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1. EXECUTIVE SUMMARY

The redevelopment of the Mudgee Hospital has been identified as a State Significant Development. This report has been prepared in accordance with the requirements as outlined in the Secretary’s Environmental Assessment Requirements (SEARs) from the Department of Planning and Environment (application no. SSD9211), dated 6th April, 2018.

This report has been prepared by JHA & Enstruct to summarise any proposed alternative water supplies, proposed end uses of potable water and non-potable water and any Water Sensitive Urban Design (WSUD) initiatives.
2. PROPOSED ALTERNATIVE WATER SUPPLIES

Given the nature of the proposed development and the need for infection control and avoid potential contaminations, no alternative water supplies are proposed for the Mudgee Hospital Redevelopment.

3. PROPOSED END USES

3.1 POTABLE WATER

Potable cold water is proposed to be used for the following applications:
- Sanitary fixtures, with staff and patient areas
- Clinical areas for staff and patient sanitation
- Appliances and equipment, including sanitisers, dishwashers and other specialist equipment
- Fire hydrant services
- Fire sprinkler services
- Fire hose reel services

3.1.1 HIGH EFFICIENCY FIXTURES

To reduce the sites potable water demand, Water efficient fixtures and fittings shall be used for staff and public amenities areas only. Water efficient fixtures and fittings shall not be used in any clinical areas.

3.2 NON-POTABLE WATER

As stated in section 2 proposed alternative water supplies, no non-potable water end uses are proposed.

4. WATER SENSITIVE URBAN DESIGN

4.1 CATCHMENT

The new development will significantly increase impervious area. Thus, the new development requires pollution reduction measures incorporated within the stormwater design to remove potential contaminants from the system.

4.2 WSUD POLLUTION REDUCTION INITIATIVES

The development will achieve the pollution reduction targets identified in Mid-Western Regional Council’s DCP by utilising water sensitive urban design (WSUD) treatment initiatives. The pollutant reduction requirements outlined in Table 4.1 below have been adopted as the minimum values for water quality treatment.

Table 4.1 – MWR Council’s Pollution Reduction Targets

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Guideline Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Pollutants (GP)</td>
<td>90%</td>
</tr>
<tr>
<td>Total Suspended Solids (TSS)</td>
<td>85%</td>
</tr>
<tr>
<td>Total Phosphorous (TP)</td>
<td>65%</td>
</tr>
<tr>
<td>Total Nitrogen (TN)</td>
<td>45%</td>
</tr>
</tbody>
</table>
4.3 RAINGARDENS

Raingardens are specially designed garden beds which filter stormwater runoff from surrounding areas or stormwater pipes. They are also called bio-retention systems as they provide biological treatment of stormwater using soil, plants, roots and microbes.

Raingardens are designed to stop excess stormwater, nutrients, and sediment from polluting council’s drainage system. Figure 4.1 below shows a detail of the proposed raingarden design.

A raingarden lets water collect and settle on the garden surface then soak through the plants and filter media. Sediment is trapped on the surface. Nutrients dissolved in the stormwater are used by the plants and toxins stick to the soil. The soil and plant roots work together to naturally filter the water and remove pollutants.

A 220 m² raingarden is proposed for Stormwater Network 1 and a 90 m² raingarden is proposed for Stormwater Network 2. Overflow pits will be provided within the raingardens to take excess flows and bypass them directly into the drainage systems.

4.4 PIT INSERTS

Pit inserts, also known as litter baskets, are considered as an at-source primary treatment solution. It is an efficient and cost-effective pre-screening primary treatment system that captures and retains gross pollutants at drainage entry points. Pit inserts, consisting of a capture basket and a filter mesh liner, are usually fitted below the road invert or surface of the pit and hence are visually unobtrusive.

Pit inserts can be customised to fit almost any stormwater inlet pit and the mesh liner opening could vary depending on the targeted capture of solids, sediment and attached pollutants. Cleaning of the pit inserts is undertaken either manually or using a small vacuum truck. The cleaning frequency depends on the catchment type, size and expected pollutant loading.

Pit inserts have been proposed for the stormwater pits in the paved areas of Stormwater Network 1 and the stormwater pits adjacent to the proposed building for Stormwater Network 2. Figure 4.2 below presents schematic detail of a pit insert.
4.5 DOWNSTREAM DEFENDER

A Rocla 1200 mm diameter Downstream Defender® has been specified to treat runoff from Stormwater Network 1 which includes large paved areas and runoff from the existing helipad. The Downstream Defender® device is an advanced hydrodynamic vortex separator that is specifically designed to provide high removal efficiencies of settleable solids and their associated pollutants, oil, and floatables over a wide range of flow rates.

The frequency of cleanout is determined in the field after installation. During the first year of operation, the unit should be inspected every six months to determine the rate of sediment and floatables accumulation. This information can be used to establish a routine maintenance schedule.

Figure 4.3 shows a schematic diagram of a Downstream Defender®.

![Figure 4.3 Schematic Diagram of a Downstream Defender® (Source: Rocla)](image)

4.6 MUSIC MODELLING

A detailed water quality analysis has been undertaken to develop the WSUD strategy for the proposed development to meet Council’s water quality targets. The water quality modelling for this study has been undertaken using the industry standard software model MUSIC (Model for Urban Stormwater Improvement Conceptualisation) Version 6.2.

The WSUD strategy, depicted in Figure 4.3, will be further developed with the landscape architect to achieve site aspirations and water quality targets.

Table 4.2 contains the MUSIC water quality treatment train effectiveness results for the proposed WSUD strategy.