



Integrated Water Management Report

221-291 Crown Street, 216-238 Keira Street
and 86-90 Burelli Street, Wollongong

Issue B

Prepared For Wollongong Developments No.8
Pty Ltd.

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1 Introduction

1.1 Brief

This Stormwater Management Statement prepared by S&G Consultants Pty Ltd on behalf of Wollongong Developments No.8 Pty Ltd ('the Applicant') supports a State Significant Development Application (SSDA) for an Infill Affordable Housing Development, SSD-76440958, for the site at 221-291 Crown Street, 216-238 Keira Street and 86-90 Burelli Street, Wollongong (the site).

Specifically, consent is sought for the following development in this SSDA:

- Demolition of existing structures on the site, retention of heritage facades, tree removal and site excavation for new basement.
- Construction of a new mixed-use development consisting of:
 - Four residential towers, ranging from 16 to 38 storeys and comprising 546 apartments including:
 - Approx. 414 market apartments.
 - Approx. 132 affordable apartments.
 - Residential lobbies and podium.
 - Communal open space.
 - A 10-storey commercial office building, an 8-story hotel comprising of 166 rooms, and numerous retail tenancies (including supermarket) costing of:
 - 10,009 sqm of commercial GRA.
 - 8,793sqm of hotel GFA.
 - 3,781 sqm of retail GFA.
 - 1,510 sqm of retail supermarket GFA.
 - Lower ground, ground and first floor retail spaces totalling 5,291 sqm of GFA (including 1,510 sqm supermarket).
- Car, motorcycle and bicycle parking for residents, workers and visitors across two basement levels, mezzanine, lower ground and levels 1 and 2 including:
 - 774 car parking spaces, including;
 - 547 residential spaces (including accessible spaces).
 - 49 residential visitor spaces.
 - 63 commercial/retail/residential visitor spaces.
 - 25 commercial/retail (staff) spaces.

- 10 hotel (staff only) spaces.
- 80 retail (supermarket) spaces.
- Five (5) loading bays.
- 320 bicycle parking spaces.
- 47 motorcycle parking spaces.
- New public open space including a new public plaza.
- Associated landscaping and public domain works.

The following tasks were carried out:

- Supplied documents and previous studies were reviewed;
- A concept stormwater drainage design has been prepared including supporting calculations; and
- This report has been compiled.

1.2 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 the relevant authorities.

The report addresses the following matters:-

- On-site stormwater management including:
- Authorities' requirements.
- Internal drainage and discharge;
- On-site detention/retention.
- Water quality;
- Overland Flowpath Management;
- Soil and water management; and
- Maintenance Strategy.

1.3 Limitations

This report is intended solely for Wollongong Developments No.8 Pty Ltd 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 observations and to the information including the referenced documents made available at the time when this report was written.

1.4 Reference Documents

The following documents have been referenced in this report:-

1. Site survey prepared by LTS, ref. 50783001DT dated 11/09/2019;
2. Architectural plans prepared by DKO Architects;
3. Wollongong Local Environmental Plan 2009.
4. Wollongong Development Control Plan 2009 – E15 Water Sensitive Urban Design
5. Stormwater plans and reports prepared by Stantec for the subject site, ref.301348203, revision D dated 27/11/20.

2 Site Description

2.1 Existing Site

The site is situated at 221-291 Crown Street, 216-238 Keira Street and 86-90 Burelli Street, Wollongong, within the Wollongong Local Government Area (LGA).

The site forms part of the Wollongong City Centre Precinct, as identified in the Wollongong Local Environmental Plan 2009 (WLEP). It is well located, being approximately 280m from Wollongong Train Station which provides services within Wollongong and to the Sydney CBD. It is adjacent to Wollongong Central shopping centre, a major regional retail hub. The site has ample access to public open space being less than 50m from MacCabe Park.

The site comprises a significant landholding of approximately 13,088m² with frontages to Crown Street, Keira Street, Burelli Street and Atchison Street. The site is owned by Wollongong Development No.8 Pty Ltd.

shows the location of the site.



Figure 2.1 Site Aerial

Source: Nearmap edits of Ethos Urban

The site area and legal description is recorded in Table 2.1 Site Description.

Table 2.1 Site Description

Legal Description	Address
Lot 1 in DP 112417	216-222 Keira Street
Lot 100 in DP 774957	226-230 Keira Street
Lot 9 in DP 551157	232-234 Keira Street
Lot 8 in DP 546125	236-238 Keira Street
Lot 1 in DP 88455	86 Burelli Street
Lot 4 in DP 17979	
Lot 5 in DP 17979	



Legal Description	Address
Lot B in DP 395330	90 Burelli Street
Lot 1 in DP 220513	221-229 Crown Street
Lot 3 in DP 17979	231 Crown Street
Lot 2 in DP 17979	233-235 Crown Street
Lot 1 in DP 17979	
Lot 7 in DP 878243	237-241 Crown Street
Lot 1 in DP 1135333	243-251 Crown Street
Lot 1 in DP 226374	253-259 Crown Street
Lot 1 in DP 183348	
Lot 2 in DP 226374	
Lot 3 in DP 319452	261 Crown Street
Lot 2 in DP 319452	269-271 Crown Street
Lot 1 in DP 319452	
Lot 2 in DP 181570	273-279 Crown Street
Lot 1 in DP 1116034	
Lot 1 in DP 82673	281-291 Crown Street
Lot 1 in DP 117019	
Lot 1 in DP 927806	281-291 Burelli Street
Lot 1 in DP 1198873	
Lot 1 in DP 1087986	

2.2 Proposed Development

The proposed development involves the following:

- Demolition of existing structures on the site, retention of heritage facades, tree removal and site excavation for new basement.
- Construction of a new mixed-use development consisting of:
 - Four residential towers, ranging from 16 to 38 storeys and comprising 547 apartments including:
 - Approx. 415 market apartments.
 - Approx. 132 affordable apartments.
 - Residential lobbies and podium.
 - Communal open space.
 - 10-storey commercial office building, comprising 7,296 sqm of GFA.
 - 8-storey, 158 room hotel, including restaurant and conference floorspace comprising 8,931 sqm of GFA.
 - Lower ground, ground and first floor retail spaces totalling 5,324 sqm of GFA.
- Car, motorcycle and bicycle parking for residents, workers and visitors across two basement levels, mezzanine, lower ground and levels 1 and 2 including 775 car parking spaces.
- New public open space including a new public plaza.
- Associated landscaping and public domain works.

Reference should be made to the architectural drawings by DKO Architects.

