



AYCE

STORMWATER MANAGEMENT  
REPORT

# HOPEPOINT CHRISTIAN SCHOOL



|                         |                                              |
|-------------------------|----------------------------------------------|
| <b>AYCE Project No.</b> | 24024                                        |
| <b>Project:</b>         | HopePoint Christian School – New Building DA |
| <b>Address</b>          | 39 Ashcroft Street, GEORGES HALL NSW 2198    |

## Document Control

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## 1. Executive Summary

AYCE has been engaged by HopePoint Christian School Georges Hall to produce the stormwater documentation for the demolition of an existing school building and proposed development of a new school building (Block F) at Hope Point Christian school, 39 Ashcroft St, Georges Hall. This Report is to be read in conjunction with the stormwater documentation and calculations to support the proposed submission for a Development Application.

This Report is to be submitted for assessment to City Of Canterbury Bankstown Council as it addresses the site stormwater conditions, the stormwater management strategies and design parameters as outlined in the following documents:

- 1- Canterbury-Bankstown – Development Control Plan – 2024 (Chapter 3.1)
- 2- Canterbury-Bankstown – Development Control Plan – 2023 (Chapter 3.4)
- 3- Canterbury-Bankstown – Development Control Plan – 2023 (Chapter 10)
- 4- Australian Rainfall and Runoff - 2019

The proposed works include the demolition an existing single storey classroom building to erect a double storey classroom building with attached amenities block on ground floor. This development does not include the construction for any new carparking area, as it will utilise the existing carparking area already available. There will be removal of some trees, allow to refer to architectural documentation for clarity.

The stormwater management shall meet the requirements as outlined in the City of Canterbury-Bankstown Council development control plan specifically Chapter 3.1 *Section 4 'Onsite Detention Systems'*.

These are as outlined below:

- On-site detention (OSD) is required where an increase in stormwater runoff, from a site, will adversely affect the receiving stormwater system hereby ensuring that the post-developed site does not exceed the rate of runoff from the pre-developed site for the corresponding stormwater events. (Ch3.1 Section 4) - AYCE has completed a site analysis of the affected area scope and relevant DRAINS calculations and determined that a 6.508m<sup>3</sup> Onsite Detention tank to reduce peak runoff across rainfall events. AYCE has documented the installation of a 8.812m<sup>3</sup> Detention tank to allow for any minor future development.
- All existing site stormwater and overland flow directed to Council stormwater system at Henry Lawson Drive via stormwater pits, pipes and grassed swale.
- All proposed building stormwater and overland flow to connect into existing internal stormwater drainage systems and directed to Council stormwater system at Henry Lawson Drive and Lionel Street. No proposed works outside of property on Council assets.
- Discharge into existing stormwater system has been attenuated by installation of a On-Site Detention tank to ensure the stormwater flows up to and including the 1% AEP are not increased, therefore not impacting the existing drainage system and overall downstream council infrastructure.
- 5000L Rainwater Tank provided for toilet flushing and Garden watering.
- Stormwater treatment in accordance with Canterbury-Bankstown Development Control Plan (Chapter 10) for rainwater reuse to include first flush device and leaf guard prior to storing water for re-use.

Erosion and sediment control plan has been designed to reduce the pollution to stormwater during demolition and construction activities. This has been designed with the principles outlined in the 'Blue Book' Managing Urban stormwater.

## 2. Overall Site Description

The Proposed development site is located at No.39 Ashcroft St, Georges Hall. This site is consisting of various school buildings including heritage building.

This site is situated north of Beale Street, where access is available at 42 Beale street, and west of Ashcroft street, where the main entry is located. The site has an internal carpark provided for staff and visitors.

The site largely slopes toward the northern end (Henry Lawson Drive) where the existing school stormwater drains to a Council stormwater pit located on the southern side of Henry Lawson Drive. The site consists of seven school buildings with one being demolished and replaced which is noted here. The overall site has an approximate area of 21 709m<sup>2</sup>.

## 3. Proposed Works Area Description

The building and works area encompass a total area of 1 355m<sup>2</sup>. Which encompasses an existing school building, which currently drains to existing site stormwater pits. The surface area is made up of pavement, artificial grass, gravel and raised fill with play areas covered in woodchips. The surface area generally drains overland to Lionel Street, which drains through an easement within the school boundary and connects to Henry Lawson Drive Council stormwater drain via a grassed swale.

See below:



