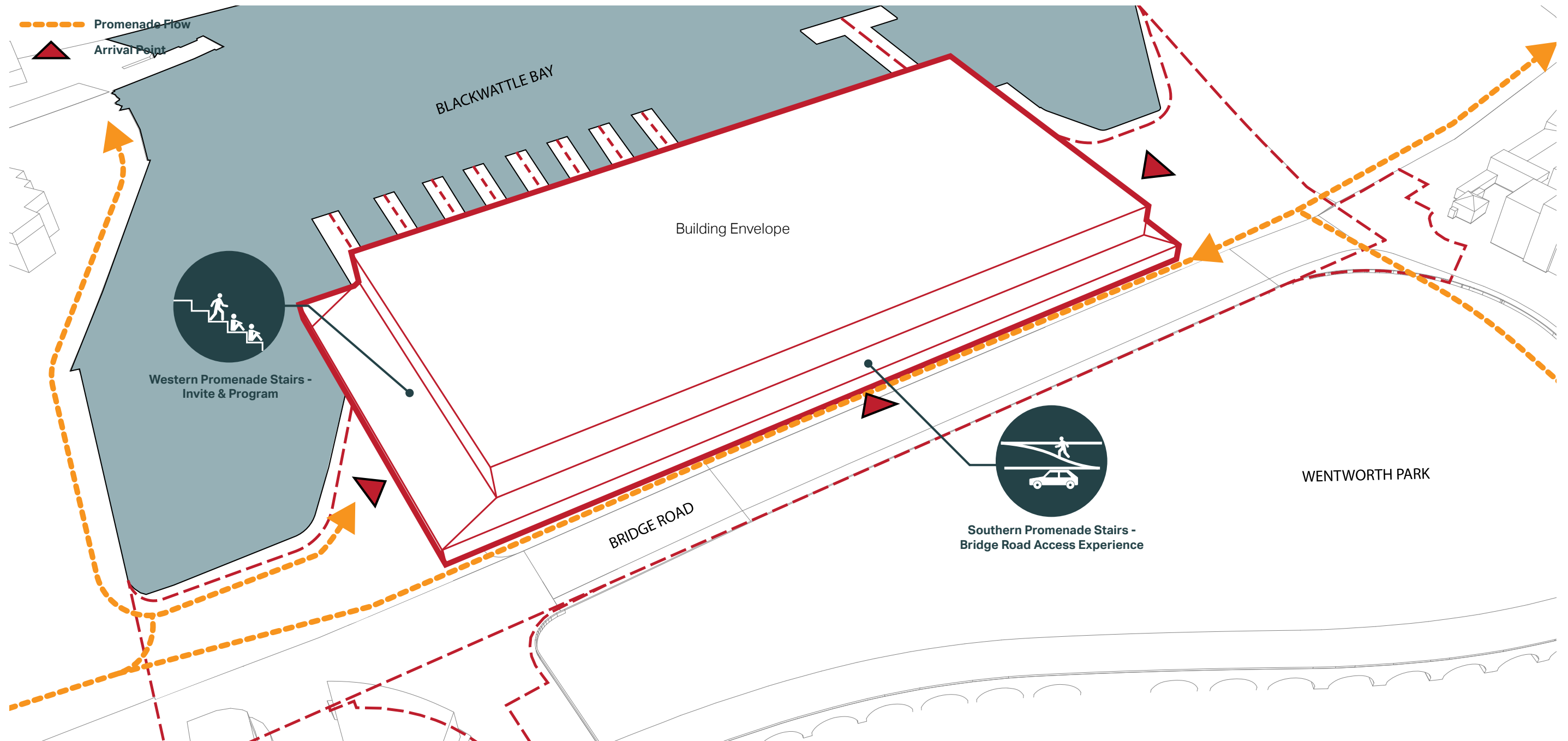


2.6 Built Form & Urban Design Analysis

Southern & Western : Key Access Points & Wayfinding

The following axonometric diagram illustrates the proposed development.



2.7 Built Form & Urban Design

Sustainability

2.7 Built Form & Urban Design Analysis

Aspirations

Ecologically Sustainable Development (ESD Study)

RESOURCES

Resources are understood not simply in terms of consumption but also in their capacity to recycle and provide social benefit. Energy, Water and Waste are handled to preserve their quality and use-value throughout their cycle. Every waste product is examined for its potential value in other applications. The social potential of these resources, the enhancement of nature, marine ecology and materiality offer opportunities for social development, education and leisure. The new Sydney Fish Market represents a chance to put experiential quality into architecture, while positively contributing to the environment.

THE NEW SYDNEY FISH MARKET

PROFITABILITY

The ambition of this project to deliver a viable and financially sound design that reduces operating costs while optimising health and satisfaction in use. The use of healthy materials, good distribution of daylight and fresh air and a strong connection with the environment will have a higher chance of retaining staff and customers, both lowering long-term risks and promoting a connection with the place.

EXPERIENCE

Sustainability and resource efficiency only becomes relevant to the average user, if it can be experienced as a quality in the architecture. The new Sydney Fish Market will demonstrate its capacity with energy, materials, water and nature, in a tangible way that will not only benefit the environment, but will enhance the user experience through healthy indoor environments, comfortable recreational outdoor areas and perceptible resource management.

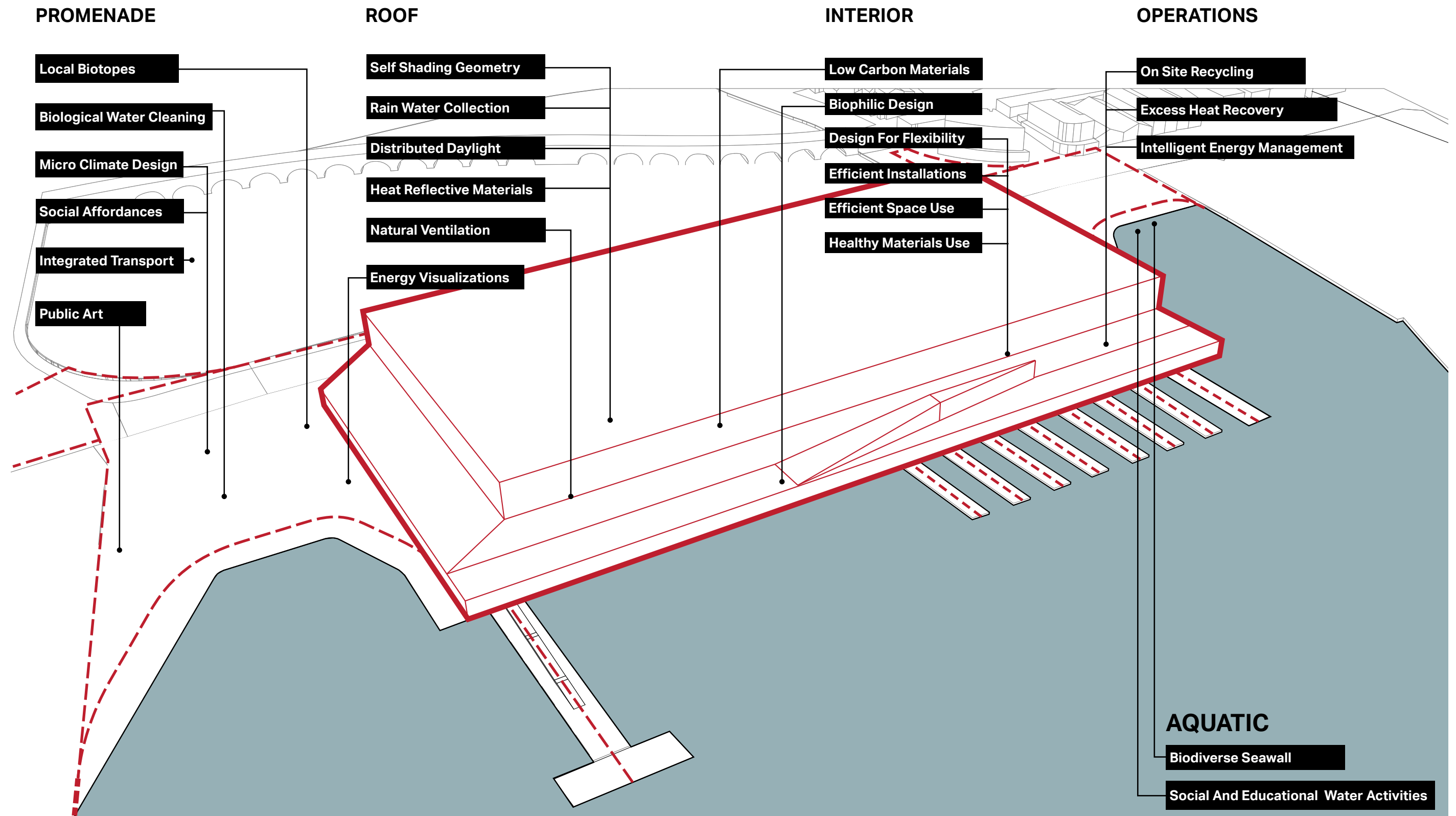
FUTURE

Our ambition is to ensure that this new construction becomes a resource for the future. Adaptability of space, structure and services will allow the new Sydney Fish Market to grow and change with minimal disruption and waste. Investment in natural and biological systems will support our natural heritage and demonstrate a capacity to benefit both economically and experientially from a symbiosis with nature.

