UNSW

Biological Sciences Project – Stage 2

Hydraulic and Fire Services Utility Report

246286-00

Issue D | 12 October 2016

Job number 246286

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Appendices

1 Hydraulic and Fire Services

1.1 Executive Summary

This report has been prepared to describe the implications of the proposed building development on the existing services infrastructure in support of the State Significant Development Application requirements for the construction and refurbishment of the existing D26 Building – Biological Sciences Project Stage 2.

It addresses the following aspects:

- the extent of the statutory infrastructure in the vicinity of the UNSW Biological Sciences building Stage 2;
- the impact the building's footprint will have on the routes of this infrastructure; and
- the implications of the relocation, realignment or augmentation of the affected services.

1.2 Introduction

This report is written in response to the State Significant Development Application Secretary's Environmental Assessment Requirements in relation to the Biological Sciences Project Stage 2, located on the UNSW Campus.

The following hydraulic and fire services Utility Report has been prepared to address the SEARs including item 9 - Utilities.

- Services Diversion;
- Cold Water Connection;
- Natural Gas Connection;
- Sewer Connection; and
- Stormwater Connection.

Design development will be required to verify the assessments made in this report.

1.3 Existing University Services

Existing UNSW private services including but not limited to the existing 250mm water main, stormwater network various sizes, bore water ring main DN100 and 150mm sewer line are located in close proximity to the existing Biological Sciences Project Stage 2 footprint.

The existing sewer main along Botany Road is a UNSW asset, but located within the Sydney Water easement and the associated water main is in close proximity. This sewer and water main are not affected by the proposed development.

The existing Upper Campus gas connection including existing Cogent supply to C25 (Lowy Cancer Research Building) will be adjusted prior to the commencement of main works including maintaining existing gas regulators for Cogent and Lowy Buildings.

Based on the initial infrastructure review, the proposed redevelopment of the D26 Building is not impacting any physical Utility service that would need to be modified or upgraded.

1.4 Sewer and Sanitary Plumbing System

The sewer connection from the building will be connected to the existing UNSW site sewer infrastructure.

It is anticipated that the proposed Biological Sciences Project Stage 2 sewer drainage system connection will be a minimum 150mm diameter service. Existing connection points will be used for the proposed redevelopment.

The sewer connections from the building have been connected to UNSW site sewer infrastructure at multiple connection points.

1.5 Domestic and Fire Water

The domestic cold water (DCW) service will be supplied from the private UNSW infrastructure via a new water connection and reduced pressure zone device (RPZD). An existing 100mm cold water connection will be utilised from the existing UNSW water main DN 250.

The system will be designed to incorporate potable and non- potable water tanks. The pipework material will be provided in accordance with the UNSW Design and Construction requirements.

UNSW has confirmed that the cold water main has adequate capacity to serve the Biological Sciences Project Stage 2.The Pressure and Flow Statement has been attached.

1.6 Bore Water

The bore water (BW) service will be supplied from the UNSW infrastructure via a new water connection with backflow prevention device. The 100mm new water connection is proposed to be connected to the existing UNSW bore water ring main DN 100.

Treated bore water will be used as source non-potable laboratory water including RO systems.

The bore water system is a non-potable water supply and will be deemed to be a protected water supply. Air gaps and RPZD will be used for significant risk of contamination.

UNSW has confirmed that the bore water main has adequate capacity to serve the Biological Sciences Project Stage 2.

1.7 Natural Gas Services

A natural gas supply will be delivered to the building for mechanical plant, hot water heating and laboratory use and will be connected to the UNSW infrastructure gas main.

The system will have the gas meter and regulator located on Lower Ground Floor. Property isolating valves will be utilised before and after the meter along with filters and regulators. The meter will be fixed in the gas meter room.

1.8 Stormwater Drainage System

Stormwater drainage to the building will be comprised of main roof water and canopy roof drainage. The stormwater water will be directed to the existing UNSW stormwater network. There are no changes to the main roof stormwater catchment area, therefore it is estimated that there will be no increase in stormwater discharge from the existing site.

1.9 Conclusion

The new hydraulic and fire systems will be supplied from the private UNSW infrastructure and do not connect directly to the authority's infrastructure. All connections will be made to the existing UNSW network including potable water, bore water, natural gas, sewer and stormwater.

Following preliminary analysis on the building's hydraulic and fire services requirements, it has been considered that there is sufficient capacity in the UNSW existing infrastructure for the new building development.

- Adequate potable cold water and fire services supplies have been identified for the Biological Sciences Project Stage 2 within the UNSW infrastructure.
- Adequate capacity in the UNSW sewer line has been identified for the Biological Sciences Project Stage 2. Multiple connection points will be provided to UNSW sewer infrastructure.
- Adequate capacity in the UNSW stormwater system has been identified for the Biological Sciences Project Stage 2. Multiple connection points will be provided to UNSW stormwater infrastructure.
- The design incorporates water sensitive urban design principles such as bore water to minimise consumption of potable water and prevent stormwater runoff together with onsite detention associated with Biological Sciences Project Stage 2.
- Adequate natural gas capacity in the UNSW infrastructure has been identified for the proposed loads including mechanical and hot water demand for the Biological Sciences Project Stage 2.

Project Development
Facilities Management
Level 3 Mathews Building
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6 July 2016

Attention: Mr Geoffrey Leeson

RE: STATEMENT OF AVAILABLE PRESSURE & FLOW

The expected maximum & minimum pressure available in the UNSW onsite combined water and fire mains given below, relate to modelled existing demand conditions, either with or without extra flows for emergency firefighting. The provided information below is not to be construed as available for normal domestic supply for this or any other proposed development.

Note: This pressure inquiry is only valid for 6 months from the date of this letter.

Assumed Connection Details

UNSW Street Name: Botany St *(Future 200mm tee on internal main)*	Side of Street: 12m West of Council Kerb and gutter
Distance and direction from nearest cross street	140m South of High Street
Approximate Ground Level (AHD)	52.5 Meters
Nominal Size of Water Main	246mm (ID) HPDE Main

Summary Flow Rates with Property Fire Prevention Demands

	Fire Flow (L/sec)	Pressure Head (M)
Fire Hose Reel Installations (Two Fire Hose Reels Simultaneously)	0.66	25.1
Fire Hydrant/ Sprinkler Installations (Pressure & flow expected to be maintained 95% of the time within UNSW water mains)	5 10 20 30	24.3 23.3 21.0 18.3
Maximum Permissible Design Flow ***	40	15.1
Maximum Mains Flow (Brigade)	55	9.5

**** Note Maximum permissible flows shall not be used to set dynamic pump curves*

Yours faithfully,

Trevor Stocker
Hydraulic Engineer, UNSW FME

Notes on Model

1. Available flow rates were determined using the “PIPES” hydraulic model to calculate pressure head losses throughout the UNSW Campus infrastructure with supply pressures based on Sydney Water Fire Flow Enquiries dated 29 October 2013.
2. The UNSW Kensington Campus is supplied off two independent water supplies from the Sydney Water 750mm main in High Street and in Botany Street.
3. A Sydney Water sectioning valve located between the two supply points enables this connection to satisfy the Grade 2 requirements of the Fire Sprinkler Code AS2118 - 1995

General Notes

1. All water supplies to the campus are metered, including fire hose reel, hydrant and sprinkler water supplies.
2. UNSW maintains double check valves at the boundary connection to the Sydney Water Infrastructure in accordance with Sydney Water requirements.
3. The use of Double Detector checks within the Kensington Campus are not required at hydrant or sprinkler booster installations and should not be installed.
4. TYCO DC03 Double Check Valves is a mandatory requirement for all works.