

The engineer in his own way is an artist too - and not just a dead fish with a slide rule.
Jørgen Varming

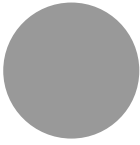
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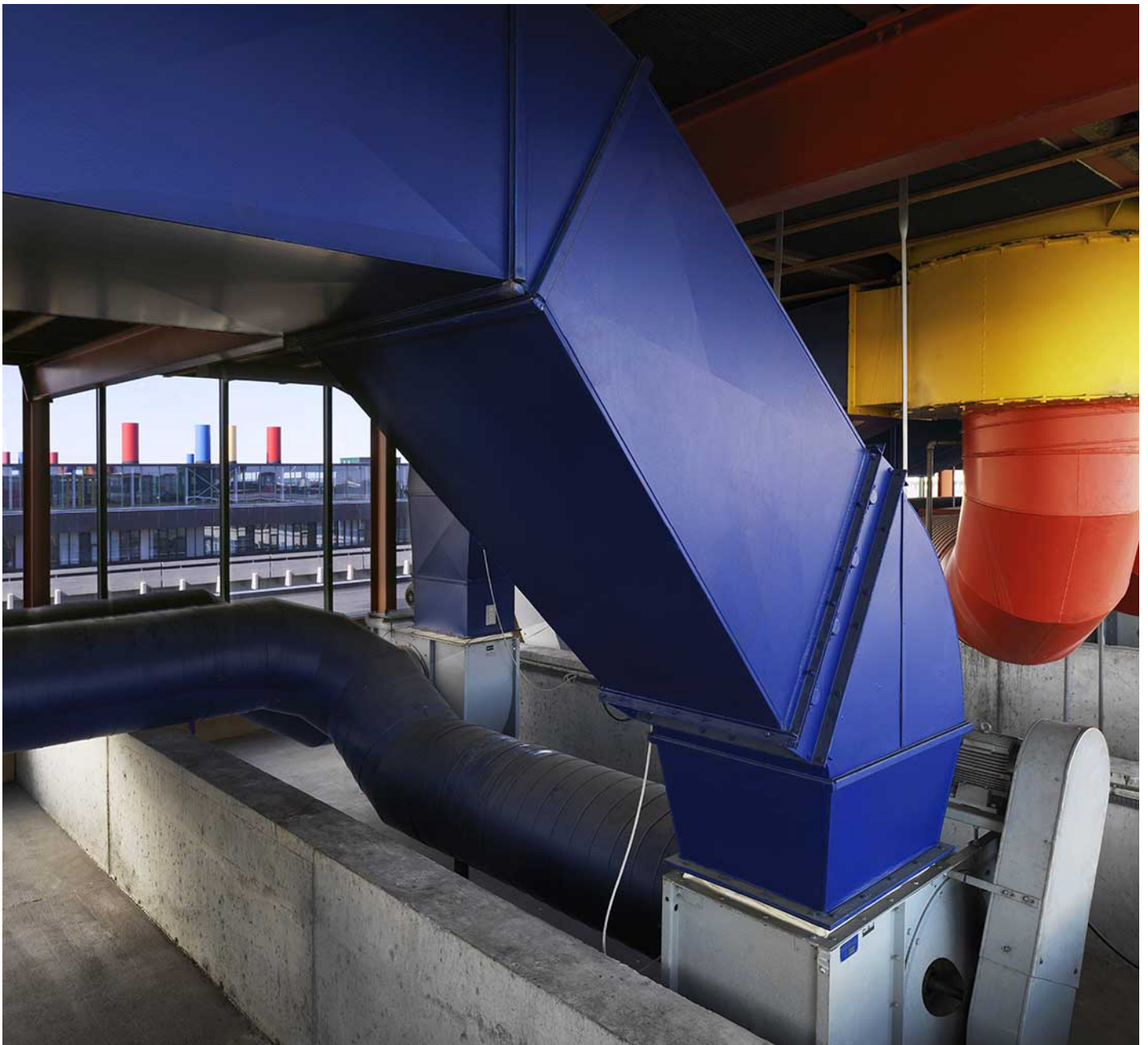
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BUILDING SERVICES

STEENSEN VARMING



The University of Sydney F23 Administration Building Infrastructure Management Report



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1.0 Introduction

This Infrastructure Management Report has been prepared by Steensen Varming and Acor in response to the Secretary's Environmental Assessment Requirements for SSD 7055 – F23 Administration Building, item 13 'Utilities'.