## 4. Stormwater Design

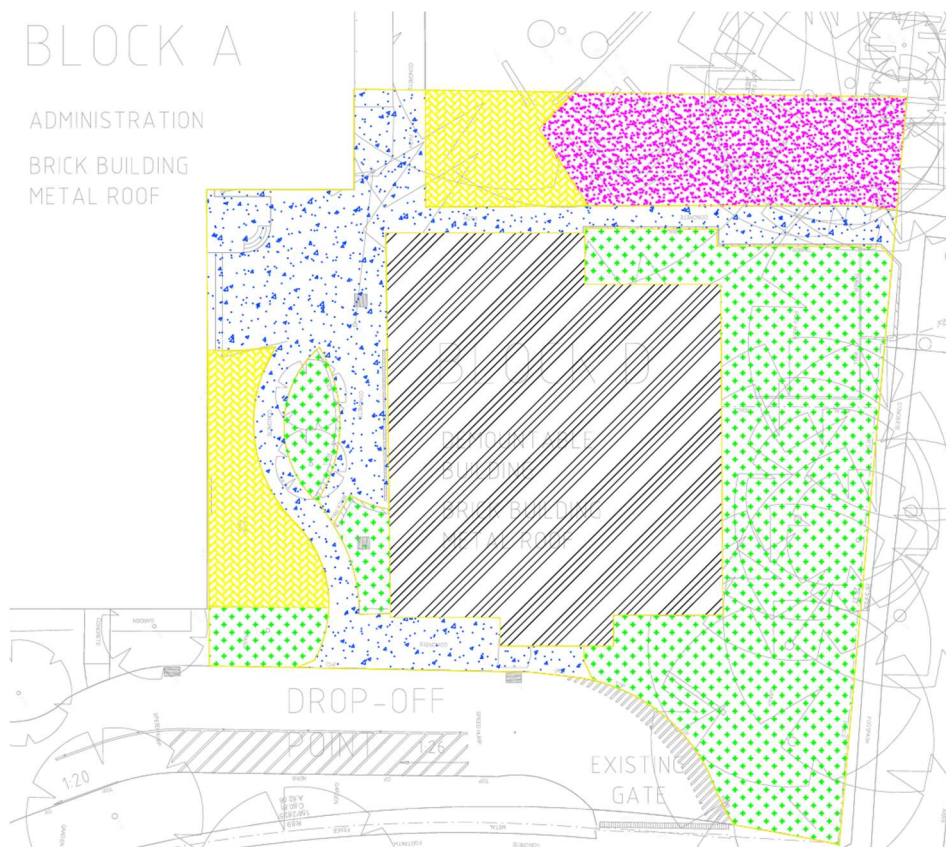
### 4.1 Overview

This proposed stormwater management system has been provided to reduce the overall site discharge within the proposed new developed works area encompassing the new school building and associated landscaping. All existing remaining areas outside the building scope boundaries are not included and overland flow from those areas are not considered within this system.

## 4.2 Existing Stormwater System

The existing roof water drains via series of pipes and pits north via a 300mm stormwater drainage easement and grassed swale and connects to Council stormwater pit located at the southern side of Henry Lawson Drive. The surface water and overland flow within the building scope drains overland into the council drainage pits located at Lionel Street and through the school which ultimately drain through the easement to Henry Lawson Drive.

### 4.2.1 Existing Catchment Analysis



|                                   | AREA m <sup>2</sup> | PERCENTAGE % |
|-----------------------------------|---------------------|--------------|
| IMPERVIOUS AREA – Pavement        | 267                 | 19.7         |
| IMPERVIOUS AREA - Roof            | 397                 | 29.3         |
| IMPERVIOUS AREA - Gravel          | 121.5               | 9.0          |
| IMPERVIOUS AREA – Artificial Turf | 110.5               | 8.2          |
| PERVIOUS AREA – Turf & Gardens    | 459                 | 33.8         |

### 4.3 Proposed Stormwater System

To meet the objectives listed in Canterbury-Bankstown DCP 2023 Ch 3 Section 4 ***“To reduce the potential for local flooding and damage to existing properties by limiting runoff from development to pre-developed level”*** we have calculated the pre and post development areas and determined that there is an increase of impervious area by 290m<sup>2</sup>.

An Onsite-Detention (OSD) tank has been proposed for the new development to reduce peak site run-off across all rainfall events to predevelopment conditions in line with Council requirements.

The drainage system has been analysed using DRAINS computer modelling software 2024 edition using the current rainfall data from the BOM website and the ARR Hub.

The site is drained via a series of inlet pits, and drainage pipes to a 7m<sup>3</sup> inground concrete detention tank complete with 150mm orifice. The rectangular OSD tank is located within the site in a low point from the developed are and discharges into an internal pit within an easement on site.

