Bovis Lend Lease

Darling Walk Fitout

ESD Report for EA Submission

ISSUE 1

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1. **Introduction**

The Darling Walk Fitout design team, with the endorsement by their client, Commonwealth Bank of Australia, is proposing to achieve a 5 star NABERS Energy design rating and target a 5 star Green Star Office Interiors version 1.1 rating in design. By meeting these ratings, the development will be in line with nation's best environmental practices. It may possibly be the largest NLA Fitout in NSW aiming for a 5-Green Star rating under Green Star Office Interiors version 1.1.

The client and project team are committed to demonstrating the use of new technologies and new applications of existing technologies in order to deliver a benchmark ESD project. The project team recognises SHFA's corporate framework for sustainability and make a commitment that the project will be consistent with the principles of Sustainability.

This document identifies key elements including architectural, mechanical, electrical, hydraulic, materials and ESD strategies to achieve the environmental targets set for Darling Walk Fitout by coordinating the different aspects of the design.

2. **Green Star Office Interiors version 1.1 rating**

This section discusses the requirements associated with achieving a 5 star Green Star Office Interiors version 1.1 rating and the implications on each of disciplines forming part of the overall fitout design.

The fitout design for a 5 star commercial workspace will require the following attributes to be targeted:

1. Darling Walk Fitout is one of the commercial Fitout projects targeting a Green Star rating. It is possibly the largest NLA Fitout in NSW aiming for a 5-Green Star rating under Green Star Office Interiors version 1.1

   To date, most Fitout projects certified under Green Star Office Interiors comprise a maximum of approx 2000sqm NLA. When rated, Darling Walk Fitout will hopefully become a Fitout with the largest NLA in NSW to be Green Star certified. This is significant due to the extensive materials selection, services and layout design as well as construction management required on a large site to achieve a 4 or 5 Green Star rating.

2. Integrated fitout with Base Building construction to reduce material waste during tenancy fitout.

   Integrating fitout with Base Building avoids unnecessary generation of waste due to removal of finishes such as flooring or ceiling to suit CBA's needs and aesthetics. Design coordination is carried out between Fitout and Base Building to ensure that essential services and layout provided by Base Building suit Fitout's final requirements. This practice can streamline resource use and material consumption, so that unnecessary strain is not added to landfill from construction and demolition waste. In addition, integrated fitout reduces labour and cost of reinstallation, as well as offering the benefit in reduction of storage space for make good items to be reinstalled at end of tenancy.

3. Installation of chilled beams in the buildings which results in lower energy consumption resulting in lower operating costs and improved indoor environmental quality for occupants' health and wellbeing.

   In general the design intent is for the central system to circulate only the amount of air needed for ventilation and latent load purposes, with the active chilled beams providing the additional air movement and sensible cooling and/or heating required through the induced room air and secondary water coil. In this manner the amount of primary air circulated by the central system is dramatically reduced (often 75-85% less than conventional "all air" systems).

   Essentially active chilled beams transfer a large portion of the cooling and heating loads from the less efficient air distribution system (fans and ductwork) to the more efficient water distribution system (pumps and piping).

The net result of this shift in loads with active chilled beam systems is lower energy consumption and operating costs.

Chilled beams are also a great improvement over the conventional VAV system for two reasons: Radiant heating or cooling reduces drafts and provides for greater well being in the environment than conventional VAV and they provide a 'one pass' system, so that air is circulated only once, reducing the likelihood of spreading pathogens. This contributes to improved indoor environmental quality.

4. Improved indoor air quality by ensuring that fresh air supply is measured (using CO_2 sensors in air return ducts) against the level of pollutants in the tenancy space.

   Higher than normal levels of CO2 can be an indicator of inadequate ventilation and can affect the quality of the breathable air within an enclosed office space. This can have substantial effects on the wellbeing of occupants and subsequently, their productivity. The installation of a monitoring system (Co2 sensors in return ducts) can detect abnormal level of CO2 indoor and automatically adjust fresh air ventilation supply rates.

5. Exceeding environmental laws, regulations and codes of practice by implementing the Dulux EnviroWash System on site during construction to minimize adverse impacts on the environment and meeting target 80% recycling on all waste generated during fitout.