3 Background

An existing consent approved on 12 December 2022 (DA-2021/957) applies to the site. The consent was granted for the demolition of existing structures, retention of heritage facades, tree removal, excavation for basement car parking and construction of a mixed-use development at the street block bound by Crown, Keira, Burelli and Atchison Streets, comprising three (3) residential towers (shop top housing), one (1) commercial building, retail shops, entertainment facilities (cinema, exhibition/performance space) and a wellness centre (pool, gym, and health services).

3.1 Secretary's Environmental Assessment Requirements

This report has been prepared to respond to the Secretary's Environmental Assessment Requirements (SEARS) dated 8 October 2024 for SSD-76440958. Specifically, this report has been prepared to respond to those SEARS summarised in the table below.

Requirement	Response
1. Ground and Water Conditions - Assess potential impacts on soil resources and related infrastructure and riparian lands on and near the site, including soil erosion, salinity and acid sulfate soils. - Provide a Surface and Groundwater Impact Assessment that assesses potential impacts on: - surface water resources (quality and quantity) including related infrastructure, hydrology, dependent ecosystems, drainage lines, downstream assets and watercourses. - groundwater resources in accordance with the relevant <i>Groundwater Guidelines</i>.	"Managing Urban Stormwater - Soils and Construction" which is regarded as the standard to which erosion and sedimentation control should be designed to within NSW. Wollongong City Council specifies compliance with the design guide in their Stormwater and Floodplain Management Technical Manual. - The control of erosion and sedimentation describes the measures incorporated during and following construction of a new development to prevent the pollution and degradation of the downstream watercourse. - An Erosion and Sediment Control Plan has prepared as part of the development application documentation and is included in Appendix A of this report. Refer to Section refer to the erosion and sediment control plan SW 201 and Geotechnical / environmental report reference no. 89584.01

Requirement	Response
2. Water Management • Provide an Integrated Water Management Plan for the development that: ○ is prepared in consultation with the local council and any other relevant drainage or water authority. ○ outlines the water-related servicing infrastructure required by the development (informed by the anticipated annual and ultimate increase in servicing demand) and evaluates opportunities to reduce water demand (such as recycled water provision). ○ details the proposed drainage design (stormwater and wastewater) for the site including any on-site treatment, reuse and detention facilities, water quality management measures and nominated discharge points. ○ demonstrates compliance with the local council or other drainage or water authority requirements and avoids adverse downstream impacts. • Where drainage infrastructure works are required that would be handed over to the local council, or other drainage or water authority, provide full hydraulic details and detailed plans and specification of proposed works that have been prepared in consultation with, and comply with the relevant standards of, the local council or other drainage or water authority	• The integrated Water Management Plan (IWMP) has been developed for the proposed development in consultation with the Wollongong City Council DCP, Water Sensitive Urban, Wollongong Local Environmental Plan • Engagement with the stakeholders has occurred throughout the planning process to ensure that the proposed water servicing, stormwater management, and drainage infrastructure align with their policies, standards, and long-term infrastructure strategies. • Drains model has been incorporated to check the pre to post development flow from the subject site, The Wollongong Development Control Plan and Council's Civil Works Specification states the minimum requirements for the design of stormwater detention infrastructure. These documents require developments and redevelopments to not increase stormwater peak flows in in all storms up to and including the 100-year ARI event. • The existing site has stormwater infrastructure along Burelli Street and Keira Street which are all in the lowest regions of the site. All stormwater is ultimately conveyed to this network, although the exact nature of the individual catchments on each pit remains unclear with existing survey data. Ultimately, all stormwater is discharged to the stormwater network at the corner of Keira and Burelli Street, which is the lowest point on site. This discharge point will be retained as part of the development • the Stormwater Quality Improvement Devices (SQID's) to be implemented and the Pollutant Export Modelling undertaken to demonstrate the effectiveness of the treatment system in achieving the reduction targets set by council. Additionally, Wollongong City Council states that nutrient levels of nitrogen and phosphorus must be retained to wetlands, and as a result, water quality modelling has also been designed to maintain these levels. As discussed in section 5.1.3 The Wollongong DCP- Refer to the Appendix 3 in the report for Stormwater Design.

Requirement	Response
3. Flood Risk - Identify the flood planning level as set out in the relevant council LEP or SEPP and identify any: - flood risks on site having regard to adopted flood studies - the potential effects of climate change, and - any relevant provisions of the <i>NSW Flood Risk Management Manual</i>. - Where the development is occurring on flood prone land a flood impact and risk assessment (FIRA) must be prepared having regard to the <i>Flood Impact and Risk Assessment Guideline - LU01</i> (FIRA guide). When determining the scope and category of the FIRA the requirements outlined in the FIRA guide must be considered. - Detail any flood risk management measures that are to be incorporated as part of the development having regard to relevant guidelines (including any design solutions, flood modification measures, property modification measures, operational procedures or Flood Emergency Response Plan). Detail any flood risk management measures that are to be incorporated as part of the development having regard to relevant guidelines (including any design solutions, flood modification measures, property modification measures, operational procedures or Flood Emergency Response Plan).	- The minimum entry level at the southeastern corner of the subject site will be set to RL: 13.55, which is 500mm above the 1% AEP flood level. - The proposed mixed-use development must be free from flooding up to and including the 1% AEP flood and must meet the Flood Planning Level Requirements detailed above. - All building components below the Flood Planning Level must be flood compatible material as per table in Council's Interim Floodplain Management Policy. - The proposed mixed-use development should not increase the likelihood of flooding on other developments, properties or infrastructure - Provide a safe refuge on or off site in the event of extreme flood event Refer to Flood Desktop review prepared by SGC.

4 On-Site Water 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 retention, and discharge into Council's infrastructure; and
- Water quality control.

These components have been designed to address the requirements of Wollongong City Council.

4.2 Authorities Requirements

The council requirements for water management are provided in the Wollongong City Council's Development Engineering Design Guidelines. The stormwater detailed requirements are as follows:-

- Council's development control plan and council's civil works specifications states the minimum requirements for the design of stormwater detection infrastructure design;
- Requirement for the developments and redevelopments to not increase the storm peak flows in all storms up to and including the 100-year ARI events;
- Stormwater quality shall be maintained through the use of treatment measures and rainwater tank;

4.3 Internal Drainage

4.3.1 Roof Drainage

The roof drainage system is a conventional rainwater outlet system designed to cater for 20-year ARI storm event. The system is a series of outlets and downpipes to be coordinated with the architectural layout in future detailed design stages. As a concept design, only indicative outlet locations have been documented and to be confirmed during CC stage.

4.3.2 Surface Drainage

The internal drainage system will be generally designed in accordance with Council's guidelines.

