

SERVICES AND UTILITIES INFRASTRUCTURE REPORT

APPENDIX S





Sydney Metro City & South West

Victoria Cross Over Station

Development:

Services and utilities infrastructure report

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1.0 Introduction

1.1 Purpose of this report

This report supports a concept State Significant Development Application (concept SSD Application) submitted to the Department of Planning and Environment (DP&E) pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The concept SSD Application is made under Section 4.22 of the EP&A Act.

Transport for NSW (TfNSW) is seeking to secure concept approval for a commercial office tower above the Victoria Cross Station, otherwise known as the over station development (OSD). The concept SSD Application seeks consent for a building envelope and its use as a commercial premises (office, business and retail), maximum building height, maximum gross floor area, future subdivision (if required) pedestrian and vehicular access, circulation arrangements and associated car parking, future subdivision (if required) and the strategies and design parameters for the future detailed design of development.

TfNSW proposes to procure the construction of the OSD as part of an Integrated Station Development package, which would result in the combined delivery of the station, OSD and public domain improvements. The station and public domain elements form part of a separate planning approval for Critical State Significant Infrastructure (CSSI) approved by DP&E on 9 January 2017.

As the development is within a rail corridor, is associated with railway infrastructure and is for commercial premises with a Capital Investment Value of more than \$30 million, the project is identified as State Significant Development (SSD) pursuant to Schedule 1, 19(2)(a) of the *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP).

This report has been prepared to outline the utility services infrastructure requirement for the OSD and specifically respond to the Secretary's Environmental Assessment Requirements (SEARs) issued for the concept SSD Application on 30 November 2017 which state that the Environmental Impact Statement (EIS) is to:

- Address the existing capacity of the site to service the development proposed and any augmentation requirements for utilities, including arrangements for drinking water, waste water and recycled water; and
- Include a services and utilities infrastructure report.

1.2 Overview of the Sydney Metro in its context

The New South Wales (NSW) Government is implementing *Sydney's Rail Future*, a plan to transform and modernise Sydney's rail network so that it can grow with the city's population and meet the needs of customers in the future (Transport for NSW, 2012). Sydney Metro is a new standalone rail network identified in *Sydney's Rail Future*.

Sydney Metro is Australia's biggest public transport project, consisting of Sydney Metro Northwest (Stage 1), which is due for completion in 2019 and Sydney Metro City & Southwest (Stage 2), which is due for completion in 2024 (Refer to **Figure 1**).

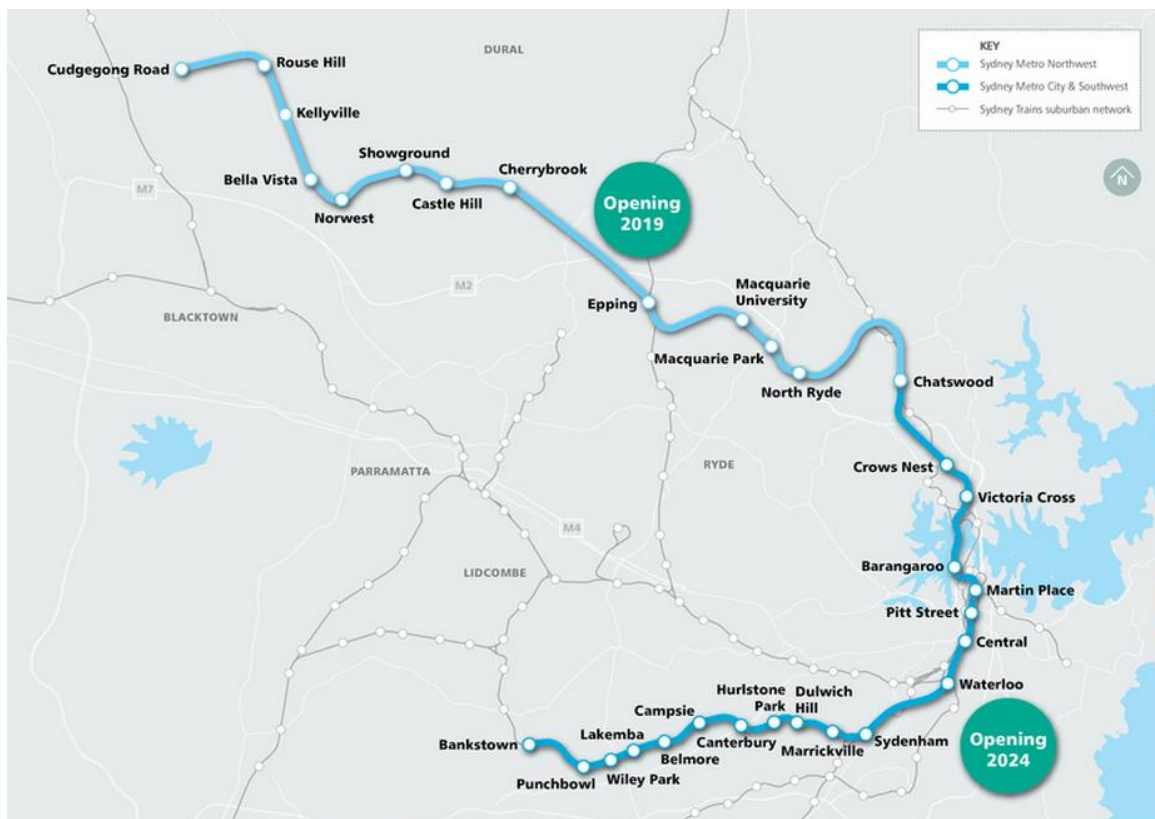


Figure 1: Sydney Metro alignment map

Stage 2 of Sydney Metro includes the construction and operation of a new metro rail line from Chatswood, under Sydney Harbour through Sydney's CBD to Sydenham and on to Bankstown through the conversion of the existing line to metro standards.

The project also involves the delivery of seven (7) new metro stations, including at North Sydney. Once completed, Sydney Metro will have the ultimate capacity for 30 trains an hour (one every two minutes) through the CBD in each direction - a level of service never seen before in Sydney.

On 9 January 2017, the Minister for Planning approved the Sydney Metro City & Southwest - Chatswood to Sydenham application lodged by TfNSW as a Critical State Significant Infrastructure project (reference SSI 15_7400), hereafter referred to as the CSSI Approval.

The CSSI Approval includes all physical work required to construct the CSSI, including the demolition of existing buildings and structures on each site. Importantly, the CSSI Approval also includes provision for the construction of below and above ground structures and other components of the future OSD (including building infrastructure and space for future lift cores, plant rooms, access, parking and building services, as relevant to each site). The rationale for this delivery approach, as identified within the CSSI application is to enable the OSD to be more efficiently built and appropriately integrated into the metro station structure.

The EIS for the Chatswood to Sydenham component of the City & Southwest project identified that the OSD would be subject to a separate assessment process.

Since the CSSI Approval was issued, Sydney Metro has lodged four modification applications with DP&E to amend the CSSI Approval as outlined below:

- Modification 1- Victoria Cross and Artarmon Substation which involves relocation of the Victoria Cross northern services building from 194-196A Miller Street to 50 McLaren Street together with inclusion of a new station entrance at this location referred to as Victoria Cross North. 52 McLaren Street would also be used to support construction of these works. The modification also involves the relocation of the substation at Artarmon from Butchers Lane to 98 – 104 Reserve Road. This modification application was approved on 18 October 2017.
- Modification 2- Central Walk which involves additional works at Central Railway Station including construction of a new eastern concourse, a new eastern entry, and upgrades to suburban platforms. This modification application was approved on 21 December 2017.
- Modification 3 - Martin Place Station which involves changes to the Sydney Metro Martin Place Station to align with the Unsolicited Proposal by Macquarie Group Limited (Macquarie) for the development of the station precinct. The proposed modification involves a larger reconfigured station layout, provision of a new unpaid concourse link and retention of the existing MLC pedestrian link and works to connect into the Sydney Metro Martin Place Station. It is noted that if the Macquarie proposal does not proceed, the modification would be surrendered. This modification application was approved on 22 March 2018
- Modification 4 - Sydenham Station and Sydney Metro Trains Facility South which incorporates Sydenham Station and precinct works, the Sydney Metro Trains Facility South, works to Sydney Water's Sydenham Pit and Drainage Pumping Station and ancillary infrastructure and track and signalling works into the approved project. This modification application was approved on 13 December 2017.

Given the modifications, the CSSI Approval is now approved to operate to Sydenham Station and also includes the upgrade of Sydenham Station.

The remainder of Stage 2 of the City & Southwest project (Sydenham to Bankstown) proposes the conversion of the existing heavy rail line and the upgrade of the existing railway stations along this alignment to metro standards. This part of the project, referred to as the Sydenham to Bankstown Upgrade, is the subject of a separate CSSI Application (Application No. SSI 17_8256) which is currently being assessed by the DP&E.

1.3 Planning relationship between Victoria Cross Station and the OSD

While the Victoria Cross Station and OSD will form an Integrated Station Development, the planning pathways defined under the *Environmental Planning & Assessment Act 1979* require separate approval for each component of the development. In this regard, the approved station works (CSSI Approval) are subject to the provisions of Part 5.1 of the EP&A Act (now referred to as Division 5.2) and the OSD component is subject to the provisions of Part 4 of the EP&A Act.

For clarity, the approved station works under the CSSI Approval include the construction of below and above ground structures necessary for delivering the station and also enabling construction of the integrated OSD. This include but is not limited to:

- Demolition of existing development
- Excavation
- Station structure including concourse and platforms
- Lobbies
- Retail spaces within the station building
- Public domain improvements
- Pedestrian through-site link
- Access arrangements including vertical transport such as escalators and lifts
- Space provisioning structural and service elements and the relevant space provisioning necessary for constructing OSD, such as columns and beams, space for lift cores, plant rooms, access, parking, retail and building services.

The vertical extent of the approved station works above ground level is defined by the 'transfer slab' level (which for Victoria Cross is defined by RL 82), above which would sit the OSD. This delineation is illustrated in **Figure 2**.

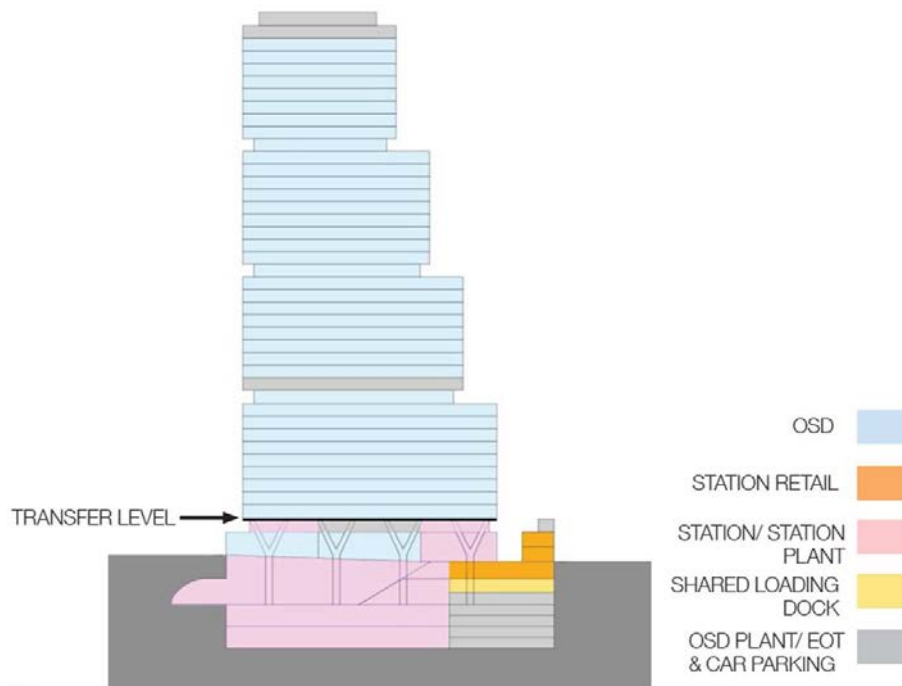


Figure 2: Delineation between the Metro station and OSD

The CSSI Approval also establishes the general concept for the ground plane of Victoria Cross Station including access strategies for commuters, pedestrians and workers. In this regard, pedestrian access to the station would be from Miller and Denison Streets and the commercial lobby would be accessed from Miller Street. Retail uses (approved under the CSSI Approval) would be located on the ground floor of the development at both the Miller Street and Denison Street levels activating the through-site link. Separate consent would be sought in the future for the fit-out and specific use of this retail space.

Since the issue of the CSSI Approval, TfNSW has undertaken sufficient design work to determine the space planning and general layout for the station and identification of those spaces within the station area that would be available for the OSD. In addition, design work has been undertaken to determine the technical requirements for the structural integration of the OSD with the station. This level of design work has informed the concept proposal for the OSD. It is noted that ongoing design development of the works to be delivered under the CSSI Approval would continue with a view to developing an Interchange Access Plan (IAP) and Station Design Precinct Plan (SDPP) for Victoria Cross Station to satisfy Conditions E92 and E101 of the CSSI Approval.

The public domain improvement works around the site would be delivered as part of the CSSI Approval.

1.4 The Site

The Victoria Cross OSD site is located at the southeast corner of the intersection of Miller and Berry Streets, North Sydney, above the southern portal of the future Victoria Cross Station (refer to **Figure 3**). The site is located in North Sydney CBD, which is identified as part of Sydney's "Harbour CBD" (along with Sydney CBD) in the *Greater Sydney Region Plan (2018)*. It is the third largest office market in Sydney and is a key component of Sydney's Global Economic Corridor.



Figure 3: Victoria Cross Station location plan

The site is located in the North Sydney Local Government Area approximately 3km north of Sydney CBD, 5km southeast of Chatswood and 2km southeast of St Leonards. The site (refer to **Figure 4**) is irregular in shape, has a total area of approximately 4,815 square metres and has street frontages of approximately 37 metres to Berry Street, 34 metres to Denison Street and 102 metres to Miller Street.