1.1 Reference Documents

The following documents have been referenced in the formulation of this Infrastructure Management Plan.

1. Architectural Drawings prepared by Grimshaw, April 2016.
2. The University of Sydney Design Standards.
3. The University of Sydney – ICT marked up drawings 'Communications Ducting Re-working for proposed Building F23'. – dated 29-7-2015.

1.2 Existing Services

All existing services affected by the construction of the F23 Administration Building will be :

- Capped, sealed and removed, if redundant; or
- Isolated and relocated if the service is to be retained.

All works associated with the capping, diverting or connecting to the existing university services infrastructure is to be co-ordinated with Campus Infrastructure Services (CIS) prior to any works being carried out.

Figure 1 below identifies the proposed site location in regards to the existing in-ground services survey. The extent of services capping, isolation and diversion shall be detailed within subsequent design phases of the project.

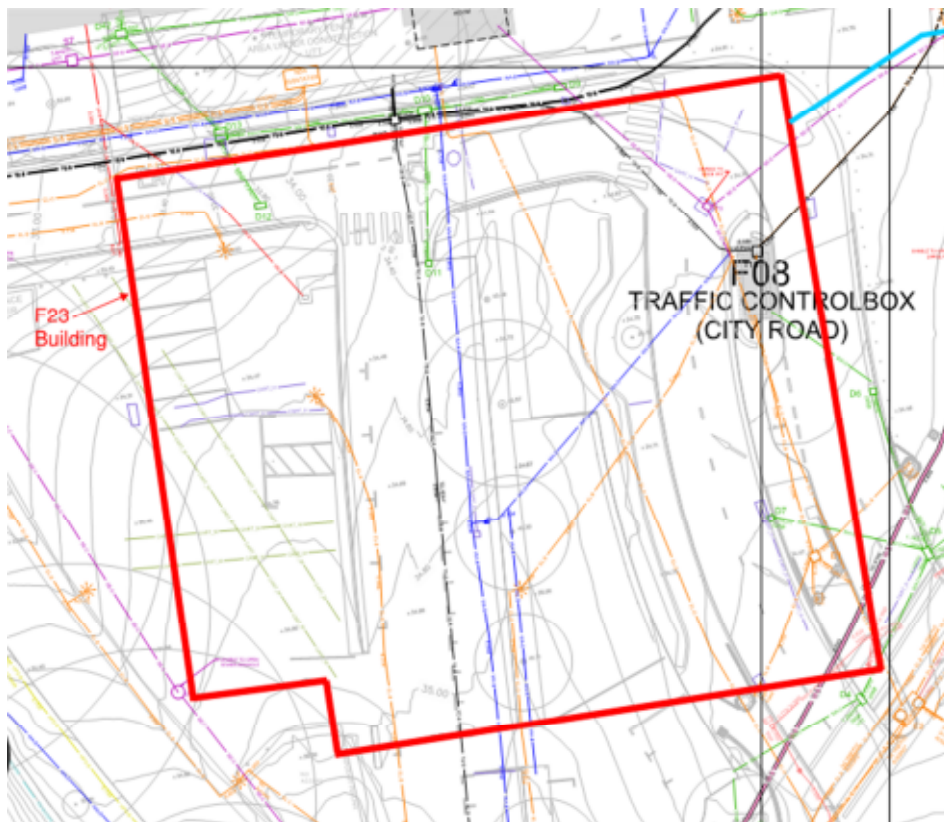


Figure 1

2.0 Electrical

2.1 Electrical Infrastructure

The preliminary diversified maximum demand for the F23 Administration building is approximately 870kVA or 1,255 Amps / phase , with the electrical supply to be obtained from a new Regional Main Switchboard located within the LEES1 development.