The internal drainage system would generally be designed to cater for 100-year ARI storm.

The runoff from the buildings and the open areas will be directed to the On-Site retentions/storm-filter tanks (OSR/SF) systems and the water quality treatment measures prior to discharging into the receiving pits.



The subsoil discharge and any runoff from the basement car park ramps will be collected in pump-out pits inside the basement. prior to being pumped into the water quality systems. The design of pump out systems will be in accordance with council's guidelines.

4.4 On-Site Detention

On-Site Stormwater Detention is not required as per Wollongong Council DCP (WDCP- Chapter E14) - sites that do not increase the impervious area by more than 100m² do not require OSD, per Section 10.1.2.

- Developments and redevelopments to not increase the storm peak flows in all storms up to and including the 100-year ARI events are not required to provide an On-Site Detention.
- Approved Stormwater plans and reports prepared by Stantec for the subject site, ref.301348203, revision D dated 27/11/20

4.5 Water Quality

4.5.1 Objectives

The quality of the discharge from the site is controlled by Wollongong City Council's Water Sensitive Urban Design Policy specifies the following stormwater quality requirements for all mixed use and commercial development types, these requirements are extracted and included below for reference.

Table 2: WSUD Stormwater Quality Performance Targets

Performance target reduction loads	Development Type	
		Multi-dwelling housing development
		Residential Flat Buildings
		Mixed Use Developments
		Minor Residential subdivisions (up to 20 lots)
		Commercial Office Development
		Industrial Development
Gross Pollutants		90%
Total Suspended Solids		80%
Total Phosphorus		55%
Total Nitrogen		40%

* Reduction in loads are relative to the pollution generated from the development without treatment

Figure 4.1 Council's Water Quality Requirements

The following items have been provided to accommodate the water quality requirements:

- A 10,000L rainwater tank 01 for building 01 roof catchment;
- A 7,500L rainwater tank 02 for building 2.3 roof catchment;
- A 7,500L rainwater tank 03 for hotel building roof catchment;
- Storm-filter 01 (includes 10x690mm Psorb Storm-filter cartridges) - catchment area 1;
- Storm-filter 02 (includes 14x690mm Psorb Storm-filter cartridges) - catchment area 2;
- Storm-filter 03 (includes 10x690mm Psorb Storm-filter cartridges) - catchment area 3;

Table 4.1 Pollutants Reduction Targets

Pollutant	Source Load	Residual Load	% Reduction
Gross Pollutants	114	0	100
Total Suspended Solids (TSS)	838	158	81.1
Total Phosphorus (TP)	1.77	0.447	74.7
Total Nitrogen (TN)	13	6.63	49

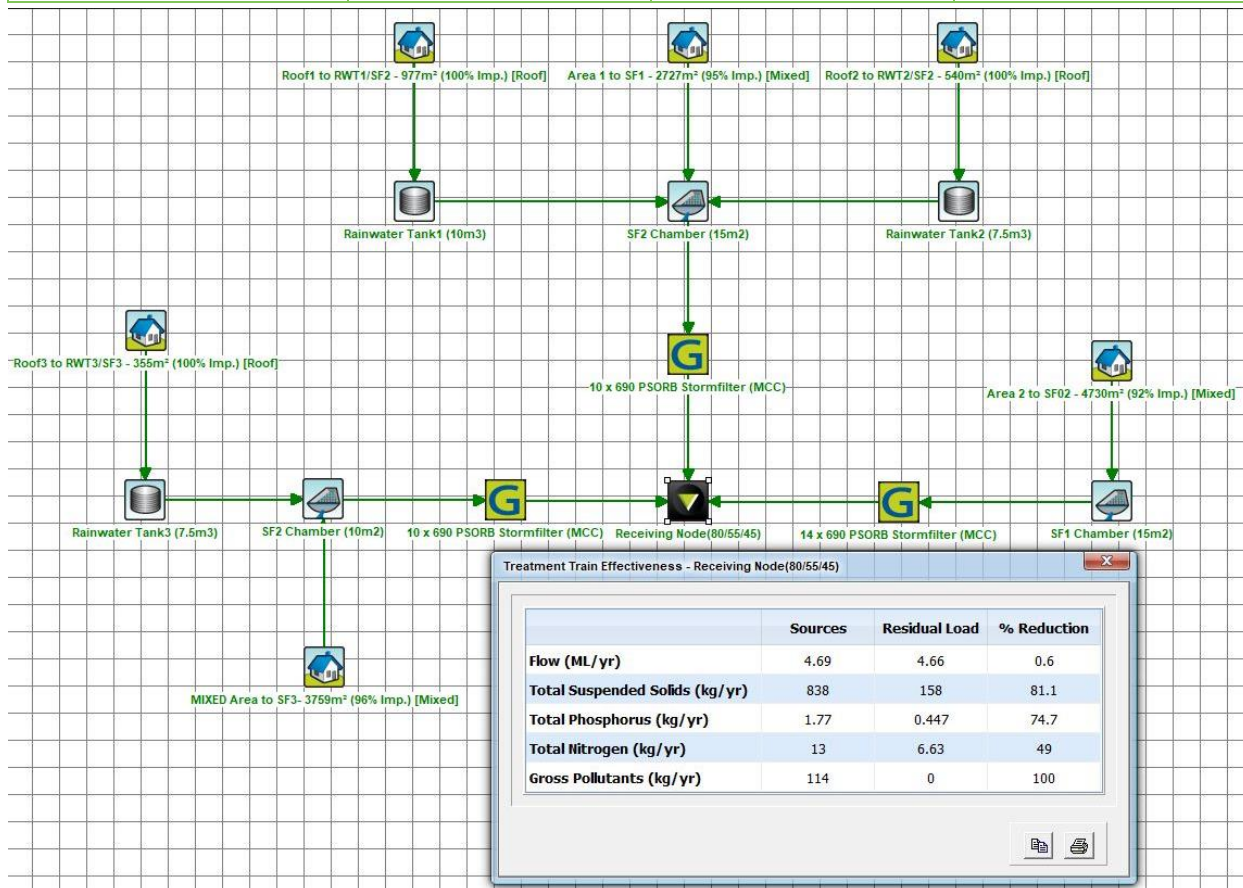


Figure 4.2 Music Model Results

4.5.2 Approach

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

- Roof areas water runoff to be collected and drained to Rainwater tanks and to be overflow to storm filter chamber tanks.