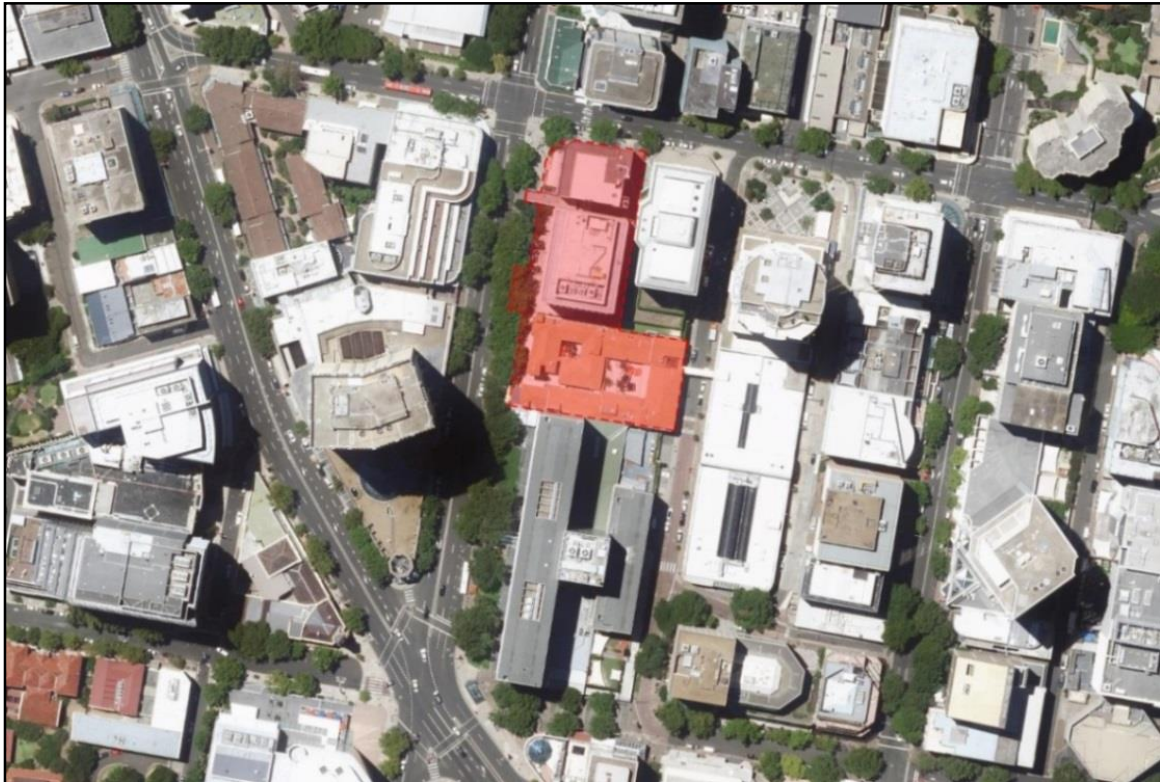


Figure 4: The site

The site comprises the following properties:

- 155–167 Miller Street SP 35644 (formerly Tower Square)
- 181 Miller Street Lot 15 in DP 69345, Lot 1 & Lot 2 DP 123056
and Lot 10 in DP 70667
- 187 Miller Street Lot A in DP 160018
- 189 Miller Street Lot 1 in DP 633088
- Formerly part 65 Berry Street Lot 1 in DP 1230458

1.5 Overview of the proposed development

This concept SSD Application comprises the first stage of the Victoria Cross OSD project. It will be followed by a detailed SSD Application for the design and construction of the OSD to be lodged by the successful contractor who is awarded the contract to deliver the Integrated Station Development.

This concept SSD Application seeks approval for the planning and development framework and strategies to inform the future detailed design of the OSD. It specifically seeks approval for the following:

- A building envelope as illustrated in **Figure 5**

- A maximum building height of RL 230 or 168 metres (approximately 42 storeys, comprising 40 commercial storeys and 2 additional storeys for the roof top mast) for the high rise portion of building envelope and RL 118 or 55 metres (approximately 13 storeys) for the lower rise eastern portion of the building envelope
- A maximum gross floor area (GFA) of 60,000 square metres for the OSD component, which is equivalent to a floor space ratio of 12.46:1
- Use of the building envelope area for commercial premises including commercial office, retail and business premises
- Use of the conceptual OSD space provisioning within the footprint of the CSSI Approval (both above and below ground), including the OSD lobby and associated retail space, basement parking, end-of-trip facilities, services and back-of-house facilities
- Car parking for a maximum of 150 parking spaces over four basement levels with an additional 11 parking spaces allocated to the station retail approved under the terms of the CSSI Approval
- Loading, vehicle and pedestrian access arrangements from Denison Street
- Strategies for utility and services provision
- Strategies for the management of stormwater and drainage
- A strategy for the achievement of ecologically sustainable development
- Indicative signage zones
- A strategy for public art
- A design excellence framework
- The future subdivision of parts of the OSD footprint (if required).

The total GFA for the Integrated Station Development including the station GFA (i.e. retail, station circulation and associated facilities) and the OSD GFA is 67,000 square metres and is equivalent to a FSR of 13.9:1.

A drawing illustrating the proposed building envelope is provided in **Figure 5**. The concept SSD Application includes an indicative design for the OSD to demonstrate one potential design solution within the proposed building envelope (refer to **Figure 6**).

Victoria Cross Station is to be a key station on the future Sydney Metro network, providing access to the growing North Sydney Central Business District (CBD). The proposal combines the Metro station with a significant commercial office tower, contributing to the North Sydney skyline. The OSD would assist in strengthening the role of North Sydney as a key component of Sydney's global economic arc and would contribute to the diversity, amenity and commercial sustainability of the CBD.

It is noted that Victoria Cross services building and new station entrance at Victoria Cross North do not form part of the concept SSD Application.

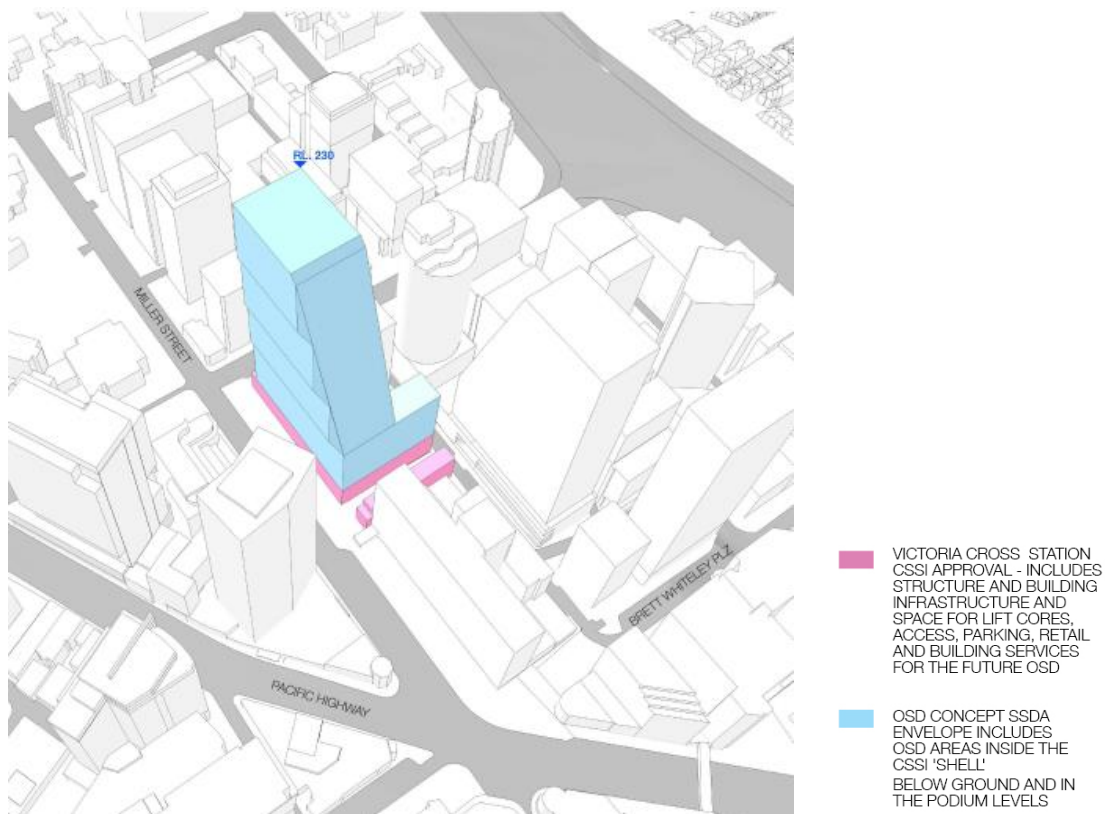


Figure 5: Proposed Victoria Cross OSD building envelope



Figure 6: Victoria Cross indicative OSD design

2.0 Scope of assessment

This report is based on the OSD concept design drawings provided by Bates Smart (hereafter referred to as the indicative OSD design). This report documents the utility services infrastructure assessment that has been undertaken for the indicative OSD design. It discusses the utilities required by the indicative OSD design and how they will be connected to the local precinct's infrastructure.

The report content incorporates a number of key utilities noted below in **Table 1**.

Table 1: Key Utilities

Utility	Notes
Stormwater drainage	Dedicated OSD connection to Dennison St drainage network
Sewerage	Dedicated OSD infrastructure connection
Potable water	Dedicated OSD infrastructure connection
Gas	Dedicated OSD infrastructure connection
Telecommunications	Dedicated OSD infrastructure connections
Electricity	Dedicated OSD infrastructure connections

The assessment includes the infrastructure capacity required to service the retail tenancies and the commercial floor space in the indicative OSD design, however the physical provisions for utility connections and plant rooms below Transfer Level are planned to be undertaken as part of the station works under the CSSI Approval. This strategy is aimed at reducing the potential for future disruption of footpath access should the OSD construction be delayed after the completion of the station.

The assessment also includes:

- Review of relevant legislation, policies and guidelines associated with the utility infrastructure;
- Consultation with TfNSW's Underground Station and Technical Services design team (METRON) regarding the location and capacity of utility supplies and strategies for connection to these supplies. This occurred as METRON advanced towards their Stage 1 design deliverable (approximately a 40% level of definition)
- Preparation of briefing calculations to inform consultation by the Water Services Coordinator (WSC) and Level 3 Accredited Services Provider, engaged by TfNSW.

The scope of services outlined above does not consider the utilities, stormwater management and flooding measures associated with the proposed Victoria Cross Station building. References to the station stormwater management and flooding features have been provided in this report to provide context for the proposed concept proposal where relevant.

Design development has been undertaken in conformance with the Sydney Metro City & Southwest Chatswood to Sydenham Design Guidelines June 2017.

3.0 Stormwater infrastructure

The following sections describe the existing stormwater assets within the vicinity of the site that interface directly with the current site development envelope. It should be noted that in-ground stormwater management, including the modification or diversion of existing stormwater assets will be undertaken as part of the CSSI approval. The following sections will detail the relevant features of this application to provide context for the broader site development. Reference should be made to the CSSI approval and subsequent design development works for further information and descriptions of modifications to any stormwater assets.

3.1 Existing trunk drainage infrastructure

Sydney Water is the service authority responsible for the operation and maintenance of the existing trunk drainage stormwater infrastructure within the site area. The existing infrastructure has been identified based on the DBYD response from Sydney Water. Refer to **Figure 7** and **Figure 8** below.

The existing trunk drainage line appears to have been amplified as part of the Lane Cove Amplification works in 1980. As a result of the amplification the stormwater asset is believed to consist of a “U-shaped” brick lined invert of 0.9m diameter and varies in depth under the building. It is believed that the works were undertaken to provide additional storage within the drainage network.

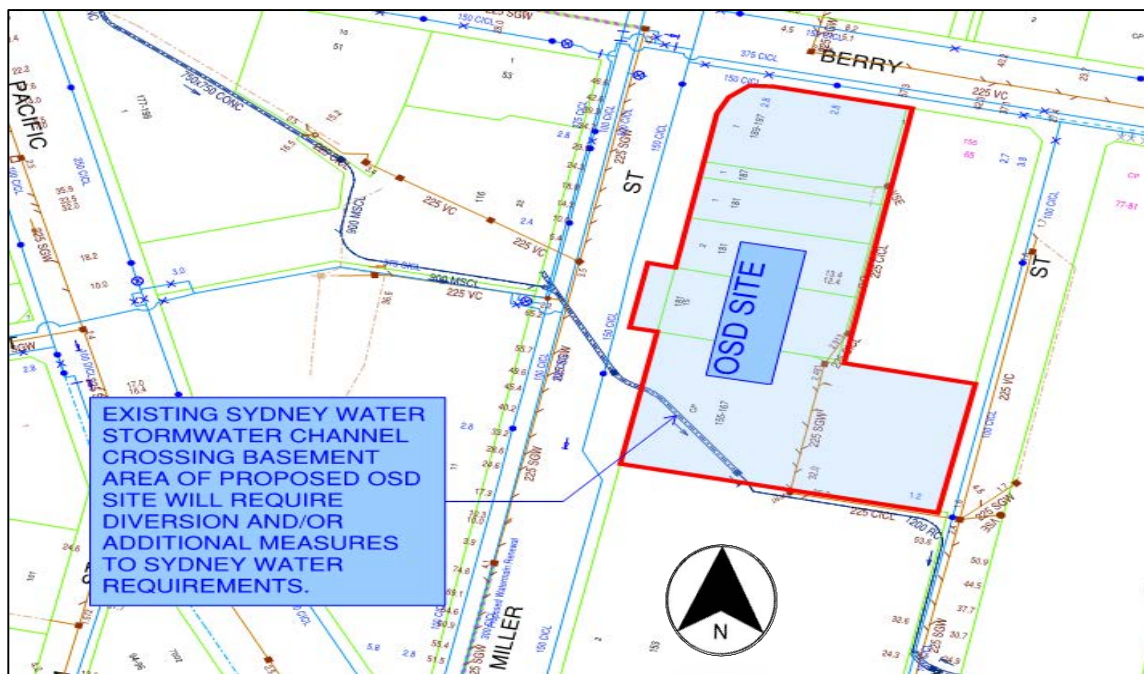


Figure 7: Existing Sydney Water DBYD stormwater assets

Source: DBYD

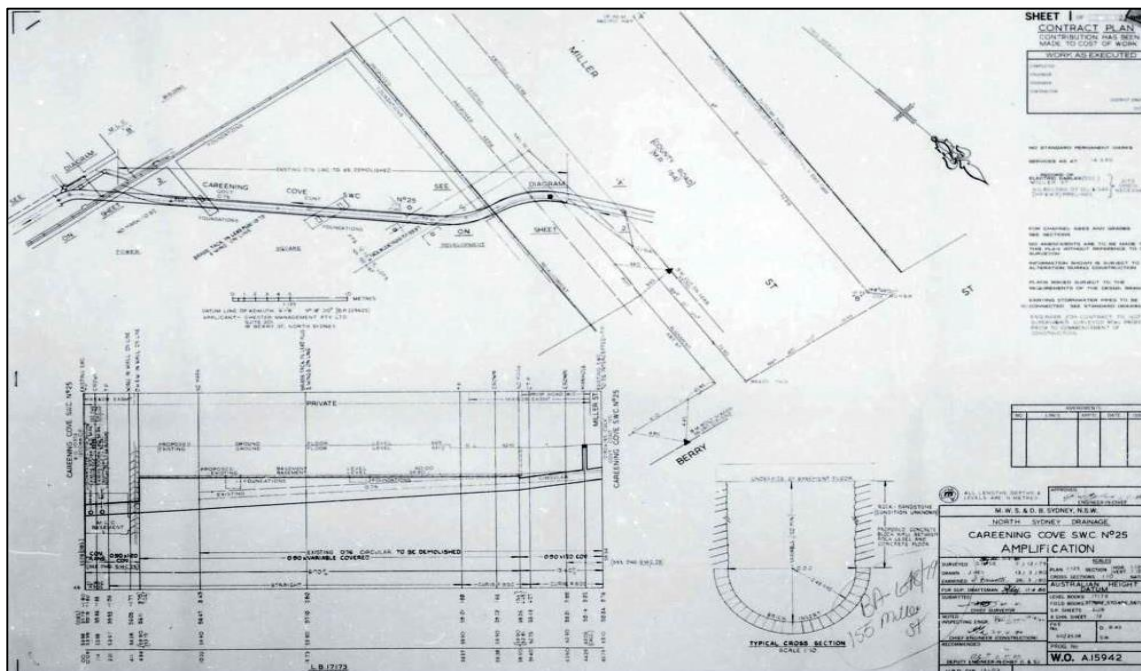


Figure 8: Extract from Work as Executed drawings demonstrating varying depth and typical cross section
Source: Sydney Water

3.2 Existing local drainage infrastructure

North Sydney Council operate and maintain the local street drainage infrastructure around the site. The site is believed to be serviced by the local drainage infrastructure in Miller Street and Denison Street. From analysis of the DBYD it is noted that the council system appears to discharge directly to the Sydney Water trunk drainage line. Refer to **Figure 9**.

