Netball NSW

Netball Central

Planning Application, ESD Report

ESD003

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Job number 222450

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Contents

Executive Summary

This report is written to accompany the Development Application submission of the Netball Central to the Department of Planning.

The Netball Central project will be designed to comply with the most current version of all relevant Regulations, Planning documentation, Codes and Standards, including:

- National Construction Code 2012
- Environmental Planning and Assessment Regulation 2000
- Sydney Olympic Park Master Plan 2030

The principles of Environmental Sustainable Development (ESD) will be an integral consideration throughout the development and include those areas listed below:

- Comfort of the occupants by maximising daylighting and natural ventilation.
- Energy efficiency initiatives such as efficient equipment selection and high-performance façade materials.
- Water-sensitive urban design measures including proposals for water-efficient tap ware and low or no-water irrigation.
- Material selection which prioritises the wellbeing and comfort of occupants by the selection of low VOC products.
- Waste management to reduce impact during site excavation.
- Transport facilities to encourage staff and visitors to use alternative modes such as public transport and bicycles.
- Pollution control including refrigerant charge monitoring.
- Native plant species selection to promote biodiversity.

1 Introduction

Netball NSW has commissioned Arup to support Scott Carver in the design of a new centre of excellence for netball, known as Netball Central, which will replace the current centre at the Anne Clarke Centre in Lidcombe.

This state of the art netball centre will reflect the position that netball has as the most participated female sport in the country, whilst addressing the core values and future requirements of Netball NSW.

This report summarises the response to the Director-General's Requirements in terms of Environmental Sustainable Development (ESD).

In determining which ESD principles to apply, investigations into both national and international rating tool guidelines and currents project examples have been made. The resulting sustainability strategy includes:

- Comfort of the occupants
- Energy conservation
- Water conservation
- Material selection
- Waste management
- Transport
- Pollution control
- Biodiversity.

1.1 Project description

The project is located at Site 107, Sydney Olympic Park immediately to the east of the Sports Centre.

The complex consists of 3 main components:

- Standard Courts Building – single storey building containing 5 sprung netball courts.
- Show Court Building – single storey building containing an elite netball show court and seating for spectators.
- Hub Building – four storey building containing reception, Netball NSW administrative functions, hall of fame, changing rooms and training facilities.

1.2 Reference

The Netball Central project will be designed to comply with the most current version of all relevant Regulations, Planning documentation, Codes and Standards, including those listed below.

1.2.1 Building Code of Australia - Section J

The National Construction Code (*NCC*), which includes the Building Code of Australia Section J is concerned with energy efficiency of buildings.

Minimum performance requirements have been set in regards to building fabric, external glazing, building sealing, air movement, HVAC systems, lighting and power, hot water supply and access for maintenance.

Section J is a minimum performance target for standard buildings; however the Netball Central ESD strategy goes beyond the Section J requirements and improves the overall comfort and sustainable performance of the building.

1.2.2 Environmental Planning and Assessment Regulation 2000

Ecologically Sustainable Development (ESD) principles will be incorporated in the design, construction and ongoing operation phases of the development as required by Schedule 2 of the *Environmental Planning and Assessment Regulation 2000.*

The proposed initiatives are detailed within the body of this report.

1.2.3 Sydney Olympic Park Master Plan 2030

This report responds to The Sydney Olympic Park Master Plan 2030 requirements and specifically to the following documents:

- 3.0 Planning Principles
- 4.0 General Controls and Guidelines.

As stated in Environmental Guidelines for Sydney Olympic Park, "*Sustainability is at the forefront of all decision making affecting building design and construction at Sydney Olympic Park"*.

The Sydney 2000 Olympic and Paralympic Games has set a benchmark for innovative environmental design and the new Netball Central development aims to follow the same Environmental Sustainability principles.

The planning document, which has been embedded in the design, requires that all development embodies a best practice approach to environmental sustainability principles by:

- minimising use of resources and production of waste and toxic materials
- protecting and enhancing biological diversity
- maximising renewable energy used and efficient energy practices
- maximising use of sustainable resources and materials
- designing for flexibility over time
- using construction methods and operational management processes with the least possible environmental impact
- promoting access and travel by public transport, walking and cycling
- connection to recycled water and effective water demand management practices
- continuing to manage the remediated lands and leachate drains
- maintaining and extending recycled water systems to all new streets as required
- maintaining and extending the existing stormwater system that recycles water, promotes infiltration to sub soil, filters pollutants and sediments, and minimises loads on adjoining waterways
- ensuring that development has no impact on existing habitats in adjacent parklands
- maintaining the system of leachate drains associated with remediated land.

