NSW GOVERNMENT | Planning & Infrastructure

MAJOR PROJECT ASSESSMENT: Commercial Buildings C3 and C5, Barangaroo South (MP10_0227 & MP11_0044)

Director-General's
Environmental Assessment Report
Section 75I of the
Environmental Planning and Assessment Act 1979
April 2012

ABBREVIATIONS

CIV	Capital Investment Value
Department	Department of Planning & Infrastructure
DGRs	Director-General's Requirements
Director-General	Director-General of the Department of Planning & Infrastructure
EA	Environmental Assessment
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
EPI	Environmental Planning Instrument
MD SEPP	State Environmental Planning Policy (Major Development) 2005
Minister	Minister for Planning and Infrastructure
PAC	Planning Assessment Commission
Part 3A	Part 3A of the *Environmental Planning and Assessment Act 1979*
PEA	Preliminary Environmental Assessment
PFM	Planning Focus Meeting
PPR	Preferred Project Report
Proponent	Lend Lease (Millers Point) Pty Limited
RTS	Response to Submissions

Cover Photograph: Illustrations of commercial buildings C3 (left) and C5 (right)

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EXECUTIVE SUMMARY

This report is an assessment of two project applications (MP10_0227 and MP11_0044) lodged by Lend Lease (Millers Point) Pty Ltd (the proponent) seeking approval to construct commercial buildings C3 and C5 at Barangaroo South.

Commercial building C3 (MP10_0044) is a 48-storey commercial building located within Block 3 of Barangaroo South, and C5 (MP11_0227) is a 39-storey commercial building located to the south within Block 2.

The capital investment value (CIV) for C3 and C5 is $550 million and $420 million respectively. The projects would create 1,120 construction jobs (560 workers per building) and provide sufficient floor space to accommodate approximately 10,300 workers once complete.

As Director-General's Requirements (DGRs) were issued for both projects prior to 1 October 2011, Part 3A of the EP&A Act, as in force immediately before its repeal on 1 October 2011, and as modified by Schedule 6A to the Act, continues to apply to these projects.

The Barangaroo site is listed as a State Significant Site under Part 12 of Schedule 3 of the Major Development SEPP. The SEPP zones the site on which the buildings are located, 'B4 Mixed Use'. The construction and operation of commercial buildings is permissible in the B4 zone, subject to development approval.

The environmental assessments (EAs) for both projects were exhibited for a 34-day period from 16 November 2011 until 19 December 2011. The department received six submissions from public agencies, including the City of Sydney and Leichhardt Council for both projects. In addition, three public submissions, one in support and two which held neutral opinions were received for commercial building C3. Two public submissions were received for commercial building C5, one supported the project and one provided general comments. The key issues raised in the submissions included:

- compliance with the Concept Plan
- built form and urban design
- amenity
- transport
- ecologically sustainable development
- contamination
- stormwater and water management
- construction impacts

On 2 March 2012, the proponent submitted Preferred Project Reports (PPRs) for both projects to address the issues raised by government authorities and the public during the exhibition period.

The department has assessed the merits of the projects and considers the key issues for both projects to be compliance with the Barangaroo Concept Plan, built form and urban design, amenity, traffic and transport, ESD, contamination and remediation, and construction impacts. The department is satisfied that the impacts associated with the construction and operation of the commercial towers have been adequately addressed in the EAs, PPRs and Statement of Commitments (SOCs), and can be satisfactorily managed through the recommended conditions of approval.

The department is also satisfied that each project area is suitable for its proposed use. The proposals are generally consistent with the approved Concept Plan (as amended), strategic planning objectives, including the *Metropolitan Plan for Sydney 2036* and draft *Sydney City Subregional Strategy*, and will facilitate the future development of the Barangaroo site.

Accordingly, the department considers that the projects are in the public interest and recommends approval of the projects, subject to conditions.

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 north and west, Hickson Road and Millers Point to the east, and Kings Street Wharf/Cockle Bay/Darling Harbour to the south. The Barangaroo precinct is divided into three parts: Headland Park; Barangaroo Central; and Barangaroo South. The area of land the subject of the project applications is located at Barangaroo South, within blocks 2 and 3 of the Barangaroo Concept Plan. A Location Plan is provided at **Figure 1** below.

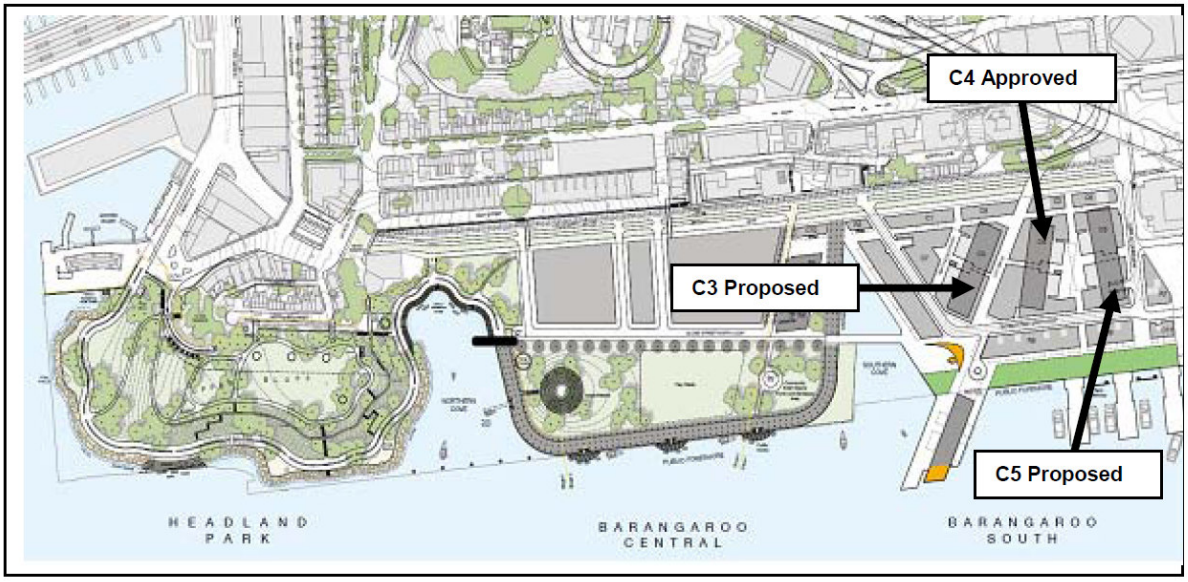


Figure 1: Location Plan

1.2 Approval History

1.2.1 Approved Concept Plan

On 9 February 2007, the then Minister for Planning approved the Barangaroo Concept Plan (MP 06_0162). The Concept Plan approved a set of built form principles to guide development within the mixed use zone. The Concept Plan has been modified four times since approval.

The most current version of the Concept Plan (MOD 4) was approved by the then Minister for Planning on 16 December 2010, and permits:

- a mixed use development involving a maximum of 563,965m^2 gross floor area (GFA), comprised of:
  - (a) a maximum of 128,763m^2 and a minimum of 84,595m^2 residential GFA
  - (b) a maximum of 50,000m^2 GFA for tourist uses
  - (c) a maximum of 39,000m^2 GFA for retail uses
  - (d) a maximum of 4,500m^2 GFA for active uses in the Public Recreation zone (3,000m^2 of which will be in Barangaroo South)
  - (d) a minimum of 12,000m^2 GFA for community uses (10,000m^2 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 functions and including an approximate 2.2km public foreshore promenade
- built form and urban design 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
- works to the existing seawalls and creation of a partial new shoreline to the harbour.

The approved configuration of the development blocks within Barangaroo South is depicted in **Figure 2** overleaf.

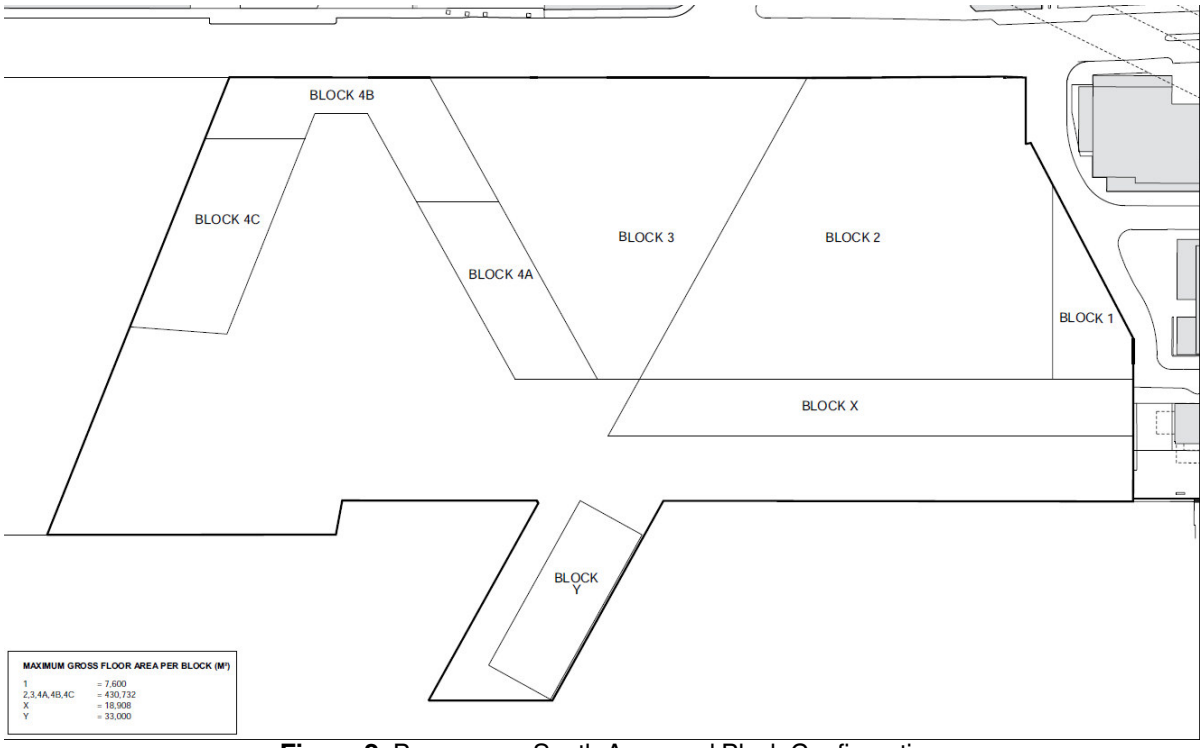


Figure 2: Barangaroo South Approved Block Configuration

1.2.2 State Significant Site Listing

On 12 October 2007, State Environmental Planning Policy (Major Projects) 2005 (Amendment No. 18) was gazetted. Amendment 18 modified the then Major Projects SEPP, now know the Major Development SEPP (MD SEPP), by listing Barangaroo as a State Significant Site (SSS), and providing development and design excellence controls in Schedule 3.

A subsequent amendment to Schedule 3, Part 12 of the MD SEPP was gazetted on 16 December 2010. The purpose of the amendment was to rectify inconsistencies between the SEPP and the Barangaroo Concept Plan that arose as a result of modifications to the Concept Plan.

1.2.3 Barangaroo South Project Approvals

Bulk Excavation and Basement Car Park (MP10_0023)

On 2 November 2010, the then Minister for Planning approved a project application for bulk excavation and remediation works, and the construction of a basement car park with capacity to accommodate up to 880 cars within blocks 2 and 3 and part of Block 4 at Barangaroo South.

On 3 March 2011, the then Minister for Planning approved MP10_0023 MOD 1 which permitted the expansion of the car park into Block 1, creating 21 additional parking spaces within the basement car park (a total of 901 spaces).

On 16 March 2011, the proponent lodged a section 75W modification (MP10_0023 MOD 2) seeking approval to modify conditions A8 and A10 of the project approval. This application was withdrawn by the proponent on 17 October 2011.

On 19 April 2011, the Deputy Director-General, Development Assessment and Systems Performance approved MP10_0023 MOD 3. MOD 3 permitted the following:

- deletion of car park levels CP1 to CP5
- reduction in the total number of car parking spaces from 901 to 779
- relocation of 50 per cent (1,100) of the approved bicycle spaces from the basement to above ground locations and/or the next basement within the Barangaroo south site
- redesign of the residential, retail and commercial car park driveway
- establishment of an additional basement driveway to service the loading facility
- reduction in the amount of total excavated material from 410,000m³ to 346,000m³
- increase in the amount of hazardous and restricted solid waste that requires remediation from 3,500m^3 to 15,000m^3

- repositioning of the CBD Metro Station Portal
- various modifications to the Instrument of Approval, including the Statement of Commitments.

It should be noted that the basement car park sits directly below blocks 1 to 3, a portion of Block 4 and Block X and it is intended to cater for the parking and loading requirements for all buildings within these development blocks. As such, all car parking associated with commercial buildings C3 and C5 will be provided within the approved basement car park.

Commercial Building C4 (MP10_0025)
On 3 March 2011, the then Minister for Planning approved the construction of a 43-storey commercial building known as commercial building C4, and associated temporary public domain works.

On 24 February 2012, the Director-General, acting under delegation, approved MOD 1 to permit changes to the design and detailing of the building façade and floor plates as a result of further design refinement, and increase the approved GFA from 98,514m^2 to 99,656m^2. In addition, the modification permitted:

- a reduction in approved car parking spaces from a maximum of 168 to 166 (within the basement car park)
- an increase in the overall bicycle parking spaces from 690 to 720
- the replacement of the child care centre and upper podium retail floor space with commercial floor space
- the construction of an additional 70m of Globe Street towards Hickson Road.

1.2.4 Planning Reviews

Barangaroo Review
In May of 2011, the Government commissioned an independent review of the planning processes and planning outcomes at Barangaroo, known as the Barangaroo Review. The review was conducted by Meredith Sussex and Shelley Penn and was finalised in August 2011, and concluded that the department's planning processes that were followed, and the approved Concept Plan and associated project approvals, are fundamentally sound. However, it recommended further review of the proposals for commercial buildings C3, C4 and C5, and the site remediation plans in order to restore community confidence in the Government's ability to deliver appropriate development outcomes at Barangaroo. In addition, the review recommended that the Government consider negotiating with Lend Lease to remove the hotel from the water.

Snapshot Design Review
In response to the recommendations of the Barangaroo Review, the Government resolved to undertake a 'snapshot' design review of commercial buildings C3, C4 and C5. The review was undertaken over two days in September 2011, by Ms Shelley Penn (Chair), Mr Ray Brown (independent architect) and Mr Peter Mould (NSW Government Architect). The findings of the review were presented to the Government on 23 September 2011. In summary, the panel made the following observations, findings and recommendations:

- commercial towers C3, C4 and C5 have been conceived as a 'family' of buildings, with C3 being identified as the 'big brother' and C4 and C5 being the two smaller 'siblings'. In order to diversify the expression of the towers, Rogers Stirk Harbour and Partners (RSHP) propose to use subtle variations in height, sun shading devices and external materials and colours
- C4 has been designed to a high standard and is expected to deliver an excellent design outcome. However, replicating this design for buildings C3 and C5 would produce a less successful outcome as it would exacerbate the visual bulk of the buildings
- to reduce the visual bulk of the towers, the panel recommended that RSHP review the designs for C3 and C5, or Lend Lease should engage a new architect to ensure a more diversified built form is provided. In addition, the Concept Plan controls could be modified to allow greater differentiation in height within the current GFA. Taller, thinner towers would help the overall composition, and reduce the visual bulk of the buildings
- the podia of the three commercial towers should be designed as separate buildings in their own right to provide opportunities for establishing the individual character of each building and its surrounding public domain
- the height of the podia for C3 and C5 could be increased to provide an improved relationship between the proposed buildings and the adjoining buildings to the east and west of the site.

Government's Response

On 30 September 2011, the Government issued its response to the 'snapshot' design review. In this regard, the Government stated that:

- the reviewers' had formed a valid but philosophically different conclusion to the Barangaroo Delivery Authority's (BDA) Design Excellence Review Panel (DEPR) and Lend Lease's architects
- it agrees that it is important to ensure that the C3 and C5 podia are of a high quality, and it supports the engagement of high calibre architects and designers to ensure a high quality outcome is provided
- it does not support a redesign of the C3 and C5 commercial towers in accordance with the recommendations of the review, as it considers that it would compromise the deliverability and feasibility of the Barangaroo project.

Barangaroo Independent Remediation Review

On 22 August 2011, the Premier announced that a Barangaroo Independent Remediation Review Panel would be established in response to the recommendations of the Barangaroo Review. The Panel was comprised of representatives from the BDA, Lend Lease, the City of Sydney Council (Council) and Australians for Sustainable Development, with the Panel chaired by a representative from the Environment Protection Authority (EPA). The Panel's role was to restore community confidence in the remediation of Barangaroo. In order to ensure this occurred, the Panel engaged Mr James Davis, an independent reviewer, to peer review all remediation documentation submitted as at 22 August 2011.

The peer review concluded that all remediation plans have been completed to a high standard, and the requirements for remediation are well understood. Notwithstanding, the review made 11 recommendations, three of which are relevant to the assessment and future monitoring of project applications. The relevant recommendations are summarised below:

- all future approvals involving remediation works comply with the requirements of SEPP 55, including notifications being provided to the Council
- the requirements for the placement of contaminated material on the Headland Park are reviewed, and an addendum to either the Remediation Action Plan (RAP), or the works plan for the basement car park is updated by the proponent to be consistent with the acceptance criteria for fill on the Headland Park
- the BDA should undertake a site wide evaluation of the criteria adopted for different development areas across the site in consultation with the Site Auditor and the OEH, to simplify the remediation criteria

The Panel endorsed the peer reviewer's findings in full. The department has liaised with the EPA to develop a set of conditions that that reflect the peer reviewer's recommendations. These conditions have been included (where relevant) in the Instrument of Approval for both applications.

2. PROPOSED PROJECTS

2.1 Project Descriptions

Project approval, as modified by the PPRs is sought for:

Commercial Building C3 (located on Block 3)

- piling and associated earthworks and remediation
- construction of a 48-storey commercial building to RL 220 with a maximum gross floor area (GFA) of 115,448m² comprised of:
  - 105,488m² commercial floor space
  - 7,021m² retail floor space
  - 1,145m² office lobby
  - 1,677m² of community uses for the purpose of a child care centre
  - 117m² to house the loading dock managers within the basement car park
- construction of a predominantly three-storey podium level to RL 18
- operation and use of the approved basement car park (MP10_0023) to accommodate 196 car spaces (178 commercial, 18 retail) allocated specifically to C3
- the creation of 401 bicycle spaces, including 65 temporary spaces within the landscaped forecourt along the site's Hickson Road frontage, and 336 spaces within the basement car park
- pedestrian and cycle access and circulation arrangements
- signage zones on the building façade to accommodate building and business identification signage
- creation of a temporary forecourt and landscaping along the Hickson Road frontage of the site, surfacing of the surrounding streets and laneways including part of Globe Street and the future City Walk, and installation of hoardings
- installation of services and utilities required to service the building.

Commercial Building C5 (located on Block 2)

- piling and associated earthworks and remediation
- construction of a 39-storey commercial building to RL 173 with a maximum gross floor area (GFA) of 90,539m² comprised of:
  - 83,760m² commercial floor space
  - 5,315m² retail floor space
  - 1,370m² office lobby
  - 94m² to house the loading dock managers within the basement car park
- construction of a predominantly three-storey podium level to RL 18
- operation and use of the approved basement car park (MP10_0023) to accommodate 153 car spaces (142 commercial, 11 retail) allocated specifically to C5
- the creation of 326 bicycle spaces, including 65 temporary spaces within the landscaped forecourt along the site's Hickson Road frontage, and 261 spaces within the basement car park
- pedestrian and cycle access and circulation arrangements
- signage zones on the building façade to accommodate building and business identification signage
- creation of a temporary forecourt and landscaping along the Hickson Road frontage of the site, surfacing of the surrounding streets and laneways including part of Globe Street and the future Margaret Street West, and installation of hoardings
- installation of services and utilities required to service the building.

Elevations of commercial buildings C3 and C5 (as described in the PPRs) are provided at **Figures 3** to **Figure 7** overleaf. Architectural drawings are provided in the PPRs which are provided at **Appendix A**.

