

EET

(BITUMEN FORMATION)

ERNEST

- GENERAL**
- G1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL, AND CONSULTANT DRAWINGS AND SPECIFICATIONS, THE DEVELOPMENT CONSENT / RELEVANT APPROVALS, AND OTHER WRITTEN INSTRUCTIONS THAT MAY BE ISSUED. THE CONTRACTOR IS TO MAKE THEMSELVES AWARE OF ALL SUCH DOCUMENTS.
- G2. DIMENSIONS SHALL NOT BE OBTAINED BY SCALING FROM THE DRAWINGS. REFER ARCHITECTS DRAWINGS FOR ALL DIMENSIONS.
- G3. REFER ANY DISCREPANCY TO THE ENGINEER/ARCHITECT.
- G4. MATERIALS AND WORKMANSHIP SHALL COMPLY WITH THE APPROPRIATE AUSTRALIAN STANDARDS, SPECIFICATIONS OR CODES AND WITH THE REQUIREMENTS OF THE RELEVANT LOCAL AUTHORITY.
- G5. THE ALIGNMENT AND LEVEL OF ALL SERVICES SHOWN ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL CONFIRM THE POSITION AND LEVEL OF ALL SERVICES PRIOR TO COMMENCEMENT OF CONSTRUCTION. ANY DAMAGE TO SERVICES SHALL BE RECTIFIED AT THE CONTRACTORS EXPENSE.
- G6. ALL SERVICES, OR CONDUITS FOR SERVING AND DRAINAGE SHALL BE INSTALLED PRIOR TO COMMENCEMENT OF PAVEMENT CONSTRUCTION.
- G7. DRAINAGE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE RELEVANT LOCAL AUTHORITY CONSTRUCTION SPECIFICATION AND THE CIVIL DRAWINGS.
- G8. NO WORK IS PERMITTED WITHIN ADJOINING PROPERTIES WITHOUT WRITTEN PERMISSION FROM THE OWNERS OR RESPONSIBLE AUTHORITY.
- G9. CONCRETE WORKS SHALL BE AS DETAILED ON THE DRAWINGS WITH REFERENCE TO THE CONCRETE SPECIFICATION.

- DRAINAGE**
- D1. ALL DRAINAGE OUTLET PIPES / LEVELS SHALL BE CONFIRMED ON SITE, PRIOR TO CONSTRUCTION COMMENCING.
- D2. STORMWATER DRAINAGE SHALL BE GENERALLY IN ACCORDANCE WITH AS3500.3. PIPES OF 300mm DIA. AND SMALLER SHALL BE UPVC TO AS1254. PIPES OF 375mm DIA. AND LARGER SHALL BE FRC OR CONCRETE CLASS 2 TO AS1342 RUBBER RING JOINTED UNO.
- D3. ALL PIPES WITHIN THE PROPERTY TO BE MIN. 100 DIA UPVC @ 1% MIN. GRADE, UNO. EQUIVALENT GRATES.
- D4. ALL PITS WITHIN THE PROPERTY ARE TO BE FITTED WITH "WELDLK" OR APPROVED EQUIVALENT GRATES.
- D5. LIGHT DUTY FOR LANDSCAPED AREAS.
- D6. HEAVY DUTY WHERE SUBJECTED TO VEHICULAR TRAFFIC.
- D7. PITS WITHIN THE PROPERTY MAY BE CONSTRUCTED AS:
- 1) PRECAST STORMWATER PITS
- 2) CAST INSITU MASS CONCRETE
- 3) ONLY 300 SQ. PITS IN LANDSCAPE AREAS CAN BE HDPE PLASTIC WHERE NOTED. SUBJECT TO THE RELEVANT LOCAL AUTHORITY CONSTRUCTION SPECIFICATION.
- D8. TRENCH DRAIN GRATES TO BE GALV. STEEL FRAME CAST INTO CONCRETE UNO.
- D9. PIPE / PIT BACKFILL TO BEDDING, HAUNCH AND OVERLAY ZONES IS TO BE 7_10 BLUE METAL SANDY LOAM OR EQUIV. TAMP COMPACTED AT OPTIMUM MOISTURE, MAY VARY IN ROAD AREAS, IE SHARP CLEAN SAND, TO LOCAL AUTHORITY REQUIREMENTS.
- D10. MINIMUM PIPE COVER IS TYPICALLY 300mm AND 450mm IN ROADWAY AREAS.
- D11. ANY PIPES AT >16% GRADE REQUIRE CONCRETE BULKHEADS IN ACCORDANCE WITH AS 3500.3.2.
- D12. ENSURE ALL GRATES TO PITS ARE SET BELOW FINISHED SURFACE LEVEL WITHIN THE PROPERTY. TOP OF PIT RL'S ARE APPROXIMATE ONLY AND MAY BE VARIED SUBJECT TO APPROVAL OF THE ENGINEER. ALL INVERT LEVELS ARE TO BE ACHIEVED.
- D13. ALL PITS 600x900 AND LARGER ARE TO HAVE A 2.0m SUBSOIL LINE DRAINED INTO THE UPSTREAM FACE AT INVERT.
- D14. ALL PITS ARE TO HAVE CONCRETE BENCHING TO OUTLET INVERT AND UP TO THIRD HEIGHT PIPE DIAMETER UNLESS SUMP NOTED OTHERWISE.
- D15. THE CONTRACTOR IS TO BE AWARE OF THE OPENING TO DEPTH PIT REQUIREMENTS OF AS3500.3.2 IE:
- 450SQ: 600 MAX. DEPTH
- 600SQ: 900 MAX. DEPTH UNO.
- D16. PROVIDE STEP IRONS TO STORMWATER PITS GREATER THAN 1200 IN DEPTH.
- D17. SUBSOIL DRAINAGE SHALL BE PROVIDED TO ALL RETAINING WALLS & EMBANKMENTS, WITH THE LINES FEEDING INTO THE STORMWATER DRAINAGE SYSTEM.
- D18. ALL SERVICES TO BE LOCATED BY HAND DIGGING, BEFORE MECHANICAL EXCAVATION FOR THE SITE OUTLET