The new LEES1 development will be located on the opposite side of Eastern Avenue, nearby the new F23 Administration building and will incorporate the development of a new chamber substation. This new chamber substation will service a new Regional Main Switchboard within the LEES1 building, which will then inturn service the following three buildings.

- F07 - LEES1 laboratory building
- Carslaw building (existing)
- F23 – Administration building
- F09 - Madsen building

Underground submains enclosed within UPVC conduits will extend from the LEES1 Regional Main Switchboard to the F23 Main Switchboard.

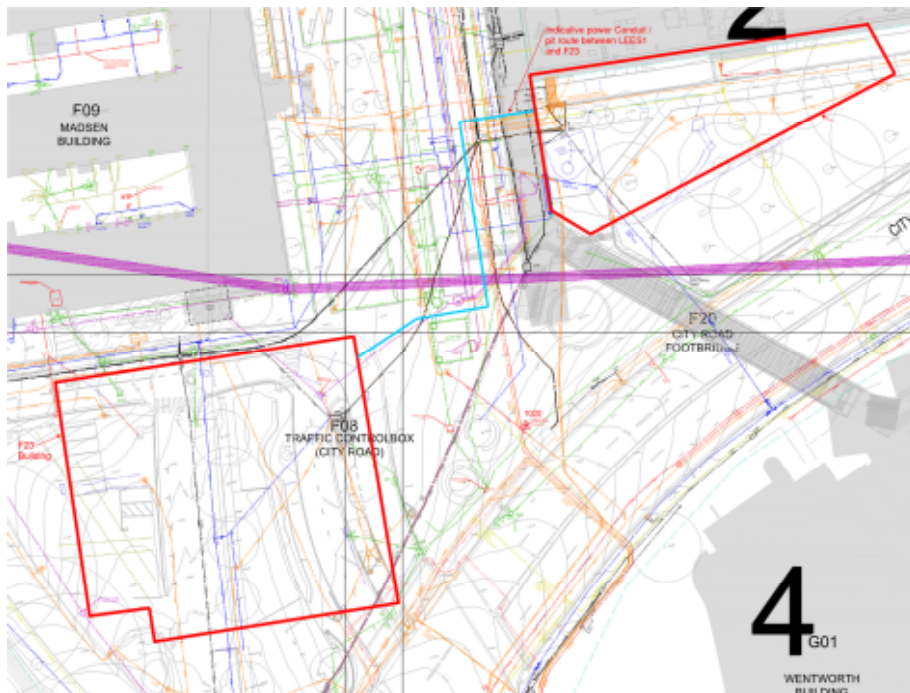


Figure 2

3.0 Communications

3.1 Communications Infrastructure

The communications infrastructure comprising both optical fibre and copper cabling, will be an extension to the existing University owned and operated system. Underground conduit and pit provisions will be installed to provide two communication points of entry into the F23 building. The University ICT will supply, install and terminate lead-in communications infrastructure into the F23 building via the above mentioned conduit and pit network.

All communication conduits and pits shall be for the exclusive use of University communications cabling.

The existing underground communications cabling shall be diverted prior to excavation of the site.

Figure 3 below represents information provided by the University ICT, that outlines the required site works to be undertaken by University approved infrastructure ICT installation contractors.

