H&H Consulting Engineers Pty Ltd *(trading as Henry & Hymas)*

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henry&hymas

15th May 2020

Our ref: 19D28-L3/af

Blacktown City Council
62 Flushcombe Rd
Blacktown NSW 2148

Attention: Laith Almoil and Tony Merrilees

RE: MARSDEN PARK PUBLIC SCHOOL
MARSDEN PARK, NSW
STATE SIGNIFICANT DEVELOPMENT (SSD9809)

Dear Tony/Laith,

The following letter is written in response to Requests for Information (RFIs) raised by Blacktown City Council dated 28/04/20 regarding the State Significant Development Application for the New Marsden Public School, Marsden Park. The letter aims to satisfy concerns relating to the civil engineering matters raised by Council's Drainage Engineers.

The following list has been populated with the various RFIs provided by Councils Drainage Engineers with the corresponding return comment from the applicant/designer provided below.

We politely ask your review the return comments and supporting documentation provided by the Civil Engineer (Henry & Hymas Engineers) and provide feedback in relation to your submissions.

Blacktown City Council's Stormwater Engineers:

1. Amend Dwg. No. C101 (04):

   i. Provide the RL of pit C-1

   ii. Ensure a minimum freeboard of 100mm between the internal and external areas such as pits B-7 to B-9. The internal first floor RL is 23.40 while the average levels of the aforementioned pits is 23.35.

   iii. The architectural plans by NBRS Architecture, dated 5.03.20, Rev.C, Dwg. No. A-100 shows a kerb profile that surrounds pits E-1 and E-2. Pits are to be free from obstruction that may prevent surface flows from being collected. Relocate the pits, remove the kerb profile or provide a 'hit and miss' kerb if required.

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Designer/applicant comments:

1.i. A level has been provided for pit C-1, refer revised drawing 19D28_SSDA_C101.

1.ii. Drawings have been updated to provide a minimum freeboard of 100mm between internal and external areas. Surface levels of B-7, B-8 and B-9 have been updated to RL 23.28 to provided 100mm freeboard between pit surface level and first-floor level. Refer to revised engineering drawings 19D28_SSDA_C101-C104.

1.iii. The layout shown on the referenced architectural drawings is indicative as the drawing is a building plan for the first floor. Submitted architectural drawing Site Plan – Access Diagram 19154-NBRS-A-051 Rev H) shows the layout and configuration of kerbs and line marking in the proposed carpark. Pits E-1 and E-2 are free from kerb lines and obstructions.

Blacktown City Council's Stormwater Engineers:

2. Amend Dwg. No. C102 (05):

   i. Council does not permit sealed pits over an OSD.

   ii. Regrade and redirect surface flows from the playing field to flow into the diversion pit via an OceanGuard. A small portion of the playing field can bypass directly into the OSD. This will allow all OSD grates to be grated and results in a simplified design. Delete pit X-1 as a result.

   iii. All OSD and diversion pit grates are to be heel proof due to being in vicinity of the Playing field.

Designer/applicant comments:

2.i. Sealed pits have been removed from drawings and heelproof grated surface pits have been specified. Refer to revised engineering drawing 19D28_SSDA_C102, C209. C210 & C212.

2. ii. Current field grading has been designed to mimic the existing topography of the site, eliminating the need for retaining elements along the western boundary and to coordinate with access from Bolwarra Drive.

Further information has been provided for the low flow diversion system which diverts treatable flows collected from stormwater pits X-1 and X-2. The low flow diversion system has been designed to accommodate stormwater flow rate induced by the 6-month storm even. 6-month flow rates are as follows 25.5l/s for the catchment draining to Pit X-1 and 6l/s for catchment draining to Pit X-2. Pit X-1 requires a ponding depth of 0.05m to manage 25.5l/s and Pit X-2 a depth of 0.03m to manage 6l/s. Adjacent heelproof access pits for the OSD have been set a minimum 0.05m above Pit X-1 to allow adequate ponding to drain 6-month flows to diversion pits WQ-1. Run-off induced by storm event in excess of the 6-month storm event simply pond in the swale and drain into the adjacent pits at RL 25.55. Similarly, pit X-2 features minor bunding to allow for a minimum of 0.03m ponding to drain

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treatable flows to pit WQ-1. Run-off induced by storm events in excess of the 6-month event overtop the bunding and are collected via sag pits Z-1 and G-1 and is directed to the OSD.

Although regrading the football field could simplify the stormwater design, regrading against the existing topography will result in further retaining structures, complicate access from Bolwarra Drive and intensify earthworks. It is the opinion of the applicant that a low flow diversion system allows for an optimal balance between all aspects of the civil design including stormwater.

2.iii. All OSD and diversion grates have been updated to be Heelproof grated surface pits. Refer to revised engineering drawings 19D28_SSDA_C102 and C209.

Blacktown City Council's Stormwater Engineers:

3.	Amend Dwg. No. C104 (04):	
	i.	Provide an emergency overflow route for major storms for the internal courtyard.

Designer/applicant comments:

3.i. Overland flow route markers have been provided showing the location of the proposed emergency overland flow path from the internal courtyard. Additional pit C-0 has been added to improve the emergency overland flow route from the internal courtyard. Refer revised engineering drawings 19D28_SSDA_C101 and C104.

Blacktown City Council's Stormwater Engineers:

4.	Amend Dwg. No. C210 (03):	
	i.	Section A - Delete the 2yr TWL from the overflow chamber.
	ii.	Provide OSD design volume calculations including average height and area of OSD.
	iii.	Provide the OSD Orifice and Weir calculations

Designer/applicant comments:

4.i. Section A has been amended, the 2-year TWL has been removed from the overflow chamber. Refer revised engineering drawing 19D28_SSDA_C210.

4.ii. OSD volume calculations have been provided. OSD layout has been amended for an overall increase in the internal width (and storage volume) of the OSD tank from 14.5m to 14.9m to allow for loss of storage by the OSD structure. Refer revised engineering drawings 19D28_SSDA_C210 and C209.

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4.iii. Orifice and weir calculations have been provided on revised engineering drawing 19D28_SSDA_C210 and C212.

Blacktown City Council's Stormwater Engineers:

5. Amend Dwg. No. C212 (01) and 211 (03):

   i. The rainwater tank detail: fix the error where two 'E' sections are shown rather than an 'F' and 'E' as per the provided sections.

   ii. The diversion weir is to be a minimum of 310mm wide as per Council's Draft WSUD handbook 2019

   iii. Design the Jellyfish unit and the diversion pit as per Council's Draft WSUD handbook 2019 section 11.9 and provide all calculations.

   iv. Provide floatables baffle in the diversion pit.

   v. The diversion pit weir RL is to be at minimum 100mm above the OSD TWL to prevent any backflows from the OSD into the SWT via the jellyfish. OR the Jellyfish internal weir is to be 100mm above the OSD TWL.

   vi. Provide the jellyfish design storm event and the catchment area as part of the calculations.

Designer/applicant comments:

5.i. The typographical error has been amended as requested.

5.ii. Diversion weir has been updated to a width of 310mm. Refer revised engineering drawing 19D28_SSDA_C212.

5.iii. The division pit and Jellyfish unit were re-designed for a higher diversion weir and longer weir. The level of the Jellyfish unit's inlet and outlet and internal weir, as well as the diversion pit inlet lines, have been re-designed. In accordance with Figure 24 on Page 88 of the previously referenced handbook, the final diversion weir level has been noted as a minimum value of RL 20.90 "to be confirmed by the manufacturer prior to obtaining Construction Certificate". Diversion flow calculations (refer engineering drawing C211) have assumed a minimum value of RL 20.90 to drive treatable flows. Refer return comment 5.v. for further information regarding the diversion pit and Jellyfish unit.

5.iv. Floatables baffle has been added in the diversion pit. Refer revised engineering drawing 19D28_SSDA_C212.

5.v. Diversion pit weir RL has been lifted as requested. To compensate for the higher water level of water passing over the taller weir, the weir has increased in length and depth of flow across the wier reduced. The designer (H&H) has liaised directly with the manufacture of the product (Ocean Protect) and can confirm the system has been designed in accordance with Blacktown City Council's

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intent and Ocean Protect's standard guidelines. Information regarding the required driving head from the outlet (across the Jellyfish unit) was provided by Ocean Protect's representative. Refer supporting letter from Ocean Protect's representative and engineering drawing C211/C212. Additionally, the stormwater line upstream (A-1 to WQ-1) of the diversion pit has been upsized to compensate for the increased downstream water level in the diversion pit. Refer revised engineering drawing 19D28_SSDA_C212 and C102.

5.vi. The Jellyfish unit's catchment area and treatable flow rate (as determined by MUSIC) has been provided on revised engineering drawings C250 and C251. Calculations have been provided on revised engineering drawing C211.

Blacktown City Council's Stormwater Engineers:

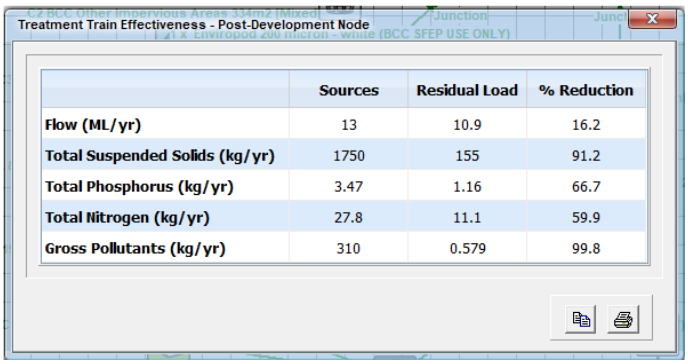
6. Amend Dwg. No. C250 (02):

   i. The total site area (23947m2) does not match the provided MUSIC model (31100m2). Catchments C38A, C38B, C1A, C1B, C19 and C20 seem to be duplicated in the MUSIC model as part of other catchments. Amend this issue to result in reduced water quality resources than currently proposed.

   ii. 40xOceanGuards are present on the plans yet only 38 are shown in the MUSIC model. Ensure a correlation between the MUSIC model and the plans.

Designer/applicant comments:

6.i. The submitted MUSIC model has been amended to match the correct catchments shown on revised engineering drawings 19D28_SSDA_C250 and C251. Unfortunately, water quality resources could not be reduced as Catchment Area 2 (for Pit G-2) has been included as bypass in the revised MUSIC model. Treatment reduction rates from the revised MUSIC model remain in accordance with Blacktown City Council's target rates as stated in BCC DCP Part J. See below and attached revised MUSIC model for review.



	Sources	Residual Load	% Reduction
Flow (ML/yr)	13	10.9	16.2
Total Suspended Solids (kg/yr)	1750	155	91.2
Total Phosphorus (kg/yr)	3.47	1.16	66.7
Total Nitrogen (kg/yr)	27.8	11.1	59.9
Gross Pollutants (kg/yr)	310	0.579	99.8

Revised post-development resultant pollutant reduction rates.

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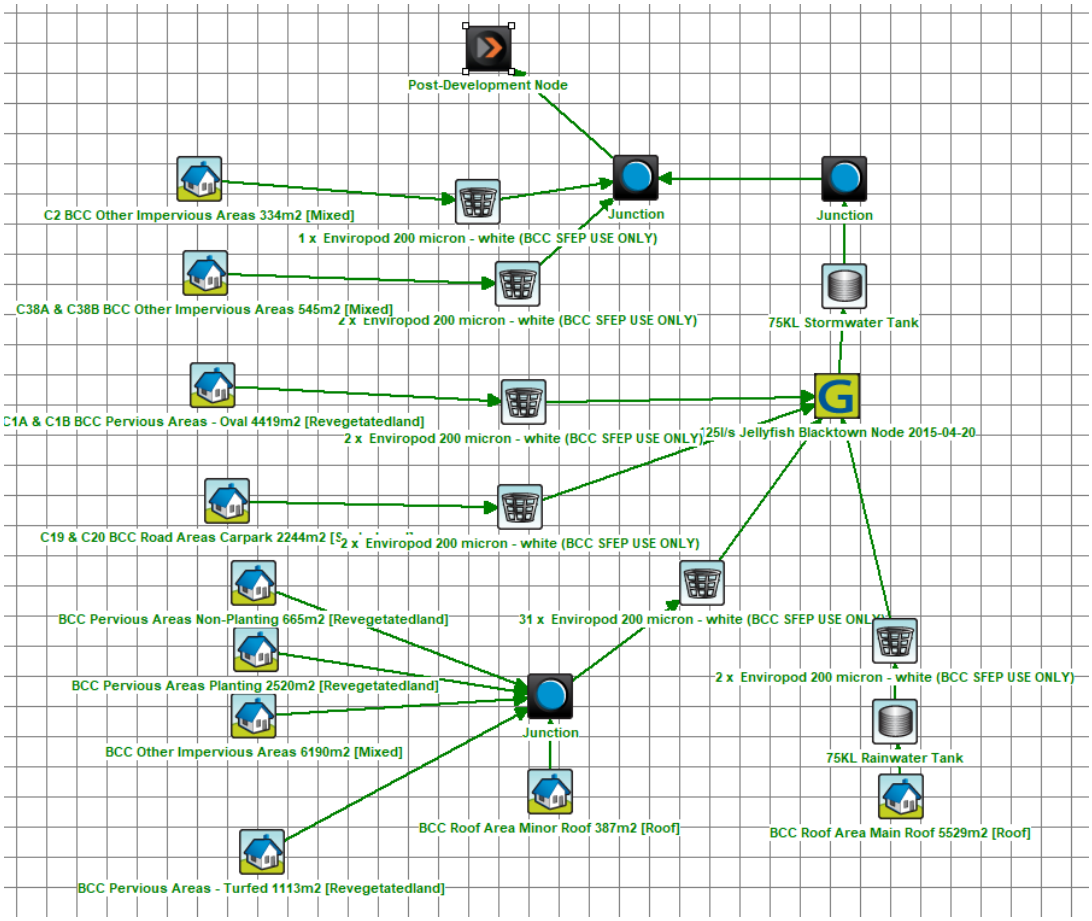
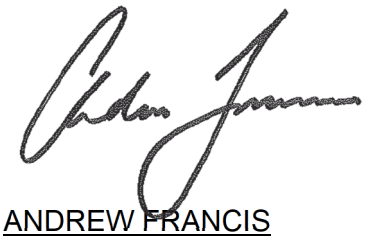


Revised post-development treatment train configuration.

6.ii The MUSIC model has been amended to correlate with the correct number of Ocean Guards shown on revised engineering drawings 19D28_SSDA_C250 and C251. Refer above and attached revised MUSIC model for review.

I trust the information presented above meets your requirements. Please review the above and enclosed and advise if you require any additional information to satisfy these matters. Feel free to contact me or Project Engineer Nicholas Wetzlar on (02) 94178400 if you would like to discuss these matters in more detail.

Yours faithfully,



<u>ANDREW FRANCIS</u>
For, and on behalf of,
H & H Consulting Engineers Pty Ltd

Date: 11th May 2020

Attention: Nicholas Wetzlar

Company: Henry & Hymas Pty Ltd
Suite 2.01, 828 Pacific Highway
Gordon NSW 2072

Re: Stormwater Quality Design – Marsden Park Primary School (OP Ref- 13500)

Dear Nicholas,

Further to your request, we have reviewed the Jellyfish Filter arrangement detail on the plan provided by you (19D28_SSDA_C212 Rev 03). In our opinion, the diversion arrangement will allow for the Jellyfish filter to operate as required. The one change I would require is the inlet IL to drop to IL20.050m at the Jellyfish device.

I trust this satisfies your requirements. Should you have any further queries please do not hesitate in contacting me.

Yours faithfully,

Harout Tcherkezian
Ocean Protect

Mob: 0419 102 700
Email: harout@oceanprotect.com.au

MARSDEN PARK PUBLIC SCHOOL
NORTHBOURNE DR MARSDEN PARK NSW
CIVIL ENGINEERING WORKS

LOCALITY SKETCH

SCALE: N.T.S.

DRAWING SCHEDULE

19D28_SSDA_C000	COVER SHEET, DRAWING SCHEDULE & LOCALITY SKETCH
19D28_SSDA_C010	NOTES
19D28_SSDA_C050	TEMPORARY SCHOOL PLAN - SHEET 1 OF 2
19D28_SSDA_C051	TEMPORARY SCHOOL PLAN - SHEET 2 OF 2
19D28_SSDA_C100	GENERAL ARRANGEMENT PLAN
19D28_SSDA_C101	DETAIL PLAN - SHEET 1 OF 4
19D28_SSDA_C102	DETAIL PLAN - SHEET 2 OF 4
19D28_SSDA_C103	DETAIL PLAN - SHEET 3 OF 4
19D28_SSDA_C104	DETAIL PLAN - SHEET 4 OF 4
19D28_SSDA_C110	ROADWORKS DETAIL SHEET
19D28_SSDA_C200	STORMWATER MISCELLANEOUS DETAILS & PIT LID SCHEDULE
19D28_SSDA_C201	STORMWATER MISCELLANEOUS DETAILS
19D28_SSDA_C209	OSD TANK PLAN
19D28_SSDA_C210	OSD TANK SECTIONS AND DETAILS
19D28_SSDA_C211	JELLY FISH DETAILS AND SECTION
19D28_SSDA_C212	STORMWATER TANK PLAN, SECTION AND DETAILS
19D28_SSDA_C250	STORMWATER CATCHMENT PLAN
19D28_SSDA_C251	DETAIL CATCHMENT PLAN
19D28_SSDA_C300	RETAINING WALL PLAN
19D28_SSDA_C310	RETAINING WALL DETAILS
19D28_SSDA_SE01	SEDIMENT & EROSION CONTROL PLAN
19D28_SSDA_SE02	SEDIMENT & EROSION CONTROL TYPICAL SECTIONS & DETAILS
19D28_SSDA_BE01	BULK EARTHWORKS PLAN

ISSUED FOR APPROVAL

SURVEY INFORMATION
SURVEYED BY LCG
DATUM: A.H.D.
ORIGIN OF LEVELS: SSM191370

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
05	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	15.05.2020					
04	ISSUED FOR COORDINATION	IK	BH	08.05.2020					
03	ISSUED FOR SSDA APPROVAL ONLY	KR	NW	24.03.2020					
02	ISSUED FOR TENDER ONLY	KR	NW	24.02.2020					
01	PRELIMINARY	IK	NW	12.02.2020					

Client
ADCO CONSTRUCTIONS PTY LTD

Architect
NBRS ARCHITECTURE

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Project: MARSDEN PARK PUBLIC SCHOOL NORTHBOURNE DR MARSDEN PARK NSW	Drawn: I.Khachab	Designed: N.Wetzlar	Date: JAN 2020
	Checked: N.Wetzlar	Approved: A.Francis	Scale @A1: N.T.S.
Title: COVER SHEET, DRAWING SCHEDULE & LOCALITY SKETCH	Drawing number: 19D28_SSDA_C000		Revision: 05

GENERAL NOTES:

1. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH BLACKTOWN CITY COUNCIL SPECIFICATION. CONTRACTOR TO OBTAIN AND RETAIN A COPY ON SITE DURING THE COURSE OF THE WORKS.
2. ALL NEW WORKS ARE TO MAKE A SMOOTH JUNCTION WITH EXISTING CONDITIONS AND MARRY IN A 'WORKMANLIKE' MANNER.
3. THE CONTRACTOR IS TO VERIFY THE LOCATION OF ALL SERVICES WITH EACH RELEVANT AUTHORITY. ANY DAMAGE TO SERVICES SHALL BE RECTIFIED BY THE CONTRACTOR OR THE RELEVANT AUTHORITY AT THE CONTRACTOR'S EXPENSE. SERVICES SHOWN ON THESE PLANS ARE ONLY THOSE EVIDENT AT THE TIME OF SURVEY OR AS DETERMINED FROM SERVICE DIAGRAMS. H & H CONSULTING ENGINEERS PTY. LTD CANNOT GUARANTEE THE INFORMATION SHOWN NOR ACCEPT ANY RESPONSIBILITY FOR INACCURACIES OR INCOMPLETE DATA.
4. SERVICES & ACCESSES TO THE EXISTING PROPERTIES ARE TO BE MAINTAINED IN WORKING ORDER AT ALL TIMES DURING CONSTRUCTION.
5. ADJUST EXISTING SERVICE COVERS TO SUIT NEW FINISHED LEVELS TO RELEVANT AUTHORITY REQUIREMENTS WHERE NECESSARY.
6. REINSTATE AND STABILISE ALL DISTURBED LANDSCAPED AREAS.
7. MINIMUM GRADE OF SUBSOIL SHALL BE 0.5% (1:200) FALL TO OUTLETS.
8. ALL TEMPORARY SEDIMENT AND EROSION CONTROL DEVICES ARE TO BE CONSTRUCTED, PLACED AND MAINTAINED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS, EROSION AND SEDIMENTATION CONTROL PLAN AND BLACKTOWN CITY COUNCIL REQUIREMENTS WHERE APPLICABLE.
9. CONTRACTOR TO CHECK AND CONFIRM SITE DRAINAGE CONNECTIONS ACROSS THE VERGE PRIOR TO COMMENCEMENT OF SITE DRAINAGE WORKS.
10. PROPERTIES AFFECTED BY THE WORKS ARE TO BE NOTIFIED IN ADVANCE WHERE DISRUPTION TO EXISTING ACCESS IS LIKELY.

