

SYDNEY INTERNATIONAL CONVENTION, EXHIBITION AND ENTERTAINMENT PRECINCT (SICEEP)

DARLING SQUARE: THE NORTH PLOT & THE SQUARE

SUSTAINABILITY REPORT
FOR DEVELOPMENT APPLICATION (SSDA 10)
FEBRUARY 2016



lendlease

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1.0 INTRODUCTION

This report supports a State Significant Development (SSD) Development Application (DA) submitted to the Minister for Planning pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

The Application (referred to as SSDA 10) follows the approval of a staged SSD DA (SSDA 2) in December 2013. SSDA 2 sets out a Concept Proposal for a new mixed use neighbourhood at Haymarket, now called Darling Square. Darling Square forms part of the Sydney International Convention, Exhibition and Entertainment precinct (SICEEP).

More specifically this subsequent DA seeks approval for the construction and use of a mixed use development within the North development plot of Darling Square and public domain works for the new 'Square'.

1.1 Overview of Proposed Development

The proposal relates to a detailed ('Stage 2') DA for a mixed use development in the North Plot of Darling Square together with domain works for the new Square. The Darling Square Site more broadly is to be developed for a mix of residential and non-residential uses, including but not limited to residential buildings, commercial, retail, community and public space. The North Plot is one of six development plots identified within the approved Concept Proposal.

Under the Concept Proposal, the North Plot is planned to accommodate a small scaled mixed use building. More specifically, this SSD DA seeks approval for the following components of the development:

- Construction and use of a mixed use building including retail, commercial, food and beverage offerings and community uses;
- Public domain and landscaping improvements comprising the creation of a new Square which links with new pedestrian connections, including laneways and the Boulevard; and
- Extension and augmentation of physical infrastructure / utilities as required.

1.2 Background

The NSW Government considers that a precinct-wide renewal and expansion of the existing convention, exhibition and entertainment centre facilities at Darling Harbour is required, and is committed to Sydney reclaiming its position on centre stage for hosting world-class events with the creation of SICEEP.

In December 2012, following an extensive and rigorous Expressions of Interest and Request for Proposals process, Darling Harbour Live (a consortium comprising Lend Lease, Hostplus, Capella Capital, AEG Ogden and Spotless) and Lend Lease were announced by the NSW Government as the preferred proponent to transform Darling Harbour and create SICEEP.

Key features of the Preferred Plan include:

- Delivering world-class convention, exhibition and entertainment facilities, including:

- o Up to 40,000m² exhibition space;
 - o Over 8,000m² of meeting rooms space, across 40 rooms;
 - o Overall convention space capacity for more than 12,000 people;
 - o A ballroom capable of accommodating 2,000 people; and
 - o A premium, red-carpet entertainment facility with a capacity of 8,000 persons.
- Providing a hotel complex at the northern end of the precinct.
- A vibrant and authentic new neighbourhood at the southern end of the precinct, now called 'Darling Square', including apartments, student accommodation, shops, cafes and restaurants.
- Renewed and upgraded public domain that has been increased by a hectare, including an outdoor event space for up to 27,000 people at an expanded Tumbalong Park; and
- Improved pedestrian connections linking to the proposed Ultimo Pedestrian Network (now The Goods Line) drawing people between Central, Chinatown and Cockle Bay Wharf as well as east-west between Ultimo/Pymont and the City.

On 21 March 2013 a critical step in realising the NSW Government's vision for the SICEEP Project was made, with the lodgement of the first two SSD DAs with the (now) Department of Planning and Environment. The key components of these proposals are outlined below.

1.3 Public Private Partnership SSD DA (SSD 12_5752)

The Public-Private Partnership (PPP) SSD DA (SSDA 1) includes the core facilities of the SICEEP Project, comprising the new, integrated and world-class convention, exhibition and entertainment facilities along with ancillary commercial premises and public domain upgrades. SSDA1 was approved on 22 August 2013.

1.4 The Concept Proposal (SSD 13_5878)

The Concept Proposal SSD DA (SSDA 2) establishes the vision and planning and development framework which will be the basis for the consent authority to assess detailed development proposals within the Darling Square Site. SSDA2 was approved on 5 December 2013. The Stage 1 Concept Proposal approved the following key components and development parameters:

- Indicative staging of demolition and development of future development plots;
- Land uses across the site including residential and non-residential uses;
- Street and laneway layouts and pedestrian routes;
- Open spaces and through-site links;
- Six separate development plots, development plot sizes and separation, building envelopes, building separation, building depths, building alignments, and benchmarks for natural ventilation and solar access provisions;
- A maximum total gross floor area (non-residential and residential GFA);
- Above ground car parking including public car parking;
- Residential car parking rates;
- Design Guidelines to guide future development and the public domain; and
- A remediation strategy.

