

STORMWATER NOTES:

- 1 - ALL PIPES TO BE 100mm Ø UNLESS NOTED OTHERWISE.
- 2 - ALL PIPES TO BE uPVC TO AS 1254-2002 UNLESS NOTED OTHERWISE.
- 3 - ALL PIPES TO BE LAYED AT 1 % MINIMUM GRADE UNLESS NOTED OTHERWISE.
- 4 - ALL PIPES SHALL BE LAID ON A 75mm SAND BED, COMPACTED TO 100% S.M.D.D. BELOW PAVEMENTS.  
( NO COMPACTION REQUIRED BELOW LANDSCAPING )  
COVER TO SURFACE FROM TOP OF PIPE TO BE 300mm MINIMUM.  
BACKFILL TO BE ADEQUATELY CONSOLIDATED AROUND PIPES BY METHOD OF RAMMING AND WATERING IN. TRENCHES TO BE FILLED WITH GRANULAR MATERIAL AS SPECIFIED.
- 5 - ALL DOWN PIPES TO BE 100mm Ø UNLESS NOTED OTHERWISE.
- 6 - DOWN PIPE LOCATIONS ARE INDICATIVE ONLY. LOCATIONS TO BE CONFIRMED WITH ARCHITECT PRIOR TO COMMENCEMENT WITH WORK.
- 7 - PROVIDE CLEANING EYES AT ALL DOWNPIPES.
- 8 - ALL PITS TO BE CAST INSITU OR, IF PRECAST, APPROVED BY ENGINEER.  
CAST INSITU PITS TO HAVE 150mm THICK CONCRETE WALLS AND BASE.  
WALLS TO BE REINFORCED WITH 1 N12 TOP TIE UNLESS NOTED OTHERWISE.  
CAST INSITU PITS GREATER THAN 1000 DEEP TO BE MINIMUM 900x600 AND TO HAVE 150mm THICK CONCRETE WALLS AND BASE. WALLS TO BE REINFORCED WITH N12 AT 300 EACH WAY UNLESS NOTED OTHERWISE.
- 9 - ALL PITS GREATER THAN 1000mm DEEP SHALL HAVE STEP IRONS AS PER COUNCIL STANDARDS.
- 10 - ALL WORK TO BE IN ACCORDANCE WITH LOCAL COUNCIL STANDARDS AND SPECIFICATIONS.
- 11 - PRIOR TO COMMENCING ANY SITE WORKS THE CONTRACTOR SHALL IMPLEMENT EROSION CONTROL MEASURES TO APPROVED SEDIMENT AND EROSION CONTROL PLAN, EPA GUIDELINES AND COUNCIL SPECIFICATIONS.  
ALL MEASURES TO REMAIN IN PLACE UNTIL COMPLETION AND STABILIZATION OF THE SITE TO COUNCIL SATISFACTION.
- 12 - ALL LEVELS SHOWN ARE TO AHD
- 13 - ENSURE THAT ALL PITS AND STORMWATER PIPES ARE LOCATED CLEAR FROM TREE ROOT SYSTEMS.
- 14 - ALL EXISTING EARTHENWARE PIPES TO BE UPGRADED TO uPVC.
- 15 - ALL WORKS TO BE IN ACCORDANCE WITH AS 3500-2003 NATIONAL PLUMBING DRAINAGE CODE PART 3 - STORMWATER DRAINAGE.
- 16 - UNLESS NOTED OTHERWISE, SUB-SOIL DRAINS ARE TO BE INSTALLED IN ACCORDANCE WITH AS3500.3 ALONGSIDE WALLS THAT IMPEDE THE NATURAL FLOW OF GROUNDWATER. THIS MAY ALSO INVOLVE TRENCHING INTO THE CLAY OR ROCK SUBGRADE TO DIRECT GROUNDWATER AWAY FROM STRUCTURES.
- 17 - IF NOT INDICATED ON PLANS, PROVIDE LEAF CATCHERS TO ALL DOWNPIPES.