EXISTING SERVICES & FEATURES

1. THE CONTRACTOR SHALL ALLOW FOR THE CAPPING OFF, EXCAVATION AND REMOVAL (IF REQUIRED) OF ALL EXISTING SERVICES IN AREAS AFFECTED BY WORKS WITHIN THE
2. CONTRACT AREA OR AS SHOWN ON THE DRAWINGS UNLESS DIRECTED OTHERWISE BY THE SUPERINTENDENT.
3. THE CONTRACTOR SHALL ENSURE THAT AT ALL TIMES SERVICES TO ALL BUILDINGS NOT AFFECTED BY THE WORKS ARE NOT DISRUPTED.
4. PRIOR TO COMMENCEMENT OF ANY WORKS THE CONTRACTOR SHALL GAIN APPROVAL OF HIS PROGRAM FOR THE RELOCATION/ CONSTRUCTION OF TEMPORARY SERVICES.
5. CONTRACTOR SHALL CONSTRUCT TEMPORARY SERVICES TO MAINTAIN SUPPLY TO EXISTING BUILDING REMAINING IN OPERATION DURING WORKS TO THE SATISFACTION AND
6. APPROVAL OF THE SUPERINTENDENT. ONCE DIVERSION IS COMPLETE AND COMMISSIONED, THE CONTRACTOR SHALL REMOVE ALL SUCH TEMPORARY SERVICES AND MAKE GOOD TO THE SATISFACTION OF THE SUPERINTENDENT.
7. INTERRUPTION TO SUPPLY OF EXISTING SERVICES SHALL BE DONE SO AS NOT TO CAUSE ANY INCONVENIENCE TO THE PRINCIPAL. CONTRACTOR TO GAIN APPROVAL FROM THE
8. SUPERINTENDENT FOR TIME OF INTERRUPTION.
9. EXISTING SERVICES, BUILDINGS, EXTERNAL STRUCTURES AND TREES SHOWN ON THESE DRAWINGS ARE EXISTING FEATURES PRIOR TO ANY DEMOLITION WORKS.
10. EXISTING SERVICES UNLESS SHOWN ON SURVEY PLAN HAVE BEEN PLOTTED FROM SERVICES SEARCH PLANS AND AS SUCH THEIR ACCURACY CANNOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COMPLETE A 'DIAL BEFORE YOU DIG' SEARCH AND TO ESTABLISH THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE SUPERINTENDENT. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY.
11. ALL BRANCH GAS AND WATER SERVICES UNDER DRIVEWAYS AND BRICK PAVING SHALL BE LOCATED IN Ø80 uPVC SEWER GRADE CONDUITS EXTENDING A MINIMUM OF 500mm BEYOND EDGE OF PAVING.

SITEWORKS NOTES

1. DATUM : A.H.D.
2. ORIGIN OF LEVELS : REFER TO BENCH OR STATE SURVEY MARKS WHERE SHOWN ON PLAN.
3. CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON SITE PRIOR TO THE COMMENCEMENT OF WORK.
4. ALL WORKS TO BE UNDERTAKEN IN ACCORDANCE WITH THE DETAILS SHOWN ON THE DRAWINGS & THE DIRECTIONS OF THE SUPERINTENDENT.
5. EXISTING SERVICES UNLESS SHOWN ON THE SURVEY PLAN HAVE BEEN PLOTTED FROM SERVICES SEARCH PLANS AND AS SUCH THEIR ACCURACY CANNOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE SUPERINTENDENT. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY.
6. WHERE NEW WORKS ABUT EXISTING THE CONTRACTOR SHALL ENSURE THAT A SMOOTH EVEN PROFILE, FREE FROM ABRUPT CHANGES IS ACHIEVED.
7. THE CONTRACTOR SHALL ARRANGE ALL SURVEY SETOUT TO BE CARRIED OUT BY A REGISTERED SURVEYOR.
8. CARE IS TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATION IS TO BE UNDERTAKEN OVER TELSTRA OR ELECTRICAL SERVICES. HAND EXCAVATE IN THESE AREAS.
9. CONTRACTOR TO OBTAIN AUTHORITY APPROVALS WHERE APPLICABLE.
10. MAKE SMOOTH TRANSITION TO EXISTING SURFACES AND MAKE GOOD.
11. THESE PLANS SHALL BE READ IN CONJUNCTION WITH APPROVED LANDSCAPE, ARCHITECTURAL, STRUCTURAL, HYDRAULIC AND MECHANICAL DRAWINGS AND SPECIFICATIONS
12. OR WRITTEN INSTRUCTIONS THAT MAY BE ISSUED RELATING
13. TO DEVELOPMENT AT THE SITE.
14. TRENCHES THROUGH EXISTING ROAD AND CONCRETE PAVEMENTS SHALL BE SAWCUT TO FULL DEPTH OF CONCRETE AND A MINIMUM OF 50mm IN BITUMINOUS PAVING.
15. ALL BRANCH GAS AND WATER SERVICES UNDER DRIVEWAYS AND BRICK PAVING SHALL BE LOCATED IN Ø80 uPVC SEWER GRADE CONDUITS EXTENDING A MINIMUM OF 500mm BEYOND EDGE OF PAVING.
16. GRADES TO PAVEMENTS TO BE AS IMPLIED BY RL'S ON PLAN . GRADE EVENLY BETWEEN NOMINATED RL'S. AREAS EXHIBITING PONDING GREATER THAN 5mm DEPTH WILL NOT BE ACCEPTED UNLESS IN A DESIGNATED SAG POINT.
17. ALL COVERS AND GRATES ETC TO EXISTING SERVICE UTILITIES ARE TO BE ADJUSTED TO SUIT NEW FINISHED SURFACE LEVELS WHERE APPLICABLE.

SURVEY NOTES

1. THE EXISTING SITE CONDITIONS SHOWN ON THE FOLLOWING DRAWINGS HAVE BEEN INVESTIGATED BY THE SURVEYOR SPECIFIED IN THE TITLE BLOCK.
2. THE INFORMATION IS SHOWN TO PROVIDE A BASIS FOR DESIGN. HENRY AND HYMAS PTY. LTD. DOES NOT GUARANTEE THE ACCURACY OR COMPLETENESS OF THE SURVEY BASE OR ITS SUITABILITY AS A BASIS FOR CONSTRUCTION DRAWINGS.
3. SHOULD DISCREPANCIES BE ENCOUNTERED DURING CONSTRUCTION BETWEEN THE SURVEY DATA AND ACTUAL FIELD DATA, CONTACT HENRY AND HYMAS PTY. LTD. THE FOLLOWING NOTES HAVE BEEN TAKEN DIRECTLY FROM ORIGINAL SURVEY DOCUMENTS.

- ORIGIN OF LEVELS SSM191370
- DATUM A.H.D.
- CONTOUR INTERVAL 0.5m

COMPACTION REQUIREMENTS

1. PREPARATION FOR PAVEMENT:
   CLEAR SITE, STRIP TOP-SOIL, CUT AND FILL AND PREPARATIONS OF SUB-GRADE SHALL BE AS DESCRIBED IN " SUBGRADE PREPARATION".
2. SUB-GRADE SHALL BE COMPACTED TO 98% STANDARD DRY DENSITY RATIO AT OPTIMUM MOISTURE CONTENT ± 2% IN ACCORDANCE WITH AS 1289 5.1.1., TOP 300MM TO 100% SDD.
3. LOWER BASE COURSE SHALL BE CONSTRUCTED FROM CRUSHED SANDSTONE COMPACTED TO 100% STANDARD DRY DENSITY RATIO AT OPTIMUM MOISTURE CONTENT ± 2% IN ACCORDANCE WITH AS 1289 5.1.1. OF THICKNESS NOTED ON DRAWINGS.
4. BASE COURSE SHALL BE CONSTRUCTED FROM FINE CRUSHED ROCK COMPACTED TO 100% STANDARD DRY DENSITY RATIO AT OPTIMUM MOISTURE CONTENT ± 2% IN ACCORDANCE WITH AS 1289 5.1.1 OF THICKNESS NOTED ON DRAWINGS.
5. WEARING SURFACE SHALL BE ASPHALTIC CONCRETE TO STANDARD SPECIFICATION, MINIMUM THICKNESS = 30mm U.N.O.
6. TESTING OF THE SUBGRADE AND PAVEMENT LAYERS SHALL BE CARRIED OUT BY APPROVED N.A.T.A. REGISTERED LABORATORY.

ISSUED FOR APPROVAL

SURVEY INFORMATION
SURVEYED BY LCG
DATUM: A.H.D.
ORIGIN OF LEVELS: SSM191370

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
05	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	15.05.2020					
04	ISSUED FOR COORDINATION	IK	NW	08.05.2020					
03	ISSUED FOR SSDA APPROVAL ONLY	KR	NW	24.03.2020					
02	ISSUED FOR TENDER ONLY	KR	NW	24.02.2020					
01	PRELIMINARY	IK	NW	12.02.2020					

Client
ADCO CONSTRUCTIONS PTY LTD

Architect
NBRS ARCHITECTURE

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Email email@hhconsult.com.au
Web www.henryandhymas.com.au

henry&hymas

Project
MARSDEN PARK PUBLIC SCHOOL
NORTHBOURNE DR MARSDEN PARK NSW

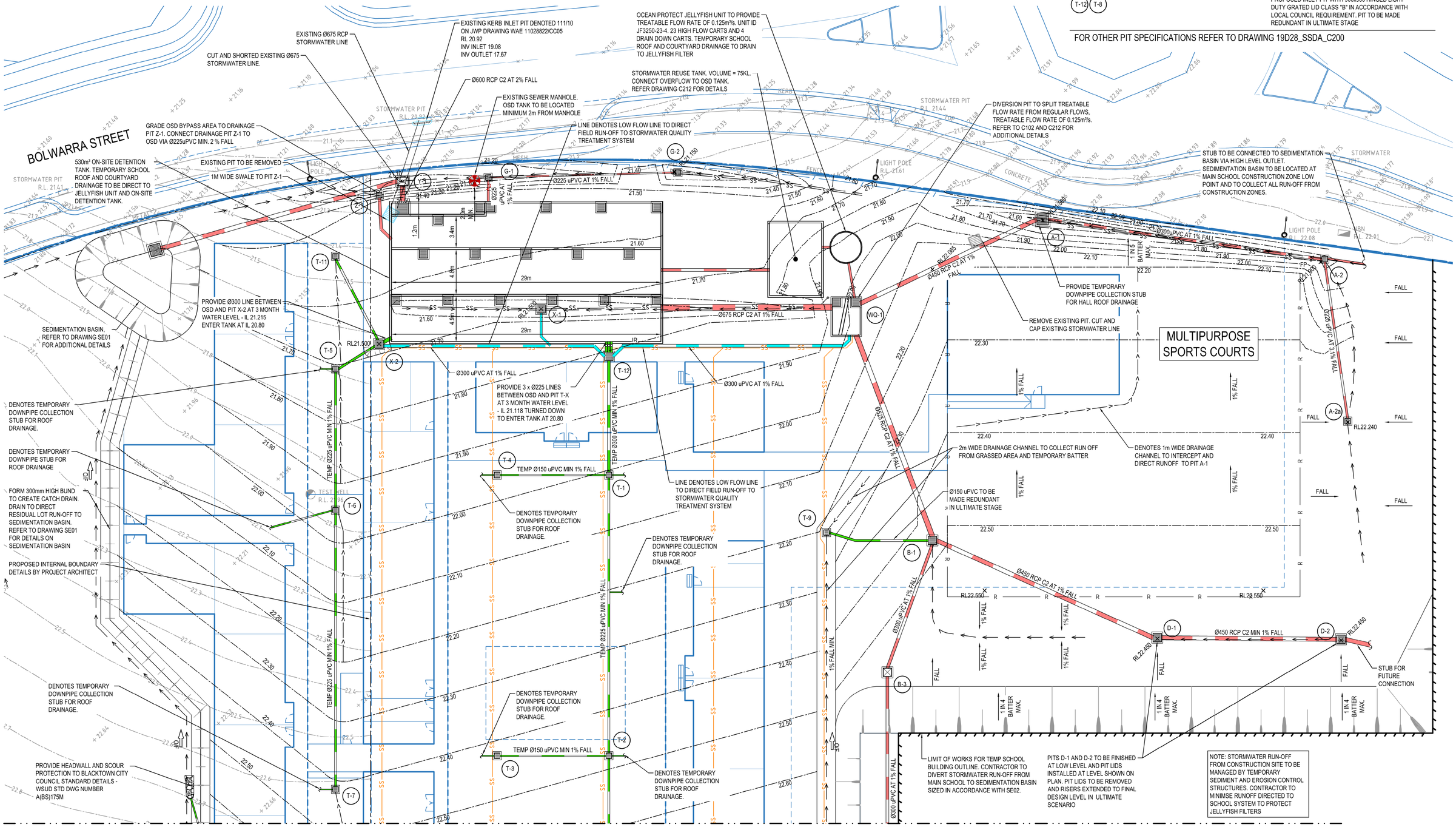
Title
NOTES

Drawn	Designed	Date
I.Khachab	N.Wetzlar	JAN 2020
Checked	Approved	Scale @A1
N.Wetzlar	A.Francis	N.T.S.

Drawing number: 19D28_SSDA_C010
Revision: 05

PIT/STRUCTURE NUMBER	DESCRIPTION
T-1, T-2, T-3, T-4, T-5, T-6, T-7, T-9, T-10, T-11	PROPOSED INLET PIT WITH 600x600 HINGED LIGHT DUTY GRATED LID CLASS "B" IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENT. PIT TO BE MADE REDUNDANT IN ULTIMATE STAGE
T-12, T-8	PROPOSED INLET PIT WITH 900x900 HINGED LIGHT DUTY GRATED LID CLASS "B" IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENT. PIT TO BE MADE REDUNDANT IN ULTIMATE STAGE

FOR OTHER PIT SPECIFICATIONS REFER TO DRAWING 19D28_SSDA_C200



FOR CONTINUATION REFER TO DWG 19D28_SSDA_C051

TEMPORARY SCHOOL PLAN

SCALE 1:200

0 4 8 12 16 20m

4 3 2 1

SCALE 1:200

ISSUED FOR APPROVAL

SURVEY INFORMATION
SURVEYED BY LCG
DATUM: A.H.D.
ORIGIN OF LEVELS: SSM191370

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
04	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	15.05.2020					
03	ISSUED FOR COORDINATION	IK	BH	08.05.2020					
02	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	25.03.2020					
01	PRELIMINARY	IK	NW	14.02.2020					

Client
ADCO CONSTRUCTION PTY LID

Architect
NBRS ARCHITECTURE

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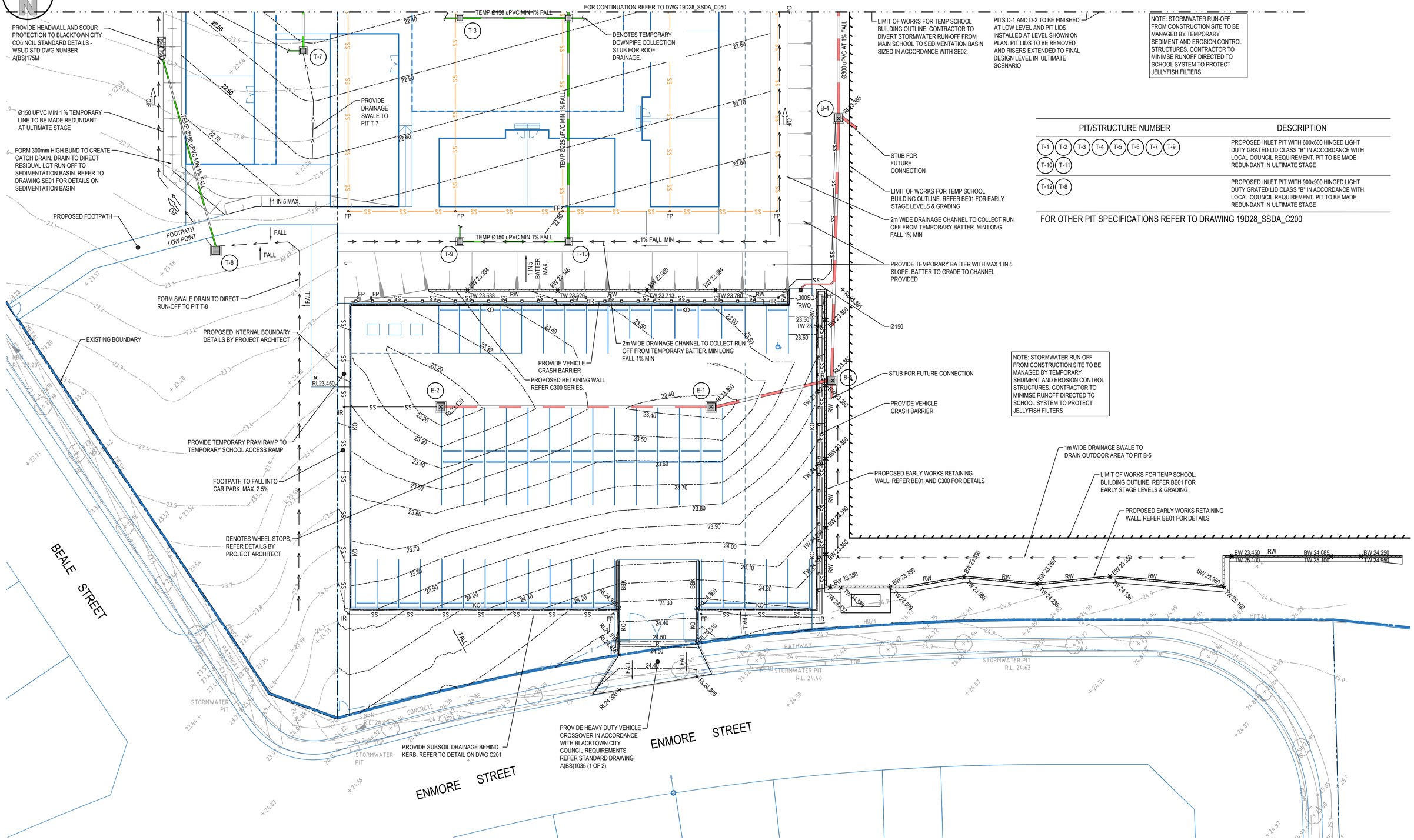
Project
MARSDEN PARK PUBLIC SCHOOL
NORTHBOURNE DR MARSDEN PARK NSW

Title
TEMPORARY SCHOOL PLAN
SHEET 1 OF 2

Drawn	Designed	Date
I.Khachab	N.Wetzlar	JAN 2020
Checked	Approved	Scale @A1
N.Wetzlar	A.Francis	1:200

Drawing number: 19D28_SSDA_C050
Revision: 04



PIT/STRUCTURE NUMBER	DESCRIPTION
T-1 T-2 T-3 T-4 T-5 T-6 T-7 T-9 T-10 T-11	PROPOSED INLET PIT WITH 600x600 HINGED LIGHT DUTY GRATED LID CLASS "B" IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENT. PIT TO BE MADE REDUNDANT IN ULTIMATE STAGE
T-12 T-8	PROPOSED INLET PIT WITH 900x900 HINGED LIGHT DUTY GRATED LID CLASS "B" IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENT. PIT TO BE MADE REDUNDANT IN ULTIMATE STAGE

FOR OTHER PIT SPECIFICATIONS REFER TO DRAWING 19D28_SSDA_C200

TEMPORARY SCHOOL PLAN

SCALE 1:200

0 4 8 12 16 20m

4 3 2 1

SCALE 1:200

ISSUED FOR APPROVAL

SURVEY INFORMATION
SURVEYED BY LCG
DATUM: A.H.D.
ORIGIN OF LEVELS: SSM191370

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
04	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	15.05.2020
03	ISSUED FOR COORDINATION	IK	NW	08.05.2020
02	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	24.03.2020
01	PRELIMINARY	IK	NW	14.02.2020