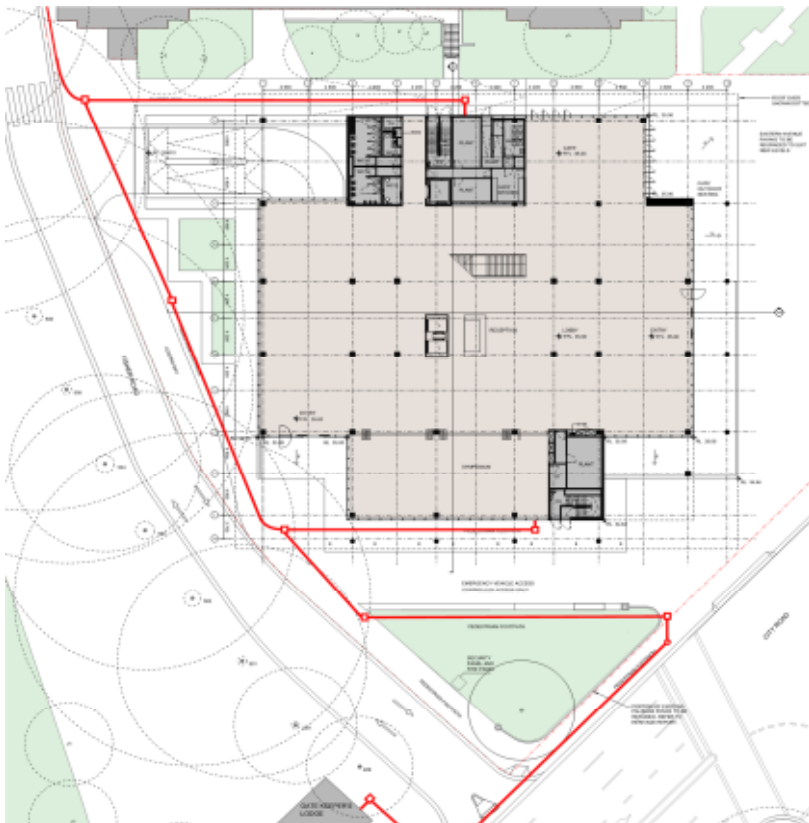


Figure 3

4.0 Hydraulics

4.1 Hydraulic Infrastructure

Figure-4 below indicates the approximate location of the hydraulic service connections into the existing and proposed Sydney University Infrastructure local to Fisher Road.

