Bankstown North Public School Upgrade

322 Hume Highway
Bankstown NSW

Water Management Plan Information

WATER MANAGEMENT PLAN INFORMATION

DEVELOPMENT AUTHORITY:	Canterbury Bankstown Council
SITE ADDRESS:	322 Hume Highway Bankstown
DEVELOPMENT GUIDELINES:	Bankstown City Council - Development Engineering Standards June 2009 Part 9.4.6 Requirements for Rainwater Tank Storage and Infiltration / Transpiration System Overflow
STORMWATER DRAINAGE:	Refer to proposed drainage plans prepared by Northrop Engineers
ON-SITE DETENTION:	Refer to proposed drainage plans prepared by Northrop Engineers

INTRODUCTION

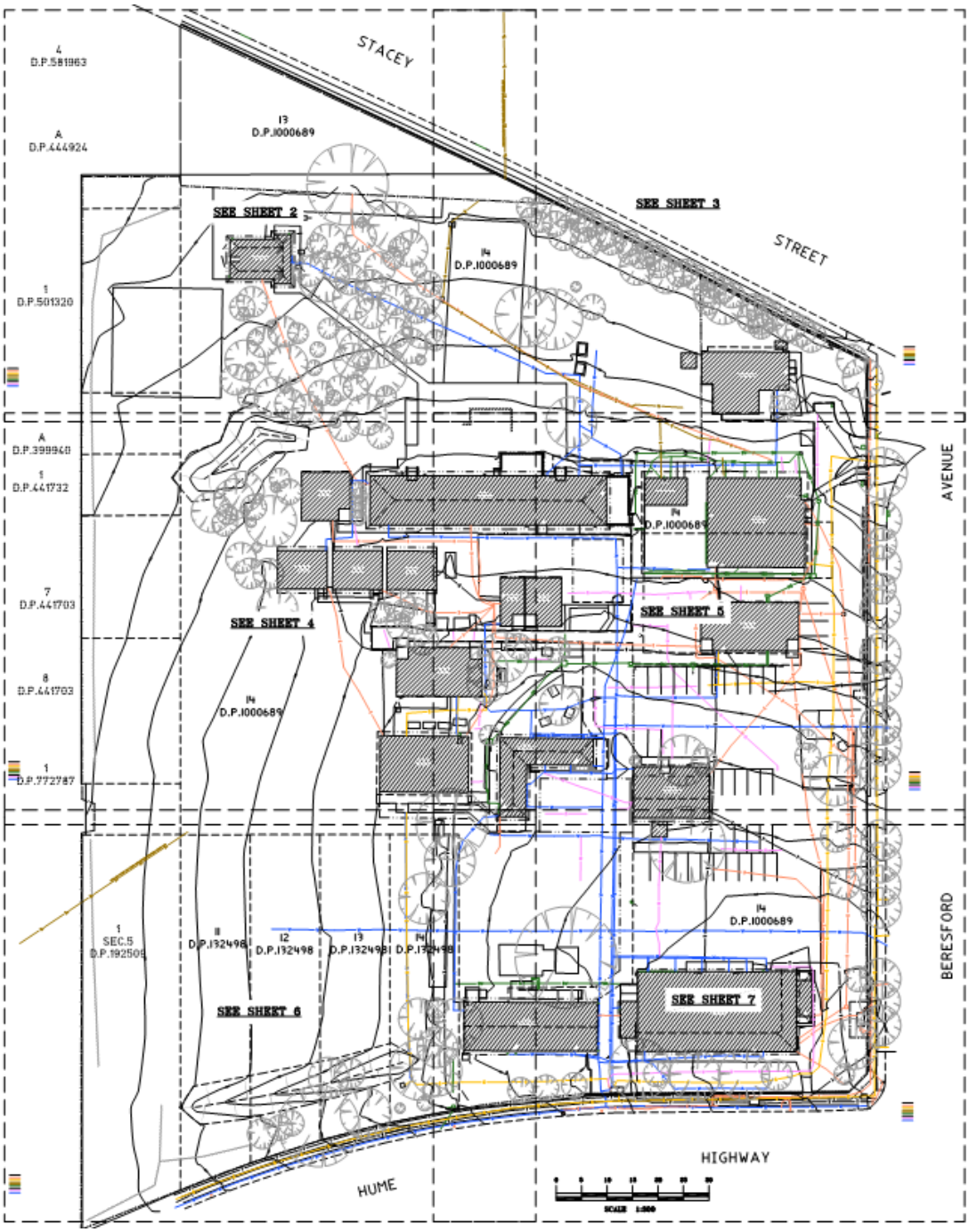
This report supports a development proposal to increase the student capacity of Bankstown North Public School from approximately 350 to 1000 pupils.

