



Hydraulic Services

Concept Design Report

Mixed Residential Development

Site 9, Sydney Olympic Park

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1 Executive Summary

1.1 Hydraulic Services

The hydraulic services covered by this Concept Design report include;

Hydraulic Services	Design Codes	Proposed Compliance
Sub-Soil Drainage Service	National Construction Code A.S. 3500.3 – 2003 Plumbing Code Of Australia Council Stormwater DCP and Policies.	Deemed To Satisfy
Stormwater Drainage Service	National Construction Code A.S.3500.3 – 2003 Plumbing Code of Australia Council Stormwater DCP and Policies.	Deemed To Satisfy
Rainwater Plumbing Service	National Construction Code A.S. 3500.3 – 2003 Plumbing Code of Australia Council Stormwater DCP and Policies.	Deemed To Satisfy
Sanitary Drainage Service	National Construction Code A.S. 3500.2 – 2003 Plumbing Code of Australia	Deemed To Satisfy
Trade Waste Drainage Service	National Construction Code A.S. 3500.2 – 2003 Plumbing Code of Australia SWC Trade Waste Policy	Deemed To Satisfy
Sanitary Plumbing Service	National Construction Code A.S. 3500.2 – 2003 Plumbing Code of Australia	Deemed To Satisfy
Potable Cold Water Service	National Construction Code A.S. 3500.1 – 2003 Plumbing Code of Australia	Deemed To Satisfy
Non-Potable Cold Water Service	National Construction Code A.S. 3500.1 – 2003 Plumbing Code of Australia	Deemed To Satisfy
Potable Hot Water Service	National Construction Code A.S. 3500.3 – 2003 Plumbing Code of Australia	Deemed To Satisfy
Natural Gas Service	National Construction Code A.S. 5601 – 2004	Deemed To Satisfy

1.2 Summary

The proposed mixed residential development at site 9, Sydney Olympic Park will be constructed on an existing parcel of land having existing carpark demolished to allow for the new development. The site is bounded by Sarah Durack Avenue to the north, Olympic Boulevard to the west, an existing building to the east and existing carpark to the south.

The building has an effective height of more than 50m in accordance with the definition provided under the Building Code of Australia. Classification of a buildings effective height determines several significant factors in the design of hydraulic services for the building, including the following;

- Adequate sizing and ventilation of sanitary drainage risers, relative to the total load and number of floors served.
- Use of water service pumps to ensure minimum pressures are available at the point of use.
- Pressure control within water services to ensure that maximum pressures are not exceeded at the point of use.
- Location of hot water plant so as to not exceed the maximum working pressures of the plant.

A summary table of the key hydraulic services design proposals is detailed below;

- Sub-Soil Drainage – will be provided below all slabs on ground. Drainage over lower levels will be collected with slotted pipework and reticulated to a central collection location where it will be pumped for discharge into the site stormwater drainage system after having the water quality managed via treatment through a gross pollutant trap device.
- Stormwater Drainage – will be provided to all areas at grade that are exposed to rainfall, as well as throughout carpark levels of the building. Carpark drainage will be provided via a dedicated system that discharges to the sub-soil drainage system for water quality treatment prior to site discharge. Other areas of the building will be drained via gravity into several connections to the civil on-site stormwater detention tank facility that is being constructed in association with this development.
- Rainwater Plumbing – two systems of rainwater plumbing will be provided to the development. One via syphonic drainage to collect roof water only and transfer rainfall into the rainwater storage tank for re-use via the site landscape irrigation system. All other rainwater plumbing system drainage will be achieved via gravity downpipes located to provide drainage to all apartment balconies and terraces throughout the development. Rainwater plumbing systems will discharge into the stormwater drainage system. All associated plumbing to be concealed with structural elements.
- Sanitary Drainage – a system of gravity drainage will be provided to collect discharge from all fixtures and sanitary plumbing systems throughout the development. A site sanitary drainage connection will be made into the Sydney Water sewer main currently located on site, and that is being diverted in association with this development.
- Trade Waste Drainage – a system of gravity trade waste drainage will be provided to collect discharge from the retail & club tenancies. Pre-treatment of the waste shall be by multiple grease arrestor units installed within dedicated rooms at ground level. Discharge from the grease arrestor into the sanitary drainage system.
- Sanitary Plumbing – aerial drainage and fully vented modified stack work shall be used to provide connection of all fixtures through the development. Stacks will be located so that each apartment can be serviced by a dedicated riser, and therefore limit any requirement to penetrate party walls between apartments. Sanitary plumbing systems shall discharge via gravity in the sanitary drainage system.
- Potable Cold Water – potable cold water shall be sourced from a dedicated connection to the existing Sydney Water main located within Olympic Boulevard. A master Authority meter and site containment backflow prevention device shall be located at the site boundary on ground level adjacent to the carpark entry. Individually metered mains pressure water services will be provided for the Residential, Commercial, Retail tenancies and building shared services facilities. A dedicated pump boosted service shall be provided for the residential tower with individual metering to each apartment, and the central hot water plant at roof level. A dedicated pump boosted service shall be provided for Commercial, and the central hot water plant at roof level.

- **Non-Potable Cold Water** – non-potable cold water shall be sourced from a dedicated connection to the existing Sydney Water main located within Olympic Boulevard. A master Authority meter and site containment backflow prevention device shall be located at the site boundary on ground level adjacent to the carpark entry. An individually metered mains pressure water service will be provided for the Residential, Commercial, Retail tenancies, building shared services facilities, and top up to the rainwater storage tank. A dedicated pump boosted service shall be provided for the residential tower with individual metering to each apartment. Non-potable cold water shall be used for toilet flushing requirements. A dedicated pump boosted service shall be provided for Commercial.
- **Rainwater Re-use** – a rainwater re-use system shall be provided for landscape irrigation throughout the development. Rainwater shall be collected from roof level only and stored in a dedicated tank at ground level. A pump and filter system shall be provided to reticulate rainwater as required to the landscape irrigation system. Non-potable cold water top-up shall be provided for periods of low rainfall.
- **Potable Hot Water** – a central gas fired hot water plant shall be provided at roof level for all residential hot water requirements. A system of flow and return pipework shall be provided with pump circulation to reticulate hot water throughout Residential areas of the development. Individual meters shall be provided to each apartment, located with service risers that are accessible from the common corridor area. Retail/Club hot water requirements shall be provided by the tenants, with garbage area hot water being generated by individual electric hot water units located adjacent to each garbage room. A central heat pump hot water plant with electric boost shall be provided at level 8 for all Commercial hot water requirements. A system of flow and return pipework shall be provided with pump circulation to reticulate hot water throughout commercial areas of the development.
- **Natural Gas** – natural gas shall be sourced from a dedicated connection to the Jemena main located within Olympic Boulevard. There currently is a high pressure gas main located within Sarah Durack Avenue. However, we have written advice that a 210kPa main will be required to be installed in Olympic Boulevard extending from Fig Tree Drive in the near future (before the development proceeds) which will be suitable for connection of the site. A site regulator assembly shall be located at the site boundary on ground level adjacent to the carpark entry. Individually metered natural gas services will be provided for the Residential, Commercial, Retail tenancies, and each Residential apartment including the central hot water plant. Residential gas meters shall be located within dedicated service cupboards accessible from common corridor areas on all Residential levels.

2 Introduction

2.1 Background

Ecove Group Pty Ltd has engaged Insync Services Pty Ltd to provide building services consultancy on the mixed residential development at Site 9, Sydney Olympic Park. Specifically, Insync Services Pty Ltd have been engaged to provide engineering consultancy with regard to the following building services disciplines;

- Hydraulic Services
- Wet Fire Services
- Mechanical Services

2.2 Scope of Services

The building services engineering elements considered within this report are as follows;

- Sub-Soil Drainage
- Stormwater Drainage
- Rainwater Plumbing
- Sanitary Drainage
- Trade Waste Drainage
- Potable Cold Water Service
- Non-Potable Cold Water Service
- Hot Water Service
- Natural Gas Service

2.3 Aims

The aim of this Concept Design report is to provide a detailed description of the hydraulic services design proposals associated with the development. Specifically the report is intended to provide a summary of the following;

- Identification of services to be provided.
- Description of the codes to which they will be installed.
- Description of the basis for design.
- Description of the required performance.
- Description of the materials to be used.

2.4 Briefing Documents

The hydraulic services engineering elements considered within this report have taken into account the following preliminary documentation and investigations;

- Building Code of Australia.
- Authority main diagrams.
- Architectural drawings prepared by Bates Smart Pty Ltd.

2.5 Associated Services

The associated services engineering elements to be considered in conjunction within this report are as follows;

- Fire Rated Construction as detailed by the Architect and Structural Engineer.
- Acoustic Performance as detailed by the Acoustic Engineer.

3 Schedule Of Accommodation

3.1 Area Schedule

Preliminary load estimates within this report have been based upon the Schedule of GFA (m²) Area detailed below;

Building Level	Floor Level	Building Area (m ²)
Ground Level	12.05	1122
Level 02	17.00	0
Level 03	20.00	0
Level 04	23.00	0
Level 05	26.00	0
Level 06	29.00	0
Level 07	33.10	1866
Level 08	36.20	1723
Level 09	39.30	668
Level 10	42.40	681
Level 11	45.50	681
Level 12	48.60	681
Level 13	51.70	681
Level 14	54.80	681
Level 15	58.20	683
Level 16	61.30	683
Level 17	64.40	683
Level 18	67.50	683
Level 19	70.60	683
Level 20	74.00	683
Level 21	77.10	683
Level 22	80.20	683
Level 23	83.30	683
Level 24	86.40	683
Level 25	89.50	683
Level 26	92.60	683
Level 27	96.00	678
Level 28	99.10	678
Level 29	102.20	678
Level 30	105.30	678
Level 31	108.40	678
Level 32	111.50	678
Level 33	114.60	678
Level 34	117.70	678
Level 35	120.80	678
Level 36	124.20	719
Level 37	127.30	610
Level 38	130.40	610
Roof Level	133.50	0
Totals	117.7m	25,130

3.2 Accommodation Schedule

Preliminary load estimates within this report have been based upon the Schedule of Accommodation detailed below;

Building Level	Totals
Ground Level	0
Level 02	0
Level 03	0
Level 04	0
Level 05	0
Level 06	0
Level 07	6
Level 08	6
Level 09	7
Level 10	8
Level 11	8
Level 12	8
Level 13	8
Level 14	8
Level 15	8
Level 16	8
Level 17	8
Level 18	8
Level 19	8
Level 20	8
Level 21	8
Level 22	8
Level 23	8
Level 24	8
Level 25	8
Level 26	8
Level 27	7
Level 28	7
Level 29	7
Level 30	7
Level 31	7
Level 32	7
Level 33	7
Level 34	7
Level 35	7
Level 36	4
Level 37	4
Level 38	3
Totals	229

4 Sub-Soil Drainage Service

4.1 Sub-Soil Drainage Generally

Specifically this section of the Concept Design report shall cover the following services:

- Sub-Soil Drainage

4.2 Standards

Works under this section of the Concept Design report shall be designed in accordance with the following standards;

- The Building Code of Australia
- Plumbing Code of Australia
- AS 3500.3 - Stormwater Drainage
- Council DCP and Policies.
- Sydney Olympic Park Authority Policies and Guidelines
- Environmental Protection Authority Policies and Guidelines

4.3 System Design

A system of sub-soil drainage will be installed to the high side of building perimeters when interfaced to sloping ground, below concrete slabs when installed below natural ground level, and behind all retaining walls.