RAINWATER RE-USE TANKS:

1. CONSIDERING THE ROOF CATCHMENT AREA, LOCATION OF PROPERTY, INTENDED USE OF RAINWATER AND GARDEN SIZE WE RECOMMEND PROVIDING A RAINWATER TANK FOR USE AS PER BASIX REQUIREMENTS, SYDNEY WATER AND NSW HEALTH REQUIREMENTS FOR NON DRINKING USE ONLY.
2. THE TANKS PROVIDED WILL REDUCE PRESSURE ON COUNCIL'S STORMWATER INFRASTRUCTURE.
3. REFERENCES:  
COOMBS P.J. & KUCZERA G. (2001), "RAINWATER TANK DESIGN FOR WATER SUPPLY & STORMWATER MANAGEMENT." STORMWATER INDUSTRY ASSOCIATION REGIONAL CONFERENCE.  
PATRICK DUPONT & STEVE SHACKEL, "RAINWATER"  
AUSTRALIAN GOVERNMENT (2004), "GUIDANCE ON USE OF RAINWATER TANKS"
4. ALL CONNECTIONS TO PLUMBING AND RAINWATER TANKS TO BE IN ACCORDANCE WITH SYDNEY WATERS' GUIDE "INSTALLING A RAINWATER TANK"  
AVAILABLE AT [www.sydneywater.com.au](http://www.sydneywater.com.au)
5. PROVIDE A DUAL SUPPLY SYSTEM AND BACKFLOW PREVENTION SYSTEM IN ACCORDANCE WITH 'BASIX-DESIGN GUIDE FOR SINGLE DWELLINGS' BY NSW DEPARTMENT OF INFRASTRUCTURE, PLANING AND NATURAL RESOURCES.
6. IF NOT SPECIFIED ON PLANS, THE FIRST FLUSH SYSTEM IS TO HAVE A MINIMUM SIZE OF 20L PER 100m2 OF ROOF CATCHMENT AREA PRIOR TO ENTERING THE RAINWATER TANK. INDIVIDUAL SITE ANALYSIS IS REQUIRED IN HEAVILY POLLUTED AREAS TO DETERMINE IF LARGER VOLUMES OF FIRST FLUSH RAINWATER ARE TO BE DIVERTED. IF IN DOUBT, CHECK WITH LOCAL HEALTH AUTHORITIES.
7. SCREENED DOWNPIPE RAINWATER HEAD OR OTHER SUITABLE LEAF AND DEBRIS DEVICE TO BE INSTALLED ON EACH DOWNPIPE. SCREEN MESH TO BE 4-6mm AND DESIGNED TO BE SELF-CLEANING.
8. FIRST FLUSH DEVICES, OR APPROVED ALTERNATIVE, TO BE INSTALLED WITH AN AUTOMATED DIVERSION AND DRAINAGE SYSTEM, THAT IS, NO MANUAL DIVERSION AND DRAINAGE VALVES. REFER TYPICAL FLUSH OUT PIT FOR DETAILS.
9. BEFORE PURCHASING MATERIALS OR PAINT TO BE USED ON ROOF CATCHMENT AREAS, THE MANUFACTURER'S RECOMMENDATIONS ON LABELS AND BROCHURES FOR RAINWATER TANK SUITABILITY TO BE READ AND ADHERED TO.
10. PRE-STORAGE PITS FOR UNDERGROUND RAINWATER STORAGE TANKS AND FLUSH OUT PITS MAY ASSIST IN LIMITING SILT, AND PREVENT VERMIN, INSECTS (INCLUDING MOSQUITOES) AND DEBRIS FROM ENTERING THE RAINWATER STORAGE AREA.
11. BUILDER/PLUMBER TO ENSURE THE INSTALLATION OF THE RAINWATER TANK SYSTEM IS IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARDS AND THE RAINWATER TANK DESIGN AND INSTALLATION HANDBOOK - HB 230-2008. IF IN DOUBT CONTACT ENGINEER.
12. RAINWATER TANK TO BE WATER PROOFED IN ACCORDANCE WITH HB 230-2008

NOTE:

STORMWATER DRAWINGS DO NOT INCLUDE SUBSOIL AGRICULTURAL DRAINAGE DETAILS FOR D.A. SUBMISSION. NORTHERN BEACHES CONSULTING ENGINEERS PTY LTD MUST BE COMMISSIONED TO INCLUDE THESE DETAILS ONLY WHEN CONSTRUCTION CERTIFICATE AND/OR CONSTRUCTION DOCUMENTATION IS COMPLETE AND PROVIDED.

