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INTEGRATED WATER CYCLE MANAGEMENT REPORT

ROSEBANK COLLEGE

121 Parramatta Road, Five Dock, NSW 2046

Date:	22 May 2020
Revision:	2
Issue:	1
Ref. No.:	20096_C_RPT_IWCM

Prepared for: **Midson Group Pty Ltd**

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Document Control

Revision	Date	Description	Prepared	Reviewed	Approved
1	15.05.20	Preliminary Issue	JK	BB	BB
2	22.05.20	DA Issue	JK	BB	BB

Prepared by	John Kokkinos	Revision	2
Approved by	Benjamin Barrett	Revision	2

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1. EXECUTIVE SUMMARY

Sparks & Partners have been engaged by Midson Group Pty Ltd to provide civil engineering services to support the proposed Development Application for Rosebank College, Five Dock. The engineering services include the design and documentation of the stormwater drainage infrastructure for the proposed development.

City of Canada Bay Council (CCB) are the approval authority for the proposed development. An Integrated Water Cycle Management Plan be prepared that takes into consideration the objectives and controls under Appendix 2 of the City of Canada Bay Development Control Plan 2017 (CCBDCP). In response to this requirement Sparks and Partners has undertaken modelling of the proposed integrated water management measures and prepared this report to demonstrate that the proposed development identifies and incorporates water conservation and stormwater management measures into its design and operation in accordance with the requirements of Appendix 2 of the CCBDCP.

2. INTRODUCTION

2.1 Existing Site

The existing Rosebank College at 121 Parramatta Road, Five Dock currently occupies a total site area of Site area 20,824m^2 and consist of seven (7) permanent school buildings, several demountable buildings, an existing chapel, hardstand, car parking areas and landscaping. The site is currently developed where majority of the site is occupied by impervious surfaces such as building roofs or hardstand. The site bound by Parramatta Road along its Southern boundary, Harris Road along its Eastern Boundary, Queens Road along its Northern boundary, and neighbouring industrial warehouses along its Western Boundary. The site consists of a gradual fall from the Eastern boundary Western boundary, with the South Western boundary corner being the lowest point. The site is accessible from all three roads. Existing stormwater drainage is located near the North Western boundary corner and along the Southern boundary.

Figure 1. Existing Site – Aerial Image (Source: Six Maps)

2.2 Proposed Development

The proposed development occupies a total site area of 2,704m² within Rosebank College and consists of one (1) new building, located within the South Eastern boundary corner, utilising a small portion of the existing carpark. The new building occupies 2,317m^2 of the site area and consists of a stormwater drainage network connecting into the existing stormwater drainage towards the Southern boundary. The existing carpark accompanying the development occupies 356m^2 of the site and will drain into the existing stormwater drainage, whilst 72m^2 of impervious hardstand throughout the developing site area is considered as stormwater bypass.

Figure 2. Proposed Development – Aerial Image (Source: Six Maps)

3. INTEGRATED WATER MANAGEMENT

3.1 General

The objective of integrated water management is to provide a strategy that brings together the different aspects of the water cycle as a whole rather than an ad hoc approach to water management. This includes the management aspects of freshwater, wastewater and stormwater. The following integrated water management strategies have been considered and addressed for the proposed development:

1. Employ an integrated water collection and recycling system for capturing and recycling roofwater;
2. Control the quality of stormwater that is disposed from the site;
3. Control the quantity of stormwater that is discharged for the site.

To demonstrate the above concept stormwater drainage plans and associated details have been prepared along with detailed modelling using the Council endorsed MUSIC software package. The concept stormwater drainage plans detail the location of the water management infrastructure including pits, pipes, dish drains, grated trench drains, pump out pit, OSD, rainwater tank, OceanGuards and Stormfilters., and are included in Appendix A.

3.2 Rainwater Reuse

Through the reuse of collected roofwater for non-potable reuse the proposed demand on potable water resources is reduced. The proposed development will capture roof water from part of the building roof area (979m²). This collected roofwater will be conveyed to an 12,000 litre tank for storage and reuse throughout the development. Re-use purposes will primarily include toilet flushing and irrigation uses. A water balance of the proposed reuse system has been completed to model the effectiveness and efficiency of the system. The water balance model was constructed using the MUSIC software package with the following inputs:

- Total approximate non-potable reuse based on:
    - Toilet reuse of 0.1kL/day/toilet for 4 days per week (to account for weekends, public and school holidays) for the 5 proposed toilets. This results in a daily demand of 0.1 kL/toilet/day x 5 toilets x 4/7 days per week = 0.29kL/day.
    - 395m² or irrigated area requiring 0.4kL/m2/year resulting in an annual demand of 158kL/yr.

Using the above determined non-potable demand the MUSIC model determines the rainwater tank has an approximate efficiency of 83%. This efficiency results in an approximate reduction in the proposed demand on potable water supplies of 213,000 litres per year.

3.3 Stormwater Quality

To ensure the quality of stormwater leaving the site is acceptable and meets council's requirements specific water quality treatment measures are to be employed. These treatment measures are to treat the collected stormwater runoff prior to discharge to the council drainage system located in Parramatta Road. The treatment measures consist of a Rainwater reuse tank, Ocean Protect OceanGuard and Stormfilters. The combination of these measures provides a treatment train approach to the treatment of stormwater runoff.

Modelling of the proposed treatment measures has been undertaken using the MUSIC software package version 6. The modelling inputs have been based on the pollutant loads within the NSW MUSIC Modelling Guidelines August 2015. The modelling results of the water quality achieved for the site is detailed in Table 1 – MUSIC Model Results below, along with a figure of the prepared model.

	Source Load	Residual Load	% Reduction Achieved	CCB % Reduction Requirement	Compliance with CCB Requirement
Total Suspended Solids (kg/yr)	232	45.6	80.3	80	Y
Total Phosphorus (kg/yr)	0.697	0.241	65.4	45	Y
Total Nitrogen (kg/yr)	7.42	4.07	45.1	45	Y
Gross Pollutants (kg/yr)	82.4	1.96	97.6	70	Y

Table 1. MUSIC Model Results

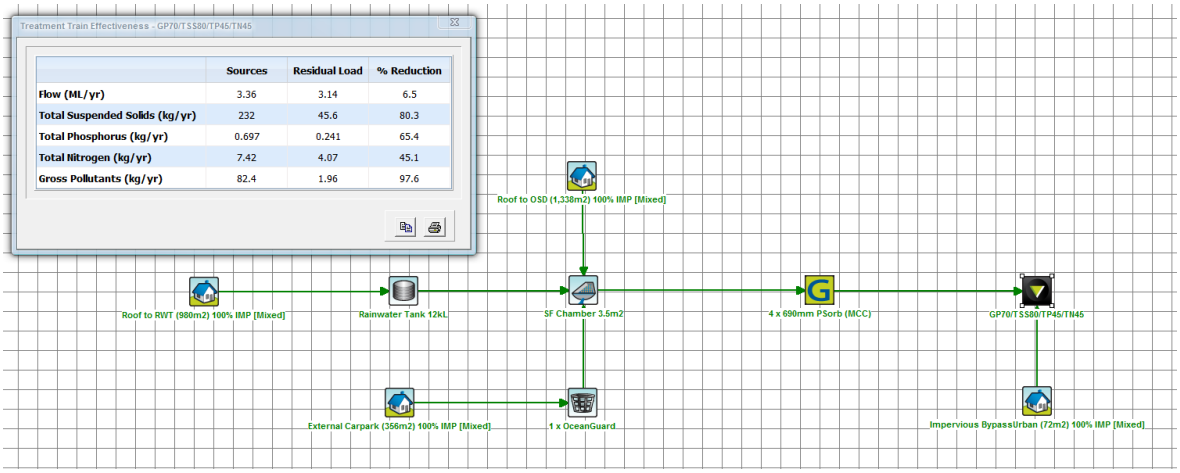


Figure 3. MUSIC Model Results

3.4 Stormwater Quantity

The proposed development requires the implementation of on-site detention (OSD) as per the CCB Engineering Guide for Development to control stormwater discharge from the site. The proposed development has an approximate area of 97.4% draining to the proposed on-site detention (OSD) facility which includes pavement (356m²) and roof (2,317m²) areas. A catchment plan of the proposed development is included in the Appendix A.

The CCBDCP required a Catchment Method is used to calculate the OSD volume and Permissible Site Discharge for the development. Based on the above catchment areas the storage required for the proposed development is approx. 48.3m³ with a maximum discharge of 48.1L/sec. Refer to the design summary on DA1.02 located in the Appendix A for review.

