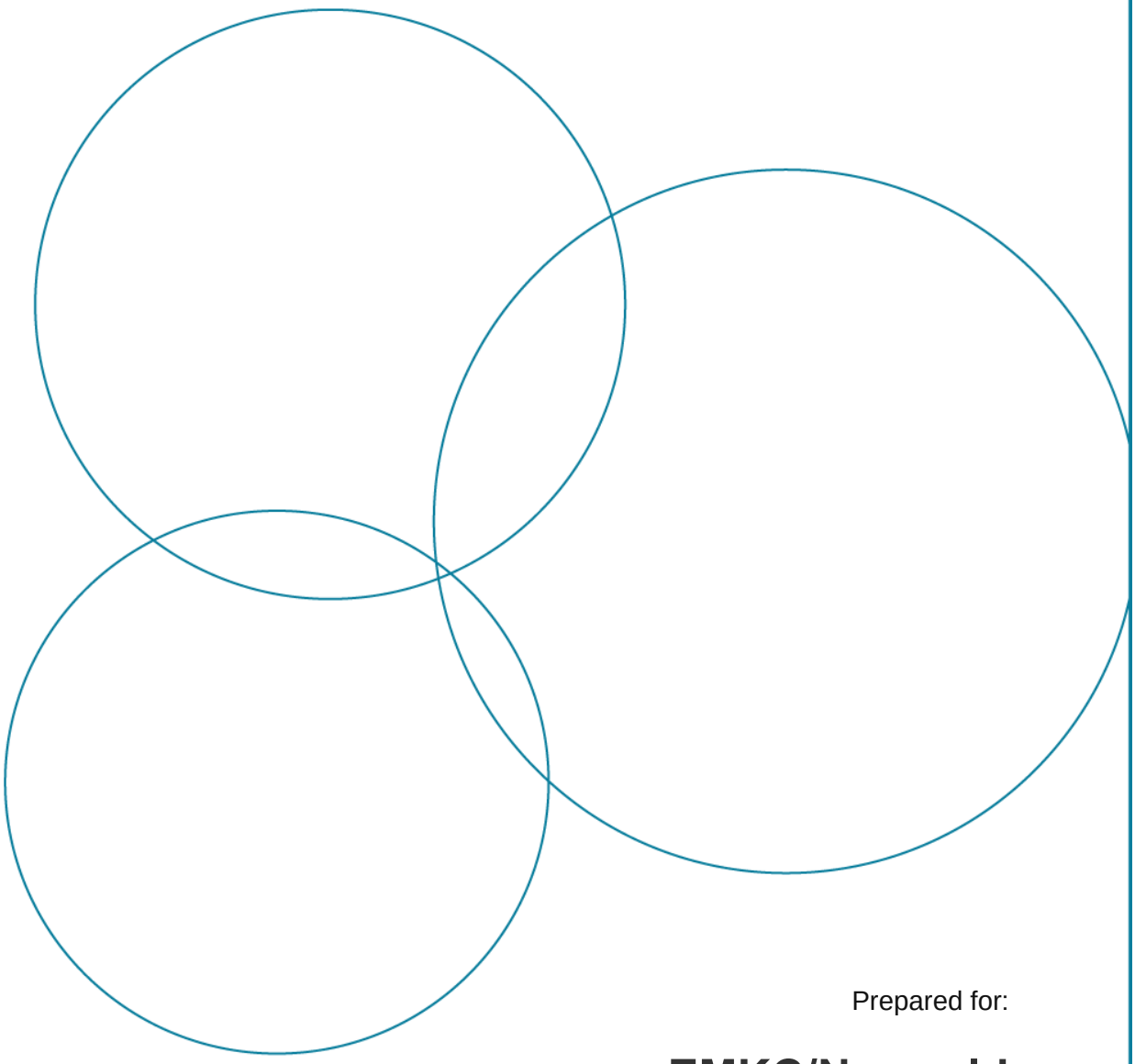
21-April 2017

Ecologically Sustainable Design Report

S17057 – Marsden Park Cold Storage



Prepared for:

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The success and realisation of the proposed initiatives will be dependent upon the commitment of the design team, the development of the initiatives through the life of the design and also the implementation into the operation of the building. Without this undertaking the proposed targets may not be achieved.

