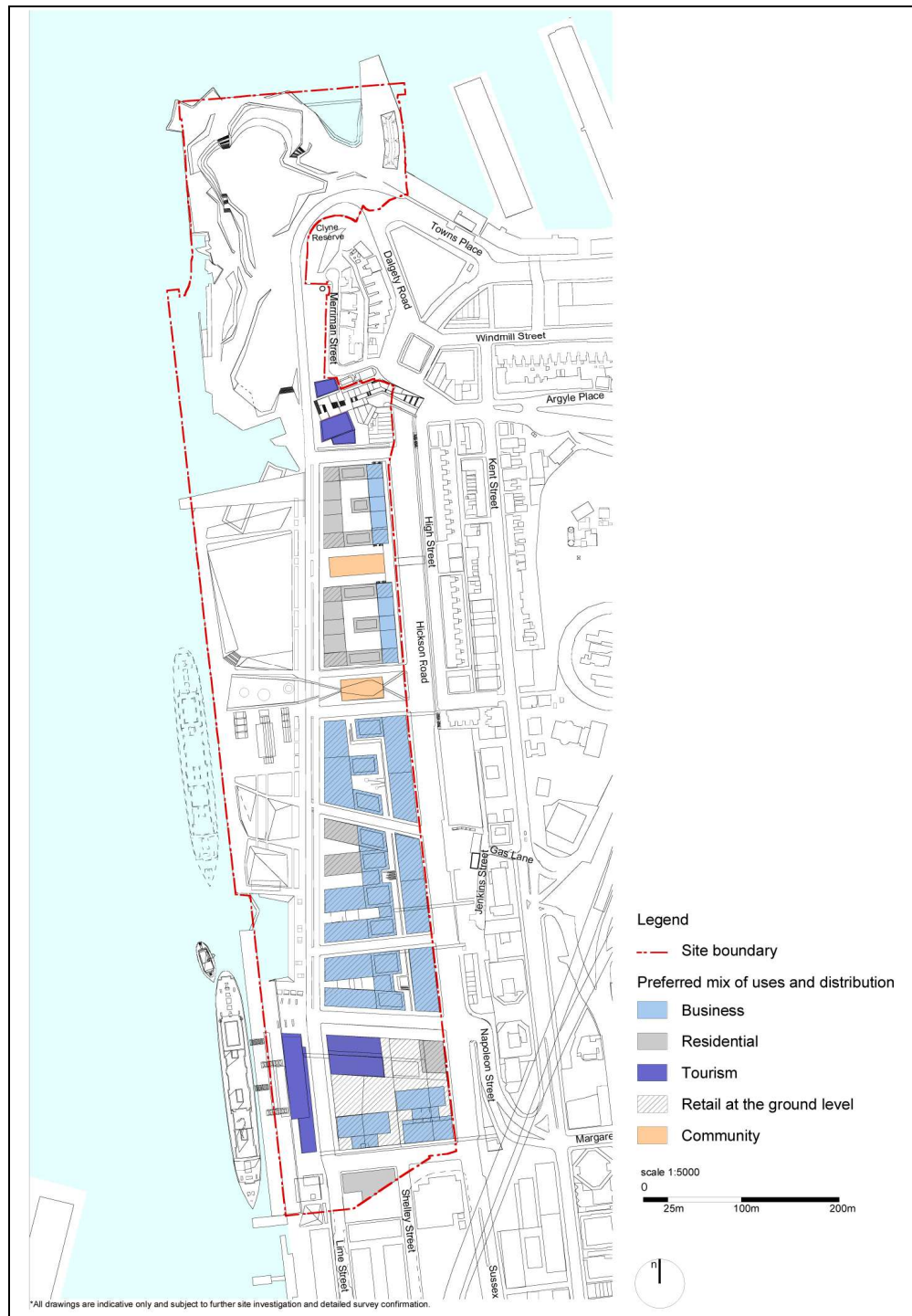


Figure 4: Original Concept Plan Layout and Land Use Matrix

It is important to note that Modifications B1 to B3 and C1 of the Concept Plan approval required design amendments to the approved scheme, including provision of a "naturalised" northern cove and headland, and enlargement of the Southern Cove. In terms of the Southern Cove, this included recognition of the need for consequential reconfiguration of the development blocks and redistribution of the Gross Floor Area (GFA) within the site (Modification C1 of the approval).

The subject Modification responds to the requirements in the Concept Plan approval relating to the Southern Cove, while proposing additional built form and public domain changes beyond reconfiguration of the approved floor space.

The following outlines the subsequent 3 Modification approvals to the Concept Plan:

MP 06_0162 MOD 1

On 25 September 2007 the Executive Director, Strategic Sites and Urban Renewal, as delegate of the Minister for Planning, approved a minor Modification to the approved Concept Plan to correct minor typographical errors and reword the design excellence terms. This Modification did not alter the maximum GFA or mix of uses.

MP 06_0162 MOD 2

On 16 February 2009, the Minister for Planning approved a second Modification to the Barangaroo Concept Plan to increase the GFA of commercial uses by 120,000 sqm in Blocks 2, 3, 4 and 5, to a total overall GFA of 438,000 sqm. The Modification increased the total maximum GFA for Barangaroo to 508,300 sqm (an increase of 120,000 sqm or 31% over the whole site).

MP 06_0162 MOD 3

On 11 November 2009, the Minister for Planning approved a third Modification to the Barangaroo Concept Plan, generally meeting the requirements of the Concept Plan approval relating to the northern headland and northern cove, with other changes as follows:

- the reinstatement of a headland at the northern end of the site with a naturalised shape and form including a build up of height and a landscaped connection to physically link Clyne Reserve to allow direct pedestrian access from Argyle Place;
- an enlargement of the northern cove to achieve a greater naturalised shape, form and edges (note this Modification and the one above were required modifications in the terms of the original Concept Plan, contained in Modification B1 and B2, and following recommendations made in the jury report regarding the original winning competition scheme);
- the consequential re-alignment of Globe Street to turn right towards Hickson Road immediately south of the enlarged cove, rather than continuing north around the headland;
- the consequential removal of development Block 8 and part of Block 7 and redistribution of the associated land use mix;
- the demolition of three heritage items being the Sandstone Seawall; the Sydney Ports Harbour Control Tower; and the MWS & DB Sewage Pumping Station; and
- amendments to the Statement of Commitments relating to the preparation of relevant plans and strategies so that work can commence in stages.

This Modification slightly reduced the approved Gross Floor Area and mix of uses, with a resulting total GFA of 501,000 sqm (comprising 489,500 sqm of mixed uses and 11,500 sqm for the passenger terminal and active uses in the open space zone).

2. PROPOSED MODIFICATION

2.1 Modification Description

2.1.1 Land to Which the Modification Applies

As previously mentioned, the Modification relates only to the southern portion of the site (known as 'Barangaroo South'), although the GFA restrictions and apportionment of uses has implications for the whole site. Generally, the northern alignment of Barangaroo South aligns with Gas Lane to the East. This is shown in the **Figure 5** below:

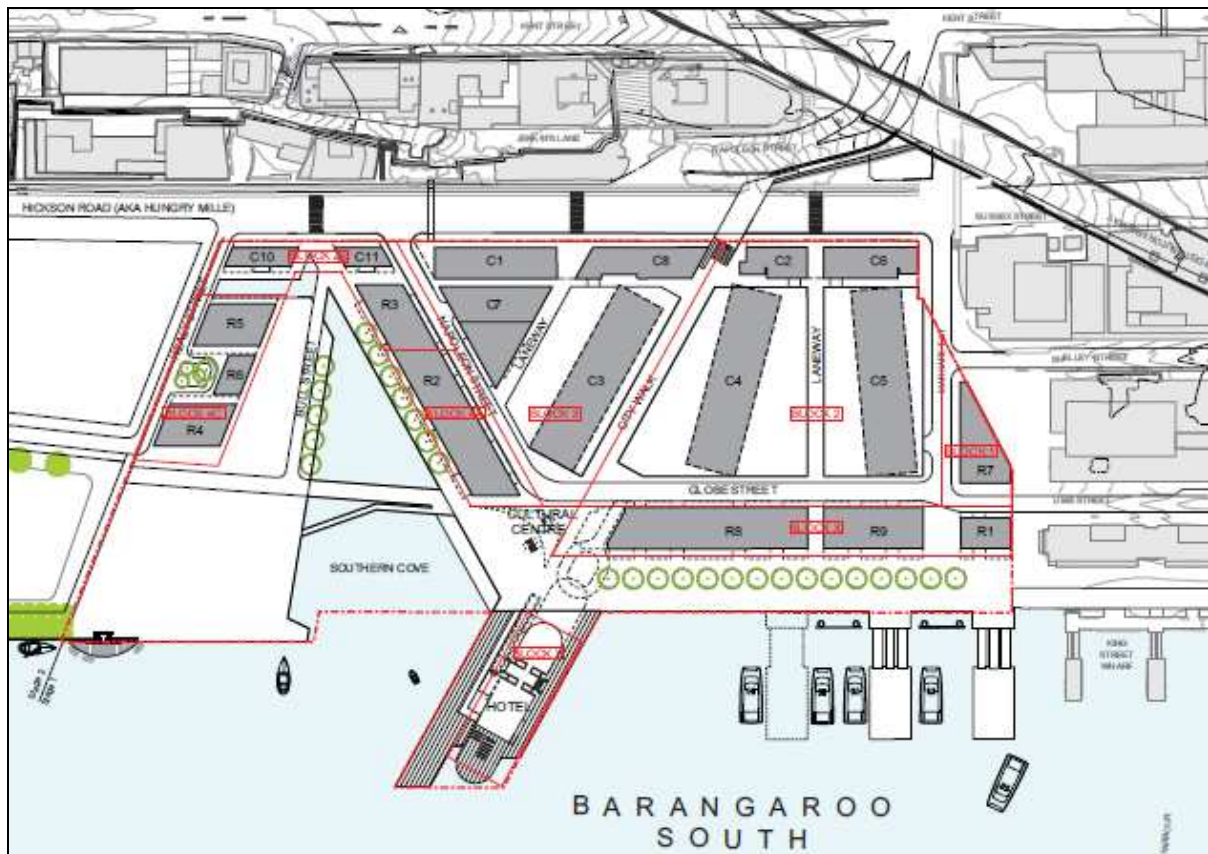


Figure 5: Land to which MOD 4 applies (surrounded by red dotted line)

2.1.2 Provisions in the Original Concept Plan approval requiring amendments

As previously mentioned, required modifications to the approved original Concept Plan were included in the terms of approval. This included requirements regarding a naturalised northern headland and northern cove, which was essentially given effect by the approval Modification 3, approved by the Minister for Planning in November 2009.

In addition to modifications to the Northern Headland and Northern Cove, modifications to the Concept Plan were required by Modifications B3 and C1 of the approval. These modification requirements (and those relating to the Northern Cove and Headland) arose from recommendations in the jury report on the winning competition scheme in 2006, pre-dating the lodgment of the original Concept Plan. The layout of the Southern Cove as shown on the approved original Concept Plan, and the modifications required by the terms of the approval, are shown (**Figure 6**) and quoted below:

"B3. Public Domain – Southern Cove

- (1) *Noting the jury report recommendations on the competition winning design scheme, further detailed design plans for the Southern Cove (north of Napoleon Street and opposite proposed "Bull Street") are to be provided to the Department prior to or concurrently with the lodgement of the first project application for major public domain works. These are to be to the written satisfaction of the Director General.*
- (2) *The plans identified in (1) are to address the following objectives:*
 - (a) *an enlarged water intrusion including a component east of the proposed "Globe Street";*
 - (b) *active edges around the enlarged waterbody, including appropriate ground floor uses in buildings to activate the foreshore area;*
 - (c) *achieving appropriate pedestrian linkages along the foreshore and connections to Hickson Road; and*
 - (d) *a theme which celebrates the water as an important part of the landscape element.*

C1. Built Form – Blocks 2, 3, 4 and 5

- (1) *Future project applications for buildings within Blocks 2,3,4 and 5 may accommodate a redistribution of the GFA (but not in excess of the total area) that is displaced by any encroachment of the enlarged Southern Cove identified in Modification B3 or built form controls identified in Modification B9."*

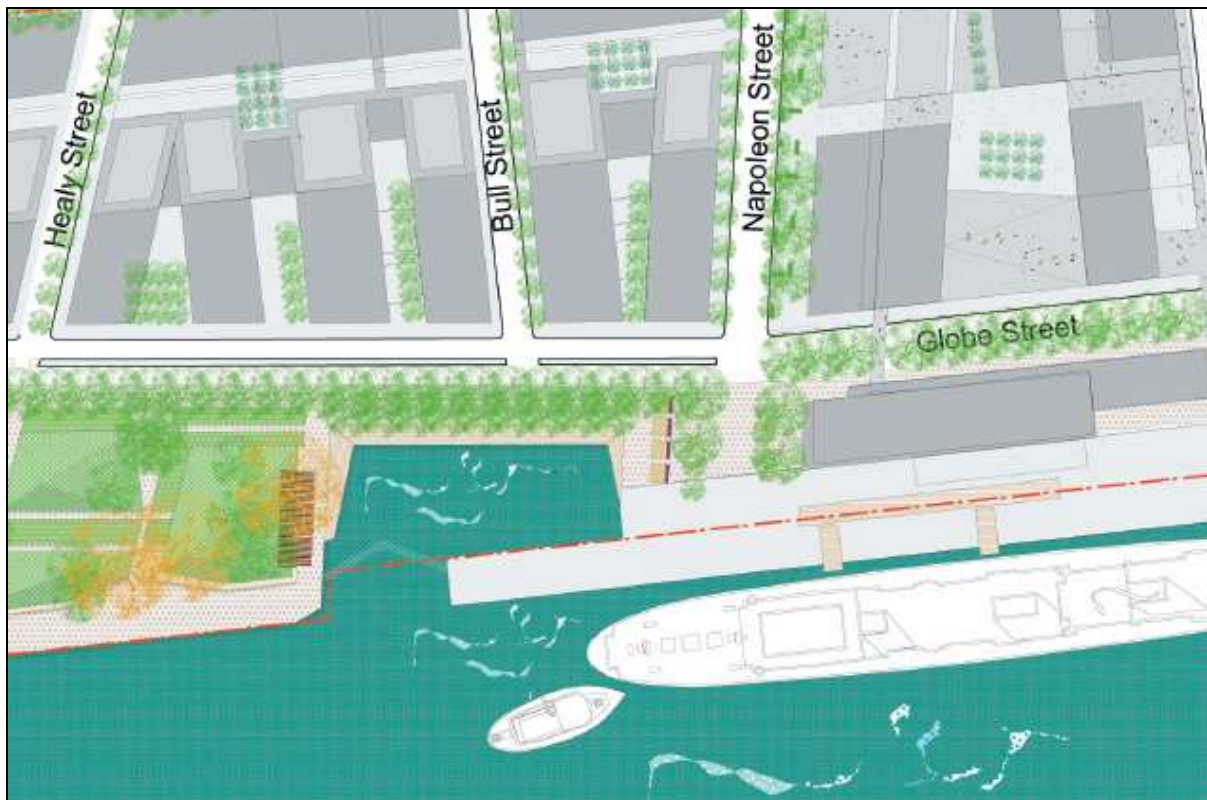


Figure 6: Southern Cove (as per original Concept Plan proposal)

The required enlargement of the Southern Cove necessitates a redesign of the southern area of the site, not just to make provision for the enlarged cove, but also to integrate the new enlarged waterbody into the overall public domain and built form which surrounds it (as outlined in Modification B3). The required enlargement of the Southern Cove water intrusion in conjunction with the planning and design requirements imposed by Modifications B3 and C1 also provided the opportunity to further reconsider the overall urban structure for the site, including the configuration of the internal street and public domain networks, arrangement and distribution of land uses and building across the Barangaroo South site. This opportunity has been taken by Lend Lease, as Proponent of the Modification request, and as developer of the Barangaroo South site.

2.1.3 Description of Concept Plan Modification

The Concept Plan Modification for Barangaroo South proposes:

- an increase in the total quantum of GFA within Barangaroo South Mixed Use Precinct from 430,275 sqm to 490,240 sqm. This is an additional 59,965 sqm, comprising an increase of 45,188 sqm in residential floor space and an increase of 14,777 sqm in commercial floor space;
- an overall increase in GFA of 62,965 sqm across the site (an increase of approximately 13%), comprising the 59,965 sqm of mixed uses and an additional 3,000 sqm relating to community and active uses;
- reallocation of the 8,500 sqm of passenger terminal GFA approved under the Concept Plan for community uses GFA, and an increase in total community uses GFA by 1,500 sqm such that there is a total of 10,000 sqm;
- an increase in total active uses allowed in the Public Recreation Zone by 1,500 sqm such that there is a total of 3,000 sqm;
- a redesign and reconfiguration of the public waterfront promenade (currently zoned RE1 Public Recreation Zone) including a reduction in the width of the public promenade from 60m to 27m;
- the reconfiguration of Blocks 1 to 4, and 3 new blocks within Block 4 being 4A, 4B and 4C;
- the establishment of two new Development Blocks within Barangaroo South, being:
 - **Block X** – a new predominantly residential development block located west of Globe Street with a maximum GFA of 18,908 sqm and a maximum building height of RL 41.5, and

- **Block Y** – the establishment of a new pier and landmark hotel building extending into the Harbour with a maximum GFA of 33,000sqm and a maximum building height of RL 170, bringing Block Y into the Barangaroo Concept Plan area;
- an increase in the maximum building height within the previously described Development Blocks 1, 3 and 4 as follows:
 - Block 1 from RL 62 to RL 80 (an increase of 18m);
 - Block 3 from RL 112 to RL 209 (an increase of 97m); and
 - Block 4 from RL 100 to a maximum of RL 175 in Block 4B (an increase of 75m), noting the approved Block 4 has been split into 3 separate Blocks;
- revisions to the approved Built Form Principles and Urban Design Controls reflecting the built form outcome being sought;
- a revised Statement of Commitments; and
- a redistribution of the approved land use mix within Barangaroo South.

Table 1 outlines the change in floor space between the current Concept Plan approval (as modified) and the Modification request:

Component Uses	Concept Plan (current, as previously modified) – GFA sqm	Proposed Modification (Mod 4) – GFA sqm	Change (sqm)
Residential (max)	83,575	128,763	+45,188
Tourist (max)	50,000	50,000	0
Retail (max)	39,000	39,000	0
Community (min)	2,000 (min)	12,000 (max)	+10,000
Passenger Terminal (max)	8,500	0	-8,500
"Active Uses" in Public Recreation Zone (max)	3,000	4,500	+1,500
Commercial (difference of above)	314,925	329,702	+14,777
Total	501,000	563,965	+62,965

Table 1: Changes in GFA Proposed in Concept Plan Modification

For the entire Barangaroo site, the Concept Plan Modification will result in:

- a 563,965 sqm mixed use development across the entire Barangaroo site, comprising:
 - a maximum of 514,465 sqm mixed uses GFA, including residential, commercial and retail uses which includes;
 - a maximum of 128,763 sqm of residential uses (a minimum of 99,763 sqm of which will be in Barangaroo South);
 - a maximum of 50,000 sqm of tourist uses GFA (including 33,000 sqm landmark hotel building);
 - a maximum of 39,000 sqm of retail uses;
 - a maximum of 4,500 sqm of active uses GFA (3,000 sqm of which will be in Barangaroo South); and
 - a maximum of 12,000 sqm of community uses GFA (10,000 sqm of which will be in Barangaroo South);
- 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;
- built form principles, maximum building heights and GFA for each development block within the mixed use zone;
- public domain landscape concept, including parks, streets and pedestrian connections (including the provision for potential pedestrian bridges over Hickson Road, although the Concept Plan Modification does not specifically seek their approval); and
- alteration of the existing seawalls and creation of a portion of the new shoreline to the Harbour.

The Concept Plan Modification (MOD 4) does not propose any amendments to Barangaroo Central or the Headland Park.

The proposed Southern Cove enlargement and landmark building location is shown in **Figures 7 and 8** below, while the revised Block layout is shown in **Figure 9**.



Figure 7: Proposed Southern Cove Enlargement



Figure 8: Artists Impression of Proposed Southern Cove

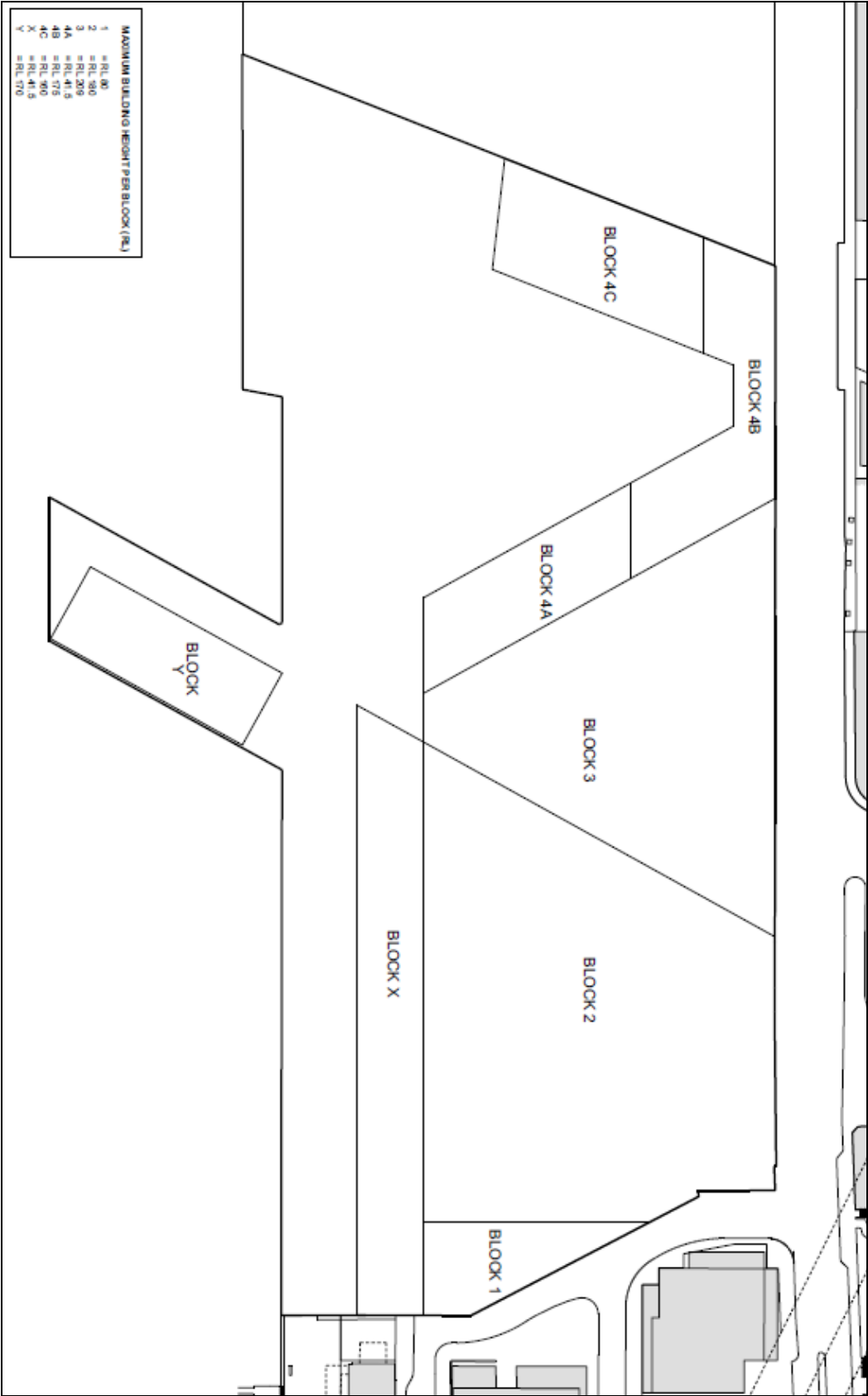


Figure 9: Proposed Revised Block Layout and Maximum Building Heights (Barangaroo South)

3. STATUTORY CONTEXT

3.1 Modification of the Minister's Approval

The proposal is a Modification Request under Section 75W of the EP&A Act 1979, to modify the Concept Plan approval for the Barangaroo development (MP 06_162), as previously modified.

The Concept Plan as originally approved and as approved following approval of MOD1, MOD 2, and MOD 3, is for a large mixed use development, including building envelopes and uses. The Modification request seeks to alter the configuration of blocks in Barangaroo South, in response to a requirement of the Concept Plan approval to enlarge the southern water cove, but also seeks other changes beyond the Concept Plan requirements allowing for redistribution of floor space. Particularly, the Modification request seeks to increase the total GFA by approximately 63,000sqm (or 13%), and the height of building envelopes. Two new development blocks are proposed (Blocks X and Y), with Block Y being a new block into Sydney Harbour and beyond the boundaries of the original Concept Plan approval. Additional land (the proposed pier into Sydney Harbour and part of Hickson Road) has been included as part of the Barangaroo State significant site by an amendment to Clause 12, Schedule 3 of the MD SEPP, which was considered as a separate process but in parallel with this modification application.

The Department is of the view that the application to modify the Concept Plan approval may be considered and approved as an application to modify under section 75W of the EP&A Act having regard to the following matters:

1. the modified Concept Plan will still be for a large mixed use development;
2. while the Modification request relates to "Barangaroo South" the changes must be considered in the context of the Concept Plan approval as a whole;
3. the additional GFA represents approximately 13% above the approved GFA;
4. the maximum GFA for the tourist uses at 50,000sqm remains unchanged, and the proposed new hotel is within that limit;
5. the modifications proposed were in part required by the terms of the Concept Plan approval, in particular, a requirement that the southern cove water body be substantially increased, while other terms of the Concept Plan approval allowed for aggregation of GFA across development blocks to accommodate the required change;
6. in contemplating and responding to the required change to the southern waterbody, the Proponent has sought additional GFA, height and building blocks beyond the current approval and site boundaries, but the essence of mixed use building envelopes, with public domain linkages to the surrounding area remains consistent with the approved Concept Plan;
7. the reclamation of the harbour land involved in the new Block Y (public pier) is generally equivalent to the increase in water into the site (the southern cove) required by the terms of the Concept Plan approval; and
8. while new issues arise from consideration of the Modification request (as often is the case for modifications), the issues are generally variants on issues considered during the assessment of the original Concept Plan application and previous modification applications.

Given all the above, the Department considers the Minister could reasonably form the view that the modification request is within the scope of section 75W of the EP&A Act and is capable of being approved as a modification under section 75W of the EP&A Act.

3.2 Major Development SEPP

The relevant development controls and land uses for the Barangaroo site are established under the Barangaroo State significant site listing in Part 12 of Schedule 3 of the MD SEPP. An amendment to the MD SEPP was considered as a separate process, but in parallel to consideration of the Concept Plan Modification. The SEPP amendment expands the footprint of the SSS to the west into part of the Harbour and to the east across part of Hickson Road to enable land uses consistent with the State and regional planning objectives for the site. The proposed SEPP provides the planning framework for future development on the site by amending the existing development controls and establishing the development controls for the expanded SSS.

The effect of the amendment is to:

- create new development blocks, redefine the existing development blocks, and reconfigure land uses in accordance with previous Concept Plan Modifications and the proposed Concept Plan Modification;

- redefine the delineation between urban development and public recreation;
- amend the site boundary to include the proposed public pier and parts of Hickson Road (to accommodate potential future pedestrian bridges);
- permit land uses for the proposed public pier that are not permitted in the Zone No W1 Maritime Waters under the *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005* and to permit land uses for the Hickson Road extension of the site that are not permitted in the Maritime and Transport Zone under *Sydney Local Environmental Plan 2005*.
- increase the maximum permissible GFA within the Barangaroo South development blocks to reflect previous Concept Plan Modifications and Lend Lease's proposed 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.

3.3 Objects of the EP&A Act

Decisions made under the EP&A Act must have regard to the objects of the Act, as set out in Section 5 of the Act. The relevant objects are:

- (a) *to encourage:*
 - (i) *the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,*
 - (ii) *the promotion and co-ordination of the orderly and economic use and development of land,*
 - (iii) *the protection, provision and co-ordination of communication and utility services,*
 - (iv) *the provision of land for public purposes,*
 - (v) *the provision and co-ordination of community services and facilities, and*
 - (vi) *the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and*
 - (vii) *ecologically sustainable development, and*
 - (viii) *the provision and maintenance of affordable housing, and*
- (b) *to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and*
- (c) *to provide increased opportunity for public involvement and participation in environmental planning and assessment.*

The Department has considered the objects of the EP&A Act and considers that the application is consistent with the relevant objects. The assessment of the application in relation to these relevant objects is provided throughout this report.

The EP&A Act adopts the definition of Ecologically Sustainable Development (ESD) found in the *Protection of the Environment Administration Act 1991*. Section 6(2) of that Act states that ESD requires the effective integration of economic and environmental considerations in decision-making processes and that ESD can be achieved through the implementation of:

- (a) *the precautionary principle - namely, 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. In the application of the precautionary principle, public and private decisions should be guided by:*
 - (i) *careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and*
 - (ii) *an assessment of the risk-weighted consequences of various options,*
- (b) *inter-generational equity—namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,*
- (c) *conservation of biological diversity and ecological integrity—namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,*
- (d) *improved valuation, pricing and incentive mechanisms—namely, that environmental factors should be included in the valuation of assets and services, such as:*

- (i) *polluter pays—that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,*
- (ii) *the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,*
- (iii) *environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.*

Detailed assessment of the economic and environmental issues associated with the project is provided in Section 5. On the basis of this assessment, the Department is satisfied that the proposal encourages ESD, in accordance with the objects of the EP&A Act.

3.4 Environmental Assessment Requirements

In accordance with section 75W(3) of the EP&A Act, the Director-General notified the Proponent of environmental assessment requirements with respect to the proposed Modification. The Department is satisfied that these requirements have been complied with.

4. CONSULTATION AND SUBMISSIONS

4.1 Exhibition

Under section 75X(2)(f) of the EP&A Act, the Director-General is required to make the Modification request publicly available. The Department:

- publicly exhibited it from 11 August 2010 until 10 September 2010 (30 days):
 - on the Department's website, and
 - at the Department's Information Centre and the City of Sydney offices;
- advertised the public exhibition in the Sydney Morning Herald and Daily Telegraph on 11 August 2010; and
- notified relevant landholders and relevant State and local government authorities in writing.

The Department received 234 submissions (and two petitions presented to the Legislative Assembly) during the exhibition of the Modification request and up to the writing of this report – 10 submissions from public authorities (including the City of Sydney and Leichhardt Council) and 224 submissions from the general public and special interest groups.

