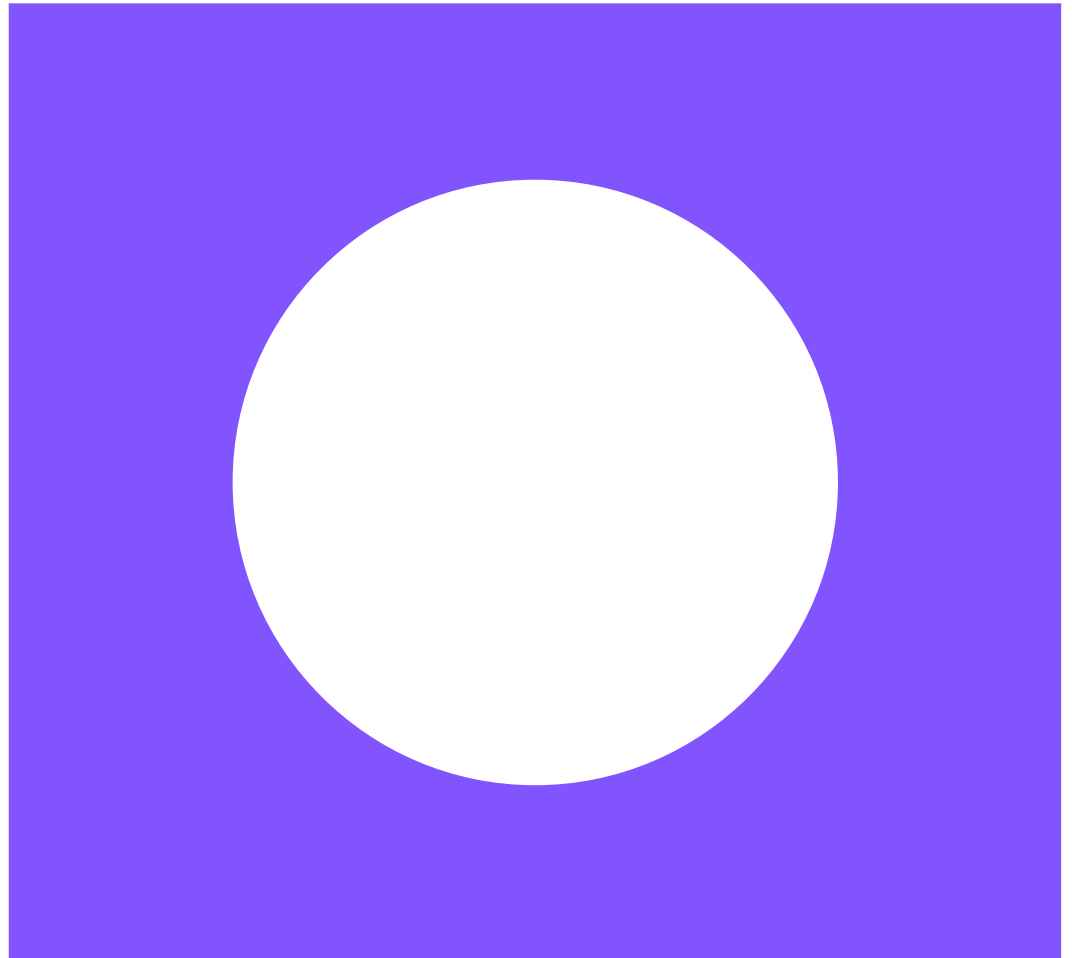




2 Flide Street, Caringbah Social and Affordable Housing Development

Integrated Water Management Plan

October 2025



Acknowledgment of Country

On behalf of Mott MacDonald, we would like to begin by acknowledging the Traditional Custodians of the land on which we meet today, and pay our respects to their Elders past and present.

We recognise and respect their cultural heritage, beliefs, continued connection to the land and water and commit to building a brighter future together.



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Integrated Water Management Plan

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Issue and Revision Record

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Executive summary

This Integrated Water Management Plan has been prepared by Mott Macdonald behalf of Homes NSW for a concurrent State Significant Development Application (SSD-84862461) and Planning Proposal for the redevelopment of existing social housing (the Project) on 2 Flide Street, Caringbah (the Site). The project involves the construction of two residential flat buildings—one rising to part 13 and part 14 storeys, and the other to 8 storeys—comprising a total of 164 social and affordable housing apartments. The development also includes a communal room and a two-level basement car park. To support the Proposal, adjustments to the permissible building height and floor space ratio (FSR) increase via an amendment to the Sutherland Shire Local Environment Plan 2015 are required.

The purpose of this Integrated Water Management Plan is to provide a feasible stormwater management plan and to address the Secretary's Environmental Assessment Requirements (SEARs) for the Project issued on 6 June 2025 which identified the following specific assessment requirements.

SEARs Requirement	Section of Report where response is provided
11. Water Management	- Detail the proposed drainage design and servicing infrastructure to be incorporated as part of the development (stormwater and wastewater). - Demonstrate how the development complies with council's drainage requirements and identify proposed stormwater treatment and water quality management measures to minimise adverse environmental impacts.
	- Water Quantity Management - Legal Discharge Point - Tailwater Assumption - Water Quantity Catchment - On-site Detention System - Water Quality Management - Water Quality Catchment - Water Quality Treatment Train - MUSIC Modelling Results
19. Flood Risk	
- Identify the flood planning area and level as set out in the relevant EPI and other supporting documents to determine; - The flood extent and velocity up to the Probable Maximum Flood and risk on-site having regard to adopted flood studies and, floodplain risk management studies and plans - The site access and egress routes - the potential effects of climate change, - any relevant provisions of the NSW Flood Risk Management Manual, and any other relevant guidelines - Where the development is occurring on flood prone land a flood impact and risk assessment (FIRA) must be prepared having regard to the Flood Impact and Risk Assessment – Flood Risk Management Guide LU01. 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	Flooding

SEARs Requirement

11. Water Management

Section of Report where response is provided

any design solutions, flood modification measures, property modification measures, operational procedures or Flood Emergency Response Plan).

This Integrated Water Management Plan supports the delivery of the proposed development as it identifies opportunities, constraints and risks related to civil design. The scope of this report summarises the existing and proposed stormwater drainage design as well as the design approach, key assumptions, relevant references and standards that will be applied to the development of concept design documentation for the proposed development. The report is to be read in conjunction with the civil engineering plans in Appendix A.

1 Introduction

1.1 Purpose of Report

The purpose of this Integrated Water Management Plan is to outline the proposed site stormwater management strategy for the development and demonstrate compliance with the stormwater management quantity and quality requirements in accordance with the SEARs issued for the project including, but not limited to, the Sutherland Shire Development Control Plan 2015, Sutherland Shire Stormwater Specification 2009, and relevant Australian and industrial standards.

1.2 Scope of Work

This management plan details the stormwater assessment undertaken, including modelling results, and presents the proposed strategy for both stormwater quantity and quality management for the development.

The assessment includes the following components:

- Understanding the existing stormwater conditions for the site including flood risk, overland flow paths, permeability, existing infrastructure and current points of discharge.
- Assessing the post-development flows for the proposed development by DRAINS to determine any increase in runoff and implement mitigation measures as required under the design criteria.
- Assessing the use of various stormwater quality treatment measures, including Water Sensitive Urban Design (WSUD) initiatives, to meet the stormwater quality objectives under the design criteria.
- Designing a stormwater system to convey the minor flows from the development to nominated points of discharge from the site and incorporating quantity and quality measures from the above.
- Considering major flows and overland flow paths through the developed site for safety and conveyance of flows and implementing above-ground drainage measures as required.
- Implementing erosion and sediment control measures to minimise sediment runoff during the construction phase.

1.3 Limitation of this Report

The proposed water management plan to be read in conjunction with relevant consultants including but not limited to, Architectural Plans, Landscape Plans, Geotechnical Report and relevant approval documents.

2 Design Guidelines and Methodologies

2.1 Consultation

Mott MacDonald is in consultation with the project team throughout the design phase to obtain a feasible design solution for the proposed development site. Iterations of the design were prepared in conjunction with the flood engineers input to flood advice, structure engineers, hydraulic engineers, landscape architects and architects. The proposed stormwater drainage design was conducted in accordance with Sutherland Shire Council Development Control Plan (DCP) and other relevant guidelines.

2.2 Codes and Guidelines

The design has been undertaken in compliance with the relevant Australian Standards, local government guidelines. Key documents used as a guidance for the design are summarised in Table 2-1.

Table 2-1: Design Criteria and Guidelines

Reference	Title	Version or Date	Originator
DRAINS	DRAINS User Manual		DRAINS
eWater	MUSIC User Manual	V5	eWater
Blue Book	Managing Urban Stormwater – Soils and Construction, Volume 1, 4 th edition, March 2004, Landcom	March 2004	Landcom
NCC	National Code Australia	2022	Australian Building Codes Board
Sutherland Shire Council	Stormwater Specification	2009	Sutherland Shire Council
Sutherland Shire Council	Development Control Plan	2009	Sutherland Shire Council
AS/NZS 3500.3	Plumbing and Drainage – Stormwater Drainage	2021	Standards Australia

2.3 Other Consultants Input

The proposed stormwater design is also based on the following source of information received.

- Architectural design provided by BATESSMART, project no.: S12899, revision: 1, dated 05.09.2025.
- Survey undertaken by Norton Survey Partners, job no: 36313, dated 03.06.2025.

2.4 Methodologies

- DRAINS
 - DRAINS software package has been utilised to size the proposed below ground pit and pipe network to convey the major/minor storm events flows.
 - This software has also been used to undertake iterations to determine suitably sized stormwater detention tanks under the stormwater management quantity requirements.
 - The DRAINS model has been undertaken the online rainfall data from ARR Data Hub.
 - Climate change rainfall modifier has been applied to undertake the hydraulic analysis.
- MUSIC
 - Modelling of the proposed development was undertaken using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) Version 6.3 software. The software was utilised to simulate urban stormwater systems operating at a range of temporal and spatial scales. MUSIC models the total amounts of gross pollutants, phosphorus, nitrogen, and total suspended solids produced within various types of catchments. It allows the user to simulate the removal rates expected when implementing water quality treatment devices to reduce the increase gross pollutant and nutrient levels created by the proposed development.
 - The water quality modelling has been undertaken in accordance with the current NSW Music Modelling Guidelines 2015.
- BYDA
 - Before You Dig Australia, due diligence investigations have been carried out with a combined services coordination and verification. The information is a supplementary to existing survey to assist civil/stormwater design and other consultants at approval submission stage.

2.5 Stormwater Management Design Criteria

2.5.1 Design Storm Events

The design storm events vary from design purposes and have been summarised below, detailed design regulations to be discussed in the following chapters:

- Water Sensitive Urban Design (WSUD) is designed for 1 in 3-month storm events.
- Permissible Site Discharge (PSD) is designed for all storm events up to and including the 1% AEP event.
- On-site Detention (OSD) volume is designed for all storms up to 1% AEP storm events.
- The hydraulic assessment incorporated a climate change rainfall modifier of 1.2, ensuring that post-development stormwater flows were effectively detained to match pre-development levels across all specified storm events.

2.5.2 Design Requirements

The listed Sutherland Shire Council guidelines in Table 2-1 above provides the synopsis of the design requirements for the subject site. Design criteria have been developed to ensure the proposed design adheres to the requirements denoted in the Sutherland Shire Council guidelines. Table 2-2 below summarises the design criteria for hydrology and hydraulics analysis.

Table 2-2: Hydraulic and Hydrology Design Criteria

Item	Standard	Adopted	
Hydrology & Hydraulics			
Hydrological Model	Sutherland Shire Environmental Specification 2009, Section 2	DRAINS (ILSAX)	
Design Rainfall Data	Sutherland Shire Environmental Specification 2009, Section 2	AR&R Online Data	
Urban Rainfall Losses	Australian Rainfall & Runoff (ARR) – Book 9 – Runoff in Urban Areas, Table 9.6.6	Parameter	Value
		Paved Area Depression Storage (Initial Load)	1.0mm
		Grassed Area Depression Storage (Initial Loss)	5.0mm
		Soil Type	3
		Slow infiltration rates. This parameter, in conjunction with the AMC, determines the continuing loss	
		AMC	3
		Description	Rather wet
		Total Rainfall in 5 Days Preceding the Storm	12.5 to 25mm
		Major Design Storm	Sutherland Shire Stormwater Specification 2009, Section 5.3
Minor Design Storm	Sutherland Shire Stormwater Specification 2009, Section 5.3	Average Recurrence Intervals for Drainage Design	
		Situation	Design Storm AEP
		Street, accessway and pathway – excluding low points which discharge through building allotments	20%
		Relief of low point areas via drainage lines traversing building allotments	5%
		Major system traversing developed areas. (Major systems are defined as those having catchment areas in excess of 15 hectares or run off in excess of 3cu.m/sec whichever is the lesser)	5%
Manning's Roughness Coefficient (Kinematic Wave Equation)	Australian Rainfall & Runoff (ARR) – Book 6 – A Guide to Flood Estimation, Section 2.5.2, Table 6.2.1	Concrete Lining - 0.013 - 0.015	
		Grass (maintained) – 0.030 - 0.035	
		Grass (unmaintained) – 0.070 – 0.080	
		Earth (clear) – 0.022 – 0.030	
Pipes and Culvert Colebrook-White (n value) formular	Australian Rainfall & Runoff, Book 6 – Flood Hydraulics	Section 2.5.2: Application of the Manning Equation, Table 6.2.1	
Pit Losses	Australian Rainfall & Runoff, Book 9 – Runoff in Urban Areas	Section 5.5.3: Energy Losses	

