

LANDCOM

# HILLS SHOWGROUND STATION PRECINCT

## ECOLOGICALLY SUSTAINABLE DEVELOPMENT REPORT

OCTOBER 2019

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## Hills Showground Station Precinct Ecologically Sustainable Development Report

Landcom

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# EXECUTIVE SUMMARY

Ecologically Sustainable Development (ESD) has been an integral part of the Project's development principles and the preparation of the concept plan. The ESD strategy for the proposed mixed-use development at the Hills Showground Station Precinct, successfully meets the requirements defined in the relevant planning and policy documents. This is largely achieved through implementing Landcom's mandated sustainability initiatives in addition to the requirements prescribed by relevant levels of planning policy.

The Secretary's Environmental Assessment Requirements (SEARs) provide overarching requirements to be addressed by the Precinct, in line with the principles from the Environmental Planning and Assessment (EP&A) Regulation. Key issue No. 1, which relates to the Environmental Planning Instruments (EPIs), Policies and Guidelines has been addressed in section 1.6 of this report. In addition, key issue No. 14 of the SEARS, which relates specifically to ESD as detailed in section 1.6.1 of this report, covers the precautionary principle, intergenerational equality, biological diversity and ecological integrity, and finally valuation, pricing and incentive mechanisms.

Compliance with the SEARs and the referenced governing principles, is further detailed in Section 4 of this report, and will be achieved through implementation of the ESD initiatives throughout design and construction summarised in the table below.

Furthermore, the sustainability related controls required by planning policies applicable to the site have also been met, these include the 'Greater Sydney Region Plan, A Metropolis of Three Cities – Central City District Plan', 'The Hills Development Control Plan (DCP) (2012), Part D Section 19 - Showground Precinct Development Control Plan; and the Hills Environmental Strategy (draft version).

Sustainability initiatives that have confirmed commitment by Landcom have also been considered as mandated requirements. The ESD Framework Strategy put forward with this report achieves compliance with all applicable planning and policy documents, as further detailed in Section 4.

The minimum requirements strongly focus on minimising energy and water consumption during operation and occupation of the Precinct. They also stipulate reductions in waste generation (and increased treatment), resilience to climate change projections, reduction of occupant's dependence on private transport and increase the amount of tree plantings and other types of green areas implemented into the design.

Further initiatives have also been discussed that could be investigated as the design progresses, maximising site specific opportunities and alignment with Landcom's Sustainable Places Strategy. The project has potential to score highly in the Green Star Design and As Built rating scheme, among the various other rating tools nominated for specific sustainability attributes (i.e. National Australian Built Environment Rating Scheme (NABERS) for residential energy consumption).

The concept design and ancillary studies undertaken as part of the planning phase, indicate that the required initiatives are being implemented. A summary of the ESD minimum mandatory requirements has been included in the table below, organised into categories reflecting the Green Star rating tool themes as the common nominated overarching rating tool. Other nominated rating tools (i.e. NABERS) to be used on various precinct space uses (i.e. residential and commercial) will contribute toward the Green Star rating.

Table 6.1 - Hills Stations Precinct ESD Mandatory Requirements Summary

| CATEGORY                     | OBJECTIVE   | MINIMUM MANDATORY REQUIREMENTS   | HILLS SHOWGROUND DESIGN RESPONSE  |
|------------------------------|---|--|---|
| General                      | <ul style="list-style-type: none"> <li>Overarching rating tools requirements to benchmark and drive ESD initiatives over project lifecycle</li> </ul>                   | <i>Policy Requirement:</i> <ul style="list-style-type: none"> <li>5-Star Green Star Design and As Built</li> </ul>   | <ul style="list-style-type: none"> <li>Commitment to complete mandated minimum rating requirements and other initiatives as further detailed in the various categories below</li> </ul>   |
| Management                   | <ul style="list-style-type: none"> <li>Integrate sustainability initiatives and considerations through best practice management processes</li> </ul>                    | <i>Policy Requirement:</i> <ul style="list-style-type: none"> <li>ESD Framework established for the precinct development (completed by this report)</li> </ul> <i>Tender Requirements*:</i> <ul style="list-style-type: none"> <li>Full Green Star credit points for Adaptation and Resilience credit (climate change)</li> <li>Supply Chain School engagement and training for commitment against modern slavery</li> </ul> | <ul style="list-style-type: none"> <li>Climate and Community Resilience Report completed</li> <li>Supply Chain School engagement commitment required from tenderers</li> <li>Committed sustainability initiatives acceptance required by tenderers</li> <li>Landcom's preferred and stretch targets are encouraged to tenderers</li> </ul>  |
| Indoor Environmental Quality | <ul style="list-style-type: none"> <li>Project initiatives that enhance indoor air quality, thermal, visual and acoustic comfort, and reduce occupant stress</li> </ul> | <ul style="list-style-type: none"> <li>Nil</li> </ul>  | <ul style="list-style-type: none"> <li>Natural light maximised through glazing and orientations</li> <li>Green spaces (vertical garden walls, roof gardens and green public space) are being implemented into the design</li> <li>A Concept Design Air Quality Assessment has been undertaken and provides recommendations for dwellings and buildings that may be impacted by road traffic emissions along Showground Road.</li> </ul> |
| Energy                       | <ul style="list-style-type: none"> <li>Reduce energy consumption and procurement of low emission generating energy sources</li> </ul>                                   | <i>Policy Requirement:</i> <ul style="list-style-type: none"> <li>5 Star NatHERS energy rating (residential)</li> <li>4.5 NABERS Energy (non-residential)</li> <li>BASIX 25-35 Energy rating (dependant on building height)</li> </ul>   | <ul style="list-style-type: none"> <li>Design maximising natural light, considerations for orientations and building fabric to enhance thermal performance</li> <li>Energy efficient lighting, and other building systems to be incorporated as design develops</li> </ul>  |

| CATEGORY             | OBJECTIVE  | MINIMUM MANDATORY REQUIREMENTS   | HILLS SHOWGROUND DESIGN RESPONSE   |
|----------------------|--|--|--|
| Transport            | <ul style="list-style-type: none"> <li>— Reduce dependence on private vehicle use by access to public transport, amenities and facilities to encourage alternative means of transport</li> </ul> | <p><i>Tender Requirements:</i></p> <ul style="list-style-type: none"> <li>— Include at least 10% of total parking spaces to have Electric Vehicle charging stations</li> </ul> | <ul style="list-style-type: none"> <li>— Access to public transport directly adjacent to development</li> <li>— Diverse range of amenities in immediate surrounds</li> <li>— EV charging ports being provided</li> <li>— End of trip facilities to be encouraged</li> <li>— Traffic study undertaken, parking quantum under DCP allowances</li> </ul>  |
| Water                | <ul style="list-style-type: none"> <li>— Reduce consumption of potable water consumption</li> </ul>  | <p><i>Policy Requirement:</i></p> <ul style="list-style-type: none"> <li>— BASIX Water rating of 40</li> </ul>   | <ul style="list-style-type: none"> <li>— Integrated Water Cycle Management undertaken and to be initiatives to be implemented as design develops. These include reduction and slowing of runoff, and stormwater treatment prior to discharge</li> <li>— Implementation of rainwater tanks</li> <li>— Efficient water consuming fixtures (taps, toilets, showers etc.) and supplementary building equipment</li> <li>— Efficient irrigation methods and use non- potable water</li> </ul> |
| Materials            | <ul style="list-style-type: none"> <li>— Assess and reduce footprint of major construction materials</li> <li>— Minimise and/or increase re-use of waste material</li> </ul>                     | <ul style="list-style-type: none"> <li>— Nil</li> </ul>  | <ul style="list-style-type: none"> <li>— Life-cycle Assessment (LCA) to be undertaken for the building materials</li> <li>— Considerations for use of sustainable fit out materials and fixtures</li> <li>— Waste management plan to be undertaken</li> </ul>  |
| Land Use and Ecology | <ul style="list-style-type: none"> <li>— Minimise projects footprint on local land and ecology</li> <li>— Reduce urban heat island effect</li> </ul>   | <p><i>Tender Requirements:</i></p> <ul style="list-style-type: none"> <li>— Full credit points for Heat Island Effect credit</li> </ul>  | <ul style="list-style-type: none"> <li>— 75% of the development plan area to reduce the impact of heat island effect (in line with Green Star requirements)</li> <li>— Arboricultural Impact Assessment undertaken identifies trees of high value, prescribing retention and protection</li> </ul>   |

| CATEGORY   | OBJECTIVE   | MINIMUM MANDATORY REQUIREMENTS                          | HILLS SHOWGROUND DESIGN RESPONSE  |
|------------|---|---|---|
|            |   |   | <ul style="list-style-type: none"> <li>— No significant findings identified within the Biodiversity Development Assessment Report (BDAR) and as such the measures required for the Site development, will only increase ecological and biodiversity values</li> </ul> |
| Innovation | <ul style="list-style-type: none"> <li>— Project innovations going above standard industry ESD initiatives</li> </ul> | <ul style="list-style-type: none"> <li>— Nil</li> </ul> | <ul style="list-style-type: none"> <li>— Photovoltaic (PV) system to be further investigated</li> <li>— Affordable housing component to be included as part of the residential development</li> </ul>   |

\* Tender Requirements pertaining to Hills Showground Station Precinct Returnable Schedule 7 - Sustainability.



# 1 INTRODUCTION

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## 1.1 OVERVIEW

This report has been prepared for Landcom on behalf of Sydney Metro to support a State Significant Development Application (SSDA) under Section 4.22 of the *Environmental Planning and Assessment Act 1979 (EP&A Act)*.

The concept for which approval is sought (the 'Concept Proposal') is for a high-density mixed-use precinct with a new public park and plaza, and associated facilities on land located within the Hills Showground Station Precinct (the 'Site') on development lots (Lot 53, Lot 55 and 56 in DP 1253217) (the 'DA Area') (Refer Figure 1.1).

The Concept Proposal comprises residential and non-residential land uses and building envelopes of varying heights from four (13m) to up to twenty storeys (68m). The proposal also includes a new road, landscaping, services and the provision of publicly accessible open space in the form of Doran Drive Plaza and a park. Concept Proposal comprises a total gross floor area (GFA) of 175,796m<sup>2</sup> across all three development lots.

The Concept Proposal meets the criteria to be declared a State Significant Development (SSD) under State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP).

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## 1.2 SITE DESCRIPTION

### 1.2.1 HILLS SHOWGROUND STATION PRECINCT

The term 'the Site' reflects the Hills Showground Station Precinct boundary identified in the SRDP SEPP and includes the areas detailed in Table 1.1 and illustrated in Figure 1.1. The Site has a total area of 8.4 hectares.

Table 1.1 Hills Showground Station

| EXISTING USE   | LEGAL DESCRIPTION       | ADDRESS                        |
|--|-------------------------|--------------------------------|
| Sydney Metro commuter carpark and plaza                      | Lot 52 1253217          | 3 De Clambe Drive, Castle Hill |
| Development Lot – Hills Showground Precinct West             | Lot 53 DP 1253217       | 5 De Clambe Drive, Castle Hill |
| Development Lot – Doran Drive Precinct                       | Lot 55 DP 1253217       | 2 Mandala Parade Castle Hill   |
| Development Lot – Hills Showground Precinct East             | Lot 56 DP 1253217       | 3 Andalusian Way, Castle Hill  |
| Hills Showground Station Box and service facility boxes      | Lot 54 & Lot 50 1253217 | 1 Mandala Parade, Castle Hill  |
| Mandala Parade, De Clambe Drive, Doran Drive, Andalusian Way | N/A                     | N/A                            |



Figure 1.1 The Hills Showground Station Precinct (The Site) Source: Cox Architecture 2019

The eastern part of the Site (Hills Showground Precinct East – Lot 56 DP 1253217) currently contains the former Council administration building and associated parking and landscaping. It was being used as a Sydney Metro’s construction site office but is proposed to be demolished by way of a separate DA (304/2020/LA) currently under consideration by Council.