It is understood that the New South Wales Government Department of Planning has a number of Secretary's Environmental Assessment Requirements (SEARs), including an Integrated Water Management Plan.

EXISTING SITE CHARACTERISTICS

- Site area = Exceeding 27,000m2
- Incorporating existing buildings for the educational purposes of Bankstown North Public School and Pre-Uni New College Bankstown
- The site is located between Stacey Street (on the north) and the Hume Highway (in the south), adjacent to Beresford Avenue (on the east).
- Survey plan prepared by CMS Surveyors – Drawing 18067detail - Sheets 1 to 7 - dated 8/10/18 indicates Australian Height Datum (AHD) site surface contours ranging from about RL67.00 in the southeast portion down to about RL60.50 in the northwest portion of the site. The average site slope across the property is observed to be about 3%.

The survey plan contours are indicated in the plan below.



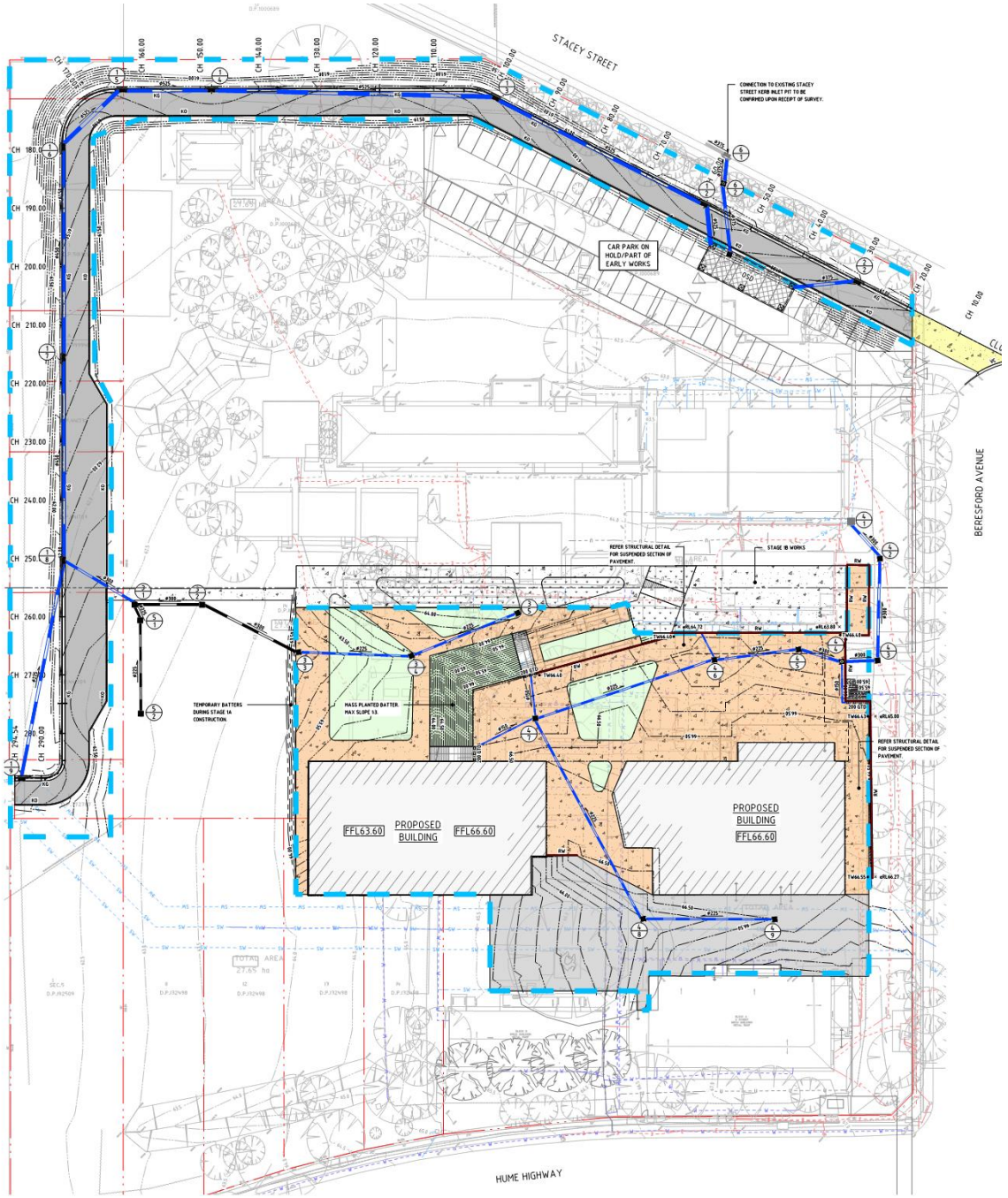
EXISTING STREET DRAINAGE

Based on available survey and street view information, it was observed that existing underground street drainage currently connects to a number of kerb inlet pits along Stacey Street on the north side of the school (see photograph below).

PROPOSED CONNECTION

It is understood that proposed stormwater drainage is to be directed from the outlet of an underground detention tank to the existing pipe system in Stacey Street, as documented on the civil engineering drainage drawings prepared by Northrop.

The plan below indicates the proposed civil engineering drainage layout with dark blue lines.



ON-SITE DETENTION STORAGE

It is understood that a proposed underground detention tank is to be installed in the northeast portion of the site, as documented on the civil engineering drainage drawings prepared by Northrop.

RAINWATER STORAGE

Rainwater storage requirements for new residential dwellings are typically provided to satisfy State Environmental Policy Building Sustainability Index (BASIX) assessment requirements, but this determination is not applicable to schools or commercial developments (which are not residential).

