Castle Hill – Site B

ESD Report for Concept DA

QIC

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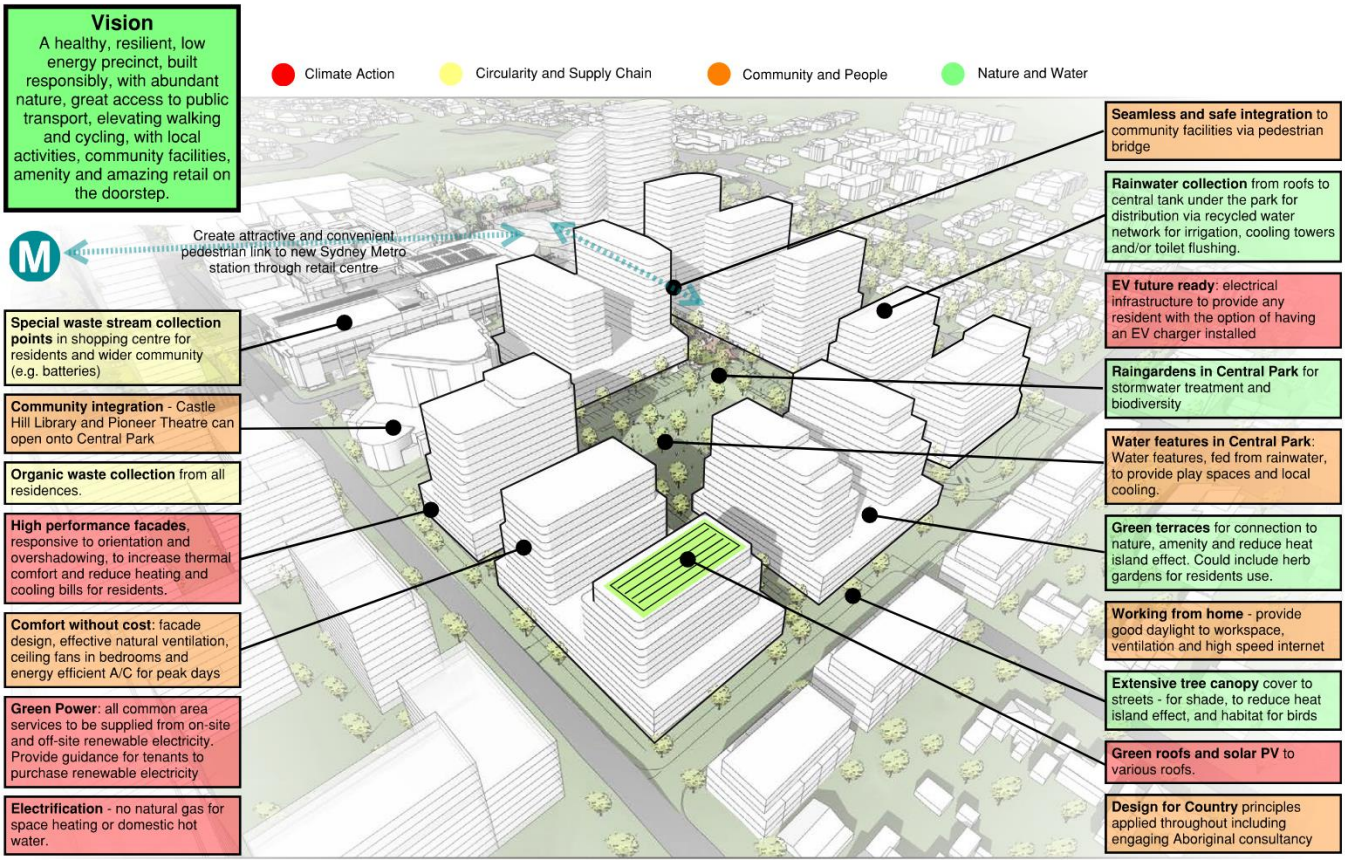
Executive Summary

This report details how ESD principles will be incorporated in the design of Castle Hill Site B and suggestions for consideration during construction and ongoing operation of the precinct at this concept stage. An ESD framework is proposed to demonstrate how the development will implement best practice sustainable building principles to improve environmental and social performance.