The western part of the Site contains the recently opened Hills Showground Metro Station, plaza and commuter car park. The remainder was cleared to create the two development lots (Lots 53 and Lot 55 DP 1253217) and the roads listed in the table above.

Former development on the western part of the Site consisted of The Hills Entertainment Centre which included an Auditorium and Council’s works depot that were demolished to make way for the metro.

The Site is bordered by the following:

- North and northwest – De Clambe Drive with a drainage basin and the Castle Hill Showground further north
- West – De Clambe Drive and Cattai Creek riparian zone with commercial/industrial warehouses further west
- South to southeast – Carrington Road across which are low density residential developments, a child care and medical/physiotherapy
- East – Showground Road across which are low density residential development.

### 1.2.2 HILLS SHOWGROUND STATION DEVELOPMENT LOTS (DA AREA)

The Concept Proposal relates to the three development lots detailed in Figure 1.1 and Table 1.2, and referred to herein as the ‘DA Area’. This land is currently owned by Sydney Metro.

Table 1.2 Hills Showground Station Precincts

| PRECINCT NAME                  | LEGAL DESCRIPTION | ADDRESS                        | DESCRIPTION OF EXISTING DEVELOPMENT  | PRECINCT AREA (M2) |
|--------------------------------|-------------------|--------------------------------|--|--------------------|
| Hills Showground Precinct West | Lot 53 DP 1253217 | 5 De Clambe Drive, Castle Hill | L shaped vacant lot with existing stormwater drainage easement on the portion adjacent to De Clambe Drive. | 3,293              |
| Doran Drive Precinct           | Lot 55 DP 1253217 | 2 Mandala Parade, Castle Hill  | Rectangular vacant lot with no vegetation.   | 7,969              |
| Hills Showground Precinct East | Lot 56 DP 1253217 | 3 Andalusian Way, Castle Hill  | Former two storey Council administration building and associated parking and landscaping.                  | 28,226             |

## 1.3 PLANNING CONTEXT

The Site is located in The Hills Shire local government area (LGA), 25km north-west of the Sydney CBD and in proximity to the following centres in the region accessible along the North West Metro: Castle Hill, Norwest Business Park and Rouse Hill Town Centre.

The Site forms part of the broader Showground Station Precinct (figures below) covering 271 hectares, rezoned in 2017 as part of the Department of Planning, Industry and Environment's (The Department) priority precinct program. The rezoning of the Precinct, along with changes to height, density, and lot size controls, as well as other supporting controls will:

- transform the area around the new Hills Showground Station into a vibrant urban centre
- provide for a maximum of 5,000 new dwellings and 2,300 new jobs over 20 years
- deliver nearly two hectares of parks and new open space
- provide community facilities, recreation areas and a mix of housing choice for people at all life stages.

This rezoning of the broader precinct followed the finalisation of the North West Rail Link Corridor Strategy in September 2013 by the Department and Transport for NSW (TfNSW) to guide planning and development along the rail corridor, with a Structure Plan prepared for each of the new eight stations. Subsequently, the Hills Shire Council (Council) unanimously voted to nominate the Showground Station Precinct, along with the Bella Vista Station and Kellyville Station Precincts, as Priority Precincts. These precincts were subsequently announced by the NSW Government in August 2014 as a means of implementing the Corridor Strategy and the Council's own corridor strategy known as 'The Hills Corridor Strategy adopted in November 2015'.

The planning controls for the Site and the broader Showground Station Precinct are set out in The Hills Local Environmental Plan 2012 (THLEP) and supported by site specific controls in The Hills Development Control Plan 2012 (THDCP).

The Site is envisaged to be developed to accommodate a high-density mixed-use precinct in line with the planning controls:

- Hills Showground Precinct West (Lot 53 DP 1253217) is zoned B2 Local Centre with maximum height of 68m (20 storeys) and Floor Space Ratio (FSR) of 5:1;
- Doran Drive Precinct (Lot 55 DP 1253217) is zoned B2 Local Centre with maximum height of 68m (20 storeys) and FSR of 4:1; and



- Hills Showground Precinct East (Lot 56 DP 1253217) is zoned R1 General Residential with a maximum building height of 52m (16 storeys) and FSR of 3:1.

An excerpt of the zoning of the Site and broader Showground Precinct is provided at Figure 1.2.

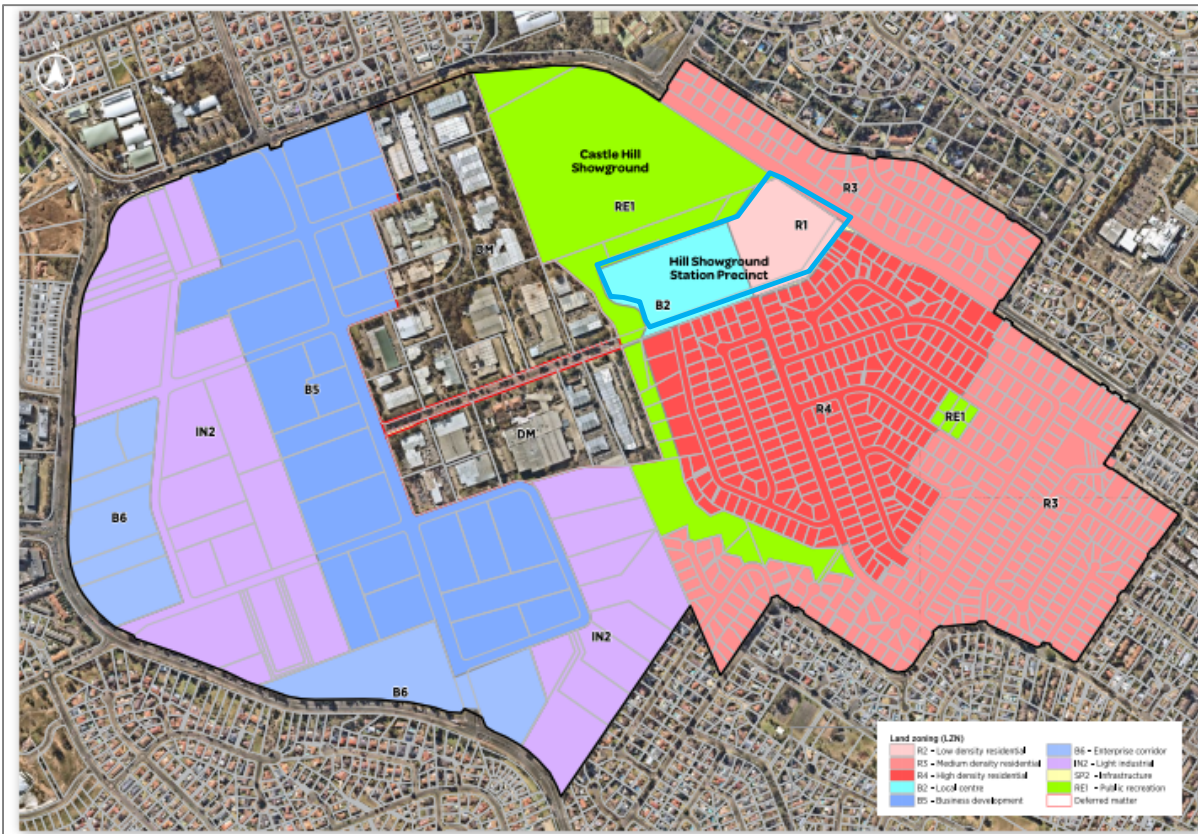


Figure 1.2 Zoning of the broader Showground Station Precinct (Source: DPIE)

## 1.4 CONCEPT PROPOSAL

The DA will specifically seek approval for a Concept Proposal comprising of:

- A maximum gross floor area (GFA) of 175,796 m<sup>2</sup> equating to up to approximately 1,900 dwellings including affordable housing;
- A maximum GFA of 13,600m<sup>2</sup> for non-residential development (commercial, retail and community facilities);
- Building envelopes, and allocation of GFA to the three precincts totalling an allocation of 175,679m<sup>2</sup> GFA;
- Landscape concept for the public domain detailing the extent of public domain including streets, pedestrian pathways, provision of Doran Drive Plaza to be a minimum of 1,400m<sup>2</sup> and a new Park on Precinct East to be a minimum of 3,500m<sup>2</sup>;
- Provision of car parking and bicycle parking
- Strategies for utilities and services provision, managing stormwater and drainage, achievement of ESD and design excellence;
- Staging plan addressing the timing of future subdivision, construction, release and development of land;
- Concept principal subdivision of development Lot 56 DP 1253217 into future major lots, public domain areas and roads.

Refer Figure 1.3 for excerpt of the Concept Proposal Reference Scheme and Figure 1.4 for an excerpt of the Height Plan.

No building or construction works are proposed to be undertaken as part of this Concept Proposal. Once the SSDA is approved, the successful purchasers of the development precincts and/or lots from Sydney Metro, will be responsible for submitting subsequent DAs for the design and construction of the buildings and public domain areas in accordance with the approved Concept.



Figure 1.3 Concept Proposal Reference Scheme (Source: Cox Architecture, 2019)

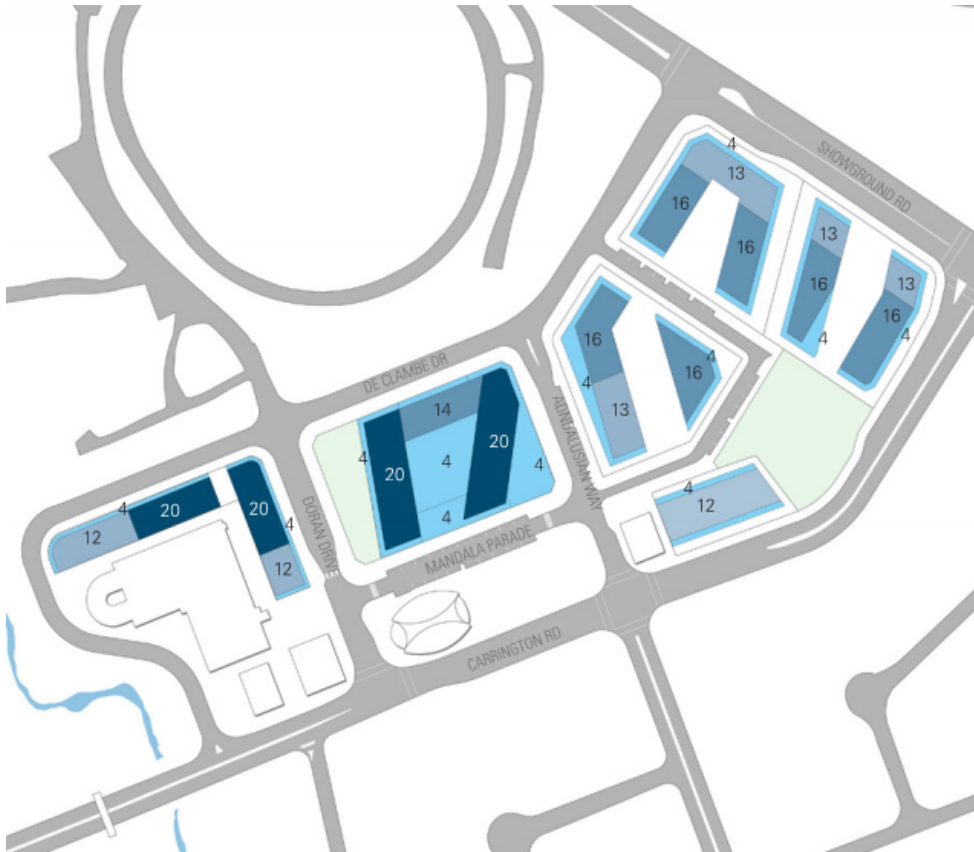


Figure 1.4 Height plan (Source: Cox Architecture, 2019)

## 1.5 APPROACH

This report establishes an ESD Framework for the Site, outlining key sustainability themes and objectives to guide the project from concept design to construction and occupation. The report forms part of the Environmental Impact Statement (EIS), and has been developed to align requirements, targets and initiatives from the following:

- Secretary's Environmental Assessment Requirements (SEARs);
- Greater Sydney Region Plan, A Metropolis of Three Cities – Central City District Plan;
- The Hills Development Control Plan (DCP) (2012), Part D Section 19 - Showground Precinct Development Control Plan;
- The Hills Environment Strategy 2019 (draft version); and
- Landcom's Sustainable Places Strategy.