All sub-soil branches shall be terminated with a bolted trap screw removable access cover at the upstream end. Access covers shall be located in accessible locations to facilitate future maintenance and cleaning of the sub-soil drainage system.

Sub-soil branches shall be terminated into pre-cast concrete sub-soil pits at the downstream end. Sub-soil pits shall be located at maximum 30 metre intervals, and shall be interconnected within stormwater pipework having a minimum diameter of 150mm.

Discharge from the sub-soil drainage system shall be directed through a pollution control device capable of removing sediments and oils, prior to being connected into the stormwater drainage system for disposal.

Where possible, on grade gravity drainage shall be the preferred method of connection for all sub-soil discharge into the stormwater drainage system. In the event that site conditions preclude a gravity drainage connection, discharge from the sub-soil drainage system shall be collected in a strategically located collection well. The collection well shall have adequate capacity to store discharge from all connected pipework during a 10 year ARI storm event of 2 hours duration. In any case the collection well shall have a minimum effective storage capacity of 3,000 litres.

Dual submersible pumps shall be installed within the collection well to transfer sub-soil discharge into the stormwater drainage system. Pumps shall be sized as a duty/standby arrangement whereby each pump has the capacity to provide the full required duty, therefore providing 100% redundancy to the system in the event of a single pump failure. Pumps shall be automatically controlled via a dedicated sub-soil pump control panel, complete with an interface connection to the Building Monitoring System.

4.4 Sizing

Sub-soil drainage shall be located and sized in consultation with the geotechnical engineer, to determine actual sub-soil flow rates for the particular development site.

4.5 Installation

Sub-Soil drainage pipework shall be installed within neatly excavated trenches, overwrapped with geotextile fabric, and covered on all sides to a depth of 150mm with blue metal backfill. Sub-soil pipework shall be installed at a minimum grade of 0.5%.

4.6 Materials

Sub-Soil Drainage services for this development shall be constructed from materials as follows;

Service	Location	Diameter	Material
Sub-Soil Drainage	In-Ground	All	DWV Grade Slotted UPVC with solvent welded joints.

The above-nominated materials have been selected for the intended purpose, durability, cost effectiveness and are in line with current trade practice.

5 Stormwater Drainage Service

5.1 Stormwater Drainage Generally

Specifically this section of the Concept Design report shall cover the following services;

- Stormwater Drainage

5.2 Standards

Works under this section of the Concept Design report shall be designed in accordance with the following standards;

- The Building Code of Australia
- Plumbing Code of Australia
- AS 3500.3 - Stormwater Drainage
- Council DCP and Policies.
- Sydney Olympic Park Authority Policies and Guidelines
- Environmental Protection Authority Policies and Guidelines

5.3 System Design

A system of stormwater drainage will be provided in accordance with code requirements, to collect discharge from the rainwater plumbing system and other connected stormwater discharges throughout the development.

Stormwater drainage pipework will be routed and collected through the building as necessary before connecting to the Authority stormwater drainage system.

Stormwater drainage pipework crossing fire compartment boundaries shall be fitted with fire collars.

Stormwater drainage pipework located within sensitive areas will be acoustically lagged in accordance with the Acoustic Engineer's requirements.

5.4 Stormwater On-Site Detention (OSD)

Stormwater OSD requirements for this development have been detailed within the Civil Engineers documentation.

5.5 Sizing

Stormwater drainage pipework shall be sized with adequate capacity to convey discharge from all connected pipework from the rainwater plumbing system, and other connected discharges. Typically the pipe capacity tables shall be used from AS 3500.3, for pipes flowing full at 1.0% grade. In addition pipework shall be of adequate size to limit flow velocities within the pipework to a maximum of 2.0m/s.

5.6 Inground Installation

Stormwater drainage pipework shall be installed within neatly excavated trenches, covered on all sides to a depth of 150mm with blue metal backfill. Inground Stormwater drainage pipework shall be installed at a minimum grade of 1.0%.

5.7 Suspended Installation

Stormwater drainage pipework shall be installed neatly in straight runs with constant fall, and include adequate brackets to prevent any variation in pipework alignment. Suspended Stormwater drainage pipework shall be installed at a minimum grade of 1.0%.

5.8 Materials

Stormwater Drainage services for this development shall be constructed from materials as follows;

Service	Location	Diameter	Material
Stormwater Drainage	In-Ground	<300mm	DWV Grade UPVC pipework with solvent welded joints.
Stormwater Drainage	In-Ground	>300mm	Class 2 FRC pipework with rubber ring joints.
Stormwater Drainage	Suspended	<300mm	DWV Grade UPVC pipework with solvent welded joints.
Stormwater Drainage	Suspended	>300mm	Class 2 FRC pipework with rubber ring joints.

The above-nominated materials have been selected for the intended purpose, durability, cost effectiveness and are in line with current trade practice.

6 Rainwater Plumbing Service

6.1 Rainwater Plumbing Generally

Specifically this section of the Concept Design report shall cover the following services:
Rainwater Plumbing Service

6.2 Standards

Works under this section of the Concept Design report shall be designed in accordance with the following standards;

- The Building Code of Australia
- Plumbing Code of Australia
- AS 3500.3 - Stormwater Drainage
- Council DCP and Policies.
- Sydney Olympic Park Authority Policies and Guidelines
- Environmental Protection Authority Policies and Guidelines

6.3 System Design

A mixture of gravity and syphonic rainwater plumbing will be provided in accordance with code requirements.

The system shall be sized with adequate capacity to convey discharge from all connected pipework during a 20 year ARI storm event of 5 minutes duration for eaves gutters and balcony outlets in non-critical areas (areas with a suitable overflow), and during a 100 year ARI storm event of 5 minutes duration for box gutters and balcony outlets in critical areas (areas without a suitable overflow).

Roof drainage outlets shall be provided to maximize flexibility for coordination purposes.

Rainwater plumbing roof outlets shall be sized to accept discharge from the fire hydrant service during pressure and flow testing of the system.

Rainwater plumbing pipework crossing fire compartment boundaries shall be fitted with fire collars.

Rainwater plumbing downpipes located within sensitive areas will be acoustically lagged in accordance with the Acoustic Engineer's requirements.

Rainwater plumbing downpipes shall have removable sealed access openings provided at the base of each downpipe, and shall discharge into stormwater drainage system.

6.4 Sizing

Rainwater plumbing pipework shall be sized with adequate capacity to convey discharge from all connected outlets. Typically the pipe capacity tables shall be used from AS 3500.3, for pipes flowing full at 1.0% grade. In addition pipework shall be of adequate size to limit flow velocities within the pipework to a maximum of 2.0m/s.

6.5 Syphonic Sizing

Syphonic rainwater plumbing pipework shall be sized with computer modeling programs provided by the syphonic drainage system manufacturer. Pipework grade and flow velocities shall be as determined by the system manufacturer.

6.6 Installation

Rainwater plumbing pipework shall be installed neatly in straight runs with constant fall, and include adequate brackets to prevent any variation in pipework alignment. Rainwater plumbing pipework shall be installed at a minimum grade of 1.0%, the exception being syphonic rainwater plumbing pipework which may be installed at 0% grade subject to design validation via computer modeling.

6.7 Materials

Stormwater Drainage services for this development shall be constructed from materials as follows;

Service	Location	Diameter	Material
Rainwater Plumbing	Gravity	<300mm	DWV Grade UPVC pipework with solvent welded joints.
Rainwater Plumbing	Gravity	>300mm	Class 2 FRC pipework with rubber ring joints.
Rainwater Plumbing	Syphonic	All	High Density Polyethylene pipework with fusion welded joints.

The above-nominated materials have been selected for the intended purpose, durability, cost effectiveness and are in line with current trade practice.

7 Sanitary Drainage Service

7.1 Sanitary Drainage Generally

Specifically this section of the Concept Design report shall cover the following services;

- Sanitary Drainage

7.2 Standards

Works under this section of the Concept Design report shall be designed in accordance with the following standards;

- The Building Code of Australia
- Plumbing Code of Australia
- AS 3500.2 – Sanitary Plumbing & Drainage

7.3 System Design

A system of sewer drainage will be provided in accordance with code requirements.

Wastewater produced from sanitary fixtures and appliances within the proposed development shall be combined into common sewer lines before connecting via gravity where possible to the Authority sanitary drainage system.

For areas of the development unable to drain via gravity, dual submersible pumps shall be installed within a collection well to transfer sewer discharge into the Authority sewer drainage system. Pumps shall be sized as a duty/standby arrangement whereby each pump has the capacity to provide the full required duty, therefore providing 100% redundancy to the system in the event of a single pump failure. Pumps shall be automatically controlled via a dedicated sewer pump control panel, complete with an interface connection to the Building Monitoring System.

Access chambers shall be installed at all major directional change locations and at intervals not exceeding 60 metres.

Overflow relief devices shall be strategically located within the system to prohibit the unwanted surcharge of sewerage into the building in the event of a blockage in the downstream network.

Vent pipes shall be strategically located within the system to maintain the integrity of fixture trap seals whilst conveying sewer gases to the atmosphere.

7.4 Main Connection

A new 225mm sewer main connection will be required into the existing 150mm Sydney Water sewer main located at the South eastern end of the site. (Olympic Boulevard). Existing 150mm sewer main traversing proposed site would require diverting for proposed development. Advice from Sydney Water coordinator required.

7.5 Sizing

Sewer drainage shall be sized with adequate capacity to convey discharge from all connected fixtures and appliances. Typically the fixture unit method of load estimation shall be used from AS 3500.2, with sewer drainage pipework to be installed at a minimum grade of 1.65%.

7.6 Inground Installation

Sanitary drainage pipework shall be installed within neatly excavated trenches, covered on all sides to a depth of 150mm with blue metal backfill. Sanitary drainage pipework shall be installed at a minimum grade of 1.65%.

7.7 Suspended Installation

Sanitary drainage pipework shall be installed neatly in straight runs with constant fall, and include adequate brackets to prevent any variation suspended pipework alignment. Sanitary drainage pipework shall be installed at a minimum grade of 1.65%.

7.8 Materials

Sanitary Drainage services for this development shall be constructed from materials as follows;

Service	Location	Diameter	Material
Sanitary Drainage	In-Ground	<300mm	DWV Class UPVC pipework with solvent welded joints.
Sanitary Drainage	In-Ground	>300mm	Class 2 FRC pipework with rubber ring joints.
Sanitary Drainage	Suspended	<300mm	DWV Class UPVC pipework with solvent welded joints.
Sanitary Drainage	Suspended	>300mm	Class 2 FRC pipework with rubber ring joints.

The above-nominated materials have been selected for the intended purpose, durability, cost effectiveness and are in line with current trade practice.

8 Sanitary Plumbing Service

8.1 Sanitary Plumbing Generally

Specifically this section of the Concept Design report shall cover the following services;

- Sanitary Plumbing

8.2 Standards

Works under this section of the Concept Design report shall be designed in accordance with the following standards;

- The Building Code of Australia
- Plumbing Code of Australia
- AS 3500.2 – Sanitary Plumbing & Drainage

8.3 System Design

A system of sanitary plumbing will be provided in accordance with code requirements.

Wastewater produced from sanitary fixtures and appliances within the proposed development shall be combined into common sanitary plumbing lines and gravitate to the sewer drainage service.

A combination of both aerial drainage and fully vented modified stack systems shall be used to achieve the most economical sanitary plumbing installation.

A ventilation network fitted to the sanitary plumbing network will maintain the integrity of fixture trap seals whilst conveying sewer gases to the atmosphere. Vent terminals shall be connected in a manifold to minimise the frequency of roof penetrations.