2.7 Built Form & Urban Design Analysis

Sustainability Focus Areas

Design applications of sustainability goals



Note: Indicative diagrammatic illustration only and subject to change following design development. Artist's impression only. Not to scale.

2.7 Built Form & Urban Design

Sustainability - Waste

2.7 Built Form & Urban Design Analysis

Waste Approach

The new Sydney Fish Market will treat waste as a resource.

Baseline data versus Targets

In order to achieve the 50% waste reduction target, the recycling rate for non-fish by-product waste new Sydney Fish Market (nSFM) must reach 59% against current quantities. Fish offal is currently sold as feed-stock however other methods of re-use are under consideration including energy production to achieve the greenhouse emission targets.

Baseline:	
MIXED FRACTIONS	5.56 t/day
RECYCLING RATE:	18%

Target:	
TOTAL DISPOSED:	< 2.29 t/day
TOTAL RECYCLED:	> 2.30 t/day
RECYCLING RATE:	59%+

Overview

As part of the City of Sydney’s Waste Management Policy, waste minimisation and resource recovery, easy access to waste systems, pollution prevention associated with waste management practices will be taken into consideration as part of nSFMs waste management strategy.

It has been identified that fish offal comprises the largest contribution of waste generation by nSFM operations, followed by general waste. Current waste practices involve separation into 3 waste streams (recyclables, general waste, organic waste), collection and disposal. This current practice results in some organic waste being mixed with general waste, which is ultimately disposed of to landfill.

The nSFM is committed to increase on-site recycling and resource optimisation through the adoption of the Waste Management Hierarchy with the ultimate goal of reducing waste going to landfill.

Waste Handling

The nSFMs waste reduction strategy for reusing and recycling waste products will include the following initiatives:

- Responsible re-use of organic waste (including fish offal, etc.) preventing the production of methane greenhouse gas (either on-site or off-site energy or fertiliser production). Organic waste can be converted into bio-fuel through the process of dehydration and anaerobic digestion;
- Reticulation of kitchen waste streams to biological treatment
- Managed packaging and container system for a production facility with recycling of insulative, containers, cardboard recycling and crate washing facility. These materials could be converted into strong structural and versatile structural composite panels.
- Managed sorting of waste streams in public areas and retailers.
- Supplier agreements for packaging aligned with waste management policy.

A detailed Operational Waste Management Plan will be developed and implemented for the following five principal areas that generate waste:

- Retailer Space, Cooking School and Restaurants
- Public Areas
- Wholesale Areas
- Auction Hall and Loading Dock
- Wharfs

The waste streams generated from each principal area can be identified to establish appropriate and targeted waste strategies suitable for that area. For example, Public Areas would generate a lot of recyclables, whereas the Wholesale Area would generate more organic waste.

Once primary waste streams from each area are identified, waste handling strategies can be developed to include waste minimisation, treatment and recycling methodologies.

Study Requirements for Bays Market District - SSD

(NSW Dept. Planning & Environment April 2017)

16.4 Identify and implement waste management strategies to achieve NSW Government’s Waste Avoidance and Resource Recovery Strategy 2007 (WARR) and compliments the NSW Government’s Waste Less, Recycle More initiatives and EPA waste and recycling programs.

Sustainable Sydney 2030

Environmental Action 2016 - 2021 Strategy and Action Plan (March 2017)

Chapter7- Zero waste city

- 70 per cent resource recovery of waste from City managed properties by end June 2021
- 50 per cent resource recovery of waste from City parks, streets and public places by end June 2021

Waste Avoidance and Resource Recovery Strategy (2007) (WARR)

Targets: Increasing recycling rates to

70% for commercial and industrial waste

3.5 Reducing waste generation

3.3 Market development for recycled content products

4.4 Reducing commercial and industrial waste

Green Star Ratings

8A - Operational Waste Performance Pathway

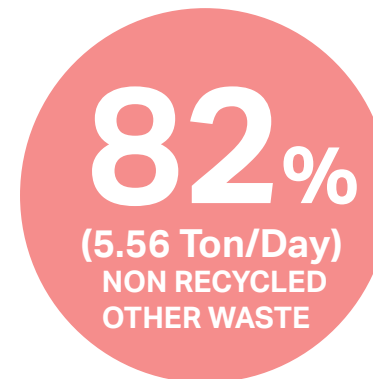
2.7 Built Form & Urban Design Analysis

Waste Baseline and Target

Minimum 50% reduction in waste, 30% reduction in Greenhouse gas emissions

BASELINE: EXISTING SFM

MIXED FRACTIONS 5.56 t/day
TOTAL DISPOSED: 4.58 t/day
TOTAL RECYCLED: 0.98 t/day
RECYCLING RATE: 18%



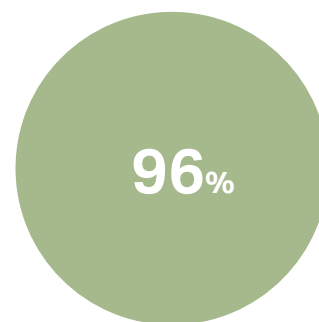
RECYCLED CONTENT

TARGET

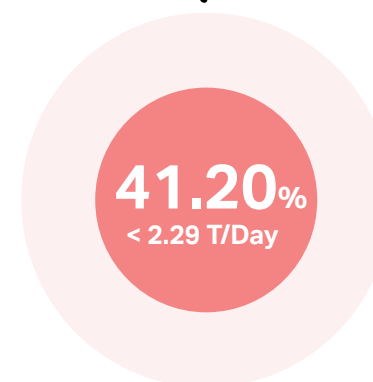
MIXED FRACTIONS 5.56 t/day
TOTAL DISPOSED: < 2.29 t/day
TOTAL RECYCLED: > 2.30 t/day
RECYCLING RATE: 59%+



BIOLOGICAL WASTE



RECYCLED FISH OFFAL

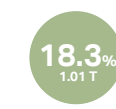


GENERAL WASTE (EXCL. OFFAL)
BASELINE 82.4% NON RECYCLED

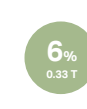
58.8% Recycled content



CARD + PAPER



RECYCLABLE PLASTICS



EPS CRATES



PALLETS



GLASS



METALS



BIOPLASTICS

Principle diagram of the Fish Market Waste-Streams and Target Recycling Percentages

2.7 Built Form & Urban Design

Sustainability - Life Cycle

2.7 Built Form & Urban Design Analysis

Life Cycle : Ecology

The new Sydney Fish Market project will improve the site’s ecological impact for future generations, and responsibly manage construction activities.

Core to the concept of equity for future generations is the preservation of native biodiversity, both on land and in the marine environment. The project aims to go beyond simply conserving the existing biodiversity as outlined in Schedule 2 7 (4) of the Environmental Planning and Assessment Regulation, but to establish a broader range of native species than currently exist on site and to improve the conditions by which they can be maintained.

The concept of Productive Landscapes forms a principle benefiting future generations whereby natural flora and fauna are not simply seen as elements to be protected, but rather as productive features that act in symbiosis with the activities of the market and local area. Native plants will be used in the filtering of water, decontamination of soil and re-establishment of native fauna colonies.

A specially constructed biodiverse sea wall will be designed and implemented under specialist advice in order to encourage the colonisation of native aquatic life.

The resulting biodiversity initiatives will serve as an education space related to local university institutions and be accessible to the public for educational and leisure purposes.

Ecology Improvements

Productive landscape - performative functions:

- Clean water
- Shading
- Recreation
- Regeneration of native flora and fauna
- Phytoremediation of contaminated soils

Productive Aquascape - performative functions:

- Establishment of landscaped sea-wall structures to aid marine biodiversity
- Mussel/Oyster farming
- Tertiary educational space for Marine ecology (west side)

Implementation Measures:

- Development of a Construction Environmental Management Plan
- Cooperation with university departments for marine ecology, biology and horticulture

Study Requirements for Bays Market District - SSD

(NSW Dept. Planning & Environment April 2017)

14. Urban and Marine Ecology

Guiding Principles for Marine Foreshore Developments

(UrbanGrowth NSW Feb 2016)

4.1 Native biodiversity maintenance and restoration

4.7 Provide recreation/education

6.1 Physical enhancements

6.1.1 Increase provision of missing habitats

6.1.2 Increase total surface area

6.2 Biological enhancements

6.2.1 “Plant” or transplantation of native species

Sustainable Sydney 2030

Environmental Action 2016 - 2021 Strategy and Action Plan (March 2017)

Chapter 9 - Urban Ecology: The targets included in this Strategy are for enhancing the urban canopy and urban ecology in the green spaces that the City has responsibility for across our local area. A progressive increase in the number of habitat features for priority fauna species is established along potential habitat linkages by 2023

Urban Ecology Action Plan (March 2014)

Listed as a priority site: Glebe Foreshore Walk East to Orphan School Creek

- Protect, expand and improve condition of naturally occurring locally indigenous vegetation'
- Protect and enhance sites that provide habitat for priority fauna species
- Improve habitat connectivity, particularly between priority sites

Bays Precinct Sydney: Transformation Plan (October 2015)

Key principles: # 15 Introduce environmental and ecological systems to improve water quality, address ongoing sources of water pollution and encourage public recreation.

