

Central Element – Lavender Bay

Integrated Water Management Plan 64-66 Lavender St & 3-7 Middlemiss St, Lavender Bay

CLIENT/ Central Element

DATE/ 11/03/2026

CODE/ 25-1385

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Document Registration

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1. Introduction

This Integrated Water Management Plan has been prepared by AT&L on behalf of Central Element to support the State Significant Development Application (SSDA) (SSD-86797708) of a proposed high density residential development at 64-66 Lavender Street and 3-7 Middlemiss Street, Lavender Bay NSW 2060. The site is located with the North Sydney Council Local Government Area (LGA) and is legally described as SP 538, SP 52429, SP 52428, SP 70601 and lot 4 DP 19368.

1.1. SSDA Project Description

The proposed development seeks approval for the rezoning of the site and development consent for the construction of a residential development.

1) The SSDA specifically involves the following works:

- Demolition of the existing buildings on site;
- Site excavation, and other preparatory site works;
- Construction of a 32 and 23-storey residential flat building including 3% designated affordable housing consisting of approximately a total of 160 dwellings,
- Five levels of basement parking,
- Vehicular access from Lavender Street and loading access from Middlemiss Street,
- A new public accessible open space, including through-site link and site landscaping and
- Site amalgamation,
- Utility and services augmentation as required.

To accommodate the proposed SSDA, a concurrent rezoning is sought to increase the site's maximum building height.

1.2. Site Description

The site is approximately 2,700m² in area and currently comprises of individual residential lots. There is an approximately 4% fall across site from the north to the south. An aerial photo of the site is shown at Error! Reference source not found. below.

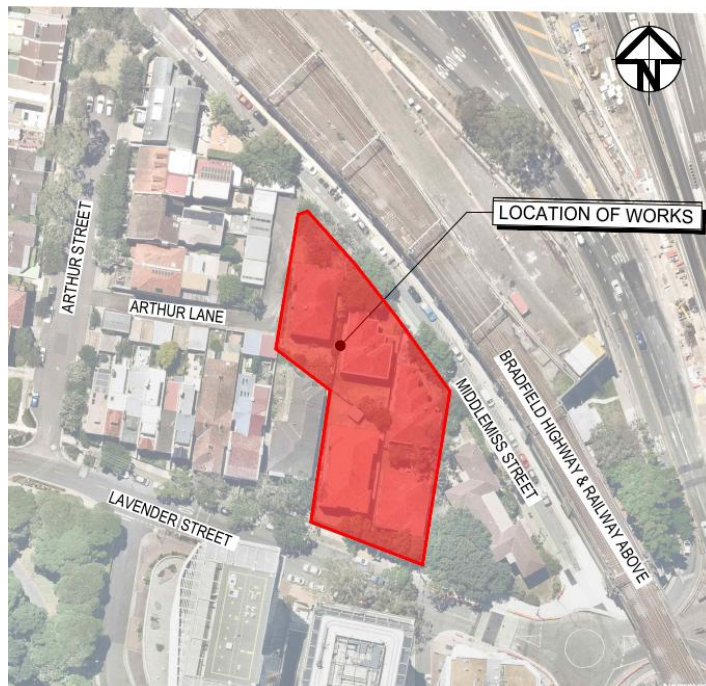


Figure 1 3-7 Middlemiss Street, Lavender Bay (Source: Nearmap, AT&L Civil Drawings)

1.3. Secretary's Environmental Assessment Requirements

In accordance with section 4.39 of the Environmental Planning & Assessment Act 1979 (EP&A Act), Secretary's Environmental Assessment Requirements (SEARs) (SSD-86797708) have been issued. This report has been prepared to respond to the issued SEARs, as set out in the table below.

Table 1 SEARs Declaration

Declaration		
Qualified Professional Name	Suzanne Mustafa	
Qualified Professional Qualifications	Bachelors of Civil and Environmental Engineering, Diploma in Engineering Practice, Member of Engineers Australia	
The undersigned declares that this IWMP has been prepared in response to the following SEARs requirements issued for the Project on 30 June 2025 (EIS) and 2 July 2025 (Rezoning Report) for SSD-86797708:		
SEARs item no.	SEARs Issue and Assessment Requirement	Relevant Section of this Report that addresses SEARs Requirement
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.	- Drainage design has been discussed in detail in Section 4 of this report. Electrical, communications, sewer and potable water infrastructure is present around the site on Middlemiss Street, Lavender Street and Arthur Lane for the development to connect into. A Combined Services Plan has been prepared to demonstrate this – refer to AT&L drawing 25-1385-C1080. - Council drainage requirements have been complied with as discussed in Section 4 of this report. On-Site Detention tanks have been designed as per Council requirements and correspondence and stormwater treatment devices have been incorporated to achieve Council's pollutant reduction targets.
Signed 		
Dated	11-03-2026	

2. Scope of Report

The scope of this report is to discuss the water management strategy for this site, including:

- Stormwater management, including On-Site Detention (OSD);
- Water Sensitive Urban Design; and
- Sediment and Erosion Control.

2.1. Supporting Documentation

The following documentation should be read in conjunction with this report:

- Architectural SSDA drawings by SJB Architects (Rev 1, dated 06/02/2026)
- Civil Engineering Drawings by AT&L (Job reference: 25-1385)

3. Flooding

As per advice received from Council (refer Appendix E), the site is not within the Flood Planning Area and is not subject to specific flood planning level requirements. They have advised that any basement entry is to be 300mm above the adjacent existing ground. This has been implemented in the design by providing a 300mm freeboard from any basement entry to the adjacent gutter invert level.

4. Stormwater Management

4.1. Design Criteria

The design criteria has been adopted from the requirements stipulated in the following documents:

- North Sydney Council Development Control Plan (2025)
- Email correspondence from Council (refer Appendix B)
- Managing Urban Stormwater Soil and Construction (2004) by Landcom ('The Blue Book')
- AS/NZS3500.3 (2025) Plumbing and Drainage
- Australian Rainfall and Runoff (ARR) 2019

4.1.1. Hydrology

This stormwater network has been designed by AT&L to accommodate to a minor storm of 5% AEP and a major storm of 1% AEP. It is noted that North Sydney DCP does not list a design/minor storm. AT&L's calculations have adopted 5% AEP as the design storm based on the neighbouring City of Sydney guidelines.

Watercom DRAINS is used as the hydrology and hydraulic modelling software. The ILSAX method has been utilised when modelling the stormwater network within DRAINS.

Further parameters include:

- Rainfall intensities have been sourced from Bureau of Meteorology's (BOM) rainfall IFD Data System.
- Runoff coefficients shall be calculated in accordance with the ARR 2019.

4.1.2. Hydraulics

- A hydraulic grade line (HGL) design method shall be adopted for pipe drainage design and will be shown on long sections.
- All pipes shall be a minimum Class 4 RCP unless otherwise approved by Council Engineers.
- Minimum pipe size for public domain is to be DN375.
- All RCP pipes to be constructed to include rubber ring joints.
- Pipe cover to be minimum 600mm in roadways, and 400mm in footpath and landscaped areas.
- Minimum internal grade of 1% is to be adopted for design. A maximum of 10% is to also be adopted.
- Pipe friction coefficients to be adopted in the DRAINS model will be the standard coefficients set. See table below outlining pipe model properties.
- Blockage factors have been adopted as 20% for on-grade pits and 80% for sag pits in line with general practice.

Table 2- Pipe Details

Material	Mannings – n	Colebrook-White - k	Minimum Pipe Class U.N.O
RCP	0.013	0.3	4

- All pipes shall be designed for the ultimate service loads and where applicable, construction loads will be accounted for.
- Maximum overland flow limit for pedestrian and shared zone is 50mm deep, 1.5m wide and a maximum velocity of 0.4m²/s.

4.2. Proposed Stormwater Drainage

4.2.1. On-Site Detention Tanks

The stormwater management strategy is to collect the stormwater from both buildings into the On-Site Detention (OSD) tank, located in Basement 1 towards the south-east corner of the site, which will discharge stormwater via an orifice in a controlled manner into Council's stormwater network on Lavender Street. An overview of the OSD location is shown on **Error! Reference source not found.** A pipe extension will be required from the existing kerb inlet pit near the intersection of Arthur Street and Lavender Street to the site to convey discharge from the OSD.

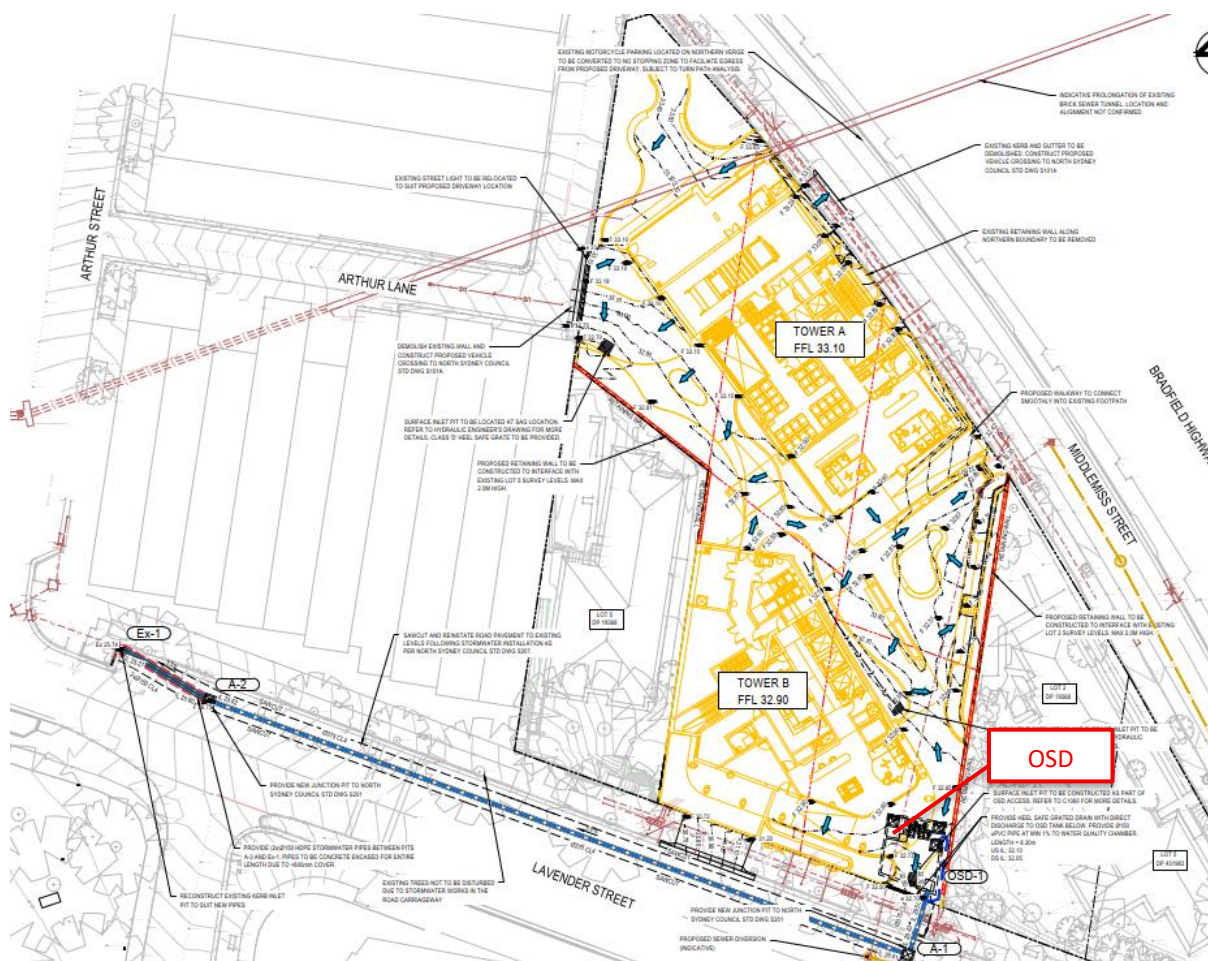


Figure 2: OSD Location (Source: AT&L Civil Drawings)

Advice was sought from North Sydney Council on the minimum OSD volume requirement and Permissible Site Discharge (PSD) (refer Appendix B), which was used to design the proposed OSDs.

On site detention must be provided to ensure that the maximum discharge of stormwater collected from the undeveloped site, which would occur during a 1 in 5-year storm of 1-hour duration is not exceeded. The undeveloped site is noted as the site in it's current condition. Based on this, AT&L have used DRAINS software to determine that the permissible site discharge from this site is 46 l/s.

Further, Council advised that stormwater run-off from the site for all storms up to a 1 in 100-year storm event is to be retained on the site for gradual release to the kerb and gutter or piped drainage system, with piped drainage being the preference if available within 50m of the site. The also require that provision is to be made for satisfactory overland flow should a storm in excess of the above parameters occur.

The OSD design is in accordance with the requirements above. The proposed OSDs parameters are provided in Table 3 below.

Table 3: OSD Parameters

Permissible Site Discharge (l/s)	OSD Volume Provided (m ³)	5% AEP discharge (l/s) Including bypass flows	1% AEP discharge (l/s) Including bypass flows	Emergency Overflow
44	75	35	43	Surcharge via OSD grate and onto Lavender Street

5. Water Sensitive Urban Design

Water Sensitive Urban Design (WSUD) is intended to minimise the impacts of development upon the water cycle and to achieve more sustainable forms of urban development. MUSIC X software has been utilised to demonstrate that the proposed stormwater treatment meets the pollutant reduction targets required by North Sydney Council (Refer to Appendix B). AT&L have adopted the City of Sydney MUSIC-link Profile's properties, concentration parameters and climate data that are preset and remained unchanged. Refer to a conceptual view of the model and MUSIC-Link report in Appendices C and D for further information.

5.1. Water Quality Devices and Measures

A combination of pit baskets (Ocean Protect's 'Oceanguard' have been nominated) and filtration cartridges (Ocean Protect's 'Stormfilters' have been nominated) are proposed within the OSD tanks to treat runoff from the building roof and open space areas.

5.2. Water Quality Modelling - MUSIC X Results

The water quality modelling demonstrates that the proposed treatment measures satisfactorily meet the pollutant reduction targets set by North Sydney Council (Refer to Appendix B). The results are shown below.

Table 4: MUSICX Modelling Results

Pollutant	Sources (Kg/yr)	Residual Load (Kg/yr)	Reduction (%)	Target Reduction (%)
Total Suspended Solids	390.9	74.37	80.98	80
Total Phosphorus	0.6556	0.1791	72.69	45
Total Nitrogen	4.803	2.114	56	45
Gross Pollutants	49.95	2.918	94.16	70

6. Sediment and Erosion Control

6.1. Sediment and Erosion Control (Construction)

The Stormwater Management Plan has been prepared in accordance with the Landcom's Managing Urban Stormwater- Soils and Construction (2004) and the relevant Council guidelines.

6.2. Sources of Pollution

The activities and aspects of the works that have potential to lead to erosion, sediment transport, siltation and contamination of natural waters include:

- Earthworks undertaken immediately prior to rainfall periods.
- Work areas that have not been stabilised.
- Clearing of vegetation and the methods adopted, particularly in advance of construction works.
- Stripping of topsoil, particularly in advance of construction works.
- Bulk earthworks and construction of pavements.
- Works within drainage paths, including depressions and waterways.
- Stockpiling of excavated materials.
- Storage and transfer of oils, fuels, fertilisers and chemicals.
- Maintenance of plant and equipment.
- Ineffective implementation of erosion and sediment control measures.
- Inadequate maintenance of environmental control measures; and
- Time taken for the rehabilitation / revegetation of disturbed areas.

6.3. Potential Impacts

The major potential impacts on waterways relate to erosion of distributed areas or stockpiles and sediment transportation. Potential adverse impacts from erosion and sediment transportation can include:

- Loss of topsoil.
- Increased water turbidity.
- Decreased levels of dissolved oxygen.
- Changed salinity levels.
- Changed pH levels.
- Smothering of stream beds and aquatic vegetation.
- Reduction in aquatic habitat diversity.
- Increased maintenance costs; and
- Decrease in waterway capacity leading to increased flood levels and durations.

6.4. Construction Methodology

The following construction methodology will be followed to minimise the impact of sedimentation due to construction works:

- Diversion of "clean" water away from the disturbed areas and discharge via suitable scour protection.
- Diversion of sediment-laden water into temporary sediment control tanks/basins to capture the design storm volume and undertake flocculation (if required). This will generally be the basement excavation in urban development.