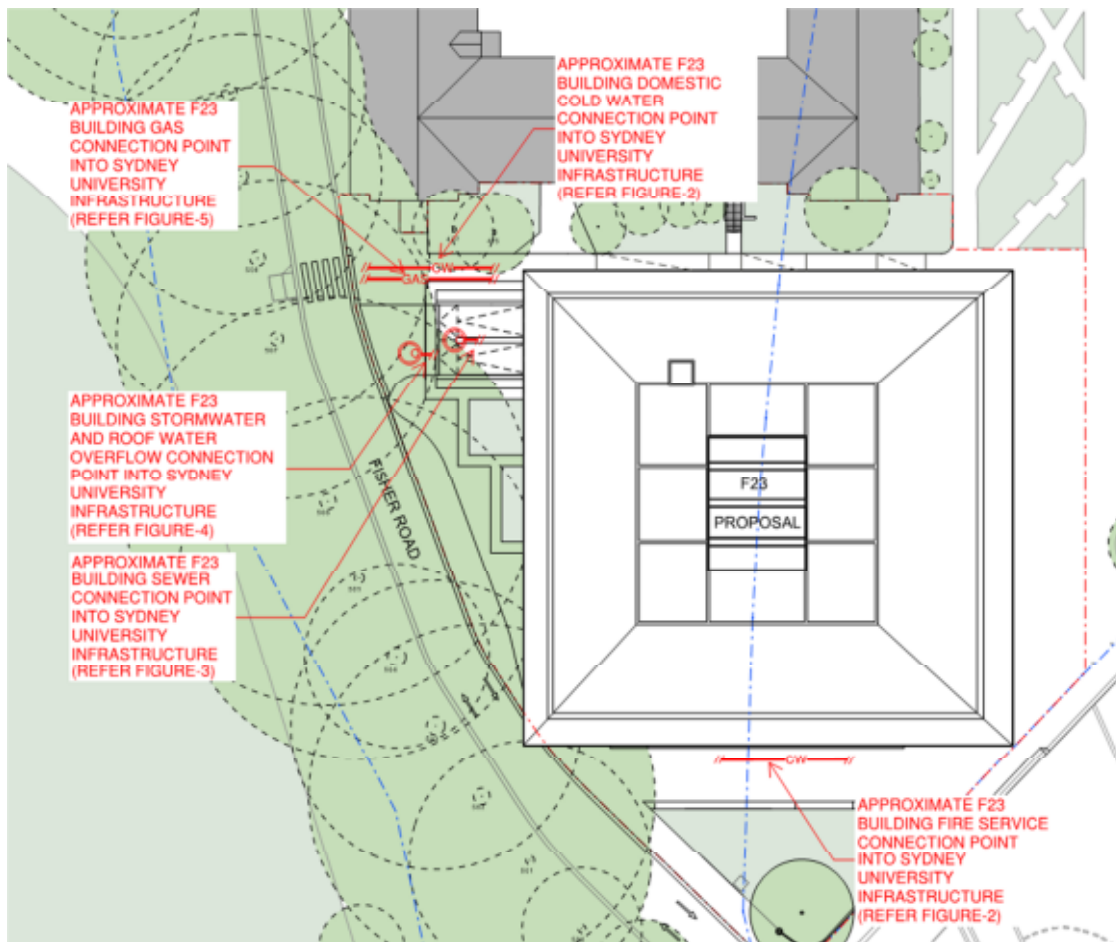


Figure 4

4.2 Water

The calculated Probable Simultaneous Flow (PSF) for the domestic cold water supply to the proposed F23 Building development has been calculated at 6.0 L/sec.

The domestic cold water will be supplied via 80mm connection from the existing Sydney University Infrastructure located on Fisher Road.

A separate 150mm connection from the existing Sydney University Infrastructure will be extended to serve the Fire Services within the proposed F23 development.

Figure-5 below indicates the proposed location of the domestic water and fire service water connection point.

