



Utilities and Infrastructure Management Plan Report

TAFE NSW – Kingswood Campus - Construction
Centre of Excellence

2-44 O'Connell St Kingswood NSW 2747

Revision History

REVISION	DATE	BY	CHECKED	COMMENTS
A	11/12/2020	MK & DL	SMcL	Draft Issue
B	14/12/2020	MK & DL	SMcL	Draft Issue
C	04/03/2021	MK & DL	SMcL	Issued for State Significant Development Application

The recipient of the latest issue as noted above will be responsible for superseding/destroying all previous documents.

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1. Introduction

This report has been prepared to accompany a detailed State Significant Development Application (SSDA) SSD_ 8571481 for the development of an educational facility at the TAFE Nepean Kingswood Campus, located at 2-44 O'Connell Street, Kingswood (the site). The legal description of the site is Lot 1 in DP 866081. The site comprises a rectangular lot with an area of approximately 23 hectares.

The purpose of this report is to provide:

- Information on the existing capacity and any augmentation and easement requirements of the development for the provision of utilities including staging of infrastructure;
- Detail impacts of any existing infrastructure assets of utility stakeholders from demolition/construction and any proposed mitigation/protection measures;
- Determine service demands following servicing investigations and demonstrate that satisfactory arrangements for drinking water, wastewater, and if required, recycled water services have been made.

Specifically, the SSDA seeks development consent for the construction and operation of the TAFE NSW Construction Centre of Excellence (TAFE CCoE) a multi-level, integrated educational facility designed to accommodate specialised training and education for construction-related TAFE NSW courses (the project). The TAFE CCoE will be a new learning environment with an emphasis on flexibility and adaptability, to encourage cross-disciplinary collaboration, industry engagement and educational excellence. On 27 February 2019, the NSW Government announced the delivery and associated funding for the CCoE.

The proposed development is classified as State Significant Development (SSD) on the basis that it falls within the requirements of clause 4, Schedule 19 of the State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP), being 'development for the purpose of a tertiary institution... that has a capital investment value of more than \$30 million'.

The Minister for Planning, or their delegate, is the consent authority for the SSDA and this application is lodged with the NSW Department of Planning, Industry and Environment (NSW DPIE) for assessment.

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) issued for the project. Specifically, this report has been prepared to respond to the Infrastructure Management Plan section 14 of SEARs Report.

2. Existing Utilities and Infrastructure Capacity and Future Requirements

2.1. Electrical

2.1.1. Maximum Demand

JN undertook a preliminary maximum demand calculation based on area schedule and space function brief outlined on the Structure Plan and the preliminary architectural drawings. Some assumptions provided around the estimated energy consumptions for lighting, power, and mechanical services per square meter for each space type in accordance with AS3000 as depicted on Table 1.

The overall anticipated maximum demand is approximately **970 kVA** (1400 Amps).

PROJECT NAME:

TAFE NSW - Kingswood Campus - Construction Centre of Excellence

PROJECT NO:

N0200816

DATE:

09.12.2020

VERSION

V3

ELECTRICAL MAXIMUM DEMAND

Room	Area	VA/m ²		Total VA/m2	Total kVA	A/Phase
		Mech	Lighting & Power			
Learning Spaces	1551	80	50	130	202	291.04
Workshop	3854	25	95	120	462	667.55
Work Space	927	50	50	100	93	133.80
Industry Engagement	552	50	50	100	55	79.68
Other (Circulation and Amenities)	1517	10	10	20	30	43.79
Comms Racks	-	-	-	-	64	92.38
Café	-	-	-	-	63	90.94
Total Load	8401				969	1399.18
MAXIMUM DEMAND	1399 A/Phase					
Total VA/m ²	115					

Table 2.1.1: Maximum Demand

2.1.2. Incoming Power Supply

Due to the high-power demand for the new Construction Centre of Excellence, a new dedicated substation of **1000kVA** in accordance with Endeavour Energy EE (The electricity distributor for Kingswood) standards and requirements will need to be established.

The new proposed substation will require a High Voltage HV connection to Endeavour Energy network, further reviewing Endeavour Energy GIS drawings, Dial-Before-You-Dig and the available information about existing services; there are two HV lines in the vicinity of the new construction centre of excellence.

HV lines and existing substations are shown in green on Figure 1:

- Spur/Dial TAFE High Voltage Line, and
- Spur/Dial Western Sydney University High Voltage Line