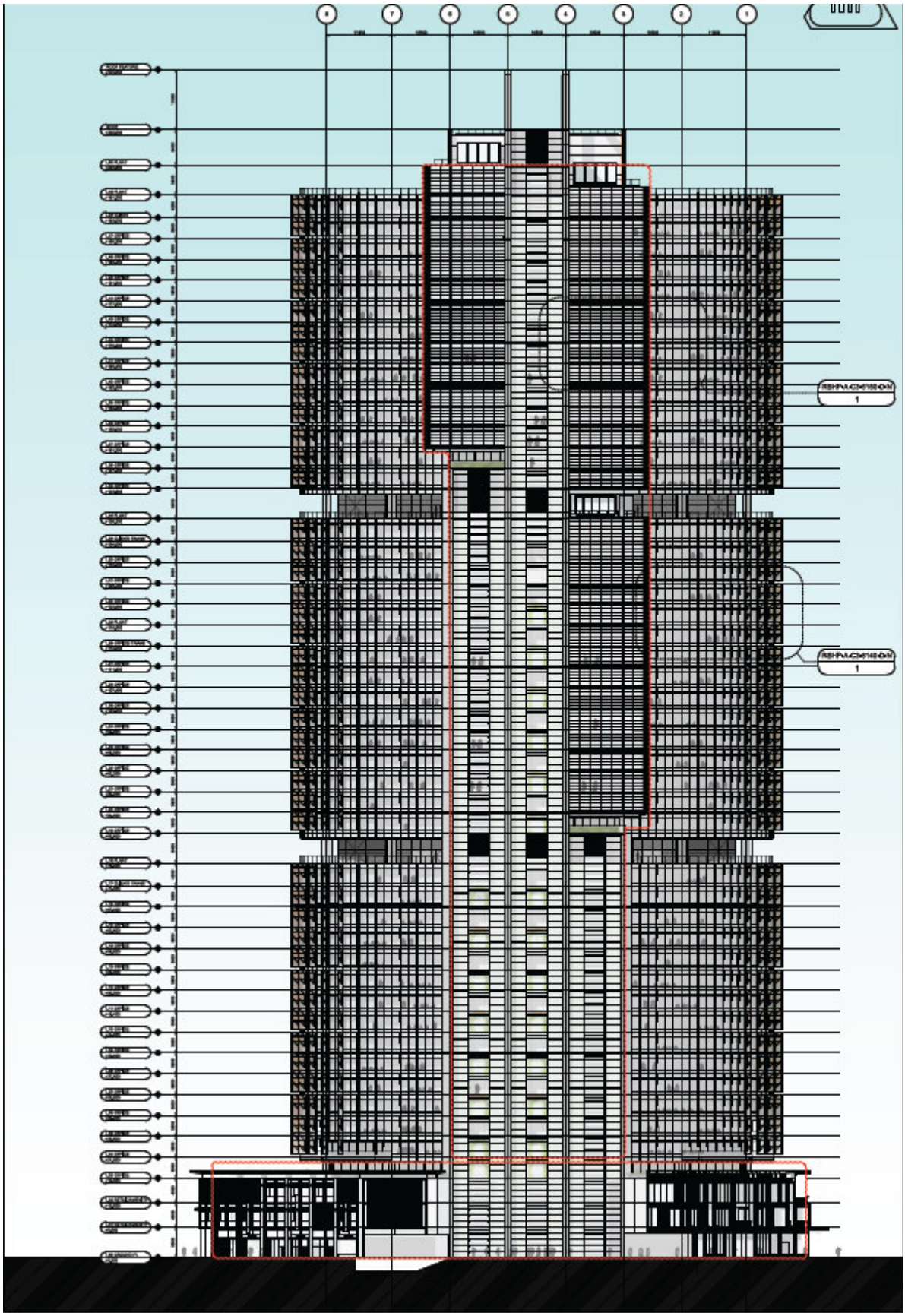


Figure 3: C3 Northern Elevation

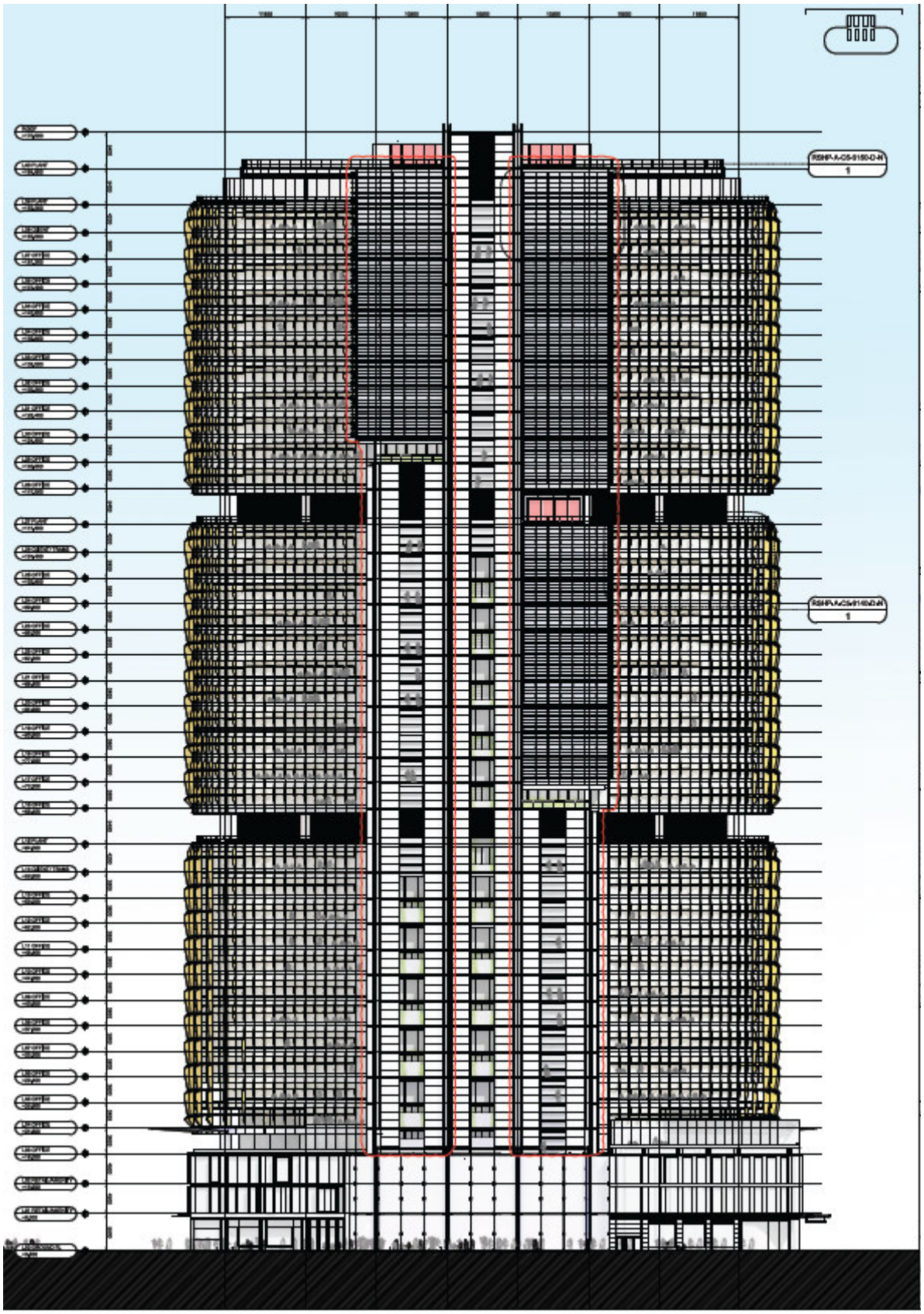


Figure 4: C5 Northern Elevation

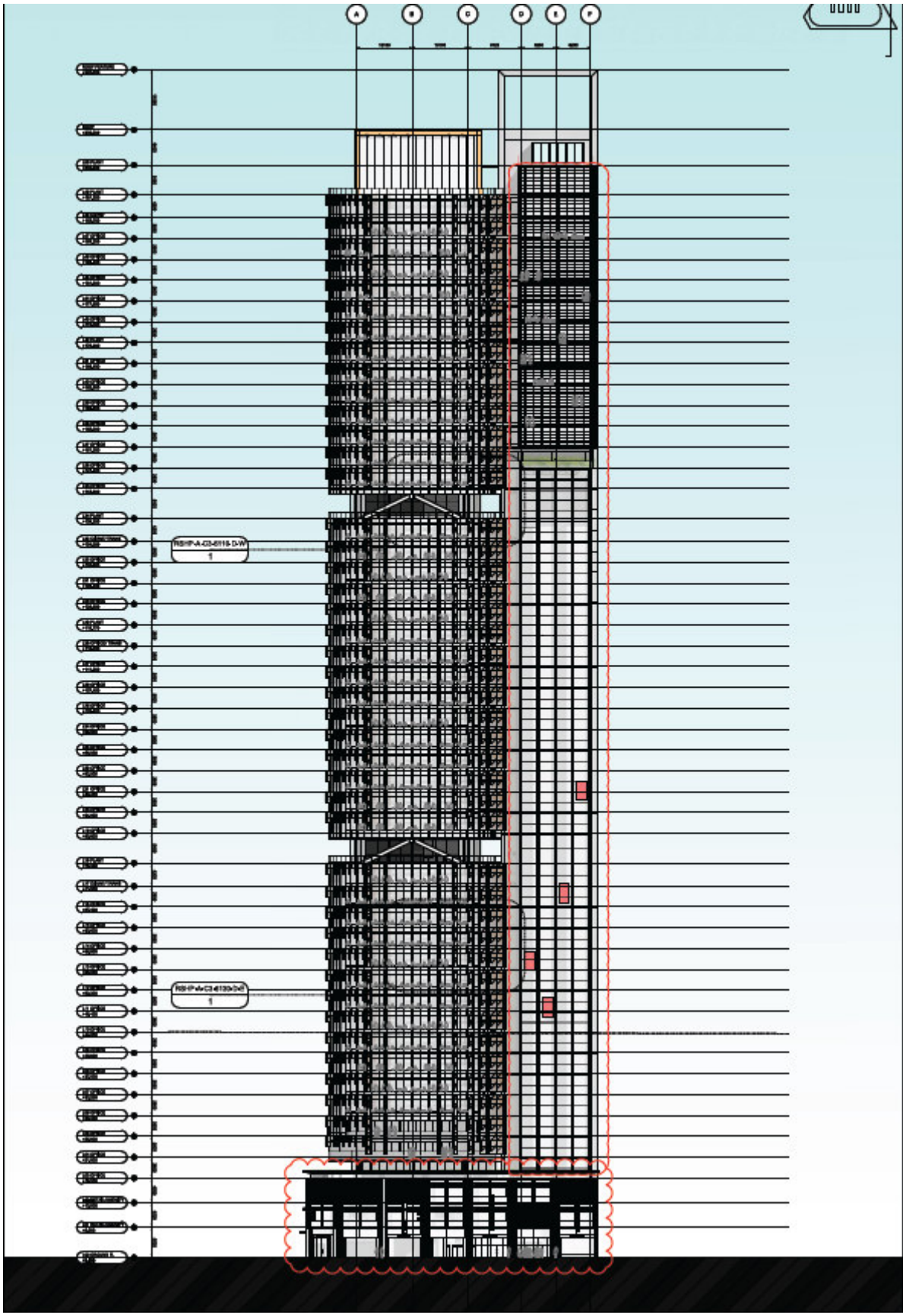


Figure 5: C3 Eastern Elevation

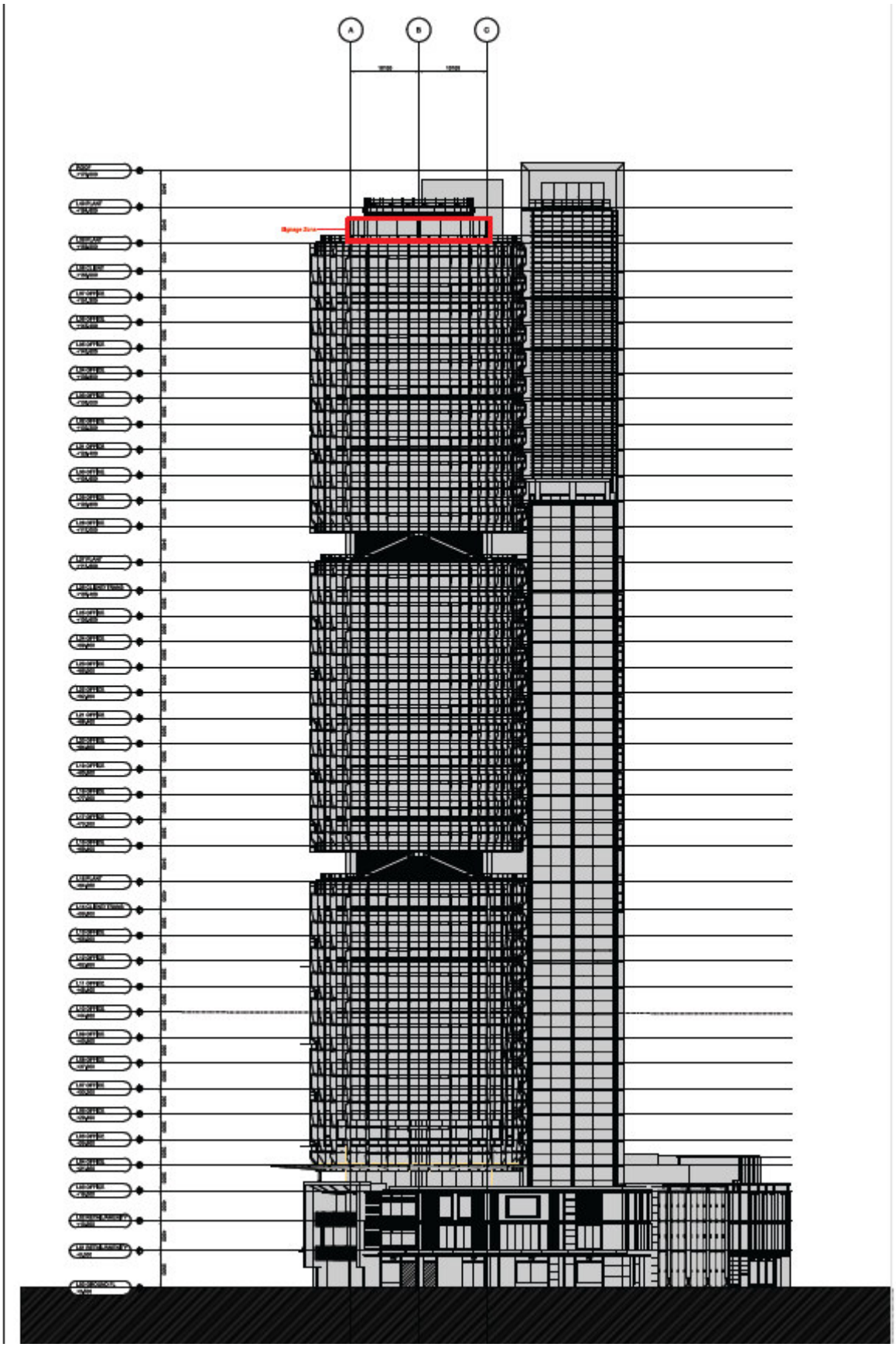


Figure 6: C5 Eastern Elevation

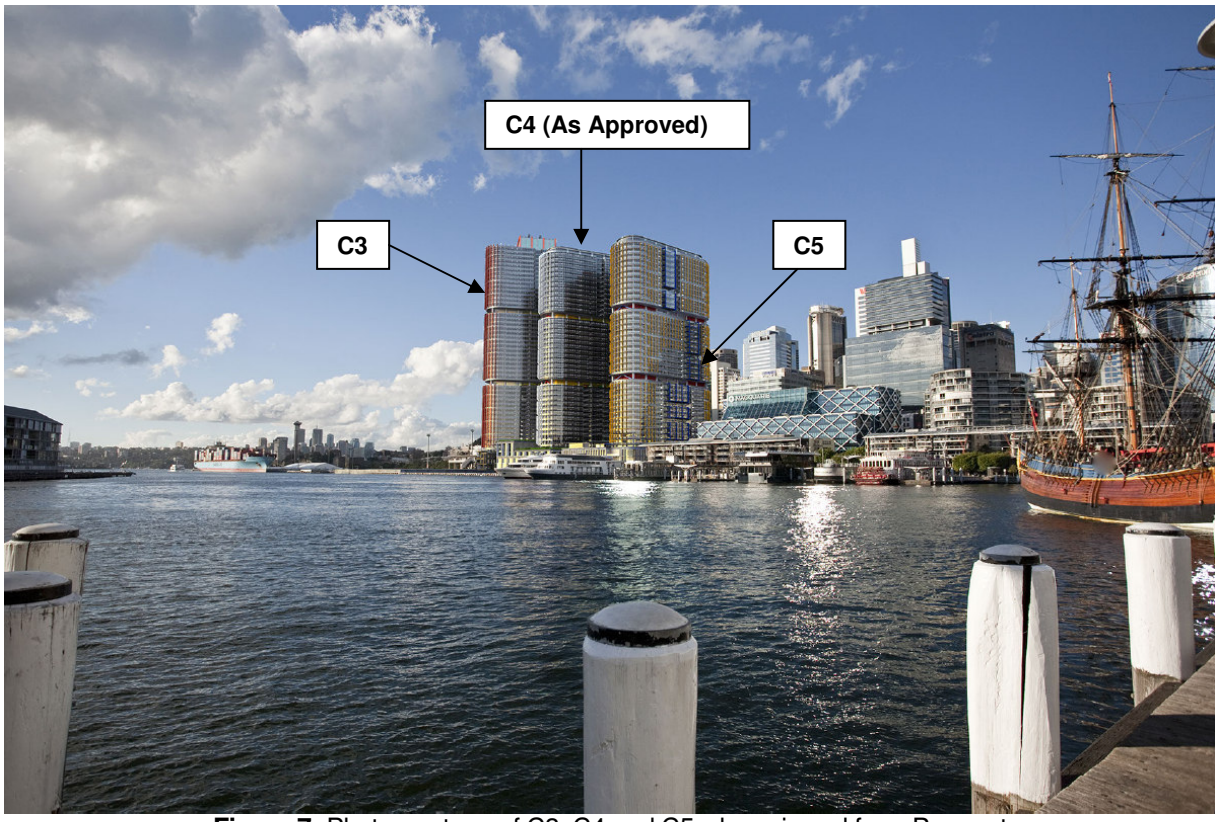


Figure 7: Photomontage of C3, C4 and C5 when viewed from Pyrmont

2.2 Project Need and Justification

The project applications form two of a series of individual project applications within Barangaroo South. Both project applications are consistent with the approved Concept Plan for Barangaroo in terms of their height, setbacks, and GFA.

Barangaroo is identified as in important part of the "Global Sydney" Strategic Centre within the NSW Government's *Metropolitan Plan for Sydney 2036*.

Regionally, there are limited sites which can provide significant new foreshore open spaces and linkages within the CBD that could deliver significant amounts of new commercial and residential floor space. Barangaroo's waterfront location, size and location on the western edge of the CBD means it presents an opportunity to deliver significant new commercial floor space and recreational opportunities. Coupled with significant infrastructure improvements and recreational and cultural activities, the redevelopment of Barangaroo can contribute to the sustained growth of the CBD and enhance the position of Sydney within the Asia-Pacific region and the global market more generally.

The proposals are also consistent with the *Draft Sydney City Subregional Strategy* as they will facilitate the delivery of the Barangaroo site, which itself will help meet the following key planning challenges in the Sydney CBD precinct:

- accommodating new jobs
- ensuring sufficient capacity for office and hotel development in keeping with the City's global status
- maintaining and improving amenity and cultural opportunities
- encouraging the development of lifestyle and entertainment activities
- maintaining and improving accessibility within the Sydney CBD
- facilitating the clustering of appropriate mutually supporting land uses.

3. STATUTORY CONTEXT

3.1 Major Project

Part 3A of the EP&A Act, as in force immediately before its repeal on 1 October 2011, and as modified by Schedule 6A to the Act, continues to apply to transitional Part 3A projects. Director-General's environmental assessment requirements (DGRs) were issued in respect of MP10_0227 and MP11_0044 prior to 1 October 2011, therefore the projects are transitional Part 3A projects.

Consequently, this report has been prepared in accordance with the requirements of Part 3A and associated regulations, and the Minister (or his delegate) may approve or disapprove of the carrying out of the projects under section 75J of the EP&A Act.

3.2 Permissibility

The Barangaroo site is listed as a SSS under Part 12 of Schedule 3 of the MD SEPP. The SEPP zones the project application sites 'B4 Mixed Use'. The construction and use of commercial buildings is permissible within this zone, subject to approval.

3.3 Environmental Planning Instruments

Under sections 75I(2)(d) and 75I(2)(e) of the EP&A Act, the Director-General's report for a project is required to include a copy of, or reference to, the provisions of any State Environmental Planning Policy (SEPP) that substantially governs the carrying out of the project, and the provisions of any environmental planning instruments (EPI) that would (except for the application of Part 3A) substantially govern the carrying out of the project, and that have been taken into consideration in the assessment of the project.

The following EPIs are applicable to the assessment of the application:

- MD SEPP
- Infrastructure SEPP
- SEPP 55
- Sydney Regional Environmental Plan (Sydney Harbour Catchment 2005)

The department's assessment of compliance with the MD SEPP and SEPP 55 is provided in Section 5 of this report. An assessment of compliance with the remaining EPIs is provided at **Appendix D**. In summary, the department is satisfied that the applications comply with the relevant provisions of the abovementioned EPIs.

3.4 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
    (a) to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and
    (b) 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 applications are consistent with the relevant objects. An assessment of the applications in relation to the relevant objects is provided in Section 5 of this report.

3.5 Ecologically Sustainable Development

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
(b) inter-generational equity
(c) conservation of biological diversity and ecological integrity
(d) improved valuation, pricing and incentive mechanisms.

Detailed assessment of the environmental issues associated with the projects is provided in Section 5. On the basis of this assessment, the department is satisfied that the projects encourage ESD, in accordance with the objects of the EP&A Act.

3.6 Statement of Compliance

In accordance with section 75I of the EP&A Act, the department is satisfied that the Director-General's environmental assessment requirements have been complied with.

3.7 Consistency with approved Concept Plan

The project applications seek approval to construct two commercial buildings with ancillary retail uses. In addition, the applications seek approval to allocate car and bicycle parking spaces for the use of each building within the basement car park approved under MP10_0023 (as modified). Temporary and permanent public domain works are also proposed within each project area.

