

10 October 2016

CPP Project 7094

Lend Lease

Level 14, Tower Three, International Towers Sydney

Exchange Place, 300 Barangaroo Avenue

Barangaroo NSW 2000

Attn: Ms. Stephanie Graham

Subject: Car Park Natural Ventilation & Pedestrian Winds– North West Plot of Darling Square

Ref: (1) CPP Report 'Pressure Loss Testing for SICEEP Perforated Panel', dated December 2014 Rev 1.
(2) CPP Report 'Computational Fluid Dynamics (CFD) for NW Plot Car Park', dated September 2014
(3) CPP Report 'Wind Tunnel Tests Report for Stage 2 State Significant Development Application (SSDA 4)' dated 24th May 2013 Rev 3.

Dear Ms. Graham,

Cermak Peterka Petersen Pty. Ltd. (CPP) was previously engaged by Lend Lease to assess the proposed Sydney International Convention Centre, Exhibition and Entertainment Precinct (SICEEP), North West Plot of Darling Square in terms of Pedestrian Winds and the ability of the car park to be naturally ventilated when clad with a porous screening material. The outcomes of these studies are contained in References (1) to (3).

This report supports an application made under section 96 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to modify Development Consent, SSD-6013 relating to the development of the North West Plot of Darling Square which is part of the Sydney International Convention, Exhibition and Entertainment Precinct (SICEEP).

Development Consent SSD-6013 was granted on 7 May 2014 by the delegate of the Minister for Planning for the following components of development:

- site preparation works including demolition of existing structures, tree removal, minor excavation, and site remediation as required,
- staged construction of a 12 storey building to be used for commercial premises, and above ground car parking,
- various public domain improvements including provision (part) new east-west pedestrian laneway (known as Dickson's Lane) linking Darling Drive to the Boulevard, upgrading of existing footpaths, provision of street trees, and provision of bicycle parking facilities, and
- building identification signage and wall advertising sign.

This Section 96 application (the Modification Application) constitutes the third modification to the consent. This Modification Application follows the approval and current assessment of a number of SSDAs within the SICEEP site as set out in Table 1.

Overview of Proposed Modifications

This Modification Application seeks approval for the following amendments:

- changes to roof plant/structures and minor alterations to the roof form,
- minor external amendments at the ground level including interfaces with the public domain, and
- external amendments to the building design including an enhancement of the car parking screening materials.

A range of other minor amendments resulting from design development (including in response to feedback from potential commercial tenants) are illustrated on the amended Architectural Drawings. These changes are to be expected in any project, especially given the nature and scale of the approved North West Plot development.

Site Description

The SICEEP Site is located within Darling Harbour. Darling Harbour is a 60 ha waterfront precinct on the south-western edge of the Sydney Central Business District that provides a mix of functions including recreational, tourist, entertainment and business.

With an area of approximately 20 ha, the SICEEP Site is generally bound by the Light Rail Line to the west, Harbourside shopping centre and Cockle Bay to the north, Darling Quarter, the Chinese Garden and Harbour Street to the east, and Hay Street to the south (refer to Figure 2).

The Darling Square Site is:

- located in the south of the SICEEP Site, within the northern portion of the suburb of Haymarket,
- bounded by the Powerhouse Museum to the west, the Pier Street overpass and Little Pier Street to the north, Harbour Street to the east, and Hay Street to the south, and
- irregular in shape and occupies an area of approximately 37,701 m².

The Modification Application Site relates to the North-West Plot and surrounds as detailed within the drawings submitted in support of Modification Application. Figure 3 illustrates the North-West Plot in the approved Concept Proposal.

Discussion

The pressure loss report (1) was undertaken to support earlier computational modelling (2) which assessed the ability of the car park to naturally ventilate when clad with a generic porous screen. The car park was demonstrated to comply with the requirements of a performance based assessment under AS1668.2. Carbon Monoxide levels remained below the relevant thresholds with the addition of fans positioned throughout the car park to promote mixing and general airflow under relatively calm ambient conditions.