The Concept Proposal was modified on 26 November 2015 to increase the amount of non-residential GFA. This minor increase in GFA was allocated to the approved North-West Plot building to meet tenant requirements. In addition to the approval of SSDA2, the following approvals have been granted for various stages of Darling Square site:

- Darling Drive (part) development plot (SSDA3) for the construction and use of a residential building (student accommodation) and the provision of associated public domain works approved on 7 May 2014;
- North-West development plot (SSDA4) for the construction and use of a mixed use commercial development and public car park building and associated public domain works approved on 7 May 2014; and
- South-West development plot (SSDA5) – construction and use of a mixed use residential development and associated public domain works approved on 21 May 2014.
- North-East development plot (SSDA7) – construction and use of a mixed use residential development and associated public domain works approved on 16 April 2015.

Approval was also granted on 15 June 2014 for SSDA6 which includes the construction and use of the International Convention Centre (ICC) Sydney Hotel and provision of public domain works. Approval was also granted for SSDA8 on 16 October 2015 which comprised the ICC Hotel fitout, external lighting and subdivision.

This report has been prepared to support a detailed Stage 2 SSD DA for the mixed use development and public domain works within Darling Square (SSDA 10), consistent with the Concept Proposal (SSDA 2).

1.5 Site Description

The SICEEP Site is located within Darling Harbour. Darling Harbour is a 60 hectare 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 hectares, 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 1). 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 37,700m².

