# Sydney Swans HQ and Community Centre

## Water Management Plan

Sydney Swans C/O APP

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# Contents

# 1 Introduction

## 1.1 Introduction

This Water Management Plan has been prepared on behalf of the Sydney Swans Limited in support of a State Significant Development (SSD) application for the proposed adaptive reuse of the Royal Hall of Industries for a high-performance sport and community facility. The facility will enable a range of land uses, including a new home for the Sydney Swans and NSW Swifts. It will accommodate a multi-purpose facility available for community uses, sporting, medical and rehabilitation areas, administration and office spaces and associated plant and store rooms

## 1.2 Site

The site is located at 1 Driver Avenue, Moore Park and comprises a portion of two separate lots, legally described as Lot 3, DP861843 and Lot 52 of DP1041134. The site is owned by the Centennial Park and Moore Park Trust and is leased to the Sydney Swans for the purposes of the development.

The proposed application will relate to the Royal Hall of Industries (RHI) building, and the associated courtyard area to the immediate south of the building. The development area is located in the south-western corner of the Entertainment Quarter precinct and has a direct frontage to Driver Avenue to the west, Lang Road to the south and Errol Flynn Boulevard to the east, an access road within the Entertainment Quarter precinct.

The RHI has in recent times been utilised as an exhibition space. The building has a rectilinear plan form with symmetrically placed entrances on all four sides, four to the east and west, and two to each of the north and south facades. The building has a gross floor area of approximately 5,700sqm at ground level with basement toilets at the southern end of the building.

The courtyard to the south of the building currently accommodates loading and general plant services associated with the RHI building and storage sheds. The building and courtyard area is surrounded by a 6.95m high brick wall.  The total area of the subject site extends to approximately 1.9ha and is illustrated at **Figure 1** below.


**Figure 1 Site Location**

## 1.3 Regional Context

The site is located within the southwestern corner of the Moore Park Showground Precinct, a major recreational area in the eastern suburbs of Sydney. Measuring approximately 28.7 hectares in area, the precinct includes a range of passive and active recreational areas with a focus on cultural, entertainment, and sporting uses. Key land uses include the Entertainment Quarter, Centennial Parklands Equestrian Centre and Fox Studios.
The location of the site is strategically significant due to its proximity to a number of key land uses within Sydney, including:

- Royal Randwick Racecourse – 1.8km
- UNSW and Prince of Wales Hospital – 3.7km
- Sydney CBD – 4.5km
- Sydney Airport – 11.9km

## 1.4 Local Context

The site is located in the City of Sydney Local Government Area (LGA). The predominant character of the area is associated with entertainment, leisure and recreational land uses, with infrastructure changes associated with the CSELR (CBD and South East Light Rail) construction.
The site has a direct frontage to Driver Avenue to the west, Lang Road to the south and Errol Flynn Boulevard to the east, an internal access road within the Entertainment Quarter precinct. Mature fig trees are located along Lang Road, Driver Avenue and Anzac Parade.

The land uses in the immediate surrounding area comprise the following:

- The Hordern Pavilion is located to the immediate north of the site, which operates as a live music and entertainment venue with an associated pedestrianised forecourt area.
- The Entertainment Quarter, to the immediate east of the site, is an entertainment, dining and leisure precinct with cinemas, restaurants, bars and an outdoor sporting, performance and event space. A 2,000-space car park is also provided.
- To the immediate south of the site is the Centennial Parklands Sports Centre, comprising netball and tennis courts with a large area of open space.
- The SCG and Allianz Stadium is located further north of the site. Allianz Stadium is currently undergoing demolition associated with the construction of a new sports stadium on the site, expected to be completed by mid-2022.
- Moore Park is located on the west and east of Anzac Parade, and Centennial Park and Queens Park are located to the south-east of the site. Collectively known as the Centennial Parklands, the parks measure 360ha in area.

## 1.5 Overview of the Proposed Development

This application seeks approval for the proposed adaptive reuse of the Royal Hall of Industries (RHI) for a high-performance sport and community facility. The development will maintain the structural integrity and façade of the RHI, whilst re-purposing the interior of the building to support a number of compatible uses and utilise the space effectively.

In addition to the repurposing of the RHI, an extension of the building will be constructed to the south of the building in the current service and courtyard area. The built form of the extension is consistent in height, scale and material with the RHI and will be largely concealed behind the existing courtyard wall.