The diagram below summarises the key initiatives to be delivered in the development.



More detail on ESD principles will be provided in future detailed applications.

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1.0 Introduction

1.1 Purpose of report

This report has been prepared on behalf of the Queensland Investment Corporation (QIC) (the Proponent) to support a Planning Proposal (PP) for amend The Hills Local Environmental Plan 2019 in relation to 17-25 Castle Street, Castle Hill (the Site).

The PP will facilitate the development of the Site to accommodate a well-designed, mixed-use neighbourhood that contributes positively to the Castle Hill Town Centre. It will deliver a public benefit to the community through the provision of high-quality and diverse housing within walking distance of amenities, the Castle Towers Shopping Centre and the Castle Hill Metro Station. It will also provide the growing community with a new public open space integrated with the surrounding pedestrian network.

The PP will complement the transforming urban environment of Castle Hill, spurred by the nearby Castle Hill Metro Station, the Pennant Street Target Area and the vision for the Castle Hill North Precinct.

The PP seeks to:

- Rezone part of the site to RE1 Public Recreation to facilitate the proposed delivery and dedication of a new public park within the centre of the Site, and maintain the existing B4 Mixed Use zoning across the balance of the site.
- Apply site-specific requirements that must be achieved in order to achieve 'incentive' height and floor space controls.

This report sets out the proposed ESD Framework and minimum requirements to apply to all development on the site.

1.2 Site Description

The Site is bound by Pennant Street, Showground Road, Castle Street and Kentwell Avenue – refer to Figure 1. It comprises 36 lots and has a total site area of approximately 40,266sqm. The whole site is owned by QIC.

The Site is generally square in shape and is largely undeveloped. A row of existing single storey houses is located along the Site's Kentwell Street frontage. An existing nine storey building containing the Castle Hills Library and residential dwellings is located on the same block as the Site on the corner of the Castle Street and Pennant Street. The site's centre primarily comprises vacant land with scattered remnant vegetation, particularly toward to the southwest of the Site.

The Site's topography gradually declines from the Showground Road and Pennant Street corner at the Site's south toward the Kentwell Avenue and Castle Street corner in the north.

Figure 1 Site Aerial

Source: Nearmap & Ethos Urban

2.0 ESD Policy and Planning Context

2.1 Overview

There are a range of planning controls and regional and local policy documents applicable to developing sustainability requirements for the proposed development including:

- State Environmental Planning Policies (SEPPs)
- Greater Sydney Regional Plan: A Metropolis Of Three Cities
- The Hills Local Environmental Plan (LEP) 2019
- The Hills Development Control Plan (DCP) 2012
- The Hills Environment Strategy 2019

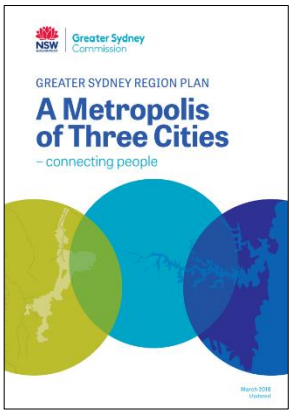
2.2 State Environmental Planning Policies (SEPP)

Regulations under the State Environmental Planning Policies (SEPP) encourage sustainable residential development and are measured using the Building Sustainability Index (BASIX) scheme. All of the buildings will exceed 6 storeys and consequently the following minimum targets apply:

- BASIX Energy = 25
- BASIX Water = 40

Refer to Section 4.0 for details of the proposed energy and water targets for the development, which will exceed the minimum requirements of BASIX.

