



Sustainability Framework

Explorer Street, Eveleigh

Revision 01, June 2023

Document information

Report title: Sustainability Framework
Project name: Explorer Street, Eveleigh
Project number: 1957
Digital file name: 1957_Explorer Street, Eveleigh - Sustainability Framework_rev02
Digital file location: 1957 Explorer Street, Eveleigh/02 Design & Analysis/2.1 Sustainability Framework

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Date: 22 / 08 / 2023

Revisions

No	Date	Approved
00	19 / 05 / 2023	PDS
01	29 / 06 / 2023	DM
02	22 / 08 / 2023	SM

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Acknowledgement to Country

Atelier Ten acknowledges the Traditional Custodians of Country throughout Australia and recognises their continuing connection to land, waters, skies, and community.

‘We are inspired by and learn from knowledge and stories of Country.

We pay our respect to Traditional Owners and their cultures, and to Elders past, present, and emerging.

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Executive summary

This Sustainability Framework sets out the key sustainability ambitions for Explorer Street, and an approach to embed environmental, social, and economic sustainability into Explorer Street.

This report is structured into four key sections which develop the narrative and provide the evidence base for its application.

Section 01

Describes the purpose of this framework as providing guidance to all future infrastructure investment and property development in the area across all stages of the project lifecycle from planning and design, to construction and operation. The methodology for establishing the evidence-base for future decision making and synthesising it into a Explorer Street -specific Sustainability Vision and Framework for delivery.

Provides a background summary of sustainability in Explorer Street at diminishing scales from Greater Sydney to the Eastern District, City of Sydney and finally Explorer Street.

Section 02

Establishes the sustainability context in which Explorer Street operates, and includes an exploration of:

- physical, environmental and social aspects of the region
- the public policy framework at local, state, Commonwealth, and global levels
- the property and real estate development environment
- emerging sustainability research on the urgency and scale of change required to address pressing socio-environmental challenges
- benchmark projects with aspects relevant to Explorer Street

It concludes with a summary of key findings which synthesises the recurring attributes of sustainable development projects and organisations.

Section 03

Introduces Explorer Street overarching Sustainability Vision and proposes a series of Sustainability Themes that reflect organisational ambitions, statutory requirements, industry and public expectations, and sustainability challenges in the built environment. The seven themes outlined are:

- Connected with Country
- Climate Positive
- Resilient and Adaptable
- Bioiverse and Regenerative
- Integrated Mobiltiy
- Healthy and Inclusive
- Innovative Community

To structure a delivery approach, this Sustainability Strategy

builds on the Sustainability Themes and for each describes:

- **Ambition** | what will Explorer Street do for sustainability
- **Rationale** | why this is critical to delivering a successful and sustainable place
- **Principles** | fundamental outcomes which represent positive achievement
- **Benchmarks** | quantifiable indicators which align with existing policies or frameworks
- **Opportunities** | potential actions to deliver sustainability across the development lifecycle
- **Supports** | specific frameworks or policies that it contributes to or facilitates

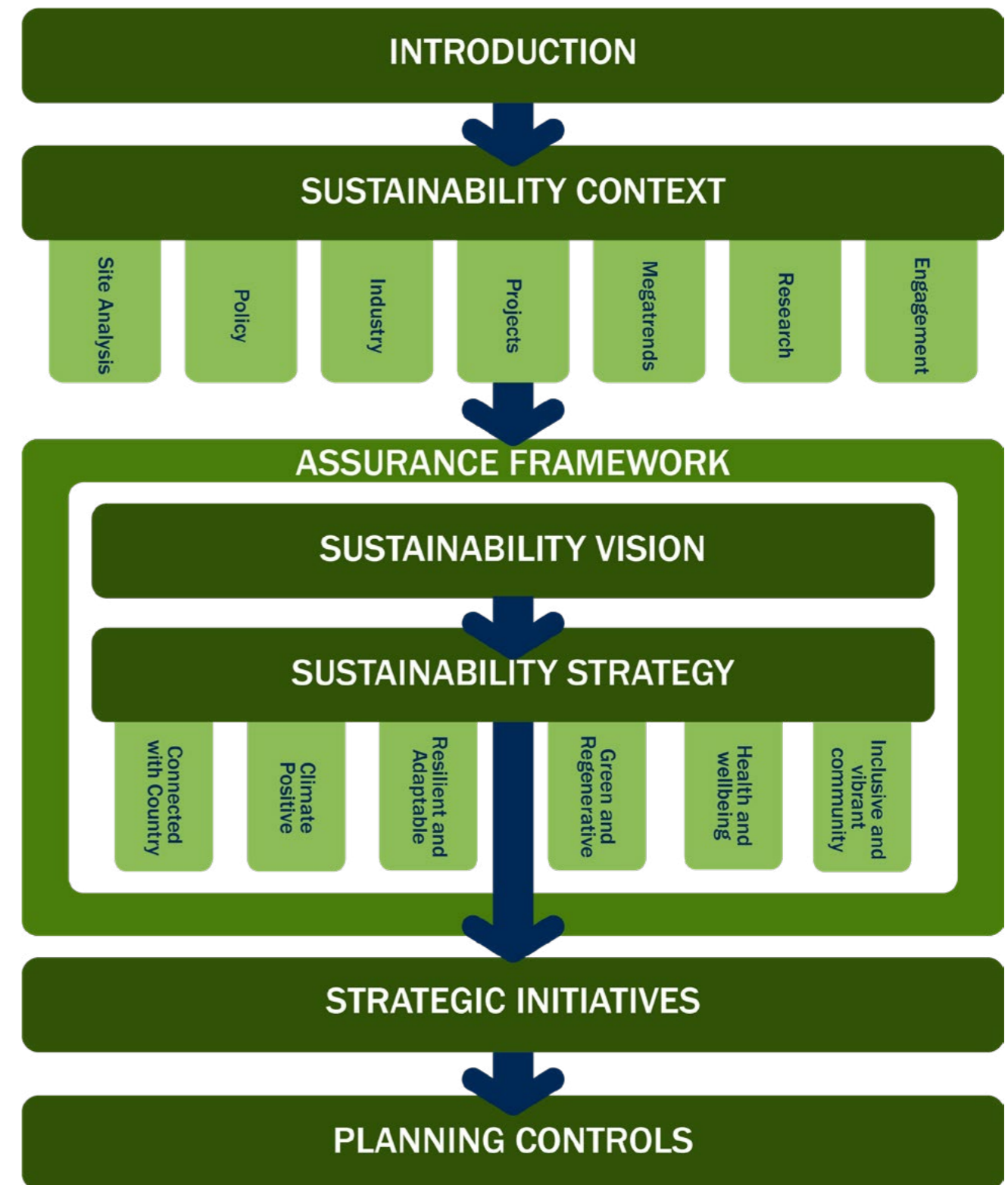


Figure 1.1 Explorer Street Structure Plan Sustainability Framework document structure (Source: Atelier Ten)

01 INTRODUCTION

1.1 Purpose and Approach

1.1.1 Purpose

This Sustainability Framework marks the beginning of a considered and coordinated approach to the implementation of sustainability at Explorer Street. It is designed to guide all future infrastructure investment and property development in the area across all stages of the project lifecycle from planning and design, to construction and operation.

This document represents the outcome of a research and engagement process designed to direct its efforts to areas most meaningful to the overarching goal.

1.1.2 Project Introduction

This framework documents an approach to sustainability that incorporates two discrete exercises conducted in succession.

The first exercise is designed to explore the current context of sustainability relevant to this particular organisation in this place. It puts Explorer Street into context, and provides an evidence base to support implementation.

1.2 Framework Vision Setting

1.2.1 Approach

This framework documents an approach to sustainability that incorporates two discrete exercises conducted in succession.

The first exercise is designed to explore the current context of sustainability relevant to this particular organisation in this place. It puts Explorer Street into context, and provides an evidence-base for future decision making. This initial research piece (as shown) includes:

- **Site** | contextual analysis of physical and environmental conditions in the Explorer Street region
- **Policy** | statutory and regulatory planning framework in which the organisation operates
- **Projects** | benchmark projects with aspects relevant to Explorer Street
- **Research** | emerging research on how society and the natural environment impact each other
- **Engagement** | meetings and workshops with relevant Government organisations and stakeholders

The second exercise synthesises this research into an Explorer Street-specific Sustainability Vision and Framework for delivery. This Sustainability Framework builds on the Design Principles proposed in the Urban Design Report and for each describes:

- **Ambition** | what will Explorer Street do for sustainability
- **Rationale** | why this is critical to delivering a successful and sustainable place
- **Principles** | fundamental outcomes which represent positive achievement
- **Benchmarks** | quantifiable indicators which align with existing policies or frameworks
- **Opportunities** | potential actions to deliver sustainability across the development lifecycle
- **Supports** | specific frameworks or policies that it contributes to or facilitates



Figure 1.1 Evidence base supporting sustainability ambition and vision (Source: Atelier Ten)

1.3 Background

1.3.1 Explorer Street, Eveleigh

Explorer Street is located in the suburb of Eveleigh, within the City of Sydney. The 2.3 Ha site is occupied with 46 social housing homes. The site is surrounded by industrial buildings of the Eveleigh Rail Maintenance Centre and railway lines to the North. To the south is the 6700m² Rotary Park and adjacent heritage low rise residential along Henderson Road. The park, built above an underground train tunnel, currently has rolling topography with trees, childrens play area and walking paths.

Explorer Street is well connected to local services, public transport, education and employment centres. The estate is within close proximity to a number of train stations including: Macdonaldtown, Erskineville and Redfern Station; and the future Waterloo Metro Station. Eveleigh is diverse and multi-cultural, home to twice the amount of Aboriginal people compared to the rest of NSW, and also a higher proportionate of people earning a lower income.

LHC intends to develop the site to contain approximately 430 dwellings, with 120 social housing dwellings, targeting a 70:30 mix of private and social dwellings.

1.3.2 City of Sydney context

Eveleigh is located South of the City of Sydney and borders the Inner West. Pre colonial contact, members of Cadigal or Gadical clans inhabited the area, with Redfern and surrounding areas being of great importance due to Shea's Creek, offering views to the trade route from Circular Quay to Parramatta. South Sydney has historically had strategic connections to the nearby railways, Port Botany and CBD, providing Sydney's most compact housing and essential support functions for the CBD.

The area has remained a culturally diverse place, traditionally being home to lower socio-economic households and with many areas becoming gentrified overtime due to the lack of affordable housing. Most of the previous South Sydney is now apart of the Eastern Harbour City as apart of the vision for the transformation of Greater Sydney.

1.3.3 A Metropolis of Three Cities

Greater Sydney will be transformed into a metropolis consisting of 3 cities: Western Parkland City, Central River City, and Eastern Harbour City. Eveleigh is located in the Eastern Harbour City.

The Metropolis will be a "collaborative city" of healthy and resilient communities that are **culturally rich and diverse**. There will be a greater supply of housing and **more diverse/affordable housing**. Open space and heritage areas will be conserved and enhanced with increased accessibility for all.

Biodiversity and waterways will be protected and healthier, with urban bushland and public open space enhanced. An increased urban tree canopy cover and implementing the Green Grid will "link parks, walking paths and bushland" to each other. The metropolis will work towards **70% reduction of emissions by 2035** and contribute to **net zero emissions by 2050**.

