Structural
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Stormwater Management Plan for SSDA Application

Eden Street Site Redevelopment

Prepared for Arncliffe Eden Property Pty Ltd / 30 June 2021

201609

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1.0 Introduction

TTW has been commissioned to prepare the concept stormwater drainage design for the Eden Street Site Redevelopment at 26-42 Eden Street & 161-179 Princes Highway, Arncliffe. This stormwater management plan has been prepared to accompany the stormwater concept plans. The site is located at approximately 10km southwest of the Sydney CBD.

This Stormwater Management Plan is submitted to the Department of Planning, Industry and Environment (DPIE) in support of a State Significant Development Application (SSDA-11429726) for the development of land identified at 26-42 Eden Street and 161-179 Princes Highway, Arncliffe (the site) for the purposes of a mixed-use precinct with open space, retail, and residential uses, comprising social and market housing as part of the NSW Land and Housing Corporation (LAHC)'s 'Communities Plus' program.

SSDA-11429726 seeks approval for the following development:

- Demolition of all existing buildings and structures on the site;
- Site preparation works, excavation and tree removal;
- The construction of a mixed-use development comprising:
    - 744 apartments across (4) buildings between 19-23 storeys in height, as follows:
        - 186 market housing apartments in Building A;
        - 202 market housing apartments in Building B;
        - 180 social housing apartments in Building C; and
        - 176 market housing apartments in Building D;
    - 3,113m2 retail gross floor area;
    - 240m2 for a future childcare centre;
    - 3,706m2 of communal open space;
    - 813 spaces of lower ground and basement car parking; and
- 4,870m2 of publicly accessible open space including a 4,000m2 park, an 870m2 public plaza (meeting space), and through site link connecting Eden Street and the Princes Highway.

2.0 Relevant Documents

The relevant documents utilised to prepare the stormwater drainage design are the following:

- Rockdale Development Control Plan 2011
- Rockdale Technical Specification – Stormwater Management
- Australian Rainfall and Runoff 2016
- Bayside Council_Checklist.pdf dated 15 December 2020

3.0 SEAR General Requirements

In accordance with section 4.39 of the Environmental Planning & Assessment Act 1979 (EP&A Act), the Secretary's Environmental Assessment Requirements (SEARs) for SSDA-11429726 were issued on 18 December, 2020. This report has been prepared to respond to the following SEARs:

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17. Stormwater and drainage

The EIS must include an Integrated Water Management Plan that:

- is prepared by a suitably qualified person in consultation with Council and any other relevant drainage authority
- details the proposed drainage design for the site including on-site detention facilities, water quality measures and the nominated discharge point
- demonstrates compliance with Council or other drainage authority requirements and avoid adverse impacts on any downstream properties.

Where drainage infrastructure works are required that would be handed over to Council, provide full hydraulic details and detailed plans and specifications of proposed works that have been prepared in consultation with Council and comply with Council's relevant standards.

4.0 Existing Site

The site is located in Arncliffe within the Bayside Council Local Government Area. The site area comprises of Lot 1/DP447649, Lot 10-12/DP23701, Lot 1-3/DP23701, Lot 7-9/DP23701, Lot 25-26/DP1228031, Lot 3/DP1094906, and is currently occupied by several three-storey residential buildings currently owned by the NSW Land and Housing Corporation.

The site location is shown in Figure 4.1.

Figure 4.1 Site Location

The proposed mixed-use development will comprise of four (4) residential towers with retail podium levels, basement carparks, and a public open space. The overall site area is approximately 13,440 m². The proposed stormwater system is composed of two (2) on-site detention (OSD) tanks to cater for the redevelopment area, conveyed by an in-ground pipe and pit system along Eden Street and will ultimately be connected to the existing Council network in Burrows Street.

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5.0 Stormwater Design

5.1 Stormwater Quantity

The site is governed by the former Rockdale Council Stormwater Management Technical Specification, 5 December 2011, which requires an on-site detention across the whole site to limit the discharge to no more than current.

The maximum Permissible Site Discharge (PSD) rate and corresponding minimum storage volumes considered in the design were 210 L/s/ha and 285 m^3/ha, respectively, for all storm events up to and including the 100-year ARI storm event.

Refer to Clause 6.2 of the Rockdale Technical Specification – Stormwater Management. The site is located under the Bonnie Doon catchment as per Map B.2 of the aforementioned document.

The maximum Permissible Site Discharge (PSD) and corresponding minimum storage volumes shall be determined from the Table 6.1 for the 50 year ARI event.

Catchment Name (Refer to Map B.2)	Permitted Site Discharge (PSD) 50 Year ARI (l/s/ha)	On Site Detention (OSD) 50 Year ARI Volume (m^3/ha)
Wolli Creek	160	350
Bardwell Creek	150	365
Bonnie Doon	210	285
Spring Street	190	305
Muddy Creek	180	320
Eve Street / Cahill Park	240	245
Scarborough Ponds	110	415
Waradiel Creek (SS1)	190	305
Bado-Berong Creek (SS2)	160	350
Goomum Creek (SS3)	180	320

Figure 5.1 Permitted Site Discharge and OSD Volume Rates - Rockdale Technical Specification

As per the above requirements, the OSD tanks have been sized accordingly with the respective catchment areas. A breakdown of the OSD tanks are shown below.

Table 5.1 On-site Detention (OSD) Tank Breakdown

SSR (m^3/ha) =	285
PSD (L/s/ha) =	210

OSD Tank Catchment	Catchment Area (m^2)	Site Storage Requirement (m^3)	OSD volume provided (m^3)	Permissible Site Discharge (L/s)
OSD 1	4,539	129	137	95
OSD 2	8,902	254	300	187

Location and details of the tanks and point of discharge are shown in the Stormwater Concept Plans in Appendix A.

An in-ground stormwater pipe and pit upgrade system is proposed along Eden Street to direct stormwater from

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within the development area to the existing Council network in Burrows Street. The following Figure 5.2 shows the layout of the proposed stormwater network modelled in DRAINS.

This concept is consistent with Council's preferred method of connection. TTW has been in coordination with Bayside Council officers and have agreed with the concept as shown in Drawing C510. Refer to Appendix B for email correspondence with Bayside Council.

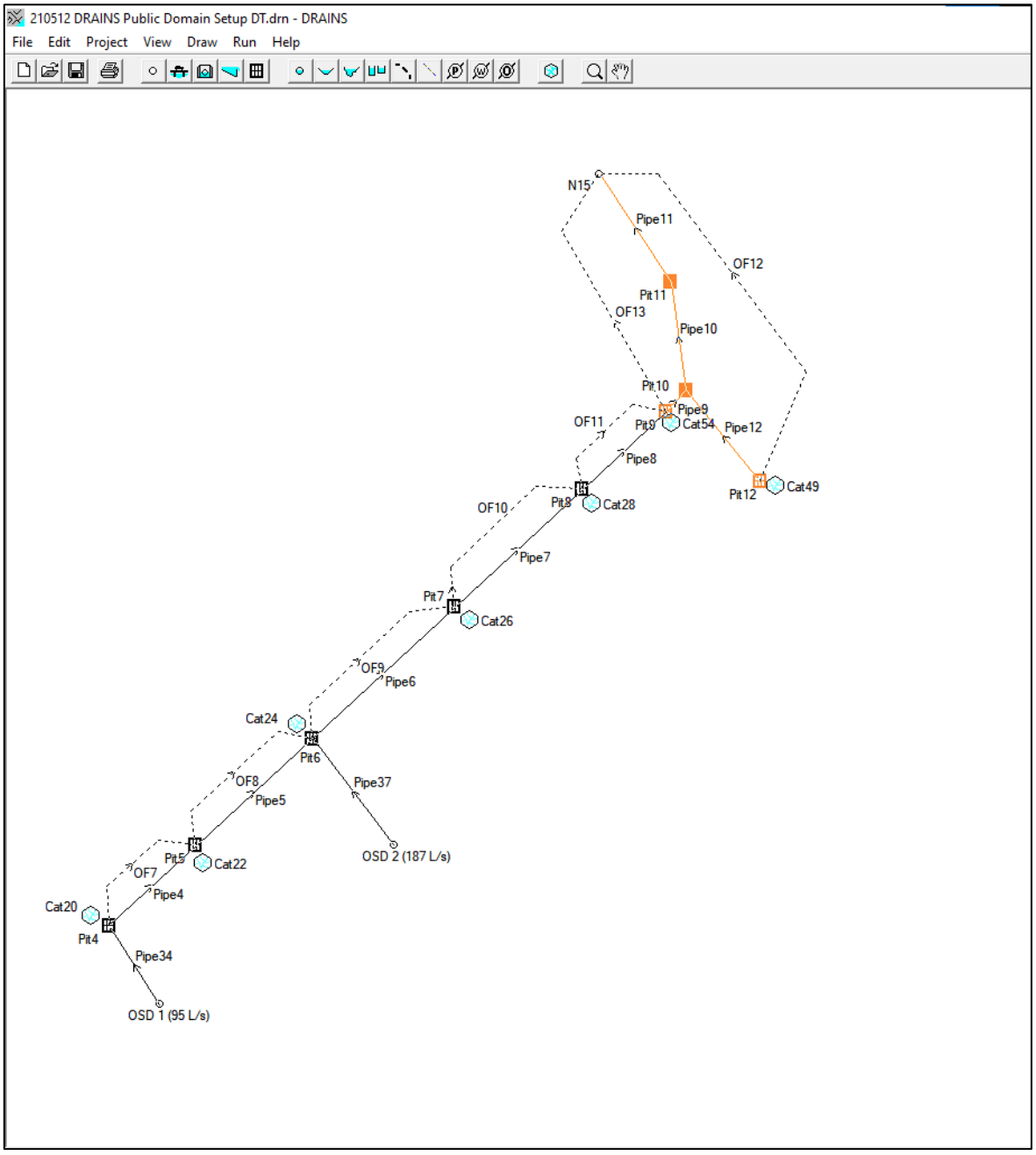

Figure 5.2 DRAINS model

Referring to the breakdown shown in Table 5.1, the rates of discharge from the two (2) OSD tanks are limited to the PSD of 95 l/s and 187 l/s, respectively, through the use of an orifice plate affixed to the OSD outlet which discharges to the proposed pit and pipe system upgrade along Eden Street.

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5.2 Stormwater Quality

Stormwater quality treatment within the site is required to comply with Rockdale Development Control Plan 2011 and Rockdale Technical Specification – Stormwater Management. Water quality treatment devices must achieve the water quality targets as specified in Table 4.2.

The treatment train is modelled in the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) to ensure targets are met.