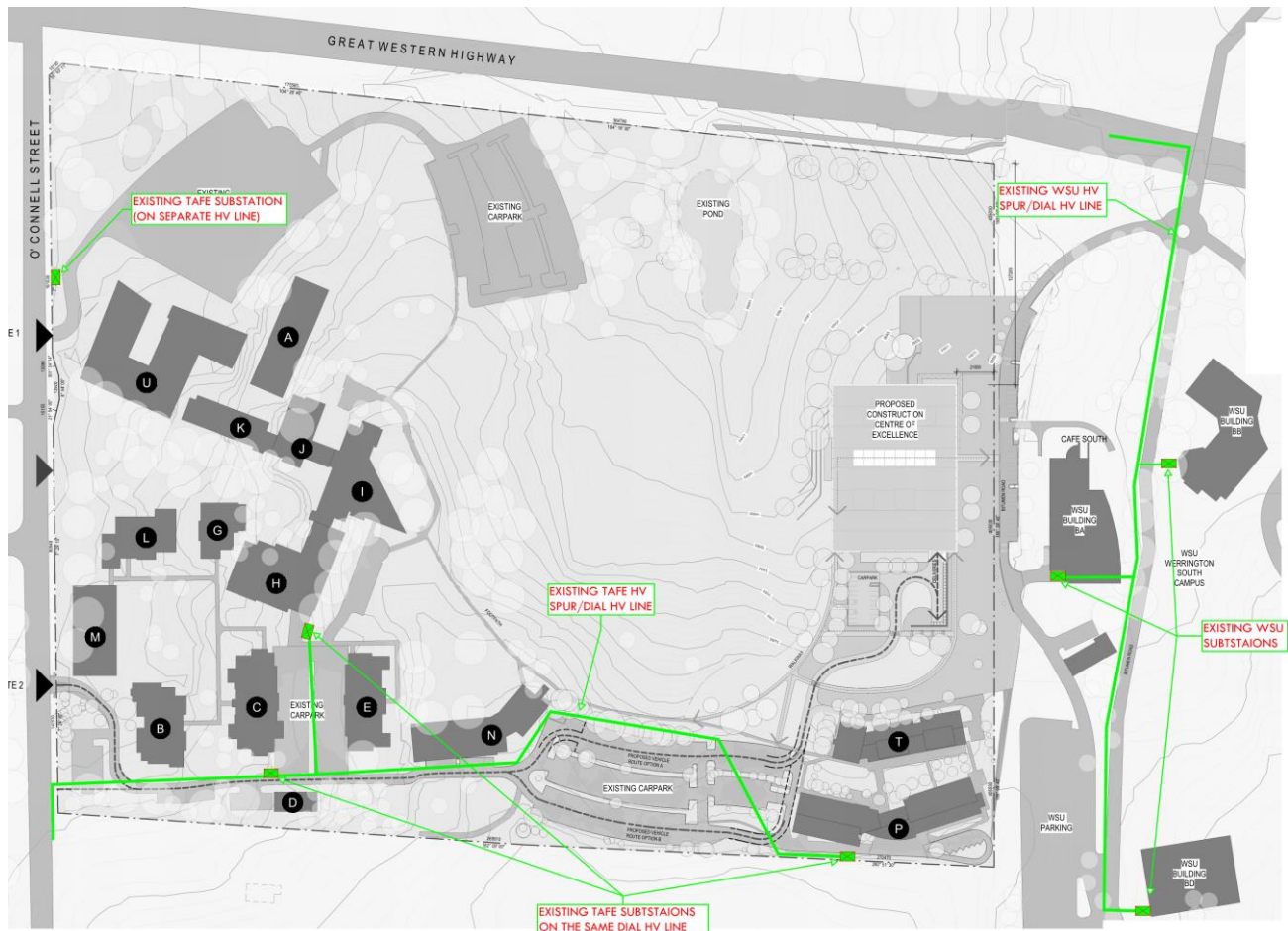


Figure 2.1.1: Existing High Voltage Lines in the Vicinity

Both HV lines are a Dial/Spur type, which means that they are a single dedicated line feeding the property and are not looped back to Endeavour Energy network. This type of lines has limited capacity, and due to the current number of substations connected on each line, we may not be able to establish the HV connection by a simple cut and joint to one of these Dial HV lines and we may be required to run new HV line all the way back to O'Connell Street in order to loop back to Endeavour Energy main network.

JN have submitted a connection application to Endeavour Energy with the proposed connection methodology to be assessed and in order to retrieve more detailed information about the existing HV network and line capacities. (Refer to attached Connection Application for reference).

2.1.3. Connection Methodology

HV Connection from TAFE Spur HV Line

The proposed method of connection submitted to Endeavour Energy, is to get the new HV connection to the new substation from the existing TAFE HV line that is running at southern end of the campus, just behind Block P. The connection can be achieved by either cut and joint two HV cables to the existing line or terminating one HV cable into the existing substation S.17337 by upgrading the HV side of the substation.

The new cable reticulation will require trenching with easements for underground conduits and pits from the new substation to existing substation next to Block P as depicted in red on Figure 2;