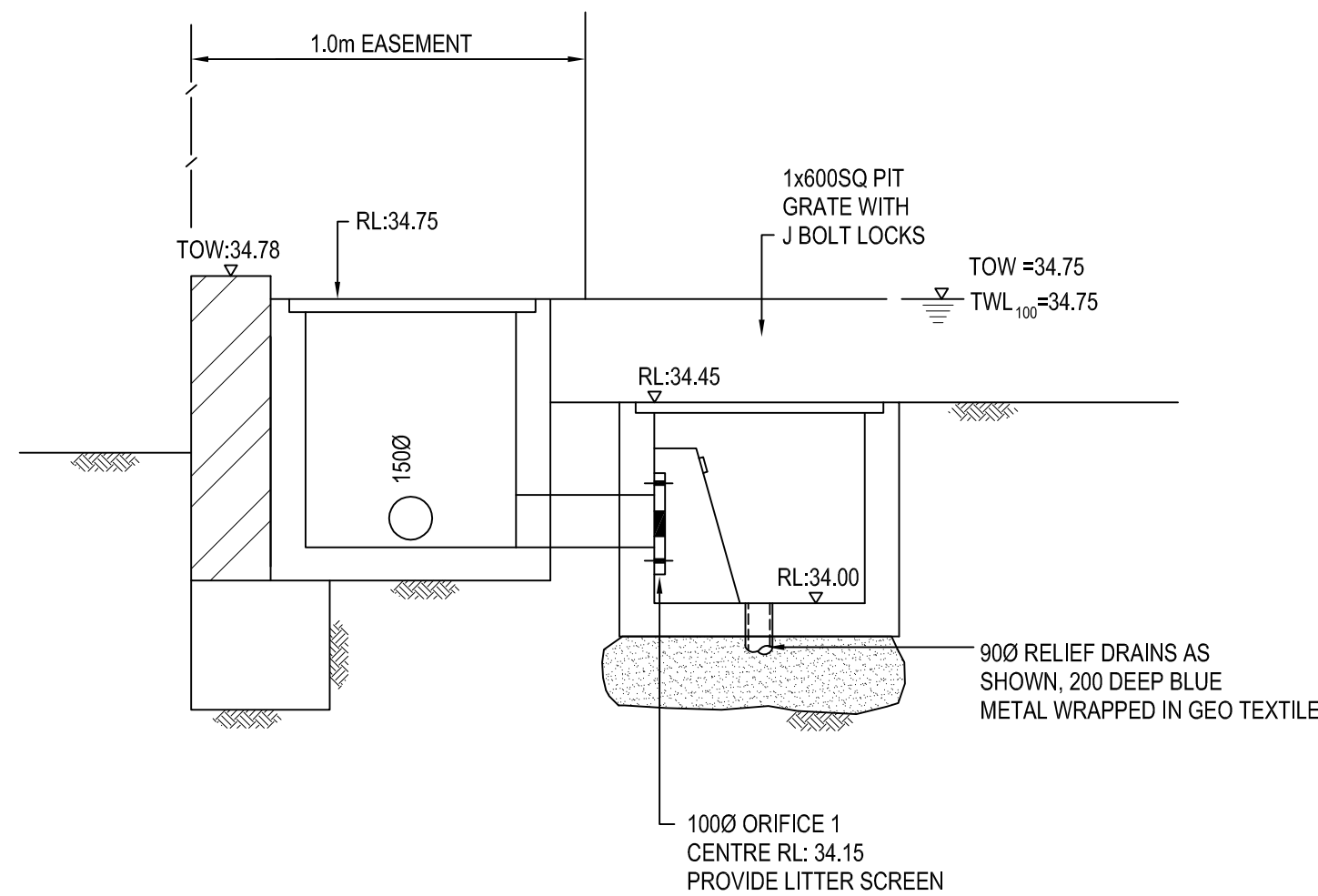
- EROSION AND SEDIMENT NOTES**
- E1. ALL EROSION & SEDIMENT CONTROL DEVICES ARE TO BE PLACED PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION WORKS. THE LOCATION OF SUCH DEVICES IS INDICATIVE ONLY AND FINAL POSITION SHOULD BE DETERMINED ON SITE. ALL DEVICES ARE TO BE MAINTAINED TO THE STANDARDS OF THE NSW DEPARTMENT OF HOUSING'S 'SOIL AND WATER MANAGEMENT FOR URBAN DEVELOPMENT'.
- E2. THE CONTRACTOR IS TO MAKE THEMSELVES AWARE OF ANY TREE PRESERVATION ORDER OR TREE REMOVAL. REQUIRED TREE PROTECTION MEASURES ARE TO BE IN ACCORDANCE WITH COUNCIL REQUIREMENTS.
- E3. A LOG BOOK OR OTHER SUITABLE RECORDS MUST BE KEPT BY THE SITE SUPERVISOR IN ACCORDANCE WITH THE EPA'S RECORDS.
- E4. NO TOPSOIL, SILT OR EXCAVATED MATERIALS IS TO BE PLACED OUTSIDE THE LIMIT OF WORKS, MATERIAL IS TO BE STOCKPILED AS SHOWN / DIRECTED WITH SILT FENCE AND UPSTREAM DIVERSION BANKS.
- E5. DURING TRENCH EXCAVATION, ALL SOIL IS TO BE PLACED ON THE UPSTREAM SIDE OF THE TRENCH AND TO THE SUPERINTENDENT'S REQUIREMENT.
- E6. DUST SUPPRESSION MEASURES ARE TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL REQUIREMENTS.
- E7. PROVIDE AND MAINTAIN SILT TRAPS AROUND ALL SURFACE INLET PITS UNTIL CATCHMENT IS VEGETATED OR PAVED.
- E8. A TURF STRIP SHALL BE PROVIDED BEHIND ALL KERBS, INLET PITS AND DRAINS AT THE COMPLETION OF THEIR FORMATION.