Table 5.2 Stormwater Pollution Reduction Targets

Pollutant	Minimum Reductions Required
Total Suspended Solids (TSS)	80%
Total Phosphorus (TP)	55%
Total Nitrogen (TN)	40%
Gross Pollutants (GP)	90%

The WSUD treatment terrain includes the following measures: One (1) Ocean Guard by Ocean Protect, thirteen (13) 690mm Psorb Storm Filters by Ocean Protect, thirty-one (31) 460mm Psorb Storm Filters by Ocean Protect, three (6) 25 kL Rainwater Tanks and a grassed swale along the deep soil area.

5.2.1 MUSIC Modelling

The effectiveness of the combination of treatment train measures has been assessed using numerical modelling within MUSIC (Model for Urban Stormwater Improvement Conceptualisation version 6). The results of the modelling were compared against the Council's pollutant reduction targets to determine the effectiveness of the proposed measures.

MUSIC simulates the performance of a group of stormwater management measures, configured in series or in parallel to form a "treatment train" against historic rainfall event data sets. It is the industry standard water quality modelling software developed by the MUSIC Development Team of the Cooperative Research Centre for Catchment Hydrology (CRCCH).

The MUSIC User Manual suggests that the time-step should not exceed the time of concentration of the smallest sub-catchment however due consideration must also be made regarding the shortest detention time of nodes within the treatment train.

5.2.2 Event Mean Concentration

MUSIC uses different event mean concentrations (EMC) to determine the pollutant loads generated by different land uses. The standard EMCs adopted within MUSIC were based on research undertaken by Duncan (1999) through the CRCCH and the results are reproduced in Australian Runoff Quality – A Guide to Water Sensitive Urban Design (ARQ). The EMC values used in the MUSIC models for this project were based on the Sydney Catchment Management Authority (CMA) Source Node(s) utilising modified % impervious area, rainfall threshold, soil properties & pollutant concentrations. The below table summarises the parameters used for the development site:

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Table 5.3 EMC Inputs for MUSIC

NODE TYPE		MEAN BASE FLOW CONCENTRATIONS Log_{10} (mg/L)			MEAN STORM FLOW CONCENTRATIONS Log_{10} (mg/L)		
		TSS	TP	TN	TSS	TP	TN
Roof	Mean	Not Applicable*Note			1.300	-0.890	0.300
	Std dev	Not Applicable*Note			0.32	0.25	0.19
Impervious	Mean	1.200	-0.85	0.110	2.150	-0.600	0.300
	Std dev	0.17	0.19	0.12	0.32	0.25	0.19
Pervious	Mean	1.200	-0.850	0.110	2.150	-0.600	0.300
	Std dev	0.17	0.19	0.12	0.32	0.25	0.19

**Note – Roof areas do not have base flows.*

5.2.3 MUSIC Catchment Breakdown

The catchments were split into the following: roof, pervious and impervious with varying imperviousness ratios.

Table 5.4 MUSIC Model Catchment Breakdown

CATCHMENT	AREA (m^2)	% IMPERVIOUS	TREATMENT
Tower D Roof	1,132	100	25kL RWT, SF Chamber, 13 x 690 PSORB Storm Filters
Tower C Roof	993	100	25kL RWT, SF Chamber, 13 x 690 PSORB Storm Filters
Tower C and D External Area	2,488	100	SF Chamber, 13 x 690 PSORB Storm Filters
Deep Soil Area	941	0	Swale, 1 Ocean Guard, SF Chamber, 31 x 460 PSORB Storm Filters
Public Area Landscaping	3,047	50	2 x 25kL RWT, SF Chamber, 31 x 460 PSORB Storm Filters
Tower B Roof	1,036	100	25kL RWT, SF Chamber, 31 x 460 PSORB Storm Filters
Tower B External Area	1,262	100	SF Chamber, 31 x 460 PSORB Storm Filters
Tower A Roof	1,393	100	25kL RWT, SF Chamber, 31 x 460 PSORB Storm Filters
Tower A External Area	1,151	100	SF Chamber, 31 x 460 PSORB Storm Filters

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5.2.4 MUSIC Model

The MUSIC model layout is shown below.

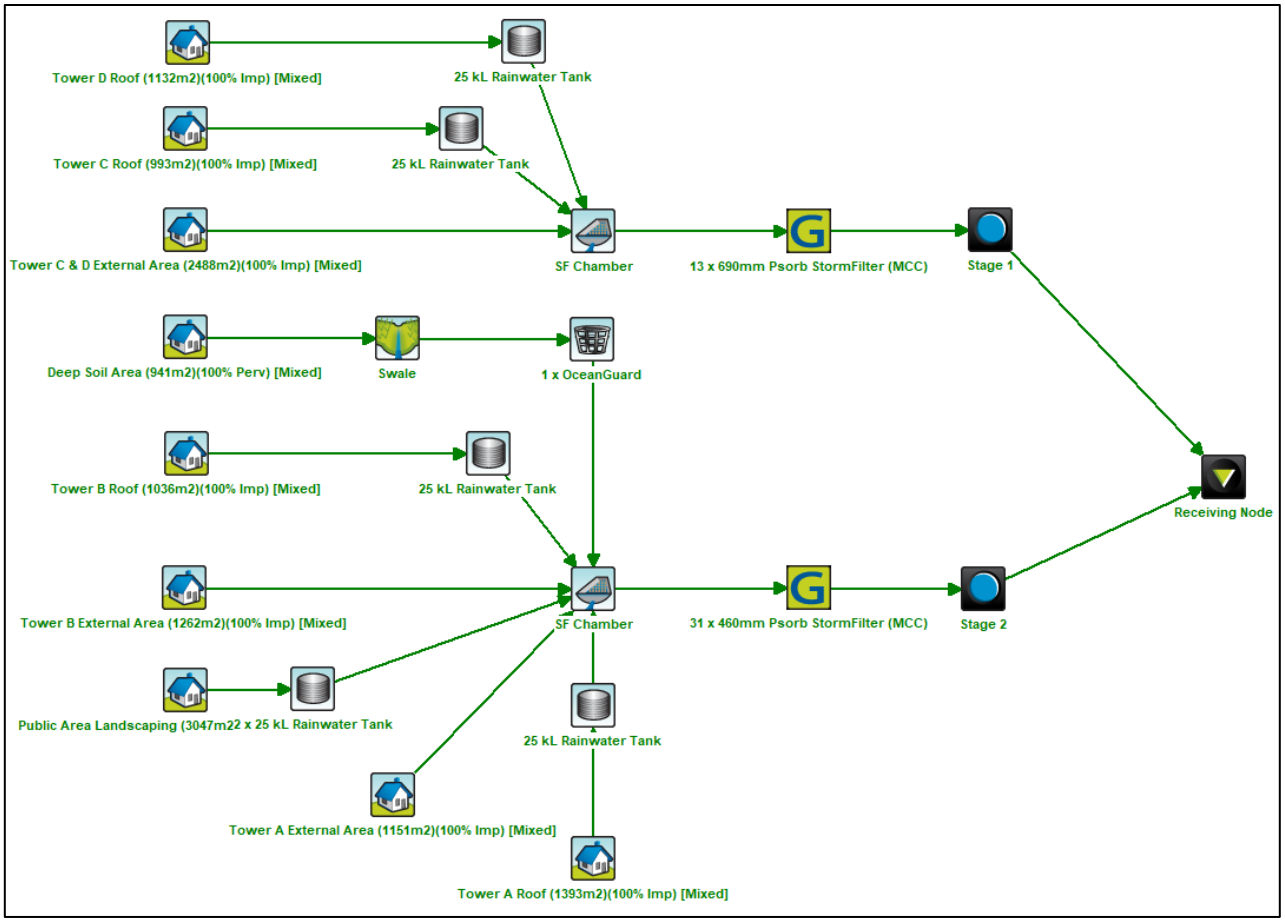

Figure 5.3 MUSIC Model Layout

5.2.5 Results

The results of the modelling are summarised below with the pollutant loads expressed in kilograms per year. The reduction rate is expressed as a percentage and compares the pollution from the post developed site to that of the existing developed state of the site to determine whether the reduction targets have been achieved.

Table 5.5 Pollutant Reduction Comparison Table

Pollutant Type	MUSIC Model Pollutant Reduction	Council Pollutant Reduction Target *(Average Annual Load)*
Gross Pollutants (GP)	100%	*90%*
Total Suspended Solids (TSS)	80.0%	*80%*
Total Phosphorus (TP)	75.7%	*55%*
Total Nitrogen (TN)	57.3%	*40%*

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The results table shows that the proposed treatment train will achieve the reduction targets for full range of pollutants. Through the implementation of the proposed water quality measures stormwater discharge from the site can be effectively managed to ensure that there is no detrimental effect to the water quality downstream of the subject site.

The proposed stormwater concept as documented is subject to DPIE's approval through the state significant development approval (SSDA) process.

6.0 Conclusion

In response to the SEARs Item No. 17 for Stormwater and Drainage, the proposed in-ground stormwater system is designed in accordance with the Rockdale DCP 2011 and Technical Specifications. The proposal has been developed in consultation with Bayside Council; it has been confirmed via email dated 13 May 2021 that the draft design addresses the requirement to extend the existing stormwater infrastructure along Eden Street to meet the site frontage. The drawings appended in this document detail the proposed drainage design including on-site detention tanks, water quality devices, nominated discharge points and the proposed upgrade for the receiving Council stormwater network.

Prepared by
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P:\2020\2016\201609\Reports\TTW\Stormwater Report\SSDA\210630 Revised Intro section_SSDA report\210630 Stormwater Management Plan_201609 Eden St Arncliffe.docx

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Appendix A

Stormwater Concept Plan

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26-42 EDEN STREET & 161-179 PRINCES HIGHWAY, ARNCLIFFE

GENERAL NOTES

1. Contractor must verify all dimensions and existing levels on site prior to commencement of works. Any discrepancies to be reported to the Engineer.
2. Strip all topsoil from the construction area. All stripped topsoil shall be disposed of off-site unless directed otherwise.
3. Make smooth connection with all existing works.
4. Compact subgrade under buildings and pavements to minimum 98% standard maximum dry density in accordance with AS 1289 5.1.1. Compaction under buildings to extend 2m minimum beyond building footprint.
5. All work on public property, property which is to become public property, or any work which is to come under the control of the Statutory Authority; the Contractor is to ensure that the drawings used for construction have been approved by all relevant authorities prior to commencement site.
6. All work on public property, property which is to become public property, or any work which is to come under the control of the Statutory Authority is to be carried out in accordance with the requirements of the relevant Authority. The Contractor shall obtain these requirements from the Authority. Where the requirements of the Authority are different to the drawings and specifications, the requirements of the Authority shall be applicable.
7. For all temporary batters refer to geotechnical recommendations.

REFERENCE DRAWINGS

These drawings have been based from, and to be read in conjunction with the following Consultants drawings. Any conflict to the drawings must be notified immediately to the Engineer.