The facility will include:

- Home of the Sydney Swans;
- Home of the NSW Swifts;
- Multi-purpose indoor facility available for community use and public events such as junior club nights, school graduations, functions
- An indoor netball court for the NSW Swifts Netball Team and netball community
- Facilities for a Swans team in the AFL National women's competition
- Player change areas, lockers and wet areas;
- Wet recovery – pool and hot/cold hydrotherapy;
- Go Foundation and Clontarf Foundation for indigenous education;
- Australian Red Cross Blood Service Donation Centre;
- Medical, rehabilitation and sport science areas;
- Gymnasium, museum, media centre and auditorium
- Back of house offices and café/canteen;
- Entry foyer and retail/shop units;
- Plant and store rooms; and
- Sydney Swans Academy.

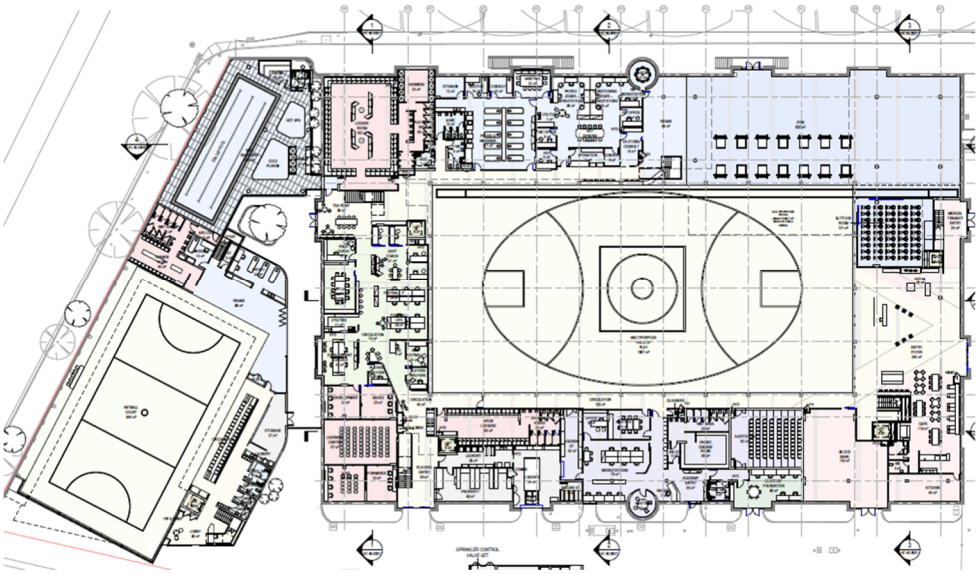


Figure 2 Populous Ground Floor Plan

| | Swans Building (inc pool) | Swifts Building |
|---|---|---|
| **General Staff** | 135 | 27 |
| **Players** | 46 | 20 |
| **GFA** | 8498 | 2090 |

**Figure 3 Area and Population Schedule**

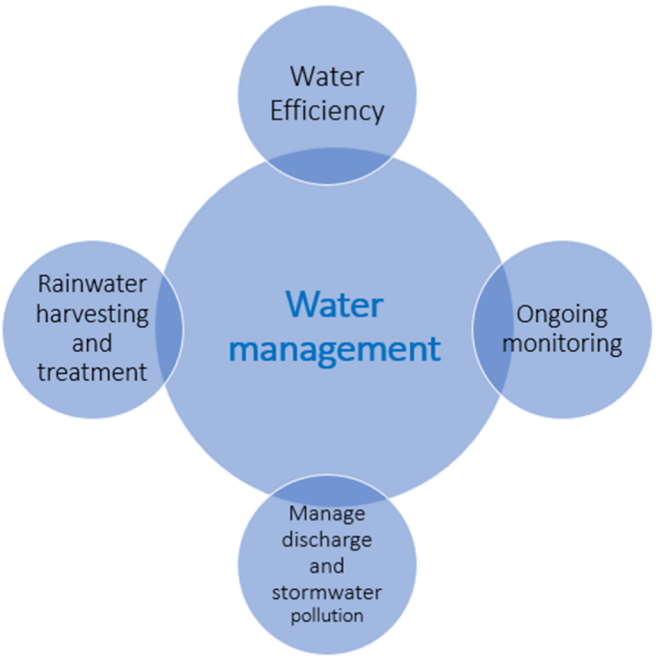
# 2 Water Management

The Sydney Swans are committed to strategies and actions to improve the management of water and reduce overall water consumption.