Wind tunnel testing of the Ombrae perforated panel was undertaken (1) to determine the performance of this less generic screening material, and found that the conservative estimates previously used in the CFD model for a generic screen were adequate.

In terms of wind impact (3), the previous wind tunnel investigation of the pedestrian level wind environment around the proposed North-West Plot development found that conditions at ground level around the site are generally suitable for pedestrian standing or walking under Lawson, which is similar to conditions throughout much of Sydney. From a wind perspective, the proposed changes to the building are minimal, Figure 1, hence it is expected that similar wind conditions will be encountered with the Section 96 scheme building massing compared with the scheme tested in the wind-tunnel.



Figure 1: Approved SSD6013 ground floor layout (L) and proposed Section 96 layout (R)

With reference to Figure 1, the locations of main entrances to the development have remained unchanged with some exceptions (deletions), and the test point layout used in (3) is expected to remain adequate.

I hope this is of assistance, please do not hesitate to contact me on 9551 2000 if you would like to discuss any aspect of this report.

Yours sincerely,

Christian Rohr
Engineering Manager
cc G. S. Wood, Director

Appendix: Client Provided Figures and Tables

Table 1 – Status of initial SICEEP SSD DAs

DA No	Description of Application	Status
12_5752	SICEEP Core Facilities – Exhibition Centre, Convention Centre, The Theatre, Event Deck and Tumbalong Park	Approved: 22 August 2013
MOD 1	S96(1A) - various	Approved: 20 February 2014
MOD 2	S96(1A) – various	Approved: 18 July 2014
MOD 3	S96(1A) – various	Approved: 1 July 2015
13-5878	Darling Square Concept Proposal	Approved: 5 December 2013
MOD 1	S96(1A) – various	Approved: 26 November 2015
MOD 2	S96(1A) – various	<i>Under Assessment</i>
6010	Western Plot (Student Accommodation – Building W2)	Approved: 7 May 2014
MOD 1	S96(2) – various	Approved: 1 April 2016
6013	North-West Plot (Public car park/ commercial office building)	Approved: 7 May 2014
MOD 1	S96(2) – various	Approved: 20 July 2015
MOD 2	S96(1A) – various	Approved: 26 November 2015
MOD 3	S96(1A) – various	Subject of this application
6011	South-West Plot (Mixed Use Residential Development)	Approved: 21 May 2014
MOD 1	S96(1A) – various	Approved: 27 July 2015
6116	ICC Hotel	Approved: 15 June 2014
MOD 1	S96(1A) – various	Approved: 8 July 2015
6626	North-East Plot (Mixed Use Residential Development)	Approved: 16 April 2015
6831	ICC Hotel fit-out, façade lighting system and subdivision	Approved: 16 October 2015
7133	Western Plot (Student Accommodation – Building W1)	Approved: 1 April 2016
7021	North Plot (Community and Retail Building and Public Open Space)	<i>Under Assessment</i>
6633	South East Plot (Mixed Use Residential Development)	<i>Under Assessment</i>