ONSITE DETENTION SYSTEM SUMMARY NOTES

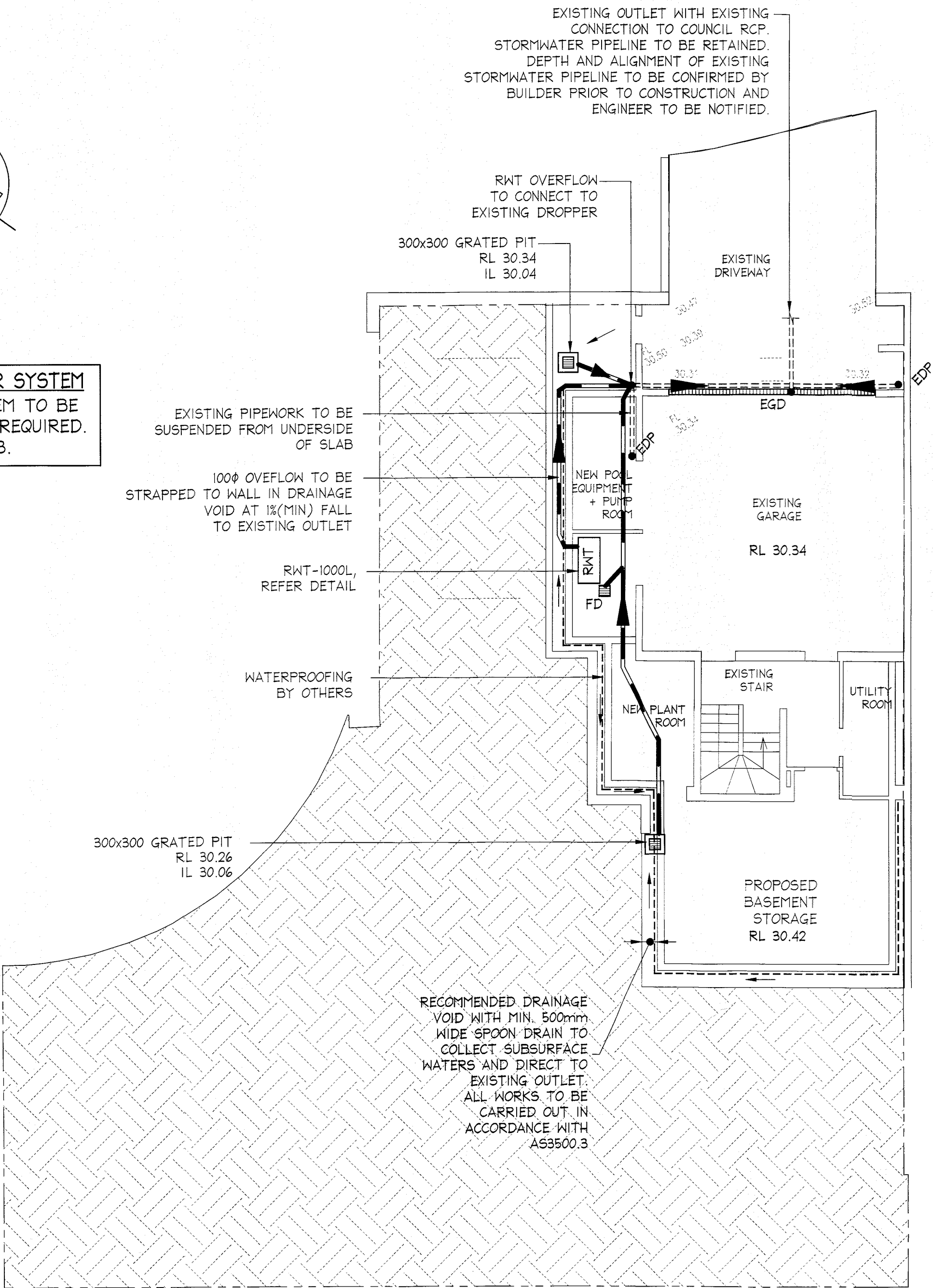
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|-----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| TOTAL SITE AREA                                                                                                                               | 535.4 m <sup>2</sup>     |
| DESIGN METHOD USED                                                                                                                            | DRAINS                   |
| PRE DEVELOPMENT IMPERVIOUS AREA                                                                                                               | 268 m <sup>2</sup> (50%) |
| POST DEVELOPMENT IMPERVIOUS AREA                                                                                                              | 272 m <sup>2</sup> (51%) |
| INCREASE                                                                                                                                      | 4 m <sup>2</sup>         |
| AS THE INCREASE IN IMPERVIOUS AREA IS < 50m <sup>2</sup> AND THE PROPOSED IMPERVIOUS AREA IS < 60%, OSD IS NOT REQUIRED FOR THIS DEVELOPMENT. |                          |
| RAINWATER TANK REQUIRED (BASIX)                                                                                                               | 864 L                    |
| RAINWATER TANK PROVIDED                                                                                                                       | 1000 L                   |

LEGEND

|       |                                                   |
|-------|---------------------------------------------------|
| EDP • | EXISTING DOWNPIPE DISCHARGE TO RAINWATER TANK     |
| —     | NEW STORMWATER PIPE                               |
| ===== | EXISTING STORMWATER PIPE                          |
| —>    | STORMWATER PIPE FALL DIRECTION IN CHARGED SYSTEMS |
| →     | STORMWATER PIPE FLOW DIRECTION                    |
| EGD   | EGD GRATED DRAIN                                  |
| FD    | 200x200 FLOOR DRAIN                               |
| RWT   | 1000L - POLY SLIMLINE 1860(H)x1250(L)x600(W)      |

NOTE: ALL DRAINAGE LINES ARE INDICATIVE ONLY. LOCATION MAY VARY DUE TO CONSTRAINTS.

