

Civil Engineering Design Report

UNSW Biological Science Project - Stage 2

Section 96

Prepared for Brookfield Multiplex / 26 October 2016

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1.0 Introduction

Taylor Thomson Whitting (TTW) has been engaged to provide the associated civil engineering works for the University of New South Wales (UNSW) for Stage 2 of the Biological Science project. The project consists of the refurbishment of the existing Biological Science building (D26) along with the accompanying external beautification works.

1.1 Development Site

D26 is located in UNSW's Kensington Campus within the Randwick City Council (RCC) local government area. It is bounded by the Wallace Wurth (C22) building and Michael Birt Lawn to the north, Botany Street to the east, Samuels Lane and Samuels Building (F26) to the south and Chancellery Walk to the west. Refer Figure 1 for site location.

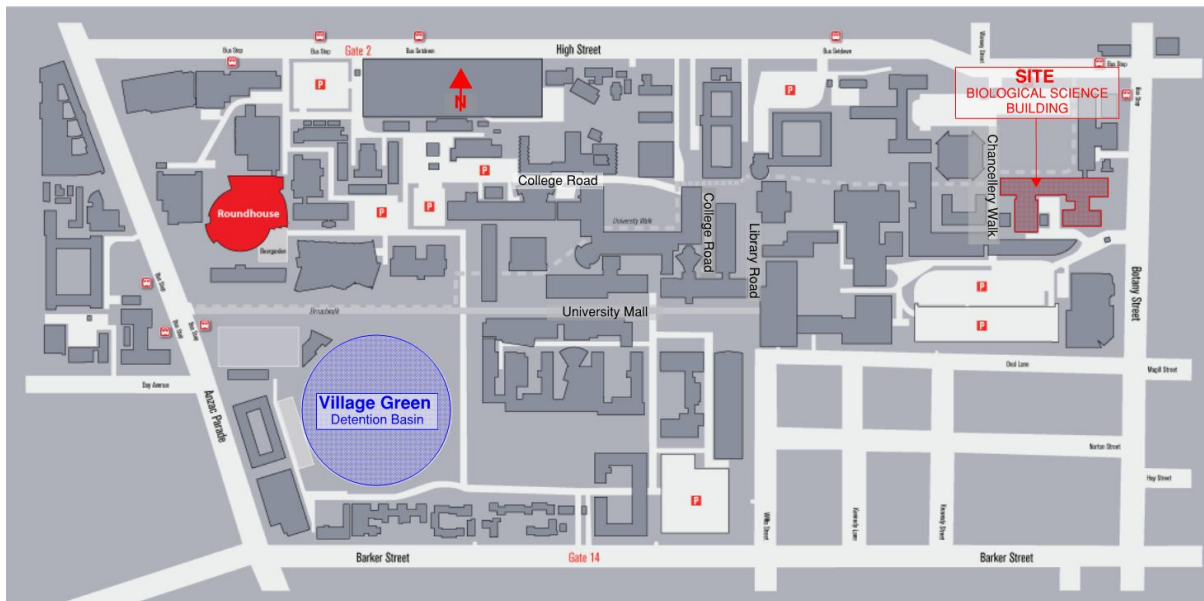


Figure 1 - Site Locality Map

1.2 Reference Documents

The civil engineering design and documentation, along with this report, is based on the following:

- Randwick City Council's Comprehensive Development Control Plan 2013 (RCCDCP)
- UNSW Kensington Campus Stormwater Strategy Master Plan (SSMP) prepared by ANA Technical Services Pty. Ltd. dated 28.11.2005
- Architectural plans prepared Woods Bagot Pty. Ltd. (ref: 120277)
- Landscape plans prepared by Black Beetle Pty. Ltd. (ref: BB 1090)

2.0 Proposed Works

The associated civil engineering works consist of minor improvements to the building frontage to Botany Street and Michael Birt Lawn.

2.1 Elevated Walkway

A new suspended slab is proposed over the extent of the existing landscaping adjacent to the building frontage. The new slab is to match the existing elevated walkway bounding the existing landscape area. The existing landscaping is proposed to be demolished with all underground stormwater drainage pipes to remain within this area. Pits located within this area will be required to be raised to suit the new levels and maintain access for maintenance of the underground pipe.

The new awning proposed above the elevated walkway is to drain via downpipes connecting to the existing stormwater network; location of downpipes and connection to the in ground drainage system is to be coordinated with the hydraulic engineer. The walkway is proposed to gently fall away from the building sheeting any surface stormwater towards the Michael Birt Lawn.