3.5 Maintenance and Monitoring

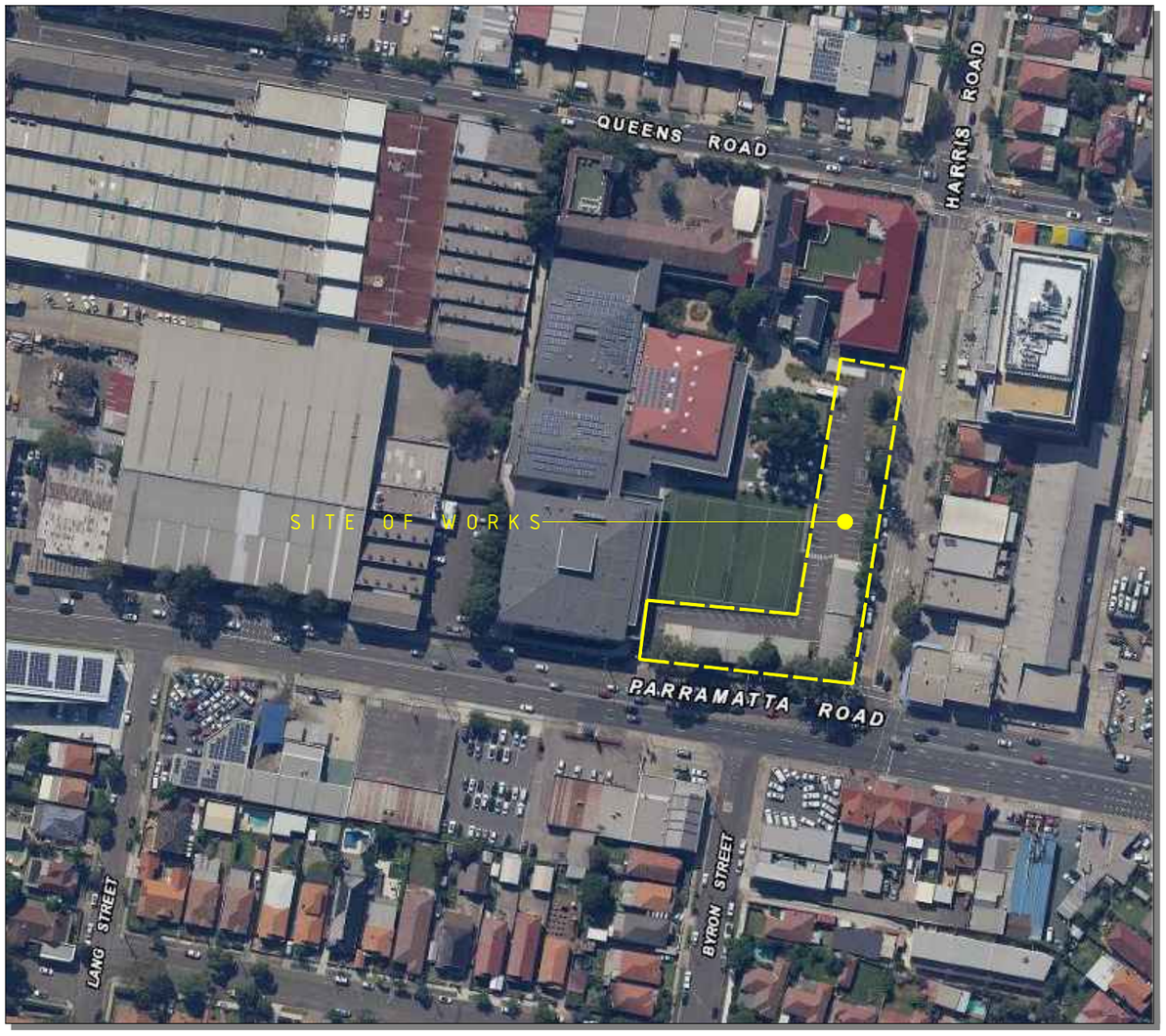
To ensure the continued efficient and correct operation of the proposed integrated water management infrastructure a 'maintenance and monitoring schedule' is included in the Appendix B of this plan. The schedule details the frequency of inspections, what is to be inspected and what rectifications to make if required for the water management infrastructure located within the proposed development. The schedule is to be implemented upon commissioning of the water management infrastructure and remain in place for the life of the development; with all records kept on site for inspection should the approval authority deem it necessary.

CONCLUSION

Based on the preparation of the concept stormwater drainage plans and MUSIC modeling results it is demonstrated that the principles of integrated water management have been incorporated into the design and operation of the proposed development at Rosebank College Five Dock in accordance with CCBDCP 2017 Appendix 2. It is demonstrated that the proposed development achieves reductions in potable water import by capturing rainwater on site and reusing this for non-potable uses including irrigation and toilet flushing, achieves pollution reduction targets set by council, and employs OSD for the control of stormwater discharge from the site in accordance with targets set by council. It is also demonstrated that the proposed development will continue to operate effectively and efficiently through the implementation and use of a monitoring and maintenance schedule ensuring the integrity of the system is maintained.

APPENDIX A. CONCEPT DRAINAGE PLANS

ROSEBANK COLLEGE EXTENSION
CONCEPT STORMWATER MANAGEMENT



LOCALITY PLAN
NOT TO SCALE - COURTESY OF SIX MAPS

DRAWING SCHEDULE

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15.05.20	PRELIMINARY ISSUE	JK	2
22.05.20	DA ISSUE	JK	3

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STRUCTURAL -
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PROJECT
ROSEBANK COLLEGE EXTENSION

ARCHITECT
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DEVELOPMENT APPLICATION

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FPA AUSTRALIA Fire Protection Association Australia. CORPORATE MEMBER

DRAWING TITLE
CIVIL DESIGN
COVER PAGE, LOCALITY PLAN & DRAWING SCHEDULE

DATE	DRAWN	DESIGNED	CHECKED
MAY 2020	JK	BB	BB

SCALE	SIZE	REVISION
NTS	A1	3

PROJECT No 20096
DRAWING No DA1.01

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SITE WORKS - GENERAL

1. ALL WORKS ARE TO BE UNDERTAKEN IN ACCORDANCE WITH LOCAL COUNCIL, AUSTRALIAN AND AUTHORITY STANDARDS.
2. ALL TRENCHING WORKS ARE TO BE RESTORED TO ORIGINAL CONDITION.
3. THE INTEGRITY OF ALL EXISTING AND NEW SERVICES IS TO BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
4. ALL PLANS ARE TO BE READ IN CONJUNCTION WITH APPROVED ARCHITECTS, STRUCTURAL ENGINEERS AND OTHER CONSULTANT'S PLANS. ANY DISCREPANCIES ARE TO BE NOTIFIED TO THE ENGINEER FOR CLARIFICATION.
5. THE ENGINEER SHALL BE GIVEN A MIN. OF 48 HOURS NOTICE FOR ALL STORMWATER DRAINAGE AND PAVEMENT INSPECTIONS. CONCRETE SHALL NOT BE DELIVERED UNTIL ENGINEERS APPROVAL IS OBTAINED.

SITE WORKS - ACCESS AND SAFETY

1. ALL WORKS ARE TO BE UNDERTAKEN IN A SAFE MANNER IN ACCORDANCE WITH ALL STATUTORY AND INDUSTRIAL RELATION REQUIREMENTS.
2. ACCESS TO ADJACENT BUILDINGS AND PROPERTIES SHALL BE MAINTAINED AT ALL TIMES.
3. WHERE NECESSARY SAFE PASSAGE SHALL BE PROVIDED FOR VEHICLES AND PEDESTRIANS THROUGH OR ADJACENT TO THE SITE.

FINISHED LEVELS

1. LEVELS BASED ON SURVEY PREPARED BY [GJ ATKINS & ASSOCIATES CONSULTING LAND SURVEYORS, 1221-5 REV-A & 17.10.19. THE CONTRACTOR SHALL VERIFY LEVELS PRIOR TO CONSTRUCTION COMMENCEMENT, ANY DISCREPANCIES SHALL BE NOTIFIED TO THE ENGINEER OR SUPERINTENDENT FOR CLARIFICATION.
2. FINISHED LEVELS SHOWN ARE CONCEPTUAL ONLY AND SUBJECT TO DETAILED DESIGN PRIOR TO CONSTRUCTION CERTIFICATE APPLICATION. FINAL FINISHED LEVELS TO BE +/- 0.5m FROM LEVELS SHOWN.
3. CARPARK & SERVICE AREA LAYOUT AND GRADES TO COMPLY WITH AS2890.
4. DRIVEWAY LAYOUT AND DESIGN TO COMPLY WITH CITY OF CANADA BAY COUNCIL ACCESS DRIVEWAY DESIGN AND CONSTRUCTION SPECIFICATION.
5. ALL CONTOUR LINES & SPOT LEVELS INDICATE FINISHED PAVEMENT LEVELS U.N.O. ON PLAN.
6. PERMANENT BATTER SLOPES ARE TO HAVE A MAXIMUM GRADE OF 1V:3H.
7. ALL FOOTPATHS ARE TO FALL AWAY FROM THE BUILDING AT 2.5% NOMINAL. GRADE.
8. ALL PAVEMENTS ARE TO BE SET AT 50mm BELOW THE FINISHED FLOOR LEVEL OF THE WAREHOUSE AND OFFICE AREAS.

SEDIMENT AND EROSION CONTROL

1. THE CONTRACTOR SHALL INSTIGATE ALL SEDIMENT AND EROSION CONTROL MEASURES IN ACCORDANCE WITH CITY OF CANADA BAY COUNCIL AND THE "BLUE BOOK" (MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION, PRODUCED BY THE DEPARTMENT OF HOUSING). THESE MEASURES ARE TO BE REGULARLY INSPECTED AND MAINTAINED.
2. THE SEDIMENT & EROSION CONTROL PLAN PRESENTS CONCEPTS ONLY, THE CONTRACTOR SHALL AT ALL TIMES BE RESPONSIBLE FOR THE ESTABLISHMENT & MANAGEMENT OF A DETAILED SCHEME MEETING COUNCIL'S DESIGN, AND ALL OTHER REGULATORY AUTHORITY REQUIREMENTS.
3. WHERE PRACTICAL, THE SOIL EROSION HAZARD ON THE SITE SHALL BE KEPT AS LOW AS POSSIBLE. TO THIS END, WORKS SHOULD BE UNDERTAKEN IN THE FOLLOWING SEQUENCE:
   a. INSTALL ALL TEMPORARY SEDIMENT FENCES AND BARRIER FENCES. WHERE FENCES ARE ADJACENT TO EACH OTHER THE SEDIMENT FENCE CAN BE INCORPORATED INTO THE BARRIER FENCE.
   b. CONSTRUCT TEMPORARY STABILISED SITE ACCESS. INCLUDING SHAKE DOWN AND WASH PAD.
   c. INSTALL SEDIMENT CONTROL MEASURES AS OUTLINED ON THESE SEDIMENT AND CONTROL PLANS (ONCE APPROVED)
4. THE CONTRACTOR SHALL UNDERTAKE SITE DEVELOPMENT WORKS SO THAT LAND DISTURBANCE IS CONFINED TO AREAS OF MINIMUM WORKABLE SIZE.
5. AT ALL TIMES AND IN PARTICULAR DURING WINDY AND DRY WEATHER, LARGE, UNPROTECTED AREAS WILL BE KEPT MOIST (NOT WET) BY SPRINKLING WITH WATER TO KEEP DUST UNDER CONTROL. TACIFIERS. MAY BE USED TO CONTROL DUST DURING EXTENDED PERIODS OF DRY WEATHER.
6. ANY SAND USED IN THE CONCRETE CURING PROCESS (SPREAD OVER THE SURFACE) SHALL BE REMOVED AS SOON AS POSSIBLE AND WITHIN 10 WORKING DAYS FROM PLACEMENT.
7. WATER SHALL BE PREVENTED FROM ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS THE CATCHMENT AREA HAS BEEN STABILISED AND/OR ANY LIKELY SEDIMENT HAS BEEN FILTERED OUT.
8. TEMPORARY SOIL AND WATER MANAGEMENT STRUCTURES SHALL BE REMOVED ONLY AFTER THE LANDS THEY ARE PROTECTING ARE STABILISED / REHABILITATED.
9. THE CONTRACTOR SHALL ALLOW FOR THE ESTABLISHMENT OF ANY OTHER EROSION PROTECTION MEASURES. (IF APPLICABLE).
10. THE CONTRACTOR SHALL REGULARLY INSPECT (MINIMUM TWICE PER WEEK) ALL EROSION AND SEDIMENT CONTROL MEASURES TO ENSURE THEY ARE OPERATING EFFECTIVELY. REPAIRS AND/OR MAINTENANCE SHALL BE UNDERTAKEN REGULARLY AND AS REQUIRED, PARTICULARLY FOLLOWING STORM EVENTS.
11. ACCEPTABLE RECEPTORS SHALL BE USED FOR CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS AND LITTER. WASTE FROM THESE RECEPTORS SHALL BE DISPOSED OF IN ACCORDANCE WITH REGULATORY AUTHORITY REQUIREMENTS. PAY ALL FEES AND PROVIDE EVIDENCE OF SAFE DISPOSAL.