Consultant	Dwg Title	Dwg No	Rev	Date
GROUP GSA	LANDSCAPE GENERAL ARRANGEMENT PLAN			
	LOWER GROUND LEVEL	DA9200	4	11/05/21
	UPPER GROUND LEVEL	DA9201	5	11/05/21
	BASEMENT LEVEL 1	DA2003	13	10/05/21
	LOWER GROUND LEVEL	DA2004	13	10/05/21
	UPPER GROUND LEVEL	DA2005	13	10/05/21
CARDNO	BOUNDARIES, DETAIL CONTOUR SURVEY	11834500	02	05/07/17

SURVEY AND SERVICES INFORMATION

SURVEY

Origin of levels : RL –
Datum of levels : A.H.D. AUSTRALIAN HEIGHT DATUM
Coordinate system : MGA
Survey prepared by : CARDNO
Setout Points : SSM 105190

Taylor Thomson Whitting does not guarantee that the survey information shown on these drawings is accurate and will accept no liability for any inaccuracies in the survey information provided to us from any cause whatsoever.

UNDERGROUND SERVICES - WARNING

The locations of underground services shown on Taylor Thomson Whittings drawings have been plotted from diagrams provided by service authorities. This information has been prepared solely for the authorities own use and may not necessarily be updated or accurate. The position of services as recorded by the authority at the time of installation may not reflect changes in the physical environment subsequent to installation. Taylor Thomson Whitting does not guarantee that the services information shown on these drawings shows more than the presence or absence of services, and will accept no liability for inaccuracies in the services information shown from any cause whatsoever.
The Contractor must confirm the exact location and extent of services prior to construction and notify any conflict with the drawings immediately to the Engineer/Superintendent.
The contractor is to get approval from the relevant state survey department, to remove/adjust any survey mark. This includes but is not limited to; State Survey Marks (SSM), Permanent Marks (PM), cadastral reference marks or any other survey mark which is to be removed or adjusted in any way.
Taylor Thomson Whitting plans do not indicate the presence of any survey mark. The contractor is to undertake their own search.

BOUNDARY AND EASEMENT NOTE

The property boundary and easement locations shown on Taylor Thomson Whitting drawing's have been based from information received from:
CARDNO dated 05/07/17
23-25 FREDERICK STREET, ROCKDALE NSW 2216
PH: 9597 9700
Taylor Thomson Whitting makes no guarantees that the boundary or easement information shown is correct. Taylor Thomson Whitting will accept no liabilities for boundary inaccuracies. The contractor/builder is advised to check/confirm all boundaries in relation to all proposed work prior to the commencement of construction. Boundary inaccuracies found are to be reported to the superintendent prior to construction starting.

SAFETY IN DESIGN

Contractor to refer to Appendix B of the Civil Specification for the Civil Risk and Solutions Register.

EXISTING SERVICES

Contractor to be aware existing services are located within the site. Location of all services to be verified by the Contractor prior to commencing works. Contractor to confirm with relevant authority regarding measures to be taken to ensure services are protected or procedures are in place to demolish and/or relocate.

EXISTING STRUCTURES

Contractor to be aware existing structures may exist within the site. To prevent damage to existing structure(s) and/or personnel, site works to be carried out as far as practicably possible from existing structure(s).

EXISTING TREES

Contractor to be aware existing trees exist within the site which need to be protected. To prevent damage to trees and/or personnel, site works to be carried out as far as practicably possible from existing trees. Advice needs to be sought from Arborist and/or Landscape Architect on measures required to protect trees.

GROUNDWATER

Contractor to be aware ground water levels are close to existing surface level. Temporary de-watering may be required during construction works.

EXCAVATIONS

Deep excavations due to stormwater drainage works is required. Contractor to ensure safe working procedures are in place for works. All excavations to be fenced off and batters adequately supported to approval of Geotechnical Engineer.

GROUND CONDITIONS

Contractor to be aware of the site geotechnical conditions, refer to geotechnical report by (insert report details) for details.

HAZARDOUS MATERIALS

Existing asbestos products & contaminated material may be present on site. Contractor to ensure all hazardous materials are identified prior to commencing works. Safe working practices as per relevant authority to be adopted and appropriate PPE to be used when handling all hazardous materials. Refer to geotechnical/environmental report by (insert report details) for details.

CONFINED SPACES

Contractor to be aware of potential hazards due to working in confined spaces such as stormwater pits, trenches and/or tanks. Contractor to provide safe working methods and use appropriate PPE when entering confined spaces.

MANUAL HANDLING

Contractor to be aware manual handling may be required during construction. Contractor to take appropriate measures to ensure manual handling procedures and assessments are in place prior to commencing works.

WATER POLLUTION

Contractor to ensure appropriate measures are taken to prevent pollutants from construction works contaminating the surrounding environment.

SITE ACCESS/EGRESS

Contractor to be aware site works occur in close proximity to footpaths and roadways. Contractor to erect appropriate barriers and signage to protect site personnel and public.

VEHICLE MOVEMENT

Contractor to supply and comply with traffic management plan and provide adequate site traffic control including a certified traffic marshall to supervise vehicle movements where necessary.

SITEWORKS NOTES

1. All basecourse material to comply with RMS specification No 3051 and compacted to minimum 98% modified standard dry density in accordance with AS 1289 5.2.1.
2. All trench backfill material shall be compacted to the same density as the adjacent material.
3. All service trenches under vehicular pavements shall be backfilled with an approved select material and compacted to a minimum 98% standard maximum dry density in accordance with AS 1289 5.1.1.

STORMWATER DRAINAGE NOTES

1. Stormwater Design Criteria :
   (A) Average exceedance probability –
   1% AEP for roof drainage to first external pit
   5% AEP for paved and landscaped areas
   (B) Rainfall intensities –
   Time of concentration: 5 minutes
   1% AEP =179.0 mm/hr
   5% AEP =168.0 mm/hr
   (C) Rainfall losses –
   Impervious areas: IL = 1.5 mm , CL = 0 mm/hr
   Pervious areas: IL =22.4mm , CL =0.84mm/hr
2. Pipes ø300 and larger to be reinforced concrete Class "2" approved spigot and socket with rubber ring joints U.N.O.
3. Pipes up to ø300 may be sewer grade uPVC with solvent welded joints (subject to approval by the engineer).
4. Equivalent strength VCP or FRP pipes may be used (subject to approval).
5. Precast pits may be used external to the building subject to approval by Engineer
6. Enlargers, connections and junctions to be manufacture fittings where pipes are less than ø300.
7. Where subsoil drains pass under floor slabs and vehicular pavements, unslotted uPVC sewer grade pipe is to be used.
8. Grates and covers shall conform with AS 3996-2006, and AS 1428.1 for access requirements.
9. Pipes are to be installed in accordance with AS 3725. All bedding to be type H2 U.N.O.
10. Care is to be taken with invert levels of stormwater lines. Grades shown are not to be reduced without approval.
11. All stormwater pipes to be ø150 at 1.0% (MIN) fall U.N.O.
12. Subsoil drains to be slotted flexible uPVC U.N.O.
13. Adopt invert levels for pipe installation (grades shown are only nominal).

EXISTING SEVICES LEGEND

S — Existing sewer
W — Existing water
E — Existing electrical
T — Existing communications
G — Existing gas
SW — Existing stormwater

SITEWORKS LEGEND

F22.20 — Finished surface level
F22.00 — Finished contour
K&G — Kerb and gutter
KO — Kerb only
RWS — Civil retaining wall type RWS
Stormwater pit and pipe line with flow direction
Suspended stormwater pipe line with flow direction to future detail
GD — Grated drain
Overland flow path
RO — Rain water outlet

SITE LOCALITY PLAN
NOT TO SCALE – IMAGE COURTESY OF NEARMAP

DRAWING SCHEDULE

No	DRAWING TITLE
C01	COVER SHEET, GENERAL NOTES, LOCALITY PLAN AND DRAWING SCHEDULE
C02	SEDIMENT AND EROSION CONTROL PLAN
C03	SEDIMENT AND EROSION CONTROL DETAILS
C05	STORMWATER MANAGEMENT PLAN, LOWER GROUND FLOOR
C06	STORMWATER MANAGEMENT PLAN, UPPER GROUND FLOOR
C07	STORMWATER MANAGEMENT PLAN - COUNCIL'S INGROUND PIPE
C10	STORMWATER DETAILS
C15	OSD TANK DETAILS, SHEET 1
C16	OSD TANK DETAILS, SHEET 2

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A1 0 1 2 3 4 5 6 7 8 9 10

Rev	Description	Eng	Draft	Date
P1	ISSUED FOR COMMENTS	DT	LA	27.05.21

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Project
26-42 EDEN STREET & 161-179 PRINCESS HIGHWAY, ARNCLIFFE

Sheet Subject
COVER SHEET, LOCALITY PLAN, GENERAL NOTES AND DRAWING SCHEDULE

Scale : A1	Drawn	Authorised
N/A	LA	NB

Job No	Drawing No	Revision
201609	C01	P1

Plot File Created: May 26, 2021 - 4:32pm

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THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES ON DRAWING C01

EDEN STREET

PRINCES HIGHWAY

FOREST ROAD

PROVIDE TEMPORARY CONSTRUCTION ENTRY/EXIT, REFER TO DRG C03 FOR DETAILS

PROVIDE CATCH DRAIN (TYP.), REFER TO DRG C03 FOR DETAILS

PROVIDE GEOTEXTILE FILTER PIT SURROUND, REFER TO DRG C03 FOR DETAILS

PROVIDE SEDIMENTATION TRAP, REFER TO DRG C03 FOR DETAILS

PROVIDE SEDIMENTATION BASIN VOL=400m³, REFER TO DRG C03 FOR DETAILS

PROVIDE HAY BALE SEDIMENT FILTER (TYP.), REFER TO DRG C03 FOR DETAILS

PROVIDE SILT FENCE), REFER TO DRG C03 FOR DETAILS

NO ACCESS DENSE SHRUBS

NO ACCESS CONC LID 21.94INP (APPROX)

CONC LID (INACCESSIBLE)

CONC LID (INACCESSIBLE) 21.94INP (APPROX)

CONC LID (INACCESSIBLE) 22.59INVO

CONC LID (INACCESSIBLE) 22.58INV

CONC LID (INACCESSIBLE) 24.53INV

CONC LID (INACCESSIBLE) 24.43INV

CONC LID (INACCESSIBLE) 26.53INV

CONC LID (INACCESSIBLE) 26.37INV

EROSION AND SEDIMENT CONTROL LEGEND

- Batter
- Siltation fence
- Catch drain
- Stormwater pit with Geotextile filter surround
- Hay bale barriers