Reference is made to the Bankstown City Council - Development Engineering Standards June 2009 Part 9.4.6 Requirements for Rainwater Tank Storage and Infiltration / Transpiration System Overflow, which indicates rainwater storage is not required for all developments, although a large majority do require them. Rainwater storage is proposed for the school upgrade works.

Water efficient fixtures and fittings are also recommended to reduce draw-off from the public water supply system. The selection of these items should meet the requirements of the Water Efficiency Labelling and Standards (WELS) scheme.

A water balancing calculation based on historical rainfall data in Sydney was adopted to estimate that - A 50m3 rainwater tank collecting a roof catchment of 2752m2 would be capable of providing 86% of non-potable demand to irrigate a landscaped area of 900m2 (see the following extract calculation summary).

WATER REUSE TANK CALCULATION (based on Bureau of Meteorology rainfall records over 20 years = 7305 days from 1983 - 2002)

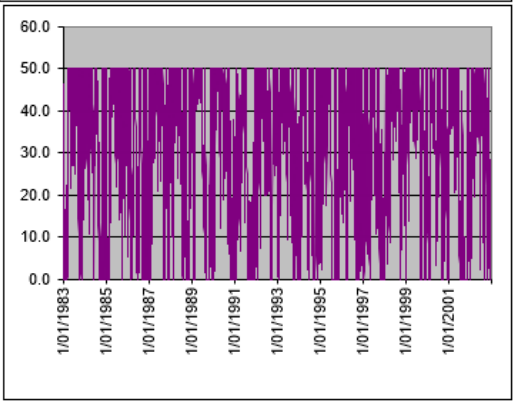
Proportion of TOTAL rainfall runoff volume drained :
68 % of drained runoff overflows from tank
32 % of drained runoff captured for reuse

20yr Runoff Coefficient = **0.945** based on **100** % impervious proportion of drained area
Area drained to tank = **2752** m2 (= 10 % of **27652** m2 site)
Irrigation demand = **4.30** mm/day = 30.10 mm/week for summer/spring (Sep-Feb)
2.15 mm/day = 15.05 mm/week for winter/autumn (Mar-Aug)
Irrigation area = **900** m2 (= 3 % of 27652 m2 site)
Any additional demand = **0** m3/day (e.g. laundry, toilets, car washing for NON-POTABLE USE ONLY)
Tank Storage = **50** m3 (Initial storage taken as **0** m3 at start of year)
Non-potable water demand = 21149.6 m3 over 7305 days
Water from main needed for 845 days out of 7305 days = 12 % of the time (water is drawn from the mains supply)
Water drawn from main = 2911.3 m3 or kL Rate of water reuse = 88 % of the time (the rainwater tank has sufficient water for reuse)
Water reused from tank = 18238.3 m3 over 7305 days
Rate of water reuse = 86 % of non-potable demand supplied by tank storage
Runoff from all storms = 57283.5 m3 (Non-potable demand is 37 % of this volume)