Key principles: # 13 Plan for future generations by being open to new ideas and embracing emerging trends.

Green Star Ratings

23.0	- Endangered or threatened species
23.1	- Ecological value (Addition to native habitat)
18A / 30 D	- Water sensitive urban design
30C / 26.2	- Storm-water pollution targets
26.1	- Storm-water- peak discharge

2.7 Built Form & Urban Design Analysis

Baseline: Landscape

Proposed new Sydney Fish Market site



Existing Conditions

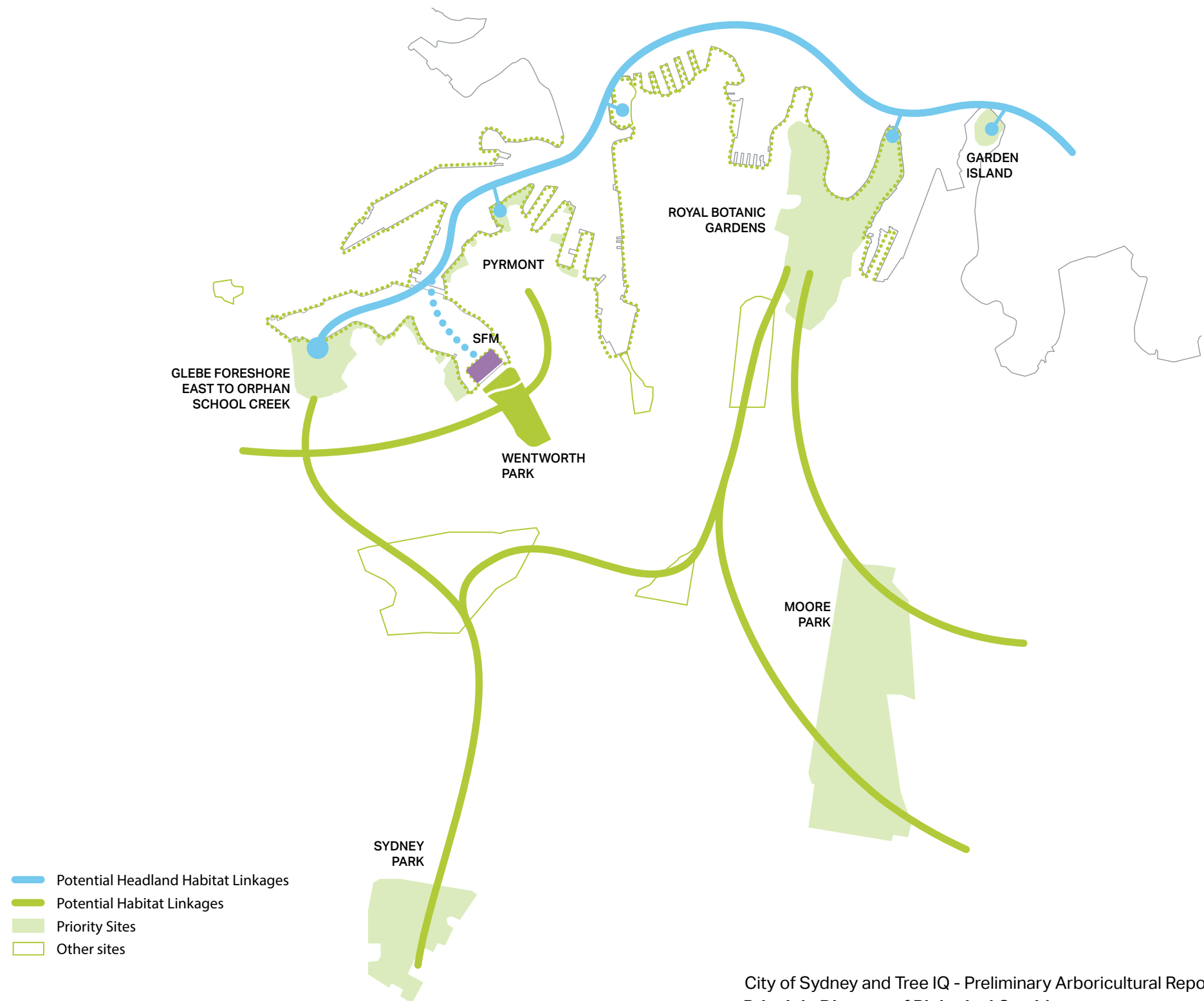
The existing Sydney Fish Market site is currently divided by an unbroken fence line and concrete wall that houses the remnants of abandoned industrial infrastructure and Blackwattle Bay Marina. Approximately 97 percent of the area of the existing site is surfaced by bitumen or concrete, and there is limited opportunity for local flora or fauna to take hold.



2.7 Built Form & Urban Design Analysis

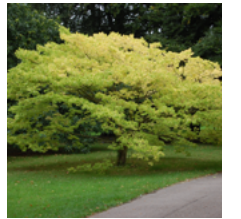
Enhancing Natural Corridors

C.O.S. Urban Ecology Strategic Action Plan



City of Sydney and Tree IQ - Preliminary Arboricultural Report
Principle Diagram of Biological Corridors

WENTWORTH PARK FLORA



Celtis sinensis



Argyrodendron actinophyllum



Lophostemon confertus



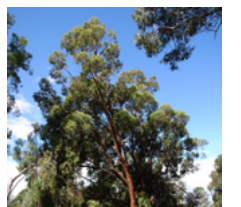
Acacia dealbata



Ficus macrophylla



Corymbia citriodora



Eucalyptus microcorys

2.7 Built Form & Urban Design Analysis

Baseline: Aquascape



Baseline data versus Targets

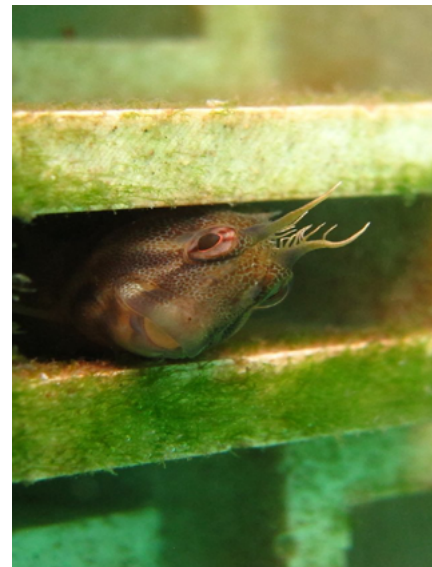
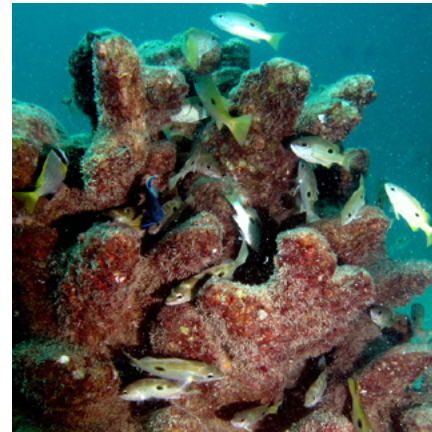
Storm-water runoff, marina activities and featureless seawalls pose a significant threat to the establishment of native marine life in Blackwattle bay. Following peak periods of rainfall, plastics, toxic materials, debris and animal corpses are flushed by the culvert into the bay. Due to the topology of the bay seawater circulation is minimal. Intermittent discharge from the culvert changes the salinity and quality of the water rapidly. Featureless concrete seawalls hinder the establishment of small fish and invertebrate colonies, leading to a less biodiverse aquatic environment than other parts of the harbour.



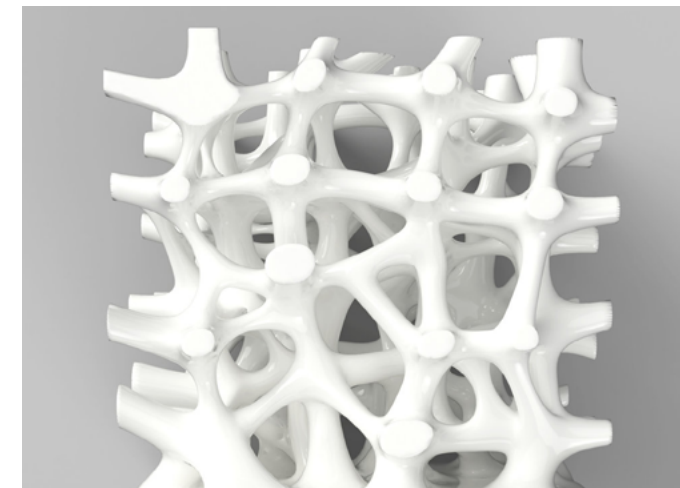
2.7 Built Form & Urban Design Analysis

Artificial Seawall: Case Studies

Sydney Institute of Marine Science (SIMS)



More than 50% of the Sydney Harbour foreshore is armoured by seawalls for land reclamation and coastal protection purposes. Seawalls are generally flat, featureless structures in comparison to rocky shores. The implementation of various contoured and porous structures assists in the re-establishment of aquatic biodiversity. A diverse topography offers protection for molluscs and small fish. Studies have been conducted on behalf of the NSW Office of Environment and Heritage.



