



15 November 2021

Department of Planning, Industry and Environment,
4 Parramatta Square, 12 Darcy Street
Parramatta NSW 2150 Australia

Dear Sir/Madam,

**Re: Residential Building R5, Barangaroo South – Section 4.55
Modification Application - Lift System & Performance Assessment**

Introduction

This report supports a modification application submitted to the Department of Planning, Infrastructure and Environment (DPIE) pursuant to section 4.55(1A) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to modify Development Consent SSD 6966 relating to Residential Building R5, Barangaroo South (the site).

Site Description

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

The Barangaroo site has been divided into three distinct redevelopment areas (from north to south) – the Headland Park, Barangaroo Central and Barangaroo South. The Residential Building R5 site is located within Barangaroo South. The site of this proposed modification application is located on land generally known and identified in the approved Concept Plan (as modified) as Block 4B, as shown in **Figure 1** below.

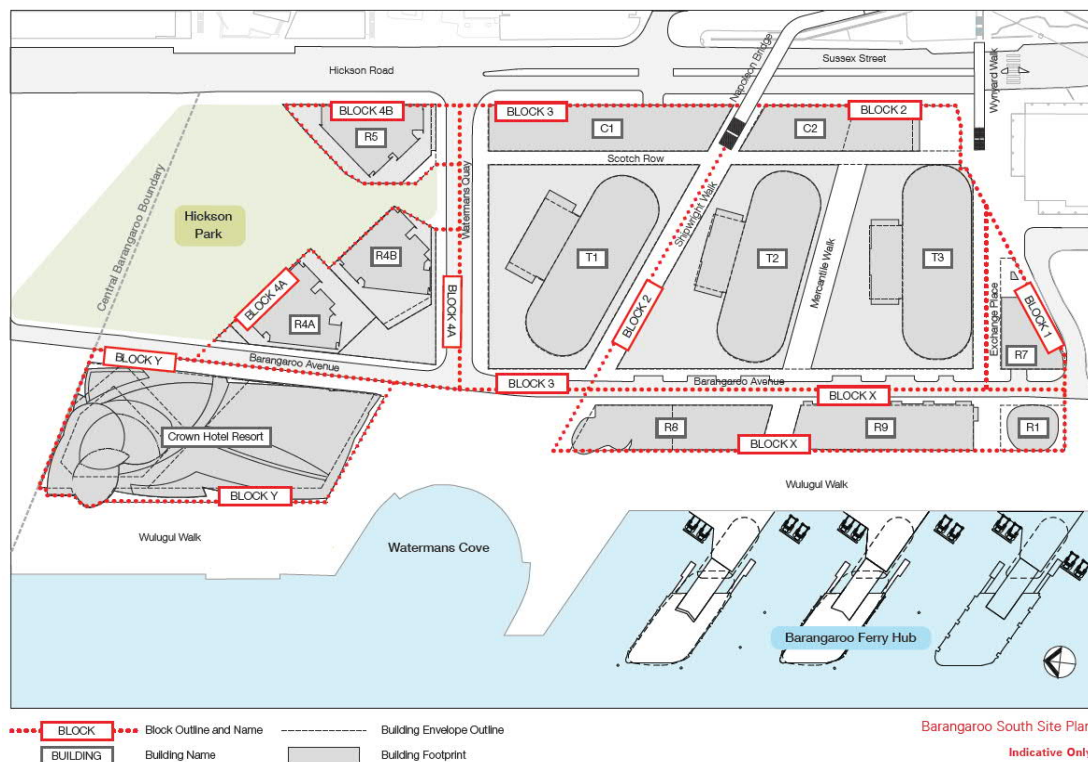


Figure 1 Block 4B in relation to Barangaroo South

Source: Lendlease

Background

Barangeroo South Concept Plan (as modified)

The approved Barangaroo South Concept Plan (MP06_0162) (as modified), includes approval for the following:

