

HYDRAULIC & FIRE SERVICES INFRASTRUCTURE MANAGEMENT PLAN

UNSW Science and Engineering Building



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2. AUTHORITY SERVICES

Sydney Water, Water & Sewer Infrastructure

The potable water supply to the University site is currently serviced by multiple water supply connections to the Sydney Water Corporation (SWC) water main through various locations along Botany Street, High Street, Anzac Parade and Barker Street. Each connection is fitted with individual water meters to monitor water usage and connected to the University's SCADA system.

The University's Campus' Fire services supply is provided from potable cold water reticulation throughout the site.

The sewer drainage for the University site is currently serviced by multiple connections to the Sydney Water Corporation (SWC) sewer main through various locations along Botany Street, High Street, Anzac Parade and Barker Street.

A 300mm diameter SWC sewer main connection is located on the eastern side of Anzac Parade adjacent to the Tyree Building. This main then extends west and connects to the Sydney Water 300mm diameter sewer main.

A catchment analysis is currently being undertaken to confirm the adequacy of the existing sewer and water main network to supply the additional water and sewer demands that the development will produce.

Jemena Natural Gas Network

The University's site is currently serviced by a 100mm diameter Jemena secondary high pressure natural gas main located in Botany Street and High Street. Staging regulators and gas meters positioned adjacent to the authority's mains connections, provide the 100kPa natural gas supply to the all existing buildings and surrounding facilities.

Jemena has verbally advised that there is adequate capacity within the Natural Gas Network System to supply the proposed Development.

A written application for additional gas loading will need to be lodged to the University's current Natural Gas retailer.

3. BUILDING SERVICES REPORT

The following services shall be covered within the investigation:-

HYDRAULIC SERVICES

- Sewer and Trade Waste Drainage
- Potable Cold and Hot Water
- Bore Water
- Treated Bore Water
- Natural Gas Service

FIRE SERVICES

- Fire Hydrant Service
- Fire Hose Reel Service
- Fire Sprinkler & Detection System
- Fire Detection & Alarm System
- Sound System and Intercom System for Emergency Purposes / Building Occupant Warning

HYDRAULIC SERVICES

Sewer and Trade Waste Drainage

The site drainage will drain to a proposed new 225mm sewer main connection point located on the corner of International Road and Union Road. This sewer connection point will be provided as part of the Lower Campus Infrastructure Works. The 225mm sewer then connects to the existing 300mm diameter SWC sewer main crossing Anzac Parade from Day Avenue.

A second sewer connection option is via a new sewer main connection which will be located just south of Third Avenue and drains down Gate 2 Avenue to the Sydney Water sewer main located in High Street.

Potable Cold Water

The existing site is serviced with a mains pressure water service supplied via the multiple water supply connections to SWC water mains. 100mm diameter water meters complete with wireless monitoring and dual RPZD's (backflow prevention valves) are situated at the Building's incoming Potable Cold Water Service.

Site investigations have determined that existing 'live' private water mains were evident in the proposed building construction zone. These service lines will require to be diverted and or removed.

The potable cold water service will be designed and constructed in accordance with The Plumbing Code of Australia, AS 3500.1, National Plumbing and Drainage Part 1: Water Supply and Sydney Water requirements.

Non Potable Cold Water (Bore Water/ Treated Bore Water)

The existing site is serviced with a mains pressure Bore Water and Treated Bore Water service supplied via the University's Campus' water bores. Bore Water is to be the primary supply of non-potable cold water for sanitary flushing and mechanical plant while the Treated Bore Water will supply all Laboratories within the new Building. Storage tanks are to be provided for both the non-potable cold water and the laboratory cold water with a secondary supply to the storage tanks from the potable cold water services.

Site investigations have determined that existing 'live' bore water mains were evident in the proposed building construction zone. These service lines will require to be diverted and or removed.

Natural Gas Service

The University Campus is serviced via a 100kPa medium pressure gas main reticulating the University Campus. Investigations have indicated that the existing internal 100mm diameter natural gas pipe located within International Road supplying the University's lower Campus will not have the required capacity for the new and future stages.

Calculations of the existing natural gas service loadings and pipeline capacities will be required to be undertaken which will determine if natural gas pipelines are required to be amplified to cater for additional gas consumption to proposed buildings. It is estimated that a new 150mm diameter natural gas service ring main with sufficient branches to proposed locations be provided to service the existing, new buildings and other future developments within the University Campus.

FIRE SERVICES

Fire Hydrant Service

The Science & Engineering Building shall be provided with a Fire Hydrant Service.

The incoming water supply will be provided from the 200mm diameter UNSW combined potable water / fire main in College / Gate 2 Roads. A 25,000 Litre (Dual compartment) Secondary Water Storage tank plus Primary Diesel and Secondary Electric full duty fire pumps situated in a secure enclosure in the Roof Plantroom. The Fire Pump will have direct access to the Roof Plantroom fire stair in accordance with AS 2419.1 – 2005, Section 6, Clause 6.4.