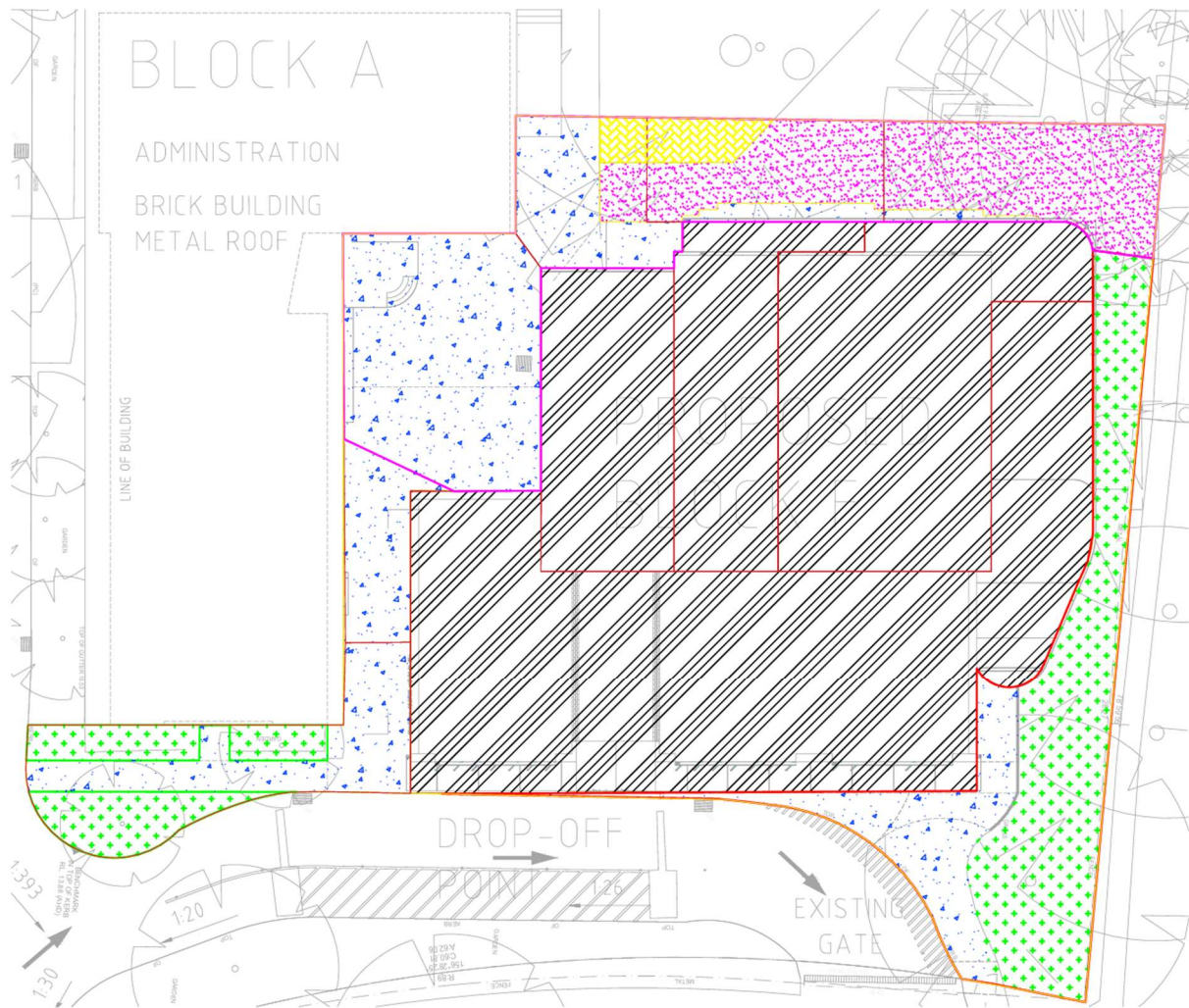
The site storage requirements (SSR) for the development has been calculated to be 6.508 m<sup>3</sup>. As surface areas around building bypass the On-Site Detention the discharge from the onsite detention has been designed to ensure the total discharge does not increase from pre-development flows by further restricting the outlet from the detention tank. The SSR also reduced post development flows to pre-development flows across all rainfall events.

| AEP | PRE- DEVELOPMENT FLOW (L/S) | POST- DEVELOPMENT FLOW (L/S) |
|-----|-----------------------------|------------------------------|
| 10% | 41                          | 41                           |
| 5%  | 46                          | 46                           |
| 2%  | 53                          | 52                           |
| 1%  | 60                          | 58                           |

The OSD tank is fitted with an 150mm sharp edged orifice to regulate the site discharge, and a maxi-mesh trash screen to prevent debris blocking the orifice and exiting the site. In the instance of blockage, the OSD tank will overflow via the access grates located in the roof of the tank. These discharge into the overland grassed swale within the easement and flows into Henry Lawson Drive.

Please refer to C-300 [B] in Appendix C for OSD dimensions and levels.

#### 4.3.1 Proposed Catchment Analysis



|                                   | AREA m <sup>2</sup> | PERCENTAGE % |
|-----------------------------------|---------------------|--------------|
| IMPERVIOUS AREA – Pavement        | 292                 | 21.5         |
| IMPERVIOUS AREA - Roof            | 769                 | 56.8         |
| IMPERVIOUS AREA - Gravel          | 109.5               | 8.1          |
| IMPERVIOUS AREA – Artificial Turf | 15.5                | 1.1          |
| PERVIOUS AREA – Turf & Gardens    | 169                 | 12.5         |

#### 4.4 Proposed Water Storage

A 5 000L rainwater tank has been proposed capturing approximately 41% of the proposed roof area, to be used for toilet flushing and garden watering. A above ground 100L first flush device has been provided at the rainwater tank in accordance with Council DCP and for easy maintenance. Rainwater tank overflow is directed to the proposed On-Site detention tank. In accordance with Canterbury Bankstown Council DCP Ch 3.1 & 10.1.

#### 4.5 Ground water

Geotechnical investigation of the site will be required to assess the any prevailing groundwater conditions and prescribe treatment/mitigation methods if required.

#### 4.7 Erosion & Sediment Control Plan

The Sediment and Erosion Control Plan has been designed to reduce the pollution to stormwater during demolition and construction activities. This has been designed with the principles outlined in the 'Blue Book' Managing Urban stormwater.

Sediment fencing to be installed around the proposed site, with a temporary construction exit to Lionel Street to prevent sediment from leaving the site.

Portable gravel kerb inlet sediment trap to be installed across the existing kerb inlets within the site drop-off area fronting Ashcroft Street to prevent sediment from entering the council system.

Refer to C-400 [C] in Appendix B

### 5. Conclusion

This report has outlined various aspects in relation to the stormwater management for the proposed development. These include site discharge flows, stormwater storage, and erosion and sediment controls during construction.

This stormwater management for this site has been designed to meet Canterbury Bankstown Council requirements as outlines in the Development control plan and Onsite Detention technical specifications.