1.3.4 Six Cities Region

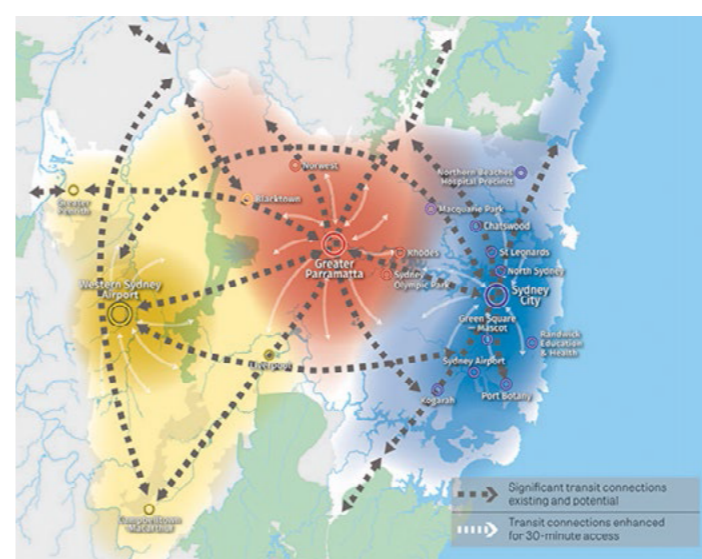
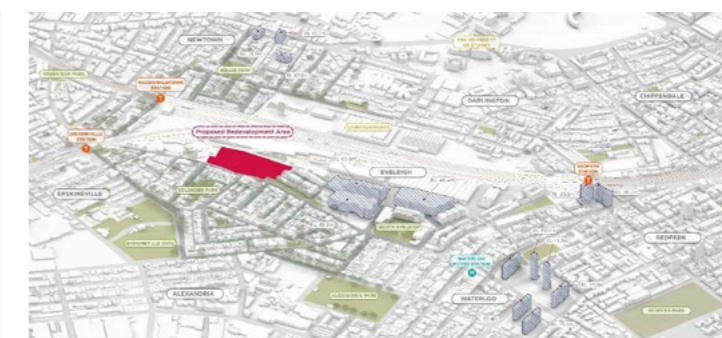
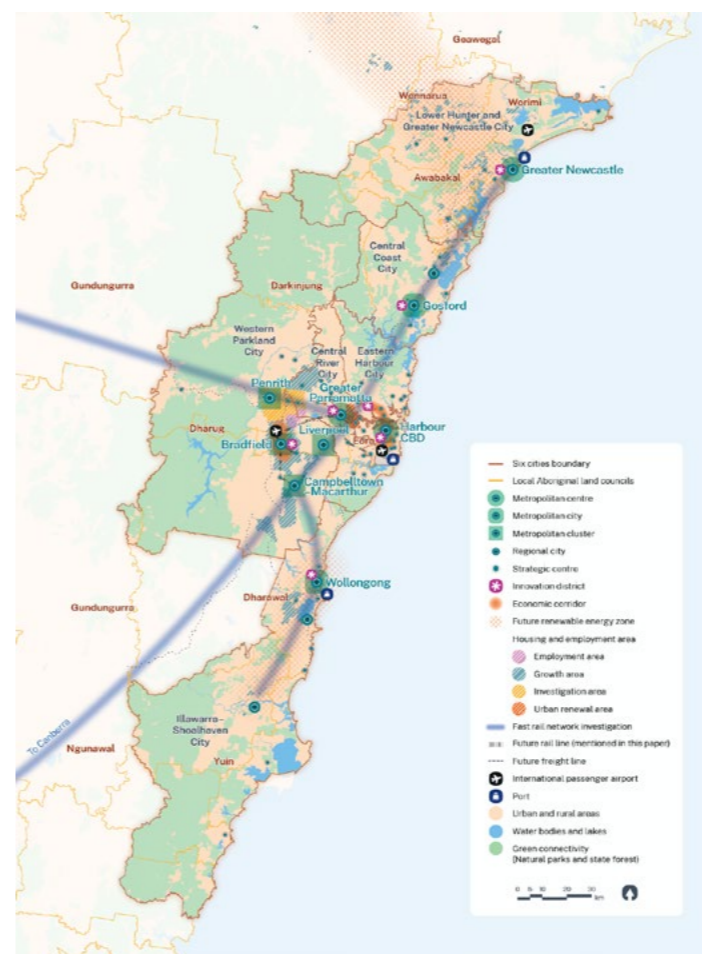
The Six Cities Region is a network of connected cities that support each other whilst leveraging each others unique character and strengths. The cities comprise of the future Metropolis of Three Cities as well as Lower Hunter and Greater Newcastle City, Central Coast City, Illawarra-Shoalhaven City.

The region will ensure digital connectivity in nanoseconds and ensure that **people and goods can move across the region in 90 minutes**. In each city jobs will be **30 minutes from people's homes**, with vibrant local centres that can meet daily needs in a 15 minute walk. The aspirations and knowledge from First Nations people are recognised and embedded in planning for the region's future.

Social sustainability will also be intrinsic to the development of the region, with the vision including **more sustainable and affordable housing that can adapt to "changing needs over time"**. Communities and cities will drive Sydney towards net zero emissions and mitigate climate related risks. Social infrastructure will be accessible and attractive with town centres embracing more experience based mix uses. **Ensuring housing is located near public transport hubs, such as the Metro, and in locations that provide a "high quality of life"**.

The NSW Government's Net Zero Plan Stage 1: 2020-2030 creates a pathway to a low-carbon state by 2050. Low and zero emission vehicles are key to the transition to clean and quiet mobility. **Renewable energy will ensure transport, homes and businesses are sustainable** and climate-proofed cities. A circular economy in these cities will transform urban systems and create efficiency of resources. **Emissions will have more than halved by 2050**, and NSW will play a leadership role in the global region for the transition to a net zero economy.

Establishing partnerships with representatives of First Nations communities, Aboriginal Community Controlled Organisations, traditional custodians, and Local Aboriginal Land Councils, the Commission will **ensure First Nations perspectives inform and influence all its planning and decision-making processes**. The commission will also create a First Nations Advisory Panel "to advise on regional strategic planning."



1.4 Site context

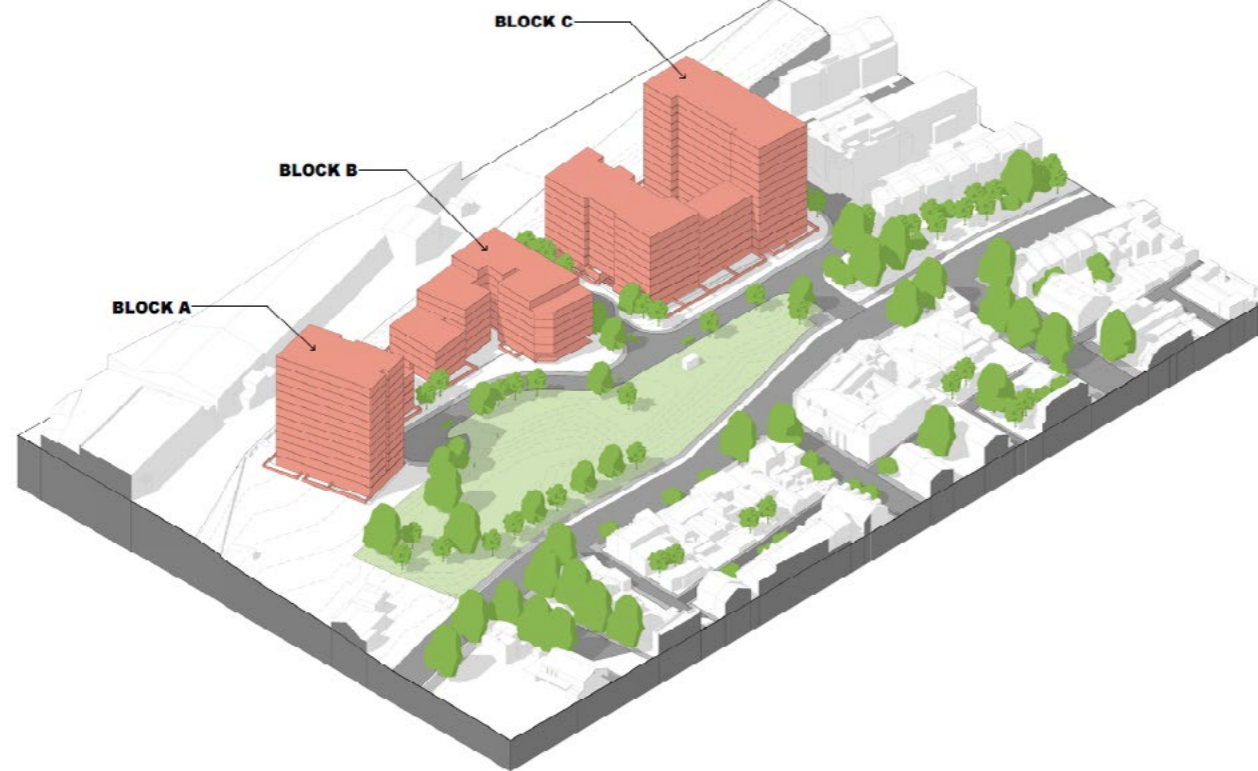


Figure 1.2 Site plan 3D (Source: Design report workshop 2 WMK)



Figure 1.3 Site plan (Source: Design report workshop 2 WMK)

1.5 Policy and planning framework

These documents layout policy ambitions and priorities for master planning globally, in the commonwealth, in NSW and Explorer Street.

These documents have been organised in a hierarchy based on their relevance to the Explorer Street Structure Plan:

- **Ambition | What do we want?**
Provide the global and national goals and aspirations for sustainability, sustainable development, and climate resilience.
- **Direction | How do we get there?**
Provide state and region specific objectives and pathways for achieving ambitions.
- **Guidance | What does it look like?**
Provide design specific approaches and support for the implementation of objectives in Sydney's built environment.
- **Place | What do we do in Explorer Street?**
Provide Explorer Street specific strategies and actions for delivering a sustainable development

A detailed review of the **Place** documents follows on the next pages. For each a short summary is provided, as well as potential implications or actions for realising them in the Explorer Street Structure Plan.

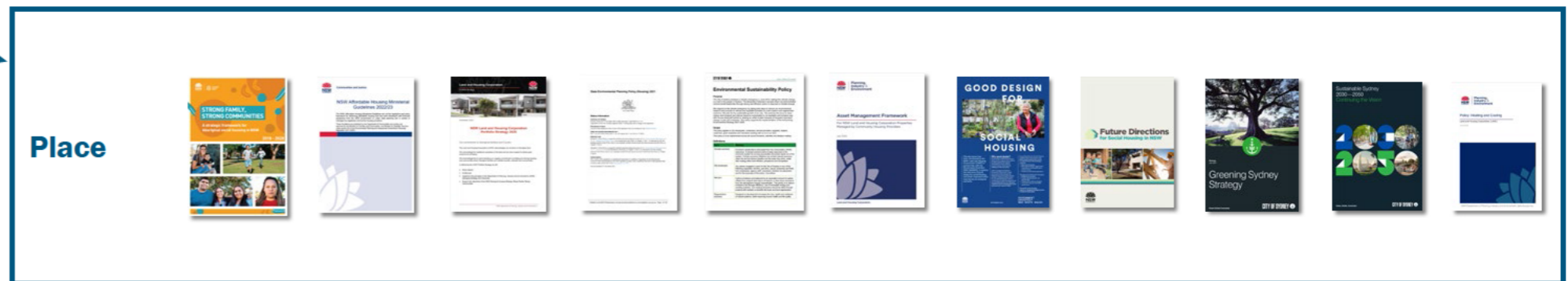
A review of these documents shows key and consistent themes across this policy context include:

- zero carbon
- responsible and efficient consumption and production
- climate resilient and adapted
- biodiversity, ecosystem functioning, ecosystem services and human well-being
- integrated active transport
- flexible, efficient and resilient water cycle
- leveraging open and real time data with smart city digital technology
- socially sustainable, inclusive and equitable communities
- good health and wellbeing
- connection to Country
- environmentally and socially responsible value chains
- multilateral governance centred collaboration and co-creation

Aspirations

Governance

Specific Strategies



1.6 Development environment

Equally important to policy and planning is the industry context in which the project will be delivered.

1.6.1 Industry

Beyond statutory requirements the property and real estate industries, along with NGOs have begun to set their own (often more ambitious) objectives for future investment.

It is important to understand these because they help drive innovation and progress towards sustainable development. Industry groups often represent a broad range of stakeholders, including businesses, communities, and environmental organizations, and their insights and recommendations can help stakeholders identify new opportunities to reduce their environmental impact and improve their social and economic outcomes.

Aligning with sustainability ambitions and concerns from industry groups can help meet increasing market demands for environmentally responsible buildings and developments. Consumers and investors are increasingly aware of the importance of sustainability, and many are actively seeking out properties and investments that align with their values. By incorporating sustainable design and development practices, developers can attract these consumers and investors, enhance their reputation, and improve their bottom line in the long term.

1.6.2 Rating tools

Additionally, a valuable sustainability assurance mechanism used by industry are third-party rating tools. Many local and international tools have recently been updated or are currently in the process of doing so. These updates are designed to better incorporate changes in industry preferences, clearer climate goals, and post-COVID responses.

Even if a project is not seeking certification through sustainability tools it is still important to understand the criteria they use, why they use them, and their future plans for the tools.

These tools are developed through a rigorous and evidence-based process and have been widely adopted as industry standards for measuring and achieving sustainability outcomes. Understanding their criteria can help a project identify areas of improvement and optimize its sustainability performance.

They are continually updated to reflect emerging best practices and the latest research and technologies, so staying informed can help projects stay ahead of the curve and future-proof their sustainability strategies.



1.7 Urban research

Another lens in support of sustainability is the body of research in climate, ecology and sociology that affirms that human impacts on natural systems are approaching key tipping points, and that we face a rapidly escalating risk environment for societal stability in a changing world.

There are new research-based frameworks for viewing these sustainability trends through several distinct yet complementary lenses, all of which have shaped the approach to this framework.

All three research directions suggest that a forward-looking Explorer Street development must integrate sustainability in a holistic manner across environmental, social, economic domains, and recognise and engage with opportunities beyond project borders.

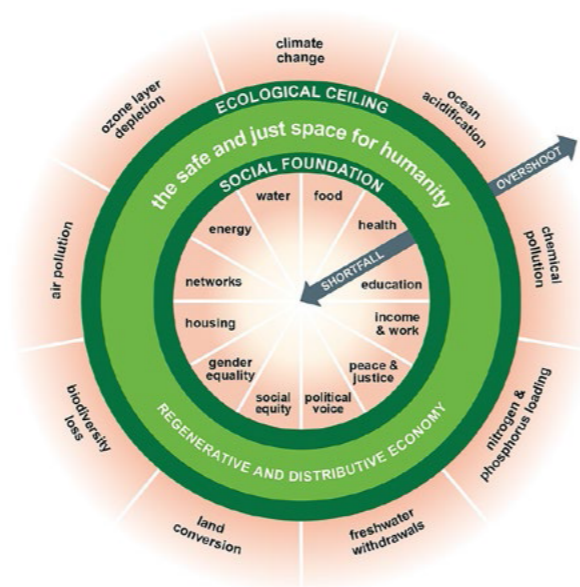


Figure 1.4 Doughnut economics visual framework for sustainable development (Source: Doughnut Economics Action Lab)

1.7.1 Doughnut Economics

Developed by University of Oxford economist Kate Raworth, the Doughnut Economics framework for sustainable development, combines the concept of planetary boundaries with the complementary concept of social needs.