0 2.5 5 7.5 10 12.5 15 17.5 20m

1:250 A1 1:500 A3

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

Rev	Description	Eng	Draft	Date
P1	ISSUED FOR COMMENTS	DT	LA	27.05.21

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612 9439 7288 | 48 Chandos Street St Leonards NSW 2065

Project
26-42 EDEN STREET & 161-179 PRINCESS HIGHWAY, ARNCLIFFE

Sheet Subject
SEDIMENT AND EROSION CONTROL PLAN

Scale : A1	Drawn	Authorised
1:250	LA	NB

Job No	Drawing No	Revision
201609	C02	P1

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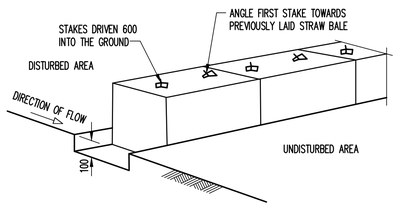
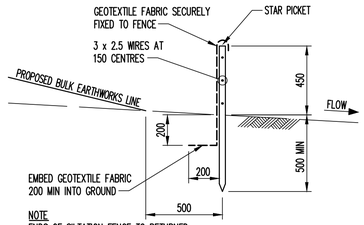
THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES ON DRAWING C01



HAY BALE SEDIMENT FILTER

NTS

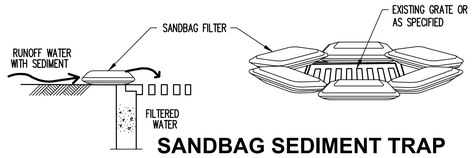
NOTE: STAKE TO BE EITHER TAR COATED STAR OR 50 x 50 HARDWOOD



NOTE
ENDS OF SILTATION FENCE TO RETURNED UP SLOPE TO PREVENT RUNOFF

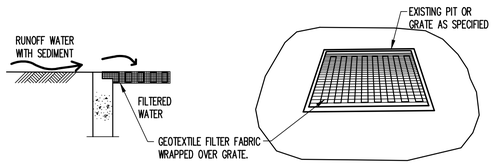
SILTATION FENCE DETAIL

SCALE 1: 20



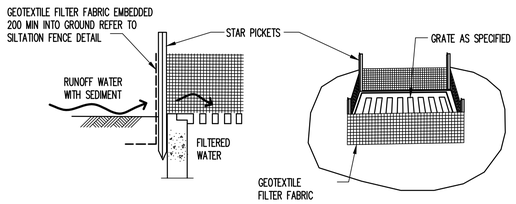
SANDBAG SEDIMENT TRAP

NTS



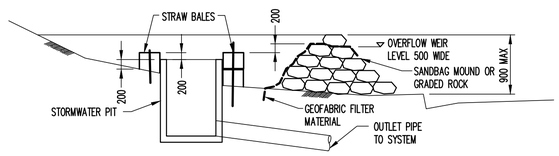
GEOTEXTILE PIT FILTER

NTS



GEOTEXTILE FILTER PIT SURROUND

NTS



SEDIMENTATION TRAP

NTS

EROSION AND SEDIMENT CONTROL NOTES

1. All work shall be generally carried out in accordance with
   (A) Local authority requirements,
   (B) EPA – Pollution control manual for urban stormwater,
   (C) LANDCOM NSW – Managing Urban Stormwater: Soils and Construction ("Blue Book").
2. Erosion and sediment control drawings and notes are provided for the whole of the works. Should the Contractor stage these works then the design may be required to be modified. Variation to these details may require approval by the relevant authorities.
   The erosion and sediment control plan shall be implemented and adapted to meet the varying situations as work on site progresses.
3. Maintain all erosion and sediment control devices to the satisfaction of the superintendent and the local authority.
4. When stormwater pits are constructed prevent site runoff entering the pits unless silt fences are erected around pits.
5. Minimise the area of site being disturbed at any one time.
6. Protect all stockpiles of materials from scour and erosion. Do not stockpile loose material in roadways, near drainage pits or in watercourses.
7. All soil and water control measures are to be put back in place at the end of each working day, and modified to best suit site conditions.
8. Control water from upstream of the site such that it does not enter the disturbed site.
9. All construction vehicles shall enter and exit the site via the temporary construction entry/exit.
10. All vehicles leaving the site shall be cleaned and inspected before leaving.
11. Maintain all stormwater pipes and pits clear of debris and sediment. Inspect stormwater system and clean out after each storm event.
12. Clean out all erosion and sediment control devices after each storm event.

Sequence Of Works

1. Prior to commencement of excavation the following soil management devices must be installed.

1.1. Construct silt fences below the site and across all potential runoff sites.

1.2. Construct temporary construction entry/exit and divert runoff to suitable control systems.

1.3. Construct measures to divert upstream flows into existing stormwater system.

1.4. Construct sedimentation traps/basin including outlet control and overflow.

1.5. Construct turf lined swales.

1.6. Provide sandbag sediment traps upstream of existing pits.

2. Construct geotextile filter pit surround around all proposed pits as they are constructed.
3. On completion of pavement provide sand bag kerb inlet sediment traps around pits.
4. Provide and maintain a strip of turf on both sides of all roads after the construction of kerbs.

WATER QUALITY TESTING REQUIREMENTS

Prior to discharge of site stormwater, groundwater and seepage water into council's stormwater system, contractors must undertake water quality tests in conjunction with a suitably qualified environment consultant outlining the following:

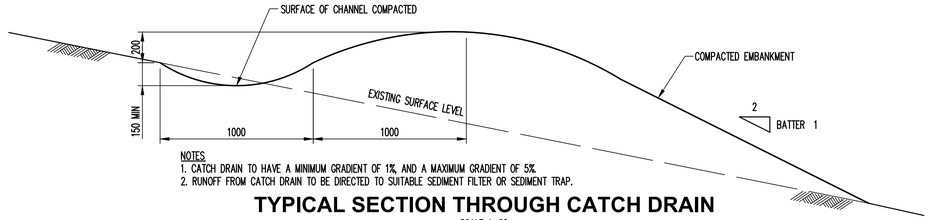
- Compliance with the criteria of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000)
- If required subject to the environmental consultants advice, provide remedial measures to improve the quality of water that is to be discharged into Councils storm water drainage system.This should include comments from a suitably qualified environmental consultant confirming the suitability of these remedial measures to manage the water discharged from the site into Councils storm water drainage system. Outlining the proposed, ongoing monitoring, contingency plans and validation program that will be in place to continually monitor the quality of water discharged from this site. This should outline the frequency of water quality testing that will be undertaken by a suitably qualified environmental consultant.

PUMP OUT NOTES

Any accumulated water contaminated with sediment, from a sediment basin or excavation pit, is to be flocculated or filtered in order to lower the suspended solid load to less than 50mg per litre gypsum gas or other approved flocculant should be applied within 24 hours of the end of the storm event. The gypsum must be spread evenly over the entire water surface. Pumping is not to occur for at least 36 hours and preferably 48 hours after application. Clean water is to be discharged to the water table via a hale bail sediment filter in a way that does not pick up sediment that has dropped to the bottom.
Note: gypsum is a hydrated form of calcium sulphate and is available at many swimming pool shops and hardware stores.

TYPICAL SECTION THROUGH CATCH DRAIN

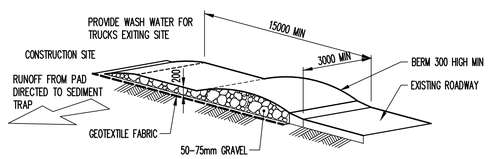
SCALE 1: 20



NOTES
1. CATCH DRAIN TO HAVE A MINIMUM GRADIENT OF 1%, AND A MAXIMUM GRADIENT OF 5%.
2. RUNOFF FROM CATCH DRAIN TO BE DIRECTED TO SUITABLE SEDIMENT FILTER OR SEDIMENT TRAP.

TYPICAL SECTION THROUGH CATCH DRAIN

SCALE 1: 20



TEMPORARY CONSTRUCTION EXIT

NTS

0 2.5 5 7.5 10 12.5 15 17.5 20m

1:250 A1 1:500 A3

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

FileName: C03.dwg - USER: lanaa - Plot File Created: May 26, 2021 - 4:32pm

A1 0 1 2 3 4 5 6 7 8 9 10

Rev	Description	Eng	Draft	Date
P1	ISSUED FOR COMMENTS	DT	LA	27.05.21

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Project
26-42 EDEN STREET & 161-179 PRINCESS HIGHWAY, ARNCLIFFE

Sheet Subject
SEDIMENT AND EROSION CONTROL DETAILS

Scale : A1	Drawn	Authorised
1:250	LA	NB

Job No	Drawing No	Revision
201609	C03	P1

Plot File Created: May 26, 2021 - 4:32pm

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THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES ON DRAWING C01

RO FOR INTERNAL BUILDING DRAINAGE REFER TO HYDRAULIC ENGINEERS

PROPOSED IN-GROUND STORMWATER PIPE SYSTEM, SUBJECT TO DETAILED DESIGN AND APPROVAL BY BAYSIDE COUNCIL

OSD TANK 2 BELOW LOWER GROUND LEVEL
MIN. VOLUME = 300m³
APPROX. AMOUNT OF OCEAN PROTECT 460
PSORB STORM FILTERS = 31
MIN. SF CHAMBER AREA = 13m²

OSD TANK 1 BELOW UPPER GROUND LEVEL
MIN. VOLUME = 137m³
APPROX. AMOUNT OF OCEAN PROTECT 690
PSORB STORM FILTERS = 13
MIN. SF CHAMBER AREA = 10m²

CONNECTION TO COUNCIL STORMWATER NETWORK ALONG EDEN ST

EDEN STREET

EDEN STREET

SITE BOUNDARY

DEEP SOIL ZONE
941 m2

BASEMENT 1 LEVEL BELOW

UPPER LEVEL ABOVE

UPPER LEVEL ABOVE

LOW GROUND LEVEL RL.19.25

LOW GROUND LEVEL RL.19.00

RETAIL STAFF (5)

RETAIL (79)

RETAIL CARPARK

ENTRY

EXIT

BROADWAY

BICYCLE PARKING

EV CHARGE

TROLLEY

RES LOADING LIFT

RETAIL LIFT

AMENITY

EOT

PLANT

ENTRY TO RETAIL

VOID ABOVE

VOID OVER

LIFT

STEP

MEETING PLACE

OPEN TO SKY

RETAIL HIGH LEVEL RISER

CAR PARK INTAKE

CENTRE MGMT

F.M. AMENITIES

MALE AMENITIES

CLN STORAGE

CPK INTAKE

TREE PLANTER ABOVE

LG CPK SUPPLY

FIRE SERVICES TANK
130m2 (155m3) ON SLAB
ABOVE CARPARK

NO. 181
SINGLE STOREY
TIMBER HOUSE
METAL ROOF

HIGHWAY

PRINCES HIGHWAY

RL.19.00

RL.19.25

RL.18.85

RL.18.45

RETAIL

RWS

RW

0 2.5 5 7.5 10 12.5 15 17.5 20m

1:250 A1 1:500 A3

A1 0 1 2 3 4 5 6 7 8 9 10

Rev	Description	Eng	Draft	Date
P2	ISSUED FOR COMMENTS	NB	DT	28.06.21
P1	ISSUED FOR COMMENTS	DT	LA	27.05.21