Artificial Seawalls

Complex tiles retrofitted to seawalls to mimic important micro-habitats of rocky shores which are missing or rare in existing seawall designs of Sydney Harbour.

Images show tile before implementation and after 12 months of submersion



3D printed Seawall by Reef Design Lab before and after installation - Project by SIMS

2.7 Built Form & Urban Design

Sustainability - Transport

2.7 Built Form & Urban Design Analysis

Transport

Overview

The new Sydney Fish Market incorporates a number of sustainable transport solutions to aid occupants in making low carbon intensive travel decisions.

A protective roof overlaps publicly accessible pathways offering protected pedestrian transit through Blackwattle Bay even after hours.

Proposed Infrastructure

In the proposed new Sydney Fish Market design, footpaths will be widened, pedestrian pathways link to Wentworth park and the light-rail stations to the waterfront ferry terminal and bus drop off.

Planned cycling routes, cycle parking and recreational walking paths enhance methods of travel to and from the CBD and surrounding areas.

Connectivity

- Designed to encourage alternate transport modes, such as walking, cycling, public transport.
- Bicycle Parking infrastructure, with quality end of trip facility (EoTF) for the staff.
- Connection to tramway Wentworth park
- Connection to dedicated ferry station at the new Sydney Fish Market
- Dedicated Coach drop-off

Management

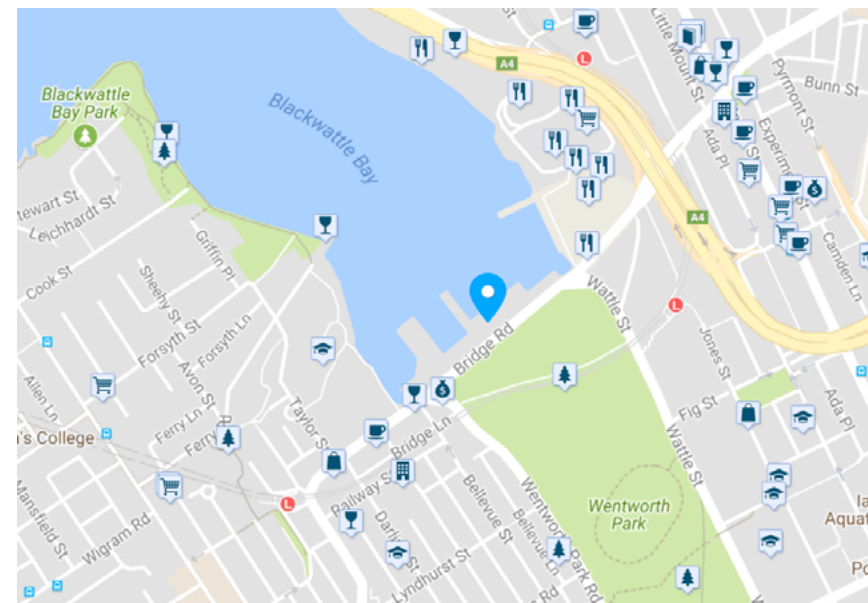
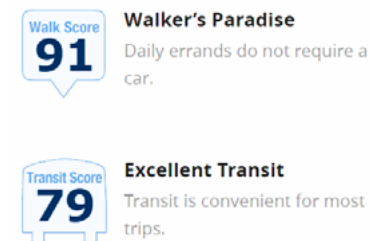
- Managed commercial traffic intersection
- On-site car parking limited to basement level

Walk Score

Walkscore: 91

Transit Score: 79*

*Transit score likely to increase post construction to >90



Study Requirements for Bays Market District - SSD

(NSW Dept. Planning & Environment April 2017)

Provide recommendations for car, car share and bicycles parking rates within the capacity of the existing road network, to reduce private vehicle travel demand and promote travel by walking, cycling and public transport

Sustainable Sydney 2030

Environmental Action 2016 - 2021 Strategy and Action Plan (March 2017)

Chapter 8 - Active and connected City:

- Encourage walking and cycling to minimise traffic congestion caused by major infrastructure projects in the city centre
- Complete the ten high-priority regional cycling routes
- Develop policies to encourage uptake of electric vehicles in the city
- Encourage walking and cycling and public transport use to reduce emissions from transport

Better Placed: An integrated design Policy (May 2017)

1.4 NSW Priorities Objective 3 - Better communities

Healthy Urban Development Checklist (NSW Dept. of Health 2009)

Chapter 10 - Physical connectivity TC1-3

Bays Precinct Sydney: Transformation Plan (October 2015)

Key principles: # 7

Establish a whole-of-precinct transport infrastructure plan early, based on connectivity, accessibility and active transport.

Key principles: # 11 Build the capacity for The Bays Precinct to be a place that contributes to healthy, prosperous and resilient lifestyles.

Green Star Ratings

17A.1 -Green travel plan

Option:

17B.1 - Access by public transport

17B.3 - Low emission Vehicle Infrastructure

17B.5 - Walkable neighbourhoods

2.7 Built Form & Urban Design Analysis

Concluding Summary

New Sydney Fish Market Sustainability Initiatives

Ecologically Sustainable Design continues to be a driving factor in the ongoing design and development of the new Sydney Fish Market. The new Sydney Fish Market will incorporate a number of ESD initiatives from a self-assessed Green Star Design and As Built v1.2 Rating to complement the initiatives undertaken to reduce the greenhouse gas emissions, potable water consumption and material resources of the site.

These have been developed around a response to the Secretary's Environmental Assessment Requirements by Department of Planning and Environment.

The ESD initiatives outlined in this report are intended to be used as a design guide for the new Sydney Fish Market. The specific initiatives that will be installed across the precinct will be determined throughout the development application stage for each individual building and will be subject to feasibility analysis, including that of the final use and layout. The initiatives will comply with the guidelines set out by the relevant authorities.

The development's commitment to reducing the overall environmental impact is evident of the holistic approach taken to long-term sustainability. Documented initiatives cover a range of categories including:

- Energy & greenhouse gas emissions
- Potable water reduction
- Minimising waste to landfill
- The indoor environment
- Occupant amenity and comfort
- Land use & ecology
- Emissions
- Building management

We trust this report provides sufficient overview of the project commitment to environmentally sustainable design and the sustainability vision for the new Sydney Fish Market.



Indicative interior view of retail and catering activities. Artist's impression only. Not to scale.

3.0 Public Domain & Public Access

New Sydney Fish Market

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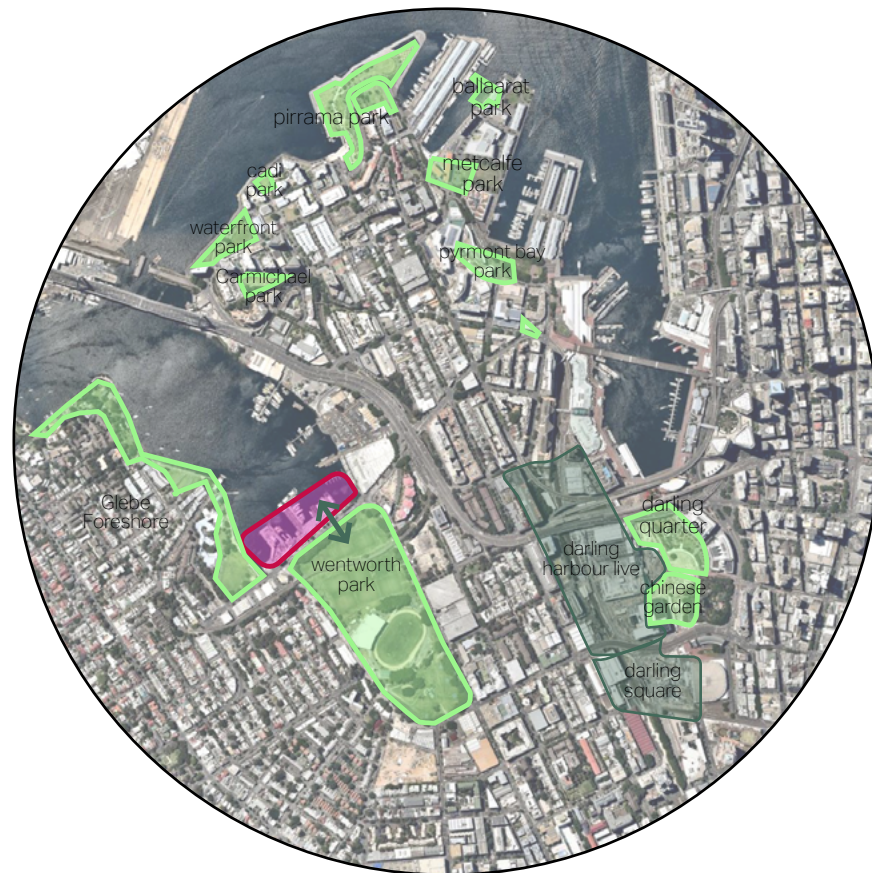
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3.0 Public Domain & Public Access