The framework regards the performance of an economy by the extent to which the needs of people are met without overshooting Earth's ecological ceiling. In this model, an economy is considered prosperous when all twelve social foundations are met without overshooting any of the nine ecological ceilings. This situation is represented by the area between the two rings, considered by its creator as the safe and just space for humanity.

Doughnut Economics is a model increasingly influencing sustainable urban development and valuable for Explorer Street to utilise as it formalises the social needs of a community and provides a useful set of metrics to work towards.

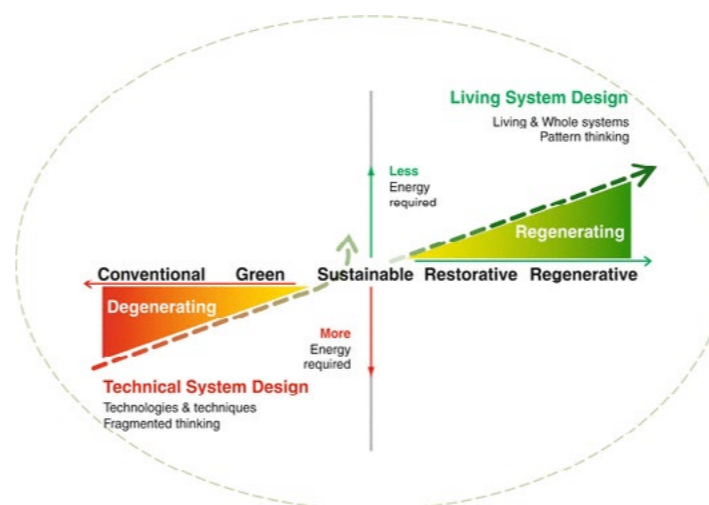


Figure 1.5 The spectrum of sustainability practices: From less bad to more good. (Source: Regenesis)

1.7.2 Regenerative Development and Design

Regenerative Design, developed by Bill Reid and the Regenesis Institute for Regenerative Practice, is a design process that engages and focuses on the evolution of the whole of the system of which we are part.

Within a regenerative economy, the focus moves up from the purely mechanical activities of production and consumption to the developmental activity of wise management. This wise management seeks to grow not only wealth but the wealth-generating capacity of all participants, as well as growing the natural capital that underpins societal wealth.

Regenerative Development and Design is a model relevant for Explorer Street because it provides a framework for development which moves beyond mitigating negative impacts and looks to actively rehabilitate; not just the environment, but also social and economic systems in a mutually beneficial way.



Figure 1.6 A framework to create connected, vibrant, and inclusive communities (Source: Project for Public Spaces)

1.7.3 Transformative Placemaking

Transformative Placemaking, developed by the Brookings Institute and the Anne T. and Robert M. Bass Center for Transformative Placemaking, is an outcome-oriented framework that defines transformative placemaking as a new form of integrated development.

Transformative Placemaking expands the scope of development to include efforts aimed not only at improving our social, emotional, and physical wellbeing, but at remaking the relationship of place and economy in ways that generate widespread, and locally-led, prosperity.

The key aim is to nurture an economic ecosystem that is regionally connected, innovative, and rooted in the assets of its local residents and businesses.

Transformative Placemaking is a useful model for Explorer Street because it has developments of a physical scale that can contribute meaningful outcomes to the community, as well as the appetite and ambition to support the area's sensitive and sustainable growth.

1.8 Case studies

As the importance of sustainable development continues to grow, so too does the significance of social housing projects in creating a more equitable and environmentally conscious future.

In this section, we explore a range of case studies that demonstrate the potential of social housing to deliver sustainable outcomes in Australia and internationally. These case studies provide valuable insights into the characteristics of successful projects and offer practical examples of how to implement sustainable design and development practices.

1.8.1 Australian case studies

We begin by examining social housing projects in Australia. The Elizabeth Street project in Redfern, the Cowper Street development in Glebe, the Flemington development in Victoria, and Tarakan Street development in Victoria have all been recognized for their innovative and sustainable design solutions.

These projects showcase a range of features that contribute to their sustainability, including the use of renewable energy, the integration of green spaces, and the incorporation of community facilities.

By studying these projects, we can gain a better understanding of the defining characteristics of successful social housing developments in Australia.

1.8.2 International case studies

We will then move on to explore two international case studies. The Kings Crescent Estate Redevelopment in London and Le Quartier des Spectacles in Montreal.

These case studies provide valuable examples of how social housing can contribute to sustainable development globally, and offer insights into how different approaches can be adapted to different contexts.



1.8.3 Elizabeth Street in Redfern, Australia

The Elizabeth Street Development is designed to provide affordable housing and commercial spaces while incorporating sustainable design principles to reduce its environmental impact.

The Elizabeth Street Development is a \$100 million AUD mixed-use development in Redfern, Sydney. It includes three buildings, consisting of a 16-story residential tower featuring 160 apartments, a 5-story commercial building, and a 4-story affordable housing building with 20 units. The development offers a range of programs, such as affordable housing, communal open spaces, and ground-floor retail spaces. The buildings encompass a mix of residential, commercial, and affordable housing units to meet various needs.

Energy, Carbon, and Net Zero:

- Solar panels on the rooftops provide approximately 10% of the development's energy requirements..
- Use of energy-efficient appliances and fixtures to reduce energy consumption.
- Central energy management system, includes real-time monitoring of electricity, water, and gas consumption, and identifies areas of inefficiency for remediation.

Affordability:

- 30% affordable housing.
- 10% social housing.

Climate Adaptation and Resilience:

- Green roof system to reduce heat absorption and improve stormwater management.
- Drought-resistant landscaping to reduce water consumption.

Transport and Mobility:

- Bicycle storage and end-of-trip facilities.
- Electric vehicle charging stations.

Community and People:

- Communal open spaces for residents and the community.
- Green space and landscaping to improve air quality and promote mental well-being.

Waste, Materials, and Circularity:

- Recycled content and low-VOC paints, to reduce the environmental impact of construction.

Nature, Ecology, and Biodiversity:

- Green wall system to improve air quality and promote biodiversity.
- Bird and bat boxes to create habitats for local wildlife.

Assurance:

- 5 Star Green Star rating for design, 4 Star Green Star rating for construction.
- 4 Star NABERS Energy rating and a 4.5-star NABERS Water rating.



Figure 1.7 Aerial of proposed social housing buildings in Redfern (Source: LAHC)



Figure 1.8 Ground Plane artist impression of Elizabeth Street (Source: LAHC)

1.8.4 Cowper Street, Glebe

The Cowper Street development comprises a mix of social, affordable, and private housing units, with a focus on sustainability and community building.

The Cowper Street development is a joint project between the City of Sydney and the NSW Government. The development includes 88 apartments, with 34 social housing units, 30 affordable rental units, and 24 private apartments. The development also features a community garden, a rooftop terrace, and ground-floor retail spaces. The total cost of the project was AUD 37 million.

Energy, carbon, and net-zero:

- Solar panels installed on the rooftop to generate renewable energy
- Double-glazed windows to reduce heat loss and gain

Affordability:

- 40% of the apartments are designated as social or affordable housing
- Rent charged to tenants is based on their income to ensure affordability
- Partnership with the City of Sydney to provide additional funding for affordable housing units

Transport and mobility:

- Located near public transportation, including bus and light rail stops
- Bicycle parking and storage facilities for residents and visitors
- Car-share spaces

Community and people:

- The development includes community spaces, such as a rooftop terrace and a community garden, to encourage social interaction among residents
- Retail spaces on the ground floor

Waste, materials, and circularity:

- Composting facilities for residents
- Cross Laminated Timber (CLT) and precast concrete structure.

Nature, ecology, and biodiversity:

- Green roof and a community garden to support local biodiversity and provide green space in an urban area
- Native plants in landscaping to support local ecology

Assurance:

- 6 Star Green Star communities rating
- 5 Star Green Star Design and As-Built
- BASIX Energy 50 for low rise and 45 for high rise
- NABERS Energy rating of 5.5 stars
- NABERS Water rating of 4.5 stars



Figure 1.9 Green space near development (Source: NSW Gov)



Figure 1.10 Activated and well lit, safe streets at the new development (Source: NSW Gov)

1.8.5 Tarakan Street, West Heidelberg

The new housing development will create 130 new social and affordable homes, located 10km from Melbourne's city centre. The Victorian Government is investing \$63.07 million for the development. The design of the new development was made in collaboration from the community and features modern sustainable design

The development will meet Victoria's changing household needs and will include a range of homes such as apartments and town houses of 1,2 and 3 bedroom homes. The new homes are inclusive and accessible for resident's different needs and feature improved open space.

Affordability:

- 100% affordable, with rent levels at or below 30% of residents' incomes.
- Mix of affordable and market-rate units, helping to create a more economically diverse community.

Transport and Mobility:

- Several bike lanes and pedestrian-friendly streets.
- At least 5 per cent of the new social housing homes will be easy to access for Victorians with disabilities.

Nature and Biodiversity:

- Safe and publicly accessible open and green spaces
- Retaining as many existing trees as possible

Assurance:

- 5-star Green Star rating and a 7-star NatHERS average rating
- project promotes good design. The Office of the Victorian Government Architect will review the design proposal and provide advice.
- All new homes built by Homes Victoria as part of the Big Housing Build will have a minimum Silver rating from Livable Housing Australia



Figure 1.11 Tarakan Street new terraces (Source: Victoria Homes)



Figure 1.12 View to new apartments (Source: Victoria Homes)

1.8.6 Holland Court and Victoria Street, Flemington

The new social and affordable Victorian development is located in the City of Moonee Valley and prioritises green space and nature. The development will be financed, designed and constructed by a not for profit project group overseen by Homes Victoria.

Resource Efficiency:

- The project will incorporate environmentally efficient design, meaning the homes will be more comfortable as well as less expensive to heat and cool

Affordability:

- The site will include social and affordable housing.

Resilience:

- Buildings designed to be adaptable to the changing needs of residents over time
- Buildings designed to be resistant to natural disasters such as earthquakes

Transport and Mobility:

- Paths and connections through the site for pedestrians and cyclists.
- At least 5% of the new social housing homes will be easy to access for Victorians with disabilities. This includes drop-off areas, paths, lifts and car parking. Inside the home, kitchens, bathrooms and storage will also be very accessible.

Community and People:

- In a first of its kind for social housing in Victoria, this site will be delivered through a Ground Lease Model. Through a partnerships approach, vacant land will be leased to a not for profit project group who will finance, design, construct, maintain and manage the sites for 40 years, before handing all land and buildings back to Homes Victoria.
- Community Committee for the renewal of the Flemington site to be established, including community members, local organisations who provide advice on the redevelopment.

Nature and Biodiversity:

- Green spaces integrated into the design of the buildings and surrounding area
- Safe and publicly accessible open and green spaces, including a gateway park and children's playground.

Assurance:

- The project aims to achieve 5-star Green Star rating and a 7-star NatHERS average rating
- The development will include 5% of Disability Discrimination Act fully accessible homes.
- All new social housing homes will have a minimum Silver level certification from Livable Housing Australia.



Figure 1.13 Aerial view of green Victoria Street housing (Source: Victoria Homes)



Figure 1.14 Plan of Flemington redevelopment (Source: Victoria Homes)

1.8.7 Le Quartier des Spectacles Development in Montreal, Canada

Le Quartier des Spectacles is a 1.2 square kilometer urban district in Montreal, Canada that has been redeveloped to become a vibrant cultural hub for the city.

The project aimed to bring together cultural institutions, commercial activities, and residential areas in a pedestrian-friendly environment. It is home to 80 cultural venues, including theaters, galleries, and museums, as well as many public spaces and parks.

The Le Quartier des Spectacles Development is made up of 35 buildings, including 7 new cultural institutions, 2 residential buildings, and a hotel, as well as various other commercial spaces. The development has a total cost of \$1.2 billion CAD and covers an area of 28.5 acres. The project also includes a public space enhancement program that has revitalized the district's streets, squares, and public spaces.

Resource efficiency:

- High-performance glazing, insulated walls, and green roofs.
- Intelligent lighting system to minimize energy consumption in public spaces.
- Rainwater harvesting is used to irrigate green spaces and supply public fountains.

Affordability:

- A portion of the residential buildings offer affordable housing units.

Transport and mobility:

- Prioritizes pedestrian and bike-friendly streets with reduced car traffic.
- Located near public transportation hubs, making it accessible to commuters.