Both project applications are consistent with the maximum GFA and height controls of the approved Concept Plan. In addition, the applications are generally consistent with the built form principles and urban design controls outlined in the *Supplementary Urban Design Statement* (as amended to comply with modification B9(1) of the Concept Plan approval). A full assessment of the applications against the applicable built form and urban design controls is provided in Section 5 of the report.

4. CONSULTATION AND SUBMISSIONS

4.1 Exhibition

Under section 75H(3) of the EP&A Act, the Director-General is required to make the environmental assessment (EA) of an application publicly available for at least 30 days. After accepting the EAs, the department publicly exhibited them from 16 November 2011 until 19 December 2011 (34 days) on its website, and at the department's Information Centre and the Council's One Stop Shop. In addition, the department also advertised the public exhibition in the Sydney Morning Herald and the Daily Telegraph on 16 November 2011 and notified relevant landholders, and State and local government authorities in writing.

The department received six submissions from public agencies, including the City of Sydney and Leichhardt Council for each project. In addition, three public submissions were received for commercial building C3, none of which objected to the development. Two public submissions were received for commercial building C5, neither of which objected to the development.

4.2 Public Authority Submissions

Each agency lodged a combined submission for commercial buildings C3 and C5. A summary of the submissions is provided below:

City of Sydney Council (Council)

The Council confirmed its opposition to the size of the floor plates above RL 60 and RL 120 and advised that it objects to the applications unless the following issues are resolved prior to determination:

- the height of C5 is reduced to RL 140 (a five floor reduction)
- an additional level (from 3 to 4-storeys) is added to the C3 and C5 podia to mitigate wind impacts and provide the buildings with a more human scale
- the design of the wind mitigation structures is fully resolved prior to determination
- take-up of GFA is tabulated and allocated to each building to ensure compliance with the Concept Plan
- revised photomontages are provided depicting the C3, C4 and C5 towers together. Furthermore, the Council does not support the use of the methodology used to prepare the visual impact assessment
- the floor plates for the buildings are reduced to in length at RL 60 and RL 120 to preserve views and vistas from public places, landmarks and heritage items along the Darling Harbour Foreshore and the Millers Point Heritage Conservation Area.

In addition, the Council advised that it has the following residual issues:

<u>Public Domain</u>

- a final public domain plan should be prepared prior to the determination of the application
- concern is raised with the relocation of the pedestrian bridge to Margaret Street West. The Council considers that the pedestrian bridge should link with City Walk
- the public domain should be aligned to integrate with the existing public domain along all edges of the building
- new roads should follow the ground plane to assist with overland flow paths.

Urban Design
- awnings should be designed to comply with the *City of Sydney Awnings Policy* to ensure pedestrians are provided with adequate wind protection and shelter
- the signage zones are excessive, and should be reduced to comply with the *City of Sydney Signage and Advertising Structures Development Control Plan* (DCP).

Environmental Amenity
- the Noise Impact Assessment should be amended to include consideration of compliance with the internal acoustic amenity criteria for residential buildings and serviced apartments outlined in the *Central Sydney DCP 1996*
- any approval should be subject to a condition requiring the proponent to provide a report from a suitably qualified acoustic engineer verifying that individual and cumulative noise emissions from mechanical plant will comply with the Council's standard noise use condition.

Traffic, Transport and Parking
- the proponent should provide further clarification in relation to the traffic model used to support the Construction Traffic Management Plan, including the impact of closing Margaret Street West to facilitate the construction of Wynyard Walk
- the proponent should clarify how the Transport Management and Accessibility Plan (TMAP) traffic generation rates have been calculated
- the proponent should update the TMAPs to reflect the State government's commitments in relation to light rail
- concern is raised with the cumulative impact of construction traffic across the Barangaroo site
- the Grosvenor Street access route is not supported on the basis that it would require trucks to access York Street during the am peak period. This would interfere with bus operations at Wynyard
- car parking should not be made available for use until the building is occupied
- no information is available in relation to the location of the loading docks associated with C3.

Child Care Centre (Commercial Building C3)
- the project should be assessed to ensure it is capable of complying with the Council's *Child Care Centres DCP*, particularly in relation to car parking provision.

Remediation
- the department should impose a condition requiring the proponent to notify the Council that the site has been remediated as per the requirements of SEPP 55.

The department notes the Council's ongoing objection to the bulk and scale of development approved under the Barangaroo Concept Plan, and the potential visual impacts of the projects on views. The department considers that these issues were fully considered and addressed during the assessment of MOD 4 to the Concept Plan, and that so long as the subject project applications comply with the relevant development standards in the Concept Plan and MD SEPP, continued justification of their appropriateness is not required.

In terms of the Council's objections that relate to the design of the wind mitigation structures, the GFA allocation for each building, and its request for revised photomontages depicting the C3, C4 and C5 towers together, the department considers that:
- the imposition of a condition requiring the proponent to design the temporary wind mitigation structures in consultation with the Council, and to the satisfaction of the Director-General, prior to the issue of a Construction Certificate will give the Council the opportunity to comment on the design of these structures
- the Barangaroo South GFA allocation table, provided by Lend Lease and displayed on the department's website, demonstrates that there is a 22,556m^2 surplus of GFA within Barangaroo South, and 14,018m^2 and 27,221m^2 of GFA would remain available for allocation within blocks 2 and 3 if the applications are approved. On this basis the department is satisfied that there is sufficient GFA available to facilitate the construction of the residual buildings across Barangaroo South
- the imposition of conditions requiring the proponent to obtain certification from a Registered Surveyor that the GFA depicted in the Construction Certificate drawings does not exceed the approved GFA will ensure that no additional floor space will be created as a result of the projects
- the revised photomontages provided by the proponent adequately depict the impact of commercial buildings C3, C4 and C5 on views and vistas within the public domain and at private residences.

In terms of the residual concerns raised by the Council, the department has concluded that:

- a final public domain plan can not be prepared until the BDA has released its Barangaroo Public Domain Plan. Notwithstanding, the department is satisfied that the temporary public domain works will be of a high quality and will integrate with the proposed buildings and surrounding public domain
- the relocation of the pedestrian bridge does not form part of the project applications. As such the issues raised by the Council are not relevant to the assessment of these applications
- the Built Form and Urban Design Principles approved under the Concept Plan (as amended) include controls that regulate the extent of signage within each development block. The applications are consistent with the signage controls for development blocks 2 and 3
- the Noise Impact Assessment does not need to be updated to consider compliance with the internal acoustic amenity criteria for residential buildings and serviced apartments as outlined in the *Central Sydney DCP 1996*, on the basis that the applications do not incorporate any residential floor space
- the department has recommended the imposition of a condition requiring the proponent to verify that individual and cumulative noise emissions from mechanical plant will comply with the Council's standard noise use condition
- the PPRs satisfactorily address the issues raised by the Council in relation to the traffic model used to support the Construction Traffic Management Plan and the TMAP. In addition, the department considers that construction traffic management was assessed under the project applications for the bulk excavation and basement car park and the construction of commercial building C4. In this regard, the department concluded that the routes proposed for construction vehicles entering and exiting the site are appropriate. The current project applications do not seek to alter the approved construction routes
- as the Government has not finalised its commitments in relation to the provision of light rail in the CBD, the department does not consider it appropriate to update the supplementary TMAPs prepared to support the project applications
- as the proponent has not provided an indicative layout for the proposed child care centre, it is not possible to assess compliance with the Council's *Child Care Centres DCP*. As such, the department has recommended the imposition of a condition requiring the proponent to lodge a separate application for the fit out and use of level 3 of the C3 podium as child care centre
- the applications will be conditioned to ensure that car parking and loading spaces comply with the rates outlined in the Concept Plan approval
- the applications will be conditioned to ensure that all remediation works are undertaken in accordance with the requirements of SEPP 55.

Leichhardt Council

The Council does not support the proposals on the basis that they deviate from the winning scheme for the East Darling Harbour Design Competition (Philip Thalis Scheme). In addition, the Council raised concerns with the potential impacts of the project on the road and public transport networks.

The department notes that the Philip Thalis Scheme has been superseded by the Barangaroo Concept Plan. In addition, the department considers that the traffic and transport impacts associated with the overall redevelopment of Barangaroo were considered and assessed as part of MOD 4 to the Barangaroo Concept Plan.

Sydney Water

Raised no objection to the applications, however it advised that the projects may affect an existing stormwater channel, and the developer will need to ensure that all temporary and permanent stormwater deviation channels comply with Sydney Water requirements.

The stormwater deviations required to construct the commercial buildings within development blocks 1 to 3 were considered and assessed as part of the bulk excavation and basement car park project application (MP10_0023, as modified). In this regard Condition B15 of the bulk excavation and basement car park project approval requires the proponent to obtain Sydney Water's approval for all proposed on-site storm water detention measures. The department also notes that Sydney Water has confirmed that it is currently assessing an application seeking approval for on-site stormwater detention measures within blocks 1 to 3 at Barangaroo South.

Transport for NSW (Transport NSW)
Transport NSW did not object to the applications, however it raised the following issues:

- commercial building C5 should incorporate through site access to ensure north-south permeability is provided through Block 2
- insufficient details are provided in relation to pedestrian access and circulation arrangements across Barangaroo South
- there are inconsistencies within the EA and the TMAP regarding the number of bicycle parking spaces proposed within the project area
- there is insufficient information to explain how bicycle parking will be accommodated for buildings C3 and C5 within the basement car park. In addition, information detailing the interrelationship between cycle access points within the building and their connection to the broader cycle network is not provided
- end of trip facilities appear to be inadequate to service the number of bicycle parking spaces proposed for C3 and C5
- the assessment should include adequate consideration of the construction and operation of Wynyard Walk, including potential wind impacts on the Wynyard Walk pedestrian bridge
- detailed plans should be submitted to demonstrate that the application will not impact on RailCorp's 33 kv power cable.

The department notes the above matters have been addressed in the PPRs.

NSW Environment Protection Authority (EPA)
The EPA raised no objection to the applications on the basis that the environmental impacts associated with the redevelopment of Barangaroo are regulated under Environmental Protection Licence No. 13336. Notwithstanding, the EPA recommended that the proponent:

- develop an air quality management plan for the project prior to construction commencing
- provide specific management measures in a revised construction framework environmental management plan for predicted noise exceedances outside standard construction hours, such as community notification, installation of hoardings and use of low noise equipment.

The department notes the above matters have been addressed in the PPRs.

Finance and Services NSW (formerly Housing NSW)
Raised no objection to the applications, however it requested:

- the imposition of conditions requiring the proponent to implement the noise mitigation strategies outlined in the Environmental Construction and Site Management Plan (ECSMP)
- a dilapidation survey for all properties managed by Finance and Services NSW prior to the commencement of construction, and a post-construction dilapidation report
- amendments to the reflectivity study to identify the impacts of the project on properties along High Street, Millers Point.

The department has recommended conditions of approval that will require the proponent to:

- implement the noise mitigation strategies outlined in the ECSMP
- undertake pre and post-construction dilapidation surveys, which will include the properties owned by Finance and Services NSW.

In addition, the department requested that the proponent investigate Finance and Services residual concerns relating to the reflectivity impacts of the projects as part of its PPR. It is noted that Finance and Services were satisfied with the responses provided in the PPRs.

4.3 Public Submissions

Three public submissions were received for commercial building C3. One submission supported the project and two submissions neither objected to, nor supported the applications. In addition, two submissions, one of support and one commenting on the project were received in relation to commercial building C5.

The key issues raised in the public submission are as follows:

- public transport impacts
- lack of architectural diversity between commercial buildings C3, C4 and C5, and the design of the podia
- appropriateness of the temporary public domain treatments
- inadequate activation of retail spaces due to the proposed hours of operation
- shadow impacts
- view impacts

- lack of on-site renewable energy generation
- management of excavated material
- signage
- opportunities to incorporate green facades.

The department has considered the issues raised in submission in Section 5 of this report.

4.4 Preferred Project Report

The proponent provided PPRs for commercial buildings C3 and C5 on 2 March 2012, which include a response to submissions. A breakdown of the information submitted in the PPRs, as well as a summary of the proposed changes to the projects is provided below.

Commercial Building C3

- internal changes to the ground and podium levels to alter the position of lifts, amenities, fire stairs and egresses, and back of house and service riser elements to improve the overall functionality of the lobby, ground floor and podium levels
- enlargement of the mid and high-rise vertical villages to improve the relationship between the tower and the core elements by widening the vertical recess
- reduction in the extent of glazing on the plant room floors, and introduction of louvered panels to frame the mechanical plant
- modifications to the podium to provide a higher level of architectural diversity, and provide a human scale to the building
- revised basement layout to improve the functionality of the back of house areas.

The proposed modifications would result in a 157m^2 increase in GFA from 115,291m^2 to 115,448m^2.

In addition, the draft SOCs have been updated to:

- require the ECSMP to be updated to include management measures for the barging of soil (if required)
- require the proponent to prepare a site wide strategy to manage dilapidation reporting over the life of the Barangaroo project
- require the proponent to provide RailCorp with plans that demonstrate that the project will not impact on RailCorp's 33 kv power line.

Commercial Building C5

- alterations to the roof form to incorporate cut away sections that reduce the extent of shadow that the building would create
- lowering of the external horizontal shade devices on the eastern and western elevations to increase light penetration within the building
- internal changes to the ground floor and podium levels to alter the position of lifts, amenities, fire stairs and egresses, and back of house services and riser elements to improve the overall functionality of the lobby, ground floor and podium levels
- enlargement of the mid and high-rise vertical villages to improve the relationship between the tower and the core elements by widening the vertical recess
- reduction in the extent of glazing on the plant room floors, and introduction of louvered panels to frame the mechanical plant
- modifications to the podium to provide a higher level of architectural diversity, and provide a human scale to the building
- revised basement layout to improve the functionality of the back of house areas.

The proposed modifications would result in a 23m^2 reduction in GFA from 90,562m^2 to 90,539m^2 in comparison to the exhibited project.

In addition, the draft SOCs have been updated to:

- require the ECSMP to be updated to include management measures for the barging of soil (if required)
- require the proponent to prepare a site wide strategy to manage dilapidation reporting over the life of the Barangaroo project.

The PPRs were referred to the agencies that responded to the original project applications for comment.

The City of Sydney Council reiterated its original objection to the bulk and scale of the buildings, the height of their podia and the methodology used to undertake the visual impact assessment, and the management of

wind impacts. Notwithstanding, the Council advised that it considered that the proponent's PPRs satisfactorily addressed the Council's residual concerns in relation to the scope of final public domain works, environmental amenity, traffic transport and parking and remediation.

Leichhardt Council did not comment on the PPRs.

The EPA and Finance and Services advised that the PPRs addressed their concerns. The remaining agencies did not comment on the PPRs.

5. ASSESSMENT

The department considers the key environmental issues for the project to be:

- consistency with the MD SEPP and the Barangaroo Concept Plan
- built form and urban design
- amenity
- ESD
- traffic and transport
- contamination and remediation
- stormwater and water management
- construction impacts
- public interest.

5.1 State Environmental Planning Policy (Major Development) 2005 (MD SEPP)

Part 12 of Schedule 3 of the MD SEPP specifies that development at Barangaroo must comply with:

- the gross floor area (GFA) and height of buildings maps
- the relevant zone objectives
- the design excellence provisions.

Commercial buildings C3 and C5 do not exceed the maximum height or GFA controls applicable to buildings within blocks 2, 3, 4A,4B, 4C and Block X, and the applications are consistent with the zone objectives on the basis that they will provide a mixed use development comprised of commercial, retail and community floor space. **Table 1** below demonstrates that the applications comply with the numeric controls specified in the MD SEPP.

Table 1: MD SEPP Controls

Control	Project Applications (as modified by the PPR)	Compliance
Height		
Block 2 Maximum Height of RL 180	MP10_0227 (commercial building C5) seeks approval to construct a 39-storey commercial building with a maximum height of RL 170[1].	Yes
Block 3 Maximum Height of RL 209	MP11_0044 (commercial building C3) seeks approval to construct a 48-storey commercial building to RL 209[1].	Yes
FSR		
Blocks 2, 3, 4A, 4B, 4C and X Maximum GFA of 428,932m^2	The applications seek approval to create two commercial buildings with a combined GFA of 205,987m^2. Taking into consideration the development already approved within development blocks 2, 3, 4A, 4B, 4C and X (commercial building C4), 123,289m^2 of GFA would remain available for allocation within the abovementioned blocks if the projects are approved.	Yes

Note[1]: The height of commercial buildings C3 and C5 has been calculated in accordance with the definition of building height contained in the Standard Instrument, which requires the measurement of the vertical distance between ground level (existing) and the highest point of the building including plant and lift overruns. The department notes that the height of the buildings to the top of the architectural roof features is RL 173 and RL 220 respectively.

Design Excellence

Clause 19(1) of Part 12 of Schedule 3 of the MD SEPP requires the consent authority to consider whether a new development will exhibit design excellence. When determining whether an application exhibits design excellence, the consent authority must have regard to:

- whether a high standard of architectural design, materials and detailing appropriate to the building type and location will be provided
- whether the form and external appearance of the building will improve the quality and amenity of the public domain

- whether the building will meet sustainable design principles in terms of sunlight, natural ventilation, wind, reflectivity, visual and acoustic privacy, safety and security, and resource, energy and water efficiency.

In addition, clause 19(3) Part 12 of Schedule 3, requires proponents to undertake an architectural design competition if a building is higher than RL 57, or the area of the site on which the building is to be erected is in excess of 1,500m^2, unless the Director-General certifies in writing that the development exhibits design excellence.

The department has considered the design excellence criteria contained in clause 19 of Part 12 of Schedule 3 of the MD SEPP, and considers that the applications exhibit design excellence for the following reasons:

- the tower and podium elements of both buildings are highly articulated and are composed of high quality materials and finishes which are appropriate to the function and location of the buildings. Therefore, the applications exhibit a high standard of architectural design
- the form and appearance of the buildings will improve the quality and amenity of the public domain by providing new views and vistas within Barangaroo South and temporary public domain works
- the buildings have been designed to:
  - provide light penetration deep within the building floor plate
  - minimise wind and reflectivity impacts within the public domain
  - provide a high degree of passive surveillance over the public domain via the provision of retail tenancies at ground floor level
  - achieve a six star (international excellence) energy rating
- the proposed buildings have been designed by Pritzker prize winning architect Lord Rogers and the proponent has confirmed that it will retain RSHP over the life of the projects.

Given the above, it is recommended that the Director-General form the view that the applications exhibit design excellence, and waive the requirement for the proponent to undertake a design competition.

5.2 Barangaroo Concept Plan

The Barangaroo Concept Plan (as modified) also includes height and GFA controls for each development block. These controls are consistent with the MD SEPP provisions outlined above, however the Concept Plan differs from the provisions of the MD SEPP in that it specifies floor space maxima for each development block. **Table 2** below demonstrates that the applications are consistent with the height and GFA controls outlined in the Concept Plan (as modified).

Table 2: Concept Plan Controls

Block 2 Control	C5 Project Application (as modified by the PPR)	Compliance
Height		
RL 180	The application seeks approval to construct a 39-storey commercial building with a maximum height of RL 170[1].	Yes
FSR		
209,213m^2 permitted within Block 2	The application seeks approval to allocate 90,539m² of GFA to commercial building C5. Taking into consideration the floor space already allocated to other buildings within Block 2 (commercial building C4), 14,108m^2 of GFA would remain available for allocation within Block 2.	Yes
Block 3 Control	**C3 Project Application (as modified by the PPR)**	**Compliance**
Height		
RL 209	The application seeks approval to construct a 48-storey commercial building to RL 209[1].	Yes
FSR		
142,669m^2 permitted within Block 3	The application seeks approval to allocate 115,448m² of GFA to commercial building C3. If the application is approved, 27,221m^2 of GFA would remain available for allocation within Block 3.	Yes

Note[1]: The height of commercial buildings C3 and C5 has been calculated in accordance with the definition of building height contained in the Standard Instrument, which requires the measurement of the vertical distance between ground level (existing) and the highest point of the building including plant and lift overruns. The department notes that the height of the buildings to the top of the architectural roof features is RL 173 and RL 220 respectively.

In addition, Modification B5 of the Concept Plan approval (as modified) requires applications to demonstrate consistency with the Built Form Principles and Urban Design Controls (Urban Design Controls) prepared by RSHP. An assessment of compliance with the Urban Design Controls is provided in Section 5.3 below.

5.3 Built Form and Urban Design

As previously outlined, Modification B5 of the Concept Plan approval requires applications to demonstrate compliance with the Urban Design Controls. These controls are similar to a development control plan in that they have been created to guide the future development of Barangaroo South and are intended to be used as a tool to achieve design excellence, as required under the MD SEPP, and Modification C2 of the Concept Plan.

In this regard, the Urban Design Controls have been broken into two parts: a set of eight overarching built form principles, and 11 urban design controls. The built form principles set out the vision for:

- the western boundary of the site
- the design of the Hickson Road boulevard
- the definition of street edges
- the provision of new north-south pedestrian links
- tapering of the built form
- the provision of open space within the development blocks
- view sharing
- the orientation of buildings.