- Provision of construction traffic shaker grids and wash-down facilities to prevent vehicles carrying soil beyond the site.
- Provision of catch drains to carry sediment-laden water to sediment tanks/basins.
- Provision of silt fences to filter and retain sediments at source.
- Provision of geofabric filters to new stormwater pits to retain sediments at source; and
- Where future construction and building works are not proposed, the rapid stabilisation of disturbed and exposed ground surfaces with turf or hydro-seeding.

6.5. Site Inspection and Maintenance

The inspection and maintenance requirements outlined in this section must be carried out while either earthworks or quarrying is being conducted, and all areas re-established.

The Contractor will be required to inspect the site after every rainfall event and at least weekly, and will:

- Inspect and assess the effectiveness of the SWMP and identify any inadequacies that may arise during normal work activities or from a revised construction methodology. Construct additional erosion and sediment control works as necessary to ensure the desired protection is given to downstream lands, drainage systems, and waterways.
- Ensure that drains operate properly and to affect any repairs.
- Remove spilled sand or other materials from hazard areas, including lands closer than 5 metres from areas of likely concentrated or high velocity flows especially waterways and paved areas.
- Remove trapped sediment whenever less than design capacity remains within the structure.
- Ensure rehabilitated lands have affectively reduced the erosion hazard and to initiate upgrading or repair as appropriate.
- Maintain erosion and sediment control measures in a fully functioning condition until all construction activity is completed and the site has been rehabilitated; and
- Remove temporary soil conservation structures as the last activity in the rehabilitation.

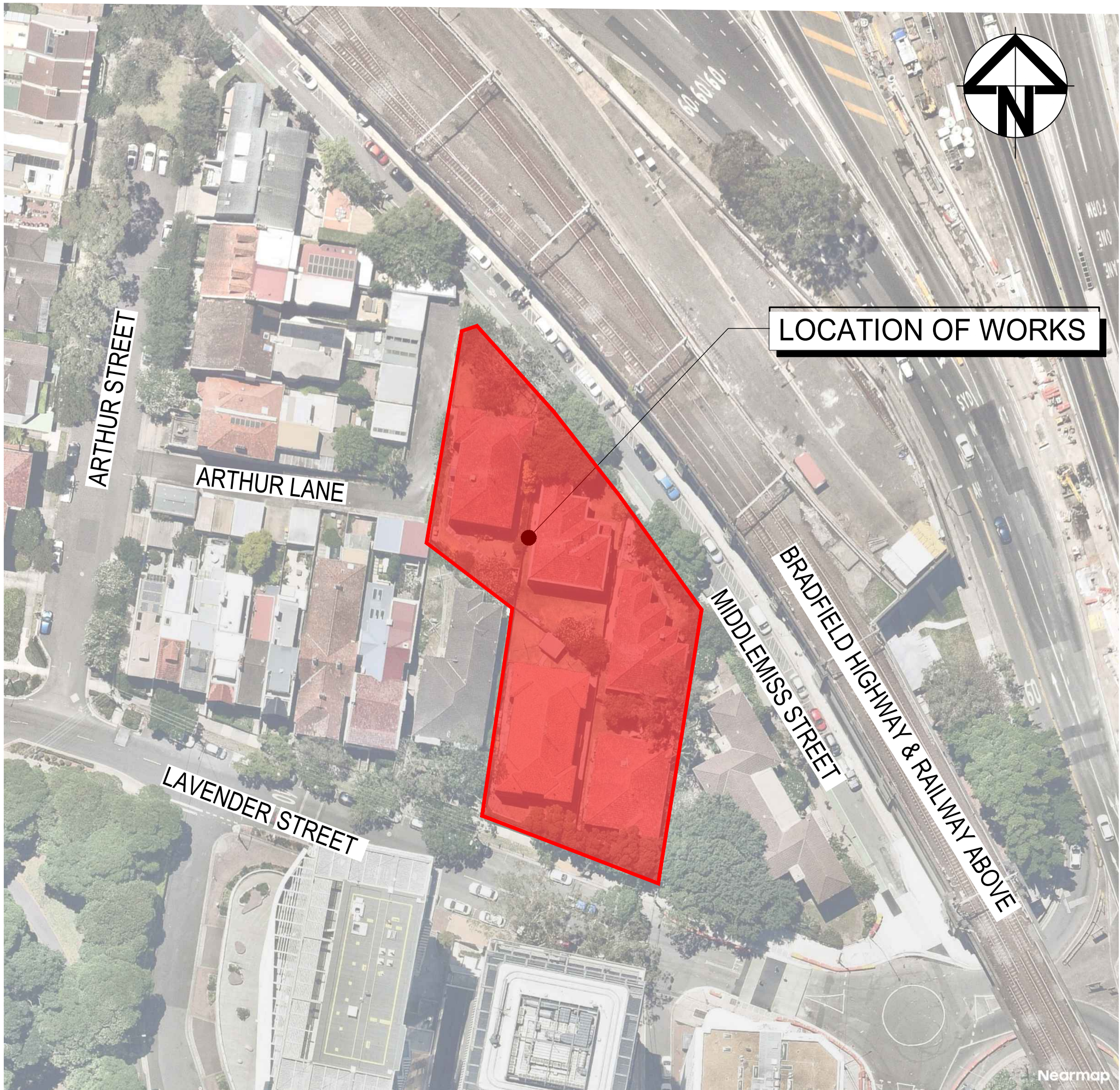
Appendix A – Civil Drawings

CENTRAL ELEMENT

3-7 MIDDLEMISS ST

64-66 LAVENDER BAY CIVIL WORKS

SSD-86797708



LOCALITY PLAN
NOT TO SCALE

DRAWING NO.	DRAWING TITLE
25-1385-C1000	COVER SHEET, LOCALITY PLAN & DRAWING LIST
25-1385-C1001	NOTE SHEET
25-1385-C1005	GENERAL ARRANGMENT PLAN
SITEWORKS	
25-1385-C1010	SITEWORKS AND STORMWATER DRAINAGE PLAN
25-1385-C1015	SITEWORKS AND STORMWATER DRAINAGE DETAILS SHEET 1
25-1385-C1016	SITEWORKS AND STORMWATER DRAINAGE DETAILS SHEET 2
PAVEMENT	
25-1385-C1030	PAVEMENT PLAN
STORMWATER DRAINAGE	
25-1385-C1050	STORMWATER DRAINAGE MUSIC CATCHMENT PLAN
25-1385-C1051	STORMWATER DRAINAGE MUSIC MODEL AND RESULTS
25-1385-C1052	STORMWATER DRAINAGE PRE-DEVELOPMENT CATCHMENT PLAN
25-1385-C1053	STORMWATER DRAINAGE POST-DEVELOPMENT CATCHMENT PLAN
25-1385-C1060	STORMWATER DRAINAGE OSD PLAN
25-1385-C1061	STORMWATER DRAINAGE OSD SECTIONS AND DETAILS
COMBINED SERVICES	
25-1385-C1080	COMBINED SERVICES PLAN
EROSION AND SEDIMENT CONTROL	
25-1385-C1090	EROSION AND SEDIMENT CONTROL PLAN
25-1385-C1095	EROSION AND SEDIMENT CONTROL DETAILS

		Bar Scales	THIS DRAWING CANNOT BE COPIED OR REPRODUCED IN ANY FORM OR USED FOR ANY OTHER PURPOSE OTHER THAN THAT ORIGINALLY INTENDED WITHOUT THE WRITTEN PERMISSION OF AT&L	Client Central Element	Scales	Drawn	SG	Project 3-7 MIDDLEMISS ST 64-66 LAVENDER ST LAVENDER BAY SSDA	Civil Engineers and Project Managers Level 7, 153 Walker Street North Sydney NSW 2060 P 02 9439 1777 E info@atl.net.au www.atl.net.au ABN 96 130 882 405				
					Designed	PS							
					Grid	GDA20 MGA56	Checked	SM		Title COVER SHEET, LOCALITY PLAN & DRAWING LIST			
					Height Datum	AHD	Approved	AT					
A	ISSUED FOR APPROVAL				10-03-26								
P1	ISSUED FOR DRAFT				27-02-26								
Issue	Description	Date											

1. ORIGIN OF LEVELS:- REFER SURVEY NOTES
2. ALL WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THE LOCAL GOVERNMENT AUTHORITIES ENGINEERING CONSTRUCTION SPECIFICATION FOR CIVIL WORKS.
3. PRIOR TO THE COMMENCEMENT OF THE WORKS THE CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORK. ANY DISCREPANCIES TO BE REPORTED TO AT&L.
4. PRIOR TO THE COMMENCEMENT OF THE WORKS, THE CONTRACTOR IS TO VERIFY THE ALIGNMENT AND LEVELS OF ALL EXISTING SERVICES AT ALL LOCATIONS WHERE THE PROPOSED SERVICES ARE TO CROSS, CONNECT TO OR ARE LOCATED IN CLOSE PROXIMITY TO THE EXISTING SERVICES. ANY DISCREPANCIES TO BE REPORTED TO AT&L.
5. CONTRACTOR MUST MAKE SMOOTH CONNECTION WITH ALL EXISTING WORKS.
6. ALL TRENCH BACKFILL MATERIAL SHALL BE COMPACTED TO THE SAME DENSITY AS THE ADJACENT MATERIAL.
7. ALL SERVICE TRENCHES UNDER VEHICULAR PAVEMENTS SHALL BE BACKFILLED WITH SAND TO 300mm ABOVE PIPE. WHERE PIPE IS UNDER PAVEMENTS BACKFILL, REMAINDER OF TRENCH TO UNDERSIDE OF PAVEMENT WITH SAND OR APPROVED GRANULAR MATERIAL COMPACTED IN 150mm LAYERS TO MINIMUM 98% MODIFIED MAXIMUM DRY DENSITY IN ACCORDANCE WITH THE CURRENT AS 1289.5.2.1 (OR A DENSITY INDEX OF NOT LESS THAN 75).
8. PROVIDE 10mm WIDE ISOLATION JOINTS BETWEEN BUILDINGS AND ALL CONCRETE OR UNIT PAVEMENTS.
9. ASPHALTIC CONCRETE SHALL CONFORM TO THE CURRENT TNSW SPECIFICATION TS 03283.1 (R116) HEAVY DUTY DENSE GRADED ASPHALT.
10. ALL BASECOURSE AND SUB-BASE MATERIAL SHALL BE IGNEOUS ROCK QUARRIED MATERIAL TO COMPLY WITH THE CURRENT TNSW SPECIFICATION TS 03315.1 (3051) GRANULAR BASE AND SUBBASE MATERIALS FOR SURFACED ROAD PAVEMENTS COMPACTED TO MINIMUM 98% MODIFIED DENSITY IN ACCORDANCE WITH THE CURRENT AS 1289 5.2.1.
FREQUENCY OF COMPACTION TESTING SHALL NOT BE LESS THAN
1 TEST PER 25m² OF BASECOURSE MATERIAL PLACED
1 TEST PER 50m² OF SUB-BASE COURSE MATERIAL PLACED
OR
1 TEST PER 50 LINEAL METRES OF ROAD PER PAVEMENT LAYER WITH A MINIMUM OF 2 TESTS ON ANY ONE ROAD.
OR
1 TEST PER 500m² PER PAVEMENT LAYER WITH A MINIMUM OF 2 TESTS ON ANY ONE ROAD.
OR
AS STATED UNDER THE NORTH SYDNEY COUNCIL SPECIFICATIONS UNLESS OTHERWISE APPROVED BY AT&L.
11. AS AN ALTERNATIVE TO THE USE OF IGNEOUS ROCK AS A SUB-BASE MATERIAL (IN NOTE 10) A CERTIFIED RECYCLED CONCRETE MATERIAL COMPLYING WITH THE CURRENT TNSW SPECIFICATION TS 03315.1 (3051) GRANULAR BASE AND SUBBASE MATERIALS FOR SURFACED ROAD PAVEMENTS WILL BE CONSIDERED. SUBJECT TO MATERIAL SAMPLES AND APPROPRIATE CERTIFICATIONS BEING PROVIDED TO THE SATISFACTION OF AT&L.
12. SHOULD THE CONTRACTOR WISH TO USE A RECYCLED PRODUCT THE CONTRACTOR IS TO SEEK ACCEPTANCE OF THE PRODUCT FROM AT&L. THE PRICE DIFFERENCE BETWEEN AN IGNEOUS PRODUCT AND A RECYCLED PRODUCT SHALL BE CLEARLY INDICATED.
13. WHERE NOTED ON THE DRAWINGS THAT WORKS ARE TO BE CARRIED BY OTHERS, (EG. ADJUSTMENT OF SERVICES) THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CO-ORDINATION OF THESE WORKS.
14. ALL WORKS CARRIED OUT ADJACENT TO AND WITHIN SERVICE EASEMENTS ARE TO COMPLY WITH THE RELEVANT SERVICE AUTHORITIES GUIDELINES AND REQUIREMENTS.

THE LOCATIONS OF UNDERGROUND SERVICES SHOWN IN THIS SET OF DRAWINGS HAVE BEEN PLOTTED FROM SURVEY INFORMATION AND SERVICE AUTHORITY INFORMATION. THE SERVICE INFORMATION HAS BEEN PREPARED ONLY TO SHOW THE APPROXIMATE POSITIONS OF ANY KNOWN SERVICES AND MAY NOT BE AS CONSTRUCTED OR ACCURATE. AT&L CAN NOT GUARANTEE THAT THE SERVICES INFORMATION SHOWN ON THESE DRAWINGS ACCURATELY INDICATES THE PRESENCE OR ABSENCE OF SERVICES OR THEIR LOCATION AND WILL ACCEPT NO LIABILITY FOR INACCURACIES IN THE SERVICES INFORMATION SHOWN FROM ANY CAUSE WHATSOEVER.

CONTRACTORS ARE TO UNDERTAKE A SERVICES SEARCH, PRIOR TO COMMENCEMENT OF WORKS ON SITE. SEARCH RESULTS ARE TO BE KEPT ON SITE AT ALL TIMES.

1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS 3600 (2018) CURRENT EDITION WITH AMENDMENTS, EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.
2. CONCRETE QUALITY ALL REQUIREMENTS OF THE CURRENT ACSE CONCRETE SPECIFICATION DOCUMENT 1 SHALL APPLY TO THE FORMWORK, REINFORCEMENT AND CONCRETE UNLESS NOTED OTHERWISE.

- CEMENT TYPE SHALL BE (ACSE SPECIFICATION) TYPE SL
- PROJECT CONTROL TESTING SHALL BE CARRIED OUT IN ACCORDANCE WITH AS 1379.
NO ADMIXTURES SHALL BE USED IN CONCRETE UNLESS APPROVED IN WRITING BY AT&L.
CLEAR CONCRETE COVER TO ALL REINFORCEMENT FOR DURABILITY SHALL BE 40mm TOP AND 70mm FOR EXTERNAL EDGES UNLESS NOTED OTHERWISE.
ALL REINFORCEMENT SHALL BE FIRMLY SUPPORTED ON MILD STEEL PLASTIC TIPPED CHAIRS. PLASTIC CHAIRS OR CONCRETE CHAIRS AT NOT GREATER THAN 1m CENTRES BOTH WAYS. BARS SHALL BE TIED AT ALTERNATE INTERSECTIONS.
THE FINISHED CONCRETE SHALL BE A DENSE HOMOGENEOUS MASS, COMPLETELY FILLING THE FORMWORK, THOROUGHLY EMBEDDING THE REINFORCEMENT AND FREE OF STONE POCKETS. ALL CONCRETE INCLUDING SLABS ON GROUND AND FOOTINGS SHALL BE COMPACTED AND CURED IN ACCORDANCE WITH R.M.S. SPECIFICATION R83.
REINFORCEMENT SYMBOLS:
N DENOTES GRADE 450 N BARS TO AS/NZS 4671 GRADE N
SL DENOTES 230 R HOT ROLLED PLAIN BARS TO AS/NZS 4671
SL DENOTES HARD-DRAWN WIRE REINFORCING FABRIC TO AS/NZS 4671

THE FIGURE FOLLOWING THE FABRIC SYMBOL SL IS THE REFERENCE NUMBER FOR FABRIC TO AS/NZS 4671.