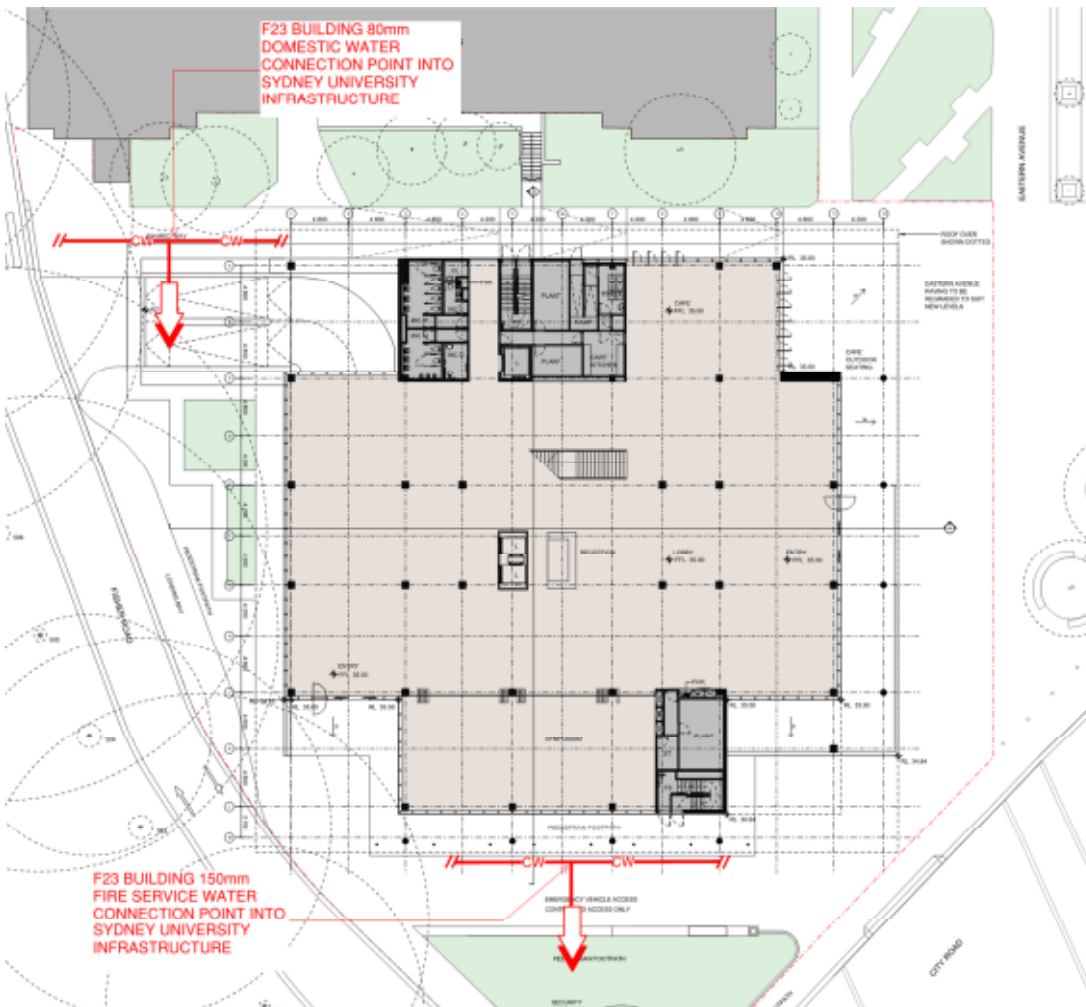


Figure 5

4.3 Sewer Drainage

The anticipated sewer Fixture Loading Units of the proposed F23 Building has been calculated at 300 Fixture Loading Unit.

The proposed F23 development, will be served via 150mm sewer drainage line connected into the new relocated sewer maintenance hole (MH S/1) at Invert Level 31.109.

The grease arrestor proposed to be located between the existing and the proposed F23 Building will connect into the main sewer drainage system via gravity.

All connection points and final construction invert levels will be determined during detail design phase of the project.

Figure-6 below indicates the proposed sewer connection point.