A summary of the issues raised in submissions is provided below.

4.2 Public Authority Submissions

A total of 10 submissions were received from public authorities.

The City of Sydney Council (City of Sydney)

The City of Sydney made a detailed submission on the Environmental Assessment and advised that it generally does not support the proposed Modification. However, Council did recommend wide-ranging changes which should be made in order to be acceptable to the City.

The following summarises the key issues raised:

1. The proposed building into Sydney Harbour is opposed (regardless of use);
2. ESD commitments should be strengthened;
3. Additional GFA is not supported due to lack of public transport and built form, including "absorbing" the overseas passenger terminal GFA;
4. Towers should taper as height increases;
5. Excessive height;
6. Affordable Housing provision should be increased;
7. Street widths should be increased and other changes made to streets and mid-block connections and the public domain;
8. Recommended procedural matters such as involvement of the Planning Assessment Commission, design excellence provisions;

9. Hickson Road inclusion in the SEPP opposed; and
10. Changes to remediation definitions opposed.

The following expands on the above points, in terms of summarising the main reasons for the issues/objection:

The proposed building into Sydney Harbour is opposed (regardless of use)

- Weakens the “distinctive western edge”.
- Microclimate affects and overshadowing on the waterfront promenade.
- Vehicular access to the hotel will conflict with pedestrians.
- An office tower (e.g. C3) can be the “landmark” building, and may even be 11m higher.

ESD commitments should be strengthened

- Seeks commitments regarding renewable energy systems, waste water and water collection.
- Suggests a basement of a building be dedicated as a district hub or base for green infrastructure.
- Additional GFA should not be supported due to lack of public transport and built form, including “absorbing” the overseas passenger terminal GFA.
- As identified by the Planning Assessment Commission (PAC) in Modification 2, the public transport solution is vital to additional GFA in Mod 2, which is now being increased again.
- Abandonment of CBD Metro and lack of commitment to the pedestrian link to Wynyard exposes a “public transport deficit” with the existing GFA, let alone an expansion.
- The FSR of two blocks exceeds the maximum FSR in the City.
- The overseas passenger terminal should be retained on the Barangaroo site (e.g. the Central part), either instead of, or in addition to, White Bay.

Towers should taper as height increases

- Larger floorplates should be on lower levels, with better bulk distribution.
- Buildings should taper to large floorplates in the mid-rise of buildings and smaller floorplates in the premium high rise section.
- Financial services tenants likely to be more diversified and not need large floorplates.
- All towers above 120m should have a maximum floorplate of 1,400 sqm and a maximum length of 50m.
- Towers between RL 60 and RL 120 should have a maximum length of 60m, with a maximum length of 80m below RL 60.

Excessive height

- Towers should rise upwards from south to north and from west to east.
- Changes in height would reduce overshadowing of the waterfront promenade.
- Residential Towers R4 and R5 are too tall and are better suited to a premium hotel and should not be higher than 100m.
- The “waterfront” or western most residential buildings should be reduced in height to RL 25, with a setback level to RL 28 (although 25% of the length could be to RL 35), which would improve wind impacts and the pedestrian relationship.
- The podiums of 3 commercial buildings are too low and should be increased by at least 1 floor to RL 25.
- The commercial towers should be reduced in height. C5 should be RL 140m, C4 should be RL 180, C3 should be RL 209, and roof levels 7m lower than these RLs.
- C7 should be reduced to RL 33.2 to match C1, and to help view corridors.

Affordable Housing provision should be increased

- “Up to 2.3%” is too low, too vague and unacceptable.
- Building C1 should be for affordable housing.
- Affordable housing should be at least 10% and up to 20%.
- Public land represents an opportunity to provide for significant affordable housing.

Street widths should be increased and other changes made to streets and mid-block connections and the public domain

- Streets and lanes should not be less than the minimum elsewhere in the City, particularly as the density of 2 blocks is greater than allowed in the CBD.
- Globe Street, Napoleon Street, City Walk and Shelley Lane should be widened.
- Globe Street and Margaret Street West should be realigned, which would also improve buildings in Blocks 2 and 3.
- There should be no parking below streets and promenades, as this will affect future maintenance and upgrading of public spaces.
- Any works under roads should be limited to "tunnel links" between car parks.
- Openness and accessibility of mid-block connections needs to be increased.
- The east-west pedestrian links through Block 2 and 3 should be extended to link Hickson Road to the waterfront.
- Midblock connections should be publicly accessible at all times and open to the sky. They should not be corporate foyers.
- A small square should be included at the west of Hickson Road where City Walk commences;
- A timber boardwalk 6m wide should be provided in line with the waterfront.
- Street trees should be provided.

Recommended procedural matters such as staging if approved, involvement of the Planning Assessment Commission, and design excellence provisions and other matters

- If approved, the Concept Plan should be staged, with Stage 1 being the southern half of Barangaroo South and stage 2 being the northern half.
- The PAC should review the Director-General's report.
- Given real or perceived conflicts of interest, the Minister should consider PAC being the determining authority.
- DoP should work with the City regarding the required design changes recommended by the City, and the City should assess future Project Applications, with guidance from a joint Taskforce.
- Richard Rogers should be engaged throughout the project for design integrity.
- Oppose extra pedestrian bridges in Hickson Road.
- Oppose changes to the remediation definitions.

The City submission on the EA includes 35 specific recommendations which arise directly or indirectly from the main issues identified above, a number of which contain multiple sub-recommendations.

The City also undertook a visual analysis in a supplementary submission dated 24 September 2010, to accompany their main submission. That analysis contended the view analysis undertaken by the Proponent was inaccurate, did not compare "before and after" and did not include enough vantage points, to which the Proponent responded as part of their PPR.

It is worth noting the submission by the City also conceded the proposed Modification contained a number of positive elements, in particular:

- a mixed use commercial office precinct, with an internationally focussed financial centre;
- extensive ground level retailing;
- an increased residential proportion;
- continuous waterfront promenades exclusive of service roads;
- lower waterfront buildings;
- weir/Southern Cove adds interest;
- acknowledgment of the quality of the architectural team (and a request they be retained throughout the project for integrity);
- an appropriate and sufficient increase in community uses floor space allocation (although the type/range of uses should be improved);
- inclusion of "edge" buildings on the western side of Globe Street (although it was submitted they are too high);
- a prestige hotel (although its location in the Harbour is opposed);
- the proposed location of the three commercial towers (although there is concern with bulk);

- the proposed revised built form principles are generally acceptable (with some qualifications or suggested changes); and
- a development envelope approach, with scope for creativity in final buildings (although it was suggested the envelopes should be "tighter" for greater certainty).

City of Sydney Preferred Project Report Submission

The City of Sydney made a further detailed submission on 3 December 2010 on the Preferred Project Report. That submission made the following summarised comments:

- The PPR has not addressed many of the concerns raised in Council's earlier submission(s).
- The main criticisms of lack of public transport commitment, the inappropriate hotel development and need for building modulation have been ignored.
- The modifications made are minor, some of which improve the Concept Plan and some create additional negative impacts, such as the increased width of tower blocks, reducing solar penetration and impacting on views to Hickson Road.
- The PPR increases the bulk of tower blocks, when the City of Sydney submissions argue against their bulk.
- The lodgement of the recent Project Application for commercial building C4 demonstrates that buildings are likely to fill up proposed building envelopes with little modulation.
- Lack of time to make further comments, including to assess the further visual analysis by the Proponent by an independent expert, and more recent wind analysis.
- Despite the further visual analysis, the City retains its opposition to the bulk of the proposal and impacts on CBD skyline and public domain.
- External advice was commissioned by the City on wind impacts, and the wind impacts assessment by the Proponent on the PPR, which identifies alleged inaccuracies, suggests wind impacts were underestimated and recommends further investigation along the foreshore promenade, where wind impacts are expected to be higher (and impacts should not be left to Project Application stage).
- The Concept Plan, as modified in the PPR, should not be approved.

The Council did concede some positive amendments were made in the PPR, including:

- widening of Shelley Street from 4m to 6m;
- removal of "Galleria" spaces and replacement with public pedestrian lanes; and
- amendment to Built Form Principles.

The Council's submission included 4 appendices, including: a Response to the Proponent's "Response to Agency Submissions"; a peer review of the wind impacts assessment report by the Proponent; a comparison of views between the proposed scheme and the City Council's preferred alternative scheme; and correspondence from the Council to the Department regarding an extension of time.

Department of Environment, Climate Change and Water (DECCW)

DECCW has made the following comments on the proposed Modification.

- The preparation of an overarching and strategic acoustic design strategy is highly desirable.
- DECCW expects detailed acoustic studies to accompany each project application.
- An Environmental Protection License (EPL) may be required for any cogeneration or tri-generation plant or power plants servicing building clusters.
- A number of activities on the site will be scheduled activities under the POEO Act will require an EPL. DECCW understands that the Barangaroo Delivery Authority will apply for an overarching EPL for the Barangaroo site.

Department of Industry and Investment (I&I)

Whilst the Department of Industry and Investment has raised no objection to the proposed Modification, the following comments have been made;

- I&I recommends mitigation measures identified in Section 7.2.1 of the Marine Ecology, Water Quality and Contaminated Sediment Impact Assessment should be implemented;

- I&I questions whether the proposed piling for the landmark hotel constitutes reclamation, which is an activity prohibited under the Sydney Harbour REP;
- The redevelopment of Barangaroo presents a unique opportunity to improve currently degraded and reclaimed aquatic and riparian habitat at this location. Whilst environmentally friendly seawall design principles are more practically implemented in the northern Headland and Cove, some features to improve aquatic biodiversity around the Southern Cove should be incorporated such as "pots"; and
- I&I requests that access to the waterfront for recreational fishing is permitted across the Barangaroo site.

Leichhardt Council

Leichhardt Council has raised the following issues with the proposed Modification.

- The Concept Plan now differs from the award winning design approved in 2007 and this is not supported;
- The removal of the cruise passenger terminal and its planned relocation to White Bay is strongly opposed. The terminal should remain at Barangaroo;
- The proposal includes two east-west pedestrian connections through lobby spaces of buildings as well as the north-south mid block connections. All pedestrian networks should be open to the sky and open 24 hours (not pass through lobby spaces of buildings);
- The proposed light rail will be critical to any redevelopment of this site;
- There is potential conflict between vehicles and pedestrians along the foreshore walk and proposed vehicle drop of circulation;
- The height and floor plates of the commercial buildings are significantly larger than existing CBD buildings. The bulk and scale of the buildings is excessive;
- The proposed design results in the overshadowing of buildings and public spaces within Pyrmont, Darling Harbour and parts of the city. These spaces should not be overshadowed;
- The proposed pier with the private hotel is strongly opposed. Council does not support the privatisation of the Harbour;
- The hotel on the pier will result in increased vehicle and pedestrian conflict with taxis, coaches, car drop offs and other vehicles;
- The hotel will result in an adverse dominant visual impact; and
- Further consideration needs to be given to the retention and enhancement of all existing significant views and need for clear views along the foreshore walk.

NSW Maritime

Whilst not objecting to the proposal, NSW Maritime made the following comments on the proposed Modification.

- Road and intersection works at Rozelle and White Bay resulting from the relocation of the Cruise Passenger Terminal to White Bay should be at no cost to NSW Maritime.
- A road and traffic plan for access to the Glebe Island/White Bay precinct is required.
- Active uses are supported. Office space and amenities for ferry staff at the Barangaroo ferry terminal will be required.
- The Barangaroo ferry wharves should be moved north to avoid encroachment on the King Street Wharf water area.
- The cost of the ferry wharves should be included as part of the public transport infrastructure for the development.
- NSW Maritime should be consulted in the design of the ferry terminal.
- The reduction in the width of the promenade will reduce public access and interaction with the Harbour and will be a loss of public amenity.

- The new Block Y which extends into the Harbour has the potential to increase navigation risks to the Southern end of Darling Harbour. Agreement needs to be reached with NSW Maritime in relation to navigation issues and commercial land tenure arrangements over Sydney Harbour.
- All faces of the wharf structure should be available for berthing large visiting vessels such as tall ships and super yachts.

Transport NSW

Transport NSW has made the following comments on the proposed Modification.

- Construction aspects for the delivery of the Barangaroo development need to be addressed through a Construction Traffic Management Plan and a Vehicle Management Plan.
- The size of construction vehicles accessing the site should be size limited to rigid single-tray trucks for spoil removal. No stop/slow traffic control on adjacent roads should be permitted for any reason during construction, including site access and egress, between 7am to 9am and 4pm to 7pm, Monday to Friday.
- Construction vehicle movements must be staged and coordinated to prevent trucks circling CBD streets whilst awaiting access to the site. During construction, there should be holding areas outside the CBD on the fringes or sufficient space within the site to store trucks and heavy vehicles that are associated with construction of the site.
- To minimise impacts on public transport, trucks associated with Barangaroo construction should not be permitted to use York Street and Clarence Street to access or egress the development site between 6am to 10am and 2pm to 8pm Monday to Friday. This should be addressed in the Vehicle Management Plan and Construction Traffic Management Plan.
- Traffic signal design plans of proposed new or modified signalised intersections will need to be submitted to and approved by the RTA prior to modifications of intersections commencing and prior to intersections being used for access to the development site.
- The EA indicates that the foreshore promenade will be a combined pedestrian and cycle path, however the Streetscape and Public Domain report indicates that the promenade will be pedestrian only. TNSW recommends the promenade be open to both cyclists and pedestrians.
- There is likely to be significant conflict between pedestrian and cyclists unless adequate management measures are introduced. It is therefore crucial that the EA address pedestrian and cycle traffic management in detail.
- TNSW notes the commitment in the revised TMAP for end of trip facilities for cyclists and pedestrians. TNSW requests that the TMAP identify the quantum and location of bicycle parking facilities for visitors. Such facilities should be prioritised in convenient locations that are well lit, sheltered and secure.
- TNSW requests that provision for car share spaces and for the preparation of a Travel Access Guide for visitors, and Workplace Travel Plans for employees be included in the final Statement of Commitments.
- The TMAP supplementary report adopts the assumption that the employment population generated by the commercial floor space will be at the rate of one person per 20 sqm. The Proponent should include details of the research that formed the basis for this assumption. TNSW's primary concern is that this rate may underestimate the population generation potential of the development and may have an impact on the urban design aspects adopted in any future Wynyard - Barangaroo Pedestrian Link.

Transport NSW Preferred Project Report Submission

Transport NSW made a further submission on 7 December 2010 on the Preferred Project Report. That submission made the following summarised comments:

- The Department of Planning's proposal to link future TMAP revisions to gross floor area increases across the entire site is supported.
- There have been a number of changes in the transport policy context of the Barangaroo-Wynyard precinct since the original Concept Plan approval, including the release of the Metropolitan Transport Plan (MTP).

- The MTP is a fully funded package of works to improve public transport services and capacity both for Central Sydney and more broadly across the metropolitan network, including:
 - 1,000 new buses;
 - an expanded light rail network connection between central and Circular Quay;
 - a new Western Express rail line;
 - improved ferry services including the delivery of 6 new ferry vessels;
 - improved customer service initiatives; and
 - long term planning to support future capacity requirements.
- A City Centre Access Plan, due for completion in early 2011, will develop a detailed and integrated strategic transport plan that will assist Government in achieving both State Plan targets and mode share targets for the CBD, including Barangaroo.
- Work has commenced on the implementation of short term bus enhancements for the Wynyard precinct, and the Wynyard master planning process was initiated in July 2010, which covers all transport modes and development options and is expected to identify options for increasing the capacity of public transport within the Wynyard precinct.
- The first capacity building projects that directly support public transport in the Barangaroo-Wynyard precinct are funded in the MTP and include:
 - The Western Express and City Relief Line which will add new rail lines and platforms at Wynyard; and
 - The Barangaroo Pedestrian Link (BPL), which will open up increased pedestrian access space on the western side of the existing station concourse.
- The delivery of the BPL has been timed to support occupancy of the first buildings in Barangaroo in 2014. Similarly, delivery of the light rail is anticipated within the life of the MTP and thus will support the early stages of development.

Transport NSW – Sydney Ferries

Sydney Ferries has made the following comments on the proposed Concept Plan Modification.

- The Concept Plan should include a ferry terminal integrated into the design of the foreshore public domain.
- Ferry wharves and ferry transportation should be included as an integral part of the Public Transport Plan for Barangaroo.

Sydney Ports

Sydney Ports has provided the following comments on the proposed Modification.

- Requests that consultation with Sydney Ports and the Harbour Master, particularly in relation to the construction of the public pier and landmark hotel building, be incorporated into the Statement of Commitments.
- Requests that the Major Development SEPP be amended in a number of instances to facilitate ongoing Port facilities related to existing assets, including the Harbour Control Tower and Moores Wharf facility.
- Notes that Sydney Ports is the landowner of Lot 2 DP 876514 and Lot 4 876514 not the Maritime Ministerial Holding Corporation. Therefore land owners consent is required from Sydney Ports prior to the determination of the application.

Sydney Water

Sydney Water has made the following comments on the proposed Modification.

- A Water Servicing Coordinator should be engaged by the developer to assist in obtaining a Section 73 Certificate from Sydney Water.
- The Proponent must fund any adjustments to Sydney Water infrastructure required as a result of the development.
- Approval is required from Sydney Water for discharge of wastewater into its system. Additional information needs to be provided to Sydney Water in relation to the operations of the proposed Blackwater Treatment Plant

- Lend Lease will need to enter into a Trade Waste Agreement with Sydney Water for the disposal of any treated wastewater from onsite remediation activities.
- Sydney Water requests ongoing consultation regarding remediation activities including review of remediation plans prior to commencement of any works.
- Sydney Water does not support the proposed ownership of water infrastructure as outlined in the Infrastructure Concept Plan. The ownership of water related infrastructure needs to be negotiated with Sydney Water prior to development occurring.
- Works to sewage pumping stations SP0014 and SP1129 will be required as a result of the development. The full cost of any works required to SP0014 are to be met by the developer.
- Sydney Water requires that the operation, maintenance and location of SP1129 is not impacted on or compromised in any way.
- The proposed deviation/adjustment to Sydney Water's city Area Stormwater Channel is not supported. An alternative design solution is required.
- Sydney Water strongly supports the Water Sensitive Urban Design initiatives and seeks further discussions regarding potential treatment measures
- A Stormwater Harvesting and Reuse Agreement will be required between Sydney Water and the harvester for any proposed use of stormwater harvested from Sydney Water's stormwater system.

4.3 Public Submissions

A total of 224 submissions (and two petitions presented to the Legislative Assembly) were received from the public during the exhibition period and up to the writing of this report. This included submissions from the following special interest groups:

- National Trust;
- Millers Point, Dawes Point, The Rocks Resident Action Group;
- Kent Street Residents Group;
- Barangaroo Action Group;
- Pyrmont Action;
- Sydney Harbour Association; and
- The Paddington Society.

Of the public submissions, 181 (81%) objected to the proposed Modification, 34 (15%) supported the proposed Modification and 9 (4%) did not object but raised questions or associated issues. The key issues raised in public submissions are listed in **Table 2**.

Issue	Proportion of submissions (%)
Excessive building height	41%
Excessive overshadowing and restriction of solar access	27%
Traffic and transport issues	25%
Bulk and scale of proposed buildings	18%
Adverse impact of development on existing views	16%
Lack of public open space	16%
Proposal is inconsistent with the concept plan	15%
Issues regarding the proposed landmark building/hotel	10%
Reduction in size of promenade	9%
Inadequate consultation	9%
Object to removal of cruise ship passenger terminal	9%
Adverse impact of development on existing amenity	8%
Overdevelopment of the area	8%
Inconsistency of the development with planning controls	8%
Built/physical form of development inappropriate	8%
Heritage issues	6%
Privatisation of the Harbour	6%
Inadequacies of planning process	5%

Table 2: Summary of Issues Raised in Public Submissions (objections)

The Department has fully considered the issues raised in submissions in its assessment of the proposed Modification, as outlined in Section 5 of this report.

4.4 Proponent's Response to Submissions

The Proponent provided a response to the issues raised in submissions on 12 November 2010 (see **Appendix C**). The response included a Preferred Project Report (PPR) which was uploaded onto the Department's website for public information on 16 November 2010, and detailed the following key changes to the proposal:

- revisions to the Urban Design Controls to reflect:
 - the reconfigured commercial tower forms within Blocks 2 and 3 and the realignment of C5 to the south resulting in:
 - a reduction in the tower length and a consequential adjustment to the floor plate such that the tower floor plate is modified from 90m x 25m to 85.5m x 30m;
 - the expansion of the podium elements to reflect the removal of the gallerias;
 - additional articulation requirements to modulate the massing and to elongate the tower forms;
 - an amendment to increase the setback control from Hickson Road;
 - an amendment to allow for identity signage to be incorporated within the building structure;
 - an amendment to require that building service vehicle not be located on Hickson Road or Globe Street; and
 - introduction of an additional control which requires that above RL 160, one of the towers must be reduced in height and/or the floor area;
 - the introduction of a minimum 40m separation between the tower forms in Block 4B and Block 4C;
 - the introduction of a minimum 15m separation between individual buildings fronting Hickson Road in Block 4C to contribute to an improved view sharing outcome;
 - the street and pedestrian network amendments as described below;
 - amendments to the Block Y controls to emphasize that the landmark hotel building drop off is not for loading or parking and to stipulate that the drop off must maintain a minimum distance of uninterrupted waterfront access of 10m in front of Block Y; and
 - amendments to Block 1 controls to reflect those relevant changes made in Blocks 2 and 3;
- revisions to the Built Form Principles to reflect the above design changes as well as to:
 - amend Principle 1 – to refer to the positive contribution of the new waterfront buildings;
 - amend Principle 4 – to reflect the wider Shelley Lane and to introduce a minimum clear height of two storeys;
 - amend Principle 6 – to reflect the finer grain structure of the laneway system and the podium level open space;
 - amend Principle 8 – to include the proposed orientation of the foreshore buildings west of Globe Street; and
- amendments to the street and pedestrian network, comprising:
 - the widening of Shelley Lane by an additional 2m to provide a 6m road reserve;
 - replacement of gallerias with 24 hour, weather protected public laneways;
 - provision of additional finer grain connections through the commercial towers and Hickson Road building lobbies to strengthen connections between Hickson Road and Globe Street;
 - extension of the northern laneway through Block 4A to the Southern Cove; and
 - introduction of new design guidelines for the landmark hotel building drop off and Globe Square.

As outlined in the Public Authority Submissions in Section 4.2 of this report, the City of Sydney Council made a further written submission on the PPR.

5. ASSESSMENT

The Department considers the key issues for the proposed Modification to be those outlined and responded to below. Where relevant, the Proponent's arguments to support the Modification request have been given, followed by a response representing the Department's assessment of that issue.

5.1 Strategic Context

5.1.1 NSW State Plan 2010

The State Plan provides an overall framework for the NSW Government in terms of its strategic direction, with targets relating to delivery and priorities, and a framework upon which other strategic documents and delivery plans relate. It contains 7 chapters which reflect its aspirations, relating to Better Transport and Liveable Cities; Supporting Business and Jobs; Clever State; Healthy Communities; Green State; Stronger Communities; and Keeping People Safe. A number of those aspirations are directly or indirectly related to the proposal. The proposal is not inconsistent with the directions within the State Plan. Indeed, the changes proposed in the Modification request should assist with specific targets in the State Plan related to increasing the share of commuter trips to the CBD by public transport (by increasing work uses close to Wynyard); increasing tourism (by an iconic hotel close to city attractions and venues); decreasing greenhouse gas emissions (by ESD commitments in the proposal); and increasing jobs closer to home (by increasing the residential uses on the site, close to jobs in the CBD).

5.1.2 Metropolitan Strategy 2005

The Metropolitan Strategy was released in December 2005 and provided a framework to guide growth in Sydney, anticipated to increase by 1.1 million people to 5.3 million by 2031. It has 5 key aims related to enhancing liveability; strengthening economic competitiveness; ensuring fairness; protecting the environment; and improving governance. The changes proposed in the Modification request have the capacity to enhance overall liveability (through the provision of increased community uses and activated foreshore areas); strengthen competitiveness regionally (by provision of office accommodation in larger floorplates, to help attract regional headquarters to Sydney and Australia); and to protect the environment (by increased residential accommodation in order to reduce pressures in outer areas, and provided environmental safeguards are regulated in terms of contamination and impacts on the Harbour from the proposed pier). The Metropolitan Strategy is being currently reviewed, as part of a 5 year review anticipated in the Strategy.

5.1.3 Metropolitan Strategy Review 2010

The Metropolitan Strategy Review was initiated by a discussion paper released in March 2010 ("*Sydney Towards 2036*"). The NSW Government is currently finalising a new Metropolitan Plan, combining the Metropolitan Strategy and Metropolitan Transport Plan into one guiding document. The Metropolitan Strategy Review includes a revision to the timeframe of the strategy (to 2036, rather than 2031) and also reviews the population projections for Sydney. The anticipated Sydney population in the exhibited discussion paper is growth of approximately 1.7 million people by 2036, to a population of approximately 6 million. This is an increase of around 700,000 people compared to the Metropolitan Strategy forecasts, although noting the additional 5 year period. In terms of the anticipated new homes and jobs, the Metropolitan Strategy forecast the need for an additional 640,000 new homes and 550,000 new jobs by 2031, while the Review anticipates the need for an additional 770,000 new homes and 760,000 more jobs by 2036. Therefore, the current review anticipates the need for an additional 130,000 homes and 190,000 jobs above the previous forecast. While these increases have not yet been translated into "targets" for each Local Government Area, it is clear each area will need to accommodate additional growth compared to previous forecasts, especially those with good access to infrastructure and services, in "established areas", given objectives of accommodating at least 70% of growth in established areas.

The Review discussion paper puts forward 10 "proposed directions", which the proposed Modification is generally consistent with.

5.1.4 Metropolitan Transport Plan 2010

The Metropolitan Transport Plan ("*Connecting the City of Cities*") was released in February 2010 and includes a transport strategy for the next 25 years and a funding program for 10 years. It includes four broad aims of commuting to work quickly and easily; transport and services accessible to all the community; an efficient, integrated and customer-focussed transport system; and revitalised neighbourhoods with improved transport hubs. The Plan shows an "indicative Light Rail Extension" along Sussex Street/Hickson Road and indicates additional funding for "*extra line extensions for more*

platforms at busy CBD [rail] stations", including Wynyard and a new City Relief Line from Redfern to Wynyard. The key issue for successful transport and land use integration and realising the potential benefits of Barangaroo, including the modifications proposed, will be the ability of Wynyard Station to meet expected increased patronage and the opportunities possible through a new City Relief Line.

5.1.5 Draft Sydney City Subregional Strategy (2008)

The draft subregional strategy followed the Metropolitan Strategy 2005 and provided greater detail regarding the jobs and housing targets for the subregion. In the case of central Sydney, the draft subregional strategy accords with the City of Sydney Local Government Area boundary. The draft strategy anticipates the need for an additional 58,000 jobs and 55,000 new homes in the sub-region, consistent with the Metropolitan Strategy 2005. The draft strategy identifies Barangaroo as a *"major development opportunity"* (pg 27), and cites the major aspects of the original approved Concept Plan, prior to its amendment to allow additional floor space in Modification 2. While the proposal increases the floor space beyond that cited in the draft strategy, the expansion is consistent with its overall direction, and also noting the Metropolitan Strategy review underway to accommodate additional anticipated growth.

5.1.6 2030 – Sustainable Sydney (2008)

This is the 'vision' document of the City of Sydney, to the year 2030. Its key theme is *"green, global and connected"*. The document recognises Barangaroo as *"crucial in the revitalisation of Sydney"*. The City of Sydney has made a detailed submission regarding the proposal, which is discussed in this planning report. Overall, it is considered the proposal is consistent with the policy directions embodied in *"green, global and connected"* in the strategy document. The issues contained in the submission from the City of Sydney largely relate to urban design and detailed aspects of the proposal, as opposed to the strategic merit of the growth involved in the proposal, notwithstanding that the growth is connected to the proposed urban form.

5.2 Economic Issues and Global Sydney

5.2.1 Economic Issues

The proposal involves an additional 63,000 sqm of GFA (approximately). Of that amount, around 22% is for office accommodation (14,777 sqm) and around 72% for residential accommodation (45,188 sqm). The modification request does not seek to alter the maximum "tourist" uses, although a significant hotel of 33,000 sqm is proposed in a prominent position, with potential to be a world-class hotel. The increase in proposed office floor space is accompanied by a proposal for larger and taller towers, to accommodate larger office floorplates.

The EA was accompanied by an Economic Impact Assessment, while the PPR was accompanied by a report on 'global trends in office accommodation'.

The report with the EA argues Barangaroo South and the proposal will bring the following economic gains:

- high value-added opportunities for "world class commercial space" in the financial services sector;
- employment opportunities;
- symbolic significance as an example of sustainable building design ("with opportunity to learn and reduce the cost of sustainable building design");
- reduced need for energy, transport and water infrastructure;
- housing opportunities to help attract talented staff;
- economic benefits through construction; and
- attracting new businesses to Sydney (as well as shifting some from elsewhere).

The report estimates businesses in Barangaroo South will value-add around \$1.5 billion annually to the Sydney economy (a 0.8% increase).

The report accompanying the PPR analysed large office floorplate buildings (over 2,000 sqm or 2,700 sqm). The report found a correlation between higher vacancy rates and smaller floorplates, that Sydney is not very well represented in terms of buildings with large floorplates (as shown in **Figure 10** below), there is a relatively small upcoming supply of larger floorplate office buildings, and there is a trend towards businesses moving to larger floorplate buildings.