- E9. TOPSOIL SHALL NOT BE RESPALED ON AREAS OTHER THAN SPECIFIED, IE: TURF / LANDSCAPE, FOOTPATH, CATCH OR SHALE DRAINS.
- E10. ALL DISTURBED AREAS ARE TO BE TURFED/SEEDED AND FERTILIZED WITHIN 14 DAYS OF EXPOSURE. THEY SHALL BE ADEQUATELY WATERED TO PROMOTE GROWTH. GROWTH SHALL BE TO THE COUNCIL/SUPERINTENDENT'S SATISFACTION. THE CONTRACT IS NOT COMPLETE UNTIL THE REVEGETATION IS ACCEPTED BY COUNCIL. SOME AREAS MAY REQUIRE THE PLACEMENT OF TURF TO ACHIEVE SATISFACTORY REVEGETATION.
- E11. TRUCKS REMOVING EXCAVATED/DEMOLISHED MATERIAL SHOULD TRAVEL ON STABILISED CONSTRUCTION PATHS AND ALL WEATHER SITE ACCESS PROVIDED IN ACCORDANCE WITH COUNCIL REQUIREMENTS. ANY SEDIMENT DEPOSITED ON THE ROAD OR ROAD RESERVE IS TO BE REMOVED IMMEDIATELY.
- E12. CONCRETE PUMPS AND CRANES MUST NOT OPERATE FROM THE FOOTPATH OR ROADWAY UNLESS SPECIFIC COUNCIL PERMISSION IS OBTAINED.
- E13. PEDESTRIAN AND TRAFFIC CONTROL MEASURES ARE REQUIRED TO BE IMPLEMENTED AND MAINTAINED DURING CONSTRUCTION IN ACCORDANCE WITH AS1742:MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
- E14. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL MEASURES ARE TAKEN DURING THE COURSE OF THE CONSTRUCTION TO PREVENT SEDIMENT EROSION AND POLLUTION OF THE DOWNSTREAM SYSTEM. ALL SEDIMENT CONTROL DEVICES TO BE INSPECTED AFTER EACH RAINFALL. EVENT FOR DAMAGE AND TRAPPED SEDIMENT TO BE REMOVED TO A NOMINATED STOCKPILE.