STORMWATER

1. ALL WORKS ARE TO BE UNDERTAKEN IN ACCORDANCE WITH THE FOLLOWING AUSTRALIAN STANDARDS AS2032, AS3500 AND AS3725 AS A MINIMUM.
2. ALL PIPES LESS THAN OR EQUAL TO Ø300mm IN SIZE ARE TO BE SOLVENT WELD-JOINTED uPVC CLASS SN6 U.N.O.
3. ALL PIPES Ø375mm OR GREATER IN SIZE ARE TO BE MIN. CLASS 2 REINFORCED CONCRETE PIPE (RCP) WITH SPIGGOT AND SOCKETED JOINT OR VANTAGE PIPE PLUS (VPIPE+) FIBRE REINFORCED CONCRETE (FRC) WITH VANTAGE PIPE PLUS JOINT U.N.O.
4. ALL PIPES ARE TO BE LAID AT MIN. 1.0% GRADE U.N.O.
5. PIPE BEDDING IS TO BE HS2 UNDER ROADS AND TRAFFICKED AREAS AND SHALL BE H2 IN LANDSCAPED AND PEDESTRIAN TRAFFICKED AREAS U.N.O.
6. ALL PIPE BENDS AND JUNCTIONS ARE TO BE MADE WITH EITHER PURPOSE MADE FITTINGS OR STORMWATER DRAINAGE PITS.
7. MINIMUM COVER FROM THE OBVERT OF THE STORMWATER PIPE OF 300mm IS TO BE PROVIDED IN LANDSCAPED AREAS AND 600mm IN VEHICULAR TRAFFICKED AREAS U.N.O.
8. WHERE MINIMUM COVER CANNOT BE ACHIEVED CONCRETE ENCASEMENT OF THE AFFECTED PIPE IS MAY BE UNDERTAKEN WITH 20MPa CONCRETE WITH A MIN. COVER OF 150mm TO ALL SIDES OF THE PIPE. THE CONTRACTOR SHALL CONFIRM THIS REQUIREMENT WITH THE ENGINEER OR SUPERINTENDENT.
9. LAID PIPELINES ARE TO HAVE THE FOLLOWING CONSTRUCTED TOLERANCES:
   a. HORIZONTAL-1:300 ANGULAR DEVIATION FROM REQUIRED ALIGNMENT;
   b. VERTICAL-1:300 ANGULAR DEVIATION FROM REQUIRED ALIGNMENT.
10. ALL DRAINAGE PITS ARE TO BE CAST IN-SITU, PRECAST DRAINAGE PITS MAY BE USED WITH APPROVAL FROM THE ENGINEER. THE CONTRACTOR SHALL SUBMIT A PRECAST PIT INSTALLATION WORK METHOD STATEMENT FOR ASSESSMENT BY THE ENGINEER FOR APPROVAL.
11. DRAINAGE PIT COVERS ARE TO BE EITHER GALVANISED STEEL OR CAST IRON CLASS 'B' IN LANDSCAPED AND PEDESTRIAN TRAFFICKED AREAS AND CLASS 'D' IN ALL VEHICULAR TRAFFICKED AREAS U.N.O.
12. DRAINAGE PIT COVERS ARE TO BE 'HEELSAFE' TYPE IN ALL PEDESTRIAN TRAFFICKED AREAS U.N.O.
13. EXISTING STORMWATER PIT LOCATIONS AND INVERT LEVELS TO BE CONFIRMED PRIOR TO COMMENCING WORKS ON SITE.
14. PROVIDE CLEANING EYES (RODDING POINTS) TO PIPES AT ALL CORNERS AND T-JUNCTIONS WHERE NO PITS ARE PRESENT.
15. DOWN PIPES CONNECTED DIRECT TO PIPES TO BE CONNECTED AT 45° TO THE FLOW DIRECTION WITH A CLEANING EYE PROVIDED AT GROUND LEVEL.

DESIGN SUMMARY

LOCAL GOVERNMENT AUTHORITY = CANADA BAY COUNCIL
DESIGN GUIDELINE = DCP 2017 APPENDIX 2

1. RAINWATER TANK:
   - 12kL RAINWATER TANK FOR IRRIGATION AND TOILET FLUSHING REUSE
   - 50% OSD VOLUME OFFSET = 6m³
2. ON SITE DETENTION (OSD):
   - OSD CALCULATION METHOD = CATCHMENT METHOD
   - CATCHMENT AREA = 2,673m²
   - SSR = 200m³/ha x 0.2673ha = 53.5m³
   - RWT OFFSET = 6m³
   - SUBTOTAL = 47.5m³
   - BYPASS AREA = 72m² (2.6%)
   - BYPASS VOLUME INCREASE = 2.6%/30% x 20% INCREASE = 1.7% VOLUME INCREASE
   - TOTAL OSD REQUIRED = 48.3m³
   - PERMISSIBLE SITE DISCHARGE (PSD) = 18Ol/s/ha x 0.2673ha = 48.1l/s
3. WATER SENSITIVE URBAN DESIGN (WSUD):
   - REFER TO IWCM REPORT FOR FURTHER DETAIL

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QUALITY ASSURED CERTIFICATION ENVISL

DEVELOPMENT APPLICATION

DRAWING TITLE
CIVIL DESIGN
SPECIFICATION NOTES

DATE	DRAWN	DESIGNED	CHECKED
MAY 2020	JK	BB	BB

SCALE	SIZE	REVISION
1:200 @ A1	A1	2

PROJECT No 20096
DRAWING No DA1.02

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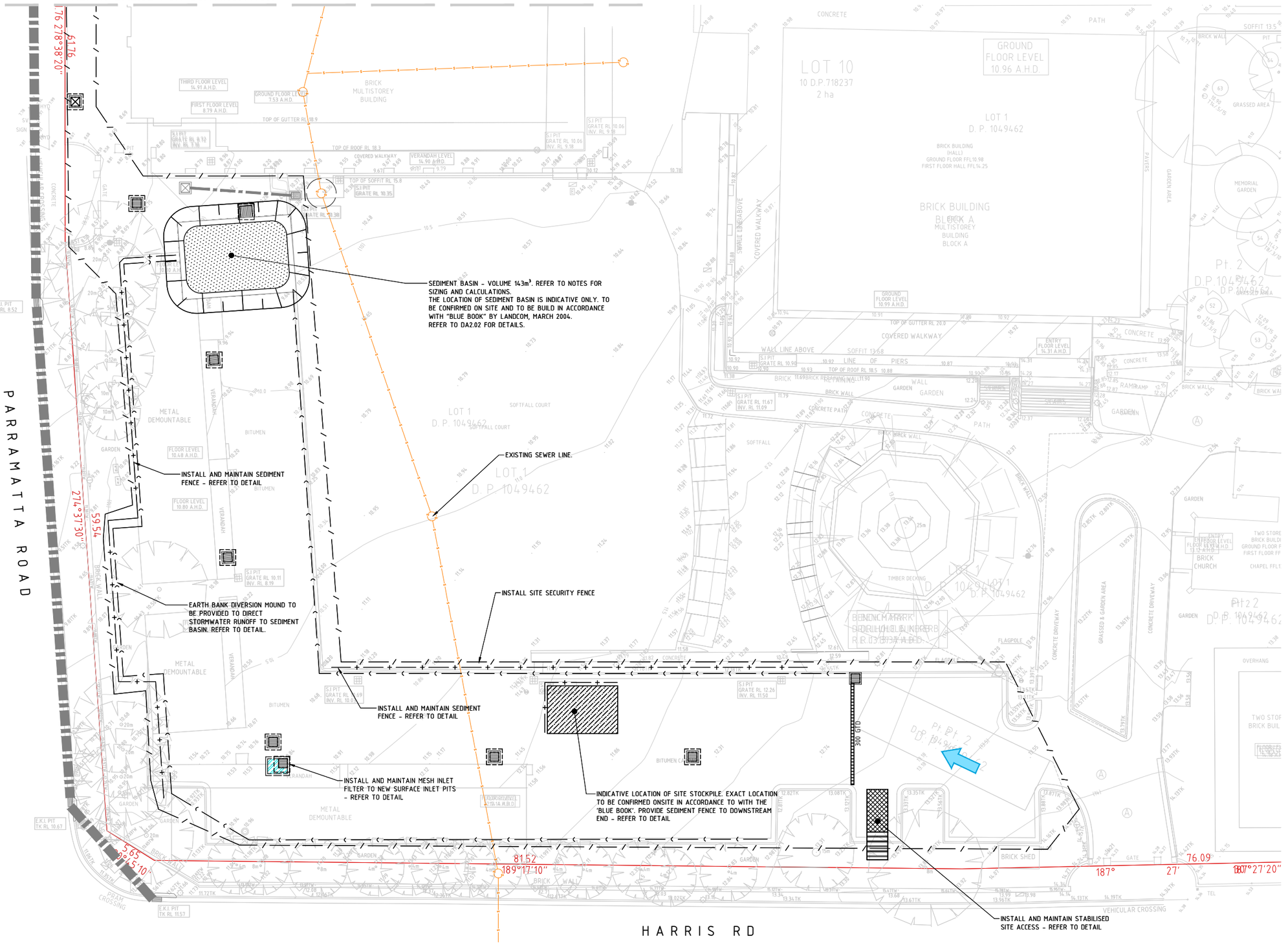

LEGEND

- SITE SECURITY FENCE
- SEDIMENT FENCE
- STABILISED SITE ACCESS
- SITE STOCKPILE
- MESH AND GRAVEL INLET FILTER
- EARTH BANK DIVERSION MOUND
- GEOTEXTILE INLET FILTER

NOTES

1. REFER TO DA1.01 FOR GENERAL NOTES AND SPECIFICATIONS
2. REFER TO DA2.11 FOR SEDIMENT AND EROSION CONTROL DETAILS

NOTES
SEDIMENT BASIN CALCULATIONS

SEDIMENT BASIN CATCHMENT AREA= 0.27Ha

SETTLING ZONE VOLUME CALCULATION:
10 x Cv x A x R
(BLUE BOOK 6.3.4 (i))

R = y-percentile, x-day
R = 38.8
(DERIVED FROM BLUE BOOK FIGURE 6.5 FOR 5 DAY 85%ile Ryde Area)

Cv (V=10) = 0.86
(FROM TABLE F2 IN App. F IN BLUE BOOK FOR CONSERVATIVE APPROACH OF HIGH RUNOFF POTENTIAL, AND RAINFALL DEPTH (31-40mm)

10x(38.8)x(0.86)x(0.27ha)
SETTLING VOLUME = 90m³

REQUIRED SEDIMENT STORAGE
=SETTLING VOLUME x 0.5 = 45m³

REQUIRED BASIN VOLUME = 90 + 45 = 135m³

VOLUME PROVIDED
70m² (BASE AREA)
155m² (TOP AREA)
2m DEPTH (INCLUDING 300mm FREEBOARD ABOVE SEDIMENT STORAGE)
SIDE SLOPE = 1V:1H

= 143m³ VOLUME PROVIDED

3m WIDE EMERGENCY SPILLWAY LOCATED AT THE LOWEST POINT OF THE NATURAL SURFACE TO ALLOW GRAVITY FLOW FROM SITE.

