Water Sensitive Urban Design Strategy Report

4 Delmar Parade & 812 Pittwater Road,

Dee Why

Issue C

Prepared For Landmark Group Australia

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REVISION TABLE

Revision	Date	Issue Description	Issued by	Approved by	Signed
A	14.01.2022	Issue A – For DA	MS	SELH	
B	17.01.2022	Issue A – For DA	MS	SELH	
C	28.01.2022	Issue A – For DA	MS	SELH	

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1 Executive Summary

This document is a stormwater strategy report for the proposed development located at 4 Delmar Parade & 812 Pittwater Road, Dee Why.

The site is a combination of multiple existing lots in Strata Plan SP 32072 and 812 Pittwater Road.

Landmark Group Australia is proposing a mixed-use development to replace the existing commercial buildings on the site. The architectural concept plans prepared by Rothelowman show two levels of basement car parking, one commercial level and four residential levels.

The proposed development is illustrated in Figure 1 below.

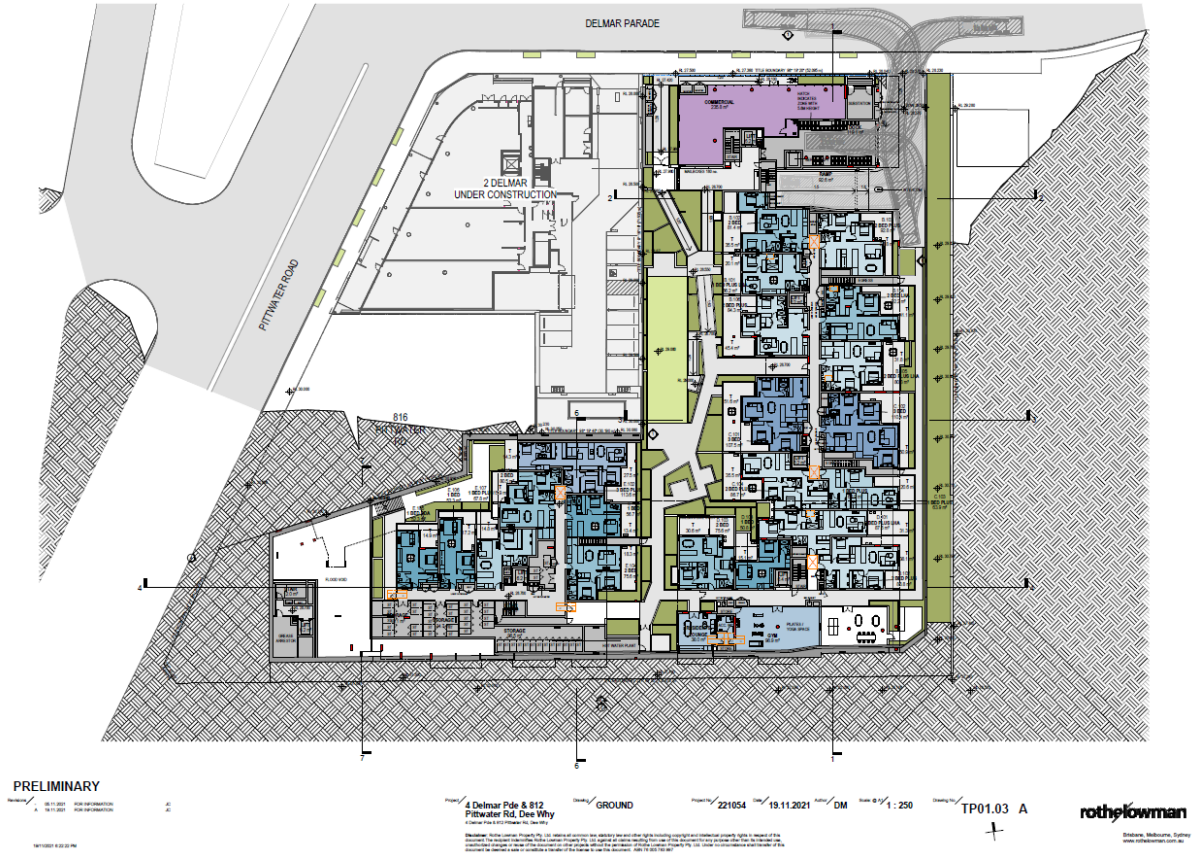

Figure 1 Ground Floor Plan

This report describes the water sensitive urban design strategy by adopting the stormwater quality and quantity measures proposed to address the local Council's requirements for stormwater drainage in support of the development.