The urban design controls supplement the built form principles by providing a set of performance based controls for each development block that regulate: building mass and location, street wall establishment, building articulation, building legibility, ground floor permeability and accessibility, roof top design, façade design, signage, public access along the wharf, and sustainable building design. Each control has a series of objectives which outline what the relevant control is seeking to achieve. In addition, the standards provide a conceptual example of how each objective may be complied with. The Urban Design Controls specify that if an application seeks to vary a control or standard, the variation will need to be justified in the project application documentation.

An assessment of compliance with the Urban Design Controls is provided below.

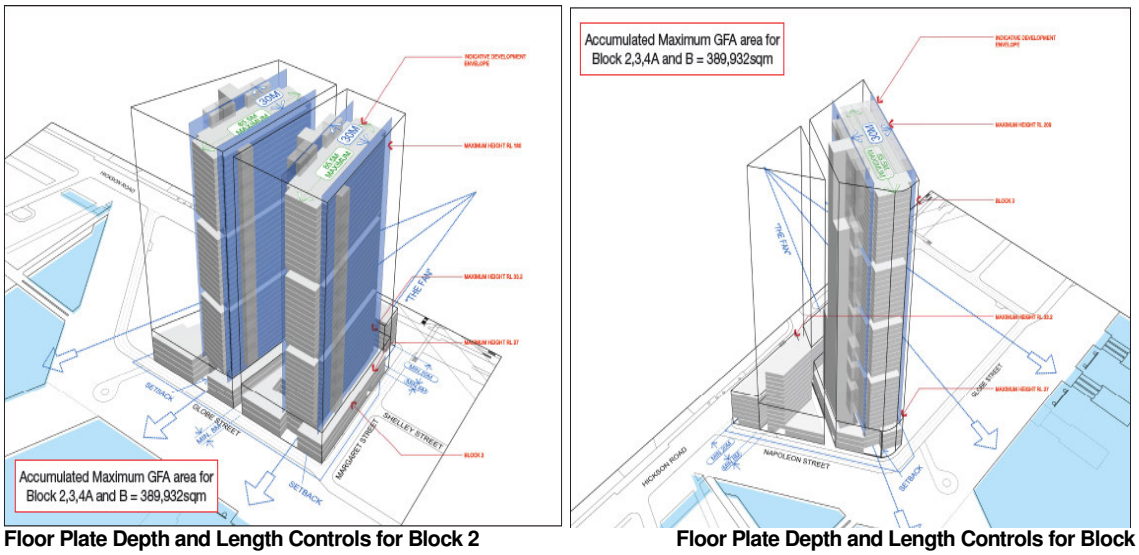
5.3.1 Building Massing and Location

The Urban Design Controls for blocks 2 and 3 require buildings to:

- adopt the fanning principle set out in the Concept Plan
- ensure building mass is appropriate within the envelope
- ensure the vertical massing of the tower form is an integral part of the tower design

In order to achieve these objectives, the design standards specify that:

- the length of the horizontal floor plate of the northern and southern elevations of the buildings should not exceed 85.5m
- the bulk of the building mass should be setback 20m from Hickson Road
- the primary floor plate depth, excluding the structure and shading devices of each tower form sits between vertical planes which establish a 30m zone. The expressed structure and secondary floor plane is permitted outside this zone (see **Figure 8**)
- the predominant podium height for buildings within blocks 2 and 3 should be three storeys and a maximum of RL 27
- either the height or the floor area of one of the towers in Block 2 should be reduced above RL 160.



Floor Plate Depth and Length Controls for Block 2 **Floor Plate Depth and Length Controls for Block 3**

Figure 8: Floor Plate Controls

The department has assessed the applications against these requirements and has concluded that:

- the applications comply with the fanning principles of the Concept Plan, as depicted in **Figure 9** below
- the length of the horizontal floor pates of C3 and C5 will not exceed 85.5m (see **Figure 8**)
- both buildings achieve a minimum setback of 20m from Hickson Road
- the primary floor plate depth sits between the vertical planes which establish the 30m zone. There is no expressed structure or secondary floor plate outside this zone (see **Figure 9**)
- both buildings have a predominant podium height of three storeys, and no part of the podia will exceed RL 27
- commercial building C5 has been designed to incorporate a 5m setback above RL 159 to reduce the floor area above RL 160 as per the design standards for Block 2 (see **Figure 10** overleaf)

Given the above, the department is satisfied that the applications comply with the building massing and location objectives of the Urban Design Controls.

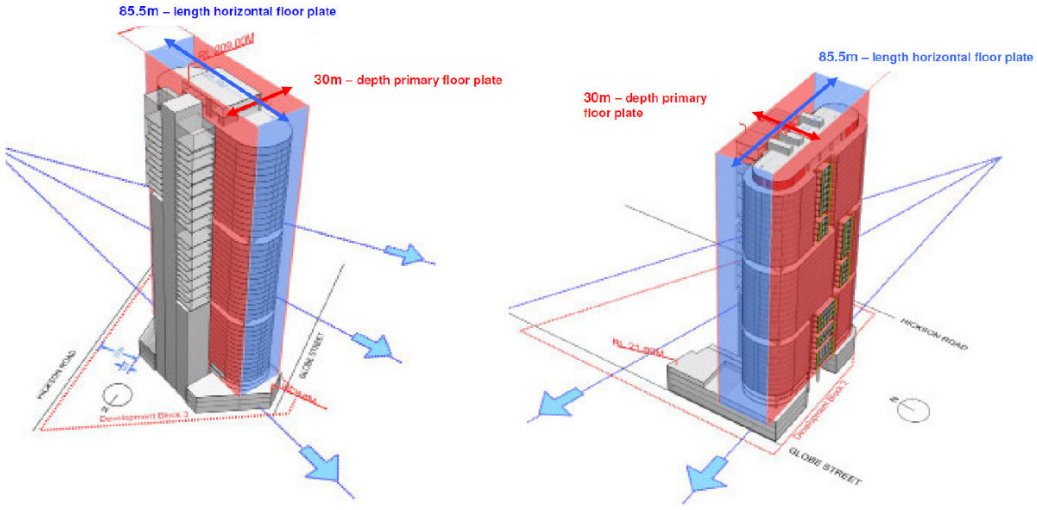


Figure 9: Diagrams Depicting Compliance with the 85.5m Horizontal Floor Plane and Secondary Floor Plane Control

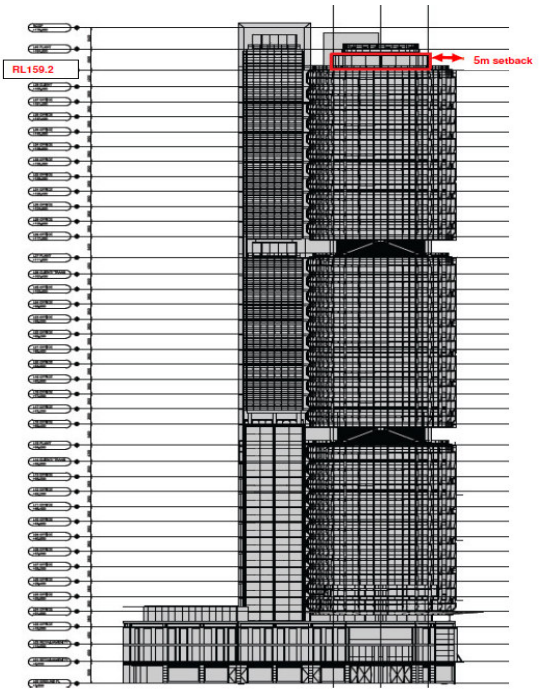


Figure 10: C5 Setbacks above RL 160

5.3.2 Street Wall Establishment and Podia Design

The Urban Design Controls seek to ensure that spaces are created that articulate and define the C3 and C5 building facades. In addition, the controls seek to ensure that the height of the C3 and C5 podia are determined having regard to their compatibility with the streetscape, how they engage and frame the public domain, and environmental performance. Furthermore, the objectives for blocks 2 and 3 require all podia to form a continuous street wall with a minimum predominant podium height of three-storeys.

In order to ensure the objectives are achieved, the standards require:

- the built form to create a street wall with a one-storey minimum height for most of the publically accessible ground floor façade
- the built form to define a street wall along Globe Street, City Walk, Margaret Street West and Hickson Road
- Shelley Lane to be 6m in width, with a defined eastern edge that runs parallel to Hickson Road
- podium height to be a minimum of 3-storeys.

The department has assessed the application against the built form controls and objectives and considers that:

- the predominant height of the C3 and C5 podia is three storeys (see **Figures 11** and **12**)
- the applications will provide a continuous street wall along Globe Street, City Walk, and Margaret Street West. The street wall along Hickson Road will be established under future project applications for commercial buildings C1, C2, C6 and C8
- the applications have been designed to ensure Shelley Street will achieve a minimum width of 6m

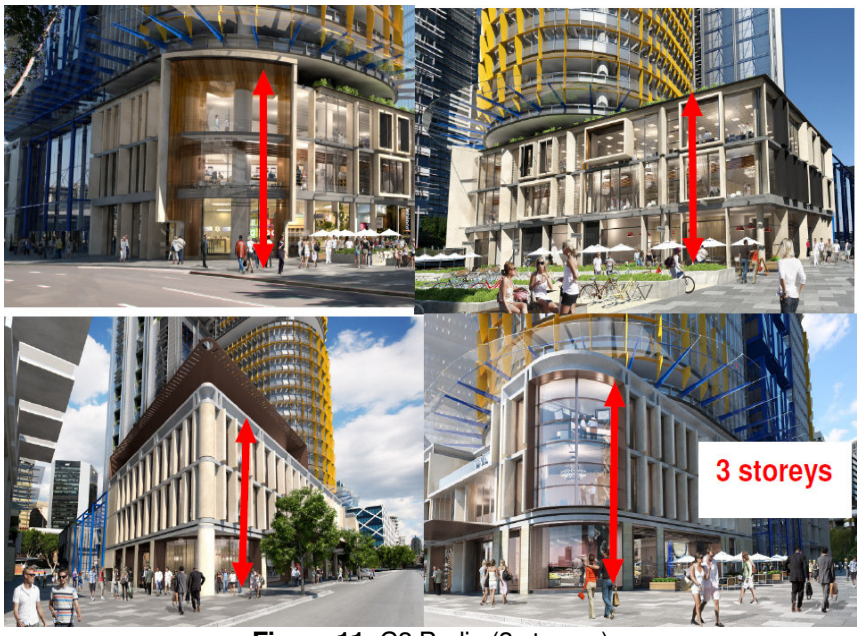


Figure 11: C3 Podia (3 storeys)

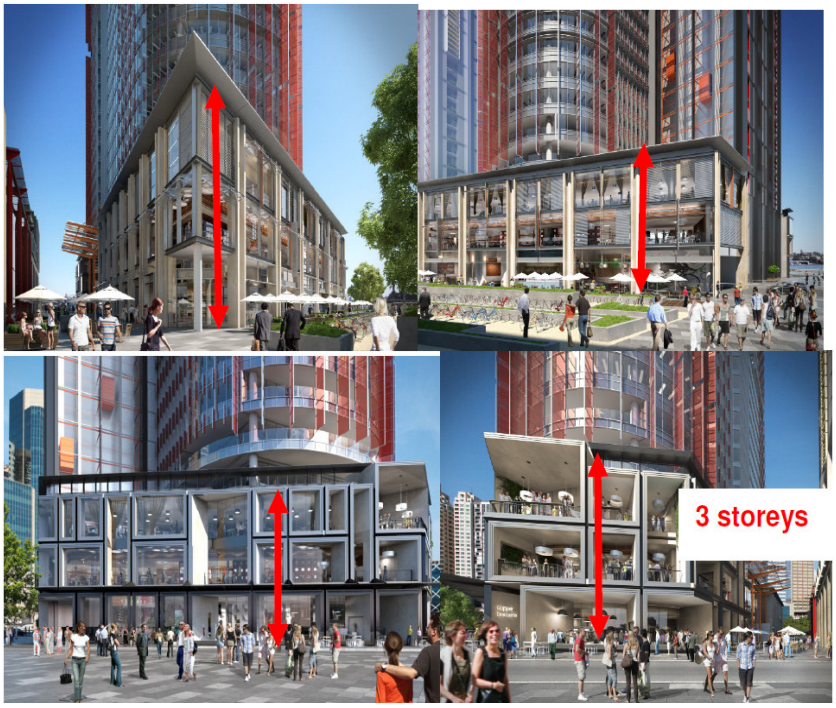


Figure 12: C5 Podia (3 storeys)

Given the above, the department is satisfied that the applications comply with the objectives and standards for street wall establishment and podia design, as outlined in the Urban Design Controls.

5.3.3 Building Articulation, Legibility and Façade Design

The Urban Design Controls seek to ensure that the building mass is articulated to provide visual interest, and enhance the play of light and shade, along with the scale and proportion of the built environment. In addition, the controls emphasise the need to ensure individual components of the building such as the structure, lift cores and circulation spaces are legible within the overall built form, and that the design of the façade is driven by functional requirements, flexibility, transparency and visual appearance. In order to ensure this occurs, the controls recommend compliance with the following objectives and standards:

Objectives

- the establishment of articulated and well proportioned buildings to reduce the perceived bulk and scale of the buildings

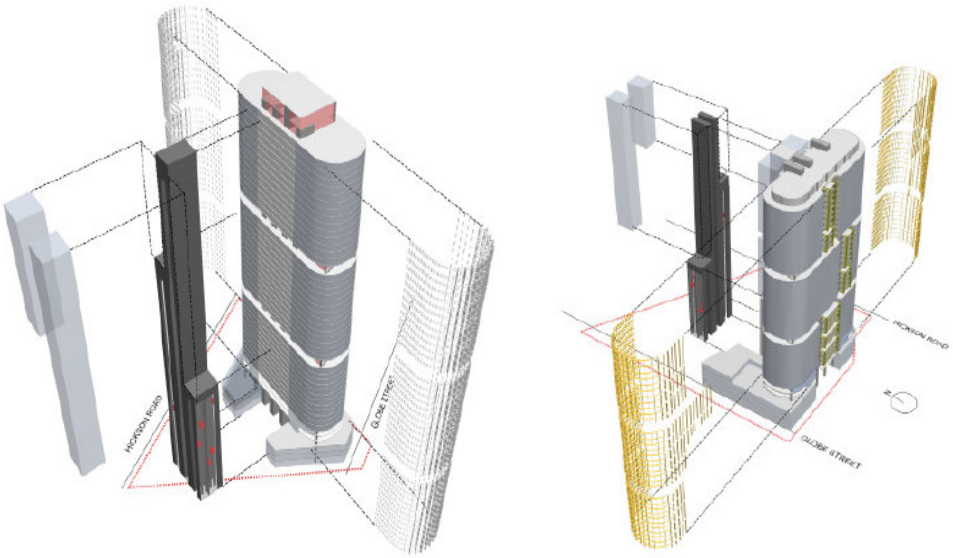
- articulation of the constituent elements of the building such as lift cores and horizontal and vertical circulation spaces within the podia and towers
- articulation of the building function and massing with appropriate façade design and detail
- the maximum continuous length of the towers' southern elevation should not exceed 60m
- to ensure rain water that strikes the southern edge of C5 is collected and re-used on site
- the design of the buildings contribute to the 'carbon neutral' aims for Barangaroo South.

Standards:

- the building envelope and floor plates are articulated and modulated using a range of architectural components such as prows, corner redents, vertical villages, expressed lift cores, bay windows and other structural expression
- the tower forms express the primary components and sustainability features of the buildings such as access to natural light
- visible parts of the towers' primary structure are to be extended to the ground plane and expressed as a separate element from the podium
- depth and layering of facades is to be achieved through relief and protrusions. Mirrored facades should be avoided
- materials such as steel, glass, concrete timber and aluminium should be incorporated to provide longevity, durability and flexibility
- ESD measures are to be incorporated on all facades
- façade components such as external shading should be used to provide light and shade to the building
- facades longer than 60m are to be modulated above podium level by distinctive and significant architectural elements such as vertical villages, cores or external staircases
- there shall be no single plane in the façade having dimensions greater than 60m in length and 60m in height (or equivalent area) without articulation, and change in plane from adjoining building elements.

The department has assessed the applications against the objectives and standards of the Concept Plan and has concluded that:

- commercial buildings C3 and C5 are appropriately designed and incorporate horizontal and vertical articulation in the form of vertical villages, redents, expressed lift cores and structural bracing to reduce the perceived bulk and scale of the building (see **Figure 13**)
- the commercial and retail uses are reflected in the design of the tower and podium facades
- the façade includes fine grain detail such as the use of louvers, vertical villages and planting to add depth to the building and provide human scale
- material selection has been based on longevity, and includes steel, glass and concrete
- both buildings propose to re-use all rainwater collected on site, in particular commercial building C5 incorporates a 6m wide glass 'skirt' at podium level to collect rain water that strikes the southern façade of the building
- the design of the buildings express the carbon neutral aims for Barangaroo via the inclusion of vertical shading devices, water capture devices and photovoltaic cells on the roof top
- visible parts of the tower structure, such as the lift core and vertical villages have been incorporated in the podium designs for C3 and C5, and extended to the ground plane
- there are no single planes in the facades which are greater than 60m in length or height without articulation (see **Figures 14** and **15**).



C3 Building Components C5 Building Components

Figure 13: Breakdown of the Buildings Constituent Elements Demonstrating Articulation and Legibility within the C3 and C5 Facades

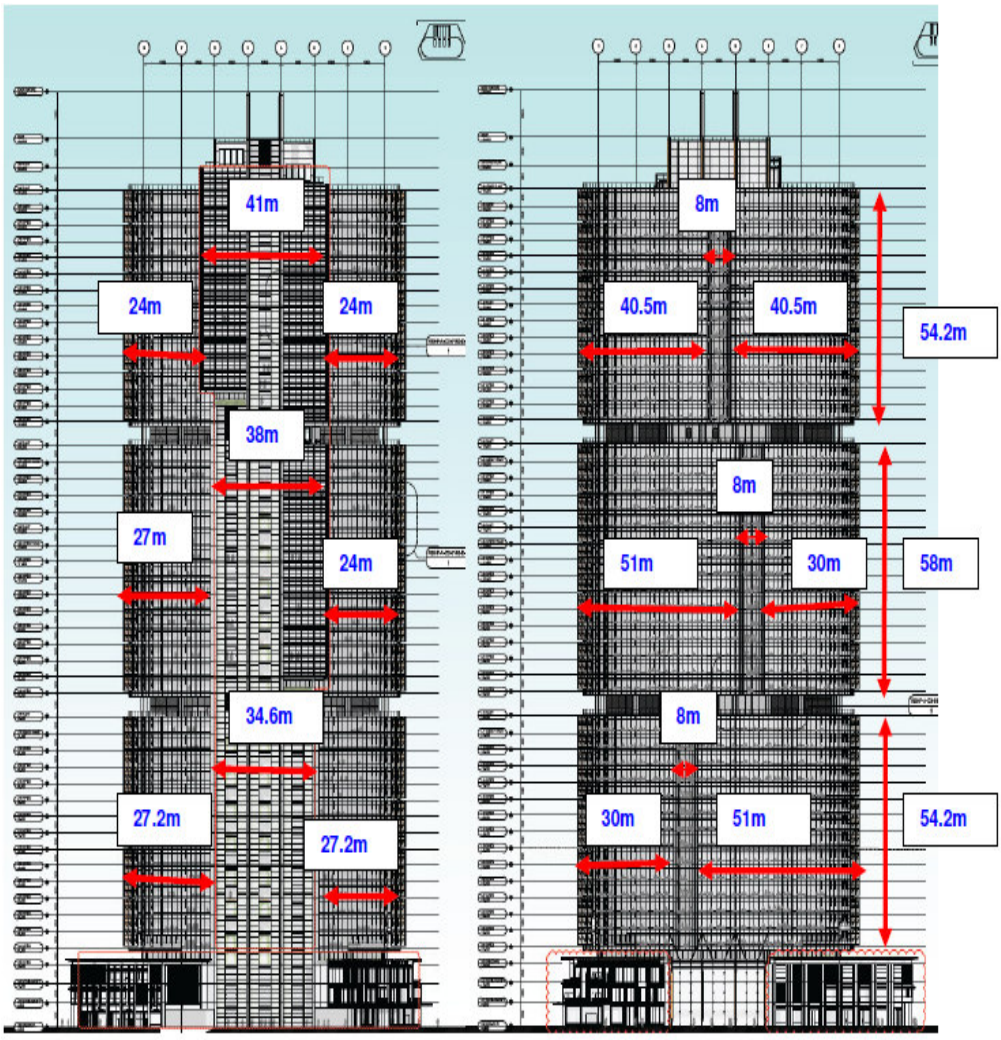


Figure 14: Diagram Demonstrating Commercial Building C3's Compliance with the 60m Vertical and Horizontal Articulation Control

