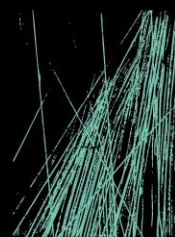




HYDRAULICS SERVICES SSDA REPORT (SSD 10352)

MORIAH COLLEGE REDEVELOPMENT



JHA

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DOCUMENT CONTROL SHEET

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1 INTRODUCTION

1.1 OVERVIEW

This Hydraulics Services report has been prepared by JHA Consulting Engineers on behalf of the Moriah College / Aver Management Pty Ltd (the Applicant).

The Hydraulics Services report accompanies an Environmental Impact Statement (EIS) in support of State Significant Development Application (SSD 10352) for the new Moriah College Redevelopment on Lot 3 DP 701512 (3 Queens Park Road) and Lot 22 DP 879582 (101 York Road) in Queens Park, NSW.

The proposal seeks consent for the demolishing of five existing buildings and a tennis court to accommodate two new buildings. The two new buildings will consist of a STEAM (Science, Technology, Engineering, Arts, and Mathematics) building new ELC. The proposed works will be undertaken over multiple demolition and construction stages with Phase 1 involving the STEAM building and Phase 2 involving the ELC building.

The purpose of this Hydraulics Services report is to demonstrate compliance with the SEARs. This report shall be read in conjunction with the Architectural design drawings and other consultant design reports submitted as part of the application. The objectives of this Hydraulics Services assessment are:

- Establish the availability of authority sewer and water services and natural gas services detailing information on the existing capacity and any augmentation requirements.

1.2 RESPONSE TO SEARS

The Hydraulics Services report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) for SSD 10352. This table identifies the relevant SEARs requirements.

<i>SEARs Item</i>	<i>Report Reference</i>
<p>1. <u>Utilities</u></p> <ul style="list-style-type: none">○ Prepare an Infrastructure Management Plan in consultation with relevant agencies, detailing information on the existing capacity and any augmentation and easement requirements of the development for the provision of utilities including staging of infrastructure.○ Prepare an Integrated Water Management Plan detailing any proposed alternative water supplies, proposed end uses of potable and non-potable water, and water sensitive urban design.○ Identify any potential impacts of the proposed construction and operation on the existing utility infrastructure and service provider assets and easements and demonstrate how these will be protected or impacts mitigated.	

Table 1: SEARs and Relevant Reference.

2 HYDRAULIC SERVICES

The hydraulic services infrastructure will be incorporated into the design and construction phases of the development as follows:

2.1 EXISTING INFRASTRUCTURE

2.1.1 SEWER DRAINAGE

The Dial Before You Dig (DBYD) and as-built information obtained indicate that the site is served by two sewer connections.

One sewer connection is at the Queens Park Road and Baronga Avenue corner and the second connection is at the Queens Park Road and York Road corner.

Site inspections and Sewer Service Diagrams (SSD) corroborated the existing site connection points.

It is not possible to provide a gravity sewer service to these connection points based on the existing levels and the levels of the proposed development.

There is a Sydney Water sewer main on the park side of Baronga Ave with sufficient capacity to serve the proposed development

A 150mm sewer main extension can be provided from the Sydney Water sewer main and extended to provide a new sewer connection point



Sewer main extension

2.1.2 POTABLE WATER SUPPLY

The DBYD and as-built information obtained indicate that the site is served by a 150mm Cast Iron Cement Lined (CICL) water main in Queens Park Road.