The report structure follows the methodology undertaken to develop the strategy to meet the various ESD requirements and initiatives contained in the documents above. This includes:

- an introduction to the proposed site development;
- investigation into the applicable policy and planning documentation;
- an overview of Landcom's Sustainable Places Strategy;
- an overview of common requirements for rating tools and standards;

- summary of all requirements and initiatives for comparison, overlap and gap analysis;
- define the ESD strategy for implementation in remaining planning stage, construction through to operation.

With this approach, it is ensured that at this concept stage, a suitable level of detail is being assessed for the large number of considerations from the various governing documents, while producing a strategic framework that is both satisfactory to proceed with planning approval and further design development. In order to be effective as the design and details of the development are advanced, it is important that the strategy is a high-level assessment to reflect this early stage of the project.

In summarising the requirements and initiatives comparison, the ESD Framework is arranged into ESD themes that enable categorisation of initiatives from the governing documentation. Given that the Green Star rating tool is a mandatory requirement from two of the governing documents, the themes used within the rating tool will be used as the categories for comparison of all requirements. These are widely accepted by industry as standard themes, and using these avoids adding another layer of complexity in comparing all requirements. The requirements also clarify the mandatory initiatives compared to those that are optional.

### 1.5.1 REQUIREMENTS TERMINOLOGY

The table below provides the terminology and definitions used throughout the report relating to requirements and goals.

Table 1.3 ESD Requirements and Goals Terminology

| TERMINOLOGY                                      | DEFINITION   |
|--|--|
| Minimum Mandatory Requirements                   | These are the minimum mandatory requirements for the development prescribed by either the planning and policy documents, or nominated as mandatory in the Tender Requirements pertaining to Hills Showground Precinct East ITT Returnable Schedule 7.  |
| Measures to be Targeted at Detailed Design Stage | These are requirements nominated as preferred in the Tender Requirements in the Hills Showground Precinct East ITT Returnable Schedule 7. documentation or are applicable targets for the Site from Landcom's Sustainable Places Strategy and these must be investigated further and incorporated where possible at the detailed design stage.               |
| Overarching ESD Goals                            | Further detailed in Section 5.1, these are the overarching principles within Landcom's Sustainable Places Strategy, which are end goals, rather than prescriptive ESD initiatives that are suitable for the current proposal (i.e. BASIX water rating of 60). This encourages developers towards continual improvement, rather than minimum compliance only. |



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## 1.6 ESD POLICY AND PLANNING CONTEXT

There are regional and local policy documents, as well as planning controls, that are applicable in governing the ESD related requirements for the proposed development. These include;

- Secretary's Environmental Assessment Requirements (which provide further detail to the overarching EP&A Regulation);
- State Environmental Planning Policies (SEPPs);
- Greater Sydney Region Plan, A Metropolis of Three Cities – Central City District Plan;
- The Hills Development Control Plan (2012), Part D Section 19 - Showground Precinct Development Control Plan; and
- The Hills Environment Strategy 2019 (draft version).

The following sections provide further detail around the ESD aspects of each of these documents. The requirement extracted from the following planning and policy documentation applicable to the Site, are addressed by implementing the ESD Strategy put forward in Section 3, and a response to how each requirement is met, is directly responded to in Section 4.

### 1.6.1 SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

The Secretary's Environmental Assessment Requirements (SEARs) represent the highest level of policy to be addressed. ESD has been an integral part of the Project's development principles and the preparation of the concept plan, and as such, considerations have been made for the Environmental Planning and Assessment Act (EP&A) Regulation ESD ideologies covering the precautionary principle, intergenerational equality, biological diversity and ecological integrity, and finally valuation, pricing and incentive mechanisms. The SEARs have been provided within the scope to be addressed as part of the EIS, which include the following of relevance and central to this report.

*The EIS shall identify how ESD principles (as defined in clause 7(4) Schedule 2 of the EP&A Regulation 2000) will be incorporated in the design, construction and operation of the development, including commitments to relevant industry benchmarks and best practice in waste and water management strategy.*

The Environmental Planning and Assessment (EP&A) Regulation (2000) Clause 7(4) Schedule 2, provides the ESD principles and definitions as follows:

1. the precautionary principle, namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by
  - a careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and
  - b an assessment of the risk-weighted consequences of various options,
2. inter-generational equity, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,
3. conservation of biological diversity and ecological integrity, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,
4. improved valuation, pricing and incentive mechanisms, namely, that environmental factors should be included in the valuation of assets and services, such as:
  - a polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,
  - b the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,



- c environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

These are the key overarching guiding principles and rationale for the preparation of this report. They are responded to directly in Section 4 of the report.

### **1.6.2 STATE ENVIRONMENTAL PLANNING POLICIES**

Regulations under the SEPP have been established to encourage sustainable residential development, measured using the Building Sustainability Index (BASIX) scheme. The intention of the scheme is to achieve the States 40% reduction target for potable water consumption and 25% reduction for greenhouse gas emissions (through reduction in energy consumption and improvement of thermal performance) in new residential buildings. As per the policy, the BASIX scheme only applies to residential dwellings.

The East Precinct levels range from 4 to 16 storeys, while the West Precinct and Doran Drive Precinct, range from 4 to 20 storeys. The mandatory target set by the SEPP is a BASIX rating of 25 for Energy for high-rise buildings (6 storeys or higher), and 35 for mid-rise (4-5 storey unit buildings). The minimum BASIX Water rating prescribed by the SEPP is 40 for all new residential developments. It should be noted that Landcom's requirements for BASIX Energy are more stringent than the minimum provided in the SEPP being set at BASIX 40 (further detailed in Section 3.2)

### **1.6.3 GREAT SYDNEY REGIONAL PLAN, A METROPOLIS OF THREE CITIES – CENTRAL CITY DISTRICT PLAN**

The Great Sydney Regional Plan, A Metropolis of Three Cities has been developed and covers five districts. The Central City District Plan is applicable to the Project, and includes several sustainability objectives for the area. These include:

**Planning Priority C19. Reducing carbon emissions and managing energy, water and waste effectively.**

- Objective 33: A low-carbon city contributes to net-zero emissions by 2050 and mitigates climate change.
- Objective 34: Energy and water flows are captured, used and re-used.
- Objective 35: More waste is re-used and recycled to support the development of a circular economy.

**Planning Priority C20. Adapting to the impacts of urban and natural hazards and climate change.**

- Objective 36: People and places adapt to climate change and future shocks and stresses.
- Objective 37: Exposure to natural and urban hazards is reduced.
- Objective 38: Heatwaves and extreme heat are managed.

### **1.6.4 THE HILLS ENVIRONMENT STRATEGY 2019 (DRAFT VERSION)**

The Hills Environment Strategy 2019 (draft) has been reviewed and is in line with The Hills DCP, and more specifically for the Site, Part D Section 19 Showground Station Precinct. The Hills Environmental Strategy provides high level guide to planning for and management of the environment within the Council area, focusing on:

- protecting areas of high environmental value and significance;
- promoting increased urban tree canopy cover;
- management of natural resources and waste responsibility; and
- prepare residents for environmental and urban risks and hazards.

While in line with the DCP sitting above this local government strategy, it does not provide further specificity on development controls or objectives above those in the DCP. The key themes and general objectives included in the strategy are as follows:

- Biodiversity
  - Protecting endangered fauna and flora, and more generally environmental habitats and ecosystems
  - Increasing urban tree canopy to mitigate the urban heat island effect, supporting cleaner air and water, and provides local fauna habitat
- Natural Resources
  - Increase uptake of adopting renewable energy generation
  - Protection of local waterways and the water quality, including wetlands
  - Reduction of potable water consumption and increased use grey water initiatives (measured through use of Building and Sustainability Index (BASIX))
  - Implementing Water Sensitive Urbane Design (WSUD)
  - Waste education, generation and transportation
  - Evolving smart cities for better monitoring and management of natural resource consumption
- Environmental and Urban Risks + Hazards
  - Bushfire and flooding assessments and preparation for high risk areas
  - Urban heat island and extreme weather events
  - Risks of pollution and public health through decreased air and water quality as well as noise and odours.

These key themes and general objectives of The Hills Environment Strategy are considered to be in line with other planning and policy documentation. Given the requirements are more prescriptive in the DCP and SEARs, demonstrating compliance with those within this report is understood to support the intentions of The Hills Environment Strategy.

### 1.6.5 THE HILLS DEVELOPMENT CONTROL PLAN

The Hills Development Control Plan (DCP) (2012) has been prepared by The Hills Shire Council in accordance with Environmental Planning and Assessment Act 1979 for the guidance of preparation and assessment of development applications. This overarching DCP document, outlines that developments are required to meet Council's ESD objectives in order to fulfil the statutory responsibilities required by Schedule 2 of the EP&A Regulation; the Local Government Act 1993. Council's overarching DCP ESD Objectives are as follows:

- ESD 1: To apply the precautionary principle where development is likely to cause short or long-term irreversible or serious threats to the environment.
- ESD 2: To allow for broad community involvement in respect to issues of concern throughout the development process.
- ESD 3: To ensure during the design, construction and operation of the development, that water is utilised efficiently and that water leaving the site is of a quality and quantity comparable to that which is received.
- ESD 4: To ensure that biodiversity and the integrity of ecological processes are not compromised by the development.
- ESD 5: To promote the following during the design, construction and operation of development:
  - the use of energy efficient materials and designs utilisation of renewable energy & materials; and

- energy efficient technology.
- ESD 6: To follow the principles of the ‘Waste Hierarchy’ (reduce, reuse, recycle) in the use of materials and the design of waste recovery and disposal systems throughout the development process.
- ESD 7: To protect neighbourhood amenity and safety in the design and construction and operation of the development.
- ESD 8: To encourage the long-term economic viability and health of the community in the development process.
- ESD 9: To encourage the use of public transport, bicycles and pedestrian trips in the development and design process.