Item	Standard	Adopted																
Pit Blockage Factors	Australian Rainfall & Runoff (ARR) – Book 9 – Runoff in Urban Areas, Table 9.5.1	Sag – kerb inlet (side entry) – 20% Sag – grated -50% Sag – combination – kerb inlet -0% & Grate – 100% On grade – kerb inlet (side entry) – 20% On-grade – grated – 50% On grade – combination – 10% (of total capacity)																
Tailwater level/sea water level	Australian Rainfall & Runoff, Book 6 – Flood Hydraulics	Refer to guide.																
Overland Flow Safety Criteria	Sutherland Shire Stormwater Specification 2009, Section 5.3	<table><tr><th colspan="2">Table 3-R-Major flow design limits</th></tr><tr><th>Location</th><th>Design limit</th></tr><tr><td>All areas routinely accessed by vehicles and people, including vulnerable people (such as children)</td><td>H1 Hazard Classification as defined in Section 7.2.7 of Book 6 ARR2019 for the critical 1% AEP event</td></tr><tr><td>All areas routinely accessible by the public but not subject to vehicle traffic</td><td>H2 or lower Hazard Classification as defined in Section 7.2.7 of Book 6 ARR2019 for the critical 1% AEP event</td></tr><tr><td>Areas without routine public access but without exclusion fencing</td><td>H3 or lower Hazard Classification as defined in Section 7.2.7 of Book 6 ARR2019 for the critical 1% AEP event</td></tr><tr><td>Where roads convey major flows</td><td>Maximum flow depth to be top of kerb or 200mm above top of kerb where the footway can cater for the depth of overland flow and where it is demonstrated that it will not cause any flooding issues to adjacent lots.</td></tr><tr><td>Structures and entrances to underground car parks</td><td>For floor levels on structures and underground carparks a minimum freeboard of 0.3m is required above the 1% AEP flood event. A higher freeboard may be required in areas of mainstream overland flooding.</td></tr><tr><td>All major systems</td><td>Freeboard to be the greatest of: Doc Set 8277088 Technical Specification for Infrastructure Design Page 100 of 249 • 150mm • Flow velocity head • The additional capacity required to convey the relevant climate change flow as</td></tr></table>	Table 3-R-Major flow design limits		Location	Design limit	All areas routinely accessed by vehicles and people, including vulnerable people (such as children)	H1 Hazard Classification as defined in Section 7.2.7 of Book 6 ARR2019 for the critical 1% AEP event	All areas routinely accessible by the public but not subject to vehicle traffic	H2 or lower Hazard Classification as defined in Section 7.2.7 of Book 6 ARR2019 for the critical 1% AEP event	Areas without routine public access but without exclusion fencing	H3 or lower Hazard Classification as defined in Section 7.2.7 of Book 6 ARR2019 for the critical 1% AEP event	Where roads convey major flows	Maximum flow depth to be top of kerb or 200mm above top of kerb where the footway can cater for the depth of overland flow and where it is demonstrated that it will not cause any flooding issues to adjacent lots.	Structures and entrances to underground car parks	For floor levels on structures and underground carparks a minimum freeboard of 0.3m is required above the 1% AEP flood event. A higher freeboard may be required in areas of mainstream overland flooding.	All major systems	Freeboard to be the greatest of: Doc Set 8277088 Technical Specification for Infrastructure Design Page 100 of 249 • 150mm • Flow velocity head • The additional capacity required to convey the relevant climate change flow as
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All major systems	Freeboard to be the greatest of: Doc Set 8277088 Technical Specification for Infrastructure Design Page 100 of 249 • 150mm • Flow velocity head • The additional capacity required to convey the relevant climate change flow as																	

Item	Standard	Adopted
		calculated using section 3.5.3.2.
Permissible Site Discharge	Sutherland Shire Council, Stormwater and Groundwater Management DCP 2015 Chapter 38	Section 1.3: The post development rate of stormwater runoff (both piped and overland) from the site shall not exceed the rate of flow of runoff from the site than would exist prior to the subject development occurring.
On-Site Stormwater Detention	Sutherland Shire Stormwater Specification 2009	Section 4.0: Specific Requirements for On-Site Detention.
Pollution reduction targets	Sutherland Shire Development Control Plan 2015, Chapter 38: Stormwater and Groundwater Management	• 80% reduction in total suspended solids (TSS) • 40% reduction in total phosphorus (TP) • 40% reduction in total nitrogen (TN) • 90% reduction in gross pollutants; and

3 Existing Site and Stormwater Conditions

3.1 The Site

The Site is located within the Sutherland Shire local government area (LGA) and is zoned R4 High Density Residential under the *Sutherland Shire Local Environmental Plan (SSLEP) 2015*.

The Site has a total area of approximately 3,596 square metres (sqm) and is bound by Flide Street to the north, Gardere Street to the west, Willarong Road to the east and the rail corridor for the T4 Eastern Suburbs & Illawarra Line to the south. Refer to Figure 3-1. The site is accessible by public transport, being within 400m of the entrance to Caringbah Station and bust stops on the Kingsway which have frequent services to Sutherland, Miranda and Cronulla.

The Site currently comprises 38 social housing units within two 3 storey buildings with a single level basement car park.

The site is not flood affected and does not require a FIRA (Flood Impact and Risk Assessment).



Figure 3-1: Site location (Source: Google Earth)

3.2 Existing Stormwater Drainage Characteristics

The development site is bound by Flide Street to the north, Gardere Street to the west and Willarong Road to the east. The site is sunken from Flide Street level, with retaining walls along Flide Street. The natural topography of the site exhibits a slope descending from east to west, specifically in the direction of Gardere Street. Existing overland flow runs through the west garden along Flide Street towards Gardere Street and north-east to south-west between the buildings from Flide Street towards the railway corridor. Figure 3-2 below represents a survey extract, with directional arrows indicating the gradient of the site. The nearest existing stormwater pit is located at the Gardere Street and is proposed to serve as the designated discharge point for stormwater from the development with an invert level of (IL) 30.75m.

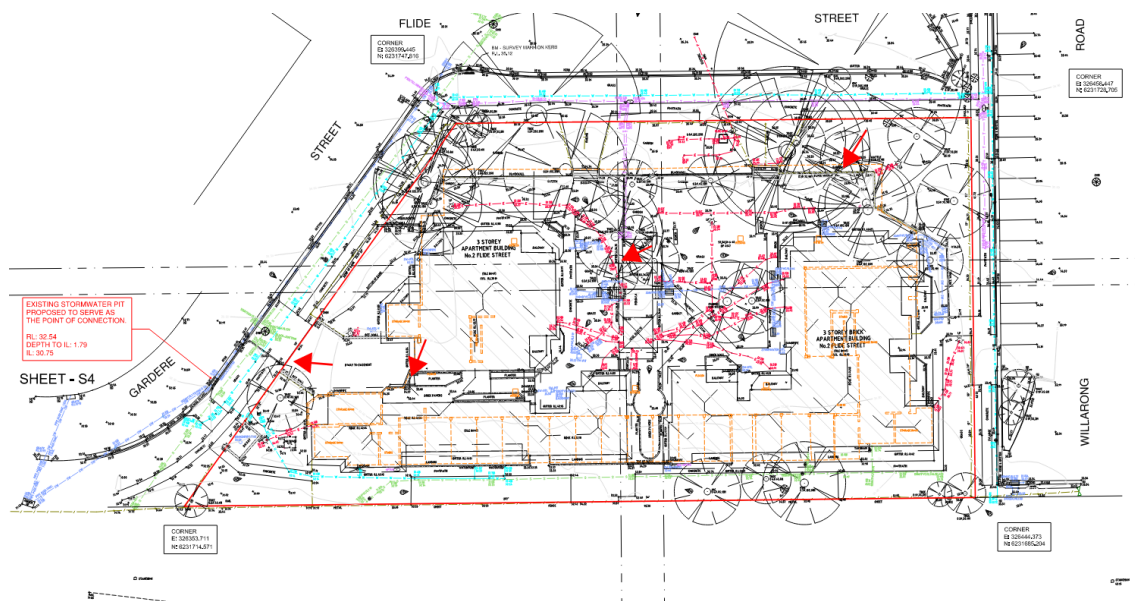


Figure 3-2: Survey, (Northern Survey Partners, 03.06.2025)

4 Proposed Development

The proposed development comprises the construction of two residential flat buildings—one rising to part 13 and part 14 storeys, and the other to 8 storeys—comprising a total of 164 social and affordable housing apartments. The development also includes a communal room and a two-level basement car park.

The proposal includes bulk earthworks, tree removal and associated landscaping and public domain works.

To support the Proposal, a concurrent Planning Proposal seeks amendments to the development standards within SSLEP as follows:

- Building Height – Increase the maximum building height development standard from 16m to 50m and
- FSR – Increase the maximum FSR development standard from 4.0 to 1.0.

The existing buildings on the Site were approved for demolition under Division 5.1 of the *Environmental Planning and Assessment Act 1979* and does not form part of this proposal. This included removal of all trees on top of the existing basement,

Refer to Site Plan at Figure 4-1 below.



Figure 4-1: Site Plan

5 Flooding

5.1 Available Flood Studies

Sutherland Shire Council follows the NSW Government's *Flood Prone Land Policy* as described in the 2023 *Flood Risk Management Manual*, to manage flood risk. Council's flood risk management program has been in operation for many years. Studies are conducted to determine the extent of flooding and management actions are then assessed, recommended and implemented.

Council has completed numerous Flood Studies and Flood Risk Management Studies and Plans over the decades. The most relevant one to the Site is the *Draft Sutherland Shire Overland Flow – Flood Study* (2023).

5.1.1 Draft Overland Flow Flood Study

Council are conducting an Overland Flow – Flood Study. This helps them to understand and manage risks associated with local flooding events. The draft flood study (completed by BMT) is currently undergoing public consultation.

Council staff have conducted site inspections on locations identified through the consultation period. Council in partnership with DCCEEW and BMT are currently conducting a revision of the flood modelling incorporating the data gained from these inspections. Once this is completed, the Flood Study will be updated and submitted for an independent peer review.

The extent of the flood study is shown in Figure 5-1.

The Draft Overland Flow Flood Study discusses flood levels, velocities and flows for the following Annual Exceedance Probability (AEP) events: 20%, 10%, 5%, 2%, 1%, 0.5% and 0.2%, and Probable Maximum Flood (PMF) event. The PMF is the largest flood that could conceivably occur at a location and defines the extent of flood-prone land. These results have been reviewed to provide insight into existing flood behaviour, identify flood risk areas and to inform planning decisions.

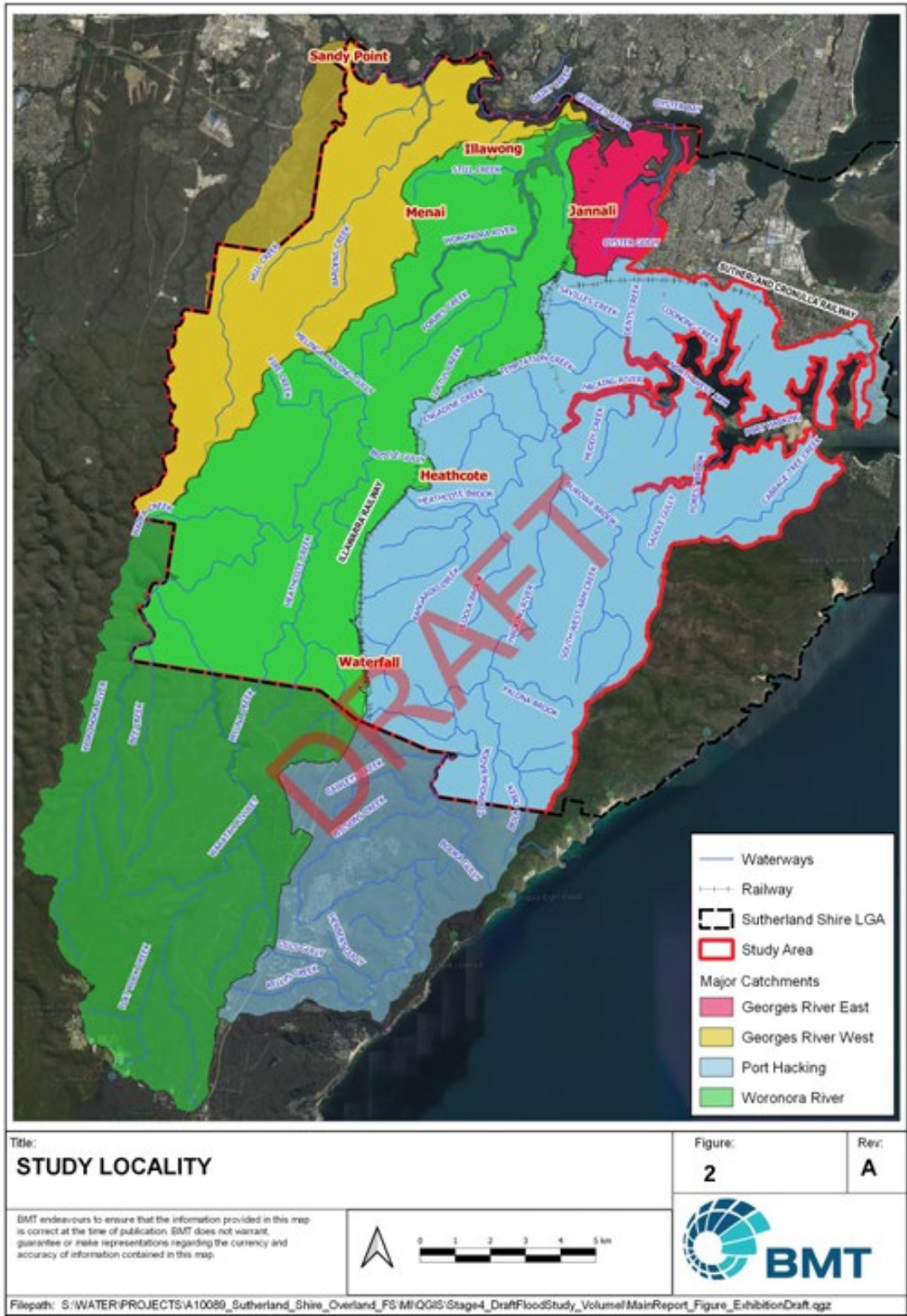


Figure 5-1: Draft Overland Flow Flood Study Locality (BMT)

5.2 Key Findings

5.2.1 Council Flood Prone Land

Shire Maps, Council's online mapping portal, provides flood risk overlays amalgamated from their flood studies.

The Site is shown in Figure 5-2 and is not identified as being flood prone.



Figure 5-2: Shire Maps – Flood Prone Land

It should be noted that *Shire Maps* does not include the outputs from the draft Overland Flow - Flood Study. Therefore, Council engineers were contacted to understand the flood affection of the Site. On 24 June 2025 Council confirmed that:

- 2 Flide Street is not affected by the 1% AEP and not considered to have flooding affection by Council
- PMF mapping isn't typically considered by Council with regards to built-form planning and would not be a constraint on the development
- The *Overland Flow Flood Study* remains in draft and has not been adopted as of the date of this report. Council are uncertain on the timing for this to become final
- The draft PMF modelling (Figure 5-3) shows a small area of affection to west side of the Site. Council consider this to be an anomaly created by the cutting for the existing driveway access and doesn't appear to be accurate. It is likely that the anomaly would be corrected with updated survey information and/or modelling



Figure 5-3: Draft PMF Flood Extents – 2 Flide Street

In summary, Council are not concerned about flooding on the site and wouldn't be looking to assess the site as flood affected in any forthcoming development application

5.3 Flood Planning Requirements

Sutherland Shire Council has a comprehensive framework for flood planning controls, which includes policies, studies, and development regulations aimed at managing flood risk and ensuring safe development in flood-prone areas.

Redevelopment of the site will require compliance with Council's flood planning controls, including:

- Sutherland Shire Local Environmental Plan (2015)
- Sutherland Shire Development Control Plan (2015)
- NSW Flood Risk Management Manual (2023)
- NSW State Governments Flood Prone Land Policy

5.4 Flood Planning Levels

5.4.1 Planning Controls

Chapter 40 of the Sutherland Shire Development Control Plan (DCP) 2015 outlines specific flood-related controls for developments. The controls aim to minimise the impact of flooding on proposed developments and ensure that new development does not worsen flooding for others. Sites are classified as **low, medium, or high flood risk** based on flood studies. The level of controls applied depends on this risk category.