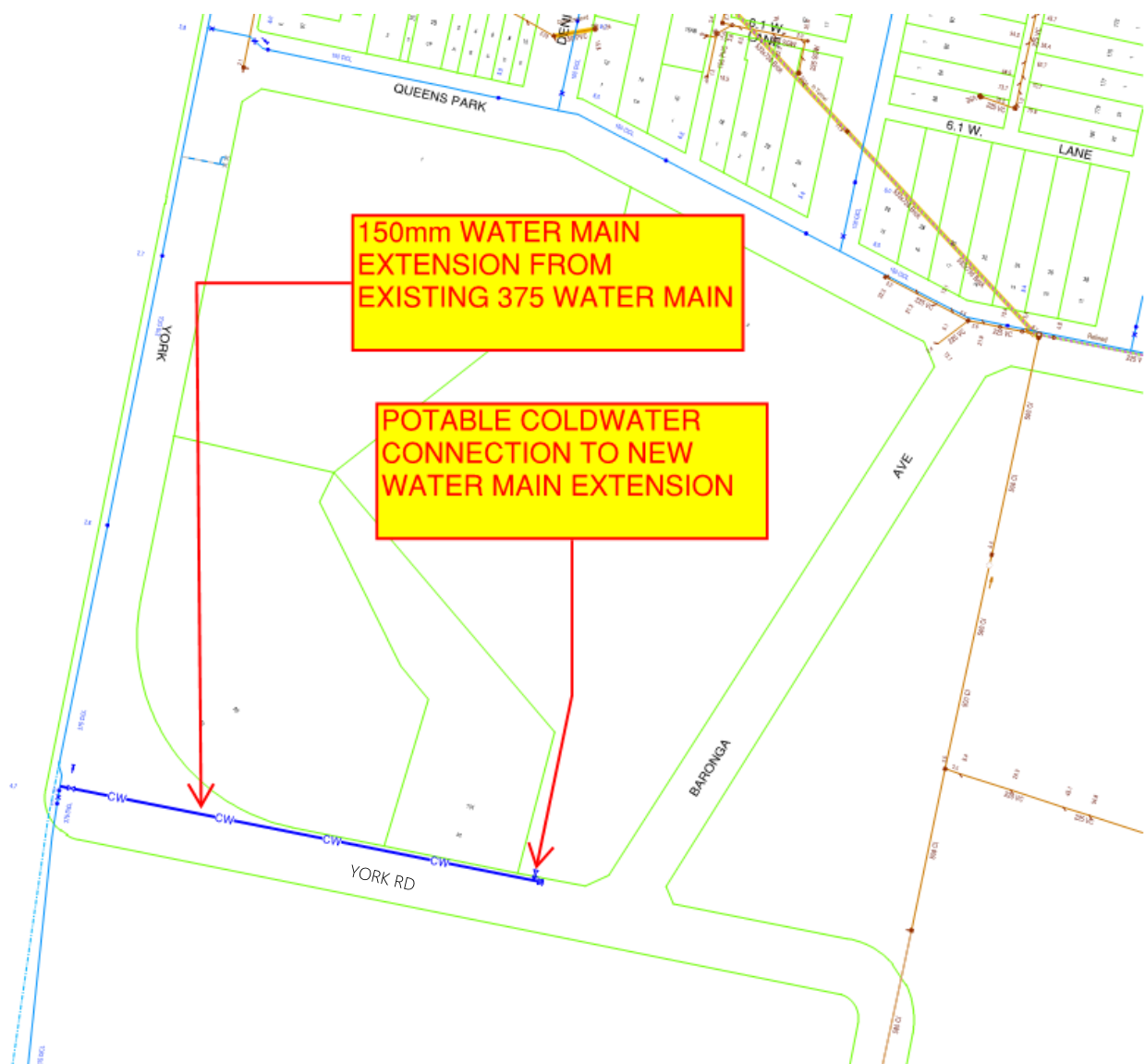
Site inspections corroborated that the existing site connection point for potable water is in Queens Park Road.

The existing water meter and backflow prevention device is located within the boundary of the site.