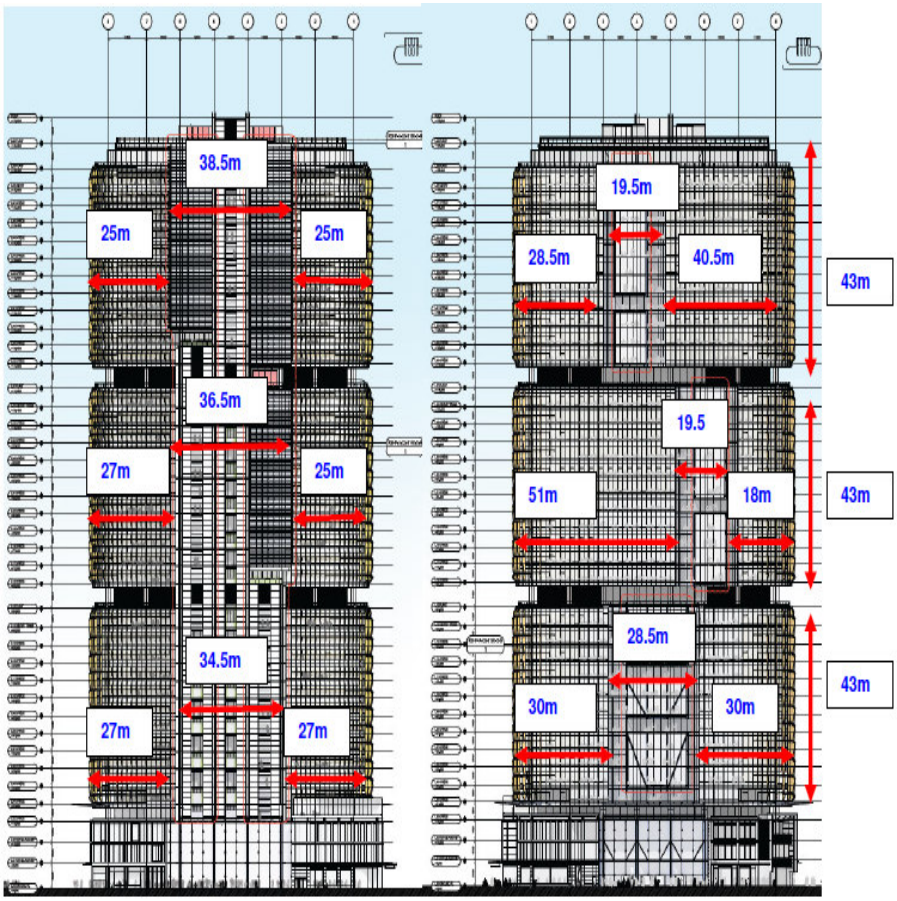


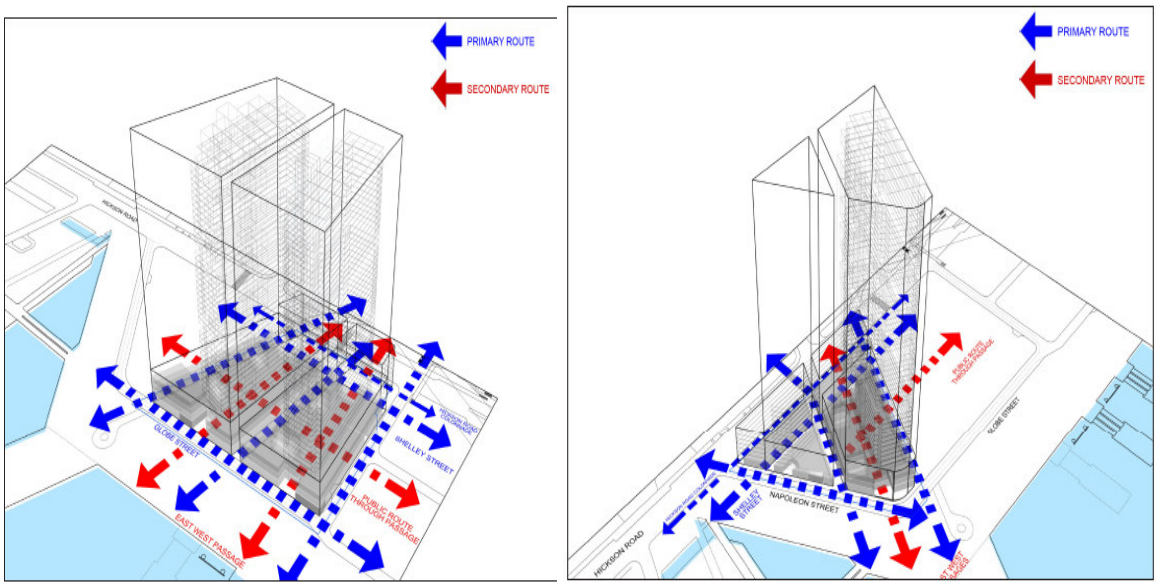
Figure 15: Diagram Demonstrating Commercial Building C5's Compliance with the 60m Vertical and Horizontal Articulation Control

5.3.4 Ground Floor Permeability and Accessibility of the Public Realm

The Urban Design Controls seek to ensure that a permeable pedestrian network is provided through Barangaroo South that correlates with pedestrian desire lines. In addition, the objectives for blocks 2 and 3 seek to provide a permeable and accessible pedestrian network through Barangaroo South that maximises safety within the public realm. Compliance with the objectives and standards for ground floor permeability and accessibility are summarised in **Table 3**, and the requisite pedestrian connections are depicted in **Figure 16**. In addition, the connections that will be created as a result of the construction of C3, C4 and C5 are depicted in **Figure 17**.

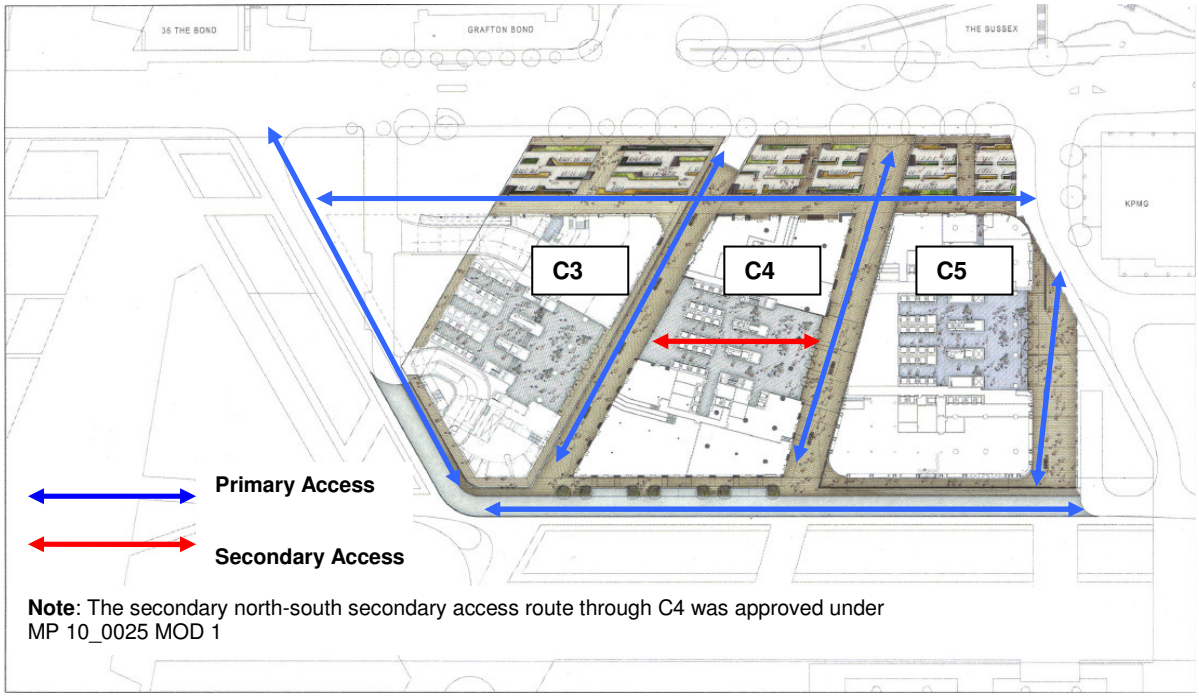
Table 3: Compliance with the Performance Standards for Ground Floor Permeability and Accessibility

Block 2	Required	Proposed	Compliance
Primary Access	• two north-south connections • one east-west connection.	• two north-south connections • one east-west connection.	• Yes • Yes
Secondary Access	• one north-south connection • two east-west connections.	• one north-south connection.	• Yes • No
Block 3			
Primary Access	• two north-south connections • two east-west connections.	• two north-south connections • two east-west connections.	• Yes • Yes
Secondary Access	• one north-south connection • one east-west connection.	• nil • nil.	• No • No
TOTAL PRIMARY CONNECTIONS WITHIN BLOCKS 2 AND 3	• four north-south connections and three east-west connections across blocks 2 and 3.	• four north-south connections and three east-west connections across blocks 2 and 3.	• Yes
TOTAL SECONDARY CONNECTIONS WITHIN BLOCKS 2 AND 3	• two north-south connections and three east-west connections through blocks 2 and 3.	• one north-south secondary connection through Block 2.	• No



Block 2 Block 3

Figure 16: Primary and Secondary Pedestrian Routes through Blocks 2 and 3



Note: The secondary north-south secondary access route through C4 was approved under MP 10_0025 MOD 1

Figure 17: Proposed Pedestrian Access Arrangements

The department notes that the project applications seek to delete the secondary north-south and east-west pedestrian connections through blocks 2 and 3. The proponent has advised that it considers the deletion of these connections appropriate given that:

- The Urban Design Controls were prepared at a time when the designs for the three commercial towers were based on an early scheme, associated with the original bid that located the lobby entrances on the eastern and western elevations of towers.
- As a result of design refinements and negotiations/agreements with the BDA and their design advisors, the lobby entrances were re-oriented north-south. There are a number of key principles that have underpinned this change and support its implementation as a superior overall result. These include:
  - If the original scheme was implemented, the lobbies would be too distant from Hickson Road and Globe Street to ensure activation of the public domain. As such, maintenance of an east-west orientation would require significant widening of the lobby entrances in order to respond to this

issue. This would in turn result in a significant loss in retail potential for the east and west ground planes at Hickson Road and Globe Street

- the north-south orientation provides an advantage of bringing the occupants of the towers into the heart of the development. Tower occupants are drawn along Hickson Road and Globe Street and then through the east-west civic streets, with the positive implication being a much greater activation of City Walk, Union Walk and Margaret Street West, whilst also maintaining significant pedestrian movement along Globe Street and Hickson Road. While a significant improvement for the activation of east-west streets, the current proposal also maintains a strong north-south pedestrian network and provides a better result overall
- the podium dimensions range from approximately 40m on their eastern edge to approximately 70m on their western edge. This existing level of east-west permeability is considered to be more than satisfactory insofar as the proposed configuration would provide significantly greater permeability than a typical Sydney block. In this regard, an additional east-west connection between buildings is not considered necessary as the additional utility value provided would be negligible
- the bulk of development on the Barangaroo site, and the worker population, is oriented north-south in the three commercial towers. Given the widest dimension on the site is between Globe Street and Hickson Road, the proposal to locate lobbies and their entrances in a north-south configuration provides opportunities for mid-block connectivity and greater pedestrian accessibility
- in addition, the north-south orientation provides greater public domain "spill out space" for the commercial towers, thereby providing greater activation of the public domain.

The department notes that the Urban Design Controls were drafted to provide a tool for achieving design excellence in a CBD location, and strict adherence to the controls, objectives and standards is not required. Given that strict adherence to the performance standards for ground floor permeability and accessibility would compromise compliance with other controls, such as ground level activation, the department accepts that on balance, the proposed buildings have been designed to provide the most appropriate design outcome without undermining pedestrian accessibility through the site.

Furthermore, the department notes that Lend Lease intends to lodge a future modification to the Concept Plan to amend the pedestrian connections, which will be consistent with the connections proposed under the C3, C4 and C5 project applications.

5.3.5 Public Domain and Ground Level Activation

Built Form Principle 6 of the Urban Design Controls, which is applicable to all development within Barangaroo South, seeks to ensure that:

- hollow blocks with open space, courtyards, walkways and gardens are created
- podium roofs interrelate with the ground plane and intermediate levels
- a fine grain structure of laneways and streets permeate the development blocks
- open space is provided at podium level between the tower forms.

In addition, the Urban Design Controls for blocks 2 and 3 seek to ensure that a vibrant public domain is created at street level. In order to achieve this, the standards require new development to:

- ensure a minimum of 60 per cent of the ground level is active on the primary street wall facades (this excludes lobby areas and service areas)
- building service areas and loading docks are not located on Hickson Road or Globe Street
- the width of driveway areas is minimised.

The project applications seek approval to undertake temporary works within the public domain. In addition, the applications seek to provide landscape works in the form of external planter beds on the northern façades of C3 and C5, and at podium level. It is intended that all temporary works will be removed and replaced once the Barangaroo Public Domain Plan is finalised by the BDA. It is anticipated that the proponent will lodge a separate application to install the permanent public domain works at a later date. **Table 4** below outlines the extent of public domain works as outlined in the PPRs.

Table 4: Summary of Proposed Public Domain Works

Building	Temporary Works
Commercial Building C3	• creation of a temporary forecourt and landscaping (installation of paving, trees, bicycle racks, planter boxes, bench seating and lighting) along the Hickson Road frontage of the site • surfacing of the surrounding streets and laneways, including a portion of Globe Street and City Walk, and installation of temporary lighting and planting • installation of hoardings.

Commercial Building C5	• creation of a temporary forecourt and landscaping (installation of paving, trees, bicycle racks, planter boxes, bench seating and lighting) along the Hickson Road frontage of the site • surfacing of the surrounding streets and laneways, including a portion of Globe Street and the future Margaret Street West, and installation of temporary lighting and planting • installation of hoardings.

The department is satisfied that the temporary public domain works will provide a network of fine grain laneways and streets within blocks 2 and 3. In addition, the department is satisfied that the temporary works will integrate with the podium and tower forms, and will provide a high quality and well designed space for building occupants and visitors to recreate within. In terms of ground level activation, the department is satisfied that the podium levels have been designed to accommodate active uses along a minimum of 60 per cent of the perimeter of the site to provide vibrancy and passive surveillance of the public domain. The department has recommended conditions of approval to ensure that the temporary public domain works are constructed prior to the issue of an Occupation Certificate for each building.

5.4 Amenity

5.4.1 Visual impacts

The EAs include visual impact assessments prepared by Virtual Ideas to quantify the impacts of the proposed development within the public domain and at private residences along Hickson Road. The assessments were prepared in accordance with the methodology endorsed under the Concept Plan (as modified). Key vantage points are identified in **Figure 18**, and a summary of the proponent's assessment of the projects' impacts on views and vistas within the public domain and at private residences is provided in **Table 5**.

Figure 18: Key Vantage Points

Table 5: Summary of the Proponent's Visual Impact Assessment

View Point	Visual Impact
Hickson Road	Commercial buildings C3 and C5 will not affect views through the site from Hickson Road, which will be provided via Union Walk, City Walk, Margaret Street West and Napoleon Street. All views along Hickson Road through to the Darling Park development will be retained.
Kent Street	The commercial buildings sit at the southern end of the Barangaroo site and will not impact on westerly views to Balmain from residential apartments along Kent Street. Notwithstanding, there will be some change to the views to the south-west over Darling Harbour at some residences. These impacts are discussed in greater detail below.

Shelley Street and Lime Street	The commercial buildings will impact on some north facing views from existing buildings within the King Street Wharf precinct. Views east, west and south from King Street Wharf will be unaffected.
Pyrmont	Views from Pyrmont to Barangaroo vary depending on the viewer's location. Existing views are characterised by layers of development that fill out the western edge of the city silhouette. Views toward Millers Point, the High Street sandstone cutting, Observatory Hill and North Sydney also vary depending on viewer location. In general, views to Millers Point and Observatory Hill diminish as the viewer moves south through Pyrmont, where views are dominated by the views of the western edge of the city silhouette. Commercial buildings C3 and C5 will read as a new extension of the City's silhouette from a number of locations within Pyrmont.
East Balmain	Views from East Balmain are more distant views across the waters of Darling Harbour. The Kent Street commercial and residential towers act as a significant wall to the north western edge of the CBD, with few gaps discernable. The key view from East Balmain is to Observatory Hill and Millers Point. Commercial buildings C3 and C5 will appear taller than some existing CBD buildings from certain perspectives, and will make a contribution to the new silhouette to the western edge of the CBD. Neither building will affect key views to Observatory Hill or Millers Point.
Darling Harbour	Views from Darling Harbour vary greatly depending on the viewer's location. The CBD generally steps the foreshore with its topography when viewed from certain locations. Views may in part also be enjoyed through to the northern shore of Sydney Harbour and its silhouette and markers, such as North Sydney and Royal North Shore Hospital. Views of commercial buildings C3 and C5 will vary depending on the viewer location. When viewed from the south, commercial building C3 will be largely obstructed by the approved commercial building C4, however commercial building C5 would be prominent. Distant views towards North Sydney and the North Shore will remain, as will a high degree of sky views through and beyond the site.
Blues Point	The visual impact of commercial buildings C3 and C5 would be minimal as they will infill the western extent of the CBD. Furthermore, both buildings would not impact negatively upon any views to Millers Point, Walsh Bay or Observatory Hill.
Millers Point	At present, the best views and vistas enjoyed at Millers Point are those from Observatory Hill Park. The park's size and height allows for panoramic views to the south-west from Pyrmont and White Bay around to East Balmain, Goat Island, and to the northern shores of Sydney Harbour. Much of this view includes water views, particularly from White Bay and to the north. There are only minor glimpses to water in the vicinity of Pyrmont, where these views are dominated by the peninsula's new built form. Commercial buildings C3 and C5 will sit behind the existing high rise residential towers when viewed from Observatory Hill park and as such would not impact on significant water views or views to the south and west.
Kent Street Residences • 127 Kent Street (Highgate) • 155 Kent Street (Georgia) • 161 Kent Street (Stamford Marque) • 183 Kent Street (Stamford on Kent) • 187-219 Kent Street	<u>127 Kent Street (Highgate)</u> • the development will be visible from apartments on all levels of the building with a west facing elevation. • commercial Buildings C3 and C5 will affect existing oblique views to the south-west over Darling Harbour and Pyrmont. Due to the distance and oblique angle of the development from the Highgate, the impact of the development on these views is limited. • existing views to the north, south, west and east will be unaffected by any of the three commercial buildings. Specifically, the proposal will have no impact on the primary views available from the Highgate to the west, north-west and north over Sydney Harbour. <u>155 Kent Street (Georgia)</u> • the development will be visible from apartments on all levels of the building with a west facing elevation. • there are no apartments in the building with windows or balconies on the south facing elevation.

	• commercial buildings C3 and C5 will affect existing oblique views to the south-west over Darling Harbour and Pyrmont (noting that it is located behind proposed Commercial Building C3 and approved Commercial Building C4). • existing views to the north, south, west and east will be unaffected by any of the three commercial buildings. <u>161 Kent Street (Stamford Marque)</u> • the development will be visible from apartments on all levels of the building with a west facing elevation. • commercial buildings C3 and C5 will affect existing oblique views to the south west over Darling Harbour and Pyrmont. • existing views to the north, south, west and east will be unaffected by any of the three commercial buildings. <u>183 Kent Street (Stamford on Kent)</u> • as the closest of the four residential buildings, Stamford on Kent will be the most affected by the development of commercial buildings C3, C4 and C5. • the development will be visible from apartments on all levels of the building with a west facing elevation. • there are no apartments in the building with windows or balconies on the south facing elevation. • commercial buildings C3 and C5 will affect existing oblique views to the south west over Darling Harbour and Pyrmont. • existing views to the north, south, west and east will be unaffected by any of the three commercial buildings. <u>187-219 Kent Street</u> • The view impacts on other non-residential buildings on Kent Street such as 187-219 Kent Street have also been considered and have been determined to be comparable to the impacts identified for the buildings listed above.

The department has reviewed the proponent's visual impact assessments and is satisfied that the photomontages accurately depict the impact of the projects. In addition, the department considers that the assessments demonstrate that both buildings are located within the building envelopes depicted in the photomontages assessed under MOD 4 to the Concept Plan, and as such will not give rise to any additional impacts beyond those identified when MOD 4 was assessed. Given the above, the department is satisfied that the applications will not give rise to any unreasonable visual impacts within the public domain or at private residences.

5.4.2 Wind Impacts

A Wind Tunnel Study (WTS) prepared by ARUP was submitted with each EA. The WTS modelled the proposed buildings to assess wind impacts for pedestrians travelling within the vicinity of the site in both isolated conditions (C3 and C5 being constructed in isolation) and at full build out (all buildings within Barangaroo South being constructed). The assessment was undertaken in accordance with Lawson's criteria for comfort and safety.

The criteria identify four categories of pedestrian suitability including: sitting, standing, walking and business walking, which are based on comfort levels for pedestrians at the peak 3 second wind speed at specific test locations not being exceeded more that five per cent of the time. The criteria recognise that pedestrian comfort decreases as wind speeds increase from 4m per second (m/s) to 10m/s. In addition, wind conditions are considered 'uncomfortable' when they exceed 10 m/s. Lawson's comfort criteria are summarised in **Table 6** below. The department notes that Lawson's comfort criteria provide a conservative approach to wind assessment in comparison to the Council's *Central Sydney DCP 1996*, which permits wind speeds ranging between 10m/s to 16m/s.

Table 6: Lawson's Comfort Criteria

Comfort Criteria[1]	Pedestrian Suitability
< 4m/s	Pedestrians sitting for a long duration
4 – 6m/s	Pedestrians standing or sitting for a short period of time
6 – 8m/s	Pedestrians walking
8 -10m/s	Business walking or cycling
> 10m/s	Uncomfortable

Note[1]: Comfort is based on the maximum of the mean or gust equivalent mean wind speed being exceeded five per cent of the time.