The proposed design aims to satisfy the *Environmental Sustainability Guidelines Sydney Olympic Park, 2008* and the Sydney Olympic Park Authority's corporate framework for sustainability.

Further details on specific initiatives are provided within the body of this report.

2 Key Environmental and Innovation Strategies

The proposed building will continue to support and further develop the Sydney Olympic Park's sustainability objectives by providing a building which incorporates innovation and excellence in sustainable building design.

The building consists of two main functional areas: the netball court areas and the central hub. Each functional area has different strategies which address the anticipated occupant requirements and key sustainability issues.

2.1 Comfort of the occupants

The new indoor netball courts will be fully naturally ventilated. As such, the sustainability strategy is focused on maximising natural lighting opportunities, ensuring user comfort and minimisation of embodied energy.

Green buildings have been shown to contribute to better health for occupants and to increase the productivity of staff. The fundamental design consideration of the building has been to provide a thermally comfortable indoor environment for the netball court users in particular.

Netball NSW has recognized that the conditions in their existing facilities are unacceptable due to extreme heat in summer and cold in winter. As a result, the aim for these new facilities is to be significantly better than the existing facility.

To this end analysis has been carried out in order to optimise the netball court building envelope passive performance and to ensure that there is the correct balance between solar shading and envelope thermal performance.

The proposed strategy alleviates summer overheating by providing shading devices while low angle solar radiation exposure will capture winter sunlight, passively heating the building.

2.1.1 Daylighting

Introducing diffuse daylight improves the sensorial perception of light.

The courts roof is designed to protect the internal space from direct sunlight but to allow sufficient diffused light to enter. This avoids the need for extensive artificial lighting whilst still meeting the thermal comfort targets.

The results of the analysis have defined the current option which includes windows and skylights. These provide adequate levels of daylight for training for more than 80% of the year. This minimises the demand for electric lighting, whilst reducing potential glare issues associated with direct sunlight.

2.2 Energy conservation

Several strategies will be assessed and put in place to minimise energy consumption.

2.2.1 Netball Courts

Natural ventilation, combined with passive design measures have been incorporated into the netball court building envelope to eliminate the need for any conditioning systems to heat or cool the standard court areas.

The use of a thermal labyrinth to temper the supply air conditions is currently being investigated for the show court.

An adaptive comfort criterion has been set to assess comfort within the netball court areas where openable elements on all facades orientations at high and low level will promote air movement through the area in shoulder and peak summer seasons. Sealing the façade will provide comfortable conditions through the winter. Fans may be incorporated to further promote comfort.

The lighting systems for Netball Central will incorporate energy-saving technology to monitor and improve building performance in operation. The feasibility of incorporating the following energy-efficient electrical systems and lighting strategies will be pursued during the next stage of design:

- High-efficiency lighting systems, including energy efficient lamps and ballasts.
- A lighting control system based on smart zoning, occupancy profiles and operational hours.
- Control of lighting systems based on available daylighting, photo sensors and motion sensors for individual zones.

2.2.2 Central Hub

The central hub consists of changing rooms, education and training facilities, a cafe and administrative areas.

The sustainability strategy has focused on minimising the energy impact of comfort conditioning and water heating, while delivering a cost effective and user friendly environment.

Passive design measures including shading, glazing selection, orientation, insulation, material selection, surface finishes and planting will be utilised to improve user comfort inside and outside the building while simultaneously reducing heating and cooling demand.

Where provided, air conditioning will be delivered via ducted VRV system. The system shall include controls to limit out of hours operation, and where appropriate, occupancy sensors will be used to further limit unnecessary operation.

The changing rooms will be mechanically ventilated with the potential for heat reclaim being explored, based on annual energy payback.

As many of these spaces are will be used intermittently, a controls strategy with either occupancy sensors or timers will be included to control both lighting and ventilation.

Provision for solar thermal water heating will be included as a future option to offset heating demand minimising the use of the gas fired boilers. The heating system will be used for both space heating and hot water heating.