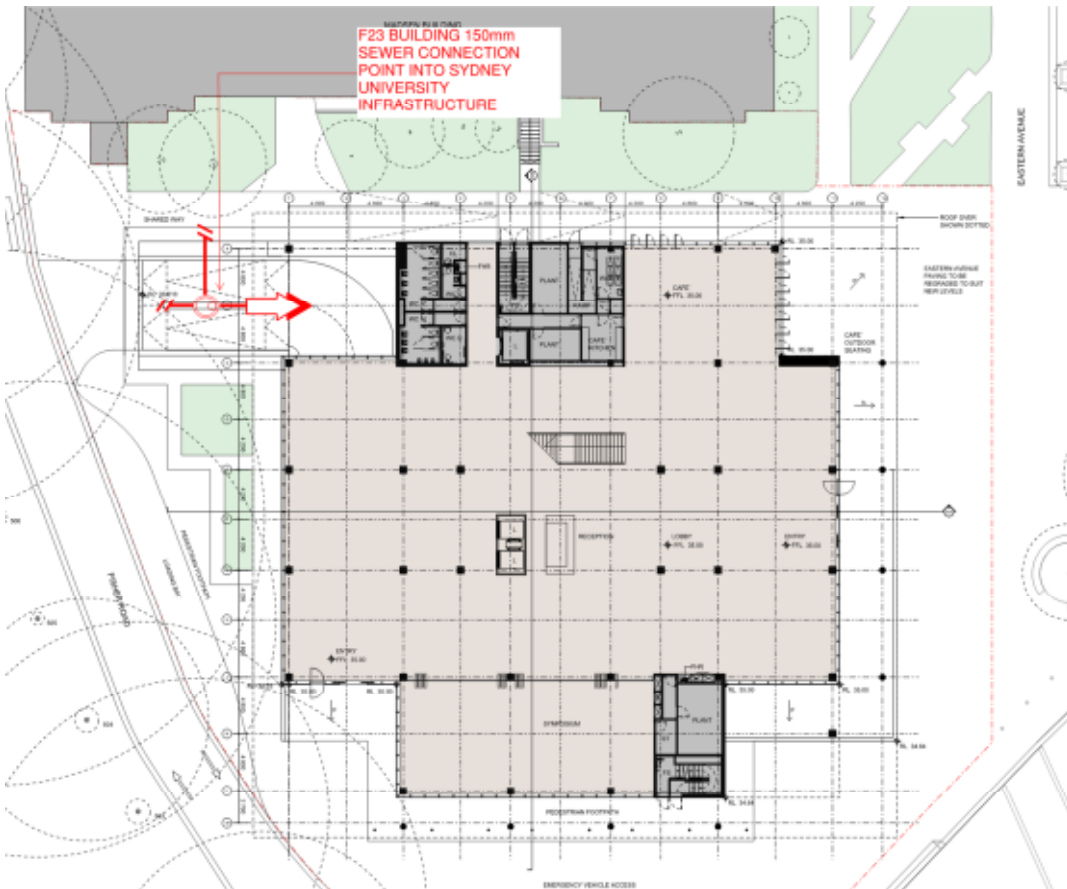


Figure 6

4.4 Roofwater

The Calculated 1:100 ARI from the roof is approximately 205L/sec.

Approximately fifty percent of the roof will be collected/conveyed and discharged into the 70,000L effective capacity rainwater harvesting tank located below ground outside the perimeter of the proposed F23 Building.

Overflow from the roofwater tank will discharge by gravity to the existing Sydney University stormwater system via a junction pit located west of the proposed basement entry ramp.

Roofwater captured will be treated and reticulated as Non-potable Cold Water for sanitary flushing and external hose tap for landscape irrigation.

The other fifty percent of the roof plus surface rainwater collected from the terrace and balconies will piped and conveyed by gravity into the existing Sydney University stormwater system via a stormwater pit located west of the proposed basement entry ramp.

Basement-1 carpark surface rainwater and sub-soil drainage will be collected and conveyed by gravity into the sub-soil tank located under Basement-2. Pumped discharge sub-soil tank will be piped and connected into the building stormwater gravity system complete with non-return valve.

Figure-7 below indicates the proposed stormwater connection point.

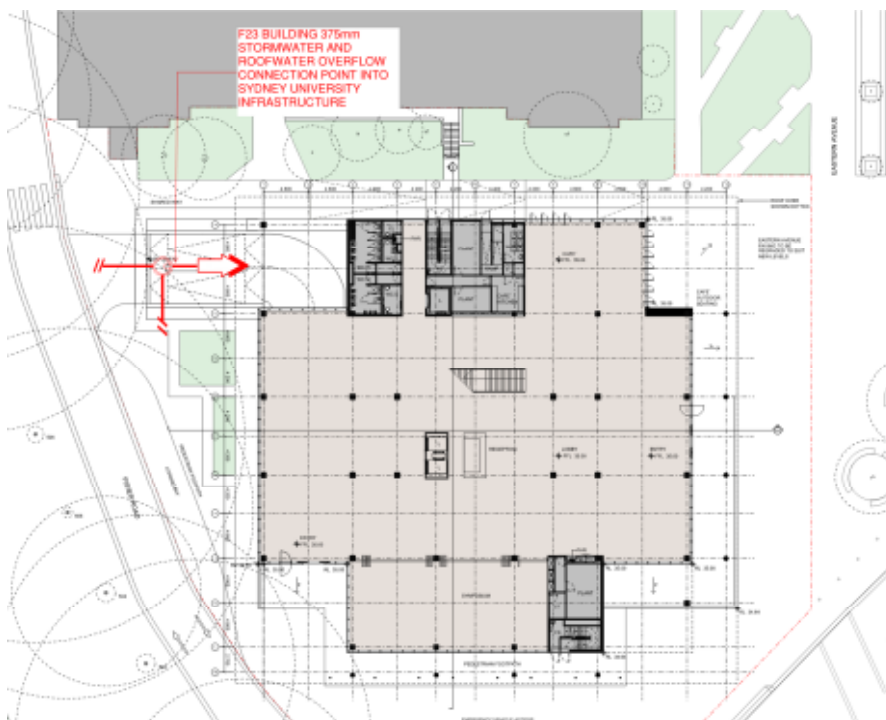


Figure 7

4.5 Gas

The anticipated total Mega Joule (MJ) loading of the proposed natural Gas System for F23 Building has been calculated at 3,600MJ:

- Mechanical = 2000MJ
- Domestic Hot Water heating = 400MJ
- Café and Commercial Kitchen = 1,200MJ.