Client: ADCO CONSTRUCTION PTY LID

Architect: NBRS ARCHITECTURE

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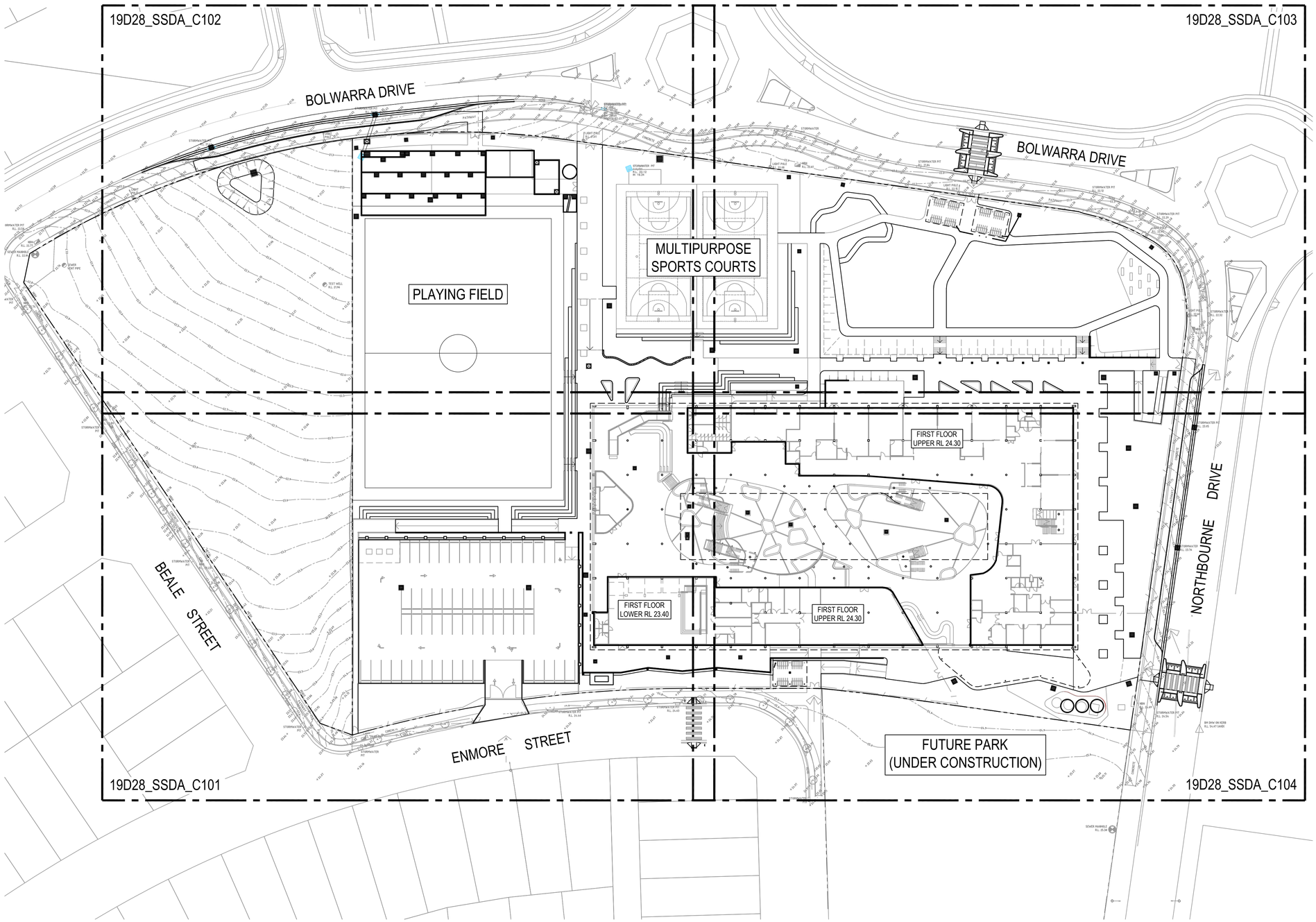
Project: MARSDEN PARK PUBLIC SCHOOL NORTHBOURNE DR MARSDEN PARK NSW

Title: TEMPORARY SCHOOL PLAN SHEET 2 OF 2

Drawn	Designed	Date
I.Khachab	N.Wetzlar	JAN 2020
Checked	Approved	Scale @A1
N.Wetzlar	A.Francis	1:200

Drawing number: 19D28_SSDA_C051

Revision: 04



LEGEND

- EXISTING BOUNDARY
- PROPOSED JUNCTION PITS
- PROPOSED SURFACE INLET PITS
- A-1 — LINE LETTER, PIT NUMBER — PROPOSED PIT TAG
- 40.125 / Ø425RCP / 20.450m / 1.5% / 39.818 — STORMWATER UPSTREAM INVERT RL. / STORMWATER PIPE DIAMETER & CLASS / STORMWATER PIPE LENGTH / STORMWATER PIPE GRADE / STORMWATER DOWNSTREAM INVERT RL.
- PROPOSED GRATED DRAIN
- PROPOSED STORMWATER PIPE
- PROPOSED LOW FLOW STORMWATER PIPE
- STORMWATER LINE TO BE MADE REDUNDANT FOLLOWING CLOSURE OF TEMPORARY SCHOOL
- SS — PROPOSED SUBSOIL LINE
- EXISTING STORMWATER PIPE
- PROPOSED BATTER LINE
- 22.7 — EXISTING CONTOURS
- 22.80 — PROPOSED CONTOURS
- RL24.300 — PROPOSED SPOT LEVEL
- 22.30 — EXISTING SPOT LEVEL
- TW 24.300 — PROPOSED TOP OF WALL LEVEL
- BW 23.300 — PROPOSED BOTTOM OF WALL LEVEL
- RWO — 300 SQ RAINWATER OUTLET WITH Ø150mm OUTLET PIPE
- KO — PROPOSED KERB ONLY
- BKO — BLACKTOWN CITY COUNCIL KERB ONLY
- BBK — PROPOSED BACK TO BACK KERB
- DD — PROPOSED DISH DRAIN
- PROPOSED STORMWATER SWALE
- RW — PROPOSED RETAINING WALL
- R — PROPOSED RIDGE LINE
- FP — SS — PROPOSED FLUSHING POINT (FP)
- SS — IR — SS — PROPOSED INTERMEDIATE RISER (IR)
- DP — PROPOSED DOWNPIPE LOCATION (DP)
- PROPOSED DOWNPIPE COLLECTION LINE
- PROPOSED LIMIT OF WORK

GENERAL ARRANGEMENT PLAN

SCALE 1:500

0 10 20 30 40 50m
10 8 6 4 2
SCALE 1:500

ISSUED FOR APPROVAL

SURVEY INFORMATION
SURVEYED BY LCG
DATUM: A.H.D.
ORIGIN OF LEVELS: SSM191370

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
06	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	15.05.2020
05	ISSUED FOR COORDINATION	IK	NW	08.05.2020
04	ISSUED FOR SSDA APPROVAL ONLY	KR	NW	24.03.2020
03	ISSUED FOR TENDER ONLY	BH	BH	05.03.2020
02	ISSUED FOR TENDER ONLY	KR	NW	24.02.2020
01	PRELIMINARY	IK	NW	12.02.2020

Client: ADCO CONSTRUCTIONS PTY LTD

Architect: NBRS ARCHITECTURE

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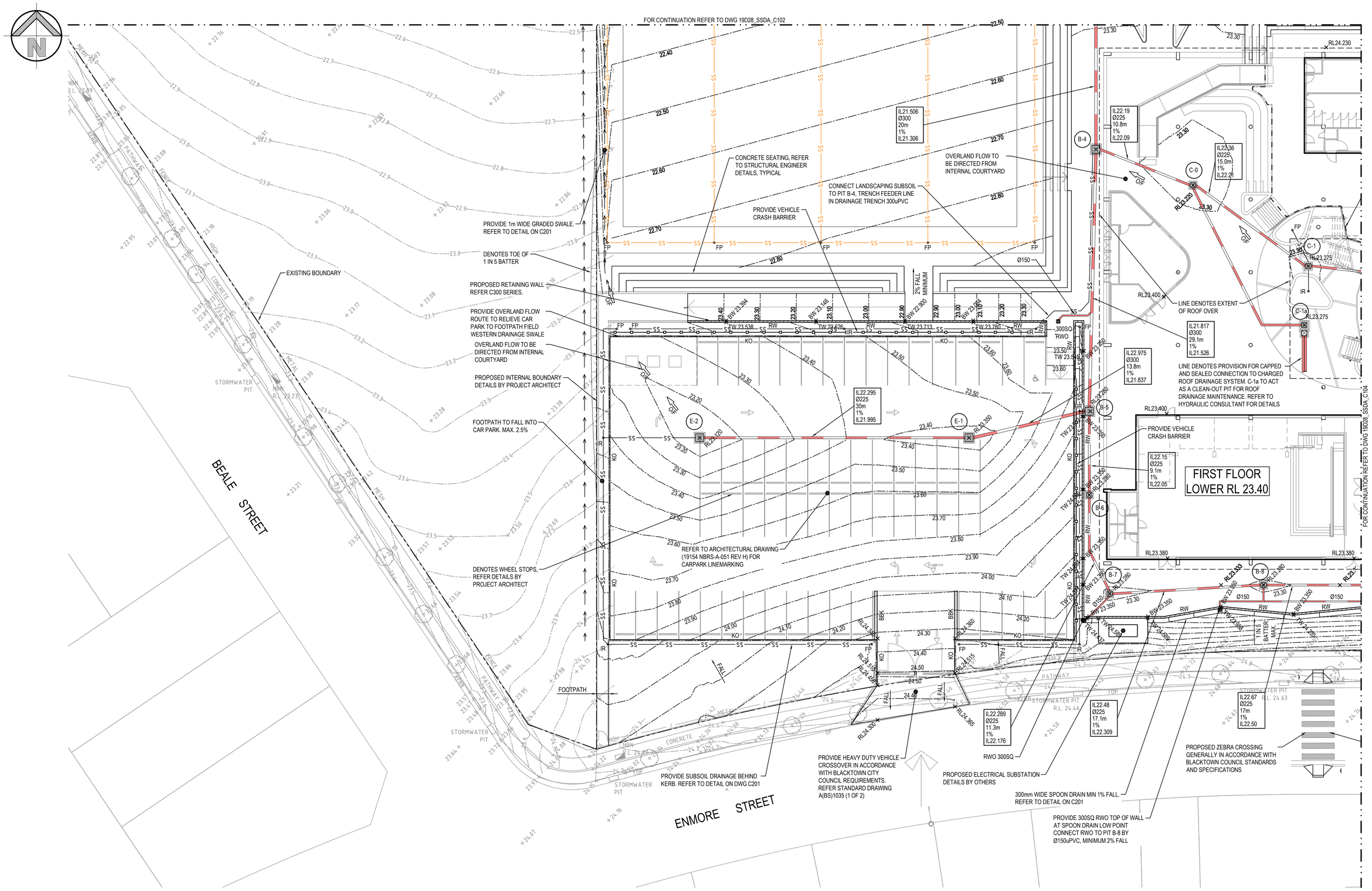
Project: MARSDEN PARK PUBLIC SCHOOL
NORTHBOURNE DR MARSDEN PARK NSW

Title: GENERAL ARRANGEMENT PLAN

Drawn	Designed	Date
I.Khachab	N.Wetzlar	JAN 2020
Checked	Approved	Scale @A1
N.Wetzlar	A.Francis	1:500

Drawing number: 19D28_SSDA_C100
Revision: 06



DETAIL PLAN

SCALE 1:200

0 4 8 12 16 20m

4 3 2 1

SCALE 1:200

ISSUED FOR APPROVAL

SURVEY INFORMATION
SURVEYED BY LCG
DATUM: A.H.D.
ORIGIN OF LEVELS: SSM191370

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
06	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	15.05.2020
05	ISSUED FOR COORDINATION	IK	NW	08.05.2020
04	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	24.03.2020
03	ISSUED FOR TENDER ONLY	BH	BH	05.03.2020
02	ISSUED FOR TENDER ONLY	KR	NW	24.02.2020
01	PRELIMINARY	IK	NW	12.02.2020

Client
ADCO CONSTRUCTIONS PTY LTD

Architect
NBRS ARCHITECTURE

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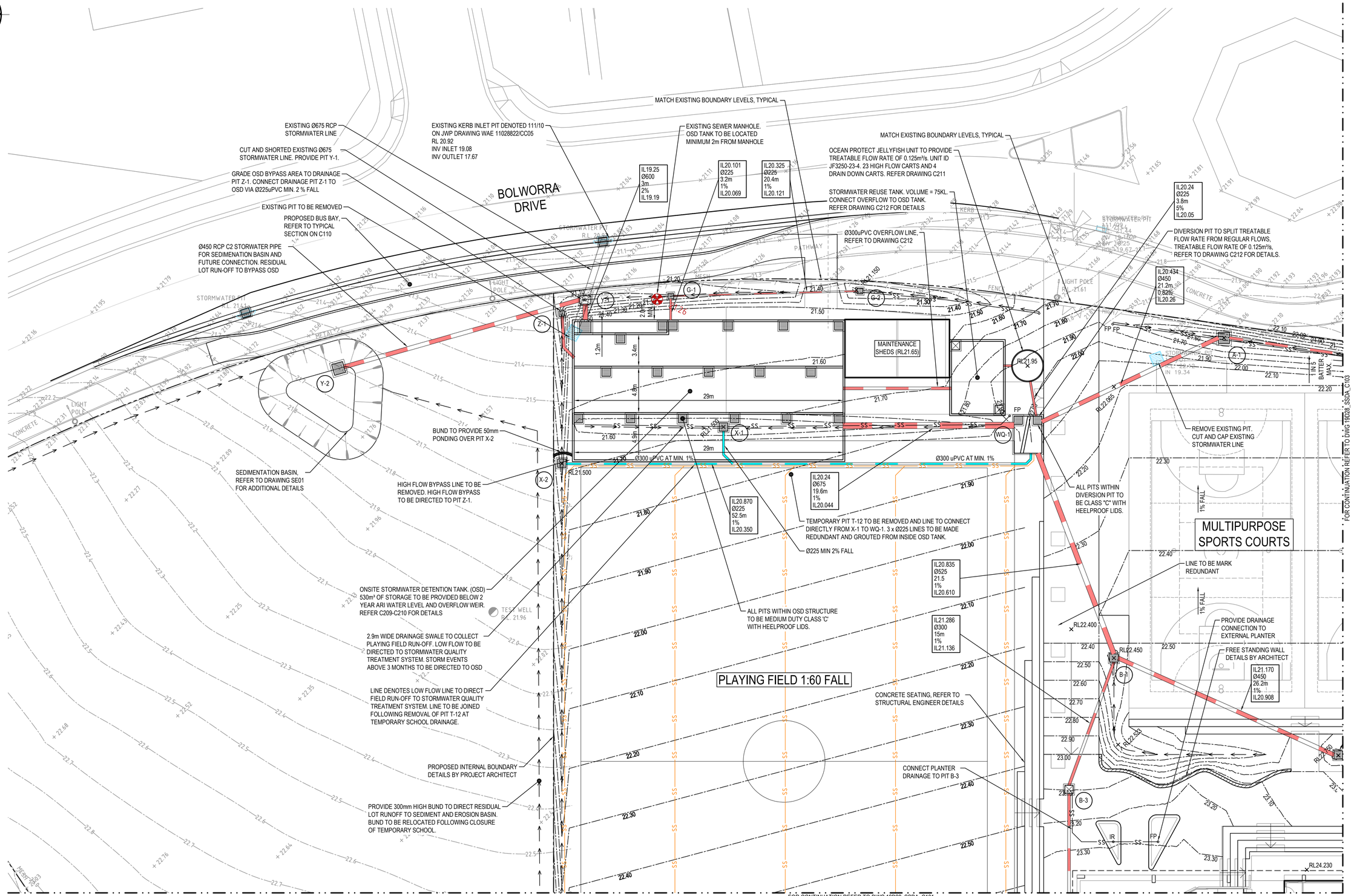
Project
MARSDEN PARK PUBLIC SCHOOL
NORTHBOURNE DR MARSDEN PARK NSW

Title
DETAIL PLAN
SHEET 1 OF 4

Drawn	Designed	Date
I.Khachab	N.Wetzlar	JAN 2020
Checked	Approved	Scale @A1
N.Wetzlar	A.Francis	1:200

Drawing number: 19D28_SSDA_C101
Revision: 06



DETAIL PLAN

SCALE 1:200

0 4 8 12 16 20m

4 3 2 1

SCALE 1:200

ISSUED FOR APPROVAL

SURVEY INFORMATION
SURVEYED BY LCG
DATUM: A.H.D.
ORIGIN OF LEVELS: SSM191370

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
07	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	15.05.2020
06	ISSUED FOR COORDINATION	IK	NW	08.05.2020
05	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	24.03.2020
04	ISSUED FOR TENDER ONLY	BH	BH	05.03.2020
03	ISSUED FOR TENDER ONLY	KR	NW	24.02.2020
02	PRELIMINARY	IK	NW	14.02.2020
01	PRELIMINARY	IK	NW	12.02.2020

Client: ADCO CONSTRUCTIONS PTY LTD

Architect: NBRS ARCHITECTURE

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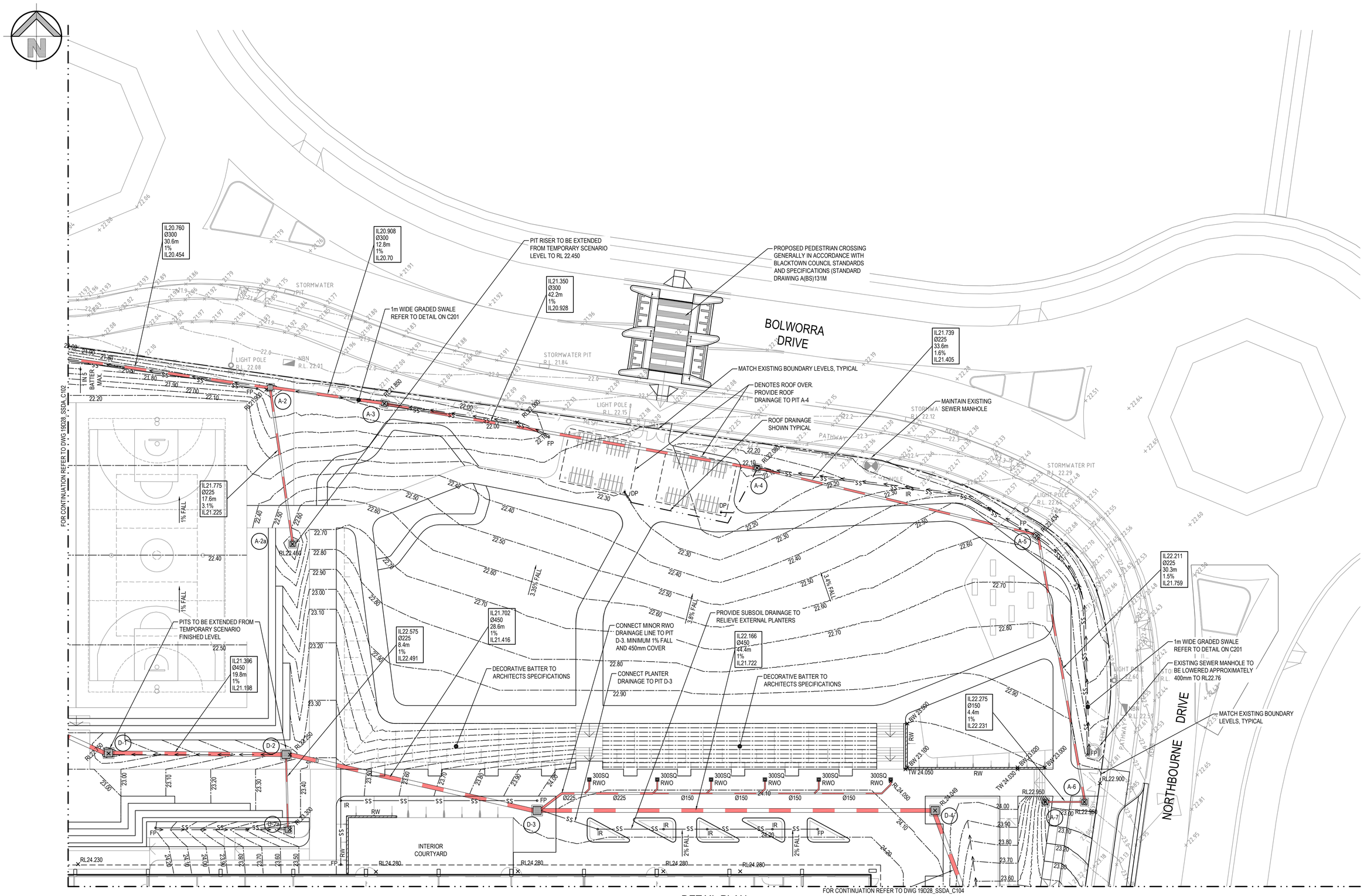
Project: MARSDEN PARK PUBLIC SCHOOL
NORTHBOURNE DR MARSDEN PARK NSW

Title: DETAIL PLAN
SHEET 2 OF 4

Drawn	Designed	Date
I.Khachab	N.Wetzlar	JAN 2020
Checked	Approved	Scale @A1
N.Wetzlar	A.Francis	1:200

Drawing number: 19D28_SSDA_C102

Revision: 07



DETAIL PLAN

SCALE 1:200

0 4 8 12 16 20m

4 3 2 1

SCALE 1:200

ISSUED FOR APPROVAL

SURVEY INFORMATION
SURVEYED BY LCG
DATUM: A.H.D.
ORIGIN OF LEVELS: SSM191370

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
06	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	15.05.2020
05	ISSUED FOR COORDINATION	IK	NW	08.05.2020
04	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	24.03.2020
03	ISSUED FOR TENDER ONLY	BH	BH	05.03.2020
02	ISSUED FOR TENDER ONLY	KR	NW	24.02.2020
01	PRELIMINARY	IK	NW	12.02.2020

