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1.0 INTRODUCTION

Terroir Pty Ltd has commissioned Taylor Thomson Whitting to undertake the Stormwater design for the proposed works at Rouse Hill Anglican College in Rouse Hill. As indicated in Figure 1, the site is located at the corner of Rouse Road and Worcester Road, Rouse Hill. This report details the stormwater requirements and is in accordance with Blacktown City Council DCP and discussions made with Council.



Figure 1: Site location

2.0 Existing Site

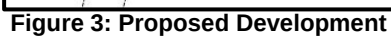
The existing developed area of the Anglican College site is marked **A** in Figure 1. The existing site consists of school buildings, car parking, access roads, and landscaping. The site is approximately 5.3Ha, with 60% impervious surface. The land falls southeast at approximately 4.5% towards the above ground detention basin in the southeast corner of the site, as shown in figure 2.

The area marked **B** in Figure 1 is currently a rural parcel of land owned by Rouse Hill Anglican College and will be developed to expand the school. This area is approximately 2.0Ha with 10% impervious surfaces. The land falls south and east as indicated by the arrows in Figure 1.



Figure 2: Previous Stage of Works

The proposed works are indicated in red in figure 3 and will take place over three separate areas of the site. The first area of the proposed works will be undertaken on the undeveloped land to the north of the site. The second area includes redevelopment within the centre of the existing developed site. The third area includes demolition of existing buildings and redevelopment to the southeast of the existing developed site, refer to figure 3. The proposed works include school buildings, associated awning and car parking.



3.1 Existing Surface Water Drainage

Within the existing developed area of the site, the existing stormwater system drains to the south eastern corner of the site, towards the above ground detention basin located at the corner of Rouse road and Worcester road Rouse Hill. The below ground surface water drainage in this area includes a network of pits and pipes that convey flow from a catchment with approximately 3.3ha of impervious surface. The remaining area flows overland towards the above ground basin without being conveyed within the stormwater network. There is no existing stormwater for the undeveloped area to the north of the site.