Gas supply to the proposed F23 development will be served via a connection to the existing Sydney University gas infrastructure, complete with Authority gas meter and regulator assembly.

An 80mm main gas supply will reticulate throughout the building at the low pressure to service all gas appliances.

Figure-8 below indicates the proposed gas connection point.

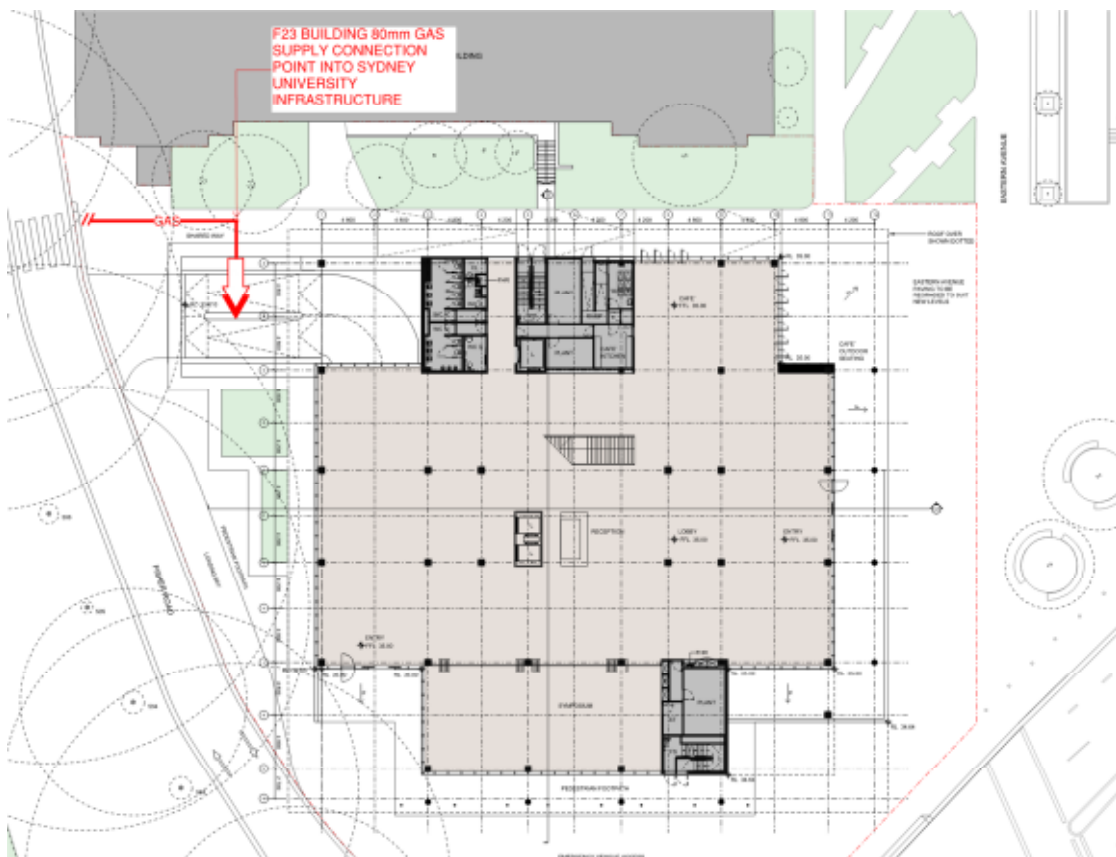


Figure 8

5.0 Fire Services

5.1 Fire Water Supply Infrastructure

A new 150mm connection into the existing Sydney University Infrastructure water main, will be extended to supply the water to serve the Fire Services within the proposed F23 development.

Subject to final flow testing a fire water storage tank infill from the potable water supply may be required to extend to a new fire water storage tank at roof level from the approved water supply connection.

Provision of new combined fire hydrant / sprinkler booster assembly and hydrant feed will be required on the southern side of the building.
Refer to the clause 'Water' which indicates the proposed location of the domestic water and fire service water connection point.