Site Analysis

Connectivity Key Links

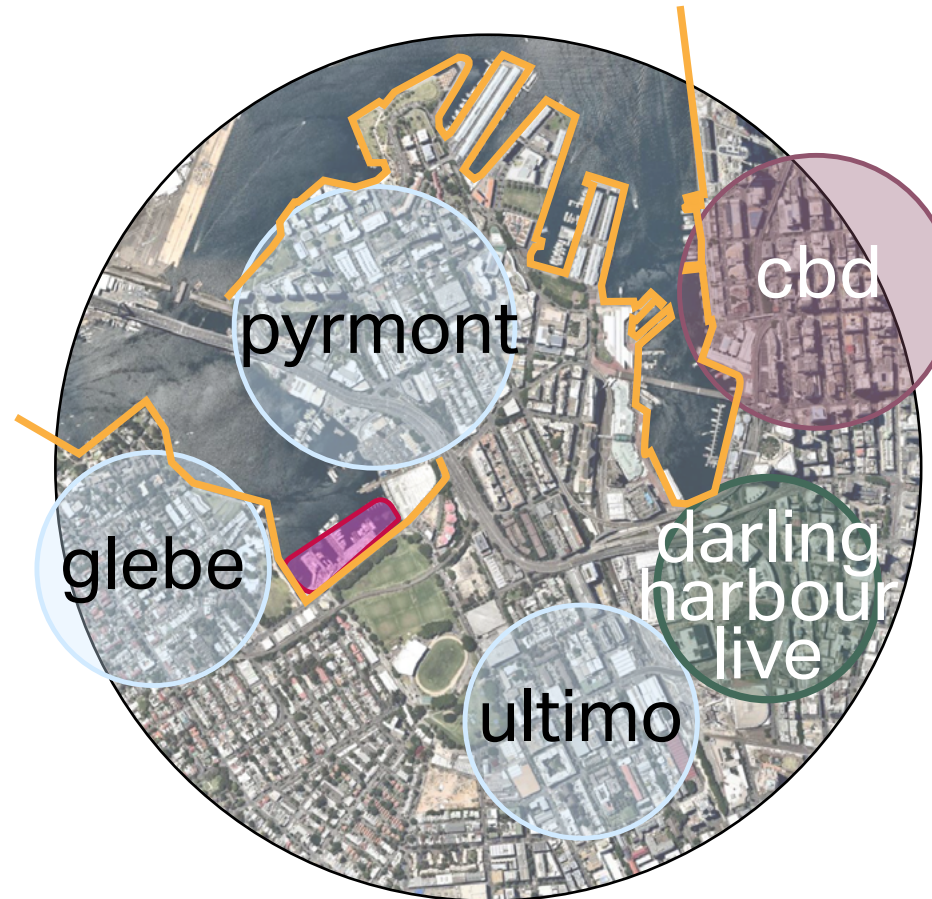
Green Spaces



Legend

- Site
- Existing parks
- Proposed/ under construction public domain

Connecting Local Communities



Legend

- Site
- Foreshore Walk

Linking Key Site Connections



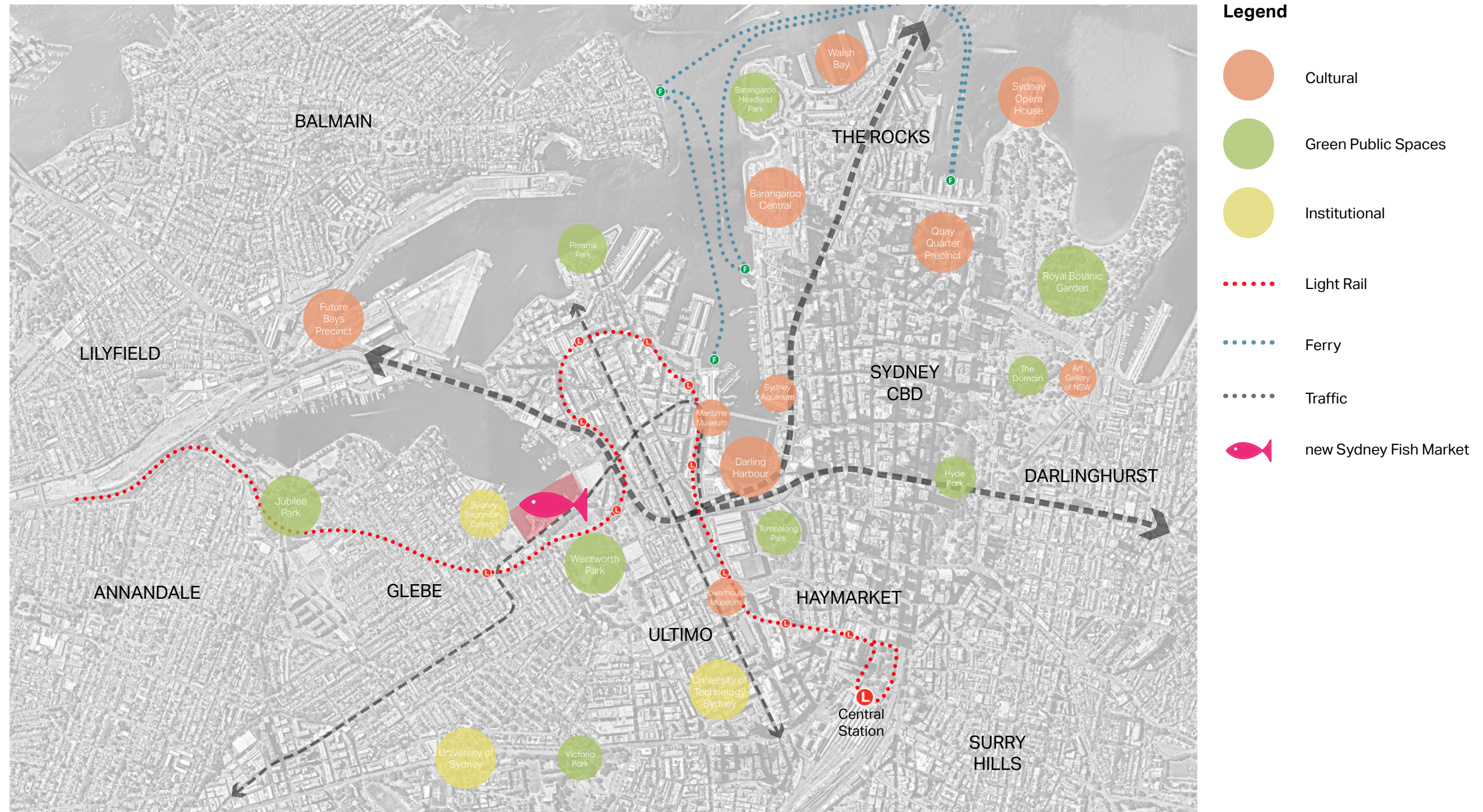
Legend

- Site
- ➔ Major public access link
- ➔ Minor public access link
- ➔ Connecting circulation