In summary, the following is proposed:

- An OSD is provided to reduce the site peak discharge;

- Water quality treatment measures are provided to meet the pollutants reduction targets; and
- A diversion of the public stormwater infrastructure as per the flood study modelling and report prepared by SGC (refer 20210067-R01).

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2 Introduction

2.1 Brief

S&G Consultants Pty Ltd (SGC) have been engaged by Landmark Group Australia (the Client) to prepare a stormwater strategy in support of the Masterplan DA associated with the proposed mixed-use development at 4 Delmar Parade & 812 Pittwater Road, Dee Why.

Rothelowman Architects have prepared the architectural plans showing the proposed site layout.

The following tasks were carried out:-

- A site visit was undertaken to ascertain on-site conditions and familiarise with the catchment;
- Supplied documents and previous studies were reviewed;
- A stormwater drainage design has been prepared; and
- This report has been compiled.

2.2 Objectives

The purpose of this report is to outline the stormwater strategy for the proposed development and respond to the requirements of the guidelines by Northern Beaches Council.

The report addresses the following matters:-

- On-site stormwater management including:
- Authorities requirements;
- Internal drainage and discharge;
- On-Site Detention (OSD);
- Rainwater reuse (if required);
- Water quality Requirements;
- Diversion and upgrade of stormwater trunk main around the proposed development;
- Soil and water management; and
- Maintenance Strategy.

2.3 Limitations

This report is intended solely for Landmark Group as the Client of SGC and no liability will be accepted for use of the information contained in this report by other parties than this client.

This report is limited to visual site observations and to the information including the referenced documents made available at the time when this report was written.

2.4 Reference Documents

The following documents are referenced in this report:

1. Site survey prepared by Norton Survey Partners ref. 53046 dated 11/03/2021;
2. Architectural drawings prepared by Rothelowman ref. 221054; and
3. Northern Beaches “Water Management for Development Policy” (February, 2021).

3 Natural & Built Environment

3.1 Existing Site

The site is the corner block on Pittwater Road and Delmar Parade in the suburb of Dee Why. The site falls in the Local Government Area of Northern Beaches Council.

The site has an irregular shape and is characterised by a natural gradient from South to North towards Delmar Pde.

The site is bounded by a reserve to the South, Pittwater Rd to the West, Delmar Pde to the North and adjoining properties to the East. The site is currently fully developed with existing detached commercial buildings connected with an internal driveway.

Figure 2 shows the location of the site.

Figure 2 Locality Plan

3.2 Proposed Development

The proposed development involves the demolition of the existing concrete slabs and the re-development of the site into a Mixed Use Development as follows:-

- Two (2) levels of basement car parking;
- One (1) commercial area on Ground level;
- Eight (8) residential floor levels;

- An open concrete channel at the southern and eastern boundaries of the site; and
- Upgrade and diversion of council trunk main around the building structures.

Reference should be made to the architectural drawings by Rothelowman and Stormwater plan & flood report prepared by SGC for details.

4 On-Site Stormwater Management

4.1 General

The management of the stormwater on site covers several aspects of the design. It is divided into the following sections:

- Internal drainage design including provision of on-site detention and discharge into Council's infrastructure;
- Roof water collection and reuse;
- Water quality control; and
- Diversion and upgrade of council trunk main through the site.

These components have been designed to address the requirements of Northern Beaches Council.

4.2 Authorities

The Council requirements are included in the "Water Management for Development Policy" (2020) as follows:-

- On-Site Detention is required to reduce the site peak discharge to pre-developed conditions; and
- Stormwater quality shall be provided through the use of treatment measures.

4.3 Internal Drainage

4.3.1 Roof Drainage

The roof drainage system is a conventional rainwater outlets and downpipe system designed to cater for 5% AEP storm event on concrete flat roofs to be coordinated with the architectural layout in future detailed design stages.