This document sets out the water balance and the key initiatives for best practice water management implemented in the design for the proposed Sydney Swans HQ and Community Centre (SSHQCC) at the Royal Hall of Industries in Moore park.

Water balance is the process of determining the ongoing water demands and alternative water sources that contribute to the overall flow of water in and out of the building.

The water management strategy for the SSHQCC is summarised below:




## 2.1 Water Supply

The project has an existing water mains connection point connected to the Sydney Water water main located in Anzac Parade. This water main is connected in a ring main configuration. It is proposed that this water main connection be maintained and reused.

## 2.2 Water Balance

The water demands for the project include:

- Amenities – WCs, handwashing and showers for players and staff
- Kitchen- Taps for miscellaneous use& food prep and dishwashers
- HVAC – Top up water required for cooling towers
- Laundry – The project will include washing machine facilities
- Landscaping – Landscaping is proposed for external areas, which will require irrigation.

The water requirements for each demand are summarise in figure 4

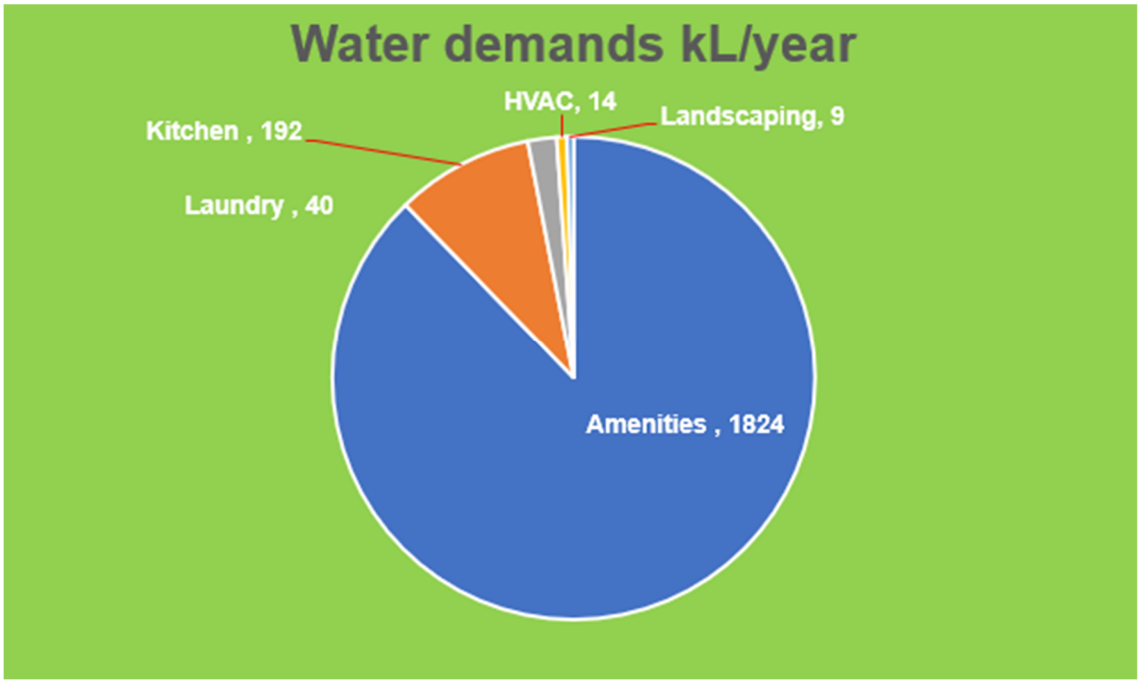



**Figure 4 Water demands for the SSHQCC development**

The predicted total water requirements for the project are estimated to be **2079kL/year**

# 3 Water Efficiency

## 3.1 Sustainability Targets for Water Conservation

The proposed development has used the Green Star - *Design & As Built v1.2* tool as a point of reference to ensure that water management practices are in line with current best practice for buildings in Australia.

As such several practical measures have been implemented in the design to minimise reliance on potable water. This includes efficiency initiatives as described below, as well as a rainwater recapture system as set out in section 4.

### 3.1.1 Fixture Efficiency

Fittings and fixtures will be selected with water efficiency performance in line with best practice standards defined within Green Star. The WELS rating scheme applies to toilets, taps, showers and urinals. The project will implement the following WELS targets for new fittings and fixtures:

| | |
|---|---|
| Taps | 5 Star |
| Urinals | 5 Star |
| Toilet | 4 Star |
| Dishwashers | 5 Star |
| Showers | 3 Star |
| Washing Machine | 4.5 Star |

### 3.1.2 Heat Rejection Water

A central water-cooled chiller will be installed to serve the Royal Hall of Industries building. The design will endeavour to maximise number of recirculation cycles before water must be removed by blowdown, reducing the quantity of make-up water required.