Contents

Executive Summary

This report outlines how environmentally sustainable development (ESD) principles can be incorporated into the design, construction and ongoing operation of New Cold at Marsden Park, NSW. It supports the State Significant Development Application (SSDA) seeking approval for the land use and envelope and outlines strategies to be explore and investigated in the detailed design stages.

The project will be designed according to best practice ESD principles across a wide range of environmental impact categories including energy, water, materials, ecology, emission, transport, indoor environmental quality and innovation. Rigorous management and governance procedures will ensure that sustainability outcomes will be delivered in operation.

Strategies to be considered in the design include:

- Load reduction, passive design, energy-efficient building services and smart controls to reduce energy consumption.
- Efficient fittings, fixtures and appliances to minimise water demand.
- Selection of non-toxic finishes to improve Indoor Environmental Quality (IEQ).
- Use of recycled water to reduce mains water consumption.
- Promotion of healthy and active living through design and education strategies, including recreational and end-of-trip facilities, design for pedestrians rather than cars, prominent placement of stairs and access to fresh food.
- Enhanced commissioning and tuning practices to translate design intent into actual performance.
- Environmental and waste management to ISO14001 standard during demolition and construction.
- Innovative marketing and education strategies to convey sustainability practices to wider audiences.
- Selective procurement to consider the supply chain impacts of materials used in construction in terms of environmental and social responsibility, and to reduce embodied carbon.

Throughout the project, appropriate documentation will be collected to demonstrate that the chosen sustainability initiatives are incorporated into the design and delivery of the building.

1 Introduction

1.1 1.1 General

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

EMKC is seeking to secure approval to establish concept proposal details for the new development of New Cold industrial facility.

1.2 1.2 Site description

The Site is located within Marsden Park. Marsden Park contains Sydney Business Park, a new commercial precinct that provides a mix of functions including warehouses, outlets and storage facilities.

More generally the site is bound by Darling Street to the north, Hollinsworth Road to the south, and Harris Avenue to the west.

A locational context area plan and location plan are provided in Figure 1 below.