NOTE: EXISTING STORMWATER SYSTEM EXISTING STORMWATER SYSTEM TO BE CHECKED AND UPGRADED AS REQUIRED. IN ACCORDANCE WITH AS3500.3.

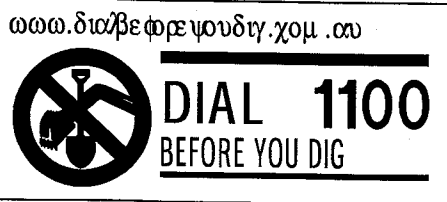


BASEMENT / SITE DRAINAGE PLAN

SCALE = 1 : 100

NOTES:

1. ALL DIMENSIONS AND LEVELS TO BE VERIFIED ON SITE BY BUILDER BEFORE COMMENCING WITH WORK.
2. FOR GENERAL NOTES REFER TO DRAWING NUMBER: DOI.



NO INVESTIGATION OF UNDERGROUND SERVICES HAS BEEN MADE. ALL RELEVANT AUTHORITIES SHOULD BE NOTIFIED PRIOR TO ANY EXCAVATION ON OR NEAR THE SITE.

DEVELOPERS & EXCAVATORS MAY BE HELD FINANCIALLY RESPONSIBLE BY THE ASSET OWNER SHOULD THEY DAMAGE UNDERGROUND NETWORKS.

CARELESS DIGGING CAN:

- CAUSE DEATH OR SERIOUS INJURY TO WORKERS AND THE GENERAL PUBLIC
- INCONVENIENCE USERS OF ELECTRICITY, GAS, WATER AND COMMUNICATIONS
- LEAD TO CRIMINAL PROSECUTION AND DAMAGES CLAIMS
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- CUT OFF EMERGENCY SERVICES
- DELAY PROJECT COMPLETION TIMES WHILE THE DAMAGE IS REPAIRED

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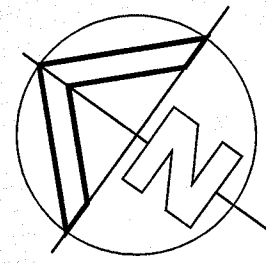
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|------------------------------------------------------------------------------------------------------------------------------|--|--|--|----------------------|--|------------------------------------------------------------|--|----------|---------|-------------|--|
| DOCUMENT CERTIFICATION                                                                                                       |  |  |  | Architect:           |  | Project:                                                   |  | Date:    | Design: | Drawn:      |  |
| Date: 11/12/18<br>Stewart McGeady<br>B.E.(Civil), MIEAust.<br>(Director: NB Consulting Engineers)                            |  |  |  | EDAA                 |  | ALTERATIONS & ADDITIONS<br>UNIT 1, 6 COLLEGE STREET, MANLY |  | DEC 2018 | CF/KO   | KO          |  |
| By: Review:                                                                                                                  |  |  |  | Client:              |  | Drawing Title:                                             |  | Job No:  |         | Drawing No: |  |
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| Date: 11.12.2018                                                                                                             |  |  |  | Issue: A             |  | Description: ISSUE FOR D.A. SUBMISSION ONLY                |  | By: KO   |         | CH          |  |
| Date: 11.12.2018                                                                                                             |  |  |  | Issue: A             |  | Description: ISSUE FOR D.A. SUBMISSION ONLY                |  | By: KO   |         | CH          |  |

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**NOTE: EXISTING STORMWATER SYSTEM**  
EXISTING STORMWATER SYSTEM TO BE CHECKED AND UPGRADED AS REQUIRED. EXISTING DOWNPIPES AT REAR OF THE PROPERTY TO BE DIVERTED TO DISCHARGE INTO NEW RAINWATER TANK.