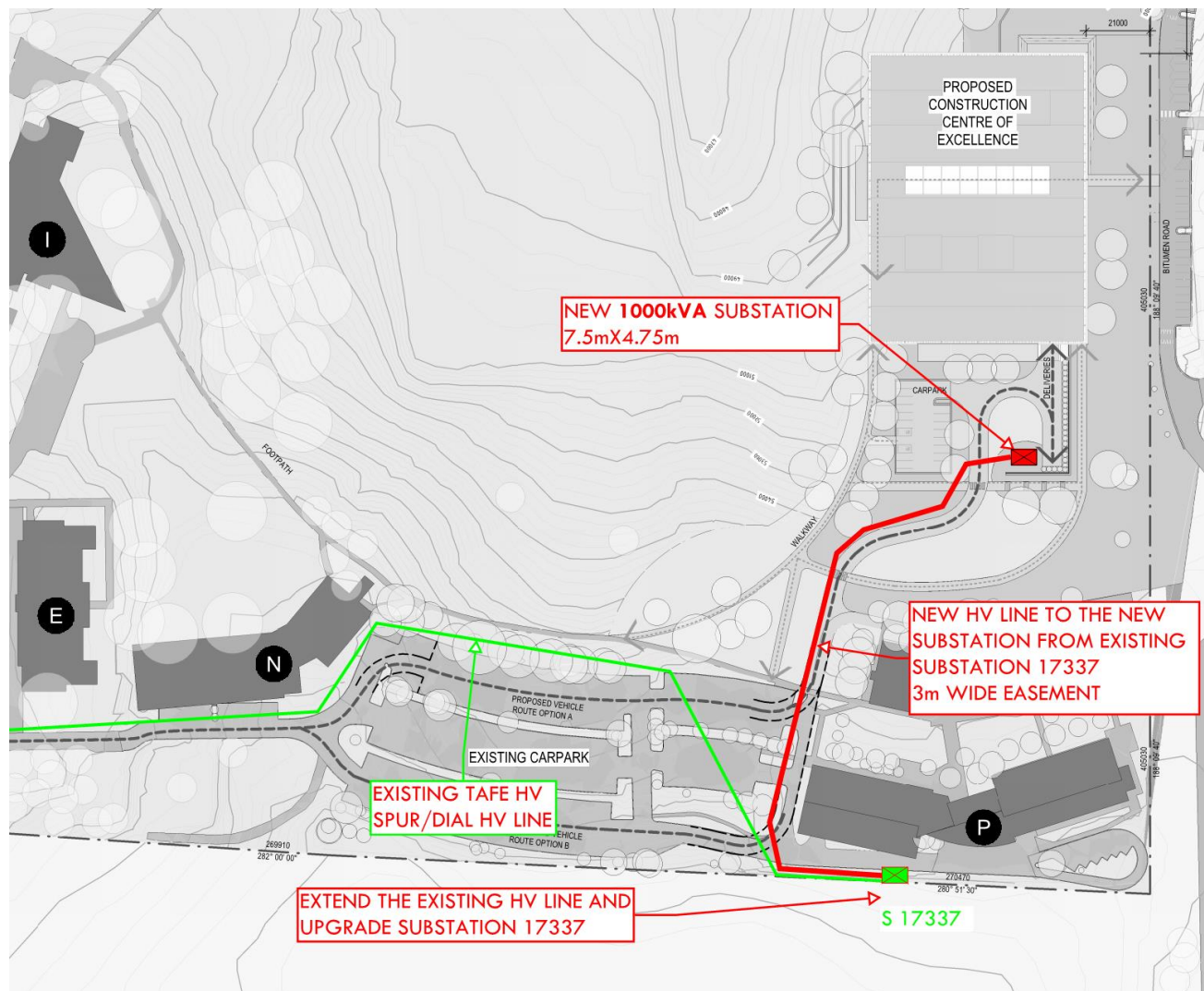


Figure 2.1.2: HV Connection from TAFE HV Dial Line

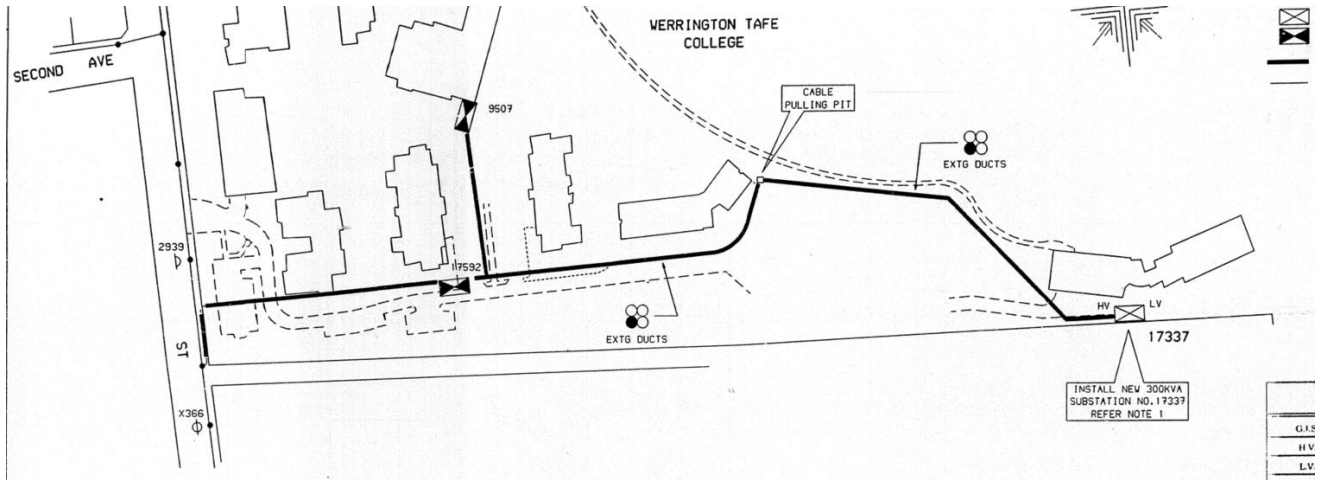


Figure 2.1.2: DBYD existing HV services in TAFE

2.1.4. Endeavour Energy Easement requirements

All Endeavour Energy assets will be designed and installed in accordance with EE standards and regulations that requires dedicated easements that cannot be shared with other services and requires 24/7 access.