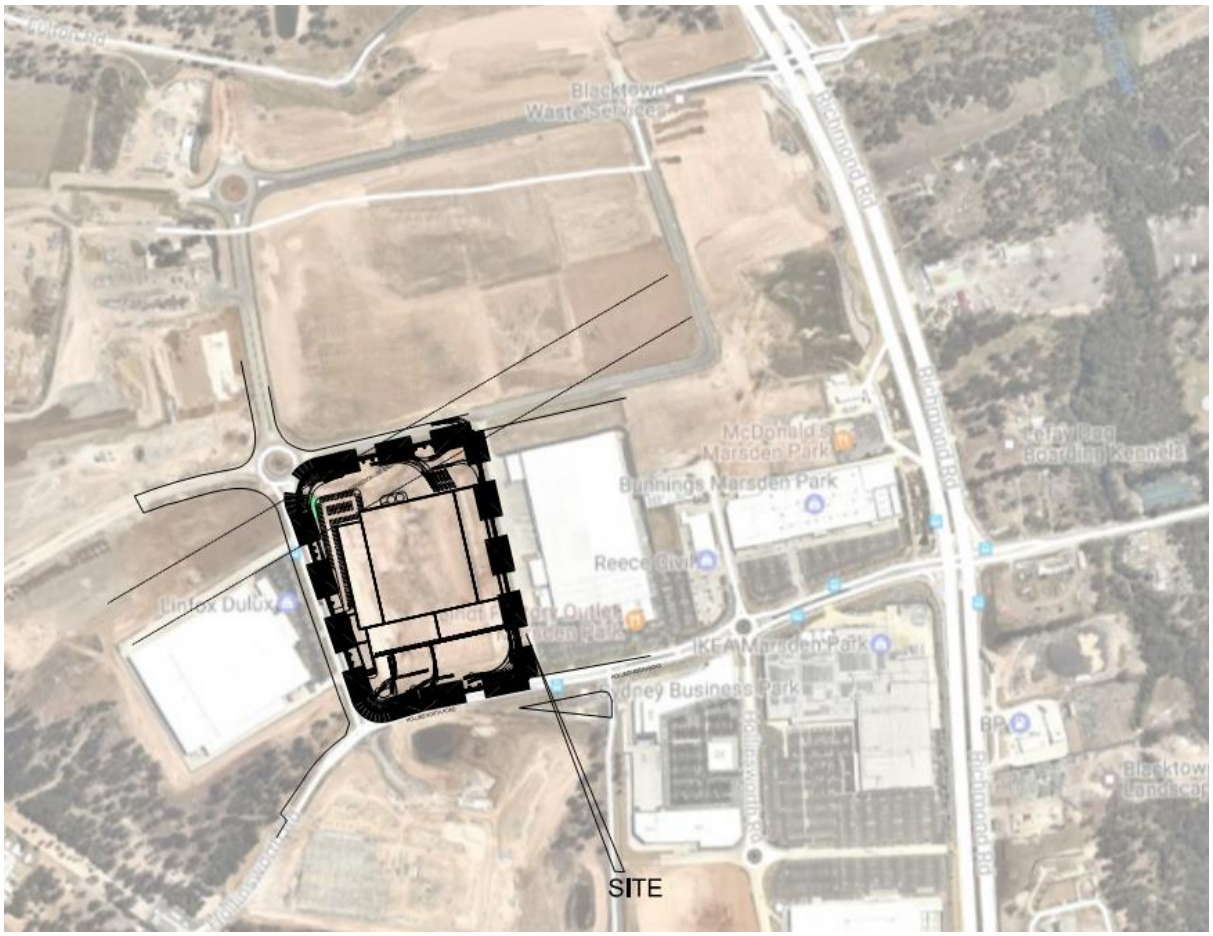


Figure 1 – Location Context Area Plan

1.3 1.3 Overview of proposed development

The proposal relates to a development application and seeks to establish concept proposal details for the New Cold. The concept proposal establishes the vision and the planning and development framework which will be the basis for the consent authority to assess future detailed development proposals.

The site is to be developed for industrial uses, including office, chiller warehouse and dispatch, and freezer warehouse and dispatch.

The Concept Proposal seeks approval for the following key components and development parameters:

- Construction and operation of an automated cold storage warehouse and distribution facility include:
  - Earthworks,
  - 33,000m^2 of cold storage space,
  - Warehousing and distribution,
  - Ancillary office space,
  - Infrastructure and services, and
  - Site landscape.

1.4 1.4 Planning Approvals Strategy

The Site is located within the Marsden Park precinct, which is identified as a State Significant Site in Schedule 2 of State Environmental Planning Policy (State and Regional Development) 2011. As the proposed development will have a capital investment exceeding $10 million, it is declared to be State Significant Development (SSD) for the purposes of the Environmental Planning and Assessment Act 1979 (EP&A Act), with the Minister for Planning the consent authority for the project.

This State Significant Development Application (DA) is a staged development application made under section 83B of the EP&A Act. It seeks approval for the concept proposal for the entire site and its surrounds.

More specifically this staged DA includes establishing land uses, gross floor area, building envelopes, pedestrian and vehicle access and circulation arrangements and associated car parking provision.

Detailed development application/s will accordingly follow seeking approval for the detailed design and construction of all or specific aspects of the proposal in accordance with the approved staged development application.

The Department of Planning and Environment provided the Secretary's Environmental Assessment Requirements (SEARs) to the applicant for the preparation of an Environmental Impact Statement for the proposed development. This report has been prepared having regard to the SEARs as relevant.

2 Environmentally Sustainable Design (ESD) Approach

The project will be designed according to best practice principles of environmentally sustainable development (ESD). Further detail is provided in the following sections.

2.1 Governance

The proposed development will establish and maintain strong governance practices, promoting engagement, transparency, and community and resilience to a changing climate.

Good environmental management practices will be adopted, including enhanced commissioning, ongoing tuning processes, building user information and environmental performance targets. Best practice construction environmental management processes will be implemented, as well as waste diversion targets from landfill. Metering and monitoring strategies will ensure operational performance can be tracked and optimised.

Performance will be measured in operation and the satisfaction of the building's occupants used as an indicator of the project's success.

Governance and management strategies are outlined in further detail in this section.

2.1.1 Commissioning and Tuning

The project team and all relevant contractors will undertake commissioning process activities for all nominated building systems that serve the project, including the following:

- Environmental performance targets will be set and documented;
- A comprehensive services and maintainability review will be conducted to address commissionability, controllability, maintainability, operability and safety;
- Best practice commissioning will be undertaken in accordance with CIBSE or ASHRAE standards;
- Tuning will be completed for all building systems, and at a minimum, quarterly adjustments and measurement must be undertaken for the first 12 months after occupation.