   The Fitout site team have implemented the patented Dulux EnviroWash System on site; an innovative, water-based treatment system that turns paint wash-out into clean water and inert solid waste, allowing for easier and safer disposal. The filtered water is recycled into other trade related applications, or released onto grassy areas. Remaining paint sludge is filtered, dried and disposed off as non-hazardous solid waste.

   Above the benchmark of 60% regulatory waste recycling, the Fitout project has consistently hit a targeted 80% recycling record throughout the duration of construction. This practice minimizes landfill from construction waste.

6. Minimizing usage of PVC products on site by replacing PVC comms cabling with non-PVC comms cabling and implementing VOIP system.

   As Australia currently has limited provision for safe recycling of PVC materials, reduction of PVC in buildings is strongly encouraged by Green Building Council of Australia. This practice decreases the strain on recycling PVC at the end of a Fitout's lifecycle.

   Through proposed investment in polyethylene comms cabling for the fitout and installation of a VOIP system which combines data and telephone in the same cable, the use of PVC materials on this project can be significantly decreased.

7. Fitout design that incorporated atriums to maximise the provision of natural lighting, long distance views and visual connections to the outdoors for work settings.

The provision of atriums and efficient work settings layout focussing around windows maximise the provision of natural lighting, long distance views and visual connections to the outdoors for the occupants. Decreased reliance on artificial lighting is believed to be beneficial for the occupants' wellbeing and productivity. Eye strain or related health problems can also be significantly reduced in situations where occupants can periodically re-focus visually on a distant object through the windows.

8. Only using paint, carpet, sealants and adhesives with low VOC (Volatile Organic Compound) on site for the fitout as research has found that health effects of excessive exposure to VOC are consistent with the Sick Building Syndrome effects such as eye, nose and skin irritation, headache and lethargy.

   All subcontractors will be briefed on the sustainable standards and criteria on this project, including introduction to use of the materials logbook on low VOC sealants, adhesives and paint on site. The foremen will collect the information fortnightly, confirming quantities and type of materials brought and used on site to ensure compliance.

9. Commitment to fitout tuning for services on a quarterly basis and re-commissioning 12 months after Practical Completion to ensure occupants' comfort are not affected by climatic or occupancy variations.

   The services installed will be revisited and fine-tuned 12 months post Practical Completion of the Fitout. The benefits of fitout tuning includes verification that the systems are performing to their optimum efficiency during all climatic and occupation variations as well as provision of an opportunity for the systems to be tuned to optimise time schedules to best match the building occupants' needs. All these contribute to energy saving efforts.

10. Careful selection of furniture, fittings and finishes to maximise good environmental outcomes balanced with the chosen aesthetic, cost effectiveness and fit for purpose requirements.

    This initiative ensures that the selection of furniture, fittings and finishes installed in the Fitout have a reduced environmental impact relative to available alternatives.

11. Indoor plants are incorporated in the fitout to improve indoor environment quality.

    Potted plant microcosm has been shown to reduce air-borne concentrations of VOC, the exposure of which causes health effects similar to Sick Building Syndrome. This Fitout has incorporated at least a large plant or two small plants per work setting, supplied and maintained by a nominated contractor, to contribute to the health and wellbeing of the occupants.

3. **Key Initiatives to Reduce Energy Consumption**

The tenant for Darling Walk Fitout, Commonwealth Bank of Australia has recently issued a Media Release that to announce that the group will reduce their carbon emissions by 20 per cent by June 2013, in comparison to 2008-2009 levels.

To this end, the design on Darling Walk Fitout will be as energy efficient as possible, to support the group in their commitment to carbon emission reduction and in being a sustainable corporate citizen.

The fitout design for a 5 star NABERS Energy commercial workspace will require the following attributes to be targeted:

1. Darling Walk Fitout is targeting a NABERS Energy Tenancy rating of 5 stars

   1 star NABERS Energy rating indicates the worst greenhouse performance and a 5 star the best. 3 star rating represents current market best practice. There is a strong drive for commercial buildings to aim for higher rating as the Australian Greenhouse Office (AGO) (1999) reports that commercial buildings in Australia are responsible for 32 million tonnes of greenhouse gas emissions (CO_2) each year.