Natural light will be used to supplement electric lighting within the central hub, where low energy lighting systems linked with timers and occupant sensing will be used to minimise energy use while providing user amenity and a safe environment.

2.3 Environmentally Sustainable Materials

Environmentally sustainable materials will be given priority in the selection of materials.

The use of untreated, exposed surfaces (i.e. no painting or sealing) will be investigated to further reduce ongoing maintenance and embodied energy costs.

Where paints or sealants are needed, low VOC and formaldehyde content products will be given preference for internal spaces.

Preference will be given to carpet and floor coverings which do not contain PVC, fitted with low VOC adhesives.

Air supply ductwork will be cleaned prior to use and access will be provided to all areas where dust and debris is likely to collect, allowing ease of future cleaning.

2.3.1 Timber Structure

As the netball courts will be operating under natural ventilation, the construction material is the most significant contributor to the overall carbon footprint of the building. To address this, the proposed court areas will use timber in the main structural elements.

Studies comparing the embodied energy of timber construction to other construction systems typically show that:

- Timber schemes excel in the fabrication and construction stages.
- There is similar energy use throughout the operational lifetime of the building.
- The total lifetime embodied energy has the potential for great carbon savings.

This assumes that the timber is not taken to landfill at the end of life but used as biomass for energy production.

In order to capitalise on the timber design and in order to facilitate the demolition of the building, the information on the design intent and the end of life process will be transferred to the building owners and operators.

2.4 Water conservation

The project aims to achieve a high environmental performance with regards to water use and the proposed design has considered different strategies to achieve low resource consumption.

The building services are required to provide water and drainage for use by large groups of people at peak periods necessitating provision for large volumes of flow. These are to be provided using the most efficient and economic means available to ensure players and patrons needs are serviced while energy and water usage is kept to the lowest volumes possible.

2.4.1 Efficient water use

Conservation measures to be incorporated into the hydraulic services design include:

- Minimisation of the use of potable water as far as possible through:
  - Low flow shower heads and hand basins.
  - Timed flow taps in general areas to shut off showers and hand basins to prevent excessive usage or taps being left running.
- Reducing water usage in toilet amenities by providing:
  - Sanitary WCs will be dual flush 3/4.5 litre pans.
  - Sanitary urinals to be low flush.
- Provision for future solar hot water system.
- Utilisation of recycle water main supply for landscaping and toilet flushing.
- Air cooled air-conditioning units which eliminates the use of water by the air conditioning system.

2.4.2 Recycled water

Although the primary water use will be for showers, sustainability measures have been investigated to reduce water usage in toilet amenities and landscape irrigation.

Considering that the Sydney Olympic Park has a water reclamation and management scheme (WRAMS), the building will be connected to the centralised distribution making reclaimed water available for irrigation, toilet flushing, and wash down.

2.5 Waste management

The building is located on a sloping site with a maximum level variation of around five meters. The proposed building has incorporated staggered levels for the netball court areas, meaning there is a step change in floor levels from one court to the next. This approach helps balance the cut and fill volumes for the site, resulting in less waste material transported off site to landfill and less clean fill brought to site during construction.

Operational waste storage facilities will be provided within the building, with sufficient area to allow the separate storage of recyclable, non-recyclable and food waste streams.

2.6 Transport

The development will encourage future users of Netball Central to make travel choices that support the state plan targets of increased public transport mode share and doubling the active transport mode share.

The site is located within close proximity to a rail station and bus stops with connections to western Sydney, making these targets achievable.

The design includes opportunities to encourage staff and visitors to use bicycles through the incorporation of:

- eight bicycle parking spaces for workers
- ten bicycle parking spaces for visitors in the north forecourt
- end of trip facilities easily accessible provided by the players changing rooms.

2.7 Pollution control

The use of low VOC paints and sealants will be targeted throughout the construction process for use in all internal spaces. Similarly, low formaldehyde wood products will be targeted where wood has been specified.

The use of refrigerant charge monitoring within the packaged air-conditioning units will be investigated to identify any potential refrigerant leaks within the units.

2.8 Biodiversity

Native plant species will be given preference when designing the landscaping with due consideration for water use, building protection, improving and promoting the biodiversity around the site.