Nature and biodiversity:

- Green roofs, rain gardens, and other green infrastructure to increase biodiversity and reduce the urban heat island effect.
- Public green spaces that provide opportunities for nature engagement and outdoor recreation.

Assurance:

- LEED Gold and BOMA BEST Platinum.
- Won several awards, including the 2019 National Urban Design Award.



Figure 1.15 Aerial view of cultural hub (Source: Quartier des Spectacles Montreal)



Figure 1.16 Light art urban exhibition (Source: Quartier des Spectacles Montreal)



Figure 1.17 Playful urban furniture (Source: Quartier des Spectacles Montreal)

1.8.8 Kings Crescent Estate Redevelopment in London, UK

The Kings Crescent Estate Redevelopment in London, UK is a large-scale regeneration project that aims to provide high-quality affordable housing for the local community.

The project involves the demolition of outdated and dilapidated buildings and the construction of modern, energy-efficient homes. The redevelopment covers an area of 2.6 hectares and is expected to cost approximately £150 million. It includes 765 homes, with a mix of affordable and market-rate housing. The development also features a community center, retail spaces, and green spaces.

Resource efficiency:

- Use of renewable energy sources, including solar panels and biomass boilers
- Water-efficient fixtures, including low-flow toilets and showers
- Energy-efficient lighting and appliances, including LED lighting and energy-saving appliances
- Building materials sourced locally where possible to reduce carbon emissions

Resilience:

- Building design meets flood resilience standards

Transport and mobility:

- The development includes bicycle storage facilities and access to public transport
- The creation of pedestrian-friendly streetscapes and pathways

Community and people:

- The development includes community spaces and facilities, including a community center, retail spaces, and green spaces.
- Programs for residents, including health and well-being programs and social events
- The design of the homes and public spaces encourages community interaction and social cohesion

Nature and biodiversity:

- The development includes green spaces and planting, including a new park and community garden
- Native plants used in landscaping to promote biodiversity

Assurance:

- Achieved a BREEAM Excellent rating
- Homes designed to meet the Passivhaus standard



Figure 1.18 Garden within redevelopment (Source: Kings Crescent Estate)

1.9 Summary of key findings

Explorer street has the opportunity to join the race to net zero carbon and implement key environmental principles which will align with national and international targets. Here are emerging themes which will help build the Environmental framework.

Climate action

- Incorporation of renewable energy sources, such as solar panels, to reduce reliance on fossil fuels and decrease carbon emissions.
- Implementation of water conservation and reuse strategies, such as rainwater harvesting and greywater systems.
- Targeting net zero, carbon neutral, and high performance, low carbon.
- Prioritising renewable energy, and offsetting unavoidable impacts.
- NSW 70% reduction in emissions by 2035 compared to 2005 levels

Waste Reduction

- Sustainable waste management practices, such as recycling programs and composting facilities.
- Responsible and efficient consumption and production of materials and resources
- Precast and prefabricated buildings/components for waste reduction and reduce noise to surrounding neighbourhood

Climate adaptation

- Maximising efficiency, increasing autonomy, sharing resources, and reducing dependency
- Drought-resistant landscaping to reduce water consumption.

Biodiversity and ecology

- Consider habitat, nature-based solutions, and ecosystem services
- Sustainable materials and green infrastructure, such as green roofs and walls, to reduce energy consumption and promote biodiversity.
- Open space that enables ecosystems and people to thrive
- Public green spaces that provide opportunities for nature engagement and outdoor recreation, e.g. playful urban furniture
- Retaining as many existing trees as possible
- Green spaces integrated into the design of the buildings and surrounding area e.g. green walls, green roofs
- Bird, bat and bee boxes to create habitats for local wildlife.
- Native plants in landscaping to support local ecology

Health and wellness

- Design for active and public transportation, including bike lanes, pedestrian walkways, and public transit connections.
- Actively co-creating communities leads to improved resilience, higher commercial value and faster sales,

greater talent attraction and retention, and encourages further good design in an area.

Affordability

- High affordability targets (e.g. 100% affordable), with rent levels at or below 30% of residents' incomes for many of the Australian case studies

Transport

- Bicycle storage and end-of-trip facilities.
- Electric vehicle charging stations.
- Design for active and public transportation

Social sustainability

- Buildings designed to be adaptable to the changing needs of residents over time such as flexible floor layouts, range of housing types e.g. apartment, townhouse, duplex/triplex
- Located near to and easy access to public transport
- Community engagement and involvement in the planning process to ensure that local needs and concerns are addressed.
- Creation of public spaces, such as parks and community gardens, to improve air quality, promote health and well-being, and foster a sense of community.
- Equitable access to public services and amenities
- Respect for cultural and historical context.
- Community center that includes health and wellbeing programs as well as events
- Equity, inclusion, diversity, accessibility, and stewardship.
- Empowering communities and maximising shared value capitalises on the existing resources in a location rather than relying entirely on the import of external capital and people.
- Ensure that existing residents are able to return once the new development has been built, so that the community can be retained.
- Shared facilities such as bicycle storage

Assurance

- Align with the latest National Building Code
- Livable Housing Australia certification
- Development to achieve 6 star Green Star Community Rating and buildings to achieve a minimum of 5 star Green star rating.

Table 3: Australian Climate Emergency Targets for Operational Carbon Performance for New Buildings and Major Renovations

Building type	Climate	Average existing building EUI ¹	Current practice (2022)	2030 Operational Carbon Performance Targets			Operational Carbon target
				Minimum performance targets (EUI NFA ²)	Min. performance targets (EUI NFA ² if applicable)	Performance equivalent to	
Class 1: Detached house	National	42.6	NatHERS 7 star ³	11-36		NatHERS ⁴ or Green Star Homes equivalent with 100% Green Power	NET ZERO with 100% Green Power
	CZ 2	11-35					
	CZ 5	11-35					
	CZ 6	11-36					
Class 1: Semi-detached house	National	44.8	NatHERS 7 star ³	11-34		NatHERS ⁴ or Green Star Homes equivalent with 100% Green Power	NET ZERO with 100% Green Power
	CZ 2	10-34					
	CZ 5	10-33					
	CZ 6	11-35					
Class 2: Residential apartment	National	69.2	NatHERS 7 star ³	29-55	23-44	NatHERS ⁴ or Green Star Buildings rating with 100% Green Power	NET ZERO with 100% Green Power
	CZ 2	29-54		23-43			
	CZ 5	29-54		23-43			
	CZ 6	29-56		23-44			
Class 3: Hotel	National	459	NABERS 3.5 star	71-77		NABERS or Green Star Buildings rating with 100% Green Power	NET ZERO with 100% Green Power
	CZ 2	76-81					
	CZ 5	73-77					
	CZ 6	69-74					
Class 5: Office	National	138	NABERS 5.5 star	63-67	55-58	NABERS or Green Star Buildings rating with 100% Green Power	NET ZERO with 100% Green Power
	CZ 2	69-77		60-67			
	CZ 5	66-72		57-63			
	CZ 6	56-68		49-59			
				57-68	49-59		

¹ Energy Use Intensity in kWh/m²/GFA/yr for whole building (including plug loads)
 The average existing building EUI is based on the reports and calculators published by the Clean 10 of Australia Governments and the Australian Government Department of Climate Change, Energy, Environment and Water that determine code-compliant baseline energy consumption figures for 2020 based on the National Construction Code of Australia
 Area definition: GFA used for all buildings due to it being the basis of the Paris Proof Method. Where applicable, this has been converted to other floor area benchmarks such as net lettable area (NLA).
² NatHERS assesses heating and cooling energy only and excludes other energy uses. Where relevant, whole building energy use equivalent to NSW's BASIX rating scheme can be used with NatHERS.



Figure 1.19 Australian Climate Emergency Targets for Operational Performance for New Buildings and Major Renovations (Source: Race to Net Zero Carbon)

City of Sydney, the first council to become carbon neutral in 2007, declared a Climate Emergency in 2019. It has committed to achieving net zero emissions by 2035 and has developed performance standards and pathways for high performing net zero energy buildings.

02 SUSTAINABILITY STRATEGY

2.1 Sustainability Themes

Explorer Street will catalyse the existing assets and will foster a place which champions energy efficiency, low carbon living, biodiversity, facilitates water neutrality and is future-proofed.

It will enrich the quality of life of residents and visitors, enhance the wellbeing of the local community, and work to protect broader environmental and climate health.

Seven sustainability themes providing direction to specific targets and design initiatives are proposed.

Energy and GHG Emissions

Explorer Street fosters climate positive outcomes in construction and operation, and industry leading in resource efficiency and aligning with the NSW Net Zero Plan framework.

Less Waste more Recycling

Explorer Street fosters an avoid, reuse, recycle, reprocess, and lastly disposes approach integrating systems to reduce waste on site.

Water Management integration

Explorer Street aims for a water neutral community fostering Water Sensity Urban Design strategies as well as water infrastructure in place that supports water re-use and harvest.

Green and Regenerative

Explorer Street has a net positive impact on biodiversity, prioritises natural systems, and fosters local ecology to create a biophilic environment.

Efficient and Healthy homes

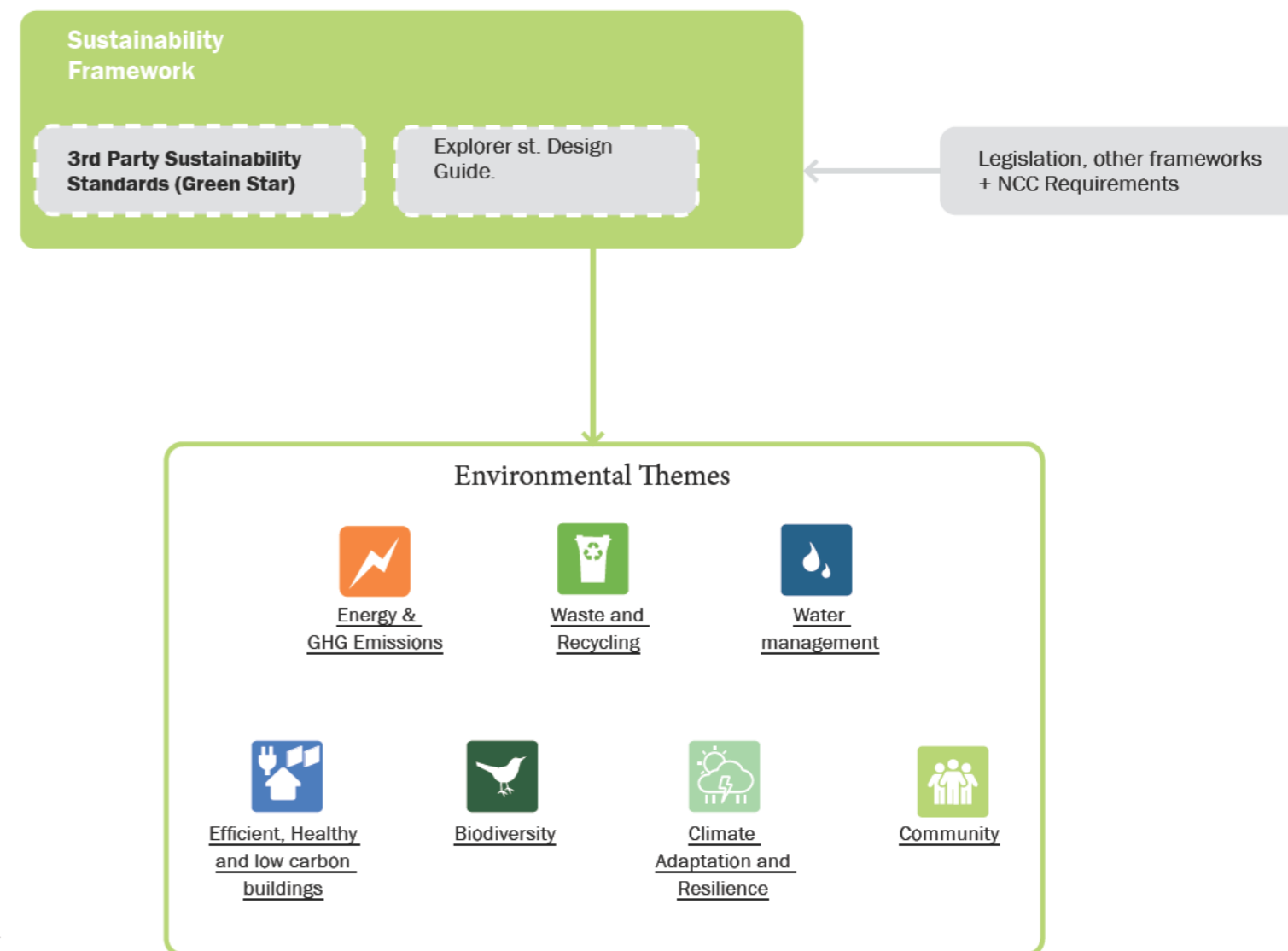
Explorer Street will be one of the first communities to foster highly efficient homes that improves thermal comfort for occupants while reducing carbon emissions.

Inclusive and Vibrant Community

Explorer Street enriches the quality of life of visitors and the community and is welcoming to all people, regardless of their age, size, gender, cultural background, disability or ability.

Resilient and adaptable

Explorer Street and its residents thrive despite short term shocks from weather and acute events and can adapt to longer term stresses like climate change.