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Project
26-42 EDEN STREET & 161-179 PRINCESS HIGHWAY, ARNCLIFFE

Sheet Subject
STORMWATER MANAGEMENT PLAN, LOWER GROUND FLOOR

Scale : A1	Drawn	Authorised
1:250	LA	NB

Job No	Drawing No	Revision
201609	C05	P2

Plot File Created: Jun 28, 2021 - 4:45pm

FileName: C:\USER: dtvolt - Plot File Created: Jun 28, 2021 - 4:45pm

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RO FOR INTERNAL BUILDING DRAINAGE REFER TO HYDRAULIC ENGINEERS

PROPOSED IN-GROUND STORMWATER PIPE SYSTEM, SUBJECT TO DETAILED DESIGN AND APPROVAL BY BAYSIDE COUNCIL

EDEN STREET

EDEN STREET

HIGHWAY

PRINCES HIGHWAY

SITE BOUNDARY

OVERLAND FLOW PATH

SUSPENDED PIPE

TURFED SWALE

DEEP SOIL ZONE

OPEN GREEN AREA 4,000 m2

UPPER GROUND LEVEL RL.25.00

LOWER GROUND LEVEL RL.19.00

UPPER GROUND LEVEL RL.24.00

LOW GROUND BELOW

LEVEL 1 ABOVE

LINE OF BUILDING ABOVE

LINE OF BUILDING ABOVE COMMUNAL OPEN SPACE

LG CPK INTAKE

SUPERMARKET PLANT ROOM ABOVE (MEZZANINE)

SUPERMARKET SERVICES 555

SUPERMARKET STOCKROOM

LOBBY

MAILRM

FIRE CONTROL RM

LOADING DOCK

19 m truck

14 m truck

ACCESS STAIR & PLATFORM TO MEZZANINE & ROOF PLANT

15m STRAIGHT LINESPANG CLEARANCE

RETAIL LOADING DOCK

RESI LOADING

DUMP ROOM

RETAIL WASTE ROOM

RESI WASTE COLLECTION ROOM

MAIL ROOM

GAS METER ENCLOSURE

FIRE TANK (UNDER)

FIRE HYDRANT BOOSTER

2 BED WALK-UP TW003

2 BED WALK-UP TW002

2 BED WALK-UP TW 001

2 BED D001

1 BED D002

2 BED D003

POS

AMENITIES

CONDENSER PLANT

VOID

RETAIL RISERS

MAILROOM

LOBBY

RETAIL

CPK INTAKE

1 STEP

TIPPING PLACE

LEVEL 1 ABOVE

NO. 181 SINGLE STOREY TIMBER HOUSE METAL ROOF

METAL ROOF

TILE ROOF

CONC LID (INACCESSIBLE)

SITE BOUNDARY

RL.26.00

RL.25.00

RL.24.00

RL.23.10

IL.23.70

IL.24.20

IL.23.90

IL.24.12

IL.24.25

#300

#150

RO

RWS

RW

MRV

0 2.5 5 7.5 10 12.5 15 17.5 20m

1:250 A1 1:500 A3

Rev	Description	Eng	Draft	Date
P2	ISSUED FOR COMMENTS	NB	DT	28.06.21
P1	ISSUED FOR COMMENTS	DT	LA	27.05.21

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Project: 26-42 EDEN STREET & 161-179 PRINCESS HIGHWAY, ARNCLIFFE

Sheet Subject: STORMWATER MANAGEMENT PLAN, UPPER GROUND FLOOR

Scale : A1: 1:250 | Drawn: LA | Authorised: NB

Job No: 201609 | Drawing No: C06 | Revision: P2

Plot File Created: Jun 28, 2021 - 4:52pm

FileName: USER: dtwitt - Plot File Created: Jun 28, 2021 - 4:52pm

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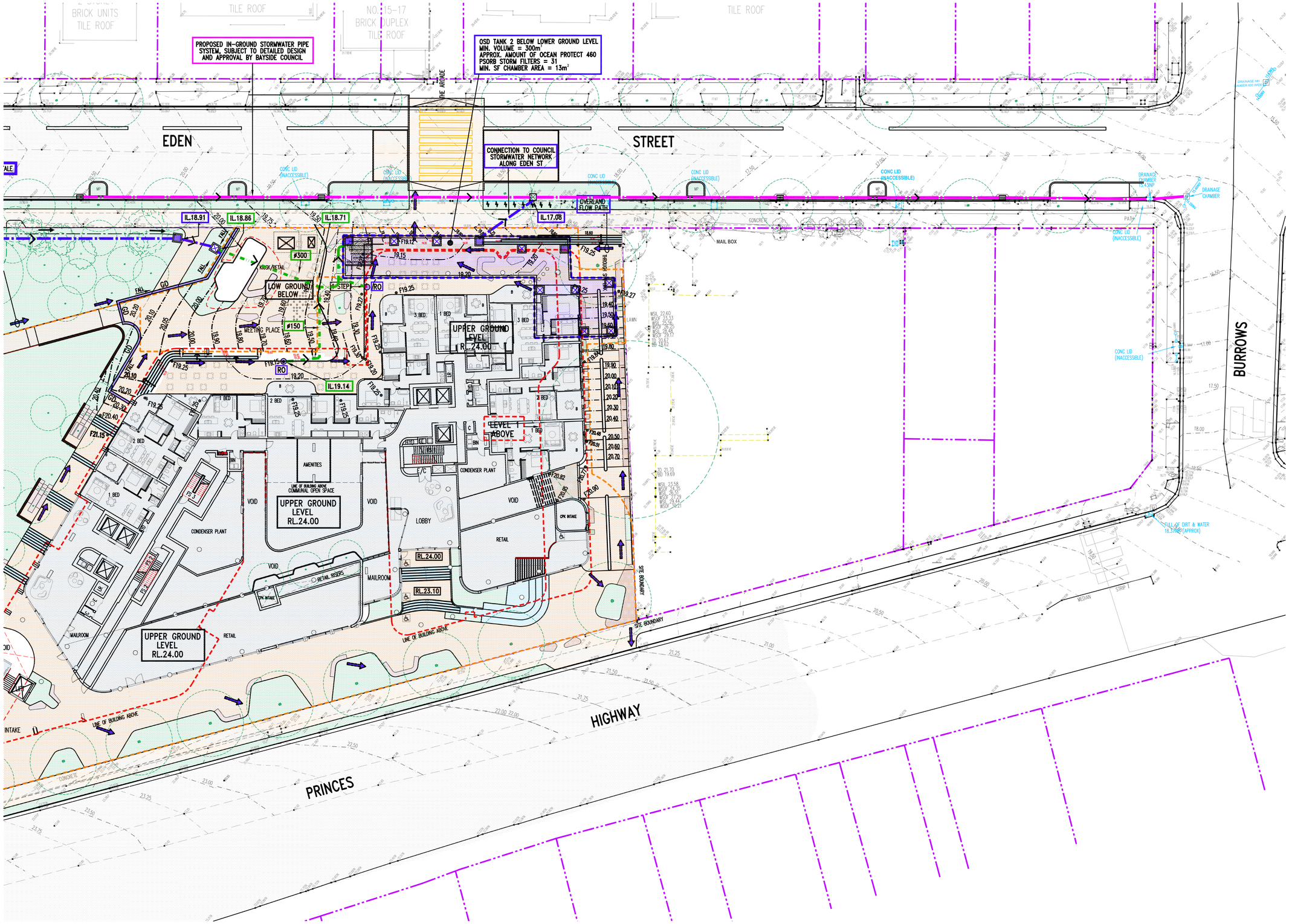

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Rev	Description	Eng	Draft	Date
P2	ISSUED FOR COMMENTS	NB	DT	28.06.21
P1	ISSUED FOR COMMENTS	DT	LA	27.05.21

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Project
26-42 EDEN STREET & 161-179 PRINCESS HIGHWAY, ARNCLIFFE

Sheet Subject
STORMWATER MANAGEMENT PLAN - COUNCIL'S IN-GROUND PIPE

Scale : A1	Drawn	Authorised
1:250	LA	NB

Job No	Drawing No	Revision
201609	C07	P2

Plot File Created: Jun 28, 2021 - 4:54pm

FileName: 007.dwg - USER: dnfdt - Plot File Created: Jun 28, 2021 - 4:54pm

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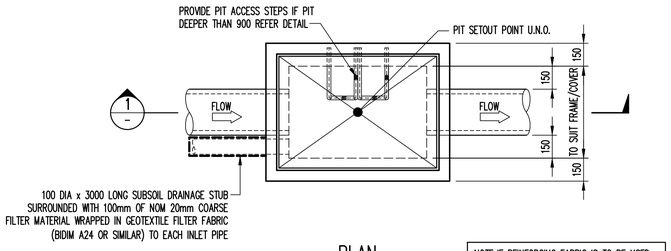
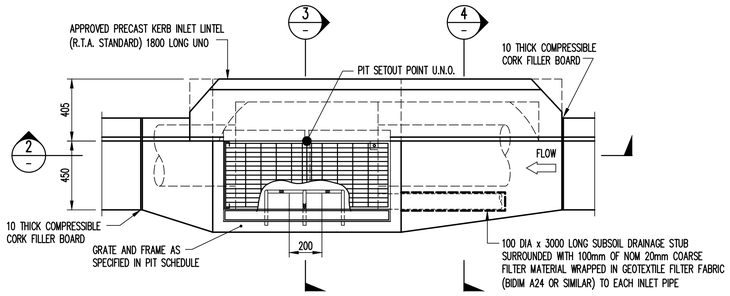


PLAN
SCALE 1: 20

NOTE:IF REINFORCING FABRIC IS TO BE USED REFER TO WALL AND CORNER DETAILS



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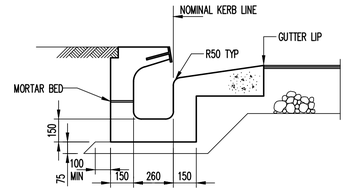
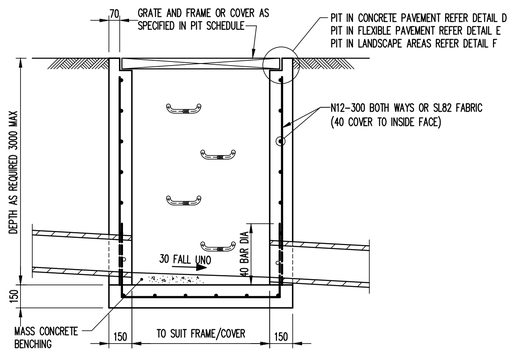
NOTE:IF REINFORCING FABRIC IS TO BE USED REFER TO WALL AND CORNER DETAILS