- The rest of the roof areas and surface runoff to be collected and drained to storm filter chamber tanks.
- Water stored in storm-filter chamber overtops storm-filter weir and gets into overflow pit inside the storm-filter chambers prior to discharging with the nominated flow rate.
- The flow from the subject site to be distributed as following:
 - a- Catchment area 1 to Storm-filter 01 – discharge to existing KIP E/1 Burelli St.
 - b- Catchment area 2 to Storm-filter 02 – discharge to existing KIP E/5 Keira St.
 - c- Catchment area 3 to Storm-filter 03 – discharge to existing KIP E/4 Burelli St.

4.5.3 Rainwater Tank

A total of 25m³ rainwater tanks have been proposed as per council's requirement. The rainwater tanks are to collect runoff from 1872m² of non-trafficable roof areas. Water stored in rainwater tanks are to re-use for landscape irrigation only.

The modelling has considered an annual demand of 330kL for irrigation and a rainwater tank of min 25m³ storage as described in Section 5.

The details for the inlet and outlet connection to be carried out at CC stage with proper coordination between different disciplines.

4.6 Overland Flow path Management

The storm-filter tanks have been designed with a cut-in-wall overflow weir located at the eastern side of each tank. This ensures the overland flow path from storm-filter tanks in case the whole pipe system is blocked. This overland flow is directed towards the boundary streets (Burelli St, and Keira St.)

5 Soil & Water Management

5.1 Construction Stage

A Soil and Water Management Plan (SWMP) has been prepared for the 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 Crown Street, Atchison Street, Burelli Street and Keira Street, through the use of shakers and wash-bays;
- Provision for regular inspections of the control measures by a trained personnel member 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).

6 Maintenance Strategy

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

- Storm filter Chambers;
- Psorb Storm Filter Cartridges; and
- Rainwater tanks.

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 6.1 SF & Psorb Cartridges & Rainwater tank Maintenance Strategy Requirements

Item	Inspection Frequency	Inspection Check Items	Maintenance Procedures
Storm-filter Chamber	6m	Clogging and blockage of mesh screen. Sediment depth in trap.	Leaves and debris to be removed from screen. Trap flood to be cleaned out
Psorb cartridges	6m	Maintenance Contractor	Follow recommended procedure set out in Ocean protect "Operation and Maintenance Guidelines"
Rainwater Tank	6m-1yr	Clogging and blockage of tank	First flush device and tank to be cleared of any debris.

Table 6.2 Storm filter Maintenance Strategy Requirements

Item	Inspection Frequency	Inspection Check Items	Maintenance Procedures
Inspection – Minor Maintenance	2 years and after major storms	Maintenance Contractor	Follow recommended procedure set out in Ocean protect "Operation and Maintenance Guidelines"
Inspection – Major Maintenance	1 yr (except in case of spill)	Maintenance Contractor	Follow recommended procedure set out in Ocean protect "Operation and Maintenance Guidelines"

Inspection Frequency Key: -

- 1yr one year
6m six monthly
3m three monthly

7 Conclusion

To summarise, the proposed Stormwater Management Scheme complies with all relevant Council's requirements.

Summary of key recommendations are:

- Rainwater tanks and overflows from the tank to be constructed at correct levels;
- Stormfilter chamber including cartridges to be installed correctly; and
- Ensure timely and periodic maintenance of all stormwater elements.