2.1.2 Building Information

Comprehensive building operation and maintenance information will be provided for all building systems, as well as building user information to educate building occupants and visitors on the sustainability features of the buildings and how to use these to reduce environmental impact.

2.1.3 Metering and Monitoring

A best practice metering and monitoring strategy will be implemented to track and monitor energy and water use in the buildings. This will ensure that they are on track to achieving the performance targets, and promptly identify any leaks, faults or excessive consumption. Sub-metering will be provided for all major energy and water uses, supplying data to the Building Management System (BMS).

2.1.4 Construction Environmental Management

A best practice Environmental Management Plan (EMP) will be developed and implemented by the head contractor, to

assist in managing environmental performance, conditions, and impacts arising from excavation, demolition and construction.

2.1.5 Operational Waste

A Waste Management Plan (WMP) will be provided for building operations. This will provide building management and occupants with guidance on how to manage waste in order to divert it from landfill.

Facilities will be provided for collection and separation of major waste streams for collection by the relevant waste contractor in operation.

Dedicated storage space will be clearly labelled for recycling and easily accessible by waste collection services.

2.2 Indoor Environmental Quality

Indoor Environmental Quality (IEQ) for the office will be improved through consideration of indoor air quality, acoustic, thermal and visual comfort, as well as daylight and views. IEQ strategies are outlined in further detail below.

2.2.1 Indoor Air Quality

The ventilation systems will be designed to with consideration of maintenance access and minimum separation distances between pollution sources and outdoor air intakes.

Ductwork will be protected during construction to minimise contamination with debris and moisture prior to occupation.

Kitchens and other sources of significant contamination will be separately exhausted without recirculation to minimise contamination at the source.

In order to minimise indoor air contamination and promote occupant health, preference will be given to paints, adhesives, sealants and floor coverings which have low Volatile Organic Compound (VOC) emissions, and engineered wood products with low formaldehyde emissions.

2.2.2 Visual Comfort

Glare control mechanisms such as internal blinds or curtains will help maximise visual comfort. Design will consider availability of daylight and maintain excellent connections to external views.

Artificial lighting will consider appropriate colour perception and lighting levels, reduced glare from lamps and uniformity.

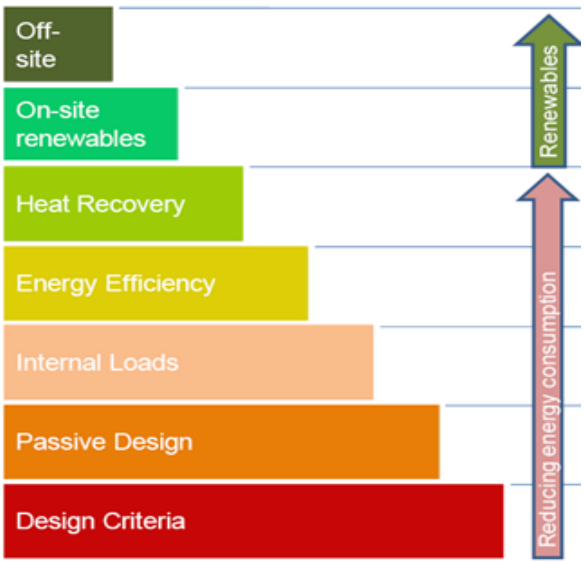
2.2.3 Thermal Comfort

Occupant thermal comfort will be improved through solar control glass, shading and careful design of air-conditioning systems.

2.3 Energy

The design will seek to reduce energy consumption, and thereby greenhouse gas (GHG) emissions, by combining a well-designed facade with high-efficiency systems, services and appliances as well as smart controls to ensure key services are only operating when required by occupants.

Before services are designed however, the first step will be to interrogate the design criteria to ensure the conditions being designed for match what occupants actually want for the building. Passive design principles will be applied to reduce the demand on active systems (e.g. HVAC and lighting).