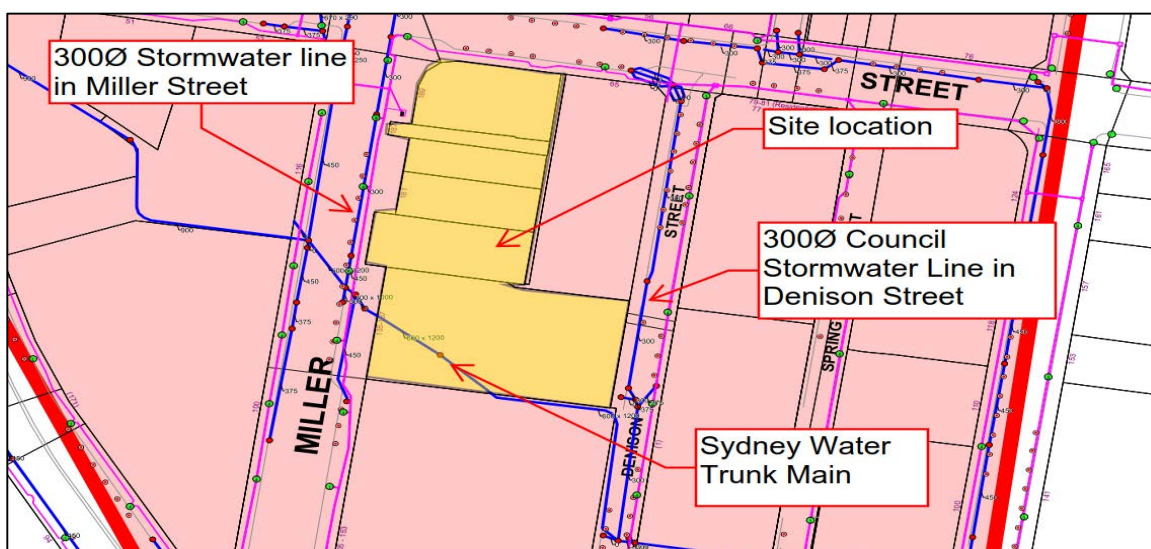


Figure 9: North Sydney Council local drainage infrastructure
Source: DBYD

3.3 Realignment of existing trunk drainage

To facilitate the new development the existing Sydney Water trunk drainage line that traverses the site will need to be relocated. The preliminary METRON design intent proposes that a new sealed pipeline will connect the existing trunk drainage line in Miller Street to the proposed flood storage in Denison Street as shown indicatively in **Figure 10** below. It is noted that the proposed location and configuration is indicative only and subject to further design development in consultation with Sydney Water.

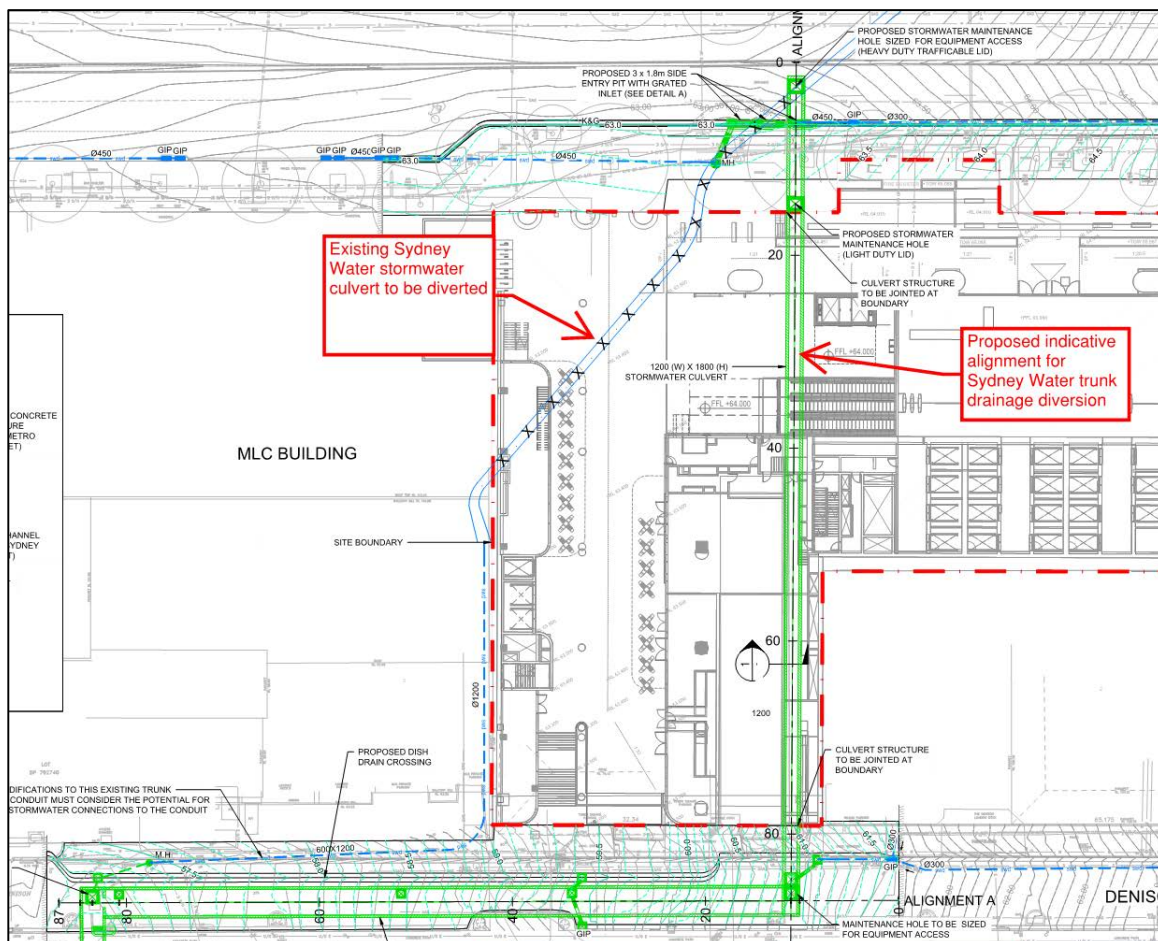


Figure 10: Indicative trunk drainage diversion
Source: METRON

3.4 Compensatory flood storage in Denison Street

The preliminary flood analysis undertaken by METRON indicates that additional flood storage would be required to achieve the flood protection requirements as noted in the *Flood assessment and stormwater management report*. The preliminary location for the below ground storage is proposed to be located in Denison Street as shown in **Figure 11**. It is noted that the proposed location is indicative only and subject to further design development in consultation with Sydney Water and Council.

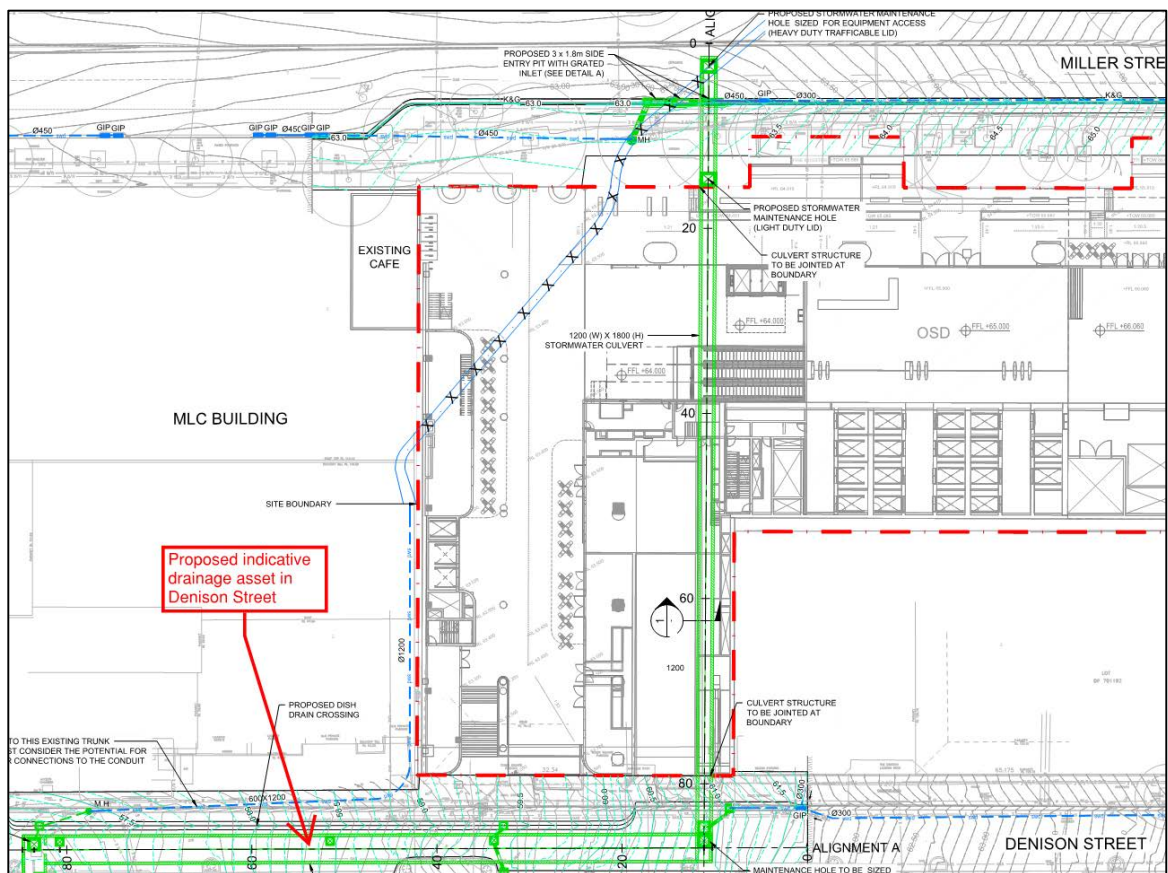


Figure 11: Indicative compensatory flood storage
Source: METRON

3.5 Proposed OSD stormwater strategy

Reference should be made to the *Flood assessment and stormwater management report* for details on the proposed indicative OSD design stormwater management strategy.

The proposed OSD is to be constructed over the proposed Victoria Cross Station building. As requested by TfNSW, a separate stormwater system will be installed within the OSD building which will discharge directly to the Council/Sydney Water system in Denison Street.

OSD stormwater run-off from the roof will be collected using a gutter and downpipe system. Run-off from the roof will be directed to the building's on-site detention and stormwater treatment system. Stormwater run-off from the building terrace areas will be graded to a series of proprietary drainage inlet systems (including rain water outlets and grated trench drains) and discharged to the building's on-site detention and water treatment devices.

Figure 12 demonstrates a typical schematic layout for the site.

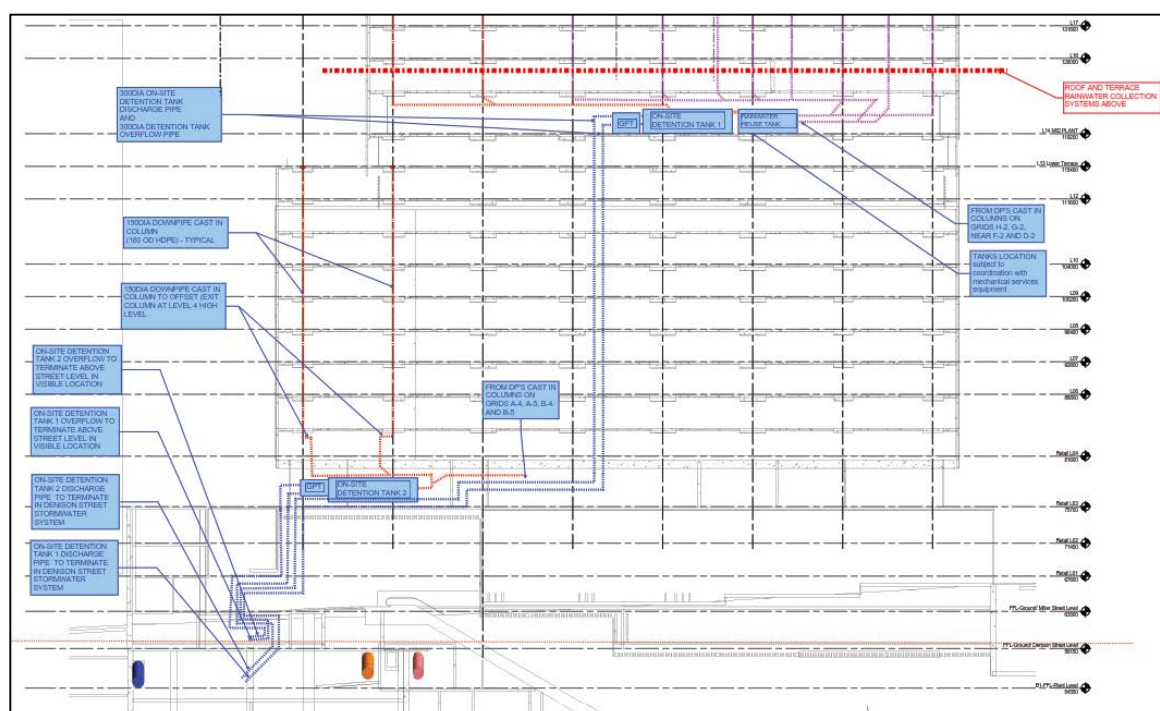


Figure 12: Typical stormwater schematic layout, see **Appendix D** for full size schematic
Source: *Flood assessment and stormwater management report*

The peak discharge from the site will be restricted to comply with Council and Sydney Water on-site detention and permissible site discharge requirements (refer to *Flood assessment and stormwater management report* for further details). A suitably sized orifice plate will be used to control the peak discharge from the on-site detention tank. A debris screen or trash screen will be used to prevent the orifice/outlet pipe from potential blocking. Discharge from the on-site detention tanks will be directed towards Denison Street drainage infrastructure.

The on-site detention system will provide an overflow device to cater for any peak discharge in excess of the design capacity (100yr ARI storm event) with consideration for the building's vertical catchments. The overflow system will discharge via a series of separate downpipes to Denison Street to allow for visual inspection.