Pad mount Substation Easement requirements:

- The 1000kVA pad mount substation requires an easement of 7.5m x 4.75m cleared of all services and structures,
- Substation location should **not** be within 1 in 100year flood zone,
- Substation location should **not** be on overland flow path,
- Must be within 5m of accessible driveway,
- Substation easement to be level with slight cross fall of 2%,
- Area adjoining the substation easement to have maximum slope of 1 in 3,
- Need Fire and Noise zone; any building structure/material with 3m to be 120/120/120 FRL
- No Hydrant boosters within 10m,
- Substation should not be within 30m of water pools.

Underground Cable Easement requirements:

- Minimum 3m wide, 6m wide required where cable jointing and turning pit are required or where ducts are discontinuous,
- Should not be under the driveway pavement adjacent to driveway (allowed to be installed under footpath)
- Must be clear of all services and structure (Services are not allowed to run parallel inside the easement, they can only cross perpendicular to the easement)
- Cable easement should not be run inside the drainage easement
- No structures are to be installed over the cable easement (except for footpath or turf)
- No trees to be planted over the easement (Some small shrubs are acceptable as long as roots do not go deeper than 400mm)

Heavy Vehicle Right of Access Way requirements:

- Minimum 5.5m wide and wider in areas to allow for manoeuvre associated with traffic swept path,
- Maximum gradient 1 in 15
- Clear to sky headroom along access way,
- Must be capable of supporting up to 30 Tons 12.5m long truck
- 24 hour 7 days a week access from public street required (If there is a gate it must be fitted with EE approved locks).

Pits for cable jointing and cable turning requirements:

- Design by suitably qualified structural engineers and approved by Endeavour Energy,
- Pre-cast concrete,
- If in roadway must be fitted with appropriate lids – Class C or D,
- Pits need to be contained within Endeavour Energy easement,
- Pits cannot be shared with other services.

2.2. Potable Water

Currently the TAFE site is served by an 80mm water meter located at the Western boundary on O'Connell St. This meter is proposed to be upgraded to a 150mm water meter and water main connection to allow for the CCOE CW water requirements as well as future use. From the upgraded water meter, a new water service is proposed to extend to the new building. This path was chosen to combine trenching and follow the path of the upgraded access road.