A2 Appendix 2

Architectural Plans

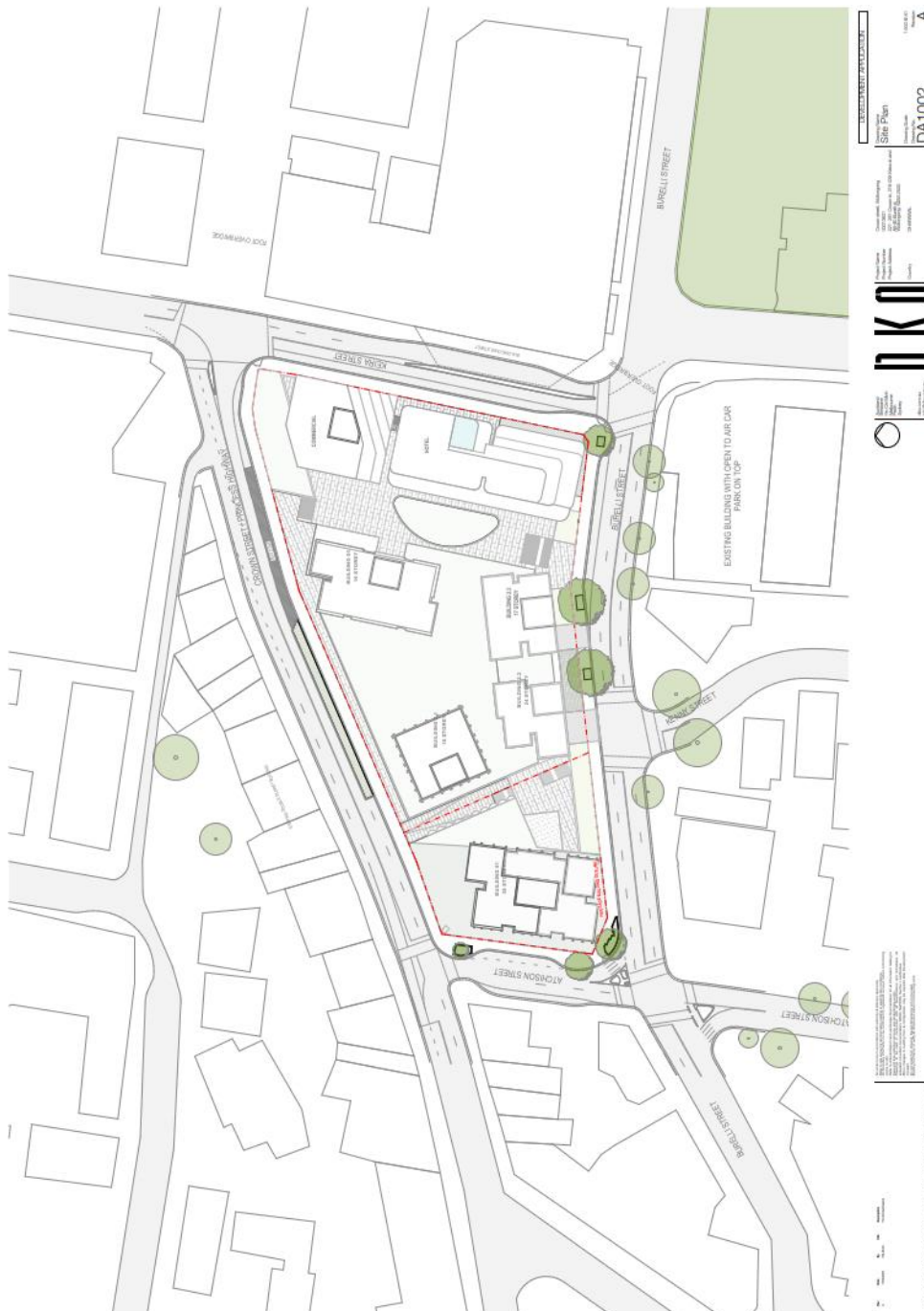


Figure A 2.1 Site Plan

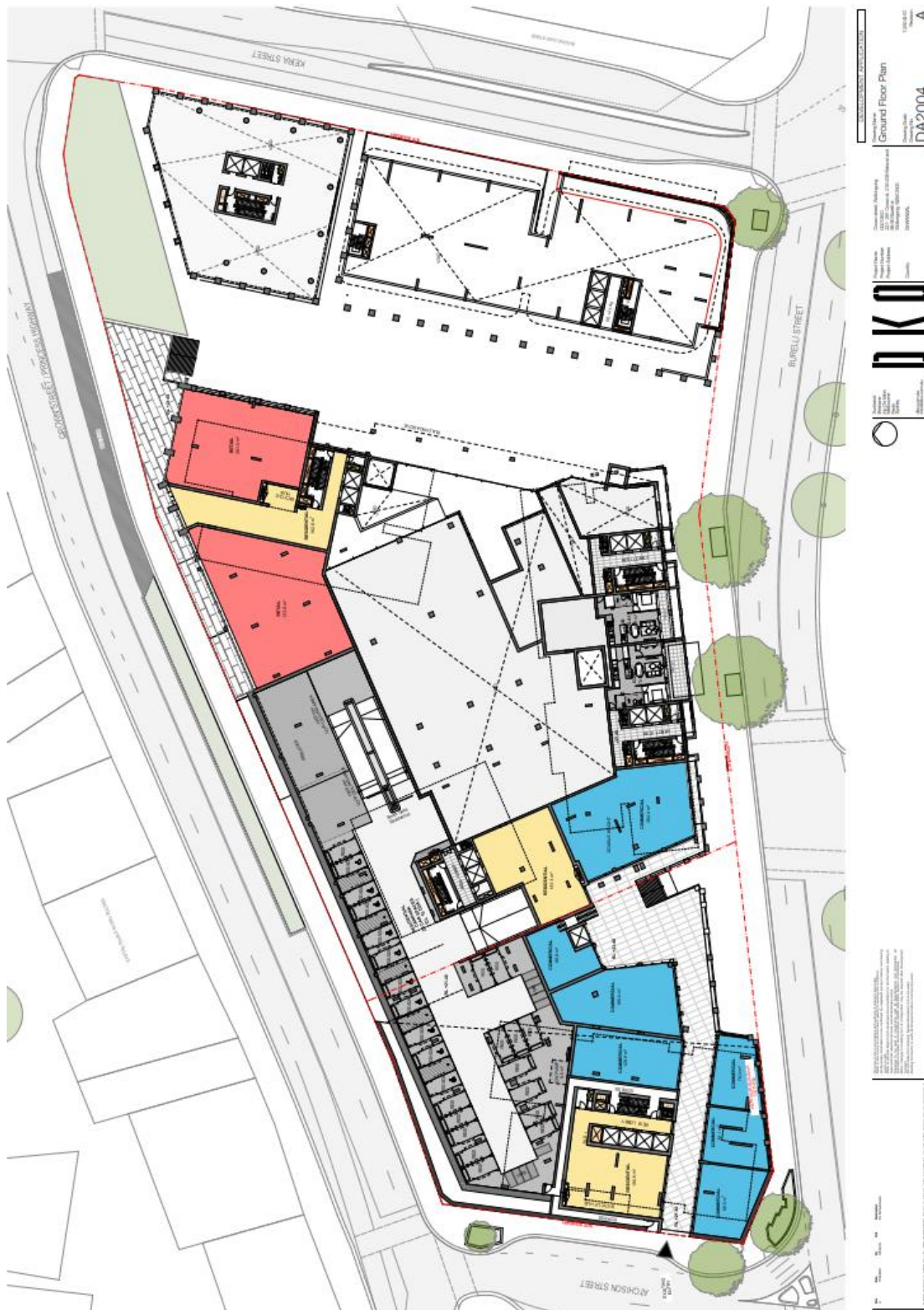


Figure A 2.2 Ground Floor Plan

A3 Appendix 3

Stormwater Design Drawings



Figure A 3.1 Basement 02 Stormwater Plan