Inspection openings shall be installed at all major directional change locations and at intervals not exceeding 30 metres.

Sanitary plumbing pipework crossing fire compartment boundaries shall be fitted with fire collars.

Sanitary plumbing pipework located within sensitive areas will be acoustically lagged in accordance with the Acoustic Engineer's requirements.

8.4 Sizing

Sanitary plumbing shall be sized with adequate capacity to convey discharge from all connected fixtures and appliances. Typically the fixture unit method of load estimation shall be used from AS 3500.2, with sanitary plumbing pipework to be installed at a minimum grade of 1.65%.

8.5 Installation

Sanitary plumbing pipework shall be installed neatly in straight runs with constant fall, and include adequate brackets to prevent any variation in pipework alignment. Sanitary plumbing pipework shall be installed at a minimum grade of 1.65%.

8.6 Materials

Sanitary plumbing services for this development shall be constructed from materials as follows;

Service	Location	Diameter	Material
Sanitary Plumbing	Suspended	<300mm	DWV Class UPVC pipework with solvent welded joints.
Sanitary Plumbing	Suspended	>300mm	Class 2 FRC pipework with rubber ring joints.

The above-nominated materials have been selected for the intended purpose, durability, cost effectiveness and are in line with current trade practice.

9 Potable Cold Water Service

9.1 Potable Cold Water Service Generally

Specifically this section of the Concept Design report shall cover the following services;

- Potable Cold Water Service

9.2 Standards

Works under this section of the Concept Design report shall be designed in accordance with the following standards;

- Plumbing Code of Australia
- AS 3500.1 – Water Services

9.3 System Design

Water supply for the development shall be drawn from a new connection into the Existing 150mm Sydney Water main located within Olympic Boulevard.

An authority water meter and site containment backflow prevention device will be provided at the site boundary, in a dedicated meter cupboard located at ground level adjacent to the carpark entry of the Northern building façade.

Due to the height of the building potable cold water service booster pumps will be required to increase pressure within the system to an acceptable level on upper floor levels. Pumps shall be provided in Triplex for residential and Duplex for Commercial and located within a dedicated pump room at ground level.

A dead-leg main pipework configuration will be provided for connection to the base of each individual potable cold water riser from buildings above, to achieve the most economical potable cold water service installation, in conjunction with a system design that provides for flexibility and redundancy in supply.

Main isolation valves will be provided at the base of each riser for individual maintenance or emergency shutdown.

9.4 Sizing

Potable cold water services shall be sized with adequate capacity to convey water supply to all connected fixtures and appliances. Typically the loading unit method of load estimation shall be used from AS 3500.1.

Potable cold water service pipework shall be sized such that the maximum velocity within any pipework is as follows;

Location	Maximum Velocity
External Locations in Ground	2.4m/s
Internal Locations in Walls and Ceilings	1.5m/s

9.5 Operating Pressures

Potable cold water services shall be designed to ensure that a minimum outlet pressure of 250kPa is available at every fixture within the proposed development. Where required pressure limiting valves shall also be provided to ensure that a maximum of 500kPa is available at any fixture within the proposed development.

9.6 Water Supply

Potable cold water service water supply shall be drawn from a new 150mm diameter connection into the 150mm Sydney Water main within Olympic Boulevard.

9.7 Metering

An Authority meter shall be provided on the incoming potable cold water supply to the development. The meter shall be located within at the site boundary, adjacent to the main vehicle entry to the site.

Additional sub-meters shall be provided as required to various strata's within the development in the meter/pump room. Sub-meters shall be pulse type meters suitable for connection into the Building Monitoring System. Typically sub-meters shall be provided to the following connections;

- Residential Services (each apartment)
- Commercial Service
- Retail Service
- Club Service
- Shared Services (Including FHR service)

9.8 Filtration

A fifty (50) micron primary water filtration system shall be provided to filter all potable cold water prior to reticulation throughout the development. The filter assembly shall be located immediately downstream of the booster pump assembly so as to filter the potable cold water supply to the entire building.

Filter assembly shall be automatic backwash type, with dual filters installed in parallel to provide redundancy during maintenance.

9.9 Booster Pumps – Residential (Triplex)

Booster pumps shall be provided to ensure adequate pressure within the potable cold water service. Pumps shall be located downstream of the Authority meter. Pumps shall be sized as a duty/duty/standby arrangement whereby each pump has the capacity to provide 50% of the full required duty, therefore providing 100% redundancy to the system in the event of a single pump failure. Pumps shall be automatically controlled via a dedicated potable cold water service pump control panel, complete with an interface connection to the Building Monitoring System.

9.10 Booster Pumps – Commercial (Duplex)

Booster pumps shall be provided to ensure adequate pressure within the potable cold water service. Pumps shall be located downstream of the Authority meter. Pumps shall be sized as a duty/standby arrangement whereby each pump has the capacity to provide 100% of the full required duty, therefore providing 100% redundancy to the system in the event of a single pump failure. Pumps shall be automatically controlled via a dedicated potable cold water service pump control panel, complete with an interface connection to the Building Monitoring System.

9.11 Backflow Prevention

Three levels of backflow protection shall be provided to the potable cold water supply for this development in accordance with the requirements of AS 3500.1 – Water Services.

Site containment backflow prevention shall be provided immediately downstream of the Authority water meter located adjacent to the main vehicle entry. The required backflow prevention device shall be a reduced pressure zone device.

Zone backflow prevention shall be provided on potable cold water supplies to the following areas within the development;

- Non-Potable Cold Water Service
- Mechanical Services Water Supply
- Fire Hose Reel Water Supply

Fixture backflow prevention shall be provided as required on potable cold water supplies to the various plant and equipment within the development.

9.12 Isolation of Wet Areas & Fixtures

All individual fixtures where possible will be controlled via (chrome plated where exposed) right-angled mini cistern taps. All groups of fixtures within designated wet areas will be controlled via in-wall recessed domed covered isolation valves generally at 2200mm above FFL or as near as practicable to the basin they serve.

9.13 Thermal Insulation

Where required potable cold water service pipework shall be thermally insulated to prevent heat gain within the service, and to prevent condensation on the pipework surface.

9.14 Flow Rates

Potable cold water supply to fixtures within the proposed development shall be based upon the following flow rates;

Fixture	WELS Rating	Flow Rate
Toilets	3 Star	Full – Not more than 6.5L/flush Half – Not more than 3.5L/flush Avge – Not more than 4.0L/flush
Basins	3 Star	7.5L/min
Showers	3 Star	7.5L/min
Urinals	3 Star	Less than 2L/flush
Sinks	3 Star	7.5L/min

Note: Flow rates to be confirmed with Basix report

9.15 Materials

Potable cold water services for this development shall be constructed from materials as follows;

Service	Location	Diameter	Material
Potable Cold Water Service – Mains Pressure	In-Ground	All	Type B Copper pipework with silver solder or mechanical press fit joints.
Potable Cold Water	Suspended Mains	All	Type B Copper

Service – Mains Pressure			pipework with silver solder or mechanical press fit joints.
Potable Cold Water Service – Pumped Service	Suspended Mains	All	Stainless steel pipework with mechanical press fit joints.
Potable Cold Water Service	Rough-In, Downstream Of Apartment Meter.	All	Polyethylene pipework with mechanical compression joints.

The above-nominated materials have been selected for the intended purpose, durability, cost effectiveness and are in line with current trade practice.

10 Non-Potable Cold Water Service

10.1 Non-Potable Cold Water Service Generally

Specifically this section of the Concept Design report shall cover the following services;

- Non-Potable Cold Water Service

10.2 Standards

Works under this section of the Concept Design report shall be designed in accordance with the following standards;

- Plumbing Code of Australia
- AS 3500.1 – Water Services
- SWC Non-Potable Water (Recycled Water) requirements.
- Sydney Olympic Park Authority Policies and Guidelines

10.3 System Design

Non-Potable water supply for the development shall be drawn from a new connection into the existing 250mm Sydney Water main to be located within Olympic Boulevard.

An authority water meter and site containment backflow prevention device will be provided at the site boundary, in a dedicated meter cupboard located at ground level adjacent to the carpark entry of the Northern building façade.

Due to the height of the building non-potable cold water service booster pumps will be required to increase pressure within the system to an acceptable level on upper floor levels. Pumps shall be provided in Triplex for residential and Duplex for Commercial and located within a dedicated pump room at ground level.

A dead-leg main pipework configuration will be provided for connection to the base of each individual non-potable cold water riser from buildings above, to achieve the most economical non-potable cold water service installation, in conjunction with a system design that provides for flexibility and redundancy in supply.

Main isolation valves will be provided at the base of each riser for individual maintenance or emergency shutdown.

10.4 Sizing

Non-Potable cold water services shall be sized with adequate capacity to convey water supply to all connected fixtures and appliances. Typically the loading unit method of load estimation shall be used from AS 3500.1.

Non-Potable cold water service pipework shall be sized such that the maximum velocity within any pipework is as follows;

Location	Maximum Velocity
External Locations in Ground	2.4m/s
Internal Locations in Walls and Ceilings	1.5m/s

10.5 Operating Pressures

Non-Potable cold water services shall be designed to ensure that a minimum outlet pressure of 250kPa is available at every fixture within the proposed development. Where required pressure limiting valves shall also be provided to ensure that a maximum of 500kPa is available at any

fixture within the proposed development.

10.6 Water Supply

Non-Potable cold water service water supply shall be drawn from a new 150mm diameter connection into the existing 250mm Sydney Water main to be located within Olympic Boulevard.

10.7 Metering

An Authority meter shall be provided on the incoming non-potable cold water supply to the development. The meter shall be located within the site boundary, adjacent to the main vehicle entry to the site.

Additional sub-meters shall be provided as required to various strata's within the development. Sub-meters shall be pulse type meters suitable for connection into the Building Monitoring System. Typically sub-meters shall be provided to the following connections;

- Residential Services (each apartment)
- Commercial Services
- Retail Services
- Shared Services

10.8 Filtration

A fifty (50) micron primary water filtration system shall be provided to filter all non-potable cold water prior to reticulation throughout the development. The filter assembly shall be located immediately downstream of the booster pump assembly so as to filter the non-potable cold water supply to the entire building.

Filter assembly shall be automatic backwash type, with dual filters installed in parallel to provide redundancy during maintenance.

10.9 Booster Pumps – Residential (Triplex)

Booster pumps shall be provided to ensure adequate pressure within the non-potable cold water service. Pumps shall be located downstream of the Authority meter. Pumps shall be sized as a duty/duty/standby arrangement whereby each pump has the capacity to provide 50% of the full required duty, therefore providing 100% redundancy to the system in the event of a single pump failure. Pumps shall be automatically controlled via a dedicated non-potable cold water service pump control panel, complete with an interface connection to the Building Monitoring System.

10.10 Booster Pumps – Commercial (Duplex)

Booster pumps shall be provided to ensure adequate pressure within the non-potable cold water service. Pumps shall be located downstream of the Authority meter. Pumps shall be sized as a duty/standby arrangement whereby each pump has the capacity to provide 100% of the full required duty, therefore providing 100% redundancy to the system in the event of a single pump failure. Pumps shall be automatically controlled via a dedicated non-potable cold water service pump control panel, complete with an interface connection to the Building Monitoring System.

10.11 Backflow Prevention

Three levels of backflow protection shall be provided to the non-potable cold water supply for this development in accordance with the requirements of AS 3500.1 – Water Services.

Site containment backflow prevention shall be provided immediately downstream of the Authority water meter located adjacent to the main vehicle entry. The required backflow

prevention device shall be a reduced pressure zone device.