FABRIC SHALL BE LAPPED IN ACCORDANCE WITH THE FOLLOWING DETAIL:

9. STOCKPILES WILL NOT BE LOCATED WITHIN 2 METRES OF HAZARD AREAS, INCLUDING LIKELY AREAS OF CONCENTRATED OR HIGH VELOCITY FLOWS SUCH AS WATERWAYS. WHERE THEY ARE BETWEEN 2 AND 5 METRES FROM SUCH AREAS, SPECIAL DESIGN CONTROL MEASURES SHOULD BE TAKEN TO MINIMISE POSSIBLE POLLUTION TO DOWNSLOPE WATERS, E.G. THROUGH INSTALLATION OF SEDIMENT FENCING.
10. 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.
11. WATER WILL BE PREVENTED FROM ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS IT IS RELATIVELY SEDIMENT FREE, I.E. THE CATCHMENT AREA HAS BEEN PERMANENTLY LANDSCAPED AND/OR ANY LIKELY SEDIMENT HAS BEEN FILTERED THROUGH AN APPROVED STRUCTURE.
12. TEMPORARY SOIL AND WATER MANAGEMENT STRUCTURES WILL BE REMOVED ONLY AFTER THE LANDS THEY ARE PROTECTING ARE REHABILITATED.

13. ACCEPTABLE RECEPTORS WILL BE PROVIDED FOR CONSTRUCTION OF
MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE
MATERIALS AND LITTER.

14. 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
MATERIALS INSTALLED OUTSIDE THE DRIP LINE
- (B) ENSURING THAT NOTHING IS NAILED TO THEM
- (C) 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 1.5 METRES OR HALF THE
DISTANCE BETWEEN THE OUTER EDGE OF THE DRIP LINE AND
THE TRUNK, WHICH EVER 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 NOT TO CUT ROOTS UNNECESSARILY NOR TO
COMPACT THE SOIL AROUND THEM.

1. ALL CIVIL WORKS TO BE UNDERTAKEN AS PER NORTH SYDNEY COUNCIL ENGINEERING & CONSTRUCTION GUIDELINES.

GENERAL NOTES

1. STORMWATER DESIGN CRITERIA:
ANNUAL EXCEEDANCE PROBABILITY:
MINOR STORM: 5% AEP
MAJOR STORM: 1% AEP
2. PIPES LESS THAN 300 DIA SHALL BE SEWER GRADE uPVC WITH SOLVENT WELDED JOINTS.
3. ENLARGERS, CONNECTIONS AND JUNCTIONS TO BE PREFABRICATED FITTINGS WHERE PIPES ARE LESS THAN DN300.
4. ALL INTERNAL WORKS WITHIN PROPERTY BOUNDARIES ARE TO COMPLY WITH THE REQUIREMENTS OF THE CURRENT AS 3500.3.1 AND AS/NZS 3500.3.2.
5. ALL STORMWATER DRAINAGE LINES UNDER PROPOSED BUILDING SLABS TO BE uPVC PRESSURE PIPE GRADE B. ENSURE ALL VERTICALS AND DOWNPIES ARE uPVC PRESSURE PIPE, GRADE B FOR A MIN OF 3.0m IN HEIGHT.
6. ALL STORMWATER DRAINAGE LINES TO BE INSTALLED WITHIN EXISTING ROADS ARE TO BE BACKFILLED WITH 3% CEMENT STABILISED SAND.
7. ALL DRAINAGE LINES TO PROVIDE A 3.0M LENGTH OF DN100 SUBSOIL DRAINAGE PIPE WRAPPED IN FABRIC SOCK, ON THE UPSTREAM SIDE OF EACH PIT. ALLOW FOR SECONDARY SUBSOIL FOR PIPES FOR PIPE GRATER THAN DN825.
8. SUBSOIL DRAIN WRAPPED IN APPROVED FILTER SOCK SHALL BE PROVIDED BENEATH ALL KERB LINES WHERE NO DRAINAGE LINES ARE SHOWN ON THE DRAWINGS AND SHALL DISCHARGE INTO DOWNSTREAM PITS.
9. WHERE SUBSOIL DRAINS PASS UNDER FLOOR SLABS AND VEHICULAR PAVEMENTS, UNSTOLTED uPVC SEWER GRADE PIPES ARE TO BE USED. CARE IS TO BE TAKEN WITH LEVELS OF STORMWATER LINES, GRADES SHOWN ARE NOT TO BE REDUCED WITHOUT APPROVAL FROM AT&L.
10. GRATES AND COVERS SHALL CONFORM TO THE CURRENT AS 3996.
11. CLASS D COVER (MINIMUM) SHALL BE PROVIDED IN TRAFFICKED PAVEMENTS WITH CLASS B (MINIMUM) BEING PROVIDED IN NON-TRAFFICKED AREAS.
12. AT ALL TIMES DURING CONSTRUCTION OF STORMWATER PITS, THE CONTRACTOR SHALL PROVIDE ADEQUATE SAFETY PROCEDURES TO PREVENT THE POSSIBILITY OF PERSONNEL FALLING DOWN PITS.
13. ALL PITS AND PIPES TO BE FOUND ON SUITABLE MATERIAL WITH A MINIMUM ALLOWABLE BEARING CAPACITY OF 100kPa up to 3.0m DEPTH TO INVERT AND 150kPa From 3.0m to 6.0m DEPTH TO INVERT ONCE EXCAVATED. A CONCRETE BLINDING LAYER (MINIMUM 100mm THICK 25MPa OR DEEPER TO ENSURE MINIMUM SPECIFIED BEARING CAPACITY IS ACHIEVED) MAY BE PROVIDED. CONTRACTOR TO ENGAGE GEOTECHNICAL ENGINEER TO PROVIDE WRITTEN CONFIRMATION.
14. ALL EXISTING STORMWATER DRAINAGE LINES AND PITS THAT ARE TO REMAIN ARE TO BE INSPECTED AND CLEANED. DURING THIS PROCESS ANY PART OF THE STORMWATER DRAINAGE SYSTEM THAT WARRANTS REPAIR SHALL BE REPORTED TO THE SUPERINTENDENT/ENGINEER FOR FURTHER DIRECTIONS.
15. ALL STORMWATER PITS ARE TO BE CAST IN-SITU IN ACCORDANCE WITH THE STORMWATER DETAILS AND SPECIFICATIONS.
16. ALL PITS MUST BE BENCHED AND STREAMLINED TO DIRECT WATER FROM THE INLET PIPE TO THE OUTLET PIPE.
17. PITS DEEPER THAN 600mm MUST BE FITTED WITH DOUBLE STEP-IRONS IN ACCORDANCE WITH THE CURRENT AS1657. PLASTIC ENCAPSULATED MAY BE USED. STEP-IRONS TO BE PROVIDED ON A SINGLE FACE WHERE POSSIBLE. SHOULD STEP-IRONS REQUIRE TO CHANGE FACE THEN 3 OVERLAPPING STEP IRONS ARE TO BE LOCATED ON EACH FACE.
18. FREQUENCY OF COMPACTION TESTING SHALL BE NOT LESS THAN 1 TEST PER 2 LAYERS PER 40 LINEAR METERS.

RIGID & SEMI-RIGID PIPE NOTES

19. PIPES 300 DIA. AND LARGER TO BE STEEL REINFORCED CONCRETE CLASS 3* APPROVED SPIGOT AND SOCKET WITH RUBBER RING JOINTS. U.N.O. ALL ROAD CROSSINGS TO BE CLASS 4* U.N.O.
20. EQUIVALENT STRENGTH FIBRE REINFORCED CONCRETE PIPES MAY BE USED SUBJECT TO APPROVAL BY AT&L OR THE LOCAL GOVERNMENT AUTHORITY.
21. REINFORCED CONCRETE PIPES TO COMPLY WITH THE CURRENT AS/NZS 4058.
22. FIBRE REINFORCED CONCRETE PIPES TO COMPLY WITH THE CURRENT AS 4139.
23. PIPES TO BE INSTALLED WITH TYPE H33 (ROAD) AND H32 (LOTS) SUPPORT IN ACCORDANCE WITH THE CURRENT AS/NZS 3725. IN ALL CASES BACKFILL EMBEDMENT ZONE WITH SELECT FILL (MINIMUM CBR 15%) TO 300mm ABOVE PIPE. WHERE PIPE IS UNDER PAVEMENTS BACKFILL REMAINDER OF TRENCH TO UNDERSIDE OF PAVEMENT WITH SAND OR APPROVED GRANULAR MATERIAL COMPACTED IN 150mm LAYERS TO MINIMUM 98% STANDARD MAXIMUM DRY DENSITY IN ACCORDANCE WITH THE CURRENT AS 1289.5.2.1. (OR A DENSITY INDEX OF NOT LESS THAN 75).

FLEXIBLE PIPE NOTES

21. FLEXIBLE PIPES TO COMPLY WITH THE CURRENT AS/NZS 2566.1.
22. PIPES TO BE INSTALLED IN ACCORDANCE WITH THE CURRENT AS/NZS 2566.2. IN ALL CASES BACKFILL EMBEDMENT ZONE WITH GRAVEL OR SAND TO 300mm ABOVE PIPE. WHERE PIPE IS UNDER PAVEMENTS BACKFILL REMAINDER OF TRENCH TO UNDERSIDE OF PAVEMENT WITH SAND OR APPROVED GRANULAR MATERIAL COMPACTED IN 150mm LAYERS TO MINIMUM 98% STANDARD MAXIMUM DRY DENSITY IN ACCORDANCE WITH THE CURRENT AS 1289.5.2.1. (OR A DENSITY INDEX OF NOT LESS THAN 75)

PRECAST CONCRETE PIT NOTES

21. PRECAST PIT MAY BE USED WITH THE APPROVAL OF AT&L THE SUPERINTENDENT AND THE LOCAL GOVERNMENT AUTHORITY AND SHALL BE INSTALLED TO THE MANUFACTURERS RECOMMENDATIONS.
23. ALL PRE-CAST PITS ARE TO BE STRUCTURALLY CERTIFIED TO MEET RELEVANT REQUIREMENTS OF THE CURRENT AS3600 AND AS3996 (2019).
24. PRE-CAST STORMWATER PITS ARE TO BE APPROVED FOR TNSW CONSTRUCTION (R11) AND ARE TO ARE TO BE DESIGNED AND CUSTOM CRAFTED WITH OPENINGS UP TO A MAXIMUM 50mm OD OF THE STORMWATER PIPES. PITS ARE ALSO TO INCLUDE PENETRATIONS FOR SUBSOIL CONNECTIONS AND DOUBLE STEP-IRONS INSTALLED FOR PITS 400mm DEEP. DEMOLITION SAWS MAY BE USED PROVIDING A NEAT FULL DEPTH CUT IS APPLIED AND ANY ADDITIONAL PENETRATIONS REQUIRED ARE TO BE CORE DRILLED.
25. SHOP DRAWINGS ARE TO BE PROVIDED FOR REVIEW AND ACCEPTANCE. IT SHOULD BE NOTED THAT THE CONTRACTOR IS TO ENSURE THAT THE STRUCTURAL COMPONENTS OF THE PITS ARE NOT COMPROMISED AND ONLY THE PIPE KNUCKOUTS ARE TO BE REMOVED FOR THE PIPE PENETRATIONS.

26. ALL PRECAST PITS TO BE FOUND ON CONCRETE BLINDING LAYER (100mm ON AN EARTH FOUNDATION OR 150mm ON A ROCK FORMATION) WITH A MINIMUM ALLOWABLE BEARING CAPACITY OF 100kPa UP TO 3.0m DEPTH TO INVERT AND 150kPa FROM 3.0m TO 6.0m DEPTH TO INVERT (MINIMUM 100mm THICK 25MPa OR DEEPER TO ENSURE MINIMUM SPECIFIED BEARING CAPACITY IS ACHIEVED). CONTRACTOR TO ENGAGE GEOTECHNICAL ENGINEER TO PROVIDE WRITTEN CONFIRMATION.
27. ALL PRE-CAST PIT PENETRATIONS SHALL BE CUT SO THAT IT IS FLUSH WITH THE INTERNAL WALL.
28. ALL PIPE JOINTING, SPARGING, RENDERING, FILLING OF GAPS TO BE FILLED WITH A HIGH STRENGTH NON-SHRINK GROUT WITH A MINIMUM 40MPa COMPRESSIVE STRENGTH AT 28 DAYS. [ANKOR DURED 702 OR SIMILAR]
29. SINGLE UNITS PREFERRED BUT IF REQUIRED MINIMUM RISER DEPTH 600mm PIT INSTALLATION AND JOINTING BETWEEN UNITS SHALL BE UNDERTAKEN IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
30. ANY DAMAGE TO THE STRUCTURAL INTEGRITY OF THE PRE-CAST PIT WILL BE REPAIRED AND STRUCTURALLY CERTIFIED AT THE CONTRACTORS EXPENSE TO THE SATISFACTION OF THE AT&L SUPERINTENDENT / LOCAL GOVERNMENT AUTHORITY.

1. THE SITE SUPERINTENDENT/ENGINEER WILL ENSURE THAT ALL SOIL AND WATER MANAGEMENT WORKS ARE LOCATED AS DOCUMENTED.
2. ALL WORK SHALL BE GENERALLY CARRIED OUT IN ACCORDANCE WITH
 - a. LOCAL AUTHORITY REQUIREMENT
 - b. EPA REQUIREMENTS
 - c. LANDCOM MANUAL "MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION", 4th EDITION, MARCH 2004.
3. MAINTAIN THE EROSION CONTROL DEVICES TO THE SATISFACTION OF THE SUPERINTENDENT AND THE LOCAL AUTHORITY.
4. WHEN STORMWATER PITS ARE CONSTRUCTED, PREVENT SITE RUNOFF ENTERING UNLESS SEDIMENT FENCES ARE ERECTED AROUND PITS.
5. CONTRACTOR IS TO ENSURE ALL EROSION & SEDIMENT CONTROL DEVICES ARE MAINTAINED IN GOOD WORKING ORDER AND OPERATE EFFECTIVELY. REPAIRS AND OR MAINTENANCE SHALL BE UNDERTAKEN AS REQUIRED, PARTICULARLY FOLLOWING STORM EVENTS.

6. WHERE PRACTICAL, THE SOIL EROSION HAZARD ON THE SITE WILL BE KEPT AS LOW AS POSSIBLE. TO THIS END, WORKS SHOULD BE UNDERTAKEN IN THE FOLLOWING SEQUENCE:

- (A) INSTALL A WOODEN FENCE ALONG THE BOUNDARIES AS SHOWN ON PLAN. REFER DETAIL.
- (B) INSTALL A SEDIMENT FENCE ALONG THE BOUNDARIES AS SHOWN ON PLAN. REFER DETAIL.
- (C) CONSTRUCT STABILISED CONSTRUCTION ENTRANCE TO LOCATION AS DETERMINED BY SUPERINTENDENT/ENGINEER. REFER DETAIL.
- (D) INSTALL SEDIMENT BASIN AS SHOWN ON PLAN.
- (E) INSTALL SEDIMENT TRAPS AS SHOWN ON PLAN.

7. UNDERTAKE THE DEVELOPMENT WORK IN ACCORDANCE WITH THE ENGINEERING PLANS. WHERE POSSIBLE, PHASE DEVELOPMENT SO THAT LAND DISTURBANCE IS CONFINED TO AREAS OF WORKABLE SIZE.

7. DURING WINDY WEATHER, LARGE, UNPROTECTED AREAS WILL BE KEPT MOIST (NOT WET) BY SPRINKLING WITH WATER TO KEEP DUST UNDER CONTROL.
8. FINAL SITE LANDSCAPING WILL BE UNDERTAKEN AS SOON AS POSSIBLE AND WITHIN 20 WORKING DAYS FROM COMPLETION OF CONSTRUCTION ACTIVITIES.

THE EXISTING SITE CONDITIONS SHOWN ON THE FOLLOWING DRAWINGS HAVE BEEN INVESTIGATED BY GEOSURV, BEING REGISTERED SURVEYORS. THE INFORMATION IS SHOWN TO PROVIDE A BASIS FOR DESIGN. AT & L DOES NOT GUARANTEE THE ACCURACY OR COMPLETENESS OF THE SURVEY BASE OR ITS SUITABILITY AS A BASIS FOR CONSTRUCTION DRAWINGS.

SHOULD DISCREPANCIES BE ENCOUNTERED DURING CONSTRUCTION
BETWEEN THE SURVEY DATA AND ACTUAL FIELD DATA, CONTACT AT&L.

THE FOLLOWING NOTES HAVE BEEN TAKEN DIRECTLY FROM THE ORIGINAL SURVEY DOCUMENTS.

DISCLAIMER:
GREYSCALE DETAIL & LEVEL SURVEY IS REFERENCED FROM DRAWING
ASP212126-DT-[C].DWG,
SURVEYED ON 11.08.21, AND IS PROVIDED FOR REFERENCE PURPOSES
ONLY.

