S4B STUDIO

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Dooleys Lidcombe Catholic Club

Development Application
ESD Report

for

Bouygues Construction

Revision B, 20th October 2016

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Revision	Date	Description	Author	Reviewer
A	13.10.16	Issued for DA	RB/BGM/LV	LV
B	20.10.16	Revised to incorporate comments	LV/TRC	LV

1. Introduction

1.1 Aim of Report

This report identifies the design initiatives and features of the development that have the potential to reduce the environmental impact of the proposed new the mixed use Club, Hotel and structured carpark development on the new amalgamated site of the Dooleys Lidcombe Catholic Club bounded by Church , John & Anne Street's and Olympic Drive, Lidcombe.

Consideration will be given to then following areas:

- Energy
- Water
- Air/Ventilation
- Noise
- Waste

1.2 Limitations

The design approach for the building is based upon preliminary estimates of heating, cooling, water, sewer, gas, stormwater and electrical loads, and preliminary planning solutions and layouts as defined in the architectural drawings and project briefings.

1.3 Sources of Information

This report is based upon the following information:

1. Dial Before You dig Information package;
    - Ausgrid (electricity)
    - Jemina (gas)
    - NBNCo (telecommunications)
    - AARNet (telecommunications)
    - Telstra (telecommunications)
    - Uecomm (telecommunications)
    - Amcom (telecommunications)
    - Nextgen (telecommunications)
    - Sydney Water (water & sewer)
    - Auburn City Council in consultation with Bonnacci (stormwater)
2. PTW Architectural Drawings Rev H & I Dated 17/03/16

1.4 Overview

The new Club and hotel development is located on the Dooleys Lidcombe Catholic Club site bounded by Church, John & Ann Street's and Olympic Drive, Lidcombe.

The development will include a Club and hotel tower with approximately 260 rooms, mounted above a two level Club and hotel complex complete with two level basement carpark and associated loading dock. There will also be a separate structured carpark building for 610 cars located adjacent the club and hotel building.

2. Energy

2.1 Siting & Construction

2.1.1. Orientation

Club & Hotel

The building forms and associated internal uses have been considered to take advantage and make best use of both solar effects and also prevailing winds experienced at the site.

The orientation of the indoor / outdoor uses of the building provides the perfect opportunity to harness the predominant daily breezes for natural ventilation.

These spaces have also been arranged around some of the highest thermally loaded spaces on the eastern and western facades. This reduces the need to provide solar control to these facades and also expend unnecessary mechanical energy to heat and / or cool these spaces at all times.

The solar collectors for the gas fired solar boosted domestic hot water system have been positioned on the building roofs facing north at an angle so as to provide maximum solar exposure.

Structured carpark

The structured carpark has been orientated to allow it to be naturally ventilated and operate as an open deck carpark. This eliminated the need for mechanical ventilation through the siting of the building.

2.1.2. Sun control

The project team have strategically incorporated external shading elements which minimise the peak solar exposure to each façade provide shading in peak solar conditions. However these will be optimised to also allow winter solar radiation to heat the same spaces in winter.

The atria roofs will be treated with combination of solar control glazing and shading elements to provide both radiant and solar control.

The culmination of these measures has resulted in a building with reduced energy consumption and superior seasonal comfort control.

2.1.3. Construction thermal properties

Club & Hotel

The building façade for the club is proposed to utilise a thermally efficient glazing system, reducing the thermal load in the occupied spaces and therefore reducing the capacity of the central cooling systems.

The building envelope will be designed to minimise uncontrolled leakage into the building.

Portions of the roof have been landscaped to improve the occupant amenity of the space. The landscaping also maximises the thermal efficiency of the roof.

In addition to the thermal load reduction offered by the glazing system, operable portions will provide the option to naturally ventilate the spaces within the building.

Structured Carpark

The building façade to the structured carpark is perforated to allow the passive / natural ventilation of the carpark to function.

2.2 Cooling

The extent of cooling shall be reduced by operating the facility as a mixed mode system whereby thermal conditions are maintained with limited use of electrically driven systems. Where a mechanical system exists the unit will turn off when a window is opened.

A central mechanical cooling system will be provided for the common areas and will form a provision for future connection to the tenanted spaces. The system will comprise of high efficiency chillers, fan coil units and chilled water pumps. The proposed central chilled water plant will be designed with high levels of efficiency when compared to a typical air conditioning system, particularly in low load situations which constitute the majority of annual operation.

2.3 Heating

Heating shall generally be provided via a heating hot water system utilising high efficiency condensing boilers with gas as a fuel source in lieu of electrically driven reverse cycle air conditioners. The use of a gas fuelled heating hot water system provides significant CO_2 emission reduction.

2.4 Domestic hot water

Domestic hot water is provided through centralised gas boosted solar hot water system with a 50% solar contribution.

Solar hot water is highly efficient because it harvests the suns free energy. Additional heating is provided from burning gas which is less carbon dioxide intensive than the use of an electric element.

The gas fired booster heating will have an energy rating greater than 3.5 stars.

2.5 Lighting

Club & Hotel

Controlled daylighting provides an opportunity to reduce energy consumption needed for artificial lighting and can improve occupant satisfaction.

Occupant comfort will be improved through the use of glare control measures such as operable shading / blinds and / or the selection of solar control glazing.

The use of natural lighting can reduce the operation of artificial lighting which can represent a significant proportion of the building's energy use. The atria and large amount of glazing promote the use of natural lighting.

Luminaire selection will be based on minimising energy consumption and potential hazard associated with disposal of lamps.

Lighting control will be used throughout with daylight harvesting in the Atria.