3.0 Public Domain & Public Access

Site Analysis

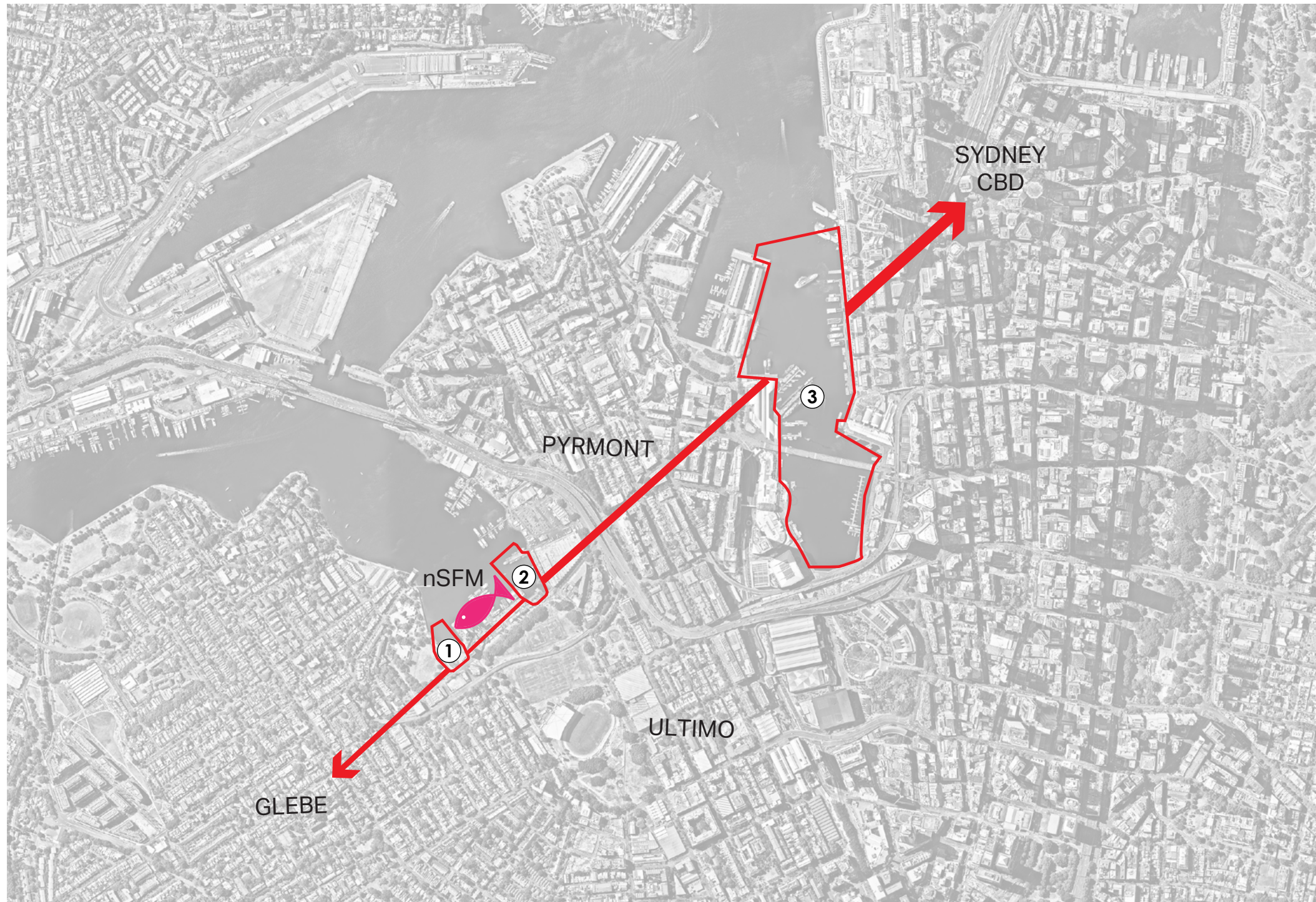
Context Plan



3.0 Public Domain & Public Access

Site Analysis

Connecting the Harbour

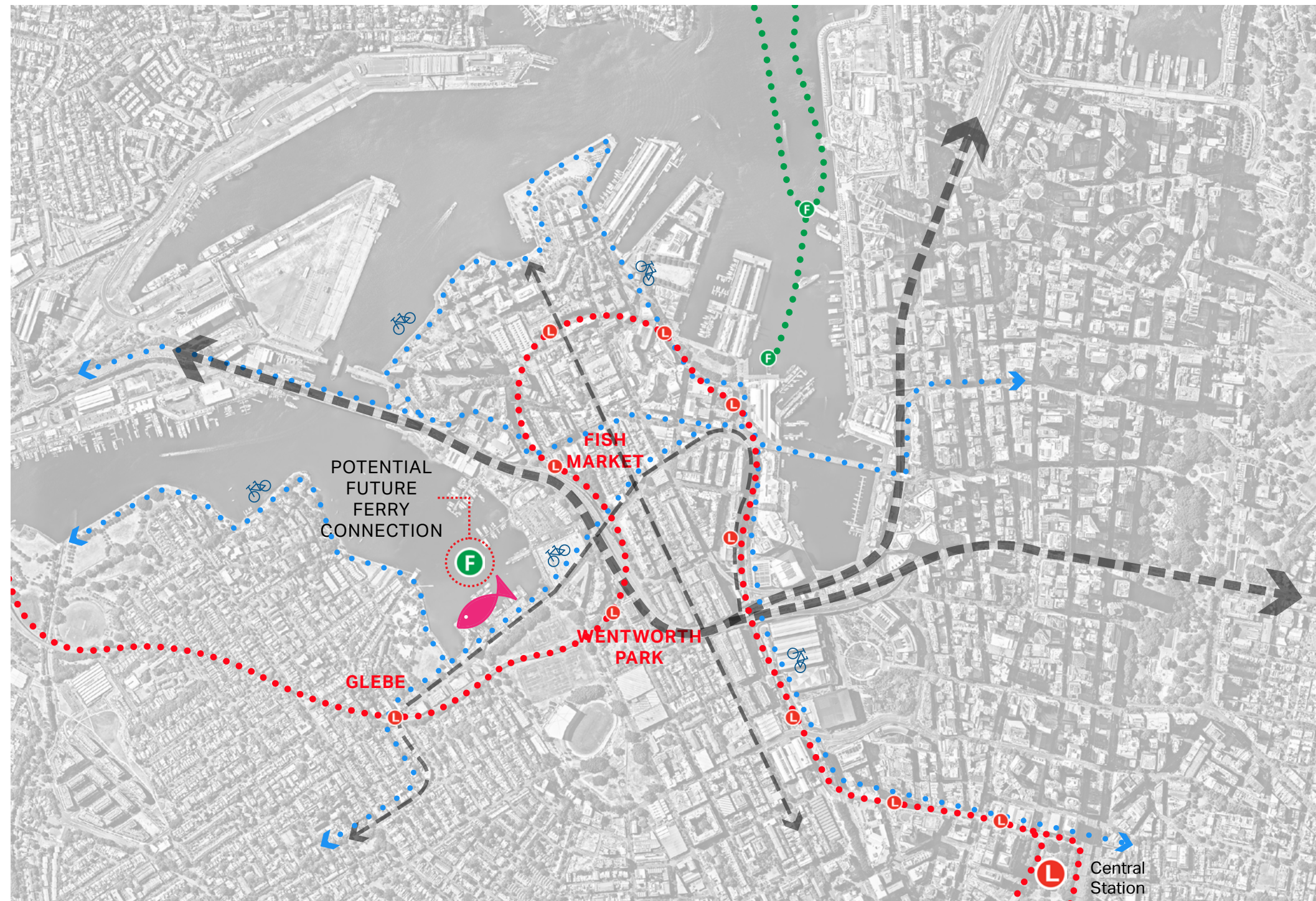


- 1 LOCAL PARK**
 - Connectivity
 - Park / Recreational
 - Local Amenities
 - Informal Play
- 2 URBAN PARK**
 - Programmed Events
 - Educational
 - Public Plaza and Building
 - Forecourt
- 3 DARLING HARBOUR**
 - Events / Festivals
 - Cultural Offering
 - Tourist Attraction

3.0 Public Domain & Public Access

Site Analysis

Transport and Intermodal Connections



- LIGHT RAIL - - - VEHICLES
- CYCLE PATHS 🐟 NEW SYDNEY FISH MARKET



Light Rail Connections



Major Roads



Cycleways

3.0 Public Domain & Public Access

Site Analysis

The Changing Heart of Blackwattle Bay



Recreational Open Space, Wentworth Park



Significant Fig Trees, Wentworth Park

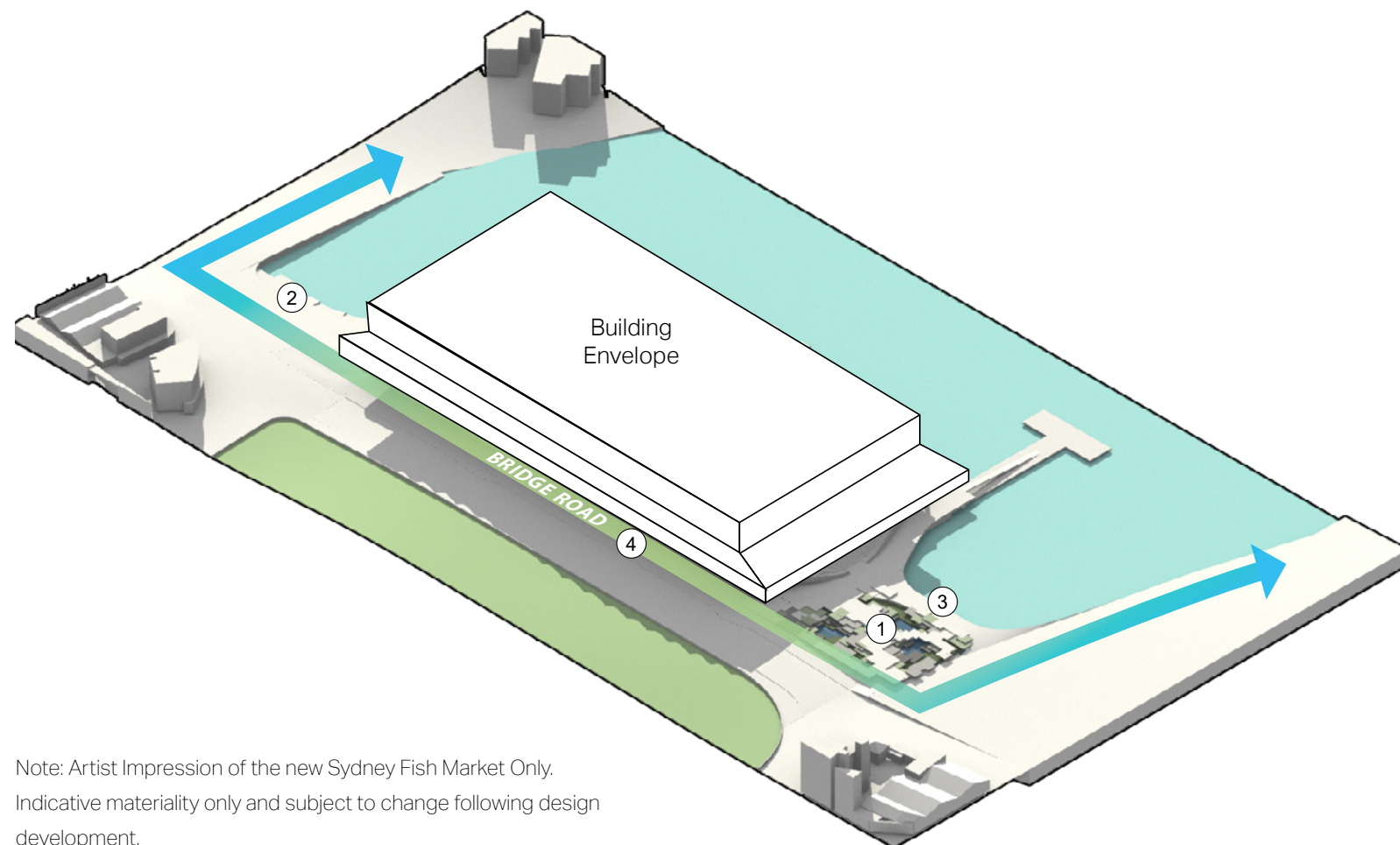


Wentworth Park to Blackwattle Bay

3.0 Public Domain & Public Access

Design Approach

Key Civic Spaces



Note: Artist Impression of the new Sydney Fish Market Only.
Indicative materiality only and subject to change following design development.