1:200
0 4 10 20

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CLIENT: ROSEBANK

BUILDER

PROJECT: ROSEBANK COLLEGE EXTENSION

ARCHITECT: ALLEANZA ARCHITECTURE

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Fire Protection Association Australia CORPORATE MEMBER

DEVELOPMENT APPLICATION

DRAWING TITLE: CIVIL DESIGN
EROSION & SEDIMENT CONTROL
PLAN SHEET 1

DATE	DRAWN	DESIGNED	CHECKED
MAY 2020	JK	BB	BB

SCALE	SIZE	REVISION
1:200 @ A1	A1	2

PROJECT No: 20096
DRAWING No: DA2.01

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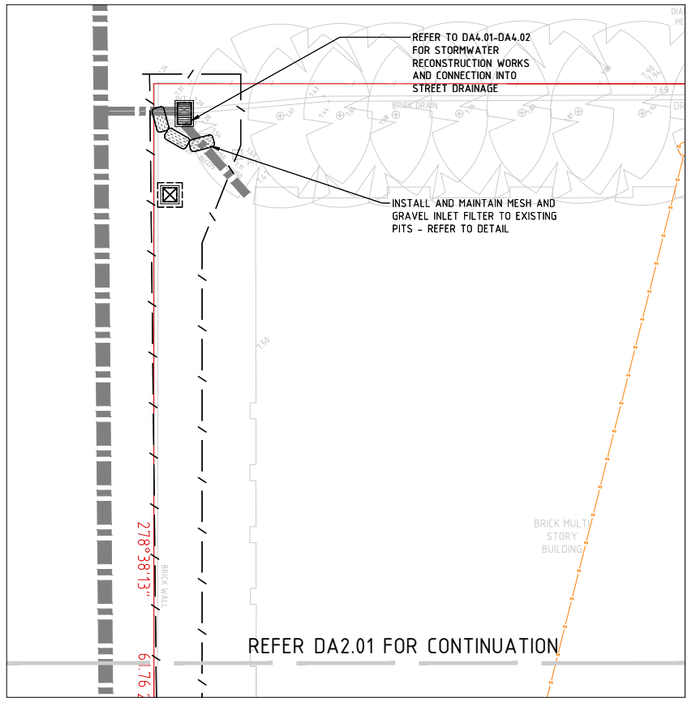
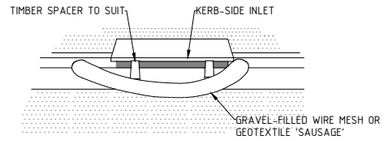
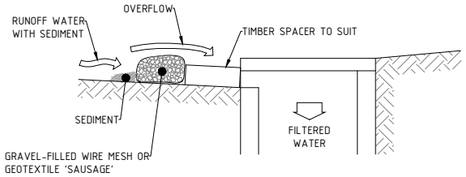


DOWNSTREAM SEDIMENT AND EROSION CONTROL MEASURES



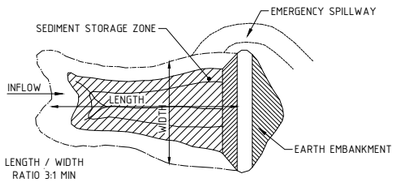


MESH AND GRAVEL INLET FILTER

NOT TO SCALE

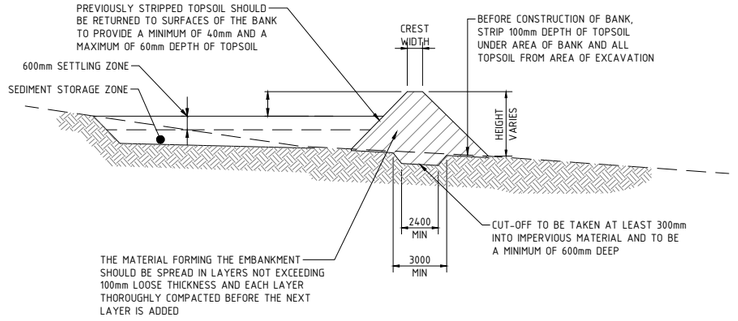
NOTES:

1. THIS PRACTICE ONLY TO BE USED WHERE SPECIFIED IN AN APPROVED SWMP/ESCP.
2. INSTALL FILTERS TO KERB INLETS ONLY AT SAG POINTS.
3. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT AND FILL IT WITH 25mm TO 50mm GRAVEL.
4. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH x 400mm WIDE.
5. PLACE THE FILTER AT THE OPENING LEAVING AT LEAST A 100-mm SPACE BETWEEN IT AND THE KERB INLET . MAINTAIN THE OPENING WITH SPACE BLOCKS.
6. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
7. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY FIRMLY ABUT EACH OTHER AND SEDIMENT-LADEN WATERS CANNOT PASS BETWEEN.



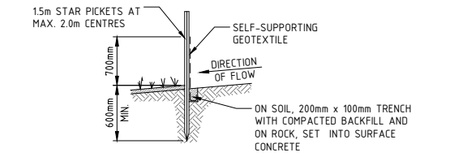
SEDIMENT BASIN WET (TYPICAL) CROSS PLAN - TYPE D AND F SOILS

NTS

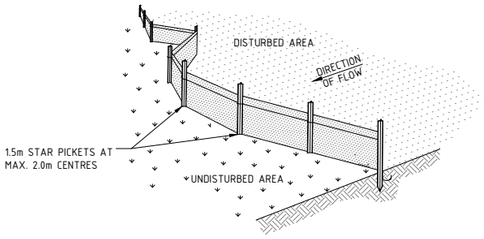


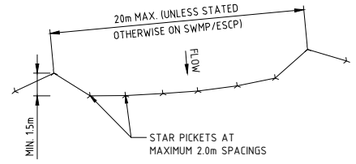
SEDIMENT BASIN WET (TYPICAL) CROSS SECTION - TYPE D AND F SOILS

NTS



SECTION DETAIL





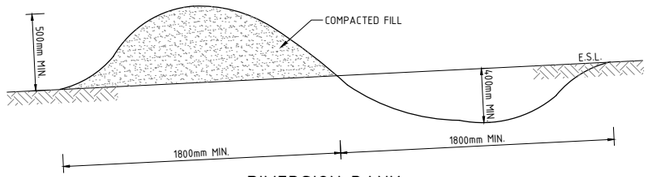
PLAN

SEDIMENT FENCE

NOT TO SCALE

NOTES:

1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50L/s IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.
2. CUT A 200mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5m LONG STAR PICKETS INTO GROUND AT 2.0m INTERVALS (MAX) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.

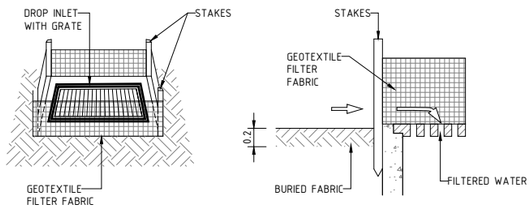


DIVERSION BANK

NOT TO SCALE

CONSTRUCTION NOTES:

1. REMOVE ALL VEGETATION AND TOPSOIL FROM UNDER THE DAM WALL AND FROM WITHIN THE STORAGE AREA
2. CONSTRUCT A CUT-OFF TRENCH 500mm DEEP AND 1200mm WIDE ALONG THE CENTERLINE OF THE EMBANKMENT EXTENDING TO A POINT ON THE GULLY WALL LEVEL WITH THE RISER CREST
3. MAINTAIN THE TRENCH FREE OF WATER AND RECOMPACT THE MATERIAL WITH EQUIPMENT AS SPECIFIED IN THE SWMP TO 95% STANDARD PROCTOR DENSITY
4. SELECT FILL FOLLOWING THE SWMP THAT IS FREE OF ROOTS, WOOD, ROCK, LARGE STONE OR FOREIGN MATERIAL
5. PREPARE THE SITE UNDER THE EMBANKMENT BY RIPPING TO AT LEAST 100mm TO HELP BOND COMPACTED FILL TO THE EXISTING SUBSTRATE
6. SPREAD THE FILL IN 100mm TO 150mm LAYERS AND COMPACT IT AT OPTIMUM MOISTURE CONTENT FOLLOWING THE SWMP
7. CONSTRUCT THE EMERGENCY SPILLWAY
8. REHABILITATE THE STRUCTURE FOLLOWING THE SWMP

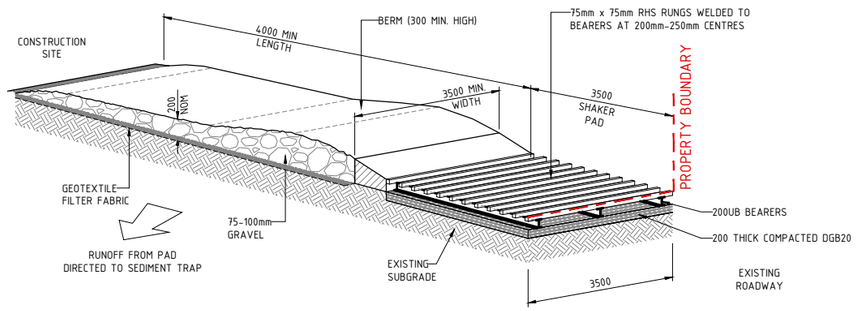


GEOTEXTILE INLET FILTER DROP INLET SEDIMENT TRAP

NOT TO SCALE

NOTES:

1. FABRICATE A SEDIMENT BARRIER MADE FROM GEOTEXTILE OR STRAW BALES.
2. CUT A 200mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.0m LONG STAR PICKETS INTO GROUND AT THE FOUR CORNERS OF PIT WALLS. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.