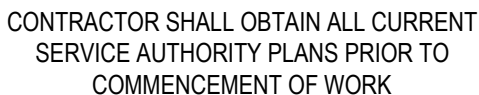
- ALL AS-BUILT DELIVERABLES, INCLUDING PLANS, MODELS, AND POINT CLOUD DATA, ARE BASED ON 3D LASER SCANNING WITH A STATED SURVEY ACCURACY OF $\pm 20\text{MM}$. DESPITE BEST EFFORTS, MINOR DISCREPANCIES MAY OCCUR DUE TO FACTORS SUCH AS SURFACE REFLECTIVITY, SCANNING RESOLUTION, OBSTRUCTIONS, ENVIRONMENTAL CONDITIONS, AND SOFTWARE LIMITATIONS.
- SCAN RELIABILITY CAN BE IMPACTED BY SURFACE CHARACTERISTICS SUCH AS REFLECTIVE, TRANSPARENT, DARK, OR WET MATERIALS.

- SURVEY DATA IS LIMITED TO WHAT WAS VISIBLE AND ACCESSIBLE FROM SCAN POSITIONS ON-SITE. OBSTRUCTED OR INACCESSIBLE AREAS WILL RESULT IN INCOMPLETE OR MISSING DATA WITHIN THE POINT CLOUD, PLANS, AND MODELS. THE SURVEY MUST BE USED IN CONJUNCTION WITH THE ACCOMPANYING POINT CLOUD DATA FOR CONTEXT AND VERIFICATION.

- AS-BUILT DRAWINGS AND REVIT MODELS ARE INTERPRETATIONS OF THE CAPTURED POINT CLOUD AND REPRESENT OBSERVED CONDITIONS AT THE TIME OF SCANNING. THEY DO NOT REPRESENT DESIGN INTENT AND MUST NOT BE USED FOR FABRICATION OR CONSTRUCTION WITHOUT INDEPENDENT ON-SITE VERIFICATION.
- MODELLED ELEMENTS MAY DEVIATE WITHIN SCAN TOLERANCE AND SHOULD BE USED AS GENERAL REFERENCE ONLY.

- ALL CRITICAL DIMENSIONS MUST BE INDEPENDENTLY VERIFIED ON-SITE PRIOR TO DESIGN, CONSTRUCTION, OR FABRICATION.
- CONSTRUCTION MUST BE BASED ON A VERIFIED PHYSICAL BENCHMARK (BM), NOT THE REDUCED
- LEVELS (RLS) SHOWN IN THE DELIVERABLES.
- DELIVERABLES ARE NOT SUITABLE FOR USE WHERE MILLIMETRE-LEVEL PRECISION IS REQUIRED WITHOUT FIELD VERIFICATION.

- THESE DOCUMENTS ARE PROVIDED FOR THE CLIENT'S USE ONLY. GEOSURV ASSUMES NO RESPONSIBILITY FOR USE OR INTERPRETATION BY THIRD PARTIES.
- GEOSURV ACCEPTS NO LIABILITY FOR ANY LOSS OR DAMAGE ARISING FROM USE BEYOND THE DELIVERABLES' INTENDED REFERENCE PURPOSE.



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LEGEND

EXISTING BOUNDARY

EXISTING EASEMENT

PROPOSED BOUNDARY

EXISTING BOUNDARY TO BE REMOVED

A	ISSUED FOR APPROVAL	10-03-26
P1	ISSUED FOR DRAFT	27-02-26
Issue	Description	Date

Bar Scales

0

5

10

15

20

25m

1 : 250 @ A1 1 : 500 @ A3

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Client

Central

Element

Scales	1:250	Drawn	SG
		Designed	PS
Grid	GDA20 MGA56	Checked	SM
Height Datum	AHD	Approved	AT

Project

3-7 MIDDLEMISS ST
64-66 LAVENDER ST
LAVENDER BAY
SSDA

Title

GENERAL ARRANGMENT
PLAN

Civil Engineers and Project Managers

at&l

Level 7, 153 Walker Street
North Sydney
NSW 2060
P 02 9439 1777
E info@atl.net.au
www.atl.net.au
ABN 96 130 882 405

Status

FOR APPROVAL
NOT FOR CONSTRUCTION

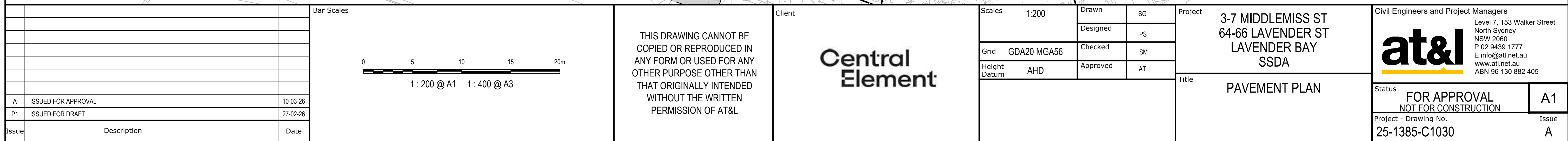
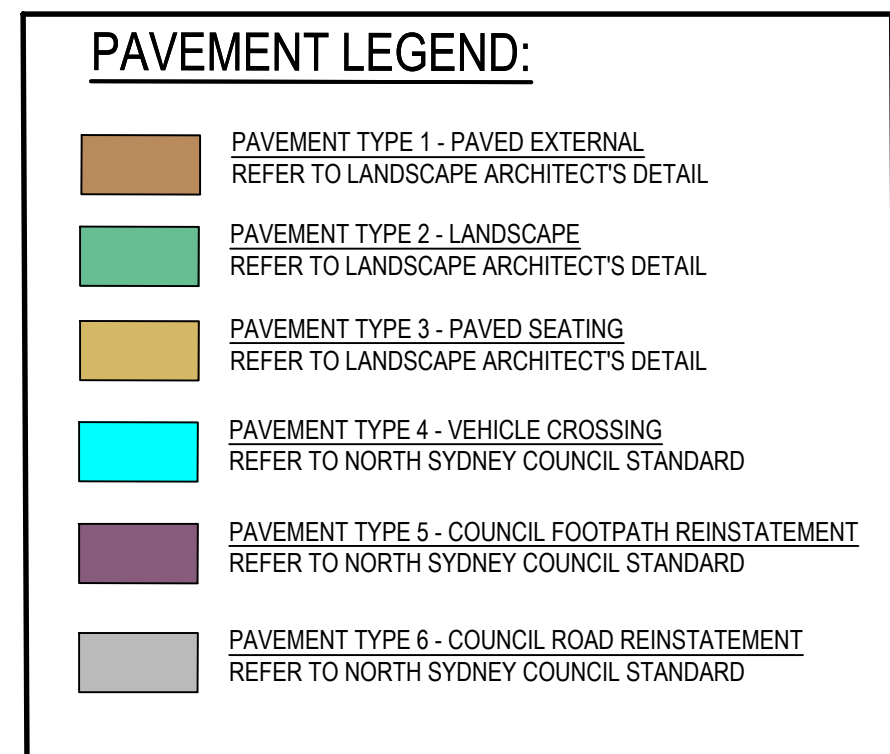
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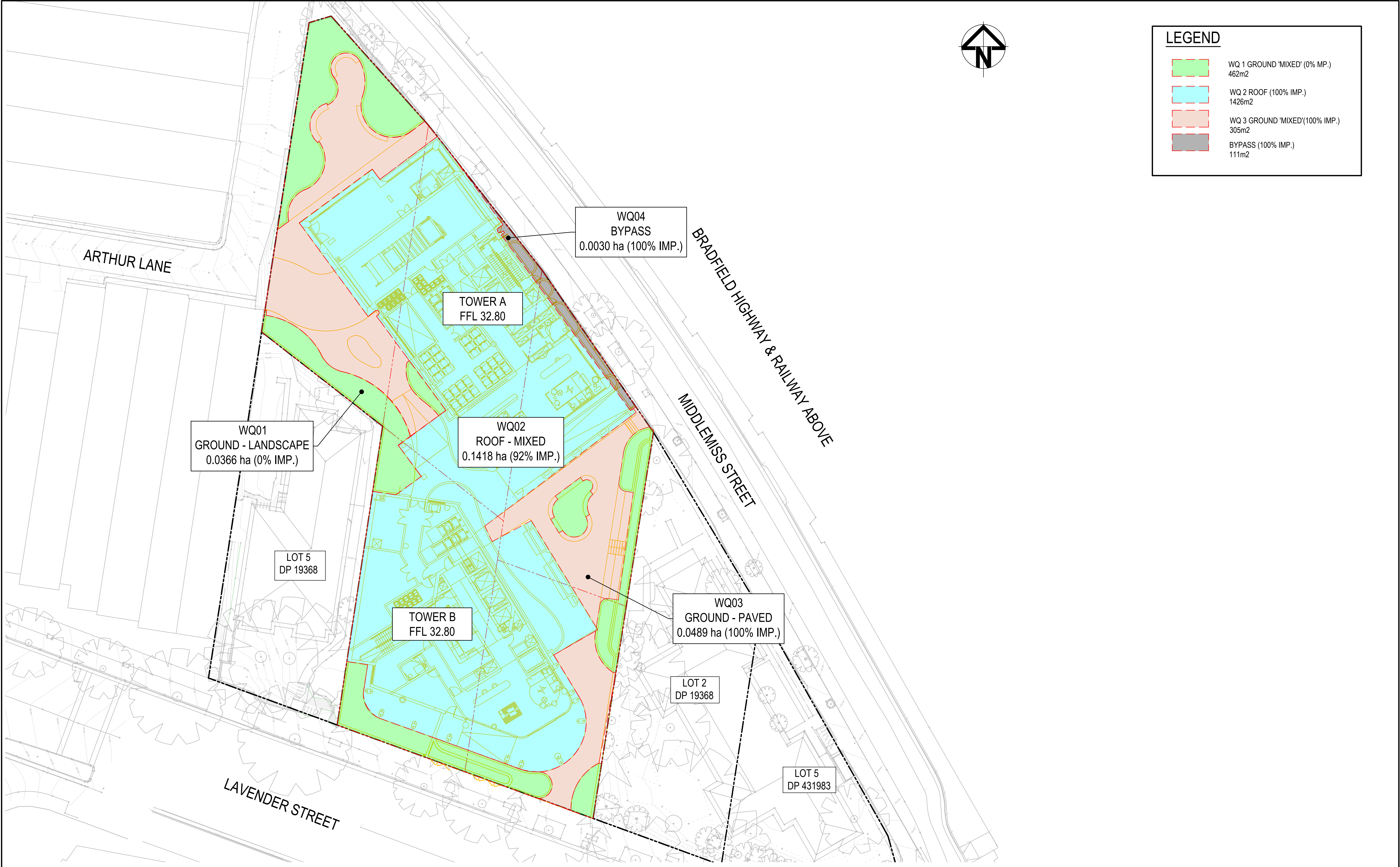
Project - Drawing No.

25-1385-C1005

Issue

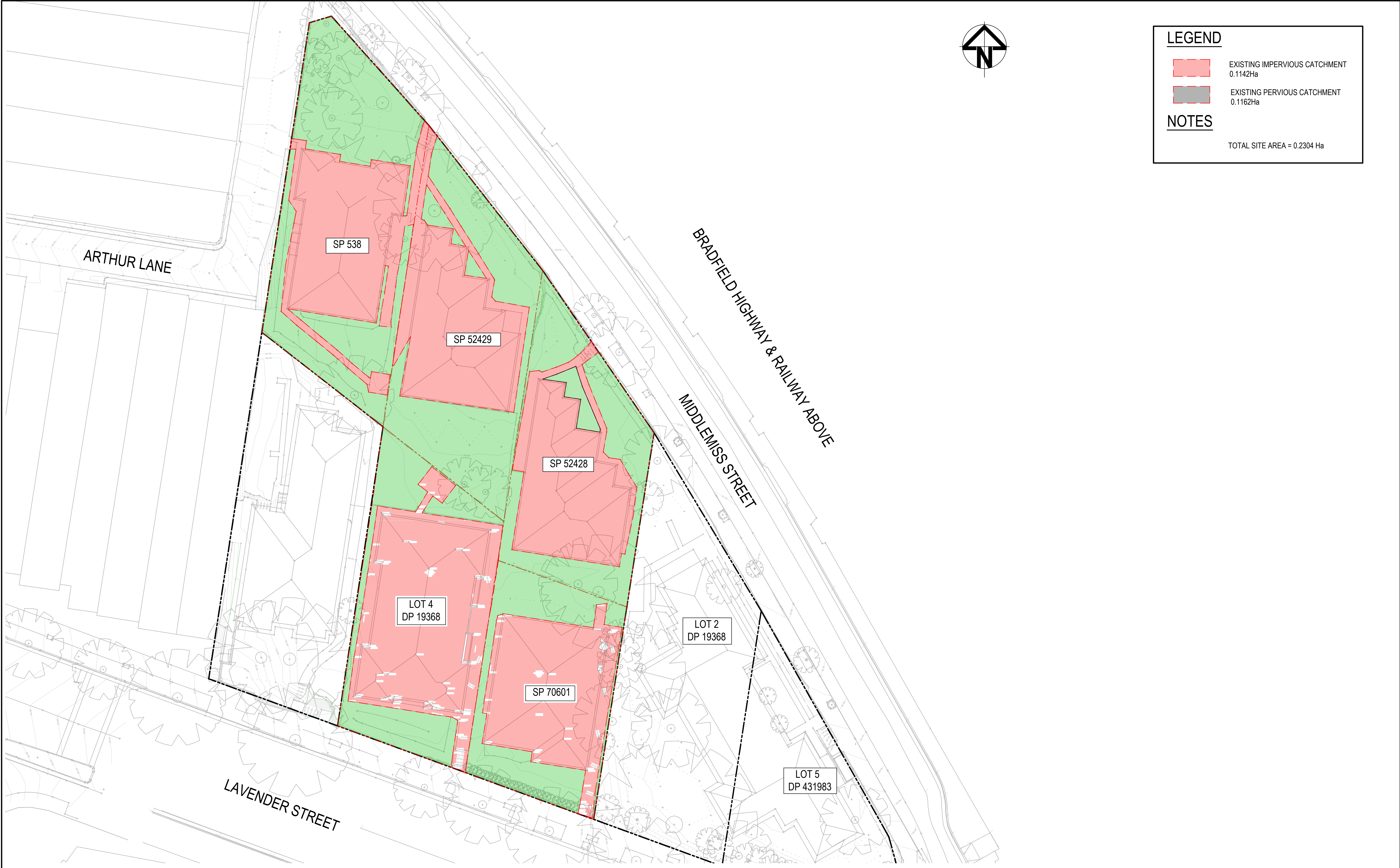
A





LEGEND	
	WQ 1 GROUND 'MIXED' (0% MP.) 462m2
	WQ 2 ROOF (100% IMP.) 1426m2
	WQ 3 GROUND 'MIXED'(100% IMP.) 305m2
	BYPASS (100% IMP.) 111m2

		Bar Scales		THIS DRAWING CANNOT BE COPIED OR REPRODUCED IN ANY FORM OR USED FOR ANY OTHER PURPOSE OTHER THAN THAT ORIGINALLY INTENDED WITHOUT THE WRITTEN PERMISSION OF AT&L	Client Central Element	Scales 1:200		Drawn SG		Project 3-7 MIDDLEMISS ST 64-66 LAVENDER ST LAVENDER BAY SSDA	Civil Engineers and Project Managers at&l Level 7, 153 Walker Street North Sydney NSW 2060 P 02 9439 1777 E info@atl.net.au www.atl.net.au ABN 96 130 882 405								
								Designed PS											
								Grid GDA20 MGA56						Checked SM					
								Height Datum AHD						Approved AT					
A	ISSUED FOR APPROVAL	10-03-26								Title STORMWATER DRAINAGE MUSIC CATCHMENT PLAN		Status		FOR APPROVAL NOT FOR CONSTRUCTION		A1			
P1	ISSUED FOR DRAFT	27-02-26										Project - Drawing No.		25-1385-C1050		Issue		A	
Issue	Description	Date																	