Max overflow volume in a day = 550.7 m3
Storms usually peak between 2pm & 6pm due to daily heating of the earth's surface by the sun, which is a maximum during the afternoon (see www.bom.gov.au/weather/nowl/sevwx/about.shtml)
Mean overflow rate for a 4 hour duration = 38 L/s

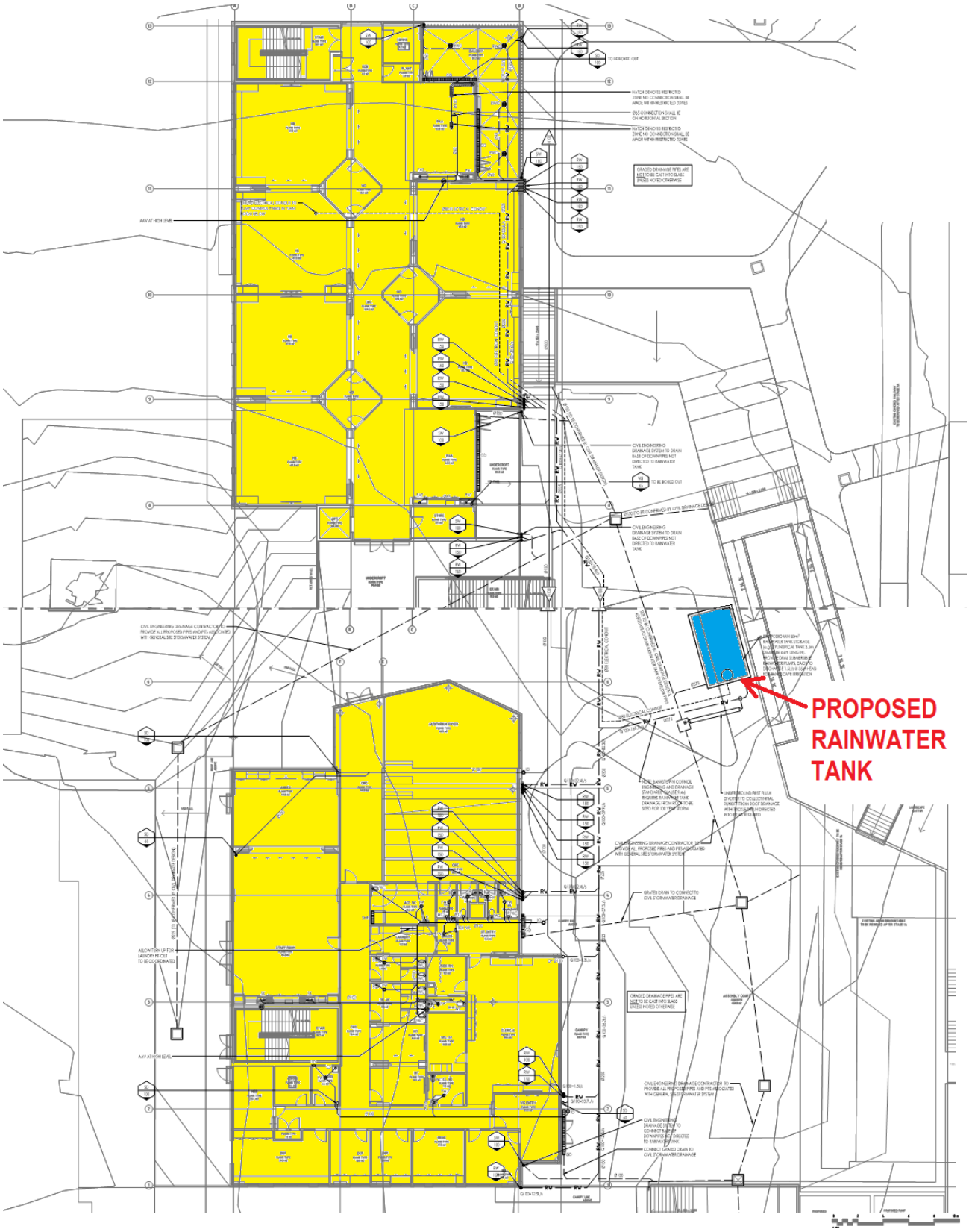
CALCULATION NOTES
(A) = date
(B) = rainfall
(C) = runoff coeff * (B) / 1000 * area drained to tank
(D) = seasonal irrigation demand / 1000 * irrigation area + any additional non-potable demand
(E) = (C) - (D)
(F) = tank capacity if ["previous (F)" storage + (E) change in storage] exceeds capacity
(F) = 0 empty tank if ["previous (F)" storage + (E) change in storage] < 0
(F) = ["previous (F)" storage + (E) change in storage] if capacity is sufficient to store
(G) = overflow difference if ["previous (F)" storage + (E) change in storage] exceeds capacity
(G) = 0 overflow if ["previous (F)" storage + (E) change in storage] is within capacity
(H) = 1 if (F) = 0 no water stored in tank
(I) = positive (E) change in storage if (H) > 1
(I) = 0 no mains drawoff if (H) = 0 tank storage sufficient