2.3 Greater Sydney Regional Plan: A Metropolis Of Three Cities



The Great Sydney Regional Plan, A Metropolis of Three Cities notes that planning for sustainability involves taking a long-term approach to managing Greater Sydney's waterways, biodiversity and bushland, rural lands and its connected green spaces and corridors. It also involves greening streets and neighbourhoods with increased tree canopy cover.

Greater Sydney, the nation's largest city, has an important role in Australia's response to climate change. The communities within Greater Sydney, with their differing characteristics, require targeted responses to mitigate climate change, focusing on the design of neighbourhoods and managing land use, infrastructure and transport. This could include using renewable energy, reducing consumption of energy and water and reducing waste and greenhouse gas emissions, which would help to deliver a more efficient and sustainable city. These responses can reduce costs for households and businesses, while contributing to global efforts to combat climate change.

The plan contains a number of sustainability objectives that are relevant to the development:

	Objective
25	The coast and waterways are protected and healthier
27	Biodiversity is protected, urban bushland and remnant vegetation is enhanced
28	Scenic and cultural landscapes are protected

30	Urban tree canopy cover is increased
31	Public open space is accessible, protected and enhanced
32	The Green Grid links parks, open spaces, bushland and walking and cycling paths
33	A low-carbon city contributes to net-zero emissions by 2050 and mitigates climate change
34	Energy and water flows are captured, used and re-used
35	More waste is re-used and recycled to support the development of a circular economy
36	People and places adapt to climate change and future shocks and stresses
37	Exposure to natural and urban hazards is reduced
38	Heatwaves and extreme heat are managed

How the development responded to these objectives is described in Section 4.0.

2.4 The Hills Local Environmental Plan (LEP) 2019

The Hills Shire Local Environmental Plan also has the following requirements related to sustainability:

Clause 7.7 Design Excellence

Design development must deliver the highest standard of architectural and urban design. Section (f) requires the development address the following matters:

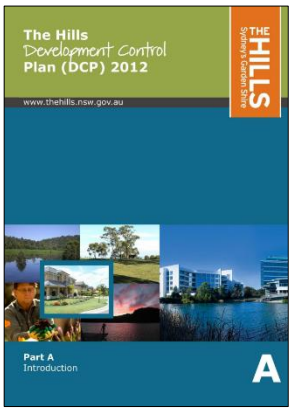
vii) environmental impacts such as sustainable design, overshadowing, wind and reflectivity,

viii) the achievement of the principles of ecologically sustainable development,

The principles of ecologically sustainable development are defined in the LEP dictionary as having the same meaning as the Act, which are defined in clause 7(4) Schedule 2 of the Environmental Planning and Assessment Regulation 2000. Refer to Section 3.0 for these principles and the proposed response.

2.5 The Hills Development Control Plan (DCP) 2012

Section 5 of The Hills Development Control Plan defines the requirements for Ecologically Sustainable Development as follows:



- Ecologically sustainable development is defined in The Hills Local Environmental Plan 2012 Dictionary.
- In order to fulfil Council's statutory responsibilities as required by Schedule 2 of the EP&A Regulation; the Local Government Act 1993, development is required to meet Council's ESD Objectives. These are summarised in the table below.

In all aspects of the planning for, and development of, land, consideration must be given to achieving the ESD objectives listed. As part of the Statement of Environmental Effects required to be submitted with all Development Applications a summary of the action taken in order to achieve these objectives must be included.

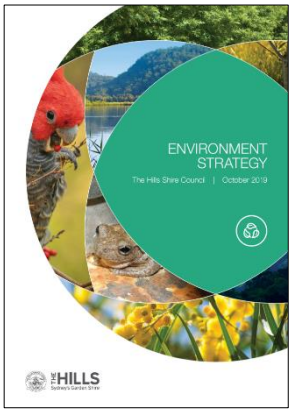
	Council's ESD Objectives
ESD 1	To apply the precautionary principle where development is likely to cause short or long-term irreversible or serious threats to the environment.
ESD 2	To allow for broad community involvement in respect to issues of concern throughout the development process.
ESD 3	To ensure 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.