3.6 Proposed stormwater peak discharge assessment

Reference should be made to the "*Flood assessment and stormwater management report*" for details on the proposed OSD peak discharge arrangements and on site detention requirements for the site. On-site detention requirements have been derived from preliminary discussions between METRON and Council – i.e. the permissible site discharge for events up to and including the 100yr ARI event are to be restricted to the pre-development 5yr ARI peak discharge. **Table 2** and **Table 3** provide a summary of the preliminary peak discharge estimates for the Integrated Station Development and typical on site detention configuration for the OSD. It should be noted that these figures are indicative only, based on the indicative OSD design and may be subject to change with further design development.

Table 2: Preliminary discharge estimates

Plan Catchment Area (m ²)	Peak Storm Duration	100yr ARI Catchment Peak Discharge Q _{p100yr} (L/s)
L43 – Rooftop to L22 Mid Rise Terrace OSD Tank 1 (2169m ²)	1.5 Hr Storm	Inflow: 135 L/s Outflow to Denison Street Drainage: 50 L/s
L13 – Lower Terrace OSD Tank 2 (793m ²)	2 Hr Storm	Inflow: 77 L/s Outflow to Denison Street Drainage: 22 L/s
Bypass to Denison Street: (1,016m ²)	1.5Hr Storm	73 L/s
Bypass ¹ to Miller Street (837m ²)	Varies	59 L/s
Total Site (4815m ²)	Varies	Net combined discharge off site: 196 L/s

Note:

1. Bypass runoff areas are drained as part of the station works under the CSSI Approval.

Table 3: Preliminary OSD detention tank storage and spatial requirements

Tank	Min 100yr Effective Storage Detention Volume ¹ (m ³)	Min Tank Volume (m ³) ²	Outlet Arrangements ³	Preliminary Spatial Dimensions ⁴ (m)
OSD Stormwater Detention Tank 1	85 m ³	105 m ³	Primary: 130mm Orifice Overflow: 300mm Pipe	Spatial allowance: 8m x 8m x 2.2m
OSD Stormwater Detention Tank 2	45 m ³	55m ³	Primary: 90mm Orifice Overflow: 300mm Pipe	Spatial allowance: 5.5m x 5.5m x 2.2m

Table 3 Notes:

1. No allowance for rainwater tank.
2. Minimum tank volume based on effective storage volume with an additional 25% for freeboard & overflow.
3. Outlet arrangements subject to detailed design.

-
4. Preliminary external tank dimensions assuming maximum height of 2m, 0.25m wall thickness. Additional allowance to be considered for maintenance access.

4.0 Sewerage infrastructure

4.1 Existing infrastructure

Sydney Water is the service authority responsible for the operation and maintenance of the existing sewerage infrastructure within the site area. The existing infrastructure has been identified based on the DBYD response from Sydney Water.

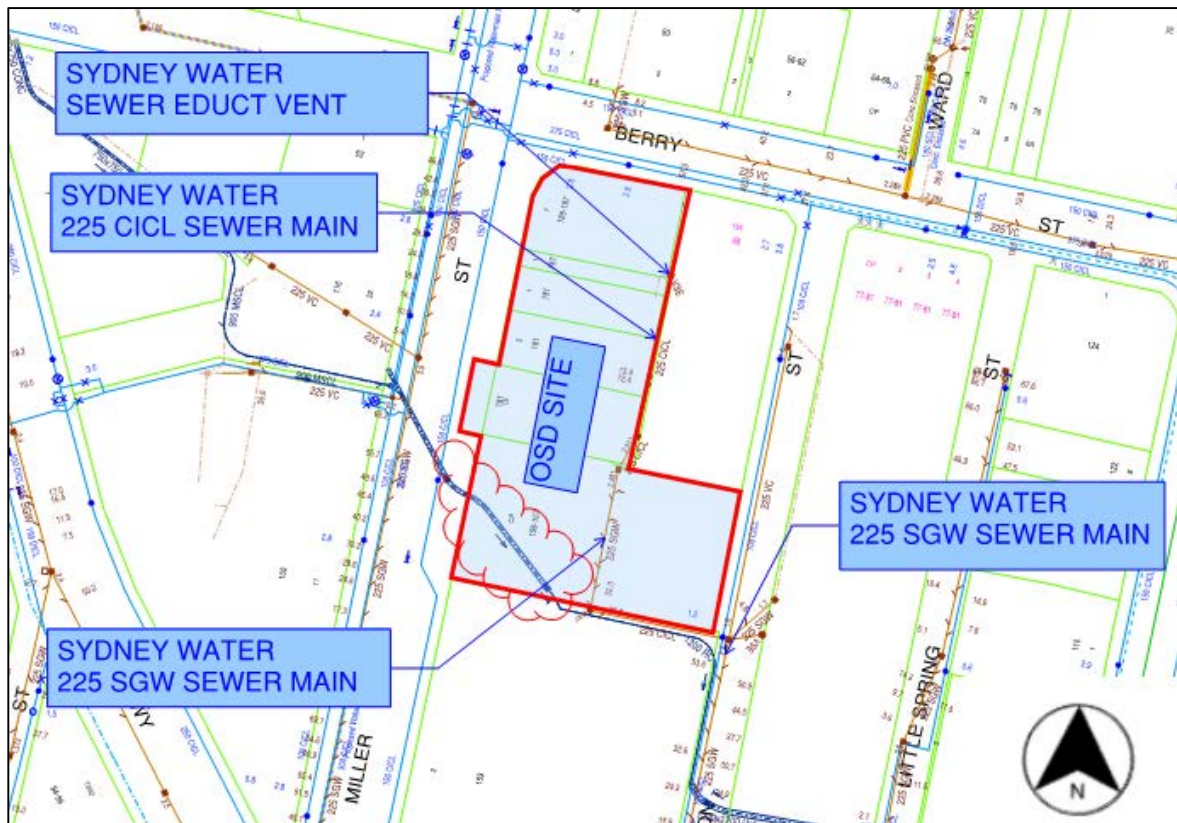


Figure 13: Existing Sydney Water DBYD sewer assets
Source: DBYD, 2017

4.2 Proposed OSD sewer connection strategy

The proposed connection strategy is shown in **Figure 14**. The proposed potable water supply connection will be designed and constructed as part of the station works under the CSSI Approval noting the following points:

- It is proposed to connect the building sewer system to the 225SGW sewer main in Denison Street as per Sydney Water advice provided in the Feasibility Letter dated 6 Nov 2017(case 165999).
- Feasibility Letter dated 6 Nov 2017(case 165999) indicates that the current 225SGW sewer main is the right size and can be used for connection of the development sewer discharges.

- The OSD sewer connection will be separate from the station sewer connections.
- The connection is subject to Sydney Water Corporation requirements and approval.
- The connection will be designed and constructed as part of the station works under the CSSI Approval.

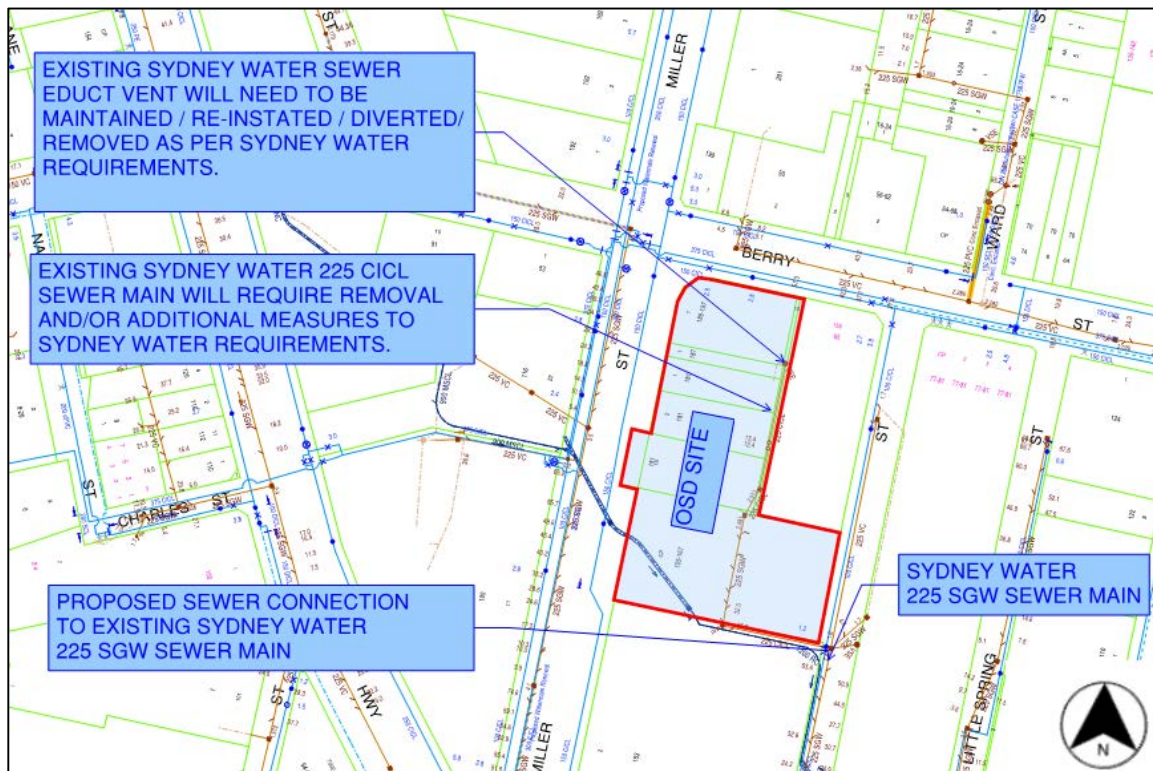


Figure 14: Existing Sydney Water sewer assets and proposed OSD sewer connection
Source: DBYD, 2017

4.3 Sewerage Considerations

A water servicing coordinator (WSC) has been engaged by TfNSW to make an application for Section 73 Notice of Requirements (NOR) and confirm Sydney Water specific conditions and requirements.

Based on a review of the DBYD information, the key issues noted are;

- The existing 225mm sewer main that runs inside the site's eastern boundary will require removal.
- The existing Sydney Water sewer E-duct vent stack currently located on the sewer main and rising to atmosphere within the site boundary will require removal.
- The final design will require these issues to be addressed to Sydney Water's satisfaction.

4.4 Sewage demand assessment

A preliminary estimate for the sewage demand from the OSD and the retail tenancies has been undertaken with demand rates noted below in **Table 4**. It should be noted that these figures are indicative only, based on the indicative OSD design and may be subject to change with further design development.

Table 4: Preliminary sewage demand

Location	NLA(m ²)	Estimated Load Demand (kL/day)
Commercial Tower	54,000	129.6
Retail tenancies	4,250	11.3

5.0 Potable water infrastructure

5.1 Existing infrastructure

Sydney Water is the service authority responsible for the operation and maintenance of the existing potable water infrastructure within the site area. The site area is believed to be supplied by the Prospect-Ryde supply system. Refer to **Figure 15**.

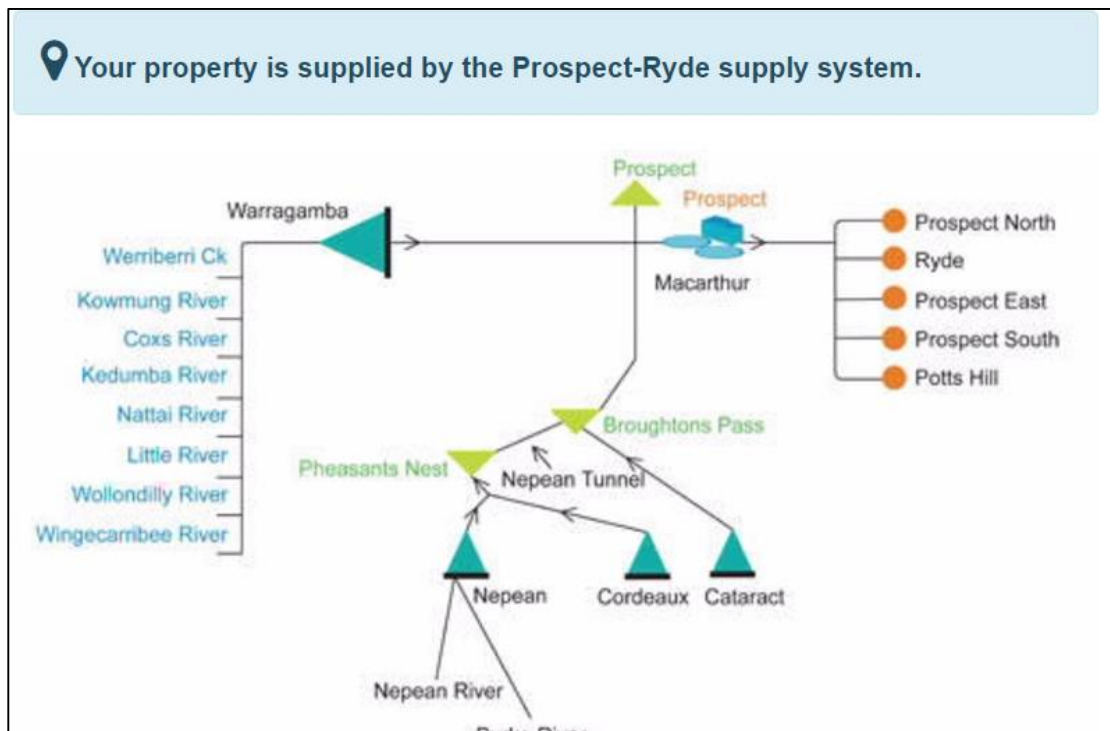


Figure 15: Water supply
Source: Sydney Water Corporation, 2017

The existing infrastructure shown in **Figure 16** has been identified based on the DBYD response from Sydney Water. It is noted that the following discussion only considers Sydney Water infrastructure and there is potential that private or other authority water infrastructure may be present within the site. To date, no other records of such infrastructure have been made available for this study and have not been identified on the DBYD plans. Further to this, no records of existing non-potable / recycled water supply infrastructure within the study area have been identified.