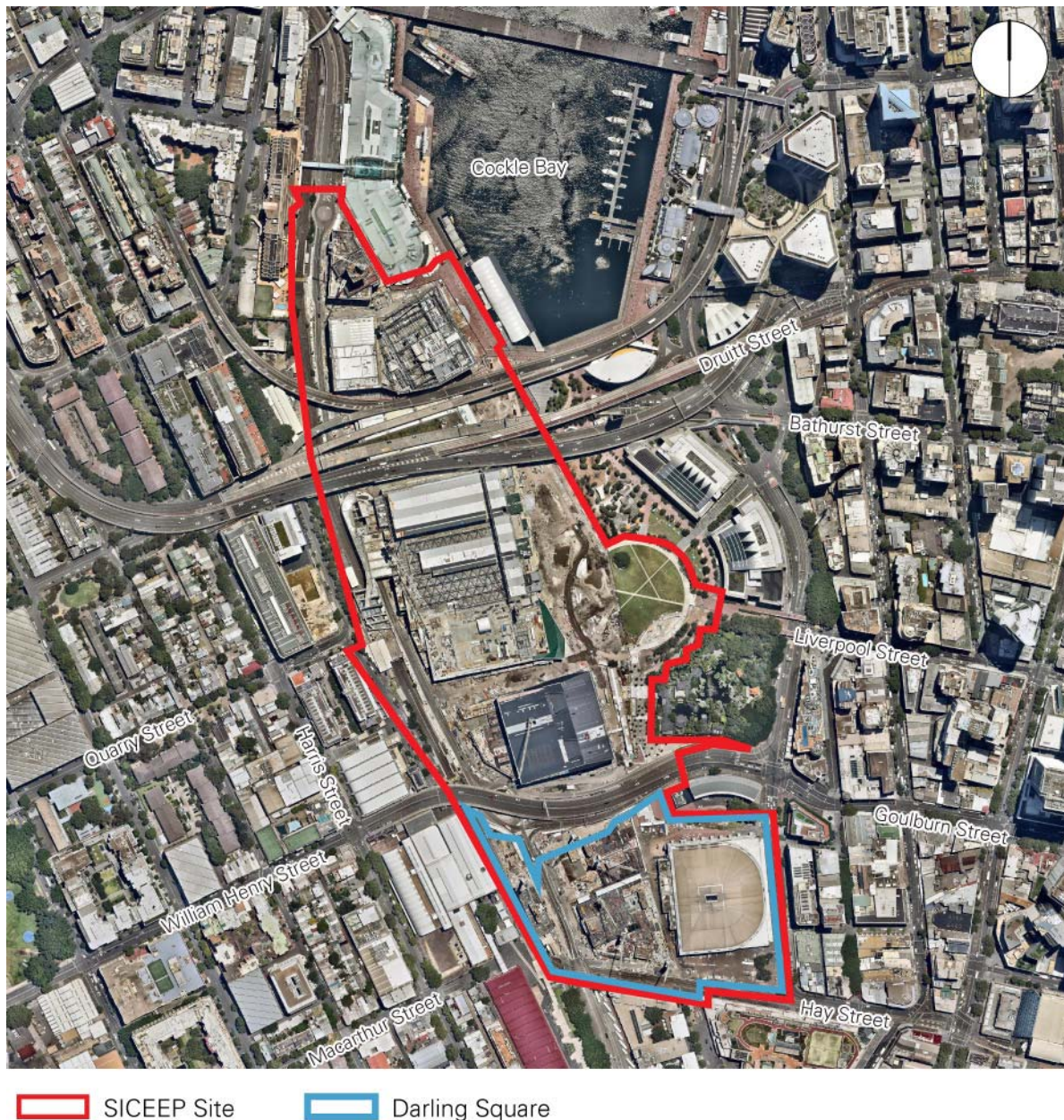


Figure 1 – Aerial Photograph of the SICEEP Site

The Concept Proposal DA provides for six (6) separate development plots across the Darling Square Site (refer to **Figure 2**):

- 1) North Plot;
- 2) North East Plot;
- 3) South East Plot;
- 4) South West Plot;
- 5) North West Plot; and
- 6) Western Plot (Darling Drive).

The Application Site area relates to the North Plot and adjoining 'Square' as detailed within the architectural and landscape plans submitted in support of the DA.

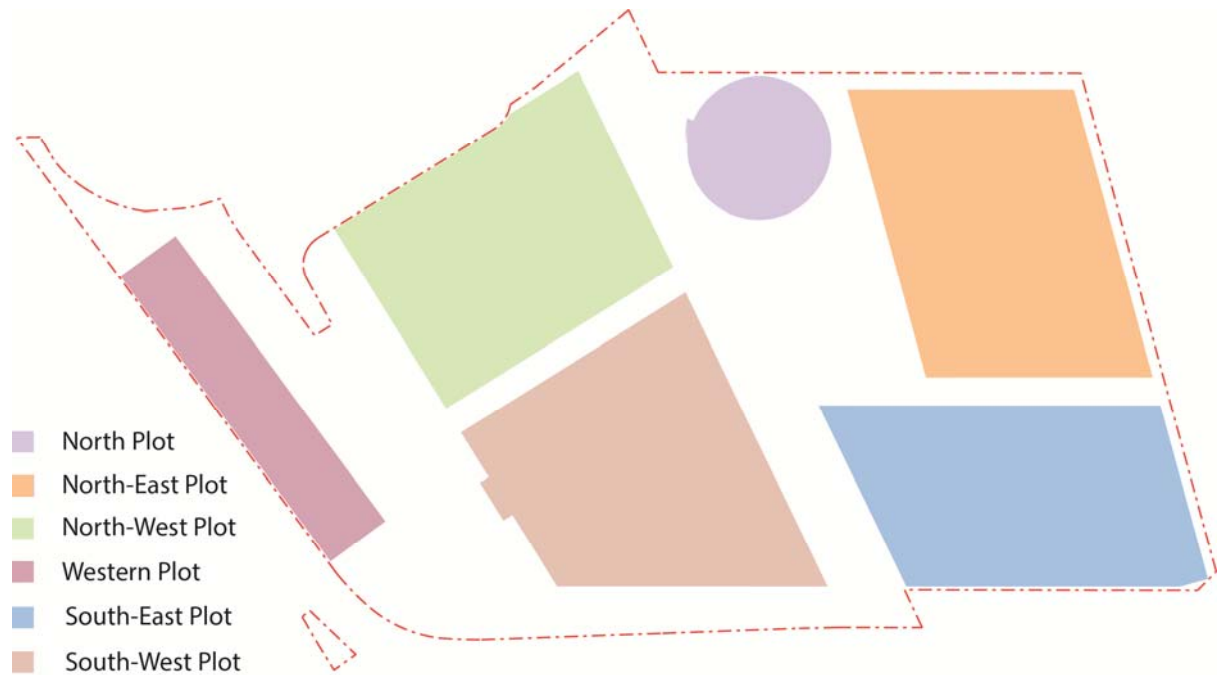


Figure 2 – Concept Proposal Development Plots

1.6 Planning Approvals Strategy

The SICEEP Project has resulted in the lodgement of numerous SSD DAs for the various components of the redevelopment project. Future applications will continue to be lodged in accordance with the Concept Proposal SSD DA for the remaining development plots of the Darling Square Site.

