Greenbox Architecture

Lane Cove West Data Centre

SSDA Sustainability Statement

Issue 1 | 17 December 2018

Job number 259234

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1 Introduction

The purpose of this memorandum is to outline Environmentally Sustainable Design (ESD) initiatives associated with AirTrunk - Sirius Road development. Adoption of a formal ESD rating or assessment tool is not proposed for the project. However, the following summarises:

1) Our opinion as to the overall energy efficiency of the proposed design in the context of the efficiency metric used by NABERS;
2) Our opinion as to the water consumption of the proposed design of the cooling system in the context of the Green Star assessment criteria;
3) Other efficiency and sustainability measures that will be implemented or considered for the project.

2 Energy Consumption

Data centres consume significant amounts of power, and energy efficiency is generally considered to be the single most important sustainability feature of any data centre design.

The National Australian Built Environment Rating System (NABERS) provide a star rating system for energy usage within data centres. Three type of rating systems are available – IT Equipment, Infrastructure and Whole Facility. The Infrastructure rating is used within this report. The two other rating types take IT equipment efficiency, which will be part of end customer fit-out and is unknown, into account and hence is not appropriate for this assessment. The rating ranges from 4 star to 6 stars. For comparison purpose, the NABERS key principle indicates that an average facility would perform equivalent to 2 to 3 energy stars level.

The NABERS Data Centres Infrastructure rating assess the efficiency by comparing the followings:

- Infrastructure Energy Consumption (ie. exclusive of IT Equipment)
- IT Energy

We have converted the above to Power Usage Efficiency (PUE) and tabulated the maximum permissible PUE with respect to each NABERS energy star rating as follows:

NABERS Energy Stars	Maximum PUE
3 – "average benchmark"	1.88
4	1.61
4.5	1.48
5	1.34
5.5	1.2
6	1.07

Table 1 NABERS Energy Stars with permissible PUE

The proposed design is highly energy efficient. A PUE of 1.3 is expected, which place the proposed development at NABERS Energy Stars rating between 5 and 5.5 stars. This high efficiency design is achieved through a combination of the following:

- Minimising losses in the electrical distribution system by:
    - Distributing power at high voltage as far as possible;
    - Use of highly efficient UPS systems

- Maximising efficiency of the cooling system by operating the data halls at higher temperatures thereby increasing the efficiency that the cooling and heat rejection systems can operate.

3 Water Consumption

The proposed design of the will utilise open circuit cooling towers for heat rejection. This cooling system is highly efficient, contributing to the low PUE value noted above, but will consume significant volume of water. In order to minimised water consumption, the cooling towers will be selected and control as follows:

- Towers will be selected to provide no more than 0.002% drift coefficient
- The system will be controlled to operate with no less than 6 cycles of concentration

The above is in line with Green Building Council of Australia (GBCA) good practice for water efficiency and in accordance with AS/NZS3666.1 – Air Handling and Water Systems of buildings – Microbial Control.

4 Other Efficiency and Sustainability Measures

Other efficiency and sustainability measures that will be implemented, where practicable, include the following:

- Power is distributed as far as practical at high voltage, reducing electrical transmission losses
- The proposed chillers are significantly more efficient that the minimum allowed to satisfy local code requirements
- Rainwater harvesting – where practical rainwater will be captured on site and used to supply make up water to the cooling towers, in place of mains water
- VSD drives will be used on fans and pumps allowing turndown and energy savings at part load
- High efficiency electrical drives will be used on the various systems
- Low flow fixtures and fittings will be used to minimise water consumption