Zone backflow prevention shall be provided on non-potable cold water supplies to the following areas within the development;

- Non-Potable Cold Water Service

Fixture backflow prevention shall be provided as required on non-potable cold water supplies to the various plant and equipment within the development.

10.12 Isolation of Wet Areas & Fixtures

All individual fixtures where possible will be controlled via (chrome plated where exposed) right-angled mini cistern taps. All groups of fixtures within designated wet areas will be controlled via in-wall recessed domed covered isolation valves generally at 2200mm above FFL or as near as practicable to the basin they serve.

10.13 Thermal Insulation

Where required non-potable cold water service pipework shall be thermally insulated to prevent heat gain within the service, and to prevent condensation on the pipework surface.

10.14 Flow Rates

Potable cold water supply to fixtures within the proposed development shall be based upon the following flow rates;

Fixture	WELS Rating	Flow Rate
Toilets	3 Star	Full – Not more than 6.5L/flush Half – Not more than 3.5L/flush Avge – Not more than 4.0L/flush

10.15 Materials

Potable cold water services for this development shall be constructed from materials as follows;

Service	Location	Diameter	Material
Non-Potable Cold Water Service – Mains Pressure	In-Ground	All	Type B Copper pipework with silver solder or mechanical press fit joints.
Non-Potable Cold Water Service – Mains Pressure	Suspended Mains	All	Type B Copper pipework with silver solder or mechanical press fit joints.
Non-Potable Cold Water Service – Pumped Service	Suspended Mains	All	Stainless steel pipework with mechanical press fit joints.
Non-Potable Cold Water Service	Rough-In, Downstream Of Apartment Meter.	All	Polyethylene pipework with mechanical compression joints.

The above-nominated materials have been selected for the intended purpose, durability, cost effectiveness and are in line with current trade practice.

11 Potable Hot Water Service

11.1 Potable Hot Water Service Generally

Specifically this section of the Concept Design report shall cover the following services;

- Potable Hot Water Service

11.2 Standards

Works under this section of the Concept Design report shall be designed in accordance with the following standards;

- Plumbing Code of Australia
- AS 3500.4 – Hot Water Services

11.3 System Design

A combination of ring mains and main supply risers be used to achieve the most economical potable hot water service installation, in conjunction with a system design that provides for flexibility and redundancy in supply.

Potable hot water for residential base building uses within the development shall be provided from the main plant, with reticulation throughout the development via flow and return pipework and dual circulating pumps. Hot water discharge from the plant shall be 65 degrees and hot water return to the plant shall be a minimum of 60 degrees.

11.4 Potable Hot Water Capacity - Residential

In order to cover peak instantaneous demands, hot water storage shall be provided. The stored water shall be maintained at a temperature of 65 degrees whilst in the storage vessels.

Hot water plant shall be provided in multiple arrays of heaters or boilers, such that each array can maintain serviceable capacity in the event of a single heater or boiler failure.

Hot water plant shall be sized upon the following usage rates;

- Daily Hot Water Consumption – 110L per apartment
- Hot Water Capacity
 - o 1 Bed = 25L peak hour
 - o 2 Bed = 40L peak hour
 - o 2 Bed + Ensuite = 75L peak hour
 - o 3 Bed = 100L peak hour
 - o 4 Bed = 150L peak hour

11.5 Potable Hot Water Capacity – Commercial

In order to cover peak instantaneous demands, hot water storage shall be provided. The stored water shall be maintained at a temperature of 65 degrees whilst in the storage vessels.

Hot water plant shall be provided in multiple arrays of heaters or boilers, such that each array can maintain serviceable capacity in the event of a single heater or boiler failure.

Hot water plant shall be sized upon the following usage rates;

- Daily Hot Water Consumption – 0.5L per person
 - o Office area: 2581m² with Population 258
- Hot Water Capacity
 - o Office = 129L peak hour

11.6 Sizing

Potable hot water services shall be sized with adequate capacity to convey water supply to all connected fixtures and appliances. Typically the loading unit method of load estimation shall be used from AS 3500.1.

Potable hot water service pipework shall be sized such that the maximum velocity within any pipework is as follows;

Location	Maximum Velocity
External Locations in Ground	2.4m/s
Internal Locations in Walls and Ceilings	1.5m/s

11.7 Operating Pressures

Potable hot water services shall be designed to ensure that a minimum outlet pressure of 250kPa is available at every fixture within the proposed development. Where required pressure limiting valves shall also be provided to ensure that a maximum of 500kPa is available at any fixture within the proposed development.

11.8 Metering

A master hot water meter shall be provided at each potable hot water plant within the development. Additional sub-meters shall be provided as required to each individual apartment, with meters located outside of the apartment, as close as practicable to the fixtures within the apartment to reduce dead-leg pipework.

All meters shall be pulse type meters suitable for connection into the Meter Data Logger system as provided by Jemena.

11.9 Circulation Pumps

Potable hot water circulation pumps shall be provided to maintain the required temperature within flow and return potable hot water pipework systems. Pumps shall be sized as a duty/standby arrangement whereby each pump has the capacity to provide 100% of the full required duty, therefore providing 100% redundancy to the system in the event of a single pump failure. Pumps shall be automatically controlled via a dedicated potable hot water service pump control panel, complete with an interface connection to the Building Monitoring System.

11.10 Backflow Prevention

A single level of backflow protection shall be provided to the potable hot water supply for this development in accordance with the requirements of AS 3500.1 – Water Services.

Fixture backflow prevention shall be provided as required on potable cold water supplies to the various plant and equipment within the development.

11.11 Isolation of Wet Areas & Fixtures

All individual fixtures where possible will be controlled via (chrome plated where exposed) right-angled mini cistern taps. All groups of fixtures within designated wet areas will be controlled via in-wall recessed domed covered isolation valves generally at 2200mm above FFL or as near as practicable to the basin they serve.

11.12 Thermal Insulation

Thermal insulation shall be provided to all potable hot water service pipework.

11.13 Flow Rates

Potable heated water supply to fixtures within the proposed development shall be based upon the following flow rates;

Fixture	WELS Rating	Flow Rate
Basins	3 Star	7.5L/min
Showers	3 Star	7.5L/min
Sinks	3 Star	7.5L/min

Note: Flow rates to be confirmed with Basix report

11.14 Temperature Control

Generally there are three main potable hot water usage requirements within the proposed development as follows;

- 43.5 degree warm water to all disabled amenities
- 50 degree hot water to all amenities
- 60 degree hot water to utility areas.

11.15 Materials

Potable hot water services for this development shall be constructed from materials as follows;

Service	Location	Diameter	Material
Potable Hot Water Service	Suspended Mains	All	Type B Copper pipework with silver solder or mechanical press fit joints.
Potable Hot Water Service	Rough-In Downstream Of Apartment Meter	All	Polyethylene pipework with mechanical compression joints.

The above-nominated materials have been selected for the intended purpose, durability, cost effectiveness and are in line with current trade practice.

12 Natural Gas Service

12.1 Gas Service Generally

Specifically this section of the Concept Design report shall cover the following services;

- Gas Service

12.2 System Design

Natural gas supply for the development shall be drawn from a new connection into the 210kPa Jemena main (not currently shown on Jemena plans, but will be built before development is completed – on advice from Jemena) located within Olympic Boulevard.

An authority gas regulator assembly will be provided at the site boundary, in a dedicated meter cupboard located at ground level of the building façade adjacent to the main vehicle entry.

Authority metering of the natural gas service shall be provided to each individual user throughout the project.

A dead-leg main pipework configuration will be provided for connection to the base of each individual natural gas risers from buildings above, to achieve the most economical natural gas service installation, in conjunction with a system design that provides for flexibility and redundancy in supply.

Main isolation valves will be provided at the base of each riser for individual maintenance or emergency shutdown.

12.3 Gas Service Capacity

In order to cover peak instantaneous demands while keeping pipe sizes to a minimum, the gas system load shall be diversified in the following areas:

- Residential unit supply - diversified in accordance with gas Authority requirements.
- Residential hot water supply - no diversification.
- Retail supply - 500MJ/h.
- Club supply 1,500MJ/h.

12.4 Sizing

Gas services shall be sized with adequate capacity to convey gas supply to all connected appliances. The pipe sizing methods from AS 5601 (2004) shall be used.

Gas service pipework shall be sized using the following parameters;

Location	Value
Pipe Type	Copper
Index Length	Variable depending on design layout
Pressure Drop	1.5kPa (to suit 5kPa reticulation pressure)
Gas Load	As per above and design layout

12.5 Operating Pressures

The incoming customer service will be at a pressure of 210kPa. The pressure shall be dropped to 5kPa for reticulation throughout the site. This shall occur via dual Authority gas pressure regulators located at ground level in a Gas Regulator Room.

12.6 Gas Supply

Natural gas supply shall be drawn from a new 210kPa connection into the Future Jemena main within Olympic Boulevard. Extension required from Fig Tree Ave A distance of approximately 230m away. Advice from Jemena required.

12.7 Metering

Gas meters shall be provided for all usages within the development including:

- Each residential unit
- Each residential hot water plant
- Commercial Service
- Retail Service (Meters by future tenant)
- Club Service (Meters by future tenant)

Gas meters shall be provided for each residential unit. Meter shall be located outside of the apartment, and shall be connected to a Jemena Meter Data Logger (MDL). The MDL system will transfer all metering data to Jemena for billing purposes.

12.8 Materials

Gas services for this development shall be constructed from materials as follows;

Service	Location	Diameter	Material
Gas Service	In-Ground	All	Polyamide (Nylon) or Type B Copper (Silver Soldered or Press-Fit System)
Gas Service	In-Wall	All	Type B Copper (Silver Soldered or Press-Fit System)
Gas Service	Above Ground	All	Type B Copper (Silver Soldered or Press-Fit System)

The above-nominated materials have been selected for the durability, cost effectiveness and intended purpose and are in line with current trade practice.

13 Spatial Requirements

13.1 Summary Spatial Requirements

Stormwater Drainage:

Item	Description	Area	Configuration	Comments
1	On-Site Stormwater Detention Tank			Refer to civil engineers documentation for details.
2	Rainwater Storage Tank	30m ²	5m x 3m x 2m deep	30m ³ effective capacity concrete tank cast in-situ above ground level slab, adjacent to the on-site stormwater detention tank. Location to be confirmed.
3	Gross Pollution Trap	10m ²	4m x 2.5m x 2.4m high.	Pre-cast concrete stormwater pre-treatment device (GPT) installed below carpark level slab to treat all carpark and loading dock area run-off.
4	Stormwater Pump Station	8m ²	4m x 2m	12m ³ effective capacity concrete tank cast in-situ below loading dock slab.

Sanitary Drainage:

Item	Description	Area	Configuration	Comments
1	Boundary Trap Connection	0.75m ²	1.5m x 0.5m x 3m deep	Main sewer connection located in ground at southern end of development. Connection to be confirmed.

Trade Waste Drainage:

Item	Description	Area	Configuration	Comments
1	Grease Arrestor Room No1.	47m ²	7.3m x 4.5m x 2.4m high	Mechanically ventilated plant room at ground level.
2	Grease Arrestor Room No2.	12.4m ²	4.1m x 3.1m x 2.4m high	Mechanically ventilated plant room at ground level.
3	Carwash Bay Oil water separator	6m ²	3m x 2m x 2.4m high	plant room at level 2 located adjacent to carwash bay

Potable Cold Water Service:

Item	Description	Area	Configuration	Comments
1	Site Backflow Prevention (RPZD)	3m ²	3m x 1m x 1.8m high	Included in potable cold water pump room.
2	Authority Cold Water Meter			Included above.
3	Potable Cold Water Pump Room	36m ²	6m x 6m x 2.4m high	Plant room at ground level. Adjacent to main driveway entry

Non-Potable Cold Water Service:

Item	Description	Area	Configuration	Comments
1	Site Backflow Prevention (RPZD)	3m ²	3m x 1m x 1.8m high	Included above in potable cold water pump room.
2	Authority Cold Water Meter			As above.
3	Non-Potable Cold Water Pump Room			As above.