Client
ADCO CONSTRUCTIONS PTY LTD

Architect
NBRS ARCHITECTURE

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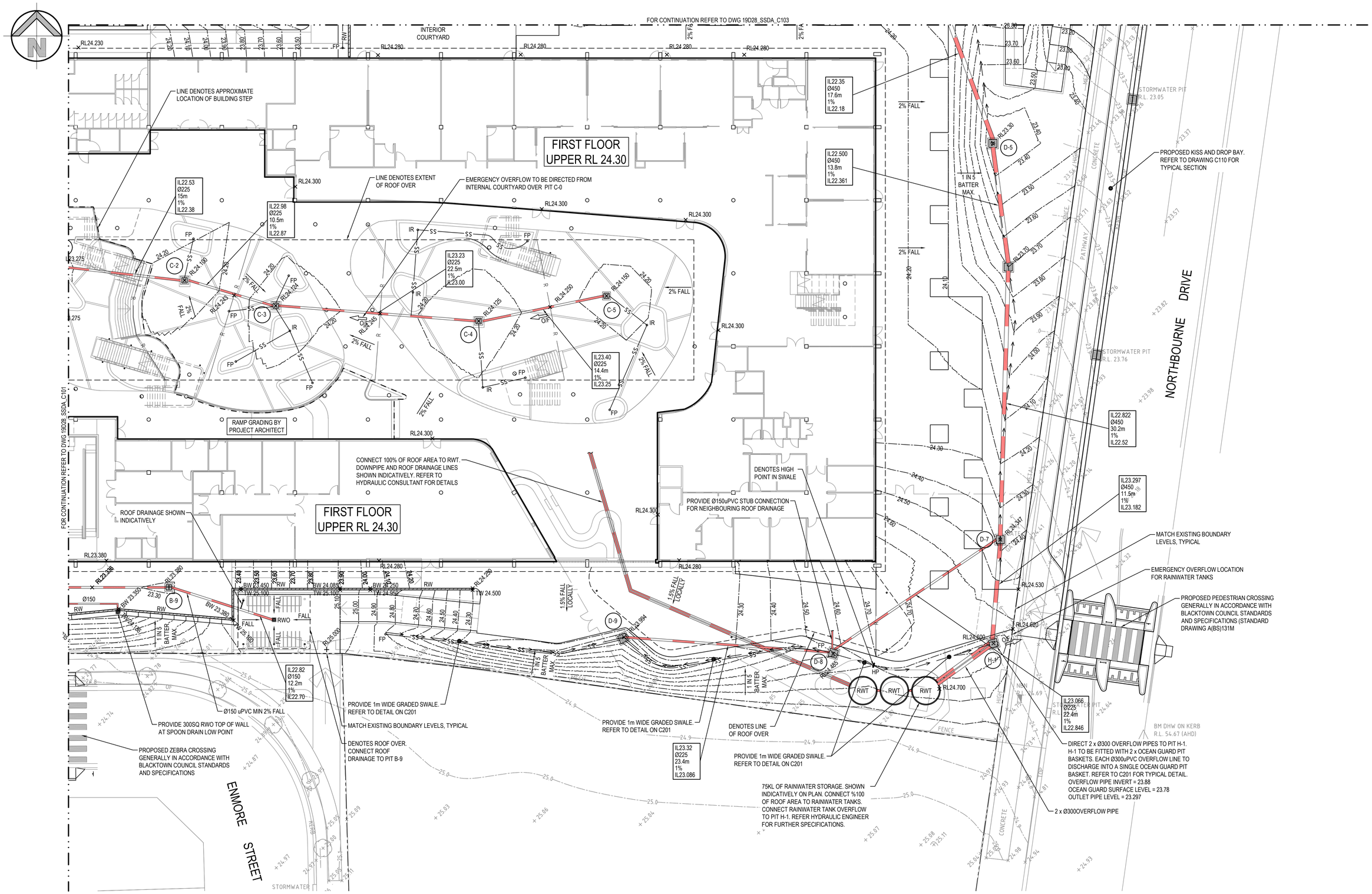
Project
MARSDEN PARK PUBLIC SCHOOL
NORTHBOURNE DR MARSDEN PARK NSW

Title
DETAIL PLAN
SHEET 3 OF 4

Drawn	Designed	Date
I.Khachab	N.Wetzlar	JAN 2020
Checked	Approved	Scale @A1
N.Wetzlar	A.Francis	1:200

Drawing number: 19D28_SSDA_C103
Revision: 06



DETAIL PLAN

SCALE 1:200

0 4 8 12 16 20m

4 3 2 1

SCALE 1:200

ISSUED FOR APPROVAL

SURVEY INFORMATION
SURVEYED BY LCG
DATUM: A.H.D.
ORIGIN OF LEVELS: SSM191370

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
06	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	15.05.2020
05	ISSUED FOR COORDINATION	IK	NW	08.05.2020
04	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	24.03.2020
03	ISSUED FOR TENDER ONLY	BH	BH	05.03.2020
02	ISSUED FOR TENDER ONLY	KR	NW	24.02.2020
01	PRELIMINARY	IK	NW	12.02.2020

Client
ADCO CONSTRUCTIONS PTY LTD

Architect
NBRS ARCHITECTURE

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Project
MARSDEN PARK PUBLIC SCHOOL
NORTHBOURNE DR MARSDEN PARK NSW

Title
DETAIL PLAN
SHEET 4 OF 4

Drawn	Designed	Date
I.Khachab	N.Wetzlar	JAN 2020
Checked	Approved	Scale @A1
N.Wetzlar	A.Francis	1:200

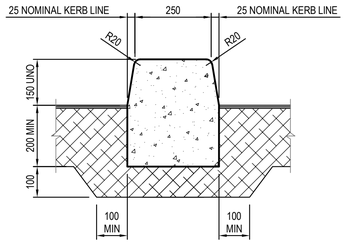
Drawing number
19D28_SSDA_C104

Revision
06

KERBING NOTES:

INCLUDES ALL KERBS, GUTTERS, DISH DRAINS, CROSSING AND EDGES.

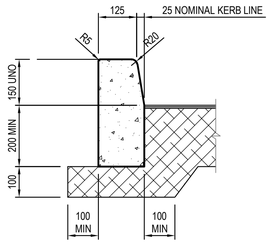
1. ALL KERBS, GUTTERS, DISH DRAINS AND CROSSING TO BE CONSTRUCTED ON MINIMUM 75mm GRANULAR BASE COURSE COMPACTED TO MINIMUM 98% MODIFIED MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289 5.2.1.
2. EXPANSION JOINTS (EJ) TO BE FORMED FROM 10mm COMPRESSIBLE CORK FILTER BOARD FOR THE FULL DEPTH OF THE SECTION AND CUT TO PROFILE. EXPANSION JOINTS TO BE LOCATED AT DRAINAGE PITS, ON TANGENT POINTS OF CURVES AND ELSEWHERE AT 12m CENTRES EXCEPT FOR INTEGRAL KERBS WHERE THE EXPANSION JOINTS ARE TO MATCH THE JOINT LOCATION IN KERBS.
3. WEAKENED PLANE JOINTS TO BE MIN 3mm WIDE AND LOCATED AT 3m CENTRES EXCEPT FOR INTEGRAL KERBS WHERE WEAKENED PLANE JOINTS ARE TO MATCH THE JOINT LOCATIONS IN SLABS.
4. BROAMED FINISHED TO ALL RAMPED AND VEHICULAR CROSSINGS, ALL OTHER KERBING OR DISH DRAINS TO BE STEEL FLOAT FINISHED.
5. IN THE REPLACEMENT OF KERBS
   EXISTING ROAD PAVEMENT IS TO BE SAWCUT 900mm FROM LIP OF GUTTER. UPON COMPLETION OF NEW KERBS, NEW BASE COURSE AND SURFACE IS TO BE LAID 900mm WIDE TO MATCH EXISTING MATERIALS AND THICKNESS. EXISTING ALLOTMENT DRAINAGE PIPE ARE TO BE BUILT INTO NEW KERB WITH A 100mm DIA HOLE.
   EXISTING KERBS ARE TO BE COMPLETELY REMOVED WHERE NEW KERBS ARE SHOWN.



BACK TO BACK KERB (BBK)

SCALE 1:10

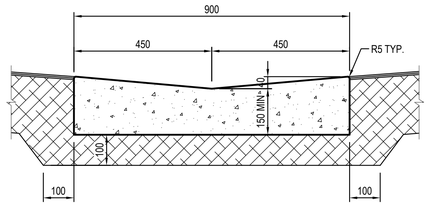
NOTE: INTERNAL USE ONLY



KERB ONLY (KO)

SCALE 1:10

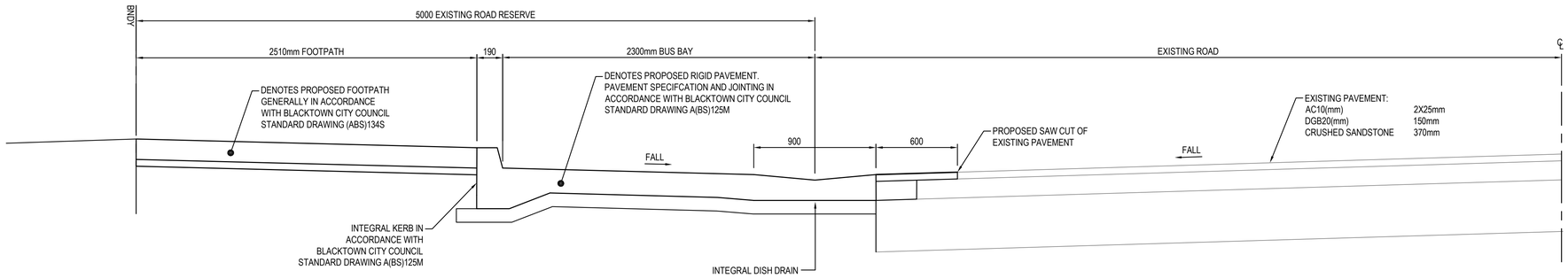
NOTE: INTERNAL USE ONLY



DISH DRAIN (DD)

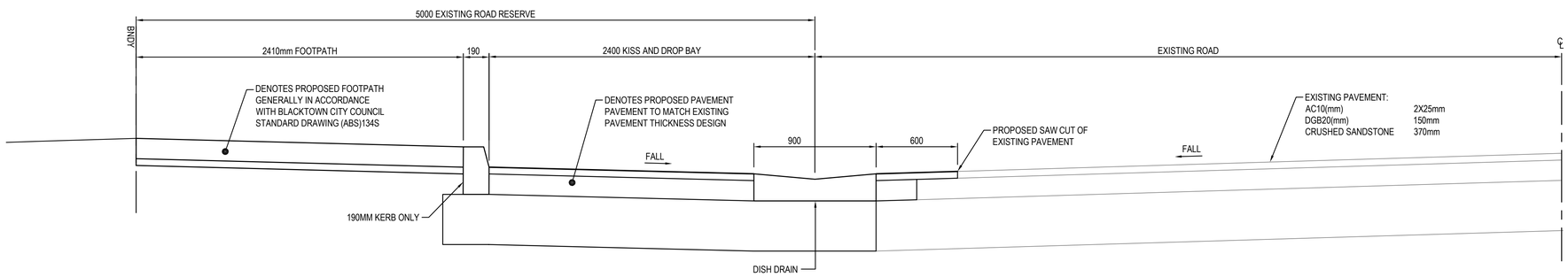
SCALE 1:10l

INTERNAL USE ONLY



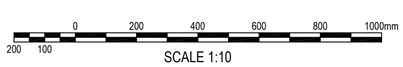
BUS BAY TYPICAL SECTION

SCALE 1:20

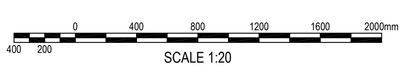


KISS & DROP TYPICAL SECTION

SCALE 1:20



SCALE 1:10



SCALE 1:20

ISSUED FOR APPROVAL

SURVEY INFORMATION
SURVEYED BY LCG
DATUM: A.H.D.
ORIGIN OF LEVELS: SSM191370

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
04	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	15.05.2020					
03	AMMENDED FOOTPATH WIDTHS - ISSUED FOR COORDINATION	IK	NW	11.05.2020					
02	ISSUED FOR COORDINATION	IK	NW	08.05.2020					
01	ISSUED FOR SSDA APPROVAL ONLY	NW	BH	24.03.2020					

Client
ADCO CONSTRUCTIONS PTY LTD

Architect
NBRS ARCHITECTURE

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Project
MARSDEN PARK PUBLIC SCHOOL
NORTHBOURNE DR MARSDEN PARK NSW

Title
ROADWORKS DETAILS SHEET

Drawn	Designed	Date
B.Hurlstone	B.Hurlstone	MAR 2020
Checked	Approved	Scale
N.Wetzlar	A.Francis	AS NOTED

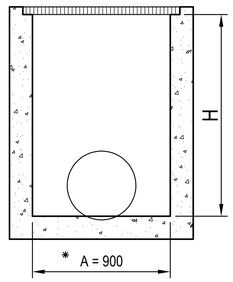
Drawing number: 19D28_SSDA_C110

Revision: 04

TYPICAL PIT CHAMBER SIZES

IT IS THE CONTRACTORS RESPONSIBILITY TO SELECT PIT CHAMBER SIZE WITH REGARDS TO PIPE SIZE, DEPTH TO INVERT AND SKEW ANGLE. REFER SKETCHES BELOW.

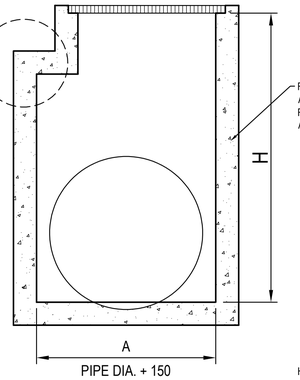
1. SELECT PIT CHAMBER USING THE STEPS BELOW:
2. SELECT PIT CHAMBER SIZE DEPENDING ON THE PIPE DIAMETERS.
3. CHECK PIT CHAMBER SIZE TO SATISFY DEPTH TO INVERT REQUIREMENTS.
   CHECK PIT CHAMBER DIMENSIONS TO SATISFY THE SKEW ANGLE IN THE TABLE.



SECTION
NTS

*A = 600 FOR PIPES UP TO 375 DIA.

1 PIT CHAMBER DIMENSIONS FOR PIPES UP TO 600 DIA.



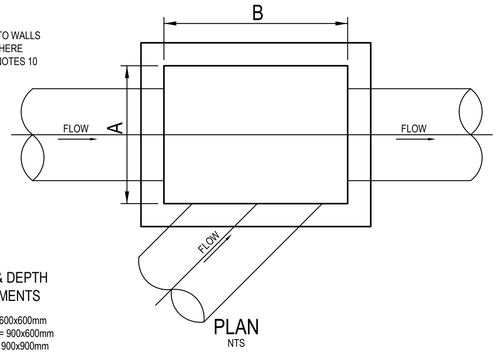
SECTION
NTS

1 PIT CHAMBER FOR PIPES GREATER THAN 600 DIA.

2 PIT SIZE & DEPTH REQUIREMENTS

H = 0-900mm - AxB = 600x600mm
H = 900-1200mm - AxB = 900x600mm
H = >1200mm - AxB = 900x900mm

FOR B = 600mm - MAX. SIDE ENTRY PIPE AT 45° SKEW = 225mm
FOR B = 900mm - MAX. SIDE ENTRY PIPE AT 45° SKEW = 375mm
FOR B = 1200mm - MAX. SIDE ENTRY PIPE AT 45° SKEW = 600mm
FOR B = 1500mm - MAX. SIDE ENTRY PIPE AT 45° SKEW = 825mm
FOR B = 1900mm - MAX. SIDE ENTRY PIPE AT 45° SKEW = 1050mm



PLAN
NTS

3 PIT CHAMBER FOR SIDE ENTRY ON SKEW

TABLE 1	
SIEVE SIZE (MM)	WEIGHT PASISNG (%)
75.0	100
9.5	100 TO 50
2.36	100 TO 30
0.60	50 TO 15
0.075	25 TO 0

TABLE 2	
SIEVE SIZE (MM)	WEIGHT PASISNG (%)
19.0	100
2.36	100 TO 50
0.60	90 TO 20
0.30	60 TO 10
0.15	25 TO 0
0.075	10 TO 0

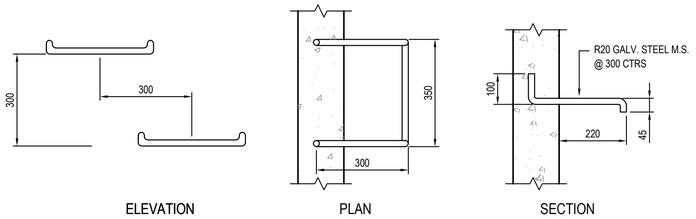
TABLE 3				
SUPPORT TYPE	BED ZONE X	HAUNCH ZONE Y	BED AND HAUNCH ZONES COMPACTION	MAX BEDDING FACTOR
HS1	100 IF D<=1500, OR 150 IF D>=1500	0.1D	50	2.0
HS2		0.3D	60	2.5
HS3		0.3D	70	4.0

PIT LID SCHEDULE

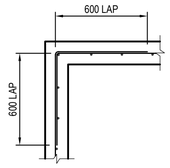
PIT/STRUCTURE NUMBER	DESCRIPTION
B-3	PROPOSED JUNCTION PIT WITH 900x900 MEDIUM DUTY SEALED LID CLASS "C" IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENT.
A-2, A-2a, A-3, A-4, A-5, A-6, A-7, B-6, B-7, B-8, B-9, C-0, C-1, C-1a, C-2, C-3, C-4, C-5, D-9, D-2a, G-1, G-2, Z-1	PROPOSED INLET PIT WITH 600x600 HINGED LIGHT DUTY GRATED LID CLASS "B" IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENT.
D-1, D-2, D-4, D-5, D-6, D-7, D-8, B-5, A-1, B-1, X-1, X-2	PROPOSED INLET PIT WITH 900x900 HINGED LIGHT DUTY GRATED LID CLASS "B" IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENT.
H-1	PROPOSED INLET PIT WITH 600x1200 HINGED LIGHT DUTY GRATED LID CLASS "B" IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENT.
E-1, E-2	PROPOSED INLET PIT WITH 900x900 HINGED HEAVY DUTY GRATED LID CLASS "D" IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENT.
B-4, D-3	PROPOSED INLET PIT WITH 900x900 HINGED MEDIUM DUTY GRATED LID CLASS "C" IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENT.
WQ-1	PROPOSED INLET PIT WITH 900x900 HINGED LIGHT DUTY GRATED LID CLASS "B" IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENT. PIT DIMENSIONS TO BE CUSTOMISED TO SUIT INTERNAL WEIR DIVERTING TREATABLE FLOW RATE.
Y-1	PROPOSED JUNCTION PIT WITH 1200x900 LIGHT DUTY SEALED LID CLASS "B" IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENT.
Y-2	PROPOSED INLET PIT WITH 900x900 HINGED LIGHT DUTY SURCHARGE STYLE GRATED LID CLASS "B" IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENT.
Z-1	PROPOSED INLET PIT WITH 600x600 HINGED LIGHT DUTY GRATED LID CLASS "B" IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENT.

NOTE:

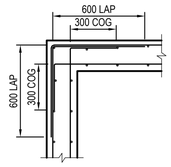
REFER TO C050 & C051 FOR TEMPORARY SCHOOL PITS LID SPECIFICATION.