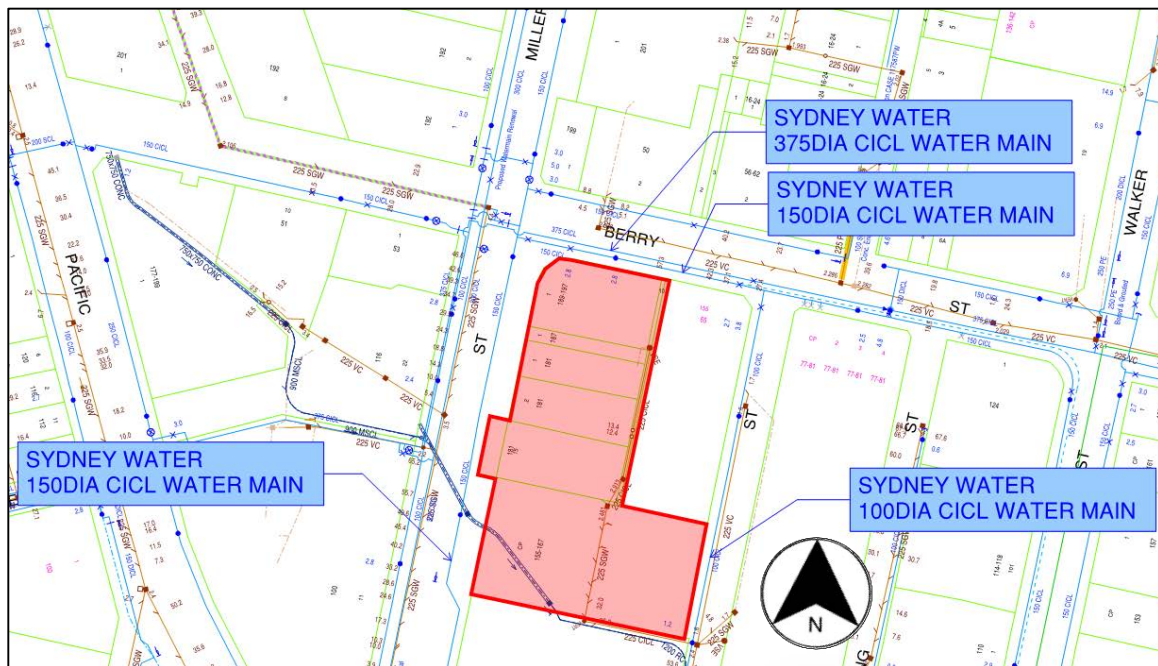


Figure 16: Existing Sydney Water potable water assets
Source DBYD, 2017)

5.2 Proposed OSD potable water connection strategy

The proposed connection strategy is shown in **Figure 17**. The proposed potable water supply connection will be designed and constructed as part of the station works under the CSSI Approval noting the following points:

- The existing Sydney Water Corporation water mains are located in Miller Street, Berry Street and Denison Street.
- It is proposed to connect the domestic potable water service to the 150mm Sydney Water water main, located in Miller Street as per Sydney Water advice provided in the Feasibility Letter dated 6 Nov 2017 (case 165999) and will be separate from the station water supply connection.
- It is proposed to connect the fire water service to the 150mm Sydney Water water main, located in Miller Street as per Sydney Water advice provided in the Feasibility Letter dated 6 Nov 2017 (case 165999)
- A combined water supply connection for OSD and retail is proposed and will be separate from the station water supply connections. The retail and OSD supplies will then branch in the hydraulic pump room.
- Feasibility Letter dated 6 Nov 2017 (case 165999) indicates that the current 150mm CICL water main in Miller Street is to be used for connection and will serve the development.

- The Authority water meter will be located within an enclosure at street level along the Miller Street frontage.
- The connection will be designed and constructed as part of the CSSI works.

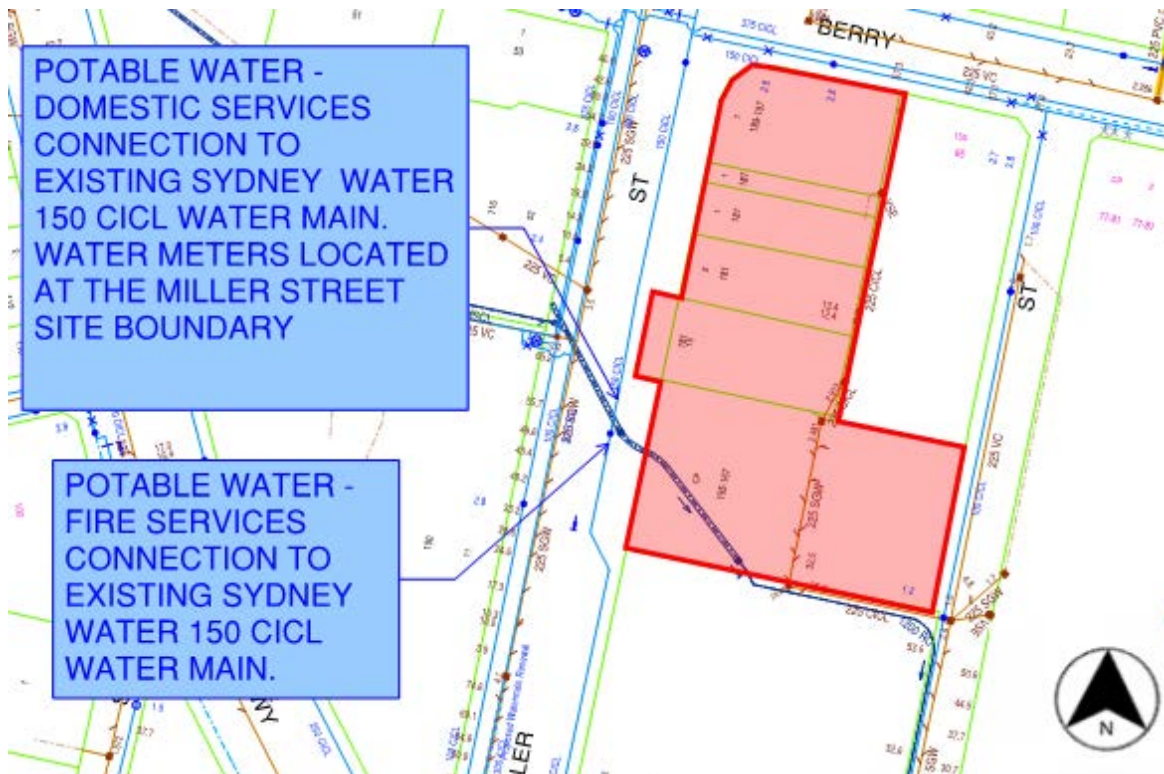


Figure 17: Proposed connection strategy to Sydney Water potable water mains
Source: Sydney Metro

5.3 Potable water considerations

A water servicing coordinator (WSC) has been engaged by TfNSW to make an application for Section 73 Notice of Requirements (NOR) and confirm Sydney Water specific conditions and requirements.

Water metering for the OSD will be located within an enclosure in the landscape area at the Miller Street frontage on the site boundary, thereby providing direct access from the street. It will comprise:

- A commercial tower authority meter.
- A retail use authority meter.

Individual retail tenancies' authority meters will be provided in a dedicated retail node room within the building, on basement level 1.

5.4 Potable water demand assessment

A preliminary estimate for the supply demand for the OSD and the retail tenancies has been undertaken with supply demand rates noted in **Table 5**. It should be noted that these figures are indicative only, based on the indicative OSD design and may be subject to change with further design development.

Table 5: Preliminary Potable Water Demand

Location	NLA(m ²)	Estimated Water use Demand (kL/day)
Commercial Tower	54,000	162.0
Retail tenancies	4,250	14.2

5.5 Proposed OSD fire services connection strategy and water demand

The primary water supply for the fire services is proposed to be connected from the existing town's main infrastructure (150 CICL potable water mains) along Miller Street. Secondary on-site fire water tank will also be provided to comply with AS 2118.6 standard for Grade 1 water supply requirement. The proposed fire services water supply connection will be designed and constructed as part of the station works under the CSSI Approval.

The fire services water serving retail and OSD is a common supply from Miller St which branches off in the valve room.

The fire services systems demand is based on the highest hazard occupancy within the Victoria Cross development; the indicative OSD design has predominantly commercial and retail spaces hence Ordinary Hazard occupancy as defined in AS 2118.1 has been used as a basis for the system demand. Refer to **Table 5**.

The basis of the fire services system demand regarding flow and water storage capacity has been undertaken with flow and storage rates noted below in **Table 6**. It should be noted that these figures are indicative only, based on the indicative OSD design and may be subject to change with further design development.

Table 6: Preliminary fire services water demand

Fire Systems	Estimated flow demand	Basis of Design	Estimated total system flow	Estimated total water storage capacity
Sprinkler	1080 l/m	Density = 5 mm/min Area of Operation = 216 m ² (AS 2118.1)	46 l/s (without drenchers) 61 l/s (with drenchers)	110,000 L (without drenchers) 150,000 L (with drenchers)
Hydrants	1200 l/m	2 hydrants @ 600 l/m		

Fire Systems	Estimated flow demand	Basis of Design	Estimated total system flow	Estimated total water storage capacity
		each (AS 2419.1)		
Drencher	760 l/m	10 drencher sprinklers considered (provision to confirm with FER/BCA)		

The fire water supply for the retail tenancies and commercial tower is a consolidated supply with branch connections from the fire valve room. The connection from the Town's Main for the fire water supply will include a backflow prevention device with a metered by-pass connection provision required by Sydney Water.

The water supply to the on-site fire water tanks shall be capable of completely refilling the tanks within 6 hours (for tanks less 500kL capacity) in accordance with AS 2118.1: 4.8. The proposed inflow to the fire water tank based on the above capacity will be minimum 7 l/s.

6.0 Recycled water

The OSD will not be supplied by reticulated recycled water from the Sydney Water infrastructure. Water efficiency and sustainability for the OSD will be achieved through on site rainwater harvesting to supplement toilet flushing in the end of trip facilities. Water efficient hydraulic fittings will be adopted so as to enable the OSD to optimise its NABERS water performance.

7.0 Gas infrastructure

7.1 Existing infrastructure

Jemena is the service authority responsible for the operation and maintenance of the existing gas infrastructure in the site's locale. The existing infrastructure shown below in **Figure 18** has been identified based on the DBYD response from Jemena.

It is noted that the following discussion only considers Jemena infrastructure and there is potential that private or other authority gas infrastructure may be present within the site. To date, no other records of such infrastructure have been made available for this study and have not been identified on the DBYD plans.

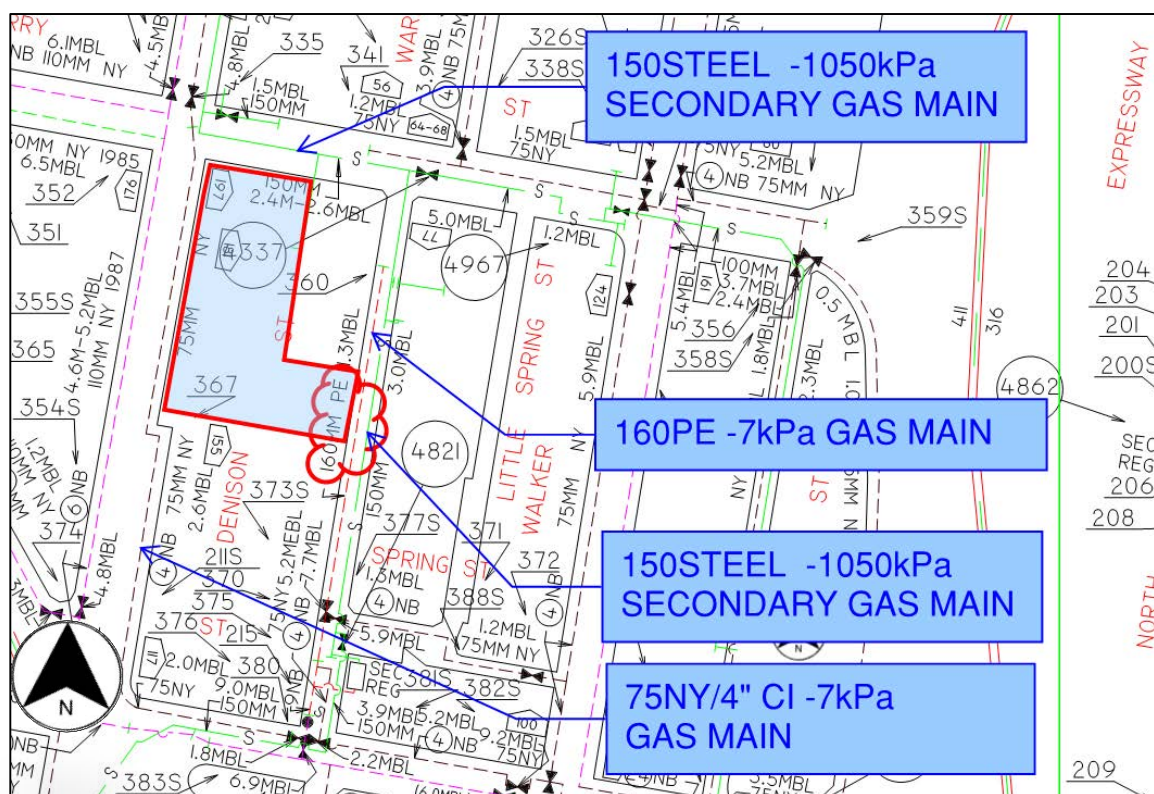


Figure 18: Existing Jemena gas services infrastructure

Source: DBYD, 2017

7.2 Proposed OSD & retail gas connection strategy

The proposed gas connection will be designed and constructed as part of the station works under the CSSI Approval noting the following points:

- The existing gas mains are currently located in Miller Street, Berry Street and Denison Street. These gas mains should be available for connection subject to Jemena conditions, requirements and approval.

- Location of connection and the location allocated at the site boundary for the gas boundary regulator and gas meters are subject to authority approval and require further discussion with and approval from Jemena.
- The OSD has a dedicated gas supply connection servicing the OSD and station retail. The station does not have a gas supply.
- As illustrated in **Figure 19**, it is proposed to extend a gas main from the Berry Street Secondary 1050kPa gas main to the frontage in Miller Street to provide a connection for the proposed OSD (subject to Jemena approval) with the main gas regulator installed in the landscape area in Miller street.
- Since the location of the gas connection, gas meters and regulators proposed by the design team are not per Jemena's initial proposed location on Berry St, the final design will need to be developed in collaboration with Jemena to their satisfaction.

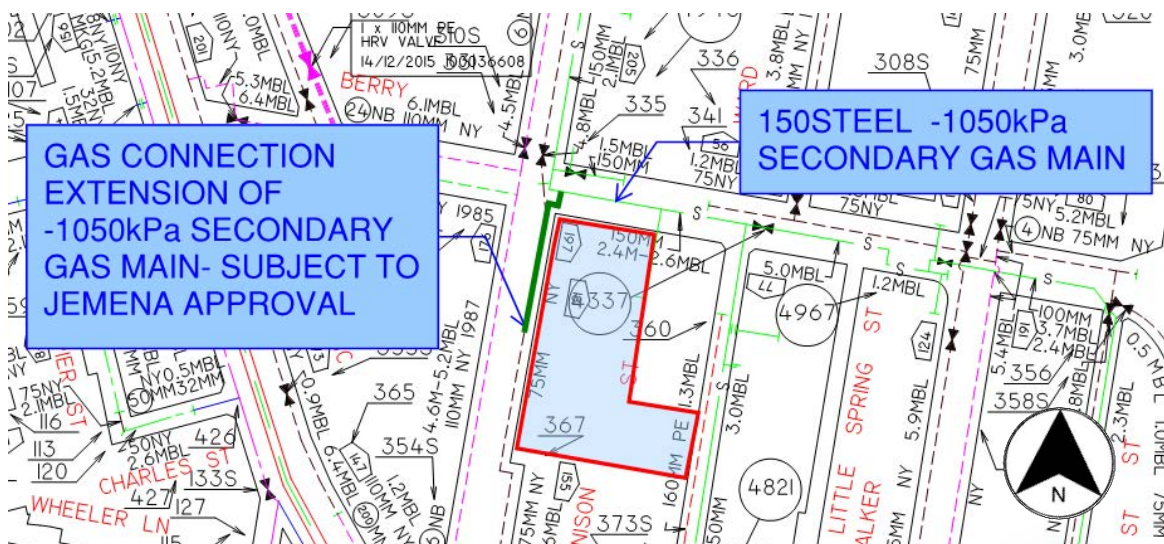


Figure 19: Proposed connection strategy to Jemena gas mains
Source DBYD, 2017

7.3 Gas considerations

A gas boundary control valve shall be installed outside of the building's boundary. The Authority (Jemena) gas meter and regulator assemblies are required to be located in the dedicated gas meter and regulator enclosure located at street level within the landscape area at the Miller Street frontage with direct access to the street.