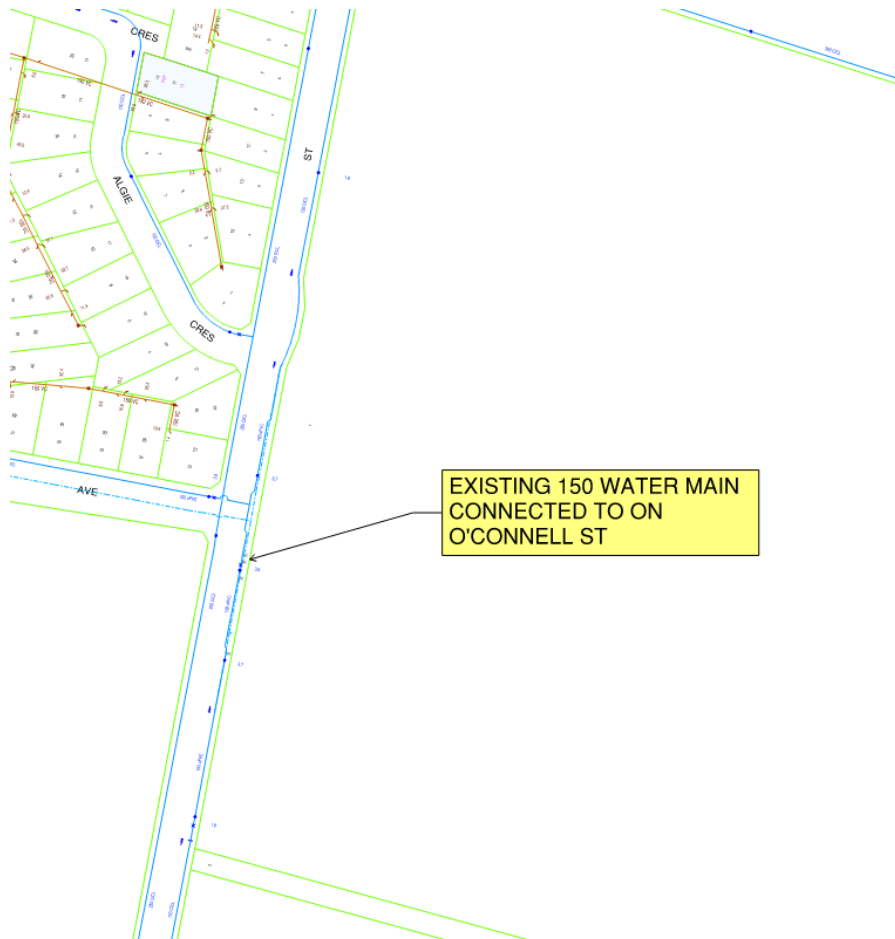


Photo: Existing CW Domestic Connection to water mains

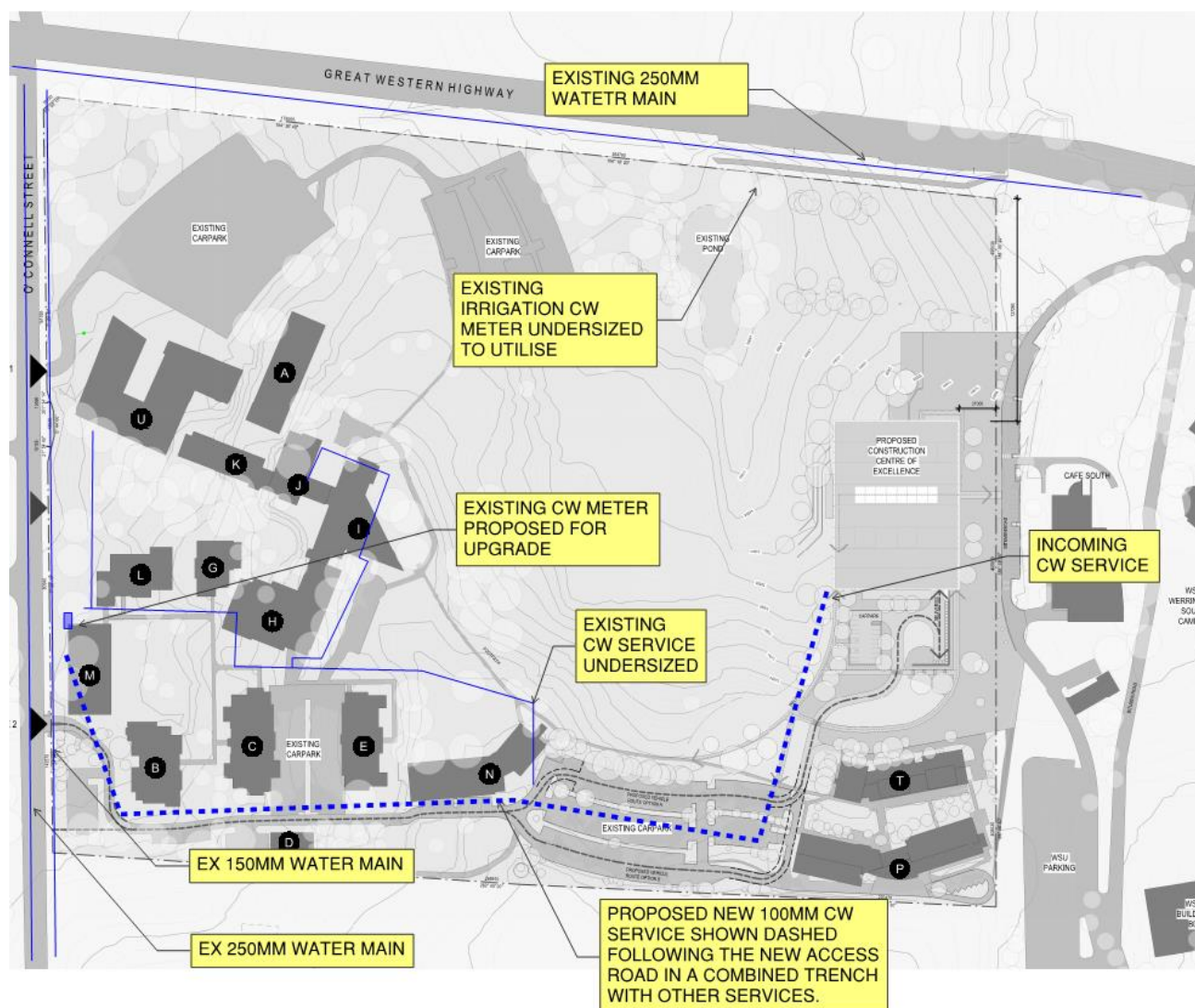


Photo: Proposed water service path

JN undertook a preliminary Potable Cold Water Usage Calculations for the new TAFE NSW Construction Centre of Excellence (CCOE) building based on Sydney Waters Average Daily Water usage spread sheet. Future proofing with a 25% additional water usage factor has been applied. Preliminary results as follows.

Daily Water Usage		
Room	Area m2	L/Day
Learning Spaces	1551	3520.77
Work Shop	3854	10868.28
Work Space	927	2104.29
Industry Engagement	552	1253.04
Other circulation space / amenities	1517	3443.59
Total litres per day building water usage		21189.97
Additional 25%		26487.4625

Water pressure for a building of this nature would typically be between 250Kpa Min and 500Kpa Max. The expected probable simultaneous flow rate is between 4.5 L/sec and 5.5 L/sec allowing for some full flow fixtures like showers and TMV / Backflow prevention training rooms.

Available pressure and flow results from the 150mm Sydney Water main on O'Connell Street have been received with favorable flow results.

CW pumps at the new CCOE building are expected due to the length of pipe required to reticulate to the building. These pumps would be Vertical multistage / variable speed drive pumps to reduce water hammer and to save power.