LEGEND

- STORMWATER PIT
- DOWN PIPE
- EXISTING LEVEL
- PROPOSED LEVEL
- PROPOSED STORMWATER LINE

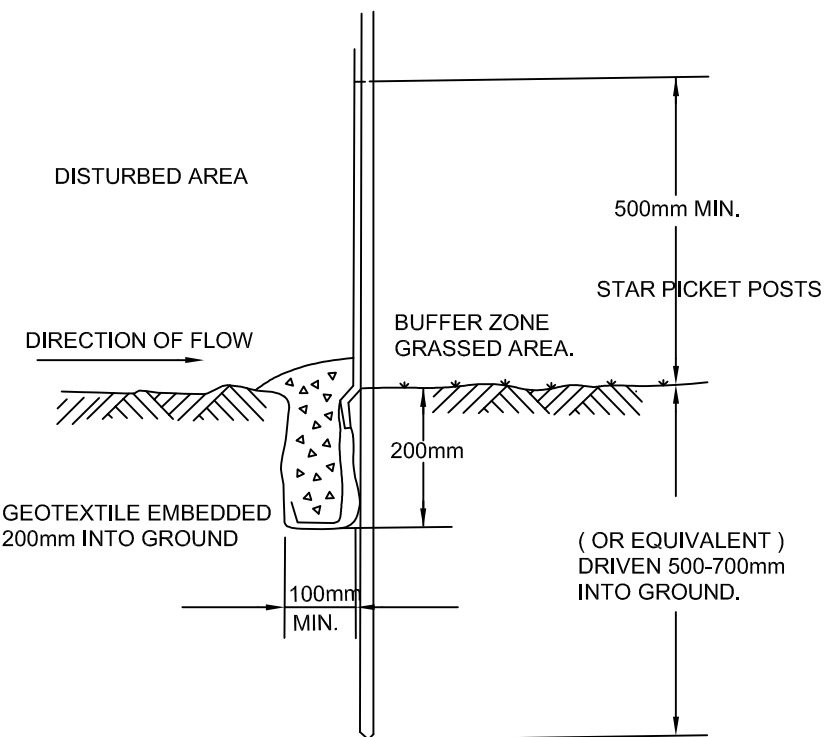
SITE DRAINAGE AND EROSION & SEDIMENT CONTROL PLAN