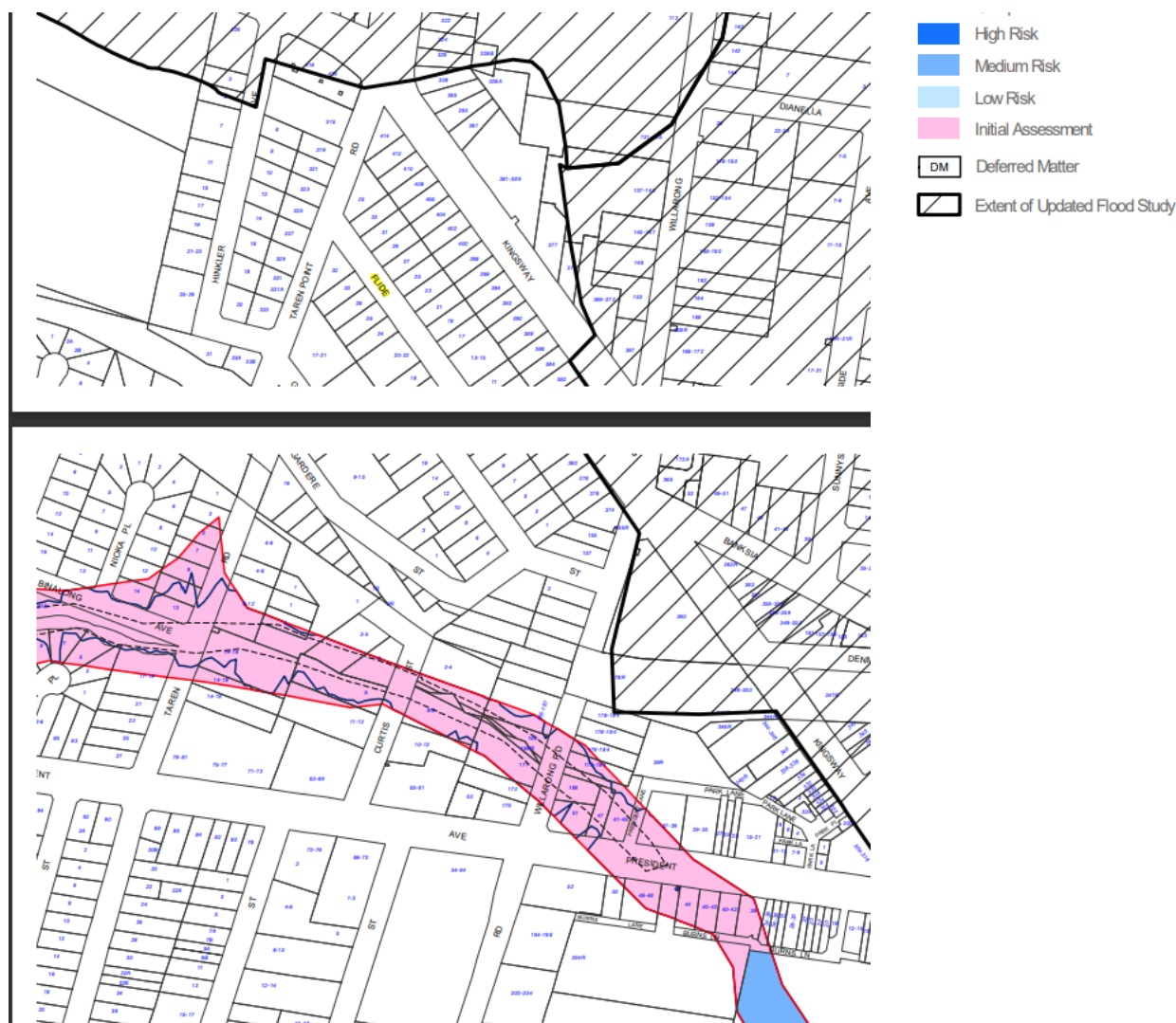


Figure 5-4: Sutherland Shire DCP 2015 – Flood Risk Management

Low Flood Risk:

Land classified as low flood risk is situated above the 1% Annual Exceedance Probability (AEP) flood level, meaning it is only affected by extremely rare and severe flood events, such as the Probable Maximum Flood (PMF). In these areas, most types of development are generally permitted, and there are usually no requirements for minimum floor levels for habitable rooms. However, developments must not increase flood risk to neighbouring properties, and a flood impact assessment may be required for sensitive uses or sites near mapped floodways. While the use of flood-compatible materials is encouraged, it is not mandatory, and safe evacuation routes should still be considered.

Medium Flood Risk:

Medium flood risk land lies between the 1% AEP flood level and the PMF but is not considered high hazard. For these areas, developments must meet minimum floor level requirements for habitable rooms, typically set at or above the 1% AEP flood level plus a safety margin (freeboard). Structural requirements are imposed to ensure buildings can withstand flood forces, and developments must not obstruct floodways or reduce flood storage. Safe access and evacuation must be demonstrated, and the use of flood-compatible materials is required for the

lower parts of buildings. A flood impact assessment is mandatory for all proposals in medium risk areas.

High Flood Risk:

High flood risk land is within the 1% AEP flood extent and is identified as high hazard, such as floodways or areas with fast or deep water. These areas are subject to the strictest controls, and some land uses may be prohibited altogether. Developments must comply with stringent minimum floor levels and significant structural requirements to ensure safety. Any proposal must not increase flood risk or obstruct floodways, and safe evacuation and access must be demonstrated for all occupants. Flood-compatible materials are required throughout the development, and a comprehensive flood impact assessment is essential. Council may refuse development if the risks cannot be adequately managed.

The site is situated above the 1% AEP flood level; therefore, it is classified as a **Low Flood Risk** Precinct. The relevant development and planning controls are outlined in Section 5.3 of the Sutherland Shire DCP (2015). These are presented in Table 5-1

Table 5-1: Low Flood Risk – Table (Page 20, DCP Chapter 40)

Land Use Category	Floor Level	Building Components & Method	Structural Soundness	Flood Effects	Car Parking & Driveway Access	Evacuation	Management & Design
Essential Community Facilities	3	2	2	1	1,2,3,4,5,6	2,4,5,6	4,5
Sensitive Uses & Facilities	2,4	1	1	1	1,2,3,4,5,6	7	1
Subdivision	2,4	1	1	1	1,2,3,4,5,6	2,3 or 4,5	3,5
Residential	2,4	1	1	1	1,2,3,4,5,6	1,2,4,5	3,5
Commercial & Industrial	1	1	1	1	4,5,6	2,4,5	2,3,5
Tourist Related Development	5	1	1	1	4,5,6	4,5,6	2,3,5
Recreation & Non-Urban		1	1	1	4,5,6	2,3 or 4,5	2,3,5
Concessional Development		1	1	1	4,5,6	2,3 or 4,5	2,3,5

5.4.2 Planning Considerations

For Low Flood Risk areas, the following Residential planning controls apply

Floor Level

- 2 - Habitable floor levels to be equal to or greater than the 1% AEP flood level plus 500mm freeboard.
- 4 - Non-habitable floor levels shall be assessed on merit having regard to the 5% AEP level as well as privacy and amenity impacts

Building Components and Method

- 1 - All structures to have flood compatible building materials below the 1% AEP flood level plus 500mm freeboard

Structural Soundness

- 1 - An engineer's report shall be provided to certify that the structure can withstand the forces of floodwater, debris and buoyancy up to and including a 1% AEP flood level plus 500mm freeboard

Flood Effects

- 1 - An engineer's report shall be provided to certify that the development will not increase flood effects elsewhere, having regard to:
 - loss of flood storage
 - changes in flood levels, flows and velocities caused by alterations to the flood conveyance

Car and Parking Access

- 1 - The minimum surface level of open car parking spaces or carports shall be no lower than the 1% AEP flood or the level of the crest of the road at the location where the site has access to the road
- 2 - Garages shall have a minimum finished floor level no lower than the 1% AEP flood plus 200mm freeboard
- 3 - The level of the driveway providing access between the road and parking space shall be no lower than 300mm below the 1% AEP flood or such that the depth of inundation during a 1% AEP flood is not greater than either the depth at the road or the depth at the car parking space
- 4 - Basement garages and car parking areas with floor level below the 5% AEP flood or more than 0.8m below the 1% AEP flood level, shall have a pump-out system, adequate warning systems, signage and exits
- 5 - Restraints or vehicle barriers shall be provided to prevent floating vehicles leaving a site during a 1% AEP flood. A flood depth of more than 200mm will cause serious water damage to a typical vehicle and a depth of 300mm is sufficient to cause a typical vehicle to float
- 6 - The crest of the driveway providing access between the road and basement garages shall be a minimum of 200mm above the level of the 1% AEP flood.

Evacuation

- 1 - Reliable access for pedestrians or vehicles shall be provided during a 1% AEP flood.
- 2 - Reliable access for pedestrians or vehicles shall be provided from the building commencing at a minimum level equal to the lowest habitable floor level to an area of refuge above the PMF level
- 4 - Adequate flood warning systems, signage and exits shall be available to allow safe and orderly evacuation without increased reliance upon the SES or other authorised emergency services personnel.
- 5 - The development shall be consistent with any relevant flood strategy, Floodplain Risk Management Plan adopted by Council or similar plan

Management and Design

- 3 - An area shall be available within the dwelling to store goods above the 1% AEP flood level plus 500mm freeboard
- 5 - No storage of materials which may cause pollution or be potentially hazardous during any flood is permitted below the 1% AEP plus 500mm

5.5 FIRA Requirements

Section 2.1, titled Need for a Flood Impact Risk Assessment, from the Flood Impact and Risk Assessment Flood Risk Management Guideline LU01 (2023) (hereafter referred to as LU01),

outlines the conditions under which a Flood Impact Risk Assessment (FIRA) is required. It states that “a FIRA is likely to be required where it is anticipated a proposed development could change flood behaviour, affect flood risk to the existing community or expose its users to flood risks that require management.”

A detailed desktop assessment of the impact of flooding to the proposed development and surrounding community has been conducted and found that the site is low risk and only affected by flooding in the most severe storm events. The proposed development is not affected by flooding in any storm event up to the 1% AEP and experiences only minor inundation during the PMF event.

Changes to the site, including the building footprint, minor topographical changes, and the proportion of impervious and pervious surfaces, are expected to have a negligible impact on the minor ponding observed within the site and surrounding areas during the probable maximum flood scenario.

Therefore, a FIRA is not required as it is not anticipated that the proposed development will significantly alter flood behaviour and affect flood risk to users or the existing community. Furthermore, this report covers the scope as outlined in section 2.2 and Appendix A of LU01 that would otherwise be covered in a FIRA for the proposed development.

6 Stormwater Management

6.1 Water Quantity Management

The proposed stormwater drainage design has been prepared in accordance with the Sutherland Shire Stormwater Specification.

The objective of stormwater quantity management is to adhere to the following controls as stated in *Sutherland Shire Development Control Plan 2015*:

- “Minimise the impacts of excessive stormwater runoff and flooding of downstream properties.”
- “Control the volume of stormwater runoff from any site to reasonable pre-development levels.”
- “Preserve and enhance water bodies and riparian zones as natural systems.”
- “Manage rainfall runoff from a site in a manner that does not increase the risk of flooding, risk to life, property damage, water pollution, sedimentation, environmental degradation or result in adverse visual impacts.”
- “Enhance the long-term health and quality of waterways and aquifers.”
- “Ensure that the peak discharge rate of stormwater flow from development is no greater than that of the permissible site discharge rate.”
- “Reduce the impacts of stormwater discharge on downstream properties and natural systems.”

6.1.1 Legal Discharge Point

A site survey undertaken by Norton Survey Partners on 03 June 2025 has identified the nearest existing stormwater pit located along Gardere Street. The survey recorded the surface level of the pit at 32.54 metres and the invert level at 30.75 metres.

Due to the presence of an existing tree and its associated Tree Protection Zone (TPZ), a junction pit is proposed along the existing stormwater network to facilitate a compliant connection for the development and associated drainage requirements.

6.1.2 Tailwater Assumption

The downstream tailwater level is a critical parameter used to evaluate potential backwater effects at the proposed outlet, considering the performance and capacity of the existing stormwater network.

As part of the hydraulic assessment conducted using DRAINS, a tailwater level corresponding to the kerb invert elevation of 32.50 has been adopted for the 1% AEP event, while a pipe obvert level of 31.05 has been assumed for the 5% AEP event.

6.1.3 Water Quantity Catchment

The DRAINS model was set up to represent the post-developed scenario and existing green field scenario. The site was divided into sub-catchments based on the layout and topography. The proposed DRAINS catchment breakdown is shown in X. Details of water quantity catchment delineation shall be read in conjunction with civil drawings sets prepared by Mott Macdonald.

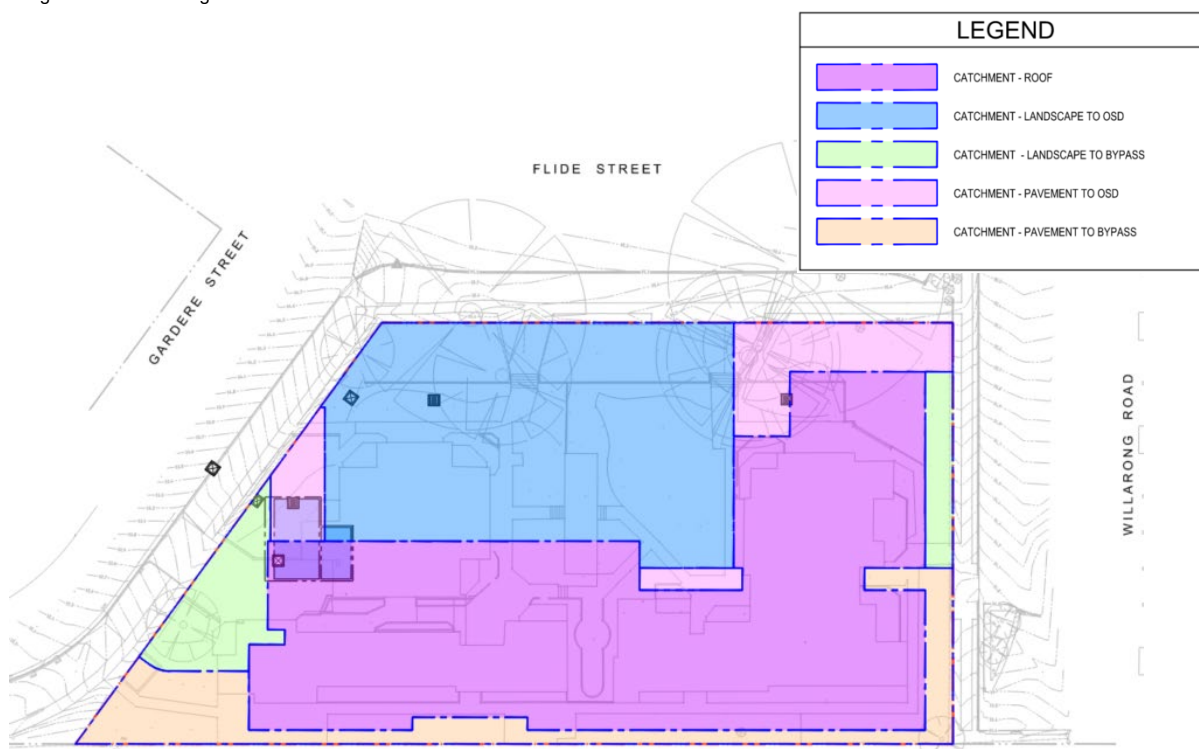


Figure 6-1: Water Quantity Catchment Plan

6.1.3.1 On-site Detention System

An on-site detention system has been proposed to ensure the following stated objectives are achieved:

- “Minimise the impacts of excessive stormwater runoff and flooding of downstream properties.”
- “Control the volume of stormwater runoff from any site to reasonable pre-development levels.”
- “The post development rate of stormwater runoff (both piped and overland) from the site shall not exceed the rate of flow from the site than would exist prior to the subject development occurring.”
- “The peak rate of flow for any site shall be calculated on the basis of catering for all storm events up to and including the 1% AEP event.”
- “Preserve and enhance water bodies riparian zones as natural systems.”