Where box gutters are proposed, the roof drainage will be designed to cater for 1% AEP storm event.

4.3.2 Surface Drainage

The internal drainage system has been designed in accordance with Council's guidelines.

The internal drainage system has been designed to cater for 1% AEP storm event.

The runoff from the buildings and the open areas will be directed to the On-Site Detention (OSD) systems and the water quality treatment measures prior to discharging into the receiving street infrastructure.

The subsoil discharge and any runoff from the basement car park ramps will be collected in pump-out pits inside the basement level 2 prior to being pumped into the OSD tank.

4.4 On-Site Detention

On-Site Stormwater Detention is a Council requirement to reduce the runoff from the site and its impact on public infrastructure and main waterways. The proposed development requires OSD.

4.4.1 Sizing

The design of the OSD is carried out using DRAINS modelling software to reduce the peak flows from the site during 20%, 5% and 1% AEP events to state of nature (0% impervious).

Reference is made to the concept stormwater plans for details.

4.4.2 Layout

The location of the OSD tank is proposed under the Common Open Space on Ground Floor.

The discharge from the proposed OSD tanks will be to the proposed Council street system in Delmar Pde.

The following table details the OSD requirements for each sub-catchment.

Table 1 OSD Requirements

Storm Event AEP	Pre-Development Site Discharge (L/s)	Post-Development OSD Controlled Site Discharge (L/s)	OSD Volume Provided (m^3/s)
20%	196	142	
5%	300	182	323
1%	407	218	

4.5 Water Quality

4.5.1 Objectives

The quality of the discharge from the site is outlined in chapter 4 of the “Water Management Policy” (2020) and replicated in the following table.

Table 2 Pollutants Reduction Targets

Pollutant	Performance Requirements
Total Phosphorus	65% reduction in the post development mean annual load
Total Nitrogen	45% reduction in the post development mean annual load
Total Suspended Solids	85% reduction in the post development mean annual load

Gross Pollutants	90% reduction in the post development mean annual load1 (for pollutants greater than 5mm in diameter)
pH	6.5 - 8.5
Hydrology	The post-development peak discharge must not exceed the pre-development peak discharge for flows up to the 50% AEP

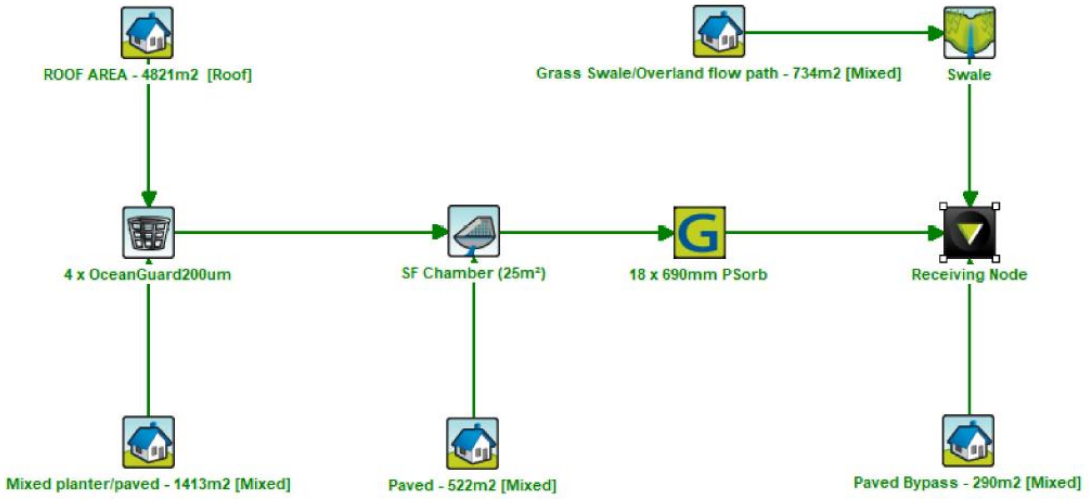
4.5.2 Approach

A treatment train approach is proposed to achieve the water quality targets. The approach is as follows:-

- Surface water runoff passes through the StormFilter Chamber installed with cartridge devices located inside the OSD tanks prior to discharging into the receiving system. The device will be fitted with an oil baffle to capture hydrocarbons.
- All inlet pipes prior entering the StormFilter Chamber to be treated through OceanGuard Baskets.