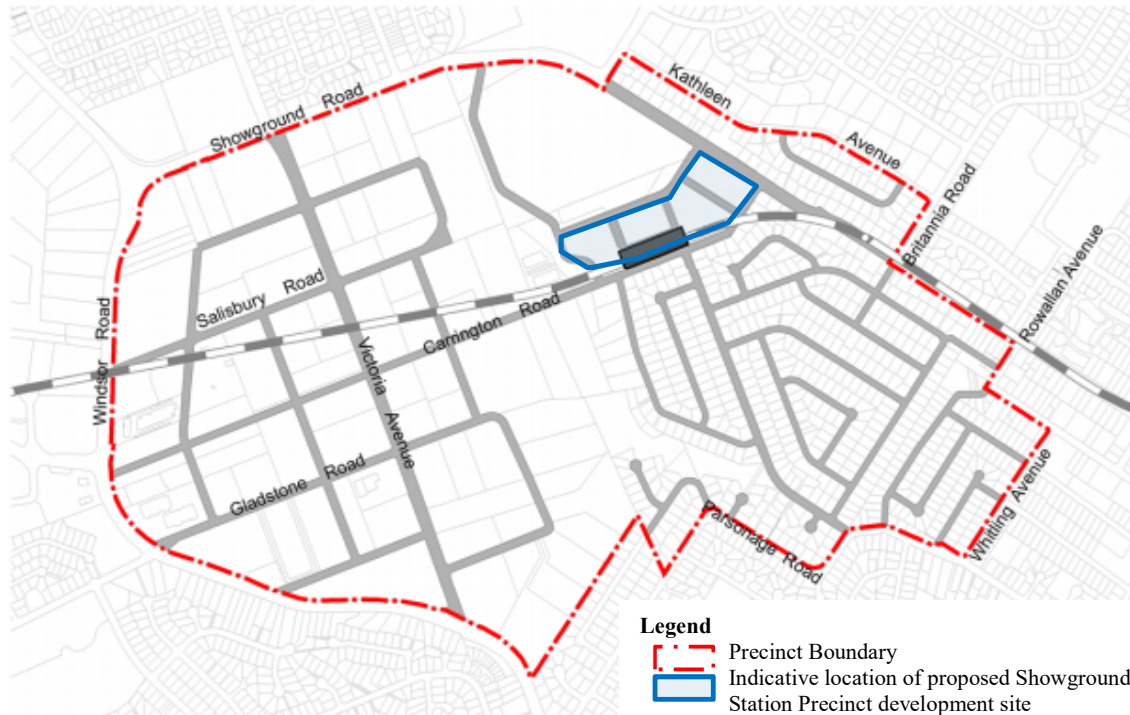


Figure 1.5 Showground Station Precinct DCP boundary and proposed development site (*The Hills DCP, 2012*)

#### 1.6.5.1 SHOWGROUND STATION PRECINCT

Further to Section 1.6.5, Part D Section 19 of The Hills DCP, Showground Station Precinct, provides more specific controls for the wider Showground Station Precinct in which the Site is located. The Showground Station Precinct land area, and indicative location of the proposed development site are shown in Figure 1.5.

Part D Section 19 of the DCP, includes the following ESD objectives and controls applicable to the Site (Clause 4.8):

**OBJECTIVES**

- A. To ensure building design is innovative and sustainable to reduce the reliance on, and consumption of, fossil fuels and potable water supplies.
- B. Development adapts to climate change.
- C. Development contributes to improved quality of life, health and well-being of the community.
- D. The design, construction and operation of development minimises adverse impacts on the natural environment.
- E. Use landscape treatments to improve amenity for people using open space.

#### CONTROLS

1. Residential flat buildings, townhouses and terraces built as a development lot should achieve a minimum 5 star Nationwide Housing Energy Rating Scheme (NatHERS) energy rating for each dwelling unit.

2. Development other than residential should achieve a minimum 5-star Green Star Design and as Built rating, respectively.
3. Building operation should achieve a minimum 4.5-star base building and tenancy NABERS Energy rating, where applicable.
4. The incorporation of green walls and roofs into the design of commercial and residential buildings is encouraged. Where suitable, building facades should incorporate vertical landscaping features to soften the visual bulk of buildings and to improve streetscape appeal.
5. Canopy trees are to be planted within street verges and medians to provide shade and reduce pavement surface temperatures. Understorey planting and permeable surfaces should also be provided where possible to reduce the extent of paved areas and to enhance the amenity of the streetscape environment.
6. Buildings are encouraged to incorporate a tri-generation facility that provides energy-efficient power, heating and air conditioning for use on site.
7. Building designs are to:
  - a) Maximise the use of natural light and cross ventilation;
  - b) Reduce the reliance on mechanical heating and cooling through the use of eaves, awnings, good insulation and landscaping;
  - c) Include energy efficient light fittings and water fittings; and
  - d) Allow for separate metering of water and energy usage for commercial and multi-unit tenancies.

The policy from the Showground Station Precinct section of the DCP (Part D Section 19) relating to ESD is summarised in Table 1.4 below. Where controls use 'encouraged' terminology and have been considered applicable to the Precinct development, these have been adopted as measures to be targeted at detailed design stage.

Table 1.4 Summary of the Showground Station Precinct DCP ESD requirements

| MINIMUM MANDATORY REQUIREMENTS   | MEASURES TO BE TARGETED AT DETAILED DESIGN STAGE   |
|--|--|
| All residential 5 Star NatHERS   | Tri-generation (however, unlikely to be viable)  |
| Non-residential 5-Star Green Star  | Incorporation of green walls and roofs, and vertical landscaping where possible  |
| 4.5 NABERS Energy (assumed to be non-residential as wording refers to base building and tenancy) | Canopy trees, understorey planting and permeable paving to the extent possible   |
|  | Maximise natural light, cross ventilation and passive design; energy efficient lighting and ventilation, separate metering of energy and water across commercial and multi-unit tenancies. |

# 2 ECOLOGICALLY SUSTAINABLE DEVELOPMENT

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## 2.1 INTRODUCTION

The ESD framework for the Precinct aligns the policy requirements for the Site, with Landcom's Sustainable Places Strategy, and further identifies opportunities for the development that can be investigated as design is progressed. It is essential for an aligned strategy to be developed within this planning stage to successfully carry initiatives through design, construction and into operations of the development. By providing development that considers and implements ESD principles, it enables occupants to live and work within the precinct with a lower environmental impact. It also provides for the opportunity for more interest and understanding to stem from the initiatives applied in the immediate surrounds to carry through to other aspects of occupant's lifestyle.

This section of the report provides detail from Landcom's Sustainable Places Strategy applicable to this development, with mandated and preferred initiatives to be considered. A summary is provided of the combined policy and planning documentation (Section 1.6), and Landcom's strategy requirements ESD with a brief introduction to rating tools that are prescribed by those requirements.

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## 2.2 LANDCOM'S SUSTAINABLE PLACES STRATEGY

Landcom have developed their 'Sustainable Places Strategy' which demonstrates their high level of commitment to social, environmental and economic shared value. The sustainability strategy consists of goals, targets and ambitions, which fit within four main categories. These include:

- Climate Resilient Places;
- Healthy and Inclusive Places;
- Productive Places; and
- Accountable and Collaborative Places.

Of the applicable goals, targets and ambitions, Landcom have mandated several that relate to ESD for the Hills Showground Precinct, as outlined further in Section 2.2.1. Other applicable measures within Landcom's Sustainable Places Strategy as further detailed in Table 3.1 are to be targeted at detailed design stage. This prescribed that they must be further assessed and worked towards as design progresses.

Both the mandated minimum requirements and measures to be targeted at detailed design stage are in most cases prescriptive and suitable for the present time. The underlying higher-level targets, nominated as overarching ESD Goals that are part of Landcom's Sustainable Places Strategy (ie. net zero embodied energy in projects) are further detailed in Section 5.1. These three levels of requirements and initiatives (further defined in Section 1.5.1) have been segregated to be separated to provide clarity on meeting requirements from the policy and planning documentation, driving success of Landcom's sustainability strategy, while highlighting opportunities for the project to further its ESD initiatives as time progress and current measures become outdated.

### 2.2.1 LANDCOM MANDATED MINIMUM REQUIREMENTS

Targets taken from Landcom's Sustainable Places Strategy are mandatory, where it has been requested that respondents to the Tender Requirements for Hills Showground Precinct East ITT Returnable Schedule 7, are required to accept that they will meet the ESD initiatives. For the Hills Showground Precinct development, these include:

1. To adopt an industry recognised, rating (i.e. Green Star):

- a 5-star Green Star Design and As Built certification;
- 2. Climate Change Adaptation Plan:
  - a Climate Change Risk Assessment; and
  - b Achieve full points in Green Star – Adaptation and Resilience credit;
- 3. Urban Heat Island:
  - a Achieve full points in Green Star - Urban Heat Island Effect credit;
- 4. Supply Chain School:
  - a Must not engage in modern slavery practices and will commit to membership to the Sustainability Supply Chain School (free), and to continued engagement and training for staff;
- 5. Electric Vehicle Charging Stations:
  - a Include shared Electric Vehicle (EV) charging points or fast-charge stations on the basis that the total number of EV charging points or fast-charge stations to be 10% of the total number of parking spaces provided in the Project.

In addition to the minimum mandated requirements above, Landcom encourage that a range of other initiatives are included with regards to water, energy and emissions, climate and resilience, waste and materials, and health, equity and inclusion. These are examined further in Section 3 of this report.

## 2.3 ESD REQUIREMENTS SUMMARY

The following table provides a summary of the specific ESD requirements for the precinct as required from state, regional and local policy (Section 1.6), and from Landcom's own mandatory requirements for this development.

Table 2.1 ESD mandatory requirements summary

| CATEGORY         | MINIMUM POLICY AND PLANNING REQUIREMENTS   | LANDCOM MINIMUM MANDATORY REQUIREMENTS TO BE ADDRESSED AT DETAILED DESIGN  |
|------------------|--|--|
| ESD Rating Tools | <ul style="list-style-type: none"> <li>— 5-Star Green Star</li> <li>— 4.5 NABERS Energy (non-residential)</li> <li>— 5 Star NatHERS Energy Rating (residential)</li> <li>— BASIX 25-35 Energy rating, Water 40 rating</li> </ul>   | <ul style="list-style-type: none"> <li>— 5 Star Design and As Built (whole site), with full points in:               <ul style="list-style-type: none"> <li>— Heat Island Effect credit</li> <li>— Adaptation and Resilience (climate change)</li> </ul> </li> </ul> |
| Other            | <ul style="list-style-type: none"> <li>— Maximise natural light, cross ventilation and passive design; energy efficient lighting and ventilation, separate metering of energy and water across commercial and multi-unit tenancies.</li> <li>— Canopy trees, understorey planting and permeable paving to the extent possible</li> </ul> | <ul style="list-style-type: none"> <li>— Supply Chain School engagement and training for commitment against modern slavery</li> <li>— Include 10% of total parking spaces to have EV charging stations</li> </ul>  |

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## 2.4 MANDATORY ESD RATING TOOLS

This section of the report provides an overview of the mandated ESD rating tools required by either planning requirements (Section 1.6) or Landcom's Sustainable Places Strategy (Section 2.2.1). The purpose is to give a brief description of the tools and requirements in achieving the mandated level or score.

The application of these comprehensive and robust tools demonstrate that the proposal achieves ecologically sustainable development.

### 2.4.1 GREEN STAR

All use classes proposed at the Hills Showground Precinct are required to achieve a minimum 5-star Green Star rating, which is considered to be 'Australian Excellence' in terms of overall sustainability performance.

Green Star is a voluntary environmental rating system that assesses holistic sustainability attributes in the design, construction and operation of buildings, fit outs and communities. Administered by the Green Building Council of Australia (GBCA), it provides third party certification of the environmental design and operation of buildings in Australia. Points are awarded to the project when it complies with a range of credits and sums them up to achieve a final star rating.

The Green Star – Design & As Built tool can be applied to new buildings or major refurbishment projects. All space uses as defined by the BCA can be certified, apart from parking garages. Projects are assessed at both the design stage (optional) and as built stage (after Practical Completion). Certification is only issued for buildings that achieve four, five and six stars.