2.2 Sustainability strategies explored

Energy & GHG Emissions

- 1 Future proofing net zero transition
- 2 All electric infrastructure (no gas)
- 3 Rooftop Solar
- 4 Battery power storage
- 5 High performance HVAC
- 6 EV / Community charging stations
- 7 Renewable energy purchase agreement
- 8 Facilities for Energy monitoring

Waste and Recycling

- 1 Waste separation and collection strategies
- 2 Organic waste treatment (warm farms/digester)
- 3 Zero waste apartment design strategies
- 4 Reduce construction and demolition waste

Water Management

- 1 Grey water diversion to site irrigation
- 2 Water efficient fittings
- 3 Rainwater collection and re use
- 4 Non potable water reuse
- 5 WSUD

Highly efficient & Healthy buildings

- 1 Efficient building fabric
- 2 Heat recovery ventilation
- 3 Mixed mode ventilation strategy
- 4 Heat Pumps for Heating/DHW
- 5 Passive design strategies
- 6 Healthy building materials
- 7 Energy efficient lighting and appliances
- 8 Induction cooking in all units

Biodiversity Enhancement

- 1 Habitat restoration, creation and expansion.
- 2 Improved links between existing sites, creating nature networks.

Climate adaptation and resilience

- 1 Climate change mitigation strategies plan
- 2 Climate resilient urban design strategies

Design guidelines for a changing climate

Community and active lifestyle

- 1 Community gardens
- 2 Access to fresh food
- 3 Community amenities
- 4 Integrated active design

2.3 Climate Positive

Net zero emissions in construction and operation.

Rationale

A zero carbon future is central to all sustainability strategies and policy documents at all tiers of government. A zero carbon present is rapidly becoming the basic expectation for innovative and thought leading industries like those targeted for investment in this precinct.

Principles

- Minimise upfront greenhouse gas emissions.
- Eliminate on-site fossil fuel combustion.
- Prioritise passive design to minimise operational energy use
- Increase and prioritisation of public and active transport
- Minimise demolishing existing buildings especially concrete structure/foundational structure
- Implement circular economy principles for waste reduction

Benchmarks

- Net zero emissions by 2050 (Net Zero Plan Stage 1: 2020-2030).
- 70% reduction below 2005 level of emissions by 2035 (Net Zero Plan Stage 1: 2020-2030).
- Net zero emissions from organic waste by 2030 (Net Zero Plan Stage 1: 2020-2030).
- 40% reduction in embodied carbon by 2030 (World Green Building Council)

Planning opportunities

- Maximise onsite renewable energy generation and storage.
- Regenerated landscapes sequester carbon.
- All-electric built environment and buildings
- Prioritise timber and other plant-based building materials that sequester carbon in their growth.
- Prioritise low embodied carbon materials.
- Invest in shared infrastructure to support waste stream diversion to recycling.
- Facilitate on site electric vehicle (EV) charging.
- Create extensive and efficient active transport paths and facilities to discourage private car use, decreasing emissions
- Potential for microgrid, especially for any new buildings to be built, link energy to shared generator/storage

Design opportunities

- Reuse and recycle building materials of existing houses to be demolished such as bricks and use within the new buildings
- Prioritise timber and other plant-based building materials that sequester carbon in their growth.
- Choose low embodied carbon materials and products for major building systems (structure, cladding, foundations, etc.).

- Construct buildings to exploit use of thermal mass to regulate internal temperature.
- Optimise all façades to shade glazing to reduce cooling energy use yet provide high quality daylighting.
- Maximise the free cooling provided by outdoor air through design for cross ventilation, and night purging.
- Incorporating sustainable water management techniques, such as rainwater harvesting and greywater recycling

Building opportunities

- Achieve Green Star rating 5 star as minimum preferably 6 stars for better environmental outcomes.
- Water-efficient appliances and fixtures to reduce water consumption.
- Energy-efficient lighting and appliances to reduce electricity consumption.
- Low-emission building materials and construction methods to minimize the carbon footprint of housing.
- Building social housing to meet the highest standards of energy efficiency, provision for highly efficient building fabric provision of the new NCC as minimum which are equivalent to NatHERS 7 star rating.
- Full electric no gas
- New installations must be energy-efficient and have a minimum energy rating of 3.5 stars.
- Implement passive design strategies, such as orientation and insulation, to reduce the need for heating and cooling.
- Implement High performance HVAC systems

Operational opportunities

- Providing training and education to social housing tenants on sustainable living practices, such as energy and water conservation, waste reduction, and recycling
- Mandatory minimum green building and infrastructure ratings for all built environment.
- Guarantee and verify operational energy efficiency through building performance tuning (e.g. NABERS ratings)
- Purchase 100% renewable energy for all operations.
- Offset all residual emissions from construction and operation with nature based solutions.
- Implement circular waste solutions for organic waste e.g. compost, biofuel



Figure 2.1 Biosolar roof combining solar panels with green roof (Source: Living Roofs)



Figure 2.3 High-speed public electric vehicle chargers (Source: NRMA)

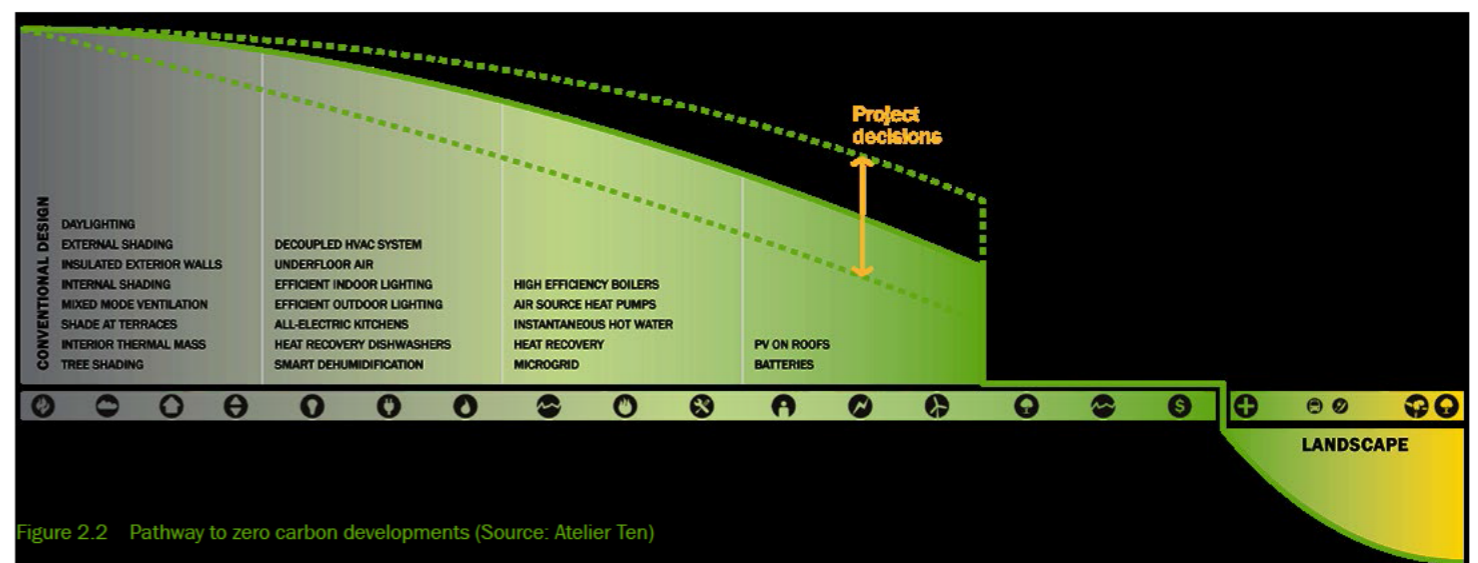


Figure 2.2 Pathway to zero carbon developments (Source: Atelier Ten)

2.4 Resilient and Adaptable

Explorer Street will mitigate exposure to foreseen risks, through being resilient to disruption, recovering rapidly, and being adaptable to societal advancement.

Rationale

Adapting to the direct effects of climate change on the environment and our settlements, as well as the indirect effects on society and the economy is critical to creating communities that will thrive long into the future, and will have greater capacity to support neighbouring communities and contribute to the resilience of the region as a whole.

Principles

- Resilient to short term shocks (extreme weather, utility failures).
- Adaptable to long term stresses (climate change, increasing energy costs).
- Flexible to changing market conditions and environmental performance expectations.

Benchmarks

- Complete climate change risk and opportunity assessments (NSW Climate Change Adaptation Strategy).
- Develop and deliver adaptation action plans (NSW Climate Change Adaptation Strategy).
- Reduce climate change impacts on health and wellbeing (NSW Climate Change Policy Framework).
- Manage impacts on natural resources, ecosystems and communities (NSW Climate Change Policy Framework).
- Support a more flexible and resilient water cycle (Resilient Sydney).
- Design to RCP8.5 climate scenarios (Green Building Council of Australia).
- Increase canopy cover by 50 per cent from the 2008 baseline by 2030 (Sustainable Sydney 2030)
- 50 per cent reduction in the annual solid pollution load discharged to waterways by stormwater by 2030 (Environmental Action Strategy)

Planning opportunities

- 100% of surface runoff from roads, roofs and other hardscapes filtered through landscape treatment before discharging to waterways.
- Consider the local context and environmental factors, such as flood risk, to ensure the safety and resilience of housing.
- On-site stormwater detention for heavy rainfall events that delay discharge.
- Building systems and infrastructure continue operating during utility failure.
- Green roofs, walls, extensive tree canopies and vegetated public realm to mitigate urban heat island effects, protect against increasing peak temperatures and increase

biodiversity.

- Locate above probable maximum flood (PMF) levels all critical equipment and services (electrical equipment and switch gear, emergency power equipment, major HVAC plant).
- Design all structures below PMF to survive flooding.
- Include space for future energy storage (electrical or thermal batteries).
- Access to communal open space and community facilities to encourage social interaction and promote community resilience.
- Integrate community facilities that can serve as gathering places during emergencies and interruptions in services.
- Prioritise materials with low thermal mass or high solar reflectance index (SRI) to reduce urban heat island (UHI) effects.
- Landscapes balance drought tolerant low evapo-transpirative species, and high evapo-transpirative species that provide local cooling.
- Plant local vegetation and trees that can withstand forecasted extremes of environmental conditions
- Provide shade and sufficient drainage for flooding in public open spaces including green spaces
- Provide cool and healthy public spaces
- Provide resilient ecosystems and green space for endemic flora and fauna
- Ensure access to fresh and affordable food
- Create a community garden to provide local and affordable healthy food

Design opportunities

- Buildings all perform 20% better than national construction code for thermal envelope performance.
- Utilise a climate responsive design approach, optimise building envelope for passive climate control.
- Provide areas of operable facade to allow fresh air during power outages
- Allow islanding of any on-site generation and standby power circuit to enable limited building operations without utility power.
- Green roofs designed to reduce peak rainwater runoff.
- Buildings collect rooftop rainwater for onsite reserve water source during emergencies.
- Designing buildings that are adaptable to changing climatic conditions and extreme weather events
- Prioritizing the use of low-maintenance and durable materials in the construction of social housing

Operational opportunities

- Develop Climate Adaptation and Community Resilience plans.
- Facilitate and enable ongoing community programming (e.g. markets, events, etc.) to foster community cohesion and robustness.



Figure 2.4 Smoke blankets Sydney during the 2020 bushfires (Source: ABC News)

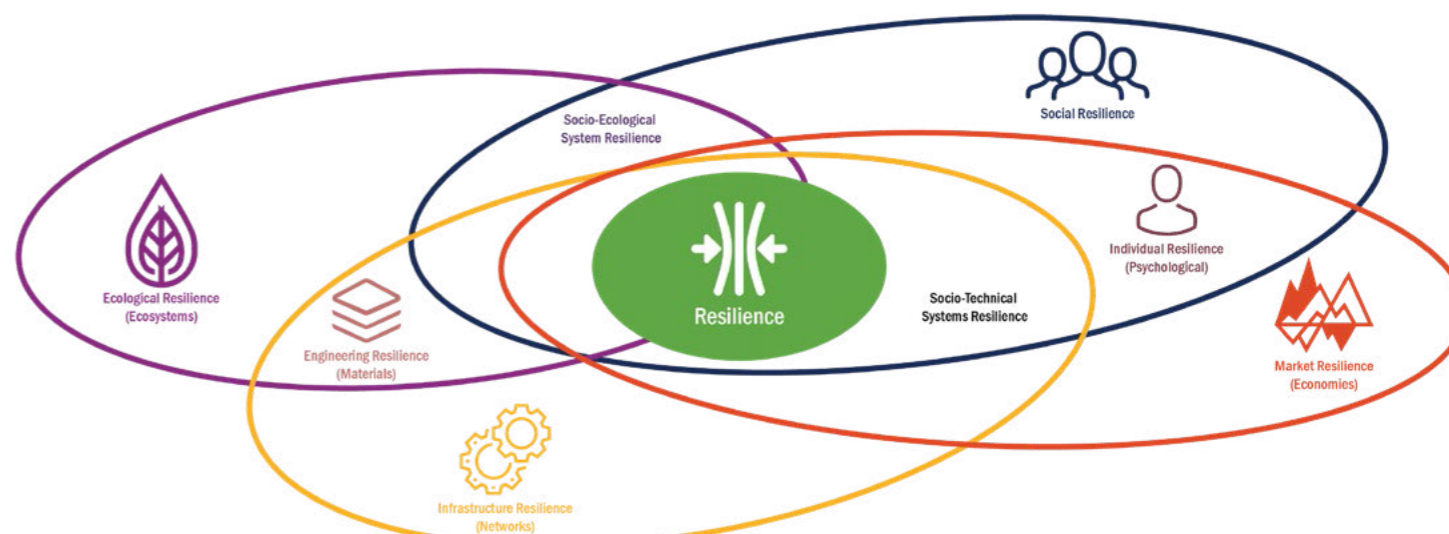


Figure 2.5 Multidisciplinary view of resilience (Source: Atelier Ten)

2.5 Green and Regenerative

Explorer Street will contain interesting and accessible green spaces that are cool and green, encouraging the local biodiversity.

