

Barangaroo South – C3

**Commercial Building** 

Utility Services Infrastructure Plan

October 2011

**Revision B** 



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# 1. Introduction

This report supports a Project Application submitted to the Minister for Planning pursuant to Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Application seeks approval for construction of a commercial building (known as Building C3) and associated works at Barangaroo South as described in the Project Description section of this report.

### Background

The 22 hectare Barangaroo site has been divided into three distinct redevelopment areas (from north to south) – the Headland Park, Barangaroo Stage 2 and Barangaroo Stage 1 (herein after referred to as Barangaroo South).

Lend Lease was successfully appointed as the preferred proponent to develop Barangaroo Stage 1 (otherwise known as Barangaroo South) on 20 December 2009.

### Planning History and Framework

On 9 February 2007 the Minister approved a Concept Plan for the site and on 12 October 2007 the land was rezoned to facilitate its redevelopment. The Approved Concept Plan allowed for a mixed use development involving a maximum of 388,300m<sup>2</sup> of gross floor area (GFA) contained within 8 blocks on a total site area of 22 hectares.

Modification No. 1 was approved in September 2007 which corrected a number of minor typographical errors.

On 25 February 2009 the Minister approved Modification No. 2 to the Concept Plan. The Approved Concept Plan as modified allowed for a mixed use development involving a maximum of 508,300m<sup>2</sup> of gross floor area (GFA) contained within 8 blocks on a total site area of 22 hectares.

On 11 November 2009 the Minister approved Modification No. 3 to the Concept Plan to allow for a modified design for the Headland Park and Northern Cove. The Approved Concept Plan as modified allows for a mixed use development involving a maximum of 489,500m<sup>2</sup> of gross floor area (GFA) across Barangaroo as a whole.

On 16 December 2010 the Minister approved Modification No. 4 to the Barangaroo Concept Plan. The Approved Concept Plan as modified allows for approximately 563,965sqm Gross Floor Area of mixed use development across the entire Barangaroo site.

This Project Application forms one of a series of individual Applications that Lend Lease will be submitting to deliver Barangaroo South. This Project Application is consistent with the established planning framework for the site, including the approved Concept Plan (as modified).

A Project Application (MP10\_0023) has been approved for the bulk excavation and construction of a basement car park to accommodate up to 880 car parking spaces and associated services and infrastructure to support the initial phases of the future development of Barangaroo South. A Section 75W Modification Application was subsequently submitted seeking to modify MP10\_0023 to extend the area of the approved basement to the south. This modification was approved by the Minister for Planning on 3 March 2011.

A further Section 75W application has been submitted to the Department of Planning and Infrastructure (the Department) and is currently being assessed, which seeks the Minister's approval to modify the depth of the excavation and change the reduced levels of the basement structure, using the same construction methodology as detailed and approved as part of the original project application. This includes:

- reduced excavation and bulk earthworks;
- reduced structural works foundations, basement levels, perimeter retention system etc; and



 installation of associated services and infrastructure to support the initial phases of the future development of Barangaroo South.

A project application for the first commercial building, known as C4, was submitted to the Department of Planning on 29 October 2010. This application sought consent for construction and use of a new commercial Building C4 with a maximum 98,514m2 GFA accommodating commercial and retail uses, a child care centre, bicycle parking and associated use and operation of car parking and loading facilities in the basement. Consent was issued by the Minister on 3 March 2011.

A Section 75W application for C4 has been submitted to the Department and is currently being assessed which seeks the Minister's approval to modify certain elements of the approved C4 building, including:

- mix of the uses within the building;
- total GFA;
- · shape of floor plates of the podium and the tower elements of the building;
- facade details;
- roof treatment; and
- basement layout.

### Site Location

Barangaroo is located on the north western edge of the Sydney Central Business District, 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 dominated by large CBD commercial tenants.

The Barangaroo site has been divided into three distinct redevelopment areas (from north to south) – the Headland Park, Barangaroo Stage 2 (also known as Barangaroo Central) and Barangaroo South.

The area of land within which development is proposed under this Project Application extends over land generally known and identified in the approved Concept Plan as Block 3 which comprises Lot 5 in DP 876514.