Table 3 MUSIC Model Results

Pollutant	Source	Residual Load	Reduction %
Total Phosphorus (kg/yr)	168	33.5	80.1
Total Nitrogen (kg/yr)	0.482	0.125	74.1
Total Suspended Solids (kg/yr)	5.47	2.47	54.9
Gross Pollutants (kg/yr)	58.8	2.58	95.6



5 Public Infrastructure

The trunk main that traverses the site is located within the proposed basement footprint and is as such to be diverted around the proposed building structures.

As part of the flood modelling and the necessity to mitigate the flooding impact of the development, the trunk main is proposed to be upgraded through the site to increase its capacity. The details are included in the stormwater design plans.

The rear of the site will include a new private drainage system made of pits and pipes to increase the inlet capacity of the inground drainage system. A concrete channel overland flow path (3m wide) is proposed on top of the upgraded inground drainage system to collect and convey overland flow. The concrete channel will continue down towards Delmar Parade along the eastern boundary of the site.

This proposal is subject to Council's approval and the detailed design in the future will be carried out in consultation with Northern Beaches Council.

6 Soil & Water Management

6.1 Construction Stage

A Soil and Water Management Plan (SWMP) has been prepared for the Masterplan DA submission. The implementation of the SWMP shall be in accordance with the guidelines of the NSW Department of Housing publication “Managing Urban Stormwater: Soils & Construction” (The Blue Book) and Sections 6.3 & 6.4 of Part A of the DCP.

The SWMP outlines the erosion and sediment control processes for the duration of the project. Emphasis should be placed firstly on minimising erosion then on preventing movement of sediment.

The clearing of the site leaves the land surface susceptible to increased erosion. The eroded particles can be transported off site and into natural waterways causing siltation, loss of hydraulic capacity and environmental stress. The SWMP aims to minimise the extent of erosion of the site, restrict movement of soil particles and mitigate the impacts of the works on the natural environment.

The SWMP provides for the:-

- Protection of disturbed ground through devices such as temporary vegetation, diversion banks and sediment fences;
- Early installation and progressive implementation of erosion controls;
- Early construction of permanent drainage structures, culverts, sediment basins traps and catch drains;
- Progressive revegetation of disturbed areas;
- Use of geotextile to stabilise disturbed surfaces during construction of culverts;
- Control of runoff from embankments through shaping of fill and construction of temporary windrows and batter drains;
- Implementation of erosion control measures at associated sites, including access tracks, roads, office/compound site and extraction sites;
- Progressive and continual implementation of temporary sediment controls;
- Diversion of runoff from disturbed areas to sediment control structures;
- Management of turbid water in basins after rain through flocculation or extraction and use for construction or dust suppression;
- Construction of temporary sediment traps at strategic locations;
- Routine maintenance of sediment control devices to ensure that they remain fully functional at all times;
- Removal of sediment from basins and other structures and placement in secure locations where further movement will not occur;

- Minimisation of transportation of mud and soil by vehicles onto Delmar Parade, through the use of shakers and wash-bays;
- Provision for regular inspections of the control measures by a trained personnel to review and update control measures. Inspections should be conducted weekly and immediately after every significant storm event;
- Dust control through progressive revegetation and application of water;
- A procedure to ensure that water is not released from basins until achieving the appropriate quality standard; and
- Meeting EPA requirements & the guidelines of the Department of Housing publication “Managing Urban Stormwater: Soils & Construction” (Blue Book).

7 Maintenance Strategy

The maintenance strategy relating to the internal drainage system involves inspecting and maintaining the following structures:-

- On-Site Detention including the orifice plates and the mesh screens; and
- The filter cartridges.
- OceanGuard baskets.

The corporate body managing the development or their contractors have the obligation to inspect and maintain these structures.

The following table indicates the minimum requirements for the inspection of the above structures and the maintenance procedures to be adopted.