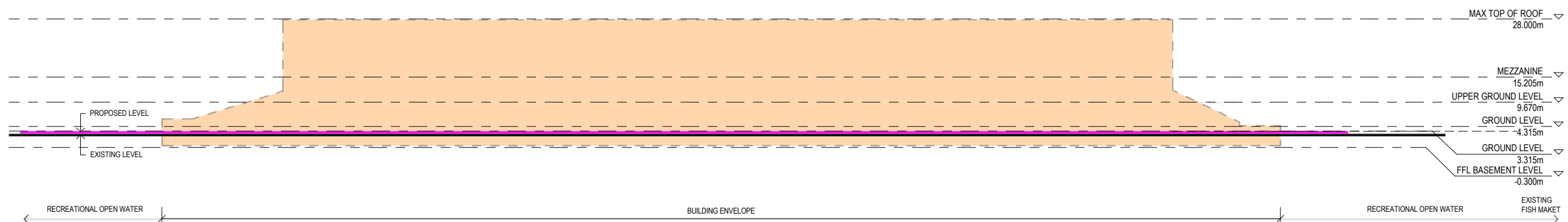
This proposal is guided by the following objectives;

- Maintain the structure for event overlays whilst providing a smaller intimate scale public domain for everyday use.
- Improve public amenities and provide a public domain with social and green infrastructure for human comfort.
- Integrate the development into the local network of streets and connections.
- Address the public domain entrances.
- Provide a thriving public domain that interacts and improves the connectivity with the harbour edge.

The proposed design strategy involves the formation of four consolidated public open space components; activated through the inclusion of social and green infrastructure and the interface between one and another.

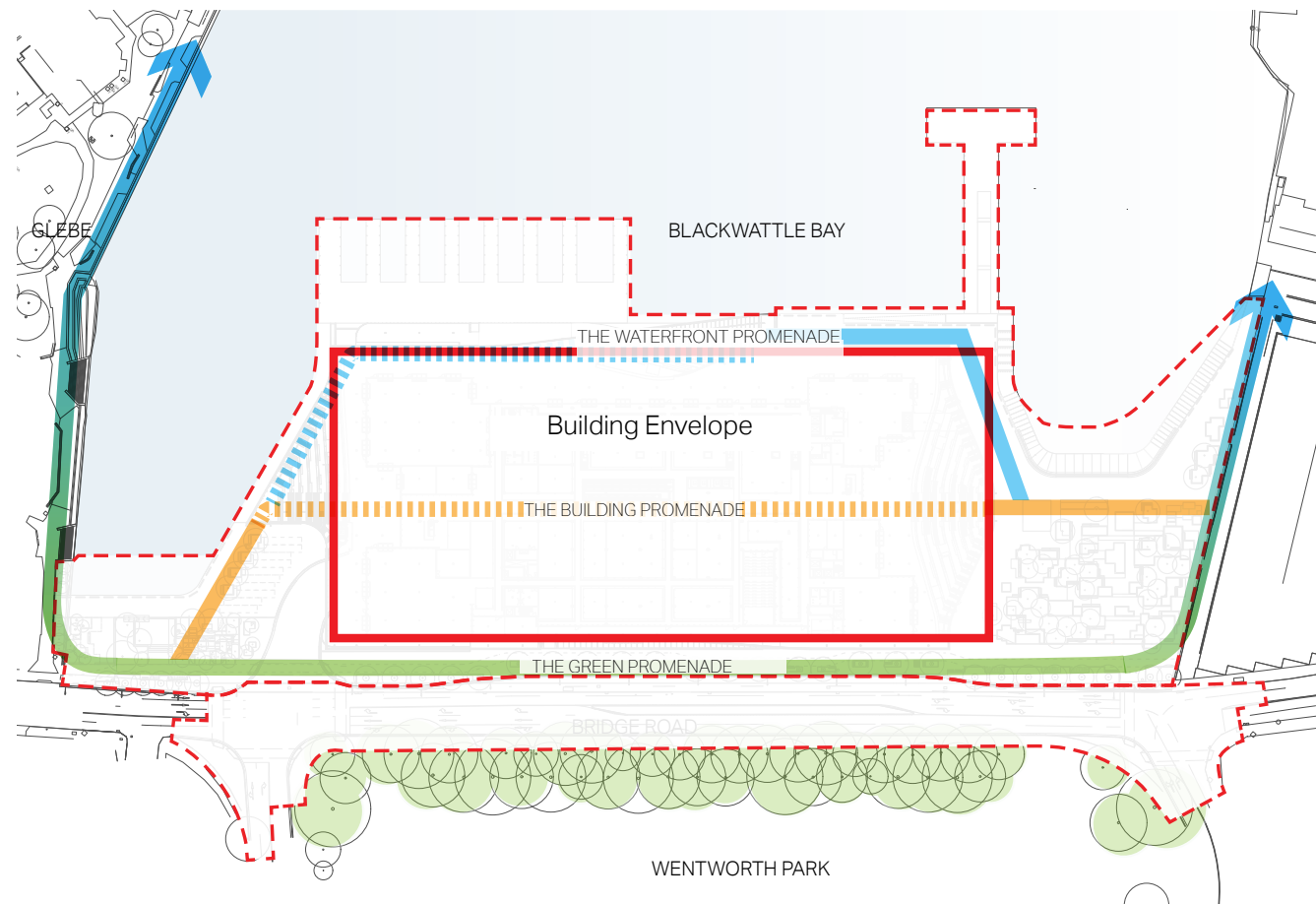
Public Domain Constructed Works

1. The Urban Park - The main public plaza and harbourside entry
2. The Local Park - The extension of the existing Glebe Foreshore
3. The Harbours Edge - The lowered public promenade connecting the public domain to the harbour's edge
4. Bridge Road - The new major boulevard and green link