The existing ramp connecting the elevated walkway to Chancellery Walk is proposed to be adjusted to incorporate complying grades for disabled access. The existing retaining wall elevating the existing walkway will be maintained along with the stairs to access the Michael Birt Lawn.

All services adjustments consequent from the proposed works will be adjusted to the respective authority's standard requirements.

2.2 Chancellery Walk

The existing elevated garden bed is proposed to be demolished to make way for an on grade garden bed between Chancellery Walk and Michael Birt Lawn. Grades of the existing path will remain with only minor reinstatement works to be completed at the interface. A retaining wall proposed to retain the proposed elevated garden bed along the edge of building D26 fronting Chancellery Walk.

2.3 Botany Street Frontage

Minor adjustments to levels are proposed in the landscaping to suit proposed landscaping. Any stormwater pits, along with any service covers, will be adjusted to suit new levels. There is no significant impact to warrant new stormwater infrastructure to be in place.

3.0 Stormwater Management

UNSW has implemented a Stormwater Strategy Master Plan (SSMP) for all new developments to adhere to. The SSMP subdivides the Kensington campus into 5 sub-catchments. The development site lies within two of these sub-catchment: the main building (D26) is within 'Catchment E' draining to Botany St and the Michael Birt Lawn is within 'Catchment A' draining to the Village Green Detention Basin. Catchment plan from the SSMP affixed to report in Appendix A. The proposed stormwater and drainage infrastructure installed will be consistent with the SSMP, prepared by ANA Technical Services Pty. Ltd dated 28.11.2005.

3.1 Elevated Walkway

New grated inlet trench drains are proposed to be installed to capture surface flows and connect to the existing drainage system. These will be installed at the base of the ramp and along the lower edge of the walkway where a trapped low point is formed between the existing retaining wall and cross fall of the walkway.

The new awning above the walkway will be drained via a series of downpipes (refer Arup drawing package). The downpipes will connect to the existing stormwater network and drain to the existing OSD prior to site discharge at Botany Street.

Impervious and pervious areas of the proposed works have not changed adversely for an upgrade to the existing stormwater detention system. The proposed additional drainage infrastructure does not impede on the hydraulic functionality of these systems.

3.2 Chancellery Walk

As the works do not result in an increase of impervious area, the existing stormwater detention system is not impeded in functionality. Any existing stormwater pits will be adjusted to suit new levels as required.

3.3 Botany Street Frontage

Similar to the above, no increase in impervious area is proposed in the works, thus the existing stormwater detention system does not hinder the functionality. Any existing stormwater pits will be adjusted to suit new levels as required.

4.0 Flooding Impacts

In accordance with the SSMP, the internal campus drainage discharges stormwater to Council catchments at 3 points: Anzac Parade North, Anzac Parade South and Botany Street. As the SSMP has been implemented to control the quantity of stormwater discharge to council infrastructure, the proposed development must maintain the intent of the implanted policy. As mentioned above the development lies within 2 catchments, thus proposed works must maintain the intent to mitigate detrimental downstream flooding.

The development is situated at the crest of the 2 catchments denoted in the SSMP catchment plan (refer Appendix A), and accordingly is not impacted by overland flow paths. Furthermore, as the new works will be consistent with the SSMP, prepared by ANA Technical Services Pty. Ltd. dated 28.11.2005, the development does not pose unfavourable affects warranting the upgrade of downstream flood mitigation structures and devices.