#### LEGEND

EDP • EXISTING DOWNPIPE DISCHARGE TO RAINWATER TANK  
===== EXISTING STORMWATER PIPE  
RWT 1000L - POLY SLIMLINE  
1860(H)x1250(L)x600(W)

**NOTE:** ALL DRAINAGE LINES ARE INDICATIVE ONLY.  
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#### NOTE:

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#### NOTE: EXISTING ROOF DRAINAGE

EXISTING ROOF DRAINAGE TO BE UTILISED WHERE ADEQUATE. BUILDER TO INSPECT AND UPGRADE AS REQUIRED IN ACCORDANCE WITH AS 3500.3

#### NOTES:

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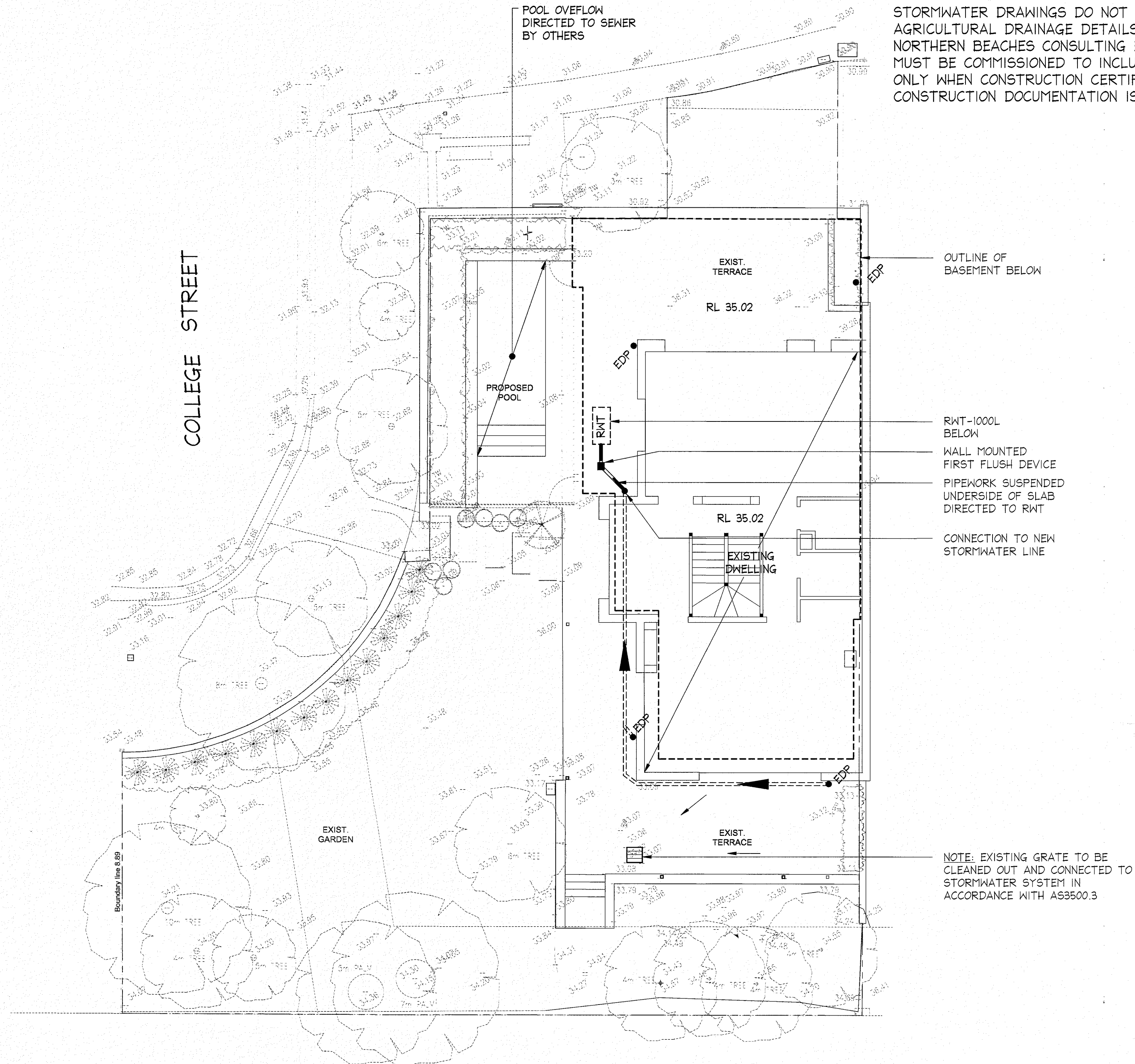
NO INVESTIGATION OF UNDERGROUND SERVICES HAS BEEN MADE. ALL RELEVANT AUTHORITIES SHOULD BE NOTIFIED PRIOR TO ANY EXCAVATION ON OR NEAR THE SITE

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#### CARELESS DIGGING CAN:

