

# Civil State Significant Development Application Report

**171320**

Prepared for University of Wollongong / 27.10.17

171320

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## 1.0 EXECUTIVE SUMMARY

Taylor Thomson Whitting (TTW) has been engaged to provide engineering consulting services for the proposed Western Building at the University of Wollongong.

This report relates to civil elements of the works.

This report is to aid the submission of a State Significant Development Application

Previous reports undertaken for the University of Wollongong by other consultants have been used in preparation of this document.

### 1.1 Civil Design Criteria

The criteria that this report addresses are:

- Stormwater overland flow,
- Site flooding,
- Stormwater design and Onsite Stormwater Detention (OSD),
- Ground conditions,
- Erosion and sediment control

## 2.0 INTRODUCTION

The new Western Building will be a landmark development for the University of Wollongong (UoW) campus. It will be located adjacent the campus Ring Road at the western end of the campus.

The proposed project will accommodate the diverse functions of The Arts English and Media (TAEM) School and the Health and Society (HAS) School and the School of Geography and Sustainable Communities (SGSC) into a collaborative and engaging hub that will support the ambitions of next generation research and learning.

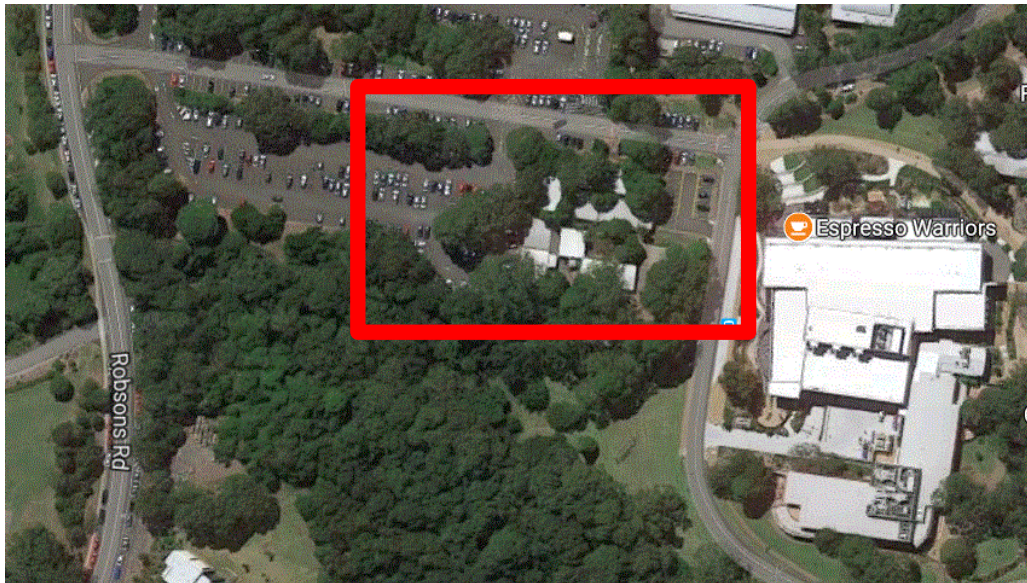
Functions accommodated include specialist teaching spaces, academic and professional staff workplace, informal collaboration spaces as well as other support spaces. The proposed building will be circa 10,000sqm gross floor area across four levels plus a plant level.

## 3.0 SITE

The site is located on the main campus at the University of Wollongong, in an area currently occupied by demountables and single storey buildings that will be demolished due to proposed works.

### 3.1 The Development Area

The development area is shown in following **Figure 1**.



**Figure 1 – Development Area**

## **4.0 EXISTING CONDITIONS**

The existing services which are located within the development site will be either relocated to suit works, capped and abandoned, or removed.

### **4.1 Existing Buildings**

Existing buildings 45-60, and associated services, are to be removed as a consequence of the proposed building.

### **4.2 Existing Carpark and Roads**

It appears that the existing carpark is asphalt. The existing footpath in front of building 45 is concrete, and the footpath around the carpark is brick.

### **4.3 Existing Services**

There are existing services owned by the university or other authorities on development site. These services include, but are not limited to water, sewer, gas, stormwater, and telecommunications. A services investigation has been undertaken with the view to ensure that services are modified / relocated / removed as required to suit the proposed works.

Whilst attempts have been made to identify all services which will be impacted, there is still the possibility that unknown services are encountered during any demolition or construction. This is due to some services being: untraceable due to their type, not being able to see the service due to depth of cover, or being located under existing buildings which are being demolished.

## 4.4 Existing Trees

The arborist report (Arboricultural Impact Assessment, June 2017) by Ian Hills indicates which trees must be retained and those that can be removed.

There is a large Sydney Blue Gum, tree numbered 2313, required to be retained.

Trees that are being retained and their Tree Protection Zones will be indicated on the design drawings.

## 4.5 Existing Stormwater

There are existing in-ground stormwater pipes and pits running along the Ring Road, which may need to be reconstructed to suit the proposed stormwater drainage works.