LEGEND



EXISTING IMPERVIOUS CATCHMENT
0.1142Ha

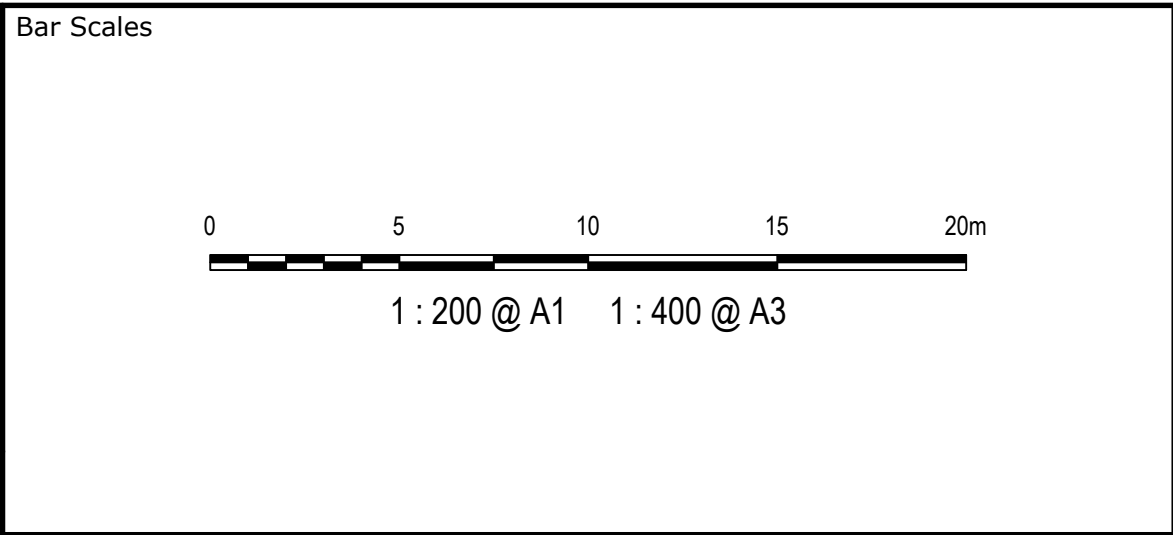


EXISTING PERVIOUS CATCHMENT
0.1162Ha

NOTES

TOTAL SITE AREA = 0.2304 Ha

A	ISSUED FOR APPROVAL	10-03-26
P1	ISSUED FOR DRAFT	27-02-26
Issue	Description	Date



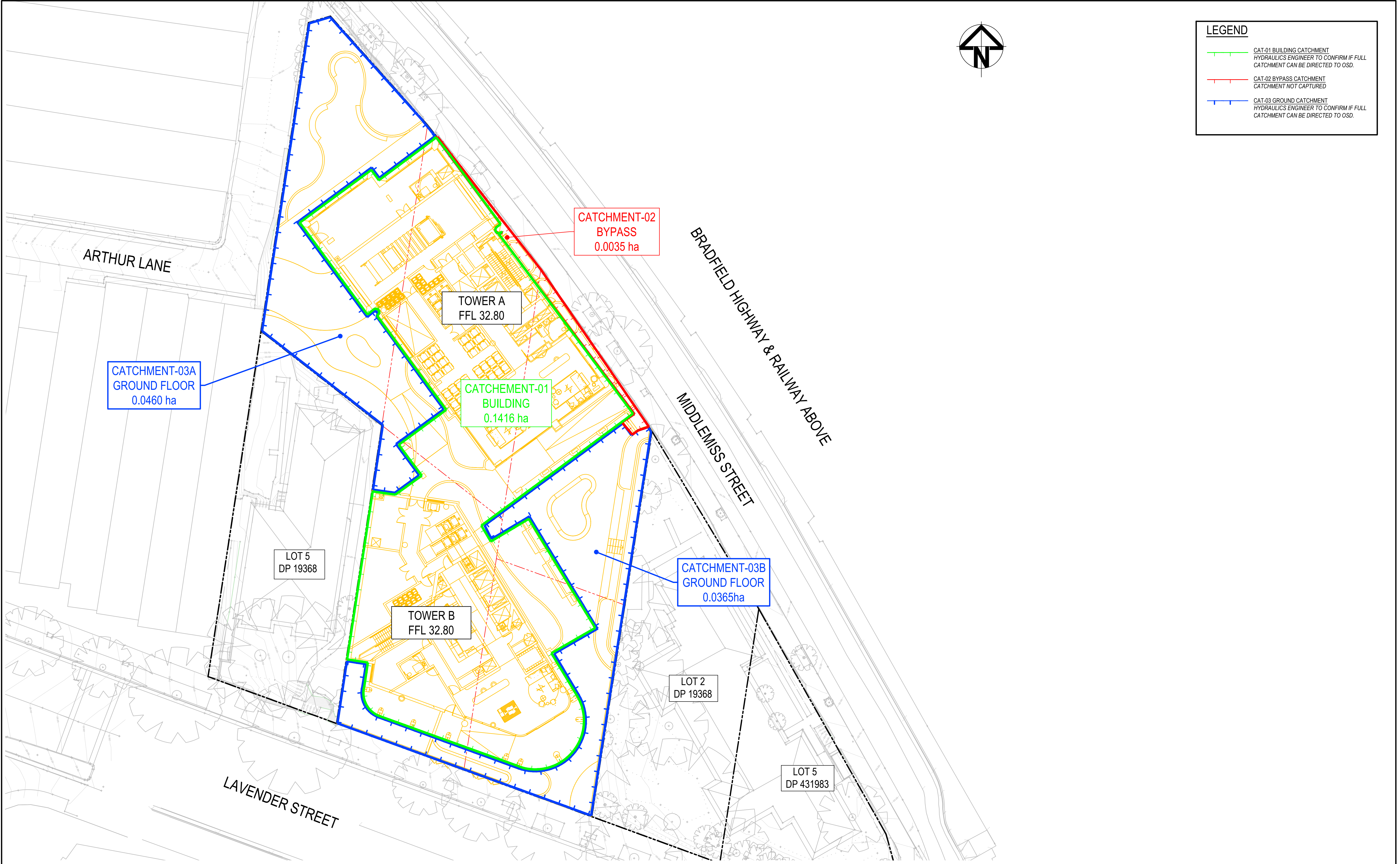
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WITHOUT THE WRITTEN
PERMISSION OF AT&L



Scales	1:200	Drawn	SG
		Designed	PS
Grid	GDA20 MGA56	Checked	SM
Height Datum	AHD	Approved	AT

Project	3-7 MIDDLEMISS ST 64-66 LAVENDER ST LAVENDER BAY SSDA
Title	STORMWATER DRAINAGE PRE-DEVELOPMENT CATCHMENT PLAN

Civil Engineers and Project Managers at&l Level 7, 153 Walker Street North Sydney NSW 2060 P 02 9439 1777 E info@atl.net.au www.atl.net.au ABN 96 130 882 405		
Status	FOR APPROVAL NOT FOR CONSTRUCTION	A1
Project - Drawing No.	25-1385-C1052	Issue A



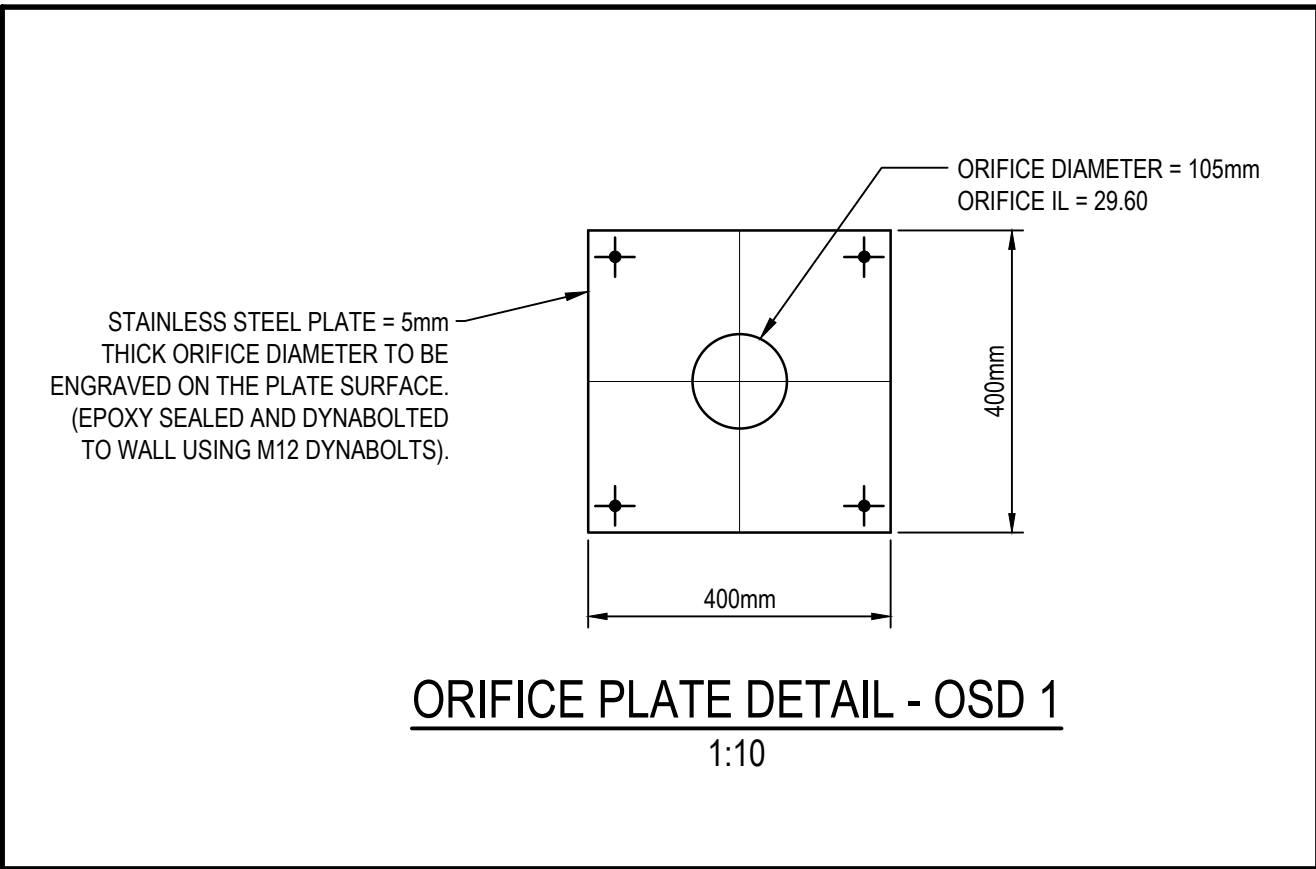
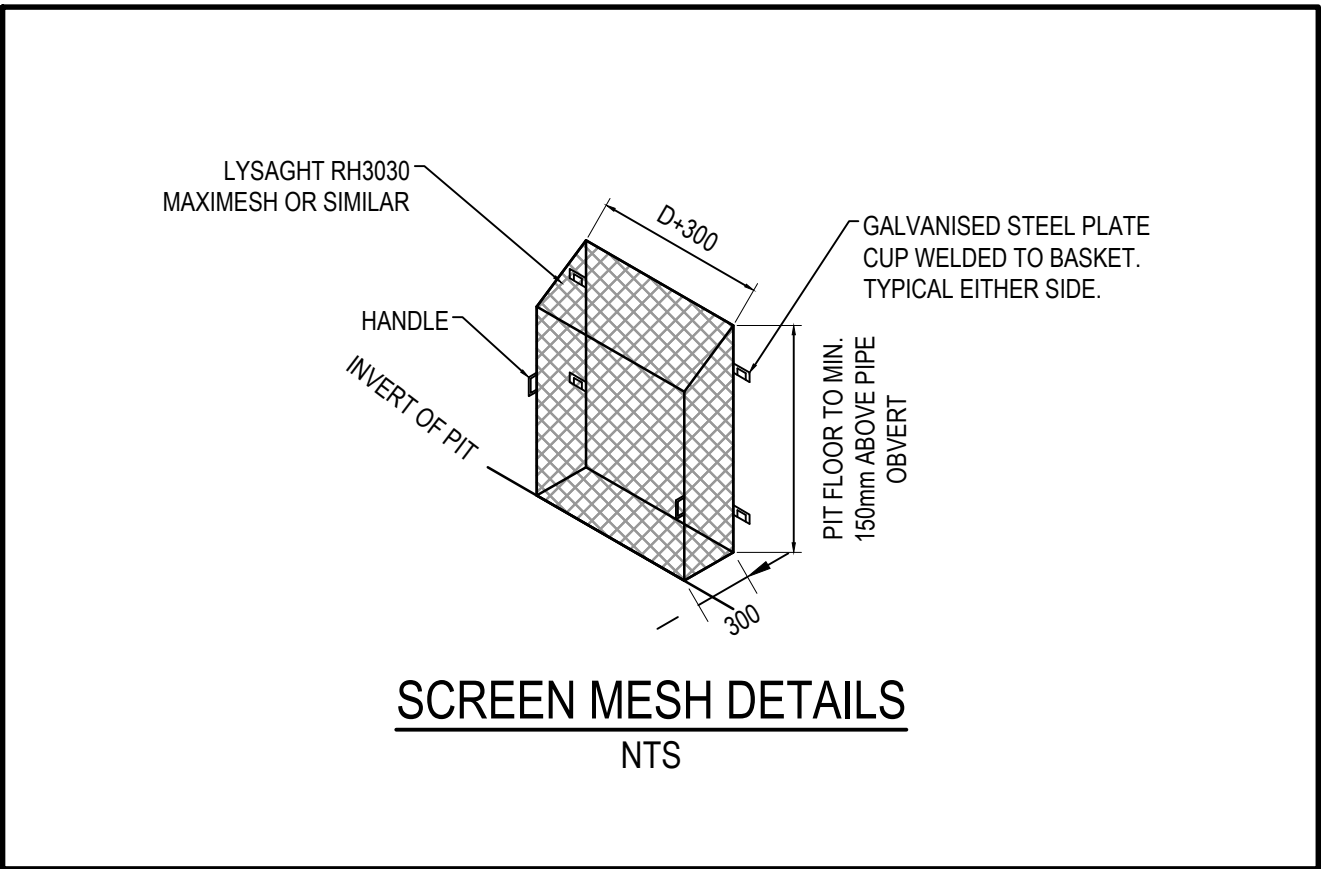
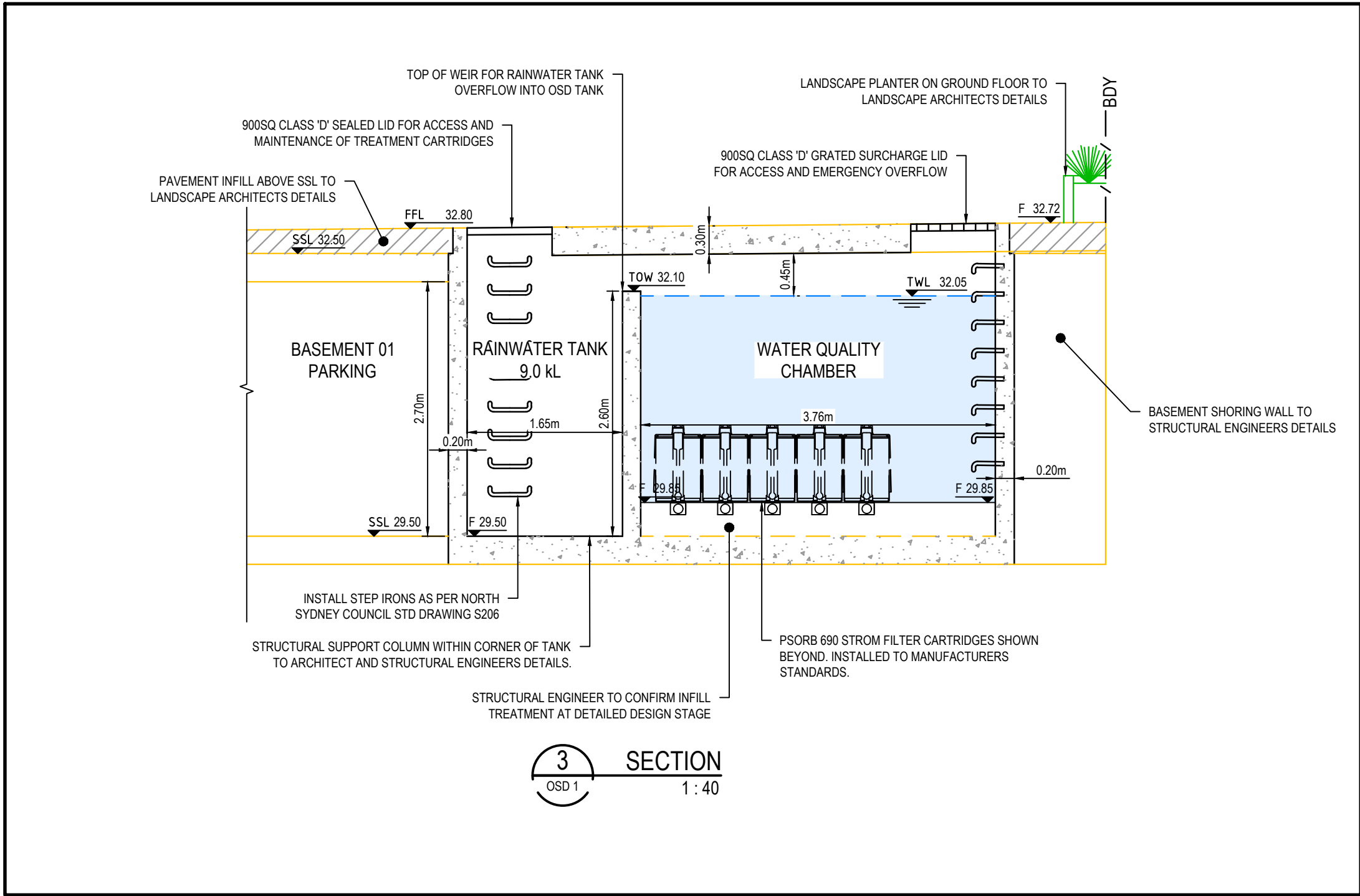
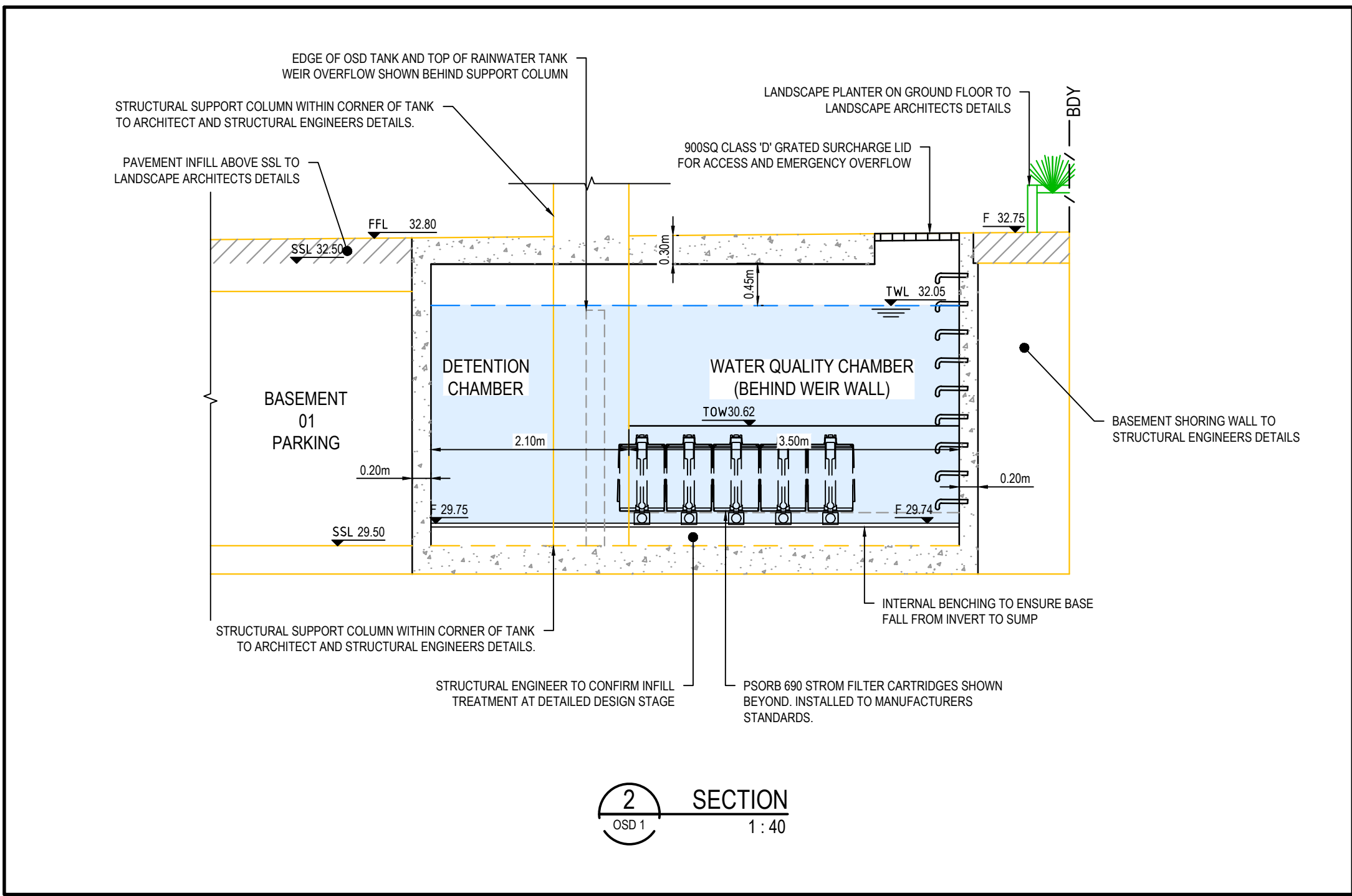
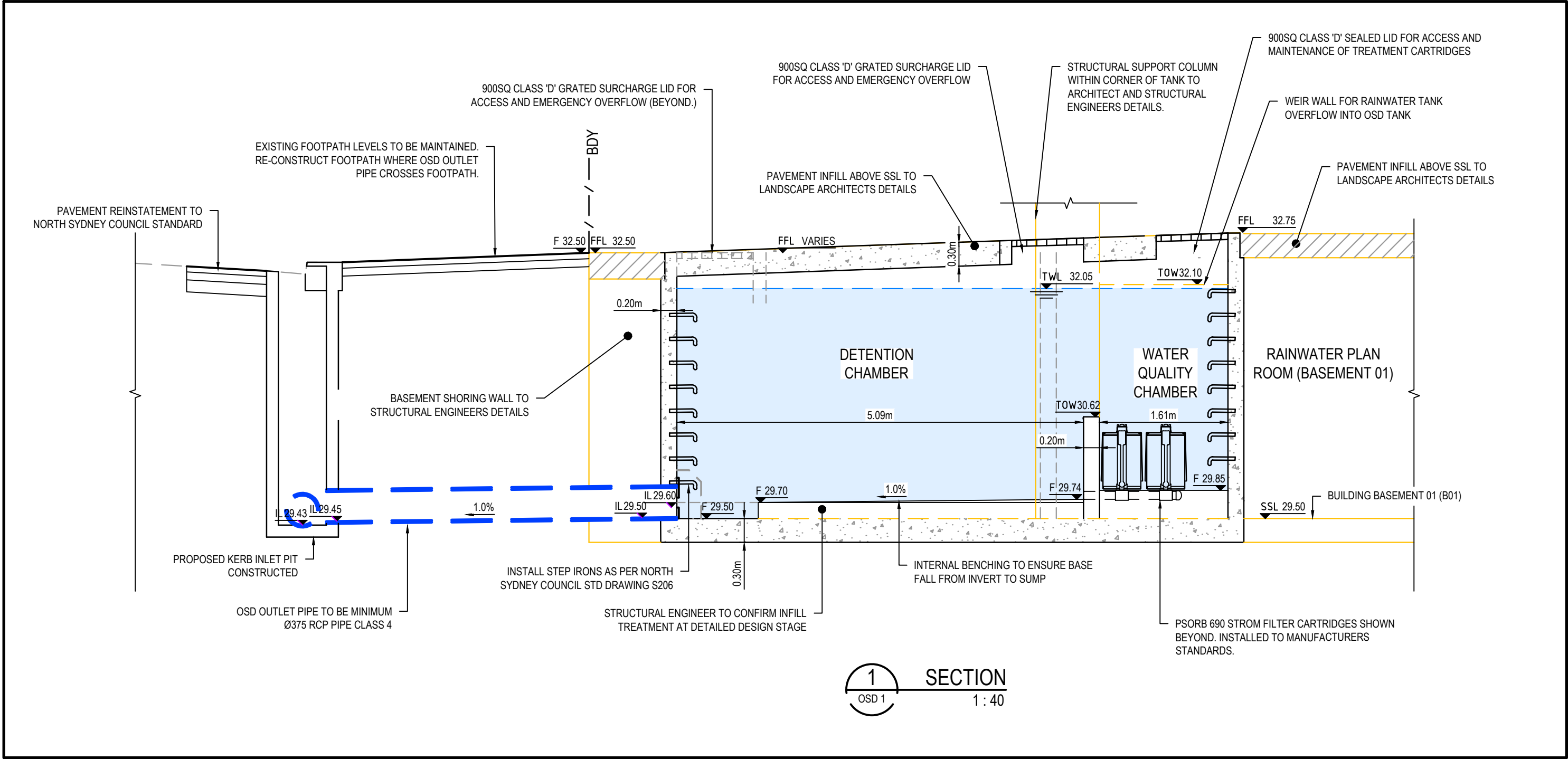
LEGEND