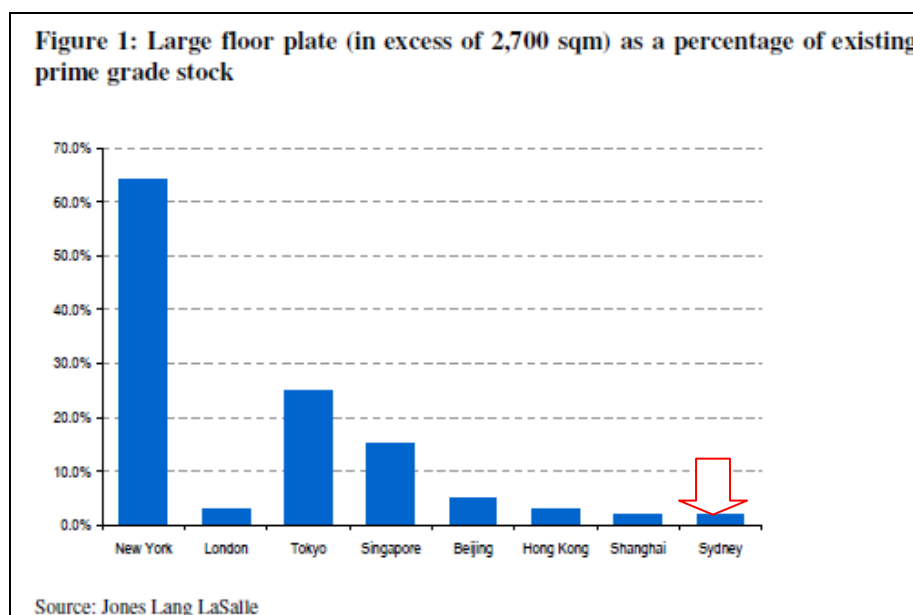


Figure 10: Existing Stock of Office Floorspace with 2,700 sqm + Floorplates - Comparison

Consideration

There are different ways to quantify economic impacts and benefits, with differing methods and assumptions. Generally, these include identifying and quantifying costs, benefits, “displacement” and flow-on or multiplier considerations. Despite this, the real and potential economic benefits from the development of Barangaroo, and the proposed modifications within the application, are such that it is agreed that the proposal would make a significant contribution to the economic development of Sydney and NSW.

It is also noted that the proposal does not alter the quantum of retail uses within the development site (remaining as a maximum of 39,000 sqm). Therefore, the issues of retail impact assessment do not apply to this Modification. At the same time, the proposal does seek to increase the amount of commercial space (and the form of such space), residential uses to increase housing choice and availability, new large buildings with potential to be of high architectural quality, a large and prominent hotel building with tourism benefits, a potentially vibrant public domain and leading sustainability measures on a large scale. These changes have the potential to make Barangaroo attractive to businesses, residents and visitors, with associated positive economic and social implications.

In terms of larger building floorplates for office buildings, it is reasonable to assume this will increase the attraction of regional and global offices to the site (as well as its Harbour location), and the analysis with the PPR regarding trends towards larger floorplate buildings accords with anecdotal and observed trends in new building design. This matter has built form implications and therefore is further addressed in Section 5.3 of this report.

5.2.2 CBD Growth and Capacity

In terms of the supply of office space within the Sydney CBD, geographically it is a peninsula, and its land supply for growth is limited by water, major recreation and naval lands to the east and existing residential areas to the south.

Given constraints in terms of land availability and for ongoing measurement, the City of Sydney has analysed supply and demand for office (and other) space since 1996 and undertaken regular “Capacity Studies” and floorspace/employment audits, the most recent being in 2008. This analysis has included identifying constraints such as planning controls that exist in the CBD relating to FSR/height, major open space and sunlight access to such space, heritage items and subdivision patterns/strata subdivided sites and recent major development. The Council’s analysis of future supply or capacity excludes areas where the City is not the consent authority (such as Barangaroo and RWA).

Consideration

There has been diverging views about how long it will take for any spare capacity for office space within the CBD to be absorbed by the market. This is affected by assumptions on take-up rates, vacancy rates, variance between grades of office space and the degree to which existing building

stock may be recycled and upgraded. Despite this, it is clear that there is a limit to supply office space in the CBD, particularly premium and A-grade office space necessary to attract globally-oriented tenants.

The applicant has argued that the proposal will assist in the supply of office accommodation, particularly to the finance and insurance sectors over the next 10 years, when considering current occupancy rates (8.1% overall, with differences in different grades of office space), supply/capacity and tenant trends. The applicant has used a figure of annual net absorption of 62,000 sqm of office space per year (or 63,600 sqm per year for a future 10 year period) which is based on 40 years of data.

The most recent capacity study by the City of Sydney in 2008 found that there is 12% capacity for growth in the CBD area, and included in **Table 3** regarding possible CBD capacity:

Area	No. Properties	Additional Capacity		
		100% Commercial	100% Residential	65% Commercial 35% Residential
A1	232	711,726	991,666	810,951
A1	58	97,149	147,207	114,670
B	134	295,175	403,370	333,044
F	72	36,833	154,902	78,158
Total	496	1,140,884	1,697,146	1,336,822

Table 3: CBD Capacity for Growth (City of Sydney Capacity Study 2008 – CBD)

This table shows that if the CBD (excluding Barangaroo, RWA and SHFA areas) developed at 65% commercial and 35% residential floorspace, then approximately 1.3 million sqm of additional space would be available through future redevelopment. At 65%, this would mean around 870,000 sqm of commercial space (although commercial is given a wide definition to include office, retail, entertainment, car parks, mixed and community uses in the Study).

In terms of office uses, the Sydney CBD office market comprises 4.82 million sqm, with around 54% (2.59 million sqm) being premium or A-grade stock. Only 10% of office stock is less than 10 years old.

Barangaroo, including the proposed modification to increase office floorplates further, will assist with the supply of office space, and the capacity of Sydney to attract new businesses globally, for many years. Simplistically, the total Barangaroo office development component of approximately 330,000 sqm (including the proposed Modification) would represent approximately 5 years full supply of office accommodation, or 50% of CBD office supply over a 10 year period. This supply is well located in terms of heavy rail access to Wynyard and outlook/parameters that premium and A Grade stock require.

5.2.3 Social Issues

In terms of social issues relevant to the proposed Modification, the main issues relate to the use and enjoyment of the site by all (equity), sustainability measures, impact on amenity of land (private and public), housing affordability and community uses within the proposal.

Consideration

The Proponent has submitted a *Community Plan* with the EA, compiled by Lend Lease and the Barangaroo Development Authority. The Plan provides an overview, including the approach to community wellbeing, principles and methodology. The overall goals relate to promoting social equity and inclusion, enhancing liveability and increasing destination vitality. These goals are sound. The document is “a plan for a plan” and is intended to evolve with the project and include measures and indicators linked to identified needs and aspirations.

The framework of the Community Plan outline is sound and will require monitoring as the project develops. It is appropriate that social and cultural issues are articulated, outlined, measured and monitored within a Plan.

In terms of the key social issues, it is considered the proposal provides a robust framework for the integration of a sound public domain with private and public buildings, and the creation of public spaces which can be vital and well connected to the surrounding city. It has been estimated that approximately 20 million people will visit the site annually. The range of uses and distribution of uses on the site is rational and well integrated into the public domain framework. Together with foreshore access of approximately 2km in length, extension of promenades which connect King Street Wharf and Darling Harbour, water integrated into the public domain in a unique way, a central communal building, and provision of open space and civic spaces, the proposal has the potential to be enjoyed by many people. This expands upon the desire by the Sydney Harbour Foreshore Authority to make Darling Harbour and the Rocks accessible and enjoyable for all members of the community. Barangaroo is a key site in enhancing public foreshore access and connections to other public land.

In terms of sustainability measures, the proposal has adopted measures which can be categorised as leading best practice. This includes carbon neutrality, zero waste, water positive, and design excellence for buildings. This is further addressed and considered in a following separate section on sustainability measures.

There are some negative impacts on the amenity of private land from increases in building height and bulk, and some impacts on the surrounding public domain. These impacts are separately addressed within this report and overall the impacts are acceptable when considered with the benefits arising from the proposal.

In terms of affordable housing, the proposal includes provision of affordable housing of up to 2.3%. The City of Sydney argues this percentage should be a minimum of 10% and preferably 20%. In terms of a percentage, the percentage of affordable housing within the development site needs to be balanced against the availability of social housing in the wider area by the NSW Land and Housing Corporation, and the land being State land, with returns from development assisting with the open space and general provision of public services.

In terms of the site being within State ownership, it has been practice that all Harbour land developed by SHFA only be available on a leasehold basis, and this remains the case for Barangaroo, including residential buildings.

In terms of community uses within the site, the proposal includes a proposed increase in the amount of community uses from a minimum of 2,000 sqm to a maximum of 12,000 sqm. The Modification indicates a proposed central communal building of 10,000 sqm, with potential for a range of uses for the public. The building location and size is supported, although the footprint and practicality of this building needs further consideration. The proposed increase in communal uses is a positive social outcome for the site, although it is reasonable to require that the detailed composition of communal uses occur after further consultation with the City of Sydney and consideration of a recent study undertaken by the City of Sydney in 2010. Such a requirement is included in the recommended instrument of approval.

Overall, the social impacts of the proposed Concept Plan Modification are considered to be positive for Barangaroo and the general community.

5.3 Urban Design and Built Form

5.3.1 Urban Design and Built Form

A key issue for consideration is the built form and urban design implications of the proposed modifications, together with the public domain framework and the relationship of the built form with the public domain. The modification proposes a number of changes to the built form, and the overall public domain. The following section responds to these changes, dealing with the overall framework and public domain first.

5.3.1.1 Public Domain, New Area in Sydney Harbour and Connectivity

5.3.1.1.1 Overall Public Domain Network and Building Blocks

In terms of overall site planning, as previously outlined in this report, the Concept Plan approval included requirements relating to the northern and southern coves. The required changes to the

northern cove were dealt with in the Modification 3 application and approval. The subject proposal deals with the required changes to the Southern Cove, while also seeking additional GFA and other changes such as new building blocks.

The required changes to the Southern Cove in the Concept Plan approval were significant. The Southern Cove, as approved yet required to be changed, is shown below:



Figure 11: Approved Southern Cove

Modification B3 of the instrument of approval required the following changes to the Southern Cove:

- An enlargement, east of Globe Street (the western-most street shown above);
- Active uses around the enlarged water body, including appropriate ground level uses;
- Pedestrian uses along the foreshore and to Hickson Road; and
- A theme celebrating water as an important landscape element

In contemplating the required changes, the Proponent has adopted a “fan” approach and resulting “building blocks” relative to the surrounding area, illustrated by the following stylised diagram:



Figure 12: “Fan” Approach and Building Blocks

Consideration

All of the design requirements of B3 of the Concept Plan approval have been met by the proposed modification. The resulting urban and public domain framework is considered to be robust, and the proponent has had careful regard to the surrounding city street grid, vistas from and along public areas, orientation of blocks (for sunlight aspect and vistas) and integrating the public domain and streets with building blocks.

One of the main issues in the assessment, and in submissions opposing the proposal, relates to the proposal to include a public pier and building in Sydney Harbour/Darling Harbour (new Block Y), and the increase in GFA and height of the building blocks, beyond just re-allocation of displaced floorspace from the required changes imposed by B3 of the instrument of approval. These matters are considered further below.

5.3.1.1.2 New Pier and Building in Sydney Harbour

While the current Concept Plan approval requires changes to the Southern Cove and allows consequential redistribution of floorspace within Barangaroo South, it does not require new building blocks beyond its boundaries. The proposal to include a new building block west of the current sea wall into Sydney Harbour/Darling Harbour waters is an indirect consequence of redistributing floorspace and site planning from an enlarged Southern Cove, although not a required one.

The proposed “pier” or reclaimed portion of land is approximately 85m long and 50m wide, with a land area of approximately 4000 sqm. The proposed building on the pier is a hotel (with possible non-strata titled serviced apartments), having a maximum GFA of 33,000 sqm. The ground level is publicly accessible around the perimeter of the proposed pier, although the proposed building cantilevers over the western end, and canopies/awnings are indicated to the east and north of the building (the east is a porte-cochere and the north for sun protection). A taxi drop off area is proposed to the east of the building, within the promenade area, as a shared zone.

The proposed Southern Cove, new pier and new building area are illustrated below:



Figure 13: Proposed Pier and Hotel Building



Figure 14: Proposed Pier and Hotel Building – Perspective Looking North



Figure 15: Aerial Perspective (Indicative) Looking South

The Proponent argues the pier “breaks up the hard, regular shoreline” and the “carefully studied landmark building” creates a dialogue with the proposed 3 commercial towers behind it. It seeks to create a “front door” to Darling Harbour and the layout and footprint has regard to the existing and proposed street pattern.

The new pier and proposed building have been a consistent point of objection within submissions, and one of the main concerns raised by the City of Sydney. It is noted the City of Sydney appears to raise less concern with a public pier, or even a low scale public building upon it, and more with the large building proposed upon it. The City of Sydney also raises concerns that the pier and building affects a consistent shoreline and western edge of the development.

Other opponents to the public pier and building upon it are more concerned with the principle involved in reclaiming valuable Harbour land, and the perceived negative precedent of this occurring elsewhere.

Consideration

It is clear the proposed pier, and proposed building upon it, is a change to the Concept Plan and will have a noticeable and striking visual impact upon the surrounding area. The key issue is whether this impact is positive or negative.

The consideration of the proposed pier and building upon it deserves close attention and assessment. This is because it is unusual, the Harbour is a key asset for Sydney and the proposal itself involves a prohibited use in *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005*, a deemed State Environmental Planning Policy.

It is considered there are 3 main aspects in considering the acceptability or otherwise of the proposed Harbour reclamation and building:

- a) the impact of the pier on water navigation;
- b) the impact of the pier in relation to Harbour foreshore access and the public domain surrounding it, and the wider surrounding area (and the “precedent”); and
- c) the impact of the proposed building upon the surrounding area.

In terms of impacts on water navigation, the waterway is relatively deep (a benefit of sandstone cliffs and Sydney Harbour generally), and the pier will have an impact on navigation of craft, although not a prohibitive one. Ferries, yachts and other craft using Darling Harbour south of the proposed pier will still be able to do so, although the waterscape is altered. Navigation issues are addressed in detail in

section 5.9 of this report. Issues of marine ecology require close attention (and are addressed within the EA and elsewhere in this report), particularly at the Project Application stage for the construction of the pier.

In terms of the reclamation of Harbour land and “precedent”, it is noted that the shoreline has altered significantly in the last 200 years. The illustration below indicates an “original” shoreline in red and variations over time, including multiple piers for shipping to the western parts of Sydney in the early-mid 1900s, servicing the warehouses in the western hill of the CBD, many of which still exist. This was prior to the concrete and bitumen rectilinear reclamation for container shipping in the later part of the 1900s.

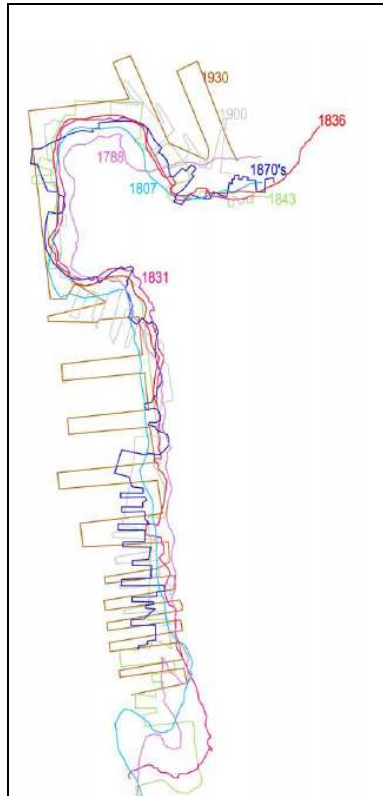


Figure 16: Changing Harbour-front at Barangaroo since Colonisation

It can be seen that earlier piers did extend past the current western alignment of the seawall, although not by much, and in the middle and northern parts of the site.

In terms of the proposed pier in Barangaroo South, it has an area of approximately 4,000 sqm. It is noted the enlarged area of the Southern Cove is approximately 8,140 sqm, and the increase in area of that waterbody is roughly equivalent to the pier's incursion into the Harbour. In this way it can be argued, at least in part, that the proposal is offsetting the impact of the incursion of the pier into the Harbour through the expansion of the Harbour into the southern cove. It is also noted that the Barangaroo northern cove has an area approximately 50% larger than the southern cove.

So, while the proposal includes additional “reclaimed” land for the proposed pier of approximately 4,000sqm, the overall concept plan “unreclaimed” around 5 times that amount of land back to water in the northern headland, northern cove and southern cove.

The resulting land-water interface in the proposed modified Concept Plan will be undulating or jagged, compared to the current straight lines. This arises from provision of a pier, an enlarged Southern Cove, a “naturalised” and enlarged northern cove and a naturalised headland park. While changes to the two coves and northern headland were required by the Concept Plan approval (and arose from a jury recommendation following the design competition for the site), the proposed pier was not required. However, the proposed pier does result in the following benefits, despite involving reclamation of Harbour land:

- a) The resulting foreshore access and interface from the proposed pier and coves has increased from around 1.4km to around 2.2km. This represents an increase of over 50% compared to the original Concept Plan approval. Waterfront access and enjoyment is particularly important

- in the attraction and enjoyment of Sydney, and requirements have been recommended to ensure unimpeded and wide pedestrian access is provided along the entire waterfront.
- b) The geometry and spaces created by the pier creates interest and opportunities for unusual and celebratory spaces, to potentially enhance the wider public domain.
 - c) While water is being reclaimed, water is being given greater intrusion into the development site, including with direct linkage and visibility from Hickson Road, to allow a public domain theme which celebrates water.
 - d) It does not follow the rigid lines imposed and required by former uses which no longer exist on the site.
 - e) Unlike other structures into Harbour land such as private marinas, the proposed pier includes public access around its perimeter.
 - f) It provides a focal point and “gateway” or “marker” for the site.

Crucial to the success of the public pier is its integration to the public domain. In this regard, the pier is at the juncture or end of the main north-south pedestrian promenade leading from King Street Wharf. At this point, the public domain changes due to the location of the southern pier, and the requirement for it to be enlarged. Appropriately, a pedestrian bridge over the water is provided, and the change in direction eastwards for pedestrians does have the potential to create a dynamic space. The proposed modification also indicates a “community building” at this point, which is also appropriate in ensuring the space feels as though it belongs to the public.

In an east-west orientation, the pier also extends a connection and vista to Margaret Street (and the link to Wynyard), at the end of “City Walk”. The juxtaposed terminating pedestrian desire lines creates further focus and interest at this point of the site.

Figure 17 illustrates the public domain in Barangaroo South and proposed pier:

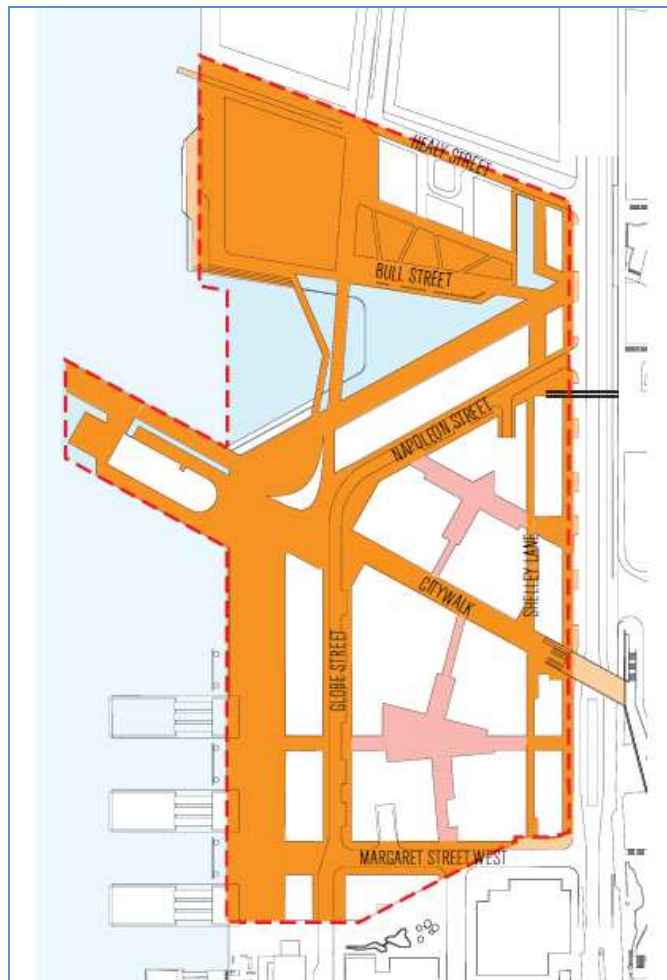


Figure 17: Public Domain in Barangaroo South (note some change occurred in the PPR)

The setback to the western line of buildings fronting the Harbour (Block X) has been increased and does not align with the King Street Wharf Buildings. This is considered appropriate as the added width to the pedestrian promenade (a total of 27m) provides a transition into the site and also provides a wider “forecourt” to the buildings which are higher than the adjoining southern buildings.

Another key issue is ensuring that the space around the hotel does not “privatise” the Harbour foreshore land or continuous Harbour access. The privileged placement of the hotel building should not be at the expense of the public walking along the foreshore and admiring the Harbour and the vantage points it provides. In this regard there are aspects of the proposal that deserve attention and control through any determination, namely:

- Continued and free access around the perimeter of the hotel;
- The proposed taxi drop off zone and potential conflicts with pedestrians;
- The canopies or awnings over the promenade to the east and north of the proposed hotel building;
- The openness of the hotel at lower levels, as indicated in photomontages; and
- The “public uses” at the lower levels of the hotel building, such that the adjoining public space is not perceived as adjoining private spaces (such as hotel room windows or balconies at lower levels).

These matters are recommended to be subject to provisions in any approval, if granted. In particular: there should be an average of 10m unobstructed access width around the hotel (with a minimum width of 6m), closest to the Harbour; the taxi drop-off zone should not extend into a 15m promenade zone measured from the harbour edge (excluding the pier), so that vehicles do not interrupt the use and enjoyment of the waterfront promenade by pedestrians; the awnings should not dominate or unreasonably impact on views and vistas towards the water or past the building, along public promenades; the hotel should appear “open” at the lower section of the building for visual interest and light permeability into public spaces as shown in indicative photomontages; and the lower levels of the hotel around its perimeter should include publicly accessible uses (no hotel or serviced rooms visible from the public way below RL 20, as proposed).

The indicative design on Level 1 of the proposed hotel, as shown in the **Figure 18** below, appears to protrude over the public walkway below. The levels above Level 3 of the building are not indicated as protruding over the public walkway. This would mean the proportions of the public space below the building at its western end would feel constrained and “tunnel like”. It is considered the height of this undercroft should be at least 10m high, commensurate with the minimum width of the walkway. This would allow a more welcoming space, better light penetration, and less long term potential conflict to “close off” the important pedestrian linkage.

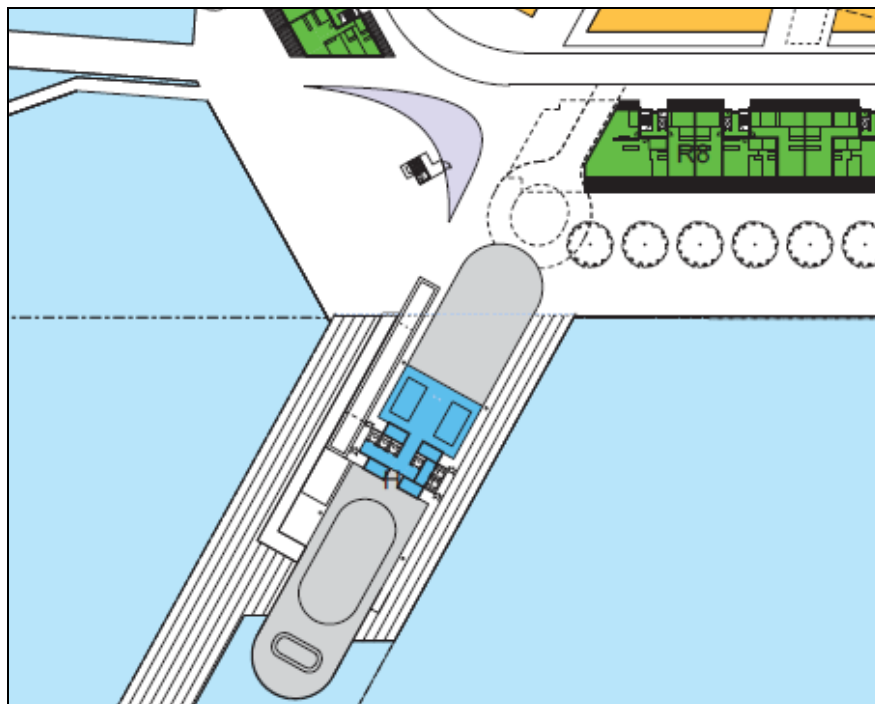


Figure 18: Level 1 of Proposed Hotel over Walkway

In terms of the proposed building on the pier, it is bold, or at least has the potential to be, as the photomontages are indicative only, and the proposal relates to Concept Plan envelopes. The impact of this on surrounding views to the site from public places is addressed in a Section 5.3.3 of this report. Provided the building is of the highest quality and subject to rigorous design requirements and scrutiny, no objection is generally raised with the building envelope proposed, subject to suggested changes by the Department. The future building has the potential to be a world class and landmark building for Sydney and Darling Harbour. Its floorplate is not excessive (provided control is placed on the proposed envelope as recommended by the Department), and indicative images demonstrate potential as a building of great interest and architectural quality.

It is appropriate the use of the proposed building is as a hotel, as this significantly adds to the attraction to Sydney and the surrounding area for tourists, it allows greater appreciation of Sydney and its Harbour to visitors, and the hotel allows greater activation and use of the surrounding public domain for periods beyond "office hours", which is vital to its success and energy of the surrounding public spaces. Any serviced apartment building is not proposed to be strata-titled.

The City of Sydney raises concerns that the proposed building envelope is far larger than the floorspace being sought. This is a reasonable concern, although the Department believes that this can be regulated by the controls within the Concept Plan.

5.3.1.1.3 Land Use Arrangement relative to the Public Domain and new Block X

The arrangement of uses relative to the public domain for the entire precinct is important. The proposal involves 3 larger office towers, creation of new Blocks Y (public pier and hotel) and Block X (western north-south residential buildings adjoining King Street Wharf). The reconfiguration of Blocks 1-4 and the enlargement of the Southern Cove also include changes to the street and lane network within blocks 1-4, including changes in the location and to the width of laneways and connections.

5.3.1.1.3.1 New Block X

The proposal includes creation of a new "Block X" shown in **Figure 20** below. This block is proposed as residential uses on upper levels and retail at ground level. The height of the proposed envelopes steps up from south to north from the equivalent of 6 storeys to 9 storeys, with 3 indicative buildings shown as R1, R8 and R9, and having their lobbies off the proposed extension of Lime Street, to the east. The new building block also has the effect of reducing the width of the north-south promenade from 60m to 27m, a significant reduction, although a width still marginally wider than the immediately adjoining King Street Wharf pedestrian promenade.



Figure 19: New Building Block X

Consideration

The proposed new Block X involves 4 main aspects for consideration:

- The appropriateness of the building block in the overall urban framework of the site and surrounds;
- The appropriateness of the heights and dimensions;
- The appropriateness of reducing the width of the promenade from 60m to 27m, and inter-relation with the existing promenade to the south; and
- The appropriateness of the uses proposed.

The following indicates the proposed building form for Block X:

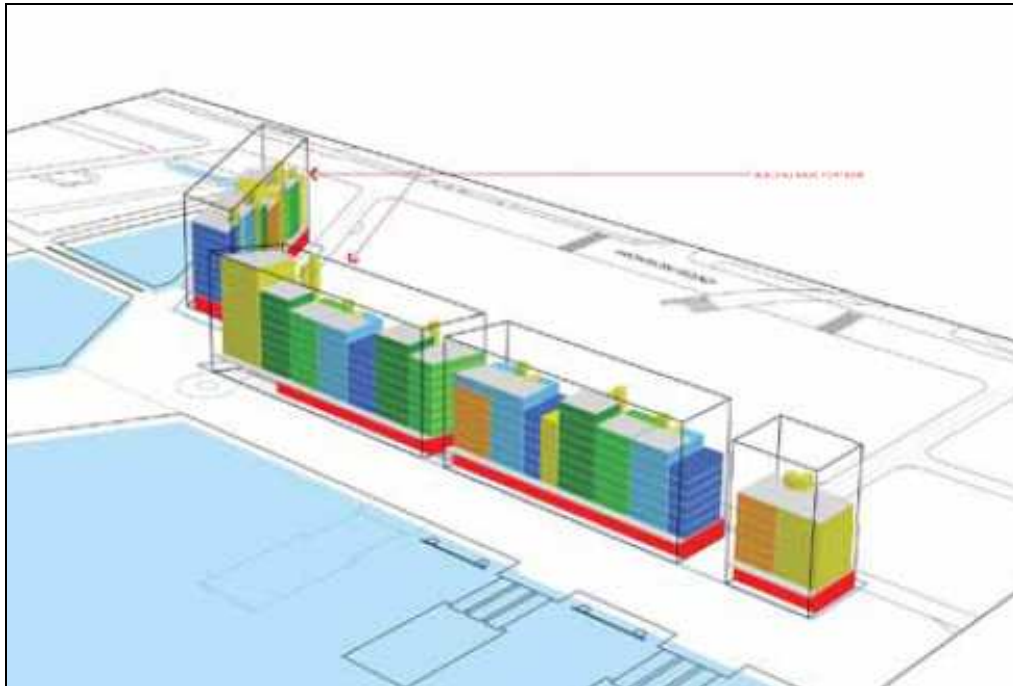


Figure 20: Block X Envelope and Indicative Buildings (latter in colour)

The City of Sydney has provided a visual analysis to show the differences in building envelopes and indicative buildings, superimposed on a photograph showing the adjoining King Street Wharf to the south (approximately RL 18):



Figure 21: City of Sydney Submission Illustrating King Street Wharf Buildings and Envelopes/ Indicative Buildings in Block X

In terms of the new block, it is considered to relate well to the surrounding urban framework, both within the site and to the south, provided the indicative buildings are generally adopted as opposed to a uniform envelope at RL 41.5. The new block allows appropriate activation of the public domain, continuation of the foreshore pedestrian promenade (at 27m slightly wider than the adjoining promenade at approximately 24m), and continuation of Lime Street in a northerly direction, with slight realignment to the east. While the foreshore promenade has been reduced significantly from 60m to 27m in the proposed Modification, the reduced width is considered to better relate to the adjoining buildings and promenade, by better framing the foreshore connection and providing appropriate activation. This is a view shared by the City of Sydney in principle, although the City of Sydney has raised issues about the proposed height of the envelope. The height and bulk of the building block is separately dealt with in Section 5.3.2 of this report, although the massing of 6-9 storeys is considered acceptable, notwithstanding the adjoining existing foreshore buildings have a height of approximately 4 storeys, and provided the southern Building R1 is no higher than 6 storeys.

5.3.1.1.3.2 Ground Level uses around the site and use configuration generally

The ground and first floor level uses are indicated in the **Figures 22 and 23** below (orange indicates retailing, yellow for commercial, green for residential and purple for cultural uses). Retail uses dominate the ground floor uses, with some commercial lobbies fronting streets along Hickson Road and in the southern part of the site. The retail uses generally occupy the ground level only, except in the central part of the site (the 3 proposed commercial towers), where they extend to the second level.