### Project Description

This Development Application seeks approval for the construction of a 49 storey building, comprising ground floor retail, a commercial lobby, childcare, podium and office tower, provision for associated cars and bicycle parking and the construction of the surrounding ancillary temporary public domain which includes access streets and landscaping.

### Purpose of this Report

This report has been prepared to accompany the Project Application for the C3 Commercial Building and associated works at Barangaroo South. It addresses the relevant Director-General Requirements for the project.

These Director-General Requirements are discussed in the Environmental Assessment Report (EAR) that has been prepared to support the application.



## 2. Stormwater Services

### 2.1. Existing Stormwater Services

Based on existing survey data and Department of Land database, the external catchment draining to the existing stormwater drainage system is approximately 14 Ha. The existing Stormwater Drainage system consists of large diameter pipes along Hickson Road that turn across the site and discharge untreated water into the harbour. Overland flows in excess of the piped flows are directed to the existing low point in Hickson Road and ponded water traverses the Barangaroo South site and ultimately discharges to the harbour.



### Catchment Plan – Existing

### 2.2. Proposed Stormwater Services

The layout of the existing pipe system and overland flow path are non compatible with the proposed Barangaroo South basement footprint, ground plane and proposed buildings. The existing stormwater needs to be diverted around the site to suit the development master plan. It is proposed that a permanent diversion to the south along the existing Shelley and Lime streets will be provided.

The stormwater management system that conveys the stormwater from the external catchment located between Bradfield Hwy and Kent Street will be diverted around the site to the north along the future constructed roads and Hickson Road.

In respect to overland flows, due to the site constraints and climate change principles, the piped stormwater management system needs to cater for 1 in 100 year event. The design of the external stormwater managements system will be in accordance with design and catchment management best practice.

Internal, on site stormwater from the building roofs and hard surfaces will be collected, treated and either discharged into the harbour or reused for irrigation.

The treatment of the most efficient event of the onsite stormwater drainage will be designed to national best practice.





Catchment Plan - Proposed

# 3. Potable Water Supply

### 3.1. Existing Water Services

Based on existing available information, recent survey works and confirmed by Sydney Water, there is a 300mm diameter water main in the western side of Hickson Road. There are numerous connections serving the previous buildings on the site. The existing connections shall be capped off at the main in accordance with Sydney Water requirements. Some existing incoming supplies may be used as temporary incoming water supplies during construction.

### 3.2. Proposed Water Services Upgrade

The potable water supply to the Barangaroo South development is proposed to be from the existing 300mm Sydney Water water main in Hickson Road. Sydney Water has confirmed that the capacities in this main are sufficient to meet the demands of the development. The flow from this main will also be used for the main fire fighting water supply subject to flow and pressure available being satisfactory to the requirements of New South Wales Fire Brigade.

There are several servicing options for potable water connection currently being investigated and discussed with Sydney Water. Construction constraints limit the ability to locate Sydney Water trunk mains within the public roadway system and provide a water main loop on the site.

A water main extension from Hickson Road extending west in Margaret Street, turning north on the site in the foreshore promenade, then turning east through the Basement to another connection to the existing 300mm dia water main is proposed for secure potable water supply to the site.

The Development water strategy and proposed implementation of a recycled water system will reduce the demand for potable water compared to a Business as Usual case. The potable water demand will be from the following potable water uses:

- All potable water uses other than toilet flushing, irrigation and wash downs.
- Potable water top up when the recycled water system is off line.



The Development will utilise standard Sydney Water process for the design and construction of a potable water main, asset created by Developer and transferred to Sydney Water for operation and maintenance.

It is understood that the Developer Charges are not applicable and any augmentation of the existing potable water main in Hickson Road would be funded by Sydney Water. We also note that the Barangaroo is within the Sydney Water Growth Services Plan 2009-2014.

## 4. Sewer Services

### 4.1. Existing sewer Services

Based on existing available information and recent survey works, there is a sewer trunk main in Hickson Road near the western kerb line draining into the existing Sewage Pumping Station SP1129.