The increased site stormwater flows from the proposed development have been modelled using approved parameters and software as outlined by Canterbury Bankstown, and flows have been reduced to pre-development flows by the implementation of an Onsite storage tank.

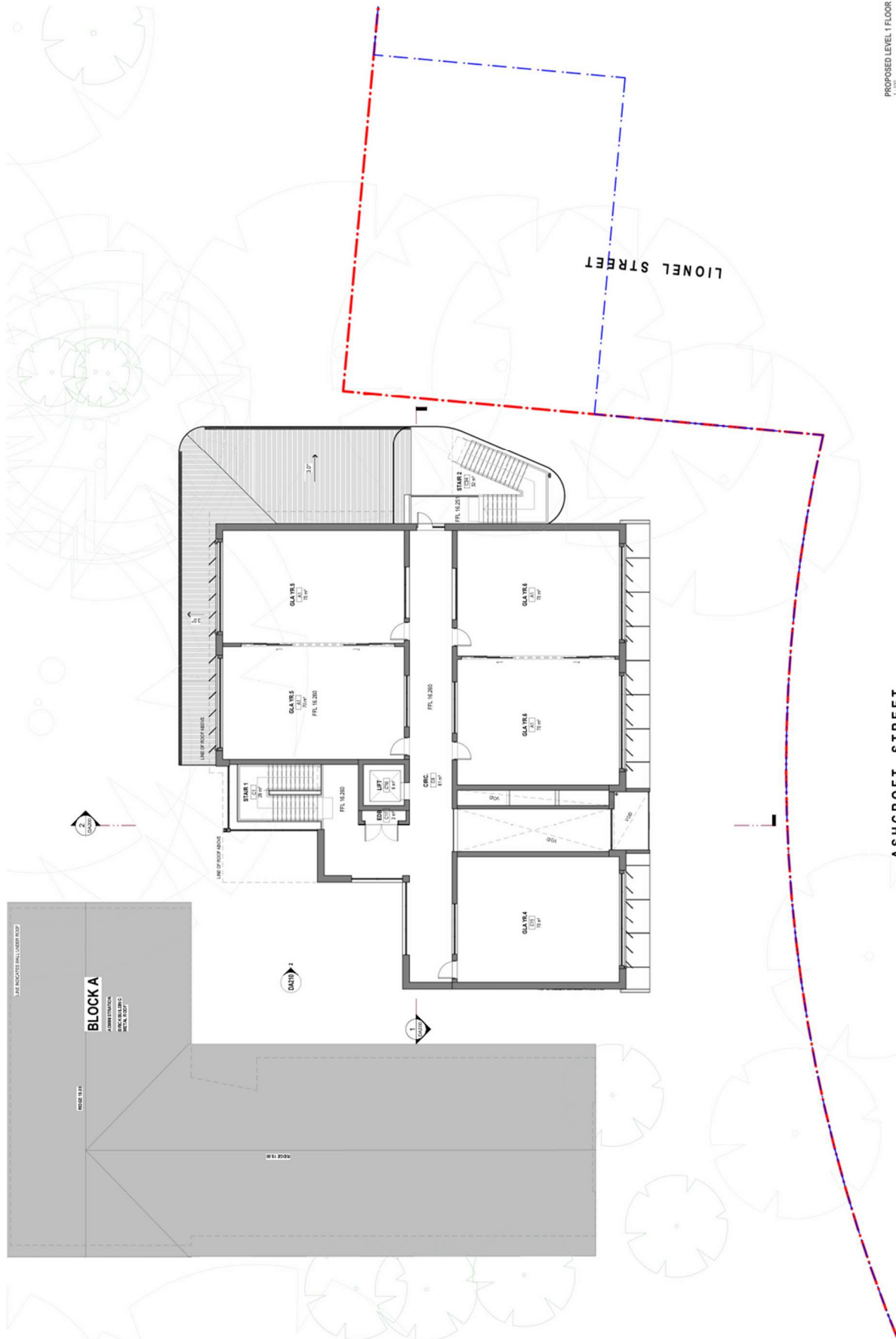
Rainwater harvesting has been implemented to reduce potable water demand, utilisation of natural resources to allow for a more sustainable design, in line with Canterbury Bankstown Council DCP Ch 10.

