

HYDRAULIC SERVICES WATER MANAGEMENT PLAN

St Anthony of Padua Austral Catholic School



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HYDRAULIC SERVICES

1. INTRODUCTION

Warren Smith & Partners (WS+P) has been engaged by Sydney Catholic Schools to prepare a Water Management Plan for St Anthony of Padua Austral Catholic School. This Water Management Plan aims to provide detailed information regarding the use of water on site.

Please refer to Figure 1 for an aerial view of the existing site where the St Anthony of Padua Austral Catholic School is to be constructed (identified in red). The school will be constructed in 6 stages with final completion expected to be in 2034.

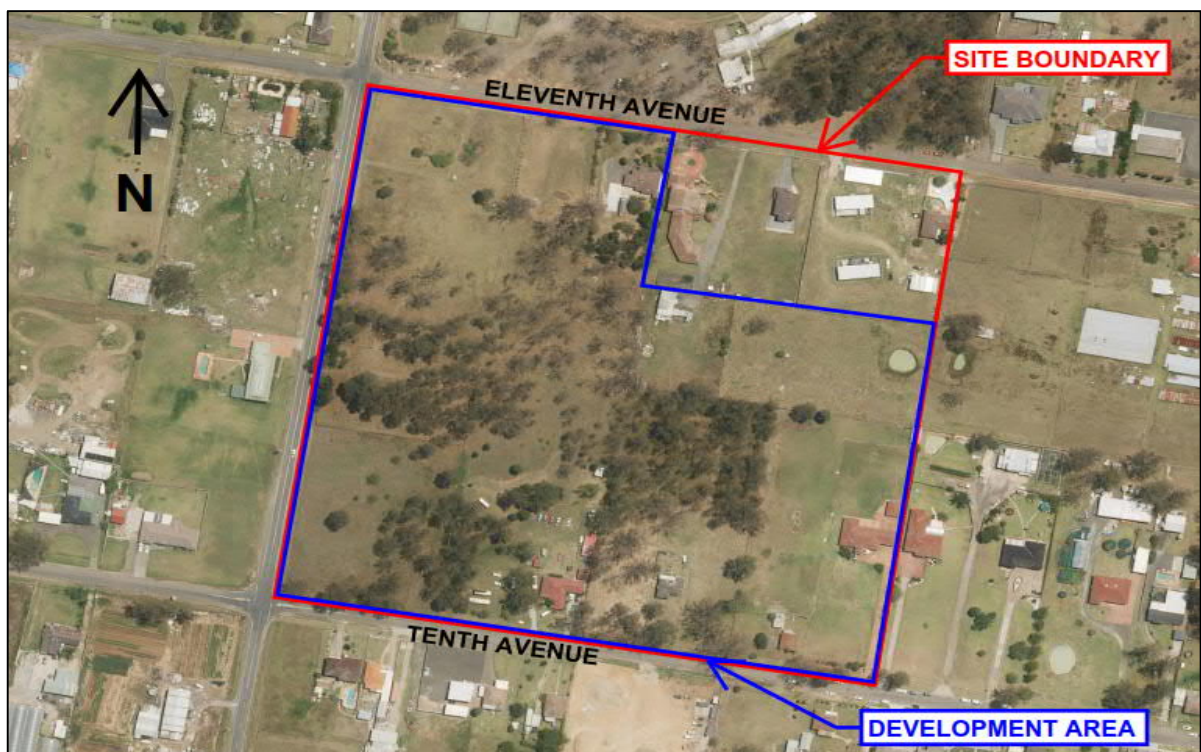


Figure 1: Aerial View of Development Site

There will be no demolition on the existing site.

2. DEMAND CALCULATIONS

2.1 WATER SUPPLY DEMAND CALCULATIONS

The assumption taken in determining the average daily potable water demands for the proposed school were taken from the Sydney Water table, “Average Daily Water Use by Property Type” and is presented in Table 1 below. Please refer to *Schedule 1* for the Sydney Water table.