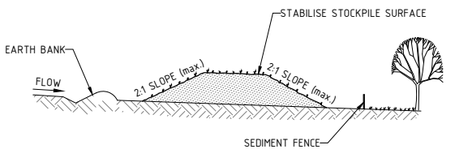


STABILISED SITE ACCESS WITH SHAKER PAD

NOT TO SCALE

MAINTENANCE

- THE TEMPORARY ACCESS SHALL BE MAINTAINED IN A CONDITION THAT PREVENTS TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY,
- THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL GRAVEL AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT,
- ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS OF WAY MUST BE REMOVED IMMEDIATELY.
- INSTALL BARRIER ON EITHER SIDE OF SHAKER PAD TO ENSURE VEHICLES ARE GUIDED ON TO THE PAD.
- INVERT OF SHAKER PAD TO BE DRAINED VIA AGRICULTURAL PIPE WRAPPED IN GEOTEXTILE FABRIC.



STOCKPILE

NOT TO SCALE

NOTES:

1. PLACE STOCKPILES MORE THAN 2 (PREFERABLY 5) METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METRES IN HEIGHT.
4. 4. WHERE THEY ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED ESCP OR SWMP TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES 1 TO 2 METRES DOWNSLOPE.

AS SHOWN

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REFERENCES

DATE	AMENDMENT	INIT	REV
15.05.20	PRELIMINARY ISSUE	SK	1
22.05.20	DA ISSUE	JK	2

DATE	AMENDMENT	INIT	REV

STRUCTURAL -
MECHANICAL -
ELECTRICAL -
CIVIL -

CLIENT: ROSEBANK COLLEGE

BUILDER

PROJECT: ROSEBANK COLLEGE EXTENSION

ARCHITECT: ALLEANZA ARCHITECTURE

SPARKS + PARTNERS
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HYDRAULIC | CIVIL | FIRE
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https://sparksandpartners.com.au/

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DRAWING TITLE: CIVIL DESIGN EROSION & SEDIMENT CONTROL PLAN SHEET 2 AND DETAILS

DATE	DRAWN	DESIGNED	CHECKED
MAY 2020	JK	BB	BB

SCALE	SIZE	REVISION
AS SHOWN	A1	2

PROJECT No: 20096
DRAWING No: DA2.02

DEVELOPMENT APPLICATION

W:\2 - PROJECTS\2020\20096 - ROSEBANK COLLEGE\3-DESIGN FILES\4-DESIGN DRAWINGS\B-CIVIL\20096_DA2.01.DWG

REFER TO DA4.02 FOR CONTINUATION

NEW Ø225mm OUTLET PIPE TO EXISTING PIT. PIPE RUN AND OUTLET DESIGN TO BE CONFIRMED WITH FURTHER SURVEY

NEW 900x900 SEALED JUNCTION PIT RL 8.600

NEW 900x900 GRATED INLET PIT RL 8.500

EXISTING 900x900 SEALED JUNCTION PIT

ASSUMED EXISTING DRAINAGE CONNECTION TO BE CONFIRMED WITH FURTHER SURVEY

1m CLEARANCE AROUND MANHOLE TO BE PROVIDED

REGRADE PAVEMENT TO SUIT CARPARK ENTRY LEVEL

PROPOSED Ø225 INLET PIPE TO OSD AND TREATMENT SYSTEM

PROPOSED Ø300 INLET PIPE TO OSD AND TREATMENT SYSTEM

BELOW GROUND TANK - REFER TO DETAIL

DISH DRAIN

DISH DRAIN

EXISTING Ø900 ROAD DRAINAGE FROM DBYD INFORMATION

RAISING MAIN TO OSD

SUBSOIL CONNECTION TO BE DETAILED

EXISTING FIELD DRAINAGE TO BE INVESTIGATED AND MAINTAINED

EXISTING SEWER TO BE CONCRETE ENCASED

GRATED TRENCH DRAIN TO DRAIN THROUGH OCEANPROTECT OCEANGUARD OR APPROVED SIMILAR FILTER BASKET. ALTERNATIVE CONNECTION TO EXISTING FIELD DRAINAGE SYSTEM TO BE INVESTIGATED IN DETAILED DESIGN STAGE.

LIFT PIT DRAINAGE TO BE CONFIRMED AT DETAILED DESIGN STAGE

EXISTING OSD AND STORMWATER SYSTEM TO BE DEMOLISHED AND REMOVED

SILT ARRESTOR PIT - REFER TO DETAIL

STORMWATER PUMPOUT PIT SIZE TBC

Ø150 VC SEWER AT APPROX IL 9.08. MIN FS 10.2 TO ACHIEVE 900mm COVER

DISH DRAIN

CURRENT SURVEY OF DRIVEWAY REQUIRED

PARRAMATTA ROAD

HARRIS RD

1:200

LEGEND

- PROPOSED STORMWATER PIPE (≤Ø300)
- PROPOSED STORMWATER PIPE (>Ø300)
- EXISTING STORMWATER PIPE
- PROPOSED STORMWATER PIT
- EXISTING STORMWATER PIT
- EXISTING KERB INLET PIT
- ONSITE DETENTION TANK
- Ø225 — PIPE FLOW DIRECTION AND SIZE
- GTD — PROPOSED GRATED TRENCH DRAIN
- DD — DISH DRAIN
- RAINWATER TANK
- BASEMENT PUMP OUT PIT
- OVERLAND FLOW PATH
- + FS55.555 — FINISHED SURFACE LEVEL
- + eRL55.555 — EXISTING SURFACE LEVEL

NOTES

1. REFER TO DRAWING DA1.02 FOR NOTES AND SPECIFICATIONS
2. REFER TO DRAWINGS DA4.11-DA4.13 FOR STORMWATER DETAILS

DEVELOPMENT APPLICATION

NORTH POINT

REFERENCES

DATE	AMENDMENT	INIT	REV
07.05.20	ISSUED FOR COORDINATION	BB	1
15.05.20	PRELIMINARY ISSUE	JK	2
22.05.20	DA ISSUE	JK	3

DATE	AMENDMENT	INIT	REV

STRUCTURAL -
MECHANICAL -
ELECTRICAL -
CIVIL -

CLIENT: ROSEBANK

PROJECT: ROSEBANK COLLEGE EXTENSION

BUILDER

ARCHITECT: ALLEANZA ARCHITECTURE

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DRAWING TITLE: CIVIL DESIGN CONCEPT STORMWATER MANAGEMENT PLAN SHEET 1

DATE	DRAWN	DESIGNED	CHECKED
MAY 2020	JK	BB	BB

SCALE	SIZE	REVISION
1:200 @ A1	A1	3

PROJECT No: 20096
DRAWING No: DA4.01

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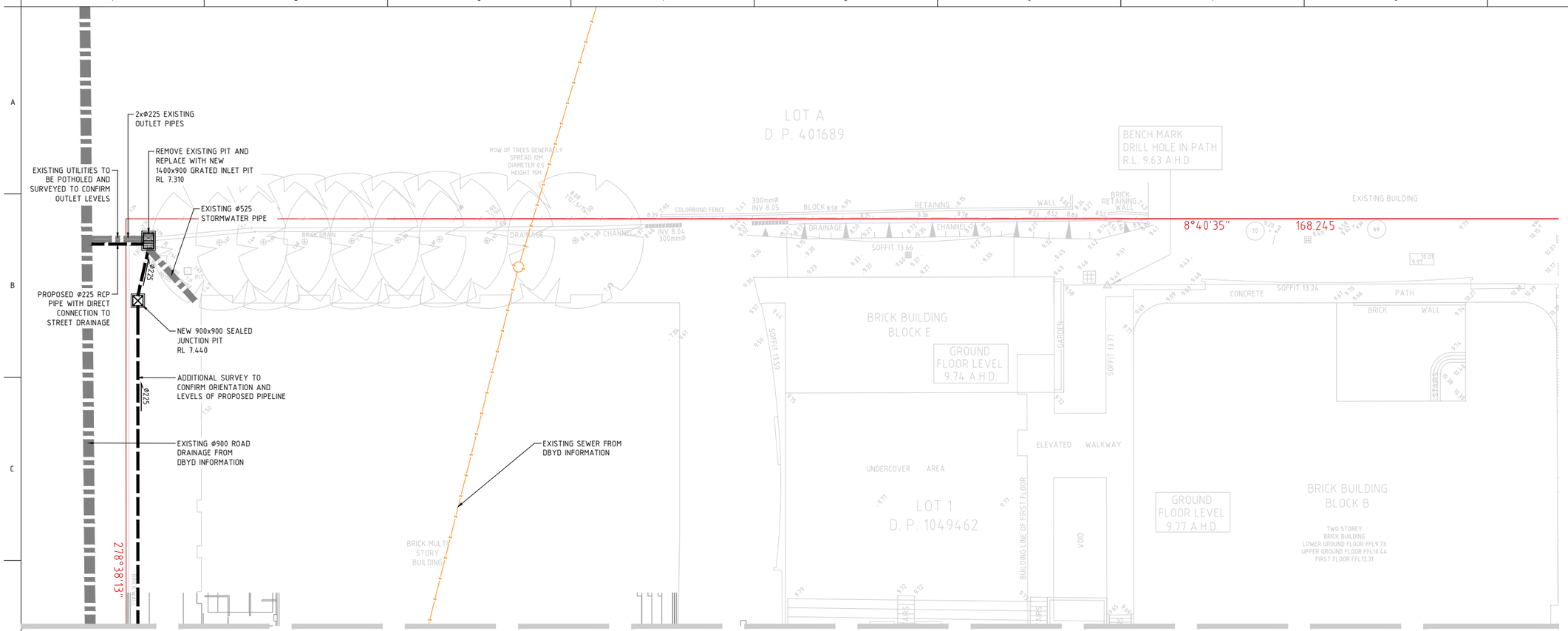

REFER TO DA4.01 FOR CONTINUATION

NOTES

1. REFER TO DRAWING DA4.01 FOR STORMWATER LEGEND AND NOTES

1:200

IMPORTANT
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22.05.20	DA ISSUE	JK	2