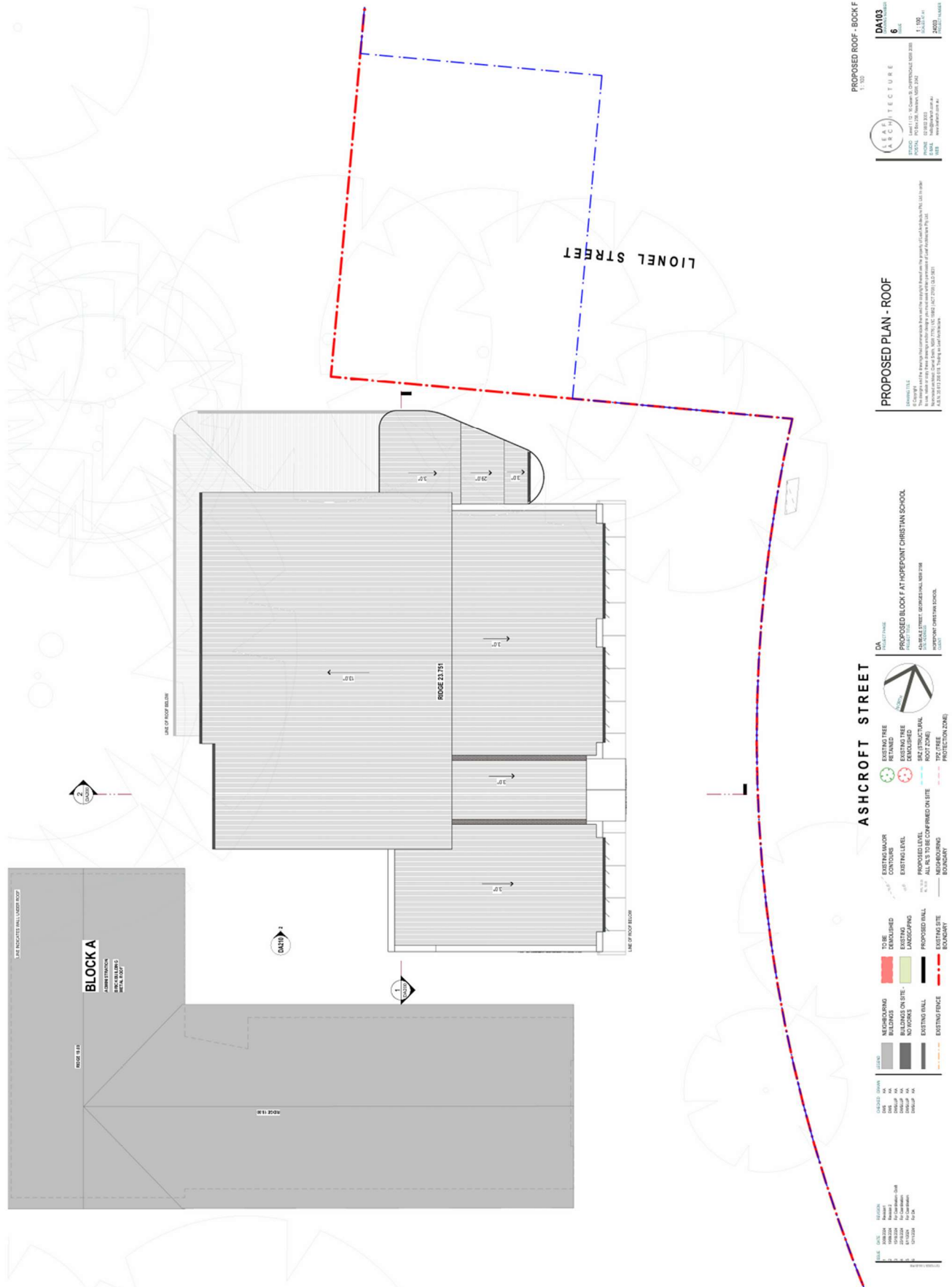
Finally, a Sediment and erosion control plan has been produced to prevent pollutants in the stormwater run-off during construction, in line with the Blue Book – Managing Urban Stormwater 2004.