Cold water services will extend to each individual fixture as located by the architect. Cold Water sub metering for the new building will be incorporated to meet Green Star requirements. Piping material will be copper tube internally and MDPE for external inground water services.

Sydney Water are to be approached in regard to feasibility review of their water mains assets and new connections prior to an official Section 73 application that would be submitted post DA approval.

Dial Before You Dig diagrams indicate no Sydney Water services are within close proximity to the building and it should not have any adverse impact on Sydney Water Existing infrastructure physically pending Sydney Water plan approval post DA.

Tap ware throughout the facility is to be compliant with the WELS tap ware labelling scheme.

2.3. Sanitary Drainage

Sanitary Drainage will be documented with connections to the existing sanitary drainage infrastructure on site. Pipe work will be designed to connect to the individual fixtures as located by the architect. Piping material will be HDPE for Green Star.

The site is currently serviced from the 225mm VC (vitreous clay) sewer main located in the North Western corner of the site extending across O'Connell St near the Great Western Highway and through the neighbouring residential properties. Sydney Water are to be approached in regard to feasibility review of their sewer assets and new loads prior to an official Section 73 application that would be submitted post DA approval.

Dial Before You Dig diagrams indicate no Sydney Water assets are within close proximity to the building and it should not have any adverse impact on Sydney Water Existing infrastructure physically pending Sydney Water plan approval post DA.

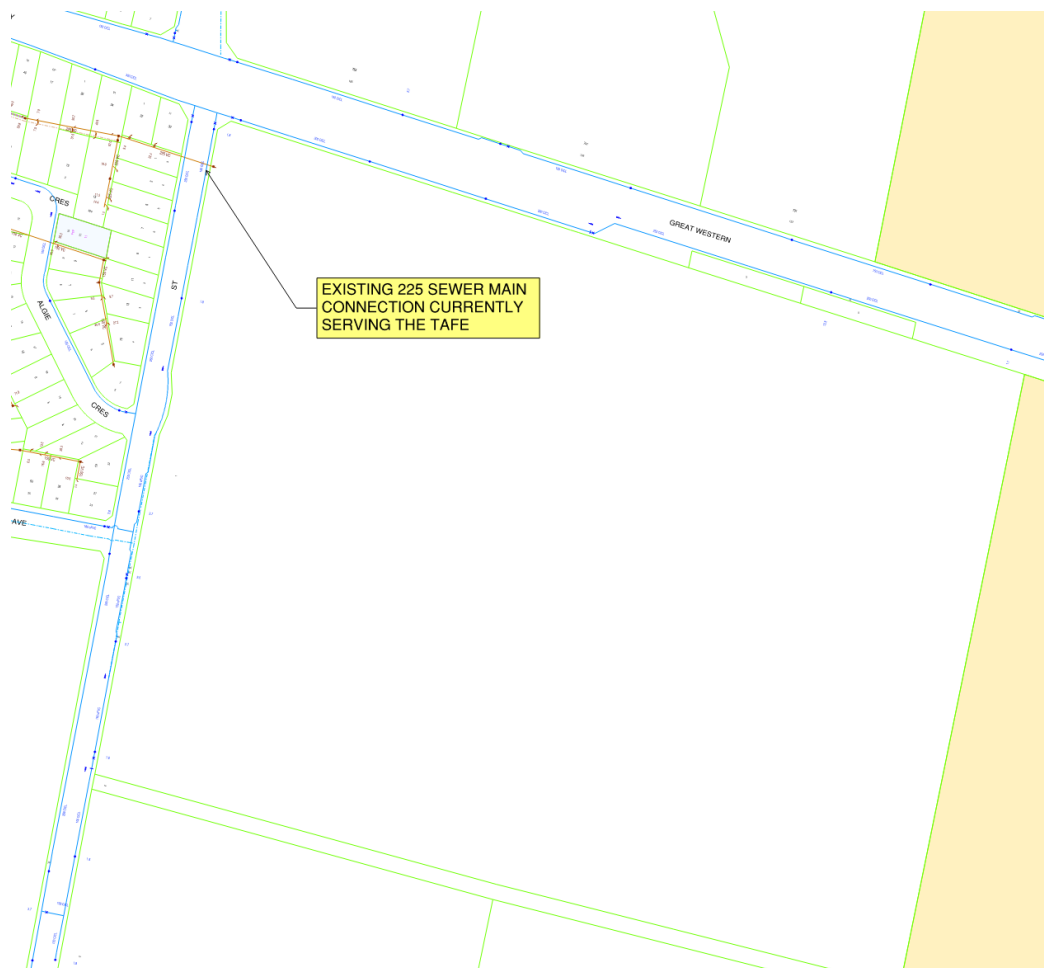


Photo: Sydney Water Diagram showing main sewer connection.

The existing sanitary drainage path has been shown approximately and is based on existing drawing records.

A gravity sewer connection from the CCOE building has been indicated on the following diagram along with a sewer pumping station and a rising main. The sewer gravity connection is pending survey for pipe size and invert level confirmation but is not expected to be suitable for use based on the existing building P having to have a pump out station installed and the general layout of the land and existing sewer location and capacity.

A sewer pumping station would be design with dual macerator pumps and 24 hr storage in case of system malfunction.