1:100

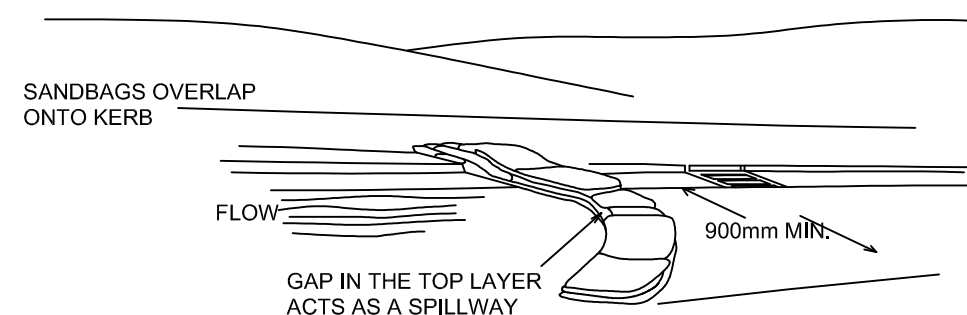


SECTION 1
1:20

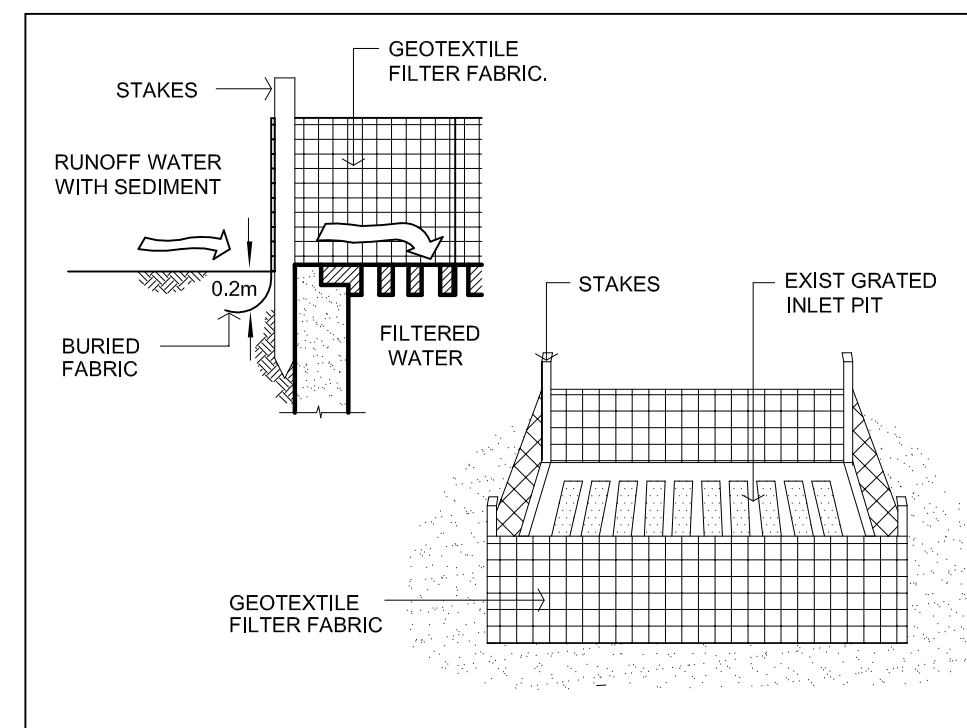
PROVIDE RAINWATER RETENTION TANK SYSTEM
VOLUME REQUIREMENT : 4000L (SILMLINE OR EQUIV.)
FIT PUMP SYSTEM (AQUASOURCE OR EQUIV.) FOR:
WC'S, LAUNDRY, SITE IRRIGATION & CARWASHING.
FIT FIRST FLUSH DIVERTER DEVICES & MOSQUITO PROTECTION
SYSTEM CONNECTED FOR POTABLE WATER TOP UP VIA FLOAT
SWITCH TO BE ENGAGED AT 10% REMAINING AND OPERATE TO 20%
REMAINING. OVERFLOW VIA 1000 TO REAR