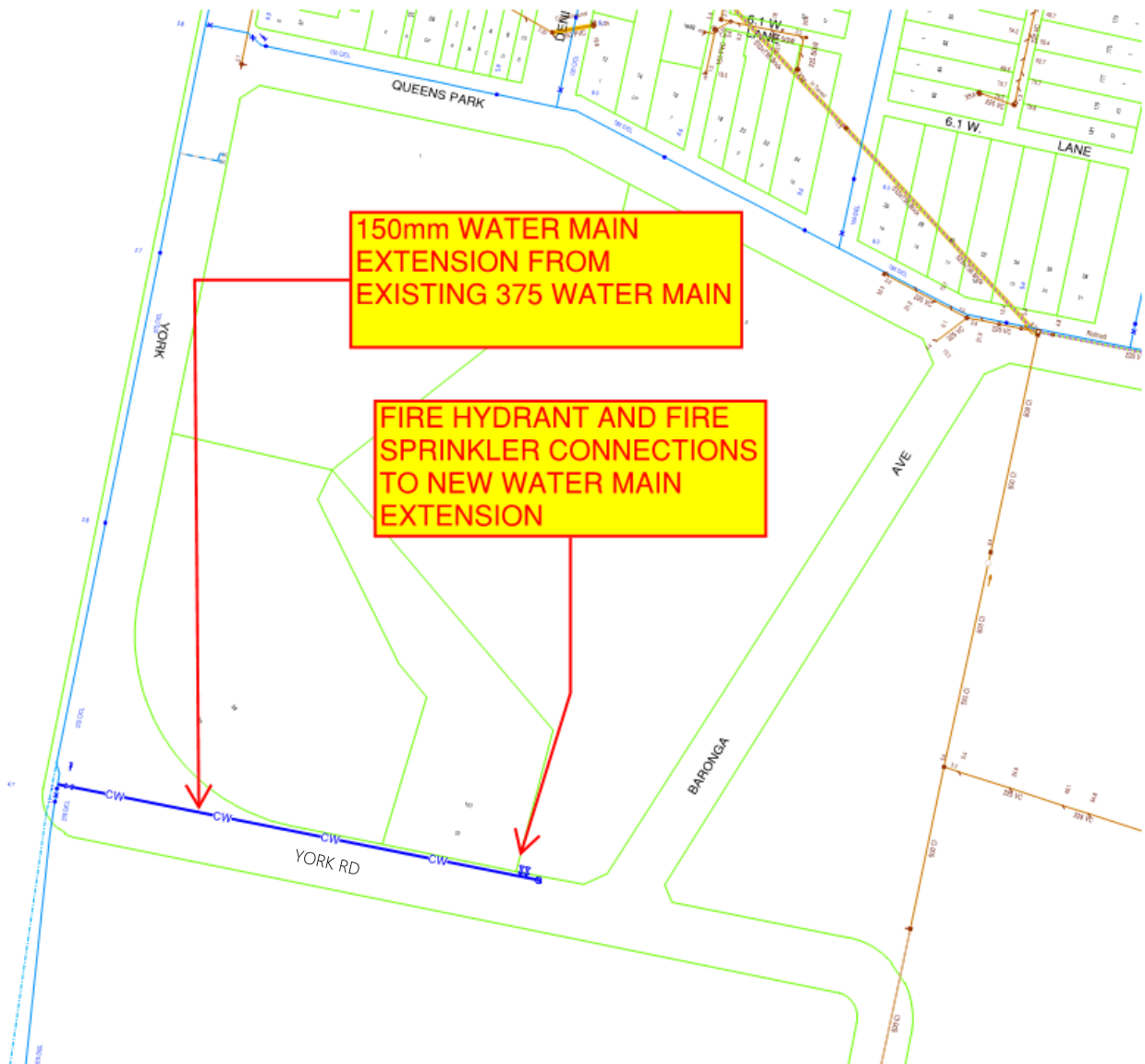
There is currently no Sydney Water main in the southern portion of York Road or within Baronga Avenue that can supply the proposed development.

There is a Sydney Water main in western portion of York Road with sufficient capacity to serve the proposed development

A 150mm water main extension can be provided from the Sydney Water main in the western portion of York Road and extended to the east within the southern portion of York Road to provide new water services (potable, fire hydrant and fire sprinkler services) connection points.