Hot Water Service:

Item	Description	Area	Configuration	Comments
1	Residential Central Hot Water Plant Room	40m ²	8m x 5m x 2.4m high	Plant room on roof level.
2	Commercial Central Hot Water Plant Room	42m ²	7m x 6m x 2.4m high	Plant room at level 8 with mechanical ventilation or direct access to external wall for heat pump ventilation.
4	Retail Electric Hot Water Units	1.5m ²	1.0m x 1.5m x 2.4m high	Electric water heater located within the tenancy area to tenant requirements.
3	Electric Hot Water Units	1m ²	1.0m x 1.0m x 1.0m high	Wall mounted at high level within or adjacent to garbage rooms

Natural Gas Service:

Item	Description	Area	Configuration	Comments
1	Site Regulator	12m ²	3m x 4m x 2.4m high	Regulator located in room at ground level with direct access to external space. adjacent to main vehicle entry at ground level.

Fire Hose Reel Service:

Item	Description	Area	Configuration	Comments
1	Fire Hose Reel cupboards	0.45m ²	0.9m x 0.5m x 2.4m high	Fire hose reel cupboards located within 4m of the entry to every fire stair at every level within the building, and as

otherwise required to achieve full coverage from 36m hose reels. (non-residential areas only)

Hydraulic Risers:

Item	Description	Area	Configuration	Comments
1	Main Hydraulic Riser	0.27m ²	0.9m x 0.3m	Adjacent to lift core.
3	Syphonic Riser	0.09m ²	0.3m x 0.3m	Adjacent to lift core.
2	Typical Residential Risers	0.36m ²	0.6m x 0.5m Or 0.9m x 0.3m	Typically, one per unit.

Note: All risers can be manipulated to vary from these sizes if required. These are generic sizes to fit expected pipework. Final riser sizes to be confirmed once pipework layouts are completed. Ideally, stack risers shall NOT offset (in order to avoid large bulkheads).

Authority Meter Cupboards:

Item	Description	Area	Configuration	Comments
1	Apartment Meter Cupboard – Type 1	0.63m ²	1.8m x 0.35m x 2.4m high	Cupboard located within the common corridor on southern corner of core. Cupboard serves 2 x Apartments. (CW, NPCW, HT & gas)
2	Apartment Meter Cupboard – Type 2	0.45m ²	1.6m x 0.50m x 0.35 x 2.4m high	Triangular cupboard located within the common corridor on north-west and north-east corner of core. Cupboard serves 3 x Apartments. (CW, NPCW, HT & gas)
3	Apartment Meter Cupboard – type 3	0.31m ²	0.9m x 0.35m x 2.4m high	Cupboard located within the common corridor on southern corner of core. Cupboard serves 3 x Apartments. (CW, NPCW & HT)
4	Apartment Meter Cupboard – type 4	0.21m ²	0.6m x 0.35m x 2.4m high	Cupboard located within the common corridor. Cupboard serves 3 x Apartments (gas only).

14 Appendix

14.1 Site plan

14.2 Sanitary Drainage Concept Schematic Diagram – Sheet 1

14.3 Sanitary Drainage Concept Schematic Diagram – Sheet 2

14.4 Sanitary Drainage Concept Schematic Diagram – Sheet 3

14.5 Stormwater Drainage Concept Schematic Diagram – Sheet 1

14.6 Stormwater Drainage Concept Schematic Diagram – Sheet 2

14.7 Cold Water Service Concept Schematic Diagram

14.8 Non-Potable Cold Water Service Concept Schematic Diagram

14.9 Hot Water Service Concept Schematic Diagram

14.10 Natural Gas Service Concept Schematic Diagram

14.11 Detail Sheet 1

14.12 Detail Sheet 2

14.13 Detail Sheet 3

SITE 9 - OLYMPIC PARK

3 OLYMPIC BOULEVARD

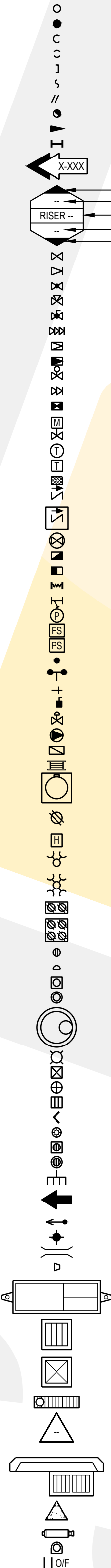
CONCEPT DESIGN

HYDRAULIC SERVICES LEGEND

PIPEWORK SYMBOLOGY & ABBREVIATIONS

	AMENDMENT CASTIN
	CHAMBER VENT PIPE - EXISTING
	COLD WATER
	CONDENSATE DRAIN - EXISTING
	CONDUIT
	DIESEL EXHAUST
	DISCONNECTED SERVICE
	ELECTRICAL SERVICE
	FIRE HOSE REEL - EXISTING
	FIRE HYDRANT - EXISTING
	FIRE SERVICE - EXISTING
	FIRE SPRINKLER MAIN - EXISTING
	FIRE SPRINKLER RANGE PIPE - EXISTING
	GAS FLUE
	GAS SERVICE - EXISTING
	GAS SUPPLY - EXISTING
	GREASE WASTE - EXISTING
	GREASE WASTE VENT PIPE - EXISTING
	HOT WATER - EXISTING
	HOT WATER - HEAT TRACED
	HOT WATER RETURN - EXISTING
	INSET BORDER
	IRRIGATION LINE - EXISTING
	NON-POTABLE COLD WATER - EXISTING
	NON-POTABLE HOT WATER - EXISTING
	NON-POTABLE HOT WATER RETURN - EXISTING
	PLANT LINE
	POOL DRAIN
	POOL HEATING WATER
	POOL WATER
	RAINWATER RE-USE - EXISTING
	ULTRA PURE WATER - EXISTING
	SANITARY DRAINAGE - EXISTING
	SANITARY PLUMBING - EXISTING
	SANITARY RISING MAIN - EXISTING
	SPRINKLER TEST DRAIN
	STORMWATER CATCHMENT
	STORMWATER DRAINAGE - EXISTING
	STORMWATER RISING MAIN - EXISTING
	SUBSOIL - EXISTING
	SYPHONIC OVERFLOW - EXISTING
	SYPHONIC STORMWATER - EXISTING
	TRADE WASTE - EXISTING
	TRADE WASTE RISING MAIN - EXISTING
	TRADE WASTE VENT PIPE - EXISTING
	VENT PIPE - EXISTING
	WARM WATER - EXISTING
	WARM WATER RETURN - EXISTING

SYMBOLS



ABBREVIATIONS

AAV	Air Admittance Valve
BO	Boundary Trap
BTW	Bucket Trap Floorwaste
CO	Clear Out
CST	Condensate Stack
DG	Disconnector Gully
DP	Downpipe
DR	Drainage Riser
DTU	Drainage Turn Up
FU	Fixture Units
GA	Grease Arrestor
GD	Grated Drain
GO	Gutter Outlet
GST	Grease Stack
GU	Grease Turn Up
GWST	Grease Waste Stack
IO	Inspection Opening
IPMF	Induct Pipe Mica Flap
IS	Inspection Shaft
KIP	Kerb Inlet Pit
Q/F	Overflow
ORG	Overflow Relief Gully
PAPA	Positive Air Pressure Attenuator
PO	Planter Outlet
PW	Plinthroom Floor Waste
RVP	Relief Vent Pipe
RWH	Rain Water Head
RO	Rainwater Outlet
S/TR	Safe Tray
S/O	Spoon Drain Outlet
SW	Sealed Floorwaste
SMH	Sewer Manhole
SO	Syphonic Outlet
SOF	Syphonic Overflow
ST	Stack
STP	Stormwater Pit
SWP	Syphonic
TG	Trench Grate
TW/MH	Trade Waste Manhole
TWST	Trade Waste Stack
TW/TU	Tradewaste Turn Up
WT	Waste Stack

ABBREVIATIONS cont.

AAV	Air Admittance Valve
BO	Boundary Trap
BTW	Bucket Trap Floorwaste
CO	Clear Out
CST	Condensate Stack
DG	Disconnector Gully
DP	Downpipe
DR	Drainage Riser
DTU	Drainage Turn Up
FU	Fixture Units
GA	Grease Arrestor
GD	Grated Drain
GO	Gutter Outlet
GST	Grease Stack
GU	Grease Turn Up
GWST	Grease Waste Stack
IO	Inspection Opening
IPMF	Induct Pipe Mica Flap
IS	Inspection Shaft
KIP	Kerb Inlet Pit
Q/F	Overflow
ORG	Overflow Relief Gully
PAPA	Positive Air Pressure Attenuator
PO	Planter Outlet
PW	Plinthroom Floor Waste
RVP	Relief Vent Pipe
RWH	Rain Water Head
RO	Rainwater Outlet
S/TR	Safe Tray
S/O	Spoon Drain Outlet
SW	Sealed Floorwaste
SMH	Sewer Manhole
SO	Syphonic Outlet
SOF	Syphonic Overflow
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DRAWING SCHEDULE

DRAWING NUMBER	DRAWING SCALE	DRAWING TITLE
HSK-000	N.T.S.	COVER SHEET & LEGEND
HSK-001	1:200	SITE PLAN
HSK-100	1:200	SANITARY DRAINAGE STUDY MAXIMUM STACK LOAD SHEET 1
HSK-101	1:200	SANITARY DRAINAGE STUDY MAXIMUM STACK LOAD SHEET 2
HSK-102	1:200	SANITARY DRAINAGE STUDY MAXIMUM STACK LOAD SHEET 3
HSK-200	1:200	STORMWATER DRAINAGE SERVICE CONCEPT SCHEMATIC DIAGRAM SHEET 1
HSK-201	1:200	STORMWATER DRAINAGE SERVICE CONCEPT SCHEMATIC DIAGRAM SHEET 2
HSK-300	1:200	POTABLE COLD WATER SERVICE CONCEPT SCHEMATIC DIAGRAM
HSK-400	1:200	NON-POTABLE COLD WATER SERVICE CONCEPT SCHEMATIC DESIGN
HSK-500	1:200	HOT WATER SERVICE CONCEPT SCHEMATIC DIAGRAM
HSK-600	N.T.S.	NATURAL GAS SERVICE CONCEPT SCHEMATIC DIAGRAM
HSK-700	AS SHOWN	DETAIL SHEET 1
HSK-701	AS SHOWN	DETAIL SHEET 2
HSK-702	AS SHOWN	DETAIL SHEET 3

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NOTE: SYMBOLS ARE DRAWN IN THE CORRECT POSITION BUT ARE NOT SHOWN TO SCALE.