The gas meter and regulator enclosure shall contain:

- The Authority's site boundary gas regulator
- The Authority's commercial tower gas meter

A spatial allocation for retail tenancy gas meter assemblies has been provided in the initial design. They will be installed in a dedicated retail node room on level B1 or alternately within each tenancy that requires gas supply.

The gas service for the commercial tower shall extend from the gas regulator and meter:

- To each mechanical plant room
- To each domestic hot water plant in the building.

7.4 Gas demand assessment

A preliminary feasibility estimate for the gas demand for the OSD and the retail tenancies has been undertaken as noted in **Table 7** below. It should be noted that these figures are indicative only, based on the indicative OSD design and may be subject to change with further design development.

Table 7: Preliminary gas load

Location	NLA(m ²)	Estimated Gas Load Demand (MJ/h)
Commercial Tower	54,000	29,500*
Retail tenancies	4,250	7,000*#

Note:

* Diversity factor has not been applied to these values

Allowance for 20 retail tenancies each at 350MJ/h.

8.0 Telecoms infrastructure

8.1 Existing infrastructure

Based on a review of the dial before you dig (DBYD) information received February 2017, a number of telecommunications carriers reticulate services adjacent to the site.

Telstra, Verizon Business, Vocus Communications, Primus Telecom, Nextgen, AARNET, AAPT, NBN and Optus, have services within Miller St, Denison St and Berry Street.

According to NBN website and DBYD fixed line services are currently available. As this is a major development, a dedicated fibre system will be required to service the building.

8.2 Proposed OSD connection strategy

Connection to the local infrastructure will be designed and constructed as part of the station works under the CSSI Approval noting the following points:

- Two Building Distributor Rooms (BDR) are proposed for the OSD, Each shall be provided with two diverse incoming connection paths, so as to provide flexibility to accommodate various public network providers and possible tenancy telecommunications requirements.
- The current proposal is for the incoming lead in cabling to come from the following two diverse routes:
 - Denison Street and entry into the basement from Denison Street
 - Miller Street and entry into the basement from Miller Street.
- Cabling within the building shall be provided by the NBN Co, additional allowances for carrier lead in cabling shall be provided for tenancy requirements (Telstra, Optus and Verizon).

8.3 Voice & data systems configuration.

Telecommunications risers within the OSD building core will connect the BDR to the on floor Telecommunications Rooms. These will accommodate the tenants' data servers and voice/data equipment.

8.4 Retail provision

A dedicated retail BDR has been accommodated in the Indicative OSD design. Dedicated retail communications cupboard/s will be available on all retail floors. They will be connected to the BDR.

9.0 Electrical infrastructure

9.1 Existing infrastructure

The OSD site is located within the Ausgrid electricity supply network. Refer to **Figure 20**.

There is an existing Ausgrid substation identified on the Ausgrid DBYD plans within the development site. The substation appears to supply low voltage to a number of properties adjacent to the site and associated street lighting. This substation will be decommissioned as part of the CSSI approved works.

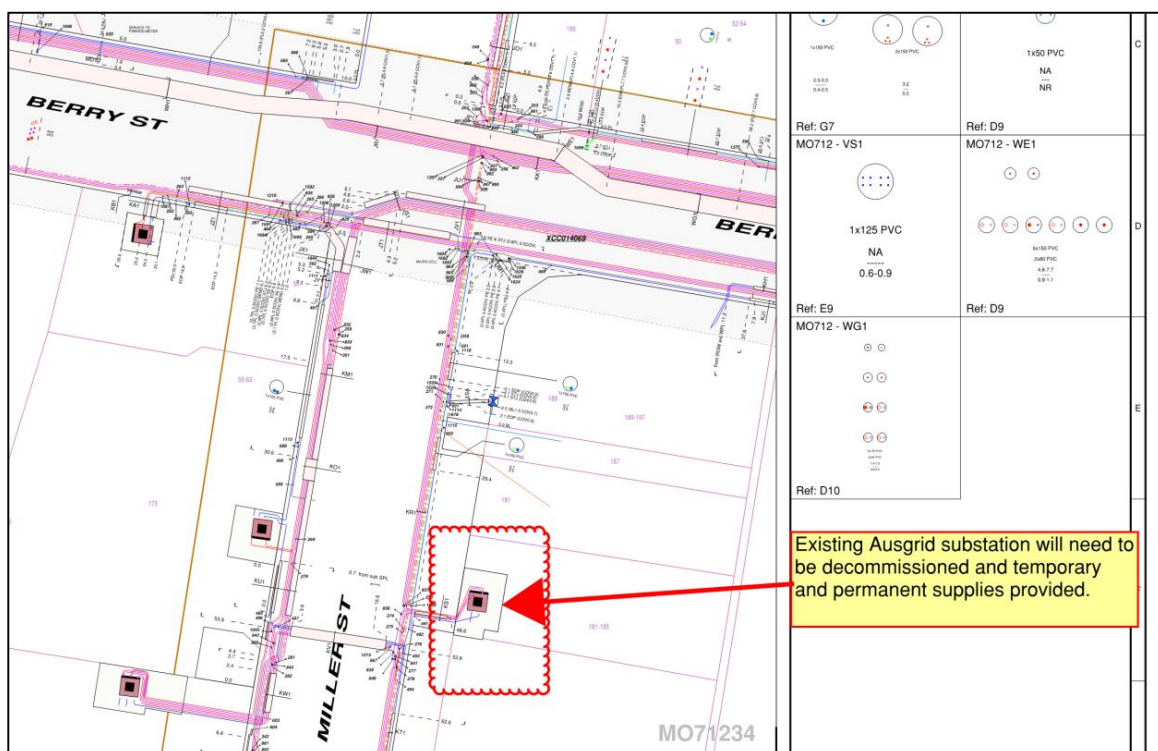


Figure 20: Site plan – existing Ausgrid network

9.2 Proposed OSD HV connection strategy

Provision for the proposed HV connection will be designed and constructed as part of the station works under the CSSI Approval noting the following points:

- The provisions are likely to take the form of connection pits, lead in conduits and primary substation structure with the actual supply of HV cables and final connection to be undertaken as part of the OSD works under the SSD Approval.
- The proposed HV supply to the development shall be from underground high voltage cables subject to final Ausgrid coordination with the Level 3 ASP designer.

- The HV cabling will be installed in a three hours fire rated concrete encasement until it enters the basement chamber substation subfloor. The basement chamber substation will be within a three hours fire rated enclosure.
- TfNSW has engaged an ASPL3 designer & verified supply availability and connection options. The ASP L3 designer has determined that there is sufficient supply available to the site and that the location of the lead in cables can be either from Miller Street, Berry Street or from Denison Street to support the demand.

9.3 Maximum demand assessment

A preliminary feasibility estimate for the HV power demand for the OSD and the retail tenancies has been undertaken as noted in **Table 8** below. It should be noted that these figures are indicative only, based on the indicative OSD design and may be subject to change with further design development.

Table 8: Power supply – maximum demand

Commercial NLA m ²	Retail NLA m ²	OSD Plant m ²	Total Demand + 10% spare	Substation Configuration
54,000	4,250	9,690	7,600 kVA	3 x 1500kVA 3 x 1500kVA

Note: The maximum demand is currently based on AS/NZS3000 Table C3 and also NS109 Table B: i.e;

- No diversity
- 100VA/m² of office NLA
- 200VA/m² of retail NLA
- 10% spare for future design flexibility

9.4 Substation infrastructure arrangement

Based on the current maximum demand and Ausgrid information for substations firm rating (NS 109), two chamber substation will be provided as follows:

- 3 x 1500kVA Transformers (chamber 1)
- 3 x 1500kVA Transformers (chamber 2)

Ausgrid Standard NS109 states the following:

- Firm rating for oil type transformers for 3 x 1500kVA chamber substations is 5500Amps. (Basement and ground substations have oil type transformers).

- Firm rating for dry type transformers for 3 x 1500kVA chamber substations is 4200Amps (summer cycle). (Elevated and upper chamber substations have dry type transformers).

The indicative OSD design accommodates the HV control rooms and chamber substations in the basement level (or level currently called Ground Denison Street) adjacent to the Miller Street corner with Berry Street). Refer to **Figure 21**.

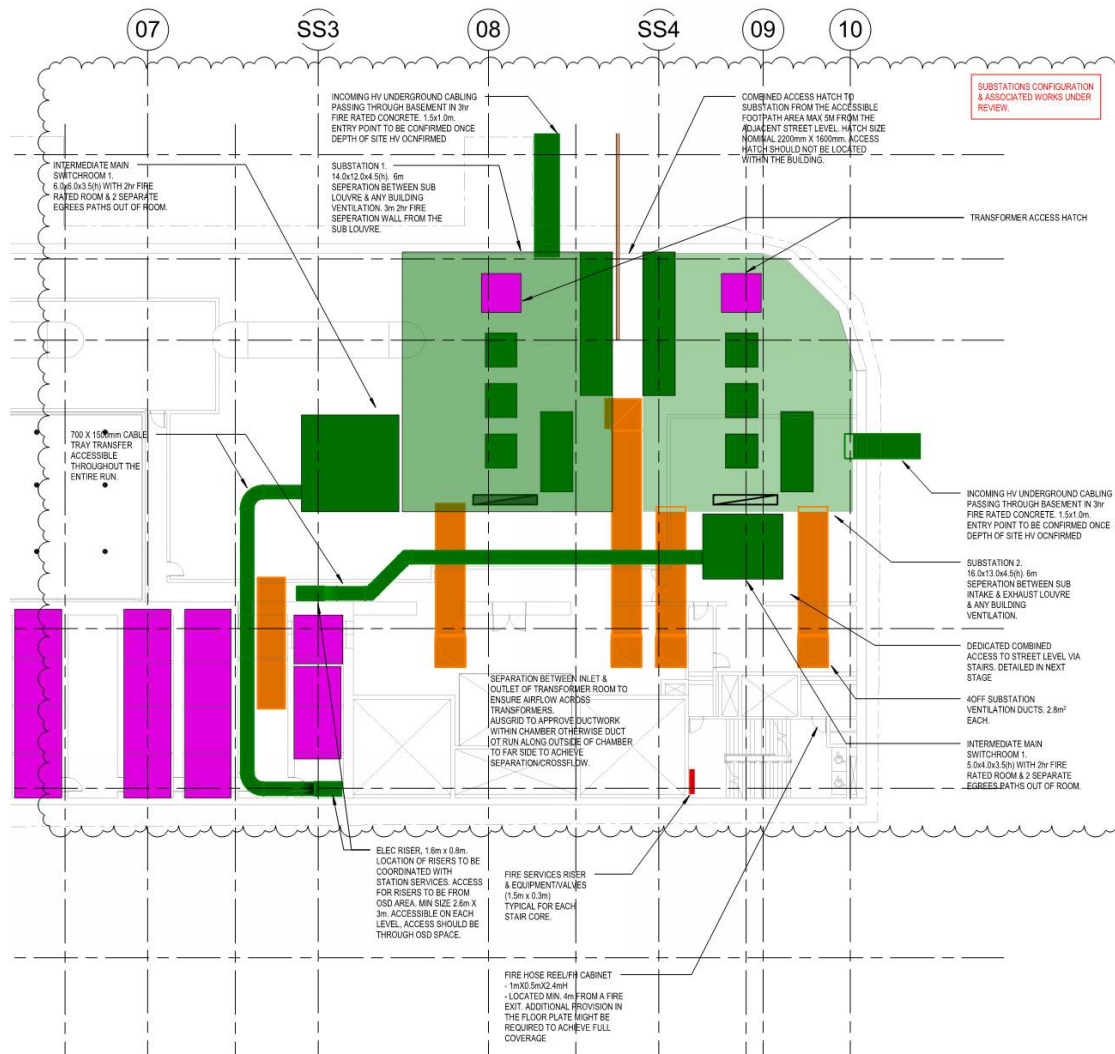


Figure 21: Indicative substation infrastructure arrangement

The substations proposed are assumed to be oil type (in accordance with Ausgrid NS113) which allows the development to have some limited spare capacity of 10% in accordance with the current client brief.

The proposed retail tenancies shall be supplied from the proposed infrastructure above.

Any future changes to the office and retail NLA including change of the substations from basement to upper or elevated chambers must be carefully considered and managed.

10.0 Protection of existing utility infrastructure

As the Victoria Cross OSD sits atop the Metro station, there are no earth works associated with the OSD project. These works will be undertaken as part of the station works under the CSSI Approval. As such the protection of existing in ground infrastructure is being undertaken as part of the CSSI approved works.

11.0 Consultation

11.1 North Sydney Council

On-site detention requirements discussed in this report have been derived from preliminary discussions between TfNSW and Council – i.e. the permissible site discharge for events up to and including the 100yr ARI event are to be restricted to the pre-development 5yr ARI peak discharge.

Future design phases will need to consult directly with Council and Sydney Water to further detail the site stormwater management plan. Preliminary analysis within this report has demonstrated that where required, onsite detention could be facilitated to restrict the combined 100yr ARI peak discharge off site to that of the pre-development 5yr ARI event.

11.2 Ausgrid

TfNSW and their L3 ASP have undertaken preliminary consultation with Ausgrid. The developer of the OSD will undertake further consultation as the design progresses and seek approvals based on their final design.

AECOM provided maximum demand calculations based on AS/NZS3000.2007 and Ausgrid standard NS109 to TfNSW on 13 September 2017 based on the indicative OSD Design. These calculations were then submitted to Ausgrid by TfNSW representatives.

Attached to this report in **Appendix A** is the Ausgrid letter of confirmation on the received documents for power supply to the site and Ausgrid instruction on the next steps that will need to be undertaken by TfNSW in order for the design to proceed.

The appointed L3 ASP designer has been provided with the preliminary substation arrangement options to review and progress the initial design definition.

11.3 Telecommunication providers

TfNSW have conducted consultation with major telecommunications providers. The developer of the OSD will undertake further consultation as the design progresses and seek approvals based on their final design. The development will need to be registered with the NBN Co.

All external works will be done by the carriers. All internal works will have to be done as part of the developer works in accordance with the carriers' requirements.

11.4 Sydney Water Corporation

TfNSW via their Water Services Coordinator (WSC) have undertaken initial consultation with Sydney Water. The developer of the OSD will undertake further consultation as the design progresses and seek approvals based on their final design.

AECOM provided water and sewer demand assessments based on the indicative OSD Design. These calculations were submitted to Sydney Water by a WSC.

Attached to this report in **Appendix C** is the Sydney Water Feasibility Letter listing the conditions and requirements for sewer, stormwater and potable water supply connections to the site and Sydney Water instructions on the next steps that will need to be undertaken by TfNSW in order for a Section 73 Certificate of Compliance to be provided for the OSD development.