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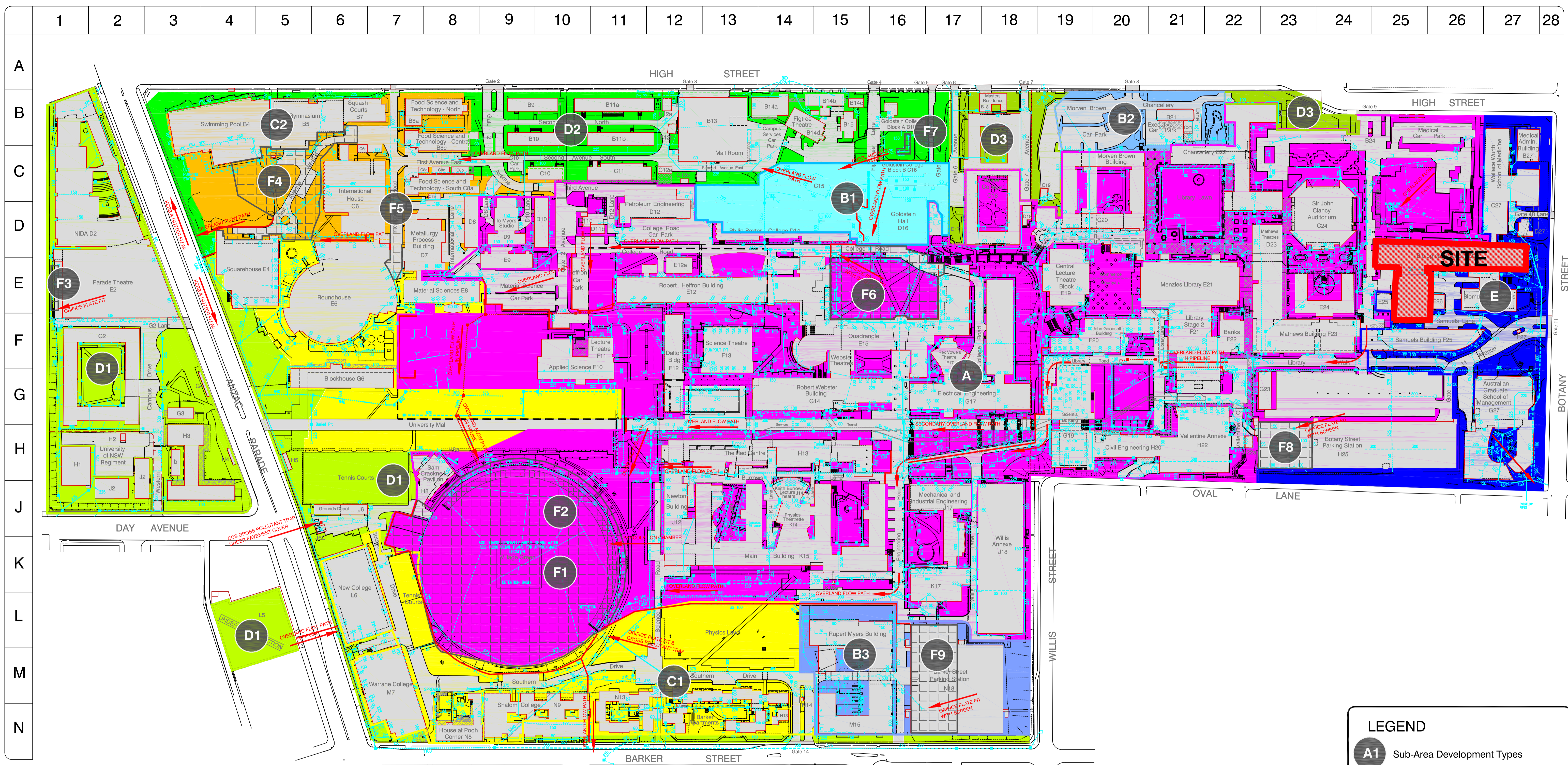


Paul Yannoulatos
Technical Director

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Appendix A

Stormwater catchment plan for Kensington Campus



MAIN AREA GROUP CHARACTERISTICS

- AREA 'A' 100 yr ARI to Village Green detention basin.
- AREAS 'B' 5yr ARI to Village Green Detention Basin; 100 yr ARI to Council street drainage
- AREAS 'C' 5 yr ARI to percolation trench; 100yr ARI to Council street drainage
- AREAS 'D' 20yr ARI to percolation / piped street drainage; 100yr ARI to Council street drainage.
- AREA 'E' Requires full detention
- AREAS 'F' Detention basins & diversion structures to be retained