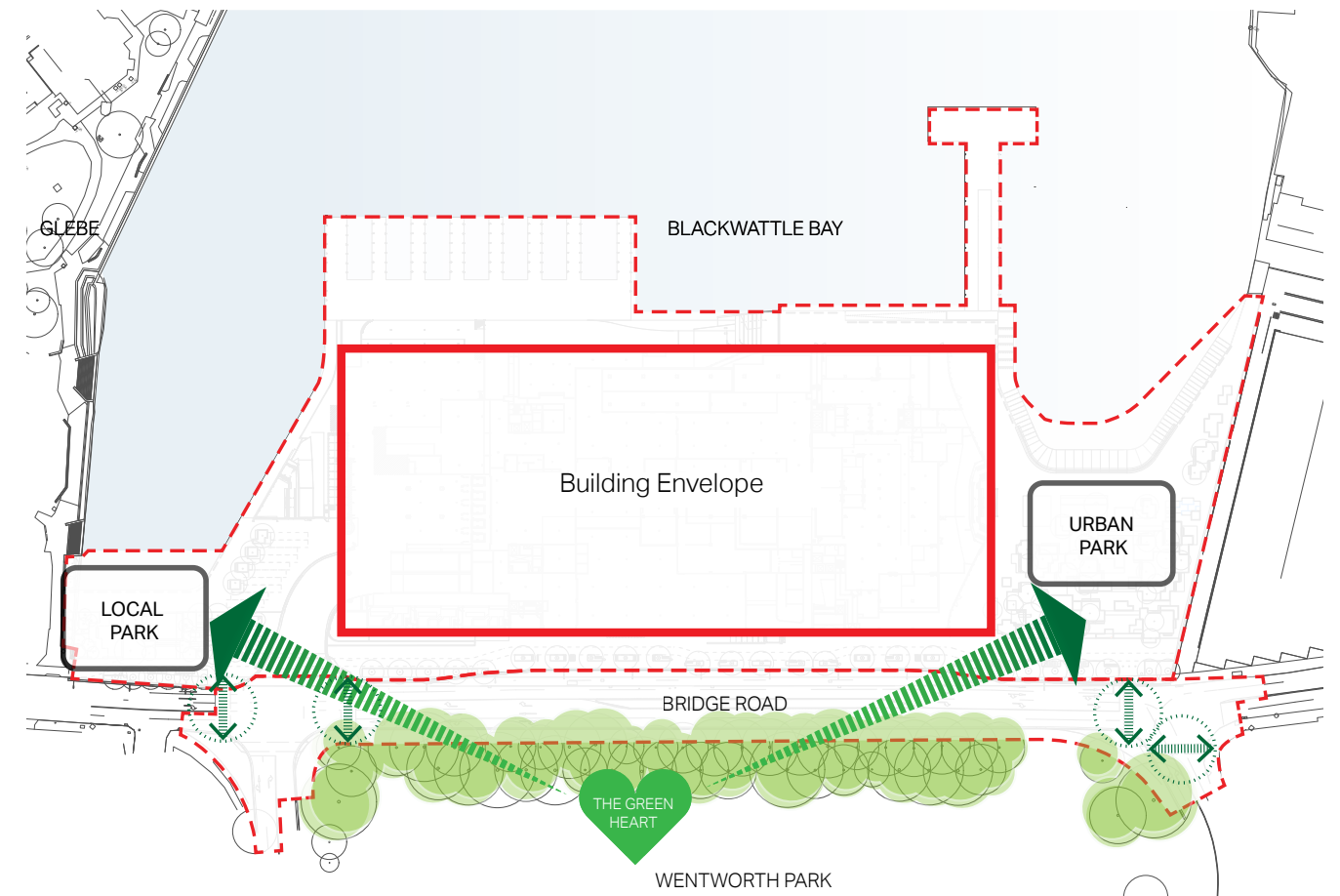


3.0 Public Domain & Public Access

Design Approach



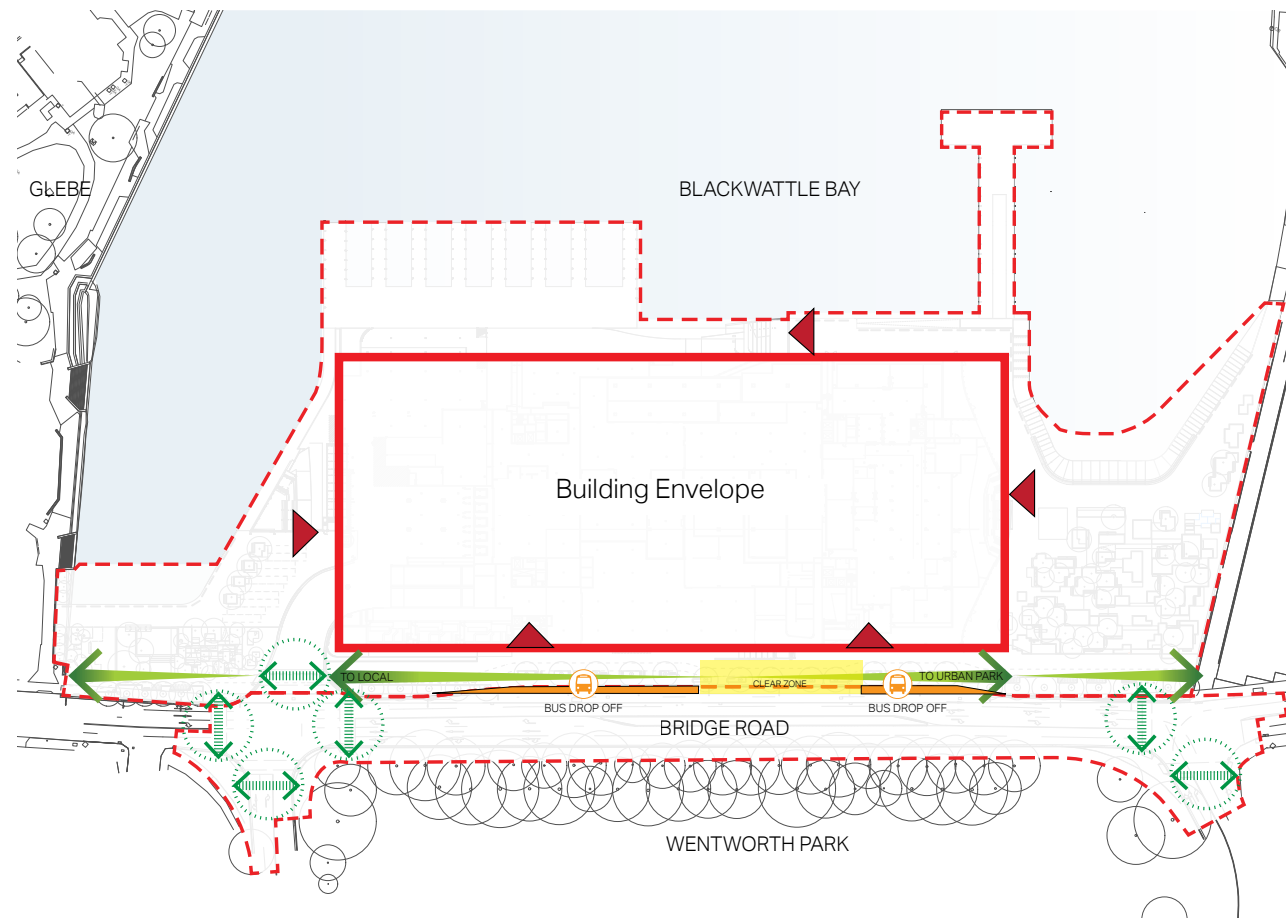
The Three Promenades



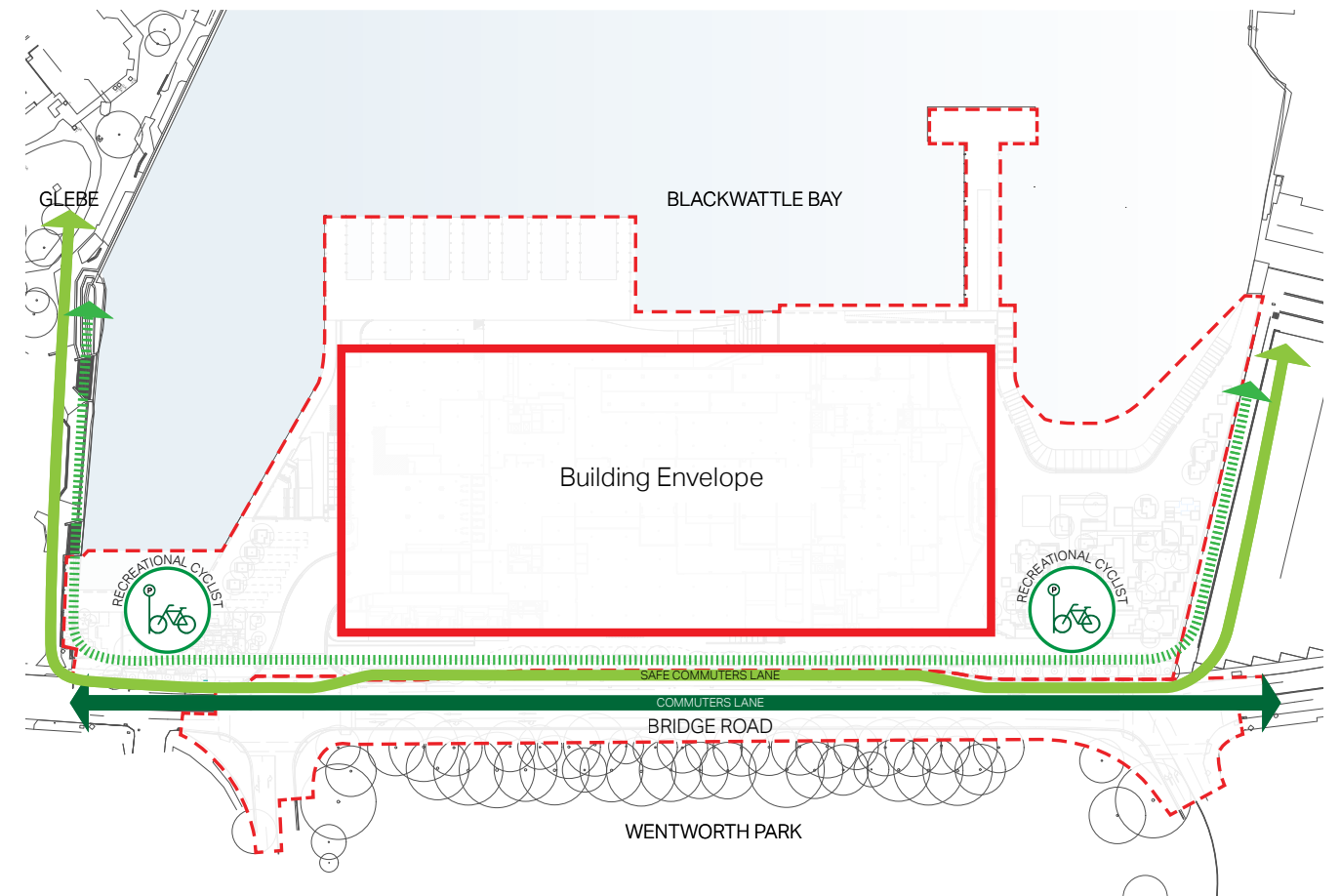
The Green Heart

3.0 Public Domain & Public Access

Design Approach



Access and Arrival



Cycling Strategy

4.0 Amenity

New Sydney Fish Market