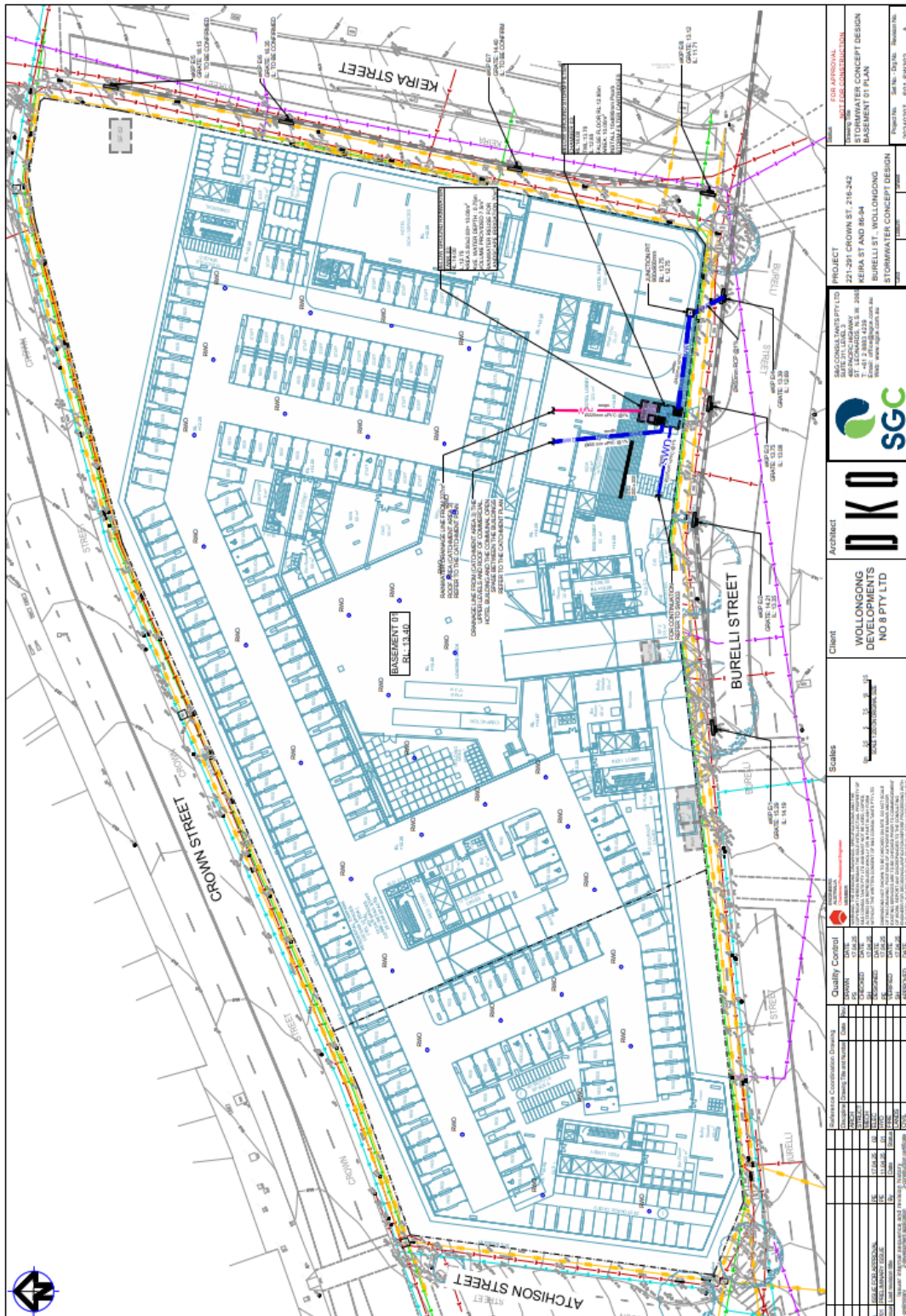


Figure A 3.2 Basement 01 Stormwater Plan

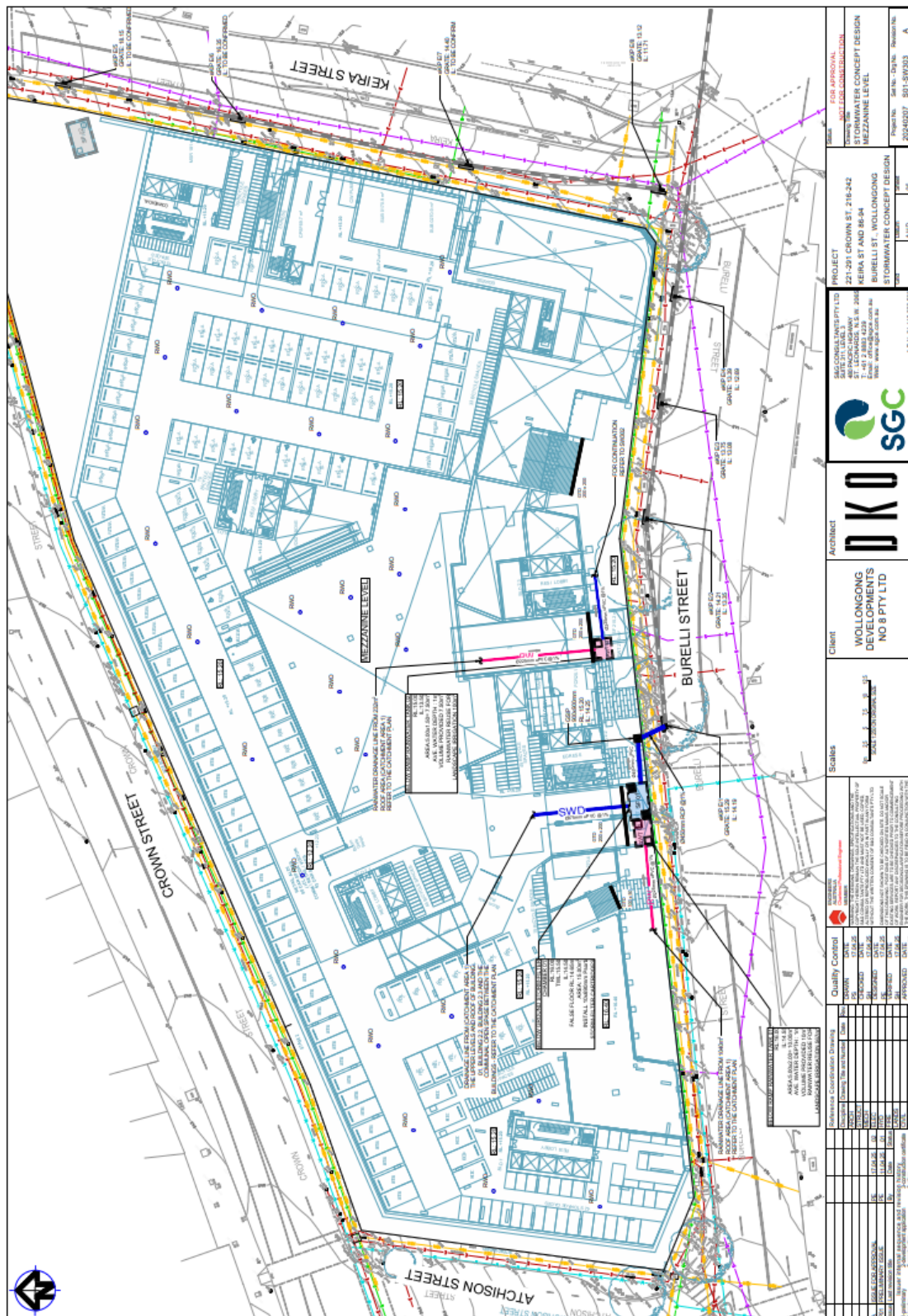


Figure A 3.3 Mezzanine Level Stormwater Plan

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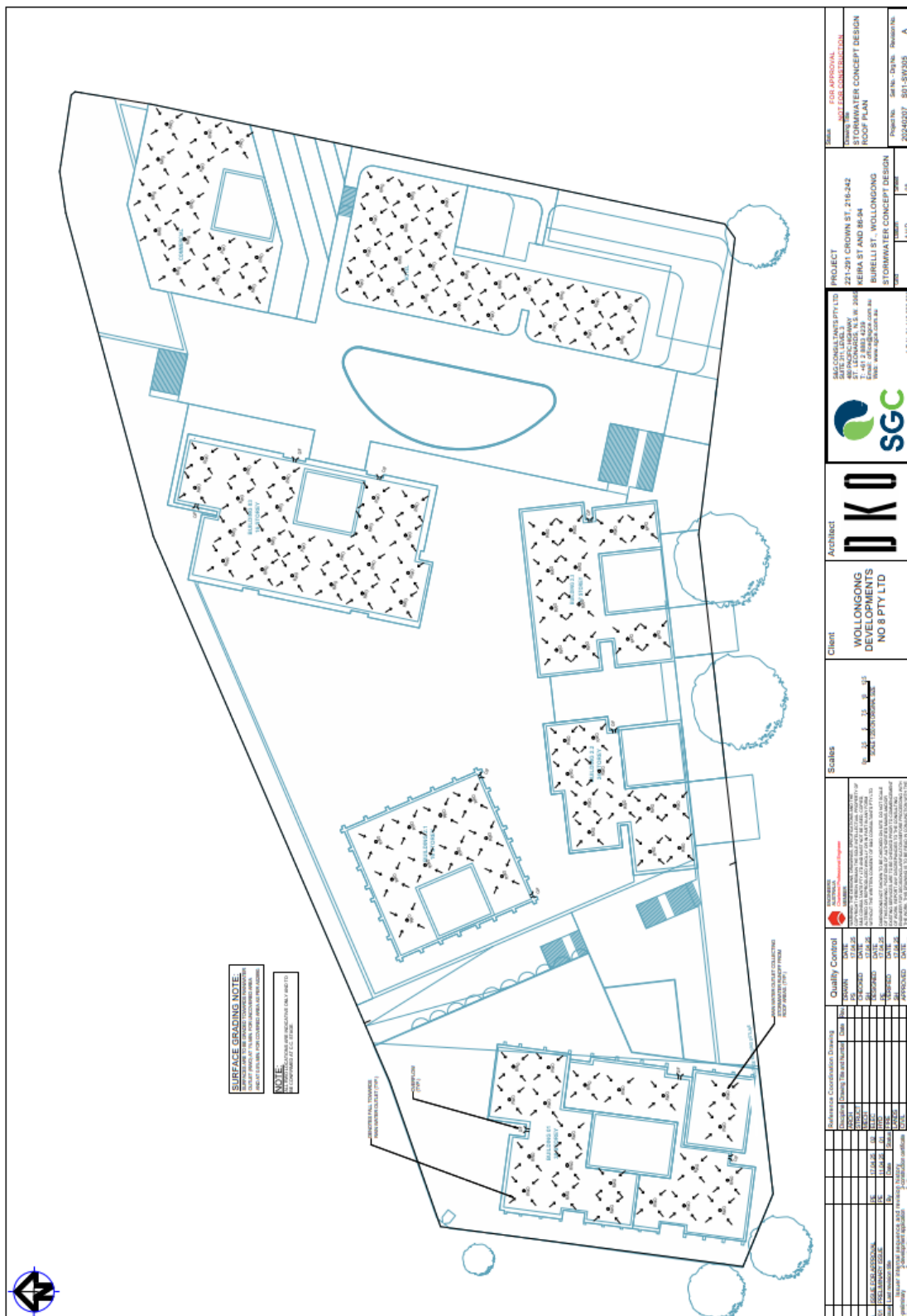


Figure A 3.5 Roof Stormwater Plan