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
Date	Sydney Airport Rainfall mm	Runoff to tank m3	Water Demand m3	Change in storage m3	Residual Tank Storage m3	Overflow from Tank m3	Days to fill from main	Water from main m3
					0.0			
1-Jan-83	1.8	4.7	3.9	0.8	0.8	0.0	0	0.0
2-Jan-83	0	0.0	3.9	-3.9	0.0	0.0	1	3.9
3-Jan-83	19.3	50.2	3.9	46.3	46.3	0.0	0	0.0
4-Jan-83	0.2	0.5	3.9	-3.3	43.0	0.0	0	0.0
5-Jan-83	0	0.0	3.9	-3.9	39.1	0.0	0	0.0
6-Jan-83	0	0.0	3.9	-3.9	35.2	0.0	0	0.0
7-Jan-83	0	0.0	3.9	-3.9	31.4	0.0	0	0.0
8-Jan-83	0	0.0	3.9	-3.9	27.5	0.0	0	0.0
9-Jan-83	0	0.0	3.9	-3.9	23.6	0.0	0	0.0
10-Jan-83	0	0.0	3.9	-3.9	19.8	0.0	0	0.0
11-Jan-83	0	0.0	3.9	-3.9	15.9	0.0	0	0.0
12-Jan-83	0	0.0	3.9	-3.9	12.0	0.0	0	0.0
13-Jan-83	0	0.0	3.9	-3.9	8.1	0.0	0	0.0
14-Jan-83	0	0.0	3.9	-3.9	4.3	0.0	0	0.0
15-Jan-83	0	0.0	3.9	-3.9	0.4	0.0	0	0.0
16-Jan-83	0	0.0	3.9	-3.9	0.0	0.0	1	3.9
17-Jan-83	0	0.0	3.9	-3.9	0.0	0.0	1	3.9
18-Jan-83	0	0.0	3.9	-3.9	0.0	0.0	1	3.9
19-Jan-83	0	0.0	3.9	-3.9	0.0	0.0	1	3.9
20-Jan-83	0	0.0	3.9	-3.9	0.0	0.0	1	3.9
21-Jan-83	0	0.0	3.9	-3.9	0.0	0.0	1	3.9
22-Jan-83	2.8	7.3	3.9	3.4	3.4	0.0	0	0.0



The suggested location for the 50m3 rainwater tank is under the external ground surface on the north side of the proposed building, where it can collect downpipe drainage from the roof. A first flush diverter is intended to be placed on the inlet pipe to the rainwater tank, to collect the initial layer of dirt washed from the roof surface at the commencement of a storm.

Refer to the indicative ground floor plan below. North is to the right.
Refer to latest architectural set for current layout.



RAINWATER REUSE

The proposed rainwater storage of 50m3 is intended to collect "clean" roof runoff from the downpipes of the main building for the purpose of landscape irrigation. Non-potable supply could also be considered to fill toilet cisterns for flushing purposes (in addition to irrigation demand), but this potential demand would be significantly less than that required for landscape irrigation.