Water main extension for potable water



Connection point for fire hydrant and sprinkler services

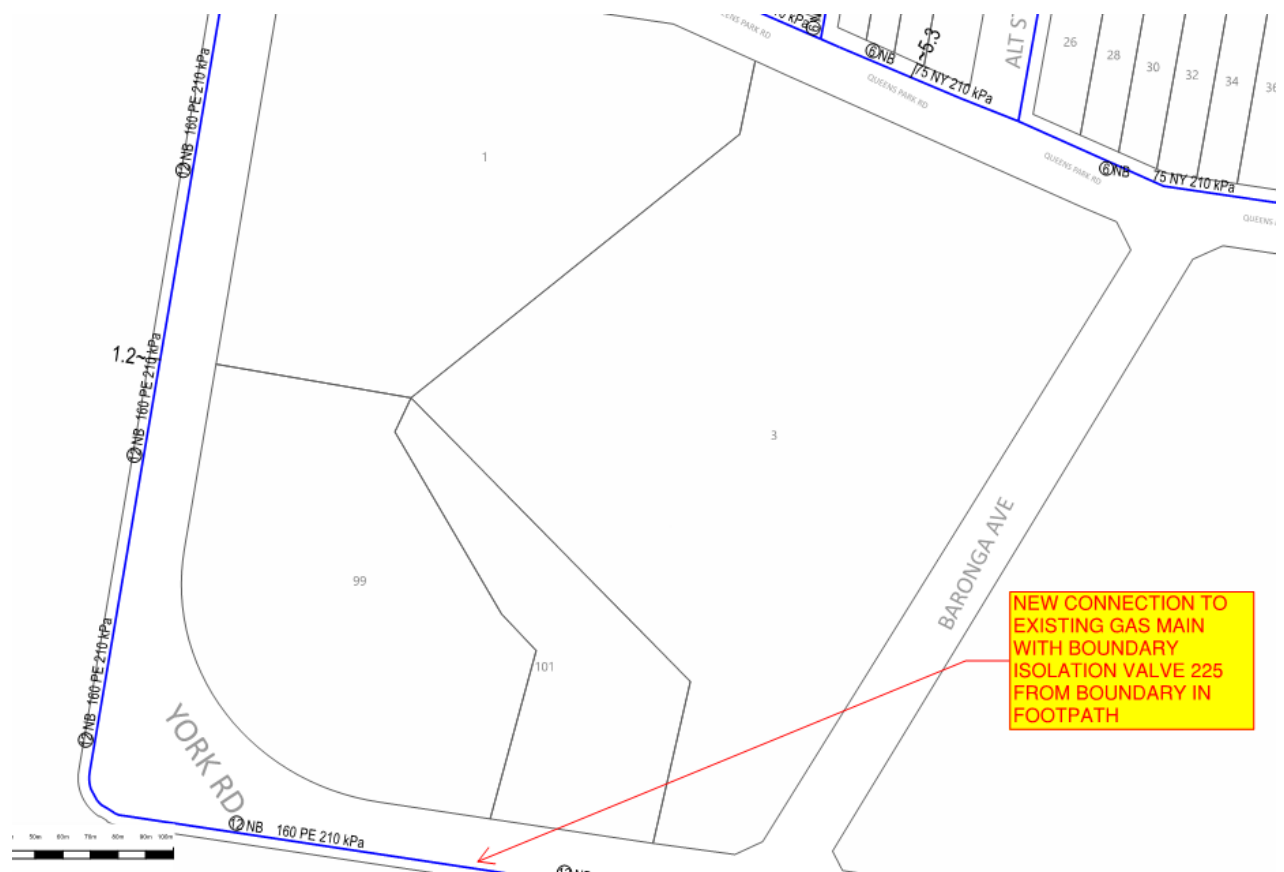
2.1.3 NATURAL GAS SERVICE

The DBYD and as-built information obtained indicate that the site is served by a 160mm 210kPa PE gas main in York Road.

Site inspections corroborated information

It is envisaged that the redeveloped site will connect to the 160mm 210kPa PE gas main in York Road.

The gas main has the capacity to service the planned development.