The Design and As Built Green Star tool considers the following key sustainability attributes:

- |                              |                        |
|------------------------------|------------------------|
| — Energy                     | — Land Use and Ecology |
| — Water                      | — Emissions            |
| — Transport                  | — Management           |
| — Indoor Environment Quality | — Innovation           |
| — Materials                  |                        |

Projects must target credits under each of these categories. Each credit is worth between 1 and 20 points, with the total number of points available being 100 (plus 10 innovation points). A star rating is awarded depending on the total number of points awarded to the completed project, as follows:

- 1 Star – Minimum Practice (only awarded in Performance Ratings): 10 - 19 points
- 2 Star – Average Practice (only awarded in Performance Ratings): 20 - 29 points
- 3 Star – Good Practice (only awarded in Performance Ratings): 30 - 44 points
- 4 Star – Australian Best Practice: 45 - 59 points
- 5 Star – Australian Excellence: 60 - 74 points
- 6 Star – World Leadership: 75+ points

To demonstrate compliance with the requirements of each credit, project teams must supply evidence in the form of drawings, specifications, product datasheets, invoices and reports as relevant.



## 2.4.2 NATHERS & BASIX

The residential elements of the Hills Showground precinct are required to achieve NatHERS 5-star energy rating by the DCP (Part D Section 19 - Showground Station Precinct). NatHERS is a rating scheme that predicts the energy efficiency of a home based on its design and provides a star rating out of ten. NatHERS certification is required across Australia for all new developments containing multiple dwellings<sup>1</sup>. It sets minimum standards for compliance in terms of water, thermal comfort and energy.

In addition to the mandated NatHERS rating, there are further requirements for BASIX rating for all new residential dwellings within NSW. As detailed in section 1.6.2 of the report, the State requires 25 for Energy for high-rise buildings (6 storeys or higher), and 35 for mid-rise (4-5 storey unit buildings).

The minimum BASIX Water rating prescribed by the SEPP is 40 for all new residential developments.

It should be noted that Landcom's requirements for BASIX Energy are more stringent than the minimum provided in the SEPP being set at BASIX 40 (further detailed in Section 3.2)

## 2.4.3 NABERS

And finally, the Hills Showground Station Precinct is required to achieve NABERS energy 5-star rating energy for the non-residential areas. Launched in 1999, NABERS is a voluntary<sup>2</sup> rating tool that may be used to measure a building's energy consumption, carbon emissions, water consumption, and waste production for comparison against similar buildings.

The key principles of NABERS are divided into metrics, including the calculation methodologies and rating scales that make up a NABERS rating; methods, including the system for managing the rating process, rules and quality assurance; and governance, including responsibilities for the oversight of the scheme, and stakeholder engagement principles (NABERS, 2016). These are outlined below.

|            |  |
|------------|--|
| Metrics    | Key principle 1: NABERS measures actual impact, not intent     |
|            | Key principle 2: NABERS is relevant to building operations     |
|            | Key principle 3: NABERS ratings are meaningful                 |
|            | Key principle 4: NABERS ratings are simple and easy to perform |
| Method     | Key principle 5: NABERS ratings are reliable                   |
| Governance | Key principle 6: NABERS management is trustworthy              |
|            | Key principle 7: NABERS development is collaborative           |

Figure 2.1 NABERS Key Principles

<sup>1</sup> NatHERS can also be used on single dwellings, if desired however this is currently not mandatory.

<sup>2</sup> Except for office spaces under the Commercial Building Disclosure (CBD) Program, which requires a Building Energy Efficiency Certificate (BEEC) as demonstrated using the NABERS Energy for offices rating.



# 3 ESD FRAMEWORK STRATEGY

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## 3.1 ESD FRAMEWORK

Given that both policy and planning documentation, and Landcom's sustainability strategy require that a Green Star rating be achieved for all areas of the development, the ESD framework has been structured by using the themes within Green Star. The subsections below briefly outline each of the category's aim, what it encompasses, and references other studies and work being undertaken as part of this planning/concept design phase. A summary table, again categorised by the Green Star credit themes, summarises where mandated requirements will contribute to the theme objectives and further provides the encouraged initiatives identified in Section 3.2.

The discussion for each of the following themes highlight contributions made to achieving the intentions of the overarching ESD principles required by the SEARs, which are directly responded to in Section 4.

### *MANAGEMENT*

The 'Management' category ensures sustainability is considered in critical decision making from a management level, including stakeholder engagement on the project, throughout all phases of the project lifecycle. The key objectives of the category seek to coordinate an integrated approach to sustainability in management of the project, to engender transparent and accountable management processes, and aims to foster sustainable cultures and behaviours throughout the project lifecycle.

Landcom's Sustainable Places Strategy aligns with the management objective by mandating that the development achieves a 5-star Green Star rating using the Design and As Built tool. This will require strategic direction on ESD, to be carried through all planning processes of the development, into the design, construction and consideration for the operation phase.

Adaptation and resilience is also covered within this management category ensuring that developments take climate change into consideration through design, completing a risk assessment and management plans for implementing mitigation measures. This has been undertaken with a Climate and Community Resilience Report completed by AECOM as part of the design development.

Key climate change risks have been identified as increases in temperature and extreme heat (high risk), extreme storms (medium risk) and extreme rainfall (medium risk). In addressing these risks, recommendations have been put forward as follows:

- to maintain and retain mature trees on the north-east and east to south east portion of the East Precinct, adjacent to Showground Road and Carrington Road providing canopy coverage;
- include rain gardens and green roofs to alleviate heat island impacts;
- undertake flood study with the inclusion of climate change projections for increased rainfall intensity;
- appropriately size stormwater infrastructure;
- multiple connection points for critical services to the precinct; and
- achieve a BASIX rating or Green Star credit for 'Adaptation and Resilience' credit.

These adaptations measures are being incorporated into the design and further investigation is required, specifically for flooding and stormwater modelling, before being fully compliant. At this stage of design however, the development and concept design aligns with the requirements of the Climate and Community Resilience Report.

There are significant ESD initiatives identified as preferred and stretch targets from Landcom's Sustainable Places Strategy, that if to be implemented will require further investigation and early initiation into design measures. These are further discussed in the sections below.

## INDOOR ENVIRONMENT QUALITY

The Indoor Environment Quality category includes project initiatives that enhance indoor air quality through measures such as ventilation and reduction in pollutants, thermal, visual and acoustic comfort. The planning documentation stipulates that buildings are designed to maximise natural lighting and ventilation, which also contribute to reducing energy consumption. Design is to align with the overarching targets of the Green Star credits within this category. An investigation is currently being undertaken into the modelled air quality expected for building occupants and adjacent spaces, with pollutants from the road network being a major consideration for some design elements such as building fabric openings, open space areas and location of air handling mechanical equipment.

GHD have provided a Concept Design Air Quality Assessment for the project, which has been carried out in line with relevant legislation and government guidance for air quality. The conclusions of the report are that there no air quality impacts anticipated from the Sydney Metro North West Rail Link or existing industrial sources in the local area.

Under worst-case conditions for road traffic emission however, predictions identified that the annual PM2.5 emissions may exceed the criteria for dwellings and buildings located directly along Showground Road. The following recommendations are made for any sensitive uses directly along Showground Road:

- The internal area of residential dwellings to be located at least 10m from the roadway
- Any balconies directly facing Showground Road on the ground and first floor should be able to be closed (i.e. a winter garden or sun room). Windows on the balcony should be openable/closable to allow the occupant to prevent direct air flow from Showground Road as desired.
- All dwellings and sensitive spaces to have mechanical ventilation/air conditioning that directly face Showground Road.
- Any sensitive uses (such as a childcare centre) should not be located directly facing Showground Road. If so, then rooms and spaces facing Showground Road should be maintained with air conditioning at all times and openable windows for emergency use only.
- Additional road traffic emissions modelling should be undertaken during detailed design.

## ENERGY

The 'Energy' category relates to energy consumption of the project throughout the construction and operational phases. Objectives of the category are to minimise absolute energy consumption within the operation stages of the project lifecycle. This is typically achieved through building systems efficiencies, passive design elements of buildings, appropriate space use consideration and design of building elements accordingly, and procuring minimal carbon emissive energy sources.

The design, while only at concept stage, has been developed to incorporate the required 5 Star NatHERS energy rating (residential) and 4.5 NABERS Energy (non-residential). This has been achieved through maximising natural light, cross ventilation and passive design of the building. While not yet specified, energy efficient lighting and separate metering of energy across commercial and multi-unit tenancies are planned for the development. The NatHERS and NABERS tools, passive design and energy efficiency measures, contribute positively to achieving Green Star 'Energy' category credits.

Going above meeting the minimum policy and committed requirements, the preferred and stretch targets identified within Landcom's Tender Requirements and Sustainable Places Strategy documentation enhance the buildings performance within the Green Star tool for energy related credits.

The Precinct also has potential to include capacity PV systems across certain roof areas. This is to be investigated further, as a means to drive down carbon emissions, and has potential for economic benefits through off-setting peak loading electricity tariff costs, as well as the total amount of energy consumption needing to be purchased. A PV system installation can gain Green Star points within the 'Energy' category, as well as 'Innovation'.

## TRANSPORT

The transport category encompasses occupant's dependency on emission intensive private vehicle transport methods. In reducing reliance on private car use, carbon emissions are reduced both directly from the decreased quantity of vehicles being used on a daily basis, but also emissions associated with construction and maintenance of the vehicles and road infrastructure network. The objectives of Green Stars credit are to have accessible public transport options available for occupants, proximity to diverse amenities, and facilitation and encouragement of alternative transport options (ie. bike, walk or EV).

The strategy for Traffic and Transport, a study undertaken by SCT Consulting has focussed on reducing transport impacts through facilitating development which supports best practice transit-oriented development principles. The report aims to adopt car parking rates that provide a balance between meeting car parking demand whilst encouraging sustainable and active transport use. Measures to be implemented encourage users of the development to make sustainable travel choices, such as providing low parking provision and excellent access to public and active transport.

The traffic and transport impact assessment concludes that the location of the site, directly adjacent to Hills Showground Station, will provide residents and employees with improved access to high frequency public transport services, which will provide an alternative to private vehicle use for site access. In addition, a strategy for restrained parking is proposed for the development concept to create a transit-oriented centre, reflecting the higher level of public transport services and to minimise additional congestion to the surrounding road network. Finally, the proposed cap on parking spaces below the DCP rates is expected to reduce the traffic impacts of this proposal. The additional vehicle trips will not have any significant adverse traffic implications on the public road network.

This strategy will support the project to score highly within the Transport category of the Green Star assessment which is focussed on the reduction of the carbon-intensive modes of transport. The precinct has the potential to score all available points across the following criteria:

- the selection of sites that have readily accessible public transport options;
- the selection of sites within close proximity of a diversity of amenities; and
- the facilitation and encouragement of the use of alternative transport options, such as bicycles or electric vehicles.

This goes above Landcom's preferred targets in achieving 5 points in Green Star credit, 'Sustainable Transport', and is assisted by the committed target to implement >10% of total number of parking spaces to have EV charging points.

## WATER

The water category of the development includes all initiatives associated with reducing the consumptions of potable water. This typically occurs through water efficiencies in fittings, fixtures and building equipment/systems, and water re-use schemes.

The strategy for water management at the Hills Showground precinct has been to develop an Integrated Water Cycle Management (IWCM) approach which aims to view each element in an integrated manner, to holistically manage the entire water cycle. This ensures water is conserved, treated to a standard that is fit for the intended use and reused where appropriate. Interaction with the environment (water quality, waterway ecosystem health), protection of flood corridors (Cattai Creek Corridor), management of stormwater runoff quality and quantity, and interaction with groundwater systems are considered in conjunction with water supply.

The IWCM strategy has established the water quality environment of the site and through a modelling process assessed the effects of the proposed concept options on stormwater quality, and identifies measures to protect the receiving environment from adverse water quality impacts. The strategy also aims to complement existing features that have been

included in the recent Metro station works, to limit re-work at the site. The water quality regime has been established through MUSIC<sup>3</sup> modelling of the Precinct.