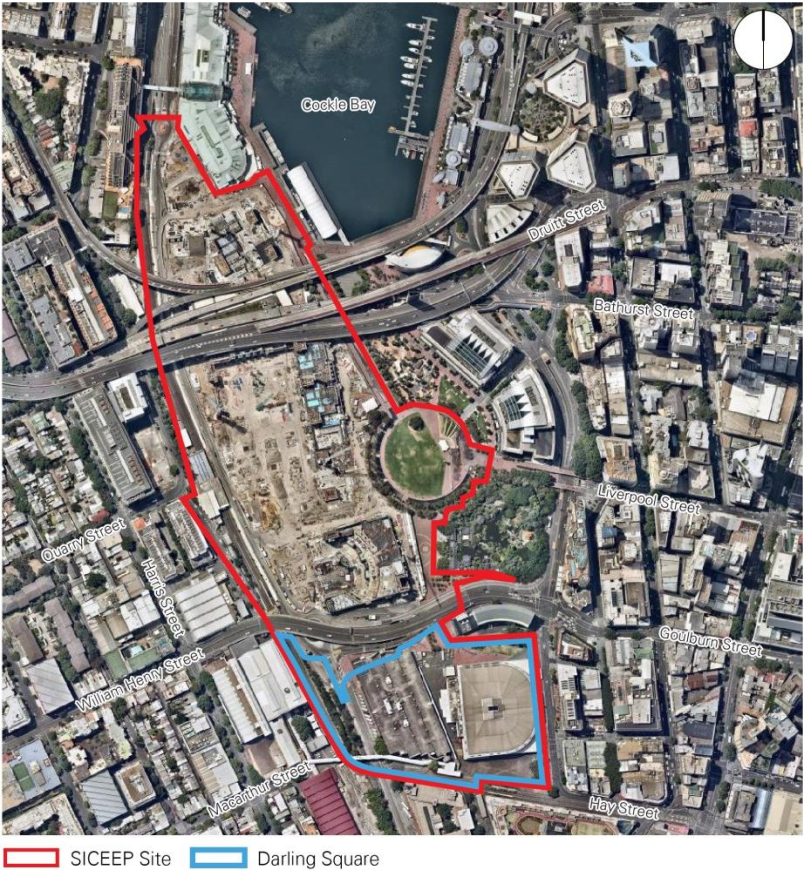


Figure 2 – Aerial Photograph of the SICEEP Site

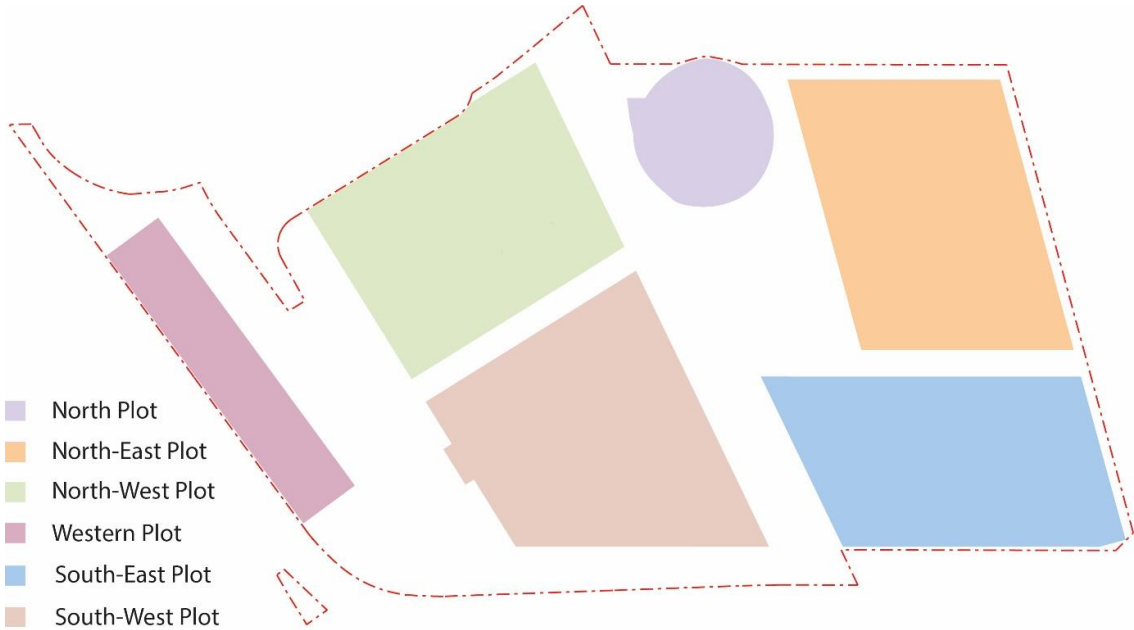


Figure 3 – Concept Proposal Development Plots