Figure 22: Ground Level Uses in Barangaroo South



Figure 23: First Floor Level Uses in Barangaroo South

Consideration

The overall uses for buildings and configuration across the site are seen as an improvement in this proposed Modification. The proposal increases the residential GFA by around 45,200 sqm (equivalent to around 450 units), and the residential population, together with the proposed hotel/serviced apartments, will add “around the clock” activity to the site, and important surveillance to the public domain.

The proposed retail uses at ground level is appropriate, together with an extension into the second level within the central part of the site. This will assist in making the public domain feel public, as well as activating it by uses which are accessible to all members of the community, not just those who work and live at the site. Adjoining Block 4A (the block immediately south of the southern water cove), the promenade reduces in width to approximately 12m where it abuts the Southern Cove. This is less than the 24-27m width of the promenade to the south which leads to it. However, the width is considered acceptable, as the adjoining building is proposed to have ground level retailing uses, the vista along the promenade will be open at its end (leading to Hickson Road), the promenade has northern exposure (although there will be some overshadowing from proposed residential buildings to the north, in Block 4C), water adjoins the promenade in the Southern Cove, bridges across the water will be visible and inviting, there is a larger civic/open space on the northern side of the waterbody (30-45m wide) and the space will be unusual within the City context, with many people using it.

The uses within the hotel are also an important consideration, particularly at the lower levels, due to the narrowness of the promenade relative to other areas (at 10m), the use of overhangs or cantilevered building elements, and the desire of people to walk closest to the water for outlook, interest and visual navigation. The proposal indicates the ground level of the hotel has retail uses, which is entirely appropriate. Levels 1-3 indicate hotel uses, although larger spaces are expected to contain restaurants and function spaces, as is common for hotel buildings. Again, this is appropriate as these spaces can also be used by the public. The “hotel rooms” do not appear to occur until the fourth level of the building, which is also appropriate and a control limiting such uses to not occur below RL 20 is recommended by the Department.

As outlined previously, there is some concern with the low height at the western end of the building, where it cantilevers over the pedestrian link below. Additional requirements have been included in the recommended approval to address this concern.

5.3.1.1.4 Public Domain Linkages to the Surrounding Area and Street Network

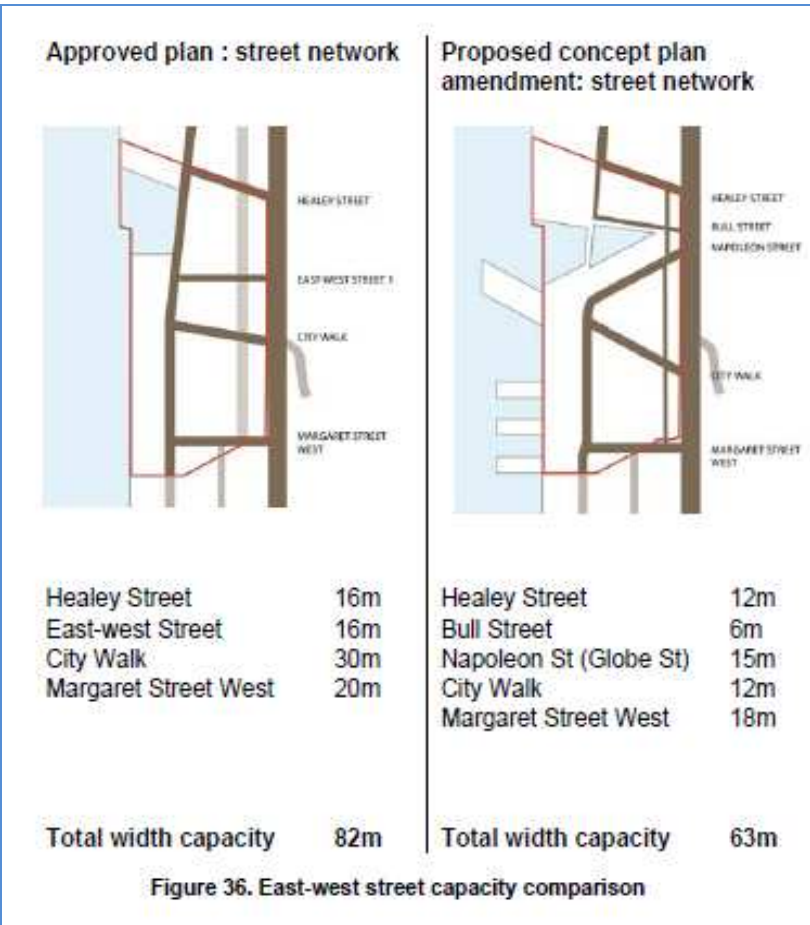
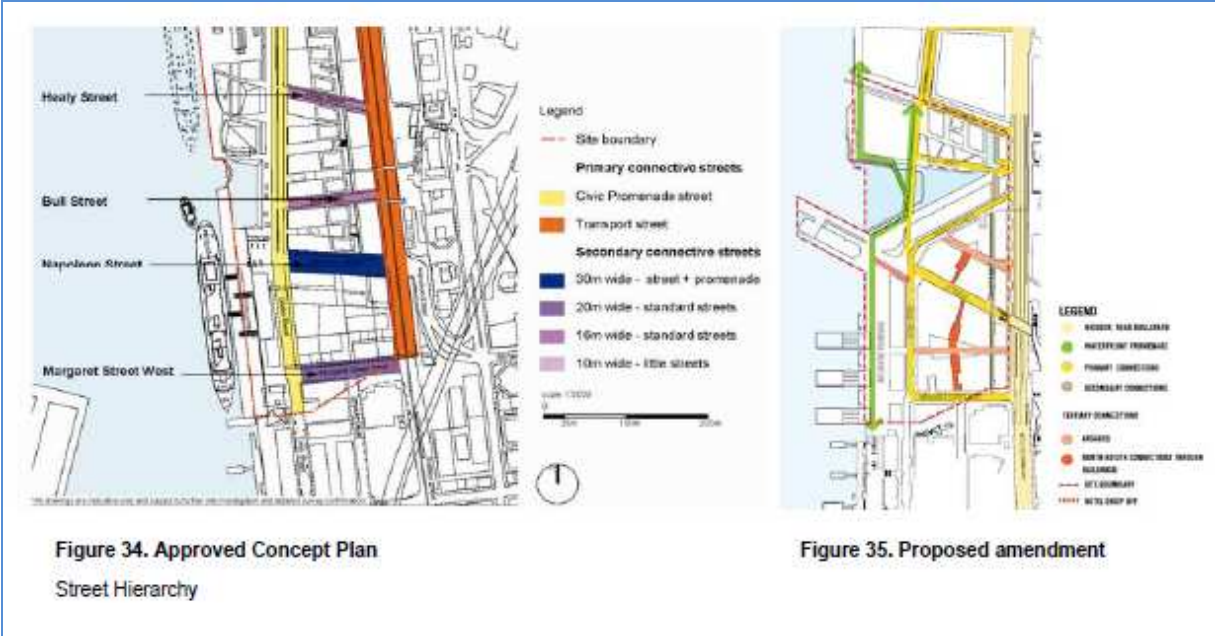
As previously mentioned, the arrangement of building blocks within the site has arisen from consideration of the integration of a required enlarged Southern Cove, connections to the surrounding area and its “grid”, orientation to the sun, and creating “gateways” or “markers”. The connection of the site to the surrounding area is shown in **Figure 24** below:



Figure 24: Connections to the Surrounding Area

For Barangaroo South, the street layout within the site has changed since the original Concept Plan, which has resulted from a combination of required changes in the approval relating to the Southern Cove, and related or unrelated associated changes. The proposal also involves changes to the proposed width of streets and laneways within the site, and connections across Hickson Road.

The issue of street widths has been raised as an issue of concern for the City of Sydney. The City of Sydney has provided the following comparisons within its submission regarding the street hierarchy, layout and widths:



Figures 25 And 26: Comparison of Streets in Original Concept Plan and Current Modification

Consideration

It should be noted that the Concept Plan has been amended to delete the overseas passenger terminal shown in the diagram above (Modification 3). However, the essence of the comparison is still valid.

The Proponent did make some amendments in its PPR and after considering the submission from the City of Sydney. Shelley Lane (running north-south, adjacent to Hickson Road) has been widened from 4m to 6m, and the east-west connections between the three proposed commercial towers vary from 8-12m. The foyers of the proposed commercial buildings have also been revised, such that they are to the north of the buildings, and the two foyers of the commercial buildings in Block 2 no longer front each other. This allows reconfiguration of the retail uses to better activate the ground level and east-west connections between buildings.

Despite the reduction in street widths in the proposed Modification, the street network is considered acceptable. Greater attention to the podium heights and tower heights (which also affect the perception of street width) is given in the built form controls, which is addressed in Section 5.2.3.

The main issue regarding the "narrowness" of the laneway/street connections is considered to be related to the connections between the commercial towers. These are relatively narrow connections (8-12m) between blocks that contain tall buildings. However, this is acceptable in terms of their relatively limited length (80-120m), connections to the wider Hickson Road and views through to water of Darling Harbour, wider connections around the site giving alternative connections to Hickson Road and Darling Harbour, and the visual density that results from the relation between the buildings and laneways will be of interest in terms of building/architectural appreciation of the towers above.

The issue of concern regarding the provision of basement parking under streets raised by the City of Sydney has been considered as part of the Barangaroo Bulk Excavation and Basement Car Park Project Application (MP10_0023).

In terms of connections across Hickson Road, the proposed Modification includes provision for potential future pedestrian connections across Hickson Road in Barangaroo South, although specific approval for these connections is not sought at this stage. A detailed submission was made by the owners of 189 Kent Street, including a submission from PTW Architects, essentially outlining an opportunity for redevelopment of that site, and future connection into Barangaroo South, via a bridge over Hickson Road. The City of Sydney advised (by letter on 29 November 2010) that a concept proposal outlining the development of the site at 189 Kent Street was presented to the Council's Design Advisory Panel and CSPC was briefed, with "general support". In this regard it is noted that the proposed Concept Plan amendment includes provision for a potential pedestrian link in generally the same position as indicated in the submission (linking to Building C1), and this matter can be further assessed at the appropriate detailed design stage. The indicative potential pedestrian linkages in the proposed Modification across Hickson Road are considered to be appropriately located should approval for their construction be sought at a later stage.

5.3.1.1.5 Heritage and Archaeology

After considering the public domain framework and building blocks, it is appropriate to consider heritage and archaeological issues prior to considering the proposed built form.

In terms of archaeology, the EA was accompanied by an Aboriginal Archaeological and Cultural Heritage Assessment. The assessment found that indigenous archaeological deposits may remain within the site in the form of stone tools or midden material. The report recommends a program of subsurface testing and this issue has been the subject of further reports and recommendations in a separate application for excavation (MP10_0023). This matter is best dealt with at the appropriate Project Application stage and during construction. This is also the case for possible non-indigenous archaeological remains.

In terms of heritage issues, the site does not contain any heritage items and is not within a Heritage Conservation Area. However, the site is in the vicinity of other heritage items and Conservation Area to the east. The heritage considerations applying to the site do not give rise to concerns regarding the proposed Modification. Appropriately, lower "streetwall" building forms are provided along Hickson Road, to frame the street appropriately and provide transition to the higher building forms contained to the west.

5.3.2 Building Bulk and Massing

5.3.2.1 Building Floorspace, Heights and Floorplates/Massing

5.3.2.1.1 Building Floorspace

The EA has included a table of proposed floorspace or Gross Floor Area (GFA) against the approved GFA for each block, and also compared the residential GFA for each Block before and after the Modification. **Table 4** provides this comparison (for the totals per block only), although also provides the change in GFA per block.

It is important to note that a direct comparison is not possible as the shape and configuration of building blocks has changed, due to the requirement to enlarge the Southern Cove and consequential proposed changes in previous modifications to the Concept Plan.

Block	Concept Plan as approved (sqm)	Proposed Modification (sqm)	Change (sqm)
1	11,800	9,400	-2,400
2	211,907	209,213	-2,694
3	85,568	142,669	+57,101
4	121,000	77,050	-43,950
X	0	18,908	+18,908
Y	0	33,000	+33,000
Total	430,275	490,240	+59,965

Table 4: Comparison of GFA for Barangaroo South

The total GFA increase proposed for Barangaroo South in the Modification is 59,965 sqm. Of this, the majority (being 51,908 sqm or 87%) is created by the 2 new Blocks X and Y. The remaining 8,000 sqm is gained from other blocks, with Block 3 seeing the main increase and other blocks reducing by comparison. Again, direct comparisons are difficult due to the different configuration of blocks.

In terms of residential uses, the EA has compared the approved maximum GFA for each block and compared this to the GFA proposed within the new blocks to show an overall increase of 44,188 sqm of residential GFA in Barangaroo South (while a further 29,000 sqm of residential floorspace in blocks 5 and 7 remains unchanged). The increase in residential uses results from increases in Block 1, 4 and new Block X.

Consideration

As mentioned above, the majority of the increase in GFA (87%) results from new Blocks X and Y (around 52,000sqm). These have been discussed previously and are considered acceptable and appropriate changes to the Concept Plan. The remaining increase of around 8,000 sqm results from larger commercial office buildings (while also reducing the total from 4 to 3 towers).

In overall terms, the increase in GFA is acceptable in the context of the proximity of Barangaroo South to public transport at Wynyard, the acceptability of the new Blocks X and Y, and the appropriate public domain framework and relationship with the building envelopes and proposed uses. The increase in residential GFA of approximately 44,000 sqm is also appropriate in terms of surveillance and activation of the surrounding area.

The other main issue is the resulting building forms of the proposed blocks, and this is directly related to the urban form, built form controls and vistas/views to the site from surrounding public areas. These matters are dealt with in following sections of this report.

5.3.2.1.2 Building Heights

In addition to increases in the proposed GFA, the proposal involves increases in the proposed maximum heights within Barangaroo South. In terms of the approach taken by the Proponent, the following objectives were cited in the EA:

- Tall buildings to maximise solar penetration;
- Buildings no taller than the CBD skyline;
- A mix of low rise buildings and podiums to moderate the scale of taller buildings; and
- A scale comparable to other "world class cities"

The following table compares the heights within the proposed building blocks with the approved heights in the Major Development SEPP and Concept Plan approval (as amended). It should be noted that it difficult for direct comparison due to the changes in configuration.

Block	Concept Plan as approved (m)	Proposed Modification (m)	Change (m)
1	62	80	+20
2	180	180	0
3	112	209	+97
4	100	41.5-175	+75
X	0	41.5	+41.5
Y	0	170	+170

Table 5: Comparison of Height for Barangaroo South

Consideration

Height was the most common issue raised in objections to the proposed Modification to the Concept Plan.

The 4 aims articulated by the Proponent are considered appropriate. The issue is whether these aims are met by the proposal, the impact the height has on the surrounding area and the other impacts such as overshadowing of the public domain and wind impacts.

In terms of the overall height of the proposal, **Figure 28** illustrates the changes in height across the site (from the western elevation, although the scale does not exactly match):

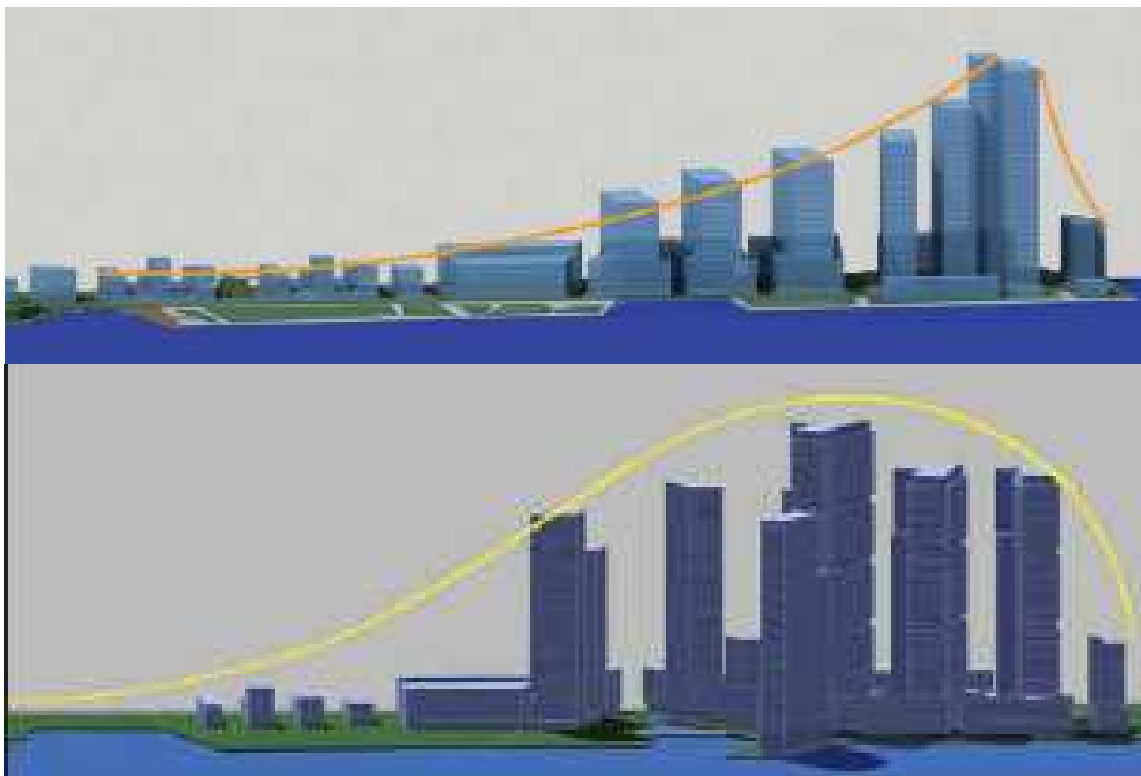


Figure 27: Indicative Height Comparison and Distribution across the site

As shown in **Figure 27**, the tapering of the buildings to the north is less pronounced, and the new building blocks and form also splay fan-like to the west in the proposed Modification. The commercial towers have been separated and reduced in number and this has resulted in bigger buildings but improved orientation for solar penetration to those buildings. There are implications of the proposal in terms of overshadowing of the public domain, including beyond the site boundaries and this is addressed in a following section.

In terms of the proposed building heights relative to CBD buildings, this is indicated in **Figure 28** below:

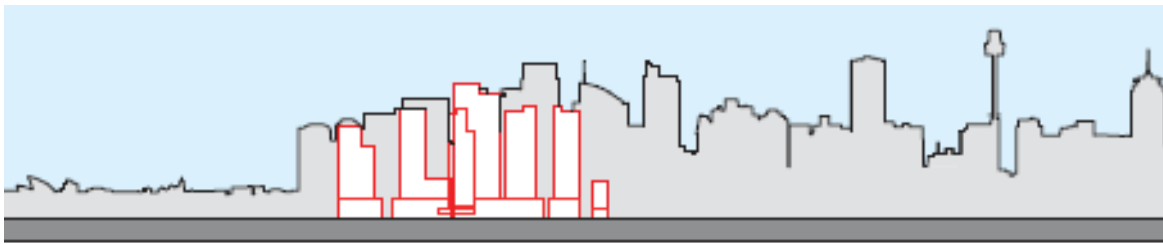


Figure 28: Height Comparison with the Sydney CBD

The height of the buildings is comparable to buildings within the CBD and less than the maximum building height allowed by the City in the CBD core area. While Barangaroo is at the edge of the City CBD and the ground level is lower relatively than the ridge upon which the CBD is located, the overall height is considered acceptable when considered against the backdrop of the CBD. It is also noted the longer views of the site from the west will see the “skinnier edge” of buildings, although this is not the case from the north or south, where building footprints and articulation become important considerations.

In terms of the more immediate interface with buildings to the east of the site (such as along Hickson Road, Margaret Street, Sussex Street and Kent Street), the height of buildings on the site are significantly higher. This is illustrated in **Figure 29** below indicating the approved height (blue line), proposed height (red line) and existing buildings to the east in grey and black:

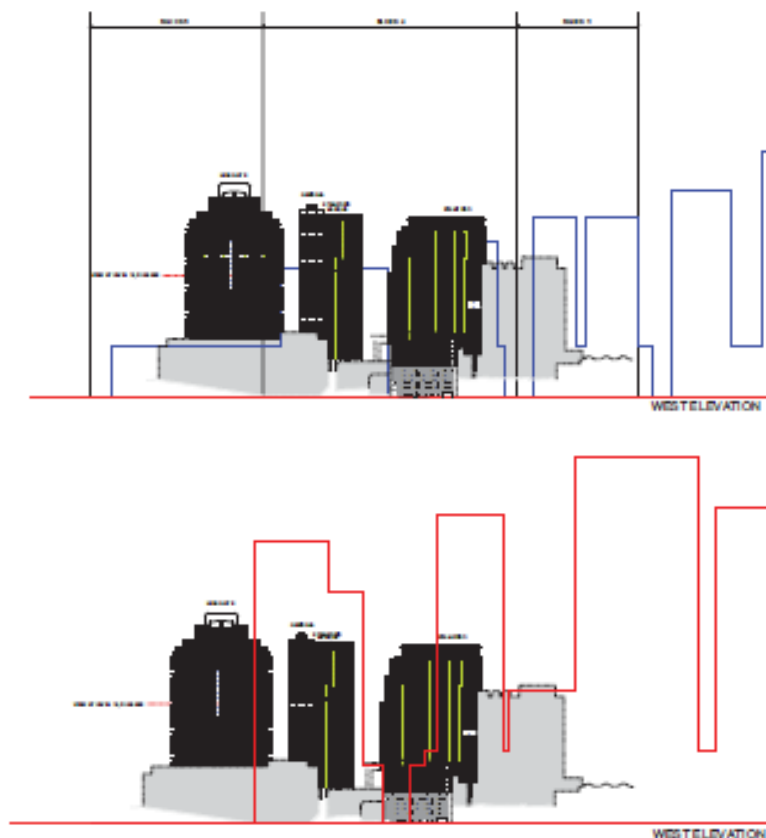


Figure 29: Height Comparison with Approved Concept Plan and Existing Buildings to the East

Despite the proposed buildings being significantly higher than those buildings to the east, the relationship is considered acceptable in the context of the wider CBD, and the transition in height due to the width of Hickson Road, lower building forms fronting Hickson Road, the lower building forms to the west and podium forms within the site.

In terms of other cities, at least in Australia, **Figure 30** provides a comparison and shows the buildings (at their slender edge) to be comparable and lower than other tall buildings in other Australian cities.

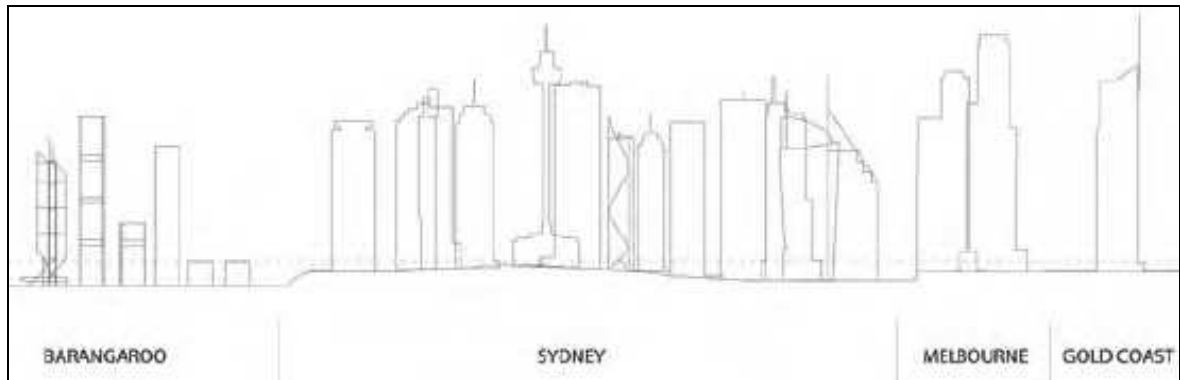


Figure 30: Height comparison to other Australian cities

In terms of the relationship of podium and towers, this is addressed in the built form controls and analysis of the proposed blocks in Section 5.3.4.

5.3.2.1.1 Building Floorplates and Massing

This issue is principally an issue for the 3 proposed commercial tower forms and the proposed hotel on the public pier due to its prominence (and to a lesser extent the northern residential building on Block 4C).

The EA included commercial tower forms in Blocks 2 and 3 having dimensions of 90m length, 25m width, 13.5m deep lift cores (to the north for 2 buildings and the south for the central building), and a surrounding podium height at RL 22 (around 20m or 5 storeys above ground level). In the PPR, the central building was re-oriented so the lift core was to the north, similar to the other two adjoining commercial buildings. Further, the dimensions were changed for the envelopes such that the length was reduced from 90m to 85m and the width increased from 25m to 30m, the lift core zone reduced in overall size although increased in depth from 13.5m to 16m, and the podium height kept the same. The envelope was also indented at each of the corners for the commercial buildings.

In both the EA and PPR, the proposed hotel building is shown as having dimensions of 80m length, 25m width and RL 170 in height. The configuration of Block 4C at the northern end of Barangaroo South also remained unchanged between the EA and PPR, although includes a stepped building footprint and variable height, including a low RL of 12m in the central element of that building envelope.

Consideration

The configuration and building floorplates in the northern residential building in Block 4C is considered appropriate. The floorplates are not excessive and the envelope massing is considerably varied in height and depth, which will also allow sun penetration through the central building element to the Southern Cove and promenade area south of the cove.

In terms of the proposed hotel, the City of Sydney makes the point that the envelopes shown in the proposed Modification are considerably bigger than the indicative photomontages of the building and indeed the maximum GFA of 33,000 sqm for that building. That is, the envelope for Block Y shows dimensions of 80m x 25m (2,000 sqm) and a height of RL 170 (equivalent to around 52 storeys). This translates to a GFA for the envelope of around 100,000 sqm, while the GFA sought is 33,000 sqm. The City of Sydney's concern is shared by the Department in that an envelope allowing such a significant amount of floorspace, if not altered, will lead to a desire to make the hotel building larger at a later time. This would not be an appropriate outcome.

The indicative design plans for the hotel indicates a floorplate of approximately 1,100 sqm. Given the visual prominence of the building, the slender form indicated in photomontages, the indicative building designs, the ample floorspace in the envelope relative to the GFA sought and the appropriate desire to create an elegant building, it is recommended the hotel have a maximum floorplate of 1200 sqm above RL 20. It is further recommended that the actual envelope be modified to 60mx20m rather than 80m x 25m above RL 20.

The proposed 3 commercial building envelopes and "indicative" building layouts, on the other hand, more closely align (except the northern half of Block 3).

It is clear the proposal is seeking to respond to a trend in newer buildings towards larger floorplates, reflecting a desire of tenants due to the economic use of space created by larger floorplates, with side

lift cores. In the proposal, the lift cores are placed on the northern side (given access to light and views in that direction). This is acceptable as the building forms to the north will be aided in terms of interesting lift forms likely to be created by the views that would be available from within the lift cores, and the articulation the proposed lift cores provide in breaking perceived massing (at least from the north and north-west).

The size of the commercial building floorplates was raised as an issue of concern in the City of Sydney submission. Both the City of Sydney and the Proponent submitted visual analysis and comparisons with other buildings having floorplates in excess of 2,000 sqm. The City of Sydney specifically recommended a “tapering” building form, shown in **Figure 31** below, which was not accepted or adopted in the Proponent's PPR.

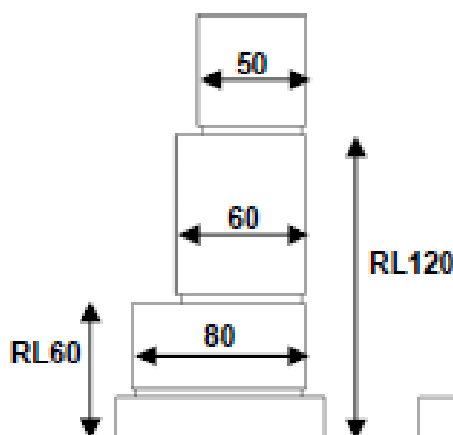


Figure 31: City of Sydney's Recommended Building Length Controls

In addition to the above maximum building lengths, the City of Sydney recommended a maximum floorplate of 1,400 sqm above RL 120. The City of Sydney argued floorplates of 2,500 sqm were unacceptable and had no contemporary precedent.

In terms of precedents, the City of Sydney provided the following other examples of larger floorplate buildings, pointing out they are lower “campus-style” buildings and generally under 15 storeys in height:

30 The Bond Hickson Road, Millers Point	MLC building North Sydney	Macquarie Group Building Sydney	Channel 7 Studios Redfern
			
			
Height 36m/9 st Dimensions 100m x 21m* Floor plate area 2100sqm* <small>*excludes cores & void</small>	Height 59m/14 st Dimensions 100m x 18m Floor plate area 1800sqm	Height 40m/11 st Dimensions 100m x 29m* Floor plate area 2825sqm* <small>*ten storey building only</small>	Height 43m/12 st Dimensions 100m x 30m Floor plate area 3000sqm

Figure 32: City of Sydney's Comparison with Other Large Floorplate “Campus” Buildings

The Proponent did make some changes in the PPR, including that above RL 160, one of the towers would be reduced in height and/or floor area, providing for a 40m minimum separation between towers in block 4B and 4C, an increased setback from Hickson Road and other minor changes.