All existing connections servicing the existing buildings are to be demolished and capped off in accordance with Sydney Water requirements.

### 4.2. Proposed Sewer Services

The sewage collection system on the site will discharge to a central Blackwater Treatment Plant (BWTP) located in the Barangaroo South basement. A bypass overflow from the BWTP connection shall be provided, connecting the Development to the existing Sydney Water Sewer located in Hickson Road.

When the BWTP is offline or there is surplus recycled water available for the needs of the buildings, then the wastewater shall be diverted to discharge directly to the Sydney Water sewer in Hickson Road, and ultimately to the Sewage Pumping Station SP1129. It is proposed to discharge the waste byproducts from the BWTP system to the Sydney Water sewer, including the desludging from the Membrane Bioreactor (MBR), and the reverse osmosis-reject water.

The buildings on the eastern section of the site, including the office towers C3, C4 and C5 will drain by gravity connection to the inlet works of the BWTP. In by-pass mode, a diversion valve will operate, directing the flow by gravity into the Sydney Water sewer. The buildings on the western side of the development, including sections of the retail outlets below the commercial towers, will discharge to a sewer pumping station located in the Basement of Barangaroo South. The discharge from the sewer pumping stations shall connect into the high level gravity collection system upstream of the by-pass diversion valve and drain to the inlet works of the BWTP.

All sewer pumping stations shall be provided with minimum 8 hours average flow storage.

Due to the Development water strategy and proposed implementation of a recycled water system, the flow to sewer will be reduced (on average by 110%) when compared to a Business as Usual case.

The Development will be required to enter into Trade Waste Agreement with Sydney Water for discharging of waste water, excess recycled water and BWTP process by-products in the Sydney Water sewer system.

In addition, the Development will require sewer mining to increase the quantity of recycled water as required for off-site export. The proposed sewer mining connection is into the Sydney Water sewer main in Hickson Road, intended to be upstream of the sewer connection serving the Barangaroo Site.

The Development will be required to enter into a Sewer Mining Agreement with Sydney Water for the proposed sewer mining at Barangaroo South.



Prior to issue of a Construction Certificate for the relevant works, a detailed design of the BWTP shall be submitted to and approved by the Director General (Director General of the Department of Planning)

# 5. Electrical Services

## 5.1. Existing Electrical Services

Barangaroo South site was served by 5 KV high voltage feeders entering the site at the southern end of Hickson Road and terminating in an Ausgrid (formerly Energy Australia) HV switch room. The HV supply and private HV reticulation were decommissioned and the private substations demolished as part of demolition works in 2010/2011. The existing electricity supply in the CBD is the traditional triplex 11KV Distribution Network Supply. It was presumed that the connection for electricity supply to Barangaroo South would be from the new City North Zone Substation at Erskine Street. It is understood that a portion of the proposed Barangaroo South development's border, which runs along Sussex Street is in close proximity to an existing Railcorp electrical line which also runs along Sussex Street. A Subsurface scan of underground services has been carried out to determine accurate location and depths of existing in-ground service using a ground penetrating radar along Hickson Road and Shelley Street. Additional information was sourced from utility authorities, Dial-Before-You-Dig and the City of Sydney Council. This investigation work has not identified any major clashes between the existing and proposed services. As the design develops for the permanent services a clash detection exercise will be carried out to determine any requirements for relocation, deviation of change in depth of the existing services. We have contacted Sydney Water and Ausgrid to discuss the services supply strategies for Barangaroo South and proposed routes for new services. Any new proposed works including the connection to the new 33kV feeder at the corner of Sussex Street and Erskine Street, and any proposed reticulation which occurs along Sussex Street, will require contact to be made with Railcorp and Ausgrid for coordination purposes.

### 5.2. Proposed Electrical Services

Ausgrid have informed that the electricity supply to Barangaroo South will be through 33KV feeders from Pyrmont Zone Substations. The feeders from Pyrmont Zone Substation will be brought to Barangaroo South site via pit and duct system in the existing roads network or by the sea (submarine cables or directional drilling). Four feeders will be provided to the precinct to supply an N-1 level of redundancy. The anticipated infrastructure planning capacity provided in these feeders will be approximately 43MVA. The exact rating will be determined on the level of de-rating applied to these cables by Ausgrid.