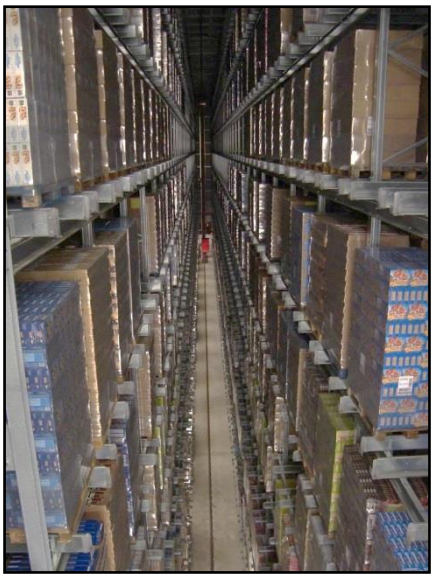
2.3.1 National Construction Code (formerly Building Code of Australia) Section J

The National Construction Code/Building Code of Australia (BCA) Section J sets minimum energy performance requirements for all new developments, which cover air-conditioning, ventilation, lighting, power and hot water, as well as building fabric considerations including thermal construction and insulation, building sealing, glazing and shading. The proposed design will be developed to meet the BCA energy efficiency requirements. JV3 modelling will be undertaken to inform the design development.

2.3.2 Energy strategies

The following strategies could be used to achieve the project's energy saving and GHG emissions targets. These are subject to change as the design develops.

- High-performance façade incorporating low-e solar control glazing with appropriate shading.
- Efficient heating, ventilation and cooling (HVAC) systems including:
    - High efficiency air conditioning,
    - Variable speed pumps,
    - Variable speed ventilation fans (including EC motors),
    - Common area ventilation to include efficiency controls such as zoning, motion sensors, and time clock control,
    - Comprehensive BMS systems to monitor and control HVAC systems,
    - Cold storage temperature and humidity level control.
- Efficient lighting systems including LED lighting throughout, with efficiency controls such as zoning, motion sensors, daylight dimming and time clock control.
- High efficiency hot water.



- High-efficiency appliances (where installed).
- Up to 50% lower energy consumption due to storage efficiency and density, and minimisation of cold air leakage.
- Consistent high-quality, efficient cold store operation, ensuring product integrity and food safety compliance.
- Improved inventory management (tracking and tracing, data sharing and EDI).
- Temperature and humidity levels can be kept at a constant due to strictly controlled product in- and outflows, use of air locks and an air-tight building.

The above mentioned strategies could also contribute to reducing peak electrical demand from the development.

2.4 Transport

Low-impact transport will be addressed by the design as well as the site. Bicycle facilities will be provided for staff and visitors, while access to existing public transport networks, cycling paths and pedestrian walkways is facilitated and encouraged. The following alternative transport initiatives are being proposed to improve amenity, promote health and reduce transport related GHG emissions:

2.4.1 Active Transport Facilities

Bicycle parking and associated facilities will be provided to staff and visitors, including end of trip facilities for staff (showers, changing amenities with appropriate drying space, and lockers). The design of the end-of trip facilities will encourage their use over that of private vehicle use.

2.5 Water

Mains water use will be minimised for the project by selecting efficient fittings, fixtures and appliances to reduce demand, and by utilising recycled water for non-potable uses.

2.5.1 Water strategies

The following strategies could be used to achieve the project's water saving targets. These are subject to change as the design develops.

- Water efficient fittings, fixtures and appliances;
- Fire test water should be collected and stored for re-use;
- Rainwater is collected and treated for reuse in non-potable applications including landscape irrigation and toilet flushing;
- Drip irrigation with moisture sensor override will be used for all landscaping;

The most efficient use for an alternative water source will be determined during detailed design, based on water quality, availability and reliability of water supply, and the minimisation of energy required for treatment and pumping.