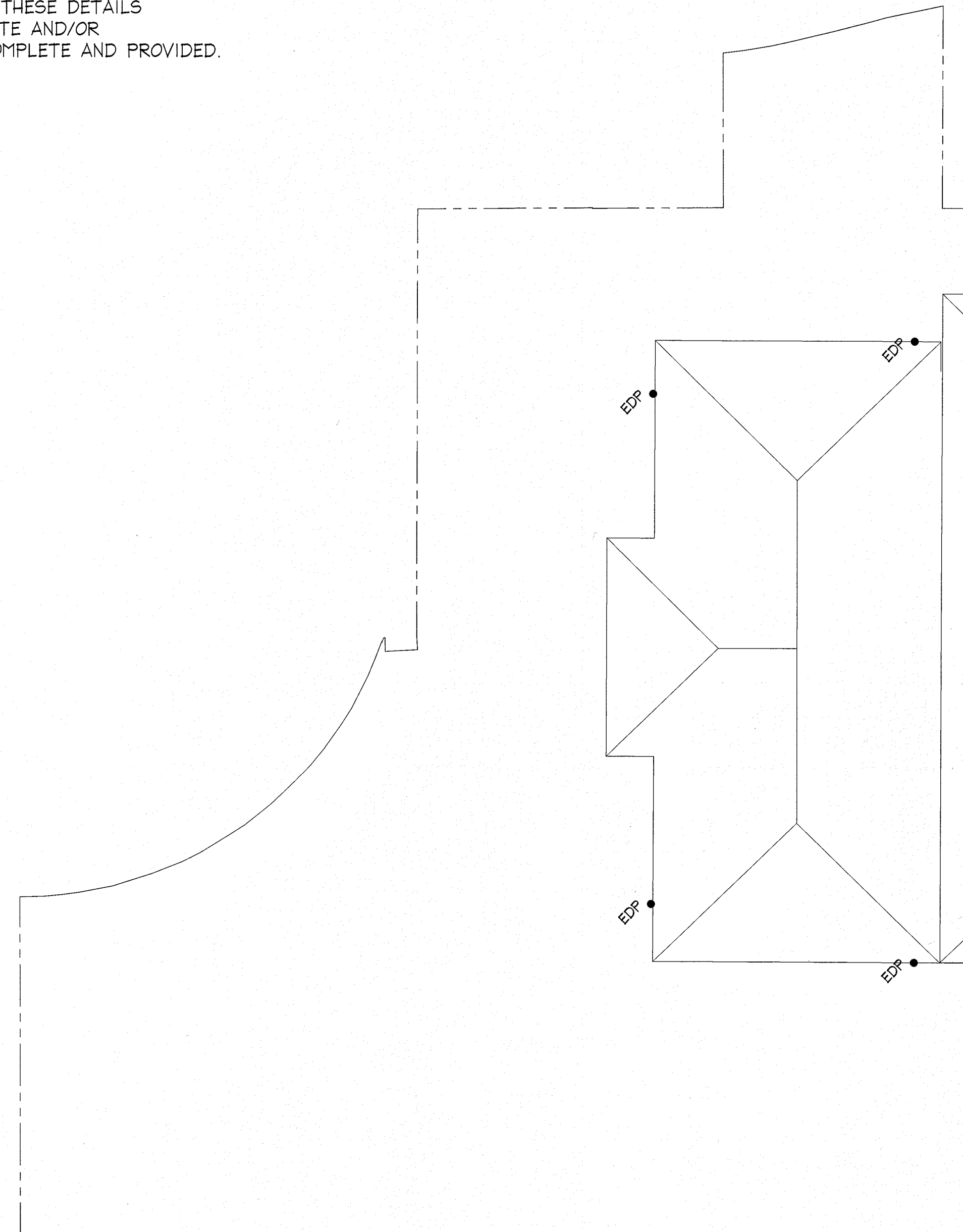
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**GROUND FLOOR DRAINAGE PLAN**