Table 1: Average Daily Water Demand

| Classification | Metric Unit | Average Demand (L/Metric Unit/Day) |
|------------------|-------------|------------------------------------|
| Education | | |
| School | Student | 20 |

Please refer to Table 2 below for the average daily water demand calculation.

Table 2: Average Daily Water Demand Calculation

| Total Students | Average Demand (L/Metric Unit/Day) | Total Average Daily Water Demand (kL) |
|----------------|------------------------------------|---------------------------------------|
| 2480 | 20 | 49.6 |

The following flows have also been estimated based on limited information:

- Probable simultaneous flow – 8 L/sec excluding continuous flows
- Fire flow for hydrants – 20 L/sec
- Fire flow for sprinklers – 20 L/sec (if required by BCA consultant)

3. UTILITY CONNECTIONS

3.1 SYDNEY WATER – WATER MAIN CONNECTION

A new connection to the water main in Eleventh Avenue is proposed to service the development. The Sydney Water water meter and RPZD is to be located adjacent to the boundary.

Refer to Figure 2 for details on the proposed water main connection.



Figure 2: Proposed Sydney Water, Water Main Connection

4. PRIVATE SYSTEM

4.1 POTABLE WATER INFRASTRUCTURE

The private cold water infrastructure will extend from the single water main connection and will ring the site to provide redundancy in the event of maintenance or a failure on the private infrastructure.

Each building will be connected separately to the infrastructure to ensure ease of maintenance and future developments.

4.2 POTABLE WATER INTERNAL TO THE BUILDINGS

The water services will be a single size to enable fixture loads to be relocated to other areas of the floor plate, which allows for flexibility, ease of maintenance and system reliability.

Where the static pressure exceeds 500kPa pressure reduction valves will be provided, to meet the requirement of Clause 3.3.4 of AS 3500.1 these valves shall not be installed within a ceiling or when ladder access would be required. Point of use pressure reductions valves will be provided within the thermostatic mixing valve boxes or backflow prevention device boxes.

A main water services cupboard will be located on every floor level in an accessible location as shown on the architectural drawings. These cupboards will contain the isolation valves, water meters and balancing valves (at an accessible height) for the individual floor level.

Hose taps are to be provided throughout the property's plant rooms, loading dock and car parks for wash down. Hose taps and irrigation connection points with backflow prevention devices will also be provided within the gardens and courtyard areas.

The hot water services within the building will be provided with separate 60-65°C flow and return mains on each floor level. The pipework will be insulated sufficiently to reduce the heat loss within the system.

Heat lost from hot water within the potable hot water flow and return pipe work systems will be replenished by a pump recirculating the water back to the hot water generation plant for reheating. The design criteria for return pipework to the plant will be 5°C loss with a maximum velocity of 0.6m/sec.

There shall be no more than one balancing valve per floor level per water service cupboard.

Warm water to required fixtures will be mixed and temperature limited using localised tempering valves or Thermostatic Mixing Valves (TMV). The valves will generally be shared between adjacent similar wet areas.

4.2.1 WATER QUALITY

Water treatment devices such as filters is not expected to be required to treat the potable water before it is delivered to the fixtures.

4.2.2 POTABLE COLD WATER PUMPS

Based on the attached pressure and flow enquiry, a pump set is likely to be required to pressurise the water from the water main to the fixture.

4.2.3 PRESSURE AND TEMPERATURE GAUGES

Pressure and temperature gauges shall be provided on the system to facilitate fault finding within major plant areas and located at the most advanced and disadvantaged pressure and temperature areas.

4.3 NON-POTABLE WATER

Non-potable cold water will be supplied from the potable cold water service with a reduced pressure zone device preceding the first take off where zone protection is required in accordance with AS 3500.1 as required to areas such as Cleaners' Rooms and Mechanical Plant. The RPZ's are to be set at a height of 1500mm (to the top of the box) and must be easily accessible and not installed in inaccessible positions. They must be a clear height above the valve to allow the test gauge to be positioned above the top level of the valve during the annual test.