Client:

ECOVE GROUP
Cnr. Australia Avenue and Herb Eliot Avenue
Sydney Olympic Park
NSW 2127
02 9763 0444

Project Manager:

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Sydney Olympic Park
NSW 2127
02 9763 0444

Architect:

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43 Brisbane Street
Sunny Hills
NSW 2110
02 8354 9100

Issue	Date	Amendment	Int.	App.
01	03/03/16	CONCEPT DESIGN	RP	BL
02	01/04/16	DA ISSUE	RP	BL

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02	01/04/16	DA ISSUE	RP	BL

SERVICE	DRAWING NUMBER	ISSUE	DATE
ARCH			
MECH			
STRUCT			
ELEC			
CIVIL			

Project:

**Site 9,
3 Olympic Boulevard
Sydney Olympic Park**

Drawing Title:

COVER SHEET & LEGEND

North Point:

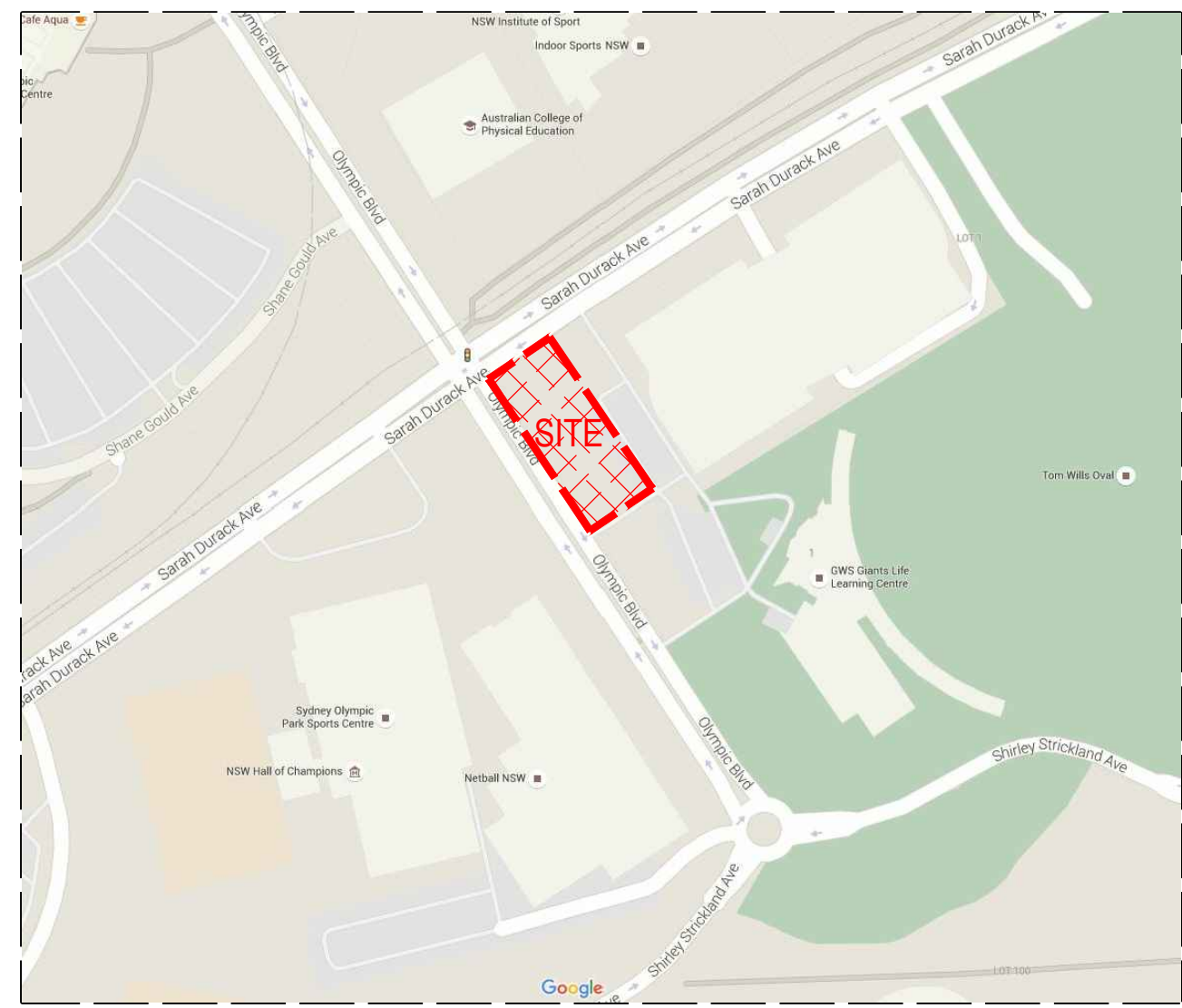
BSI
Quality ISO 9001
Certified System
FS 581006

Job No: **20150077**

Dwg No: **HSK-000**

Scale: (A1) N.T.S.

Issue: **02**



LOCALITY PLAN

DA ISSUE

NOTE: THIS IS A STANDARD LEGEND. ALL SYMBOLS MAY NOT NECESSARILY BE USED IN THESE DRAWINGS.

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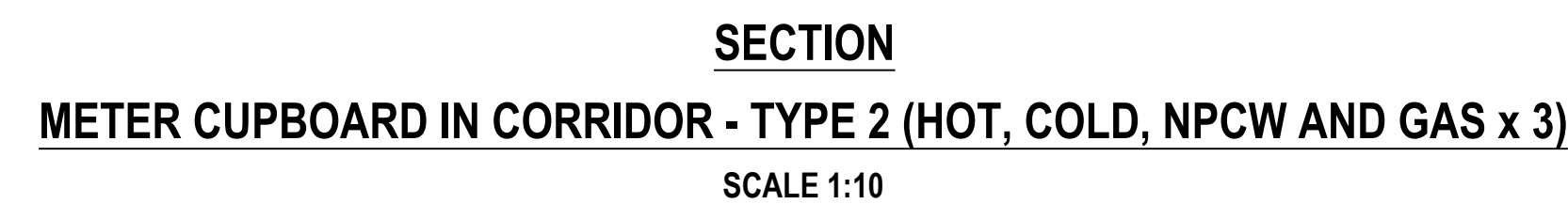
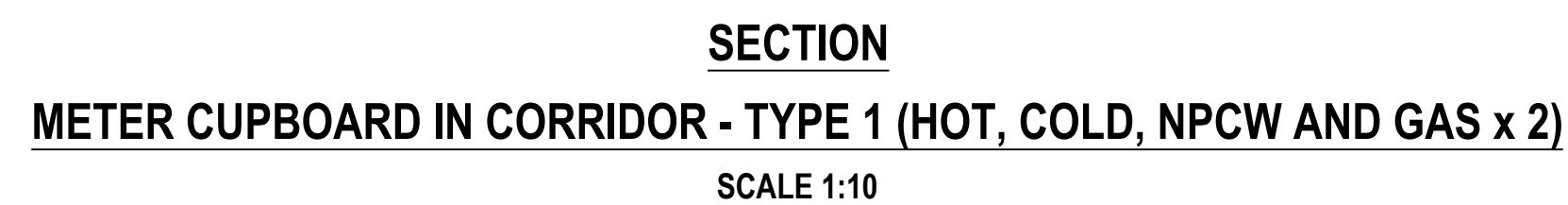
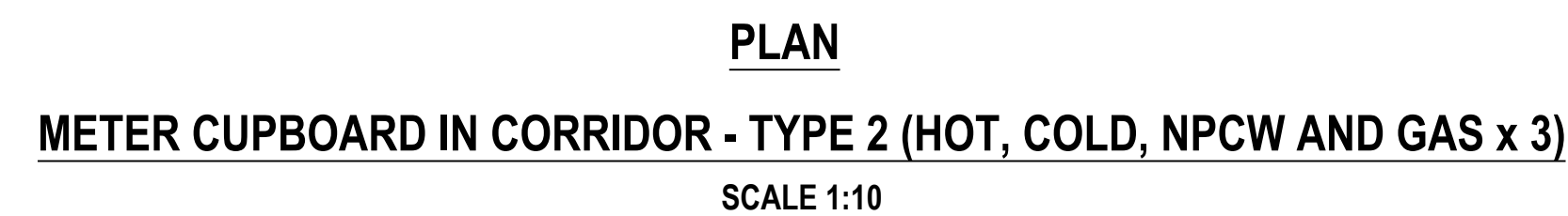
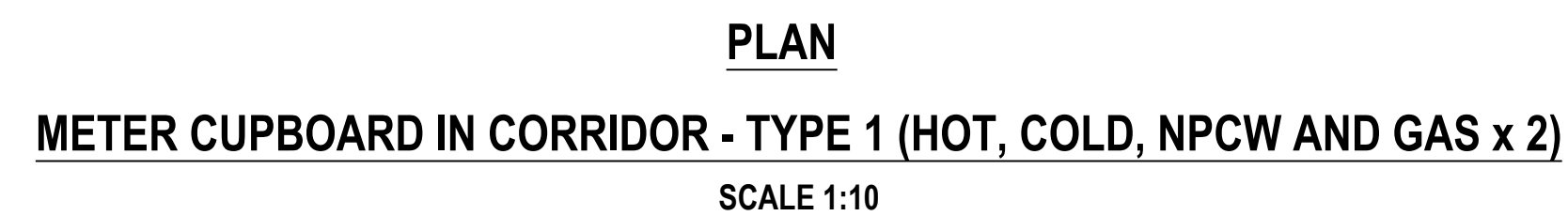
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Dwg No: HSK-201	Is 0