Figure A 3.6 MUSIC Catchment and Details Stormwater Plan

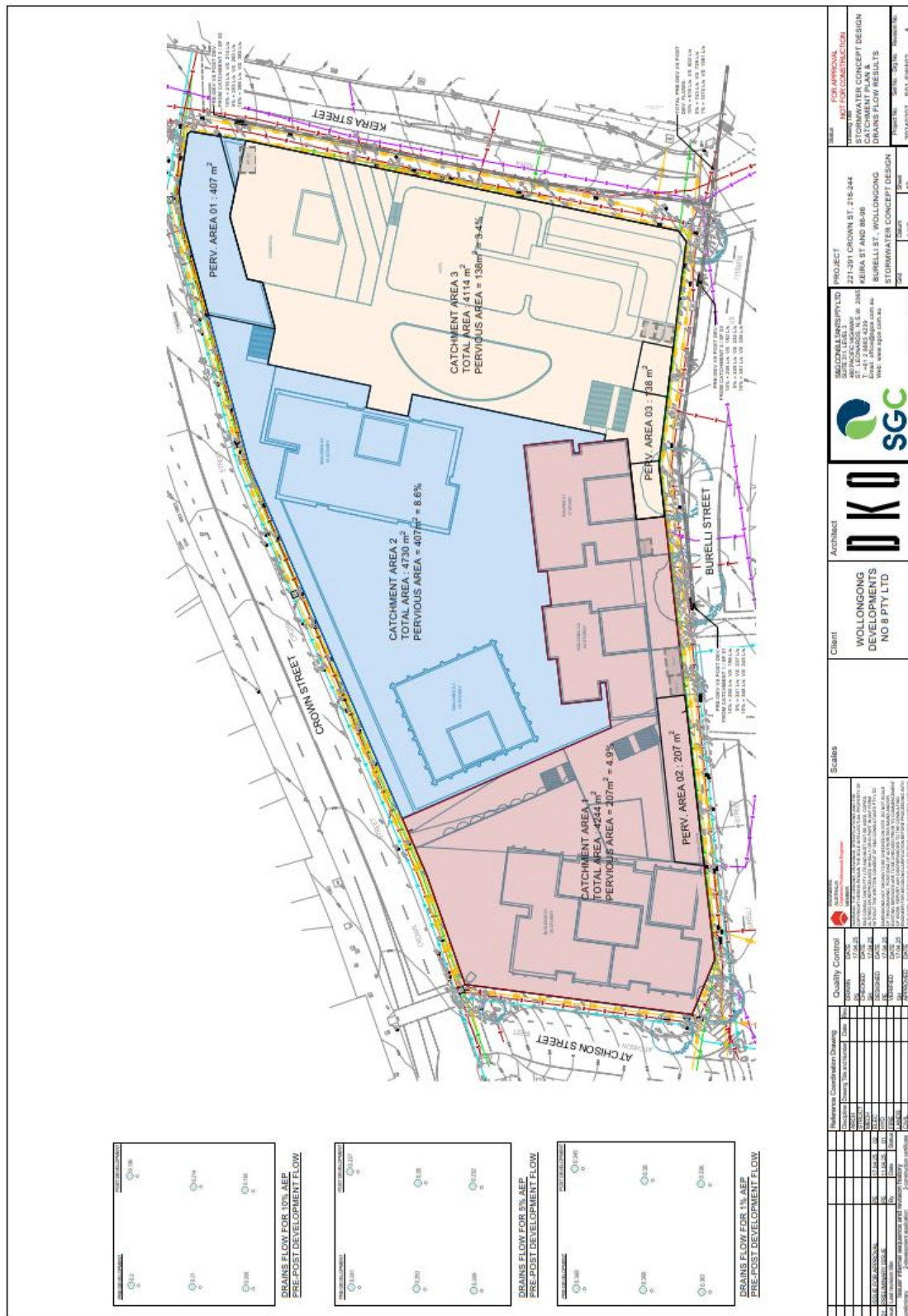


Figure A 3.7 Drains Catchment and Flow Details Stormwater Plan



Figure A 3.8 Erosion & Sediment Control Plan & Details

A4 Appendix 4

Maintenance Schedule



How does it work?