5. WATER USAGE REDUCTION

5.1 LOW FLOW TAPS

Where possible, potable water usage will be reduced by the use of low flow taps and sanitary fixtures, typically using the following flow rates:

- Shower 9.0L/min
- Basin 7.7L/min
- Sink 7.7L/min

Low flow taps are only to be used if the fixtures chosen comply with the AushFG and STH are satisfied with them.

5.2 WATER METERING

The development will be metered by both utility-owned water meters at the property boundary, and client-owned and read water meters.

These water meters will have the capability for connection to the BMCS via pulse read-out and will be monitored by the BMCS for water demand and leak monitoring.

Privately owned (and read) sub meters shall be provided to meter the usage of the following:-

- Separate buildings
- Domestic hot water supply
- Kitchen
- Mechanical plant

5.3 RAINWATER REUSE

10kL rainwater tanks are proposed to be provided to each building on the site, this will be used to supply irrigation only.

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SCHEDULE 1 SYDNEY WATER TABLE

| Development Type | Development Sub-Type | Key Metric | Metric Unit | Average Demand (L/Metric Unit / Day) |
|------------------|-------------------------------------|----------------------|------------------------------|---------------------------------------|
| Residential | Single Lot Torrens | Dwelling | Each dwelling | 623.00 |
| | Flats Torrens | Net Floor Area | Square Meter | 2.36 |
| | High Rise Units | Net Floor Area | Square Meter | 3.34 |
| | Single Lot Community | Dwelling | Each dwelling | 623.00 |
| Mixed | Residential / Commercial | Combined Floor Area | Each dwelling / Square Meter | Use separate rates for each component |
| | Commercial / Industrial | Combined Floor Area | Square Meter | Use separate rates for each component |
| Commercial | Aged Accom - Self Care | Net Floor Area | Square Meter | 2.50 |
| | Aged Accom - Hostel | Bed | Each bed | 271.00 |
| | Aged Accom - Full Care | Bed | Each bed | 271.00 |
| | Childcare | Net Floor Area | Square Meter | 3.60 |
| | Hotel / motel / serviced apartments | Room | Each room | 359.94 |
| | Office | Net Floor Area | Square Meter | 2.27 |
| | Shopping Centre | Net Floor Area | Square Meter | 3.00 |
| | Laundry / Dry Cleaner | Net Floor Area | Square Meter | 10.50 |
| | Café / Fast Food / Butcher / Deli | Net Floor Area | Square Meter | 2.48 |
| | Retail Units | Net Floor Area | Square Meter | 2.48 |
| | Medical / Veterinary | Net Floor Area | Square Meter | 2.48 |
| | Mechanical Repair | Net Floor Areas | Square Meter | 2.48 |
| | Car / Boat Sales | Net Floor Area | Square Meter | 2.48 |
| | Car Wash | Net Floor Area | Square Meter | 9.40 |
| | Club | Net Floor Area | Square Meter | 3.77 |
| Industrial | Heavy Process | | As required | |
| | Chemical Manufacturing | | As required | |
| | Printing Manufacturing | | As required | |
| | Beverage Manufacturing | | As required | |
| | Light Factory Unit | Developed floor area | Square Meter | 2.82 |
| | Warehousing | Developed floor area | Square Meter | 2.82 |
| | Transport / Bus Depot | Site area | Square Meter | 0.91 |
| Special Uses | University | Student | Each student | 20.00 |
| | School | Student | Each student | 20.00 |
| | Hospital | Bed | Each bed | 271.00 |
| | Religious assembles | Developed floor area | Square Meter | 1.30 |
| | Government Depot | Site area | Square Meter | 0.91 |
| | Community Centre / Library | Floor area | Square Meter | 1.84 |
| | Sport Fields with Amenities | | As required | |
| | Park & Reserves | | As required | |
| | Services - Police / Ambulance etc. | Floor area | Square Meter | 1.40 |