SUB-AREA DEVELOPMENT CONSTRAINTS

- AREA 'A' All stormwater run-off to Village Green Detention Basin. Areas F1, F2, F6, F8 & F9 and diversion structures are to be retained
- AREA 'B1' 5yr ARI to Village Green detention basin via piped drainage, 5 to 20yr ARI to Council kerb via piped drainage. 100 yr ARI to Anzac Pde North Council catchment. Retain diversion structures.
- AREA 'B2' 5yr ARI to Village Green detention basin via piped drainage, 20yr ARI to High St kerb via piped drainage, 100 yr ARI to Anzac Pde North Council catchment
- AREA 'B3' 5yr ARI to Village Green detention basin via piped drainage, 20yr ARI to Barker St kerb via piped drainage, 100 yr ARI to Anzac Pde South Council catchment. Retain detention basin F9
- AREA 'C1' 5yr ARI roof drainage to percolation trench, 20yr ARI to Council kerb via piped drainage, 100 yr ARI to Anzac Pde South Council catchment. Retain diversion structures
- AREA 'C2' 5yr ARI roof drainage to percolation trench, 20yr ARI to Council kerb via piped drainage, 100 yr ARI to Anzac Pde North Council catchment. Retain detention basins F4 & F5 and diversion structures
- AREA 'D1' 20yr ARI roof drainage to percolation trench with overflows to existing piped drainage, 100 yr ARI to Anzac Pde South Council catchment. Retain detention basin F3 & diversion structures.
- AREA 'D2' 20yr ARI roof drainage to percolation trench, with overflows to Council kerb or existing piped drainage, 100 yr ARI to Anzac Pde North Council catchment. Retain detention basin F7 and diversion structures.
- AREA 'D3' 20yr ARI to Council kerb via piped drainage. Discharges to Anzac Pde North Council catchment.
- AREA 'E' Drains to Botany St Catchment. All developments require full detention to Council standard requirements.

LEGEND

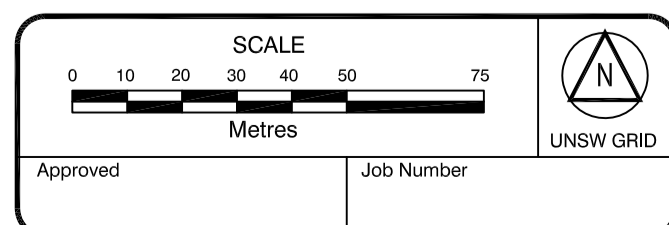
- A1 Sub-Area Development Types
- F1 Detention areas or percolation trenches

AREAS 'F' Detention basins & percolation trenches to be retained

- AREA 'F1' Village Green detention basin. All bank profiles and levels are protected. Banks can be raised, but not lowered. To be maintained and permanently retained. Percolation chamber serving Village Green detention catchment, to be maintained and permanently retained.
- AREA 'F2' Percolation / detention tank serving NIDA roof water discharge, to be maintained and permanently retained in some form.
- AREA 'F3' Percolation / detention tank serving Swimming Pool Lawn. Must be maintained, and rained in some form.
- AREA 'F4' 5 yr ARI surcharge basin for stormwater surcharge pits in First Avenue West. Encroaches onto Swimming Pool Lawn. Must be maintained, and rained in some form.
- AREA 'F5' 5 yr ARI surcharge basin for stormwater surcharge pits in International Road. Must be maintained in some form.
- AREA 'F6' Quadrangle Lawn detention basin with discharge orifice plate pit in College Rd. College Rd is raised below pit to retain overland flow. Must be maintained and rained in some form of equal capacity, as Village Green detention volume cannot be safely increased.
- AREA 'F7' Percolation trench serving Goldstein roof water discharge, to be maintained and permanently retained in some form of equal capacity.
- AREA 'F8' Upper Campus Car Park detention basin with discharge orifice pit in ground floor. Must be maintained and permanently retained, as Village Green detention volume cannot be safely increased.
- AREA 'F9' Barker Street Car Park detention basin with discharge orifice pit in ground floor. Must be maintained and permanently retained, as Village Green detention volume cannot be safely increased.

NOTE: THIS DRAWING REMAINS THE PROPERTY OF THE UNIVERSITY OF NEW SOUTH WALES AND SHOULD NOT BE REPRODUCED WITHOUT THE APPROVAL OF THE INFORMATION SERVICES MANAGER.

No.	DATE	DRAWN	CHKD	AMENDMENT	No.	DATE	DRAWN	CHKD	AMENDMENT
2	21.02.11	RJA	RJA	New drawing number					
1	28.11.05	RJA	RJA	Updated with RCC Development Engineer's comments					



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SITE SERVICES

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 Telephone (02) 9450 2423

DRAWING STATUS
 UNSW POLICY
 DESIGNED R Andrews
 DRAWN R Andrews DATE 14/10/05
 SCALE AS SHOWN

KENSINGTON CAMPUS

MASTER PLAN
 STORMWATER CATCHMENT MANAGEMENT PLAN

CAD Reference	Drawing No.	List Revision	Revision
SS-HYD-STORMWATER	FME 0012 / H	21/02/2011	2