An on-site detention system detains stormwater temporarily while releasing it at a controlled manner that can be accommodated by the existing council drainage system.

In accordance with the stormwater drainage design requirements set by the Sutherland Shire Council, Mott MacDonald has reviewed the existing site conditions alongside the proposed architectural plans to determine an optimal solution for managing stormwater runoff. The objective is to minimise impacts on neighbouring properties and the existing drainage infrastructure.

The proposed on-site detention (OSD) system will be situated beneath the upper ground floor, suspended above the lower ground level. Its footprint will remain within the basement extent. The OSD outlet is designed to discharge into the proposed junction pit located along Gardere Street.

Considering the legal point of discharge, tailwater level assumptions, and the proposed catchment layout, Mott MacDonald has undertaken a hydraulic assessment using DRAINS

software. This assessment evaluates the water levels within the on-site detention tank and determines the required storage volume for all storm events up to and including the 1% Annual Exceedance Probability (AEP).

A summary of the on-site detention system will be provided at a later stage, following completion of the final sizing based on the updated architectural plans once they are received.

Accordingly, post-development site discharge is effectively managed through the implementation of an on-site detention (OSD) tank. Detailed design information regarding the OSD system can be found in the civil drawing set prepared by Mott MacDonald in Appendix A.

6.1.4 Overland Flow Path

During major storm events, overland flow is expected to traverse through the courtyard area, with sheet flow directed towards the nearest street outlets.

7 Water Quality Management

To ensure that the development improves the quality of stormwater leaving the development site, Mott MacDonald has reviewed the site and formulated a Water Sensitive Urban Design concept model, treatment train effectiveness and summarised the results in this section of the report. MUSIC software was utilised to simulate urban stormwater systems operating at a range of temporal and spatial scales. MUSIC models the total amounts of gross pollutants, phosphorus, nitrogen and total suspended solids produced within various types of catchments. It allows the user to simulate the removal rates expected when implementing water quality treatment devices to reduce the increased gross pollutant and nutrient levels created by the proposed development.

7.1 MUSIC Modelling Pluviograph Data Input

As there is no official MUSIC rainfall file available for the Sutherland Shire Council Local Government Area (LGA), an alternative approach was required to proceed with the water quality modelling. To address this, Ocean Protect was contact requesting for a MUSIC template with built in rainfall data of the nearest station. The rainfall data adopted covers the period from 1979-1988.

7.2 Water Quality Catchment

The MUSIC model was set up to represent the post-developed scenario. The site was divided into sub-catchments based on the layout and topography. The proposed MUSIC catchment breakdown is shown in Table 7-1. Details of water quality catchment deliniation shall be read in conjunction with stormwater management plan prepared by Mott Macdonlad.

A water quality catchment plan will be provided in later issues.

The proposed catchments are separated into the following land use types:

- **Roof** – The roof area of all proposed buildings.
- **Landscape** – Both landscape and natural areas that are within the development.
- **Mixed Area** – All paved area outside roof and landscape area

MUSIC soil and groundwater parameters are set as per Table 7-1 and MUSIC node rainfall runoff parameters are set as per Table 7-2 respectively.

Table 7-1: Soil/groundwater Parameters for MUSIC Modelling

	Units	Mixed	Roof
Impervious area parameters			
Rainfall threshold	mm/day	1.50	1
Pervious area parameters			
Soil storage capacity	mm	120	120
Initial storage	% of capacity	30	25
Field capacity	mm	80	80
Infiltration capacity coefficient - a		200	200
Infiltration capacity coefficient - b		1	1

	Units	Mixed	Roof
Groundwater properties			
Initial depth	mm	10	10
Daily recharge rate	%	25	25
Daily baseflow rate	%	5	5
Daily deep seepage rate	%	0	0

Table 7-2: Stormwater Quality Parameters for MUSIC modelling

Land Use	Storm Flow						Base Flow					
	TSS		TP		TN		TSS		TP		TN	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
(All values expressed as log ₁₀ mg/l)												
Mixed	2.40	0.32	-0.30	0.25	0.34	0.19	1.20	0.17	-0.85	0.19	0.11	0.12
Roofs	1.30	0.32	-0.89	0.25	0.30	0.19	1.10	0.17	-0.82	0.00	0.32	0.12

(Note: SD = Standard Deviation, TSS = Total Suspended Solids, TP = Total Phosphorus and TN = Total Nitrogen)

7.3 Water Quality Treatment Train

The following treatment train has been proposed for the site:

- Stormwater capture within the development area is directed into the civil stormwater network consisting of pit and pipe networks and to be treated by rainwater tank and StormFilters from Ocean Protect or equivalent.
- Stormwater runoff not draining to the water quality chamber shall be installed with an OceanGuard basket within the pit to treat suspended solids as best practice.
- The treatment train that has been modelled is limited to the new building drainage network that drains into the combined water quality / detention tank.

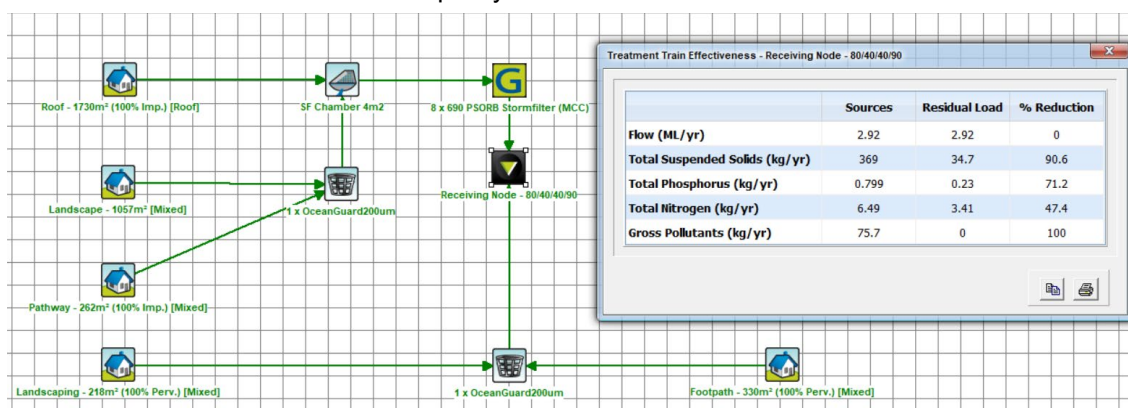


Figure 7-1: MUSIC Modelling Result Extract

7.4 Rainwater Re-use

Downpipes with first flush devices to be installed before roof stormwater entering into rainwater tank to avoid any debris blockage, overflow from rainwater tank shall be directly into StormFilter chamber for further treatment.

7.5 MUSIC Modelling Results

Based on the results of this assessment, the proposed water quality treatment train will provide adequate improvements in Total Suspended Solids, Total Phosphorus, Total Nitrogen and Gross Pollutants for the proposed development. Similarly, Table 7-3 below indicate the minimum works required to meet the water quality targets. Further options could be explored during the detailed design phase of the project to further refine the stormwater network and treatment train and/or achieve higher standards where feasible.

Table 7-3: MUSIC Modelling Assessment Results

Pollutants	Sutherland Shire Development Control Plan 2015, Chapter 38: Stormwater and Groundwater Management	Reduction %	Results
Gross Pollutants (GP)	90%	100%	Satisfy
Total Suspended Solids (TSS)	80%	90.3%	Satisfy
Total Phosphorus (TP)	40%	71.1%	Satisfy
Total Nitrogen (TN)	40%	47.4%	Satisfy

7.6 Maintenance and Access and Safety

7.6.1 Maintenance Requirements

Throughout the operational life of the development, the stormwater system will require regular simple maintenance to ensure effective functionality, minimise lifecycle costs and maintain safety.

It is proposed maintenance activities are the responsibility of the strata facilities department and should generally include:

- Removal of gross pollutants such as litter and debris from open areas to prevent from entering the stormwater network.
- Periodic inspection of the stormwater network including pit/pipe network, StormFilters, detention tanks and outlets at street pits.
- Periodic inspection of rainwater tanks (requirements to be set out by building hydraulic design).
- Unblocking of inlets and outlets (system flushing) as required, including flushing of subsoil drainage systems.
- Removal of sediment build-up as required.
- Landscaping maintenance to grass swales and bio-retention basins.
- Regular inspection of safety elements (such as proposed fencing/gates around bio-retention basins).

7.6.2 Access and Safety

The following items for access and safety should be considered by the project architect and civil engineering team for the detailed design stage of the project:

- Covers and grates to stormwater network to be lockable to prevent unauthorized access or displacement.
- Appropriate fencings / barriers with lockable gates to detention tanks and pipe headwall outlets to prevent access from children.

8 Erosion and Sediment Control

The erosion and sediment control measures will be undertaken for each lot with reference to Landcom Blue Book; Managing Urban Stormwater Soil for best practice through the construction phase to limit any sediments generated from the site from entering the external stormwater network and creek. As such the following measures are to be undertaken as part of the proposed construction works:

- Sediment fence to be installed around the site perimeter to trap any sediment.
- Shaker grid/wash down facility to be installed at the site egress to limit any sediments from being carried outside of the constructions site.
- Stockpile location to be confirmed by contractor on-site during the construction phase, preferably to be located at the highest point of the site.

8.1 Construction Phase Pollutants of Concern

Pollutants that are typically generated during the construction phase of a development have been identified by reviewing the Managing Urban Stormwater: Soils and construction by Landcom. The various pollutants and their priority ratings are listed in the Table 7-1 below.

Table 8-1: Construction Phase Pollutant Loads

Pollutant	Source	Priority
Litter	Paper, construction packaging, food packaging, cement bags, off-cuts	High
Sediment	Unprotected exposed soils and stockpiles during earthworks and building	High
Hydrocarbons	Fuel and oil spill, leaks from construction equipment and temporary carpark areas	High
Toxic materials	Cement slurry, asphalt prime, solvents, cleaning agents, wash waters (e.g., from tile works)	High
pH altering substances	Acid sulfate soils, cement slurry and wash waters	High

8.2 Construction Phase Performance Criteria

The construction phase performance criteria are limited to those parameters that are directly linked to construction site management practices are listed in Table 8-2.

Table 8-2: Construction Phase Performance Criteria

Issue	Construction Phase Stormwater Design Objectives	
Erosion Control	Erosion Control Measures	• Minimise exposure of disturbed soils at any time • Divert water run-off from undisturbed areas around disturbed areas. • Determine the erosion risk rating using local rainfall erosivity, rainfall depth, soil-loss rate or other acceptable methods. • Implement erosion control methods corresponding to identified erosion risk rating

Issue		Construction Phase Stormwater Design Objectives
Sediment Control	Sediment control measures	Determine appropriate sediment control measures using: • Potential soil loss rate, or • Monthly erosivity, or • Average monthly rainfall
	Design storm for sediment control basins.	Collect and drain stormwater from disturbed soils to sediment basin for design storm event:
	Sediment basin dewatering	• Design storm for sediment basin sizing is 80th % five-day event or similar. Site discharge during sediment basin dewatering: • TSS < 50mg/l TSS, and • Turbidity not > 10% receiving water turbidity, and
Water Quality	Litter and other waste, hydrocarbons and other contaminants	Avoid wind-blown litter; remove gross pollutants. Ensure there is no visible oil or grease sheen on released waters. Dispose of waste containing contaminants at authorised facilities
Water stability and flood flow Management	Changes to the natural waterway hydraulics and hydrology	For peak flow for the 1-year and 100-year ARI event, use constructed sediment basins to attenuate the discharge rate of stormwater from the site

9 Conclusion

The objective of this Integrated Water Management Plan is to provide a comprehensive and detailed overview of the proposed stormwater drainage system for the proposed development site. It also outlines the approach taken to ensure compliance with various regulations and guidelines, including those set forth by the Sutherland Shire DCP and relevant council guidelines.

This Integrated Water Management Plan has been developed in accordance with the guidelines and standards listed outlined below:

- Sutherland Shire Council DCP
- Sutherland Shire Council Stormwater Specification
- Australian Standards 3500.3 Plumbing and Drainage – Stormwater Drainage
- DRAINS User Manual
- MUSIC User Manual
- Managing Urban Stormwater – Soils and Construction, Volume 1, 4th edition, March 2004, Landcom
- National Code Australia

To manage the impacts of the proposed development on the existing site and downstream stormwater conditions. The Integrated Water Management Plan addressed the following components:

- Stormwater quantity management includes implementing detention tanks to mitigate the peak flows from the site to retain existing conditions.
- Stormwater quality management implementing treatment trains with StormFilter cartridges, OceanGuard baskets and rainwater tank to achieve the water quality objectives.
- Recommended maintenance and safety and access considerations.
- Construction phase erosion and sediment control measures to minimise soil erosion and control sediment discharge from site.

The implementation of the measures outlined in this plan in the development of this site will result in no worsening stormwater and environmental conditions and will provide improvement to quality of the runoff discharged from the site.

For a comprehensive understanding of the water management plan, this report should be read in conjunction with the civil drawing set prepared by Mott MacDonald, located in Appendix A.