Specific objectives and development controls are contained within the Development Control Plan which identify specific areas where ESD principles need to be carefully considered and provides controls detailing how these principles are to be achieved.

Section 4.0 describes the ESD framework and how this responds to the Council's ESD objectives.

2.6 The Hills Environment Strategy 2019

The Hills Environment Strategy 2019 is informs the planning priorities and five year actions in The Hills Local Strategic Planning Statement: *Hills Future 2036*. It also establishes the basis for strategic planning for, and management of, the Shire's environment to 2036. The four environmental priorities are:



- **Protect areas of high environmental value and significance,** through the land use planning system, continued use of rural cluster subdivisions, and community involvement, including support for the Shire's 31 Bushcare groups
- **Increase urban tree canopy cover**, to improve the character of local places while addressing urban heat island effect, through master planning and urban design, and our ongoing Street Tree Planting program
- **Manage natural resources and waste responsibly,** through mechanisms that protect the Shire's waterways and wetlands, reduce water and energy use and waste generation, and move towards innovative approaches
- **Prepare residents for environmental and urban risks and hazards,** by improving the planning framework to address bushfire and flooding risks, urban heat island and extreme weather, and pollution.

Section 4.0 describes the ESD framework and how this responds to the four environmental priorities.

3.0 Ecologically Sustainable Development

3.1 Definition of Ecologically Sustainable Development

The Local Environment Plan refers to the Environmental Planning and Assessment Regulation 2000. Clause 7(4) of Schedule 2 of this regulation defines the principles of ecologically sustainable development as follows:

a) 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:
   i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and
   ii) an assessment of the risk-weighted consequences of various options,

b) 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,

c) conservation of biological diversity and ecological integrity, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,

d) improved valuation, pricing and incentive mechanisms, namely, that environmental factors should be included in the valuation of assets and services, such as:
   i) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,
   ii) 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,
   iii) 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.

3.2 Response

This project responds to the ecological sustainable development principles as described below. Further details are provided in Section4.0.

Precautionary Principle

The project does not present threat of serious or irreversible environmental damage. The project will create habitat to improve the existing site, implement climate change adaptation principles, and apply industry best practice ESD initiatives.

Appropriate due diligence has been and will continue to be conducted along the development process to ensure the precautionary principle is satisfied. Due diligence includes conducting required studies to address all environmental requirements and all statutory provisions in all relevant planning instruments, including the Biodiversity Conservation Act 2016, relevant SEPPs and LEPs.

Inter-Generational Equity

To support limiting climate change to below 1.5°C in line with the recommendations of the Intergovernmental Panel on Climate Changes, the International Energy Agency, and the Green Building Council of Australia, and to align with the NSW Government's goal of zero carbon emissions by 2050, the following will be implemented:

- All dwellings will be designed to achieve minimum thermal comfort and energy efficiency requirements to reduce energy bills and provide resilience to a changing climate.
- Photovoltaic panels will be installed on roofs to generate renewable energy.

Conservation of Biological Diversity and Ecological Integrity

The development is located on previously cleared and developed land and has limited biological diversity and ecological integrity. The development aligns with this principle as there are no adverse environmental impacts on the site, with no threatened species, critically endangered, endangered, or vulnerable ecological communities or species.

Biodiversity enhancement will be achieved post development following the planting and regeneration of native vegetation. Ecological integrity is also maintained through integrated water cycle management practices, including:

- stormwater peak discharge will not exceed pre-development levels.
- a combination of vegetated swales, rainwater re-use and engineering structures (including cartridge filters) to meet pollution reduction targets.