   A typical tenancy would contribute approx 158 – 117 $kgCO_2/m^2$ emission rate per annum, rating on the NABERS Energy Tenancy around 2.5 - 3 stars. Hence Darling Walk Fitout's targeted 5 stars is a significant improvement from the typical tenancy and will be in line with the world's best environmental practices.

2. Installation of chilled beams in the buildings which results in lower energy consumption resulting in lower operating costs.

   Essentially active chilled beams transfer a large portion of the cooling and heating loads from the less efficient air distribution system (fans and ductwork) to the more efficient water distribution system (pumps and piping).

   The net result of this shift in loads with active chilled beam systems is lower energy consumption and operating costs.

3. Fitout design that incorporated atriums to maximise the provision of natural lighting and reduce the need for artificial lighting requiring energy consumption.

   The provision of atriums and efficient work settings layout focussing around windows maximise the provision of natural lighting. Decreased reliance on artificial lighting results in reduced energy consumption.

4. Lighting levels are designed to 8W/m_2 and use of high efficiency T5 luminaires.

   Lighting levels designed to 8W/m_2 represents a 20% improvement over the minimum BCA requirements for lighting levels at 10W/m_2. With appropriate luminaire and parabolic reflector design, the T5 luminaire offers higher utilisation of the available light on the working plane. As far as energy savings is concerned, the T5 luminaire can achieve a saving of 36% as compared with the common T8 luminaire with conventional ballast.

5. Significant lighting controls are implemented in the design, including time clock switching for the open plan areas, daylight sensors around the perimeter areas and motion sensors in the meeting rooms or quiet rooms.

   A favorable outcome from the combined lighting controls implemented as per above offers a 23% reduction in the lighting loads of the fitout. Decreased lighting loads will result in energy efficiency due to minimised luminaires installed in the fitout.

6. Implementation of good control on all computer equipments.

   "Good control" implies that systems are in place that will ensure (independent of tenant behaviour) that the equipments will switch off or move into a hibernation/sleep mode when not in use or after hours. Strategies to ensure this include:

   Settings that cannot be changed by staff guarantee sleep/hibernation mode operating during non-occupancy hours for all computers and office equipment or a software program is implemented to initiate automatic shutdown procedures to the PCs after hours

   These good control strategies contribute to a 46% reduction in the energy associated with regular computer use.

7. Installation of electrical sub-metering

   Separate sub-metering is provided in the fitout for tenancy lighting and small power consumption, and for each floor. Substantive energy use greater than 25kVA within the tenancy, such as supplementary air conditioning for computer server rooms, are also provided with sub-metering.

   Sub-metering allows successful monitoring of energy consumption so that sufficient data is available to building managers to allow them to monitor consumption and compare historical data. This allows building managers to fine-tune the operational procedures to minimise consumption and to detect any operational problems early on.

   Sub-metering also allows monitoring consumption on a floor-by-floor or large consumption source basis thereby facilitating the management of energy use.

8. Office design lighting zoning

   Lighting expenditure can represent two-thirds of a tenancy's total energy costs. Decreasing the size of lighting zones allows for greater control over lighting, giving tenants the ability to reduce energy consumption and costs by only lighting those areas or zones that are occupied.

   All individual or enclosed spaces in the tenancy have separate lighting switches, with the size of each switched lighting zones not exceeding 100m^2 for 95% of the tenancy.

4. **Summary**

Darling Walk Fitout will be designed to achieve a 5 star NABERS Energy design rating and to target a 5 star Green Star Office Interiors version 1.1 rating.

A sustainable fitout within the Darling Walk buildings will have a positive environmental and social impact for both the Darling Walk development and the SHFA Public Domain. The fitout will minimise waste and provide a better working environment to make Darling Walk a significant landmark tenancy in New South Wales.

Utilising new technologies and optimising existing technologies will have a substantial impact both environmentally and socially.

By incorporating the measures noted in this document and the thorough monitoring of construction and operation of the tenancy, Darling Walk Fitout presents a significant potential to meet the proposed nation's best practice environmental targets.