Appendix A: Civil Drawings

DRAWING LIST

DRAWING NUMBER	DRAWING TITLE
103419-MMD-CAR-XX-DR-C-0000	COVER SHEET, DRAWING LIST AND LOCALITY PLAN
103419-MMD-CAR-XX-DR-C-0001	GENERAL NOTES
103419-MMD-CAR-XX-DR-C-0011	EROSION AND SEDIMENT CONTROL PLAN
103419-MMD-CAR-XX-DR-C-0015	EROSION AND SEDIMENT CONTROL DETAILS
103419-MMD-CAR-XX-DR-C-0051	SITEWORKS & DRAINAGE UPPER GROUND FLOOR PLAN
103419-MMD-CAR-XX-DR-C-0052	SITEWORKS & DRAINAGE LOWER GROUND FLOOR PLAN
103419-MMD-CAR-XX-DR-C-0331	ON-SITE DETENTION SECTION AND DETAILS
103419-MMD-CAR-XX-DR-C-0511	WATER QUANTITY CATCHMENT PLAN
103419-MMD-CAR-XX-DR-C-0512	WATER QUALITY CATCHMENT PLAN

SEARS REQUIREMENT

WATER MANAGEMENT	SECTION OF REPORT WHERE RESPONSE IS PROVIDED
- Detail the proposed drainage design and servicing infrastructure to be incorporated as part of the development (stormwater and wastewater). - Demonstrate how the development complies with council's drainage requirements and identify proposed stormwater treatment and water quality management measures to minimise adverse environmental impacts.	- 103419-MMD-CAR-XX-DR-C-0051 - 103419-MMD-CAR-XX-DR-C-0052 - 103419-MMD-CAR-XX-DR-C-0331 - 103419-MMD-CAR-XX-DR-C-0511 - 103419-MMD-CAR-XX-DR-C-0512

HOMES NSW AFFORDABLE HOUSING

2 FLIDE STREET,
CARINGBAH, NSW 2229

COVER SHEET, DRAWING LIST AND LOCALITY PLAN
SSD-84862461
ISSUE FOR INFORMATION



LOCALITY PLAN

NTS

SOURCE: NEARMAP (2025)

NOT FOR CONSTRUCTION

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M M MOTT MACDONALD	Level 10, 383 Kent Street Sydney, NSW 2000 Australia NSW 2000, Australia PO Box Q1678, QVB Sydney T +61 (0)2 9098 6800 W www.mottmac.com		0123456789101112131415161718192021222324252627282930313233343536373839404142434445464748495051525354555657585960616263646566676869707172737475767778798081828384858687888990919293949596979899100	SCALE 050m100m 1:1000	CLIENT NSW GOVERNMENT Homes NSW	TITLE 2 FLIDE STREET, CARINGBAH, NSW 2229 COVER SHEET, DRAWING LIST AND LOCALITY PLAN	DRAWING INFORMATION	
	Drawn: J. O Designed: A. DE BORJA Checked: A TARSHAN Approved: -	Revision: 01 Status: INF Security: STD						
	DRAWING NUMBER 103419-MMD-CAR-XX-DR-C-0000							
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FILE LOCATION: C:\Users\mottmac\Documents\Projects\103419-MMD-CAR-XX-DR-C-0000\103419-MMD-CAR-XX-DR-C-0000-Cover Sheet.dwg

103419-MMD-CAR-XX-DR-C-0000

GENERAL NOTES	
GN1	ALL WORKMANSHIP AND MATERIALS SHALL COMPLY WITH THE NATIONAL CONSTRUCTION CODE OF AUSTRALIA AND THE RELEVANT CURRENT AUSTRALIAN STANDARDS.
GN2	ANY DISCREPANCIES, OMISSIONS OR ERRORS SHALL BE REPORTED TO THE SUPERINTENDENT FOR CLARIFICATION BEFORE PROCEEDING WITH THE WORK.
GN3	DO NOT SCALE MEASUREMENTS FROM THE DRAWINGS.

STORMWATER NOTES

SW1	FOR RESIDENTIAL SUBDIVISIONS AND PUBLIC ROADS . ALL 0375mm TO 0600mm DRAINAGE PIPES SHALL BE CLASS 4 APPROVED SPIGOT AND SOCKET REINFORCED CONCRETE PIPES WITH RUBBER JOINT LINES IN ACCORDANCE WITH ASHES 1260/2009 . DRAINAGE PIPES SHALL BE CLASS 3 APPROVED SPIGOT AND SOCKET REINFORCED CONCRETE PIPES WITH RUBBER JOINT JOINTS (UNJO).
	ALL P-V-C-U DRAINAGE PIPES IN FOOTPATHS OR ACCESS WAYS SHALL BE P-V-C-U DRAINAGE CLASS 58 IN ACCORDANCE WITH ASHES 1260/2009 . - P-V-C-P PIPES AND FITTINGS FOR DRAIN, WASTE AND VENT APPLICATION . HEAVY DUTY P-V-C-P TO BE IN ACCORDANCE WITH ASHES 1254 . 2010 - P-V-C-P PIPES AND FITTINGS FOR STORM AND SURFACE WATER APPLICATIONS MAY BE USED WITHIN ALLOWMENTS.
SW2	FOR COMMERCIAL OR INDUSTRIAL SITES - ALL 0300mm TO 0600mm DRAINAGE PIPES SHALL BE CLASS 4 APPROVED SPIGOT AND SOCKET REINFORCED CONCRETE PIPES WITH RUBBER JOINTS (UNJO) . ALL 0675mm OR LARGER DRAINAGE PIPES SHALL BE CLASS 3 APPROVED SPIGOT AND SOCKET REINFORCED CONCRETE PIPES WITH RUBBER JOINTS (UNJO) . ALL DRAINAGE PIPES LESS THAN OR EQUAL TO 0225mm SHALL BE P-V-C-U DRAINAGE CLASS 58 IN ACCORDANCE WITH ASHES 1260/2009 - P-V-C-P PIPES AND FITTINGS FOR DRAIN, WASTE AND VENT APPLICATION WITH SOLVENT WELDED JOINTS.
SW3	EQUIVALENT STRENGTH FIBREGLASS REINFORCED CONCRETE (F.R.C.) AND/OR HIGH DENSITY POLYETHYLENE (H.D.P.E.) MAY BE USED SUBJECT TO APPROVAL BY THE SUPERINTENDENT.
SW4	ALL PIPE JOINTS UP TO AND INCLUDING 0450mm AND TAPERS, SHALL BE VIA PURPOSE MADE FITTINGS (UNJO).
SW5	MINIMUM GRADE TO STORMWATER LINES TO BE 1% (UNJO).
SW6	CONTRACTOR TO SUPPLY AND INSTALL ALL FITTINGS AND SPECIALS INCLUDING VARIOUS PIPE ADAPTORS TO ENSURE PROPER CONNECTION BETWEEN DISSIMILAR PIPEWORK.
SW7	ALL CONNECTIONS TO EXISTING DRAINAGE PITS SHALL BE MADE IN A TRADESMAN LIKE MANNER AND THE INTERNAL WALL OF THE PIT AT THE POINT OF ENTRY SHALL BE CEMENT RENDERED TO ENSURE A SMOOTH FINISH WITH NO PROTRUSIONS.
SW8	ALL IN-SITU CONCRETE PITS TO BE 320mm MINIMUM AT 28 DAYS.
SW9	PITS AND PIPES IN AREAS OF SALINITY HAZARD SHALL HAVE INCREASED COVER TO ANY REINFORCEMENT.
SW10	Precast concrete pits may be installed in lieu of cast in-situ pits, when pipe joints are accommodated within the overall dimensions of the pit, and approved by the superintendent.
SW11	PITS DEEPER THAN 1000mm SHALL BE 1500mm INSTALLED IN ACCORDANCE WITH THE LOCAL OR STATUTORY AUTHORITY REQUIREMENTS.
SW12	BEDDING SHALL BE TYPE HZ (UNJO) FOR PIPES NOT UNDER PAYMENTS . AND TYPE H2S FOR PIPES UNDER PAYMENTS IN ACCORDANCE WITH ASHES 1254 . 2007 - DESIGN FOR INSTALLATION OF BURIED CONCRETE PIPES.
SW13	BEDDING TRENCH WITH SAND OR APPROVED GRANULAR BACKFILL TO 300mm (MIN) ABOVE THE PIPE . WHERE THE PIPE IS UNDER PAYMENTS BACKFILL REMAINDER OF TRENCH TO PAYMENT SURFACE WITH SAND OR APPROVED GRAVEL . SUB BASE COMPACTED IN 150mm LAYERS TO 98% STANDARD MAXIMUM DRY DENSITY . THE CONTRACTOR IS TO ENSURE COMPACTION EQUIPMENT IS APPROPRIATE FOR THE PIPE CLASS USED.
SW14	WHERE STORMWATER LINES PASS UNDER FLOOR SLABS DWG GRADE P-V-C-U RUBBER JOINT ARE TO BE USED (UNJO).
SW15	WHERE SUBSOL DRAINAGE LINES PASS UNDER FLOOR SLABS AND VEHICULAR PAVEMENTS, UNLITTED P-V-C-U DWG GRADE CLASS 58 PIPE SHALL BE USED.
SW16	PROVIDE 3m LENGTH OF 0100mm SUBSOL DRAINAGE LINE OR 200 NYLON STRIP DRAIN SURROUNDING WITH 150mm of 20mm BLVD GRAVEL AND 100mm OF 10mm #4 GEOTEXTILE FILTER FABRIC OR APPROVED EQUIVALENT . AT INVERT OF INCOMING UPSTREAM PIPE ON EACH PIT.

SITEWORKS NOTES

S#1 DATUM : Australian Height Datum (AHD)
ORIGIN OF LEVELS : BM / SSM 1234 10.00
ORIGIN OF CO-ORDINATES : Mapping Grid of Australia (MGA)
SURFACE PREPARED BY :

S#2 THE CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORK, AND REPORT ANY DISCREPANCIES TO THE SUPERINTENDENT.

S#3 ALL EXISTING SERVICES (INCLUDING ANY NOT SHOWN ON THE PLANS) MUST BE IMMEDIATELY REPORTED TO POSITIONING AND LEVEL PRIOR TO ANY EXCAVATION. ANY DISCREPANCIES SHALL BE REPORTED TO THE SUPERINTENDENT. MINIMUM SERVICE CLEARANCES SHALL BE MAINTAINED FROM THE RELEVANT SERVICE AUTHORITY.

S#4 THE CONTRACTOR SHALL ARRANGE FOR ALL SETTING OUT BY A REGISTERED SURVEYOR.

S#5 IT IS THE CONTRACTORS RESPONSIBILITY TO NOTIFY THE DEPARTMENT OF LAND AND SURVEY INFORMATION NOW, OF ANY SURVEY MARKS THAT WILL BE DESTROYED IN THE CONSTRUCTION OF WORKS.
CONTACT HEAD OFFICE ON 1300 552 637 <http://www.landsurv.gov.au>
and http://www.landsurv.gov.au/publications_report_frames.html

S#6 THE CONTRACTOR SHALL OBTAIN ALL REGULATORY AUTHORITY APPROVALS AT THEIR OWN EXPENSE.

S#7 WHERE NEW WORKS MAINTAIN EXISTING DRAINAGE, THE CONTRACTOR MUST ENSURE THAT A SMOOTH AND EVEN PROFILE, FREE FROM ABRUPT CHANGES IS OBTAINED.

S#8 ALL DISTURBED AREAS SHALL BE RESTORED TO THEIR ORIGINAL CONDITION, UNLESS SPECIFIED OTHERWISE.

S#9 EXCAVATED TRENCHES SHALL BE COMPACTED TO THE SAME DENSITY AS THE ADJACENT NATURAL MATERIAL, ANY SUBSIDENCE'S DURING THE PERIOD TO BE RECTIFIED AS DIRECTED BY THE SUPERINTENDENT.

S#10 ANY EXISTING TREES WHICH FORM PART OF THE FINAL LANDSCAPING DESIGN ARE TO BE PROTECTED FROM CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH THE LANDSCAPE ARCHITECT'S DETAILS AND / OR BY -

PROTECTING THEM WITH BARRIER FENCING OR SIMILAR MATERIALS INSTALLED OUTSIDE THE DRIP LINE, ENSURING THAT NOTHING IS NESTED UNDER THEM.

PROHIBITING PAVING, GRADING, SEDIMENT WASH OR PLACING OF STOCKPILES WITHIN THE DRIP LINE EXCEPT UNDER THE FOLLOWING CONDITIONS:

ENCROACHMENT ONLY OCCURS ON ONE SIDE AND NO CLOSER TO THE TRUNK THAN EITHER 1.5m OR HALF THE DISTANCE BETWEEN THE OUTLINE OF THE DRIP LINE AND THE TRUNK, WHICH EVER IS THE GREATER.

A DRAINAGE SYSTEM THAT ALLOWS AIR AND WATER TO CIRCULATE THROUGH THE ROOT ZONE OF A TREE AND THAT THE SOIL AROUND ALL FILL LAYERS OF MORE THAN 300mm cape IS TAKEN NOT TO CUT ROOTS UNNECESSARILY NOR TO COMPACT THE SOIL AROUND THEM.

S#11 RECEPTORS FOR CONCRETE AND MORTAR SLURRIES, PAINTS, ADX WASHINGS, LIGHT WEIGHT WASTE MATERIALS AND LITTER ARE TO BE PROVIDED AS NECESSARY. DISPOSAL OF WASTE SHALL BE IN A MANNER APPROVED BY THE SUPERINTENDENT OR AS SPECIFIED IN THE WORKS CONTRACT.