CATCHMENT-01 BUILDING CATCHMENT
HYDRAULICS ENGINEER TO CONFIRM IF FULL
CATCHMENT CAN BE DIRECTED TO OSD.

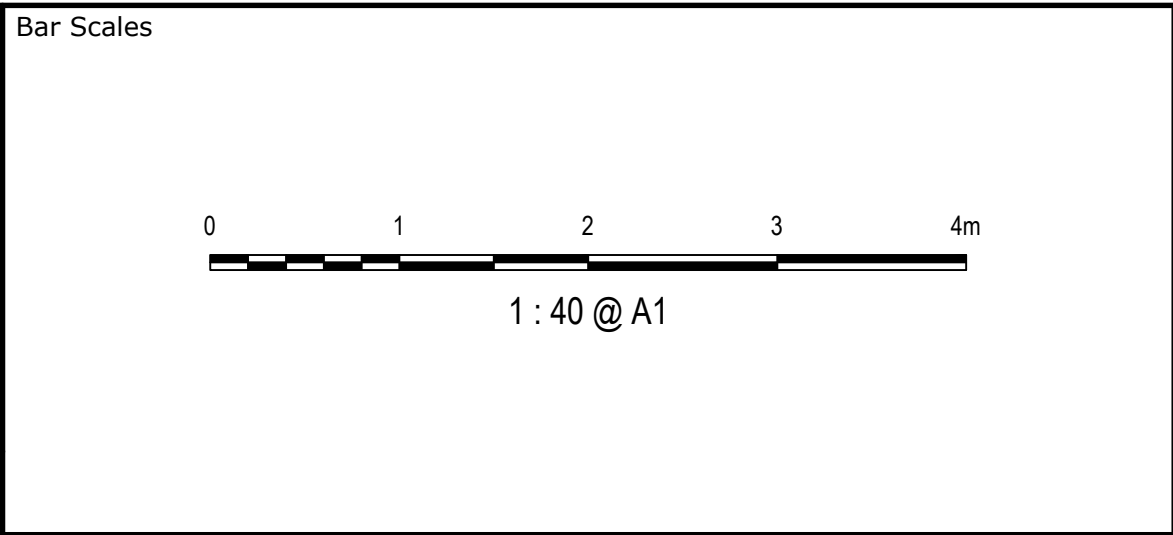
CATCHMENT-02 BYPASS CATCHMENT
CATCHMENT NOT CAPTURED

CATCHMENT-03 GROUND FLOOR CATCHMENT
HYDRAULICS ENGINEER TO CONFIRM IF FULL
CATCHMENT CAN BE DIRECTED TO OSD.

		Bar Scales
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A	ISSUED FOR APPROVAL	10-03-26
P1	ISSUED FOR DRAFT	27-02-26
Issue	Description	Date



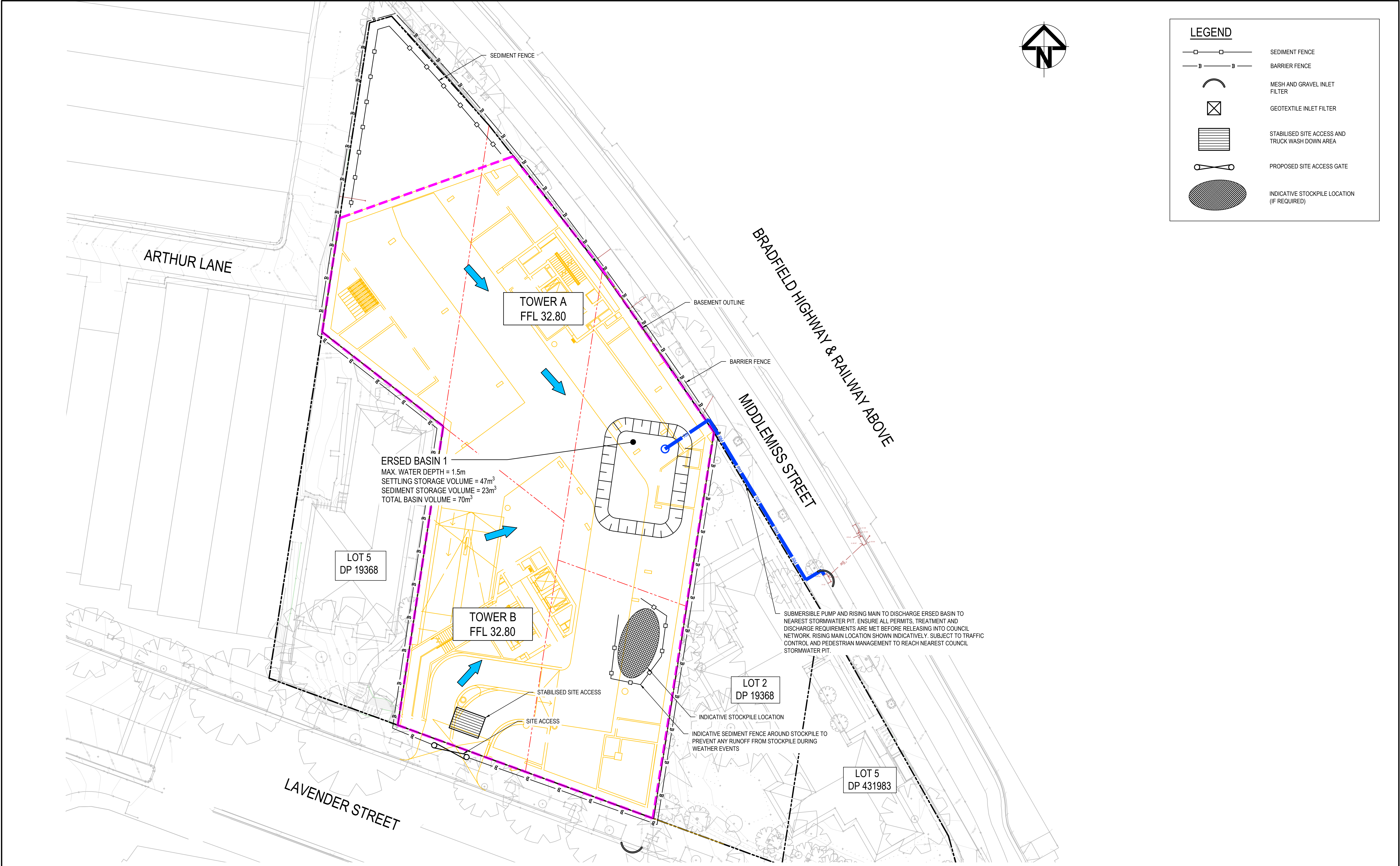
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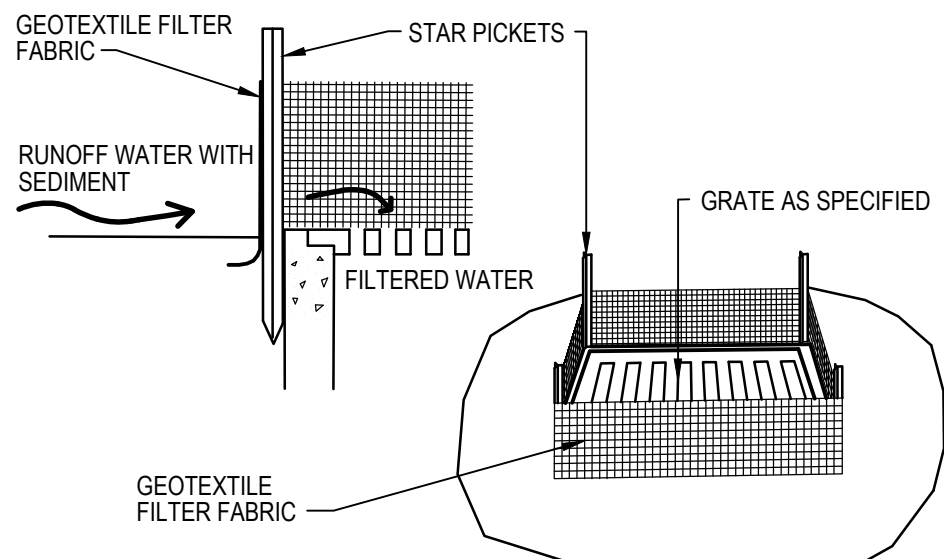
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		Designed	PS
Grid	GDA20 MGA56	Checked	SM
Height Datum	AHD	Approved	AT