In terms of safety, Lawson identifies two 'distress' criteria, which are based on peak wind speeds through a development. In this regard, it is recommended that the peak wind speed should not exceed 15m/s more than twice a year, or once per season in areas that are universally accessible. In addition, winds should not exceed 20m/s more than twice a year, or once per season where universal access is not provided.
Based on the criteria outlined above, the WTS' demonstrate that:

- C3 complies with the comfort criteria at 11 of the 13 test points during isolated conditions. Notwithstanding, all test points comply with the comfort criteria at full build out
- C3 complies with the 15m/s and 20m/s 'distress' criteria at 10 of 13 test points during isolated conditions, and 12 of 13 test points at full build out. Notwithstanding, test points 7, 8 and 13 would only pass the 20m/s 'distress criterion' in isolated conditions, and test points 7, 8, 14 and 15 would only pass the 20m/s 'distress criterion' at full build out
- C5 complies with the comfort criterion at all test locations in isolated conditions and at full build out
- C5 complies with the 15m/s and 20m/s 'distress' criteria at 13 of the 14 test locations isolated conditions, however full compliance is achieved at full build out. Notwithstanding, test points 8 to 10, 15, 16, 19 and 20 only comply with the 20m/s 'distress criterion' in isolated conditions. This will marginally improve at full build out, with test points 12, 16 and 12 only passing the 20m/s 'distress criterion' at full build out
- in addition, exceedences of the 15m/s 'distress criterion' in the majority of instances are marginal, with exceedences of between 0.4m/s and 3.9m/s occurring 0.022 per cent of the time.

Despite the minor non-compliances identified in the WTS, ARUP concluded that subject to the installation of landscaping (plantings), awning extensions and vertical screens within the C3 and C5 project areas, the applications would able to comply with Lawson's comfort and distress criteria at all locations, both in isolated conditions and at full build out.

The department notes that both the Council and TNSW raised concerns in relation to the exceedences identified in the WTS, in particular the Council requested that the proponent increase the height of the C3 and C5 podiums (from 3 to 4-storeys), and decrease the height of the C5 tower by five storeys to ensure the applications would not create any adverse wind conditions for pedestrians. Furthermore, TNSW requested that the proponent install suitable mitigation measures to ensure that the projects will not generate wind speeds in excess of 15m/s to ensure that persons with a disability can access the site via the Wynyard Walk Bridge.

The department has reviewed the comments provided by the Council and TNSW and has concluded that:

- whilst the applications would exceed the Lawson comfort criteria at a number of test points, the applications would still comply with the Council's 13m/s criterion for comfort along major pedestrian streets, parks and public places during isolated conditions and at full build out. Notwithstanding, the proponent has committed to installing temporary and/or permanent wind mitigation measures to ensure that the applications will comply with the Lawson comfort criteria
- whilst commercial building C5 will exceed the 15m/s safety criteria at test point 12, adjacent to the Wynyard Walk Bridge in both isolated conditions and at full build out, the proponent has committed to installing temporary and/or permanent wind mitigation measures to ensure that the applications will comply with Lawson's 15m/s safety criterion at all test locations. This will ensure that the pedestrian wind environment would be suitable for persons with a disability.

In order to ensure that no adverse wind impacts will be created, and the temporary and permanent wind mitigation structures will not create an undesirable urban design outcome, the department has recommended the imposition of conditions requiring the proponent to:

- design the temporary wind mitigation structures in consultation with the Council and TNSW, and to the satisfaction of the Director-General, prior to the issue of a Construction Certificate
- undertake post-construction wind testing to ensure an appropriate environment provided for pedestrians in isolated conditions and at full build out.

The department is satisfied that subject to the imposition of the abovementioned conditions, the applications will not result in any adverse wind impacts for pedestrians accessing the site.

5.4.3 Reflectivity

Reflectivity studies were provided for both project applications. The studies were undertaken in accordance with the Hassall methodology, which is considered the current best practice industry standard in the absence of an applicable Australian Standard. Observer viewing points for both buildings are depicted in **Figure 19** overleaf.

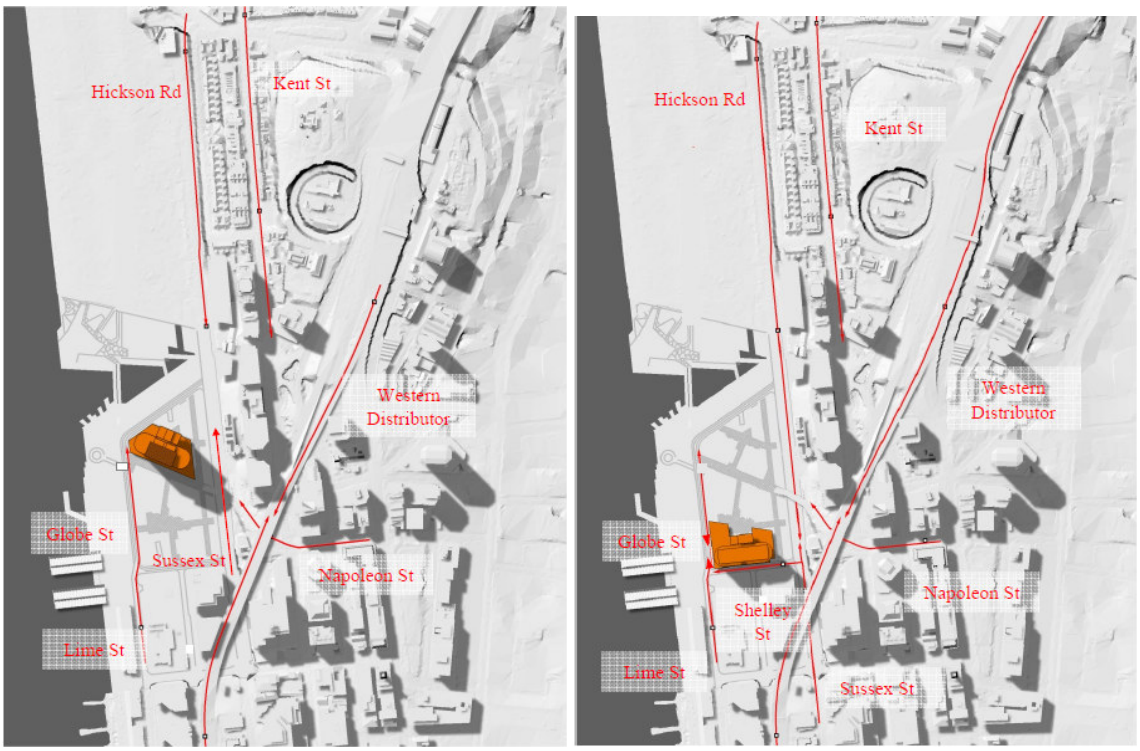


Figure 19: Observer Viewing Points

The studies modelled solar reflections in a 3D environment to determine the projects' potential to generate 'disability' glare for drivers and 'discomfort' glare for pedestrians and occupants of surrounding buildings. It is important to note that, 'glare' is measured by determining the extent of veiling luminance, which is expressed in candela per metre square (Cd/m^2). When veiling luminance exceeds $500Cd/m^2$ it has the potential to cause 'disability glare' and may impact on the ability of an observer to perform visual tasks without taking evasive action. Where luminance exceeds $500Cd/m^2$ within a roadway, it is important to assess whether solar reflections will cause disability glare, given its potential to cause road accidents.

The department has reviewed the proponent's reflectivity study and notes that:

- the applications would not result in any unacceptable glare impacts at surrounding receivers
- the applications would not result in any unacceptable glare impacts for pedestrians using the roadways
- commercial building C3 would exceed the 'disability glare' criterion at 2 of the 7 test locations within public roadways, and commercial building C5 would exceed the 'disability glare' criterion at 5 of the 8 test locations within public roadways.

A full assessment of the potential reflectivity impacts outlined in the proponent's Reflectivity Study is provided at **Appendix E**.

In terms of the test points where the 'disability glare' is exceeded, the department considers that the impacts of these exceedences would be acceptable on the basis that:

- reflections would only occur for short durations of up to a maximum of one hour
- reflections would either occur at angles that would not affect drivers, or would be mitigated with the installation of the sunshades and spandrel cladding on the building facades.

The department notes that Finance and Services NSW was concerned that the reflectivity reports did not identify the potential impacts of the projects on properties along High Street, Millers Point. The PPRs included revisions to these studies which clarified that the extent of the potential reflectivity impacts on these properties, and concluded that reflections would be unlikely to penetrate into the living areas of these properties. Finance and Services NSW has reviewed the supplementary information provided in the PPRs and has advised that this information addresses their concerns.

In summary, the department is satisfied that the projects would not result in any unacceptable glare impacts for drivers, pedestrians or the occupants of the surrounding buildings. Notwithstanding, as the results of the studies were premised on the reflectivity of the glazing not exceeding 20 per cent, the department has recommended the imposition of a condition limiting the reflectivity of materials used on both buildings to 20 per cent.

5.4.4 Overshadowing

Shadow analysis diagrams were provided in both EAs to depict the extent of overshadowing as a result of the construction of commercial buildings C3, C4 and C5. These diagrams have been prepared in accordance with the methodology approved under the Concept Plan. An analysis of the overshadowing impacts of the projects at winter solstice (21 June) is provided below.

21 June

The shadow analysis indicates that some additional shadowing would occur on Sydney Wharf (between Barangaroo and Darling Island) between 8am and 10am (see **Figure 20**). The section of the wharf affected by the additional shadowing accommodates the Australian Maritime Museum and some residential uses.

By 10am, the shadows would recede into Darling Harbour, and by 12 noon the residential buildings, the waters of Darling Harbour, and the future waterfront promenade would not be impacted by shadows. Furthermore, the revised shadow diagrams demonstrate that between 12 noon and 2pm a significant amount of direct sunlight would be available to the waters of Darling Harbour, the foreshore promenade and public open space within the Barangaroo Concept Plan area (see **Figure 20**).

The impacts of shadows in the afternoon hours (between 12pm and 5pm) are predominantly confined to commercial buildings to the south, and the western distributor to the east.

Figure 20: Shadow Impacts 21 June between 9am and 3pm

The department considers that the additional overshadowing impacts are acceptable given that:

- the shadows cast by the proposed buildings would be less than shadowing approved for blocks 2 and 3 under the Concept Plan (as modified)
- the Waterfront Promenade and public domain areas are capable of receiving adequate sunlight during the day
- there would be no additional overshadowing after 10am at residential properties during mid-winter. This would ensure these properties would maintain a minimum of three hours solar access between 9am and 3pm as recommended under the Residential Flat Code.

5.4.5 Operational Noise

The EAs include acoustic studies prepared by Wilkinson and Murray, which consider the cumulative impacts of the projects against the noise management criteria outlined in the OEH's *Industrial Noise Policy* and the *Environmental Criteria for Road Traffic Noise*. The assessments identify 15 residential and commercial premises that have the potential to be affected by operational noise. Noise monitoring locations used to undertake the assessment are depicted in **Figure 21** below. A full assessment of the operational noise impacts is provided below.

Figure 21: Noise Monitoring Locations

Operational Noise

The cumulative assessment predicts that there would be no exceedences of the site specific noise criteria during the day, evening or night time periods. **Table 7** below summarises compliance with the relevant noise management criteria of the *Industrial Noise Policy*.

Table 7: Operational Noise Levels from all Mechanical Plant

Site	Calculated L_{Aeq} (dBA) and [criterion]			Compliance
	Daytime 7-6pm	Evening 6-10pm	Night Time 10pm-7am	
38 Hickson Road, Millers Point	46 [58]	46 [50]	41 [45]	Yes
37 High Street, Millers Point	32 [52]	32 [49]	27 [45]	Yes
187 Kent Street, Millers Point	46 [58]	46 [50]	41 [45]	Yes
155-157 Kent Street, Millers Point	43 [58]	43 [50]	38 [45]	Yes
127-153 Kent Street, Millers Point	42 [58]	42 [50]	37 [45]	Yes
168-170 Kent Street, Millers Point	43 [58]	43 [50]	38 [45]	Yes
56 Merriman Street, Millers Point	29 [51]	29 [49]	24 [45]	Yes
21 Edward Street, Balmain East	29 [54]	29 [45]	24 [40]	Yes
Darling Island Apartments, Pyrmont	35 [52]	35 [49]	30 [44]	Yes
Sydney Wharf Apartments, Pyrmont	38 [52]	38 [49]	33 [44]	Yes
King Street Apartments, Sydney	41 [57]	41 [50]	36 [45]	Yes
The Sussex Hotel, 22-26 Sussex Street	49 [65]	49 [65]	44 [65]	Yes
The Bond, 30 Hickson Road	45 [65]	45 [65]	40 [N/A]	Yes
American Express, Shelley Street	45 [65]	45 [65]	40 [N/A]	Yes
Temporary Cruise Passenger Terminal	31 [65]	31 [65]	26 [65]	Yes

Road Noise

The noise impact assessments demonstrate that the applications would not result in an increase in noise beyond 2dBA as permitted under the *Environmental Criteria for Road Traffic Noise.* Given the above, the department is satisfied that the additional traffic generated by the applications would not result in any adverse noise impacts.

Overall, the department is satisfied that the operation of the proposed commercial buildings would not generate any adverse noise impacts. Notwithstanding, the department has recommended the imposition of conditions to ensure that all mechanical plant installed on site is consistent with the assumptions used to undertake the noise impact assessments.

5.5 Transport

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 per cent by public transport (63 per cent via rail and 20 per cent via bus), 12 per cent pedestrian/other, four per cent via car and one per cent via ferry.

The TMAP outlines a proposed road hierarchy for the Barangaroo precinct, 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.

In addition to the TMAP, the Government has established the Barangaroo Transport Taskforce, chaired by the Director-General, Transport for NSW and including representatives from the department, Council, Infrastructure NSW, the Department of Premier and Cabinet, the BDA and Lend Lease, to develop an Integrated Transport Plan (ITP) for Barangaroo. The department notes that the ITP will outline long and short-term transport requirements for Barangaroo. To date a draft plan has not been finalised for public consultation. The department expects that the TMAP will be revised once the ITP is finalised.

5.5.1 Traffic

A supplementary TMAP was appended to the C3 and C5 EAs. Based on the proposed GFA allocations, these buildings are forecast to generate 149 (C3) and 126 (C5) two-way vehicle movements in the am peak hour (8 – 9am) and 139 (C3) and 116 (C5) two-way movements in the pm peak hour (5 – 6pm).

When combined with the vehicle movements forecast for commercial building C4, it is estimated that 419 and 389 vehicle trips would occur within the Barangaroo South precinct in the am and pm peak hours respectively. These movements are summarised in **Table 8** below.

Table 8: Peak Hour Traffic Generation

Traffic and Parking generation for C5 building			**AM Peak Hour**				**PM Peak Hour**			
Trip purpose	Variable	Variable number	trip rate	no of trips	In	out	trip rate	no of trips	In	out
Commercial	car park space	142	0.26	37	30	7	0.26	37	7	30
Retail	car park space	11	0.4	5	4	1	0.4	5	1	4
Drop offs	private car			4	2	2		4	2	2
	taxi			40	20	20		40	20	20
Service vehicles				40	20	20		30	15	15
C5 Traffic Generation				**126**	**76**	**50**		**116**	**45**	**71**
C4 and C3 Traffic Generation				293	179	114		273	104	169
Total cumulative traffic generation C3 + C4 + C5				**419**	**255**	**164**		**389**	**149**	**240**

The supplementary TMAP examines in detail the current and future stage performance of the five nearest and most relevant intersections to the site. These include:

- Hickson Road and Globe Street (Priority Controlled - Temporary)
- Napoleon Street and Hickson Road (Priority Controlled - Existing, Traffic Signals - Future)
- Sussex Street and Shelley Street (Traffic Signals)
- Sussex Street and Erskine Street (Traffic Signals)
- Erskine Street and Shelley Street (Traffic Signals).

A comparison of existing and future intersection performance during the am and pm peak hours demonstrates that intersections within the vicinity of the site would experience minor increases in the degree of saturation and average daily per vehicle times following the full occupation of Buildings C3, C4 and C5, however this would be similar to existing conditions. In addition, no intersections would reach saturation. Predicted levels of service are outlined in **Table 9** below.

Table 9: Existing and Forecast Intersection Performance

Peak Hour	**Intersection**	**Existing 2011**			**Forecast C3 + C4 + C5**		
		LOS	**DOS**	**AVD (sec)**	**LOS**	**DOS**	**AVD (sec)**
AM	Hickson Road & Globe Street	N/A			A	0.61	14
	Hickson Road & Napoleon Street	A	0.65	3	B	0.60	16
	Sussex Street & Shelley Street	A	0.48	11	B	0.57	15
	Sussex Street & Erskine Street	B	0.71	21	B	0.89	25
	Erskine Street & Shelley Street	A	0.57	11	A	0.59	11
PM	Hickson Road & Globe Street	N/A			B	0.78	15
	Hickson Road & Napoleon Street	A	0.67	4	B	0.79	21
	Sussex Street & Shelley Street	A	0.32	8	A	0.43	13
	Sussex Street & Erskine Street	B	0.88	24	C	0.97	33
	Erskine Street & Shelley Street	A	0.25	12	A	0.29	12

The department has reviewed the revised TMAP and is satisfied that it accurately predicts the traffic impacts associated with the operation of commercial buildings C3 and C5. In addition, the department is satisfied that the traffic generated by the proposed developments can be accommodated within the existing road network.

5.5.2 Vehicular Access

Vehicular access to the site is proposed to be provided from Globe Street. Vehicular entrances to access the car parking areas for C3 and C5 are proposed to be constructed as part of the Bulk Excavation and Basement Car Park Project Application (MP 10_0023 MOD 3).

5.5.3 Car Parking

The applications seek approval to allocate 196 car parking spaces to commercial building C3 (comprising 178 commercial and 18 retail spaces), and 153 car parking spaces to commercial building C5 (comprising 142 commercial and 11 retail spaces) within the approved basement car park. To facilitate pick-up and drop-off, the developments will also utilise the on-street parking spaces on Globe Street that were approved under the C4 project approval (MP10_0025 MOD 1). Up to 36 shared loading dock spaces are also proposed to be provided within the basement car park.

The number of parking spaces has been determined having regard to the relevant parking rates approved under the Concept Plan (as modified), based on the GFA allocations for each building. Under the approved Concept Plan, it is recognised that the parking policy for Barangaroo should support public transport and non car (walk/cycle) travel. Low car parking provision is considered important because it will also act to limit potential traffic generation by the site's activity to a level which will not unduly compromise the operation of the CBD's existing road network.

Modification C4 of the Concept Plan (as amended) sets a maximum rate of 1 space per 600 m^2 of commercial GFA, with all other uses (except residential) required to comply with the car parking rates outlined in the Council's Local Environmental Plan (LEP). **Table 10** below demonstrates that both applications exceed the car parking maxima for commercial and 'other' uses.

Table 10: Compliance with the Concept Plan Car Parking Rates

Car Parking Requirements for Commercial Building C3			
Use	Parking Rate	Maximum Spaces Permitted	Spaces Proposed
Commercial Building C3 (105,488m² commercial GFA)	1 space/600m² (Concept Plan)	175.74	178
Commercial Building C3 (9,960m² 'other' uses[1])	As per 'other' uses in the Sydney LEP 2005	8.16	18
TOTAL		**183.9**	**196**
Car Parking Requirements for Commercial Building C5			
Use	Parking Rate	Maximum Spaces Permitted	Spaces Proposed
Commercial Building C5 (83,760m² commercial GFA)	1 space/600m² (Concept Plan)	139.6	142
Commercial Building C5 (6,779m² 'other' uses[1])	As per 'other' uses in the Sydney LEP 2005	7.93	11
TOTAL		**147.53**	**153**

Note[1]: The formula for calculating 'other uses' is as follows:
Maximum Number = Total 'Other' FSA/Total FSA within development x Site Area/50

The department notes that the non-compliances with the car parking maxima are a result of the proponent:

- not revising the car parking calculations to reflect the changes to the GFA proposed under the PPRs
- dividing the total FSA for 'other' uses proposed under the project applications by the total FSA approved under the Barangaroo Concept Plan, and then multiplying the area of all land included within the Barangaroo South divided by 50 to calculate the car parking requirements applicable to the individual buildings.

The department has recommended the imposition of a condition requiring the proponent to comply with the car parking maxima outlined in **Table 10** above, in order to ensure compliance with the car parking rates approved under the Concept Plan.

It is proposed that the basement car park will operate as a public car park in the evenings and on the weekends, for a wider range of users visiting the site. It is not anticipated that public use of the car park during these times will coincide with peak commuter traffic, and as such the surrounding road system is considered to provide adequate capacity. Notwithstanding, the department has excluded the use of basement car park as a public car park after standard office hours. The impact of using the basement car park as a public car park will be assessed under a separate application.

The department considers that subject to the imposition of a condition restricting the number of car parking spaces available for use by the future tenants of commercial buildings C3 and C5, the amount of car parking available will be reasonable given the site's proximity to good public transport services. It is noted that the Concept Plan (as modified) promotes public transport and non-car travel (e.g. walking, cycling, and ferry). Lower car parking provision is considered necessary to achieve a reduction in the reliance of car usage and encourage a shift to public transport and non-car use. It will also reduce any potential impacts associated with traffic generation to and around the site.