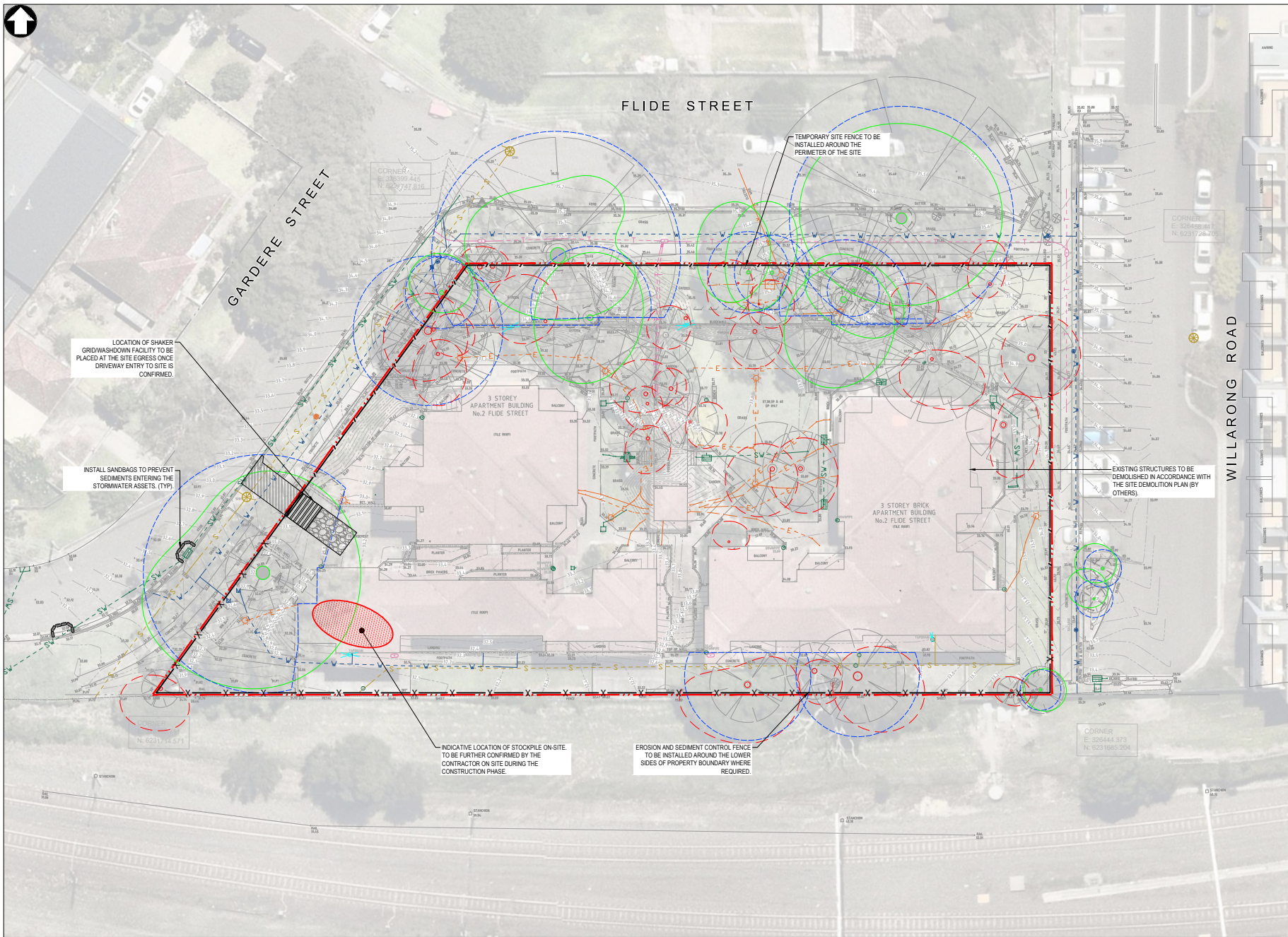
EXISTING SERVICES NOTES

- E51 EXISTING SERVICES HAVE BEEN PLOTTED FROM SUPPLIED DATA AND AS SUCH THEIR ACCURACY CANNOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE SUPERINTENDENT.
- E52 THE CONTRACTOR SHALL ALLOW FOR THE CAPPING, OFF, EXCAVATION AND REMOVAL IF REQUIRED OF ALL REDUNDANT EXISTING SERVICES IN AREAS AFFECTED BY WORKS WITHIN THE CONTRACT AREA, AS SHOWN ON THE DRAWINGS UNLESS DIRECTED OTHERWISE BY THE SUPERINTENDENT.
- E53 THE CONTRACTOR SHALL ENSURE THAT AT ALL TIMES SERVICES TO ALL BUILDINGS NOT AFFECTED BY THE WORKS ARE NOT DISRUPTED.
- E54 IF REQUIRED, THE CONTRACTOR SHALL CONSTRUCT TEMPORARY SERVICES TO MAINTAIN EXISTING SUPPLY TO BUILDINGS REMAINING IN OPERATION DURING WORKS TO THE SATISFACTION AND APPROVAL OF THE SUPERINTENDENT. ONCE DIVERSION IS COMPLETE AND COMMISSIONED THE CONTRACTOR SHALL REMOVE ALL SUCH TEMPORARY SERVICES AND MAKE GOOD TO THE SATISFACTION OF THE SUPERINTENDENT AND THE RELEVANT SERVICE AUTHORITY.
- E55 INTERRUPTION TO SUPPLY OF EXISTING SERVICES SHALL BE DONE SO AS NOT TO CAUSE ANY INCONVENIENCE TO THE PRINCIPAL. THE CONTRACTOR IS TO GAIN APPROVAL FROM THE SUPERINTENDENT FOR ALL INTERRUPTION. THE CONTRACTOR IS RESPONSIBLE FOR ALL LIAISON.
- E56 ALL BRANCH GAS AND WATER SERVICES UNDER DRIVEWAYS AND BRICK PAVING SHALL BE LOCATED IN 0.080mm uPVC SEWER GRADE COVERS EXTENDING A MINIMUM OF 500mm BEYOND THE EDGE OF PAVING.
- E57 CLEARANCE AND COVER REQUIREMENTS SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY BEFORE COMMENCEMENT OF WORKS AND SHALL BE ADHERED TO AT ALL TIMES.
- E58 CARE IS TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATIONS ARE TO BE UNDERTAKEN OVER TELECOM OR ELECTRICAL SERVICES. HAND EXCAVATE IN THESE AREAS ONLY.

SOIL AND WATER MANAGEMENT NOTES	
GENERAL INSTRUCTIONS	
SWM01	THESE PLANS PRESENT A CONCEPTUAL SOIL AND WATER MANAGEMENT PLAN (SWMP) ONLY AND SHOWS A POSSIBLE WAY OF MANAGING SOIL AND EROSION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ESTABLISHMENT AND MANAGEMENT OF THE SITE AND PREPARING A DETAILED PLAN AND OBTAINING APPROVAL FROM THE RELEVANT AUTHORITY PRIOR TO THE COMMENCEMENT OF ANY WORKS.
SWM02	THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE ENGINEERING PLANS AND ANY OTHER PLANS, WRITTEN INSTRUCTIONS, SPECIFICATION OR DOCUMENTATION THAT MAY BE ISSUED AND RELATING TO DEVELOPMENT OF THE SUBJECT SITE.
SWM03	THE CONTRACTOR WILL ENSURE THAT ALL SOIL AND WATER MANAGEMENT WORKS ARE CONSISTENT WITH MANAGING URBAN STORMWATER - SOLIDS AND CONSTRUCTION - ALSO KNOWN AS THE BLUE BOOK.
SWM04	ALL BUILDERS AND SUB-CONTRACTORS SHALL BE INFORMED OF THEIR RESPONSIBILITIES IN MINIMISING THE POTENTIAL FOR SOIL EROSION AND POLLUTION TO DOWNSLOPE LANDS AND WATERWAYS.
EROSION CONTROL	
SWM05	WATER SHALL BE PREVENTED FROM ENTERING THE PERMANENT DRAINAGE SYSTEM UNTIL SEDIMENT CONCENTRATION IS LESS THAN OR EQUAL TO 50mg/L, IS THE CATCHMENT AREA HAS BEEN PERMANENTLY LANDSCAPED AND / OR ANY LIKELY SEDIMENT HAS BEEN FILTERED THROUGH AN APPROVED STRUCTURE.
SWM06	ANY SAND USED IN THE CONCRETE CURING PROCESS (SPREAD OVER THE SURFACE) WILL BE REMOVED AS SOON AS POSSIBLE AND WITHIN 10 WORKING DAYS FROM PLACEMENT.
SWM07	ACCEPTABLE RECEPTORS WILL BE CONSTRUCTED FOR CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS AND LITTER.
SWM08	'SEDIMENT' FENCING WILL BE INSTALLED AS INDICATED ON THE PLANS AND AT THE DIRECTION OF SITE SUPERINTENDENT TO ENSURE CONTAINMENT OF SEDIMENT. THE SEDIMENT FENCING WILL OUTLET OR OVERFLOW UNDER STABILISED CONDITIONS INTO THE SEDIMENT BASIN, TO SAFELY CONVEY WATER INTO A SUITABLE FILTERING SYSTEM THROUGH THE PORES IN THE FABRIC BULK.
SWM09	THE SEDIMENT BASINS WILL BE CONSTRUCTED WITH THE MINIMUM NET SEDIMENT CAPACITY OF XX CUBIC METRES AND DESIGNED TO REMAIN STABLE IN AT LEAST THE 1 IN XX YEAR CLIMATIC DISTURBANCE RETURN PERIOD. ARTIFICIAL FLOODING OF THE FINER PARTICLES MAY NOT BE NECESSARY IN THIS INSTANCE.
SWM10	STOCKPILES SHOULD NOT BE LOCATED WITHIN 5m OF TREES AND HAZARD AREAS, INCLUDING LIKELY AREAS OF CONCENTRATED OR HIGH VELOCITY FLOWS SUCH AS WATERWAYS, DRAINAGE LINES, PAVED AREAS AND DRIVEWAYS, WHERE THEY ARE WITHIN 5M OF SUCH AREAS. SPECIAL SEDIMENT CONTROL MEASURES SHOULD BE TAKEN TO MINIMISE POSSIBLE POLLUTION TO DOWNSTREAM WATERS. MEASURES SHOULD ALSO BE APPLIED TO PREVENT THE EROSION OF THE STOCKPILE.
SWM11	ALL CUT AND FILL BATTERS ARE TO BE SEEDED AND MULCHED WITHIN 14 DAYS OF COMPLETION OF FORMATION.
SWM12	ANY EXISTING TREES WHICH FORM PART OF THE FINAL LANDSCAPING PLAN WILL BE PROTECTED FROM CONSTRUCTION ACTIVITIES BY: a. PROTECTING THEM WITH BARRIER FENCING OR SIMILAR b. BATTERS INSTALLED NEAR THE DRIP LINE c. ENSURING THAT NOTHING IS NAILED TO THEM d. PROHIBITING PAVING, GRADING, SEDIMENT WASH OR PLACING OF STOCKPILES WITHIN THE DRIP LINE EXCEPT UNDER THE FOLLOWING CONDITIONS: (i) ENCROACHMENT ONLY OCCURS ON ONE SIDE AND NO CLOSER TO THE TRUNK THAN EITHER 1.5 METRES OR HALF THE DISTANCE BETWEEN THE OUTER EDGE OF THE DRIP LINE AND THE TRUNK, WHICHEVER IS THE GREATER. (ii) A DRAINAGE SYSTEM THAT ALLOWS AIR AND WATER TO CIRCULATE THROUGH THE ROOT ZONE (E.G. A GRAVEL BED) IS PLACED UNDER ALL FILL LAYERS OF MORE THAN 300 MILLIMETRES DEPTH (iii) CARE IS TAKEN.
SWM13	DURING WINDY WEATHER, LARGE DISTURBED UNPROTECTED AREAS SHOULD BE KEPT MOST (NOT WET) BY SPRINKLING WITH WATER TO KEEP DUST UNDER CONTROL.
SWM14	TEMPORARY PROTECTION FROM EROSIONE FORMS WILL BE UNDERTAKEN ON LANDS WHERE FINAL SHAPING HAS NOT BEEN COMPLETED BUT WORKS ARE UNLIKELY TO PROCEED FOR PERIODS OF TWO MONTHS OR MORE (EG. ON TOPSOIL STOCKPILES). THIS MAY BE ACHIEVED WITH A VEGETATIVE COVER, A RECOMMENDED LISTING OF PLANT SPECIES FOR TEMPORARY COVER IS: i) AUTUMN / WINTER SOWING - OATS / FREEDRAT AT 20 kg/ha - JAPANESE MILLET AT 10 kg/ha ii) SPRING / SUMMER SOWING - JAPANESE MILLET AT 20 kg/ha - OATS / FREEDRAT AT 10 kg/ha
SWM15	DIVERSION BANKS / CHANNELS WILL BE REHABILITATED AS SOON AS POSSIBLE AND WITHIN 5 WORKING DAYS FROM THEIR FINAL SHAPING. OTHER THAN IN THE WINTER MONTHS, SUITABLE MATERIALS INCLUDE TURF GRASSES SUCH AS COUCH OR KIKUYO. DURING WINTER, OR AT OTHER TIMES WHEN TEMPORARY REHABILITATION (MORE THAN 3 MONTHS) IS REQUIRED, IT IS SUGGESTED THAT HESSIAN CLOTH IS USED ONLY IF TACKED WITH APPROPRIATE PEGS AND AN ANONIC BITUMEN EMULSION. FOOT AND VEHICULAR TRAFFIC SHOULD BE KEPT AWAY FROM THESE AREAS.
SWM16	UNDERTAKE SITE DEVELOPMENT WORKS IN ACCORDANCE WITH THE ENGINEERING PLANS, WHERE POSSIBLE. PHASE DEVELOPMENT SO THAT LAND DISTURBANCE IS CONFINED TO AREAS OF WORKABLE SIZE.
CONSTRUCTION SEQUENCE	
SWM17	WHERE PRACTICAL, THE SOIL EROSION HAZARD ON THE SITE SHOULD BE KEPT AS LOW AS POSSIBLE. TO THIS END, WORKS SHOULD BE UNDERTAKEN IN THE FOLLOWING SEQUENCE: (i) INSTALL INLET SEDIMENT TRAPS TO ALL GULLY PITS FRONTING THE SITE. (ii) INSTALL 1.8m CHAIN WIRE FENCE AROUND THE BOUNDARIES AND ATTACH HESSIAN CLOTH OR SIMILAR TO IT ON THE INNERWARD SIDE (TIES AT THE TOP, CENTRE AND BOTTOM AND AT 1M INTERVALS OR AS INSTRUCTED BY THE SUPERINTENDENT). (iii) INSTALL GEOGRABIC SEDIMENT FENCE AND SEDIMENT TRAPS AROUND ALL PERMANENT STORMWATER RETICULATION STRUCTURES AS SHOWN ON THE PLAN. (iv) CONSTRUCT STABILISED CONSTRUCTION ENTRANCE AS SHOWN ON THE PLAN OR TO LOCATION AS DETERMINED BY SUPERINTENDENT. (v) INSTALL DIVERSION BANKS ALONG THE BOUNDARY WHERE REQUIRED, REHABILITATE DISTURBED LANDS DOWNSLOPE FROM THE BASINS WITHIN 20 WORKING DAYS. (vi) ENSURE THAT THE SEDIMENT BASIN IS DIRECTED ONTO A TURFED AREA AND DRAINS TO A SUITABLE LOCATION. A TEMPORARY STORMWATER LINE MAY BE NECESSARY TO CONVEY THE FLOWS TO THIS LOCATION. CONSTRUCT DIVERSION CHANNELS AT THE BOUNDARY TO DRAIN INTO THE SEDIMENT BASIN AS SHOWN ON PLANS. (vii) AT COMPLETION STABILISE SITE AND DECOMMISSION SEDIMENT BASIN AND ALL EROSION CONTROL DEVICES.
SWM18	TEMPORARY SOIL AND WATER MANAGEMENT STRUCTURES WILL BE REMOVED ONLY AFTER THE LANDS THEY ARE PROTECTING ARE REHABILITATED.
SWM19	FINAL SITE LANDSCAPING WILL BE UNDERTAKEN AS SOON AS POSSIBLE AND WITHIN 20 WORKING DAYS FROM COMPLETION OF CONSTRUCTION ACTIVITIES.
SITE INSPECTION AND MAINTENANCE	
SWM20	AT LEAST WEEKLY AND AFTER EVERY RAIN FALL EVENT, THE CONTRACTOR WILL INSPECT THE SITE AND ENSURE THAT - (i) DRAINS AND ALL SEDIMENT CONTROL DEVICES OPERATE EFFECTIVELY AND INITIATE REPAIR OR MAINTENANCE AS REQUIRED. (ii) RECEPTORS FOR CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS AND LITTER ARE TO BE EMPLOYED AS NECESSARY. DISPOSAL OF WASTE SHALL BE IN A MANNER APPROVED BY THE SUPERINTENDENT. (iii) SPILLED SAND (OR OTHER MATERIALS) IS REMOVED FROM HAZARD AREAS, INCLUDING LIKELY AREAS OF CONCENTRATED OR HIGH VELOCITY FLOWS SUCH AS WATERWAYS, GUTTERS, PAVED AREAS AND DRIVEWAYS. (iv) SEDIMENT IS REMOVED FROM BASINS AND / OR TRAPS WHEN LESS THAN 20mm OF TRAPPING CAPACITY REMAINS PER 100m² OF DISTURBED LANDS, AND / OR LESS THAN 500mm DEPTH REMAINS IN THE SETTLING ZONE. ANY COLLECTED SEDIMENT WILL BE DISPOSED IN AREAS WHERE FURTHER POLLUTION TO DOWN SLOPE LANDS AND WATERWAYS IS UNLIKELY. (v) REHABILITATED LANDS HAVE EFFECTIVELY REDUCED THE EROSION HAZARD AND INITIATE UPGRADING OR REPAIR AS APPROPRIATE.
SWM21	THE CONTRACTOR SHALL PROVIDE ALL MONITORING CONTROL AND TESTING.