DATE	AMENDMENT	INIT	REV

STRUCTURAL –
MECHANICAL –
ELECTRICAL –
CIVIL –

CLIENT: ROSEBANK

BUILDER

PROJECT: ROSEBANK COLLEGE EXTENSION

ARCHITECT: ALLEANZA ARCHITECTURE

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DEVELOPMENT APPLICATION

DRAWING TITLE: CIVIL DESIGN CONCEPT STORMWATER MANAGEMENT PLAN SHEET 2

DATE	DRAWN	DESIGNED	CHECKED
MAY 2020	JK	BB	BB

SCALE	SIZE	REVISION
1:200 @ A1	A1	2

PROJECT No: 20096
DRAWING No: DA4.02

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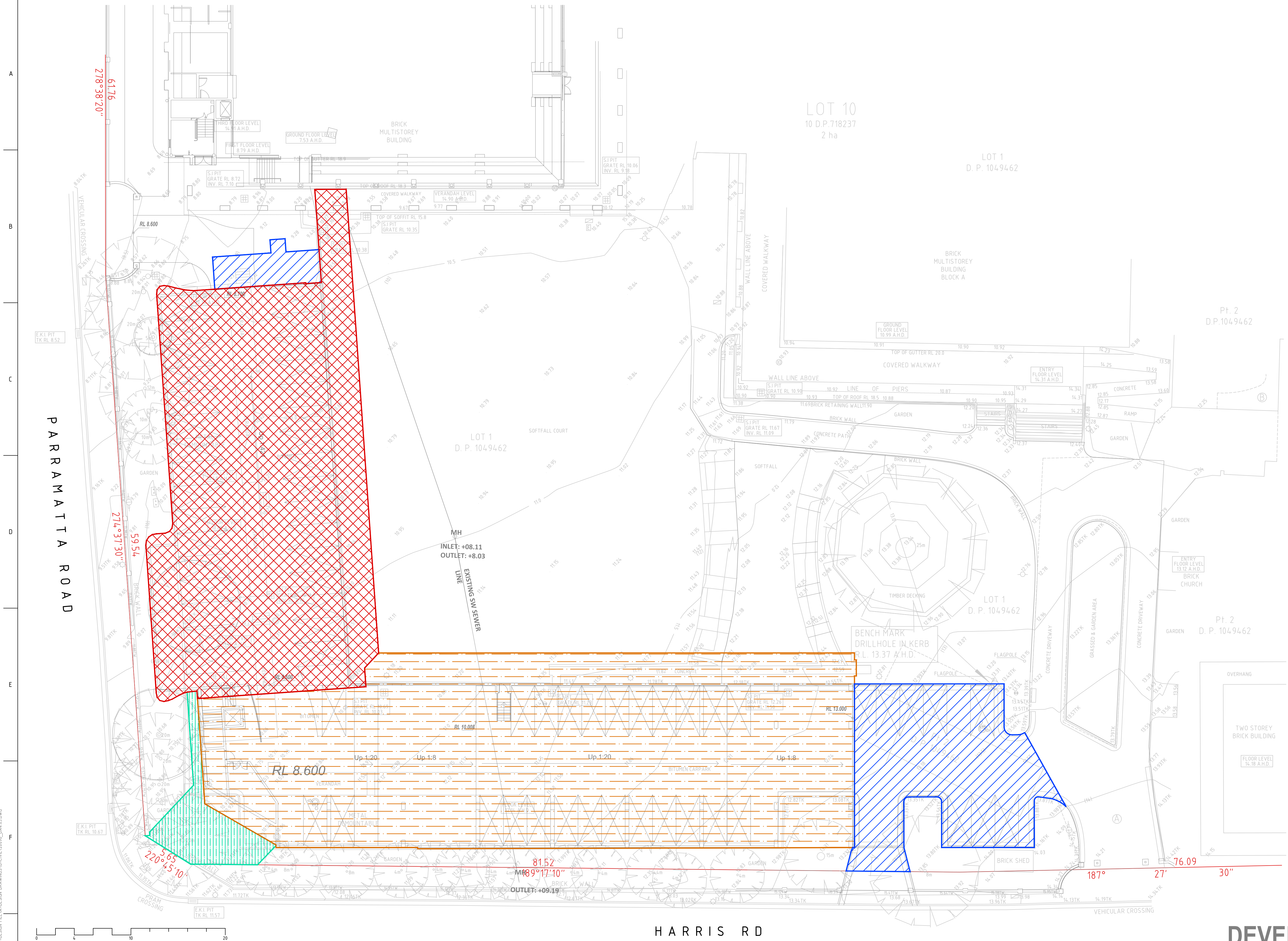

LEGEND

(blue hatch)	IMPERVIOUS EXISTING CATCHMENT AREA = 356m^2
(red cross-hatch)	ROOF TO RAINWATER TANK CATCHMENT AREA = 979m^2
(orange dashed)	ROOF TO STORMFILTER CHAMBER CATCHMENT AREA = 1,338m^2
(green vertical)	IMPERVIOUS BYPASS CATCHMENT AREA = 72m^2
	TOTAL AREA = 2,745m^2

NOTES

1. REFER TO DRAWING DA1.02 FOR GENERAL NOTES & SPECIFICATION NOTES.
2. REFER TO DRAWINGS DA4.01 AND DA4.02 FOR STORMWATER MANAGEMENT PLANS.

DEVELOPMENT APPLICATION

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15.05.20	PRELIMINARY ISSUE	JK	2
22.05.20	DA ISSUE	JK	3

STRUCTURAL –
MECHANICAL –
ELECTRICAL –
CIVIL –

CLIENT: ROSEBANK

BUILDER

PROJECT: ROSEBANK COLLEGE EXTENSION

ARCHITECT: ALLEANZA ARCHITECTURE

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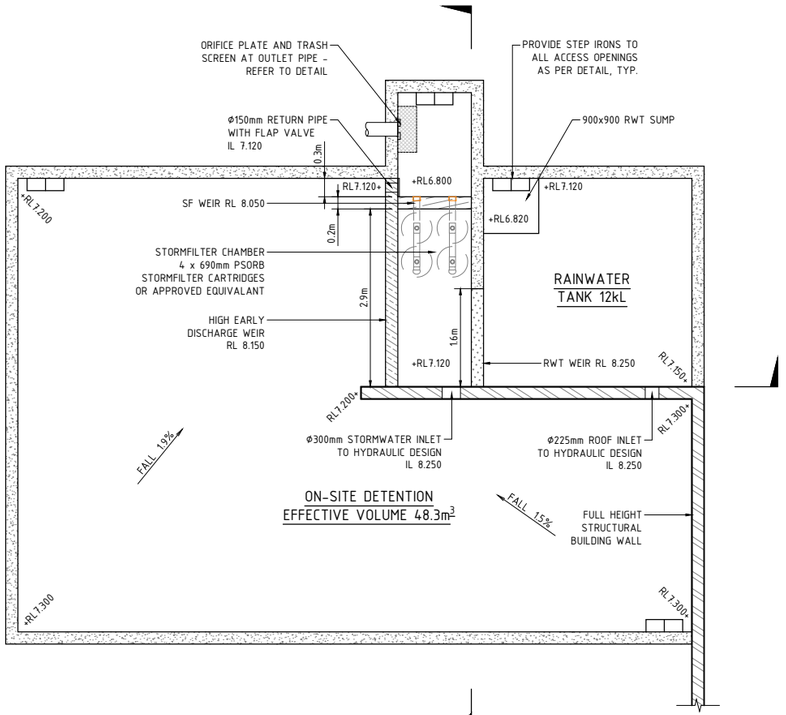
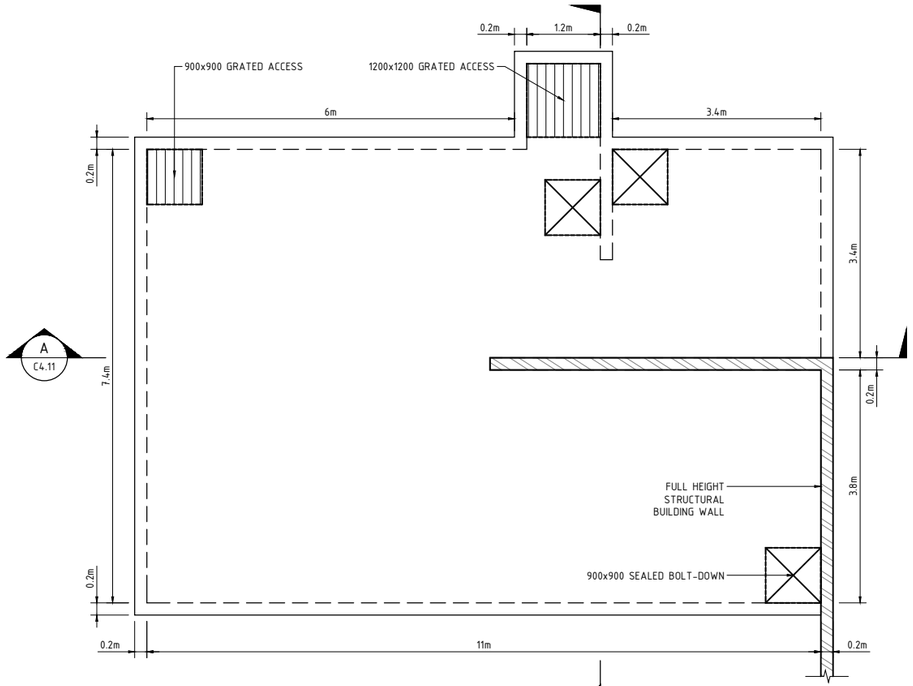
DRAWING TITLE: CIVIL DESIGN CONCEPT STORMWATER CATCHMENT PLAN

DATE	DRAWN	DESIGNED	CHECKED
MAY 2020	JK	BB	BB

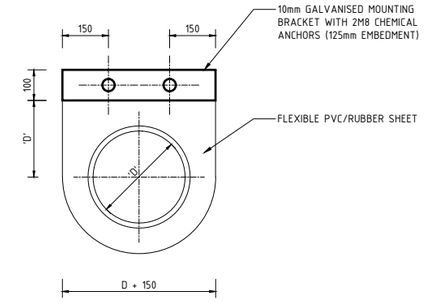
PROJECT No	SCALE	SIZE	DRAWING No	REVISION
20096	1:200 @ A1	A1	DA4.05	3