5.5.4 Bicycle Parking

The project application for commercial building C3 proposes the creation of 401 bicycle spaces, including 65 temporary spaces within the landscaped forecourt along the site's Hickson Road frontage, and 336 spaces within the basement car park.

In addition, the project application for commercial building C5 proposes the creation of 326 bicycle spaces, including 65 temporary spaces within the landscaped forecourt along the site's Hickson Road frontage, and 261 spaces within the basement car park.

End of trip facilities for both project applications are also proposed within the basement car park, however the application does not specify the rates at which these facilities will be provided.

Statement of Commitment 48 of the Concept Plan approval (as modified) specifies that bicycle parking facilities will be provided in accordance with the Council's requirements. In this regard, the *Central Sydney DCP 1996* specifies that bicycle parking should be provided at a rate of 1 space per 100 car parking spaces provided in the development. The department notes that since MOD 4 to the Concept Plan was approved, the Council has prepared the *Draft Sydney Development Control Plan 2010*, which seeks to increase bicycle parking rates across the City. **Table 11** below summarises the requirements for bicycle facilities as specified in the Central Sydney DCP and the Draft Sydney DCP.

Table 11: Comparison of the Central Sydney DCP and Draft Sydney DCP Bicycle Parking Requirements

Control	Number of Bays Required		Compliance
Central Sydney DCP	C3	C5	
1 bicycle parking space per 100 car parking spaces	1.83	1.47	Yes, 401 bicycle parking spaces proposed for C3 and 326 proposed for C5.
one readily accessible shower room within the building	1	1	Yes, a shower and change room is proposed within the basement car park.
Draft Sydney DCP Bicycle Parking Rates			
• 1 bicycle parking space per 150m^2 of commercial GFA for employees	702.98	558.4	No, 401 bicycle parking spaces proposed for C3 and 326 proposed for C5.
• 1 bicycle parking space per 400m^2 of commercial GFA for visitors	263.62	209.4	
• 1 per 25m^2 of publically accessible retail floor space for employees	280.84	212.6	
• 2 plus 1 per 1000m^2 of retail floor space over 1000m^2 GFA for visitors	8.21	6.31	
Total Bicycle Parking Spaces	**1255.65**	**986.71**	**As above.**
Draft Sydney DCP End of Trip Facility Rates[1]			
• 1 personal locker for each bicycle parking space	401	326	The applications do not specify the number of end of trip facilities provided for each building.
• 1 shower/change cubicle for up to 10 bicycle parking spaces	1	1	
• 2 shower/change cubicles for 11 to 20 bicycle parking spaces	2	2	
• Beyond 20 bays, 2 additional showers are provided per 20 bicycle parking spaces	38.10	30.6	

Note [1]: Based upon the bicycle parking spaces proposed under the PPRs

The department notes that the applications comply with the Council's current DCP requirements, however do not comply with the requirements of the Draft Sydney DCP. The department considers that the bicycle parking rates outlined in the Draft Sydney DCP should not be used to calculate bicycle parking requirements at Barangaroo, given that the TMAP prepared to support the Concept Plan (as amended), and the supplementary TMAPs prepared to support the EAs for commercial buildings C3 and C5 target the provision of bicycle parking spaces based on five per cent of workers accessing the site via bicycle.

Based on the use of the TMAP rates for bicycle parking (five per cent of employees, based on 1 employee per 20m^2 of GFA), commercial building C3 would generate the need for 288.62 bicycle parking spaces, and C5 would generate 226.34 spaces. The applications exceed these requirements with 401 bicycle parking spaces proposed for C3 and 326 proposed for C5.

Whilst the department does not support the use of the bicycle parking rates outlined in the Council's draft DCP as they do not correlate with the mode split targets and bicycle parking rates specified in the TMAP, the department notes that the TMAP does not specify the rate at which end of trip facilities should be provided for commercial or retail developments. In this regard, the department considers that the Draft Sydney DCP provides an appropriate ratio of end of trip facilities to bicycle parking spaces. As such the department has recommended the imposition of a condition requiring the proponent to provide end of trip facilities as per the rates specified in the Draft Sydney DCP.

The EAs specify that the temporary bicycle parking spaces within the Hickson Road forecourt will be relocated under a future application for the final public domain works. Further assessment of compliance with the bicycle parking standards outlined in the Concept Plan will be undertaken when this application is lodged in order to ensure there are sufficient facilities to service commercial buildings C3 and C5.

The department supports the provision of bicycle spaces as it will provide sustainable transport options for workers and visitors, and will assist in achieving a shift away from car usage. The department has recommended the imposition of conditions to ensure bicycle parking spaces and end of trip facilities are provided prior to the issue of an Occupation Certificate.

5.5.5 Travel Demand Management

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.

The Travel Demand Management Plans (TDMPs) submitted with the EAs provide a framework for developing Work Place Travel Plans (WPTP) that address travel demand and sustainable travel initiatives for commercial buildings C3 and C5.

The main objectives of the WPTPs are to reduce the need to travel, and promotion of sustainable means of transport. The more specific objectives include:

- high modal share for public transport, cycling and walking to work and residential journeys
- to ensure adequate facilities are provided at the site to enable staff and visitors to commute by sustainable transport modes
- to reduce the number of car journeys associated with business travel by staff and visitors
- to facilitate the sustainable and safe travel of new employees
- to reduce the need to travel for work-related activities, particularly air travel
- to raise awareness of sustainable transport amongst staff and visitors.

In order to meet the objectives and targets of the WPTPs, the following physical and management measures are recommended for implementation:

- general marketing and promotion
- reduce the need to travel
- spreading travel demand (through flexible working hours)
- cycling, walking, and use of public transport
- car/taxi share and shuttle bus service
- way finding
- staff induction
- visitor travel/site access information.

The site's proximity to public transport services, and the provision of a low car parking and a pedestrian and cycle friendly environment, will assist in meeting the objectives of the WPTPs. The proponent has committed to preparing WPTPs for C3 and C5 in its SOCs.

The department is satisfied that the use of SOCs to secure the implementation of WPTPs for the proposed commercial buildings is acceptable.

5.6 Environmentally Sensitive Design (ESD)

The SOCs approved under the Concept Plan (as modified) provide environmental performance targets for future project applications.

The ESD reports submitted with the EAs outline the sustainability targets proposed for commercial buildings C3 and C5. Both buildings have been designed to achieve a 6 Star Green Star Office Design Rating under Version 3 of the Green Building Council of Australia's Office Tools. It should be noted that 6 star buildings represent world leadership in sustainable building design and construction.

In order to achieve a 6 star rating, the following initiatives will be targeted:

- a high level of environmental management during construction phase
- exceeding the 80 per cent requirement for recycling of construction waste
- measures to achieve a high level of indoor environmental quality
- energy efficient facade, mechanical systems and building services
- cycling facilities including secure storage, change rooms showers and lockers
- allocation of 25 per cent of car parking spaces to be designed for small cars
- water efficient fixtures and fittings and rainwater capture and re-use
- utilise precinct non-potable recycled water where appropriate, and treatment of wastewater through the precinct blackwater treatment plant
- use of sustainable and recycled materials and minimising use of PVC
- emissions and pollution control measures.

The SOCs for both projects include requirements to ensure these targets are achieved.

The department is satisfied that the proposed development adequately incorporates the principles of ESD in accordance with the objects of the EP&A Act. The department has recommended the imposition of a condition requiring the proponent to certify that the buildings achieve a 6 star rating prior to the issue of the final Occupation Certificate.

5.7 Contamination and Remediation

The applications propose the removal of approximately 12,900m^3 of excavated material outside the envelope of the approved basement car park. The removal of this material is required to facilitate the construction of the C3 and C5 piles and core facilities.

Based on testing undertaken across the site, it is likely that there will be contaminated material in the area below the envelope of the basement car park. The proponent has prepared a Human Health and Ecological Risk Assessment (HHERA) and Remedial Action Plan (RAP) for blocks 1 to 3 which outline the remediation methodologies and site clean-up criteria. The HHERA was approved by the OEH on 11 July 2011, and the RAP was approved by the Minister for Planning and Infrastructure on 17 August 2011.

The EAs for both project applications include a letter from Graeme Nyland, the Site Auditor, dated 27 October 2011, which confirms that the approved HHERA and RAP can be relied upon to undertake the remediation works associated with commercial buildings C3 and C5.

The department is satisfied that the approved HHERA and RAP can be relied upon to ensure that the C3 and C5 project areas will be remediated in accordance with the requirements of SEPP 55. In order to ensure this occurs, the department has recommended the imposition of conditions requiring:

- all remediation works to be undertaken in accordance with the *Human Health and Ecological Risk Assessment, Declaration Site (Development Works) Remediation Works Area – Barangaroo*, as approved by the OEH on 11 July 2011, and the *Amended Remedial Action Plan, Barangaroo – ORWS Area*, as approved by the Minister for Planning and Infrastructure on 17 August 2011
- the proponent to submit a detailed site audit summary report, site audit statement and validation report to the EPA (OEH), the Director-General, the Certifying Authority, and the Council within six months of the completion of remedation works

- the site auditor to verify that any excavated material for use or disposal offsite, including but not limited to the Headland Park at Barangaroo, is managed appropriately and in compliance with the relevant legislation and any relevant approved materials management plans
- the proponent to notify the Council that remedation works have been completed, as per the requirements of clauses 17 and 18 of SEPP 55.

These conditions have been prepared in conjunction with the EPA, as per the recommendations of the Barangaroo Independent Remediation Review.

5.8 Stormwater and Water Management

Stormwater Management Plans have been prepared by for both buildings. The management plans propose the collection of all rainwater runoff from roof areas and awnings and the reticulation of captured water to a rainwater harvesting system for reuse or discharge within the development for non-potable uses.

Water sensitive urban design (WSUD) measures will be used to treat stormwater that is to be discharged into Sydney Harbour. The WSUD elements will be designed with regard to:

- selection of appropriate vegetation for swales and bio-retention areas where appropriate
- selection of appropriate filter media for bio-retention systems
- incorporating multiple drainage entry points to bio-retention systems to avoid concentration of flow where appropriate
- incorporating energy dissipaters at drainage outfalls where necessary
- selection and sizing of appropriate gross pollutant traps
- regular maintenance by authorities of all water quality measures to remove built-up sediment
- separation of construction drainage and operational drainage during phase delivery if appropriate
- adopting landscaped batter slopes appropriate to the soil type used.

The above measures have been incorporated into the SOCs (commitment 23).

The Environmental Construction and Site Management Plan identifies that the majority of stormwater controls required to manage stormwater quality during construction works will be provided as part of the construction works associated with the bulk excavation and basement car parking project application. Notwithstanding, the application proposes the following measures to supplement those provided under the bulk excavation and basement car parking project application:

- treatment of site runoff as per the City of Sydney Council and OEH's requirements
- installation of additional sediment fencing
- installation of silt arrestors
- placement of hay bales around and along catch drains and stormwater drainage pits.

In order to ensure stormwater management will occur in accordance with current best practice, the department has recommended a condition of approval requiring all soil erosion and sediment control measures to be designed in accordance with Landcom's *Managing Urban Stormwater – Soils & Construction Volume 1 (2004).*

Further, the department has recommended the imposition of a condition requiring the proponent to provide details of the proposed stormwater disposal and drainage infrastructure prior to the issue of the relevant Construction Certificate for the proposed buildings. This condition also requires certification from Sydney Water that post-construction stormwater management measures are satisfactory.

5.9 Construction Impacts

Environmental Construction and Site Management Plans (ECSMPs) have been prepared to address environmental issues associated with the construction of commercial buildings C3 and C5, including:

- site management
- construction methodology
- environmental management
- implementation of noise, vibration, air quality, stormwater management, waste and traffic management controls
- auditing and monitoring procedures.

The department notes that the ECSMPs for C3 and C5 are essentially an update of the ESCMP prepared to manage the environmental issues associated with the construction of the basement car park. These updates deal with the cumulative impacts of the simultaneous construction of the basement car park and commercial buildings C3, C4 and C5. Given the length of construction works at Barangaroo South, and the likelihood of several buildings being constructed simultaneously, the department supports this approach. Furthermore, the department also notes that all construction related environmental impacts are regulated under Environmental Protection Licence (EPL) No. 13336. The department has recommended the imposition of a condition requiring the proponent to comply with the requirements of EPL 13336 at all times.

The department has reviewed the ECSMPs in consultation with the EPA and other relevant government agencies, and is satisfied that it provides a suitable framework for managing the works associated with the construction of the proposed buildings. A discussion of the specific construction related impacts of the project, as well as mitigation and management measures to offset potential impacts is provided below.

5.9.1 Construction Noise and Vibration

The EAs were accompanied by Construction Noise and Vibration Assessments (CNVAs) prepared by Wilkinson Murray, which address the noise and vibration impacts of the projects both on and off-site. The CNVAs:

- establish site specific construction noise management levels and vibration criteria in accordance with OEH's *Interim Construction Noise Guidelines (ICNG) and Assessing Vibration: A Technical Guideline*
- identify noise sensitive commercial and residential receivers likely to be affected by noise and vibration from the proposed works
- predict the cumulative noise impacts associated with the construction of C3, C4, and C5
- recommend management/mitigation measures to ameliorate potential noise impacts associated with the construction of commercial buildings C3 and C5.

The site specific construction noise management levels are summarised in **Table 12** below. In addition, a Location Plan identifying potential noise sensitive receivers is provided at **Figure 22**. The department has reviewed these criteria in conjunction with OEH, and considers them acceptable for the purpose of assessing the impacts associated with the construction of commercial buildings C3 and C5.

Table 12: Site Specific Construction Noise Management Criteria

Location	Construction Noise Management Level, L_{Aeq} - dBA				Maximum Construction Noise Level, L_{Aeq} - dBA
	Day	Evening	Night	Saturday (extended)	
1 – Hickson Road Residences	63	58	54	55	75
3 – The Sussex Hotel	70	64	54	62	75
5 – High Street Residences	57	49	46	50	75
6 – Dawes Point Residences	56	49	45	51	75
7 – Balmain East Residences	59	50	45	51	75
8 – Darling Island Residences	57	49	44	55	75
All Commercial Properties	70				
Schools / Preschools	55*				
Parks / Outdoor Play Areas	65				

* The external noise goal of 55dBA is based on a 10dB reduction through an open window.

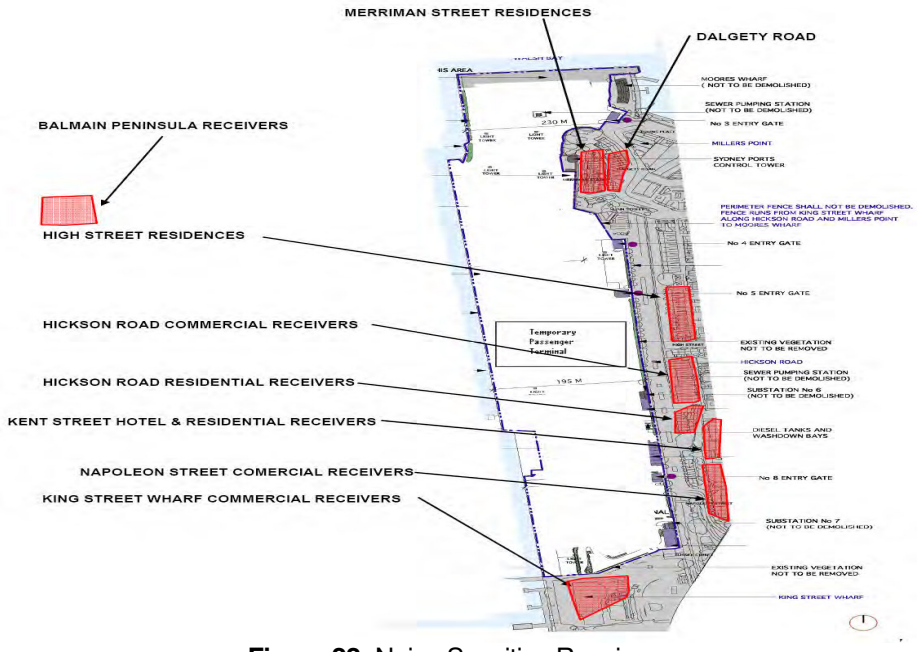


Figure 22: Noise Sensitive Receivers

Construction Noise

The proponent's assessment of the cumulative impacts of the construction of the proposed buildings against the accepted site specific construction noise and vibration criteria concluded that:

- during normal weekday operating hours there would be exceedences of up to 10dBA at residential receivers along Hickson Road
- on Saturdays exceedences of up to 15dBA would occur at residential receivers along Hickson Road, and lower magnitude exceedences are predicted at residences on High Street
- there would be no exceedences of the 70dBA noise limit for commercial premises
- internal noise levels of up to 48dBA are predicted for restaurants and cafes at the northern end of Lime and Shelley Streets
- external noise levels at nearby pre-schools would comply with the 65dBA noise criterion for active recreation levels, and no internal exceedences would occur
- noise levels at the temporary cruise ship passenger terminal would be up to 54dBA.

Tables 13 to **15** summarise the construction noise impacts.

Table 13: Cumulative Noise Levels at Residential Receivers

Location	Predicted Noise Day/Night dBA		Day			Evening			Night			Saturday (Extended)		
			Criteria dBA	Exceedance dBA	Compliance	Criteria dBA	Exceedance dBA	Compliance	Criteria dBA	Exceedance dBA	Compliance	Criteria dBA	Exceedance dBA	Compliance
						Scenario E								
1 – Hickson Road Residences	73	52	63	10	No	58	-	Yes	54	-	Yes	55	15	No
5 - High Street Residences	56	42	57	-	Yes	49	-	Yes	46	-	Yes	50	6	No
6 - Dawes Point Residences	52	37	56	-	Yes	49	-	Yes	45	-	Yes	51	-	Yes
7 - Balmain East Residences	52	36	59	-	Yes	50	-	Yes	45	-	Yes	51	-	Yes
8 - Darling Island Residences	57	37	57	-	Yes	49	-	Yes	44	-	Yes	55	-	Yes
9- Sydney Wharf Residences	58	38	57	1	Marginal	49	-	Yes	44	-	Yes	55	-	Yes

Table 14: Cumulative Noise Levels at Commercial Receivers

Location	Predicted Noise Day/Night dBA		Day			Evening			Night			Saturday (Extended)		
			Criteria dBA	Exceedance dBA	Compliance	Criteria dBA	Exceedance dBA	Compliance	Criteria dBA	Exceedance dBA	Compliance	Criteria dBA	Exceedance dBA	Compliance
Scenario E														
Lime Street, (King Street Wharf)	67	38	70	-	Yes	70	-	Yes	70	-	Yes	70	-	Yes
30 Hickson Road	64	49	70	-	Yes	70	-	Yes	70	-	Yes	70	-	Yes
Shelly Street	70	39	70	-	Yes	70	-	Yes	70	-	Yes	70	-	Yes
Temporary Cruise Terminal	59	48	70		Yes	70	-	Yes	70	-	Yes	70	-	Yes
Sussex Street	68	40	70				-	Yes	70	-	Yes	70	-	Yes

Note: Activities during the evening and night attributed to basement and carpark works only.

Table 15: Cumulative Noise Levels at Sensitive Noise Receivers

Location	Predicted Noise Day/ Night dBA	Day Playground			Day Internal Noise (Assuming 10dB façade reduction)		
		Criteria dBA	Exceedance dBA	Compliance	Criteria dBA	Exceedance dBA	Compliance
Scenario E							
Billabong Child Care Centre	64	65	-	Yes	55	-	Yes
KU Lance Preschool	56	65	-	Yes	55	-	Yes

Note: Premises unlikely to be used during the evening, and not at night..

The noise levels are consistent with the bulk excavation and basement car park construction noise assessment, whereby noise from Commercial Buildings C3, C4 and C5 construction works were not considered significant contributors to predicted exceedances. It is noted that all construction noise levels will be well below the maximum construction noise level of 75dBA.

Selection of noise control kits for some louder plant works would reduce these noise levels to some extent, and could potentially eliminate exceedances during normal working hours.

For Saturday operations where feasible, construction activities will be planned to ensure that the loudest activities occur during standard construction hours (Saturday morning). In addition, Wilkinson Murray recommend implementing respite periods during the use of equipment over defined periods which will be implemented through the Noise and Vibration Management Plan under the ECSMP.

In terms of the cumulative noise impacts associated with vehicles accessing the site during construction works, the CNVAs concluded that additional vehicle movements would not increase noise levels by more than 2dBA. Given the above, the applications comply with the noise goals outlined in the Government's *Road Noise Policy*.

Vibration Impacts

Construction, demolition and excavation activities have the potential to generate vibration at surrounding receivers. However, the department notes that the only works associated with the construction of commercial buildings C3 and C5 that would have the potential to generate vibration off site relate to the excavation and piling works required beyond the envelope of the approved basement car park.

The closest off-site receiver is located near the intersection of Hickson Road and Napoleon Street, which is setback approximately 50m from the boundary of the site. As this building is a commercial building, the applicable human comfort criterion for continuous vibration is 0.4mm/s PPV. As this building has an old brick and stone façade, the CNVAs have used the 3mm/s PPV criterion that is recommended under *German Standard DIN 4150 – 3 Structural Vibration Part 3 – Effects of Vibration on Structures,* to ensure the structural integrity of heritage buildings.

The CNVAs concluded that based on the proposed works, vibration levels at surrounding properties would not exceed 0.1mm/s, and are therefore well below the human comfort and structural integrity vibration criteria.