GEOFABRIC "SILT" FENCE



SEDIMENT TRAP IN DISH DRAIN



INLET PIT SEDIMENT TRAP



ENGINEERING INSPECTIONS : 48hrs NOTICE IS REQUIRED

- THE CONTRACTOR IS TO BE AWARE OF THE MANDATORY INSPECTIONS REQUIRED BY THE DEVELOPMENT CONSENT (DA) UNDER THE ENVIRONMENTAL PLANNING & ASSESSMENT ACT. CHECK WITH THE PCA.
- THESE MAY INCLUDE : EXCAVATION, REINFORCEMENT PRIOR TO CONCRETE POURING, PIPES & PITS PRIOR TO BACKFILL, FRAMING PRIOR TO COVERING, FINAL INSPECTION AND OTHER FOR VARIOUS CERTIFICATIONS.

UNDERGROUND SERVICES SEARCH SHOULD BE UNDERTAKEN PRIOR TO ANY EXCAVATION TAKING PLACE UPON THE SITE.

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No.	DATE	REVISION	DETAILS
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PREPARED BY:

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PREPARED FOR:

KATE & JAMES MARTIN

**PROPOSED RESIDENCE
14 ERNEST STREET,
BALGOWLAH HEIGHTS**

ORIGINAL SIZE: A1	
SCALE: 1:100	DATUM: AHD
LONG SECTION: H: V:	CROSS SECTION: H: V:
DATE OF PLAN: 26.11.21	APPROVED
CHECKED: C.P.M.	Christopher P. Morris BE (Hons) MIE Aust CP Eng (MFR) RPED Accredited Engineer (No. 205272)
DRAWN: P.S.	
JOB REF: 21081-C01	SHEET 1 OF 1 SHEETS

29 November 2021

Northern Beaches Council
1 Belgrave Street
Manly NSW 2095

Our Ref: 21081

Stormwater and Onsite Detention Design Rationale Report

Proposed Dwelling
14 Ernest Street, Balgowlah Heights

The site drainage design undertaken by CPM Engineering for the above project was prepared in accordance with the following Australian Standards, Policy and best Engineering practice:

- Northern Beaches Councils' 'Water Management Development Policy V2'
- AS3500.3.2 Stormwater Drainage – Acceptable Solutions
- Australian Rainfall & Runoff (2016)

Attached is the DA Stormwater Documentation Checklist.

This property has the benefit of a rear easement to drain water. The New Dwelling Proposal includes a Rainwater Tank and Onsite Detention basin.

The On Site Detention and Drainage System has been designed in accordance with Councils' Stormwater Design Policy. The DRAINS stormwater drainage analysis software has been used calculate site discharges and size the detention basin to limit the post development site runoff to the 35% Impervious Fraction 20 Year Event pre development site runoff:

PSD: 29 l/s

SSR: 4.0 m3

The DRAINS input and post development out put data files are attached for the peak events in the 20 year design storm event.