## 3.2 Reference Case Potable Water Demand

A preliminary analysis has been conducted to determine the savings compared to a benchmark building of the same size with standard fittings and fixtures. It is estimated that by improving the efficiency of the amenities in the project, the design improved % on a reference case.

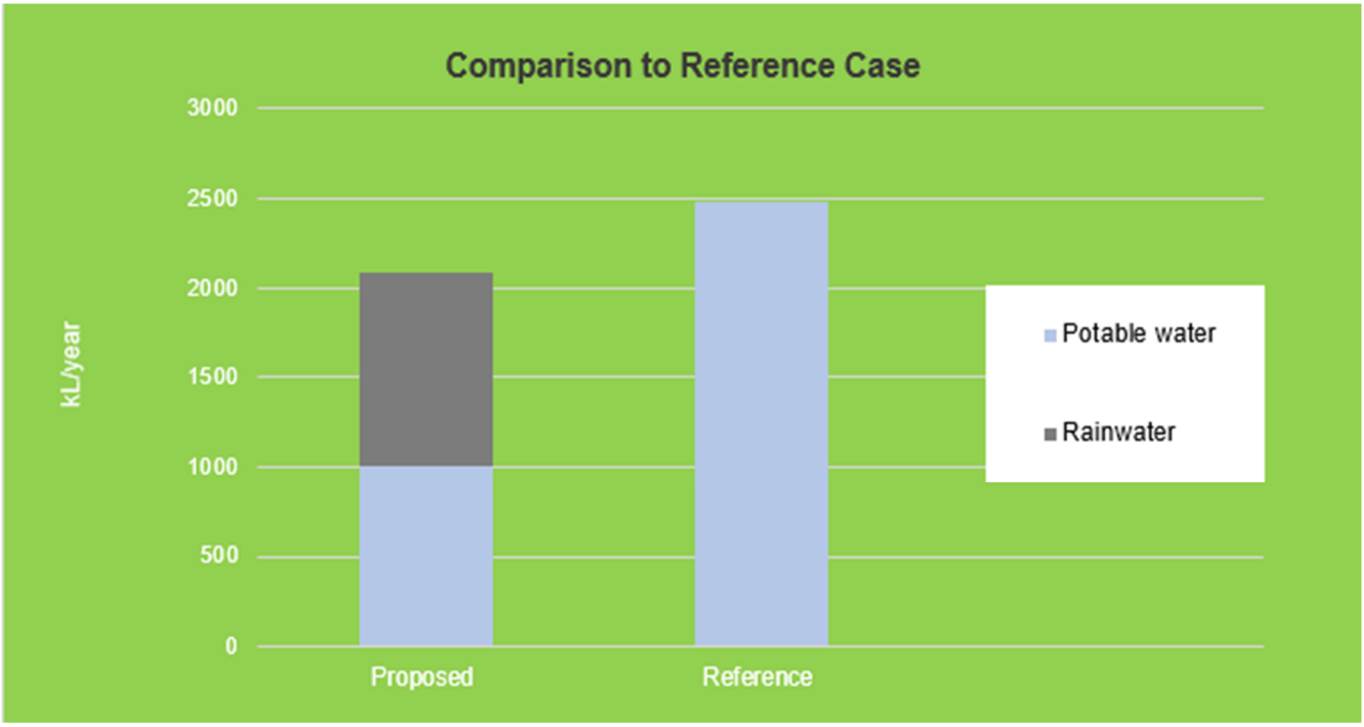



**Figure 5 Estimated water efficiency improvement through fixture & fitting selections and use of rainwater**

# 4 Rainwater Harvesting

## 4.1 Rainwater Demands

Rain water captured from the roof area will provide a sustainable water source for non-potable demands.

This will serve:

- Landscape irrigation – water demand for irrigation expected to be 9.1kL/year
- Toilet Flushing – water demand for flushing expected to be 555kL/year

Total non-potable demand = 564.1 kL/year

This service is expected to significantly reduce potable water reliance for these uses.

## 4.2 Rainwater Tank capacity assessment

As assessment on the appropriate size for the storage tank indicated that the proposed development would be best served by a 25kl rain water tank connected to 700m2 of roof area.