Irrigation water can be applied by a timer-controlled automatic sprinkler system or manually applied by maintenance personnel on the school grounds using hoses connected to rainwater tap locations. The landscaping contractor is anticipated to recommend suitable precipitation rates for selected plant species in particular planter locations, and rainwater is to be supplied at a suitable flowrate and pressure. In the situation where the rainwater tank is empty (during drought periods), water can be drawn from the public street main supply, in conjunction with suitable backflow prevention measures. The use of drought tolerant planting should also be used to minimise the need for excessive irrigation in the event of prolonged periods of dry weather.

TEMPORARY EROSION & SEDIMENT CONTROL MEASURES

During the construction works the management of soil and water movement requiring erosion and sediment control is anticipated to be undertaken in accordance with the Landcom publication *Soils and Construction: Managing Urban Stormwater 4th Edition, March 2004* (also known as "the Blue Book"). Expected temporary construction measures to be undertaken include:
- Sediment fencing on the low side of earthmoving operations
- A gravel layer at the construction vehicle access point into the area of works
- Regular monitoring of soil movement characteristics and cleaning of sediment deposits as required during construction
- Security fencing around the area of construction works

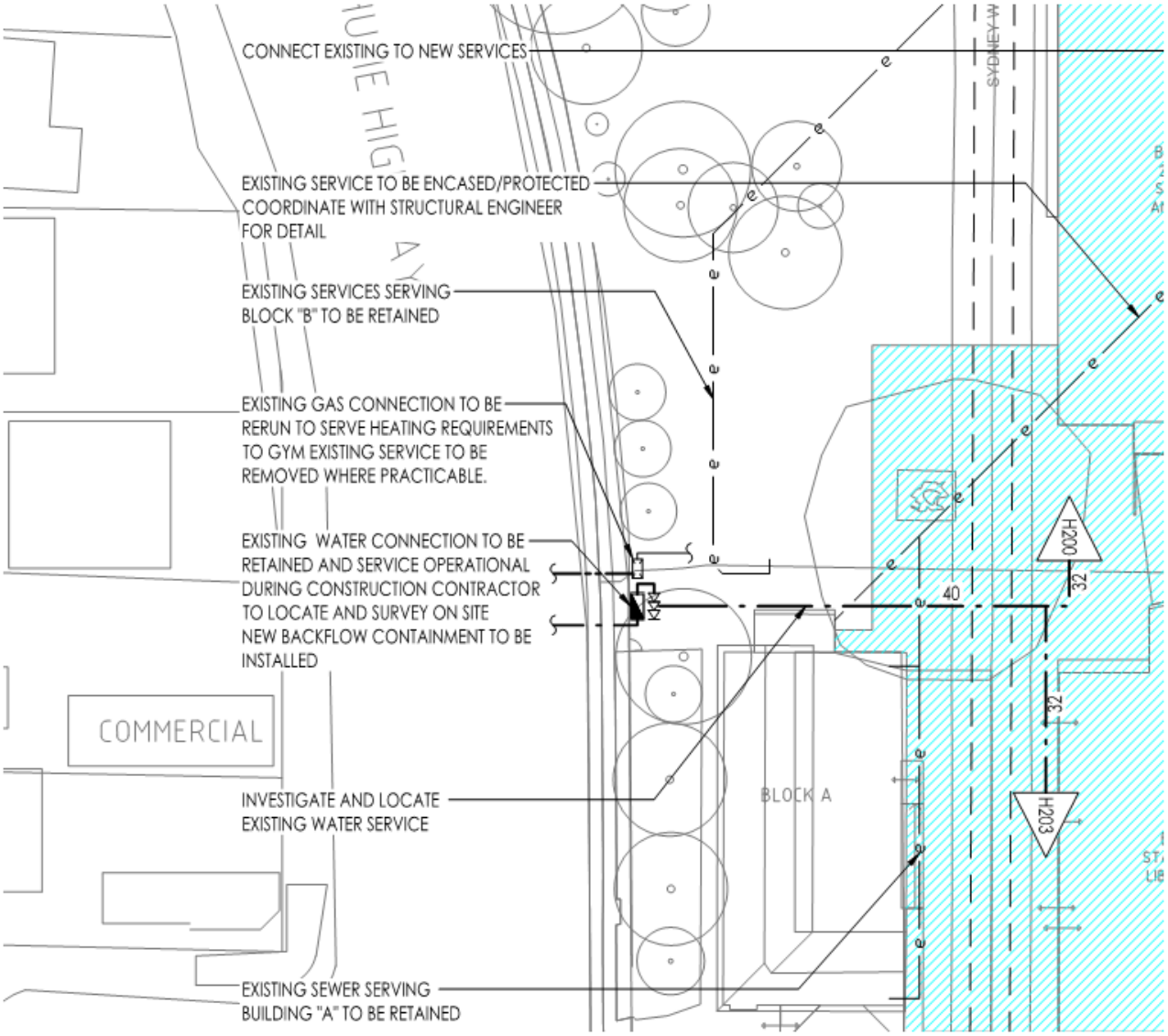
Reference should be made to the civil engineering drainage drawings prepared by Northrop.