Stormwater enters the cartridge chamber, passes through the filtration media and begins filling the cartridge center tube. When water reaches the top of the cartridge the float valve opens and filtered water is allowed to drain at the designed flow rate. Simultaneously, a one-way check valve closes activating a siphon that draws stormwater evenly throughout the filter media and into the center tube. Treated stormwater is then able to discharge out of the system through the underdrain manifold pipework.

As the rain event subsides, the water level outside the cartridge drops and approaches the bottom of the hood. Air rushes through the scrubbing regulators releasing the water column and breaking the siphon. The turbulent bubbling action agitates the surface of the cartridge promoting trapped sediment to drop to the chamber floor. After a rain event, the chamber is able to drain dry by way of an imperfect seal at the base of the float valve.

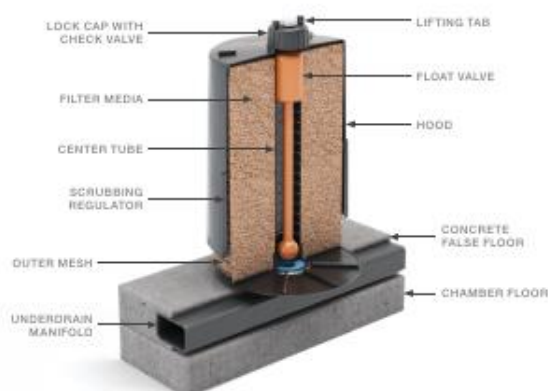


Figure 1: StormFilter® components



Figure 2: Example conceptual diagram of a StormFilter® system

Maintenance Procedures

To ensure optimal performance, it is advisable that regular maintenance is performed. Typically, the StormFilter® requires an inspection every 6 months with a minor service at 12 months. Additionally, as the StormFilter® cartridges capture pollutants the media will eventually become occluded and require replacement (expected media life is 1-3 years).

Primary types of maintenance

The table below outlines the primary types of maintenance activities that typically take place as part of an ongoing maintenance schedule for the StormFilter®.

Service Type	Description of Typical Activities	Frequency
Inspection	Visual inspection of cartridges & chamber Remove larger gross pollutants Perform minimal rectification works (if required)	Every 6 Months
Minor Service	Evaluation of cartridges and media Removal of accumulated sediment (if required) Wash-down of StormFilter® chamber (if required)	Every 12 Months
Major Service	Replacement of StormFilter® cartridge media	As required

Maintenance requirements and frequencies are dependent on the pollutant load characteristics of each site. The frequencies provided in this document represent what the manufacturer considers to be best practice to ensure the continuing operation of the device is in line with the original design specification.

Inspection

The purpose of the inspecting the StormFilter® system is to assess the condition of the StormFilter® chamber and cartridges. When inspecting the chamber, particular attention should be taken to ensure all cartridges are firmly connected to the connectors. It is also an optimal opportunity to remove larger gross pollutants and inspect the outlet side of the StormFilter® weir.

Minor Service

This service is designed to ensure the ongoing operational effectiveness of the StormFilter® system, whilst assessing the condition of the cartridge media.

- 1 Establish a safe working area around the access point(s)
- 2 Remove access cover(s)
- 3 Evaluate StormFilter® cartridge media (if exhausted schedule major service within 6 months)
- 4 Measure and record the level of accumulated sediment in the chamber (if sediment depth is less than 100 mm skip to step 9)
- 5 Remove StormFilter® cartridges from the chamber
- 6 Use vacuum unit to removed accumulated sediment and pollutants in the chamber
- 7 Use high pressure water to clean StormFilter® chamber
- 8 Re-install StormFilter® cartridges
- 9 Replace access cover(s)

Major Service (Filter Cartridge Replacement)

For the StormFilter® system a major service is reactionary process based on the outcomes from the minor service, specifically the evaluation of the cartridge media.

Trigger Event	Maintenance Action
Cartridge media is exhausted ^[1]	Replace StormFilter® cartridge media ^[2]

^[1] Multiple assessment methods are available, contact Ocean Protect for assistance

^[2] Replacement filter media and components are available for purchase from Ocean Protect

This service is designed to return the StormFilter® device back to optimal operating performance.

- 1 Establish a safe working area around the access point(s)
- 2 Remove access cover(s)
- 3 By first removing the head cap, remove each individual cartridge hood to allow access to the exhausted media
- 4 Utilise a vacuum unit to remove exhausted media from each cartridge
- 5 Use vacuum unit to remove accumulated sediment and pollutants in the chamber
- 6 Use high pressure water to clean StormFilter® chamber
- 7 Inspect each empty StormFilter® cartridges for any damage, rectify damage as required
- 8 Re-fill each cartridge with media in line with project specifications
- 9 Re-install replenished StormFilter® cartridges
- 10 Replace access cover(s)

Additional Types of Maintenance

Occasionally, events on site can make it necessary to perform additional maintenance to ensure the continuing performance of the device.

Hazardous Material Spill

If there is a spill event on site, the StormFilter® unit should be inspected and cleaned. Specifically, all captured pollutants and liquids from within the unit should be removed and disposed in accordance with any additional requirements that may relate to the type of spill event. Additionally, it will be necessary to inspect the filter cartridges and assess them for contamination – and, depending on the type of spill event, it may be necessary to replace the filtration media.

Blockages

In the unlikely event that flooding occurs upstream of the StormFilter® system, the following steps should be undertaken to assist in diagnosing the issue and determining the appropriate response.

- 1 Inspect the upstream diversion structure (if applicable) ensuring that it is free of debris and pollutants
- 2 Inspect the StormFilter® unit checking the underdrain manifold as well as both the inlet and outlet pipes for obstructions (e.g. pollutant build-up, blockage), which if present, should be removed

Major Storms and Flooding

In addition to the scheduled activities, it is important to inspect the condition of the StormFilter® after a major storm event. The focus is to inspect for damage and abnormally high sediment accumulation that may result from localised erosion. Where necessary damaged components should be replaced and accumulated pollutants should be removed and disposed

Figure A 4.1 Ocean Protect cartridge maintenance

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