This was determined by comparing demands from flushing and irrigation as detailed in 4.1

The calculations are based on available data (from the BOM website) and is extracted from the Mean rainfall. The table below outlines the available Mean rainfall for Centennial Park.

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean rainfall (mm) | 104.8 | 112.5 | 127.6 | 131.7 | 124.5 | 126.4 | 105.5 | 86.8 | 71.3 | 83.4 | 86.6 | 83.6 |

**Figure 6 Mean historical rainfall data for Centennial Park**

The simplified model used assumes that the storm event occurs once per fortnight. It should be noted that the mean rainfall is not predicted rainfall and extended periods with no rain are possible, however are not modelled in the calculations. The model is shown in figure 7 below.

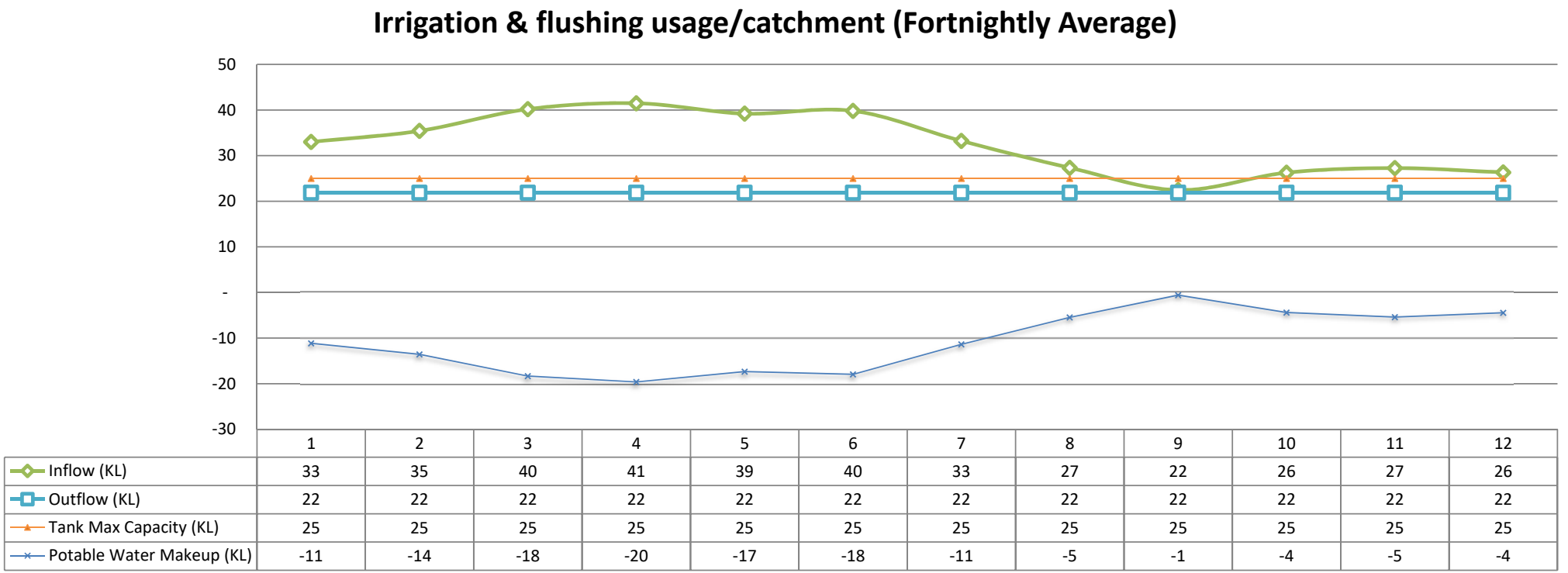
Calculating the monthly inflow based off a runoff coefficient of .9 applied to the 700m$^2$ it has been determined that a system of this size will provide 784.kL/year.

Considering the non-potable demand of 564.1kL year (refer section 4.1) the system is adequately sized to provide harvested rainwater for the require end uses.
The system has the capacity to serve 27.1% of the project water demands through alternative water supply, which reduces the reliance on potable water.