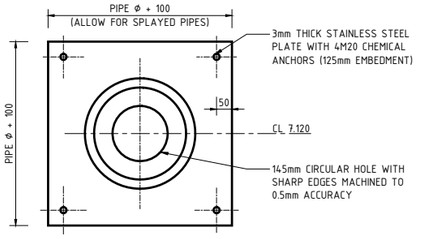
OSD BASE PLAN
SCALE 1:50



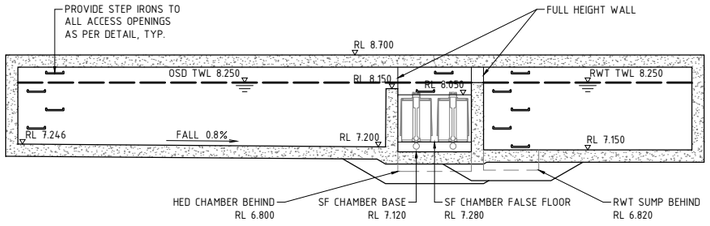
OSD LID PLAN
SCALE 1:50



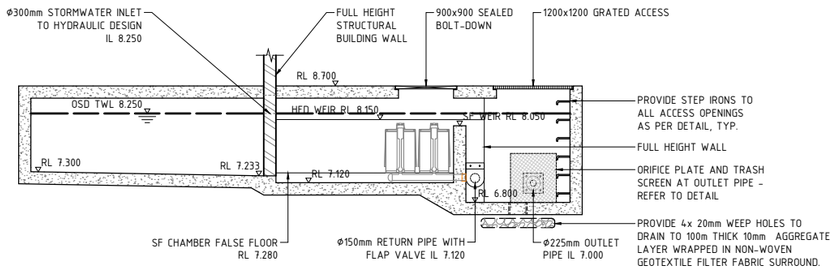
FLAP VALVE
SCALE 1:10



ORIFICE PLATE
SCALE 1:10

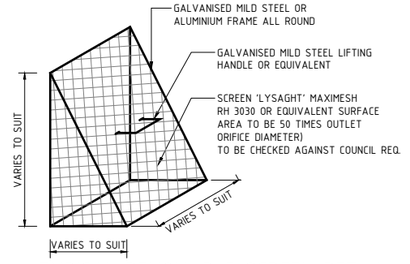


OSD SECTION A
SCALE 1:50



OSD SECTION B
SCALE 1:50

NOTES
PROVIDE FIXING CLIPS OR BRACKETS TO WALL OF PIT AT OUTLET. ALLOW FOR EASE OF REMOVAL.



TYPICAL REMOVABLE SCREEN DETAIL
NOT TO SCALE

AS SHOWN

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REFERENCES

DATE	AMENDMENT	INIT	REV
15.05.20	PRELIMINARY ISSUE	JK	1
22.05.20	DA ISSUE	JK	2

DATE	AMENDMENT	INIT	REV

STRUCTURAL -
MECHANICAL -
ELECTRICAL -
CIVIL -

CLIENT: ROSEBANK

BUILDER

PROJECT: ROSEBANK COLLEGE EXTENSION

ARCHITECT: ALLEANZA ARCHITECTURE

DEVELOPMENT APPLICATION

SPARKS +PARTNERS
CONSULTING ENGINEERS
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DRAWING TITLE: CIVIL DESIGN
STORMWATER MANAGEMENT
DETAILS SHEET 1

DATE	DRAWN	DESIGNED	CHECKED
MAY 2020	JK	BB	BB

PROJECT No	SCALE	SIZE	REVISION
20096	AS SHOWN	A1	2

DRAWING No: DA4.11

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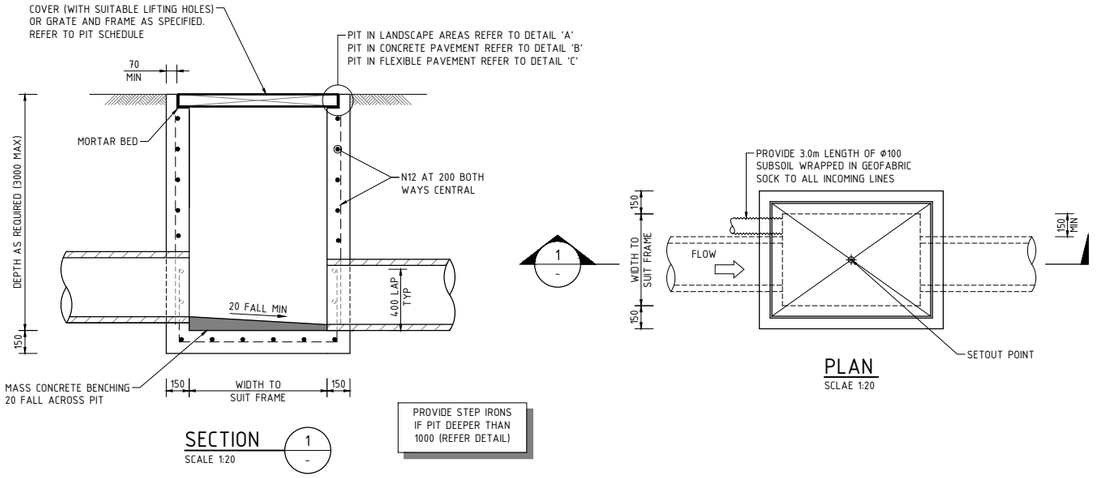
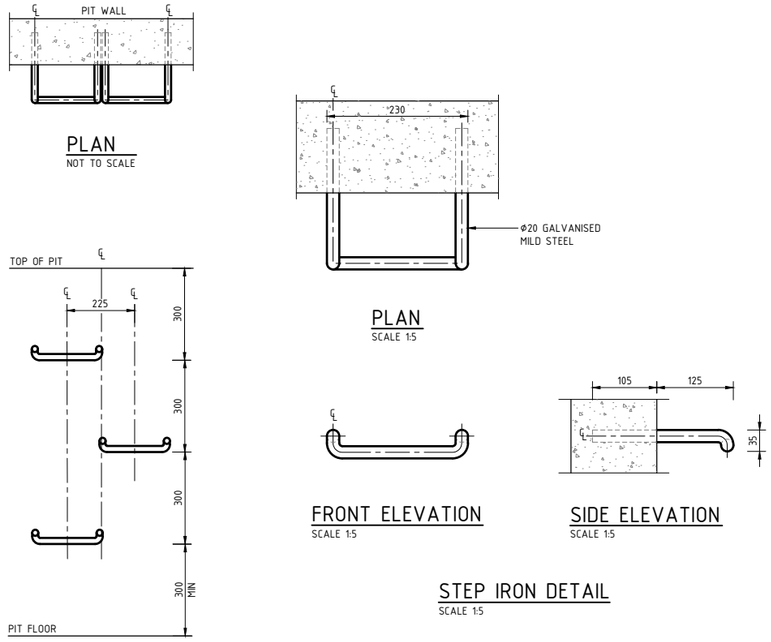


SURFACE INLET / JUNCTION PIT

(PIPE SIZES ≤ Φ450)

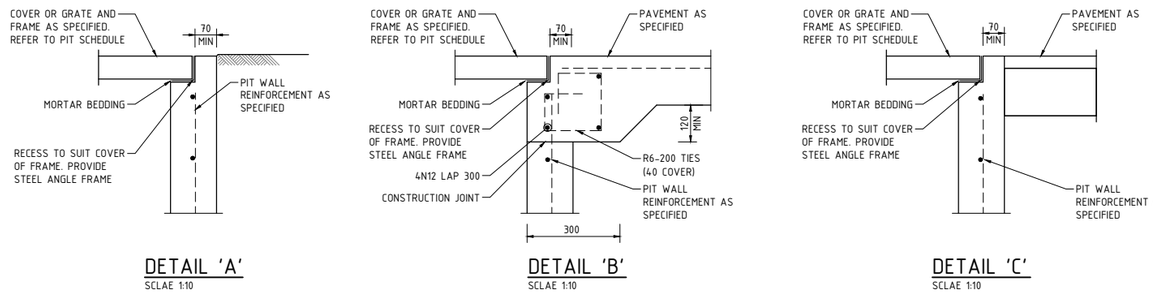


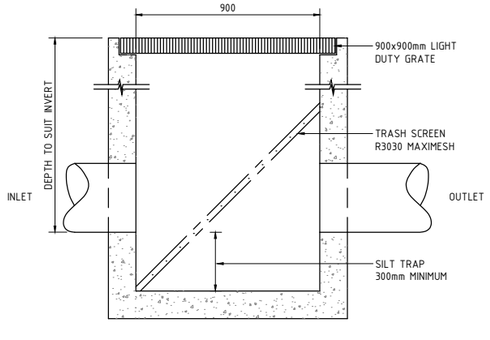
STEP IRON DETAIL

SCALE 1:5

STEP IRON PLACEMENT TO OSD & PIT WALL

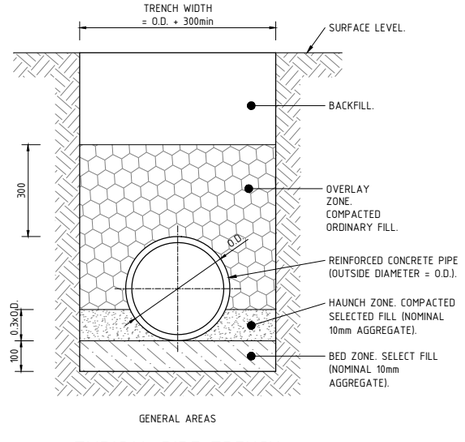
NOT TO SCALE





SW SUMP WITH SILT TRAP & TRASH SCREEN

NOT TO SCALE



TYPICAL PIPE TRENCH

SCALE 1:10

NOTES

1. TRENCH WIDTH MAY NEED TO BE INCREASED SUBJECT TO ACHIEVING ADEQUATE COMPACTION.
2. MINIMUM PIPE COVER NOT UNDER ROADS = 300mm UNO
3. THE CONTRACTOR SHALL ENSURE THAT THE SHORING OF TRENCHES IS INSTALLED AS REQUIRED BY STATUTORY REQUIREMENTS.
4. ENSURE BACKFILLING COMPACTION MEETS THE FOLLOWING STANDARDS
   A) TRENCHES UNDER PAVED AREAS & BUILDINGS - 100% SMDD
   TRENCHES NOT UNDER PAVEMENTS - 90% SMDD

AS SHOWN

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REFERENCES

DATE	AMENDMENT	INIT	REV
15.05.20	PRELIMINARY ISSUE	JK	1
22.05.20	DA ISSUE	JK	2

DATE	AMENDMENT	INIT	REV

STRUCTURAL -
MECHANICAL -
ELECTRICAL -
CIVIL -

CLIENT: ROSEBANK

BUILDER

ARCHITECT: ALLEANZA ARCHITECTURE

DEVELOPMENT APPLICATION

PROJECT: ROSEBANK COLLEGE EXTENSION

SPARKS + PARTNERS
CONSULTING ENGINEERS
HYDRAULIC | CIVIL | FIRE
Level 1, 91 George Street | Parramatta | NSW 2150
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https://sparksandpartners.com.au/