Table 3 Maintenance Strategy Requirements

Item	Inspection Frequency	Inspection Check Items	Maintenance Procedures
OSD Tanks	Once every 6 months	Clogging and blockage of mesh screen. Sediment depth in trap.	Leaves and debris to be removed from screen. Trap solids to be cleaned out
Filter Cartridges	Once every 3 months or (1)	Silt deposit at base of chamber.	Clean out device as per manufacturer's specifications.
OceanGuard basket	Once every 3 months or (1)	Silt deposit at base of basket.	Clean out device as per manufacturer's specifications.

Notes:-

(1) Subject to manufacturer's requirements.

A1 Appendix 1

Survey Plans

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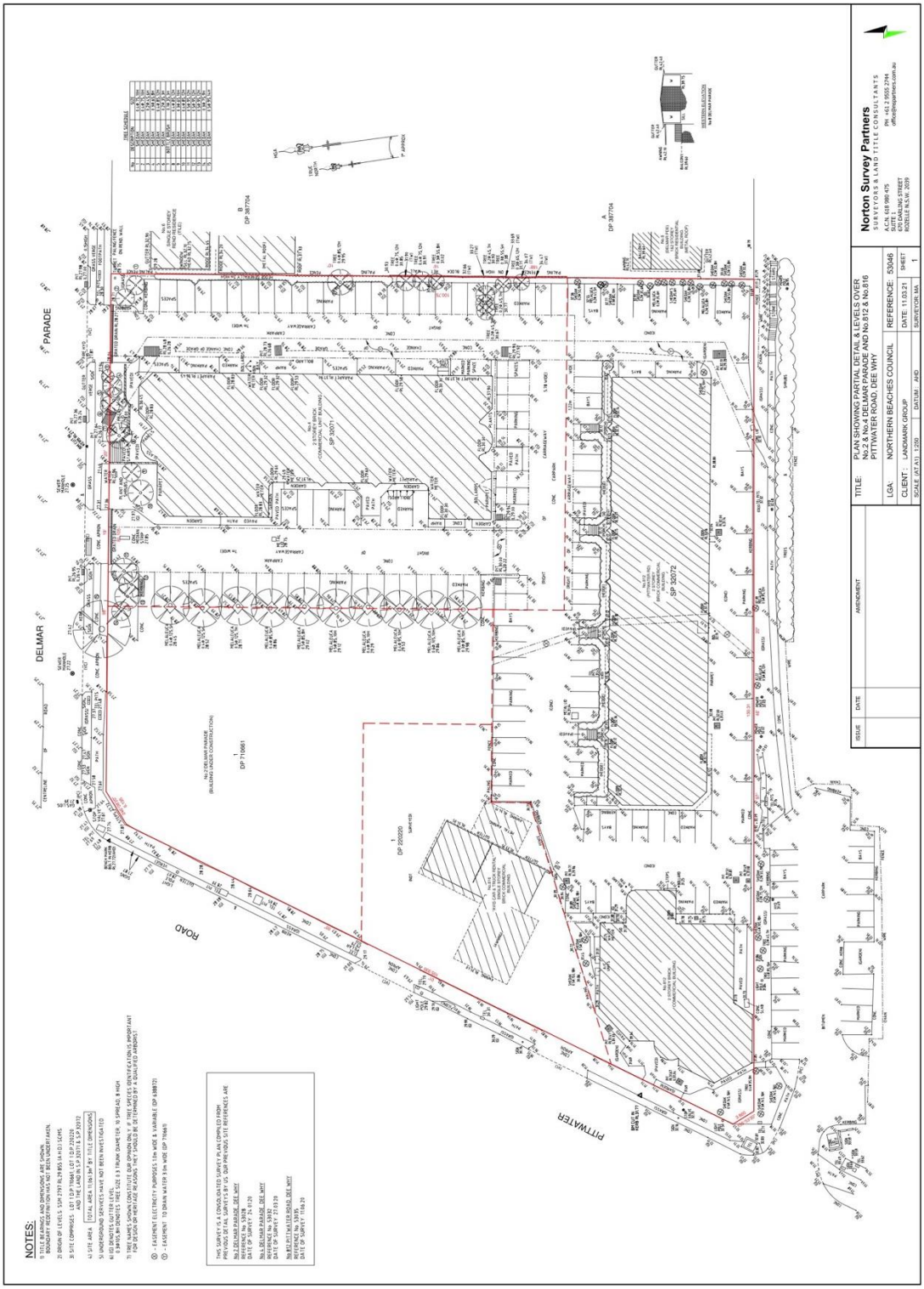