2.0 Referenced Documentation

2.1 Architectural

Initial schematic design drawings, including plans and elevations, provided by the Architect for the North Building Kengo Kuma and Associates dated June 2015 and drawings for The Square, as provided by the Landscape Architect ASPECT Studios.

2.2 Building Services

Discussions and correspondence with the Project Managers and Development Managers within the project team.

2.3 Other Consultants

Other consultants, including structural, civil, DDA, BCA, acoustics have been based on conversations with the Project Manager and Development Manager.

2.4 Limitations

This report is based on documentation supplied as of June 2015. This documentation is subject to change as the design progresses and specific outcomes may be substituted or omitted whilst still targeting the sustainability aspirations for the Darling Square precinct.

3.0 Whole of Precinct ESD Principles

Lend Lease has undertaken an integrated approach to sustainability across the total SICEEP site. In addition to the building based initiatives, a number of whole of precinct initiatives are being investigated which, if provided, will benefit the community including:

3.1 Enhanced connections and public transport links

The master plan design for the precinct lays out a connected and enhanced navigation through the site; enticing the local community as well as visitors through improved walkability and innovative way finding, making public transport the easy and obvious choice for people providing affordable, green and safe travel options;

3.2 Passive Signage

Simple material that indicates the sustainability attributes of key items. This could include:

- Labelling of key materials that indicate what it is, where it is from, how much embodied carbon it contains and how it may be recycled – “This bench is made from plantation spotted gum from North Queensland and has absorbed 100kgs of carbon dioxide from the atmosphere”;
- Design attributes that support sustainable outcomes – “this landscaped area treats stormwater runoff to reduce pollution into the harbour”;
- Directional information such as links to public transport;
- Heritage and Indigenous references to the precinct’s past such as those proposed in the Heritage Interpretation strategy.

3.3 Dynamic Informatics Systems and Technology

- Explore the opportunity for online and mobile phone applications that provide more detailed information about the sustainability credentials of the precinct that can be automatically activated by proximity or scanning QR codes with a smartphone;
- Wi-Fi hotspots within the public domain;

3.4 Green Star Communities

The Darling Square project more broadly has been reviewed and appraised using the Green Star Communities Rating tool - Pilot version 0.2. Darling Square is currently planning to target a minimum 5-Star Green Star Communities rating based on current project initiatives, which includes the North Plot and The Square as part of this assessment.

4.0 The North Plot & Square Specific ESD Principles

The North Plot and Square development aims to deliver a sustainable project, with reduced operational energy consumption, reduced potable water use, minimisation of waste to landfill and appropriate materials selection while at the same time maintaining a high level of indoor environmental quality through appropriate services design, façade configuration and materials selection.

The North Plot multi-use development will be targeting a 5 Green Star rating whilst The Square and the North Plot will be contributing to the overarching target for a minimum 5 star Green Star Communities rating for the SICEEP precinct. Initiatives targeted within the Green Star tool will ensure significant sustainability principles will be incorporated into the design, appropriate management practices are applied through the construction period and facilities and resources are provided to ensure the delivery and operation of the building achieves the sustainability objectives.

Given initiatives currently proposed, annual greenhouse gas emissions and water consumption from the proposed development are expected to provide a significant reduction when compared to Green Star reference benchmarks. These targets are to be confirmed through design development. This section describes how these targets are proposed to be achieved. Strategies with regards to Management, Materials, Transport and Ecology etc are described in detail in section 5.0.

Targeted Green Star sustainability principles discussed will be incorporated wherever possible and where we have control over the design and delivery. Where tenants are responsible for their own fitout works, they will be encouraged to adopt the same principles through a 'fitout Guide' and / or lease requirements. The applicability of the fitout works and impact on the Green Star rating is yet to be confirmed with the GBCA.

4.1 Energy and Greenhouse Gas Emissions

The following summarises the technologies essential to ensure that the project's greenhouse emissions reductions are achieved.