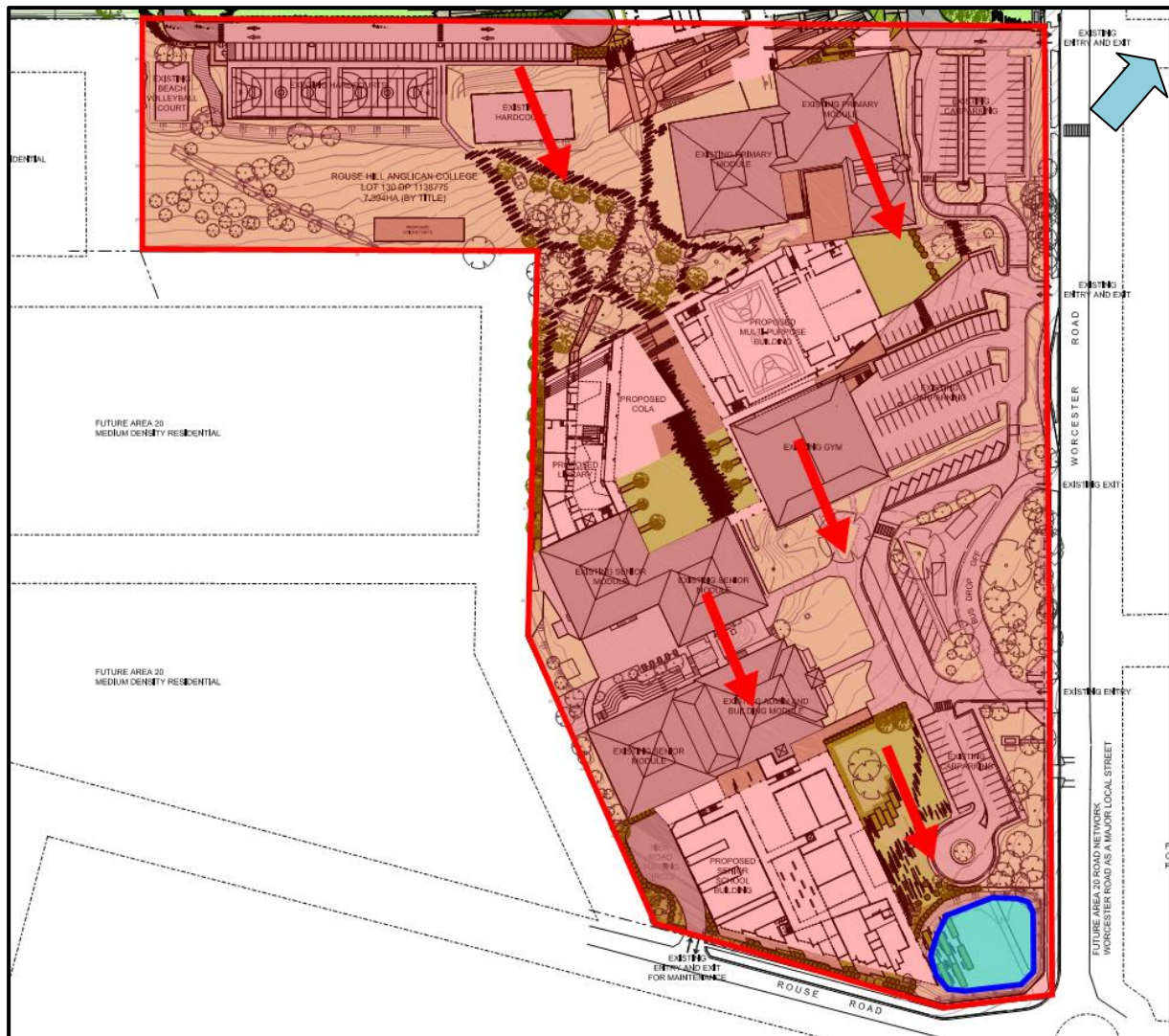


Figure 4: Existing Stormwater

3.2 Proposed Surface Water Drainage

The drainage for the proposed works is separated into three separate areas as indicated in figure 4 below and the attached stormwater plans in Appendix A. The northern area of the site (indicated in red) will connect to the existing drainage system on Worcester Road. The central area (indicated in blue), and south eastern areas of the site (indicated in green) will be collected by new pits and pipes and will connect into the existing system that discharges to the detention basin.

The proposed drainage for the north area of the site has a catchment of 1.80 Ha and will be collected by a network of new pits and pipes. Landscape swales will keep the overland flow contained within this part of the site. On site detention (OSD) will be provided to ensure that post development runoff from this area does not exceed pre-development runoff.

The proposed drainage for the central area of the site has a catchment of 0.48 Ha and will be collected by a network of new pits and pipes, which will connect into the existing stormwater system on site. The existing above ground detention basin will be amended to ensure that post development runoff from this area does not exceed pre-development runoff.

The proposed drainage for the south east area of the site has a catchment of 0.34 Ha and will be collected by a network of new pits and pipes before discharging into the existing detention basin. OSD is not required as this area is already developed with existing buildings and there is no net increase in impermeable area.

The proposed new stormwater pits and pipes will be designed for the 5 year ARI and in accordance with Blacktown Council Stormwater Drainage Manual Appendix D.