Project	3-7 MIDDLEMISS ST 64-66 LAVENDER ST LAVENDER BAY SSDA
Title	STORMWATER DRAINAGE OSD SECTIONS AND DETAILS

Civil Engineers and Project Managers		
Level 7, 153 Walker Street North Sydney NSW 2060 P 02 9439 1777 E info@atl.net.au www.atl.net.au ABN 96 130 882 405		
Status	FOR APPROVAL NOT FOR CONSTRUCTION	A1
Project - Drawing No.	25-1385-C1061	Issue A

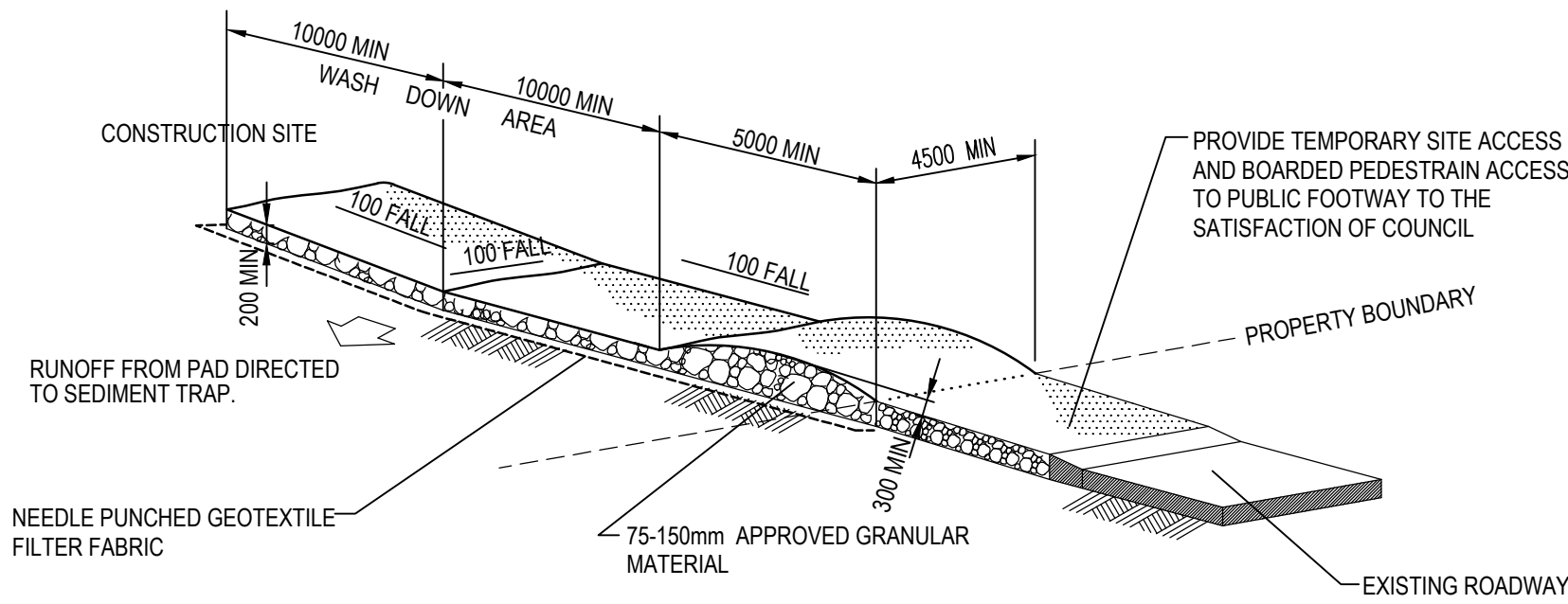


		Bar Scales		THIS DRAWING CANNOT BE COPIED OR REPRODUCED IN ANY FORM OR USED FOR ANY OTHER PURPOSE OTHER THAN THAT ORIGINALLY INTENDED WITHOUT THE WRITTEN PERMISSION OF AT&L	Client Central Element	Scales 1:200		Drawn SG	Project 3-7 MIDDLEMISS ST 64-66 LAVENDER ST LAVENDER BAY SSDA	Civil Engineers and Project Managers Level 7, 153 Walker Street North Sydney NSW 2060 P 02 9439 1777 E info@atl.net.au www.atl.net.au ABN 96 130 882 405 at&l					
						Designed PS									
						Grid GDA20 MGA56	Checked SM								
						Height Datum AHD	Approved AT								
								Title							
								EROSION AND SEDIMENT CONTROL PLAN		Status		FOR APPROVAL NOT FOR CONSTRUCTION		A1	
A ISSUED FOR APPROVAL		10-03-26										Project - Drawing No.		Issue	
P1 ISSUED FOR DRAFT		27-02-26										25-1385-C1090		A	
Issue Description		Date													



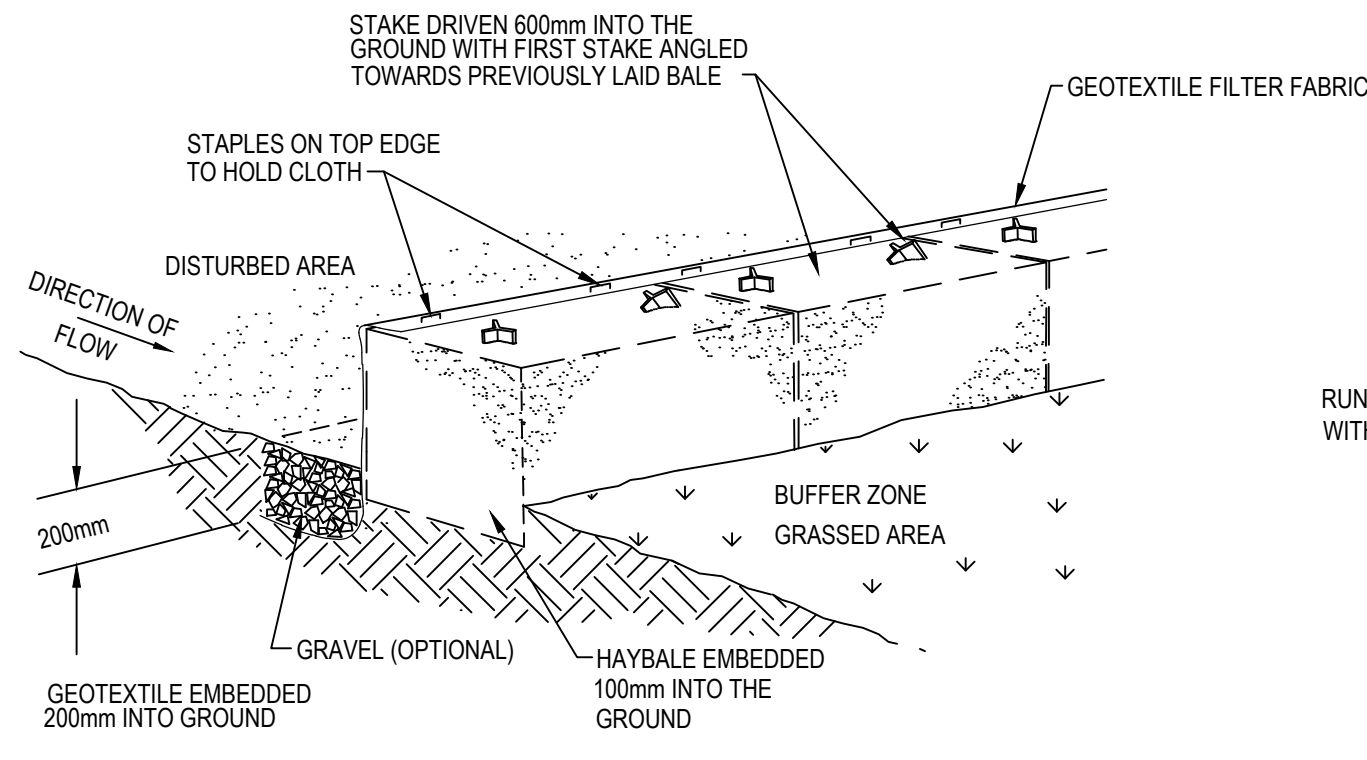
GEOTEXTILE FILTER PIT SURROUND

NTS



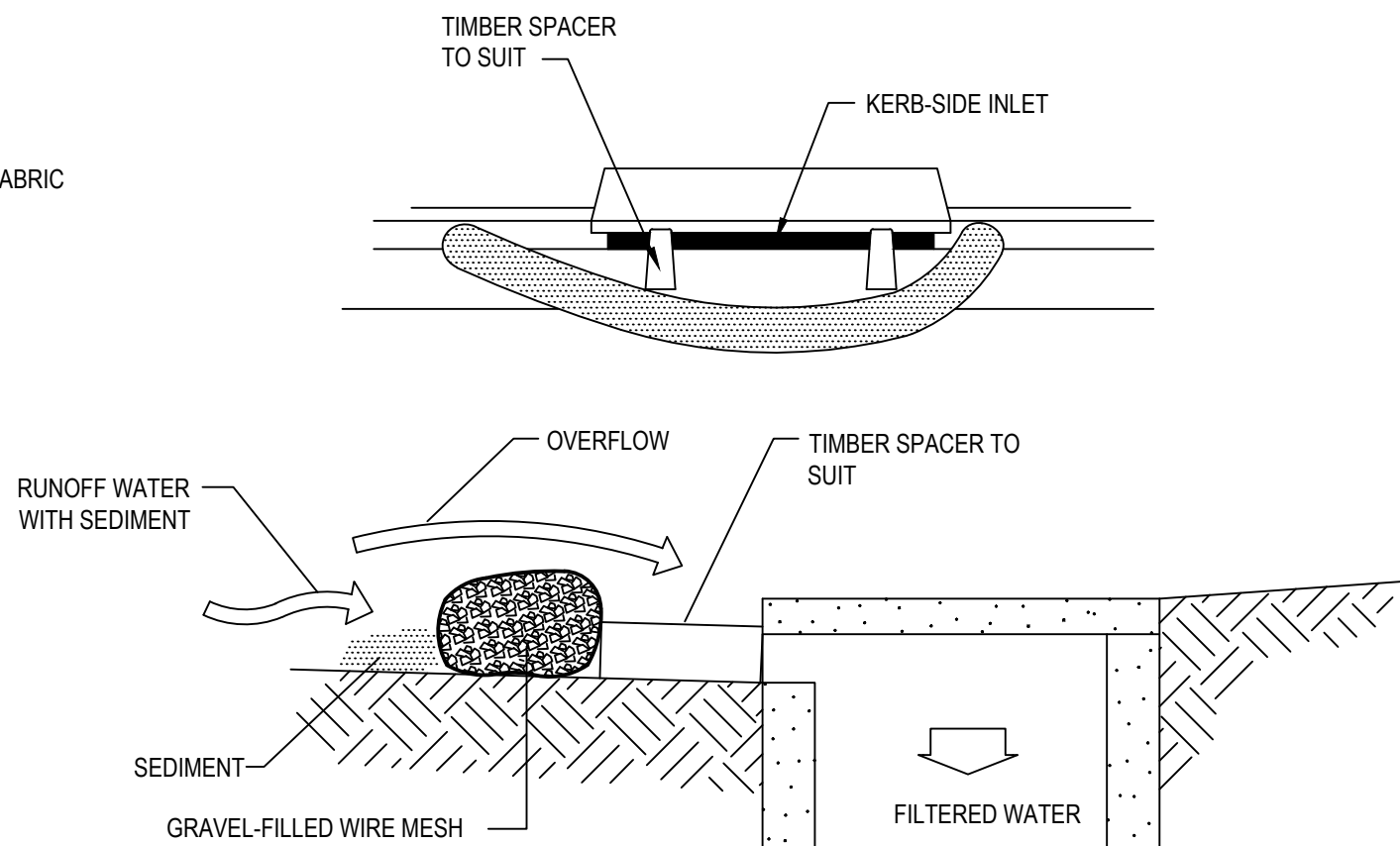
STABILISED SITE ACCESS AND TRUCK WASH DOWN AREA

NTS



HAYBALE AND GEOTEXTILE SEDIMENT FILTER

NTS



MESH AND GRAVEL INLET FILTER

NTS

SWMP Commentary, Standard Calculation

Note: These "Standard Calculation" spreadsheets relate only to low erosion hazard lands as identified in figure 4.6 where the designer chooses to not use the RUSLE to size sediment basins. The more "Detailed Calculation" spreadsheets should be used on high erosion hazard lands as identified by figure 4.6 or where the designer chooses to run the RUSLE in calculations.

1. Site Data Sheet

Site name: Lavender Bay

Site location: Lavender Bay

Precinct: -

Description of site: SSDA Proposal for two (2x) residential towers (shared basement) and associated public areas on ground floor

Site area	Site					Remarks
	B1					
Total catchment area (ha)	0.233					
Disturbed catchment area (ha)	0.233					

Soil analysis							DIPNR mapping (if relevant)
Soil landscape	Ig						Sections 6.3.3(c), (d) and (e)
Soil Texture Group	D						

Rainfall data							
Design rainfall depth (days)	5						See Sections 6.3.4 (d) and (e)
Design rainfall depth (percentile)	85						See Sections 6.3.4 (f) and (g)
x-day, y-percentile rainfall event	40						See Section 6.3.4 (h)
Rainfall intensity: 2-year, 6-hour storm	10.5						See IFD chart for the site
Rainfall erosivity (R-factor)	2420						Automatic calculation from above data

Comments:

Spreadsheet Standard edi-w1

1

SWMP Commentary, Standard Calculation

2. Storm Flow Calculations

Peak flow is given by the Rational Formula:

$$Q_y = 0.00278 \times C_{10} \times F_y \times I_{y,tc} \times A$$

where: Q_y is peak flow rate (m^3/sec) of average recurrence interval (ARI) of "y" years
 C_{10} is the runoff coefficient (dimensionless) for ARI of 10 years. Rural runoff coefficients are given in Volume 2, figure 5 of Pilgrim (1998), while urban runoff coefficients are given in Volume 1, Book VIII, figure 1.13 of Pilgrim (1998) and construction runoff coefficients are given in Appendix F
 F_y is a frequency factor for "y" years. Rural values are given in Volume 1, Book IV, Table 1.1 of Pilgrim (1998) while urban coefficients are given in Volume 1, Book VIII, Table 1.6 of Pilgrim (1998)
 A is the catchment area in hectares (ha)
 $I_{y,tc}$ is the average rainfall intensity (mm/hr) for an ARI of "y" years and a design duration of "tc" (minutes or hours)

Time of concentration (t_c) = $0.76 \times (A/100)^{0.38}$ hrs (Volume 1, Book IV of Pilgrim, 1998)

Note: For urban catchments the time of concentration should be determined by more precise calculations or reduced by a factor of 50 per cent.

Peak flow calculations, 1

Site	A (ha)	t_c (mins)	Rainfall intensity, I, mm/hr						C_{10}
			1 _{yr,tc}	5 _{yr,tc}	10 _{yr,tc}	20 _{yr,tc}	50 _{yr,tc}	100 _{yr,tc}	
B1	0.233	5	100	150	176	202	237	265	0.5

Peak flow calculations, 2

ARI yrs	Frequency factor (F_y)	Peak flows						Comment
		B1 (m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)	
1 _{yr,tc}	0.9	0.029						
5 _{yr,tc}	0.95	0.046						
10 _{yr,tc}	1	0.057						
20 _{yr,tc}	1.05	0.069						
50 _{yr,tc}	1.15	0.088						
100 _{yr,tc}	1.2	0.103						

Spreadsheet Standard edi-w1

1

SWMP Commentary, Standard Calculation

4. Volume of Sediment Basins, Type D and Type F Soils

Basin volume = settling zone volume + sediment storage zone volume

Settling Zone Volume

The settling zone volume for Type F and Type D soils is calculated to provide capacity to contain all runoff expected from up to the y-percentile rainfall event. The volume of the basin's settling zone (V) can be determined as a function of the basin's surface area and depth to allow for particles to settle and can be determined by the following equation:

$$V = 10 \times C_v \times A \times R_{y-\%ile, x-day} \quad (m^3)$$

where:

10 = a unit conversion factor

C_v = the volumetric runoff coefficient defined as that portion of rainfall that runs off as stormwater over the x-day period

R = is the x-day total rainfall depth (mm) that is not exceeded in y percent of rainfall events. (See Sections 6.3.4(d), (e), (f), (g) and (h)).