Rationale

A net zero future is central to all sustainability strategies and policy documents at all tiers of government. Actively protecting existing biodiversity and regenerating environmental and ecological damage across the value chain is rapidly becoming the baseline expectation.

Principles

- Maximise resource efficiency.
- Minimise upfront greenhouse gas emissions.
- Eliminate on-site fossil fuel combustion.
- Prioritise passive design to minimise operational energy use.
- Preserve and protect existing natural ecosystems
- Establish a biophilic environment that provides regular immersion in and contact with nature and natural systems.
- Maximise future mature tree canopy and vegetation coverage in public domain.
- Prioritise nature-based solutions wherever possible.
- Protect and enhance local habitat including both native flora and fauna.
- Establish a biophilic environment that provides regular immersion in and contact with nature and natural systems.

Benchmarks

- 40% Tree Canopy Cover across Greater Sydney (NSW Gov).
- Achieve site vegetation coverage of at least 40% (Greater Sydney Commission).
- Maintain and introduce habitat (Biodiversity Sensitive Urban Design, RMIT).
- Improve potential for positive human-nature interactions (Biodiversity Sensitive Urban Design, RMIT).
- Mitigate light and noise pollution impacts on nature (Biodiversity Sensitive Urban Design, RMIT).

Planning Initiatives

- Upgrade and enhance open spaces and Rotary Park to be a place for community gathering and passive and intentional physical exercise e.g. outdoor workout area
- Ensure that all open spaces are safe and accessible to all including sufficient and fun lighting during the evening to also encourage play
- Survey existing flora and fauna at the park and create habitats to retain them and encourage more biodiversity
- Plant native vegetation species that are appropriate for the site
- Incorporate design elements that make open space interesting and encourage people to stay, e.g. outdoor art

- exhibition, fish ponds, beautiful flower gardens, children play park
- Ensure the new building development doesn't overshadow Rotary Park
- Embrace the significant level changes at Rotary Park and include within the redesign of the park e.g. create elements of play such as childrens bike paths around the level changes or slides
- Retain or replant existing trees on site and in the park
- Incorporate green infrastructure, such as green roofs and walls, rain gardens, rooftop gardens to increase biodiversity and reduce the urban heat island effect
- Establish green spaces and community gardens in new social housing developments to promote sustainable living and community engagement.
- Balance between plant species:
 - Native to the Plant Community Type (PCT) attracts local birds and insects to help with the local ecosystem.
 - Locally-sensitive drought tolerant plant species which require little irrigation and maintenance.
 - High evapo-transpirative planting for localise passive cooling
- Carefully restrict site and precinct lighting through use of a light allowance to substantially reduce light pollution and preserve dark skies at night.
- Include green spaces and urban forests in the design of new developments to improve air quality and provide habitat for wildlife

Design Opportunities

- Prioritise timber and other plant-based building materials that sequester carbon in their growth and establish a biophilic environment
- Building roofs actively contribute to sustainability ambitions: solar PV, green roofs.
- Buildings designed for disassembly.
- Buildings designed for alternative second- and third-life uses.

Operational Opportunities

- Providing residents with education and training on sustainable living practices
- Establishing partnerships with local community groups and stakeholders
- Guarantee and verify operational energy efficiency through building performance tuning (e.g. NABERS ratings)
- Mandatory use of recycled materials and products with recycled content through built environment construction.
- Purchase 100% renewable energy for all operations.
- Offset all residual emissions from construction and operation with nature based solutions.
- Implementing green waste management practices

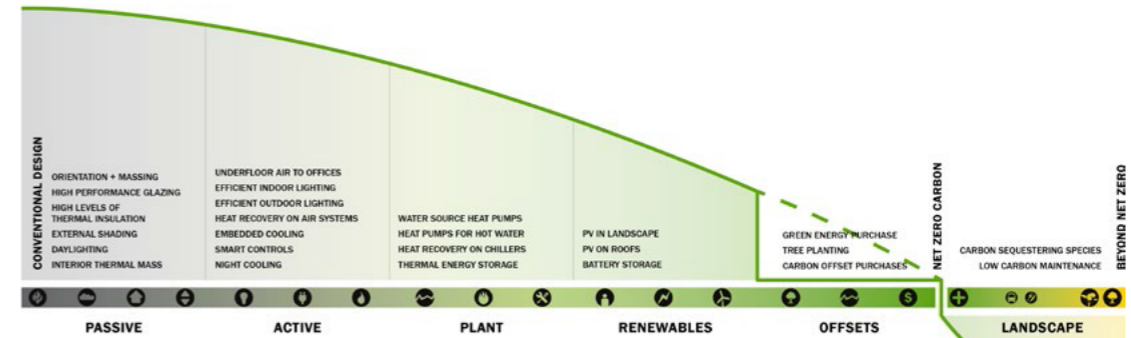


Figure 2.6 Pathway to a regenerative future (Source: Atelier Ten)

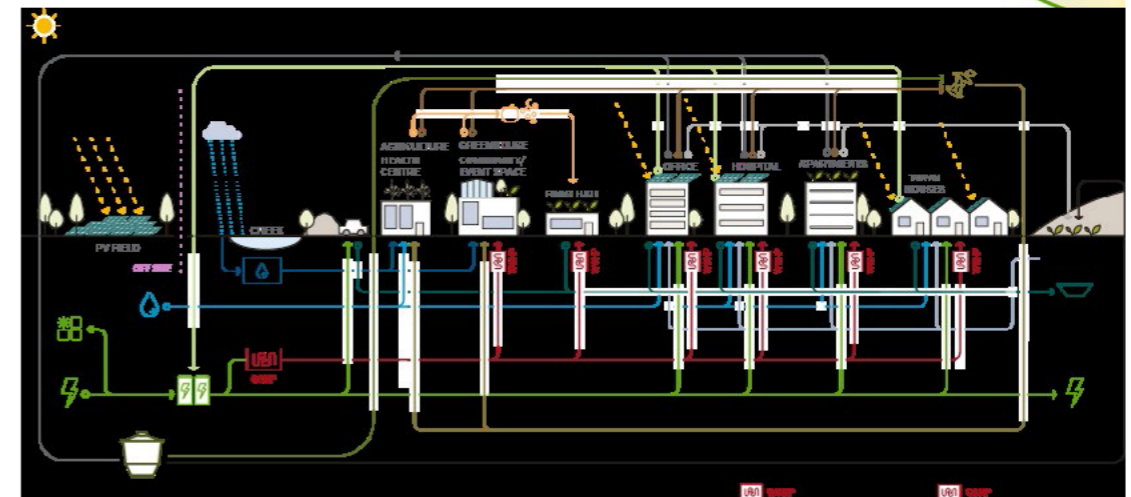


Figure 2.7 Opportunities for circular economy at Explorer Street (Source: Atelier Ten)

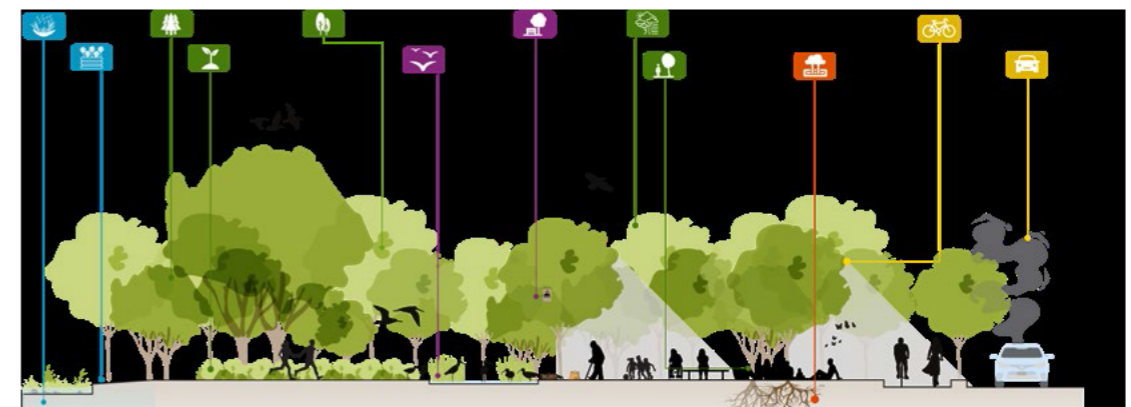


Figure 2.8 Opportunities to incorporate biodiversity in the built environment (Source: Atelier Ten)

2.6 Health & Wellbeing

Explorer Street will enrich the physical and mental health and wellbeing of the community.

Rationale

Explorer Street will prioritise human health and wellbeing, inclusion, mobility options, access to resources, affordability, and participation in leadership. These factors enable successful and vibrant places that improve liveability and resilience, achieve higher commercial value and faster sales, encourage further good design in an area, and demonstrate a commitment to corporate social sustainability.

Principles

- Foster a vibrant, cohesive social environment that is reflective of community history and identity.
- Encourage active mobility and recreational exercise.
- Nature, biophilia, immersion and contact with natural systems
- Safety, and enhancing social engagement.
- Built environment is welcoming to diverse users communities.
- All built environment is fully physically accessible and inclusive.
- Public and amenity space support socialising and collaboration.
- Promote responsible labour practices and support human rights

Benchmarks

- Waterways are connectors: destinations are linked by pathways for people along watercourses and natural corridors (Sydney Green Grid).
- Precinct residents and visitors rely on a range of sustainable transport options, especially active mobility (Sydney Green Grid & Future Transport 2056).
- Promote access to fresh, nutritious and affordable food and drink (Healthy Built Environment Checklist).
- Promote access to quality open spaces, including green space and recreational facilities (Healthy Built Environment Checklist).

Planning opportunities

- Establish green spaces and community gardens in new social housing developments to promote sustainable living, community engagement and environmental stewardship
- Incorporating community spaces and amenities to promote community engagement and wellbeing
- Build a dedicated community space where people can collaborate and learn e.g. healthy cooking classes, games days
- Serve all developed areas with fully accessible pedestrian pathways and separated bicycle paths to encourage a healthy lifestyle and reduce reliance on private cars
- Establish Rotary Park to contain elements for active

and passive exercise for different people e.g. interesting walking paths, playground, outdoor workout area

- Accessible drinking water fountains, with water bottle filling, are available in all public spaces
- Affordable and fresh food available close to the site e.g. community/rooftop garden provides fresh food
- Unobstructed lines of sight and visual connection to all open space on the site create a sense of openness and enables passive surveillance
- Distinct and memorable urban design and landscape features that encourage people to stay
- Publicly accessible courtyards and cultural places
- Activated ground plane that encourages community such as community facility/spaces, temporary art in open space, activated open space, community garden, communal courtyards
- Substantial and creative public lighting to enforce safety, accessibility but also sensitivity to local wildlife and prevents light pollution
- Ensure that the nearby railway causes minimum harm...

Design opportunities

- Minimise pedestrian exposure to surface parking lots by, for example, placing parking underground of apartments and providing direct footpath access to building entrances and lobbies.
- Celebrate natural materials through biophilic design.
- Design facilities and open spaces to be accessible for range of abilities
- Maximize natural light and ventilation within all homes to reduce energy consumption and improve indoor air quality
- Ensure that all homes have views to greenery

Operational opportunities

- Encourage communal collaboration through establishing an events board for the residents of the new development and local community/organisations
- Curated and cohesive visual narrative recognising local history.
- High quality cleaning practices, including the elimination of hazardous or harmful ingredients in cleaning
- Precinct operations, especially ecological management and stewardship, encourage individual volunteerism and community development.
- All eligible built environment (including private buildings) achieves basic healthy building certification.
- Eliminate pesticide use from landscape maintenance.
- A heating and cooling guide must be provided to tenants to ensure they understand how to use the system effectively and efficiently.