FPA AUSTRALIA — Fire Protection Association Australia. CORPORATE MEMBER

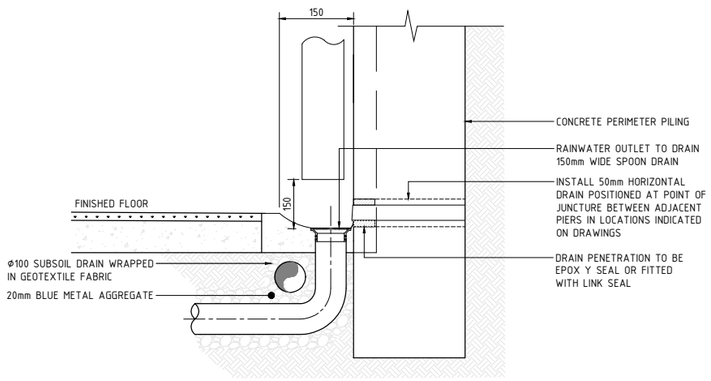
DRAWING TITLE: CIVIL DESIGN STORMWATER MANAGEMENT DETAILS SHEET 2

DATE	DRAWN	DESIGNED	CHECKED
MAY 2020	JK	BB	BB

SCALE	SIZE	REVISION
AS SHOWN	A1	2

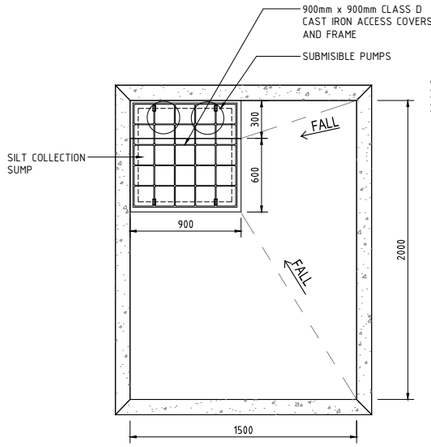
PROJECT No: 20096
DRAWING No: DA4.12

W:\2 - PROJECTS\2020\20096 - ROSEBANK COLLEGE\3-DESIGN FILES\A-DESIGN DRAWINGS\B-CIVIL\20096_DA4.1X.DWG

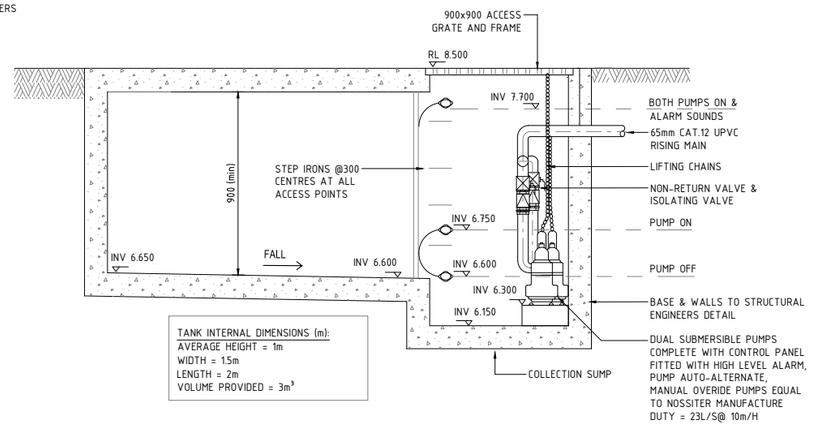


BUILDING PERIMETER DISH DRAIN

NOT TO SCALE



BASE PLAN VIEW



TANK INTERNAL DIMENSIONS (m):
AVERAGE HEIGHT = 1m
WIDTH = 1.5m
LENGTH = 2m
VOLUME PROVIDED = 3m³

SECTION VIEW

STORMWATER SUB-SOIL PUMP STATION 3m³

NOT TO SCALE

NOTES

CARPARK PUMP OUT PIT SIZING

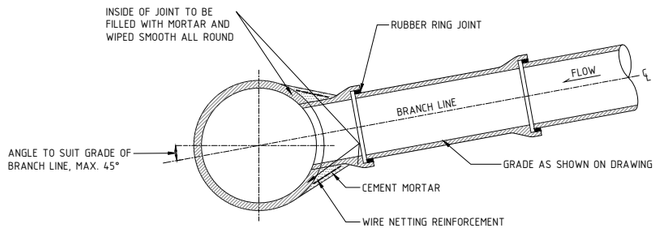
PUMP SIZING: AREA = 315m²
COEFFICIENT = 1.00
INTENSITY ($I_{100\ 5MIN}$) = 255mm/h
INFLOW = 22.31l/s
PUMP DUTY = 23l/s

STORAGE SIZING: AREA = 315m²
COEFFICIENT = 1.00
INTENSITY ($I_{100\ 5HOUR}$) = 26.6mm/h
INFLOW = 2.33l/s
VOLUME OVER 5 HOURS = 41.895m³

VOLUME PUMPED OUT IN 0.5 HOURS AT 23l/s = 41.4m³

PUMP OUT PIT STORAGE REQUIRED = 0.495m³

PUMP OUT PIT STORAGE PROVIDED = 3m³



NOTES

1. CENTRE LINE OF BRANCH MUST INTERSECT CENTRE LINE OF MAIN.
2. THE BRANCH IS TREATED AS A 'DEAD END' LINE WITH A MANHOLE TO BE LOCATED WITHIN 50m OF MAIN.
3. HORIZONTAL ANGLE AT A BREAK INTO MAIN SHOULD NOT BE LESS THAN 45° AND MUST NOT EXCEED 90°.
4. BRANCH LINE ø150 MIN, ø750 MAX.

DIRECT CONNECTION

NOT TO SCALE

AS SHOWN

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CLIENT: ROSEBANK

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PROJECT: ROSEBANK COLLEGE EXTENSION

ARCHITECT: ALLEANZA ARCHITECTURE

DEVELOPMENT APPLICATION

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https://sparksandpartners.com.au/
FPA AUSTRALIA Fire Protection Association Australia CORPORATE MEMBER
DNV·GL QUALITY MANAGEMENT CERTIFICATION

DRAWING TITLE
CIVIL DESIGN
STORMWATER MANAGEMENT
DETAILS SHEET 3

DATE	DRAWN	DESIGNED	CHECKED
MAY 2020	JK	BB	BB

SCALE	SIZE	REVISION
AS SHOWN	A1	2

PROJECT No: 20096
DRAWING No: DA4.13

W:\2 - PROJECTS\2020\20096 - ROSEBANK COLLEGE\3-DESIGN FILE\A-DESIGN DRAWINGS\B-CIVIL\20096_DA4.1X.DWG

APPENDIX B. MAINTENANCE & MONITORING SCHEDULE

STORMWATER DRAINAGE SYSTEM MONITORING AND MAINTENANCE SCHEDULE

Author Name & Signature: Date:

Rosebank College, 121 Parramatta Road, Five Dock

General Notes:

1 - Maintenance is to be carried out with regard to relevant occupational health and safety guidelines and standards. This includes all confined space, traffic management, fall arrest and other requirments.

2 - Initial monitoring and inspections of the stormwater system post commissioning are to be carried out every 3 months for the first year of operation. The amount and type of debris is to be noted and recorded. This information shall be used to determine if modification of the frequency of inspections is required.

3 - The frequency of inspections shown in the stormwater maintenance schedule are the maximum periods. Inspection frequencies may be reduced upon completion of the initial monitoring and inspection program as noted in note 2.

4 - Blank copies of the maintenance schedule are to be made and filled out during each subsequent inspection with the details kept on site for future reference.

Inspected by: .....

Date of Inspection: .....

Date of Next Inspection: .....

Item to be Inspected	Frequency	Performed by	Inspected Yes/No	Maintenance Required Yes/No	Maintenance Procedure	Maintenance Completed Date
General						
Eaves/Box Guttering System and Downpipes	Six Monthly/ After Major Storm	Owner / Maintenance Contractor			Inspect and remove any build up of sediment, debris, litter and vegetation within gutter system.	
Stormwater surface inlet and junction pits	Four Monthly/ After Major Storm	Owner / Maintenance Contractor			Remove grate and inspect internal walls and base, repair where required. Remove any collected sediment, debris, litter and vegetation. (e.g. Vacum/eductor truck) Inspect and ensure grate is clear of sediment, debris, litter and vegetation. Ensure flush placement of grate on refitment	
General inspection of complete stormwater drainage system (that's visible)	Bi-annually	Owner / Maintenance Contractor			Inspect all drainage structures noting any dilapidation, carrry out required repairs.	
Rainwater Tank						
First Flush Device	6 Monthly	Owner / Maintenance Contractor			Inspect first flush device to ensure correct operation. Remove accumulated litter & debris. If device is not functioning properly repair or replace.	
Internal Inspection	6 Monthly	Owner / Maintenance Contractor			Check for evidence of access by animals, birds or insects including the presence of mosquito larvae. If present, identify access point and close. If evidence of algal growth, find and close points of light entry.	
Tank and tank roof	6 Monthly	Owner / Maintenance Contractor			Check structural inegrity of tank including roof and access covers. Any dilapidation including holes or gaps are to be noted and repaired.	
Water Quality Devices						
Ocean Protect OceanGuard	Refer Manufactures Manual	Maintenance / Specialised Contractor			Refer to manufacturers operation and maintenance manual.	
Ocean Protect Stormfilter	Refer Manufactures Manual	Maintenance / Specialised Contractor			Refer to manufacturers operation and maintenance manual.	
On-Site Detention Tank						
Trash Screen	Six Monthly/ After Major Storm	Owner / Maintenance Contractor			Inspect trash screen to ensure correct operation. Remove accumulated litter & debris. If device is not functioning properly repair or replace.	
Orifice Plate	Six Monthly/ After Major Storm	Owner / Maintenance Contractor			Inspect orifice plate to ensure correct operation. Check orifice diameter size is correct and no damage is present to orifice edge. Check orifice plate is securely fastened to wall with no gaps present between plate and face of wall. If gaps are present fill with sealant or mortar to provide water tight seal.	
Weep Holes in base of sump	Six Monthly/ After Major Storm	Owner / Maintenance Contractor			Inspect weep holes in base of sump. Ensure weep holes are able to drain effectively and remove accumulated sediment and debris if present.	
Tank and tank roof	6 Monthly	Owner / Maintenance Contractor			Check structural inegrity of tank including roof and access covers. Any dilapidation including holes or gaps are to be noted and repaired.	