SECTION 4
SCALE 1:20



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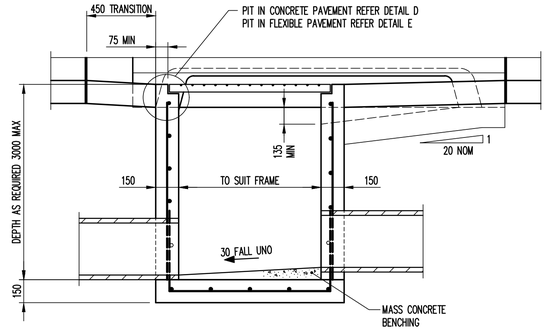

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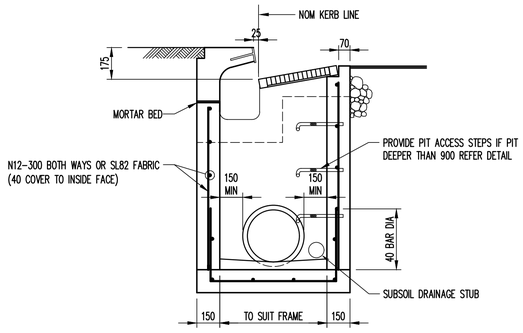
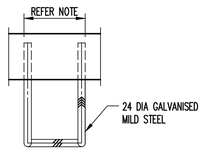
SCALE 1:20



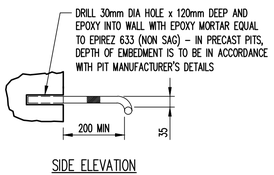
SECTION 3
SCALE 1:20

PIT TYPE A

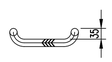


PLAN

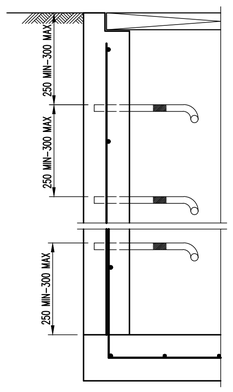
NOTE
1 WHEN POSITIONED IN STRAIGHT ALIGNMENT, STEP TO BE 400 WIDE.
2 STAGGERED STEPS TO BE 200 WIDE, STEPS TO BE STAGGERED 200 CENTRE TO CENTRE FOR ALTERNATE STEPS.
3 SPACING OF STEPS TO BE UNIFORM TO WITHIN ±5mm IN EACH PIT.
4 STEPS TO BE IN ACCORDANCE WITH AS1657.



SIDE ELEVATION



FRONT ELEVATION

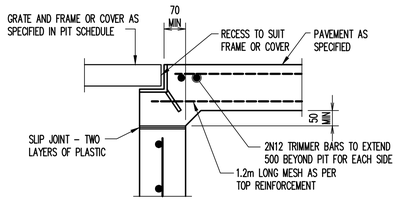


SECTION

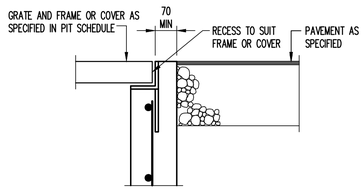
PIT ACCESS STEP DETAIL

SCALE 1: 10

PIT TYPE B



DETAIL D
SCALE 1: 10



DETAIL E
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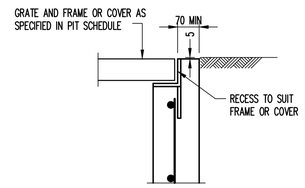

DETAIL F
SCALE 1: 10

0 0.2 0.4 0.6 0.8 1 1.2 1.4 1.6m
1:20 A1 1:40 A3

0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8m
1:10 A1 1:20 A3

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

FileName: C10.dwg – USER: lanos – Plot File Created: May 26, 2021 – 4:52pm

A1 0 1 2 3 4 5 6 7 8 9 10

Rev	Description	Eng	Draft	Date
P1	ISSUED FOR COMMENTS	DT	LA	27.05.21

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Project
26-42 EDEN STREET & 161-179 PRINCESS HIGHWAY, ARNCLIFFE

Sheet Subject
STORMWATER DETAILS, SHEET 1

Scale : A1	Drawn	Authorised
AS SHOWN	LA	NB

Job No	Drawing No	Revision
201609	C10	P1

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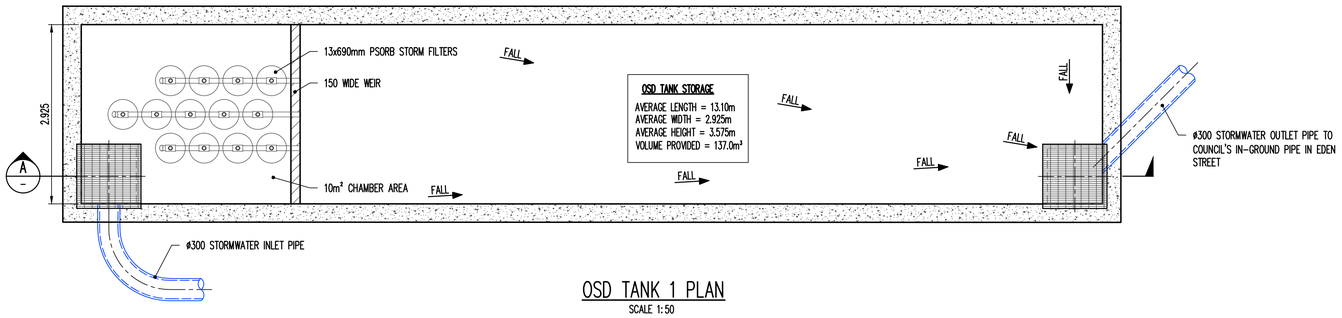
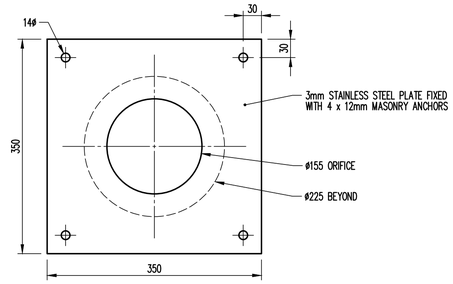
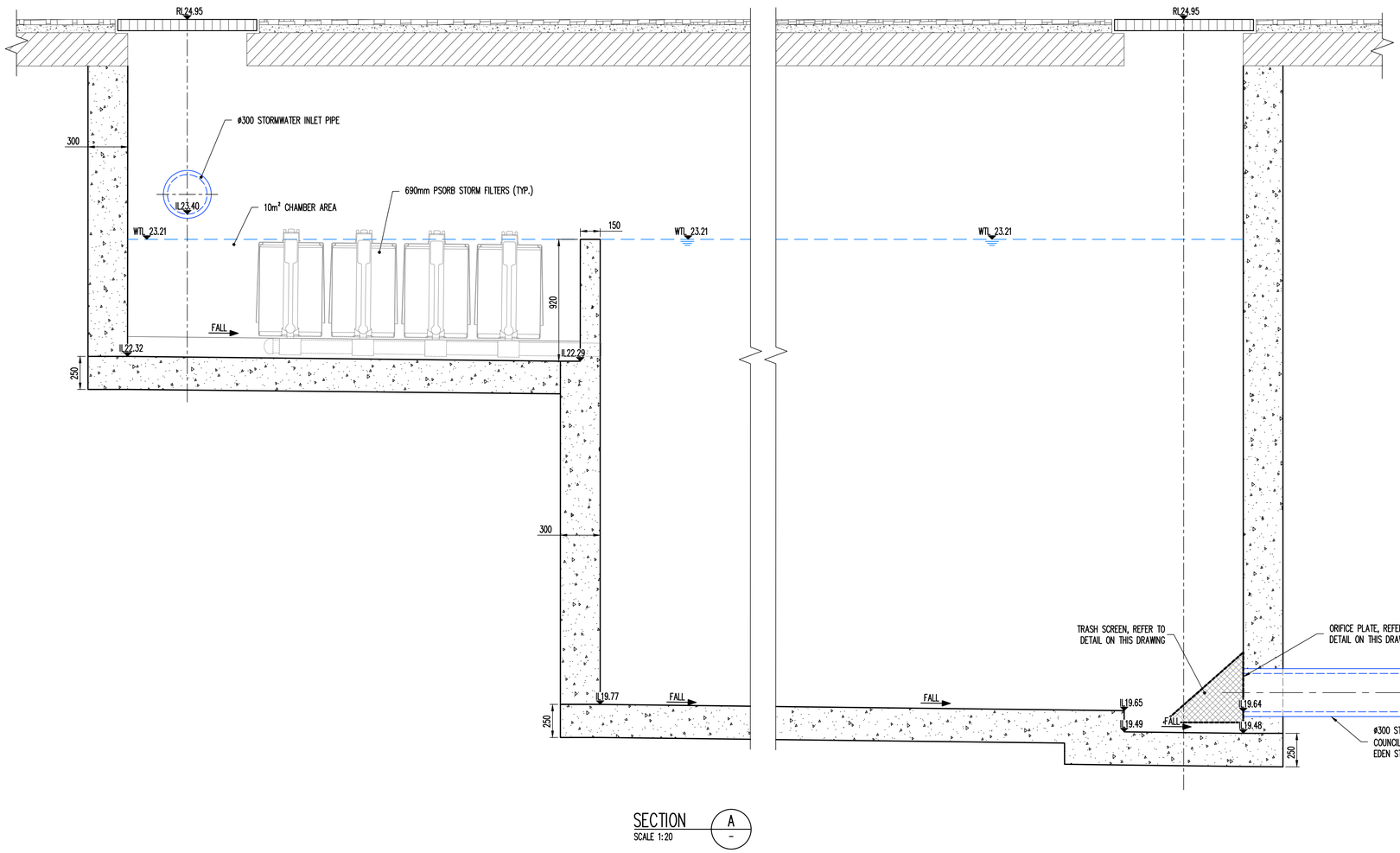