Figure A 1.1 Survey

A2 Appendix 2

Stormwater Concept Design

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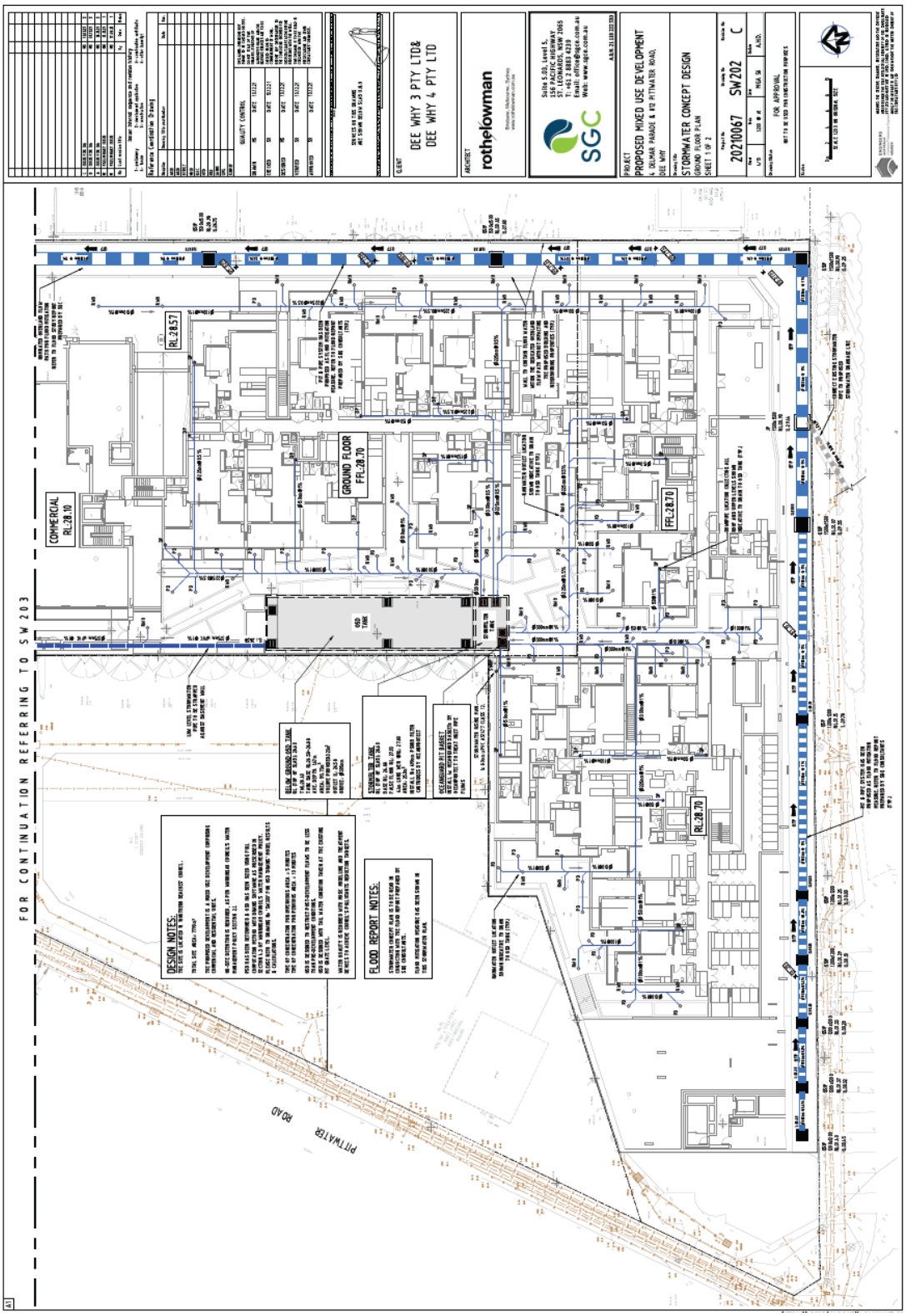