This strategy has also established the water quality environment of the site and assessed the effects of the proposed development on stormwater quality to identify appropriate measures of environmental water quality protection. Water quality treatment devices included in this IWCMS:

- rainwater tanks (collecting from roof surfaces);
- gross pollutant traps and filtration devices at major discharge points of the precincts and catchments;
- the strategy also aims to complement existing features that have recently been built with the Metro station works to limit re-work at the site; and
- linear bioretention in garden beds (for additional treatment of runoff from the site).

The MUSIC model showed that stormwater harvesting within the Precinct has the potential to yield up to 4.02ML/year in some years, which will contribute to meeting the demand for non-potable water. This strategy developed thus far aligns with Landcom's preferred ESD initiative to implement a Water Sensitive Urban Design (WSUD) or other water management strategy to minimise storm water discharge and reduce pollutant loads.

Other preferred and stretch targets relating to potable and non-potable water consumption identified for the project include ratings in NABERS water (Office/commercial, hotel or retail), BASIX water (residential), minimum points within the Green star credits, implementation of a water management strategy (relating to storm water discharge and reduce pollutant loads) and stretch target to become 'water positive' in operations.

Achieving the preferred targets in NABERS and BASIX ratings schemes will require design to consider efficiency in the water consuming fixtures and fittings, as well as the building system as a whole. Similarly, achieving the preferred 5 points in Green Star 'Potable Water' credit will require a reduction demonstrated when comparing a predictive model of the proposed building water consumption against that of a reference building. There is opportunity within water related initiatives to perform strongly in the preferred BASIX and NABERS rating schemes and resultantly in the Green Star credits.

The water category within Green Star focusses on potable water consumption within the building. Achieving high credits in this category is considered achievable as there are many cost-effective fixtures and fittings that can be sourced to achieve the required consumption rates for 5-star performance. The water strategy to meet the Green Star requirements will focus on the following key areas:

- the selection of equipment that is more water efficient than comparable standard practice equivalents;
- the use of water-efficient supplementary equipment; and
- the selection of water-efficient toilets, taps and showers.

The Green Star tool also considers the irrigation in the assessment of potable water consumption. Rainwater tanks are proposed on each building within the development and are to feed the irrigation system, reducing the precincts consumption of potable water.

## **MATERIALS & WASTE**

The 'Materials' category of ESD initiatives encompasses those relating to the construction and fit out materials used within the precinct development. Given the design is at concept phase, specific material initiatives cannot be confirmed until the design is further developed. Landcom has stretch target to undertake a lifecycle assessment (LCA) on the

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<sup>3</sup> MUSIC is stormwater management software, designed to help urban stormwater professionals visualise possible strategies to tackle urban stormwater hydrology and pollution impacts. The software is owned by, eWater, an Australian Government not-for-profit organisation.

proposed precinct development to inform decisions around materials selection and quantity reduction to work towards zero carbon embodied energy on projects.

In undertaking the preferred and stretch targets for waste and materials assessment to inform selection and design, the precinct would be in a strong position to score highly in Green Star material related credits. Specifically, the credits cover completion of an LCA, considered selection of fit out and construction materials (material content and responsibly sourced), use of sustainable products and minimisation of construction/demolition waste.

Minimising the environmental impact of materials used for the project's construction contributes to minimising the environmental impacts of the project indirectly for the benefit of future generations. This assists in achieving the inter-generational equity principle required by the SEARs by contributing towards minimising impacts to health, diversity and productivity of environments outside of the Site.

## *LAND USE & ECOLOGY*

The land use and ecology category seeks to minimise the projects footprint on local land and ecology, reduce impacts from urban heat island effect and encourage remediation of contaminated land where possible. The development is aiming, and currently on track, to achieve a minimum of 75% of the site footprint be covered with urban heat island effect reducing elements. This is through a mixture of tree canopy coverage, landscape and vegetation, and pavements and roof materials with a high Solar Reflectance Index (SRI). Shared green roof spaces, public forecourt and pedestrian access way through the precinct are to enable tree canopy coverage and opportunities for inclusion of local ecologically valued attributes to be integrated throughout the design,

An Arboricultural Impact Assessment has been undertaken by Creative Planning Solutions for the precinct development. The report details trees that are dead, or of low and medium value trees that are to be removed as part of the development. Further it stipulates the retention and protection of 47 trees (44%) for the development. The inclusion of vertical gardens is also to be further investigated as the design is developed to further align the precincts initiatives with both the planning and policy requirements, and Landcom's own targets.

A Biodiversity Development Assessment Report (BDAR) has been prepared by WSP under the Biodiversity Conservation (BC) Act 2016 to form part of the EIS submission. It details that no native vegetations or associated Plant Community Type (PCT) were recorded within the Site, due to the area previously being cleared for approved urban development. One non-native vegetation type was recorded on the Site, being a miscellaneous ecosystem (urban exotic / native landscape plantings). There were no threatened flora species, ecological communities or their habitat, listed under the BC Act, have been determined to be affected by the project. The report summarises that given the development will not result in the direct or indirect impact on any remnant native vegetation or associated PCT, the Biodiversity Offset Scheme is not applicable for this development. The development is considered unlikely to result in a significant impact on any Matters of National Environmental Significance (MNES). Given this, a referral of this development under the EPBC Act to the Department of the Environment and Energy is not warranted.

The Arboricultural Impact Assessment and BDAR provide guidance and the developers due diligence in seeking identify and avoid having serious or irreversible environmental damage on the Site. These directly contribute to addressing the precautionary principle, required by the SEARs, in completing detailed evaluation to avoid environmental damage at the Site and the use of risk assessment for the development of recommendations produced. The reports also ensure that conservation of biological diversity and ecological integrity is achieved based on a risk-assessment process. The inclusion of requirements for green spaces on and within the building, as well as extensive landscaping further contributes to enhancing the biological diversity and ecological integrity of the Site. For a previously developed site, increasing tree and other green coverage above conservation of the existing, is a more desirable outcome for the Site.

## *INNOVATION*

The innovation category covers ESD initiatives that aren't included in any of the of the above. Applicable to this project will be the inclusion of a PV system and affordable housing. This has potentially to achieve additional credit points in the Green Star rating tool and leverages off Landcom's preferred and stretch targets identified in the Sustainable Places Strategy.

## 3.2 ESD FRAMEWORK SUMMARY

The table below summarises mandatory requirements from policy and planning documents, the development Tender Requirements as well as the ESD initiatives outlined in Landcom's Sustainable Places Strategy. Further, the table includes encouraged initiatives for the development, aligning with other goals from the Landcom's Sustainable Places Strategy.

Table 3.1 Hills Showground Station Precinct ESD Framework summary

| CATEGORY   | OBJECTIVE   | MINIMUM MANDATORY REQUIREMENTS  | MEASURES TO BE TARGETED AT DETAILED DESIGN STAGE   | HILLS SHOWGROUND DESIGN RESPONSE AT DETAILED DESIGN STAGE  |
|------------|---|---|--|--|
| General    | <ul style="list-style-type: none"> <li>Overarching rating tools requirements to benchmark and drive ESD initiatives over project lifecycle</li> </ul> | <i>Policy Requirement:</i> <ul style="list-style-type: none"> <li>5-Star Green Star Design and As Built</li> </ul>  | <i>Landcom's Sustainable Places Strategy:</i> <ul style="list-style-type: none"> <li>Align with applicable sections of current Government Resource Efficiency Policy (GREP) for Energy, Water, Waste and Clean Air.</li> </ul>   | <ul style="list-style-type: none"> <li>Combination of completing the mandated minimum requirements and other initiatives as further detailed in the various categories below</li> </ul>  |
| Management | <ul style="list-style-type: none"> <li>Integrate sustainability initiatives and considerations through best practice management processes</li> </ul>  | <i>Policy Requirement:</i> <ul style="list-style-type: none"> <li>ESD Framework established for the precinct development (completed by this report)</li> </ul> <i>Tender Requirements:</i> <ul style="list-style-type: none"> <li>Full Green Star credit points for Adaptation and Resilience credit (climate change)</li> <li>Supply Chain School engagement and training for commitment against modern slavery</li> </ul> | <i>Tender Requirements:</i> <ul style="list-style-type: none"> <li>Achieve full points in Green Star credit, 'Responsible Construction Practices'</li> </ul> <i>Landcom's Sustainable Places Strategy:</i> <ul style="list-style-type: none"> <li>Prepare and implement an effective Climate Change Adaptation Plan and Community Resilience Plan with measurable outputs</li> </ul> | <ul style="list-style-type: none"> <li>Climate and Community Resilience Report completed. Key risks and proposed adaptations measures include: <ul style="list-style-type: none"> <li>Increase in temperature and extreme heat (high risk) <ul style="list-style-type: none"> <li>Maintain and implement tree canopy coverage</li> <li>Rain gardens and green roofs to be implemented</li> </ul> </li> <li>Extreme storms and rainfall (medium risks)</li> </ul> </li> </ul> |

| CATEGORY                     | OBJECTIVE   | MINIMUM MANDATORY REQUIREMENTS                          | MEASURES TO BE TARGETED AT DETAILED DESIGN STAGE   | HILLS SHOWGROUND DESIGN RESPONSE AT DETAILED DESIGN STAGE   |
|------------------------------|---|---|--|---|
|                              |   |   |  | <ul style="list-style-type: none"> <li>— Flood study to be undertaken at detailed design stage</li> <li>— Drainage sizing elements to account for climate change projections</li> <li>— Supply Chain School engagement commitment required from tenderers</li> <li>— Committed sustainability initiatives acceptance required by tenderers in the returnable schedule documentation and further Landcom's preferred and stretch targets are encouraged for commitment</li> </ul>  |
| Indoor Environmental Quality | <ul style="list-style-type: none"> <li>— Project initiatives that enhance indoor air quality, thermal, visual and acoustic comfort, and reduce occupant stress</li> </ul> | <ul style="list-style-type: none"> <li>— Nil</li> </ul> | <p><i>Policy Requirement:</i></p> <ul style="list-style-type: none"> <li>— Maximise natural light, cross ventilation and passive design</li> </ul> | <ul style="list-style-type: none"> <li>— Architect maximising natural lighting with glazing options and orientations of buildings and windows.</li> <li>— Green spaces (vertical garden walls, roof gardens and green public space) are being investigated for suitability in the design.</li> <li>— Consideration is being made for air quality with an investigation being undertaken and findings to be implemented into design once completed. See section 3.1 Indoor Air Quality for further detail on recommendations.</li> </ul> |