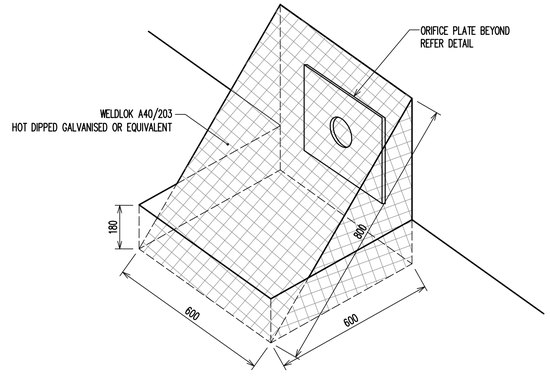
OSD TANK 1 PLAN
SCALE 1:50



OSD TANK 1 ORIFICE PLATE DETAIL
SCALE 1: 5



SECTION A–A
SCALE 1:20



TRASH SCREEN DETAIL
NTS

0 0.5 1 1.5 2 2.5 3 3.5 4m
1:50 A1 1:100 A3

0 0.2 0.4 0.6 0.8 1 1.2 1.4 1.6m
1:20 A1 1:40 A3

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

FileName: C15.dwg – USER: tanos – Plot File Created: May 27, 2021 - 2:04pm

A1 0 1 2 3 4 5 6 7 8 9 10

Rev	Description	Eng	Draft	Date
P1	ISSUED FOR COMMENTS	DT	LA	27.05.21

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Project
26-42 EDEN STREET & 161-179 PRINCESS HIGHWAY, ARNCLIFFE

Sheet Subject
OSD TANK DETAILS, SHEET 1

Scale : A1	Drawn	Authorised
AS SHOWN	LA	NB

Job No	Drawing No	Revision
201609	C15	P1

Plot File Created: May 27, 2021 - 2:04pm

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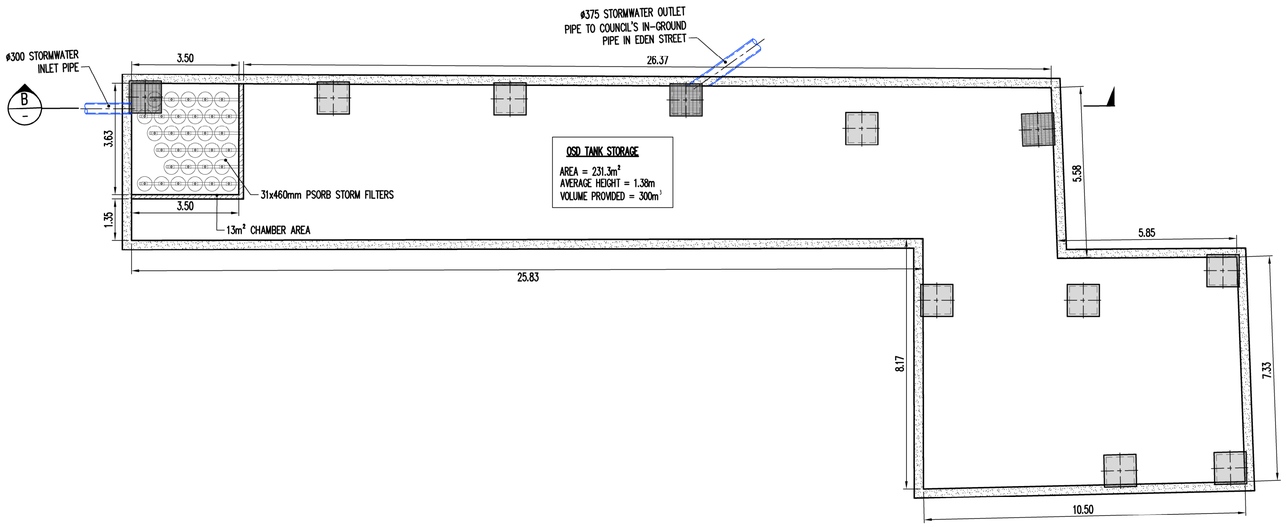
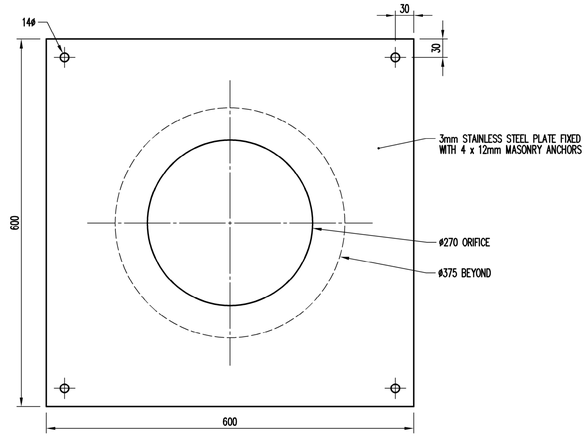
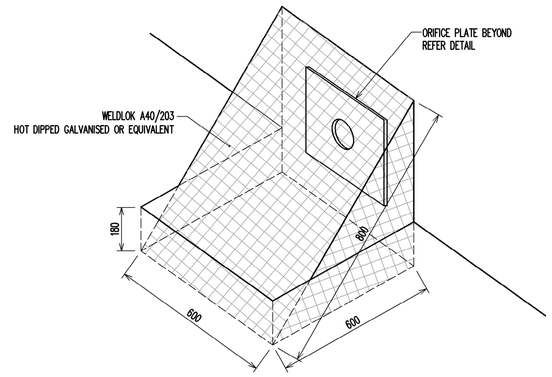


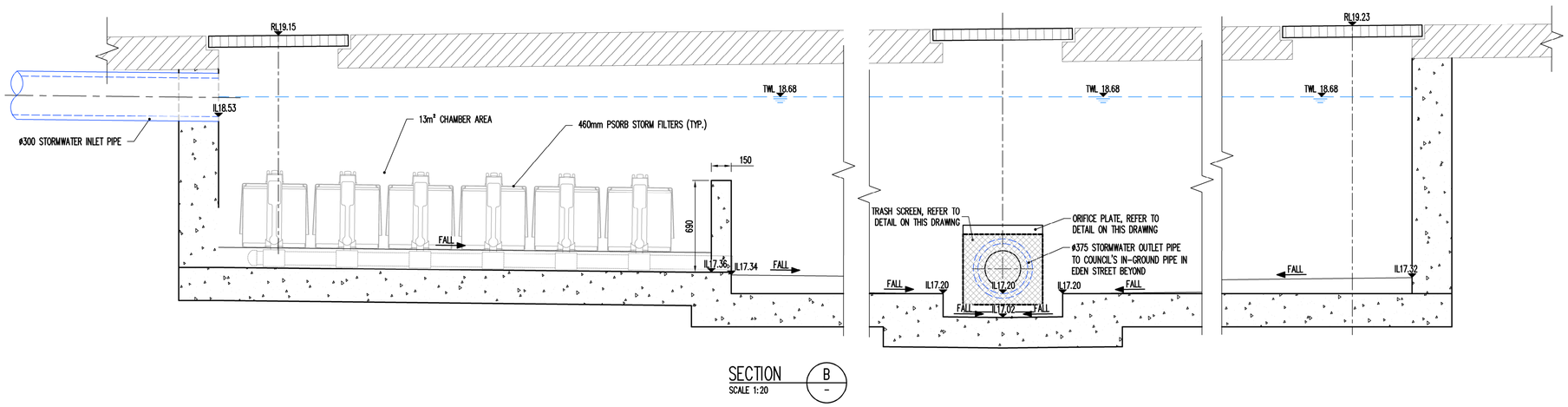
OSD TANK 2 PLAN
SCALE 1:100



OSD TANK 2 ORIFICE PLATE DETAIL
SCALE 1: 5



TRASH SCREEN DETAIL
NTS



SECTION B – B
SCALE 1:20

0 1 2 3 4 5 6 7 8m
1:100 A1 1:200 A3

0 0.2 0.4 0.6 0.8 1 1.2 1.4 1.6m
1:20 A1 1:40 A3

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

FileName: C16.dwg – USER: dtrott – Plot File Created: Jun 28, 2021 - 5:12pm

A1 0 1 2 3 4 5 6 7 8 9 10

Rev	Description	Eng	Draft	Date
P2	ISSUED FOR COMMENTS	NB	DT	28.06.21
P1	ISSUED FOR COMMENTS	DT	LA	27.05.21

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26-42 EDEN STREET & 161-179 PRINCESS HIGHWAY, ARNCLIFFE

Sheet Subject
OSD TANK DETAILS, SHEET 2

Scale : A1	Drawn	Authorised
AS SHOWN	LA	NB

Job No	Drawing No	Revision
201609	C16	P2

Plot File Created: Jun 28, 2021 - 5:12pm

Appendix B

Council Correspondence

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David Tolentino

From: Christopher Thompson <Christopher.Thompson@bayside.nsw.gov.au>
Sent: Thursday, 13 May 2021 2:37 PM
To: Nemesio Biason Jr
Cc: David Tolentino; Karim Elazar
Subject: RE: 26-42 Eden St and 161-179 Princes Hwy Arncliffe - Proposed Stormwater in Eden St
Attachments: C510-P1.pdf; C511-P1.pdf

Hi Nemesio,

I agree that this is what Council requires for the development. Rockdale Technical Specification Stormwater Management requires an OSD system and an underground stormwater discharge connection as the combined stormwater discharge for the site exceeds 50L/s in the 50 year ARI event. This will require the extension of existing stormwater infrastructure on Eden Street to meet the site frontage of which the draft design addresses, the detailed design will need to be in accordance with Rockdale Technical Specification Stormwater Management with attention paid to section 3.1.3 and section 8.4.

Best regards,

Christopher Thompson Development Engineer
444-446 Princes Highway, Rockdale NSW 2216
T 02 9562 1645
E christopher.thompson@bayside.nsw.gov.au **W** www.bayside.nsw.gov.au

---

From: Nemesio Biason Jr <Nemesio.BiasonJr@ttw.com.au>
Sent: Wednesday, 12 May 2021 3:18 PM
To: Christopher Thompson <Christopher.Thompson@bayside.nsw.gov.au>
Cc: David Tolentino <david.tolentino@ttw.com.au>
Subject: 26-42 Eden St and 161-179 Princes Hwy Arncliffe - Proposed Stormwater in Eden St

Hi Christopher,
We refer to the proposed development at 26-42 Eden St and 161-179 Princes Hwy, Randwick. The proposed development is going to be submitted through the SSDA planning pathway.
The developer/design team have had a pre-DA/SSDA meeting with Council on the 15 December 2020, refer to Stormwater related meeting extract below.

We understand that:

- OSD is required for the proposed development which we are providing within the site.
- Connecting to the kerb and gutter is not allowed. As such we proposed the following installation of new inground pipeline in Eden St fronting the proposed site connecting the existing stormwater pipe network in Burrows/Eden St intersection. Could you please review the attached concept drawings to see if you agree prior to us providing you with a more detailed drawings for Council's approval.

I will call to discuss.