A = total catchment area (ha)

Sediment Storage Zone Volume

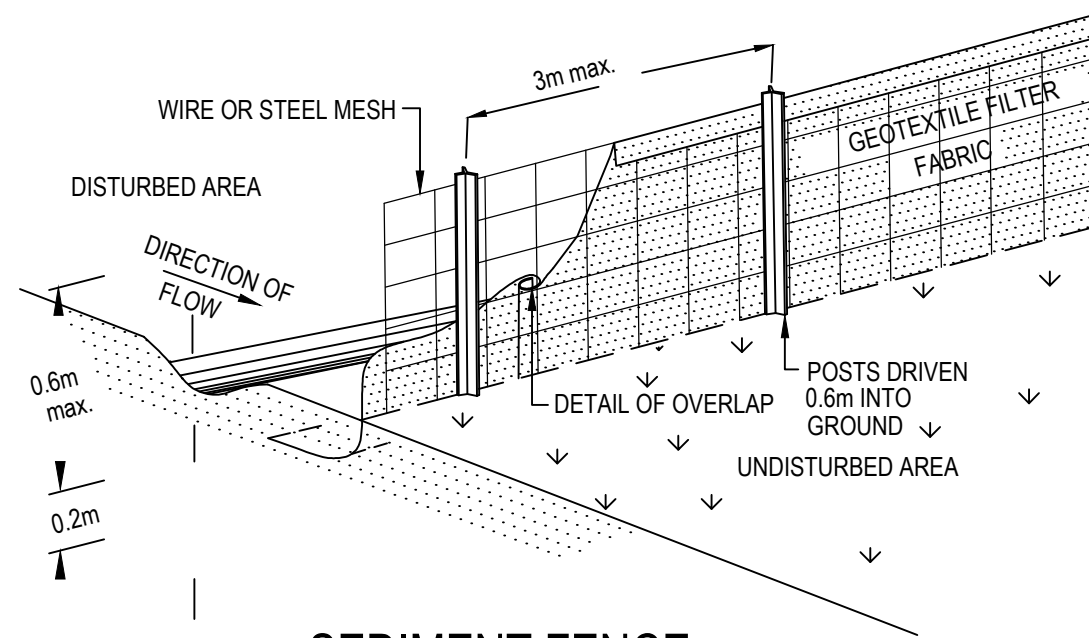
In the standard calculation, the sediment storage zone is 50 percent of the setting zone. However, designers can work to capture the 2-month soil loss as calculated by the RUSLE (Section 6.3.4(i)(ii)), in which case the "Detailed Calculation" spreadsheets should be used.

Total Basin Volume

Site	C_v	R x-day y-%ile	Total catchment area (ha)	Settling zone volume (m^3)	Sediment storage volume (m^3)	Total basin volume (m^3)
B1	0.50	40	0.233	46.6	23	69.9

Spreadsheet Standard edi-w1

1



SEDIMENT FENCE

NTS

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P1	ISSUED FOR DRAFT	27-02-26
Issue	Description	Date

Bar Scales

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Central
Element

Client

Scales

Drawn

SG

Designed

PS

Grid GDA20 MGA56

Checked

SM

Height Datum AHD

Approved

AT

Project

3-7 MIDDLEMISS ST
64-66 LAVENDER ST
LAVENDER BAY
SSDA

Title

EROSION AND SEDIMENT
CONTROL DETAILS

Civil Engineers and Project Managers

Level 7, 153 Walker Street
North Sydney
NSW 2060
P 02 9439 1777
E info@atl.net.au
www.atl.net.au
ABN 96 130 882 405

Status

FOR APPROVAL
NOT FOR CONSTRUCTION

A1

Project - Drawing No.

25-1385-C1095

Issue

A

Appendix B – OSD, Rainwater Reuse Tanks and Water Quality Requirements

FW: 3-7 Middlemiss Street -Proposed high rise development

From: Sandesh Ghimire <Sandesh.Ghimire@northsydney.nsw.gov.au>
Sent: Monday, 1 December 2025 11:35 AM
To: suzanne.m@apl.net.au
Subject: 3-7 Middlemiss Street -Proposed high rise development

Hi Suzanne,

Regarding OSDs, Rainwater Reuse Tanks and Water quality requirements:

1. What are the OSD requirements?

"On site detention must be provided to ensure that the maximum discharge of stormwater collected from the undeveloped site, which would occur during a 1 in 5-year storm of 1-hour duration is not exceeded. All other stormwater run-off from the site for all storms up to a 1 in 100-year storm event is to be retained on the site for gradual release to the kerb and gutter or piped drainage system (if it is available within 50 m from the site, it would be priority). Provision is to be made for satisfactory overland flow should a storm in excess of the above parameters occur."

Determination of the required cumulative storage must be based on stage-storage curve or determined by DRAINS computer modelling, or any other available computer modelling method.

**** We would just like to confirm that the undeveloped site means the site in its current condition.

2. What are Rainwater Reuse targets? Are there specific re-use rates to be used? What end uses does it need to be connected to?

Council does not have specific re-use targets or re-use rates. End uses may include garden irrigation, toilets etc.
Rainwater tanks are to be designed in accordance with Basix and Sydney Water requirements.

3. Are there Water Quality requirements? (All development with Gross Floor Area more than 2000m²)

We are assuming you will be using MUSIC modelling, which is commonly used to analyse stormwater quality treatment, however North Sydney Council doesn't (unfortunately) have MUSIC inputs.

Should you be using MUSIC modelling, the City of Sydney inputs would be very similar to North Sydney. So, there would be no harm in using the Sydney City Council MUSIC link.

If you are using some other modelling, I can at least advise that Council has an expectation for the targets below.

80% retention of the typical urban annual load for Total Suspended Solids (TSS)

45% retention of the typical urban annual load for Total Phosphorus (TP)

45% retention of the typical urban annual load for Total Nitrogen (TN)

70% retention of the typical urban annual load for gross pollutants (litter).

Regards,
Sandesh Ghimire

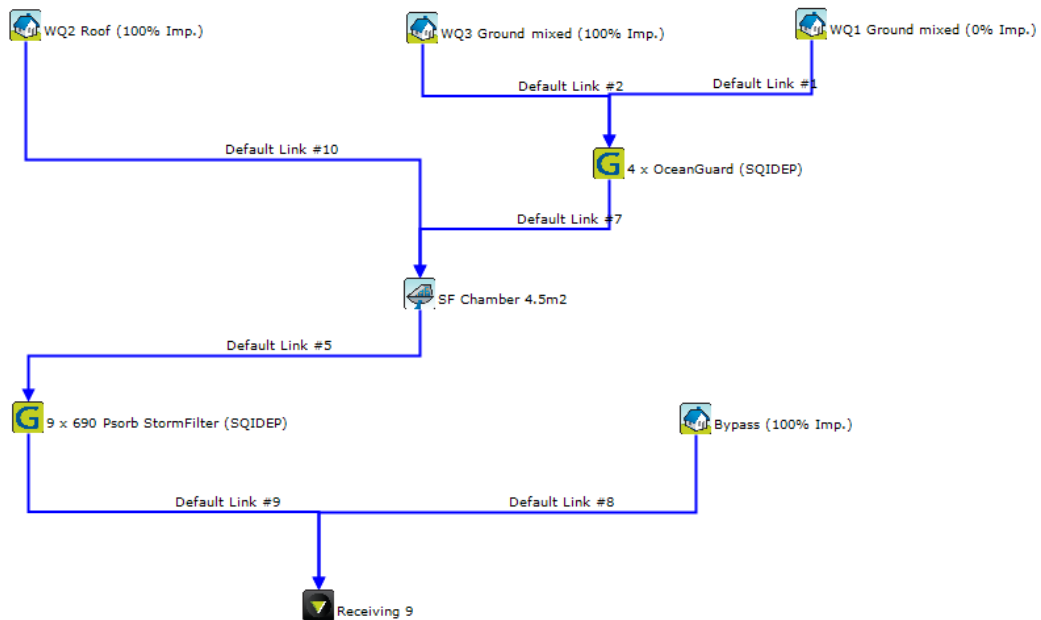


Sandesh Ghimire
Development Engineer

P +61 2 9936 8153
Sandesh.Ghimire@northsydney.nsw.gov.au



Appendix C – MUSIC Model layout



Appendix D – MUSIC-Link Report

MUSIC-link Report

Project Details		Company Details	
Project:	25-1385-Lavender Bay	Company:	AT&L
Report Export Date:	10/03/2026	Contact:	Suzanne Mustafa
Catchment Name:	Receiving 9	Address:	Lvl 10, 124 Walker St, North Sydney
Catchment Area:	0.227767ha	Phone:	
Impervious Area*:	81.7567953215347%	Email:	suzanne.m@atl.net.au
Rainfall Station:	66062 SYDNEY		
Modelling Time-step:	Six minutes		
Modelling Period:	01/01/82 - 31/12/1986 11:54:00 PM		
Mean Annual Rainfall:	1278.438mm		
Evapotranspiration:	1265.834mm		
MUSICX Version:	1.50.0.13577 (5.50.0.13577)		
MUSIC-link data Version:	5.3		
Study Area:	City of Sydney		
Scenario:	City of Sydney Development		

* takes into account area from all source nodes that link to the chosen reporting node, excluding Import Data Nodes

Treatment Train Effectiveness		Treatment Nodes		Source Nodes	
Node:	Reduction	Node Type	Number	Node Type	Number
Flow	0.002%	Generic Treatment Nodes	2	Urban_Mixed Nodes	4
TSS	80.34%	Sedimentation Basin Nodes	1		
TP	73.211%				
TN	56.369%				
GP	94.158%				

Comments

Music Link requirement for TSS shown as 85% reduction. North Sydney Council have advised this target is 80%.

Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Generic	4 x OceanGuard (SQIDEP)	High Flow Bypass	None	99	0.08 m ³ /s
Generic	9 x 690 Psorb StormFilter (SQIDEP)	High Flow Bypass	None	99	0.011 m ³ /s
Receiving	Receiving 9	Flow Reduction	None	None	0.002 %
Receiving	Receiving 9	GP Reduction	90	None	94.158 %
Receiving	Receiving 9	TN Reduction	45	None	56.369 %
Receiving	Receiving 9	TP Reduction	65	None	73.211 %
Sedimentation	SF Chamber 4.5m2	% Reuse Demand Met	None	None	0 %
Sedimentation	SF Chamber 4.5m2	ExfiltrationRate	0	0	0 mm/h
Sedimentation	SF Chamber 4.5m2	ExtendedDetentionDepth	0.25	1	0.77 m
Sedimentation	SF Chamber 4.5m2	High Flow Bypass Out	None	None	0 ML/y
Urban_Mixed	Bypass (100% Imp.)	Impervious Area	None	None	0.011 ha
Urban_Mixed	Bypass (100% Imp.)	Pervious Area	None	None	0 ha
Urban_Mixed	Bypass (100% Imp.)	Total Area	None	None	0.011 ha
Urban_Mixed	WQ1 Ground mixed (0% Imp.)	Impervious Area	None	None	0 ha
Urban_Mixed	WQ1 Ground mixed (0% Imp.)	Pervious Area	None	None	0.03 ha
Urban_Mixed	WQ1 Ground mixed (0% Imp.)	Total Area	None	None	0.03 ha
Urban_Mixed	WQ2 Roof (100% Imp.)	Impervious Area	None	None	0.131 ha
Urban_Mixed	WQ2 Roof (100% Imp.)	Pervious Area	None	None	0.011 ha
Urban_Mixed	WQ2 Roof (100% Imp.)	Total Area	None	None	0.142 ha
Urban_Mixed	WQ3 Ground mixed (100% Imp.)	Impervious Area	None	None	0.044 ha
Urban_Mixed	WQ3 Ground mixed (100% Imp.)	Pervious Area	None	None	0 ha
Urban_Mixed	WQ3 Ground mixed (100% Imp.)	Total Area	None	None	0.044 ha

Only certain parameters are reported when they pass validation

Failing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Receiving	Receiving 9	TSS Reduction	85	None	80.34 %
Sedimentation	SF Chamber 4.5m2	Notional Detention Time	8	12	0.043 h

Only certain parameters are reported when they pass validation

Appendix E – Flood Planning Level Advice

RE: Flood Planning Level - 64-66 Lavender St & 3-7 Middlemiss St./Discharge to



Sandesh Ghimire <Sandesh.Ghimire@northsydney.nsw.gov.au>
To Suzanne Mustafa

 Reply
  Reply All
  Forward
 

Mon 23/02/2026 10:34 AM

 Follow up. Start by Monday, 23 February 2026. Due by Monday, 23 February 2026.

You forwarded this message on 24/02/2026 11:47 AM.

Click here to download pictures. To help protect your privacy, Outlook prevented automatic download of some pictures in this message.



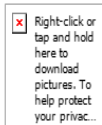
RE: 3-7 Middlemiss Street -Proposed high rise development
Outlook item

Hi Suzanne,

These properties are not located within the FPA, therefore no floor level requirements. However, the development needs to set their basement driveway entrance 300mm above the existing ground level to ensure they are not directing overland flow into the basement.

For the size of this development, Council would expect that their discharge is connected directly into the Council Stormwater System not to the kerb and gutter. The nearest system that they can connect into is on the corner of Arthur Street and Lavender Street, connecting into Middlemiss Street is not acceptable as the downstream pipe under the bridge abutment is undersized.

Regards,
Sandesh Ghimire



Sandesh Ghimire
Development Engineer

P +61 2 9936 8153
Sandesh.Ghimire@northsydney.nsw.gov.au



The first of these is the fact that the system is not a simple one. It is a complex system, and as such, it is not possible to understand it by looking at its parts in isolation. The system is a whole, and it is only by looking at the whole that we can understand it. This is the first principle of systems thinking: the whole is greater than the sum of its parts.

The second principle is that the system is dynamic. It is not a static system, and it is not a system that can be understood by looking at a single point in time. The system is a process, and it is only by looking at the process that we can understand it. This is the second principle of systems thinking: the system is a process.

The third principle is that the system is interconnected. It is not a system of isolated parts, and it is not a system that can be understood by looking at the parts in isolation. The system is a network, and it is only by looking at the network that we can understand it. This is the third principle of systems thinking: the system is a network.

The fourth principle is that the system is self-organizing. It is not a system that is controlled by an external force, and it is not a system that can be understood by looking at the external force. The system is a self-organizing system, and it is only by looking at the self-organizing process that we can understand it. This is the fourth principle of systems thinking: the system is a self-organizing system.

The fifth principle is that the system is resilient. It is not a system that is fragile, and it is not a system that can be understood by looking at the fragility. The system is a resilient system, and it is only by looking at the resilience that we can understand it. This is the fifth principle of systems thinking: the system is a resilient system.

The sixth principle is that the system is adaptable. It is not a system that is rigid, and it is not a system that can be understood by looking at the rigidity. The system is an adaptable system, and it is only by looking at the adaptability that we can understand it. This is the sixth principle of systems thinking: the system is an adaptable system.

The seventh principle is that the system is sustainable. It is not a system that is unsustainable, and it is not a system that can be understood by looking at the unsustainability. The system is a sustainable system, and it is only by looking at the sustainability that we can understand it. This is the seventh principle of systems thinking: the system is a sustainable system.

The eighth principle is that the system is equitable. It is not a system that is inequitable, and it is not a system that can be understood by looking at the inequity. The system is an equitable system, and it is only by looking at the equity that we can understand it. This is the eighth principle of systems thinking: the system is an equitable system.

The ninth principle is that the system is just. It is not a system that is unjust, and it is not a system that can be understood by looking at the injustice. The system is a just system, and it is only by looking at the justice that we can understand it. This is the ninth principle of systems thinking: the system is a just system.

The tenth principle is that the system is peaceful. It is not a system that is violent, and it is not a system that can be understood by looking at the violence. The system is a peaceful system, and it is only by looking at the peace that we can understand it. This is the tenth principle of systems thinking: the system is a peaceful system.



NORTH SYDNEY

LEVEL 10
124 WALKER STREET
NORTH SYDNEY NSW 2060
02 9439 1777
INFO@ATL.NET.AU

PARRAMATTA

SUITE 1.02 LEVEL 1
60 STATION STREET
PARRAMATTA NSW 2150
02 9068 8517
INFO@ATL.NET.AU

BRISBANE

SUITE A1 LEVEL 20
127 CREEK STREET
BRISBANE QLD 4000
07 3211 9581
INFO-QLD@ATL.NET.AU

MELBOURNE

LEVEL 4
50 MARKET STREET
MELBOURNE VIC 3000
03 9124 7350
INFO-VIC@ATL.NET.AU

atl.net.au