- A mixed use development involving a maximum of 602,354 sqm gross floor area (GFA), comprised of:
 - a maximum of 191,031 sqm of residential GFA of which a maximum of 162,031 sqm will be in Barangaroo South;
 - a maximum of 76,000 sqm of GFA for tourist uses of which a maximum of 59,000 sqm will be in Barangaroo South;
 - a maximum of 34,000sqm of GFA for retail uses of which a maximum of 30,000 sqm will be in Barangaroo South;
 - a maximum of 5,000 sqm of GFA for active uses in the Public Recreation zone of which 3,500 will be in Barangaroo South; and
 - a minimum of 12,000sqm GFA for community uses.
- 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 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.
- Alteration of the existing seawalls and creation of a partial new shoreline to the harbour.
- Construction, operation and maintenance of a concrete batching plant to supply concrete for construction of future development under this Concept Plan at Barangaroo South.
- No approval is granted or implied for the future use of a heliport and/or a helipad.

This modification seeks approval for minor design alterations resultant from ongoing detailed design development of the building. This modification will result in a building consistent with the Concept Plan (as modified).

Residential Building R5 - Development Consent SSD 6966

Development consent SSD 6966 was granted by the Independent Planning Commission of NSW (IPC) on 3 October 2019 for Residential Building R5, comprising a 30-storey mixed use building, with 210 residential units (including Key Worker Housing) and retail floor space at ground level. This included a total gross floor area (GFA) of 19,158 sqm, 18,287 sqm of which was approved for residential floor space, and the remaining 817sqm was approved for retail floorspace.

Consent was also provided for associated building public domain works, demolition of interim basement elements, fit-out and use of the basement and associated building identification signage zone.

SSD 6966 has been amended to incorporate design changes, alter the internal layout, alter apartment mix and numbers, modify the car parking distribution and other minor amendments to the overall design of the building throughout detailed design.

Overview of Proposed Modifications

This modification application seeks consent for physical amendments and internal layout changes to Building R5, as a result of ongoing design development. Broadly, the following amendments are sought as part of this modification application:

- Minor internal layout reconfiguration resulting from riser and kitchen changes, with resultant floor space redistribution.
- Reconfiguration of the rooftop layout, including location of building maintenance unit, PV cells and the lift motor room.
- Minor façade rationalisation.
- Minor changes to the landscaped terraces.
- Internal amendments to the retail tenancies including the addition of amenities and change in location of retail stairs and lift.

A further detailed description of the proposed modifications is contained in the supporting letter to the modification application prepared by Ethos Urban.



The *Apartment Design Guide* (July 2015) (ADG) sets the below objective regarding vertical transport performance: ,

Objective 4F-1

For buildings of 10 storeys and over, the maximum number of apartments sharing a single lift is 40.

The ADG criteria has been created for buildings that would not have vertical transportation design carried out and therefore can be considered general guidance for the provision of lifts in those types of buildings.

As part of the planning regime for the One Sydney Harbour Towers, lift servicing has been compared to commensurate buildings internationally, with the proposed lift provisioning providing equal or better performance than those benchmarked against (as further described below).

Calculating the lift performance in R5 with respect to the Objective 4F- 1 of the Apartment Design Guidelines results in the following outcome;

Tower	Number of apartments	Number of Lifts	Ratio
R5 (On Market)	162	2	1:81
R5 (KWH)	50	1	1:50

However when designing significant apartment towers the lift provisions need to be designed by a Vertical Transportation Engineer to lift industry accepted design criteria.

The lift engineering for the project has been carried out by Lendlease Integrated Solutions Vertical Transport Design Services and we confirm lift performance of the proposed lifts is commensurate with international global standards.

Lift Design Criteria

The international guides for Vertical Transportation design are the Chartered Institution of Building Services Engineers (CIBSE) Guide D or The Vertical Transportation Handbook (Strakosch).

The target performance levels in each of these guides is as follows:



Target Performance Levels					
Apartment Building Type	CIBSE Luxury	CIBSE Normal	CIBSE Low Income	Strakosch Downtown	Strakosch Development
Interval (sec)	45-50	50-60	60-70	40-60s	50-90s
Balanced 2-Way Handling Capacity (%)	8%	6% to 8%	5% to 7%	5% to 7%	6% to 7%

Definition of Terms

The following definitions are important to provide background information to understand the way in which lifting systems are designed and measured in terms of quality and performance.