## 4.6 Existing Overland Flow

The main campus overland flow path, in this area, as outlined in Cardno's Stormwater Assessment (2014), is along the campus Ring Road and onto the eastern oval. It is known that road drainage system is designed to convey up to 5 year Australia Rainfall Intensity (ARI) flow to ensure road serviceability is maintained.

Cardno's recent investigation (10 July 2017, Ref: 8201720801-letter 002) indicated that the culvert under Robson's Road causes water flow through the western carpark and onto the site.

## 4.7 Ground Conditions

The ground conditions for the adjacent sites are expected to be relatively similar. General conditions for the Western Building area are expected to consist of:

- Fill – relatively shallow layer of fill (most likely associated with carpark construction). Typically up to 200 – 300mm depth.
- Alluvium – stiff to hard, highly plastic silty clay, typically 3– 5m thickness.
- Residual Clay – Silty clay / sandy clays beneath the Alluvium layer, at depths of 4.5 – 6m below the surface.
- Highly Weathered Siltstone/Sandstone – Bed rock commencing at approximately 9m below surface.
- Moderately Weathered Sandstone – approximately 10 – 15m below the surface.

It is expected that deleterious materials together with topsoils may be encountered within future pavement areas and should be stripped and removed to spoil.

Further testing will be required after demolition of existing buildings and during excavation.

## 4.8 Flooding

As per Cardno's Stormwater Assessment, the University of Wollongong campus is affected by flooding. The report indicates that the proposed site is affected by the 1% AEP and Probable Maximum Flood (PMF) flow. It is indicated that 1% Annual Exceedance Probability (AEP) will produce below 100mm of flooding which has slow velocity (less than 0.3m/s) and therefore is categorised as being a low hazard. In addition, during the PMF the flow is deeper and faster around 200mm depth at 3 m/s.

## 5.0 CIVIL ENGINEERING

### 5.1 Onsite Stormwater Detention (OSD)

OSD is being provided in accordance with Council's stormwater policy.

The proposed building area will increase the hard stand surfaces, leading to an increasing stormwater runoff, therefore OSD is proposed.

The proposed stormwater concept, including OSD tank locations, is shown in **Appendix A**.

### 5.2 Stormwater

Pits and gutters will collect site stormwater, down pipes and in-ground conduits will convey the water to the OSD tank.

After attenuation, water will be discharged to the University's in-ground stormwater system. The piped stormwater system will be designed to convey 5% AEP storm flow.

The proposed stormwater concept, including OSD tank locations, is shown in **Appendix A**.

### 5.3 Overland Flow

All external surfaces will drain away from the proposed building and any upstream flow is diverted around the development sites.

Upstream water from overtopping Robson's Road will be conveyed through the loading dock as overland flow. The overland flow will ensure water is diverted away from the habitable building areas and external student congregation areas.

### 5.4 Flooding

The building floor levels for the Proposed Development will be above the 1% AEP flood height with appropriate freeboard.

In large storm events, the loading dock will be under water until water recedes. As the large storm events are rare, with raised water levels lasting for several, the impact is likely to be minimal.

### 5.5 Flood Mitigation Strategy

To mitigate flood water, the building floor level will sit above the 1% AEP with freeboard.

In addition, walls to deflect water away from the site building, where possible, have been incorporated.

## 5.6 Pavement

The proposed pavements will be designed to coordinate with proposed loads, suit structure demands, and accessibility. The loading is likely to be a concrete pavement, with asphalt for road pavement if requirement.

## 5.7 Stormwater Quality

Stormwater quality treatment will be provided in accordance with Council's water quality requirements.

## 5.8 Erosion and Sediment Control

Erosion and sediment controls will need to be provided during construction.

Refer to **Appendix B** for the sediment erosion control plan. The measures proposed include but are not limited to: silt fences, sediment ponds, hay bale filters, pit sediment traps, and stabilised construction access.

## 6.0 Summary

This report outlines the civil and stormwater works intent which will be developed further in Design Development.