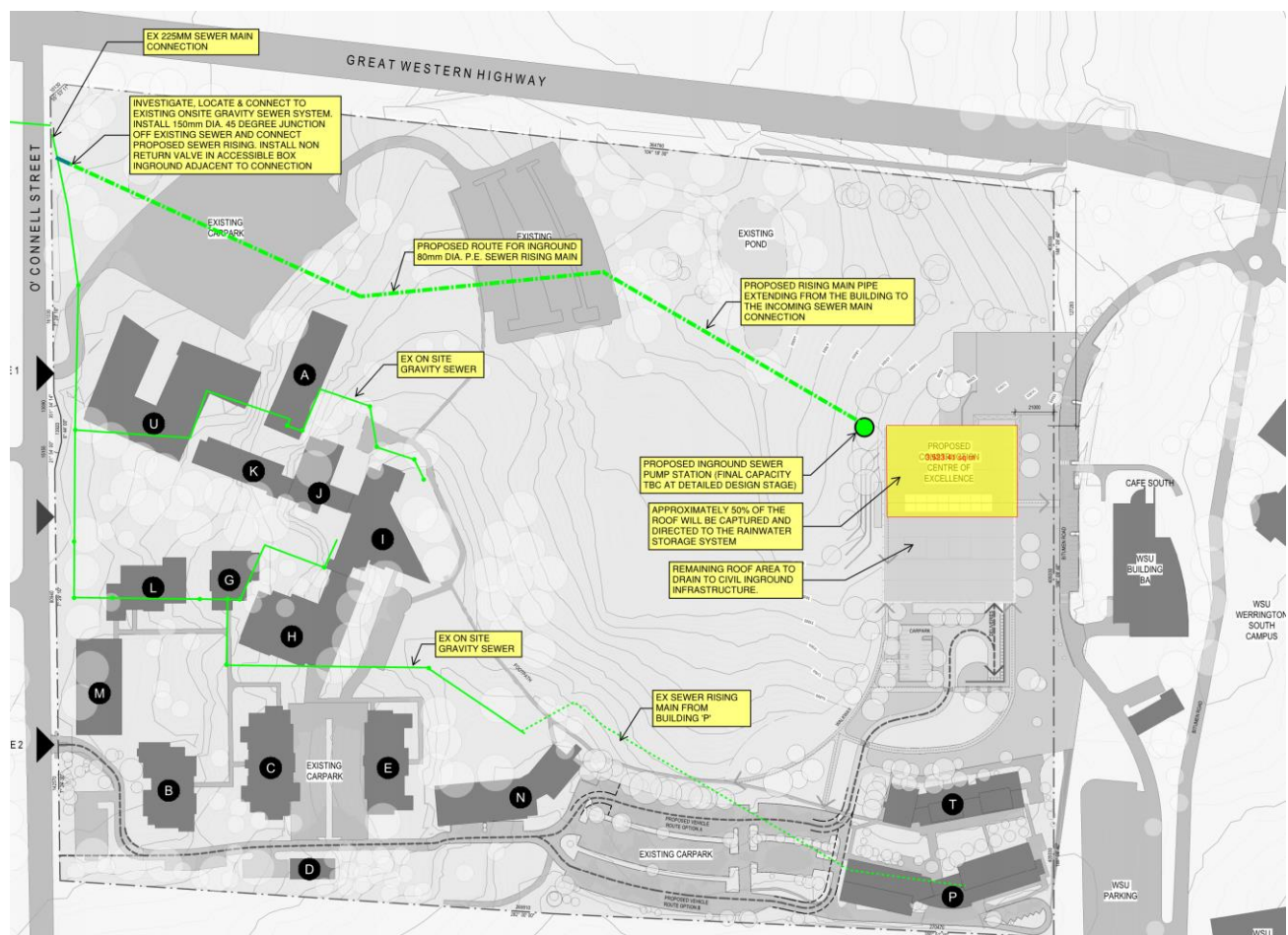


Photo: Proposed connections to the existing site sewer

2.4. Gas

Currently the site has a gas meter and piping system arrangement connected to the existing high-pressure gas main on O'Connell St. This existing connection at the Western boundary is expected to be retained.

A new application to Jemena for an upgraded load demand will be submitted to confirm the pipe size into the existing regulator/meter enclosure is sufficient.



Photo: Existing gas meter (high pressure meter and reg set)