Figure A 2.1 Ground Floor Stormwater Concept Plan Part 1 by SGC

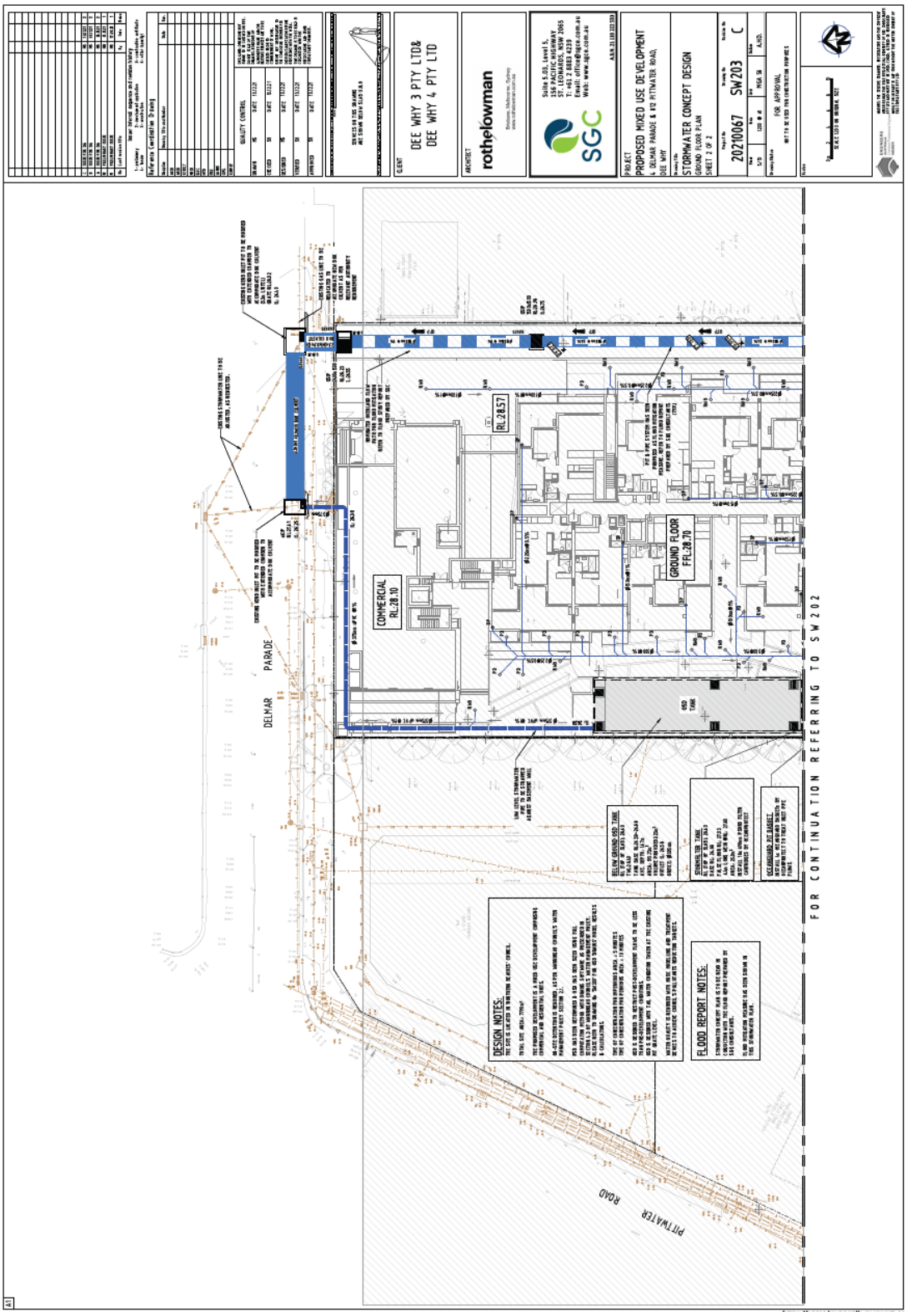

Figure A 2.2 Ground Floor Stormwater Concept Plan Part 2 by SGC

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