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M M MOTT MACDONALD		Level 10, 383 Kent Street Sydney, NSW 2000 Australia NSW 2000, Australia PO Box Q1678, QVB Sydney T +61 (0)2 9098 6800 W www.mottmac.com		<table><tr><td>01</td><td>23.09.25</td><td>ISSUED FOR INFORMATION</td><td>ADB</td><td>AT</td></tr><tr><td>Rev</td><td>Date</td><td>Description</td><td>Ch'k'd</td><td>App'd</td></tr></table>		01	23.09.25	ISSUED FOR INFORMATION	ADB	AT	Rev	Date	Description	Ch'k'd	App'd	SCALE 1:100 0 5m 10m		CLIENT  		TITLE 2 FLIDE STREET, CARINGBAH, NSW 2229 GENERAL NOTES		DRAWING INFORMATION Drawn: J O Designed: A DE BORJA Checked: A TARSHAN Approved: - Revision: 01 Status: INF Security: STD		DRAWING NUMBER 103419-MMD-CAR-XX-DR-C-0001	
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LEGEND

SITE BOUNDARY

ADJACENT SITE BOUNDARY LINE

TEMPORARY CONSTRUCTION SITE ACCESS WITH SHAKE GRID

EXISTING STORMWATER PITS

EXISTING LEVELS

SEDIMENT TRAP - SAND BAGS

SEDIMENT FENCE

INDICATIVE LOCATION OF STOCKPILE

EXISTING TREES TO BE REMOVED
- REFER TO SITE ARBORIST REPORT FOR DETAILS

EXISTING TREES TO BE RETAINED
- REFER TO SITE ARBORIST REPORT FOR DETAILS

TREE PROTECTION ZONE
- REFER TO SITE ARBORIST REPORT FOR DETAILS

TREE PROTECTION AREA
- REFER TO SITE ARBORIST REPORT FOR DETAILS

TREE PROTECTION FENCE
- REFER TO SITE ARBORIST REPORT FOR DETAILS

GENERAL NOTES

1. CONTRACTORS TO CONFIRM PUMP-OUT FROM DEEP BASEMENT EXCAVATION.

2. UPON INSTALLATION OF NEW STORMWATER PITS, SANDBAGS ARE TO BE PLACED AROUND PROPOSED PITS TO PREVENT AND SEDIMENT RUNOFF TO THE PITS.

3. EROSION AND SEDIMENT CONTROL MEASURES TO BE INSTALLED IN ACCORDANCE WITH THE PUBLICATION URBAN STORMWATER SOILS AND CONSTRUCTION 'THE BLUE BOOK' (4TH EDITION) PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION, EXCAVATION OR CONSTRUCTION WORKS UPON THE SITE.

4. BUILDERS SHALL PROVIDE SEDIMENT FENCING MATERIAL DURING CONSTRUCTION TO THE LOW SIDE BOUNDARIES. SEDIMENT CONTROL FABRIC SHALL BE AN APPROVED MATERIAL (eg PROPAB SILT FENCE OR SIMILAR) STANDING MINIMUM 500mm ABOVE GROUND AND EXTENDING 200mm BELOW GROUND.

5. GRASS VERGES AND VEGETATION SHALL BE MAINTAINED AS MUCH AS PRACTICAL AND SHALL NOT BE CLEARED FROM NEIGHBORING SITE TO PROVIDE A BUFFER ZONE TO THE CONSTRUCTION SITE.

6. NO PARKING OR STOCK PILING OF MATERIALS IS PERMITTED ON THE LOWER SIDE OF SEDIMENT FENCE.

7. VEHICLE ACCESS SHALL BE RESTRICTED TO ONE DESIGNATED POINT AS SHOWN AND VEHICLE CROSSINGS ARE TO BE ADEQUATELY COVERED AT ALL TIMES WITH BLUE METAL OR THE LIKE.

8. TEMPORARY CONSTRUCTION ENTRY POINT SHALL BE AS PER DRAWING 0015. BUILDER TO ENSURE ALL DROPPABLE SOIL AND SEDIMENT IS REMOVED PRIOR TO CONSTRUCTION TRAFFIC EXITING SITE USING VEHICLE WHEEL WASH, CATTLE GRID, WHEEL SHAKER OR OTHER APPROPRIATE DEVICE. BUILDER SHALL ENSURE ALL CONSTRUCTION TRAFFIC ENTERING AND LEAVING THE SITE, DO SO IN A FORWARD DIRECTION.

9. ALL STORMWATER INCIDENT ON THE CONSTRUCTION SITE MUST BE COLLECTED AND APPROPRIATELY DISPOSED OF IN A MANNER THAT DOES NOT INCREASE THE FLOOD RISK FOR THE CATCHMENT AREA OR DEGRADE THE QUALITY OF WATER BEING DISPOSED OF TO COUNCIL STORMWATER INFRASTRUCTURE.

10. MEASURES OUTLINED IN THE EROSION AND SEDIMENT CONTROL PLAN MUST BE IMPLEMENTED PRIOR TO AND MAINTAINED DURING AND AFTER THE CONSTRUCTION WORKS.

11. ALL DISTURBED AREAS AND STOCKPILES TO BE STABILISED WITH 5 DAYS.

12. TOPSOIL TO BE STRIPPED, STOCKPILED AND RE-SPREAD ON COMPLETION OF EARTHWORKS. NONE TO BE REMOVED.

13. NO DISTURBANCE OF THE SITE OTHER THAN IMMEDIATE AREA OF WORKS.

14. SEDIMENT BASIN TO BE SIZED IN ACCORDANCE WITH 'SOILS AND CONSTRUCTION, VOLUME 1, MANAGING URBAN STORMWATER GUIDE'.

NOTE:

THIS PLAN IS CONCEPT ONLY. IT IS CREATED TO HIGHLIGHT SOME OF THE SEDIMENT AND EROSION CONTROL MEASURES WHICH MAY APPEAR. THE CONTRACTOR IS RESPONSIBLE FOR THE FINAL DESIGN AND ENSURING ALL MEASURES ARE TAKEN TO PROTECT THE ENVIRONMENT.

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GOVERNMENT

Homes

NSW

TITLE

2 FLIDE STREET,
CARINGBAH, NSW 2229
EROSION AND SEDIMENT CONTROL
PLAN

DRAWING INFORMATION

Drawn: J O

Designed: A. DE BORJA

Checked: A TARSHAN

Approved: -

Revision: 02

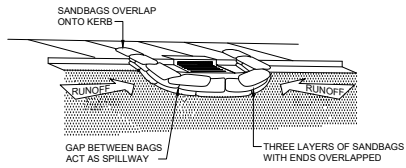
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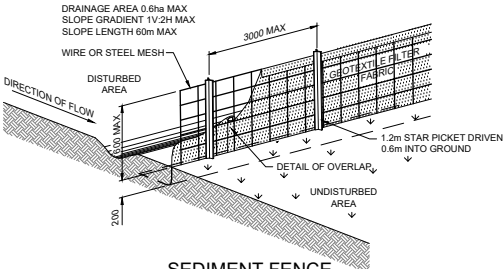
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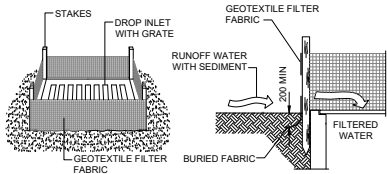
SEDIMENT TRAP FOR KERB INLET
(AT LOW POINT - SANDBAG)

NTS



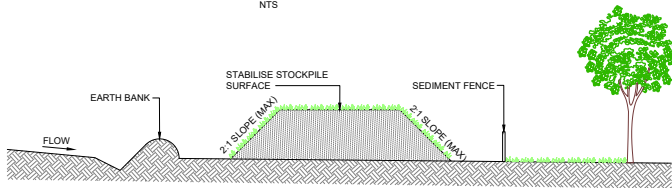
SEDIMENT FENCE
(GEOTEXTILE FILTER FABRIC)

NTS



SEDIMENT TRAP FOR DROP INLET
(GEOTEXTILE FILTER FABRIC)

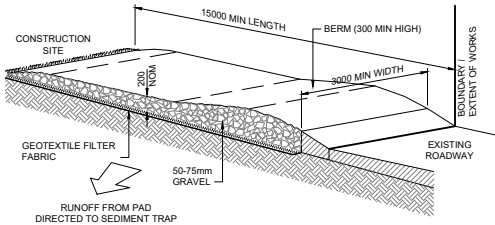
NTS



- CONSTRUCTION NOTES**
1. PLACE STOCKPILES AS DIRECTED BY THE SUPERINTENDENT.
 2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
 3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2m IN HEIGHT.
 4. WHERE THEY ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED E.S.C.P OR S.W.M.P. TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
 5. CONSTRUCT EARTH BANKS ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND INSTALL SEDIMENT FENCES 1m TO 2m UPSLOPE CONSISTENT WITH MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION", ALSO KNOW AS "THE BLUE BOOK".

STOCKPILES

NTS

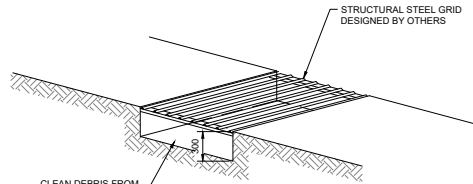


TEMPORARY SITE ENTRANCE

NTS

MAINTENANCE

- THE TEMPORARY ACCESS SHALL BE MAINTAINED IN A CONDITION THAT PREVENTS TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY.
- THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL GRAVEL AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
- ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS OF WAY MUST BE REMOVED IMMEDIATELY.



SHAKER PAD

NTS

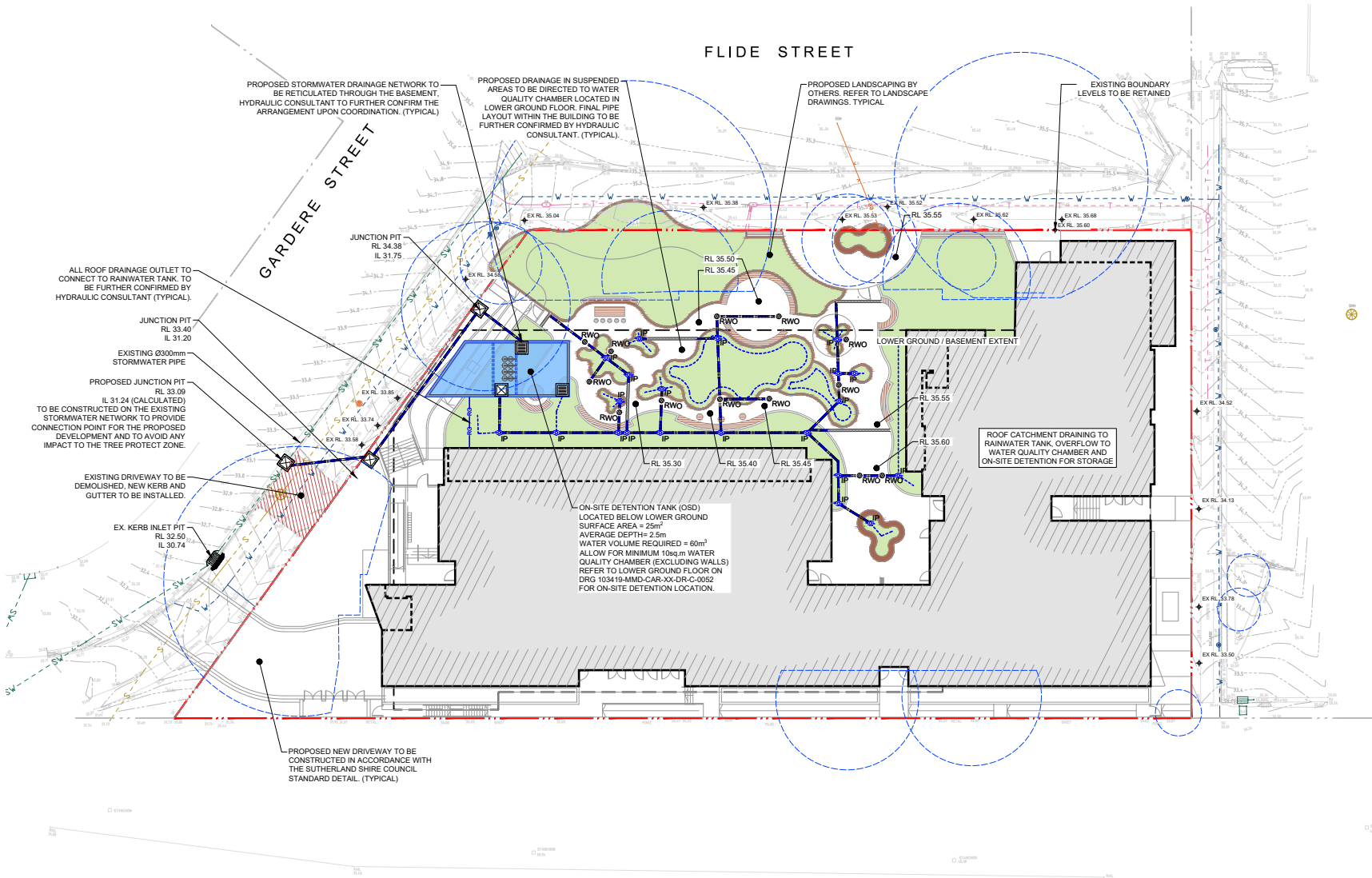
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103419-MMD-CAR-XX-DR-C-0015



LEGEND

PROPOSED SITE BOUNDARY

EXISTING

BOUNDARY

SW

STORMWATER

STORMWATER

SUBSOIL

JUNCTION PIT

SURFACE INLET PIT

GRATED TRENCH DRAIN

INSPECTION POINT

RWO

RAINWATER OUTLET

ON-SITE DETENTION TANK

TREE PROTECTION ZONE

- REFER TO SITE ARBORIST REPORT FOR DETAILS

NOTES:

1. TOTAL SITE AREA = 3,596m²

2. PROPOSED STORMWATER DRAINAGE IS CONCEPT ONLY FOR DEVELOPMENT APPROVAL AND SUBJECT TO DETAILED DESIGN AT CONSTRUCTION ON CERTIFICATE STAGE.

3. EXISTING SERVICES SHOWN INDICATIVE ONLY. REFER TO SERVICE PLANS APPROVED BY RELEVANT AUTHORITIES FOR FURTHER INFORMATION. EXISTING SERVICES SUBJECT TO FURTHER INVESTIGATION PRIOR TO CONSTRUCTION FOR DETAILED DESIGN PURPOSES.