The department has reviewed the CNVAs in conjunction with OEH, and considers that the potential construction noise and vibration impacts of the projects are acceptable for the following reasons:

- the exceedences predicted at the Hickson Road residences are below the maximum construction noise goals recommended in OEH's *Interim Construction Noise Guideline* (maximum of 75dBA recommended, and 73dBA for cumulative impact of basement, C3, C4 and C5)

- all exceedences are based on a worst case construction scenario, which would only occur for a limited period
- any potential exceedences could be managed via the implementation of the noise mitigation measures recommended by Wilkinson Murray.

Notwithstanding, in order to manage the potential impacts of noise associated with the construction of commercial buildings C3 and C5, the department has recommended the imposition of a condition requiring the proponent to undertake all works in accordance with the approved CNVA and EPL 13336.

5.9.2 Air Quality

The EAs for commercial buildings C3 and C5 included Air Quality Impact Assessments (AQIAs) prepared by AECOM in accordance with OEH's guidelines, and accompanied the EA.

In terms of the air quality impacts associated with construction works, the AQIAs:

- identify potential pollutant emissions associated with the construction of commercial buildings C3 and C5
- assesses predicted pollutant concentrations against OEH's impact assessment criteria
- recommends air quality management and monitoring procedures.

In this regard, the AQIAs concluded that the main air quality impacts associated with the construction of C3 and C5 are:

- the use of diesel powered plant and equipment, which would predominantly result in the emission of nitrogen oxide (NO_2) and particulate matter (PM_{10})
- fugitive dust emissions from exposed surfaces and vehicles.

Although the projects are predicted to comply with the relevant air quality standards, AECOM has recommended a number of standard air quality control measures to minimise and manage the potential dust impacts associated with the construction of commercial buildings C3 and C5. In order to ensure these measures are implemented, the department has recommended the imposition of a condition requiring the proponent to undertake all construction work in accordance with the recommendations of the AQIAs and EPL 13336.

5.9.3 Waste Management

The waste management plans (WMPs) submitted with the EAs propose the following measures to manage construction waste:

- a greater than 90 per cent diversion of construction waste from landfill via the implementation of the project specific waste avoidance and reduction strategy
- all non-recyclable waste will be disposed of at a licensed landfill site.

The department has reviewed the proposed construction waste management measures and is satisfied that they would ensure the suitable disposal of construction waste. In addition, the department has recommended the imposition of conditions to ensure the handling and disposal of construction waste is managed appropriately. These conditions require the proponent to:

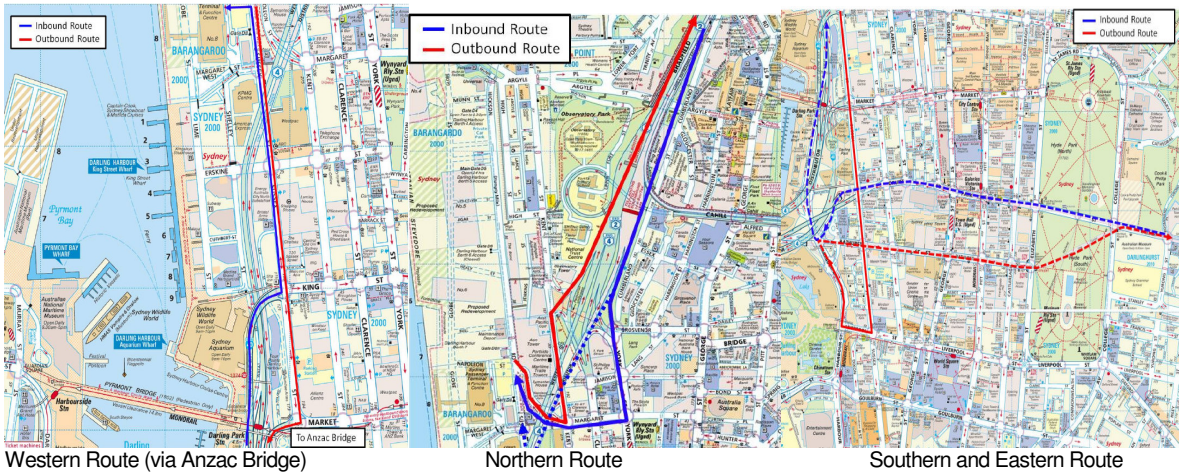
- undertake all waste disposal as per the recommendations of the WMPs
- ensure all waste material removed from the site is transported and disposed of in accordance with OEH's *Environmental Guidelines Part 1: Assessment, Classification and Management of Liquid and Non-Liquid Waste*
- ensure all waste is disposed of at a facility that is licensed to accept waste.

5.9.4 Construction Traffic Management

A Construction Traffic Management Plan (CTMP) was submitted with each EA, addressing the following:

- construction related truck and car traffic generation and its anticipated route to and from the site
- impacts of construction traffic on the existing road network including cumulative impacts of known construction activity in the precinct
- pedestrian safety along the site boundary and at the work site entry and exit points
- potential traffic conflicts with car, bus and other vehicles and pedestrian access for the temporary Cruise Passenger Terminal
- Hickson Road and Shelley Street pedestrian provisions during construction.

All site access for construction vehicles is expected to occur via the routes identified in **Figure 23** overleaf.



Western Route (via Anzac Bridge) Northern Route Southern and Eastern Route

Figure 23: Truck Access Routes

In terms of the proposed northern access route, the department notes that the Council raised concern over the impact construction vehicles may have on the efficient functioning of public transport routes along York Street in the morning and afternoon peaks. As is the case with the bulk excavation and basement car park project approval, a condition is recommended by the department restricting the use of York Street by construction traffic between 6am and 10am and 2pm and 8pm Monday to Friday.

The CTMPs provide an assessment of the cumulative impacts of constructing the bulk excavation and basement car park, Headland Park and the C3, C4 and C5 projects on the surrounding road network. The highest combined level of total morning peak hour car/ute and truck traffic movements generated by all the worksites will be a total of 335 vehicle movements per hour. This is comprised of:

- am peak (8am - 9am): 172 cars in, 50 cars out, 58 trucks in, 55 trucks out
- pm peak (5pm - 6pm): 50 cars in,172 cars out, 55 trucks in, 58 trucks out

Additionally, the CTMPs provide a comparison of the current performance of three key intersections within close proximity to Barangaroo against the performance of these intersections during the peak construction period. In this regard, the results of this comparison identify that whilst existing peak hour traffic conditions at some Sussex Street intersections are currently heavy, the proposed construction traffic would have minimal impact on the levels of service at these intersections.

The department has reviewed the intersection modelling in conjunction with Transport for NSW and is satisfied that additional traffic associated with construction of commercial buildings C3 and C5 would not have a significant impact on the performance of surrounding intersections.

The CTMPs also propose the following measures to maintain pedestrian access during construction works:

- maintenance of safe pedestrian access along the western side of Hickson Road
- provision of a pedestrian crossing at the intersection of Hickson Road and Napoleon Street
- provision of a minimum 6 metre wide pedestrian access route along the waterfront.

In summary, the department is satisfied that the CTMPs for both applications clearly identify the impacts of construction work on pedestrian safety and amenity and the performance of the surrounding road network. In addition, the department is satisfied that the CTMPs include appropriate measures to manage pedestrian amenity and safety and the performance of the road network. Notwithstanding, in order to ensure that these impacts are managed during construction works, the department has recommended the imposition of a condition requiring the proponent to undertake works in accordance with the recommendations of the CTMP.

5.10 Public interest

The proposals are deemed to be in the public interest as they will facilitate the future development of Barangaroo in accordance with the approved Barangaroo Concept Plan, which in turn will provide the following key public benefits:

- creation of approximately 1,120 construction jobs
- the provision of an additional 205,987m^2 of commercial/retail floor space which may accommodate up to 10,230 workers within close proximity to the CBD
- provision of new public domain providing new links between Barangaroo and the Sydney CBD.

Government agencies and the City of Sydney Council, have recommended a number of conditions in order to mitigate the environmental impacts of the proposed development and these have been incorporated into the approval, where appropriate.

As such, the department considers the site to be suitable for the proposed development and that the project applications are in the public interest. Consequently, the department recommends approval of the projects, subject to conditions.

6. CONCLUSION

The department has assessed the EAs and considered all submissions lodged as a result of exhibition. The key issues relating to the assessment of the proposed buildings include: compliance with the Barangaroo Concept Plan (as modified), built form and urban design, amenity, contamination and remediation, transport, ESD, stormwater and water management, construction management, and the public interest.

The department considers that the proposals comply with the building envelopes, GFA and height controls for the site approved under the MD SEPP and the Concept Plan (as modified), and will provide a high quality built form and public domain.

The department has reviewed the EAs and duly considered advice from public authorities as well as issues raised in public submissions in accordance with section 75I(2) of the EP&A Act. All key environmental issues associated with the proposal have been assessed, and appropriate conditions are recommended.

The developments are consistent with the strategic objectives for the area, the *Metropolitan Plan for Sydney 2036,* and the requirements of relevant planning instruments, policies and objectives.

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 TMAP for the site will be sufficient to absorb the travel demand created by the proposed developments.

The department is of the view that the recommended conditions and implementation of the measures detailed in the proponent's EAs, PPRs and SOCs adequately mitigate the environmental impacts of the proposal.

The department considers the site to be suitable for the proposed development and that the applications are in the public interest. Consequently, the department recommends approval of the projects, subject to the conditions outlined in the instruments of approval.

7. DELEGATIONS

On 18 April 2012, the Minister delegated his functions to determine project applications within the Barangaroo Concept Plan area to the Director-General if:

- the approval will be generally consistent with the Barangaroo Concept Plan (MP06_0162) current at the time of determination
- a political disclosure statement has not been made
- there are less than 25 public submissions in the nature of objection
- any submission made about the application by the Council of the City of Sydney has been considered in the assessment of the application.

The proponent's political disclosure statements confirm that it has not made a reportable political donation, and less that 25 public submissions of objection were received for both applications during the exhibition period. In addition, the projects as modified by the PPRs are consistent with the approved Concept Plan (as modified), and the department has considered the submissions made by the Council in response to the EAs, the PPRs and the draft conditions of approval. Where relevant, the department has included conditions to address the Council's concerns. As such, the applications can be determined under delegation by the Director-General.

8. RECOMMENDATIONS

Recommendations

That the Director-General:

a) **Consider** the findings and recommendations of this report
b) **Waive** the requirement to undertake a design competition for commercial buildings C3 and C5 in accordance with clause 19(4)(a) of State Environmental Planning Policy (Major Development) 2005 (MD SEPP) and Modification C2(7)(a) of the Barangaroo Concept Plan
c) **Approve** the project applications for commercial buildings C3 (MP11_0044) and C5 (MP10_0227), subject to conditions, under section 75J of the *Environmental Planning and Assessment Act, 1979*
d) **Sign** the attached Instruments of Approval (**Tags A** and **B**).

19/4/12

A/Director
Metropolitan and Regional Projects North

19/4/12

A/Executive Director
Major Projects Assessment

20/4/12

Deputy Director-General
Development Assessment & Systems Performance

APPENDIX A ENVIRONMENTAL ASSESSMENT

See the department's website at:
http://majorprojects.planning.nsw.gov.au

APPENDIX B SUBMISSIONS

See the department's website at:
http://majorprojects.planning.nsw.gov.au

APPENDIX C PROPONENT'S RESPONSE TO SUBMISSIONS

See the department's website at:
http://majorprojects.planning.nsw.gov.au

APPENDIX D CONSIDERATION OF ENVIRONMENTAL PLANNING INSTRUMENTS

1. State Environmental Planning Policy (Infrastructure) 2007

Clause 104 and Schedule 3 of the SEPP identify certain development as traffic generating, which includes commercial building C3 and C5, being commercial premises exceeding 10,000m^2 in area. Clause 104(2) and (3) require traffic generating developments to be referred to the RTA, now Roads and Maritime Services (RMS), before being determined, and that any submission from RMS is to be taken into consideration. The department referred the EAs for both projects to RMS in accordance with the requirements of clause 104 of the SEPP. No submissions were received from RMS.

Clause 104(3) also requires that the following matters are to be considered:

(ii) the accessibility of the site concerned, including:

(a) the efficiency of movement of people and freight to and from the site and the extent of multi-purpose trips, and

(b) the potential to minimise the need for travel by car and to maximise movement of freight in containers or bulk freight by rail, and

(iii) any potential traffic safety, road congestion or parking implications of the development.

The EAs for each project have been accompanied by transport management and accessibility plans and construction traffic management plans which appropriately address key access and traffic management issues.

The Barangaroo South development site is located at the western edge of the CBD, adjacent to existing commercial development, and can reply upon existing and proposed access and public transport services, including rail and ferry services. This will provide for the efficient movement of people to and from the site. The approved Barnagaroo Concept Plan has considered pedestrian links to the development site and the Government has committed to providing a pedestrian link, known as Wynyard Walk, from Wynyard station.

Parking spaces for each building are to be located within the combined basement area beneath the three commercial tower buildings – C3, C4 and C5. The number of spaces being provided is in accordance with the parking rates specified in the Barangaroo Concept Plan, as modified. This minimises parking spaces, thereby minimising car travel demands. In addition substantial bicycle parking facilities are to be provided for each building.

Traffic safety and road congestion issues in relation to the vehicular access to the development site have been considered with approval of the Barangaroo Concept Plan and with the separate project approval for the basement excavation and car park (MP10 _0023).

2. Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005

Barangaroo is located within the boundaries of the Sydney Harbour Catchment and as such is subject to the provisions of Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (Sydney Harbour REP). The Sydney Harbour REP aims to provide a clear and consistent planning framework to protect and enhance the unique attributes of the Harbour.

Within the Sydney Harbour REP, Barangaroo is identified as being within the 'Foreshores & Waterways Area' boundary. Part 3, Division 2 of the Sydney Harbour REP refers to matters which are to be taken into consideration by consent authorities before granting consent for development. Buildings C3 and C5 are generally consistent with the relevant provisions and matters for consideration set out in Clauses 20 to 27 of the Sydney Harbour REP, namely:

- biodiversity, ecology and environment protection
- public access to, and use of, foreshore and waterways
- maintenance of a working harbour
- interrelationship of waterway and foreshores and waterways
- foreshore and waterways scenic quality
- maintenance, protection, enhancement of views
- boat storage.

3. Sydney Harbour Foreshore and Waterways Area DCP

The Sydney Harbour Foreshore and Waterways Area Development Control Plan (the DCP) complements Sydney Harbour REP and provides more detailed design parameters for development within the foreshore area of Sydney Harbour. The proposals for C3 and C5 are generally consistent with this DCP with regard to:

- landscaping
- access to waterways
- the built form
- visual impacts.

APPENDIX E SUMMARY OF REFLECTIVITY IMPACTS

Viewing Location	Impact of Commercial Building C3	Impact of Commercial Building C5
Lime Street and Globe Street	• Veiling luminance would not exceed 500Cd/m^2 when travelling north along Lime/Globe Street. As such there would be no adverse reflectivity impacts at this location.	• Veiling luminance would not exceed 500Cd/m^2 when travelling north along Globe Street. As such there would be no adverse reflectivity impacts at this location. • Veiling luminance would exceed 500Cd/m^2 when travelling south along Globe Street between 4pm and 6pm all year round. These reflections would occur for durations of 3 minutes. As reflections would occur at visual inclinations higher than 7 degrees from the horizontal plane, reflections could be block by using the car's sun visor. As Globe Street is not a high speed road, and reflections would occur for brief periods, the use of sun visors to block reflections is considered safe in accordance with the Hassall methodology. • Given the above, the project would not result in any adverse reflectivity impacts along Lime or Globe Street.
Sussex Street and Hickson Road	• Veiling luminance would not exceed 500Cd/m^2 when travelling south on Hickson Road. • Veiling luminance would exceed 500 Cd/m^2 when travelling north along Sussex Street only at the very lowest edge of the podium façade below 2 degrees from the horizontal plane. Reflections at these inclinations are likely to be blocked by atmospheric conditions or existing buildings. As such, the project would not result in any adverse reflectivity impacts when travelling north along Sussex Street. • Given the above, the project would not result in any adverse reflectivity impacts along Sussex Street or Hickson Road.	• Veiling luminance would not exceed 500 Cd/m^2 when travelling north along Sussex Street. As such there would be no adverse reflectivity impacts at this location. • Veiling luminance would exceed 500Cd/m^2 when travelling south along Hickson Road near the Argyle overpass between 5am and 6am from October to February. These reflections would occur for durations of 2 minutes. As these reflections are produced by very narrow surfaces, and are partially blocked by fins on the building, these surfaces subtend a view angle smaller than the sun disk at distances greater than 160m from the façade. Beyond this, the maximum reflection intensity diminishes proportionally to the area of sun disk not reflected. Based on measured intensities, it is expected that reflections along the roadway would be well below the acceptable threshold. • Given the above, the project would not result in any adverse reflectivity impacts along Sussex Street or Hickson Road.
Margaret Street and Napoleon Street	• Veiling luminance would not exceed 500Cd/m^2 when travelling west along Margaret Street. As such there would be no adverse reflectivity impacts at this location. • Veiling luminance would exceed 500Cd/m^2 when travelling west along Napoleon Street directly beneath the Western Distributor overpass between 3pm and 4.30pm between April and October. These reflections would occur for up to 30 minutes. • These reflections are cast at a glancing level along the façade facets, and the sun would also be visible at the same time that reflections occur along Napoleon Street, however reflections may be visible when the sun is blocked from view. • Mitigating factors will include the low rise building planned along Sussex Street, and external shading devices on the façade. These will prevent excessive glare with assumed protrusions of 150mm minimum from the glass panel joints or alternative mitigation measures. • Given the above, the project would not result in any adverse reflectivity impacts along Napoleon Street, with proposed shading and with protruding mullions.	• Veiling luminance would not exceed 500Cd/m^2 when travelling west along Margaret Street. As such there would be no adverse reflectivity impacts at this location. • Veiling luminance would exceed 500Cd/m^2 when travelling south along a 90m portion of Napoleon Street between 6pm and 7pm from October to February. These reflections would occur for durations of up to 30 minutes. • These reflections are cast at a glancing level along the façade facets, and the sun would also be visible at the same time that reflections occur along Napoleon Street, such that the effect of the reflections would be negligible in comparison to the glare effects from the sun. • Given the above, the project would not result in any adverse reflectivity impacts along Margaret Street and Napoleon Street.

Kent Street	• Veiling luminance would not exceed 500Cd/m^2 when travelling south along Kent Street. As such there would be no adverse reflectivity impacts at this location.	• Veiling luminance would not exceed 500Cd/m^2 when travelling south along Kent Street. As such there would be no adverse reflectivity impacts at this location.
Western Distributor	• Veiling luminance would not exceed 500Cd/m^2 when travelling north along the Western Distributor. As such there would be no adverse reflectivity impacts at this location.	• Veiling luminance would not exceed 500Cd/m^2 when travelling north along the Western Distributor. As such there would be no adverse reflectivity impacts at this location.
Shelley Street	• There will be no direct views and therefore no reflectivity impacts at Shelly Street.	• Veiling luminance would exceed 500Cd/m^2 when travelling west along Shelley Street between 5pm and 6:30pm from August to April. These reflections would occur for durations of up to one hour. • The façade of the building would be parallel to drivers travelling west, and the sun would also be visible at the same angle from the view ahead. As such, the effect of the reflections is unlikely to increase the incidence of glare at this location.
Impact on Pedestrians	• Potential glare impacts for pedestrians moving along roadways are similar to those modelled for drivers. As pedestrians move at a significantly slower rate than vehicles, it would be safe for pedestrians to adjust their view in any location where reflections occur.	• Potential glare impacts for pedestrians moving along roadways are similar to those modelled for drivers. As pedestrians move at a significantly slower rate than vehicles, it would be safe for pedestrians to adjust their view in any location where reflections occur.
Impact on Surrounding Buildings	• Solar reflections from the façade will reach surrounding buildings both within and adjacent to the Barangaroo site. Reflections will occur for short intermittent periods during the morning when low angle sun is reflected off the faceted glazing on the eastern side of the building. In these instances, the effective reflectivity of glazing would be low due to the angle of incidence of sunlight from the east being close to normal. • In addition, late morning to afternoon reflections would be at a high vertical angle and would not travel far or penetrate deep into the floor plates of surrounding buildings. • Low angle evening sun could be reflected at glancing angles off the façade into the CBD area, however west facing facades would receive direct sunlight this time, therefore reflections from the proposed building are unlikely to cause any additional discomfort for building occupants. • Given the above, the proposed building is not considered to generate any adverse reflectivity impacts on surrounding buildings.	• Solar reflections from the façade will reach surrounding buildings both within and adjacent to the Barangaroo site. Reflections will occur for short intermittent periods during the morning when low angle sun is reflected off the faceted glazing on the eastern side of the building. In these instances the effective reflectivity of glazing would be low due to the angle of incidence of sunlight from the east being close to normal. • In addition, late morning to afternoon reflections would be at a high vertical angle and would not travel far or penetrate deep into the floor plates of surrounding buildings. • Low angle evening sun could be reflected at glancing angles off the façade into the CBD area, however west facing facades would receive direct sunlight this time, therefore reflections from the proposed building are unlikely to cause any additional discomfort for building occupants. • Given the above, the proposed building is not considered to generate any adverse reflectivity impacts at surrounding buildings.

APPENDIX F RECOMMENDED CONDITIONS OF APPROVAL