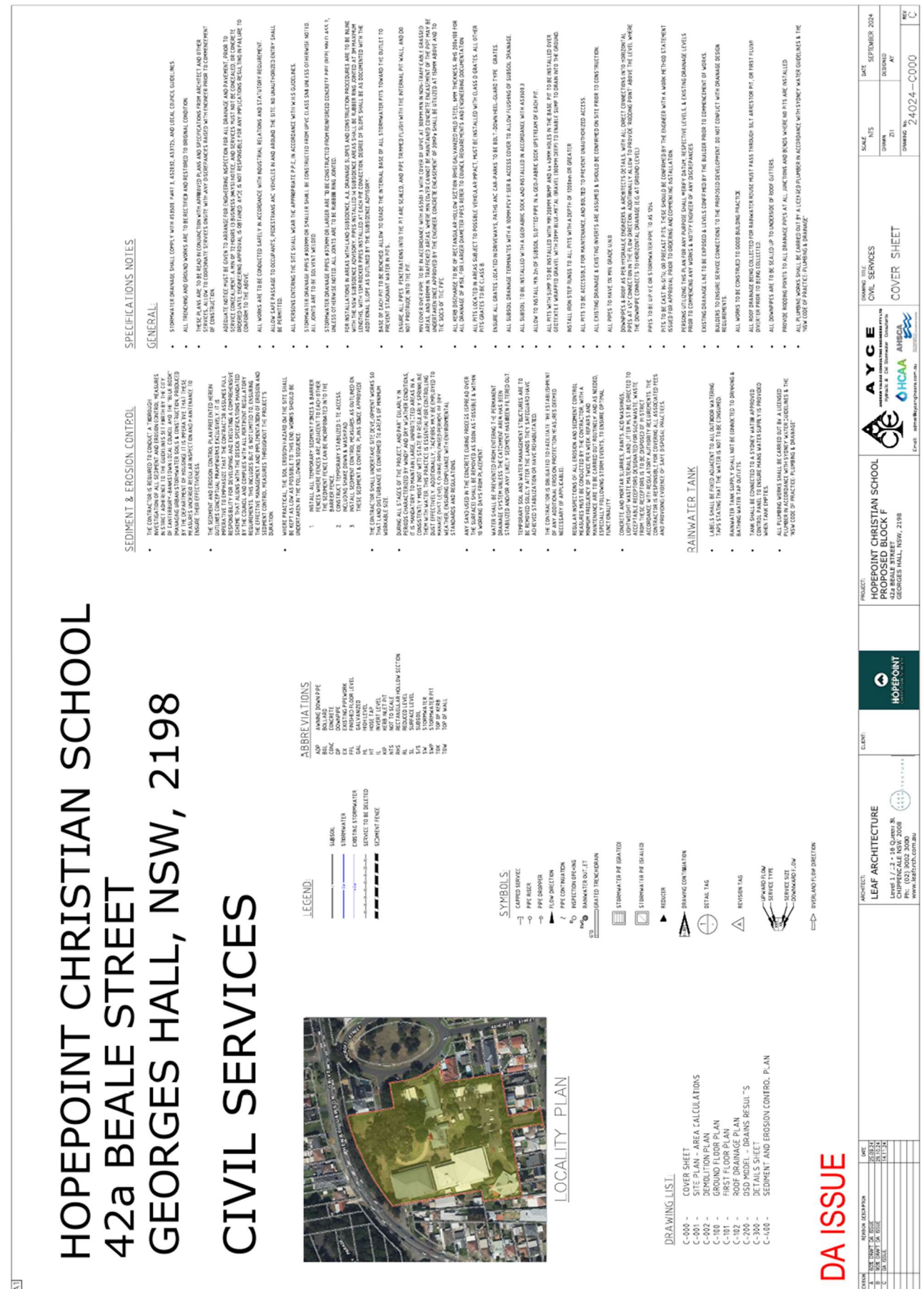




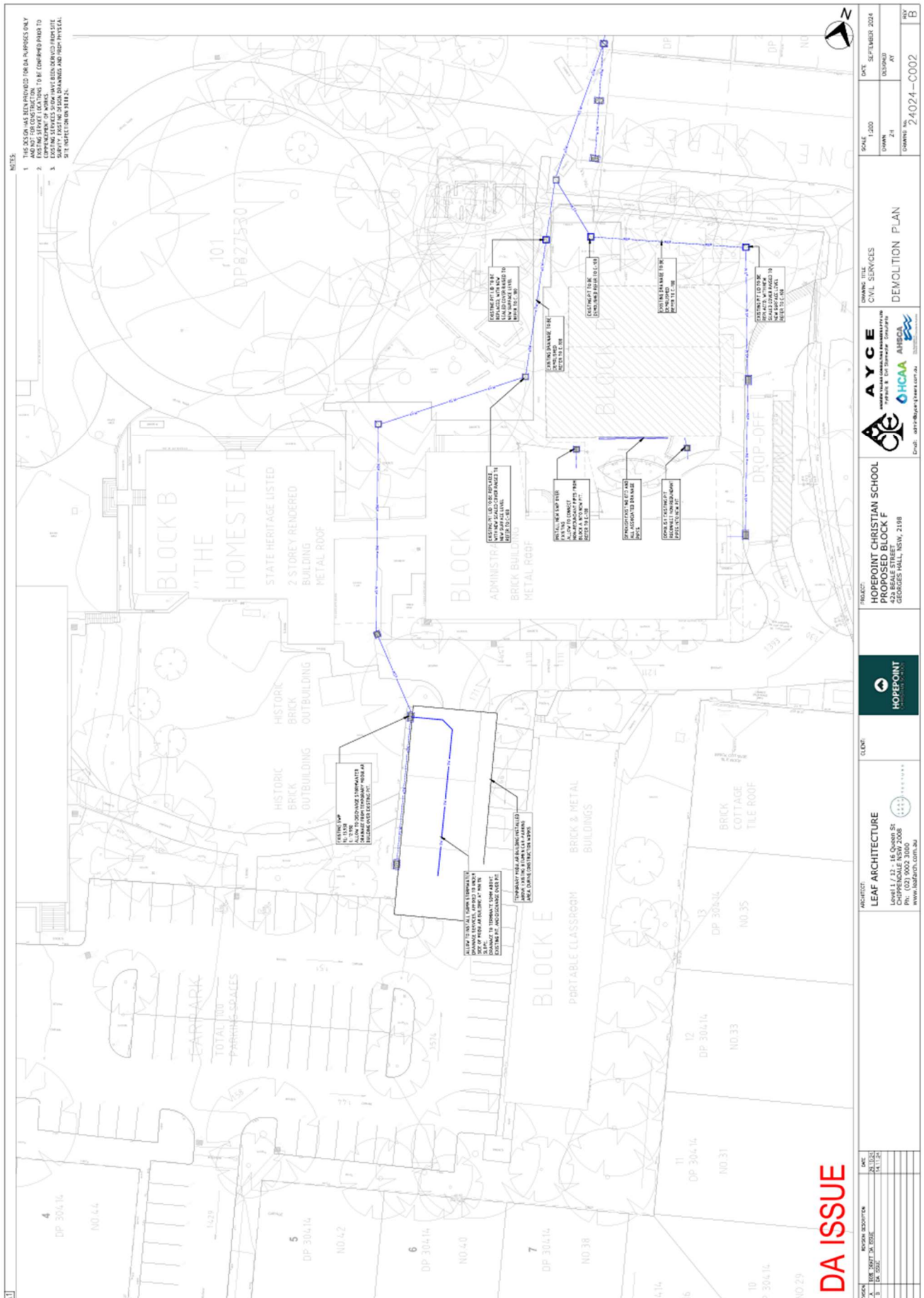




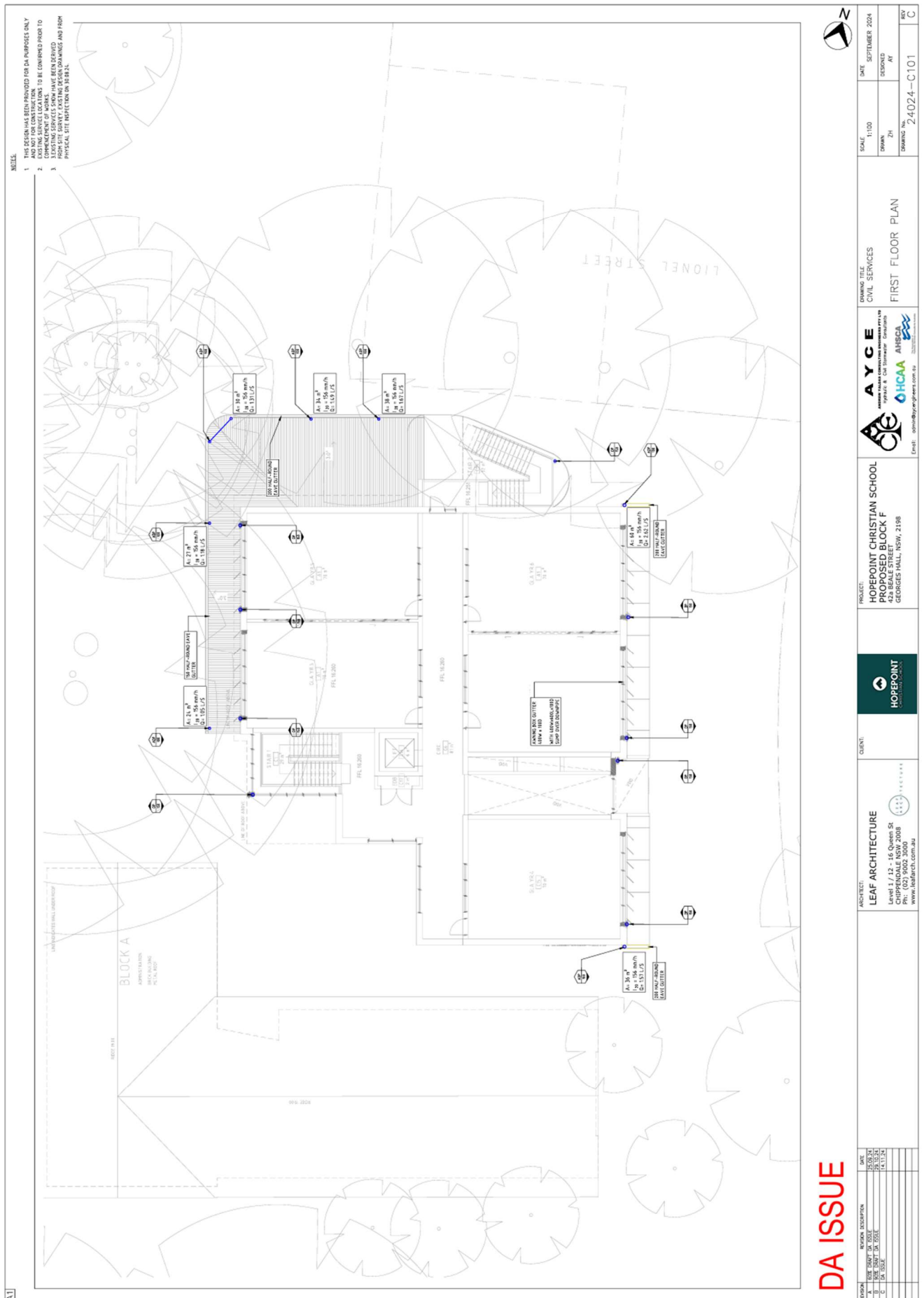