- **LED light fittings:** Use will be encouraged throughout all areas where applicable.
- **Mixed Mode Ventilation:** During periods of favourable ambient conditions, the Market Hall (including mezzanine) mechanical ventilation and conditioning will be disabled and the façade will be opened to enable natural ventilation. While this results in energy savings, a high level of indoor environment quality will also be required.
- **Heating and Cooling:** Mechanical heating and cooling will be provided to the Market Hall and mezzanine level via on-floor PAC units, while a variable refrigerant flow system is proposed for upper levels. Energy efficiency will be a key selection criteria for any proposed systems.
- **Ventilation and lighting controls:** Controls will be provided to ensure that lighting and ventilation is provided only when required and can be modulated to meet demand where appropriate. As an example, CO2 sensors are proposed to modulate ventilation air to ensure air quality is maintained, whilst minimising associated energy consumption.
- **Heat Recovery:** Heat recovery ventilators are proposed for all upper levels to reduce energy associated with providing ventilation.
- **Energy Efficient Appliances:** While excluded from the Green Star greenhouse gas emissions reduction target, any appliances proposed will be required to be selected with energy efficiency as a key selection criteria.

- **Energy and water metering:** Energy and water metering will be provided to monitor energy and water uses to enable building and public space performance to be monitored against targets and issues resulting in excessive consumption identified and rectified. Metering will be on a floor by floor basis to enable a more accurate understanding of consumption by tenancy.
- **Façade:** A high performance double glazing and external shading will be utilised wherever possible to control heat transmission, maintain thermal comfort and permit adequate daylight.

4.2 Water Conservation and Management

To ensure the project achieves its water reduction target a number of initiatives are currently proposed and/or being considered. Fixtures, fittings and appliances will be selected with flow rates as low as practically possible to reduce potable water demand.

While there are spatial restrictions preventing a rainwater reuse tank within the building, rainwater and stormwater from the building's site will be collected by the public domain stormwater treatment system. Captured water will be used for irrigating landscape in the public domain with options being explored for water to be reticulated into the building for toilet flushing.

While this report does not specifically address water sensitive urban design (WSUD), a report provided by Hyder as part of the planning submission confirms project requirements, documented in the project SEARs and the City of Sydney Development Control Plan, and how they are achieved. In summary, the Darling Square precinct which includes the North Plot, will achieve pollution reduction targets nominated for gross pollutants, total suspended solids, total phosphorous, and total nitrogen. This is achieved through a combination of green roofs, vegetated buffers, rainwater tanks with reuse, bioretention tree pits, bioretention gardens, gross pollutant traps and filter devices.

4.3 Third Party Certification

The North Plot is targeting a Green Star rating of 5 stars whilst the precinct is also targeting a 5 star Green Star rating as a contributor to a broader precinct rating utilising the Green star Communities tool. A targeted Green Star rating confirms the projects commitment to deliver a development in accordance with current best practice standards. The initiatives relevant to Green Star are discussed in section 5.0 of this report and address numerous sustainability issues such as management, materials, energy, water, indoor environmental quality, waste, transport, ecology and innovation.

5.0 Green Star

The Green Star rating scheme, a voluntary national sustainable design rating tool set up and managed by the Green Building Council of Australia (GBCA) is being used to guide the design process. The Green Star scheme is a comprehensive rating system that evaluates the environmental design and construction of buildings and communities - 4, 5 and 6 Star ratings can be awarded by the GBCA.

Green Star is a holistic assessment scheme, which assesses the sustainability features of a development within 8 different categories.

- Management
- Indoor Environmental Quality
- Energy
- Transport
- Water
- Materials
- Land Use and Ecology
- Emissions

Credits are awarded based on meeting criteria in each of the categories and the credits are summed and weighted according to their environmental importance and totalled to give a star rating. There are 105 Credits available. A score of 45-59 Credits is equal to 4 Stars (Best Practice), a score of 60-74 Credits is equal to 5 Stars (Australian Excellence) and a score of 75 or more credits is equal to 6 Stars (World Leadership).

The following sections outline how the sustainability initiatives currently being considered can be recognised under the Green Star tool. While the initiatives to be incorporated into the project will alter as the design evolves, the initiatives described below are those currently being considered by the project and will be confirmed through design development. While a building Green Star rating will be applicable to the North Plot only, sustainability principles associated with the Green Star Communities rating tool will be applied to The Square wherever applicable as part of the Communities Green Star rating. Many of the applicable principles are consistent with the materials, transport, water, emissions and land use and ecology principles identified below.