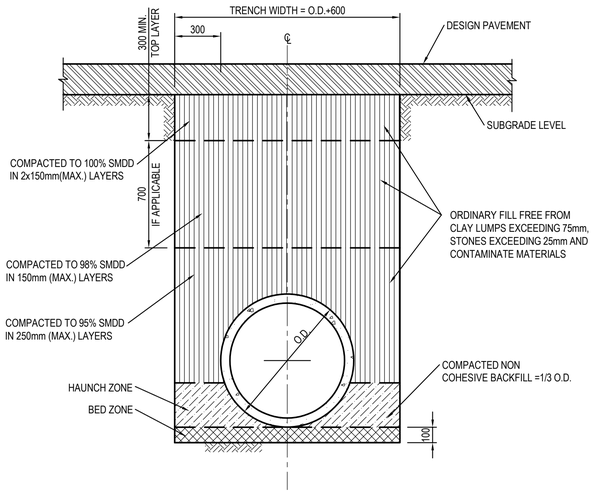
TYPICAL STEP IRON DETAIL
SCALE 1:10



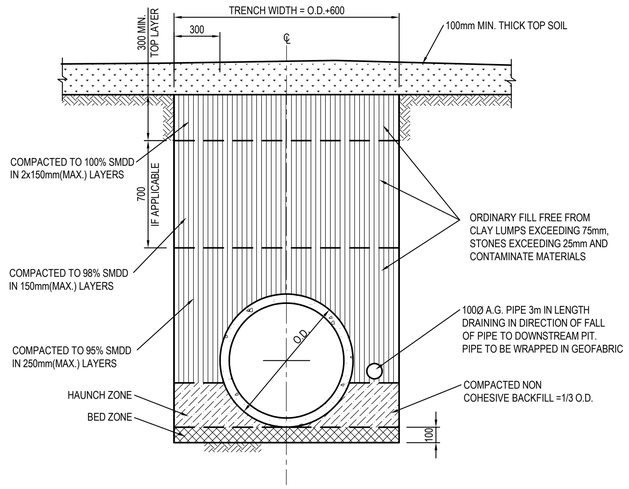
150 WALL - CORNER DETAIL
SCALE 1:20



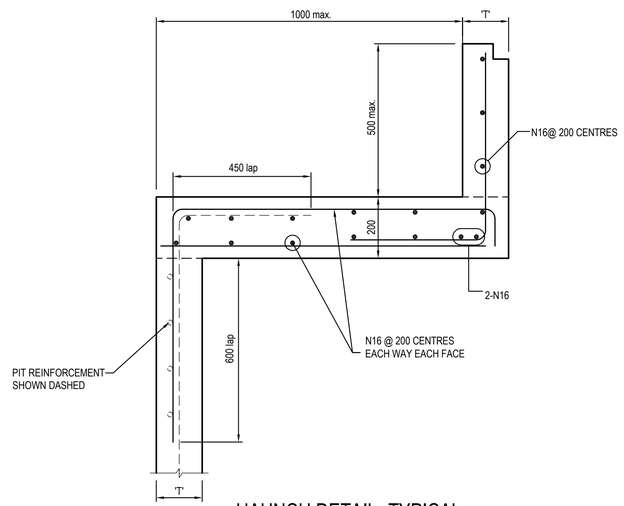
200 WALL - CORNER DETAIL
SCALE 1:20



PIPE TRENCH INSTALLATION BENEATH PAVEMENT
(H1 & H2 SUPPORT)
SCALE 1:20



PIPE TRENCH INSTALLATION IN LANDSCAPE AREAS
(H1 & H2 SUPPORT)
SCALE 1:20



HAUNCH DETAIL -TYPICAL
SCALE 1:10

NOTES:

- ALL GRATED INLET PITS TO CONTAIN OCEAN PROTECT 200 MICRON PIT BASKETS OR APPROVED EQUIVALENT UNLESS NOTED ON PLAN. REFER DRAWING C201 & C250 FOR DETAILS.
- ALL PITS IN FOOTPATH TO BE FITTED WITH SLIP RESISTANT HEELGUARD LID.
- PIT SCHEDULE ABOVE DOES NOT INCLUDE PIT LIDS FOR WATER QUALITY DEVICES OR BELOW GROUND OSD TANKS, REFER DRAWINGS C210 AND C211.

0 400 800 1200 1600 2000mm
400 200
SCALE 1:20

0 200 400 600 800 1000mm
200 100
SCALE 1:10

ISSUED FOR APPROVAL

SURVEY INFORMATION
SURVEYED BY LCG
DATUM: A.H.D.
ORIGIN OF LEVELS: SSM191370

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
05	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	15.05.2020
04	ISSUED FOR COORDINATION	IK	NW	08.05.2020
03	ISSUED FOR SSDA APPROVAL ONLY	KR	NW	24.03.2020
02	ISSUED FOR TENDER ONLY	KR	NW	24.02.2020
01	PRELIMINARY	IK	NW	12.02.2020

Client: ADCO CONSTRUCTIONS PTY LTD
Architect: NBRS ARCHITECTURE

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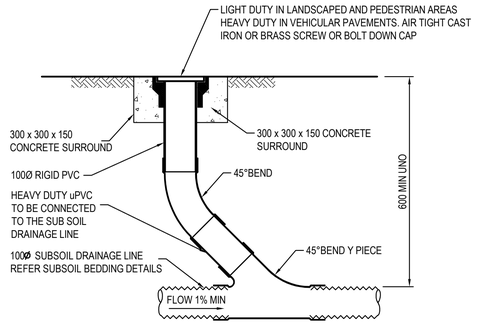
Project: MARSDEN PARK PUBLIC SCHOOL NORTHBOURNE DR MARSDEN PARK NSW
Title: STORMWATER MISCELLANEOUS DETAILS & PIT LID SCHEDULE

Drawn	Designed	Date
I.Khachab	N.Wetzlar	JUNE 2019
Checked	Approved	Scale
N.Wetzlar	A.Francis	AS NOTED

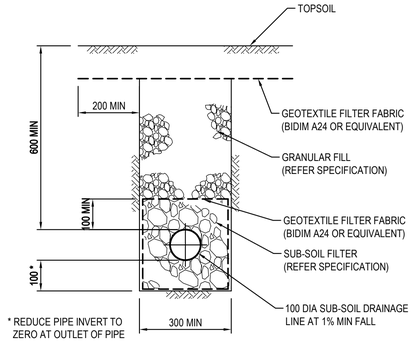
Drawing number: 19D28_SSDA_C200
Revision: 05



INTERMEDIATE RISER (IR)

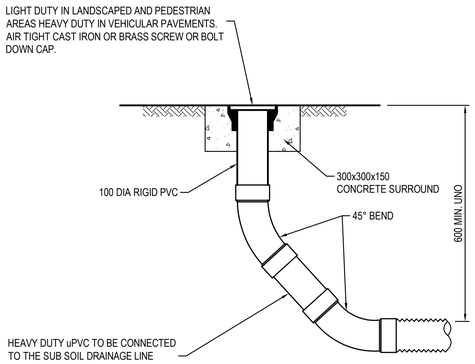
SCALE 1:10

NOTE: SLOTTED RIGID PVC PIPE AND FITTINGS MAY BE USED



SUB-SOIL IN LANDSCAPED AREAS

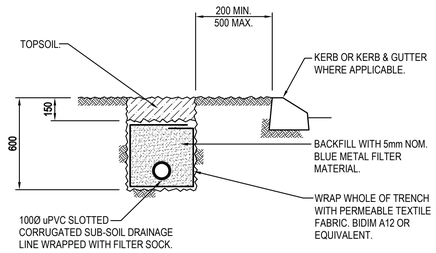
SCALE 1:10



FLUSHING POINT (FP)

SCALE 1:10

NOTE: SLOTTED RIGID PVC PIPE AND FITTINGS MAY BE USED



SUB-SOIL DRAIN DETAIL

SCALE 1:20

SUBSOIL DRAINAGE NOTES

1. GENERALY PROVIDE SUBSOIL DRAINS TO INTERCEPT GROUNDWATER SEEPAGE AND PREVENT WATER BUILD-UP BEHIND WALLS AND UNDER FLOORS AND PAVEMENTS. CONNECT SUBSOIL TO SURFACE DRAINS OR TO THE STORMWATER DRAINAGE SYSTEM AS APPLICABLE.

2. PIPE DEPTH:
PROVIDE THE FOLLOWING MINIMUM CLEAR DEPTH, MEASURED TO THE CROWN OF THE PIPE, WHERE THE PIPE PASSES BELOW THE FOLLOWING ELEMENTS:

- 100mm BELOW FORMATION LEVEL OF THE PAVEMENT, KERB OR CHANNEL.
- 100mm BELOW THE AVERAGE GRADIENT OF THE BOTTOM OF FOOTINGS.

3. JOINTING:
AT JUNCTIONS OF SUBSOIL PIPES PROVIDE TEES, COUPLINGS OR ADAPTORS TO AS2439.1.

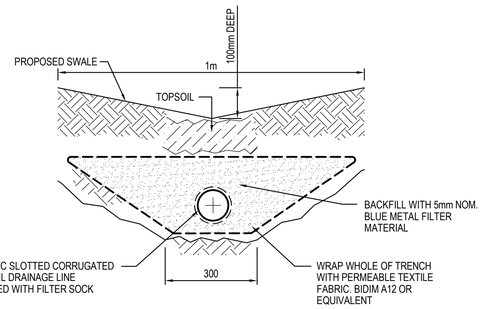
4. TRENCH WIDTH MINIMUM 300mm.

5. PIPE UNDERLAY
GENERAL: GRADE THE TRENCH FLOOR EVENLY TO THE GRADIENT OF THE PIPELINE. IF THE TRENCH FLOOR IS ROCK, CORRECT ANY IRREGULARITIES WITH COMPACTED BEDDING MATERIAL. BED PIPING ON A CONTINUOUS UNDERLAY OF BEDDING MATERIAL, AT LEAST 75mm THICK AFTER COMPACTION. LAY THE PIPE WITH ONE LINE OF PERFORATIONS AT THE BOTTOM.

CHASES: IF NECESSARY TO PREVENT PROJECTIONS SUCH AS SOCKETS AND FLANGES FROM BEARING ON THE TRENCH BOTTOM OR UNDERLAY.

6. PIPE SURROUNDS:
GENERAL: PLACE THE MATERIAL IN THE PIPE SURROUND IN LAYERS SMALLER THAN OR EQUAL TO 200mm LOOSE THICKNESS, AND COMPACT WITHOUT DAMAGING OR DISPLACING PIPING.
DEPTH OF OVERLAY: TO THE UNDERSIDE OF THE BASE OF OVERLYING STRUCTURES SUCH AS PAVEMENTS, SLABS AND CHANNELS TO WITHIN 150mm OF THE FINISHED SURFACE OF UNPAVED OR LANDSCAPED AREAS.

7. FILTER SOCKS:
PROVIDE POLYESTER PERMEABLE SOCKS CAPABLE OF RETAINING PARTICLES OF 0.25mm SIZES. SECURELY FIT OR JOIN THE SOCK AT EACH JOINT.



SUBSOIL DRAIN DETAIL IN SWALES

SCALE 1:10

0 200 400 600 800 1000mm
200 100
SCALE 1:10

0 400 800 1200 1600 2000mm
400 200
SCALE 1:20

DRAINAGE NOTES:

1. ALL STORMWATER WORK TO COMPLY WITH AS 3500 PART 3.

2. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE MINIMUM COVER OF 600mm ON ALL PIPES.

3. PROTECTION OF PIPES DUE TO LOADS EXCEEDING W7 WHEEL LOAD SHALL BE THE CONTRACTOR'S RESPONSIBILITY.

4. BEDDING TYPE SHALL BE TYPE H2 FOR RCP. WHERE NECESSARY THE OVERLAY ZONE SHALL BE REDUCED TO ACCOMMODATE PAVEMENT REQUIREMENTS. REFER TO THIS DRAWING FOR DETAILS.

5. MINIMUM COVER OVER EXISTING PIPES FOR PROTECTION DURING CONSTRUCTION SHALL BE 800mm.

6. NO CONSTRUCTION LOADS SHALL BE APPLIED TO PLASTIC PIPES.

7. FINISHED SURFACE LEVELS SHOWN ON LAYOUT PLAN DRGS TAKE PRECEDENCE OVER DESIGN DRAINAGE SURFACE LEVELS.

8. ALL PIPES UP TO AND INCLUDING 300 DIA. SHALL BE SOLVENT OR RUBBER RING JOINTED PVC CLASS SH PIPE TO AS1260. ALL OTHER PIPES TO BE RCP USING CLASS 2 RUBBER RING JOINTED PIPE. HARDIES FRC PIPE MAY BE USED IN LIEU OF RCP IF DESIRED IN GROUND. ALL AERIAL PIPES TO BE PVC CLASS SH.

9. ALL PITS IN NON TRAFFICABLE AREAS TO BE PREFABRICATED POLYESTER CONCRETE "POLYCRETE" WITH "LIGHT DUTY" CLASS B GALV. MILD STEEL GRATING AND FRAME.
ALL PITS IN TRAFFICABLE AREAS (CLASS "D" LOADING MAX) TO HAVE 150mm THICK CONCRETE WALLS AND BASE CAST IN-SITU f'c=32 MPa, REINFORCED WITH N12-200 BOTH LOADING WAYS CENTRALLY PLACE .U.N.O. ON SEPARATE DESIGN DRAWINGS IN THIS SET. GALV.MILD STEEL GRATING AND FRAME TO SUIT DESIGN LOADING. PRECAST PITS, RECTANGULAR OR CIRCULAR IN SHAPE, MAY BE USED IN LIEU AND SHALL COMPLY WITH RELEVANT AUSTRALIAN STANDARDS.

10. ALL PITS, GRATINGS AND FRAMES SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATION AND TO BE IN ACCORDANCE WITH AS3500.3 AND AS3996.

11. PIT CHAMBER DIMENSIONS ARE TO BE SELECTED TO SATISFY THE FOLLOWING:
- PIPE SIZE
- DEPTH TO INVERT
- SKEW ANGLE
REFER TYPICAL PIT CHAMBER DETAILS BELOW
IF PIT LID SIZE IS SMALLER THAN THE PIT CHAMBER SIZE THEN THE PIT LID IS TO BE CONSTRUCTED ON THE CORNER OF THE PIT CHAMBER WITH THE STEP IRONS DIRECTLY BELOW. ALTERNATIVELY THE PIT LID TO BE USED, IS TO BE THE SAME SIZE AS THE PIT CHAMBER.

12. FOR PIPE SIZES GREATER THAN Ø300mm, PIT FLOOR IS TO BE BENCHED TO FACILITATE FLOW.

13. GALVANISED STEP IRONS SHALL BE PROVIDED AT 300 CTS FOR PITS HAVING A DEPTH EXCEEDING 1200mm. SUBSOIL DRAINAGE PIPE SHALL BE PROVIDED IN PIPE TRENCHES ADJACENT TO INLET PIPES. (MINIMUM LENGTH 3m).

14. ALL SUBSOIL PIPES SHALL BE 100mm SLOTTED PVC IN A FILTER SOCK, UNO, WITH 3m INSTALLED UPSTREAM OF ALL PITS.

15. ALL PIPEWORK SHALL HAVE MINIMUM DIAMETER 100.

16. MINIMUM GRADE FOR ROOFWATER DRAINAGE LINES SHALL BE 1%.

17. ALL PIPE JUNCTIONS AND TAPER UP TO AND INCLUDING 300 DIA. SHALL BE VIA PURPOSE MADE FITTINGS.

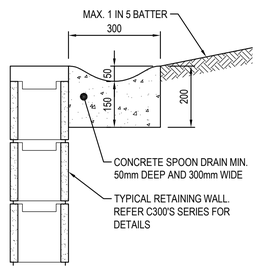
18. ALL ROOF DRAINAGE TO BE INSTALLED IN ACCORDANCE WITH AS3500, PART 3. TESTING TO BE UNDERTAKEN AND REPORTS PROVIDED TO THE SUPERINTENDENT.

19. LOCATION OF THE DIRECT DOWN PIPE CONNECTIONS MAY VARY ON SITE TO SUIT SITE CONDITIONS, WHERE CONNECTION SHOWN ON LONG SECTIONS CHAINAGES ARE INDICATIVE ONLY.

20. PITS IN EXCESS OF 1.5 m DEEP TO HAVE WALL AND FLOOR THICKNESS INCREASED TO 200mm. REINFORCED WITH N12@200 CTS CENTRALLY PLACED BOTH WAYS THROUGHOUT U.N.O.ON SEPARATE DESIGN DRAWINGS IN THIS SET. IF DEPTH EXCEEDS 5m CONTACT ENGINEER.

21. SUBSOIL DRAINAGE LINES FOR LANDSCAPE AREA NOT SHOWN ON THESE DRAWINGS. REFER TO LANDSCAPING PLANS FOR DETAILS.

22. ALL STORMWATER PITS TO HAVE Ø100 uPVC SLOTTED SUBSOIL PIPES CONNECTED TO THEM. THESE SUBSOILS TO EXTEND 3m UPSTREAM OF THE PIT AT A MINIMUM GRADE.



RW SPOON DRAIN DETAIL

SCALE 1:10

PLAN ID	MAXIMUM PIT PLAN DIMENSIONS
S	450mm x 450mm
M	600mm x 600mm
L	900mm x 900mm
XL	1200mm x 1200mm

DEPTH ID	BAG DEPTH	OVERALL DEPTH
1	170	270
2	300	450
3	600	700

		DEPTH ID		
		1	2	3
PLAN ID	S	■		
	M	■	■	
	L	■	■	■
	XL	■	■	■

GENERAL NOTES

1. THE MINIMUM CLEARANCE DEPENDS ON THE CONFIGURATION (SEE NOTE 2) AND THE LOCAL COUNCIL REQUIREMENTS.
2. CLEARANCE FOR ANY PIT WITHOUT AN INLET PIPE (ONLY USED FOR SURFACE FLOW) CAN BE AS LOW AS 50mm. FOR OTHER PITS, THE RECOMMENDED CLEARANCE SHOULD BE GREATER OR EQUAL TO THE PIPE OBVERT SO AS NOT TO INHIBIT HYDRAULIC CAPACITY.
3. OCEAN PROTECT PROVIDES TWO FILTRATION BAG TYPES:- 200 MICRON BAGS FOR HIGHER WATER QUALITY FILTERING AND A COARSE BAG FOR TARGETING GROSS POLLUTANTS.
4. DRAWINGS NOT TO SCALE.

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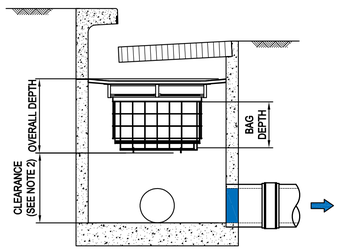
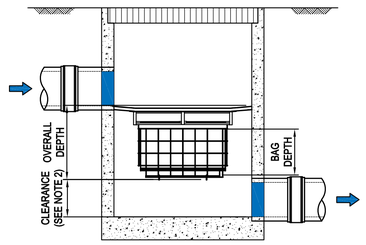
SPECIFICATION DRAWING



SURFACE FLOW CONFIGURATION

SCALE: 1:20



PIPE FLOW CONFIGURATION

SCALE: 1:20

ISSUED FOR APPROVAL

SURVEY INFORMATION
SURVEYED BY LCG
DATUM: A.H.D.
ORIGIN OF LEVELS: SSM191370

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
05	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	15.05.2020					
04	ISSUED FOR COORDINATION	IK	NW	08.05.2020					
03	ISSUED FOR SSDA APPROVAL ONLY	KR	NW	24.03.2020					
02	ISSUED FOR TENDER ONLY	KR	NW	24.02.2020					
01	PRELIMINARY	IK	NW	12.02.2020					

Client: ADCO CONSTRUCTIONS PTY LTD

Architect: NBRS ARCHITECTURE

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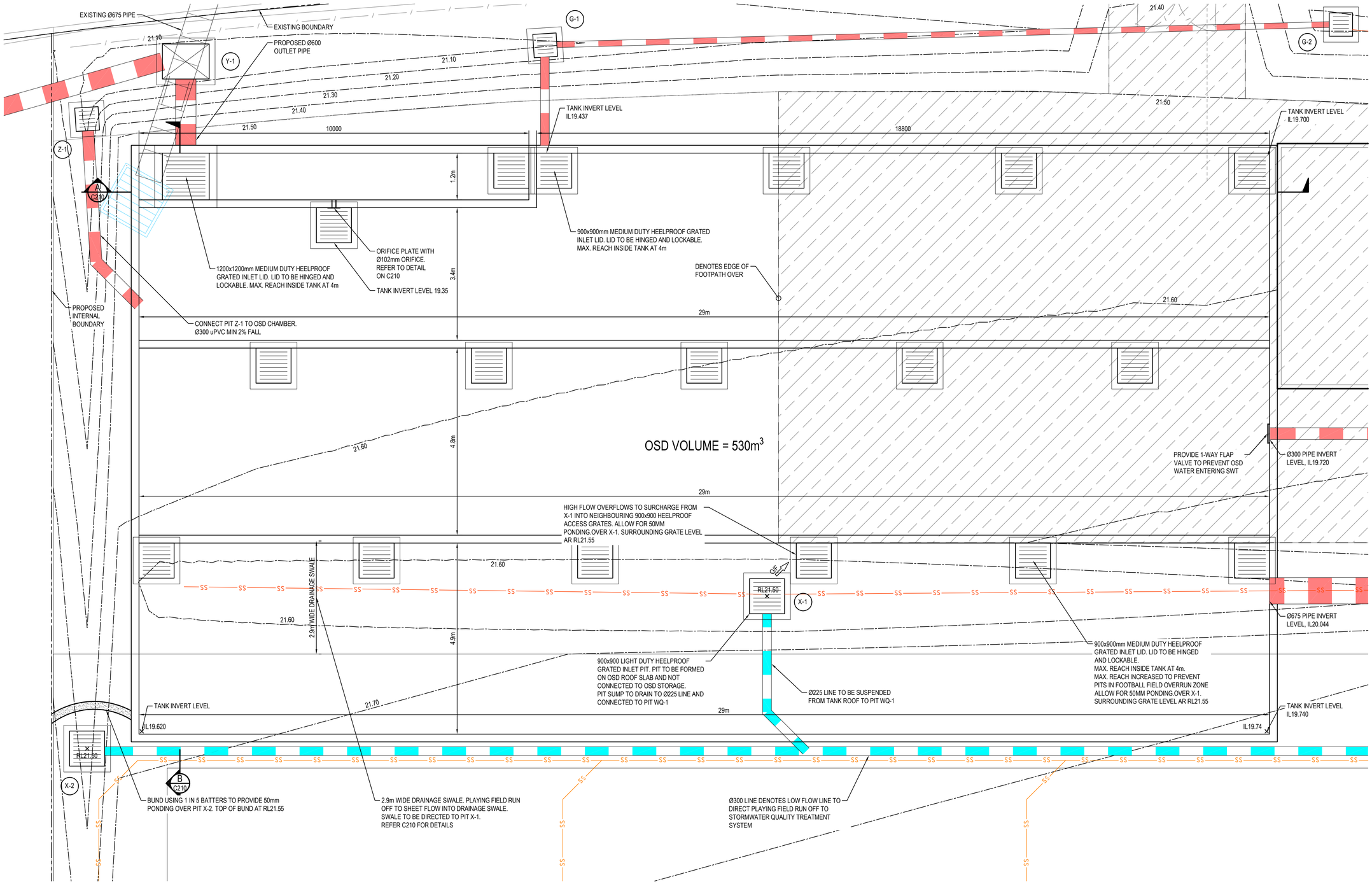
Project: MARSDEN PARK PUBLIC SCHOOL
NORTHBOURNE DR MARSDEN PARK NSW