## APPENDIX B – Stormwater/Civil Design (AYCE)

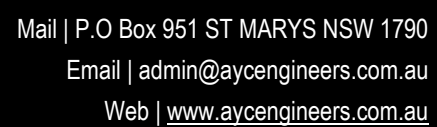


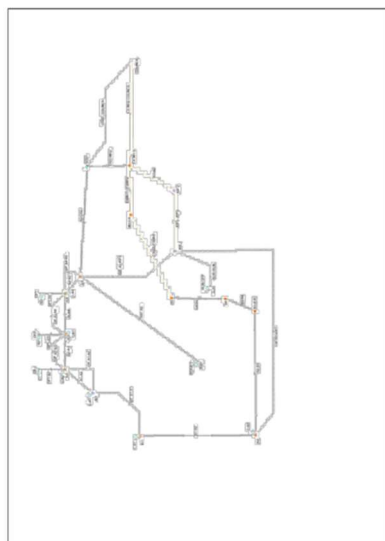
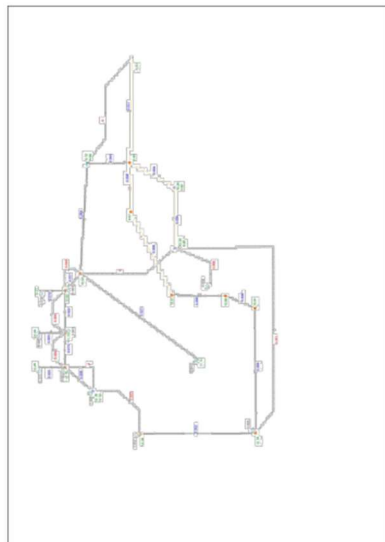