The Proponent also undertook a comparative analysis of other contemporary buildings with floorplates larger than the City of Sydney is recommending, as shown in **Figure 33** below (the red outline being a typical floor level of the commercial buildings proposed):

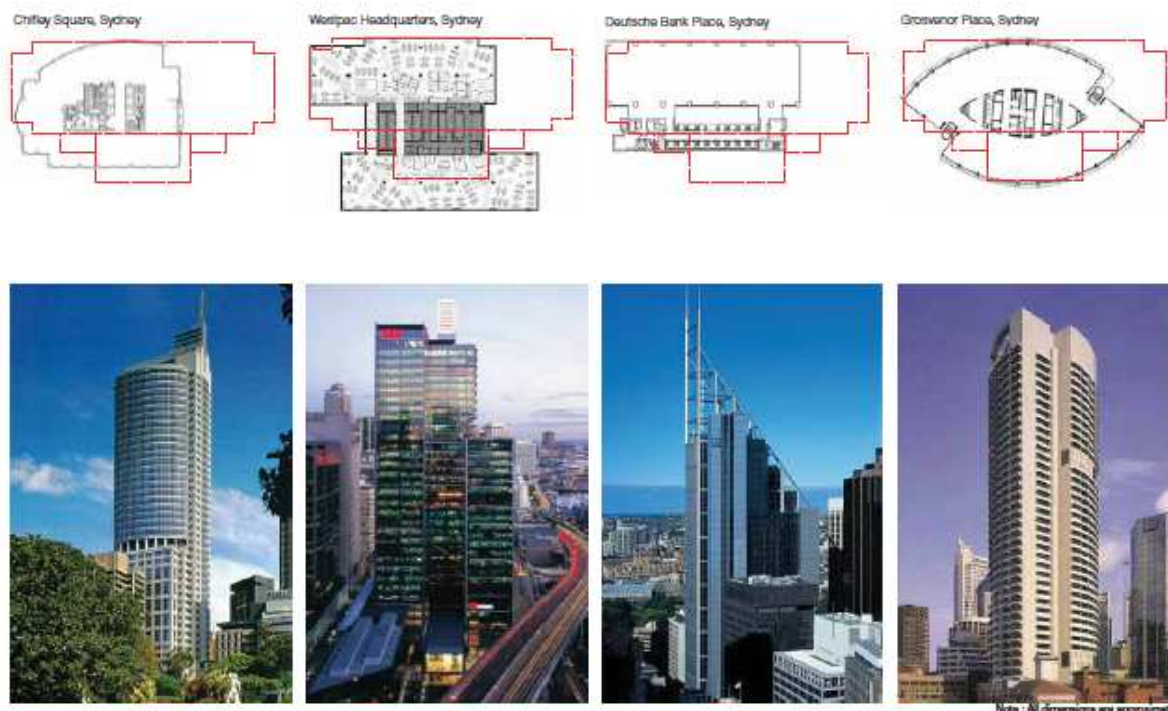


Figure 33: Proponent's Comparison with Other Large Floorplate Buildings

The Proponent also proposes a wide range of measures to address building articulation.

It is agreed the proposed floorplates of approximately 2,400 sqm are large for contemporary buildings, however it is also acknowledged this space is attractive for businesses. Careful attention is needed to ensure that building masses are articulated are made diverse and interesting, as in the schematic diagram provided by the Proponent below (**Figure 34**).

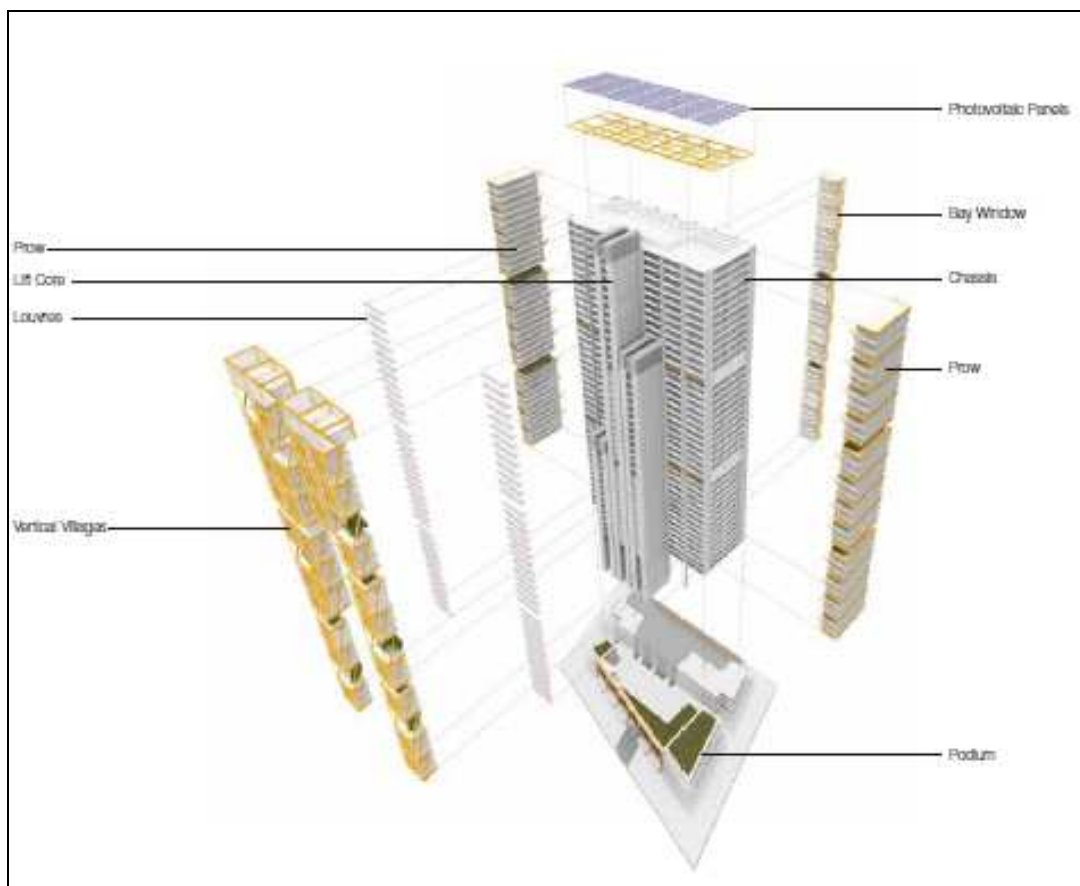


Figure 34: Proponent's Example of Tower Building Massing

The key to a successful design resolution for the large floorplates proposed lies in the shape of buildings and their articulation and legibility. Interesting and engaging buildings can be achieved at floorplates larger than 2,000 sqm, as shown in the Proponent's analysis of other buildings.

Conversely, City of Sydney's suggested controls could result in uniform and uninteresting buildings. While the controls may address "bad" building outcomes they do not necessarily result in good ones. For instance, a building having a "complying" floorplate of 1,400 sqm and a length of 60m as recommended by the City of Sydney with no articulation within this mass would be less interesting than a very well articulated or shaped building with a larger floorplate or overall length.

Therefore, as an alternative to the approach recommended by the City of Sydney, the Department has recommended built form controls which will ensure long uninterrupted wall expanses (either vertically or horizontally) are not allowed. Specifically, a built form control for the commercial tower buildings requires any vertical wall expanse of 60m in height or width be articulated with a change in building plane, so the massing is relieved and articulated, except where otherwise directed by the Barangaroo Design Excellence Review Panel.

5.3.2.2 Overshadowing and Wind Impacts on the Public Domain

5.3.2.2.1 Overshadowing of the Public Domain

The Proponent provided overshadowing diagrams and analysis comparing the existing shadows from the approved Concept Plan (red) with the shadows created from the proposed Modification (yellow indicating additional or new shadows).

The following diagrams (**Figure 35**) show the shadow impacts from building envelopes (indicative buildings are shown in blue outline within the envelopes) in mid-winter between 11am and 2pm:



Figure 35: Shadow Impacts on Public Domain

Consideration

The main issue raised with overshadowing of the public domain from the proposed Modification is the shadow created by the proposed hotel building on the new pier into Darling Harbour, specifically the shadow impacts on the pedestrian promenade beyond and within the site. The new shadow from the proposed hotel will have a length of approximately 250m along this promenade at 1pm in mid-winter. As shown above, the shadowing of the promenade does occur over lunchtime periods in mid-winter, from around 12.30pm onwards and is worst at around 1pm.

The Proponent also provided analysis in the PPR of the area of public domain (open space and civic areas) affected at various times of the year by shadow, the area unaffected by shadows and the relative percentages of shadows. In mid-winter during the 12noon to 2pm lunch period at half-hourly intervals; the percentages of public domain in shadow were 21%, 19%, 56%, 63% and 44%.

As stated, the main impact of overshadowing, particularly in terms of "additional" shadow arising from the proposed Modification, is the impact on the promenade leading from King Street Wharf to the south. Despite the additional overshadowing in this area, the shadow impact is considered acceptable for the following reasons:

- the length of shadow is not excessive in terms of the overall foreshore promenade of Barangaroo;

- there will be sunlight past the shadow and realisation of a temporary shadow when walking along the promenade; and
- the outlook and space will not feel constrained or uninviting and the changing nature of the built and water environment will provide visual interest.

Further, there is a diverse range of other public realm areas available within Barangaroo South and the wider Barangaroo site – the promenade south of the proposed pier is only 44% of the total waterfront promenade area available within Barangaroo South and only 30% of the total waterfront public domain area proposed to be provided across the entire Barangaroo South site (i.e. including the central parklands within Barangaroo South). This promenade is a very small portion of public space available within Barangaroo as a whole which includes 65% of its area as public open space.

5.3.2.2.2 Wind Impacts on the Public Domain

Wind analysis was provided with the EA (as a qualitative “desktop review”) and further quantitative analysis provided as a supplement to the PPR. The most recent wind analysis reflects the building envelope and built form changes outlined in the PPR. This included wind tunnel test procedures and test results. Pedestrian winds were measured within the site and surrounding area. A variety of locations were chosen (51 in total), and various winds tested (from 16 directions) from different directions (at 22.5 degree intervals). The “Lawson” criteria for comfort was used (greater than 10m/s wind being uncomfortable).

In its submission on the PPR, the City of Sydney Council engaged Heggies Pty Ltd to undertake a peer review of the wind tunnel testing analysis by the Proponent. That submission advised it is “normal” to undertake a desktop review of wind impacts at Concept Stage and detailed analysis at Project stage, although a quantitative study (as undertaken) is warranted where a large proposal is involved. The peer review advised the use of the “Lawson” criteria is *“used internationally and have been accepted for use by Australian authorities”* and are similar to Council’s own criteria. It found the assumed wind conditions used are well documented. In terms of the wind tunnel testing Heggies found the 22.5 degree intervals were “somewhat larger” than ideal testing (as it may “miss” key angles of wind channelling between buildings along street orientations). Despite this it found that compromises in testing are always made and given the large number of test locations (51), the overall results would not have been affected by a significant degree by the increments chosen. The review made comment that some of the building envelopes used in the wind tunnel appeared different to the proposal in relation to a gap in Block X, the base of the proposed hotel and an arcade through Building R2, and this may affect wind impacts around these buildings. The modelling also appeared to include extensive awnings, yet not include landscaping, and the promenade locations appeared to be close to buildings.

Consideration

The wind tunnel report showed that there were some surrounding areas with higher wind levels but still in the comfortable range of under 8m/s winds (namely to the west at Jones Bay Wharf and to the east of the Southern Cove intersection with Hickson Road). In terms of within the site, wind levels were found to be under 8m/s, although in three locations (two just north of the proposed hotel building and one at the far north-west corner of Barangaroo South) the wind speeds were 8-10m/s, still deemed as comfortable, but only for “able bodied” pedestrians. No locations were found to be “dangerous”.

Overall, it is considered the wind impacts arising from the proposal will be acceptable, although this will be a matter that requires further consideration at the Project Application stages, when buildings are further refined and building elements are detailed, such as awnings and articulated building bays.

The submission and peer review commissioned by the City Council does raise some issues and concludes that some winds may have been underestimated, although given the analysis and range of impacts in a large range of areas, and other matters such as awnings, landscaping and street furnishings that would occur, overall it is considered that the wind impacts are capable of being satisfactorily addressed through detailed design.

5.3.3 Public Views and Vistas to the Proposed Development

This section addresses and considers the impacts of the bulk and scale of the proposal from key public places. There are 2 main issues on this matter:

- The appropriate methodology in illustrating and assessing impacts; and
- The appropriateness of the proposal when considering its bulk and scale, relative to the surrounding area, when viewed from key public areas.

In terms of the first issue, the City of Sydney criticised the visual analysis provided with the proposal in the EA, in terms of various matters relating to methodology, accuracy and vantage points. The Department also had some concerns regarding methodology. The Proponent has provided additional information in the PPR to address this issue and to support the assessment of the proposal's visual impact generally. This included consideration of view impacts on private land (addressed in Section 5.4.1 of this report) and from public areas.

The additional submitted information included a range of photographs and photomontages ("before and after"), from 17 vantage points.

Consideration

The Proponent undertook visual analysis from a range of view points, as illustrated in **Figure 36** below.



Figure 36: Visual Analysis Vantage Points in PPR

The analysis undertaken was comprehensive. In terms of the 17 vantage points, they represent a range of views to the site from a wide spectrum of places and compass directions. While other vantage points could have been chosen (e.g. Goat Island, closer at Lime Street), the range of places and analysis represents a good spectrum from which to analyse and consider the visual impacts of the proposal.

In terms of vistas and views, it is noted the City of Sydney's Central Sydney DCP 1996 identifies key vistas and views within the CBD. No vistas to Barangaroo are identified, although this is due to the previous use of the site and the lack of key landmarks or heritage items of value. The redevelopment of the site was not likely to have been contemplated at the time of the DCP, and this would also be the case for the Sydney Harbour Foreshores and Waterways Area DCP 2005. Despite this, thorough assessment of visual impacts is required in the DGRs, within the statutory and strategic context, and is important for such a significant site.

As a first principle, and underpinning planning for the site as far back as the original design competition for Barangaroo, the public domain and street network should connect well with the City grid, open up views along streets towards the Harbour and allow public access to and through the site. The overall site planning, street layout and location of open space and civic spaces is considered to be sound, particularly by providing additional water areas to enhance foreshore recreation in the proposed Modification. The proposed site planning provides a sound basis for the subsequent location of buildings.

It is then relevant to consider the proposed building bulk, particularly the changes proposed in the Modification application, as viewed from public places. This should also be considered in the wider

context of the Barangaroo site, with the benefits to be gained from new large open space areas, foreshore access, a sloping headland park and views generally to and from the northern part of the site, adjoining Millers Point Conservation Area.

The Proponent has provided a comprehensive visual analysis from public areas. The analysis outlines the methodology and reasons to support choice of a 24mm lens, and also provides two rectangles within the 24mm photos, representing the view contained in a 35mm lens (outer white rectangle in the photograph below) and 50mm lens (inner rectangle). As explained in the analysis, these photographs at longer lens lengths have the effect of “cropping” the same photograph (see **Figure 37**).



Figure 37: Example of Photomontage Analysis in the PPR

For each of the 17 locations outlined, 5 colour photographs/photomontages were provided, as follows (each with a 24mm lens and with 35mm and 50mm lens frame shown in white rectangles):

- Existing site and surrounds;
- Representation of the existing built form outside the site, used for 3D modelling of the proposal/photomontages on the site;
- Image showing the approved Concept Plan massing (inductive envelopes);
- Image showing the proposed envelopes (Modification 4, subject proposal); and
- Image showing the proposed envelopes, with indicative buildings within the envelopes.

This approach, rationale and methodology in the analysis undertaken and presented in the PPR are considered sound.

The following images (**Figures 38 to 51**) from within that PPR visual analysis demonstrates the images taken from various vantage points (generally north, south, east and west of the site), with the approved envelopes on the left and the proposal on the right from the same vantage point:



Figures 38 and 39: Hickson Road (from the north)



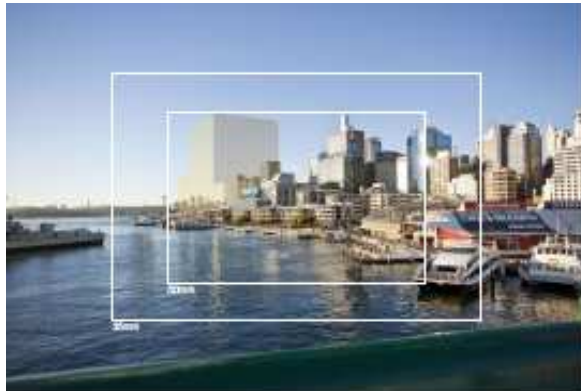
Figures 40 and 41: Observatory Park (from the north-east)



Figures 42 and 43: Gas Lane (from the east)



Figures 44 and 45: King Street Wharf Foreshore Walk (from the south)



Figures 46 and 47: Darling Harbour (from the south)



Figures 48 and 49: Pyrmont Park Pier (from the west)



Figures 50 and 51: Balmain Wharf (from the north-west)

It is clear the proposal will have added visual impacts compared to the approved Concept Plan, and this can be seen in the visual analysis provided, particularly when comparing “like with like” approved and proposed envelopes.

From further distances, it is considered the additional height is more apparent than the bulk of buildings, due to the distance. It is noted that “height” was the main issue raised in written submissions opposing the development proposal. In this regard it is important to note that Barangaroo is a CBD location and that tall buildings are an accepted feature of CBD locations.

Generally, from more distant views to the west and north, the proposal is perceived as part of the city skyline behind the development, although the proposed increases in height are noticeable. The proposed higher and larger buildings have the effect of reading the site more as part of the CBD behind it, although this would also have been the case with the approved Concept Plan as modified.

From closer views, along the foreshore promenade and Darling Harbour the main difference is the proposed hotel on the pier, which “spreads” the development westwards, and the southern commercial building. Barangaroo South will appear dense, like areas of the CBD and significantly higher than buildings and the setting of Darling Harbour and King Street wharf to the south, when viewed from those southern closer vantage points.

The visual impact of the proposed hotel building has the potential to be a positive element in the urban setting of which it is part, provided it is of the highest quality. In this regard, the recommendation seeks to reduce the footprint of the envelope sought, limit the floorplates to below that put forward in the proposal and includes other measures to address design quality. For other buildings on the site, the density and prominence of buildings when viewed across water also has the potential to be interesting and add to the attraction of visiting the area, again provided the design and massing is well articulated and of very high quality.

After considering the proposal against the approved Concept Plan and the visual impact of the proposal on the views and vistas to the site from public areas, the Department considers that the proposal will have a strong visual impact on the more immediate areas, although this impact is acceptable, subject to recommended changes to the envelopes sought for blocks X and Y, additional or varied built form controls and amendments to aspects of the approval sought. These matters are outlined in the recommended terms of approval.

With the recommended changes, the Department is satisfied the visual impact of the proposal and future buildings can be managed during the Project Application stage(s).

5.3.4 Built Form Controls

While considering that the overall development framework, building blocks, form and height is acceptable, the urban design aspects and controls for the individual building blocks also require assessment.

Figure 52 illustrates the building block numbers (or letters) for the Barangaroo South precinct.

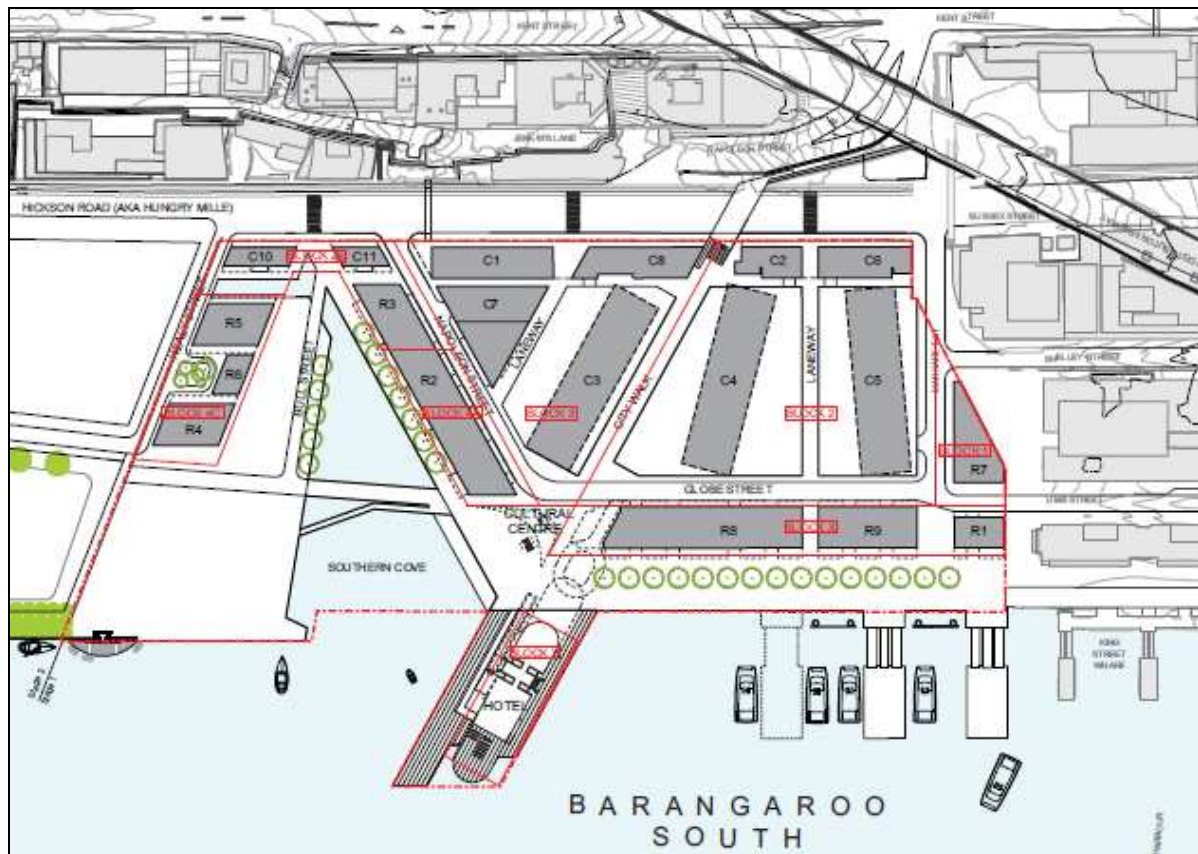


Figure 52: Building Blocks (red) and Building Numbers (black)

The existing Concept Plan approval includes controls relating to built form (B9 of the instrument of approval), while the EA(s) for previous approvals also included built form controls. Given the change in configuration, these controls need to be revised.

The Proponent's EA, as revised and updated in the PPR (Appendix C), puts forward recommended built form controls to accompany the proposed configuration and building envelopes. These are in a section titled "Urban Design Controls" and seek to "*guide the future design and development of the buildings within Barangaroo South*". This is done by providing controls in the following 10 areas, for which each block and building is then analysed and "objectives" and "standards" established (as relevant):

1. Building mass and location.
2. Street wall establishment.
3. Building articulation.
4. Building legibility.
5. Ground floor permeability and accessibility.
6. Ensuring quality of rooftops.
7. Facades.
8. Active street fronts.
9. Signage.
10. Public access on pier.

Consideration

The 10 areas for built form controls put forward by the Proponent are considered appropriate and well considered. However, a following control is recommended to apply to all building blocks:

11 Sustainable Building Design

The design of buildings and the public domain shall incorporate, utilise and integrate leading sustainability practices in design, massing, materials and detailing. Buildings should be a model for sustainable building design and construction, and where accepted sustainability measures exist for the type of building being proposed, an industry-leading rating should be

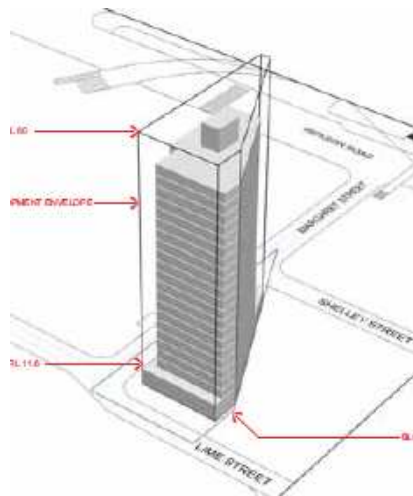
achieved. Sustainability measures should preferably be legible and discernable in the building design.

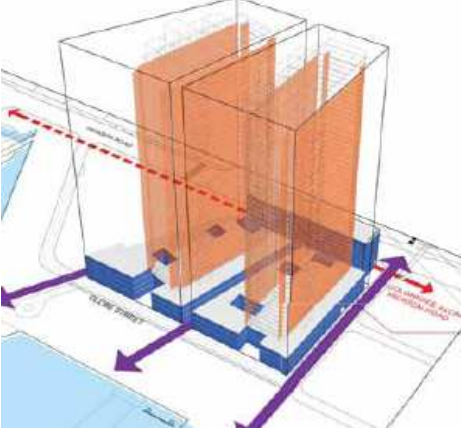
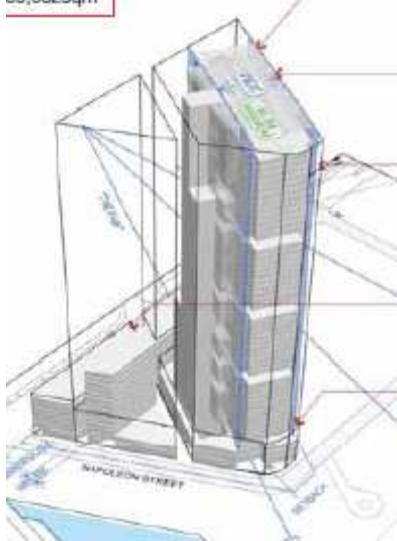
For each building block, the Proponent has suggested “objectives” and “standards”. The introduction to these controls states: *“The standards provide an example of how the objectives may be achieved through the building design. It is not intended that these Standards, Controls or Objectives become a set of prescriptive design requirements. This has specifically been avoided to allow for innovation, creativity and alternative design solutions to be achieved...”* This is understandable from an architectural innovation point of view. However, controls also need to ensure undesirable outcomes are avoided; there are measurable aspects to objectives, particularly where architectural desire may conflict with commercial considerations. The Department has therefore recommended additional or modified controls, where required.

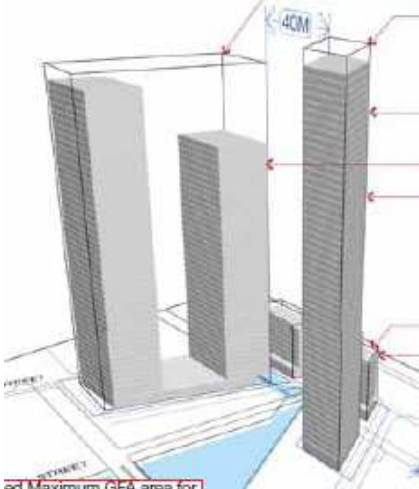
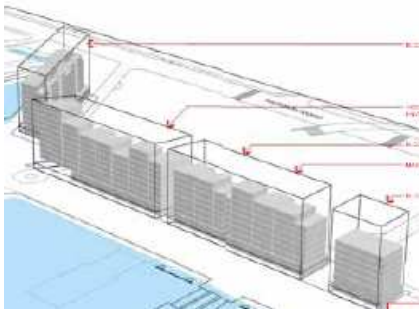
Generally, the proposed controls are reasonable, although additional controls are recommended, and generally the minimum street wall height of 1m on several blocks is considered too low where a consistent higher street wall would result in a better relationship with the surrounding area (e.g. Globe Street and Hickson Road). The proposed building envelopes are recommended by the Department to be changed on the new Blocks X and Y, better reflecting design intentions and indicative designs.

The City of Sydney has also made suggestions about the proposed built form controls (noting its opposition to the proposed hotel) and commented on proposed heights and other matters (including recommending GFAs for each block/building rather than aggregation). Other submissions have also raised issues regarding the proposed buildings, height and bulk and associated visual impact. These issues have been considered. In terms of not aggregating GFA across blocks (such as for 2, 3, 4A, 4B and 4C), this is considered acceptable in terms of the individual envelopes and controls proposed and recommended. In some cases, the proposed envelopes are recommended to be reduced (new Blocks X and Y) to provide greater certainty regarding the outcome and an appropriate relationship with the surrounding built form.

Table 6 below outlines the consideration and response by the Department to the proposed built form controls for each block, as outlined in the PPR.