11.5 Jemena

TfNSW have undertaken preliminary consultation with Jemena. The developer of the OSD will undertake further consultation as the design progresses and seek approvals based on their final design.

AECOM provided a gas demand assessment based on the indicative OSD Design. These calculations were submitted to Jemena by a TfNSW representative.

Attached to this report in **Appendix B** is the Jemena *Sydney Metro Station Servicing Assessment* itemising the gas loads used for modelling the supply and showing the proposed gas main available for connection and the location for the gas connection. The assessment advises on the next steps that will need to be undertaken by TfNSW in order for the OSD to be connected to the gas supply network.

Since the location of the gas connection, gas meters and regulators proposed by the design team are not per Jemena's initial proposed location on Berry St, the final design will need to be developed in collaboration with Jemena to their satisfaction

12.0 Conclusion

Based on preliminary consultation between TFNSW and the relevant Utility Services Providers, it is believed that there is sufficient capacity in existing infrastructure to accommodate the proposed indicative OSD Design. As per the specific requirements of individual Utility Services Providers, the developer of the OSD will be required to undertake more detailed enquiries and arrange for final connections and associated approvals based on the final design.

Appendix A

Ausgrid consultation



Address all relevant correspondence to:

Ausgrid Contestability Section
Building 3, 51-59 Bridge Road
Hornsby NSW 2077

E: Contestability@ausgrid.com.au

17th October 2017

Transport for NSW
Attention: Paul Rogers
L43 680 George St
SYDNEY NSW 2000

Email: paul.rogers@transport.nsw.gov.au

Reference Number: 1900078088

Dear Paul

Electricity Network Connection Application at: Victoria Cross Train Station 155 Miller St, North Sydney

We have received your Connection Application dated 9th October 2017, and assigned it reference number 1900078088.

We have made a preliminary assessment of your Connection Application and wish to advise the application is incomplete and we cannot proceed to a connection offer at this stage. To enable *Ausgrid* to further consider and process your request you will require a certified design and associated certification number, and you should include this on your application.

This letter provides guidance on how to obtain a certified design and associated certification number.

Scope of Network Alterations

Ausgrid's assessment has determined that the following works are likely to be required to connect your development.

- ☐ Installation of 2 off 3 x 1500kVA chamber substations

These works are classified as contestable, which means that you are required to fund the design and some or all of the construction works. If you have not already done so, you will need to engage and manage suitably qualified contractors, known as Accredited Service Providers (ASPs) to undertake the design and construction.

Initially, your ASP Level 3 (ASP/3) will undertake the design, and then your ASP Level 1 (ASP/1) will undertake construction in accordance with the design and *Ausgrid's* policies and standards. The timeframe for the works will vary depending on factors such as the complexity and the way in which you manage your ASP's.

Once the works have been satisfactorily completed and electrified, the premises connection assets will be owned and maintained by *Ausgrid* as part of the electricity distribution network.

Design Stage

You or the person you represent must engage an ASP/3 to design the necessary network alterations. *Ausgrid* has classified the design information for connection as **complex**. Therefore, for this connection, *Ausgrid* will need to

prepare the Design Information – Site Specific Terms and Conditions. Your ASP/3 will then use this document to prepare and submit a design that is certifiable.

You will also need to enter into a Contract for Design Related Services with *Ausgrid* as outlined below. This Contract sets out the rights and obligations of *Ausgrid* and yourself with respect to certification of your ASP/3's design by *Ausgrid*.

Once the design has been certified by *Ausgrid*, your Connection Application will be complete and you may use the design certification number to request that your Connection Application proceed to a connection offer or expedited connection, provided you assure *Ausgrid* that the development has not materially changed since you submitted your original Connection Application.

Contract for Design Related Services

This letter is an offer to enter into a Contract for Design Related Services. It remains open for acceptance for 45 business days. A copy of the Contract for Design Related Services is available for your review on our website <http://www.Ausgrid.com.au> at the following link:
<http://www.ausgrid.com.au/~media/Files/Network/ASPs/ASP3%20new/CDRS%20Appendices/Design%20Contract%202017.pdf>.

No work will be undertaken by *Ausgrid* until a Design Contract is in place.

You are encouraged to contact ASP/3's and ASP/1's to understand the likely overall costs you will incur for design and construction before you accept and commit to the Contract for Design Related Services.

IMPORTANT: The contractual arrangements provide the framework for a design to be prepared by your ASP/3, and NOT by *Ausgrid*. *Ausgrid's* fees as outlined below are for the design related network services we provide during the design phase, and are IN ADDITION to the fees charged by your ASP/3 in preparing the design.

Acceptance Fees

The acceptance fees relating to the Contract for Design Related Services are payable upon acceptance. *Ausgrid* will invoice you once we receive your signed acceptance form. The Contract will not commence until you pay the invoiced fee.

These fees are an estimate for the *Ausgrid* services required. Further fees may apply for any additional services required and these will be quoted on each occasion. *Ausgrid's* published rates for our services are amended from time to time in our Connection Policy – Connection Charges publication, and in accordance with the Contract, *Ausgrid* reserves the right to charge the rates that are applicable at the time the service is provided.

Fees for *Ausgrid's* services are in addition to the design and construction costs charged by your ASP's, and some fees may not be refundable if the service has already been provided.

The Acceptance Fee will be calculated as follows (GST inclusive). These fees and rates are set by the Australian Energy Regulator:

Design Information	\$7,480.38
Design Certification	\$14,874.02
Administration	\$639.78
Facilitation	\$483.84
TOTAL	\$23,478.02

General

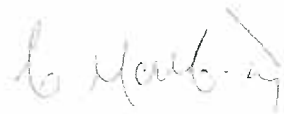
Standard *Ausgrid* documents mentioned in this letter, including those enclosed, are available on *Ausgrid's* website www.ausgrid.com.au. If you do not have access to the web and would like to read any of the documents mentioned in this letter they may be obtained by contacting the phone number below.

Should you require any further information please contact me on the phone number or email address detailed below.

What to do next

- ☐ Read the Contract for Design Related Services on our website. To accept our offer to enter into a Contract for Design Related Services,
 - Complete and sign the Acceptance of Offer in the space provided below and return it to *Ausgrid*.
Note that a tax invoice will be generated based on the details provided on the form.
 - You will also need to pay *Ausgrid's* fees as detailed above. An invoice for the above total amount will be forwarded to you on acceptance of the contract.
- ☐ Engage the services of an ASP/3 to submit a design to *Ausgrid* for certification. Note that *Ausgrid* will not accept the design for certification until the Contract for Design Related Services is in place.

Yours sincerely,



Cedric Halfort
Acting Manager, Contestable Connections - Sydney North
Ausgrid

Direct Telephone Number: 0408 968 133
Facsimile: 02 9477 8341
Email: chalfort@ausgrid.com.au

Encl: Acceptance of Offer Form
Contestable Connection or Relocation flowchart

Acceptance of Offer

Design Offer Expiry Date: 19th December 2017

Ausgrid - MC Reference Number: 1900078088

Ausgrid - AP/AE Reference Number: 800184452

Ausgrid - Trim Reference Number: B17/5223

Premises: Victoria Cross Train Station 155 Miller St, North Sydney

The Connection Applicant accepts the above Ausgrid's offer of a Contract for Design Related Services in relation to the design of connection assets at the above premises.

Please note that a tax invoice will be generated based on the details provided on this form.

Changes to this information following invoice processing will result in additional charges.

Details of Person or Company to invoice for the payment of Ausgrid Fees and Charges.		
<p>This is the party that will be billed and responsible for payment.</p> <p>If you are signing on behalf of a third party, we require their details for invoicing</p>	Transport for NSW	print name of person or company
	18 804 239 602	ABN
	Level 43, 680 George St	postal address - line 1
	Sydney NSW 2000	postal address - line 2
	Paul Rogers	contact name
	0435 106 073	contact phone number
	paul.rogers@transport.nsw.gov.au	email address
	4200031172	purchase order number

Signed by the Connection Applicant (as per application form details)

Hugh Lawson

Hugh Lawson

Deputy Project Director, CSW

21/11/17

Transport for NSW

18 804 239 602

hugh.lawson@transport.nsw.gov.au

0431 507 166

signature

print name of signatory

print position of signatory

date

company name

ABN

email address

contact phone number

AUSGRID USE ONLY:

Date of Receipt : _____



Address all relevant correspondence to:

Ausgrid Contestability Section
Building 3, 51-59 Bridge Road
Hornsby NSW 2077

E: Contestability@ausgrid.com.au

15/01/2018

Transport for NSW
Attention: Paul Rogers
L43, 680 George St
Sydney NSW 2000

Email: paul.rogers@transport.nsw.gov.au

Project Number: SC12459

Dear Paul,

Electricity Network Connection Application at: 155 Miller St North Sydney

The design information for this development has been prepared and forwarded electronically to your email address. Please forward the document(s) to your ASP/3 so that the design can be finalised and submitted for certification.

The design information and Contract for Design Related Services are valid for a maximum period of 12 months from the date of provision by Ausgrid. Should a design not be submitted and certified within the 12 month validity period, you may apply for an extension. Note that additional Ancillary Service Fees will apply.

You should discuss with your ASP/3 the notification requirements associated with the electrical design. Such notification periods may have an impact on the timing of your connection.

Ausgrid will only certify a submitted design prepared against the design information when all requirements of the Contract for Design Related Services are met.

Property Rights

Property rights in favour of Ausgrid are required for all new and altered and, in some instances, existing Ausgrid assets located on private property. To meet this obligation you have two options:

1. At least six (6) weeks prior to electrification of any electrical network construction works a Deed of Agreement (DoA) for Easement or Lease must be executed by all parties. Once executed, Ausgrid will place a caveat over the property. The caveat will be released upon easements being registered. Easement documents must be lodged with LPI without delay following electrification, in accordance with the DoA and Connection Contract. It is recommended that you **allow at least 4 weeks** for Ausgrid to execute standard Deeds of Agreements.
2. Alternatively, you may opt to lodge easements with LPI prior to electrification. In this case, two (2) weeks prior to electrification of any electrical network construction works you must provide evidence of lodgement of the property rights with LPI. If property rights are not lodged in time, the electrification will need to be rescheduled. It is recommended that you **allow at least 10 weeks** for Ausgrid to execute standard leases and easements.

To avoid possible delays in electrification, we recommend you proceed with Option 1 and provide a signed DoA as soon as possible.

The DoA and easement/lease documents, and directions for signing are available on our website at the following link: www.ausgrid.com.au/CDRS

Long Lead Time Items

Please note that the Connection Works potentially require items of equipment that have long lead times. Please ensure that you arrange for such item to be procured and delivered to site in a timely manner during the construction period. In general these types of items can include:

- ☐ Kiosk and pole mounted substations.
- ☐ Chamber substation transformers, high voltage and low voltage switchgear and other components.
- ☐ Intelliruptors.

All items used in constructing the Connection Works must be Ausgrid approved material.

What to Do Next

- ☐ Distribute the design information to ASP/3 designers for quotations if required.
- ☐ Select and arrange an ASP/3 designer to prepare and submit a compliant design to Ausgrid.
- ☐ Commence arrangements to satisfy Ausgrid's property rights requirements.

General

Standard Ausgrid documents mentioned in this letter, including those enclosed, are available on Ausgrid website www.ausgrid.com.au. If you do not have access to the web and would like to read any of the documents mentioned in this letter they may be obtained by contacting the phone number below.

Should you require any further information please contact me on the phone number or email address detailed below.

Yours sincerely,

Shanming Zhou
Contestability Project Coordinator
Ausgrid

Direct Telephone Number: 9477 8357
Email: szhou@ausgrid.com.au

Encl: Design Information

Appendix B

Jemena consultation

1. PURPOSE

The aim of this document is to provide a preliminary assessment of Jemena's existing infrastructure and outline Jemena Gas Network's capacity to service the new developments around Sydney Metro Stations. Where there is insufficient capacity to service the development then a gas reinforcement is specified. All gas loads were supplied by TfNSW for the Sydney Metro Stations; Victoria Cross, Pitt Street, Crows Nest and Marrickville Stabling Yards. Recommendations on route selection and reinforcements are subject to change with a detailed review of the proposed gas supply options.

2. COMMERCIAL FEASIBILITY

Natural Gas is available in the vicinity of these developments and may be able to supply these proposals.

Our policy is to supply all developments wherever possible, depending upon economic viability.

In consideration of our shareholders' interests and under NSW regulation, Jemena Gas Networks (NSW) Ltd is required to ensure that any connection to the natural gas distribution system is commercially viable and therefore must assess each request for supply on an individual basis.

Upon the provision of the final layout and load configurations for the developments a full economic evaluation can be undertaken to determine the viability of supplying natural gas to the site, as a contribution may be required to assist in the economic viability of the proposal.

There will costs associated with disconnections and any relocation works that are required.

To assist in the planning of supply to the development I can confirm that;

- The sites to be developed are currently reticulated with gas.
- Where the existing network in an area does not have sufficient capacity to supply the additional load a network reinforcement will be required. A contribution may be required.
- Costs will be associated with any works that require Jemena to relocate the existing gas network.
- See attached for proposed network reinforcements.

3. VICTORIA CROSS

3.1 GAS LOADS

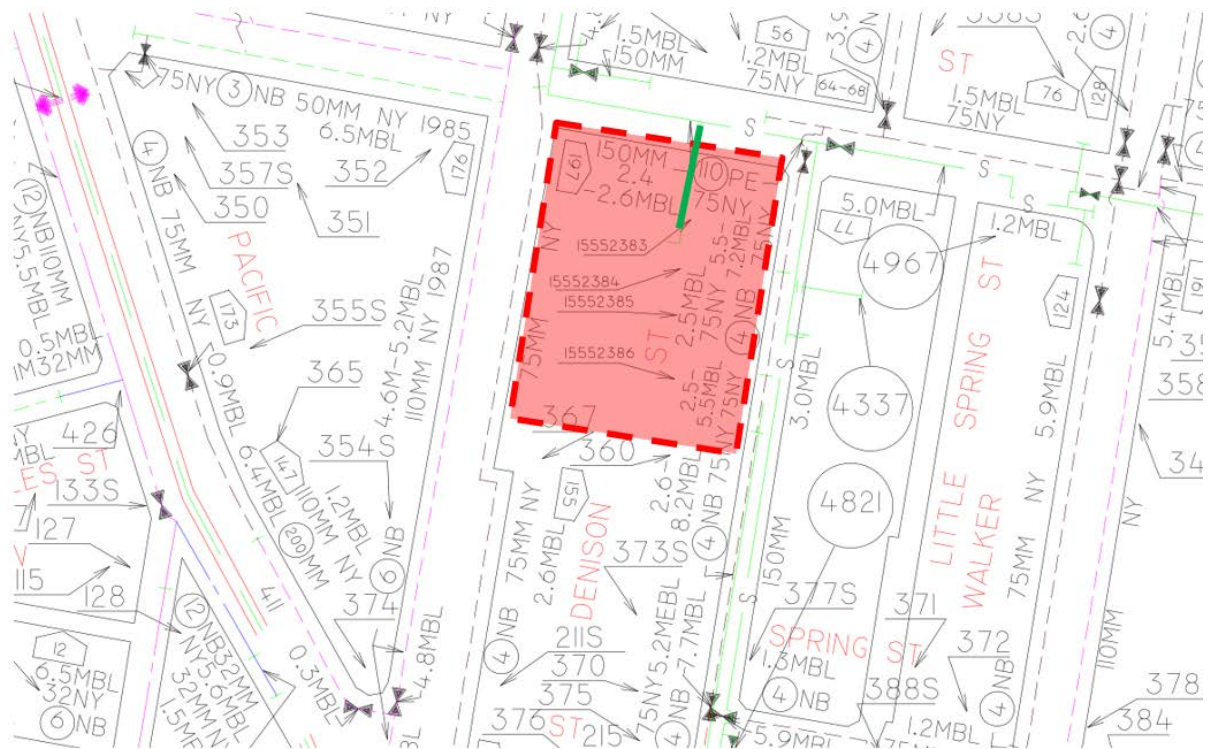
The Gas loads were provided by TfNSW and used in modelling the loads at Victoria Cross Station in Miller Street, North Sydney.