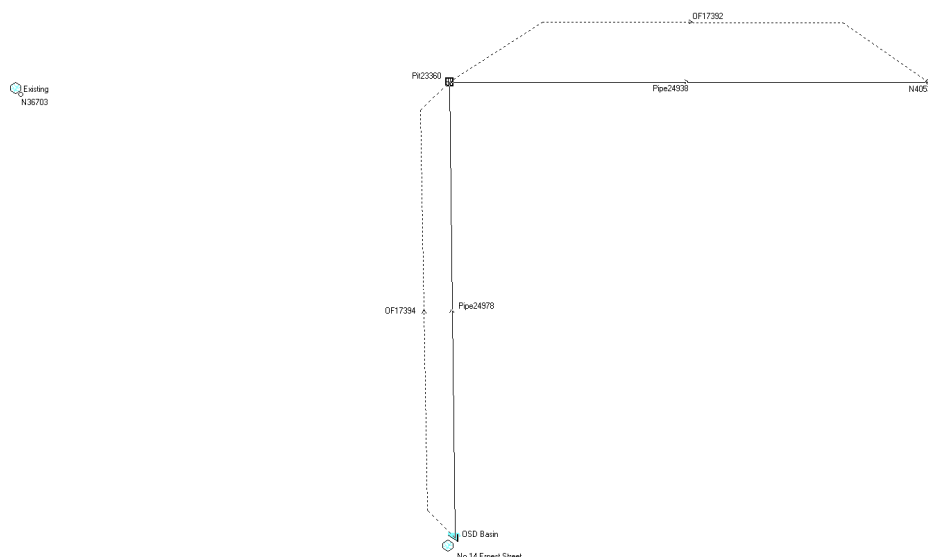


Figure 1: Drain Input Arrangement

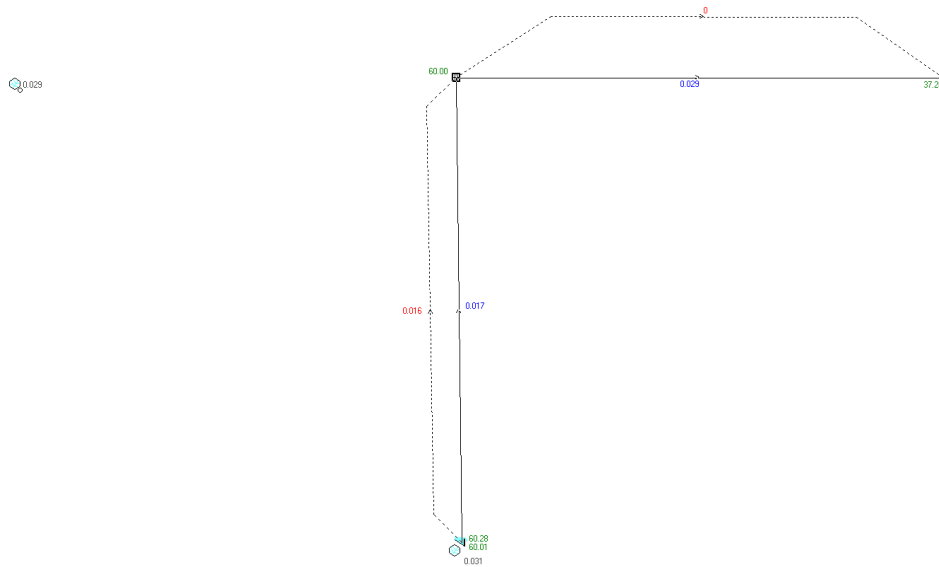


Figure 2: Drain Output: Worst case minor storm event (20yr)

Should you have any queries regarding this matter, please do not hesitate to contact the undersigned.

Yours Sincerely,

CPM Engineering

Chris Morris
BE(Hons) MIEAust CPEng NPER
Accredited Certifier

Appendix 16 – On-site Detention Checklist

This checklist is to be used to determine the on-site stormwater disposal requirement for developments and must be completed and included with the submission of any development application for these works. Please read this form carefully for its notes, guidelines, definition and relevant policies.

For assistance and support, please contact Council's Development Engineering and Certification team on 1300 434 434.

Part 1 Location of the Property			
House Number	14	Legal Property Description	
Street	ERNEST STREET	Lot	15A
Suburb	BALGOWLAH HEIGHTS	Section	
Postcode	2093	DP	31138

Part 2 Site Details			
Northern Beaches Stormwater Regions (refer to Map 2 of Northern Beaches Council's Water Management for Development policy)	3	Total Site Area	875.3
Pre-Development Impervious Area	432	Post-Development Impervious Area	398
Is the site of the development located within an established Flood Prone Land as referred to Council's Local Environmental Plans? If yes, On-site stormwater Detention system (OSD) is not required and please proceed to part 5 of this checklist If no, please proceed to part 3 of this checklist.			Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Part 3: Northern Beaches Stormwater Regions (refer to Map 2 of Northern Beaches Council's Water Management for Development policy)
If the site of the development located within Region 1, please proceed to the part 4.1 of this checklist
If the site of the development located within Region 2, please proceed to the part 4.2 of this checklist
If the site of the development located within Region 3, please proceed to the part 4.3 of this checklist <input checked="" type="checkbox"/>
If the site of the development located within Region 4, please refer to Council's Warriewood Valley Water Management Specification.

Part 4 Determination of OSD Requirements

Part 4.1 Northern Beaches Stormwater Region 1

Is the additional impervious area of the development more than 50 m² on a cumulative basis since February 1996?