5.1 Management

Lend Lease has a proven track record in the management of sustainability in its projects. Many credits relate to the way in which the project is delivered and Lend Lease has in place the necessary controls and procedures to achieve the outcomes targeted.

Green Star Accredited Professional. The majority of Lend Lease's sustainable design personnel are Green Star Accredited Professionals and the ESD consultant on the project has been accredited since 2005 and served in Green Star working groups, assessments and peer reviews.

Commissioning and Tuning. The design consultants will provide documentation that outlines the design intent and contractors will be required to ensure they commission systems in accordance with the appropriate CIBSE and ASHRAE standards. The contractors will be required, during the first 12 months post completion, to tune the base building systems to ensure the building operates as per

design intent. Energy and water targets which align with the building's metering system will be generated to assist in the tracking of performance through the building tuning period. An independent commissioning agent will be engaged to review the services design with regards to commissioning, set commissioning plans and standards and to manage the commissioning and building tuning process. In addition the project will be reviewed with regards to the maintainability of the building services during the design stage.

Adaptation and Resilience. A climate change risk assessment will be undertaken to identify key risks to the project and where necessary risks will be managed through the design.

Building Information. Building user information, including operation and maintenance information, will be made available to all relevant stakeholders.

Commitment to Performance. Performance targets will be generated for energy and water to enable the performance of the building to be monitored against the targets. Where possible performance targets will align with the metering and monitoring system.

Metering and Monitoring. Metering of significant base building energy uses will be provided and a system for monitoring to enable the performance of the building to be continually assessed with regards to energy and water consumption will be provided. The monitoring strategy will be developed in accordance with the relevant standard.

Operational Waste. Waste management plan will be developed which identifies project requirements to ensure waste generation is minimised and recycling maximised.

5.2 Indoor Environmental Quality (IEQ)

The overall planning and design of the building will be developed to maximise IEQ outcomes. This is a process of balancing daylight, glare control, thermal comfort and air quality whilst not impacting energy efficiency.

Quality of Indoor Air. Ventilation air will be designed to comply with ASHRAE standard 62.1:2013 with regards to separation between pollution sources and air intakes, provide adequate access for maintenance to both sides of moisture catching components and all ductwork will be cleaned prior to occupancy, or alternatively protected during construction. In addition kitchen exhaust risers will be provided for all food tenancies tenant printer and photocopy equipment will be required to be selected as low emission to maintain a high level of air quality.

Acoustic Comfort. Internal ambient noise levels will be no higher than 5dB(A) above the "satisfactory" sound levels in Table 1 of AS2107:2000 and consideration will be given to reverberation times and noise isolation of any meeting rooms and private offices provided as part of the fitout.

Lighting Comfort. Lights will be flicker free and address the perception of colour in the space. Lighting levels will be provided in accordance with AS1680 and glare will be reduced in accordance with AS1680.

Visual Comfort. Glare from direct sunlight will be reduced by either external shading or internal blinds. In addition, daylight and the maintenance of views are a key design criteria for the façade.

Reduced Exposure to Pollutants. Only paints, adhesives and sealants and floor coverings that have a low level of volatile organic compounds (VOCs) will be used throughout the internal areas of the project. In addition all composite wood products used internally will be required to achieve a

minimum formaldehyde emissions requirement to ensure the impact of pollutants on the indoor environment is minimised.

5.3 Energy

Energy efficiency is a high priority for the building design. The energy category in Green Star rewards projects for energy efficiency and peak energy demand reduction as follows.

Greenhouse Gas Emissions. Energy efficiency features to be incorporated as discussed in section 4.1 will enable a significant reduction in greenhouse gas emissions when compared to a reference case as defined by the Green star tool.

Peak Electricity Demand Reduction. The building's demand on the electrical grid will be reduced via energy efficiency.

5.4 Transport

The project benefits from an ideal location adjacent to Sydney's CBD and amongst a varied selection of community, retail and food outlets. The extension of the light rail networks currently running through the site to the inner west and eastern suburbs will further improve the public transport service for the building occupants. While Green Star includes a performance based pathway which the project may investigate, the following indicates the more certain prescriptive pathway initiatives being considered by the project.

Access by Public Transport. The project is located within close proximity to Town Hall and Central Station as well as being adjacent to the city Light Rail service which has recently been extended to Dulwich Hill and will soon connect to central station and the eastern suburbs. Bus services along Harris Street and George Street provide bus connections. The project is therefore considered to be well serviced by easily accessible public transport.