Block	Envelope/Identification	Consideration
1	 <p>GFA: 9,400sqm Height: RL 80</p>	<p>The controls for this block are appropriate and reasonable, with the following additions:</p> <p>Control 7 Objectives: Add “The width of driveways shall be minimised”.</p> <p>Control 8 Objectives: Add “Signage shall be integrated into the building design”.</p>

<p>2</p>	 <p>GFA: 428,932sqm (2,3,4A,4B,4C) Height: RL 180</p>	<p>The controls for this block are appropriate and reasonable, with the following additions:</p> <p>Control 1 Objectives: Add "Interesting building shapes are encouraged".</p> <p>Control 1 Standards: Delete "maximum of 29m setback from Hickson Road".</p> <p>Control 1 Standards: Change minimum of 1 storey podium height to "minimum predominant podium height of 3 storeys".</p> <p>Control 2 Objectives: Add "Podium height shall be determined having regard to compatibility of streetscape form with the surrounding area, and appropriate engagement and framing of the public domain, together with environmental considerations on the public domain and surrounding buildings".</p> <p>Control 2 Objectives: Add "The streetwall height on Hickson Road shall be robust and complement the eastern side of Hickson Road, seeking a "boulevard effect" along Hickson Road".</p> <p>Control 3 Objectives: Add "Methods to capture and reuse rainwater that strikes the southern elevation of Building C5 are encouraged".</p> <p>Control 7 Standards: Add "There shall be no single plane in the façade having dimensions greater than 60m in length and 60m in height (or equivalent area) without significant articulation, and change in plane from adjoining building elements, unless as otherwise instructed by the Barangaroo Design Excellence Review Panel".</p> <p>Control 8 Standards: Add "The width of driveways shall be minimised".</p> <p>Control 9 Standards: Add "Signage shall not be greater than 1 building level high (between floor slabs)".</p>
<p>3</p>	 <p>GFA: 428,932sqm (2,3,4A,4B,4C) Height: RL 209</p>	<p>The controls for this block are appropriate and reasonable, with the following additions:</p> <p>Control 1 Objectives: Add "The northern half of the Block (Building C7) shall contain comparatively lower buildings (when compared to the tower forms) as generally indicated in the indicative design".</p> <p>Control 1 Standards: Delete "maximum of 29m setback from Hickson Road".</p> <p>Control 1 Standards and Control 2 Objectives: Change minimum of 1 storey podium height to "minimum predominant podium height of 3 storeys".</p> <p>Control 2 Objectives: Add "Podium height shall be determined having regard to compatibility of streetscape form with the surrounding area, and appropriate engagement and framing of the public domain, together with environmental considerations on the public domain and surrounding buildings".</p> <p>Control 2 Standards: Add "The width and height of the colonnade along Hickson Road shall be</p>

		<p>appropriate to encourage its use, and be integrated into the proportions of the buildings of which it is part".</p> <p>Control 7 Standards: Add "There shall be no single plane in the façade having dimensions greater than 60m in length and 60m in height (or equivalent area) without significant articulation, and change in plane from adjoining building elements, unless as otherwise instructed by the Barangaroo Design Excellence Review Panel".</p> <p>Control 8 Standards: Add "The width of driveways shall be minimised".</p> <p>Control 9 Standards: Add "Signage shall not be greater than 1 building level high (between floor slabs)".</p>
4B and 4C	 <p>GFA: 428,932sqm (2,3,4A,4B,4C) Height: RL 160-175</p>	<p>The controls for this block are appropriate and reasonable, with the following additions:</p> <p>Control 1 Objectives: Add "If buildings are proposed within 4C they shall be separated by at least 18m and the podium shall be low to allow sunlight penetration through the buildings to the southern water cove and adjoining promenade on the southern side of the water cove"</p> <p>Control 1 Standards "Varified" be corrected to "varied"</p> <p>Control 8 Standards: Add "The width of driveways shall be minimised".</p> <p>Control 9 Standards: Add "Signage shall not be greater than 1 building level high (between floor slabs)".</p>
X and 4A	 <p>GFA: 18,908sqm Height: RL 41.5</p>	<p>The controls for this block are appropriate and reasonable, although there is concern that the maximum envelope control is too high and would result in an inappropriate height relationship with the public domain and surrounding building if it were filled. The indicative building designs are more appropriate. The following changes are recommended:</p> <p>The envelope shall be amended so that at the southern end of Block X (Building R1), the RL is a maximum of RL 27, with 6 habitable levels.</p> <p>Control 1 Objectives: Add "The predominant height of the building mass fronting the foreshore promenade shall be 6 or 7 storeys above ground level, with over 70% of the building frontages having a consistent height. Any "pop ups" shall not result in more than 9 storeys above ground level and the overall massing shall be such to create an homogenous yet interesting streetwall".</p> <p>Control 8 Objectives: Add "At least 70% of the ground floor frontages to the pedestrian waterfront promenade shall comprise retail or entertainment uses, open to the public and activating the adjoining foreshore pedestrian promenade".</p>


		Control 8 Standards: Add "The width of driveways shall be minimised".
Y	 <p>GFA: 33,000sqm Height: RL 170</p>	<p>The new hotel has the potential to be an exciting addition to the area, provided it is of the highest quality. Concern is held regarding the building envelope, in terms of the large floorplate that may result (around 2,000sqm, noting the indicative building footprint appears to be around 1000sqm-1100sqm). It is recommended the envelope be reduced in length and width, and other measures be introduced to give primacy to the public domain and foreshore access. Otherwise, the controls are appropriate and reasonable, with the following additions:</p> <p>The envelope shall be amended so that the width is a maximum of 20m, and the length is a maximum of 60m, above RL 20.</p> <p>Control 1 standards be amended to reflect the changes in the envelope above.</p> <p>Control 1 Objectives: Add "The design of the building shall appear open/ transparent at lower levels, particularly as viewed from the south and north along the foreshore promenade, to encourage views through the building at lower levels and greater appreciation of water and the surrounding public domain".</p> <p>Control 1 Objectives: Add "The building massing at the lower levels (to RL 20) shall give primacy to the use, enjoyment, accessibility and activation of the public domain and walkways around the pier".</p> <p>Control 1 Standards: Add "Any overhang of the western edge, above the public pedestrian promenade on the pier, shall be a minimum of 10m in height, so that the walkway is inviting and feels public".</p> <p>Control 2 Objectives: Add "Canopies and awnings shall not dominate or unreasonably impact on views and vistas towards the water or past the building, along public promenades".</p> <p>Control 5 Standards: Add "An average width of 10m, at ground, closest to the harbour waterfront, is to be provided around the perimeter of the pier, with a minimum width of 6m".</p> <p>Control 5 Standards: Add "The taxi drop-off zone shall not extend into a 15m promenade zone measured from the harbour edge (excluding the pier), so that vehicles do not interrupt the use and enjoyment of the waterfront promenade by pedestrians".</p> <p>Control 9 Standards: Add "Signage shall not be greater than 1 building level high (between floor slabs)".</p>

Table 6: Consideration and Response to the Proposed Built Form Controls for each Block

In terms of design excellence and subsequent processes, adequate and appropriate provisions exist in the current terms of the Concept Plan approval, which are not sought to be varied.

5.4 Amenity Impacts on Surrounding Land

5.4.1 View Impacts from Private Land

The impact of the proposed Modification on existing public and private views is a key issue for consideration, in particular potential impacts on residential buildings in Kent Street between Gas Lane and Observatory Hill - Highgate, Georgia, Stamford Marquee and Stamford on Kent (see **Figure 53**).



Figure 53: Location of Residential Towers on Kent Street

In response to concerns raised during the exhibition of the EA, the Proponent has provided additional view analysis in the PPR for the properties to the east of Barangaroo South, comparing the proposed Modification to the approved Concept Plan.

Within this analysis, when comparing the approved Concept Plan and the proposed Concept Plan Modification, the orthogonal studies (view corridors - see **Figure 55**) indicate that the number of units with reduced view corridors is greater than the number of units with increased view corridors. However, this methodology does not reflect the wider field of view available to these residential buildings. Accordingly, an analysis of oblique views (view cones – see **Figure 54**) was undertaken and it illustrates that the view sharing outcome achieved in the approved Concept Plan (as modified) is also achieved in the proposed Concept Plan Modification.

Figure 54 below demonstrates the broad oblique view analysis (with proposed Concept Plan view corridors shown in orange and approved Concept Plan view corridors shown in blue), while **Figure 55** demonstrates the orthogonal view analysis (with proposed increased view corridors shown in green and reduced views shown in orange).

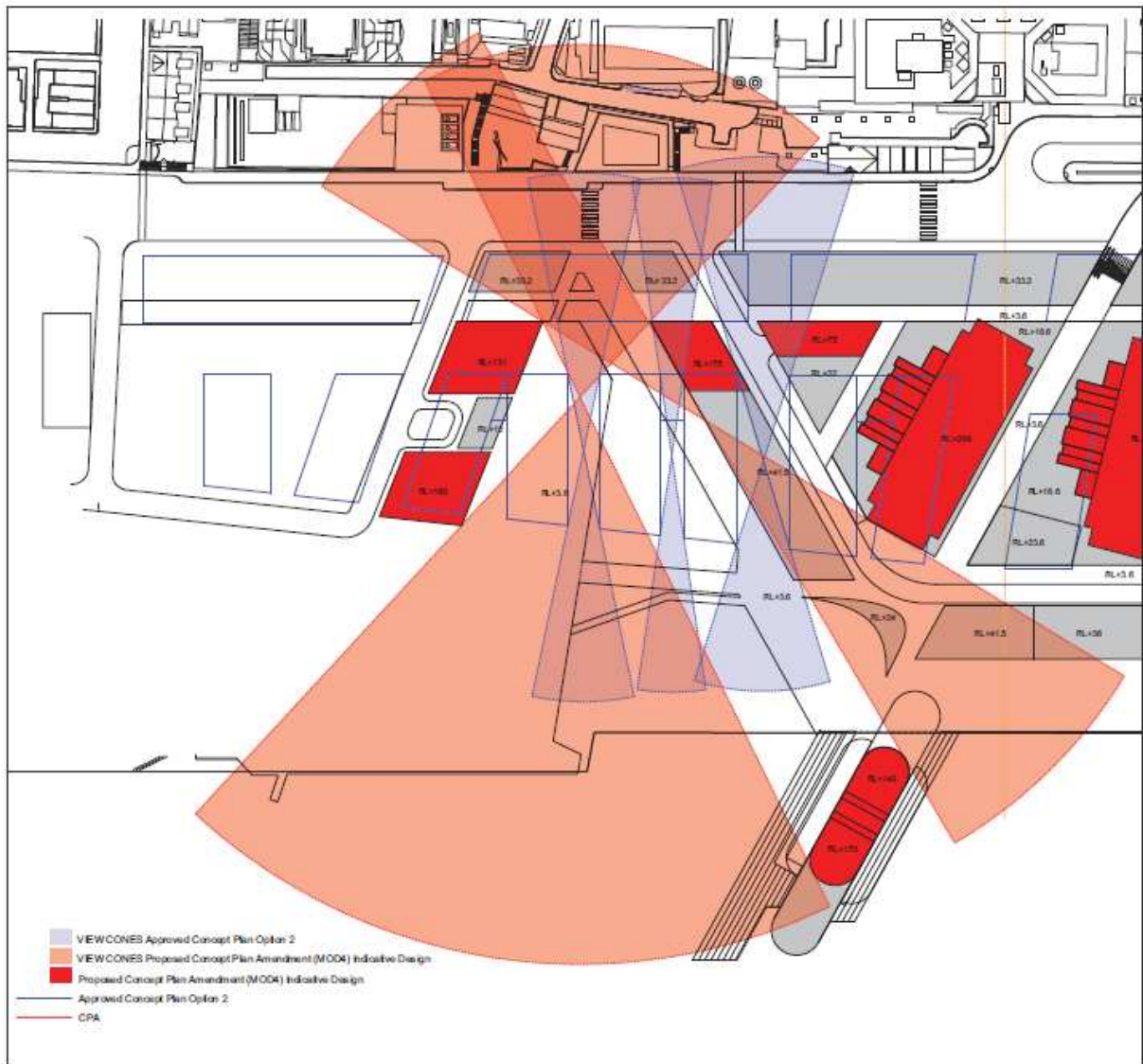


Figure 54: Oblique View Analysis – Approved (blue) v Proposed (orange)

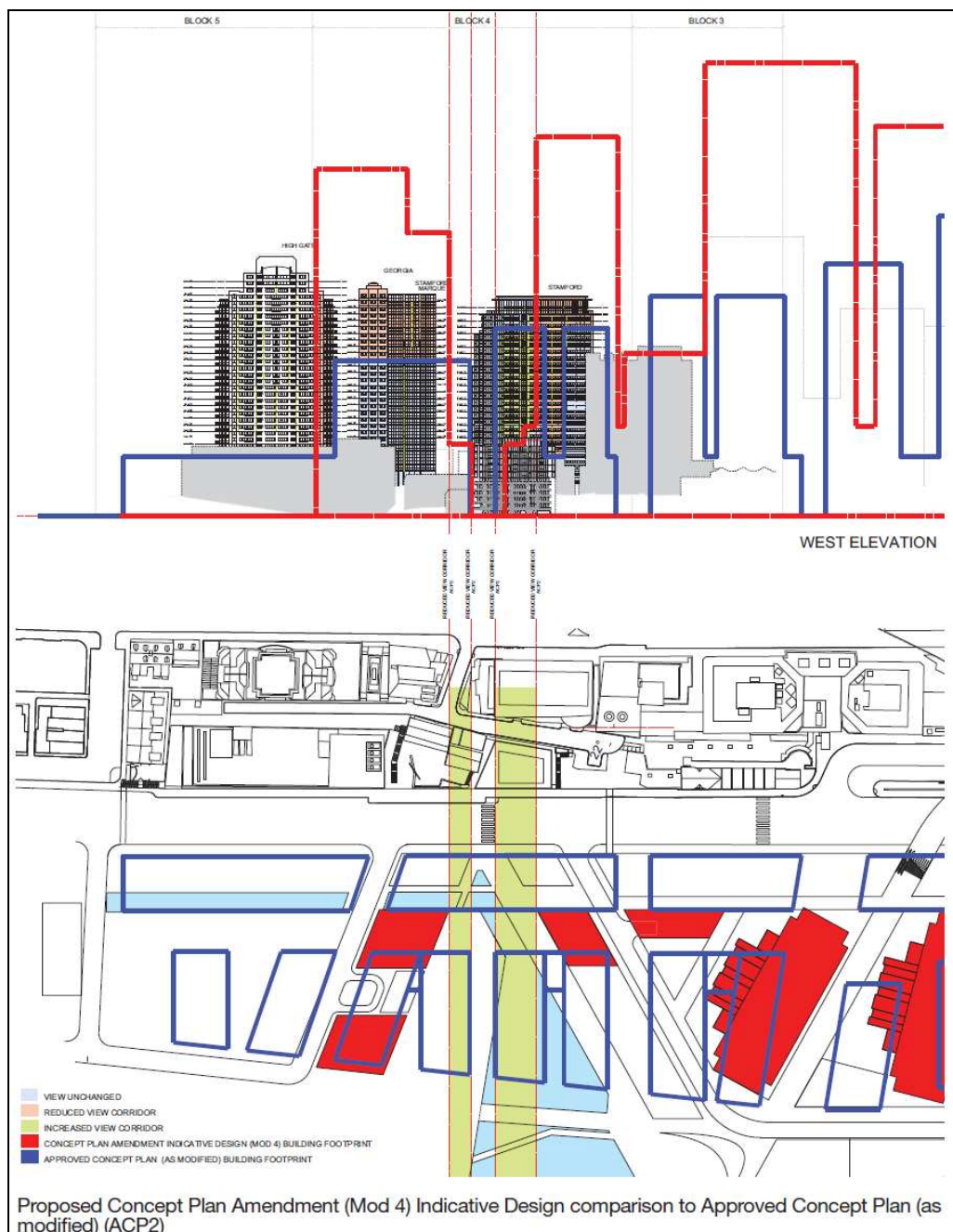


Figure 55: Orthogonal View Analysis – Reduced Views (orange) v Increased Views (green)

It should be noted that the building envelopes for the approved Concept Plan are indicative only, as buildings within those envelopes are subject to built form controls to regulate the size and location of podiums and towers by introducing maximum heights (for the podiums), maximum widths and depths, minimum building separations and minimum street setbacks. However, for the purposes of view impact analysis, the indicative envelopes are considered satisfactory.

The results of the view analysis regarding each Kent Street residential tower (from north to south) are discussed below:

Highgate

Currently enjoys existing views from the western facing units exist ranging from Darling Harbour in the south-west to the northern edge of the CBD peninsula.

The analysis shows that the proposed Modification will result in some view loss looking south-west in comparison to the approved Concept Plan (refer pgs 10-13 of Appendix C of the PPR - Supplementary Urban Design Statement).

The photomontage below (**Figure 56**) is an indicative image showing views as a consequence of the proposed Modification from Level 25 of Highgate towards the south-west and west. Proposed residential towers R4 and R5 are shown in the centre foreground.



Figure 56: Indicative View Impacts on the Highgate Building

Georgia

Existing views from the western facing units exist ranging from Darling Harbour in the south-west to the northern edge of the CBD peninsula.

The analysis shows that the proposed Modification will result in some view loss looking south-west to Darling Harbour and looking east towards Pyrmont and Glebe Island in comparison to the approved Concept Plan (refer pgs 14-17 of Appendix C of the PPR - *Supplementary Urban Design Statement*).

The photomontage below (**Figure 57**) is an indicative image showing views as a consequence of the proposed Modification from Level 25 of Georgia towards the south-west and west. Proposed residential towers R4 and R5 are shown in the centre foreground, residential tower R3 is shown on the left and the proposed landmark hotel building is shown at the entry to the Southern Cove.



Figure 57: Indicative View Impacts on the Georgia Building

Stamford Marque

Currently enjoys existing views from the western facing units exist ranging from Darling Harbour in the south-west to the northern edge of the CBD peninsula.

Similar to the Georgia, the analysis shows that the proposed Modification will result in view loss looking south-west to Darling Harbour and looking east towards Pyrmont and Glebe Island in comparison to the approved Concept Plan (refer pgs 18-21 of Appendix C of the PPR - *Supplementary Urban Design Statement*).

The photomontage below (**Figure 58**) is an indicative image showing views as a consequence of the proposed Modification from Level 25 of Stamford Marque towards the south-west, west and north-west. Proposed residential towers R4 and R5 are shown in the centre foreground, residential tower R3 is shown on the left and the proposed landmark hotel building is shown at the entry to the Southern Cove.



Figure 58: Indicative View Impacts on the Stamford Marque Building

Stamford on Kent

Currently enjoys existing views from the western facing units exist ranging from Darling Harbour in the south-west to the northern edge of the CBD peninsula.

The analysis shows that the proposed Modification will result in view loss looking south-west to Darling Harbour and looking east towards Pyrmont and Glebe Island in comparison to the approved Concept Plan (refer pgs 22-25 of Appendix C of the PPR - *Supplementary Urban Design Statement*).

The photomontage below (**Figure 59**) is an indicative image showing views as a consequence of the proposed Modification from Level 25 of the Stamford on Kent towards the south-west, west and north-west. Proposed residential towers R4 and R5 are shown on the right of the image, residential tower R3 is shown in the centre, while commercial tower C3 is shown on the left.



Figure 59: Indicative View Impacts on the Stamford on Kent Building

Consideration

The NSW Land and Environment Court case *Tenacity Consulting v Warringah Council* established Planning Principles for the consideration and assessment of view impacts, view loss and view sharing with view sharing defined as follows:

“The notion of view sharing is invoked when a property enjoys existing views and a proposed development would share that view by taking some of it away for its own enjoyment”.

In considering whether or not view sharing is reasonable, the following criteria were adopted:

- What views are affected (i.e. whether or not they are iconic views, water views, obscured etc.);
- From what part of the property are the views obtained;
- The extent of the impact; and
- The reasonableness of the proposal which is causing the impact.

In this regard, an assessment of the impact of the proposal upon views from the Highgate, Georgia, Stamford Marque and Stamford on Kent in accordance with these principles is as follows:

Views which are affected

In this case the views that are affected are largely water views, with also views to Darling Harbour, Pyrmont and Balmain.

From what part of the property are the views obtained

The views from the buildings to the east of the site are obtained from the western facing windows, and balconies of the Highgate, Georgia, Stamford Marque, and Stamford on Kent buildings.

The extent of the impact

The current modification will result in minor additional view loss in comparison with the approved Concept Plan, the final details of which will be determined at project application stage for the individual buildings on Barangaroo.

The reasonableness of the proposal which is causing the impact

The Proponents view analysis concludes that when comparing both orthogonal and oblique studies on view loss, the view sharing outcome achieved in the approved Concept Plan is also achieved in the proposed Concept Plan Modification. In this regard, the Visual Impact Analysis and indicative photomontages indicates that the proposed Concept Plan Modification will deliver a view sharing outcome for apartments with a western outlook from residential buildings on Kent Street (i.e. Stamford

on Kent, Highgate, Stamford Marquee and the Georgia) that is consistent with the established parameters of the approved Concept Plan. Particularly:

- View sharing will be achieved through the proposed location of tall slimline towers around the Southern Cove, allowing views through to the Harbour beyond.
- The Southern Cove and surrounding public domain will create a view corridor between buildings to the Harbour.
- View sharing will be further strengthened through the revised Urban Design Controls which have been introduced in the PPR – i.e.:
 - a minimum 40m separation between the tower forms in Block 4B and Block 4C (between buildings R3 and R5 in **Figure 60** below); and
 - a minimum 15m separation between individual buildings fronting Hickson Road in Block 4B and 4C (buildings R11 and R10) to contribute to an improved view sharing outcome for the Kent Street residential properties and for the residential building at 38 Hickson Road located opposite to buildings R11 and R10.



Figure 60: Southern Cove Buildings and View Corridor (between R11 and R10)

In addition, whilst the proposed hotel building at the entrance to the Southern Cove will also interrupt some views to the west, the building itself is intended to be a 'landmark' and will in itself provide an impressive visual marker for Barangaroo. Significant separation will also be provided between the hotel building and residential apartments in Kent Street, allowing for views beyond the hotel, where it is not already partially screened by proposed residential towers R3, R4 and R5.

5.4.2 Other View Impacts

The proposal will result in some loss of view and outlook from commercial properties adjoining the Barangaroo site, particular to the south from the KPMG building, Macquarie Bank building and the AMEX building. Whilst it is acknowledged that view loss will occur as a consequence of the proposed Modification, the impacts are not considered unreasonable given that views from these buildings were already obstructed by the approved Concept Plan. Private views cannot be guaranteed and protected, but need to be considered in determining the public benefits of the proposal. In this regard, view corridors and vistas along significant streets and pedestrian connections have been protected.

It is also worth noting that the proposed Concept Plan Modification represents the maximum potential building mass that can be achieved on the site and view impacts are likely to be less in net terms. In this regard, there is an opportunity for future applications to design buildings in a manner that considers views and outlook and accommodate view corridors where possible.

5.4.3 Overshadowing

Located to the east, south-east and south of the site are some residential and commercial buildings fronting Hickson Road and within King Street Wharf. The impact the current modification may have on the overshadowing of these properties (particularly of the adjoining Highgate, Georgia, Stamford Marque, Stamford on Kent) is a key issue for consideration.

A shadowing analysis for the proposed Concept Plan Modification was included as part of the original EA. The shadowing analysis was 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 and proposed Concept Plan Modification shadows.

To provide a realistic 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 block from the maximum development block envelopes. It is important to note however, the maximum potential extent of shadowing 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. Accordingly, the shadowing analysis also shows the shadows expected to be cast by the Proponent's indicative layout.

Consideration

The shadow analysis indicates that in mid-winter some additional shadowing will occur on Sydney Wharf between 9am and 10am. The Wharf currently accommodates the Australian Maritime Museum on its eastern side and some upper level residential uses. During this same time, some additional shadowing also occurs over the Wharf 7 plaza area and the docked historic ship associated with the Natural Maritime Museum (as shown in **Figure 61** below). It is considered that this period of additional shadowing is acceptable given that no further shadowing occurs after 10am in the mid-winter period. That is, the early morning hours affected by shadowing are not peak hours of use for the area affected, and will not cause any significant impact on the use and enjoyment of facilities.

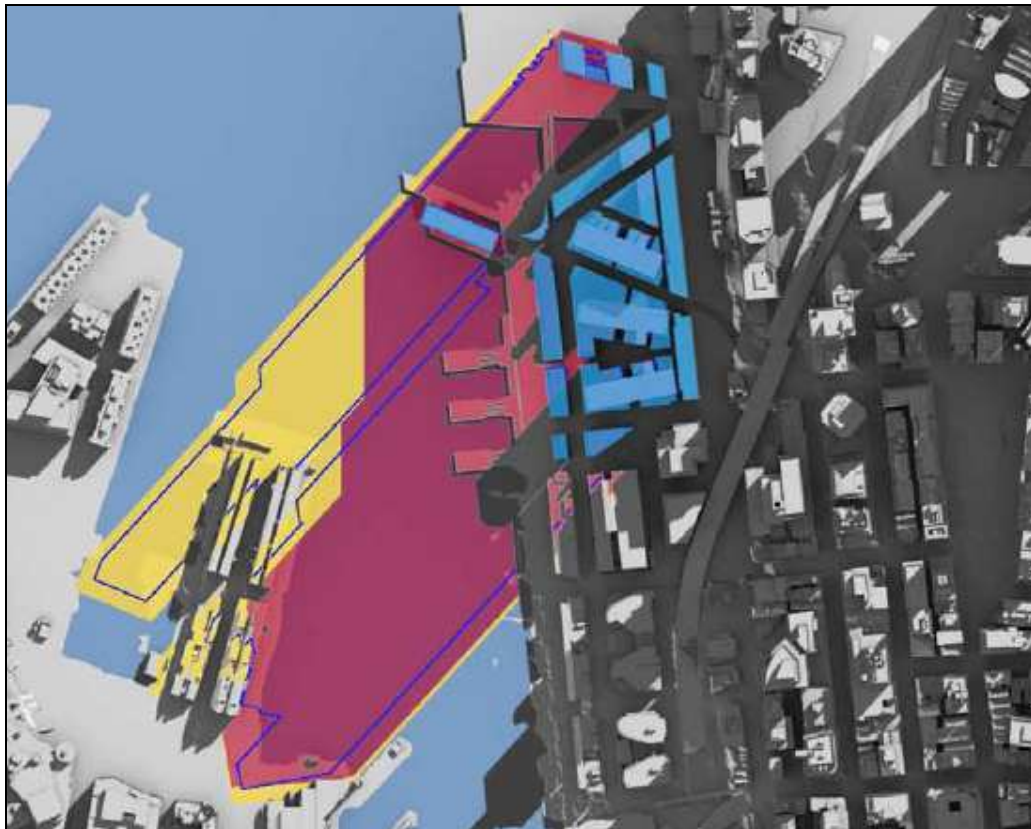


Figure 61: 9am Shadow/21 June (yellow – proposed CP shadow; red – approved CP shadow)

As the day progresses during mid-winter, the extent of shadowing on the waters of Darling Harbour reduces progressively between 10am and 2pm. The key lunch time period (12pm to 2pm) associated with the peak demand for recreational boating activity, demonstrates that a significant portion of direct sunlight will still be available to the waters of Darling Harbour as a consequence of the proposed Modification. By 12pm any additional shadowing is largely confined to waters directly adjoining Barangaroo South (from the proposed landmark hotel building) and commercial buildings to the south within the King Street Wharf precinct, behind the waterside bars and dining areas (as shown in **Figure 62** below).



Figure 62: Noon Shadow/21 June (yellow – proposed CP shadow; red – approved CP shadow)

Some minor additional overshadowing will occur on commercial buildings with the CBD in the afternoon, which is not considered significant. Residential buildings in Kent Street will not be affected by shadow until after 3pm (see **Figure 63** below).



Figure 63: 3pm Shadow/21 June (yellow – proposed CP shadow; red – approved CP shadow)

Overall, it is considered that the overshadow impacts of the proposed Concept Plan Modification on properties external to the Barangaroo site are acceptable, particularly given that:

- the waters of Darling Harbour continue to receive significant direct sunlight during the middle of the day and the afternoon (during peak periods of usage);
- residential properties to the east and west are largely unaffected and are not expected to experience significantly more shadowing than envisaged by the approved Concept Plan;
- the extent of additional shadowing to properties to the west is only for a short period of time between 9am and 10am in mid-winter; and
- the extent of additional afternoon shadowing over CBD buildings from the proposed envelopes is marginal when compared to the impacts of the approved Concept Plan envelopes.

5.5 Transport and Access

Sydney CBD is the most accessible region in the metropolitan area and has a high level of public transport use, walking and cycling. Planning for the Barangaroo site has sought to achieve an appropriate balance to minimise traffic growth, limit parking supply, and make full use of existing and proposed transport initiatives.

A Transport Management and Accessibility Plan (TMAP) has been prepared for the approved Barangaroo Concept Plan (as modified) to provide an integrated approach in the planning and delivery of transport and access arrangements for the precinct. The TMAP identifies the following mode split targets for the journey to work in the Barangaroo precinct: 83% by public transport (63% rail, 20% bus); 12% pedestrian / other; 4% car; and 1% ferry.

A number of public and agency submissions raised issues in relation to transport and access. The impact of additional GFA and resultant number of employees and residents both locally and more broadly was a key consideration of the original Concept Plan and is a key issue for the current Modification.

5.5.1 Public Transport

Based on a conservative development program and population figures identified for Barangaroo, the Department considers there to be three key periods relating to the provision of, and access to public transport relevant to the development of Barangaroo – these being the short term (present to 2014), the medium term (2014-2018) and the long term (2018-2027).

In this respect, the cumulative predicted population figures for Barangaroo for these periods are identified in **Table 7**.

Period	Commercial/Retail	Residential	Hotel/Tourism	Cumulative Total
2010-2014	1,250	300		1,550
2014-2018	9,889	922	1,650	14,011
2018-2027	8,334	1,253		23,598

Table 7: Cumulative Population Figures for Barangaroo in the Short, Medium and Long Term

There have been a number of transport policy changes relevant to the Barangaroo-Wynyard precinct since the Minister for Planning approved the original Barangaroo Concept Plan in 2007. The key change in this respect is the deferment of the CBD Metro and the development and implementation of the Metropolitan Transport Plan (MTP).

The MTP provides a strategy to effectively link Sydney's land use planning with its transport network and fully integrate the Plan with the Metropolitan Strategy. The Metropolitan Strategy itself is based on a policy of concentrating development and supporting transport services in Sydney's centres including the CBD, thereby making better use of existing infrastructure, strengthen economies, create a more liveable city and concentrate new housing and employment development in areas underpinned by efficient transport links.

The Government has also announced a 10 year funding guarantee to ensure key projects in the MTP are delivered in a timely way.

Transport NSW has detailed that the MTP outlines a number of initiatives to improve transport services and capacity across Sydney and the CBD relevant to the Barangaroo-Wynyard precinct. These include a new Western Express Rail Line, a new and expanded light rail network and 1,000 new buses for greater Sydney.

Importantly, the delivery and timing of these initiatives are integral to the development of the Barangaroo Precinct. **Table 8** provides further detail on the various public transport modes in the Sydney CBD and their relationship to Barangaroo.

Public Transport Mode	Relationship to Barangaroo
Heavy rail	<p>The Barangaroo site is in close proximity to the City Rail network at Wynyard Station, which will provide the key public transport access to the precinct.</p> <p>Wynyard Station faces increasing demand as the north western quadrant of the CBD continues to expand in employment and services. As outlined in the TMAP, the NSW Government is investigating options to upgrade Wynyard Station in the future through the Wynyard Precinct Master Plan. The Plan, which is expected to be released in early 2011, aims to reduce overcrowding and improve pedestrian flows, and provide for better integration of the station with development in the immediate surrounds.</p> <p>In addition to the TMAP, a number of heavy rail improvements are proposed that would support future development in the Sydney CBD, including Barangaroo. These improvements include:</p> <ul style="list-style-type: none"> • The new Western Express Line into the Sydney CBD, enabling increased services from Western Sydney and additional capacity at key city stations including Wynyard to be delivered by 2018. • Long term planning to support future capacity requirements, including corridor protection through the CBD and across the harbour.
Light rail	<p>Based on the information outlined in the EA, the proposed road layouts and pedestrian facilities are planned to allow for any future construction of a light rail system along Hickson Road should it be identified as the preferred option. The NSW Government and City of Sydney are currently undertaking studies to identify options for light rail in the Sydney CBD, including the ability to service the Barangaroo precinct.</p>
Buses	<p>The Concept Plan modification retains the proposed bus routes and extensions to existing bus routes, envisaged by the approved Concept Plan (as modified). This approach is consistent with the TMAP in place. The MTP also provides for 1,000 new buses across the Greater Sydney, which would benefit the Sydney CBD.</p>
Ferries	<p>As outlined by the Proponent in the PPR, the proposed Concept Plan modification facilitates the future provision of ferry wharves and provides an</p>

	indicative location at the southern end of the site. The construction of wharves and the provision of associated infrastructure would be undertaken by others and does not form part of this modification.
Metro rail	The Concept Plan (as approved) identifies an Interim Metro Corridor in an east-west direction at the southern end of the Barangaroo site. The Concept Plan modification does not preclude the use of this corridor for future transport requirements. Relevant corridors and station boxes have been afforded protection under the ISEPP.

Table 8: Public Transport Arrangements for Barangaroo (Existing and Planned)

Consideration

The Department has considered the submissions made in relation to public transport capacity and comments provided by Transport NSW and believes that the development of the Barangaroo precinct can be supported by the existing network and committed public transport improvements in the Sydney CBD.