4. ALL PROPOSED STORMWATER TO BE DESIGNED TO CATER FOR MINOR STORM EVENT OF 5% AEP IN ACCORDANCE WITH SUTHERLAND SHIRE STORMWATER SPECIFICATION 2009, SECTION 5.3.

5. SAFE OVERLAND FLOW PATH TO CATER FOR MAJOR STORM OF 100 YEAR ARI.

6. ALL BUILDING DRAINAGE TO BE CONFIRMED BY HYDRAULIC CONSULTANTS.

7. PROVIDE OCEAN PROTECT STORMFILTER CARTRIDGES OR SIMILAR, DETAILS TO BE PROVIDED BY THE MANUFACTURER.

8. REFER EX DRAINING 103419-MMD-CAR-XX-DR-C-0051 FOR ON-SITE DETENTION DETAILS.

9. ON-SITE DETENTION TANK TO BE DESIGNED IN ACCORDANCE WITH SUTHERLAND SHIRE COUNCIL STORMWATER AND GROUNDWATER MANAGEMENT DOP 2015, CHAPTER 38 AND STORMWATER MANAGEMENT GUIDELINE.

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SCALE
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NSW GOVERNMENT

Homes NSW

TITLE

2 FLIDE STREET,
CARINGBAH, NSW 2229
SITEWORKS AND DRAINAGE
UPPER GROUND FLOOR PLAN

DRAWING INFORMATION

Drawn: J O
Designed: A. DE BORJA
Checked: A TARSHAN
Approved: -

Revision: 01
Status: INF
Security: STD

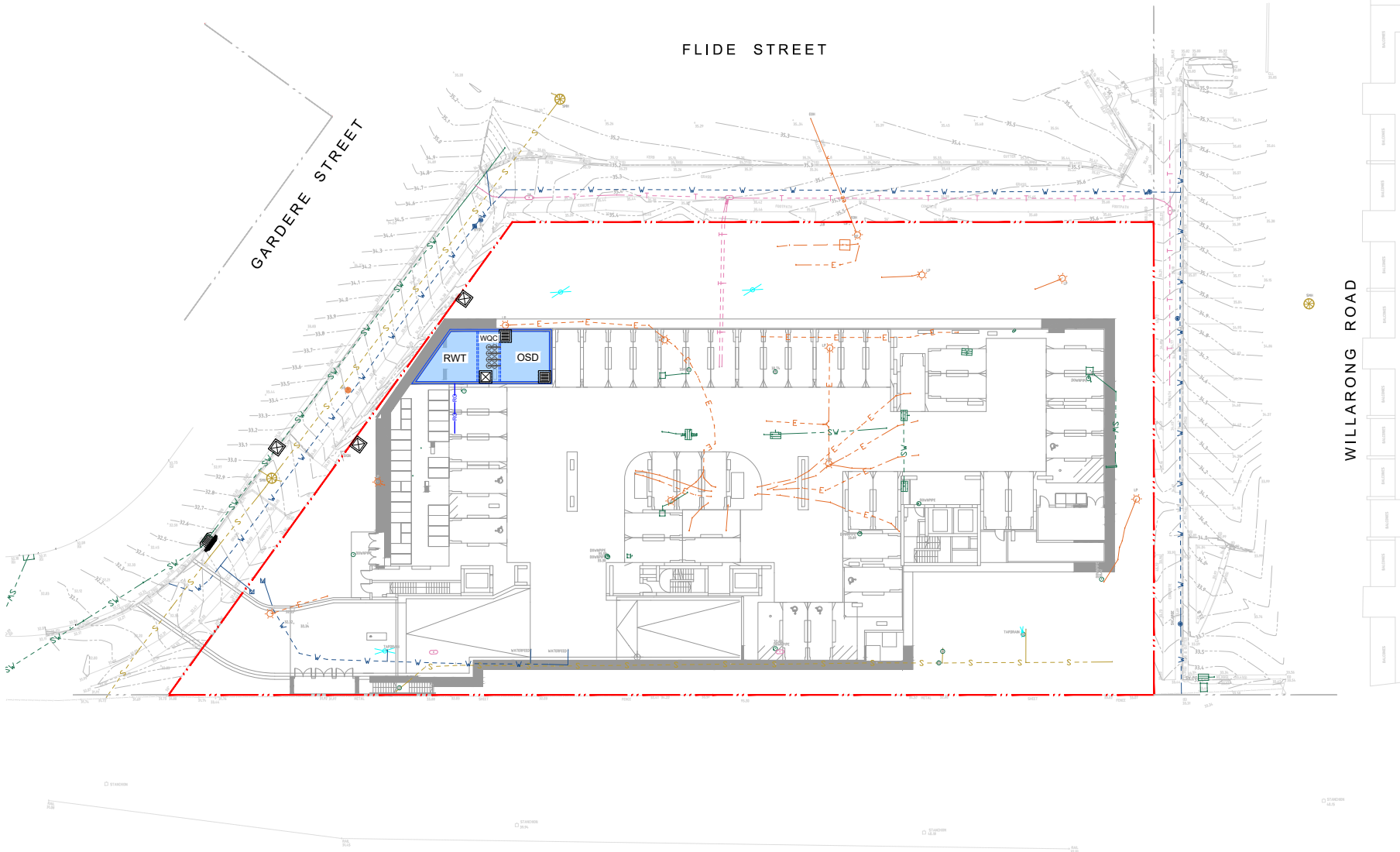
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103419-MMD-CAR-XX-DR-C-0051

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LEGEND	
	PROPOSED SITE BOUNDARY
	EXISTING BOUNDARY
	PROPOSED DRAINAGE PIPE
	PROPOSED KERB JUNCTION PIT
	PROPOSED OSD TANK

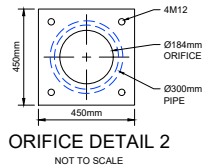
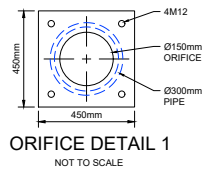
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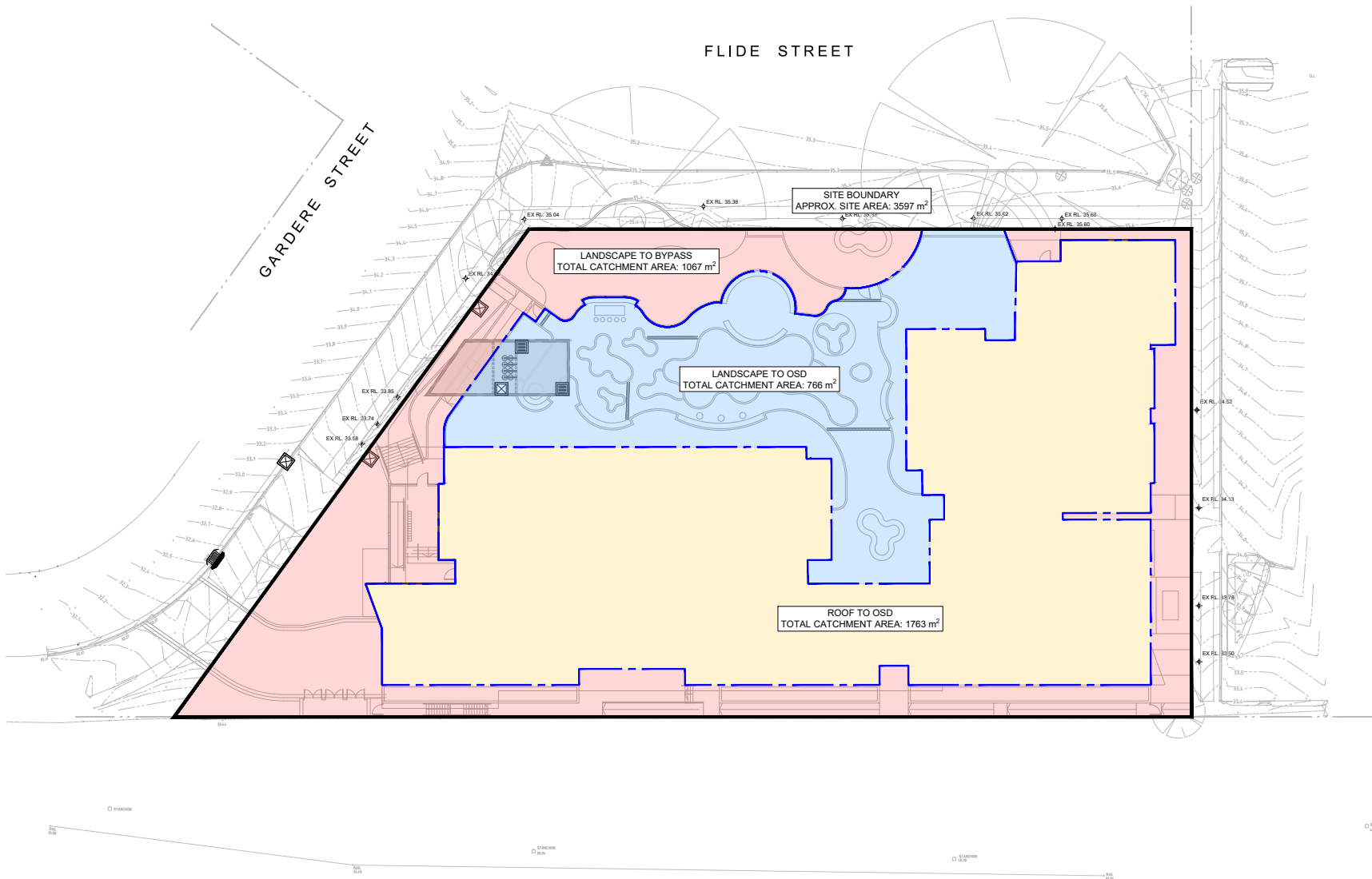
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		Rev	Date	Description	Chk'd	App'd							
SCALE 1:200 0 10m 20m						CLIENT  NSW GOVERNMENT  Homes NSW		TITLE 2 FLIDE STREET, CARINGBAH, NSW 2229 SITEWORKS AND DRAINAGE LOWER GROUND FLOOR PLAN		DRAWING INFORMATION Drawn: J. O Designed: A. DE BORJA Checked: A. TARSHAN Approved: - Revision: 01 Status: INF Security: STD			
DRAWING NUMBER 103419-MMD-CAR-XX-DR-C-0052													

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SITE CATCHMENT	
TOTAL SITE AREA (ha)	0.3597
PROPOSED ROOF TO OSD	0.1763
PROPOSED LANDSCAPE TO BYPASS	0.1067
PROPOSED LANDSCAPE TO OSD	0.0786

WILLARONG ROAD

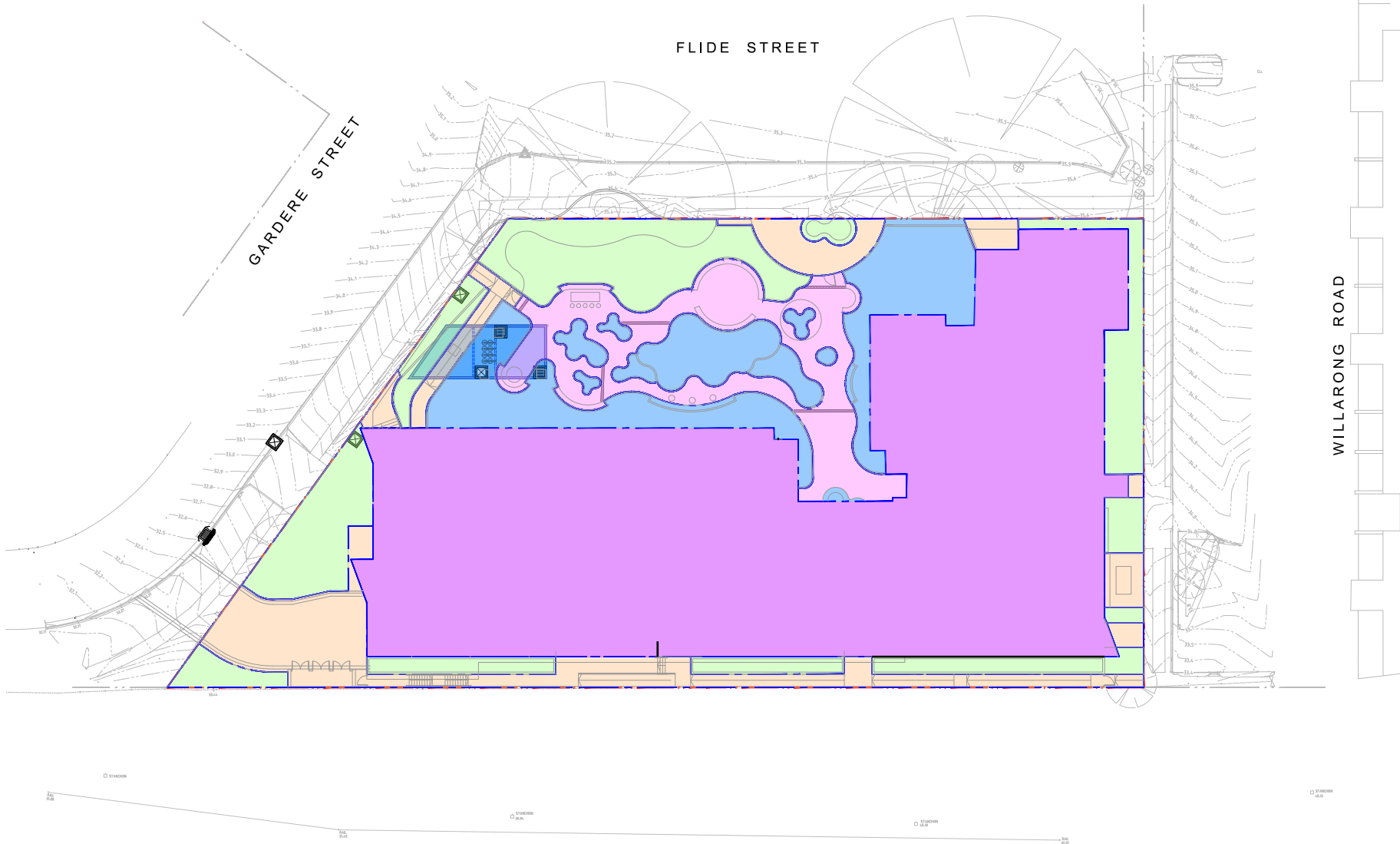
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Rev	Date	Description	Chk'd	App'd																								
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LEGEND	
	CATCHMENT - ROOF
	CATCHMENT - LANDSCAPE TO OSD
	CATCHMENT - LANDSCAPE TO BYPASS
	CATCHMENT - PAVEMENT TO OSD
	CATCHMENT - PAVEMENT TO BYPASS

NOTES:	
TOTAL SITE AREA: 3,596m ²	
POLLUTANT REDUCTION TARGETS SPECIFIED IN SUTHERLAND SHIRE DEVELOPMENT CONTROL PLAN 2015, CHAPTER 38, STORMWATER AND GROUND MANAGEMENT SECTION 6.2:	
TOTAL SUSPENDED SOLIDS (TSS):	80%
TOTAL PHOSPHORUS (TP):	40%
TOTAL NITROGEN (TN):	40%
GROSS POLLUTANT (GP):	90%

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