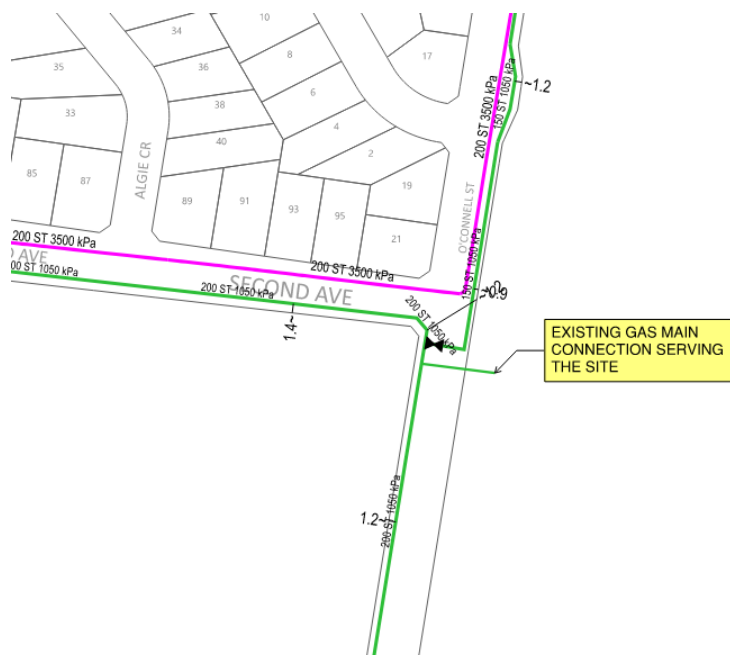


Photo: Existing gas service coming into the site.

It is proposed that a new, upgraded meter set and pipe supply to the new building be installed. This new gas service will share a trench with the new CW pipe from the existing meter location, reticulating at 100kPa and reducing pressure at the building envelope to keep service pipe sizes down.

See below drawing markup of the expected new piping supply from the meter location. Sub metering of the gas service will be Included. Piping material will be copper tube and MDPE.

Currently there is no JEMENA infrastructure assets within the proposed new build area.

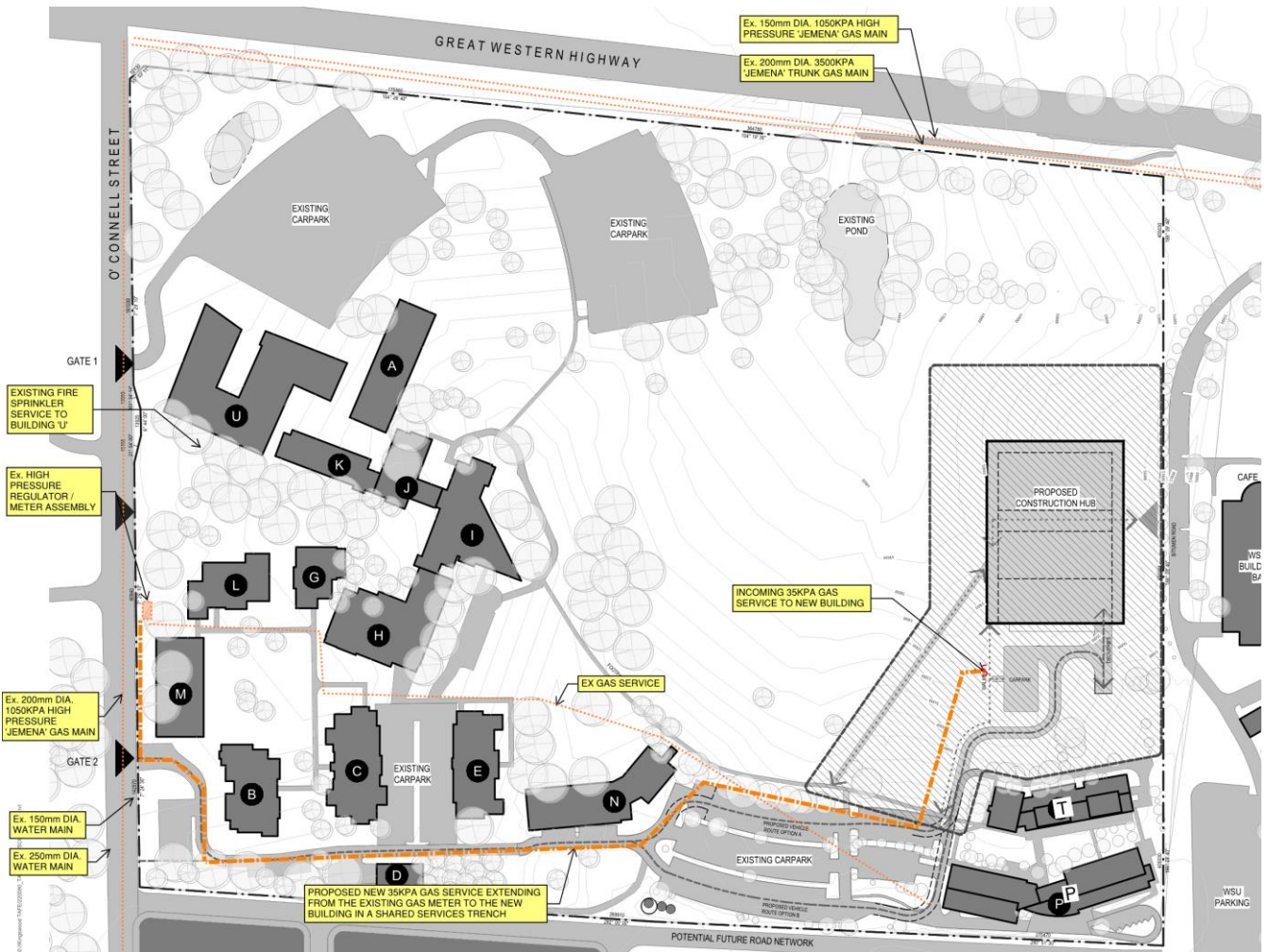


Photo: Proposed new gas service path to CCOE