Short to Medium Term

In the short (2010-2014) to medium term (2014-2018), and given the moderate increase in population predicted prior to 2018, the Department is satisfied that improvements outlined by Transport NSW in regard to both public transport and pedestrian flows delivered through the Wynyard Station Master Plan process, pedestrian upgrades and other non-heavy rail transport initiatives in and around the Barangaroo-Wynyard Precinct, will ensure that travel demand is met and appropriate levels of access to and from Barangaroo are provided.

However, this is generally contingent upon:

- the delivery of improved pedestrian links between Barangaroo and Wynyard including the Barangaroo Pedestrian Link and improvements to Margaret Street and other streets adjoining Barangaroo (refer to Section 5.5.2.1 of this report);
- improvements in pedestrian flows within Wynyard Station as part of the Wynyard Precinct Master Plan process currently being developed by Transport NSW;
- initial ferry services being delivered by 2014; and
- ongoing strategic planning for the proposed light rail extension between Haymarket and Circular Quay.

Critical to meeting travel demand and access requirements in the short to medium term is the concurrent delivery of the pedestrian upgrades linking Wynyard with Barangaroo, with the occupation of commercial building C4 within Barangaroo South anticipated in 2014. A modification is therefore recommended which requires details of proposed improved pedestrian linkages between Barangaroo and Wynyard to be provided with relevant Project Applications for built form above ground level within Barangaroo.

Long Term

The TMAP has previously relied on specific rail proposals in close proximity to Barangaroo to provide additional public transport capacity, such as the North West Metro and CBD Metro. The supplementary TMAP provided with the Modification to the Concept Plan has identified the initiatives announced by the NSW Government in the MTP would serve a similar purpose in providing additional public transport capacity for the Sydney CBD. The Proponent considers that these initiatives (as outlined in **Table 8**), would also be of considerable benefit to the Barangaroo precinct.

In the long term (2018-2027), the Department is satisfied that the delivery of the NSW Government's public transport objectives for Sydney and the CBD, as relevant to the Barangaroo-Wynyard precinct, coupled with the implementation of the Proponent's TMAP will be sufficient to absorb the travel demand created by the ongoing development of Barangaroo.

However, it is vital that the relevant public transport initiatives are delivered in a timely manner. The development of Barangaroo represents a significant investment by the private sector in the CBD's future and this development can only be realised if the NSW Government supports Barangaroo's development and occupation with relevant public transport improvements and access arrangements at appropriate times. Assuming that key pedestrian linkages have been delivered by 2014, this includes:

- By 2018, heavy rail upgrades into the Sydney CBD, enabling increased services from Western Sydney and additional capacity at key city stations including Wynyard to accommodate the predicted increase in population in the Sydney CBD and Barangaroo at this time;

- Full ferry services for Darling Harbour providing direct access to Barangaroo and the western CBD;
- The continued support for a fully funded light rail extension from the existing line between Haymarket and Circular Quay;
- Improvements to the Wynyard Bus interchange; and
- Ongoing long term planning to support future capacity requirements, including corridor protection through the CBD and across the harbour.

It should be noted that given the importance of the MTP to the future of Sydney and the CBD, key elements such as the Western Express Rail Line and light rail extensions have been declared critical infrastructure by the Minister of Planning to provide greater certainty of delivery.

While noting the Concept Plan (as approved) provides requirements in relation to the updating of the TMAP at the completion of each development block, the Department considers that this should be strengthened so that TMAP requirements are more closely aligned to key transport initiatives that support the development of Barangaroo.

Subsequently, a modification has been recommended that requires the TMAP to be updated at key transport milestones, or as otherwise directed by the Director-General, including 2014 and 2018 to ensure that the development of Barangaroo is aligned with key planned public transport improvements. This approach also ensures that sufficient time passes to more fully assess the progress of planned public transport improvements for the Sydney CBD, and the opportunities for the Barangaroo precinct to benefit from these improvements.

5.5.2 Walking and Cycling

The TMAP outlines a proposed network to support walking and cycling to, from and within the Barangaroo site (**Figure 64**). More specifically, this includes the following initiatives:

- Overhead pedestrian bridges to facilitate connection to Margaret Street and Wynyard Station.
- The Concept Plan modification facilitates the approved bicycle strategy for Barangaroo South, namely connection to the City of Sydney "Cycle Plan". The principal route into Barangaroo South from the city to the south is from Kent Street, turning into Napoleon Street onto Hickson Road. Hickson Road is currently a City of Sydney bicycle route with a dedicated, marked bicycle lane.
- The Foreshore Promenade will be designed wide enough to accommodate both pedestrians and bicyclists. The Foreshore Promenade will connect into the route leading through King Street Wharf to the pedestrian Pyrmont Bridge at Darling Harbour.
- The public domain will contain bicycle racks at strategic locations, and developments at Barangaroo South will be required to provide facilities such as secure bicycle storage and showers that encourage commuter cyclists.

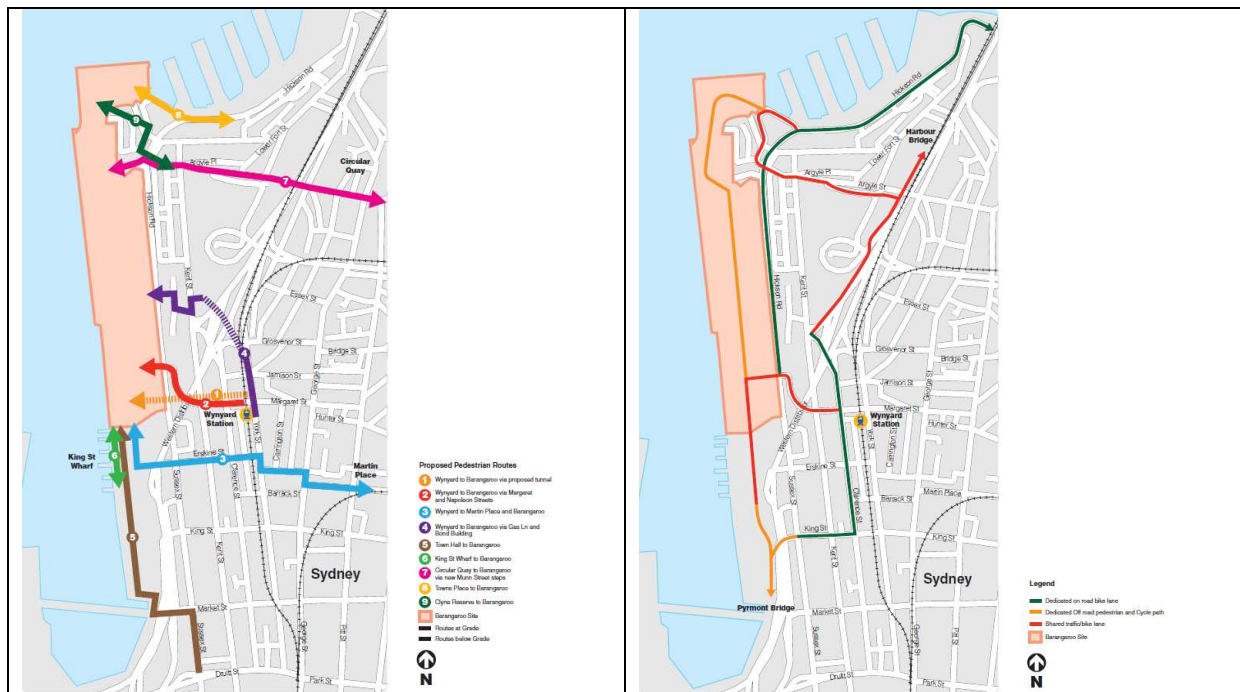


Figure 64: Existing and Proposed Pedestrian and Cycle Routes

5.5.2.1 Barangaroo Pedestrian Link

The Barangaroo Pedestrian Link (BPL) has been identified as a key pedestrian link between Sydney CBD and the Barangaroo precinct, and provides direct access to Wynyard Station (**Figure 65**). The BPL was originally identified as part of the CBD Metro project, and has received planning approval as a stand alone project following a modification to the CBD Metro Project Application (MP09_0036 MOD 1).

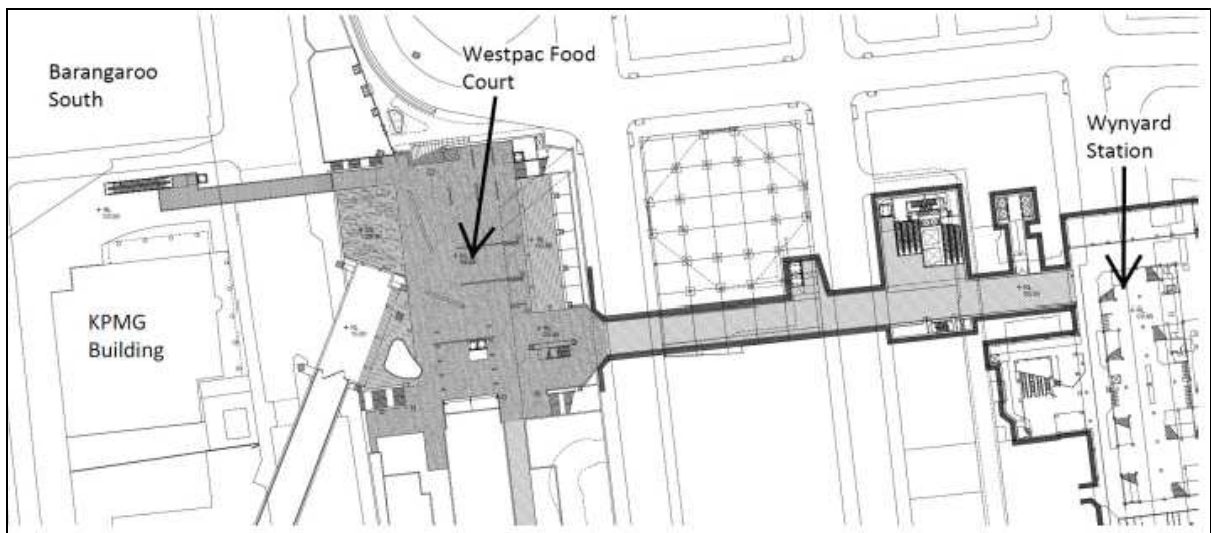


Figure 65: Barangaroo Pedestrian Link

The Department has also identified the importance of the BPL on the western side of Hickson Road as part of the approval of the Barangaroo Bulk Excavation and Basement Car Park Project Application (MP10_0023). A condition of this approval requires additional analysis and design work to ensure that the BPL bridge can be accommodated on the western side of Hickson Road whilst maintaining adequate space for pedestrian movement at ground level around the bridge landing.

Consideration

The Department considers that the BPL is an essential link between the Barangaroo site, Wynyard Station and the Sydney CBD. The BPL will support the targets in the TMAP for the majority of trips to/from the site to be made by public transport.

Transport NSW has confirmed that the development of the pedestrian link is fully funded and will be developed concurrently with the development of C4 to ensure improved pedestrian access to and from the Wynyard precinct is in place. This will also ensure improvements are in place prior to the completion of the Western Express Rail project.

Transport NSW has confirmed that it is continuing the detailed planning and design work required to support the improved pedestrian links in conjunction with the Wynyard master planning process now underway.

5.5.3 Traffic

The TMAP outlines a proposed road hierarchy for the Barangaroo precinct (**Figure 66**), where Hickson Road is the key road for the precinct and provides connections to the Sydney CBD via Napoleon Street, Margaret Street and Sussex Street. Local roads are proposed within the site to support access to commercial, residential and recreational uses at Barangaroo.

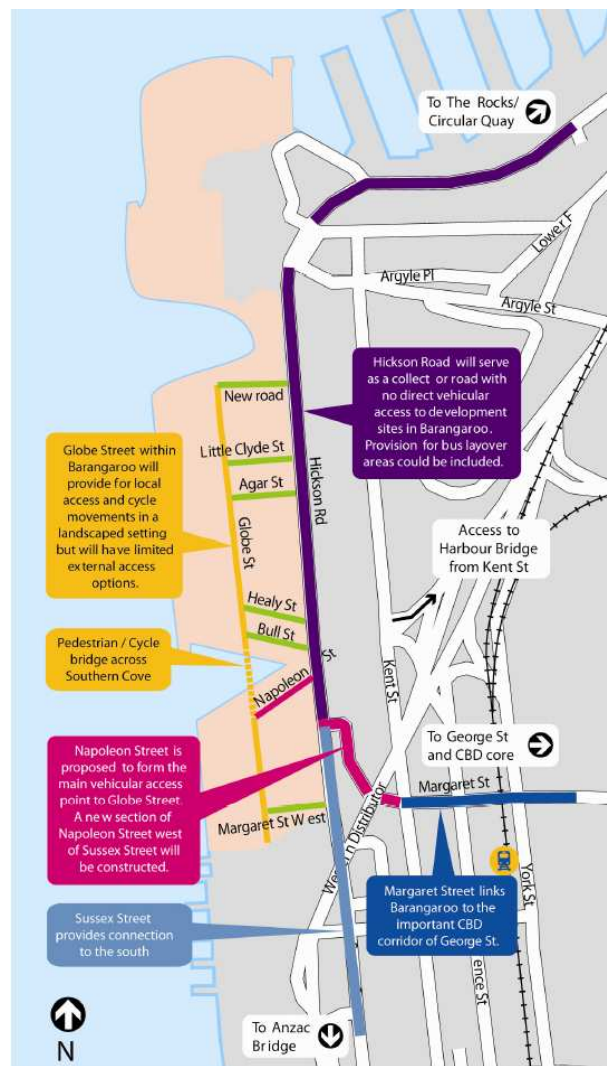


Figure 66: Barangaroo Road Hierarchy

Traffic analysis has been undertaken using the same transport principles and assumptions that were used for TMAP September 2008 including the rates for calculating population, parking and trip generation. Although there have been changes in GFA that have resulted in slightly more car parking spaces, this has not contributed to any additional peak hour traffic generation in the vicinity of the site, as shown in **Table 9** below. This is due to the residential parking spaces contributing to a lower traffic generation rate in the peak periods than the commercial spaces as well as a significant reduction in the number of hotel rooms which reduces the traffic generation in the peak periods. The one instance where traffic generation is slightly higher in the AM outbound peak, with an additional eight forecast movements. This is considered a minor increase (approximately 3%) and is considered to have an insignificant impact on the overall local road network.

Time Period	Direction	TMAP September 2008 Concept Plan (Mod 2)	TMAP Supplementary 2010 Concept Plan (Mod 4)
AM	In	309	308
	Out	233	241
PM	In	272	263
	Out	413	408

Table 9: Traffic Generation at Barangaroo (Peak Periods)

Since the traffic generation is similar to the TMAP and these are the key inputs for the Paramics modelling, the Proponent has indicated that the traffic outcome for the TMAP Supplementary Report is unchanged when compared to the TMAP (September 2008). The TMAP originally concluded that there would be reasonable traffic operation without overloading the local road network. This conclusion is unchanged for the TMAP Supplementary Report.

Consideration

The Department has considered this information and supports the conclusions made on the traffic analysis. The realisation of the mode share targets adopted in the TMAP is integral in supporting the traffic management outcomes for Barangaroo.

5.5.4 Parking

The EA for the Concept Plan modification indicates that up to 2,690 spaces would be required to support the increase in GFA proposed at Barangaroo. This represents an increase from a total of up to 2,446 car spaces in the approved Concept Plan. The main changes relate to a decrease in the commercial car parking and an increase in the residential car parking numbers. The following car parking rates adopted by the approved Concept Plan (as modified) are proposed to be retained and applied to Barangaroo South, as detailed in Table 10.

Land Use	Car Parking Rates
Commercial	1 space per 600m2 GFA
Residential	
1 bedroom / bedsitter	0.5 spaces
2 bedrooms	1.2 spaces
3 bedrooms	2 spaces
3+ bedrooms	2 spaces
Retail	As per City of Sydney LEP 2005 rates
Tourist	As per City of Sydney LEP 2005 rates

Table 10: Car Parking Rates for Barangaroo

As a first stage in delivery of the car parking spaces for Barangaroo South, approval was given to construct 880 spaces as part of the Bulk Excavation and Basement Car Park Project Application (MP10_0023) that will service the mixed use precinct. This car parking will be augmented by additional basement car parking provision to reflect the new mix of uses and to service the landmark building and Block X, and are subject to separate future Project Applications.

Consideration

The Department supports the parking rates used for the Barangaroo precinct and believes that it is an appropriate response to maximise the use of public transport for the site and minimise traffic impacts on existing CBD streets and intersections.

5.6 Infrastructure

5.6.1 Utilities and Services

The demands that the proposed additional GFA will place on the services and infrastructure surrounding the development is a key issue for consideration.

An Infrastructure Concept Plan has been prepared and submitted as part of the EA for the proposed Concept Plan Modification to identify the upgrades and new works required to service Barangaroo South. Individual Indicative Infrastructure Plans have also been prepared for stormwater, potable

water supply, sewer, electrical, telecommunications, and natural gas services. A centralised water treatment plant, centralised chillers and Harbour heat rejection plant are also proposed.

As acknowledged in the EA, further detailed work is required in the lead up to, and during future Project Applications to determine the achievable infrastructure requirements. However the following sections illustrate the Indicative Infrastructure Plans for each service and outline their respective underlying principles.

Electrical Services

- Energy Australia has confirmed that supply will be from the City North Zone Substation located on the corner of Erskine Street and Sussex Street.
- Barangaroo South will be connected to the City North Zone substation via a 33kV feeder with similar redundancy provision to the 11kV Triplex network.
- Feeders to Barangaroo South will likely be reticulated along Sussex Street and Hickson Road in underground ducts from the City North Zone Substation.
- Substations will be established within buildings and basements at Barangaroo South and supplied from the underground Energy Australia feeders.

Telecommunications

- Extensive upgrading of the surrounding telecommunications systems will be required.
- The Proponent will work with telecommunications providers to develop strategies to supply Barangaroo with the appropriate concepts/technologies (phone, internet broadband, etc) to meet the expected demands of the development.

Natural Gas

- Strategies to develop gas supply shall be developed with the relevant gas supplier.
- The existing high pressure main may require extending to provide sufficient gas.
- Any new gas mains shall be owned and maintained by the utility supplier and shall be reticulated under the roadways around Barangaroo South. Easements will be created where necessary.
- Metered connections shall be made to each building to serve mechanical boiler plant and other gas uses.

Consideration

The Department is satisfied that the development contemplated by the proposed Concept Plan Modification is able to be adequately serviced.

5.6.2 Developer Contributions

Section 61 of the *City of Sydney Act 1988* allows for a 1% levy to be imposed on development over \$200,000 including commercial components of government, public authority or the City of Sydney's developments, determined under Part 4 of the EP&A Act. The contributions are payable to the City of Sydney to assist with funding of public infrastructure, community projects and facilities. Section 75R(4) of the EP&A Act provides that development contributions apply to Part 3A projects that would have been subject to development contributions if they had been assessed under Part 4 of that Act.

As the subject application is for a modification to a Concept Plan, it is relevant to consider whether developer contributions should be levied on subsequent project applications.

Consideration

Section 94 contributions did not form part of the modifications relating to the existing Concept Plan approval (as modified). The development of Barangaroo will result in the provision of significant public infrastructure and community facilities within the site, including approximately 11 hectares of new public open space/public domain, including a range of formal and informal open spaces serving separate recreational functions and a 2.2km public foreshore promenade. A new internal road network, public streetscape improvements and linkages to the surrounding street network are also proposed.

It is the Department's view that, given the extent of infrastructure and community facilities to be provided on this site, the imposition of a levy under Section 61 of the *City of Sydney Act* would be

unreasonable in this case. Therefore, a modification requiring this levy to apply to subsequent project applications is not recommended.

Further, the Proponent is required through contractual arrangements and the *Barangaroo Delivery Authority Act, 2009* provisions to pay developer contributions to the State as follows:

- a development levy which is 1% of the amount of the development cost of the development works, which is paid as the development progresses; and
- a public art levy which is 1% of the amount of the development cost of the development works, which is part payment and part public art works-in-kind and is paid/delivered as the development progresses.

Council did not raise the payment of section 94 contributions in their submission to the Department on the proposed Concept Plan Modification.

5.7 Ecologically Sustainable Development (ESD)

5.7.1 ESD Initiatives

An Ecologically Sustainable Development assessment was prepared and submitted as part of the EA which outlines the targets proposed for the development as proposed by the modified Concept Plan. The assessment also demonstrates the proposed Concept Plan Modification complies with the Statement of Commitments and original ESD initiatives established under the approved Concept Plan.

Consideration

The Concept Plan Modification continues to satisfy the approved Concept Plan's ESD principles for the site as follows:

- the Proponent is committed to constructing residential and commercial buildings that achieve minimum 5 star Green Star building ratings;
- the Proponent is proposing to exceed the minimum 35% potable water reduction and 40% sewer outfall reductions nominated in the approved Statements of Commitment through the provision of demand reduction measures and the Blackwater treatment plant;
- the proposal's greenhouse gas reduction targets are consistent with or seek to improve upon those established in the approved Statements of Commitment, namely:
 - 35% reduction in operational energy related to carbon emissions;
 - minimum 20% of power is proposed to be purchased from low impact renewable sources; or
 - alternatively 20% reduction in greenhouse gas emissions through carbon offsets, if appropriate and feasible;
- key open space areas will have direct sunlight in mid-winter;
- landscaping principles for the site promotes the use of non-invasive plant species;
- car parking rates and the overall quantum of proposed car parking is consistent with the TMAP approved for the site, which adopts lesser rates of provision than standard practice, thus promoting public transport and reducing the reliance on private vehicles;
- the Concept Plan Modification does not impede any future Metro Rail Corridor and associated operations;
- roads and car parking areas have been designed to accommodate and complement light rail, buses and taxi stops, offering alternatives to private vehicles; and
- centralised waste collection and recycling areas promote the streaming of recyclables from the ongoing operation of buildings and public spaces.

In addition, the Proponent aspires to exceed the above targets through:

- creation of a radial grid arrangement to facilitate building design that is oriented for optimum solar, light access and wind mitigation;
- creation of a "water positive" site by developing infrastructure with the capacity to recycle and export more water than the amount of potable water imported;
- creation of a zero waste community which reduces, recycles and treats waste off site to minimise waste going to landfill and convert waste to energy;

- creation of a carbon neutral environment that is effectively powered through an offsite renewable energy source;
- achievement of minimum 6 Star Green Star commercial buildings and use of green infrastructure to extend sustainability outcomes across the whole of Barangaroo South rather than individual buildings; and
- provision of large and high grade commercial floor plates comprising flexible floor plates that can be fitted out in a range of ways, ensuring long term building viability.

The Proponent has given an undertaking that future Project Applications will be undertaken in conformance with the above initiatives and as such they are reflected in the proposed Statement of Commitments.

Consideration

The proposed ESD targets and initiatives proposed by the Proponent are above and beyond the existing approved Concept Plan ESD principles for Barangaroo and as such are supported by the Department. The Green Building Council of Australia has also expressed support for the proposal in a submission to the modification EA dated 6 September 2010.

5.7.2 Climate Change and Sea Level Rise

A Climate Change and Sea Level Rise Report (CCSLRR) was prepared as part of the EA. The Assessment was prepared in accordance with the *NSW Sea Level Rise Policy Statement* and *NSW Draft Coastal Planning Guideline: Adapting to Sea Level Rise*. The NSW Government has adopted a planning benchmark of 0.9m mean sea level rise by 2100.

The CCSLRR details that there is a risk that a 0.9m sea level rise could result in inundation of the Barangaroo site by either direct coastal inundation or by a failure of the stormwater system where the discharge point to the Harbour would become submerged. As a result the CCSLRR recommends the establishment of a sea wall, or subsequent landward change in the proposed public domain height, at a minimum height of 2.575 AHD. The recommended sea wall height is based on it being:

- greater than the current 1 in 100 year event (1.435 AHD) for Sydney Harbour plus an additional 0.9m to accommodate mean sea level rise (2.335 AHD); and
- equal to the current Sydney Harbour Foreshores DCP (1.675 AHD) plus an additional 0.9m (2.575 AHD).

It is also noted that the height of the wall should be incrementally increased in the future to respond to actual demonstrated sea level changes.

The CCSLRR makes the following recommendations concerning the management of stormwater:

- the stormwater discharge point should be located within the existing caisson structure seawall or basement perimeter retention system wall (in the case of the Southern Cove) at the highest point possible to allow gravity flow of the site run-off to the Harbour;
- the pipeline should be designed to be of sufficient capacity to manage partial backfilling from inundation during storm surge events which may occur towards 2100; and
- overland flow paths should also be identified to manage the stormwater flows should the discharge point become obstructed which may occur towards 2100 during an extreme storm surge event.

The CCSLRR also concludes there is a residual risk of inundation impacts on the basement development if mean sea level rise in Sydney Harbour is greater than 0.9m and an extreme storm surge event occurs greater than the current 1 in 100 year event. To mitigate these residual and co-incident risks, the following measures are recommended:

- selecting materials to prevent accelerated degradation of infrastructure and buildings;
- locating key infrastructure at elevated locations closer to Hickson Road (such as substations);
- providing for safe exit routes above storm flood height levels; and
- adopting principles of adaptive management such as the design of future public domain elements and seawalls is designed so its height may be incrementally increased should future research, change in Government policy or actual events suggest that sea level rise will be greater than current projections.

Consideration

Development as envisaged by the proposed Concept Plan Modification will be undertaken in conformance with the recommendations of the CCLRR and accordingly the above recommendations are reflected in the Proponent's Statement of Commitments. This is considered to be satisfactory to the Department and addresses the issue of potential impacts of climate change and sea level rise for the purposes of the Barangaroo Concept Plan Modification.

5.8 Environmental Impacts

5.8.1 Contamination

Barangaroo has been used for wharf/ port related activities since the 1800s. Original finger wharves were removed and the site was largely filled in 1961-1968 for the construction of longshore berthing, with some additional filling in the north of the site (area of former Southern Cove) in the late 1980s or early 1990s. The primary potential for contamination at Barangaroo is associated with uncontrolled fill used in various stages of site reclamation and potential migration of contamination from the former gasworks site located to the north and northeast. Based on soil and groundwater testing, the relevant contaminants of concern are:

- **fill:** could include metals, TPH, BTEX, PAHs, PCBs, OCPs, VOCs, SVOCs, asbestos.
- **gasworks:** could include metals, TPH, BTEX, PAHs, phenols, sulphate, cyanide, ammonia.

There is also potential for Acid Sulphate Soils (ASS) and hazardous building materials such as lead, PCBs, asbestos to be present.

In May 2009, DECCW declared part of the Barangaroo site (Blocks 4 and 5) 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 DECCW Declaration Area). The DECCW Declaration Area is illustrated in **Figure 67**.

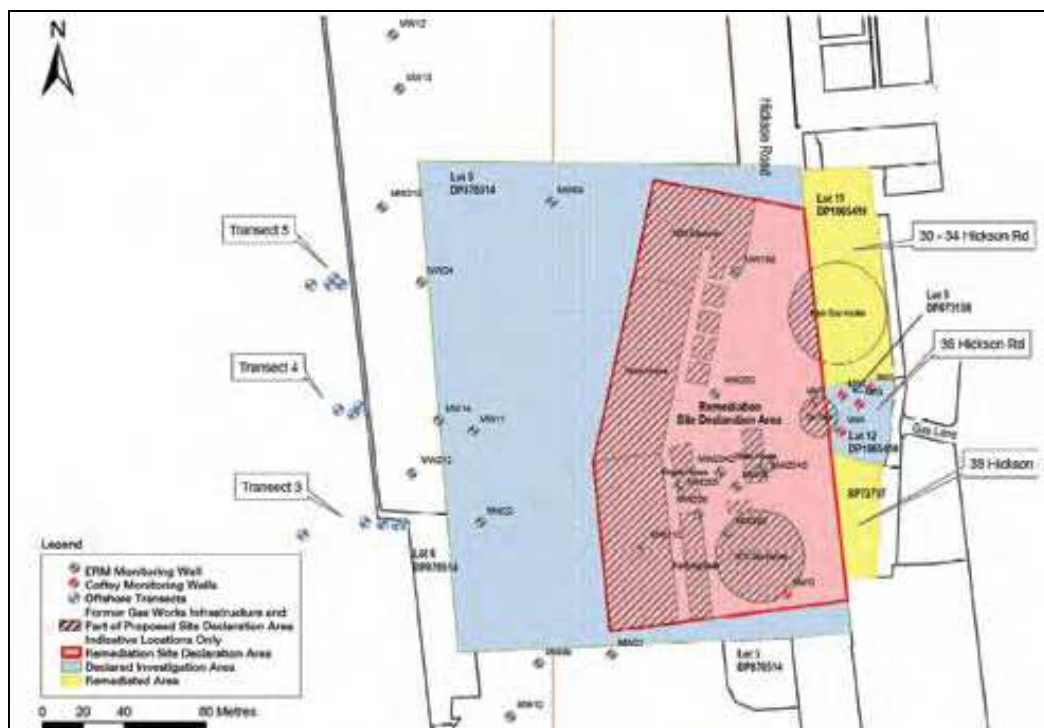


Figure 67: DECCW Declaration Area

Remediation of that part of Barangaroo South is within an area comprising Blocks 4 and 5 and the Southern Cove, and the adjacent area of Hickson Road and is being guided by the Overarching Remedial Action Plan prepared by ERM, and will be the subject of a separate future Remedial Action Plan and Project Application(s). In addition, a specific Remedial Action Plan has been prepared in support of the Excavation and Basement Car Parking Project Application (MP10_0023) which has been approved, and deals with the remediation strategy for land south of the DECCW Declaration Area.

Consideration

The proposed Concept Plan Modification does not propose a change to the overall remediation strategy for the site as contemplated by the approved Concept Plan. The Overarching Remedial Action Plan for Barangaroo and the Remedial Action Plan Other Remediation Works (South) Area have been prepared in accordance with the requirements of State Environmental Planning Policy No. 55 (SEPP 55) and establish the first phase of the endorsed remediation activities for Barangaroo, including Barangaroo South. SEPP 55 promotes the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment. Proposed remediation works will be undertaken in conformity with these two RAPs.

Future detailed RAPs will also be prepared for remaining areas of Barangaroo South, including Block 5 and the DECCW Declaration Area. The preferred remediation strategy for Barangaroo South is to remediate contaminated soil which is either a source of groundwater contamination and/or a risk to human health. Remediation may also be undertaken to address those portions of the DECCW Declaration Area outside the Barangaroo Concept Plan area (i.e. under Hickson Road).