Title: STORMWATER MISCELLANEOUS DETAILS

Drawn	Designed	Date
I.Khachab	N.Wetzlar	JUNE 2019
Checked	Approved	Scale
N.Wetzlar	A.Francis	AS NOTED

Drawing number: 19D28_SSDA_C201
Revision: 05



OSD TANK PLAN

SCALE 1:50

0 1000 2000 3000 4000 5000mm
1000 600 200
SCALE 1:50

ISSUED FOR APPROVAL

SURVEY INFORMATION
SURVEYED BY LCG
DATUM: A.H.D.
ORIGIN OF LEVELS: SSM191370

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
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02	ISSUED FOR COORDINATION	IK	NW	08.05.2020
01	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	24.03.2020

Client
ADCO CONSTRUCTIONS PTY LTD

Architect
NBRS ARCHITECTURE

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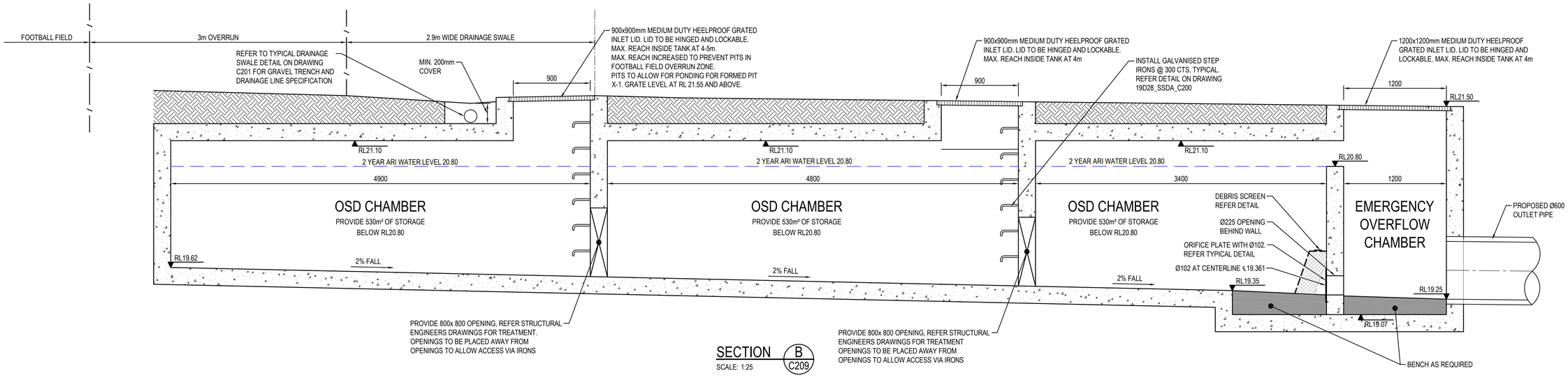
Project
MARSDEN PARK PUBLIC SCHOOL
NORTHBOURNE DR MARSDEN PARK NSW

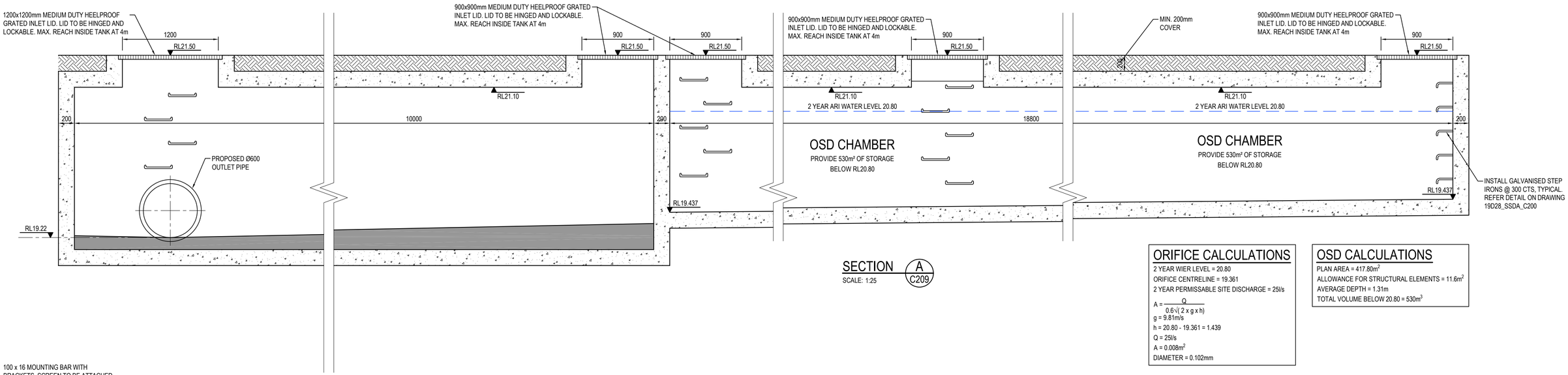
Title
OSD TANK PLAN

Drawn	Designed	Date
I.Khachab	N.Wetzlar	JUNE 2019
Checked	Approved	Scale @A1
N.Wetzlar	A.Francis	AS NOTED

Drawing number: 19D28_SSDA_C209
Revision: 03



SECTION B / C209
SCALE: 1:25



SECTION A / C209
SCALE: 1:25

ORIFICE CALCULATIONS

2 YEAR WIER LEVEL = 20.80
ORIFICE CENTRELINE = 19.361
2 YEAR PERMISSABLE SITE DISCHARGE = 25l/s

$$A = \frac{Q}{0.6\sqrt{(2 \times g \times h)}}$$

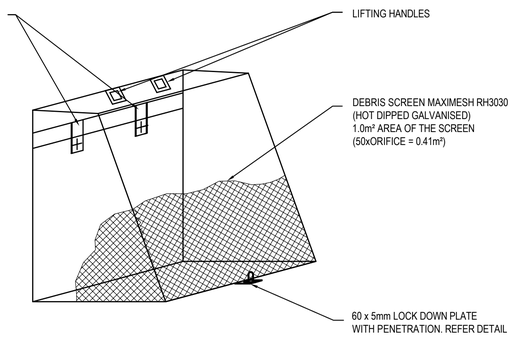
g = 9.81m/s
h = 20.80 - 19.361 = 1.439
Q = 25l/s
A = 0.008m²
DIAMETER = 0.102mm

OSD CALCULATIONS

PLAN AREA = 417.80m²
ALLOWANCE FOR STRUCTURAL ELEMENTS = 11.6m²
AVERAGE DEPTH = 1.31m
TOTAL VOLUME BELOW 20.80 = 530m³

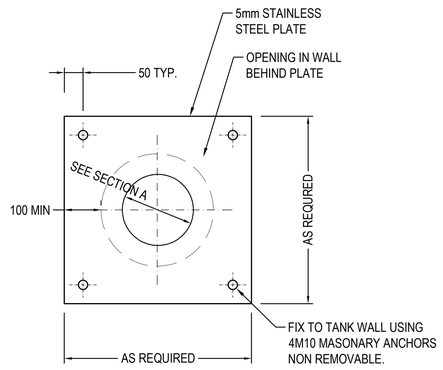
100 x 16 MOUNTING BAR WITH BRACKETS, SCREEN TO BE ATTACHED (GENERALLY ON A SLIDING MECHANISM) TO THE WALL, BUT SHOULD BE REMOVABLE (WITHOUT THE USE OF TOOLS) TO PERMIT CLEANSING AND EASY INSPECTION OF THE OUTLET CONTROL. ALL STEEL TO BE HOT DIPPED GALVANISED.

MAXIMESH RH3030 IS RECOMMENDED FOR ORIFICES LESS THAN 150mm IN DIAMETER AND SCREEN AREA 50xTHE ORIFICE AREA REFER BLACKTOWN CITY COUNCIL STANDARD DRAWINGS FOR DETAILS



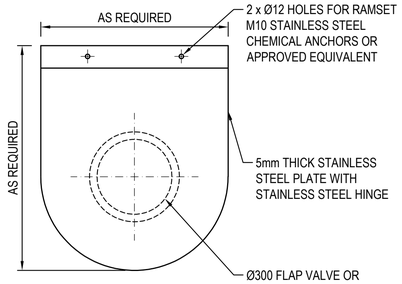
DEBRIS SCREEN DETAIL

NOT TO SCALE
ALL STEEL TO BE HOT DIPPED GALVANISED



ORIFICE PLATE

SCALE 1:10



FLAP VALVE DETAIL

SCALE 1:10

CONFINED SPACE DANGER SIGN

DANGER

CONFINED SPACE
NO ENTRY WITHOUT CONFINED SPACE TRAINING

COLOURS:	DANGER AND BACKGROUND	WHITE
	ELLIPTICAL AREA	RED
	RECTANGLE CONTAINING ELLIPSE	BLACK
	OTHER LETTERING AND BOARDER	BLACK

A) A CONFINED SPACE DANGER SIGN SHALL BE POSITIONED IN A LOCATION SUCH THAT IT IS CLEARLY VISIBLE TO PERSONS PROPOSING TO ENTER THE BELOW GROUND TANKS/ CONFINED SPACE AT ALL ACCESS POINTS OF THE TANK/ CONFINED SPACE.

B) SIGN TO BE MINIMUM DIMENSIONS:- 300mm x 450mm (LARGE ENTRIES SUCH AS DOORS)
250mm x 180mm (SMALL ENTRIES I.E.. GRATES, MANHOLES)

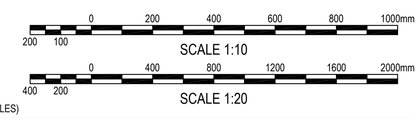
C) SIGN SHALL BE MANUFACTURED FROM COLOUR BONDED METAL OR POLYPROPYLENE

D) SIGN SHALL BE AFFIXED TO A SURFACE WITH SCREWS AT EACH CORNER.

OSD SIGN

THIS IS AN
ON-SITE STORMWATER DETENTION SYSTEM
REQUIRED BY YOUR LOCAL COUNCIL
IT IS AN OFFENCE TO REDUCE THE VOLUME OF THE TANK OR BASIN OR TO INTERFERE WITH THE ORIFICE PLATE THAT CONTROLS THE OUTFLOW
THE BASE OF THE OUTLET CONTROL PIT AND THE DEBRIS SCREEN MUST BE CLEANED OF DEBRIS AND SEDIMENT ON A REGULAR BASIS BY THE OWNER
THIS PLATE MUST NOT BE REMOVED

SIZE: 110mm X 80mm
CORNERS: SQUARE
COLOUR: ETCHED AND FILLED BLACK LEGEND ON NATURAL SILVER BACKGROUND
MATERIAL: ALUMINIUM 0.9MM MILL



ISSUED FOR APPROVAL

SURVEY INFORMATION
SURVEYED BY LCG
DATUM: A.H.D.
ORIGIN OF LEVELS: SSM191370

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
05	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	15.05.2020
04	ISSUED FOR COORDINATION	IK	NW	08.05.2020
03	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	24.03.2020
02	ISSUED FOR TENDER ONLY	KR	NW	24.02.2020
01	PRELIMINARY	IK	NW	13.02.2020

Client: ADCO CONSTRUCTIONS PTY LTD
Architect: NBRS ARCHITECTURE

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Project: MARSDEN PARK PUBLIC SCHOOL
NORTHBOURNE DR MARSDEN PARK NSW

Title: OSD TANK SECTIONS AND DETAILS

Drawn	Designed	Date
I.Khachab	N.Wetzlar	JUNE 2019
Checked	Approved	Scale @A1
N.Wetzlar	A.Francis	AS NOTED

Drawing number: 19D28_SSDA_C210
Revision: 05

Circular culvert / Throttling pipe flow estimator

Based on chapters 9.1 - 9.33 , Willi H Hager "Wastewater Hydraulics" Springer 1999

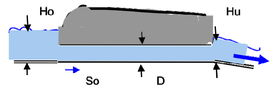
D	Ho	Hu	So	n	L	χ	Yo	Flow type
m	m	m	m/m		m	full pipe		
0.3	0.66	0.61	0.05	0.013	3.8	4.493	2.200	pressurised
Up IL	20.24	20.05	Down IL					N/A
R*d	Rd	jd	Hd	h/l culvert	qd	Q	χ	
			m	m		cub.m/sec	free	transitional flow type
0.0509	0.0314	0.6333	0.24	0.3981	N/A	0.130	4.455	N/A

Project No	19D28
Date	11.05.2020

For SSDA

Qc max	Qcr	Q uni	Qgate tr	Qpress tr	Qpress	Qgate	Quni
							free
N/A	0.245	0.064	0.137	0.174	0.130	0.137	0.222
f	Yt	Cd	Q simple culvert	Qor	Sf	Fd	Qunifull
0.166	2.27	0.64	N/A	0.098	0.1048	N/A	0.222

Operational Diagram



Logic:

Ho and Hu are Energy Heads u/s and d/s of culvert respectively. **So** and **Sf** are Energy and pipe's gradients respectively. D is a pipe diameter.
χ is pipe roughness characteristic (5.31). **L** is culvert's length. **Yo** =Ho/D **and Fd** is pipe Froude number
Free Flow in the culvert can be either critical, uniform or gated. Flow is critical whenever χ >2. Maximum filling ratio should be 95%. Yo is generally lower than 1.20.
If **Sf** exceeds **So** hydraulic jump may develop in the pipe leading to the formation of standing waves and if filling ratio is larger than 90% to choking of the pipe (usually near the outlet).
For larger approach level 1.2<Yo<1.5 and free culvert flow, gated flow appears when the u/s section is submerged sealing the culvert's inlet against airflow.
Pressurised flow develops when outlet of the culvert is submerged (choked) and Yo is equal or larger than 1.0.
Transition between gated and pressurised flow is analysed using roughness characteristics **Rd** and **Rd*** as per chapter 9.33 as well as possibilities of outlet choking due to hydraulic jump formation and/or high filling ratio. Then the choice is made between gated and pressurised flow for a transitional flow type (this selection is automatic).
It is a well known fact that for the culvert flow situation a free surface flow often needs more head than pressurised flow. Also supercritical flow in the pipe is unstable leading to formation of waves,h/jumps etc thus discharge under these conditions (described as "critical" in the program) may be lower than that under the "uniform" flow conditions.
Please note that the sharp-crested inlet configuration (Cd=0.64) is considered for transitional gated flow. For **Qgate** coefficient **Cd** can be changed in cell C15.
The approach taken in this spreadsheet is based on formulas valid for a long culvert (L/D>=10).
This spreadsheet is set up to automatically compute the discharge through the pipe/culvert for the flow situation described by the input parameters(Ho;Hu;n;So;D;L;Cd).
The final flow rate appears in cell G9 (brown font).
Flowrates for each flow situation are displayed in cells A13-H13 and D15,E15 and H15. It allows the user to compare the floweret selected by the program to other relevant Flowrates and make his/her own judgements. The Flowrates calculated by this spreadsheet are on the conservative side.

To use this program please follow these easy steps:

1 Type input data in yellow cells
2 Read flow type in cells I5 and I9
3 Read culvert discharge in cell G9

Good luck

Abbreviations and formulas used in the spreadsheet

Qcmax	Maximum free flow discharge for this situation (9.6)
Qcr	Discharge for "critical" flow situation
Quni	Discharge for "uniform" flow situation
Qgate tr.	Discharge for transitional-gated flow situation
Q press. tr	Discharge for transitional-pressurised flow situation
Q press. tr	Discharge for "pressurised" flow situation
Qgate	Discharge for "gated" flow situation
Q uni free	Free uniform discharge
Q uni full	Uniform discharge for the 95% full pipe
Q simple culvert	Discharge calculated using formulas for a "simple culvert" (9.9 - 9.13)
Qor	Discharge calculated using small orifice formulae with Cor = 0.64

χ > 2

1. Free flow

Uniform flow

$$\frac{Hon}{D}=\frac{2}{\sqrt{3}}\left(\frac{nQ}{So^{\frac{1}{2}}D^{\frac{8}{3}}}\right)^{\frac{1}{2}}\frac{1}{2}\left[1+\left(\frac{9}{16}\chi^2\right)\right] \quad (5.31)$$

Critical flow

$$\frac{Hoc}{D}=\frac{5}{3}\left[\frac{Q}{\left(gD^5\right)^{\frac{1}{2}}}\right]^{\frac{3}{5}};Qcmax=0.61\left(gD^5\right)^{\frac{1}{2}}$$

2. Gate flow

$$Q=Cd\left(\frac{\pi}{4}\right)D^2\left[2g(Ho-CdD)\right]^{\frac{1}{2}}$$

3. Pressurised flow

$$Qp=\left(\frac{\pi}{4}\right)D^2\left[\frac{2gHd}{1+\sum\xi}\right]^{\frac{1}{2}}$$

5. Other formulas used

$$q_n=\frac{nQ}{So^{\frac{1}{2}}D^{\frac{8}{3}}}=\frac{3}{4}y_n^2\left(1-\frac{7}{12}y_n^2\right) \quad (5.14)$$

$$\chi(roughness)=\frac{So^{\frac{1}{2}}D^{\frac{1}{6}}}{ng^{\frac{1}{2}}}$$

$$Fd=\frac{Q}{(gDh^4)^{\frac{1}{2}}} \quad (6.35;9.9-9.13)$$

$$h/l\,culvert=\sum\xi=12.64\left(\frac{gLn^2}{D^{\frac{4}{3}}}\right)$$

$$Hd=Ho+SoLd-Hu$$

$$flow\ is\ critical\ if\ \chi\geq 2$$

$$for\ trans.\ flow\ regime$$

$$Rd<R*d-gated\ flow$$

$$Rd>R*d-pressur.\ flow$$

4. Transitional flow

$$R*d=\frac{1}{9}\left[1.75\frac{Yo-0.90}{Yo-0.64}-1\right]$$

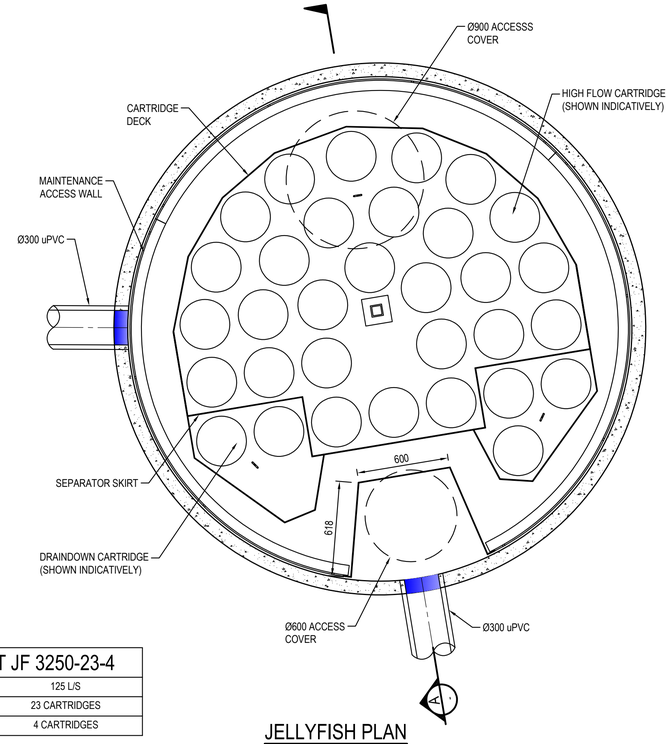
$$Rd=\frac{gL_dn^2}{D^{\frac{4}{3}}}$$

$$Q=q_d\left(gD^5\right)^{\frac{1}{2}};$$

$$gated\ flow\ q_d=0.71(Yo-0.64)^{\frac{1}{2}}$$

$$\Pr essurised\ flow\ q_d=0.94\left[\frac{Yo+j_d-1}{1+9j_d\chi_d^{-2}}\right]^{\frac{1}{2}}$$