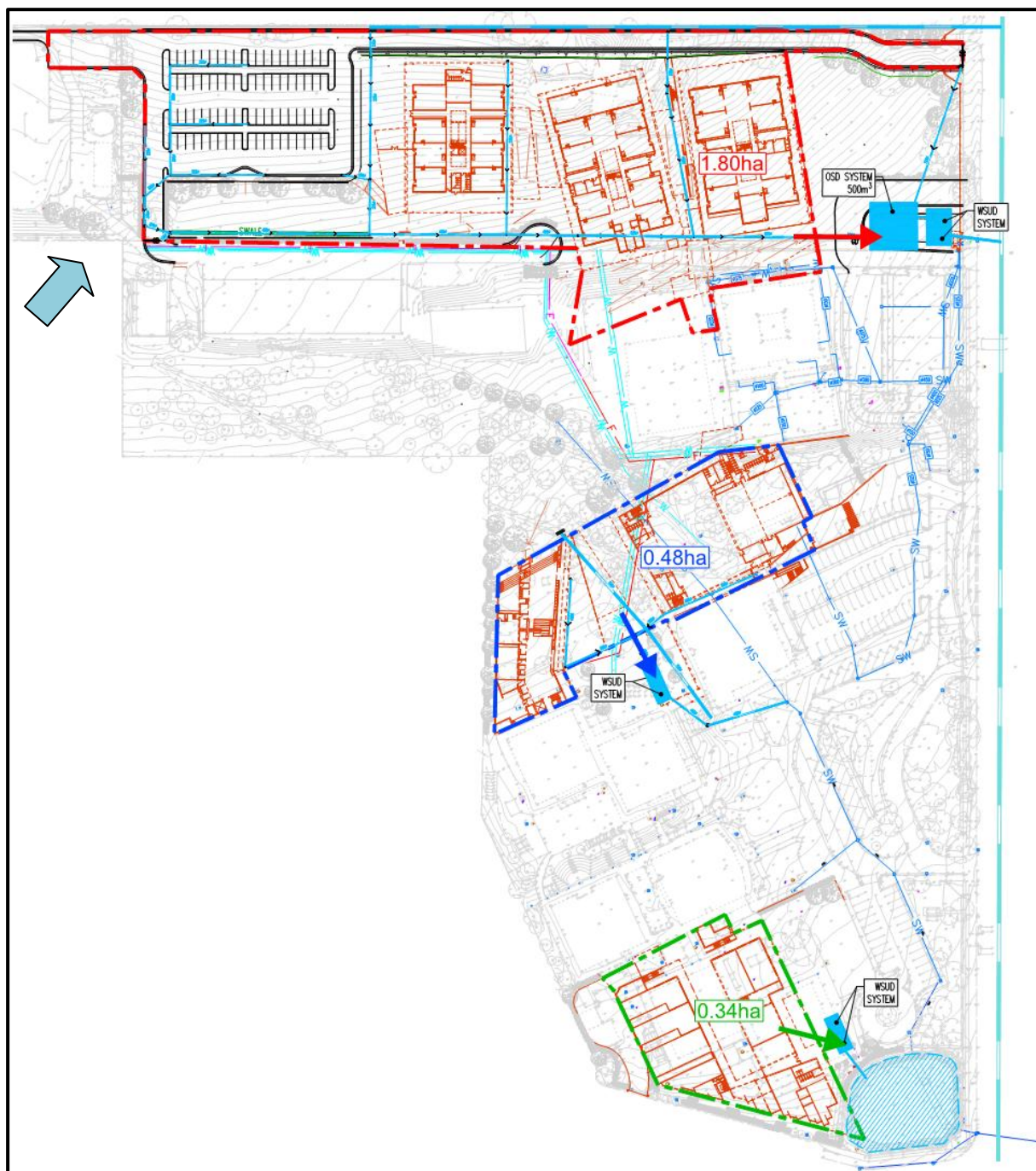


Figure 4: Proposed Stormwater

3.3 Overland Flow

There is currently a 2.9Ha catchment that falls towards the central area of the site where proposed works will be undertaken. Overland flow from this catchment will be collected by a new 750mm diameter pipe and designed for the 100 year ARI flow of 1,085 l/s. This new pipe will be constructed below the proposed works and will discharge as overland flow on to the natural surface that grades down towards the existing open detention basin (refer to figure 5)..