2.6 Materials

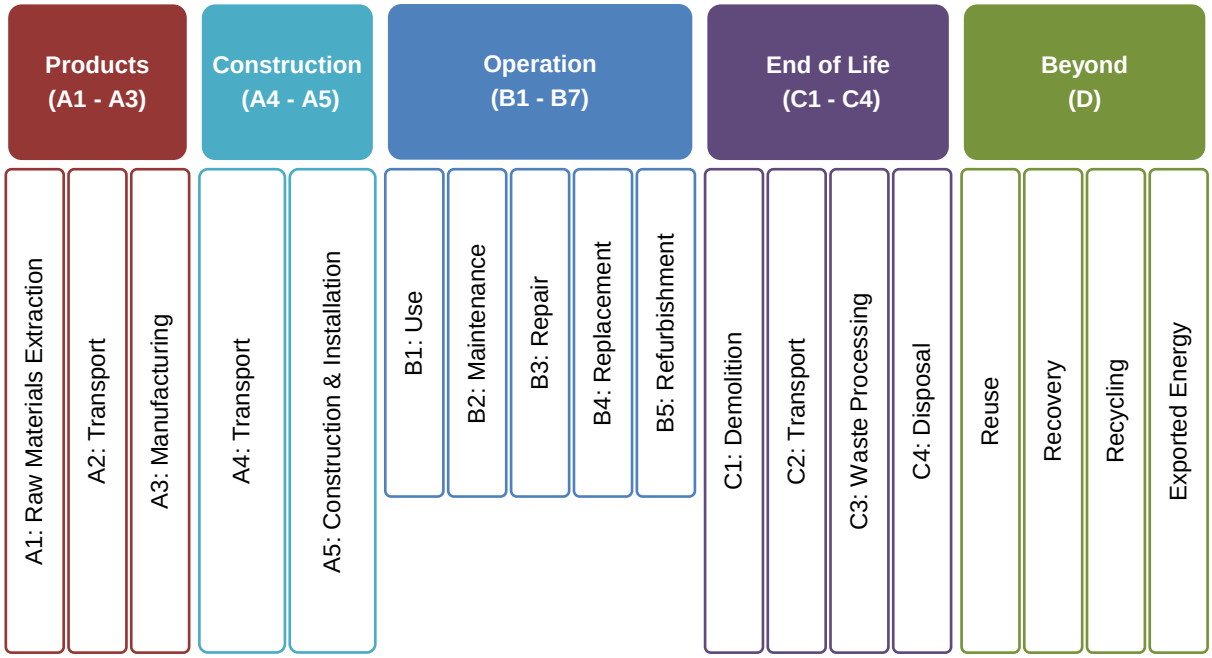
2.6.1 Material Selection

Materials used in construction are responsible for waste generation, resource depletion, GHG emissions and water consumption. In order to minimise these impacts compared to a standard development, the following principles could be applied to material selection on the site:

- Portland cement reduction in concrete mixes by using industrial waste product such as fly ash;
- Use of reclaimed water in cement mixes;
- Use of manufactured sand in cement mixes;
- Selection of responsible steel products sourced from accredited steel makers and fabricators;
- Selection of FSC or AFS certified timbers;
- Selection of Best Practice Certified PVC products;
- Specification of sustainable products where appropriate, such as those containing recycled content, third-party environmentally certified products, and those with product stewardship agreements in place;
- Local procurement to support the local economy and reduce transport emissions.

2.6.2 Life Cycle Impacts

Life cycle impacts will be considered in order to inform the design and specification of materials. In particular, the following major items could be targeted throughout the design development to determine options to reduce life cycle impacts: sub-structure; super-structure; envelope; internal walls; internal finishes and services.



2.6.3 Waste minimisation

A Waste Minimisation Plan may be implemented to deliver best practice waste management during the design, construction and operation of the project. A proposed waste strategy is:

- Establish waste targets (including a minimum of 80% construction and demolition waste diversion from landfill).
- 'Design out' waste.
- Implement best practice construction waste management plans and engage with the supply chain.
- Provide infrastructure and guidance to maximise waste recycling during operation.
- Set up an operational waste agreements.

The project team will forecast waste quantities and reused / recycled content and set targets for waste reduction.

Before starting on site, the contractor will submit a copy of the plan identifying the actions to be taken to reduce waste in construction, increase the level of recovery, increase reused and recycled content, and quantify the resulting changes. The Construction Waste Management Plan will:

- Define responsibilities and actions to prevent, reduce and recover waste;
- Identify waste arising, reuse and recycling routes;
- Record waste movements and benchmark against best practice.

Initiatives to design out waste will be developed in the design and could include:

- Eliminating unnecessary elements.
- Standardising sizes and details to reduce offcuts.
- Reducing complexity to simplify construction process.
- Evaluating the reuse and recycling opportunities of materials before specifying.
- Maximising off-site fabrication of elements to reduce waste.

Initiatives to reduce waste during construction will be agreed with the contractor and could include:

- Setting up a logistics plan and utilising just-in-time delivery.
- Reducing the amount of surplus materials by ordering the correct amount at the right time.
- Providing safe, secure and weatherproof materials storage areas to prevent damage and theft.
- Establishing take-back schemes with suppliers to collect surplus materials.
- Engaging with the supply chain to supply products and materials using minimal packaging and segregate packaging for reuse.

2.7 Land Use & Ecology

The project will enhance existing ecological value by reusing a previously developed site with the addition of landscaping. The site is not currently ecologically valuable and does not contain any threatened species.

Native and low water use plants should be selected for landscaping.