DA ISSUE

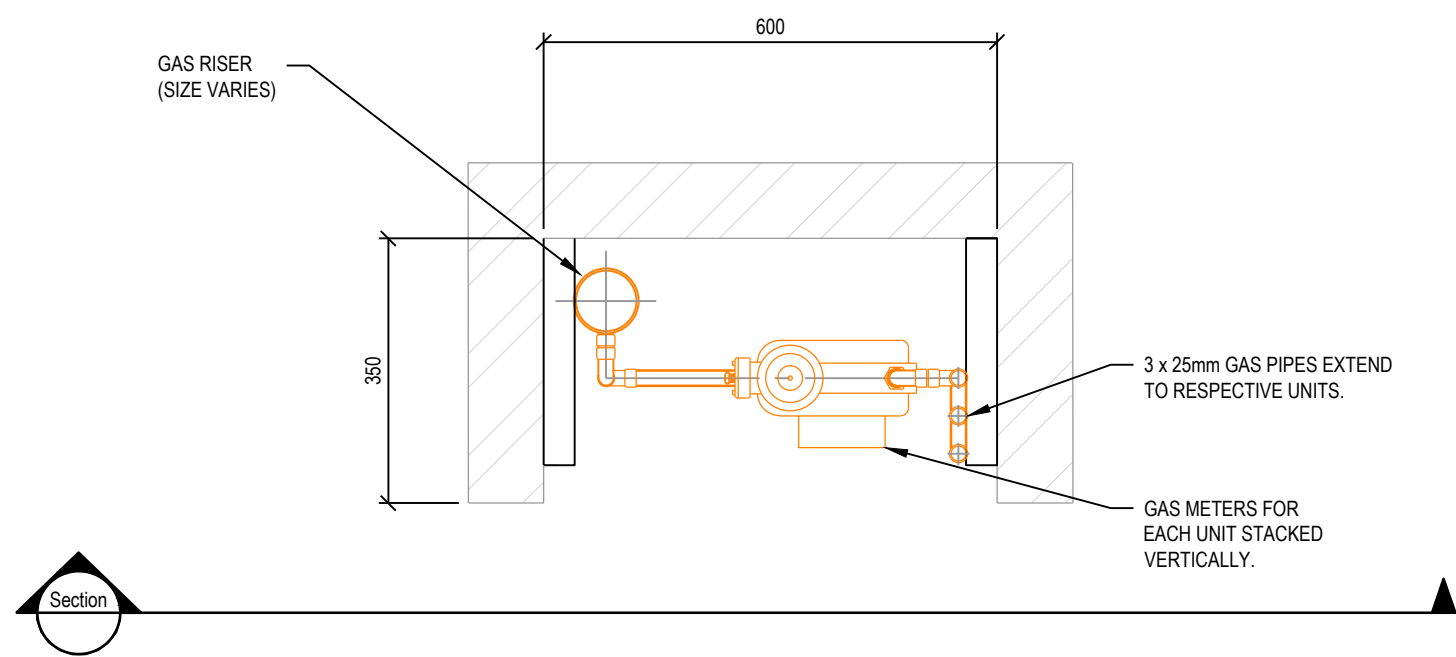
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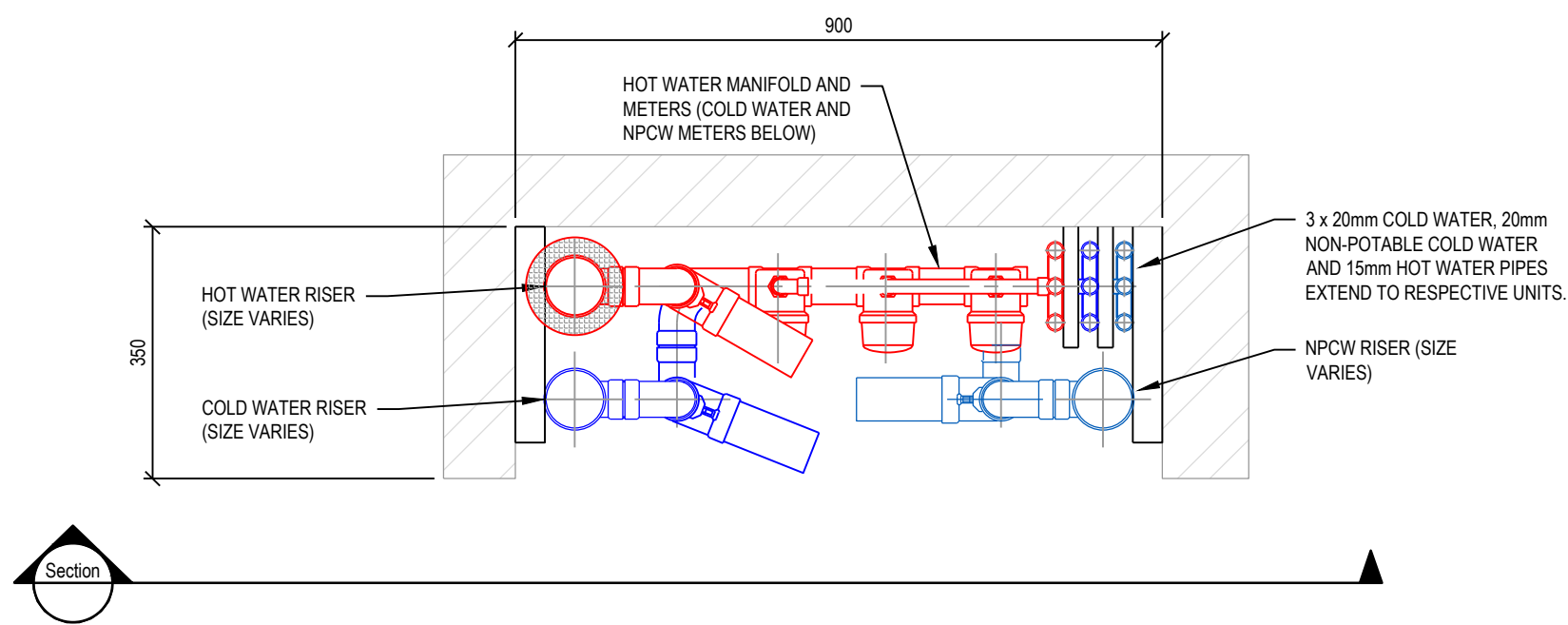
INSYNC SERVICES



PLAN

METER CUPBOARD IN CORRIDOR - TYPE 3 (GAS x 3)

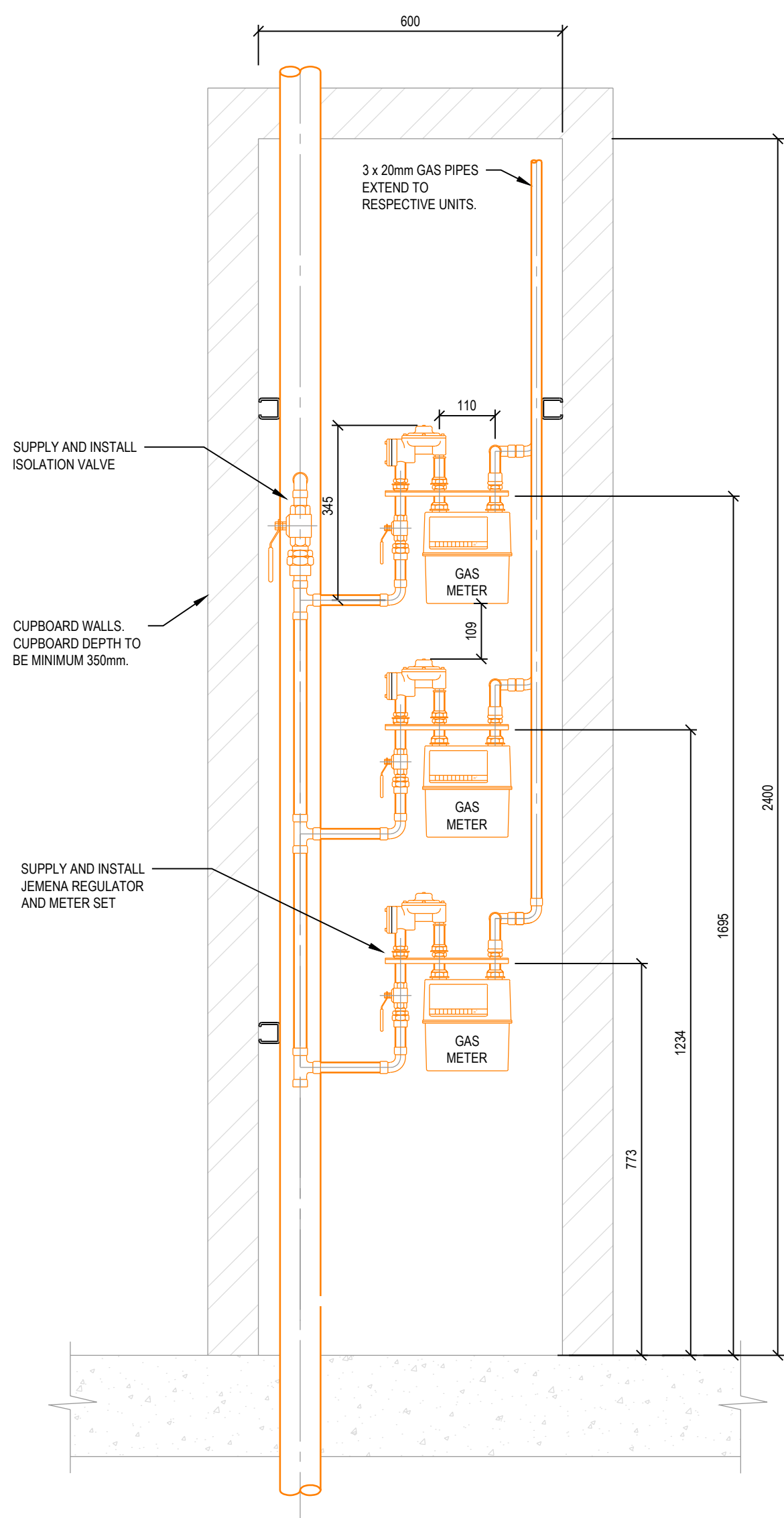
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PLAN

METER CUPBOARD IN CORRIDOR - TYPE 4 (HOT, COLD AND NPCW x 3)

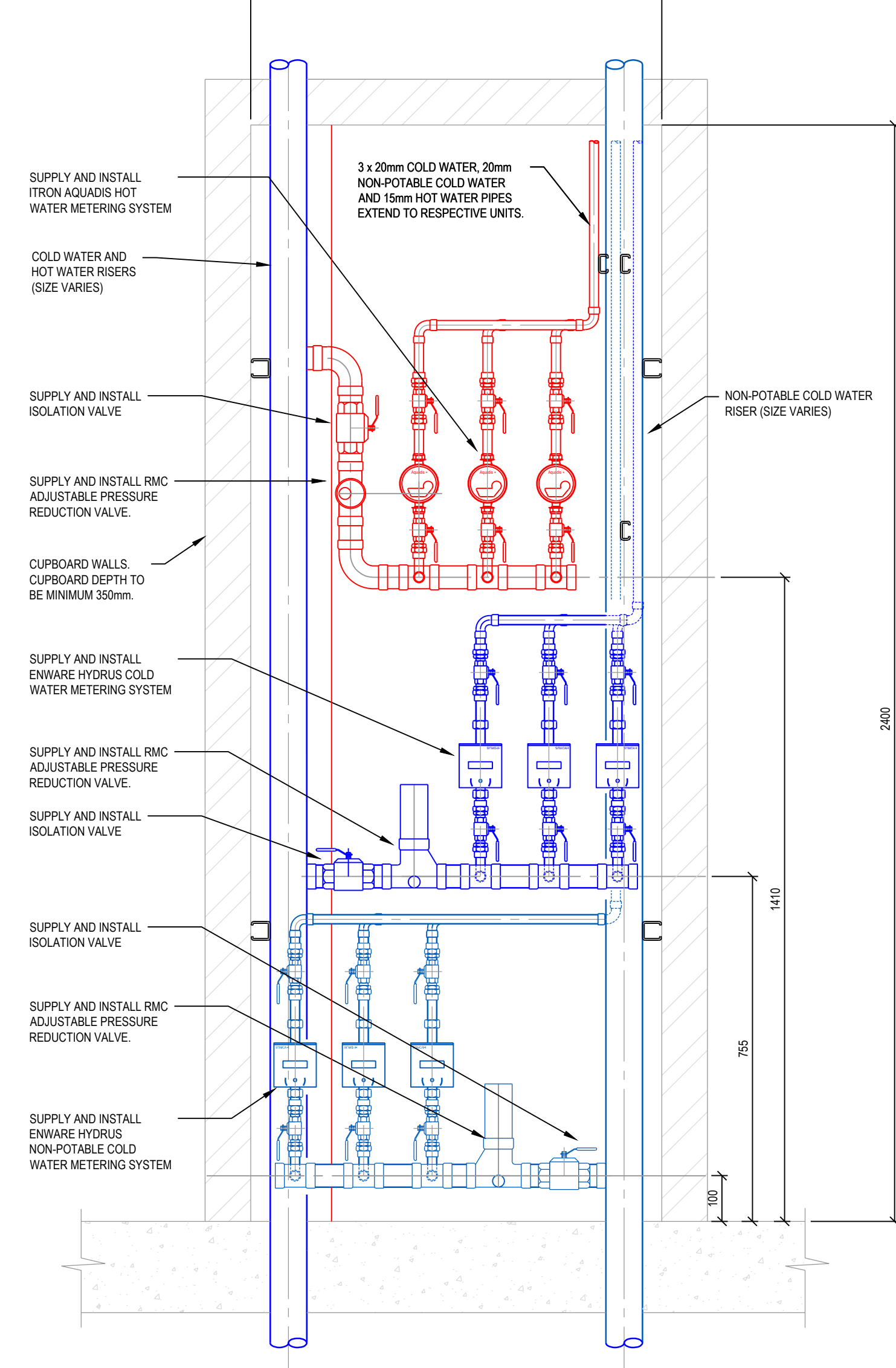
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SECTION

