Swire Cold Storage Facility - Marsden Park

Sustainability Initiatives (Rev C)

Prepared for Swire Cold Storage Pty Ltd

By Beca Pty Ltd (Beca)

ABN: 85 004 974 341

27 July 2015

Table of Contents

1 Introduction

This document summarises the following key sustainability initiatives that are proposed for the design and development of the proposed Swire cold storage development at Marsden Park, NSW:

2 Water

Rain water harvesting is proposed across the whole of the main roof area (31,700 sq.m) for toilet flushing, landscaping irrigation and use in the refrigeration system for heat rejection via roof mounted condensers.

In the past, the condensers have traditionally used 100% mains water. However, in recent projects, Swire has invested in significant infrastructure to reduce their condenser mains water usage through rainwater harvesting. For the Marsden Park project, Swire has estimated their total condenser water usage as 12,500kl/year based on other sites and their objective is to reduce the condenser use of mains water by 80%.

MUSIC modelling based on condenser water usage of 12,500kl/year in conjunction with the toilet flushing and landscaping water usage requires a useable rain water tank volume of 1500kl to meet Blacktown City Council's 80% non-potable reuse requirement. This storage of 1500kl will be provided at 3 locations on the site each of 500kl (under both Office/Amenities buildings and as part of the combined sprinkler/rain water tank). The 80% reuse figure should also satisfy Swire's objective of 80% mains water usage reduction for their condensers.

3 Energy efficiency

The site will feature modern LED lighting throughout (internal and external) which Swire has estimated will result in a 90% energy saving compared with traditional metal halide cold storage warehouse lighting. This saving is based on known savings at other Swire facilities where LED lights have been recently retrofitted. The saving is due to the higher efficiency of the LED lights, off/on control of the lights using motion sensors and refrigeration saving due to less heat needing to be removed from the cold store. In the past, the metal halide lights needed to be left on constantly during operating hours due to the long restrike times in the cold conditions.

The warehouse will be refrigerated by a modern highly energy efficient system. Some of the key features of the system are:

- Use of a natural refrigerant (ammonia) with zero GWP (global warming potential) and zero ODP (ozone-depleting potential).
- Use of variable speed refrigeration compressors for efficient performance
- Use of speed controlled fans for condensers and evaporators to optimise energy efficiency
- State-of-the-art industrial based control system and sophisticated energy management system for automated efficient operation
- SCADA system to facility easy performance monitoring

- Use of rain water collected from the building to reduce mains water use as noted above.
- Use of outside ambient air for defrosting of the freezer wall alcove and penthouse evaporators.

The refrigerated envelope will be insulated using modern PIR or XFLAM wall and ceiling insulation panels with extruded polystyrene floor insulation designed in accordance with best industry practice. The insulated envelope will have a separate weather roof and colorbond wall cladding to provide shading to reduce the thermal load compared with exposed panel construction. The 'shade' cladding will also provide protection to the panels to minimise any thermal efficiency loss over time.
The building underfloor heating system to prevent frost heave in the ground under the building will be a low energy use system utilising outside ambient air drawn under the building through pipes. The resulting cooler air will in turn be ducted to the Plant Room, Electrical Rooms and Workshop and utilised to air condition these areas.

Swire is also considering installing a Powerstar transformer in series with the Power Authority transformer to provide improved voltage optimisation, power conditioning and efficiency. This will be investigated further during the detailed design period.

4 Carbon emissions

The facility will include installation of a 500 kW (minimum) Solar PV roof top system, to produce energy - mainly for internal site usage, with some of the zero carbon energy exported to the grid. This is contingent on approvals from Electricity Authorities. Parked refrigerated semi-trailers onsite will have access to electricity from the solar PV system in daytime hours.
The energy efficiency initiatives above, as well as the solar PV system, will contribute to a reduced carbon footprint.

5 Waste

Waste cardboard and paper: Waste cardboard from warehouse activities will be segregated at activity areas and consolidated into central site bins / compactors for removal by contract recyclers.

Plastic waste: Waste plastic from warehouse activities will be segregated at activity areas and consolidated into central site bins / compactors for removal by contracted recyclers.

Waste management and recycling at staff offices and amenities: In line with Swire's sustainability ethos, waste will be separated at source at staff amenity and office areas. This will assist in the separation of paper, cardboard, plastic, aluminium, and general waste at source, for site consolidation to be removed by the relevant contractor(s).

Putrescible waste: Waste from all Site activities will be collected in separate and nominated bins for Site consolidation for pick up by Registered Contractors.

Operational Waste Management Plan: Swire has prepared an Operational Management Plan for the site as shown set out in the table below.

Operational Waste Management Plan (Swire Marsden Park v4b)				
Type of Waste	**Average / Week (tonnes/week)**	**Peak Week (tonnes/ week)**	**Proposed on Site Storage and Treatment facilities**	**Destination**
Cardboard Packaging / Office paper	0.35 t	0.52 t	Paper and cardboard to be separated at source for recycling. Paper and cardboard to be reused where possible or compacted for recycling.	Removal by licensed contractor for recycling
Plastic Packaging	0.69 t	1.04 t	To be stored in appropriate bins screened from public view	Removal by licensed contractor for recycling
Pallets	None	None	Stored on site in appropriate and designated areas suitably screened from public view	Pallets in 'closed loop' for continued re-use; pallets repaired where necessary.
Used Toner cartridge			On site	Toner recycler for recycling
General Waste (Food waste from cold store and general waste from employee amenities)	0.56 t	0.83 t	To be stored in appropriate bins screened from public view	Disposal by licensed waste contractor to licensed waste disposal facility.
Trade waste from truck wash	Minor flows, subject to Trade waste Agreement with Sydney Water	Minor flows, subject to Trade waste Agreement with Sydney Water	To sewerage system	Sewerage system
Battery recharge areas	Will only be operated if there is a spill in battery charging area	Will only be operated if there is a spill in battery charging area	Bunding of spills	Emptied by licenced contractor in event of spill

Forklifts – Counterbalance and High reach	20 batteries per year removed from site; 1 tonne each battery = 20 t p.a. **Aver 0.4 t /week**	0.4 t / week	No storage of obsolete batteries; exchange of batteries by Toyota materials Handling.	TMH deliver used batteries to *Orbitas Resource Recovery*, Sydney for resource recovery.
Ablutions waste			To sewerage system	Sewerage system

6 Employee end-of-trip facilities and onsite amenity

Employee communal open space has been provided at the north of the site which will have solar access.

Secure, covered facilities will be provided for 12 bicycles.

Showers and lockers will be provided in the Office/Amenities buildings for use at end-of-trip.

Separate amenities areas will be provided for visiting non-employee truck drivers.