Yes ☐ No ☐

If yes, OSD is required and please refer to section 9.3.1 of Council's Water Management for Development Policy

If no, OSD is not required and please proceed to the part 5 of this checklist

Part 4.2 Northern Beaches Stormwater Region 2

Part 4.2.1 Description of Work

Residential flat building, commercial, industrial, multiple occupancy development and subdivisions resulting in the creation of three lots or more, will require OSD in all case. Please provide a design in accordance with the section 9.3.2 of Council's Water Management for Development Policy. Any single residential building development, please proceed to part 4.2.2 of this checklist.

Part 4.2.2 Exemption

Is the site area less than 450m²?

Yes ☐ No ☐

Does the site of the development drain directly to the ocean without the need to pass through a drainage control structure such as pipe, bridge, culvert, kerb and gutter or natural drainage system?

Yes ☐ No ☐

Is it an alternation and addition development to the existing dwellings?

Yes ☐ No ☐

If yes to any of the above questions, OSD is not required.

If no to all the above questions, proceed to part 4.2.3

Part 4.2.3 Determination of OSD Requirements

Calculation

a) Site area m² x 0.40 (40%) = m²

b) Post- development impervious area = m²

OSD will not be required when (a) is greater than (b)

Is OSD required for this development (tick one only) Yes ☐ No ☐

If yes, provide a design in accordance with the section 9.3.2 of Council's Water Management for Development Policy.

If no, OSD is not required and please proceed to part 5 of this checklist.

Part 4.3 Northern Beaches Stormwater Region 3

Part 4.3.1 Stormwater Zone

In the region, the method of stormwater control to be applied shall depend on the location of the site. Please refer to Map 3 of Northern Beaches Council's Water Management for Development policy.

If the site of the development located within stormwater zone 1, please proceed to the part 4.3.2 of this checklist

If the site of the development located within stormwater zone 2, please provide a design in accordance with the section 9.3.3.3 of Council's Water Management for Development Policy.

If the site of the development located within stormwater zone 3, please provide a design in accordance with the section 9.3.3.4 of Council's Water Management for Development Policy.

If the site of the development located within stormwater zone 4, please provide a design in accordance with the section 9.3.3.5 of Council's Water Management for Development Policy.

Part 4.3.2 Determination of OSD requirements in Stormwater Zone 1

Part 4.3.2.1 For A New Building

1) Exemption	<p>a) Is the site area less than 400? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p> <p>b) Is the post-development impervious area less than 190 m²? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p> <p>If yes to both questions, OSD is not required. If no to any of the above questions, please process to calculation</p>
2) Calculation	<p>a) Site area <u>875</u> m² x 0.35 = <u>306</u> m² + 50 = <u>356</u> m²</p> <p>b) Post- development impervious area <u>398</u> m²</p> <p>OSD will not be required when (b) is less than 250 m² and (a) is greater than (b) Is OSD required for this development? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>If yes, provide a design in accordance with the section 9.3.3.2 of Council's Water Management for Development Policy. If no, OSD is not required and please proceed to part 5.</p>

Part 4.3.2.2 For Alterations and Additions

If the current impervious area of the site is more than 60% of the site area, OSD will be required. Alternatively, please proceed to the next calculation section.

1) Calculation	<p>Is the post development impervious area increased by less than 50 m²? Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>Is the post development impervious area less than 60% of the site area? Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>If yes to both questions, OSD is not required. If no to any of the above questions, provide a design in accordance with section 9.3.3.2 of Council's Water Management for Development Policy</p>
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Part 5 Disposal of Stormwater

Does the site fall naturally towards the street?

Yes ☐ No ☒

If yes, provide a design in accordance with section 5.1 of Council's Water Management for Development Policy.

If no, provide a design in accordance with section 5.5 of Council's Water Management for Development Policy.

Definitions

Designed to help you fill out this application

Site area: This refers to the area of the land bounded by its existing or proposed boundaries.

Impervious area: This refers to driveways, parking spaces, pathways, paved areas, hardstand areas, roofed areas, garages and outbuildings.

Pre Development Impervious area: This refers all impervious areas of the site before the development.

Post Development Impervious areas: This refers all the impervious areas within the site after the development is completed.