A mains pressure Fire Brigade booster valve assembly incorporating suction outlets is proposed to be installed adjacent to the southern entry to the Building and in an accessible location for a brigade connection and will be connected to the incoming hydrant system water supply. Discussion and approval will be sought with Fire & Rescue NSW as to the final location.

The fire hydrants will be installed within designated fire stairs and within four (4) metres of compartment exits as required under the NCC.

The Fire Hydrant System will be designed to incorporate the following requirements of Australian Standard AS 2419.1 – 2005:-

- Fire Hydrant System to all areas (except as modified by Fire Engineering Alternative Solutions).
- Anti-tamper monitoring of fire services isolation valves and fire pump monitoring as required for a Building exceeding 25m in effective height.

Fire Hose Reel System

The Fire Hose Reel System will connect to the Fire Hydrant Service.

New Fire Hose Reels will be provided throughout the Building in accordance with AS 2441 and the NCC.

Fire Sprinkler Service

The Science & Engineering Building shall be provided with a Fire Sprinkler Service.

The incoming water supply will be provided from the 200mm diameter UNSW combined potable water / fire main in College / Gate 2 Roads and booster via an Electric Sprinkler Pump as the primary supply. A 135,000 Litre Secondary Water Storage tank plus Diesel fire sprinkler pumps. The Fire Pump Enclosure will be provided to satisfy statutory requirements in the Roof Plantroom. The Electric Sprinkler Pump and Sprinkler Alarm Valve Room will be provided direct access to a road or open space at Ground Level.

A mains pressure Fire Brigade booster valve assembly incorporating suction outlets is proposed to be installed adjacent the southern entry to the Building and in an accessible location for a brigade connection and will be connected to the incoming sprinkler system water supply. Discussion and approval will be sought with Fire & Rescue NSW as to the final location.

The Fire Sprinkler System will be designed to incorporate the following requirements of Australian Standard AS 2118.1 – 1999:-

- Fire Sprinkler System to all areas (except as modified by Fire Engineering Alternative Solutions).
- Anti-tamper monitoring of fire services isolation valves and fire pump monitoring as required by AS 2118.1 for a Building exceeding 25m in effective height.

Fire Detection & Alarm System

An automatic Fire Detection System to the requirements of Section E2 of the NCC, AS 1670.1 – 2015 and the Arup Fire Engineered Solution.

The automatic smoke detection system would consist of the following:-

- Main Fire Indication Panel located in the main Foyer area in a clearly visible location as part of a Fire Control Centre.
- Addressable Analogue Photo Optical smoke detectors provided throughout the building except ceiling voids as nominated in the Arup Fire Engineered Solution.
- Monitoring of the Fire Sprinkler System and Fire Hydrant System.
- Shutdown of the Mechanical Ventilation System or Control / Exhaust as nominated by AS 1668.1 where required by the Arup Fire Engineered Solution.
- Red Fire Alarm Strobe at the front entry point and at the Hydrant Booster.
- Manual Call Points installed in evacuation routes.
- Smoke detectors and probe type sampling detectors shall be compatible with the analogue addressable Fire Indication Panel. Probe type detectors shall be complete with detector housing and PVC sampling probes.

Sound System & Intercom System for Emergency Purposes (SSISEP)

General

- The SSISEP will be provided throughout the new Science & Engineering Building to comply with the requirements of AS 1670.1 – 2015 as required by E4.9 of the NCC.

Master Emergency Control Panel (MECP)

- One (1) MECP shall be equal in manufacture to the Vigilant QE90 or Inertia 2000 located in the Fire Control Centre within the Ground Floor Entry Foyer.

Warden Intercommunication Phone (WIP)

- The WIP shall be equal in manufacture to the A-Phone and shall be red in colour.

Loudspeakers

- Two (2) types of speakers shall be used where appropriate:

Plantrooms - Round type reflex horn type speakers.

False Ceilings – Office areas - 125mm round recessed panel high fidelity cone speakers. Speakers will be. Type: Fire Sense or equal.

All loudspeakers shall be adjusted for sound output in accordance with AS 1670.4 – 2015. Where sound intelligibility cannot be achieved, visual warning devices shall be provided.

Cables and Wiring

Wiring types to be used:

- Two (2) hour fire rated cable for wiring runs from MECP to all loudspeakers on each floor and shall also be used in plant areas. Minimum 1.5mm conductors.
- 240V grade double insulated fixture 0.75mm² for speaker cabling intra floor.
- All cabling shall be installed in accordance with AS 3000 and AS 1670.4 - 2015.

Inter-floor Cabling

- Provide galvanised steel metal riser ducts or galvanised cable tray.