| CATEGORY | OBJECTIVE   | MINIMUM MANDATORY REQUIREMENTS   | MEASURES TO BE TARGETED AT DETAILED DESIGN STAGE  | HILLS SHOWGROUND DESIGN RESPONSE AT DETAILED DESIGN STAGE   |
|----------|---|--|---|---|
| Energy   | <ul style="list-style-type: none"> <li>Reduce energy consumption and procurement of low emission generating energy sources</li> </ul> | <p><i>Policy Requirement:</i></p> <ul style="list-style-type: none"> <li>5 Star NatHERS energy rating (residential)</li> <li>4.5 NABERS Energy (non-residential)</li> <li>BASIX 25-35 Energy rating (dependant on building storeys)</li> </ul> | <p><i>Policy Requirement:</i></p> <ul style="list-style-type: none"> <li>Maximise natural light, cross ventilation and passive design, energy efficient lighting and ventilation, separate metering of energy across commercial and multi-unit tenancies.</li> </ul> <p><i>Tender Requirements:</i></p> <ul style="list-style-type: none"> <li>BASIX Energy rating of 40 (residential)</li> <li>Achieve 3 points in Green Star credit, 'Greenhouse Gas Emissions' with use of BASIX rating tool</li> <li>On-site energy generation for at least 5% of total predicted energy demand in operation</li> <li>Project base buildings to be carbon neutral (net zero) in operations</li> </ul> <p><i>Landcom's Sustainable Places Strategy:</i></p> <ul style="list-style-type: none"> <li>5-star NABERS Energy (Office/commercial, hotel or retail)</li> <li>All new projects modelled to reduce Greenhouse Gas (GHG) emissions at a precinct scale (transport &amp; stationary) by 50% against 2016 reference case (CCAP Precinx modelling)</li> </ul> | <ul style="list-style-type: none"> <li>Architectural scope meeting design requirements with maximising natural lighting, considerations for building and glazing orientations and implementing effective building fabric to enhance thermal performance of building</li> <li>As design further develops, energy efficient lighting, and other building systems such as HVAC will be incorporated to achieve required energy related ratings requirements</li> <li>BASIX Energy rating of 40 committed to further investigation from in the Tender Requirements Returnable Schedule 7.</li> <li>Further ESD initiatives to be investigated during detailed design stage as noted.</li> </ul> |



| CATEGORY  | OBJECTIVE   | MINIMUM MANDATORY REQUIREMENTS   | MEASURES TO BE TARGETED AT DETAILED DESIGN STAGE   | HILLS SHOWGROUND DESIGN RESPONSE AT DETAILED DESIGN STAGE   |
|-----------|---|--|--|---|
| Transport | <ul style="list-style-type: none"> <li>Reduce dependability on private vehicle use by access to public transport, amenities and facilities to encourage alternative means of transport</li> </ul> | <p><i>Tender Requirements:</i></p> <ul style="list-style-type: none"> <li>Include at least 10% of total parking spaces to have Electric Vehicle charging stations</li> </ul> | <p><i>Tender Requirements:</i></p> <ul style="list-style-type: none"> <li>Achieve 5 points in Green Star credit, 'Sustainable Transport'</li> </ul> <p><i>Landcom's Sustainable Places Strategy:</i></p> <ul style="list-style-type: none"> <li>All new projects modelled to reduce Greenhouse Gas (GHG) emissions at a precinct scale (transport &amp; stationary) by 50% against 2016 reference case (CCAP Precinx modelling)</li> </ul> | <ul style="list-style-type: none"> <li>Development located directly on train line providing ease of access or occupants to use public transport system.</li> <li>Diverse range of amenities being included in the precinct development as well as already existing in the local area</li> <li>EV charging ports being provided to meet minimum 10% of providing parking bays</li> <li>End of trip facilities to be encouraged for the office spaces to further encourage active transport utilisation</li> <li>Traffic study undertaken, assessing impacts to traffic flow and stipulating parking rates provided by the development being under DCP allowances to reduce occupant's dependability on private vehicles transport</li> </ul> |
| Water     | <ul style="list-style-type: none"> <li>Reduce consumption of potable water consumption</li> </ul>   | <p><i>Policy Requirement:</i></p> <ul style="list-style-type: none"> <li>BASIX Water rating of 40</li> </ul>   | <p><i>Policy Requirement:</i></p> <ul style="list-style-type: none"> <li>Separate metering of water across commercial and multi-unit tenancies</li> </ul> <p><i>Tender Requirements:</i></p> <ul style="list-style-type: none"> <li>BASIX Water rating of 60 (residential)</li> </ul>  | <ul style="list-style-type: none"> <li>Integrated Water Cycle Management undertaken and recommendations to be included into design achieving reduction and slowing of runoff, ad stormwater treatment prior to discharge (pollutant traps, filtration devices and biofiltration gardens).</li> </ul>  |

| CATEGORY          | OBJECTIVE   | MINIMUM MANDATORY REQUIREMENTS                          | MEASURES TO BE TARGETED AT DETAILED DESIGN STAGE  | HILLS SHOWGROUND DESIGN RESPONSE AT DETAILED DESIGN STAGE  |
|-------------------|---|---|---|--|
|                   |   |   | <ul style="list-style-type: none"> <li>— Achieve 5 points in Green Star credit 'Potable Water'</li> <li>— Embed Water Sensitive Urban Design (WSUD) or other water management strategies to minimise storm water discharge and reduce pollutant loads.</li> <li>— Project to target 'water positive' in operations</li> </ul> <p><i>Landcom's Sustainable Places Strategy:</i></p> <ul style="list-style-type: none"> <li>— 5-star NABERS Water (Office/commercial, hotel or retail)</li> <li>— Targets to not exceed pollutant discharge loads not to exceed Nitrogen 45, Phosphorus 65, Suspended Solids 85, Gross Pollutants 90.</li> <li>— Project to model and demonstrate reduction to mains potable water demand by 50% at the precinct scale, against a 2016 reference case (CCAP Precinx modelling)</li> </ul> | <ul style="list-style-type: none"> <li>— Implementation of rainwater tanks for the capture of rainwater, reducing run off and further reducing potable water consumption</li> <li>— Efficient water consuming fixtures (taps, toilets, showers etc.) and supplementary building equipment to be specified as design further develops</li> <li>— Implementation of efficient irrigation methods and utilisation of captured non-potable water from rainwater tanks</li> </ul> |
| Materials & Waste | <ul style="list-style-type: none"> <li>— Assess and reduce footprint of major construction materials</li> </ul> | <ul style="list-style-type: none"> <li>— Nil</li> </ul> | <p><i>Tender Requirements:</i></p> <ul style="list-style-type: none"> <li>— 95% of construction waste diverted from landfill (excluding contaminated materials)</li> <li>— Achieve 1 point in Responsible Building Materials credit (Green Star) for timber</li> </ul>  | <ul style="list-style-type: none"> <li>— LCA to be undertaken for the building materials as minimum for the development</li> <li>— Considerations for use of sustainable fit out materials and fixtures implemented within the development</li> </ul>  |

| CATEGORY             | OBJECTIVE  | MINIMUM MANDATORY REQUIREMENTS  | MEASURES TO BE TARGETED AT DETAILED DESIGN STAGE  | HILLS SHOWGROUND DESIGN RESPONSE AT DETAILED DESIGN STAGE  |
|----------------------|--|---|---|--|
|                      | <ul style="list-style-type: none"> <li>Minimise and/or increase re-use of waste material</li> </ul>  |   | <p><i>Landcom's Sustainable Places Strategy:</i></p> <ul style="list-style-type: none"> <li>Undertake detailed Waste Management Plan for the project, with focus on minimizing organic waste and ultimately working towards zero waste in operation</li> <li>100% timber sourced for construction (by cost weight) is Forest Stewardship Council Certified or agreed equivalent (i.e. Australian Forestry Standards)</li> <li>Undertake LCA and use to inform decision of highest impact materials working towards zero carbon in embodied energy of projects.</li> <li>Assessment and reporting of materials used against International Living Future Institute's 'Red List'.</li> </ul> | <ul style="list-style-type: none"> <li>Undertake a waste management plan to ensure adequate provisions are made in providing recycling and other waste facilities</li> </ul>   |
| Land Use and Ecology | <ul style="list-style-type: none"> <li>Minimise projects footprint on local land and ecology</li> <li>Reduce urban heat island effect</li> </ul> | <p><i>Tender Requirements:</i></p> <ul style="list-style-type: none"> <li>Full credit points for Heat Island Effect credit</li> </ul> | <p><i>Policy Requirement:</i></p> <ul style="list-style-type: none"> <li>Canopy trees, understorey planting and permeable paving to the greatest extent possible</li> </ul> <p><i>Tender Requirements:</i></p> <ul style="list-style-type: none"> <li>Achieve 1 point in Green Star credit, 'Ecological Value'</li> </ul> <p><i>Landcom's Sustainable Places Strategy:</i></p> <ul style="list-style-type: none"> <li>Enhance the local habitat, biodiversity or ecological communities, compared to the</li> </ul>   | <ul style="list-style-type: none"> <li>75% of the development plan area to be covered with green canopy, vegetation or landscaping/building elements that reduce the impact of heat island effect</li> <li>Arboricultural Impact Assessment undertaken to investigate trees of high value, prescribing retention and protection of those throughout the development</li> <li>Ecological value study to be undertaken that no endangered or vulnerable species</li> </ul> |

| CATEGORY   | OBJECTIVE   | MINIMUM MANDATORY REQUIREMENTS                          | MEASURES TO BE TARGETED AT DETAILED DESIGN STAGE   | HILLS SHOWGROUND DESIGN RESPONSE AT DETAILED DESIGN STAGE   |
|------------|---|---|--|---|
|            |   |   | site conditions pre-acquisition or pre-masterplan (Landcom Biodiversity Calculator)  | <p>or ecological communities are present on site.</p> <ul style="list-style-type: none"> <li>— BDAR report completed finding no species or ecologies of significance disrupted by the development</li> </ul>  |
| Innovation | <ul style="list-style-type: none"> <li>— Project innovations going above standard industry ESD initiatives</li> </ul> | <ul style="list-style-type: none"> <li>— Nil</li> </ul> | <p><i>Landcom's Sustainable Places Strategy:</i></p> <ul style="list-style-type: none"> <li>— Enable free Wi-Fi to key public open spaces</li> </ul> | <ul style="list-style-type: none"> <li>— PV system to be further investigated as part of detailed design having potential to reduce overall imported energy, or where paired with battery solutions could shift peak electricity loading and provide economic benefits for the precinct</li> <li>— Consideration made for provision of free Wi-Fi to key public spaces</li> </ul> |

# 4 PLANNING AND POLICY COMPLIANCE

This section provides direct responses to the various mandatory requirements of the planning and policy documentation detailed in Section 1.6, referring to the ESD Framework recommended for the Precinct in Section 3. The ESD Framework demonstrates compliance with of the applicable policies.

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## 4.1 SEARS

The SEARS are detailed in Section 1.6.1 of this report, which includes specific ESD related SEARs to be addressed by the proposed development. These include high level principles, concepts and ideologies to be incorporated into the design, construction and operation of the proposed development including commitments to relevant industry benchmarks and best practice in waste and water management strategy. The required EP&A Regulation 2000 principles are being addressed by the concept design for the development with the measures and framework set out in Section 3 of this report for the proposed development.

Specifically, the four applicable aspects of ESD principles from the EP&A Regulation are addressed by this ESD framework strategy, further detailed in Section 1.6 which include are the precautionary principle, intergenerational equality, biological diversity and ecological integrity, and finally valuation, pricing and incentive mechanisms.

### *THE PRECAUTIONARY PRINCIPLE*

The Hills Showground Station Precinct is considered to align with the precautionary principle as there are no adverse environmental impacts on the already developed site, as detailed through the EIS. Measures outlined within the ESD framework further the commitment and actions currently being undertaken to minimise environmental impact of the precinct development, predominantly during the operational phase of the project, that are heavily influenced by design. Detailed evaluation of the Site and existing conditions have been undertaken, seen through the Arboricultural Impact Assessment and BDAR. This type of investigation, using risk-weighted assessment in a large contributor in avoiding serious or irreversible damage to the environment.

During construction, the Contractor will be required to implement an Environmental Management Plan, minimising any environmental impact from construction activities. Therefore, the development proposal is consistent with the EP&A Regulations objectives to avoid serious or irreversible damage to the environment.

### *INTER-GENERATIONAL EQUITY*

Intergenerational equity has been considered by the development proposal by minimising resource consumption in the construction, fit out and operation of the Precinct as well as reducing waste production. Initiatives implemented for the project minimising resource consumption is for the benefit of current and future generation alike. The initiatives in providing better access and increasing diverse community amenities and transport options will be to the benefit of future generations.

