

26th June 2023

Ref: SY220254

Anna Matthews
Ranbury
Level 1, 51 Berry St,
North Sydney, NSW, 2060

Dear Anna,

Re: Stormwater Design - REF – Gunnedah Hospital Redevelopment

Northrop Consulting Engineers Pty Ltd (Northrop) have been commissioned to prepare a Stormwater Management plan for the proposed Gunnedah Hospital Redevelopment.

On-Site Stormwater Detention (OSD)

According to Gunnedah Shire Council's Engineering Guidelines for Subdivisions and Developments, On-site Stormwater Detention (OSD) is generally required for all types of developments in the Gunnedah Shire Council Local Government area to limit post development flows to predevelopment rates. This is typically provided on most developments to avoid nuisance flooding of downstream properties.

To control flows generated during storm events, water is stored and released at controlled rate on the development site.

A pre-development catchment plan and a post-development catchment plan has been created to determine if the proposed works would result in an increase in impervious areas. The table below shows the pre-development and post-development impervious and pervious areas. **This assessment of the proposed development area indicates that there has been an overall reduction to impervious surfaces for the development site and as such On-site Stormwater Detention is not considered necessary for the development.** If during the design development there is an increase to the impervious surfaces in comparison to the pre-development scenario, an OSD tank will be required.

CATCHMENT CALCULATIONS:

	<u>PRE-DEVELOPMENT</u>	<u>POST-DEVELOPMENT</u>
TOTAL AREA	32,623m ²	32,623m ²
IMPERVIOUS AREA	21,410m ² (65%)	19,729m ² (60%)
PERVIOUS AREA	11,213m ² (35%)	12,894m ² (40%)

Stormwater Quality Management

Gunnedah's DCP does not provide specific requirements for this type of development, a request for information was sent to council in relation to the stormwater quality requirements for the site. The Integrated Water Cycle Management Strategy (2010) prepared by Woodlots & Wetlands Pty Ltd for Gunnedah Shire Council, outlines the Stormwater Quality best practice targets for Gunnedah Council.

Contaminant (kg/yr)

Best Practice Stormwater Targets (% reduction compared with conventional urban development)

Total Suspended Solids (TSS)	85%
Total Phosphorus (TP)	65%
Total Nitrogen (TN)	45%
Gross Pollutants (GP)	90%

Table 1 Pollutant Reduction Targets

To achieve the best practice stormwater targets water quality devices have been incorporated in the design and modelled in MUSIC. To achieve these targets, a Rainwater tank, Stormfilter Cartridges and Ocean Guards have been specified, as shown on drawings GHR-CI-MW-0401 and GHR-CI-MW-0402. The MUSIC model is shown below, and it will be updated during the detailed design phase to ensure the best practice stormwater targets are achieved in detailed design.

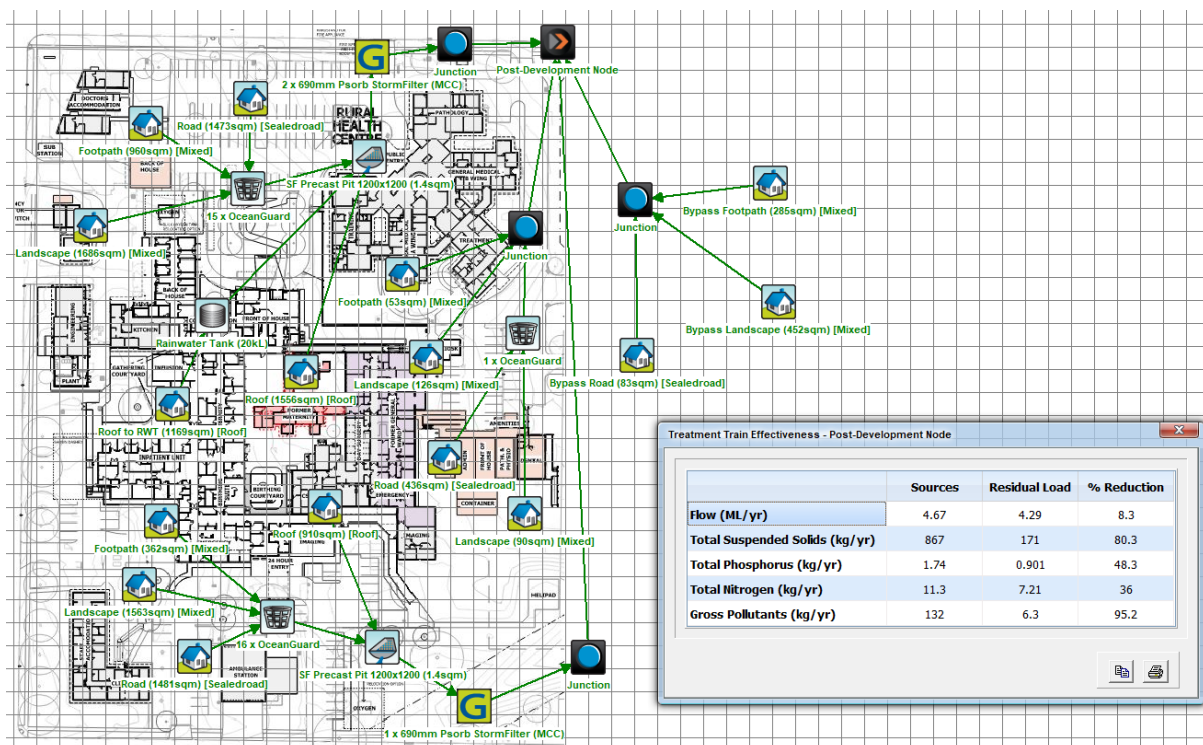


Figure 1: MUSIC model.

We trust this information is satisfactory. If you have any queries, please feel free to contact me – (02) 9241 4188

Yours faithfully,

Aline Carvalhaes

Aline Carvalhaes

Civil Engineer

On behalf of Northrop Consulting Engineers