Improved Valuation, Pricing and Incentive Mechanisms

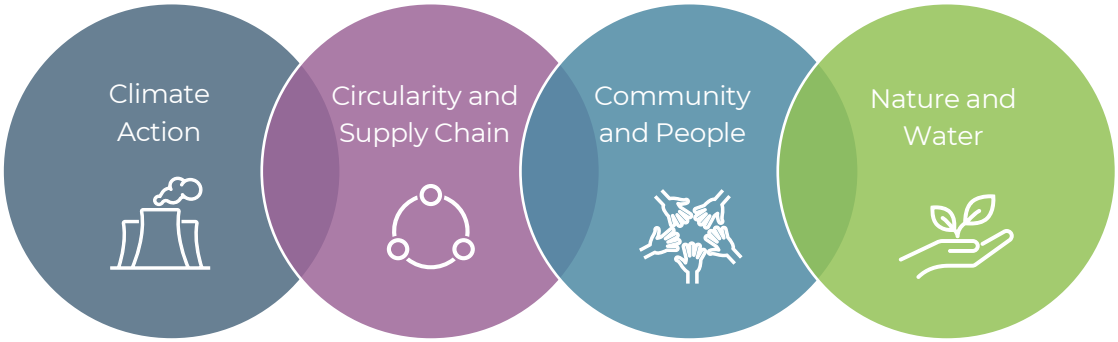
The design, construction and operation of the project will reduce energy and water consumption and greenhouse gas emissions. Environmental goals have been established based on industry recognised rating tools which are designed to deliver beneficial environmental and social outcomes during construction and operation.

4.0 ESD Framework

4.1 Establishing the framework

Megatrends are the global patterns of change that impact business, economies, cultural, societal and environmental outcomes. They are drivers that are disrupting what is considered to be 'business as usual'. They provide both a challenge and an opportunity to make positive changes and meets the long term strategic requirements of different stakeholders.

The four key megatrends influencing the sustainability of the development are:



These can be broken down into tangible and measurable goals and objectives that can be tracked and assessed over the life of the development, including:

Climate Action	**Circularity and Supply Chain**	**Community and People**	**Nature and Water**
Phase out fossil fuels Low energy bills 100% renewable electricity Low embodied carbon Carbon neutral Resilience & Adaptation	Renewable / recycled resources Minimise waste Closed loop products Ethical and transparent supply chain	Healthy buildings and indoor environments Community facilities and programs Equality Inclusive Design	Blue-green infrastructure Reduce heat island Connection to nature Preserve water resources Native planting

4.2 Proposed ESD Framework Structure

The megatrends form the basis of the proposed ESD framework. The table below summarises the proposed minimum requirements and key initiatives to be adopted on the project. These will be further developed during the design of each stage of the development and described in the ESD Reports for each subsequent DA submission.

Category	Objective	Minimum Requirements	Proposed Initiatives
Climate Action	Reduce life cycle GHG emissions, phase out fossil fuels and maximise on-site renewables. Design for resilience to a changing climate.	▪ 7 star NatHERS average ▪ BASIX Energy 25+	▪ High performance facades, responsive to orientation and overshadowing, to increase thermal comfort and reduce heating and cooling bills for residents. ▪ No natural gas boilers for space heating and domestic hot water. ▪ Renewable electricity: roof top photovoltaic panels to contribute to common area electricity consumption. Guidance to be provided for body corporates and occupants to purchase renewable electricity. ▪ Low embodied carbon: reduction of material and product GHG emissions through design efficiency, material selection and engagement with the supply chain. ▪ Low carbon transport: provide safe and convenient pedestrian and cycling networks and connection to the metro station. Electrical infrastructure capacity to provide residents with the option of having an EV charger installed.
Circularity and Supply Chain	Reduce consumption of raw materials, maximise closed loop systems and minimise waste. Support environmental and social transparency and certification in the supply chain.	▪ 90% construction waste diverted from landfill	▪ Waste strategy to be developed to include organic waste collection from residences and retail. ▪ Special waste stream collection points in the precinct for residents and wider community (e.g. batteries). ▪ Sustainable Procurement Plan to be developed for key construction materials.
Community and People	Deliver healthy buildings and spaces to support physical and mental wellbeing. Support inclusivity, diversity and equality in design and construction.	▪ Circa 4,000m^2 of public open space ▪ Prioritise pedestrians and cyclists	▪ Create a public central park locating it away from main roads and surrounding it by residential interfaces and traffic calmed local streets. The park will include fitness facilities and spaces for community activities. ▪ Provide a pedestrian connection over Penant Street with a pedestrian bridge connecting the site to the future Main Street precinct. ▪ Comfort without cost: facade design, effective natural ventilation, ceiling fans in bedrooms and energy efficient A/C for peak days. ▪ Working from home - provide good daylight to workspace, ventilation and high speed internet.