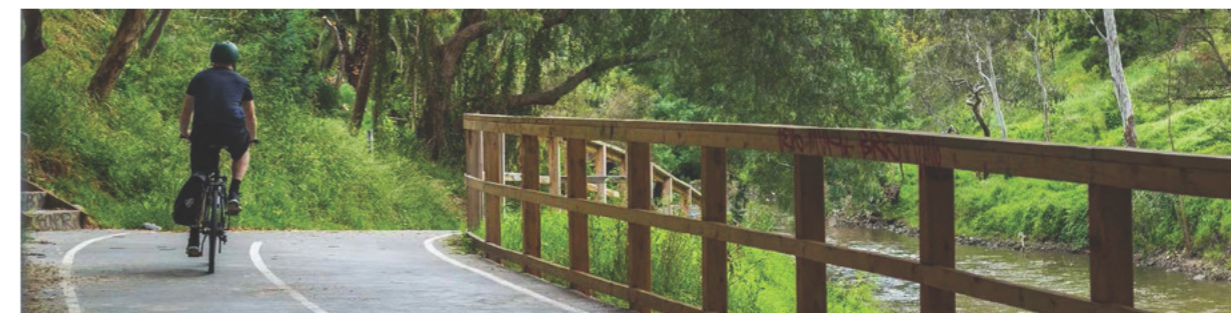


Figure 2.9 Waterways as connectors (Source: Unsplash)



Figure 2.10 Opportunities to accessible and inclusive nature (Source: Atelier Ten)

2.7 Inclusive & Vibrant Community

Explorer Street will create an environment that is welcoming to all people, regardless of their age, size, gender, culture, disability or ability, so they become part of the community.

Principles

- Built environment is welcoming to diverse users communities.
- All built environment is fully physically accessible and inclusive.
- Public spaces and amenities support gathering, socialising and collaboration.
- Provide spaces that can be used for community activities and services.
- Foster a vibrant, cohesive social environment that is reflective of community history and identity.

Benchmarks

- 3% of the total number of goods and services contracts to Aboriginal businesses, in line with NSW Government Aboriginal Procurement Policy.

Planning opportunities

- Encourage the surrounding community to stay and remain resilient to rising costs of living and gentrification; to sustain strong, familiar and resilient communities. Through supporting community advocacy groups, maintaining affordable rent for all buildings to be developed
- Access to communal open space and community facilities to encourage social interaction and promote community resilience.
- Inclusive design principles that enable tenants with disabilities or mobility issues to access and use housing and communal facilities.
- Flexibility in design to accommodate changing household needs, such as the addition of extra bedrooms or modifications to support ageing in place.
- Incorporating community spaces and amenities to promote community engagement and wellbeing
- Ensure that social housing developments are integrated with the surrounding community, rather than isolated from it.
- Ensure that social housing is designed to be safe and secure, with well-lit public spaces and appropriate security measures.
- Generous footpath widths to support mobility aids, and commercial and social activity.
- Unobstructed lines of sight and visual connection to create a sense of openness and safety
- Exterior power points to support informal community gathering.
- Distinct and memorable urban design and landscape features.
- Sporting equipment, gyms and outdoor gyms cater for all

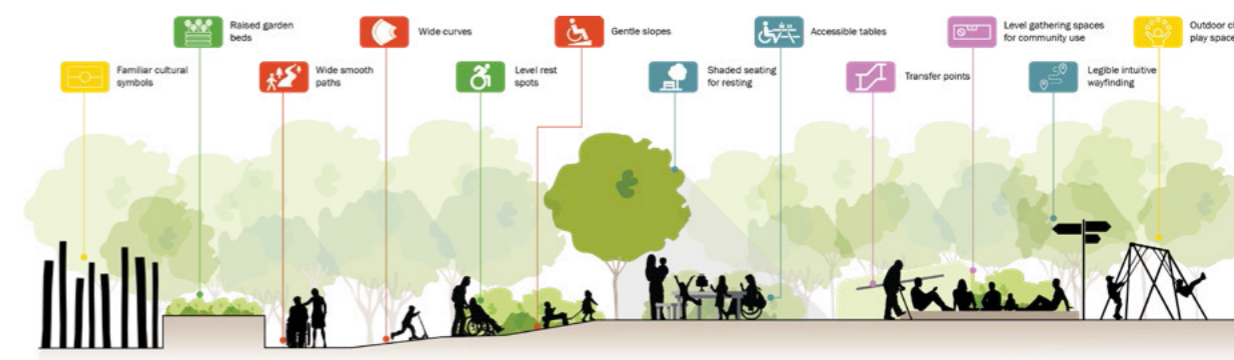
people including disabled, elderly and women

Design opportunities

- Prevent the isolation of social housing occupants through designing all buildings to be well connected and also dispersing social housing apartments throughout the three buildings proposed to prevent further inequities and discrimination
- Foster a sense of community through shared spaces, such as courtyards, gardens, and community rooms.
- Use flexible design strategies to accommodate different household sizes and needs, including multi-generational families and people with disabilities.
- Accessible street furniture and physical artefacts (e.g. ledges, planters) to allow visitors to stop and rest especially in park areas
- Design social housing to be aesthetically appealing and to create a sense of pride and ownership among residents.

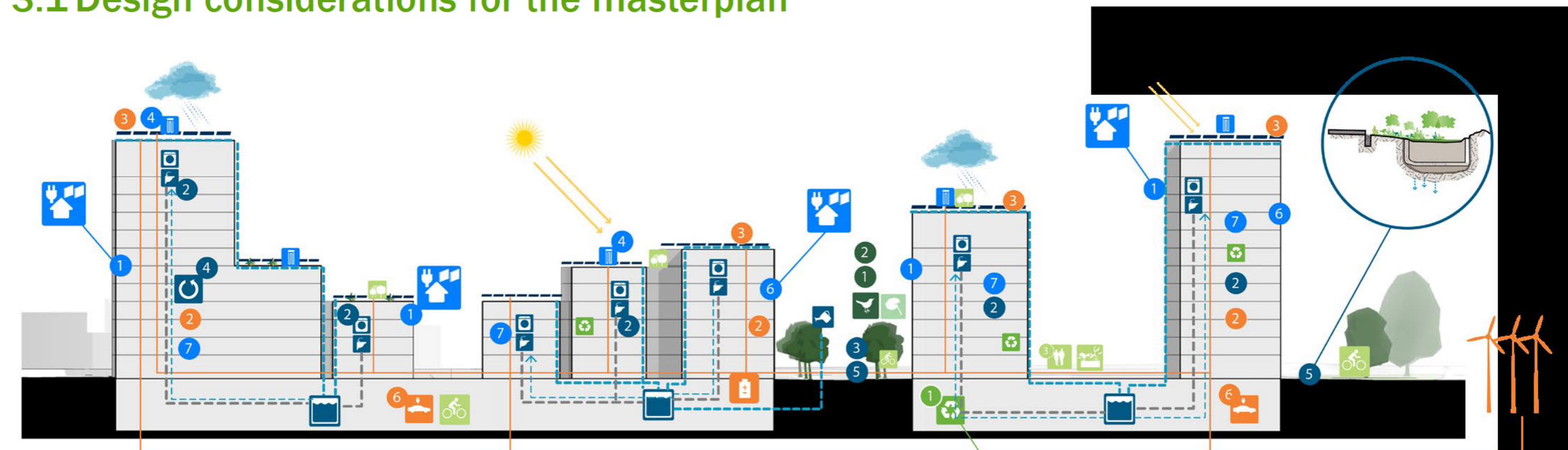
Operational opportunities

- Partner with community organisations and residents to develop housing solutions that meet the specific needs of the community.
- Providing training and education to social housing tenants on sustainable living practices, such as energy and water conservation, waste reduction, and recycling
- Dedicated community spaces for collaborating
- Implement programs to communicate, educate and engage the public.
- Conducting regular assessments of the environmental performance and sustainability of social housing properties, and implementing measures to improve their efficiency and reduce their environmental impact
- Consult with community members and engage them in the design process to ensure that their needs and preferences are taken into account.

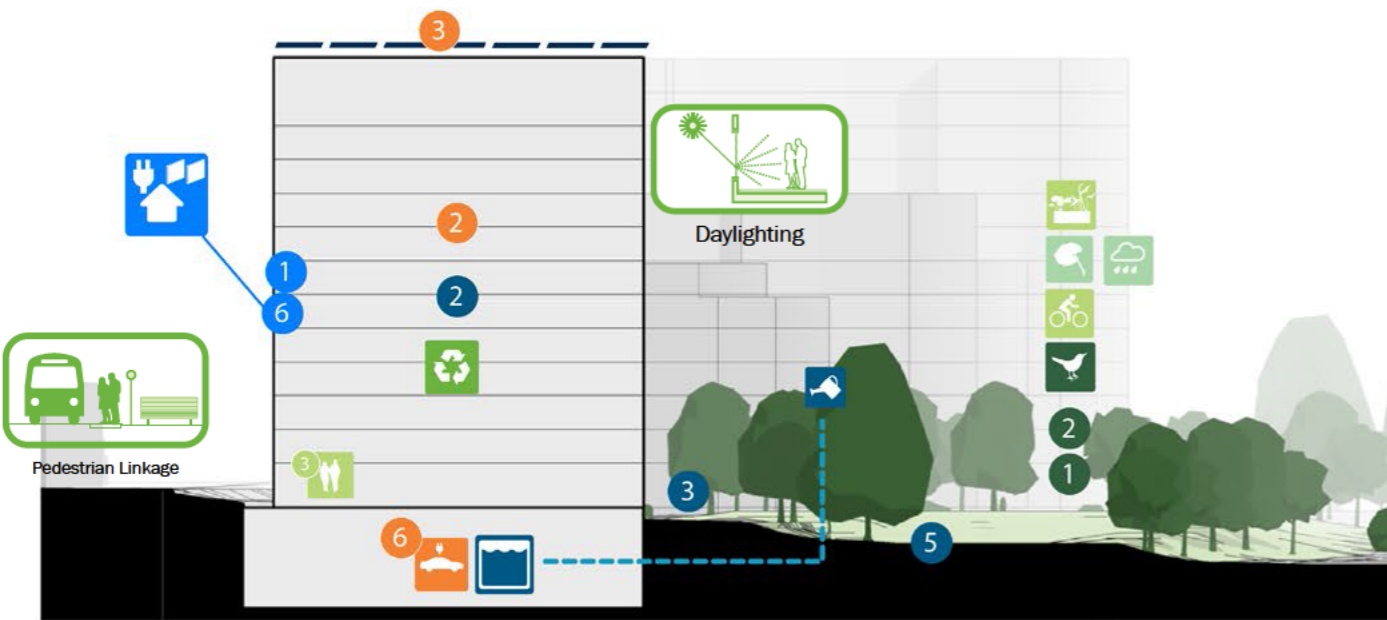


03 IMPLEMENTATION

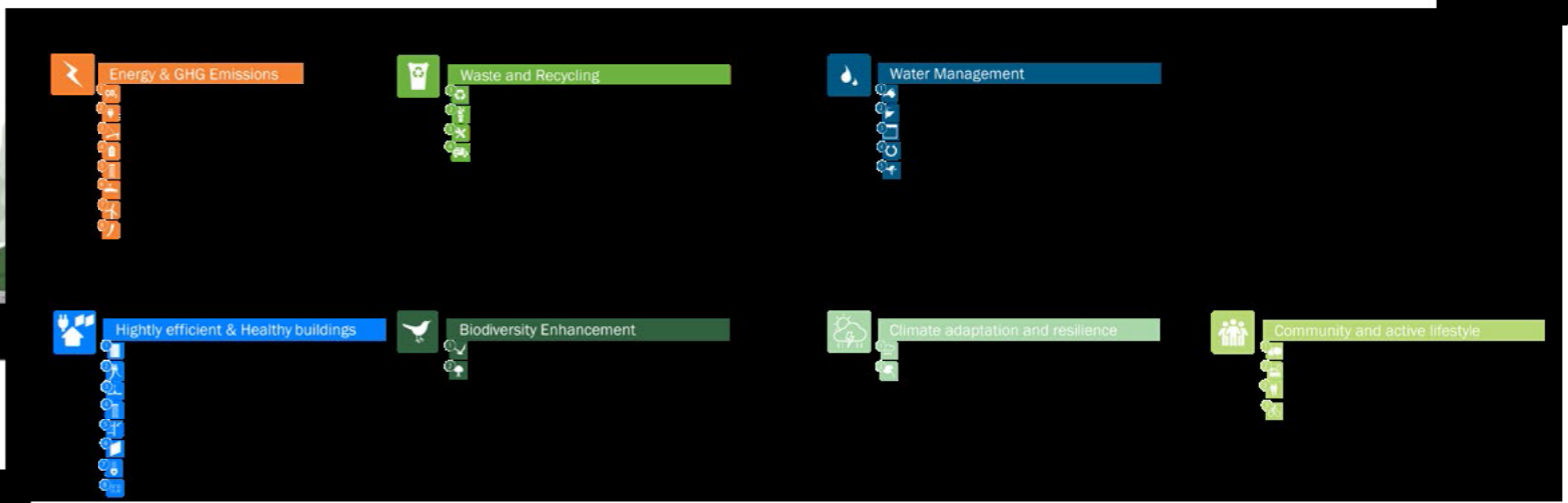
3.1 Design considerations for the masterplan