POTABLE WATER SUPPLY

The potable water supply serving the project will be connected to the existing DN50 water service with a new Reduced Pressure Zone Device (RPZD) for site containment and will serve WELS rated sanitary fixtures and tapware to EFSG requirements.

Rainwater reuse to serve sanitary flushing can be considered to subsidise the requirement for potable water serving sanitary fixtures.

Existing water meter location indicated in the below section of the current hydraulic site plan



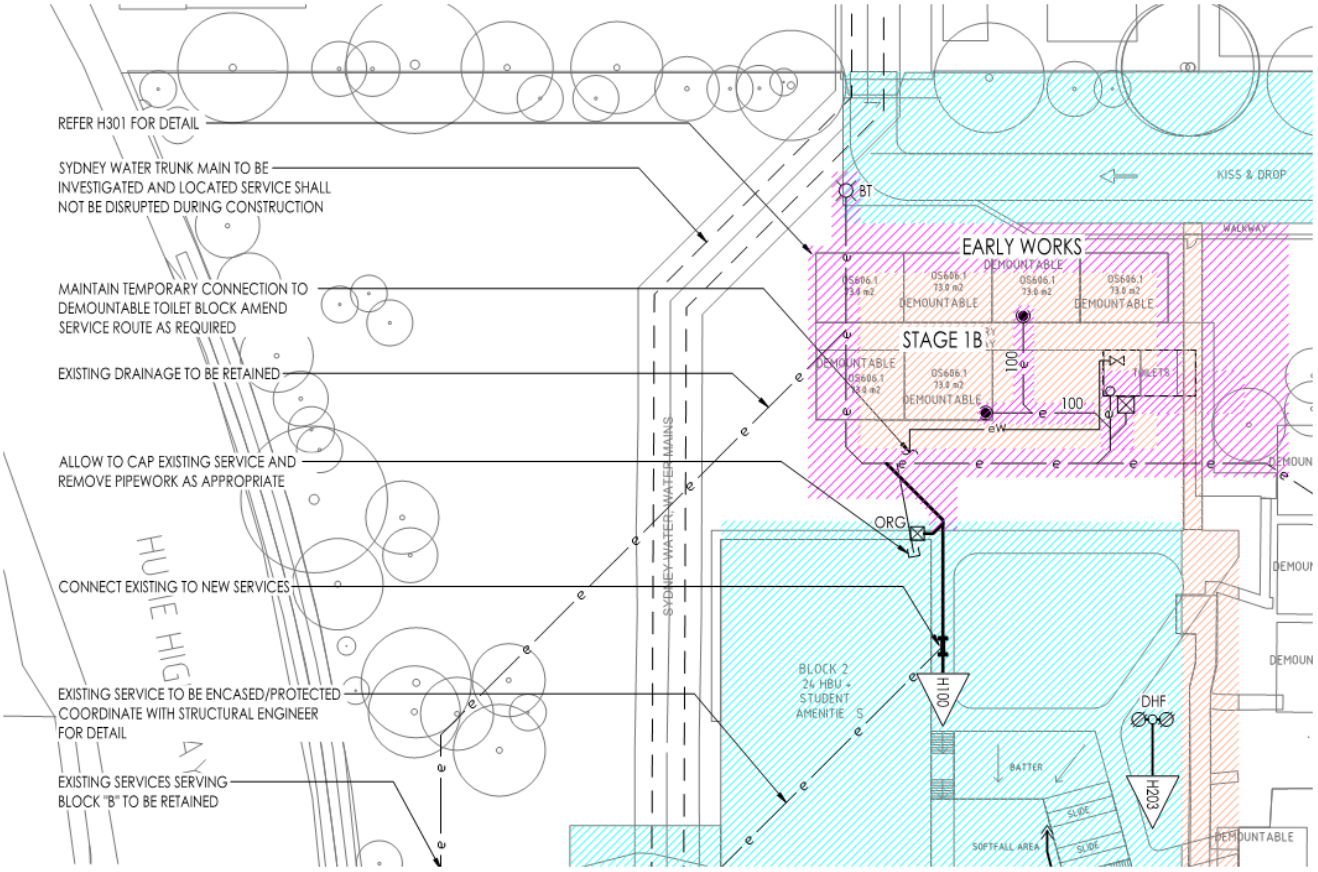
WASTE WATER

The waste water (Sewer) for the site will discharge to the existing boundary tap connection located to the West of the main building.