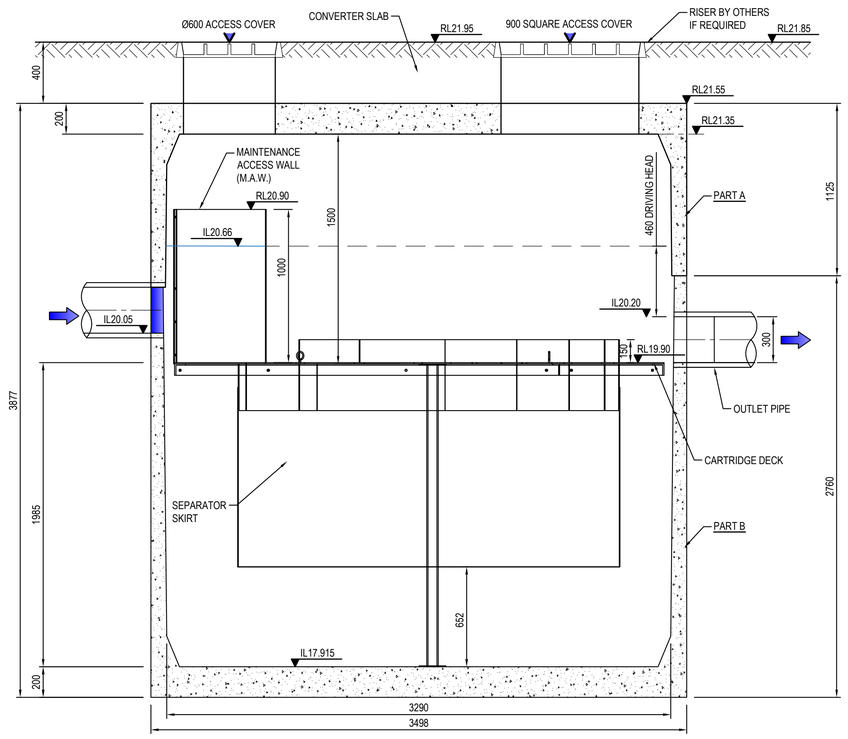
$$Yo=\frac{Ho}{D},\ j_d=So\frac{L_d}{D}$$



JELLY FISH UNIT JF 3250-23-4	
TREATABLE FLOW RATE	125 L/S
HIGH FLOW CARTRIDGES	23 CARTRIDGES
DRAINDOWN CARTRIDGES	4 CARTRIDGES

JELLYFISH PLAN

SCALE: 1:20



SECTION A
SCALE: 1:20

ISSUED FOR APPROVAL

0 400 800 1200 1600 2000mm
400 200
SCALE 1:20

SURVEY INFORMATION
SURVEYED BY LCG
DATUM: A.H.D.
ORIGIN OF LEVELS: SSM191370

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
06	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	15.05.2020					
05	ISSUED FOR COORDINATION	IK	NW	11.05.2020					
04	ISSUED FOR COORDINATION	IK	NW	08.05.2020					
03	ISSUED FOR SSDA APPROVAL ONLY	KR	NW	24.03.2020					
02	ISSUED FOR TENDER ONLY	KR	NW	24.02.2020					
01	PRELIMINARY	IK	NW	13.02.2020					

Client: ADCO CONSTRUCTIONS PTY LTD

Architect: NBRS ARCHITECTURE

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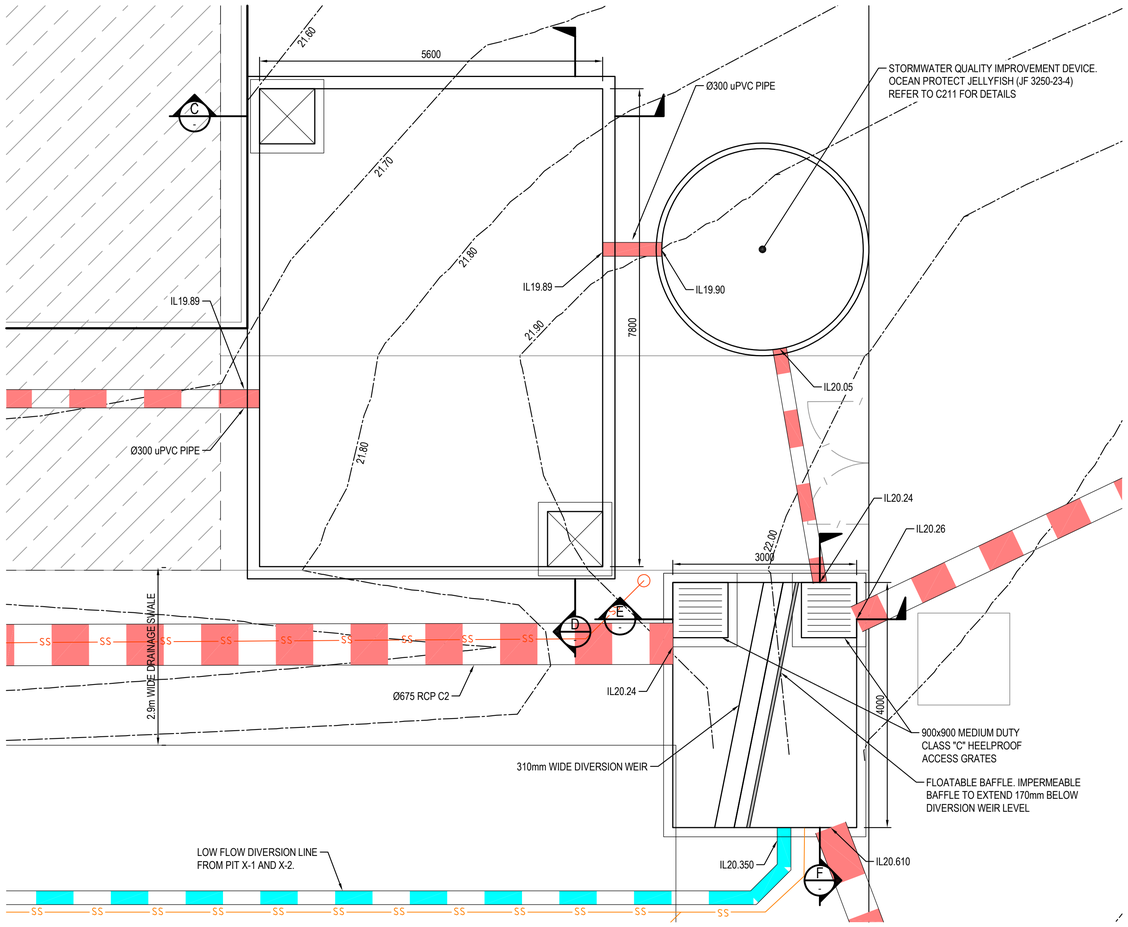
Project: MARSDEN PARK PUBLIC SCHOOL NORTHBOURNE DR MARSDEN PARK NSW

Title: JELLY FISH DETAILS AND SECTION

Drawn	Designed	Date
I.Khachab	N.Wetzlar	JUNE 2019
Checked	Approved	Scale
N.Wetzlar	A.Francis	AS NOTED

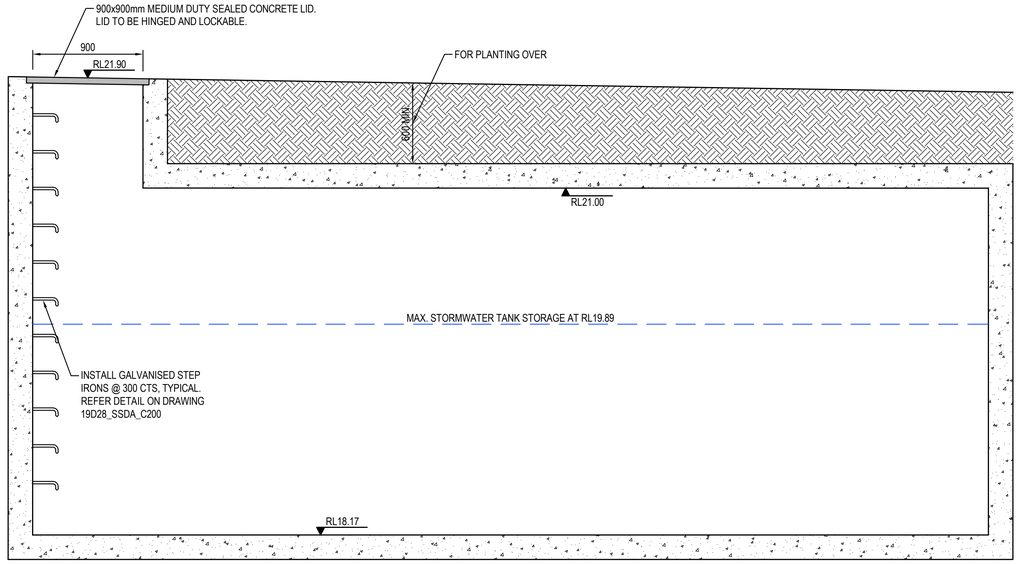
Drawing number: 19D28_SSDA_C211

Revision: 06



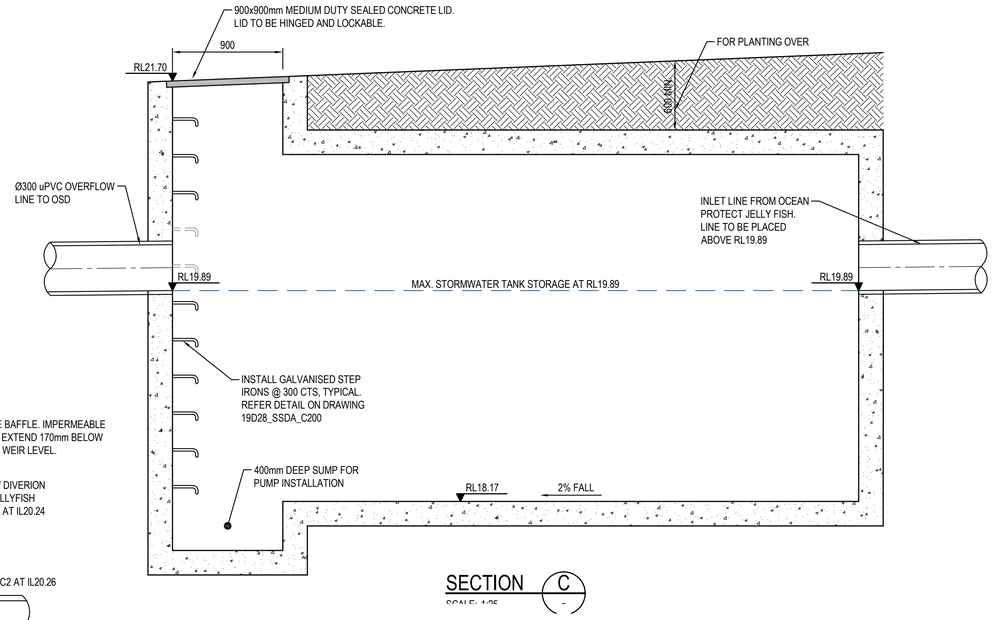
RAINWATER TANK

SCALE: 1:50



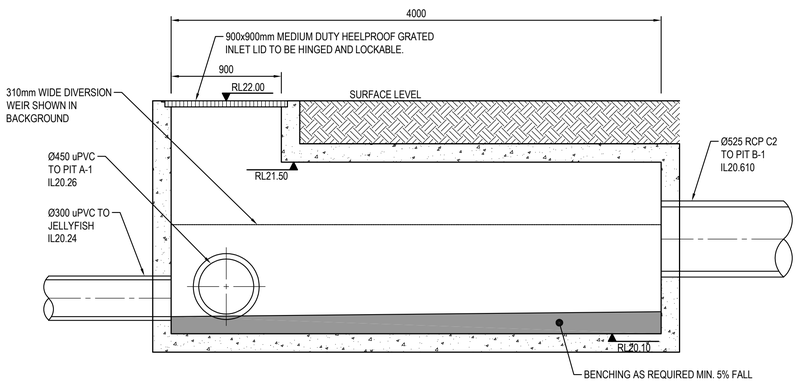
SECTION D

SCALE: 1:25



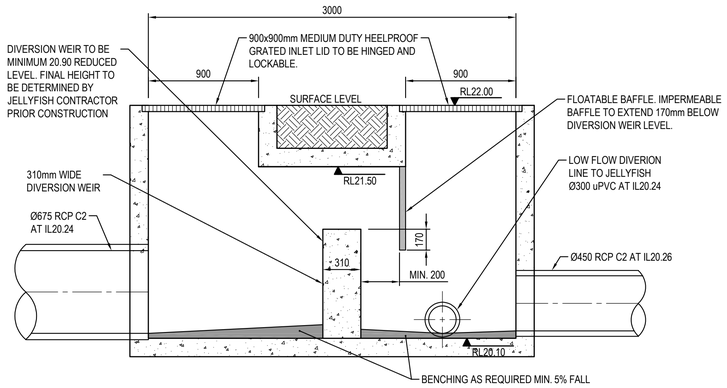
SECTION C

SCALE: 1:25



SECTION F

SCALE: 1:25



SECTION E

SCALE: 1:25

0 400 800 1200 1600 2000mm

400 200

SCALE 1:20

ISSUED FOR APPROVAL

SURVEY INFORMATION
SURVEYED BY LCG
DATUM: A.H.D.
ORIGIN OF LEVELS: SSM191370

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
04	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	15.05.2020					
03	ISSUED FOR COORDINATION	IK	NW	11.05.2020					
02	ISSUED FOR COORDINATION	IK	NW	08.05.2020					
01	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	24.03.2020					

Client
ADCO CONSTRUCTIONS PTY LTD

Architect
NBRS ARCHITECTURE

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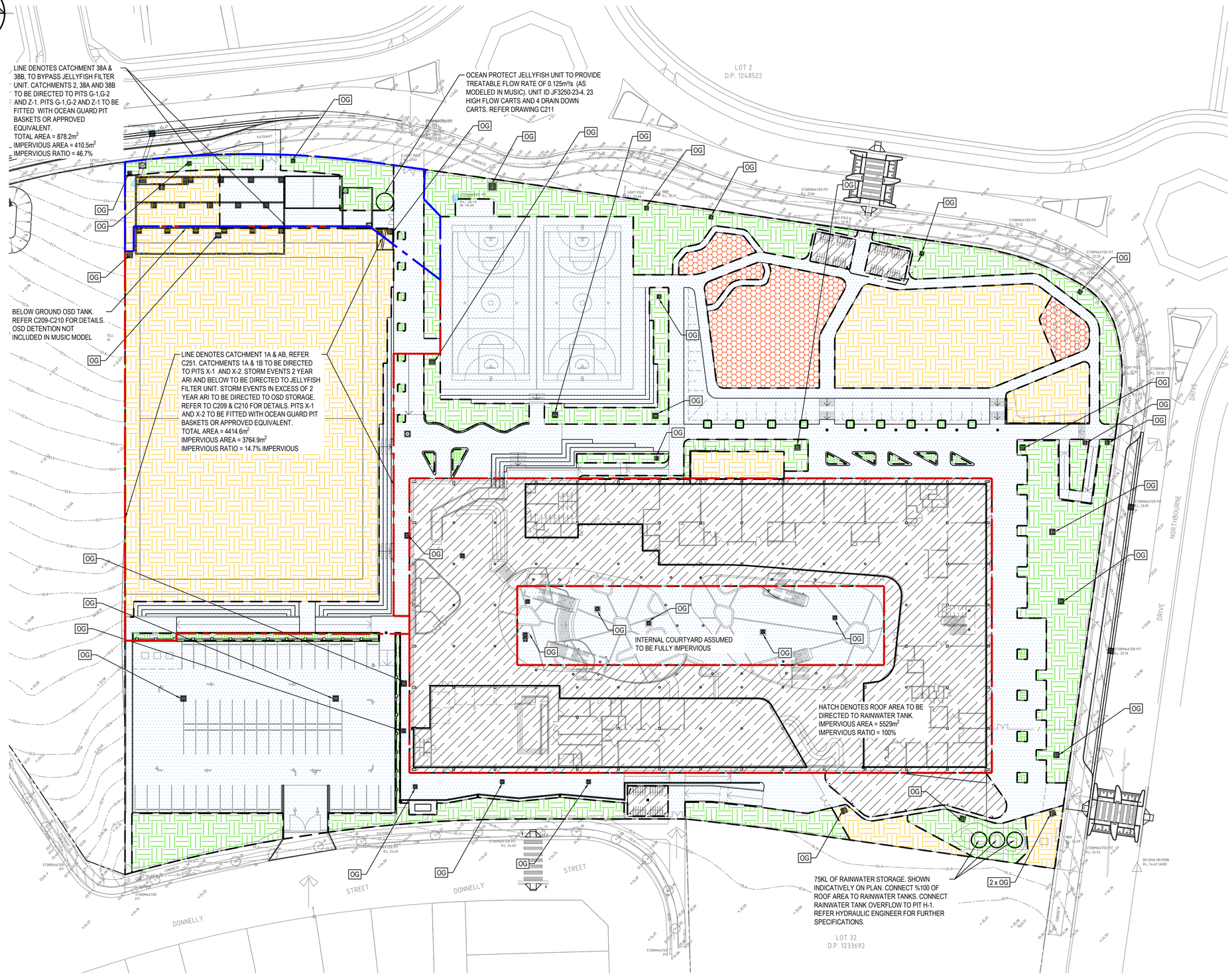
Project
MARSDEN PARK PUBLIC SCHOOL
NORTHBOURNE DR MARSDEN PARK NSW

Title
RAINWATER TANK PLAN AND SECTIONS

Drawn	Designed	Date
I.Khachab	N.Wetzlar	JUNE 2019
Checked	Approved	Scale @A1
N.Wetzlar	A.Francis	AS NOTED

Drawing number
19D28_SSDA_C212

Revision
04



CATCHMENT PLAN

SCALE 1:400

0 8 16 24 32 40m

8 6 4 2

SCALE 1:400

LEGEND

EXISTING BOUNDARY

OG — OCEAN GUARD PIT BASKET, 200 MICRON MESH PIT INSERT OR APPROVED EQUIVALENT

TOTAL SITE AREA: 23947m²

ROOF AREA
AREA= 5916m²
5529m² OF ROOF AREA DIRECTED TO RWT

IMPERVIOUS AREA
AREA= 9123m²

TOTAL PERVIOUS AREA = 8908m²

TURFED AREA
AREA= 5174m²

LANDSCAPING AREA PLANTED
AREA= 3069m²

LANDSCAPING AREA NON PLANTED
AREA= 665m²

CATCHMENT DIRECTED TO JELLYFISH SYSTEM = 18,654.2m²

1 YEAR FLOW = 0.298m³/S
3 MONTH FLOW = 0.149m³/S
TREATABLE FLOW RATE REQUIRED IN MUSIC = 0.125m³/S

CATCHMENT DIRECTED TO JELLYFISH SYSTEM (FIELD LOW FLOW DIVERSION SYSTEM) = 4414.6m²

1 YEAR FLOW = 0.042m³/S
3 MONTH FLOW = 0.021m³/S
TREATABLE FLOW RATE REQUIRED IN MUSIC = 0.125m³/S

CATCHMENT TO BYPASS JELLYFISH SYSTEM = 878.2m²

REFER TO C251 FOR CATCHMENTS

ISSUED FOR APPROVAL

SURVEY INFORMATION
SURVEYED BY RPS
DATUM: A.H.D.
ORIGIN OF LEVELS: SSM191370

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
04	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	15.05.2020
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01	ISSUED FOR TENDER ONLY	KR	NW	24.02.2020