Barangaroo will be the first development in the CBD connected to 33KV Distribution System. The 33KV Distribution Network is different to the traditional 11KV Distribution Network.

The intent of the design is to reticulate the feeders from the linkage point receiving pit, along Shelley Street and Hickson Road in an underground pit and duct system in a ring main configuration. The feeders will terminate in the HV Control Rooms that will be located in the basement. The substations, established in the basement and upper levels of the commercial towers, to service the site demand, will be connected to the HV Control Points. Each Ausgrid substation will be configured with three (3) 33kV/400V transformers each rated at 1500kVA and configured in an N-1 level of redundancy.

It is proposed that the HV supply to the District Central Chilled Water Plant is by a private HV networks including private substations connected to HV supply in an Ausgrid HV Control Room.



# 6. Gas Services

### 6.1. Existing Natural gas Services

Based on existing survey data and information from Jemena, there is an existing gas supply at the intersection of Napoleon St and Hickson Road and also at the end of Lime St near the south-west corner of the site.

## 6.2. Proposed Natural gas Services

Jemena has indicated that the existing gas network is insufficient to supply the capacity required for Barangaroo and significant augmentation works will be required to the existing gas network and at the Redfern pressure station.

Jemena will provide metering equipment while Barangaroo South will be required to provide a gas room, pay connection fees and fund gas reticulation network within the site including required regulators.

The supply strategy for natural gas supply to Barangaroo South is dependent on natural gas demand and possible implementation of onsite power generation. Provision of Cogeneneration will significantly increase the demand for the gas supply required to the site and will determine the optimum gas pressure and metering strategy employed on the site.

Lend Lease is currently undertaking studies for the provision of Cogeneration Plant at Barangaroo.

# 7. Telecommunications Services

## 7.1. Existing Telecommunications Services

Telecommunications networks, including Mobile Voice and Wireless Broadband services exist in Hickson Road, Lime Street, Sussex Street and Kent Street.

The majority of the existing network infrastructure is limited to basic copper services in the vicinity of the Barangaroo South site. The current pathways in the area are servicing a temporary Shipping Terminal and surrounding developments. Several other Carriers and Telecommunications Services Providers (i.e. resellers) of telecommunications infrastructure is supported by these pathways.

All major telecommunications services are located to the east on Kent Street, and new and augmented pathways have been recently installed to the south of the Precinct to service new developments in Kent Street, Shelly Street and the 'King Street Wharf' precinct. Major existing pathways for large commercial grade services do not exist on Hickson Road adjacent to the site.

## 7.2. Proposed Telecommunications Services

The telecommunications vision for Barangaroo South is to provide a fully integrated, open access telecommunications network infrastructure (ICN). The communications infrastructure is envisaged to be an enabler for connectivity and accessibility, community communication, and utilities monitoring. The ICN will provide a common platform for the interconnection and management of a number of information and base/tenant building services, to provide a fully integrated communications facility throughout the



precinct. The ICN will utilise optical fibre technology so as to support "day-one" systems as well as future proofing the site.

Lend Lease will provide new 'Carrier Neutral' access pits on Hickson Road and pathways within the development to extend access to the site and various individual buildings in the precinct. Lend Lease will provide by way of 'Pits & Pipes' or cable pathways into the site on pre-defined and coordinated routes. The infrastructure will extend long term flexibility and the ability to cater for all potential tenants, residents and visitors in the delivery into Barangaroo any Telecommunication Services from any Carrier or Service Provider.

Pathways from existing city exchanges may need to be upgraded to support the onsite demands. It is currently envisaged that the Kent Street Exchange and Daley Street Exchange be the two key diverse locations to service the precinct.

The concept plan aims to support a converged IP network for the delivery of all communications services.

- Telecommunications network allowance for high speed fibre based telecommunications services for delivery of broadband, telephony, FTA TV, Pay TV and Satellite services.
- Communications network allowance for a high speed, communications network for management of systems such as BMS, CCTV, Intercom, Access control, energy monitoring, PA, Car park management, etc.