### *CONSERVATION OF BIOLOGICAL DIVERSITY AND ECOLOGICAL INTEGRITY*

The site is located within a medium to high density mixed use precinct, where areas have already been cleared and previously developed prior to the Precinct being planned. As such there is limited biological diversity and ecological integrity to remain. The Arboricultural Impact Assessment has been prepared and details trees of high value that are to be protected through construction and integrated into the design. The BDAR identified no remnant native vegetation, associated PCTs, threatened flora species, ecological communities or their habitat were recorded within the Site. This demonstrates the conservation ideology carrying through the planning phase and follows into design with measures proposed for implementing landscaping and communal green spaces initiatives to increase the biological and ecological value of the Precinct.

## IMPROVED VALUATION, PRICING AND INCENTIVE MECHANISMS

Improved valuation, pricing and incentive mechanisms have been included into the design and operation planning of the Precinct. This has occurred, and will be enhanced in construction through implementation of an Environmental Management Plan stipulating control under which the construction must be conducted. Predominantly waste generation and pollutant discharging from site are governed by strict pricing mechanisms as well as environmental regulations. The use of natural resource is to be minimised through the operation phase with high efficiency water and energy targets being mandated. This is also the case in construction, building and fit out materials with further assessment to be undertaken and influence design accordingly.

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## 4.2 STATE ENVIRONMENTAL PLANNING POLICIES

The BASIX scheme developed under the SEPP, aims to achieve a 25% reduction in greenhouse gas emissions and a 40% reduction for potable water consumption in new residential buildings. As detailed in the ESD Framework Summary in Section 3.2, the use of the BASIX scheme is mandated under the energy category of 25-35 (depending on building storeys), and a rating of 40 is to be targeted at detailed design stage.

Under the water category, a minimum rating of 40 is prescribed by the SEPP, and a rating of 60 is to be targeted at detailed design stage. The ESD Framework Strategy outlined goes above minimum policy requirements and standard industry benchmarks in both water and energy categories.

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## 4.3 GREAT SYDNEY REGIONAL PLAN, A METROPOLIS OF THREE CITIES – CENTRAL CITY DISTRICT PLAN

The regional plan provides high level objectives for which the Site complies with by implementing the ESD Framework Strategy set out in this report. Further detail around the objectives has been included in Section 1.6.3.

Objective 33 of the Regional Plan is working towards net-zero emissions by 2050 and mitigating climate change. As mandated minimums, the ESD Strategy Framework requires stringent 5 Star NatHERS energy rating for residential, 4.5 NABERS energy rating for non-residential and a BASIX rating of 25-35 (dependant on building storey height). Further, measures to be targeted at detailed design stage minimising energy consumption include:

- BASIX of 40 for residential;
- 5-star NABERS for non-residential; and
- maximising natural light, cross ventilation and implementing passive design principles.

Measures working towards being carbon neutral to be targeted at detailed design phase include:

- base building to be carbon neutral in operations;
- on-site generation for at least 5% of total predicated energy demand; and
- at a precinct scale, modelled to reduce Greenhouse Gas (GHG) emissions at a precinct scale (transport & stationary) by 50% against 2016 reference case (CCAP Precinx modelling).

Objective 34 from the Regional Plan relates to energy and water flows being captured, used and re-used. For energy, this is addressed by the inclusion of photovoltaics on site. For water, WSUD are to be implemented at detailed design phase with the project targeting to be water positive in detailed design phase as well as modelling to be undertaken demonstrating a reduction to mains potable water demand by 50% at the precinct scale, against a 2016 reference case (CCAP Precinx modelling).

Objective 35 relates to increasing waste reuse and recycled to support a circular economy. A detailed Waste Management Plan is to be undertaken in detailed design stage focusing on minimising organic waste and ensuring adequate facilities are allowed for to achieve effective recycling and general waste system, as well as targeting 95% of construction waste diversion from landfill.

The Planning Priority C20 relates to adapting to the impacts of urban and natural hazards, and climate change. This covers Objectives 36, 37 and 38. A Climate and Community Resilience Report has already been completed for the Site, identifying high temperatures and extreme storms and rainfall as the highest risks. This has been addressed in the ESD Framework Strategy, using Green Star Adaptation and Resilience credit as the industry benchmark. The Site must achieve the full point for this credit. The site will also maintain and implement further tree canopy coverage, rain gardens and green roofs, as well as requiring a flood study be undertaken and drainage elements sized to account for climate change.

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## 4.4 THE HILLS ENVIRONMENT STRATEGY 2019 (DRAFT VERSION)

The key elements of the Hills Environment Strategy 2019 (draft version) applicable to the Site focus on promoting increased urban tree canopy cover, management of natural resources and waste responsibility, and preparing residents for environmental and urban risks and hazards.

These are addressed by implementing the ESD Framework Strategy by requiring:

- implementation of green spaces (vertical garden walls, roof gardens and green public space) where possible throughout detailed design phase;
- minimising energy consumption by requiring minimum levels be met in industry standard benchmark tools (BASIX, NatHERS and NABERS) for the various space uses on site, as well as targeting more stringent levels at detailed design stage;
- implementing a photovoltaic system for the Site's own energy generation;
- mandating water discharge maximum pollutant levels to be targeted at detailed design stage and implementing WSUD principles in design;
- achieving a minimum industry standard BASIX water rating for residential, with more stringent levels to be targeted in detailed design stage (including NABERS for non-residential) and 5 points in the Green Star Potable Water credit;
- targeting water positive in detailed design stage and modelling to be demonstrate reduction to mains potable water demand by 50% at the precinct scale, against a 2016 reference case (CCAP Precinx modelling);
- implementing the recommendations from the Integrated Water Cycle Management report;
- requiring a Waste Management Plan be undertaken at detailed design stage, focusing on minimising organic waste and ensuring adequate facilities are allowed for to achieve effective recycling and general waste system;
- targeting 95% of construction waste diversion from landfill;
- implement recommendations from the Climate and Community Resilience report;
- achieve full points Green Star Adaptation and Resilience credit as the industry benchmark;
- maintain and implement further tree canopy coverage, rain gardens and green roofs;
- implement recommendations from the Air Quality report undertaken; and
- a flood study be undertaken and drainage elements sized to account for climate change.

## 4.5 THE HILLS DEVELOPMENT CONTROL PLAN

The Hills DCP outlines the overarching ESD principles to be complied with as summarised below, with the applicable ESD Framework Strategy response demonstrating compliance.

| ESD PRINCIPLE | SUMMARY OF INTENT   | ESD FRAMEWORK STRATEGY RESPONSE   |
|---------------|---|---|
| ESD 1         | Apply precautionary principle   | Aboricultural Impact Assessment and BDAR investigation have been undertaken to ensure not significant risks are identified for the proposed development.  |
| ESD 2         | Allow for broad level community involvement in respect to issues of concern                                 | The DA process undertaken enables community feedback for the proposed development.  |
| ESD 3         | Efficiently use water through design and construction and water leaving site is comparable to the receiving | <p>Industry standard benchmark levels (BASIX) for water consumption are mandated as minimum, with more stringent targets (BASIX and NABERS) to be aimed for at detailed design stage.</p> <p>Maximum pollutant levels for water discharges from site are set and WSUD principles to be implemented into design.</p> <p>At a precinct scale, modelling to be undertaking indicating 50% reduction to 2016 reference case.</p>  |
| ESD 4         | Biodiversity and integrity of ecological processes are not compromised by the development                   | <p>Aboricultural Impact Assessment and BDAR investigation have been undertaken to ensure not significant risks are identified for the proposed development.</p> <p>Ecological value of site to be improved with proposed green spaces through the Precinct.</p>   |
| ESD 5         | Implement energy efficiency materials and technology in design, and utilise of renewable energy             | <p>Minimising energy consumption by requiring minimum levels be met in industry standard benchmark tools (BASIX, NatHERS and NABERS) for the various space uses on site, as well as targeting more stringent levels at detailed design stage.</p> <p>Project base building, targeted at detailed design stage, to be carbon neutral.</p> <p>Photovoltaic system to generate at least 5% of total predicted energy demand.</p> |
| ESD 6         | Follow waste hierarchy in use of materials and disposal systems throughout development                      | <p>Waste Management Plan to be undertaken.</p> <p>95% of construction waste diverted from landfill.</p> <p>LCA to be undertaken for building materials.</p>   |
| ESD 7         | Protect neighborhood amenity and safety throughout development life cycle                                   | Climate and Community Resilience Report completed with recommendations to be implemented into detailed design.  |



|       |  |  |
|-------|--|--|
| ESD 8 | Encourage long-term economic viability and health of the community   | The development of the site promotes long-term economic viability and health of the community generally with providing a diverse range of accessible services, in well-connected (public transport) capacity.  |
| ESD 9 | Encourage the use of public transport, bicycles and pedestrian trips | <p>10% of parking spaces are to have Electric Vehicle charging stations.</p> <p>Parking spaces are well below standard allocations, promoting the reduction to reliance on private transport vehicles.</p> <p>The development being directly on a train line greatly promotes the use of public and active transport measures.</p> |

# 5 RECOMMENDATIONS

The recommendations from developing the ESD Framework put forward in Section 3.2, are for its implementation now and as further detailed design, construction and operational project phases are carried out. There are significant initiatives required to be investigated and targeted for the Site as detailed design phase is undertaken. As design progresses there will be significantly more detail of the proposed development available to confirm feasibility of the targets, and implement those that are possible. Beyond the requirements outlined, it is important to understand the underlying ESD goals driving the requirements, identified within the EP&A Regulation (responded to in Section 4) as well as Landcom's sustainability overarching ESD goals, further outlined in Section 5.1).

This report is provided with best practice ESD initiative being implement. It is important to understand that ESD initiatives and what is possible to achieve is quickly developing. As such the prescribed recommendations put forward may become outdated depending on the time in which construction of the Precinct is carried out and the below section has been included to provide guidance of the longer-term targets being worked towards that are to continually be strived for.

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## 5.1 OVERARCHING ESD GOALS

The nature of the development duration and industry standard performance changing over time requires that continual improvement be strived for. The purpose of this section is to acknowledge Landcom's higher level Leadership Targets for the vision of sustainable places. While some may not be feasible at the current point in time, these are further underlying sustainability targets that could be considered in future. Opportunities in advancing design or construction measures that can shift the development closer to the below Leadership Targets are strongly encouraged, and at a minimum an investigation and strategy should be developed and assessed against the social, environmental and economic implications of the opportunities being implemented.

The sustainability Leadership Targets include:

- carbon neutral in building operation;
- creating water positive places;
- net positive ecological outcomes;
- zero carbon in embodied energy of projects; and
- achieving zero waste in operations.

## 6 CONCLUSION

The ESD Framework for the proposed, mixed-use development at the Hills Showground Station Precinct, successfully meets the requirements defined in the relevant planning and policy documents. This is largely achieved through implementing Landcom's mandated sustainability initiatives.

The ESD approach is strongly focussed on minimising energy and water consumption during operation of the Site. Reducing waste generation (and increased treatment), resilience to climate change projections, reduction of occupant's dependence on private transport and increase the amount of tree plantings and other types of green areas implemented into the design are also central to the sustainability strategy.

Further initiatives have also been discussed in the report that could be investigated as the design progresses, maximising site specific opportunities and alignment with Landcom's Sustainable Places Strategy. The project has potential to score highly in the Green Star Design and As Built rating scheme, among the various other rating tools nominated for specific sustainability attributes (i.e. NABERS for residential energy consumption).

The concept design and ancillary studies undertaken as part of the planning phase, indicate that the required initiatives are being implemented within the proposed Hills Showground Station Precinct.