SCALE = 1 : 100



**ROOF DRAINAGE PLAN**

SCALE = 1 : 100

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|----------------------------------------------------------------------------------------------------|--------|--------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------------|----------------------|----------------|------------------------------------------------------------|---------|----------|-----------|-------|--------|----|
| DOCUMENT CERTIFICATION                                                                             |        |                                |  | NB Consulting Engineers                                                                                                                                                                                                                                                                                                                        |         | Architect: | EDAA                 | Project:       | ALTERATIONS & ADDITIONS<br>UNIT 1, 6 COLLEGE STREET, MANLY | Date:   | DEC 2018 | Design:   | CF/KO | Drawn: | KO |
| Date: 11/12/18<br>Stewart McGeady<br>B.E.(Civil), MIE Aust.<br>(Director: NB Consulting Engineers) |        |                                |  | STRUCTURAL - CIVIL - STORMWATER - REMEDIAL<br>A.C.N. 076 121 616 A.B.N. 24 076 121 616<br>Sydney: Ph: (02) 9984 7000 Fax: (02) 9984 7444<br>Suite 207, 30 Fisher Road Dee Why N.S.W. 2099<br>Gold Coast: Ph: (07) 5631 4744<br>Unit 8, 1726 Gold Coast Highway Burleigh Heads QLD 4220<br>E: nb@nbconsulting.com.au W: www.nbconsulting.com.au |         | Client:    | George & Ellen Platt | Drawing Title: | BASEMENT & ROOF<br>DRAINAGE PLAN                           | Job No: | 180866   | Drawn No: | D02   | Issue: | A  |
| 05.12.2018                                                                                         | A      | ISSUE FOR D.A. SUBMISSION ONLY |  | KO                                                                                                                                                                                                                                                                                                                                             | CH      |            |                      |                |                                                            |         |          |           |       |        |    |
| Date:                                                                                              | Issue: | Description:                   |  | By:                                                                                                                                                                                                                                                                                                                                            | Review: |            |                      |                |                                                            |         |          |           |       |        |    |

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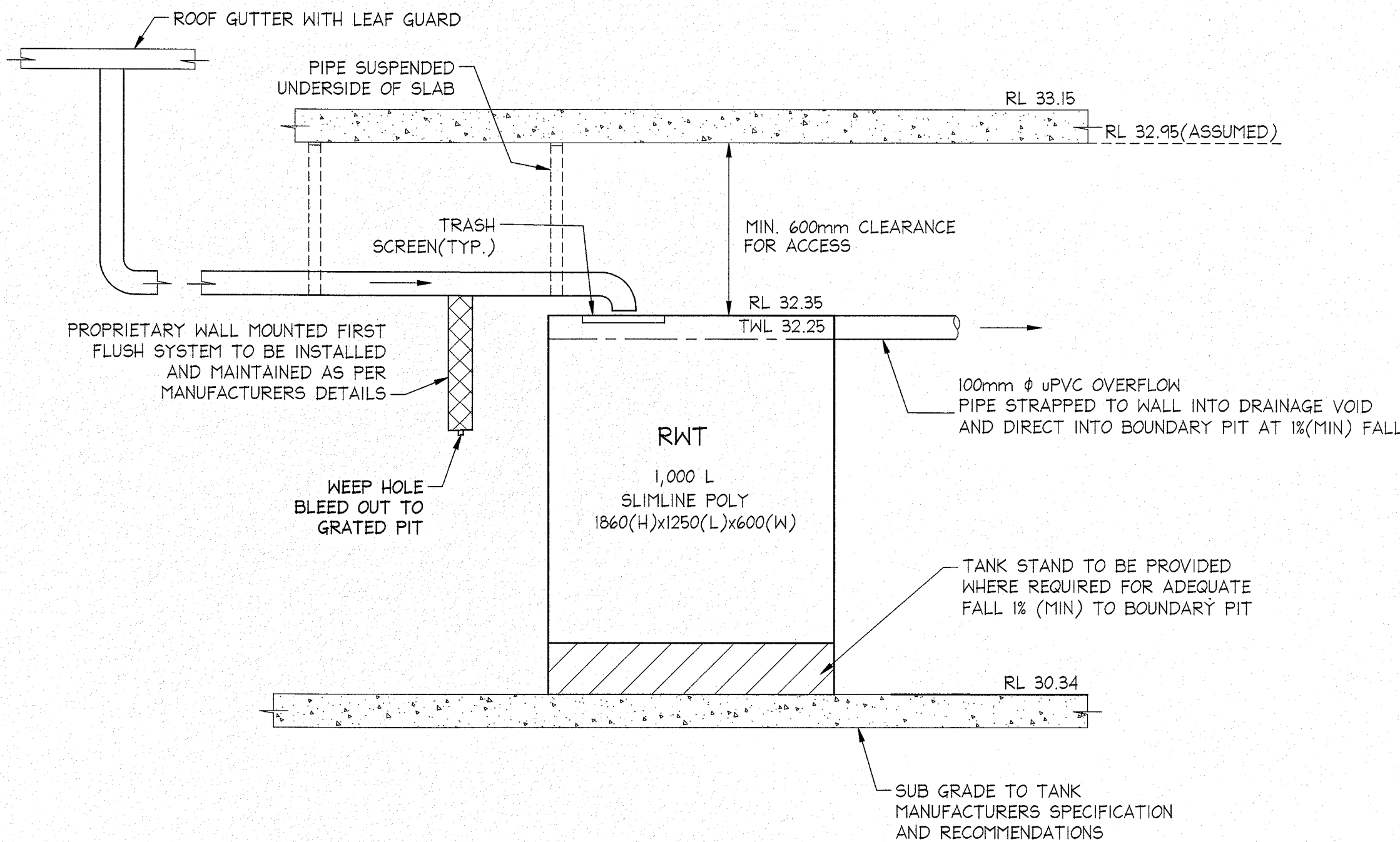
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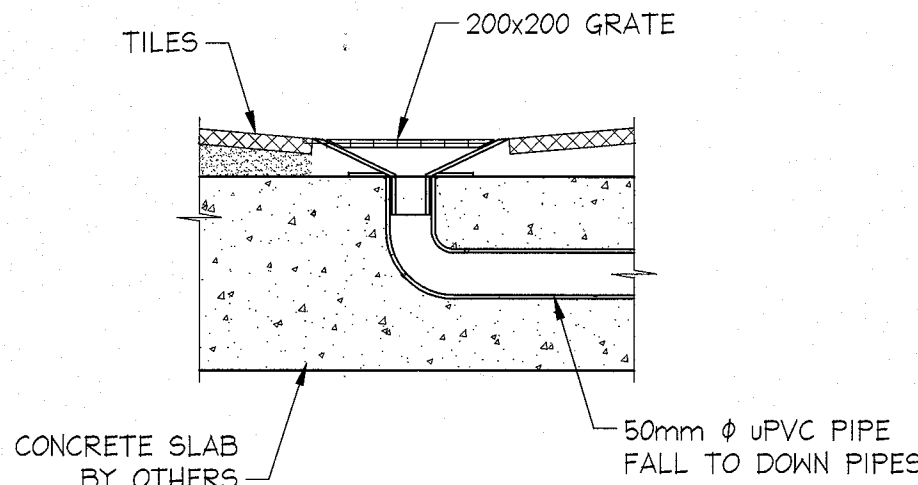
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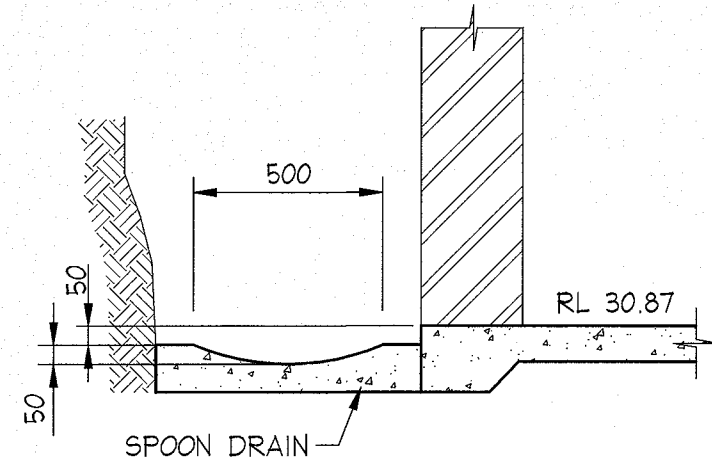
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TYPICAL SECTION RAINWATER RE-USE TANKS  
NOT TO SCALE