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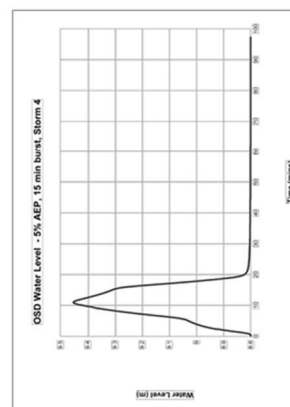
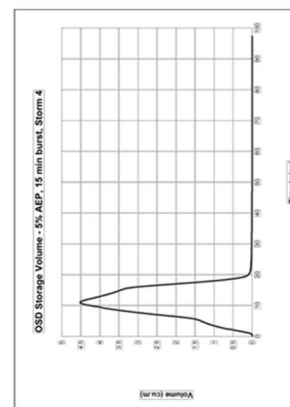
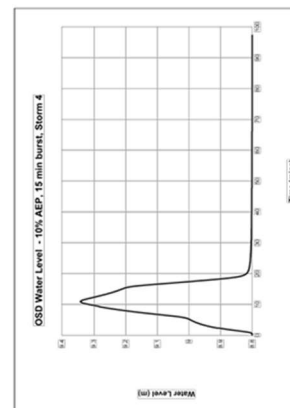
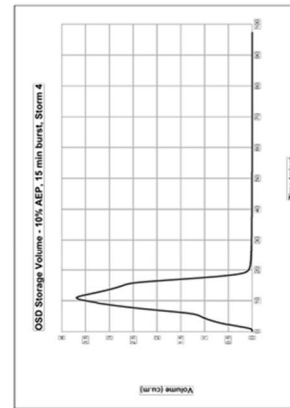
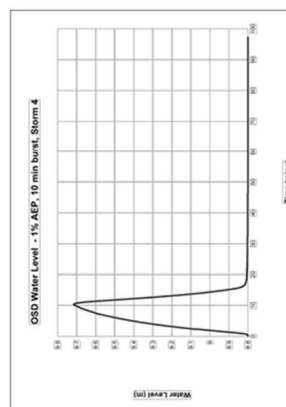
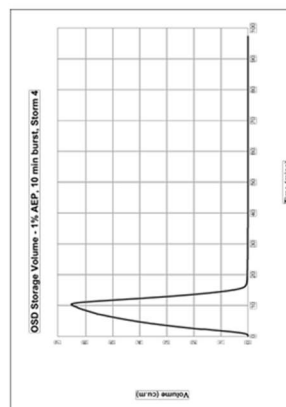
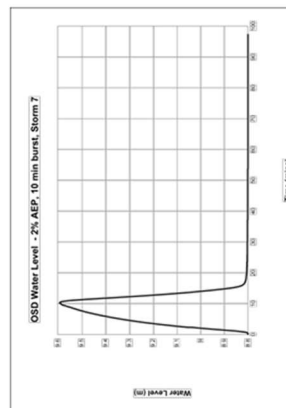
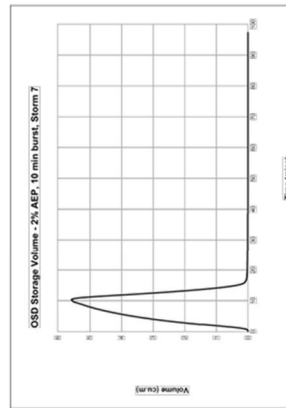






### 1% AEP DRAINS DIAGRAM RESULTS

### DRAINS DIAGRAM SETOUT



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|      |                      |     |          |                                                                                                                                             |                                                                                                                                                        |                                                                                                                       |                                                                                                                                                                                                                                                                                                            |                                                                |                                                                        |                        |
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| NOOK | REVISION DESCRIPTION |     | DATE     | ARCHITECT:<br><b>LEAF ARCHITECTURE</b><br><br>Level 1 / 12 - 16 Queen St<br>Melbourne VIC 3000<br>Ph: (03) 9002 3000<br>www.leafarch.com.au | CLIENT:<br><div><br/><b>HOPEPOINT</b><br/>CONSULTING GROUPS</div> | PROJECT:<br><b>HOPEPOINT CHRISTIAN SCHOOL</b><br><b>PROPOSED BLOCK F</b><br>423 BEALE STREET<br>GEORGETOWN, NSW, 2198 | <div><br/>ANTHONY YOUNG CONSULTING ENGINEERS PTY LTD<br/>17/18-19, Old Northern Crossroads<br/><br/>Email: omyoung@ayce.com.au</div> | DRAWING TITLE<br>CIVIL SERVICES<br>OSD MODEL<br>DRAINS RESULTS | SCALE<br>NIS<br>DRAWN<br>ZH<br>CHECKED<br>AT<br>REV<br>B<br>24024-C200 | DATE<br>SEPTEMBER 2024 |
|      | A                    | SEE | 28.09.24 |                                                                                                                                             |                                                                                                                                                        |                                                                                                                       |                                                                                                                                                                                                                                                                                                            |                                                                |                                                                        |                        |
|      | B                    | SEE | 14.11.24 |                                                                                                                                             |                                                                                                                                                        |                                                                                                                       |                                                                                                                                                                                                                                                                                                            |                                                                |                                                                        |                        |