Gas diagram

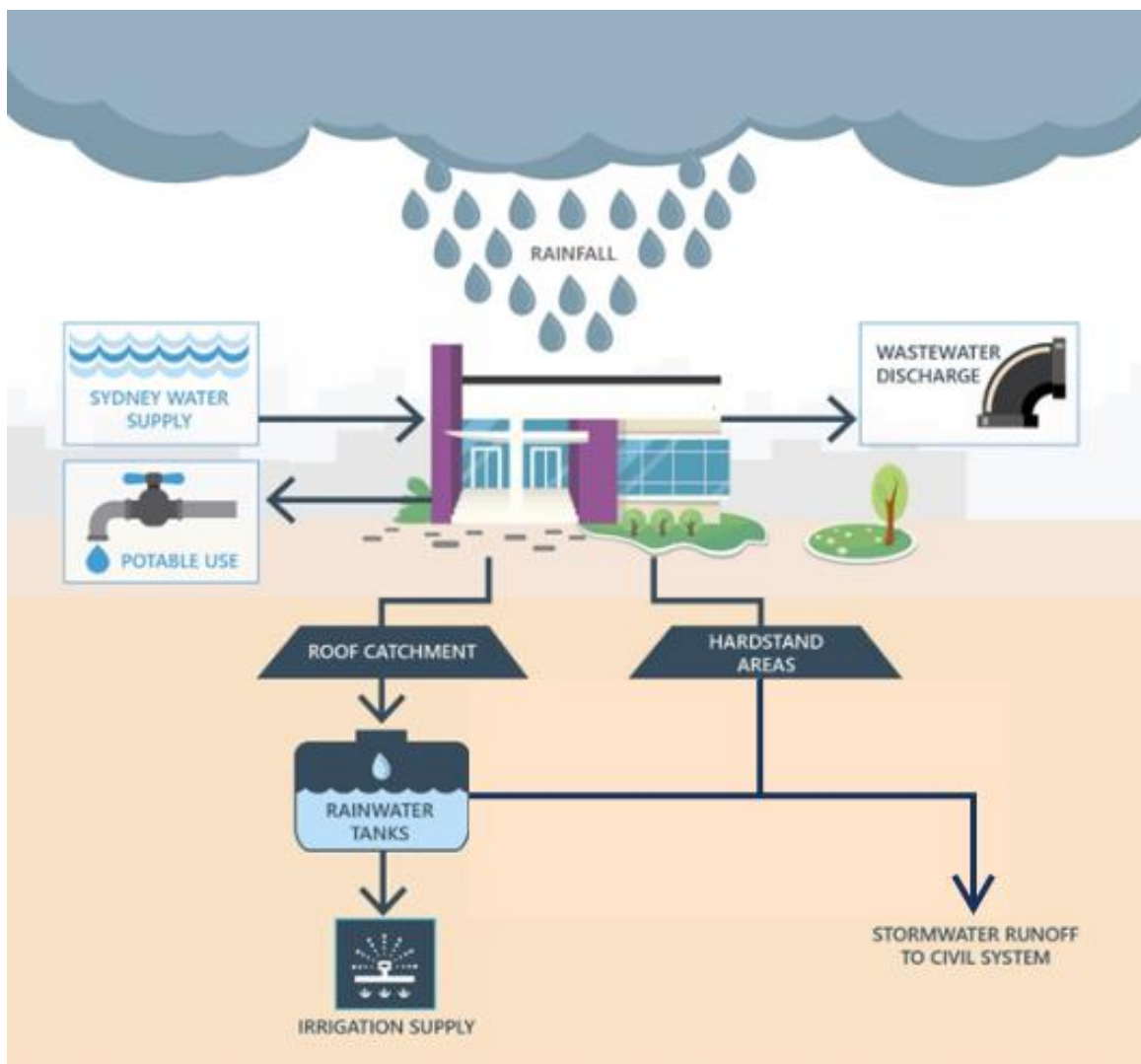
3 INTEGRATED WATER MANAGEMENT PLAN

3.1 WATER MANAGEMENT

Traditionally, water planning has based on importing potable water for consumption, then discharging it via the sewerage system and viewing stormwater as a flooding risk that should be conveyed offsite as quickly as possible via the stormwater system.

By treating stormwater as a resource rather than a problem, the conventional planning method shifts to a sustainable management system. Sustainable urban water management means to simultaneously plan for the following:

- Reducing the amount of wastewater leaving a catchment that may cause pollution in other locations (e.g. ocean out falls).
- Reducing the reliance on drinking quality water (i.e. potable water) supplied by Sydney Water.
- Using water more appropriately i.e. using potable water for consumption only – not for watering the garden.
- Reducing the impact of stormwater on waterways.



3.2 ALTERNATIVE WATER SUPPLIES

A feasibility study was performed by JHA into the potential use of rainwater harvesting to provide an alternative water source on site for landscape irrigation services. Rainwater storage tanks will be incorporated into the development and connected to the roof water downpipes. We estimate the irrigation area would be approximately 3900m² encompassing the eastern and western perimeters area and the northern central green space.

3.3 RAINWATER COLLECTION

It is envisaged that downpipes from the roof areas will discharge to a rainwater harvesting tank. The approximate roof catchment area is 2400m².

Preliminary calculations indicate that the proposed 100 kilolitre rainwater harvesting tank storage volume, as nominated by the ESD consultant, providing water for irrigating the estimated 3900m² of landscape watering demands (in the order of 14.2 kilolitres per day).

Based on a preliminary water balancing assessment the proposed 100 kilolitre rainwater harvesting tank achieves the following:

- Meets an average of 38% of the estimated annual landscaping demand i.e. 52% of the landscaping water demands are estimated to be provided from the potable water supply
- Provides an average run-off reduction of 66% from the collected roof area

3.4 WATER USE REDUCTION INITIATIVES

3.4.1 HIGH EFFICIENCY FIXTURES

Water consumption shall be reduced by incorporating water efficient fixtures and fittings (WELS rated), time flow taps for student use in accordance with Educational Facilities Standards and Guidelines.

3.4.2 HOT WATER

Individual hot water units are proposed to be installed at individual or groups of fixtures. Due to the minimal consumption of hot water in education facilities this will reduce energy consumption as usage will be limited to on demand.

To further reduce the energy consumption associated with hot water, hot water will not be provided to student restroom wash basins.

3.4.3 WATER SENSITIVE URBAN DESIGN (WSUD)

The landscaping of the site will be designed with best practice WSUD principles in mind.

Refer to the landscape plans and report