STANDARD FLOOR DRAIN - 'FDI'  
SCALE = 1 : 10



SPOON DRAIN DETAIL  
SCALE = 1 : 20

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**DOCUMENT CERTIFICATION**

Date: 11/12/18  
Stewart McGeedy  
B.E. (Civil), MIEAust.  
(Director NB Consulting Engineers)

**NB Consulting Engineers**  
STRUCTURAL - CIVIL - STORMWATER - REMEDIAL  
A.C.N. 076 121 616 A.B.N. 24 076 121 616  
Sydney: Ph: (02) 9984 7000 Fax: (02) 9984 7444  
Suite 207, 30 Fisher Road Dee Why N.S.W. 2099  
Gold Coast: Ph: (07) 5631 4744  
Unit 8, 1726 Gold Coast Highway Burleigh Heads QLD 4220  
E: nb@nbconsulting.com.au W: www.nbconsulting.com.au

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| Architect: | EDAA                 | Project:       | ALTERATIONS & ADDITIONS<br>UNIT 1, 6 COLLEGE STREET, MANLY |  |  | Date:   | DEC 2018 | Design:     | CF/KO | Drawn: | KO |
| Client:    | George & Ellen Platt | Drawing Title: | DRAINAGE DETAILS                                           |  |  | Job No: | 180866   | Drawing No: | D03   | Issue: | A  |

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|-------|------------|--------|---|--------------|--------------------------------|-----|----|---------|----|
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