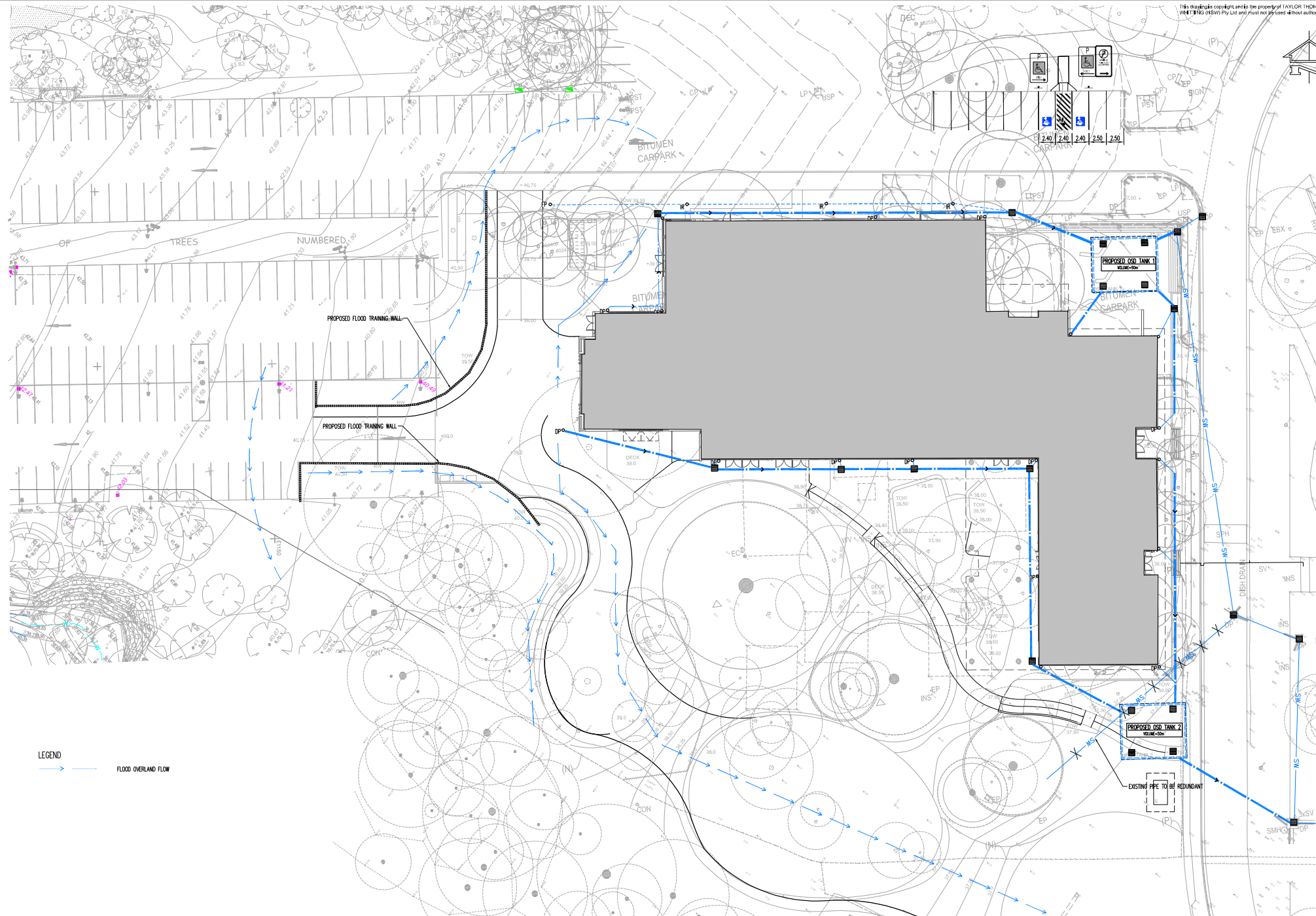
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## 7.0 Appendix A

# Proposed Stormwater Concept



LEGEND  
FLOOD OVERLAND FLOW

Reference: C05A001 - C05B: design - Ref: The Council - Oct 18, 2017 - 1:30pm

A1 1 2 3 4 5 6 7 8 9 10

|                   |             |     |          |      |     |             |     |       |      |
|-------------------|-------------|-----|----------|------|-----|-------------|-----|-------|------|
| PS PARKING ADDED  | KH          | KH  | 10.10.17 |      |     |             |     |       |      |
| PA REISSUE FOR SD | KH          | RG  | 11.09.17 |      |     |             |     |       |      |
| P3 REISSUE FOR SD | KH          | RG  | 18.09.17 |      |     |             |     |       |      |
| P2 REISSUE FOR SD | KH          | RG  | 18.09.17 |      |     |             |     |       |      |
| P1 REISSUE FOR SD | KH          | RG  | 15.08.17 |      |     |             |     |       |      |
| Rev               | Description | Eng | Draft    | Date | Rev | Description | Eng | Draft | Date |

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Project  
UNIVERSITY OF WOLLONGONG,  
WESTERN BUILDING CIVIL  
WORKS

Sheet Subject  
SITE WORKS PLAN SHEET 1

|                                         |                   |                |
|-----------------------------------------|-------------------|----------------|
| Scale: A1<br>1:250                      | Drawn<br>RG       | Authorised     |
| Job No<br>171320                        | Drawing No<br>C05 | Revision<br>P6 |
| Not to be Created Oct 18, 2017 - 1:30pm |                   |                |

## **8.0 Appendix B**

# **Erosion and Sediment Control Plan**



SCALE 1-20

|                                         |            |            |
|-----------------------------------------|------------|------------|
| Scale: 1: A1                            | Drawn      | Authorised |
| 1:250                                   | RG         |            |
| Job No                                  | Drawing No | Revision   |
| 171320                                  | C02        | P1         |
| Printed: Created: Aug 15, 2017 - 3:42pm |            |            |