Reduced Car Parking Provision. There is no car parking proposed as part of this development

Active Transport Facilities. The provision of secure bicycle parking within the building will be considered as part of the individual tenancy fit out applications. Bike parking will be included throughout the public realm supporting the precinct. In addition, The North Plot is situated on Sydney's new boulevard connecting Cockle Bay with Central Station, and is connected into the City of Sydney's cycleway network including the major north/south commuter route along Darling Drive.

Walkable Neighbourhoods. Given the near CBD location of the project, a variety of amenities will be located nearby ensuring convenience for building occupants. The Darling Square Precinct has a walk score of 100 when measured as part of the walkable community's walk score assessment.

5.5 Water

The project will be targeting a high level of performance with regards to water efficiency and reduction of potable water consumption.

Potable Water. Green Star rewards all water initiatives under a single credit which assesses the building's performance with regards to its improvement on a business as usual benchmark. Savings

against the business as usual benchmark will be achieved via the selection of low-flow fixtures and fittings.

5.6 Materials

Careful consideration will be given to materials with regards to their environmental impacts to enable numerous materials related initiatives to be incorporated into the design and delivery.

Comparative Life Cycle Assessment (LCA). The project will undertake an LCA to establish the overall performance of the selected building materials with regards to their whole of life (cradle-to-grave) environmental performance against numerous impact categories. To enable a positive impact, the inclusion of flyash to significantly reduce Portland cement content and concrete mixes which include a minimum of 50% recycled water will be targeted. In addition, at least 30% of coarse aggregate in the concrete will be targeted to be crushed slag aggregate or alternatively at least 25% of fine aggregate (sand) inputs in the concrete will be manufactured sand or other alternative materials. In addition steel use will be reduced as far as practically possible.

Responsible Building Materials. Materials will be sourced from responsible facilities/manufacturers and sources. Steel will be sourced from manufacturers and facilities which have appropriate credentials, only timber from certified forests will be used on the project and only PVC which meets the GBCA's Best Practice Guideline for PVC will be permitted.

Sustainable Products. The use of materials which are reused, recycled, have an Environmental Product Declaration or third party certification such as GECA or Green Tag or other will be prioritised where possible.

Construction and Demolition. The construction team will aim to recycle at least 90% of construction and demolition waste using a waste contractor that can sort and direct waste for recycling. Waste contractor(s) and waste processing facilities that comply with the 'Green Star Construction and Demolition Waste Operational and Reporting Criteria' will be considered.

5.7 Land Use and Ecology

The predevelopment condition of the site is hard landscaping. Remediation works are required to be undertaken through the Darling Square site, additional vegetation will be provided and stormwater will be appropriately managed throughout the site as part of the project. The ecological value of the site will therefore be improved from its current state.

5.8 Emissions

Emissions from the site will be minimised as far as possible. By using environmentally friendly refrigerants, addressing stormwater appropriately and managing light spill any negative impact of the building can be significantly reduced.

Stormwater. Appropriate pollutant reduction targets will be achieved.

Light Pollution. The design of the external lighting system will ensure that light does not spill upwards to the sky or beyond the boundary. This can be a nuisance to adjacent properties, particularly residential neighbours.

Microbial Control. No water based heat rejection is currently proposed.

Refrigerant Impacts. The volume of refrigerants used and the refrigerant type will be considered.

5.9 Innovation

To enable the Green star rating to be achieved, numerous innovation credits will be considered by the project. The GBCA has recently released Innovation Challenge credits which enable projects to register to target up to 10 additional credits. Examples of initiatives to be considered by the project team include sustainable site sheds, energy metering data integrity and contractor education.

6.0 Conclusion

The North Plot and The Square development will achieve the sustainability aspirations set for the Darling Square precinct. This project aims to deliver a sustainable mixed-use building, with low operational energy consumption, reduced potable water use, minimisation of waste to landfill and appropriate materials selection while at the same time maintaining a good level of indoor environmental quality through appropriate mechanical design, façade configuration and materials selection.

The North Plot and The Square are directly targeting or contributing to a Green Star rating that will ensure significant sustainability principles will be incorporated into the design, appropriate management practices are applied through the construction period and facilities and resources are provided to ensure the delivery and operation of the building of the building has the potential to achieve the sustainability objectives.