Building	Gas Load (MJ)		Total
	Domestic Hot Water	Mechanical Plant	
EOT Hot Water	5740	0	5740
Tower Hot Water	49200	0	4920
Mech Use	0	17500	17500
Retail x 17	8500	0	8500
Total	19160	17500	36660

3.2 PROPOSED CONNECTION STRATEGY

The load was modelled on the low pressure and secondary pressure networks. The low pressure network does not have sufficient capacity to support the development. There is sufficient capacity on the secondary network and a secondary service already exists to the site (Figure 1). No reinforcement is required.

Figure 1: Secondary service connection to Victoria Cross (Service already existing)



Appendix C

Sydney Water consultation



Case Number: 165999

6 November 2017

TRANSPORT FOR NSW
c/- WARREN SMITH & PARTNERS PTY LTD

FEASIBILITY LETTER

Developer: TRANSPORT FOR NSW
Your reference: 5694000
Development: 155-167 MILLER ST, North Sydney being Lot CP SP35644, Lot 1 DP633088, Lot 1 DP123056, Lot 15 DP69345, Lot 2 DP123056, Lot A DP160018
Development Description: Construction of Victoria Cross Station Over Site Development for Sydney Metro.
Your application date: 1 September 2017

Dear Applicant

Thank you for providing us with the opportunity work with you on the concept design for the construction of Victoria Cross Station Over Site Development as a part of the Sydney Metro. This Feasibility Letter (Letter) is a guide only. It provides general information about what Sydney Water's requirements may be when you apply to us for a Section 73 Certificate (Certificate) for your proposed development. **The information is accurate at today's date only.**

When you obtain development consent for this development we will require you to apply to us for a Section 73 Certificate. You will need to submit a new application (and pay another application fee) to us for that Certificate by using your current or another Water Servicing Coordinator (Coordinator).

Sydney Water will then send you either a:

- Notice of Requirements (Notice) and Developer Works Deed (Deed) or
- Certificate.

These documents will be the definitive statement of Sydney Water's requirements.

There may be changes in Sydney Water's requirements between the issue dates of this Letter and the Notice or Certificate. The changes may be:

- if you change your proposed development eg the development description or the plan/site layout, after today, the requirements in this Letter could change when you submit your new application; and
- if you decide to do your development in stages then you must submit a new application (and pay another application fee) for each stage.

What You Must Do To Get A Section 73 Certificate In The Future.

To get a Section 73 Certificate you must do the following things. You can also find out about this process by visiting www.sydneywater.com.au > Plumbing, building & developing > Developing > Land development.

- 1. Obtain Development Consent from the consent authority for your development proposal.**
- 2. Engage a Water Servicing Coordinator (Coordinator).**

You must engage your current or another authorised Coordinator to manage the design and construction of works that you must provide, at your cost, to service your development. If you wish to engage another Coordinator (at any point in this process) you must write and tell Sydney Water.

For a list of authorised Coordinators, either visit www.sydneywater.com.au > Plumbing, building & developing > Developing > Providers > Lists or call **13 20 92**.

The Coordinator will be your point of contact with Sydney Water. They can answer most questions that you might have about the process and developer charges and can give you a quote or information about costs for services/works (including Sydney Water costs).

- 3. Developer Works Deed**

It would appear that your feasibility application is served from existing mains and does not require any works to be constructed at this time. Sydney Water will confirm this with you after you have received Development Approval from Council and your Coordinator has submitted a new Development application and Sydney Water has issued you with a formal Notice of Requirements.

- 4. Water, Sewer and Stormwater Works**

4.1 Water

Your development must have a frontage to a water main that is the right size and can be used for connection.

Based on the indicated drinking water demand of 157.74kLs/day and the current network configuration, Sydney Water has assessed your application and found that:

- The existing 150mm CICL watermain in McLaren St and the 150CICL main in Miller St will serve the northern and southern ends of your development respectively.
- Your development must have its own connection to that water main and a water service and meter.
- Please see the paragraphs below on Multi-level individual metering requirements, Private Water Services Connection and Metering, Large Water Service Connection and Fire Fighting for additional information.

4.2 Sewer

Your development must have a sewer main that is the right size and can be used for connection.

Based on the indicated wastewater flow of 129.19kLs/day and the current network configuration, Sydney Water has assessed your application and found that:

- The existing 225mm SGW main in McLaren St and the 225SGW sewer main near Denison St will serve the northern and southern ends of your development respectively.
- Please note, if you intend to pump your wastewater to Sydney Water's wastewater main, you will be required to lodge an application with Sydney Water's Tap In™.

4.3 Stormwater

Stormwater adjustment will be required for the station below as per feasibility case 165891. The way in which the stormwater is conveyed through the site will require consideration as part of the overall subdivision of the site. Suitable easement / covenant documents to our requirements shall be prepared and registered on the property certificate of title.

On-site Stormwater Detention (OSD)

The proposed development will require an OSD system to offset stormwater run-off. To determine the required On Site Detention and Permissible Site Discharge (PSD), the following site specific information is required to be submitted:

- Total site area (m²)
- Existing pre-development impervious area (m²)
- Proposed post-development impervious area (m²)

Discharged Stormwater Quality Targets

Stormwater run-off from the site should be of appropriate quality before discharged into a Sydney Water asset or system. Developments must demonstrate stormwater quality improvement measures that meet the following specified stormwater pollutant reductions:

Pollutant	Pollutant load reduction objective (%)
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Gross Pollutants (>5mm)	90
Total Suspended Solids	85
Total Phosphorus	65
Total Nitrogen	45

You may use our tool, through the website below, to determine whether your development is Deemed to Comply. In some cases though, we may request an eWater MUSIC model before approving your connection.

5. Ancillary Matters

5.1 Asset adjustments

After Sydney Water issues this Notice (and more detailed designs are available), Sydney Water may require that any water main/sewer main/stormwater located in or around your site needs to be adjusted/deviated. If this happens, you will need to do this work as well as the extension we have detailed above at your cost. The work must meet the conditions of this Notice and you will need to complete it **before we can issue the Certificate**. Sydney Water will need to see the completed designs for the work and we will require you to lodge a security. The security will be refunded once the work is completed.

5.2 Entry onto neighbouring property

If you need to enter a neighbouring property, you must have the written permission of the relevant property owners and tenants. You must use Sydney Water's **Permission to Enter** form(s) for this. You can get copies of these forms from your Coordinator or the Sydney Water website. Your Coordinator can also negotiate on your behalf. Please make sure that you address all the items on the form(s) including payment of compensation and whether there are other ways of designing and constructing that could avoid or reduce their impacts. You will be responsible for all costs of mediation involved in resolving any disputes. Please allow enough time for entry issues to be resolved.

6. Multi-level individual metering requirements

Your development must either allow for or provide individual metering. This means that you must:

1. comply at all times and in all respects with the requirements of Sydney Water's "Multi-level Individual Metering Guide" (version 7 dated 28 October 2016);
2. provide and install plumbing and space for individual metering in accordance with Sydney Water's "Multi-level Individual Metering Guide";
3. if and when you implement a strata/ stratum plan (or strata/ stratum subdivide) you must:
 - a. engage an Accredited Metering Supplier ("**AMS**") to provide individual metering in accordance with the "Multi-level Individual Metering Guide" and meet the cost of the meters and metering system;

transfer the meters and metering system to Sydney Water once the Testing Certificate has been issued by Sydney Water to the AMS and the AMS has confirmed that payment for the meters and metering system has been paid in full.

OTHER THINGS YOU MAY NEED TO DO

Shown below are other things you need to do that are NOT a requirement for the Certificate. They may well be a requirement of Sydney Water in the future because of the impact of your development on our assets. You must read them before you go any further.

Approval of your building plans

Please note that the building plans must be approved when each lot is developed. This can be done at Sydney Water Tap inTM. Visit www.sydneywater.com.au > Plumbing, building & developing > Building > Sydney Water Tap inTM.

This is not a requirement for the Certificate but the approval is needed because the construction/building works may affect Sydney Water's assets (e.g. water, sewer and stormwater mains).

Where a Sydney Water stormwater channel, pipe or culvert is located within ten (10) metres of your development site it must be referred to Sydney Water for further assessment.

Your Coordinator can tell you about the approval process including:

- Possible requirements;
- Costs; and
- Timeframes.

Note: You must obtain our written approval before you do any work on Sydney Water's systems. Sydney Water will take action to have work stopped on the site if you do not have that approval. We will apply Section 44 of the *Sydney Water Act 1994*.

Soffit Requirements

Please be aware that floor levels must be able to meet Sydney Water's soffit requirements for property connection and drainage.

Private Water Services Connection and Metering

To provide domestic water to the total development you will need to connect to the Sydney Water main. You must lodge an application for this connection at Sydney Water Tap inTM. We will then tell you about any requirements you need to meet. Visit www.sydneywater.com.au > Plumbing, building & developing > Building > Sydney Water Tap inTM to find out more.

Visit www.sydneywater.com.au > Plumbing, building & developing > Plumbing > Meters & metered standpipes to find out more about our metering requirements for your development.

Large Water Service Connection

A water main is available to provide your development with a domestic supply. The size of your development means that you will need a connection larger than the standard domestic 20 mm size.

To get approval for your connection, you will need to lodge an application with Sydney Water Tap inTM. You, or your hydraulic consultant, may need to supply the following:

- A plan of the hydraulic layout;
- A list of all the fixtures/fittings within the property;
- A copy of the fireflow pressure inquiry issued by Sydney Water;
- A pump application form (if a pump is required);
- All pump details (if a pump is required).

You will have to pay an application fee.

Sydney Water does not consider whether a water main is adequate for fire fighting purposes for your development. We cannot guarantee that this water supply will meet your Council's fire fighting requirements. The Council and your hydraulic consultant can help.

Fire Fighting

Definition of fire fighting systems is the responsibility of the developer and is not part of the Section 73 process. It is recommended that a consultant should advise the developer regarding the fire fighting flow of the development and the ability of Sydney Water's system to provide that flow in an emergency. Sydney Water's Operating Licence directs that Sydney Water's mains are only required to provide domestic supply at a minimum pressure of 15 m head.

A report supplying modelled pressures called the Statement of Available pressure can be purchased through Sydney Water Tap inTM and may be of some assistance when defining the fire fighting system. The Statement of Available pressure, may advise flow limits that relate to system capacity or diameter of the main and pressure limits according to pressure management initiatives. If mains are required for fire fighting purposes, the mains shall be arranged through the water main extension process and not the Section 73 process.

Disused Water Service Sealing

You must pay to disconnect all disused private water services and seal them at the point of connection to a Sydney Water water main. This work must meet Sydney Water's standards in the Plumbing Code of Australia (the Code) and be done by a licensed plumber. The licensed plumber must arrange for an inspection of the work by a NSW Fair Trading Plumbing Inspection Assurance Services (PIAS) officer. After that officer has looked at the work, the drainer can issue the Certificate of Compliance. The Code requires this.

Disused Sewerage Service Sealing

Please do not forget that you must pay to disconnect all disused private sewerage services and seal them at the point of connection to a Sydney Water sewer main. This work must meet

Sydney Water's standards in the Plumbing Code of Australia (the Code) and be done by a licensed drainer. The licensed drainer must arrange for an inspection of the work by a NSW Fair Trading Plumbing Inspection Assurance Services (PIAS) officer. After that officer has looked at the work, the drainer can issue the Certificate of Compliance. The Code requires this.

Trade Wastewater Requirements

If this development is going to generate trade wastewater, the property owner must submit an application requesting permission to discharge trade wastewater to Sydney Water's sewerage system. You must wait for approval of this permit before any business activities can commence.

The permit application should be emailed to Sydney Water's Business Customer Services at businesscustomers@sydneywater.com.au

It is illegal to discharge Trade Wastewater into the Sydney Water sewerage system without permission.

A **Boundary Trap** is required for all developments that discharge trade wastewater where arrestors and special units are installed for trade wastewater pre-treatment.

If the property development is for Industrial operations, the wastewater may discharge into a sewerage area that is subject to wastewater reuse. Find out from Business Customer Services if this is applicable to your development.

Backflow Prevention Requirements

Backflow is when there is unintentional flow of water in the wrong direction from a potentially polluted source into the drinking water supply.

All properties connected to Sydney Water's supply must install a testable **Backflow Prevention Containment Device** appropriate to the property's hazard rating. Property with a high or medium hazard rating must have the backflow prevention containment device tested annually. Properties identified as having a low hazard rating must install a non-testable device, as a minimum.

Separate hydrant and sprinkler fire services on non-residential properties, require the installation of a testable double check detector assembly. The device is to be located at the boundary of the property.

Before you install a backflow prevention device:

1. Get your hydraulic consultant or plumber to check the available water pressure versus the property's required pressure and flow requirements.
2. Conduct a site assessment to confirm the hazard rating of the property and its services. Contact PIAS at NSW Fair Trading on **1300 889 099**.

For installation you will need to engage a licensed plumber with backflow accreditation who can be found on the Sydney Water website:

<http://www.sydneywater.com.au/Plumbing/BackflowPrevention/>

Other fees and requirements

The requirements in this Notice relate to your Certificate application only. Sydney Water may be involved with other aspects of your development and there may be other fees or requirements.

These include:

- plumbing and drainage inspection costs;
- the installation of backflow prevention devices;
- trade waste requirements;
- large water connections and
- council fire fighting requirements. (It will help you to know what the fire fighting requirements are for your development as soon as possible. Your hydraulic consultant can help you here.)

Other fees and requirements

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These include:

- plumbing and drainage inspection costs;
- the installation of backflow prevention devices;
- trade waste requirements;
- large water connections and
- council fire fighting requirements. (It will help you to know what the fire fighting requirements are for your development as soon as possible. Your hydraulic consultant can help you here.)

No warranties or assurances can be given about the suitability of this document or any of its provisions for any specific transaction. It does not constitute an approval from Sydney Water and to the extent that it is able, Sydney Water limits its liability to the reissue of this Letter or the return of your application fee. You should rely on your own independent professional advice.

END

Appendix D

Schematic drainage layout

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