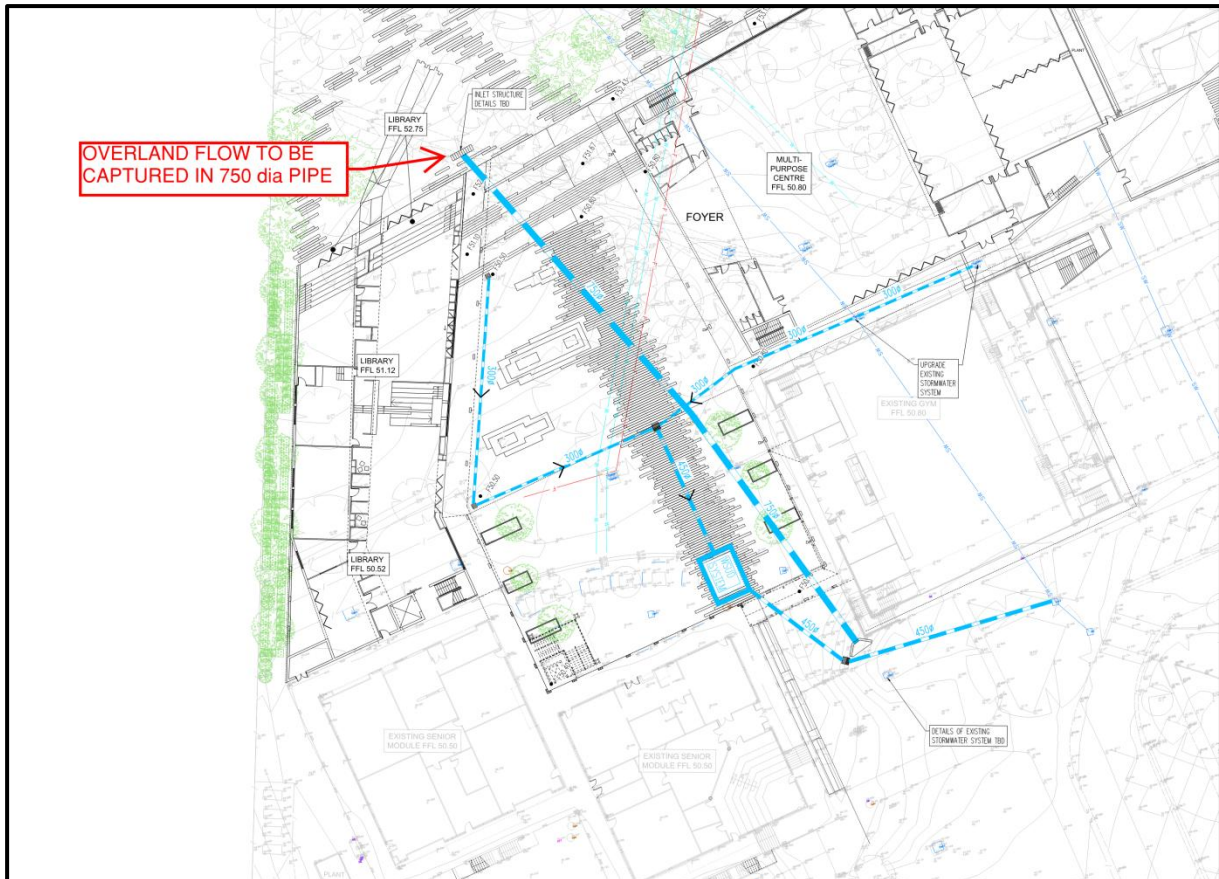


Figure 5: Overland Flow Pipe Capture

3.4 Stormwater Quality

Stormwater quality analysis has been undertaken in accordance with Blacktown City Council's DCP 2006, Part R (Amended 2011). For water quality treatment there are effectively two areas to be considered; the northern catchment that discharges to the existing drainage in Worcester road, southern catchment that discharges to the existing detention basin. The southern catchment includes both the central and south eastern areas of proposed works as shown in figure 4.

Both catchments have been modelled in MUSIC to demonstrate that the proposed stormwater treatment devices achieve the stormwater treatment targets outlined in the Council DCP:

- 90% removal of Gross Pollutants;
- 85% removal of total suspended solids;
- 65% removal of total phosphorus;
- 45% removal of total nitrogen; and
- 90% removal of Hydrocarbons

Northern Catchment (indicated red in Figure 4): The treatment train will include a 65m swale in conjunction with 5 x Humes Jellyfish®, 1x Humeceptor (or equivalent).

Pollutant	Load (kg/yr)	Residual Load	Load reduction (%)
Gross Pollutants (kg/yr)	310	3.26	98.9
Total Suspended Solids (kg/yr)	2310	210	90.9
Total Phosphorus (kg/yr)	3.79	1.28	66.3
Total Nitrogen (kg/yr)	28.3	11.9	58

Southern Catchment (indicated blue and green in Figure 4): The treatment train will include 7 x Humes Jellyfish, 1x Humeceptor (or equivalent).

Pollutant	Load (kg/yr)	Residual Load	Load reduction (%)
Gross Pollutants (kg/yr)	729	9.48	98.7
Total Suspended Solids (kg/yr)	4580	116	97.5
Total Phosphorus (kg/yr)	7.73	1.96	74.6
Total Nitrogen (kg/yr)	57.5	18.7	67.5

In conjunction with the above Humes have provided an independent validation that indicates 90% removal of Hydrocarbons through the use of Humeceptor.

4.0 CONSTRUCTION PHASE STORMWATER MANAGEMENT

Construction works to be carried out in accordance with the “Blue Book” erosion and sediment control requirements. The exact controls will vary depending on construction methodology and timing, but typically consist of:

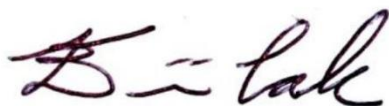
- Sediment fences;
- Sediment trap;
- Vehicle shaker grid and wash down; and
- Sand bags surrounding existing pits.

A conceptual erosion and sediment control plan has been included in the civil drawing set (drawing number SKC03).

5.0 CONCLUSION

The stormwater for the proposed works will be captured in a series of new pits and pipes with the provision of water quality treatment and on-site detention in accordance with Council’s DCP. The below ground stormwater system has been designed to convey flows for the 5 % AEP storm in accordance with Council’s Stormwater Drainage Manual Appendix D. Existing overland flow paths through the site will be maintained following development, and will convey flows up to the 1% AEP storm.

Prepared by:
**TAYLOR THOMSON WHITTING
(NSW) PTY LTD**



Eirian Crabbe
Senior Civil Engineer

Authorised by:
**TAYLOR THOMSON WHITTING
(NSW) PTY LTD**



Stephen Brain
Technical Director

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APPENDIX A

Stormwater Plans