METER CUPBOARD IN CORRIDOR - TYPE 3 (GAS x 3)

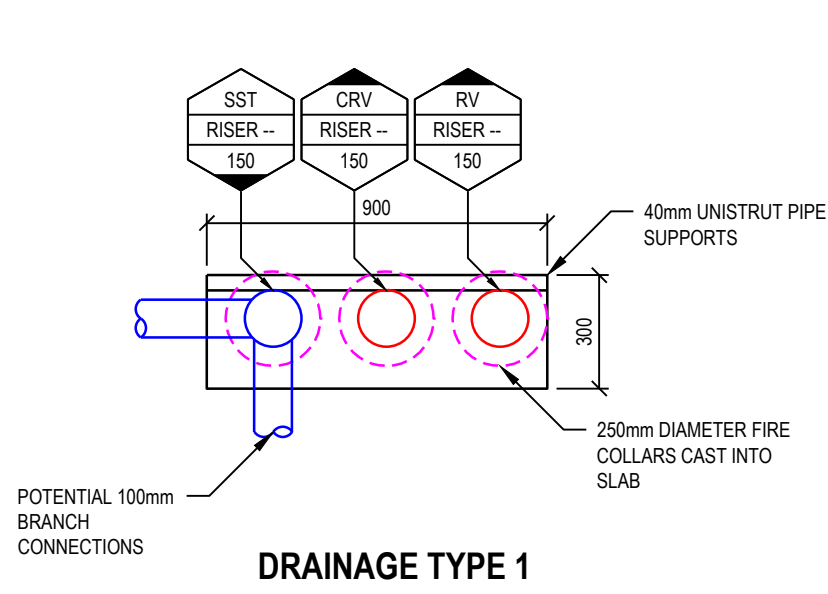
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SECTION

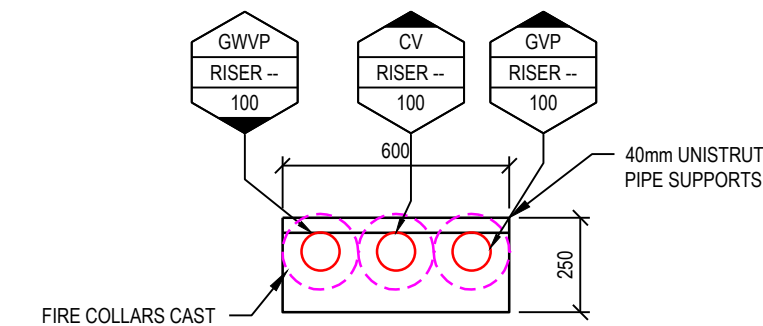
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SCALE 1:10



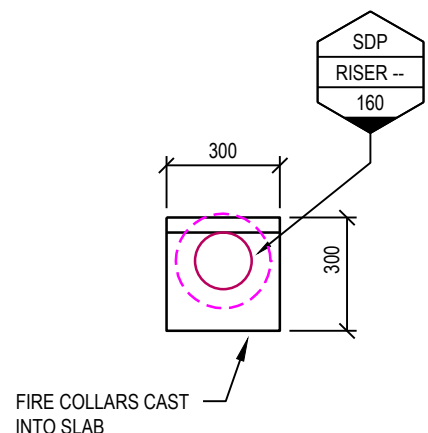
DRAINAGE TYPE 1

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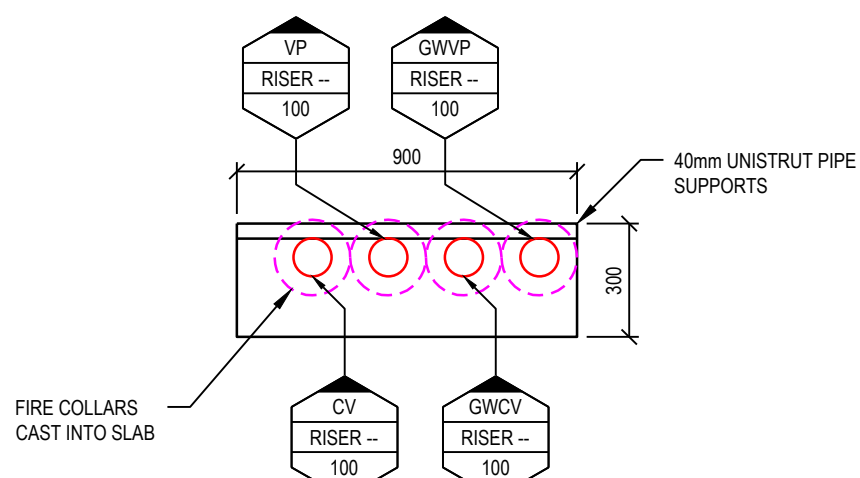
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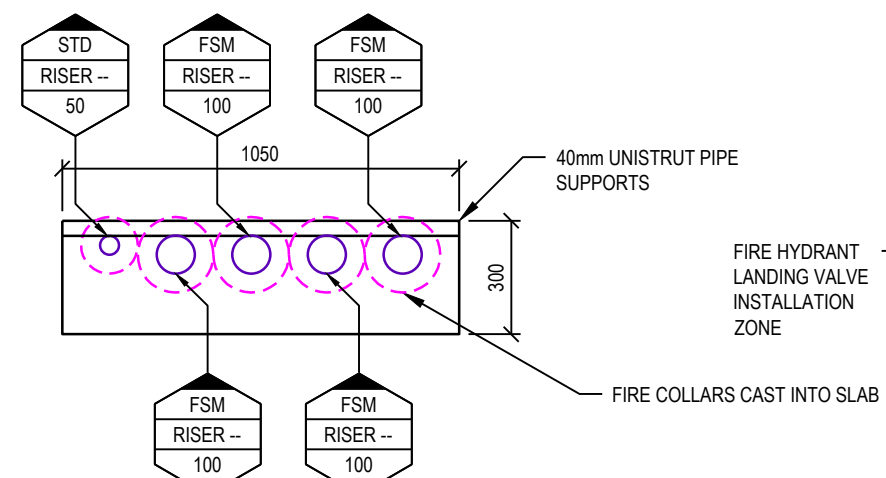
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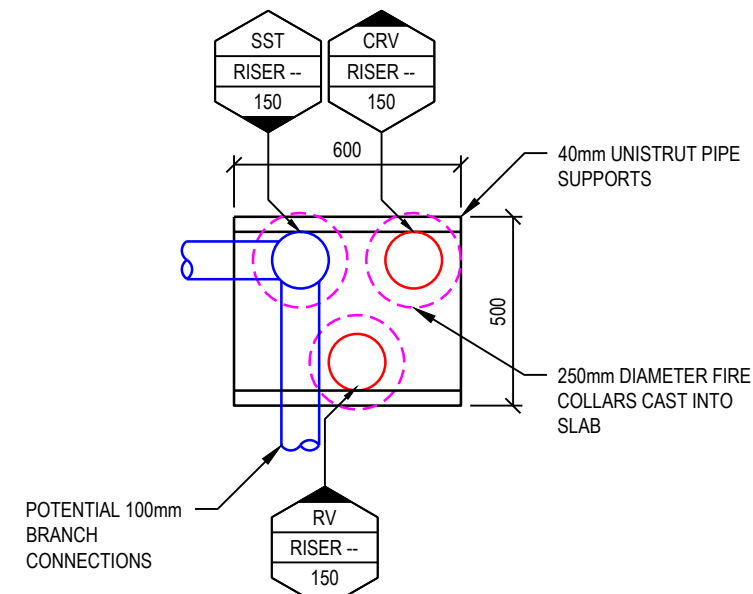
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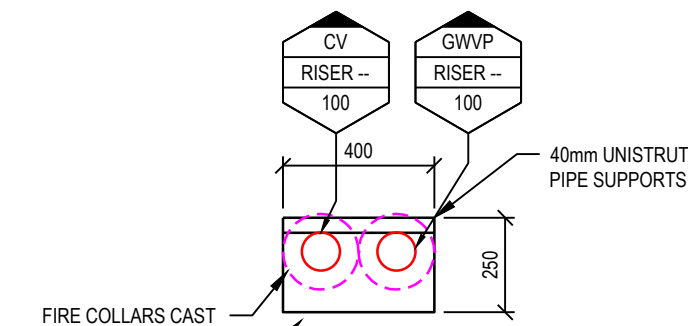
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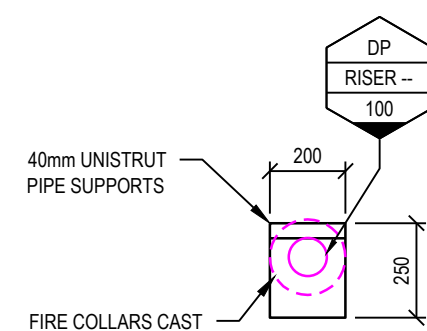
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SCALE 1:20



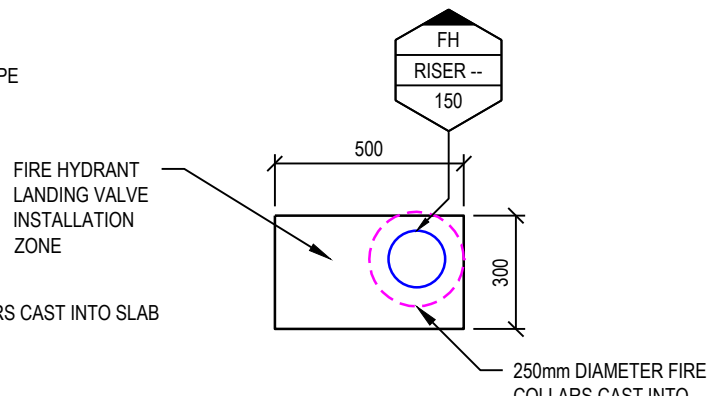
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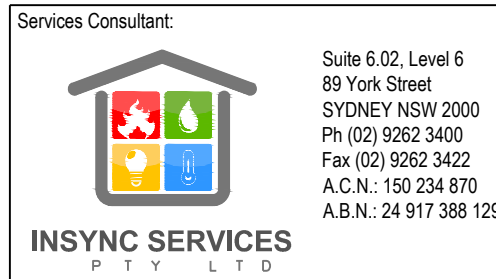
DOWNPIPE TYPE 1

SCALE 1:20



FIRE HYDRANT

SCALE 1:20



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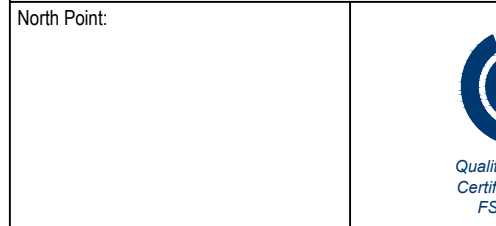
Architect:
Bates Smart Architects
43 Brisbane Street
Sunny Hills
NSW 2010
02 8354 9100

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SERVICE	DRAWING NUMBER	ISSUE	DATE
ARCH			
MECH			
STRUCT			
ELEC			
CIVIL			

Project:
**Site 9,
3 Olympic Boulevard
Sydney Olympic Park**

Drawing Title:
DETAIL SHEET 2



Job No: **20150077**
Dwg No: **HSK-701**
Scale: (A1) AS SHOWN
Issue: **02**

DA ISSUE

INSYNC SERVICES
HYDRAULIC SERVICES

ORIGINAL SIZE: A1



DA ISSUE