Regards
Nem

Section 16 – Stormwater and Drainage

Rockdale Council's 15 Dec 2020 pre-DA comments

- The stormwater system is to be designed in accordance with the former Rockdale Council Stormwater Management Technical Specification dated 5 December 2011, which will require on-site detention across the whole site to limit discharge to no more than current.

- The overflow from the Detention System to be directed via a new Pipe Network System (Pipes and Pits) in Eden Street to the existing Council network in Burrows Street. Council will not accept a gutter discharge to the Eden Street kerb.

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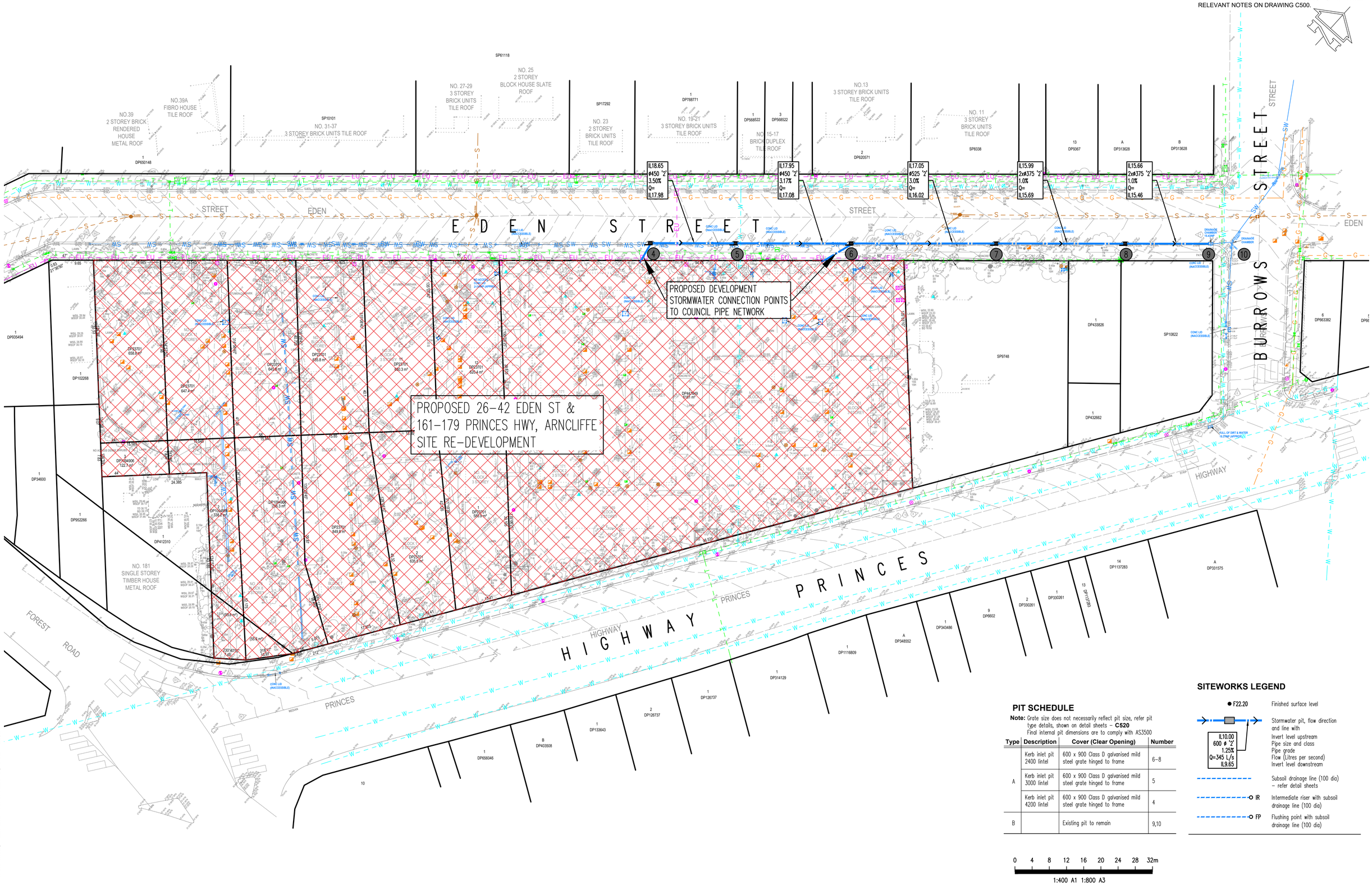

PIT SCHEDULE

Note: Grate size does not necessarily reflect pit size, refer pit type details, shown on detail sheets – **C520**
Final internal pit dimensions are to comply with AS3500

Type	Description	Cover (Clear Opening)	Number
A	Kerb inlet pit 2400 lintel	600 x 900 Class D galvanised mild steel grate hinged to frame	6-8
	Kerb inlet pit 3000 lintel	600 x 900 Class D galvanised mild steel grate hinged to frame	5
	Kerb inlet pit 4200 lintel	600 x 900 Class D galvanised mild steel grate hinged to frame	4
B		Existing pit to remain	9,10

SITEWORKS LEGEND

● F22.20	Finished surface level
IL10.00 600 ø 'Z' 1.25% Q=345 L/s IL9.65	Stormwater pit, flow direction and line with Invert level upstream Pipe size and class Pipe grade Flow (Litres per second) Invert level downstream
	Subsoil drainage line (100 dia) – refer detail sheets
IR	Intermediate riser with subsoil drainage line (100 dia)
FP	Flushing point with subsoil drainage line (100 dia)

0 4 8 12 16 20 24 28 32m

1:400 A1 1:800 A3

FileName: C510.dwg – USER: dandt – Plot File Created: May 12, 2021 - 2:01pm

A1 0 1 2 3 4 5 6 7 8 9 10

Rev	Description	Eng	Draft	Date
P1	FOR INFORMATION	NB	DT	12.05.21

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Project
26-42 EDEN STREET & 161-179 PRINCES HIGHWAY, ARNCLIFFE (PUBLIC DOMAIN)

Sheet Subject
STORMWATER MANAGEMENT PLAN

Scale : A1	Drawn	Authorised
1:400	JH	-

Job No	Drawing No	Revision
201609	C510	P1

Plot File Created: May 12, 2021 - 2:01pm

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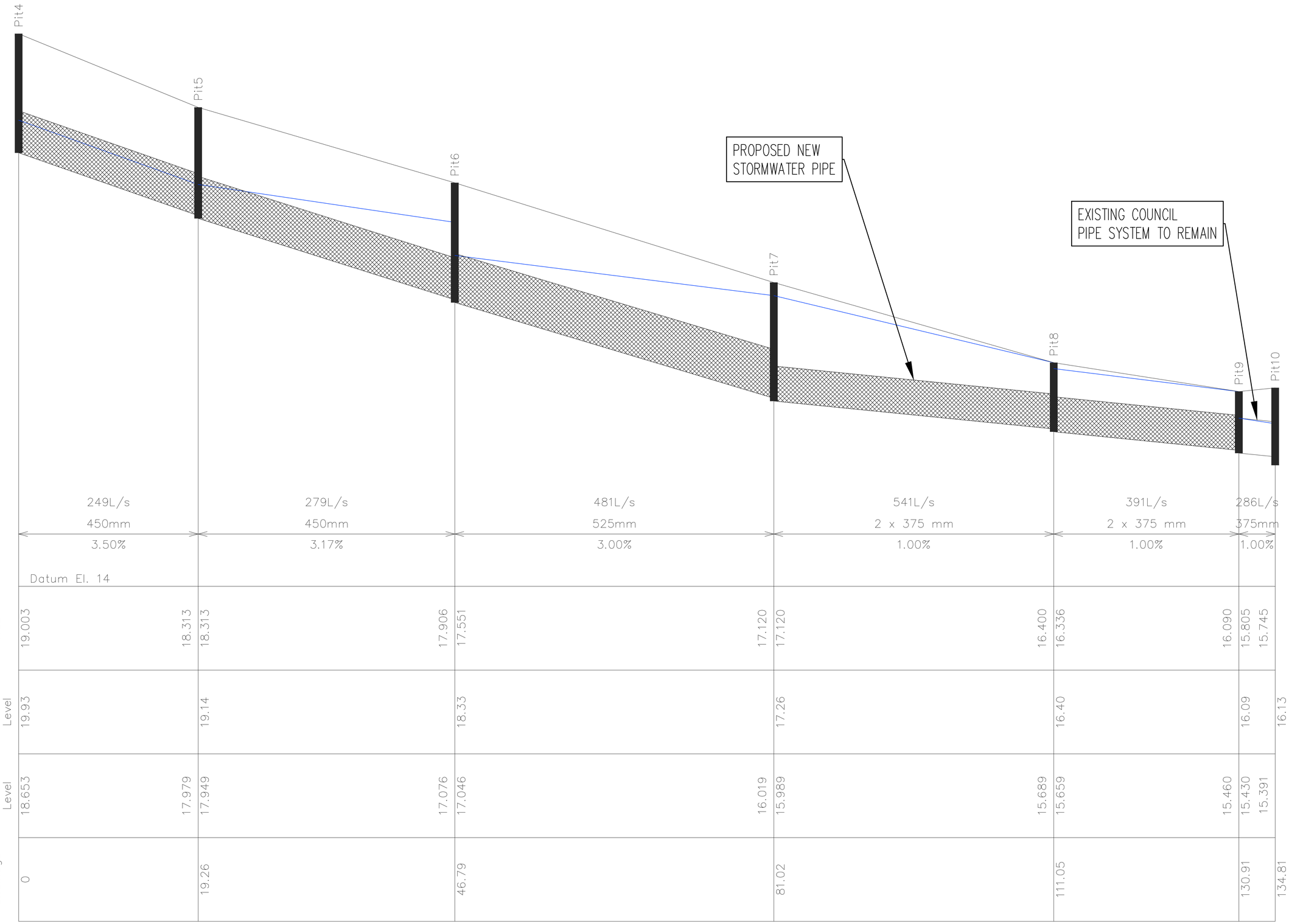

FileName: C511.dwg - USER: dmott - Plot File Created: May 12, 2021 - 2:02pm

A1 0 1 2 3 4 5 6 7 8 9 10

Rev	Description	Eng	Draft	Date
P1	FOR INFORMATION	NB	DT	12.05.21

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Project
26-42 EDEN STREET & 161-179 PRINCES HIGHWAY, ARNCLIFFE (PUBLIC DOMAIN)

Sheet Subject
STORMWATER LONGITUDINAL SECTION
20-YEAR ARI STORM EVENT

Scale : A1	Drawn	Authorised
1:200	JH	-

Job No	Drawing No	Revision
201609	C511	P1

Plot File Created: May 12, 2021 - 2:02pm