The calculations are based on the following assumptions:

- Fortnightly usage patterns (5 days a week)
- Number of users – 206 staff
- Percentage of Visitors = 20%
- 3.5l per flush

The chart below indicates the extent that a 25kl rain water tank off 700m2 roof will provide capture rainwater to service non-potable demands.




| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inflow (KL) | 33 | 35 | 40 | 41 | 39 | 40 | 33 | 27 | 22 | 26 | 27 | 26 |
| Outflow (KL) | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 |
| Tank Max Capacity (KL) | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Potable Water Makeup (KL) | -11 | -14 | -18 | -20 | -17 | -18 | -11 | -5 | -1 | -4 | -5 | -4 |

Figure 7 simplified model of monthly inflow and outflow based on 25kL tank

## 4.3 Rainwater Tank capacity assessment

The Rainwater harvesting equipment will be located within a plant room adjacent to the rain water storage tank. The storage tank will be located externally, the location is yet to be determined. There is no requirement for any water storage post filtration as the filtration process is rapid and the water is used as soon as it has been cleaned.

The filtration process will be as follows:

Rainwater harvested from the roof travels down a pipe into a storage tank or pit. Dense sediment will settle at the bottom of the tank. A float switch triggers the operation of the system to commence pumping or a pressure drop inline indicates the need to treat and transfer water instantaneously.

Filtration consists of at least two stages. Removal of coarse solids to 100 micron, then fine solids of 1-5 micron; via a cartridge, bag or screen filter prior to disinfection.

UV disinfection will be used following the filtration, which uses certain wavelengths of ultra violet light to destroy micro-organisms (bacteria, virus, and cysts such as cryptosporidium and giardia), in the water.

The treatment steps are summarised in Figure 7

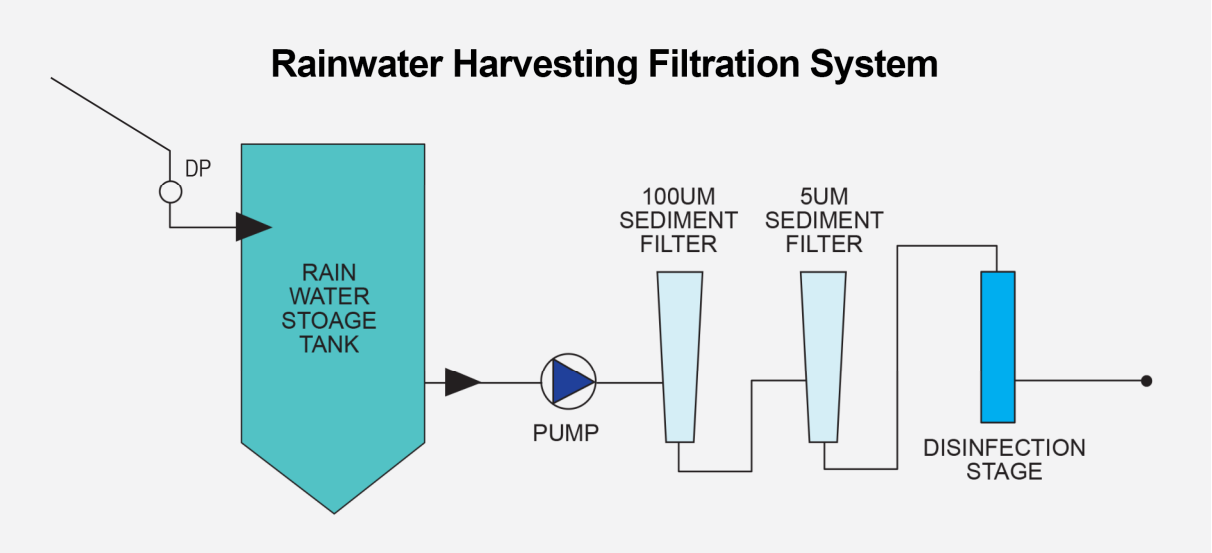



**Figure 8 Rainwater treatment process.**

# 5 Ongoing Monitoring

Digital Water metering is to be provided to monitor consumption and will include an automatic leak detection system. Separate metering is to be provided for Swans and Swifts portions and meters for mains water and for reclaimed rainwater.

# 6 Discharge

## 6.1 Discharge to Sewer

The project will connect to the existing Sydney Water sewer located on the site. The expected sewer discharge quantities will be based on the water usage figures outlined above. It is estimated that 80% of the potable water usage will discharge to the Sydney Water sewer. This is estimated to be 9,440l

## 6.2 Stormwater

Stormwater treatment measures have been implemented to ensure runoff in the surrounding environment is of a high quality.

This has been detailed in a sperate report. Refer to Civil Stormwater Report prepared by TTW Engineers.

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