Heat island effect will be reduced through the selection of less absorbent roofing materials and increased landscaping.

2.8 Emissions

Emissions to water, soil and the sky will be minimised during construction and operation.

2.8.1 Reduced Peak Discharge to Stormwater

Stormwater discharged from the site will meet pollution reduction targets for total suspended solids, gross pollutants, total nitrogen, total phosphorus, petroleum hydrocarbons and free oils.

2.8.2 Light Pollution

Outdoor lighting on the project will generally be designed in accordance with AS 4282:1997 and external light pollution will be minimised.

2.8.3 Refrigerant impacts

Refrigerants will be selected with an low Ozone Depletion Potential (ODP) of zero.

2.9 Community & connectivity

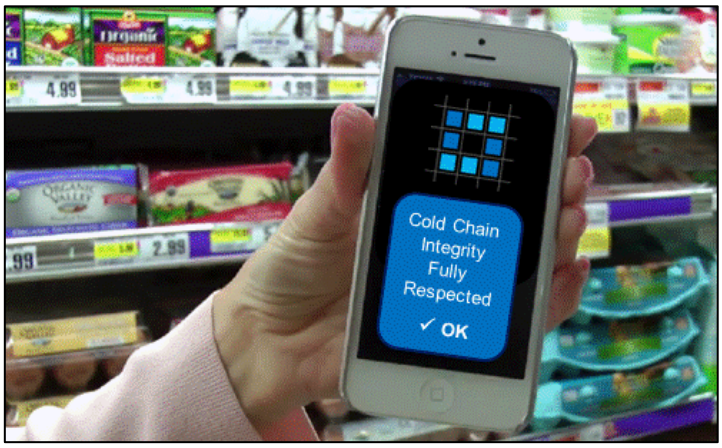
The project will be designed to maximise community benefit, encourage active, healthy lifestyles, maintain good pedestrian and cyclist linkages and facilitate safe social interaction, exercise, community groups and events.

The following strategies will be considered in creating a successful public space which attracts visitors and maximises opportunities for interaction and integration with the rest of the Darling Harbour.

- Promotion of healthy and active living through design and education strategies, including recreational and end-of-trip facilities, design for pedestrians rather than cars, prominent placement of stairs and access to fresh food.
- Innovative marketing and education strategies to convey sustainability practices to wider audiences.
- Practices which encourage community ownership and leadership.

2.10 Innovation

A range of innovations could be investigated by the project team during detailed design to determine whether they can be adopted for the project, including:



- Maintaining product integrity and food safety by providing an uninterrupted cold chain is one of our core competences.
- NewCold's ambition is to create consumer transparency into the cold supply chain by scanning product labels.
- Tracking the product from the source to the shelf with all the relevant data.
- Rapid and secure product track & traceability.
- Integrating Healthy Environments.
- Contributing to industry benchmarking
    - State of the art, large scale high-bay cold stores
    - Repetitive processes through automation, flexibility to include customer-specific requirements
    - Quality control through pallet inspection point upon receipt
    - Oxygen reduced storage environment
    - Automated shuttles from customers' factories
    - Proprietary WMS, allowing tailor-made solutions
- Energy metering integrity.
- Occupant engagement & marketing excellence.
- Contractor education: Sustainably training for all contractors on-site.
- Soft landings: The building is designed, built, commissioned, and tuned by adopting a 'Soft Landings' approach.
- Green cleaning & groundskeeping practices.
- Design for Robustness: Reviewing the design and materials to ensure durability for high-traffic surfaces and high-use fittings.

3 Conclusion

The initiatives outlined in this report demonstrate how New Cold development can incorporate best practice ESD initiatives into its design, construction and ongoing operation. Through a combination of energy, water and other strategies, the project will exceed minimum requirements for sustainable development in Australia.

Strategies to be explored and investigated in later design stages include:

- Careful lighting design and selection of non-toxic finishes to improve Indoor Environmental Quality (IEQ).
- Efficient fittings, fixtures and appliances combined with rainwater capture and reuse.
- Efficient building fabric and services to deliver operational energy saving.
- Active transport facilities to encourage healthier living while reducing carbon emissions from transport.
- Selective procurement of materials used in construction in terms of environmental and social responsibility.
- Innovative marketing and education strategies to explain sustainability practices to the public.

Rigorous management and governance procedures will ensure that sustainability outcomes will be delivered in operation.