The remediation process is focused on soil remediation to ensure the site is suitable for future use and to address the source of groundwater contamination. Extensive groundwater remediation is not proposed, as groundwater contamination is to be addressed by remediating the contamination source (soil). Notwithstanding this, treatment of contaminated groundwater will be undertaken as part of excavation dewatering and also where any in-situ remediation is undertaken.

The treatment of contaminated material is proposed to be ex-situ stabilisation of materials, or chemical oxidation (in-situ or ex-situ). For stabilisation, chemical additives will be blended into the contaminated soil to limit solubility and mobility, and allow potential re-use of some material and limited off-site disposal to landfill.

This is a proven method of treating a broad range of contaminants including petroleum hydrocarbons, PAHs and metals. Chemical oxidation (in-situ or ex-situ) is another treatment option which may be undertaken to treat contaminated soils, to allow retention in-situ, or reuse following excavation.

The re-use of treated materials (where suitable) within the broader Barangaroo site will deliver significant environmental benefits including:

- minimising waste disposal to landfill;
- minimising CO2 emissions through reduced transport requirements;
- reducing the amount of imported fill; and
- helping minimise the carbon footprint of the overall Barangaroo re-development.

As outlined in the Bulk Excavation and Basement Car Parking Project Application (MP10_0023), temporary stockpiling may be required across the Barangaroo site to store excavated (and where relevant suitably treated) material. Unsuitable treated material will be disposed off site to a licensed landfill operator.

The two RAPs which have been prepared to date have been reviewed by accredited Site Auditors, who have advised:

- the assessment of remedial options in the RAPs was adequate;
- the preferred remediation options and rationale are appropriate;
- the validation sampling approach is reasonable, however the frequency of sampling required will depend upon the results obtained and their consistency;
- a groundwater monitoring plan should be prepared; and
- the site management plan and contingency plan measures are considered appropriate.

The Site Auditor has concluded that the remediation and validation approach is generally appropriate and that the level of detail in the RAP is appropriate for the current stage of the remediation planning process. In reviewing the RAP associated with the Bulk Excavation and Basement Car Parking Project Application (MP10_0023), the Site Auditor also considered that the RAP strategies contained within that RAP are generally consistent with the Overarching RAP.

The Statement of Commitments commits the Proponent to implementation of the RAPs and their respective findings and reinforces the need for subsequent RAPs to be prepared for future relevant Project Applications, namely the future Project Application that will be prepared specifically for the remediation of the DECCW Declaration Area.

It should be noted that a Project Application (MP10_0087) is currently on public exhibition for a pilot trial for in-situ remediation of the contaminated land within the DECCW Declared Area. Director General's Assessment Requirements have also been issued for a Project Application (MP10_0026) for the remediation of the DECCW Declared Area and Land Forming Works (including the Southern Cove) which will be informed by the results of the pilot trial.

The Department has further considered the potential for the land proposed for inclusion in the Barangaroo Concept Plan (the pier/hotel) by the proposed Modification to be contaminated. This is addressed in detail in Section 5.8.2 of this report. The possibility of contamination within the seabed has been considered and it is concluded that any issues arising from contaminated sediments can be managed through appropriate construction methodology and industry standard mitigative measures.

5.8.2 Environment Impacts of Public Pier/Hotel

A Marine Ecology, Water Quality and Contaminated Sediment Impact Assessment was prepared as part of the EA for the proposed Concept Plan Modification (Appendix T of the exhibited report) as construction related activities associated with the pier (and the approved Southern Cove) have the potential to impact on water quality in the Harbour. An assessment of the potential additional impact on the environment is detailed below.

5.8.2.1 Potential Impacts due to Construction of Pier/Hotel on Water Quality, Marine Vegetation and Aquatic Ecology

Water Quality: Piling associated with construction of the hotel has the potential to generate localised short term increases in turbidity through resuspension of sediments. Resuspension of bottom sediments has the potential to cause remobilisation of associated heavy metals and other contaminants into the water column. Once resuspended, these contaminants have the potential to affect fish, algae and invertebrates. Additionally, excavation of the Southern Cove has the potential to cause the release of contaminated land-based sediments and groundwater into the marine environment, impacting on water quality and aquatic ecology. The Marine Ecology, Water Quality and Contaminated Sediment Impact Assessment has considered appropriate design and construction methodologies associated with the hotel and Southern Cove and have concluded that by employing appropriate industry standards and mitigation measures, any impacts of the proposed development on water quality within Darling Harbour are expected to be negligible, localised and short-term in nature.

Marine Vegetation: No marine vegetation was recorded in the vicinity of the proposed development during field surveys, nor is any marine vegetation mapped by NSW DPI (2005) in the immediate area. Due to the lack of aquatic vegetation at or in the vicinity of Barangaroo South, no additional impacts on these habitats are expected as a consequence of the proposed Concept Plan Modification.

Aquatic Ecology: The placement of piles and other structures into the seabed would displace soft sediment benthic habitat and any associated benthic infauna. If accidentally released, the settlement of contaminated land-based sediments on the seafloor, excavated during construction of the Southern Cove, could also impact on nearby benthic marine fauna. However, the abundance of similar benthic habitat in Sydney Harbour suggests that benthic communities such as those recorded at Barangaroo would be widespread and thus, any localised impacts from the potential development on benthic invertebrate communities of Sydney Harbour would be considered to be negligible.

Mobile fauna such as fish and sharks may be impacted in the short term by the presence of barges and by noise generated during construction works. However, due to the current high levels of boating activity in Darling Harbour these effects are likely to be negligible. Removal of the existing structures at Barangaroo will eliminate existing artificial habitat for sessile invertebrates which currently exists; however, new intertidal and subtidal habitats would be created at Barangaroo South.

The proposal would not have any impact on any threatened or protected species of flora or fauna. Due to the high level of boating activity and lack of suitable feeding and nesting habitats at Barangaroo, it is highly unlikely that any species of threatened fauna listed under the *Threatened Species Conservation Act 1995* or *Environment Protection and Biodiversity Conservation Act 1999*, which have the potential to occur in Sydney Harbour, would utilise this area. Further, no aquatic vegetation protected under the *Fisheries Management Act 1994* is present in the vicinity of the proposed development.

In summary, if effectively mitigated using the industry standard methods and techniques described in the Marine Ecology, Water Quality and Contaminated Sediment Impact Assessment, any potential impacts on water quality and aquatic ecology arising from the public pier/hotel or Southern Cove, would be negligible, temporary and localised.

5.8.2.2 Geotechnical and Contamination Issues Associated with the Construction of the Pier/Hotel

The proposed submerged basement structure below the pier and hotel is proposed to be suspended above the current Harbour bed level. Modeling undertaken as part of the Marine Ecology, Water Quality and Contaminated Sediment Impact Assessment has found that velocities under and near the proposed pier/hotel are unlikely to be significantly increased such that existing bed sediments would be mobilised. To mitigate against possible mobilisation of existing contaminated sediments, any activities not conducted in the dry, associated with construction of the pier/hotel and submerged basement car park (such as pile driving) should employ industry standard and appropriate techniques as described in the Marine Ecology, Water Quality and Contaminated Sediment Impact Assessment. Prior to such activities, silt curtains should be installed around the work area. Water quality monitoring should be undertaken surrounding the development, to ensure that water quality conditions are maintained beyond the silt curtains and in the broader area. Piled foundations to the proposed pier/hotel would be founded in suitable strength sandstone bedrock at appropriate depths below the existing Harbour bed. On this basis, contamination issues associated with laying of the foundations are expected to be readily managed within acceptable levels.

Consideration

The Department is satisfied that through appropriate design, detailing and construction methodology, and by employing the appropriate industry standard mitigative measures described in the Marine Ecology, Water Quality and Contaminated Sediment Impact Assessment, the proposed construction of the pier and hotel building would be unlikely to have any significant or lasting impacts on the marine environment (including water quality impacts and impacts on flora and fauna), and any impacts would be short-term in nature and highly localised. Further, any future Project Application/s for the construction of the pier and/or hotel will be required to detail the proposed construction methodology.

5.8.3 Marine Ecology

Due to the lack of aquatic vegetation in the vicinity of Barangaroo, impacts are not expected on:

- Benthic habitat – as the seabed comprises clayey, silty, sandy sediments and exhibits considerable bio turbation and accordingly does not have habitat value;
- Seagrass / Mangroves / Saltmarsh – as no seagrass was observed during spot dives, or on the video transects undertaken by the Proponent 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 by the Proponent for the site.

During development excavation and construction works, all stormwater and wastewater on site will be contained, collected, decontaminated/treated and discharged to either the sewage network or stormwater system. Water generated from dewatering activities during excavation would be monitored and treated to ensure that water quality conditions (i.e. site specific trigger limits) were satisfactory prior to discharge to sewer or into the Harbour via stormwater. In the case that treated water is discharged to the Harbour, the increased freshwater input would cause localised decreases in salinity levels. However, due to the naturally high variability in salinity levels in estuarine environments such as Sydney Harbour, this is unlikely to have a significant effect on the aquatic fauna or flora in the area.

Consideration

Any potential increase in run-off from the site is not expected to have an impact on the limited marine vegetation or aquatic ecology that may be present in the vicinity of Barangaroo. Any Project Application for the construction of the proposed public pier, ferry wharves, formation of the Southern Cove and formation of the new shoreline in Barangaroo Central and the Headland Park/Northern Cove will be required to address in detail any impacts on the existing marine ecology. An appropriate modification in the amended concept plan approval is recommended accordingly.

5.8.4 Water Quality

Construction works which have the potential to impact on water quality in Darling Harbour include:

- piling associated with construction of the landmark building and ferry terminals which have the capacity to generate short term localised increases in turbidity through resuspension of sediments;

- minor localised and short term resuspension of bottom sediments which may cause 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, potentially impacting on water quality and aquatic ecology.

To minimise water quality impacts, the Marine Ecology, Water Quality and Sediment Assessment Impact Report, submitted by the Proponent as part of the EA for the proposed Concept Plan modification, has recommended:

- all excavation and construction activities associated with the Southern Cove should be carried out in a manner which reduces the potential for materials to enter the Harbour;
- any construction activities associated with the basement perimeter retention systems, seawalls, caissons, and existing embankment should limit the creation of turbid plumes into the marine environment by utilising appropriately designed and positioned silt curtains, installed prior to the commencement of operations;
- construction Management Plans should be prepared and implemented to address erosion and sediment management;
- water quality monitoring should be undertaken to ensure that water quality conditions are maintained beyond the silt curtains and in the broader area;
- site spillage equipment should be retained and utilised to avoid any spills entering the water;
- materials such as sand may be used to limit the potential resuspension of silts from within the Southern Cove following inundation;
- following construction of the Southern Cove, during inundation with seawater, the silt curtain should remain in place until the turbidity within the Southern Cove returns to background conditions reflective of levels outside of the silt curtain and at the nominated reference locations; and
- should barging of spoil / excavated material from the site be proposed, consultation with the Harbour Master will be required including an assessment of potential impacts and proposed mitigation measures.

Consideration

These recommendations are in response to the Concept Plan Modification's known scope of water related impacts and are considered satisfactory to the Department. They will be particularly relevant to Project Applications submitted for future development of Barangaroo.

5.9 Staging and Construction Related Issues

5.9.1 Staging

The Proponent is proposing to seek approval for a series of initial individual project applications for Barangaroo South for site works, remediation, basement car parking, public domain and individual buildings in quick succession to commence works on site, including:

- bulk excavation and basement car parking (MP10_0023 – approved on 2 Nov 2010);
- Block C4 commercial building (MP10_0025 – lodged on 29 October 2010); and
- DECCW declared remediation and land forming works (MP10_0026 – DGRs issued 23 March 2010).

Initial investigation work has already commenced at Barangaroo South and is expected to be completed by late 2010. Works associated with the approval of MP10_0023 including retention, dewatering and construction work will commence in late 2010, with the first building (commercial building C4) targeted for completion by 2014.

Consideration

The Proponent has detailed that the development program will be driven by market demand, and the rate of residential take up. It is anticipated by the Proponent that the indicative project staging for buildings and associated basements will be:

- between 40,000 sqm – 90,000 sqm by 2014;

- between 50,000 sqm – 100,000 sqm by 2016;
- between 50,000 sqm – 100,000 sqm by 2018;
- between 50,000 sqm – 100,000 sqm by 2021; and
- between 50,000 sqm – 120,000 sqm by 2024.

Pending determination of this Concept Plan Modification, the Proponent has stated that they will revisit the Bulk Excavation and Basement Car Parking Project Approval to confirm the size of any required enlargements to the approved basement car parking structure. Works are also being coordinated with the proposed Barangaroo Headland Park works, ensuring a holistic construction approach.

5.9.2 Soil and Geotechnical Issues

A Geotechnical Report was provided with the EA that provides preliminary advice with respect to the proposed Concept Plan Modification on:

- landform and geotechnical capability;
- seismicity;
- liquefaction;
- foundations; and
- acid sulphate soils.

Detailed investigations will need to be validated and refined during detailed design and the preparation of subsequent Project Applications.

5.9.2.1 Landform and Geotechnical Capability

The provided geotechnical report indicates that the geotechnical conditions at Barangaroo South are suitable for the development proposed by the amended Concept Plan. Rock excavation is likely to be required in the east and north of the site, however rock defects that could present difficult excavation conditions are not anticipated. Ongoing inspections during the course of excavations will be required to ensure support structures can adequately bear rock masses, and to also minimise the risk of disruption from local failures/rock defects.

In terms of the pier and landmark building specifically, the geotechnical challenges of constructing in the Harbour can be addressed through the adoption of standard and accepted engineering design and construction techniques, including the use of bored piled foundations to rock through driven liners or from within a cofferdam.

Having regard to the Interim Metro Corridor, the geotechnical report identifies a series of design considerations which will ensure that development as envisaged by the Concept Plan Modification does not impede the Interim Metro Corridor or affect the future operations within the corridor.

5.9.2.2 Seismicity

Each individual building within Barangaroo will need to be assessed individually (within Project Applications seeking approval) to determine whether any design considerations need to be incorporated into the buildings to accommodate earthquake risks. Building specific assessments will be required due to the varying soil profile underlying the site.

5.9.2.3 Liquefaction

Based on the limited in situ testing completed to date, there are zones within the fill and marine/estuarine deposits that are described as “granular, loose and saturated”. It is considered by the Proponent’s geotechnical expert that liquefaction - a process by which saturated, unconsolidated sediments are transformed into a substance that acts like a liquid - is a potential risk in these zones during a seismic event.

The density and classification of these materials will require further assessment and verification as the drilling methods utilised during the existing investigations may have loosened the material leading to inaccurate assessments. The impact of potential liquefaction on temporary and permanent structures will also require detailed assessment within individual Project Applications following completion of the detailed ground investigation.

5.9.2.4 Foundations

Foundation conditions will vary considerably across the site depending on building location, presence of a basement and proposed basement depth. Various foundation options have been outlined in the submitted geotechnical report based on potential foundations depth, including spread footings (where

rock is present at the basement level) and piled foundations (where fill or marine/estuarine sediments are present at basement level).

5.9.2.5 Acid Sulphate Soils

A high potential of acid sulphate soil is associated with the estuarine sediments in Sydney Harbour and it is anticipated that the estuarine sediments underlying the site could have acid sulphate soil potential. Actual acid sulphate conditions only occur when the materials are exposed and allowed to oxidise. Where these sediments are to be exposed in excavations, aggressive conditions are likely to result. Durability design will need to assess this issue carefully.

A total of five samples have been analysed to evaluate the potential for potential or actual acid sulphate soils to be present. The results indicate that actual acid sulphate soils were not present in the samples analysed, however, there is potential for acid sulfate soils to be present at depths within the marine/estuarine deposits.

The sulphur and acid trails observed within the samples exceed DECCW's accepted criteria and accordingly trigger the preparation of an Acid Sulphate Soils Management Plan. To that end, an Acid Sulphate Soils Management Plan has been prepared and submitted with the Bulk Excavation and Basement Car Park Project Application (MP10_0023). The Management Plan outlines the strategies for dealing with the actual and potential acid sulphate soils. In general, material will be placed into an appropriately bunded treatment area (pads) and treated with a neutralising agent (e.g. lime, or taken off site for disposal at an approved landfill site). The treatment pad design details are presented in the Management Plan.

Consideration

The Concept Plan Modification does not raise any new or additional impacts beyond those approved by the established planning framework for Barangaroo. The following design considerations, engineering methods and investigations are identified in the geotechnical report to input into the preparation of subsequent Project Applications and detailed design:

- engagement of a geotechnical engineer during construction to assess and verify rock materials;
- installation of rock anchors where required to provide temporary lateral restraint to retaining walls;
- adoption of the specific geotechnical recommendations as they apply to the pier and landmark building;
- adoption of the strategy outlined in of the geotechnical report to protect the Interim Metro Corridor and future operations in the corridor;
- the preliminary design of piled foundations should be undertaken generally in accordance with the recommendations identified in the geotechnical report and with reference to AS 2159;
- each proposed structure is to be evaluated in accordance with AS/NZS 1170.0–2002 and 1170.4–2007 once its form and position is finalised to determine the potential Earthquake Design Category;
- further detailed assessment to determine the impact of potential liquefaction on temporary and permanent structures and any consequential mitigation measures;
- further testing will need to assess the density and classification of fill and marine/estuarine deposits to determine the risk of liquefaction;
- further detailed testing in accordance with the requirements of AS2159 and AS3600 to confirm the exposure classification and durability design requirements; and
- future Project Applications will adopt the prepared Acid Sulfate Soils Management Plan, where appropriate.

Importantly, these recommendations have been incorporated into the Statements of Commitment that form part of the proposed Concept Plan Modification and are supported by the Department.

5.9.3 Stormwater Management

The Stormwater Concept Plan prepared in support of the proposed EA for the Modification of the Concept Plan for Barangaroo South has been designed to provide:

- positive drainage for the 1 in 20 year storm event flows; and
- safe overland flow paths to convey 1 in 100 year storm event flows.

Rainwater will be collected through either a central rainwater tank or individual rainwater tanks within buildings and will be harvested for reuse, thereby reducing the runoff entering the stormwater system.

A typical minor-major drainage strategy will be adopted for stormwater drainage and incorporated into a piped network generally designed to meet City of Sydney's drainage standards conveying minor storm event flows (1 in 20 year) to the Harbour, and overland flow paths conveying major (1 in 100 year) storm flows.

Future building/basement entries will be designed to provide adequate freeboard above the predicted 1 in 100 year overland flow levels. City of Sydney has confirmed that due to the proximity of the site to the Harbour, on-site detention of stormwater will not be required.

Consideration

While the detailed design of individual components of the stormwater disposal system for Barangaroo South will be submitted with future Project Applications, through their amended Statement of Commitments, the Proponent has given an undertaking that future Project Applications will be undertaken in conformance with the Stormwater Concept Plan. This is considered to be a satisfactory arrangement by the Department.

5.9.4 Air, Noise and Odour

An Air Quality Impact Assessment (AQIA) has been prepared and submitted as part of the EA for the proposed Concept Plan Modification to determine the potential air quality and odour impacts arising from future development as envisaged by the Concept Plan Modification.

Consideration

The AQIA found that the proposed scope of the Concept Plan Modification does not result in any additional or more intense construction activity beyond that envisaged by the approved Concept Plan.

The construction of the landmark building and pier will rely on submerged and/or in situ construction methods (i.e. within the Harbour and below water level) that will not give rise to air quality and/or odour impacts.

The construction of the Southern Cove, partially within the DECCW Declared Area may raise specific odour issues; however the proposed Statements of Commitment require any future Project Application to specifically address air quality and odour impacts, as was the case with the Bulk Excavation and Basement Car Parking Project Application (MP10_0023).

5.9.5 Noise and Vibration

Potential vibration impacts related to the proposed scope of construction activity in Barangaroo South have also been considered in a Construction Noise and Vibration Assessment submitted as part of the proposed Concept Plan Modification.

Noise sources associated with Barangaroo South that could potentially impact the surrounding community include:

- mechanical services plant;
- retail units and future retail outlets;
- car parking and loading docks;
- road traffic;
- ferries and other Harbour traffic;
- entertainment; and
- construction noise.

The closest noise sensitive receivers are expected to be the residential areas on and adjacent to the site and the existing child care facility on Hickson Road. Construction noise will be the greatest source of noise, however a Noise and Vibration Management Plan has been prepared which proposes the following mitigation measures to minimise construction noise impacts to the community, where practicable:

- selection of alternate appliances or processes;
- acoustic barriers and buffer zones;
- silencing devices;
- treatment of specific equipment;
- material handling methods;
- the establishment of appropriate site practices;
- strategic positioning of processes on site;
- establishment of direct communication with affected parties;

- management training;
- complaints handling; and
- monitoring.

Consideration

A detailed assessment of operational noise sources will be undertaken during the design phase when Project Applications are submitted for individual buildings and public domain works. However, the Department is satisfied that the proposed Concept Plan Modification will not result in any significant additional impacts beyond those reasonably understood and expected to have been contemplated in the approved Concept Plan, provided appropriate planning conditions and controls are imposed on the construction and operation of new development, as was the case with the Bulk Excavation and Basement Car Parking Project Application (MP10_0023).

The Proponent has also committed to the recommendations of the Noise and Vibration Management Plan in the proposed Statement of Commitments.

5.9.6 Waste

Consistent with the Proponent's commitment to minimise waste to landfill and greenhouse gas emissions, a Waste Management Plan has been prepared for the proposed Concept Plan Modification which considers potential construction and operation waste generation.

Construction waste targets set for Barangaroo South are:

- a greater than 90% reduction of construction and demolition waste to landfill; and
- a greater than 60% reduction in greenhouse gas emissions compared to business as usual waste disposal.

To achieve these targets, detailed waste management plans will be prepared which will address:

- waste avoidance and reduction;
- resource recovery;
- training;
- waste utilisation on other sites;
- good housekeeping;
- monitoring and reporting;
- materials and procurement; and
- transportation of waste.

Similarly operational waste targets have been set including a greater than 80% diversion of operational waste to landfill, and the creation of a closed loop return of useable soil and energy from waste processing. The achievement of these targets is reliant upon:

- sustainable consumption and waste minimisation;
- source segregation, storage and collection;
- resource recovery of recyclable waste; and
- resource recovery and green power generation.

Consideration

Subject to the adoption of the recommendations within the Waste Management Plan, the Department is satisfied that the Concept Plan Modification will not result in any significant additional impacts beyond those expected under the approved Concept Plan. In this regard, the Proponent will be required to demonstrate that the waste reduction initiatives are incorporated into future Project Applications for Barangaroo South.

5.10 Navigation Impacts

5.10.1 Public Pier and Landmark Building

The Darling Harbour precinct is the most popular location within the waterways of Port Jackson for commercial trading vessels and links to the many foreshore businesses in the area. The types of commercial vessels include, but are not limited to: hire boats; water taxis; large and charter vessels; and ferries (both public and private). The area also attracts a large amount of recreational vessels

(powered and non-powered) due to the waterfront access provided and due to the available entertainment value of Darling Harbour.

A Navigation Study to determine the potential impacts of the Concept Plan Modification on navigation within Darling Harbour was submitted as part of the EA. **Figure 68** shows the proposed Barangaroo Concept Plan amendment overlaid on the existing navigation layouts for Darling Harbour.



Figure 68: Proposed Navigation Arrangements

The public pier and landmark building is proposed to be sited at the location of the former Sydney Ports Corporation cruise ship terminal. This was previously comprised of a 40m berth box plus a 30m water-side restricted zone when a liner was berthed. This area of water is currently regularly not used for navigation or the movement of vessels.

The existing width of Darling Harbour between the King Street Wharf and Pyrmont Wharf is approximately 130m and widens to approximately 220m wide in front of the proposed public pier location. Between King Street Wharf and Pyrmont Wharf, a nominal 15m buffer zone on each side leaves approximately 100m for active vessel navigation or approximately 50m in each direction. By comparison, at Barangaroo South a nominal 15m buffer zone on each side leaves approximately 190m for active vessel navigation or approximately 95m in each direction.

The introduction of the 85m long Public Pier does not represent a net reduction in the width of the navigation channel, when compared to the existing channel width at the existing King Street Wharf. Further, Matilda charter vessels and Sydney Ferries departing from the Aquarium currently have to change course to navigate around the Australian National Maritime Museum pontoons and change course again to avoid King Street Wharf. Therefore, vessels operating in Darling Harbour that would have to navigate past the proposed public pier would already be used to altering course to avoid existing navigation hazards.

The length of the public pier from the existing foreshore would be approximately 17m further into the Harbour than the length of the existing berth boxes for the adjacent King Street Wharves (68m long). The public pier may therefore result in some restriction to sight lines between vessels travelling up and down Darling Harbour and vessels exiting the existing King Street Wharf or the proposed future Barangaroo Ferry Wharves. The introduction of a 4 knot speed limit, and provision of port hand lateral markers that will be lit at night at the western most end of the public pier, would mitigate potential navigational impacts arising from the public pier and aid sight lines.

Super yachts, or other similar vessels, berthing alongside the southern side of the landmark building are not expected to pose any threats to navigation in the area. Vessels intending to berth at this point would approach from the western side of the channel which would allow for an unobstructed view of all vessel movement in and out of Darling Harbour. Vessels leaving the berth would typically sound their

horns three times when moving astern, consistent with boating regulations, and have an unobstructed view of vessels leaving Darling Harbour along the eastern channel. Similarly, vessels leaving Darling Harbour along this channel would have an unimpeded view of vessels arriving or departing from the landmark building once past King Street Wharf.

The public pier and landmark building will not impact on the Southern Cove and the operation of the future ferry wharves as:

- vessels are not proposed to navigate the Southern Cove;
- any vessels inadvertently navigating the Southern Cove could head north without being impacted by the public pier;
- any vessels inadvertently navigating the Southern Cove could head south by moving slowly into the nominal 15m buffer zone of water beyond the west end of the public pier. From the buffer zone, these vessels would have clear lines of sight north and south and would be clearly visible to other vessels heading north from Darling Harbour; and
- the Barangaroo Ferry Wharves would operate as an extension of the King Street Wharf facility and would depart the ferry wharves and easily navigate past the proposed public pier.

Consideration

The construction of the public pier will change the navigational waters within Darling Harbour. There are some issues that have the potential to affect navigation of vessels including their speed into and out of the area. However, NSW Maritime has viewed the proposal and accompanying Navigation Study and considers issues can be addressed with careful planning. In this regard, NSW Maritime has granted land owners consent for the lodgement of the Modification application (as freehold owner of Sydney Harbour).

The Proponent will be required to engage in formal consultation with NSW Maritime and agreement reached regarding navigational issues and commercial tenure arrangements over Sydney Harbour in relation to the detailed design of any future pier for Barangaroo South (subject to a future Project Application).

The construction phase of the landmark building, public pier and submerged basement is likely to give rise to short term navigational challenges. Prior to the undertaking of any works (the subject of a future Project Application), the Proponent will be required to develop a detailed work method plan for all water based construction related activities in consultation with Sydney Ports, NSW Maritime and other appropriate authorities.

5.10.2 Future Ferry Wharves

Construction of the future ferry wharves is proposed to be undertaken by others and does not form part of the Concept Plan Modification.

5.11 Public Interest

The public benefits resulting from the proposal (as modified) include:

- the delivery of a key site in responding to the demand for commercial floor space in the Sydney CBD to assist in developing Sydney as a Global city;
- increased employment opportunities (total of 21,123 workers) and residential dwellings (total of 2,475 residents) to help meet targets set by the Metropolitan Strategy;
- an appropriate increase in commercial and worker density where the site is best accessed to public transport, reflecting land use and transport integration;
- a more interesting and varied pedestrian interface with Sydney Harbour;
- provision of Harbour foreshore fully accessible by the public with wide walkways;
- provision of a range of urban spaces and public domain, integrated with appropriate surrounding uses to enliven these spaces, particularly with respect to the width of the waterfront promenade and the configuration of spaces between buildings;
- an improved pedestrian streetscape along the new City Walk, Shelley Lane and Globe Street by ensuring a consistent built form and ensuring an appropriate road width is provided;
- recognising Barangaroo South as an opportunity to deliver a signature development of high urban design and architectural quality;

- provision more useable and viable commercial floor plates which will help encourage commercial and tourist development and create economic stimulus;
- improved mix of uses by increasing the amount of residential and community/public uses integrated into the core commercial precinct thereby encouraging greater activation for longer periods of the day and on weekends;
- improvement of public amenity and views to and from within the development, maximise solar penetration to public places, minimise wind impacts and maximise views to and from the CBD and the water along the Margaret Street alignment;
- adequate separation of vehicles and pedestrians along the waterfront promenade to ensure that a high quality experience is achieved; and
- provision of appropriately scaled retail space at the ground plane to ensure activation, with residential above to provide visual security.

6. CONCLUSION

The Department has assessed the merits of the project and is satisfied that the impacts of the proposed Modification have been addressed via the Statement of Commitments and Modifications to the application recommended by the Department. The Department is also satisfied that the impacts of additional GFA and building height, in particular the bulk and scale, can be suitably mitigated and/or managed through the design excellence process required by the SEPP, and through the imposition of additional built form controls. The proposed redevelopment establishes a sound framework for the public domain and foreshore open space and access, and the provision of Ecologically Sustainable Development (ESD) outcomes on the site.

The Department is satisfied that the delivery of the Government's public transport objectives for Sydney and the CBD, as relevant to the Barangaroo-Wynyard precinct, coupled with the implementation of the Transport Management and Accessibility Plan for Barangaroo will be sufficient to absorb the travel demand created by the ongoing development of Barangaroo.

On these grounds, and subject to amendments to ensure design excellence, appropriate built form and high pedestrian amenity outcomes for the site, the Department is satisfied that the current Modification is acceptable.

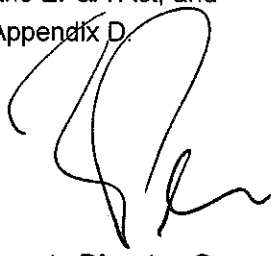
All statutory requirements relating to the proposed Modification have been met.


7. RECOMMENDATION

It is recommended that the Minister for Planning:

- a) **consider** the findings and recommendations of this report;
- b) **determine** that the proposed modification falls within the scope of section 75W of the EP&A Act;
- c) **approve** the modification under section 75W of the EP&A Act; and
- d) **sign** the attached Instrument of Modification in Appendix D.


11.12.10
Executive Director
Major Projects Assessment


12/12/10
Deputy Director-General
Development Assessment & Systems
Performance


Director-General
13/12/2010


Tony Kelly