1 SITE SECTION 01



2 SITE SECTION 02



3.2 Energy - Initiatives Table



Initiative	Design Guidelines	NCC 2022	Green Star credit	National & NSW Strategies	Notes
1 Future-proofing net-zero transition	Align with Section 4.5 Environmentally Sustainable Development to deliver a net-zero carbon development	Align with NCC 2022 - the new annual energy use budget which provides a flexible approach to encouraging the selection of more efficient equipment.	Aligns with 'Responsible' category and 'Positive category' <ul style="list-style-type: none"> Zero Carbon Action Strategy 	Supports the Australian Government's commitment to reduce greenhouse gas emissions by 43% by 2030 and achieve net zero emissions by 2050 & Supports the NSW Net Zero Plan framework	
2 All-electric infrastructure (no gas)	Align with Section 4.5.5	Align with the new annual energy use budget which provides a flexible approach to encouraging the selection of more efficient equipment, the major contributor to household energy use.	Aligns with 'Positive' category points: <ul style="list-style-type: none"> Require the precinct to be all-electric Zero Carbon Action Strategy 	Supports the Australian Government's commitment to reduce greenhouse gas emissions by 43% by 2030 and achieve net zero emissions by 2050	
3 Rooftop Solar PV	Align with Section 4.5.2	Align with J9D5 Facilitates for solar photovoltaic and battery systems	Aligns with 'Positive' category and Building Energy Source <ul style="list-style-type: none"> On-site Generation - Perspective Pathway 	Supports the NSW Net Zero Plan framework	<ul style="list-style-type: none"> NCC requirements of at least 20% of the roof area of a building must be left clear for the installation of solar photovoltaic panels as minimum.
4 Battery power storage		Align with J9D5 Facilitates for solar photovoltaic and battery systems	Aligns with 'Positive' category and Building Energy Source <ul style="list-style-type: none"> Energy Storage - Perspective Pathway 	Supports the NSW Net Zero Plan framework	<ul style="list-style-type: none"> In order for the grid to transition to a high degree of renewable energy storage will be required so that electricity can be consumed when it is needed. Future proof spatial requirements on site.
5 High-performance HVAC	Align with Section 4.5	Align with Part J6. Air-conditioning and ventilation	Aligns with 'Responsible' category <ul style="list-style-type: none"> Sustainable buildings High performing buildings 	Supports the NSW Net Zero Plan framework	
6 EV / community charging stations	Align with Section 4.5.5	Align with J9D4 Facilities for electric vehicle charging equipment		Supports the Electrification of transport in the city Strategy and action plan for the city of Sydney Supports the NSW Net Zero Plan framework	<ul style="list-style-type: none"> Provision of electric charging facilities in all new building in accordance with the NCC as minimum. Equipment based on market research prior to construction. An EV car share scheme for the precinct can be potentially investigated as a measure to reduce private car ownership
7 Renewable energy Purchase agreement			Aligns with 'Positive' category points: <ul style="list-style-type: none"> All buildings operated by the precinct renewable energy 	Supports the NSW Net Zero Plan framework (35% emissions reduction in NSW by 2030)	
8 Facilities for Energy monitoring	Align with Section 4.5	Align with J9D3.	Aligns with 'responsible' category points <ul style="list-style-type: none"> Responsible Procurement Sustainable buildings 		

3.3 Waste - Initiatives Table



Initiative	Design Guidelines	NCC 2022	Green Star credit	National & NSW Strategies	Notes
1 Waste separation and recycling	Align with Section 4.7 objectives to reduce waste and maximize resource recovery 4.7.1 Waste and Recycling management plans	-	Aligns with 'Responsible' category • Integrated Development	Supports the NSW Waste Avoidance and resource recovery strategy	• A strategy in place to engage all stakeholders ongoing operations of the precinct in relation to waste management and recycling facilities (e.g waste separation and recycling strategies and facilities on site)
2 Organic waste treatment on site	Supports Section 4.7 objective to reduce amount of waste generated going to landfill	-	Aligns with 'Responsible' category and potential for Leadership • Integrated Development • Market Transformation opportunities	Supports the National food waste strategy, Halving Australia's food waste by 2030	• A strategy in place to engage all stakeholders involved in the development and ongoing operations of the precinct in relation to organic waste treatment on site. (e.g facilities such as worm farms, composting or Digester)
3 Zero waste Apartment design strategies	Align with Section 4.7.3	-	Aligns with 'Responsible' category • Integrated Development		
4 Reduce construction & Demolition waste	Align with Section 4.7.2 Construction and demolition waste	-	Aligns with 'Responsible' category • Integrated Development	Supports the NSW Waste Avoidance and resource recovery strategy	

3.4 Water - Initiatives Table



	Initiative	Design Guidelines	NCC 2022	Green Star credit	National & NSW Strategies	Notes
1	Grey water diversion To site irrigation	Align with Section 4.6 Water and flood management encouraging sustainable water use practices		Aligns with 'Responsible' category and 'Resilient' categories <ul style="list-style-type: none"> Drought Resilience Resource Management 	Aligns with NSW Water Strategy	
2	Water-efficient fittings			Aligns with 'Responsible' category and 'Resilient' category <ul style="list-style-type: none"> Sustainable buildings High performing buildings Drought Resilience 	Aligns with NSW Water Strategy	<ul style="list-style-type: none"> Provision for efficient WELS and Watermark certified fixtures.
3	Rainwater collection and re-use	Align with Section 4.6 Water and flood management encouraging sustainable water use practices		Aligns with 'Responsible' category and 'Resilient' categories <ul style="list-style-type: none"> Drought Resilience Resource Management 	Aligns with NSW Water Strategy	<ul style="list-style-type: none"> Provision for rainwater collection from all possible rooftop and solar areas, and treated to non-potable standards for use in toilet flushing, dish washers and washing machines.
4	Non-potable water reuse	Align with Section 4.6.4 Water re-use, recycling and harvesting		Aligns with 'Responsible' category and 'Resilient' categories <ul style="list-style-type: none"> Drought Resilience Resource Management 		
5	Water Sensitive Urban Design	Align with Section 4.5 and 4.2		Aligns with 'Resilience' category and 'Nature' categories <ul style="list-style-type: none"> Impact to Nature Integrated water management Drought Resilience 		<ul style="list-style-type: none"> Provision for landscaped swales to improve the quality of groundwater and water entering the waterways and tree bays

3.5 Highly efficient & Healthy buildings - Initiatives Table



Initiative	Design Guidelines	NCC 2022	Green Star credit	National & NSW Strategies	Notes
1 Efficient Building Fabric	Align with objectives 4.5 to minimize energy use and 4.5.1 Buildings to achieve a minimum 5 star Green star	Comply with Part J4 Building Fabric as a minimum requirement	Aligns with 'Healthy', 'Positive' categories and 'Responsible' <ul style="list-style-type: none"> Healthy Buildings Highly efficient Sustainable buildings 		<ul style="list-style-type: none"> High performance building fabric (including roof, high performance glazing and insulation) plus reducing thermal bridging can reduce the need for heating and cooling.
2 Heat recovery ventilation		Align with Part J6. Air-conditioning and ventilation	Aligns with 'Healthy', 'Positive' categories and 'Responsible' <ul style="list-style-type: none"> Healthy Buildings Highly efficient Sustainable buildings 		<ul style="list-style-type: none"> Heat Recovery Ventilation (HRV) is an essential system for controlling humidity and CO2 levels in indoor environments. With airtight buildings and increased insulation, there is little air exchange between the indoor and outdoor environment, leading to a build-up of moisture and CO2.
3 Mixed mode ventilation strategy	Align with Section 4.3.7 provision to achieve good levels of ventilation	Comply with Part F6 Light and Ventilation	Aligns with 'Healthy' and 'Responsible' <ul style="list-style-type: none"> Healthy Buildings Sustainable buildings 	Align with Apartment Design Guide Tools for improving the design of residential apartment development NSW guidelines	<ul style="list-style-type: none"> The building's orientation maximizes capture and use of prevailing breezes for natural ventilation in habitable rooms Provision of ceiling fans and large operable windows / doors to balconies were possible.
4 Heat Pumps for heating / DHW	Align with Section 4.5	Align with Part J6. Air-conditioning and ventilation	Aligns with 'Positive' category points: <ul style="list-style-type: none"> Require the precinct to be all-electric Zero Carbon Action Strategy 	Supports the NSW Net Zero Plan framework	<ul style="list-style-type: none"> Gas heating and hot water units can be replaced with efficient electric heat pumps. Heat pumps produce around 3-5.5 times more heat per unit of energy input than gas boilers.
5 Passive design strategies		Comply with Part F6 Light and Ventilation	Aligns with 'Healthy', 'Positive' categories and 'Responsible' <ul style="list-style-type: none"> Healthy Buildings Highly efficient Sustainable buildings 	Align with Apartment Design Guide Tools for improving the design of residential apartment development NSW guidelines	
6 Healthy Building Materials	Align with Section 4.5 Environmentally Sustainable Development to deliver a net-zero carbon development		Aligns with 'Healthy', 'Positive' categories and 'Responsible' <ul style="list-style-type: none"> Healthy Buildings Life Cycle Impacts Exposure to toxins 	NSW Circular Economy Policy Statement. Too Good To Waste	<ul style="list-style-type: none"> Low carbon materials options No VOC materials Avoid the red list materials Use of certified materials
7 Energy efficient lighting and appliances	Align with Section 4.5 Environmentally Sustainable Development to deliver a net-zero carbon development		Aligns with 'Positive' categories and 'Responsible' <ul style="list-style-type: none"> Highly efficient Sustainable buildings 	Supports the NSW Net Zero Plan framework	
8 Induction cooking in all units			Aligns with 'Positive' category points: <ul style="list-style-type: none"> Require the precinct to be all-electric 	<ul style="list-style-type: none"> Supports the NSW Net Zero Plan framework 	<ul style="list-style-type: none"> Fully electric development no gas

3.6 Biodiversity - Initiatives Table



Initiative	Design Guidelines	NCC 2022	Green Star credit	National & NSW Strategies	Notes
1 Habitat restoration, creation and expansion.	Align with Section 4.2.6 Ecology		Aligns with 'Nature' category and 'Places' categories <ul style="list-style-type: none"> Impacts to nature (enhance ecological value) Biodiversity for Wildlife Safe and Enjoyable places 		<ul style="list-style-type: none"> Provide features including water-bodies, trees, shrubs, ground cover vegetation and retention
2 Improved links between existing sites, creating nature networks.	Align with Section 4.2.6 Ecology		Aligns with 'Nature' category and 'Places' and 'Healthy' categories <ul style="list-style-type: none"> Impacts to nature Biodiversity for Wildlife Safe and Enjoyable places Access to nature 		<ul style="list-style-type: none"> Provision for links and enhance existing and potential biodiversity corridors wherever possible

3.7 Climate Adaptation and Resilience - Initiatives Table



Initiative	Design Guidelines	NCC 2022	Green Star credit	National & NSW Strategies	Notes
1 Climate change mitigation and adaptation plan	Align with Section 4.5 Environmentally Sustainable Development to ensure the development is resilient against the effects of climate change		Aligns with 'Resilient' category <ul style="list-style-type: none"> Climate change resilient Operations Resilient Community resilient Heat Resilient 	Align to NSW Climate Change Adaptation Strategy	<ul style="list-style-type: none"> A strategy in place to ensure the design mitigates and can adapt to the effects of climate change (sea level rise hotter weather, hazard of fires and other disasters) Adaptation action plan in place
2 Climate resilient urban design Guidelines	Align with Section 4.5 Environmentally Sustainable Development and 4.6 Water and flood management		Aligns with 'Resilient' category <ul style="list-style-type: none"> Climate change resilient Operations Resilient Community resilient Heat Resilient 	Align to NSW Climate Change Adaptation Strategy	<ul style="list-style-type: none"> A strategy in place for a resilient urban design strategy against, climate change

3.8 Community- Initiatives Table



Initiative	Design Guidelines	NCC 2022	Green Star credit	National & NSW Strategies	Notes
1 Community rooftop/courtyard zone	Align with Section 3.1 Locality statement Principles e) Well designed, high quality public spaces for use by the general community for passive recreation, culture and living and that encourage inclusive social interactions between residents and the local community.		Aligns with 'Places' category and 'People' categories <ul style="list-style-type: none"> • Safe and enjoyable places • Inclusive access 		<ul style="list-style-type: none"> • Provision for rooftop or courtyard community spaces which cater for passive recreational and cultural interactions among tenants.
2 Veggie garden beds			Aligns with 'Places' category and 'People' categories <ul style="list-style-type: none"> • Safe and enjoyable places • Access to fresh food • Inclusive planning strategies 		<ul style="list-style-type: none"> • Potential access to fresh food and local food production
3 Walkable access to amenities			Aligns with 'Places' category and 'People' categories <ul style="list-style-type: none"> • Safe and enjoyable places • Inclusive access 		<ul style="list-style-type: none"> • Provision for ground level amenities such as supermarket/ childcare/ community centre/ doctors etc.
4 Integrated active design	Align with Section 4.6.4 Water re-use, recycling and harvesting		Aligns with 'Places' category <ul style="list-style-type: none"> • Sustainable transport • Streets for people • Safe and enjoyable places 		<ul style="list-style-type: none"> • Provision for bike paths, walk pathways, bike storage facilities, water fountains, playgrounds etc.