The existing connection size of 150mm will be adequate for the needs of the building, a section of existing pipework will be replaced during construction to facilitate connection to the existing boundary trap.

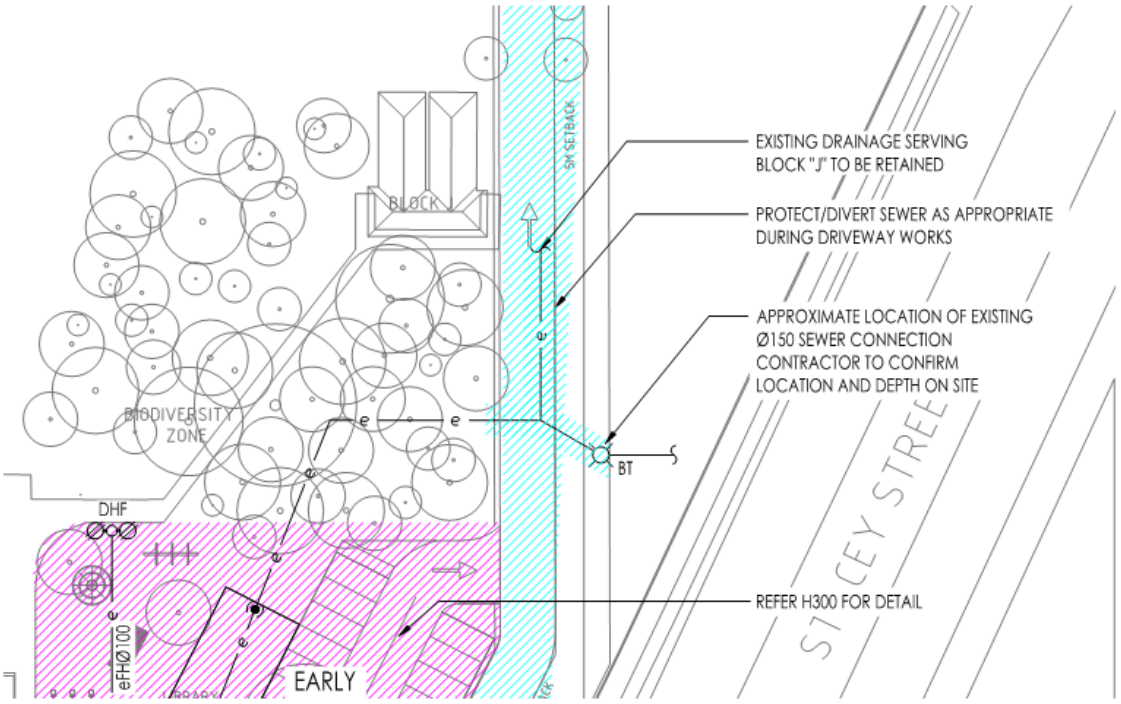
The existing sanitary drainage pipework shall be inspected using CCTV and any sections of pipe work that are seen to be damaged or otherwise unsuitable for connection shall be replaced or re-lined using specified re-lining material.

Existing sewer connection locations indicated in the below sections of the current hydraulic site plan



The primary sewer connection point is shown above serving the new building. The connection of existing waste water services to existing buildings shall be retained/diverted during construction to suit the orientation of the new building as required with any pipework that is damaged or unsuitable for retention to be replaced or relined using the specified pipe or relining material.

Connection shown to early works phase to be removed and service capped at completion of new build and removal of temporary buildings.



Secondary waste water connection shown above, serving existing block N, I and J shall be retained.
The temporary library shall be connected to the existing waste water service as part of the early works phase.
Connection made as part of the early works phase to the temporary library, shall be removed and capped on completion of the new build and removal of temporary library.

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