Structured carpark

The use of natural lighting reduces the operation of artificial lighting which can represent a significant proportion of the building's energy use. The carpark façade is perforated and designed to allow a large amount of natural lighting.

Luminaire selection will be based on minimising energy consumption and potential hazard associated with disposal of lamps.

Lighting control will be also be used throughout with daylight harvesting in the perimeter zones. This will turn lighting off when there is no use of the carpark and in spaces where it can be effectively lit by natural daylight.

3. Water

3.1 Landscaping

The landscaping has been designed to minimise water consumption through plantation of native and water efficient species. The plants are proposed to be predominantly indigenous species with the remaining having low water requirements.

Where feasible throughout the podium levels of the development native species are to be incorporated into the planting design to provide additional habitat for native birds.

The landscape plan will be developed in the detail design phases based on these principles.

3.2 Water Efficiency

The design incorporates the most efficient WELS fixtures and fittings suitable for their specific application. These fixtures and fitting include basin taps, toilets, urinals & shower heads. Water efficient Dishwashers and Clothes Washers will also be installed in the hotel and club.

The air conditioning heat rejection may be achieved through the use of efficient cooling towers for the central water cooled systems. Water cooled air conditioning systems provide substantial energy and water savings because the associated air conditioning equipment operates over 4 times more efficiently than the equivalent air cooled equipment. The water for the use of the cooling towers will be predominantly provided by the collected rainwater for the site.

3.3 Water Tanks

470.5kL of combined detention/retention will be provided via various water tanks incorporated into the site for rainwater collection of the development.

Club & Hotel

It is proposed to provide a combined rainwater storage/on-site detention tank beneath the building structure adjacent to Olympic Drive. A second detention tank is proposed near the access from Church Street. A separate detention tank will be provided under the multi-storey carpark located between Board Street and Ann Street. The majority of roofwater and surface water picked up will be collected and connect into these storages via a system of downpipes, pits and pipes.

The most efficient use of the harvested rainwater is to provide water for the cooling towers. The minimal level of required treatment and associated infrastructure along with the associated energy efficiency as a result of utilising water cooled equipment makes this the most practical and water efficient solution for rainwater reuse.

Structured carpark

The rainwater collected from the structured carpark will be diverted into the site wide combined rainwater detention / retention system for re-use in the club. This is more effective use of the collected water as there is a limited water use in the structured carpark.

4. Air

Club & Hotel

On site sources of odour and fumes such as waste storage areas, carparks, toilets and kitchens will all be mechanically ventilated.

Gas burners associated with the heating hot water and domestic hot water systems will be flued to atmosphere.

The discharge locations of the ventilation systems and will be at the high level of the buildings. The discharge will be located such that the amenity of residents and the adjacent property is not reduced and so that the prevailing winds will quickly dilute contaminants.

Indoor air quality will be greatly improved from a benchmark development in that there is extensive use of mixed mode systems incorporating natural ventilation to the building.

Structured carpark

As the structured carpark will be passively / naturally ventilated, the effective ventilation within the building will be much higher than would normally be provided by a traditional mechanical ventilation system. This provides much greater indoor environment quality for the occupants of the carpark.

5. Noise

An assessment of the existing acoustic environment, including roads and land uses has been conducted and acoustic treatment including building construction recommended to ensure a suitable internal amenity for future tenants based on the relevant criteria as detailed in the Australian Standard AS2107:2000.

The assessment has recommended building designs, including façade construction (primarily glass selections) and layouts such that a suitable amenity for future tenants is provided within the development.

An acoustic assessment of potential noise sources associated with the development (including building services, the loading dock and car movements on the site) has been conducted. The assessment details the relevant acoustic criteria for noise impacting on surrounding receivers based on the EPA and council requirements. Where required, suitable acoustic treatments have been specified such that noise levels at surrounding receivers will comply with the relevant noise level criteria.

Refer to the DA Noise Impact Assessment Report prepared by Marshall Day Acoustics for further details.

6. Waste & Recycling

A Waste Management Plan prepared by SLR reflects the following key elements for both the construction and ongoing operation of the facility

6.1 Construction Waste

- An estimated 10,740m³ waste will be generated from demolition, noting that the Ann and Board Street dwellings are to be demolished under separate approval. Seventy percent of demolished waste can be re-used
- Approximately 100,000 tonnes of excavated material will be generated. Excavated soils and/or rock may be re-used as fill material, provided no contamination is present
- It is estimated that more than 70% of the predicted construction waste arising from the project site could be re-used (on-site or at another development) or recycled off-site.

Bouygues will be responsible for the management and disposal of construction waste and implementation of the Waste Management Plan.

6.2 Operational Waste

- 240 L, 660 L and 1100 L mobile garbage bins (MGBs) will be used to transfer waste and recycling from activity areas to waste storage areas.
- MGBs will be stored in the Club and Hotel bin storage rooms or (for general waste and cardboard) emptied into compactors located in the basement nearby the loading dock.
- The Club will utilise up to 27 x 660 L MGBs per day for transfer and storage of waste and recycling, therefore a space allocation of approximately 36m² per day will be required.
- General waste bins and cardboard recycling bins will be emptied on a daily basis into waste compactors located in the basement.
- Where co-mingled recycling is collected on a weekly basis, approximately 60 x 660 L co-mingled recycling MGBs and a space allocation of approximately 80m² will be required.
- Additional space will need to be provided for approximately 8 x 1100 L crushed glass bins which will also be stored with Club bins.
- The Hotel Tower will utilise up to 3 x 660 L MGBs per day for storage of waste and recycling, therefore a space allocation of approximately 4 m² per day or 24.1m² per week will be required depending on the waste collection frequency.