			▪ Induction cooktops - cleaner, quicker, safer, better control and no toxins or air pollutants released into apartments. ▪ Community integration – Castle Hill Library and Pioneer Theatre are next to the central park with opportunities for council to integrate with the new public space. ▪ Seamless and safe integration between shopping centre and precinct via pedestrian bridge. ▪ NSW Government Architect's "Designing with Country" principles applied including engaging an Aboriginal consultancy.
Nature and Water	Deliver blue-green infrastructure, reduce water consumption and increase native habitat. Create shade to reduce heat island effect.	▪ 40% tree canopy cover	▪ Extensive tree canopy cover to streets - for shade, to reduce heat island effect, and habitat for birds. ▪ Green terraces for connection to nature, amenity and reduce heat island effect. Could include herb gardens for residents use. ▪ Green walls to some facades to provide shade, create visual interest, increase biodiversity and provide more connection to nature. ▪ Water features in Central Park: Water features, fed from rainwater, to provide play spaces and local cooling. ▪ Rainwater collection from all roofs to central tank under the park for distribution via non-potable water reticulation network. ▪ Non-potable water pipework connected to all non-potable water uses (toilets, irrigation, washing machines, cooling towers and wash down). ▪ Raingardens in Central Park for stormwater treatment and biodiversity.

4.3 Alignment with policy and plans

The proposed ESD framework supports and aligns with the documents described in Section 2.0.

Category	SEPP	Greater Sydney Regional Plan	The Hills DCP Objectives	The Hills Environment Strategy
Climate Action	▪ BASIX Energy	▪ Objective 33: low carbon and zero net emissions by 2050 ▪ Objective 34: energy flows are captured, used and re-used ▪ Objective 36: people and places adapt to climate change and future shocks and stresses ▪ Objective 38: heatwaves and extreme heat are managed	▪ ESD 5: energy efficiency and renewables ▪ ESD 9: low carbon transport	▪ Prepare residents for environmental and urban risks and hazards
Circularity and Supply Chain		▪ Objective 35: more waste is re-used and recycled to support the development of a circular economy	▪ ESD 6: waste hierarchy principles	▪ Manage natural resources and waste responsibly
Community and People	▪ BASIX Thermal Comfort	▪ Objective 31: public open space is accessible, protected and enhanced ▪ Objective 32: link parks, open spaces, and walking and cycling paths ▪ Objective 36: exposure to natural and urban hazards is reduced	▪ ESD 2: community involvement ▪ ESD 7: amenity and safety ▪ ESD 8: community health and local economy ▪ ESD 9: cycling and walking	▪ Prepare residents for environmental and urban risks and hazards
Nature and Water	▪ BASIX Water	▪ Objective 30: urban tree canopy cover is increased ▪ Objective 34: water flows are captured, used and re-used ▪ Objective 38: heatwaves and extreme heat are managed	▪ ESD 3: water use and stormwater quality ▪ ESD 4: biodiversity	▪ Protect areas of high environmental value and significance ▪ Increase urban tree canopy cover

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