Two Way Traffic – This is where the dominant traffic flow is to and from the main floor of the building, the main floor is the primary entry and exit from the lifting system, in this case “Ground Floor”.

Handling Capacity - This is the percentage of the buildings population that can be transported in a five minute period, with the car load at no more than 80% of the cars designated capacity.

Average Interval – This is the average period of time between successive car departures from the main lobby.

Apartment Building Type –

CIBSE describes building quality as Luxury, Normal and Low Income
 Strakosch describes building quality as two types, the “Downtown” type housing high proportion of business people, whereas “Development” houses a higher proportion of families.

Populations for a residential building are defined by the expected bedroom occupancy and are adjusted for the apartment building type



	Occupancy Ratio's				
Apartment Building Type	CIBSE Luxury	CIBSE Normal	CIBSE Low Income	Strakosch Downtown	Strakosch Development
Studio	1.0	1.5	2.0	1.5-1.75	1.75-2.0
1 Bedroom	1.5	1.8	2.0	1.5-1.75	1.75-2.0
2 Bedroom	2.0	3.0	4.0	3.0-3.5	3.5-4.0
3 Bedroom	3.0	4.0	6.0	4.5-5.25	5.25-6.0

Traffic Studies

The design for each rise of the building were applied to Elevate (V9.0.30) using the general analysis mode and the results are presented below.

Building R5 (On Market)

Population based on CIBSE Luxury

Low Rise serving Ground, P2 to 26

1 x 18 and 1 x 21 passenger lift @ 3.0m/s

Average Interval 60.4sec for a 8% HC (two way)

This rise extends to basement for carpark pickups

There is a small increase in interval (57.0s to 60.4s) from the previously approved 4.0m/s lifting solution however this does not result in outcome of poor amenity when considered against international benchmarks.

Building R5 (KWH)

Population based on CIBSE Normal

Low Rise serving Ground, P1 to 16

1 x 18 passenger lift @ 2.5m/s

Average Interval 55.7sec for a 9% HC (two way)

This rise extends to basement for carpark pickups

There is no change to the lift specification for KWH from the previously approved scheme.



Passenger Lift Provisions

Lift Type and Capacity

- The passenger lifts in all Lendlease apartment buildings are a minimum of 17 person with car dimensions 1450mm wide x 2000mm deep x 2600mm high (clear internal) to allow for the requirements of the BCA DDA provisions, stretcher capabilities and movement of furniture such as king sized beds
- Additionally one lift in R5 “On Market” has been increased to 21 person (1650w x 2000d) to provide additional space for larger furniture and building plant
- Doors are at a minimum 1100mm wide x 2100 high
- Group collective operational control
- Lifts are designed to comply with the requirements of the SAA Lift Code AS1735, Workcover Authority and the NCC.
- Lifts will incorporate facilities for persons with a disability to comply with AS1735 Part 12 (NCC Compliance)

Passenger Lift Availability

Availability of lift service to the apartment floors is a priority, the performance of the lift system selected would provide statistically an average availability of 98% with expected breakdown rate of less than four “non-interference” calls per annum.

Should an event occur the average response times for the lift technician is between 30 min and 1 hour.

In the event of a breakdown or maintenance in the “On Market” pair, the other lift in the pair will be available to the occupants. Should the single lift in the KWH lobby be unavailable an access route has been provided between the two lobbies and lift access control would be managed to ensure all occupants continue to have lift service

Conclusions

Building R5 vertical transport provisions result in commensurate or greater performance than international benchmarks for luxury apartments.

Should you require further information please don't hesitate to contact me.

Yours Sincerely

A handwritten signature in black ink, appearing to be "Ian S. Robinson", with a long horizontal line extending to the right.

Ian S. Robinson
Technical Manager – Vertical Transportation, Integrated Solutions
Lend Lease
Australia