Client: ADCO CONSTRUCTIONS PTY LTD

Architect: NBRS ARCHITECTURE

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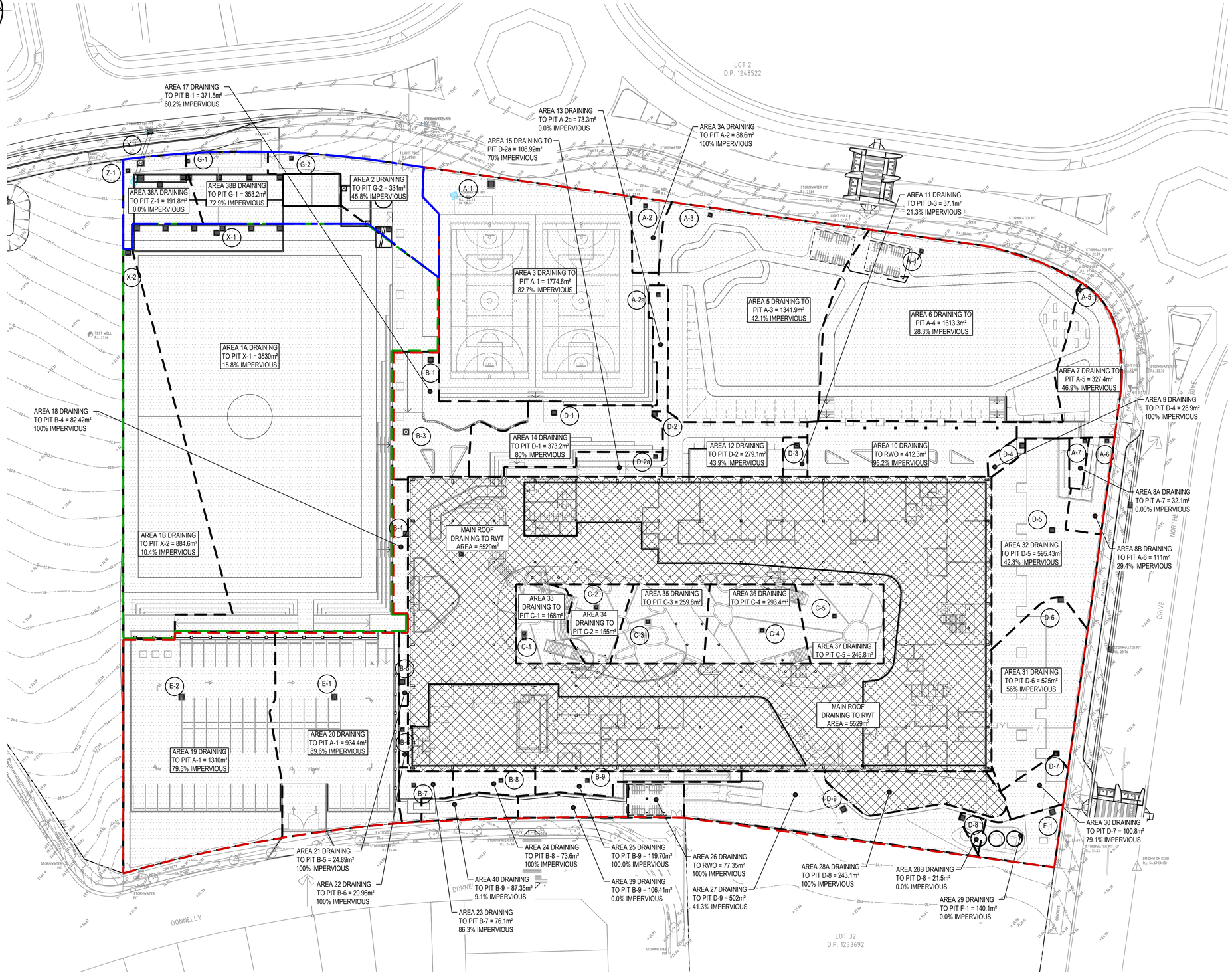
Project: MARSDEN PARK PUBLIC SCHOOL NORTHBOURNE DR MARSDEN PARK NSW

Title: CATCHMENT PLAN

Drawn	Designed	Date
I.Khachab	N.Wetzlar	JAN 2020
Checked	Approved	Scale @A1
N.Wetzlar	A.Francis	1:400

Drawing number: 19D28_SSDA_C250

Revision: 04



DETAIL CATCHMENT PLAN

SCALE 1:400

0 8 16 24 32 40m

8 6 4 2

SCALE 1:400

ROOF AREA

SURFACE DRAINAGE AREA

C1 - CATHCMENT DIRECTED TO JELLYFISH SYSTEM = 18,654.2m^2

1 YEAR FLOW = 0.298m^3/S
3 MONTH FLOW = 0.149m^3/S

C2 - CATCHMENTS DIRECTED TO JELLYFISH SYSTEM (FIELD LOW FLOW DIVERSION SYSTEM) = 4414.6m^2

1 YEAR FLOW = 0.042m^3/S
3 MONTH FLOW = 0.021m^3/S

C3 - CATCHMENT TO BYPASS JELLYFISH SYSTEM = 878.2m^2

ISSUED FOR APPROVAL

SURVEY INFORMATION
SURVEYED BY RPS
DATUM: A.H.D.
ORIGIN OF LEVELS: SSM191370

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
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Client
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Architect
NBRS ARCHITECTURE

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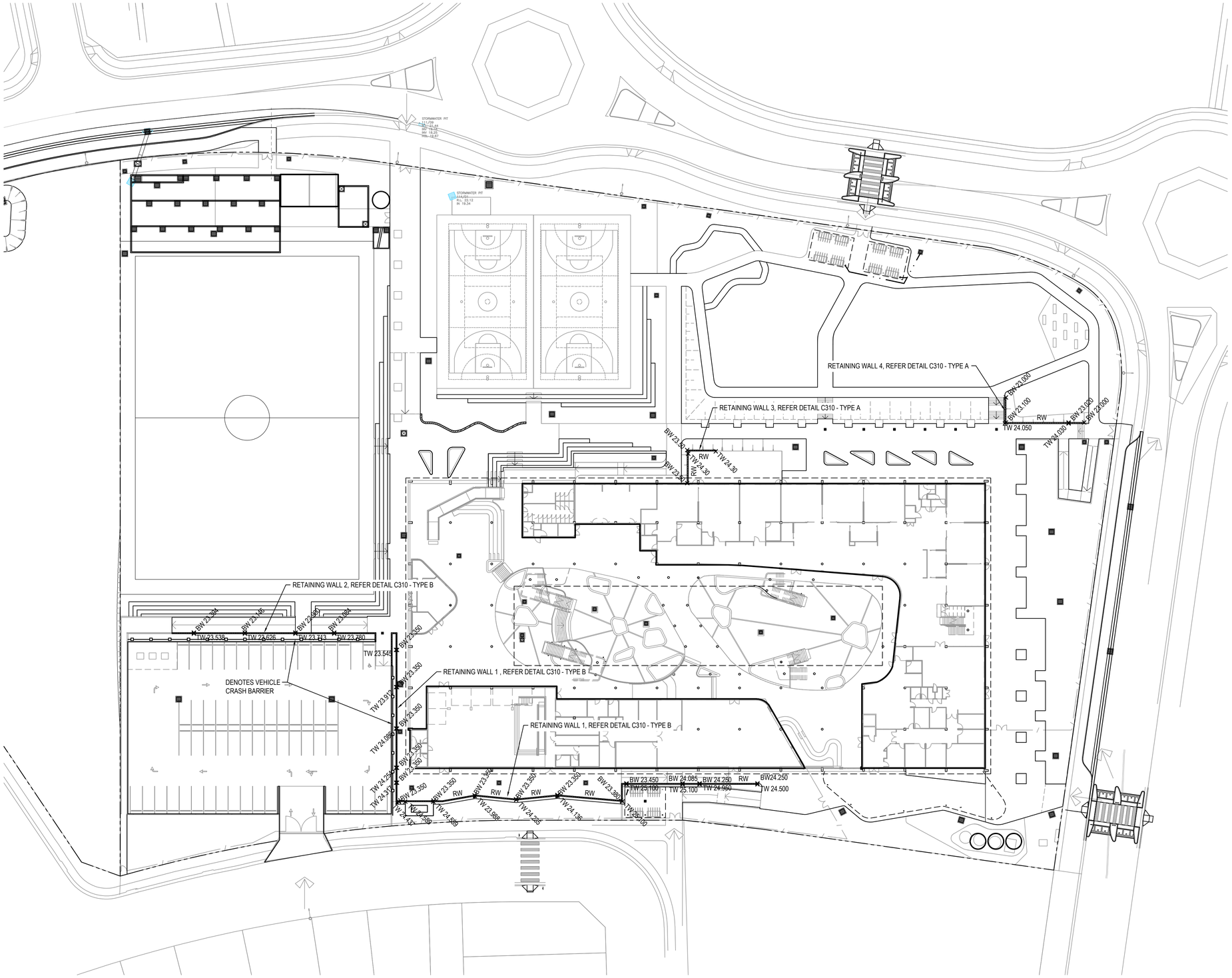
Project
MARSDEN PARK PUBLIC SCHOOL
NORTHBOURNE DR MARSDEN PARK NSW

Title
DETAIL CATCHMENT PLAN

Drawn	Designed	Date
I.Khachab	N.Wetzlar	JAN 2020
Checked	Approved	Scale @A1
N.Wetzlar	A.Francis	1:400

Drawing number 19D28_SSDA_C251

Revision 04



RETAINING WALL PLAN

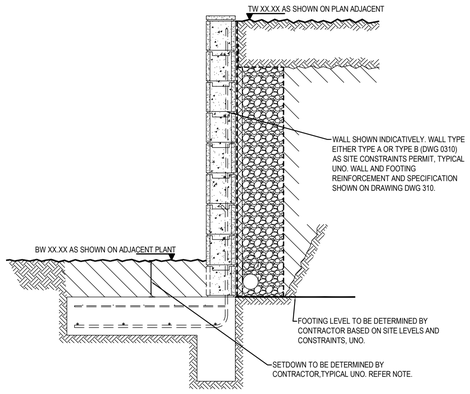
SCALE 1:400

LEGEND

RW — PROPOSED 190 BLOCK WORK RETAINING WALL

RETAINING WALLS NOTES

1. DRAINAGE SHALL BE PROVIDED AS SHOWN ON THE DRAINAGE DRAWINGS.
2. BACKFILLING SHALL BE CARRIED OUT AFTER GROUT OR CONCRETE HAS REACHED A MINIMUM STRENGTH OF 0.85fc. BACKFILLING SHALL BE APPROVED GRANULAR MATERIAL COMPACTED IN LAYERS NOT EXCEEDING 200mm TO 95% STANDARD COMPACTION UNLESS NOTED OTHERWISE.
3. PROVIDE WATERPROOFING TO BACK WALLS AS SPECIFIED OR NOTED.
4. WHERE RETAINING WALLS RELY ON CONNECTING STRUCTURAL ELEMENTS FOR STABILITY, DO NOT BACKFILL AGAINST THE WALL UNLESS IT IS ADEQUATELY PROPPED OR THE ELEMENTS HAVE BEEN CONSTRUCTED AND HAVE SUFFICIENT STRENGTH TO WITHSTAND THE LOADS.
5. FOR ALL TEMPORARY BATTERS OBTAIN GEOTECHNICAL ENGINEERS RECOMMENDATIONS.



FOOTING SETDOWN AND STEPS TO BE DETERMINED ON-SITE BY CONTRACTOR TO SUIT SITE CONDITIONS AND CONSTRAINTS. IF REQUIRED, CONTACT LANDSCAPE ARCHITECT FOR PLANTING SETDOWN ALLOWANCES AND CIVIL ENGINEER FOR PAVEMENT AND SERVICE SETDOWN ALLOWANCES.

0 8 16 24 32 40m
8 6 4 2
SCALE 1:400

ISSUED FOR APPROVAL

SURVEY INFORMATION
SURVEYED BY LCG
DATUM: A.H.D.
ORIGIN OF LEVELS: SSM191370

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
05	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	15.05.2020					
04	ISSUED FOR COORDINATION	IK	NW	08.05.2020					
03	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	24.03.2020					
02	ISSUED FOR TENDER ONLY	KR	NW	24.02.2020					
01	PRELIMINARY	IK	NW	13.02.2020					

Client
ADCO CONSTRUCTIONS PTY LTD

Architect
NBRS ARCHITECTURE

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Project
MARSDEN PARK PUBLIC SCHOOL
NORTHBOURNE DR MARSDEN PARK NSW

Title
RETAINING WALL PLAN

Drawn	Designed	Date
I.Khachab	N.Wetzlar	JAN 2020
Checked	Approved	Scale @A1
N.Wetzlar	A.Francis	1:400

Drawing number: 19D28_SSDA_C300
Revision: 05

MASONRY CONSTRUCTION:

B1 ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS3700 AND AS NOTED ON THE DRAWINGS.

B2 BRICK AND BLOCK COMPRESSIVE STRENGTH (f'uc) SHALL BE 15 MPa MINIMUM UNO. STRENGTH GRADE SHALL BE CLEARLY INDICATED ON THE DELIVERY DOCKETS.

B3 JOINT MORTAR SHALL BE OF CLASS M3 WITH 1:1:6 (CEMENT: LIME: SAND) PROPORTIONS BY VOLUME AND COMPLY WITH AS3700. MORTAR JOINTS SHALL BE 10 mm THICK AND HAVE A MAXIMUM TOOLED DEPTH OF 3 mm UNO.

B4 NON-LOAD BEARING WALLS SHALL BE SEPARATED FROM THE LOAD-BEARING ELEMENTS BY 15 mm THICK 'CANEITE' OR EXPANDED POLYSTYRENE UNO AT BOTH HORIZONTAL AND VERTICAL FACES.

NON-LOAD BEARING WALLS SHALL BE TIED TO THE SOFFITS OF BEAMS OR SLABS OVER BY USING 'MET 4-1' TIES (OR APPROVED EQUIVALENT), AT 800 mm MAX. CENTRES, UNO ON THE DRAWINGS, TO MANUFACTURER'S SPECIFICATIONS

B5 WHERE CONCRETE SLABS BEAR ON UNREINFORCED MASONRY, INCLUDING CLAY BRICKS, RENDER THE BEARING SURFACE OF THE MASONRY WALL WITH 1:3 (CEMENT : SAND) MORTAR TO ACHIEVE A LEVEL SURFACE AND PLACE A PRE-GREASED METAL SLIP JOINT PROTECTED BY 0.2 mm POLYETHYLENE SHEET TAPED TO THE FORMWORK BEFORE PLACING CONCRETE. SPECIAL DETAILS SUCH AS WATER-PROOFING MAY APPLY FOR ROOF SLABS OR SIMILARLY EXPOSED ELEMENTS.

B6 CONTROL JOINTS

1. CONTROL JOINTS SHALL BE PROVIDED IN MASONRY WALLS AS PER THE TABLE BELOW UNLESS CLOSER SPACINGS ARE SPECIFIED ELSEWHERE IN THE DOCUMENTATION.

MASONRY TYPE	LOCATION	JOINT SIZE (mm)	SPACING (m)
CONCRETE MASONRY	- EXTERNAL	10	7.0
	- EXTERNAL (WITH OPENINGS > 900mm IN HEIGHT)	10	5.0
	- INTERNAL (FACE FINISHED)	10	6.0
	- INTERNAL (RENDERED)	10	5.0
LIGHT-WEIGHT MASONRY	- INTERNAL / EXTERNAL	10	6.0
CLAY MASONRY	- INTERNAL / EXTERNAL	15	6.0 *
	- PARAPET WALLS	15	4.0

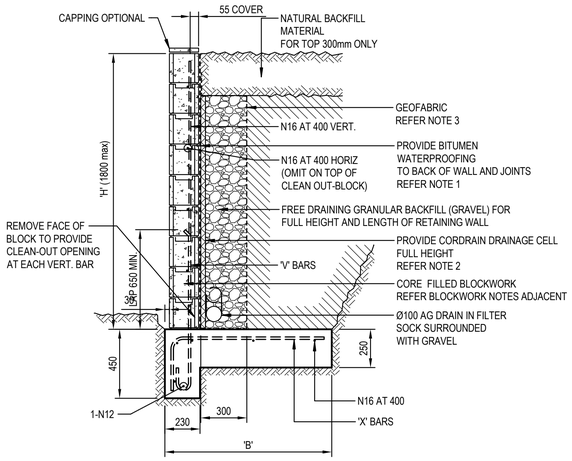
* - FOR REACTIVE ' CLASS M' SITES ONLY. REFER TABLE 4.3 OF AS3700.2011 FOR ARTICULATION JOINTS IN CLAY MASONRY.

2. CONTROL JOINTS SHALL BE PLACED AT HALF THE SPECIFIED SPACING FROM A CORNER. PROVIDE JOINTS TO MATCH JOINTS IN THE SUPPORTING STRUCTURE.
3. CONTROL JOINTS MUST BE KEPT FREE OF MORTAR AND SEALED WITH A POLYETHYLENE FOAM BACKING ROD SQUEEZED INTO THE GAP AND A GUNNED-IN MASTIC SEALANT. IF THE WALL IS TO BE FIRE-RATED, A FIRE-RATED SEALING SYSTEM WILL BE REQUIRED INSTEAD.

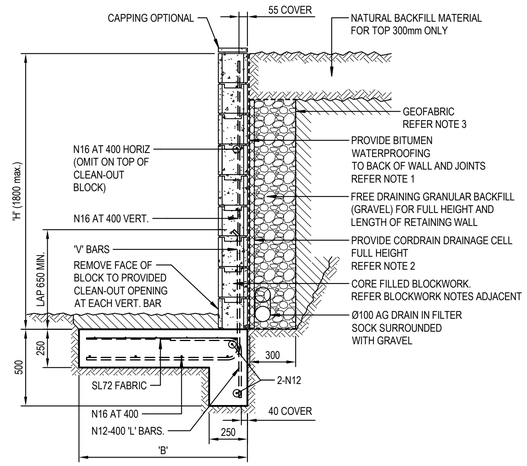
B7 BLOCKWORK

1. IN CORE-FILLED BLOCKWORK, EXCESS MORTAR PROTRUDING INTO THE CORES SHALL BE REMOVED BY RODDING AFTER EACH COURSE IS LAID. EVERY CORE FILLED WITH GROUT SHALL HAVE A CLEANOUT BLOCK IN THE BOTTOM COURSE.
2. REINFORCEMENT SHALL BE PLACED AND SECURELY TIED IN POSITION AS SHOWN ON THE DRAWINGS. STARTER BARS SHALL BE HELD IN PLACE BY TYING TO HORIZONTAL BARS AT CLEANOUT BLOCKS. PROVIDE COVER TO REINFORCEMENT AS SHOWN IN THE DETAILS.
3. CORE FILLING GROUT SHALL BE AS NOTED IN CONCRETE NOTES IN LIFTS NO MORE THAN 1200mm IN HEIGHT.

Element	Slump	Max. Agg. Size	Cement Type	Exposure Classifn.	Min. Conc. Grade (f'c) MPa U.N.O	Conc. Cover (U.N.O.)
Core Filling Grout	230±30	10	GP	-	20	-



200 SERIES BLOCK WALL - TYPE A



200 SERIES BLOCK WALL - TYPE B

RETAINING WALL SECHEDULE - TYPE A

TOTAL HEIGHT 'H' (mm)	HEIGHT OF BLOCK TYPE			'B' (mm)	'V' & 'X' BARS	'K' BARS
	150 SERIES	200 SERIES	300 SERIES			
800	800	-	-	800	N12 AT 400	-
1000	1000	-	-	900	N12 AT 400	-
1200	1200	-	-	1000	N12 AT 400	-
1400	-	1400	-	1100	N16 AT 400	-
1600	-	1600	-	1200	N16 AT 400	-
1800	-	1800	-	1400	N16 AT 400	-

NOTES:

1. ENSURE REAR FACE OF RETAINING WALL IS FULLY WATERPROOFED. USE EMER-PROOF ECOFLEX OR APPROVED EQUIVALENT IN ACCORDANCE WITH MANUFACTURERS SPECIFICATION. EG: 2 COATS min. APPLIED IN OPPOSITE DIRECTIONS AND ALLOWED TO CURE FOR 7 DAYS. (TO BE CONIRMED BY THE ARCHITECT)
2. INSTALL FULL HEIGHT DRAINAGE CELL TO REAR OF WALL, USE NYLEX CORDRAIN/18 OR APPROVED EQUIVALENT, AT 1500 CENTRES.
3. PROVIDE GEOFABRIC MATERIAL AS SEPARATION BETWEEN GRANULAR BACKFILL (GRAVEL) AND NATURAL BACKFILL MATERIAL. USE BIDIM A24 OR APPROVED EQUIVALENT.
4. MINIMUM ALLOWABLE BEARING PRESSURE AT BASE = 150 kPa

RETAINING WALL SCHEDULE - TYPE B

TOTAL HEIGHT 'H' (mm)	HEIGHT OF BLOCK TYPE		'B' (mm)	'V' & 'X' BARS	'K' BARS
	200 SERIES	300 SERIES			
800	800	-	800	N16 AT 400	-
1000	1000	-	1200	N16 AT 400	-
1200	1200	-	1500	N16 AT 400	-
1400	1400	-	1800	N16 AT 400	-
1600	1600	-	2100	N16 AT 400	-
1800	1800	-	2300	N16 AT 200	-

NOTES:

1. ENSURE REAR FACE OF RETAINING WALL IS FULLY WATERPROOFED. USE EMER-PROOF ECOFLEX OR APPROVED EQUIVALENT IN ACCORDANCE WITH MANUFACTURERS SPECIFICATION. EG: 2 COATS min. APPLIED IN OPPOSITE DIRECTIONS AND ALLOWED TO CURE FOR 7 DAYS. (TO BE CONIRMED BY THE ARCHITECT)
2. INSTALL FULL HEIGHT DRAINAGE CELL TO REAR OF WALL, USE NYLEX CORDRAIN/18 OR APPROVED EQUIVALENT, AT 1500 CENTRES.
3. PROVIDE GEOFABRIC MATERIAL AS SEPARATION BETWEEN GRANULAR BACKFILL (GRAVEL) AND NATURAL BACKFILL MATERIAL. USE BIDIM A24 OR APPROVED EQUIVALENT.
4. MINIMUM ALLOWABLE BEARING PRESSURE AT BASE = 150 kPa

0 400 800 1200 1600 2000mm
400 200
SCALE 1:20

ISSUED FOR APPROVAL

SURVEY INFORMATION
SURVEYED BY LCG
DATUM: A.H.D.
ORIGIN OF LEVELS: SSM191370

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
05	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	15.05.2020
04	ISSUED FOR COORDINATION	IK	NW	08.05.2020
03	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	24.03.2020
02	ISSUED FOR TENDER ONLY	KR	NW	24.02.2020
01	PRELIMINARY	IK	NW	13.02.2020

Client: ADCO CONSTRUCTIONS PTY LTD
Architect: NBRS ARCHITECTURE

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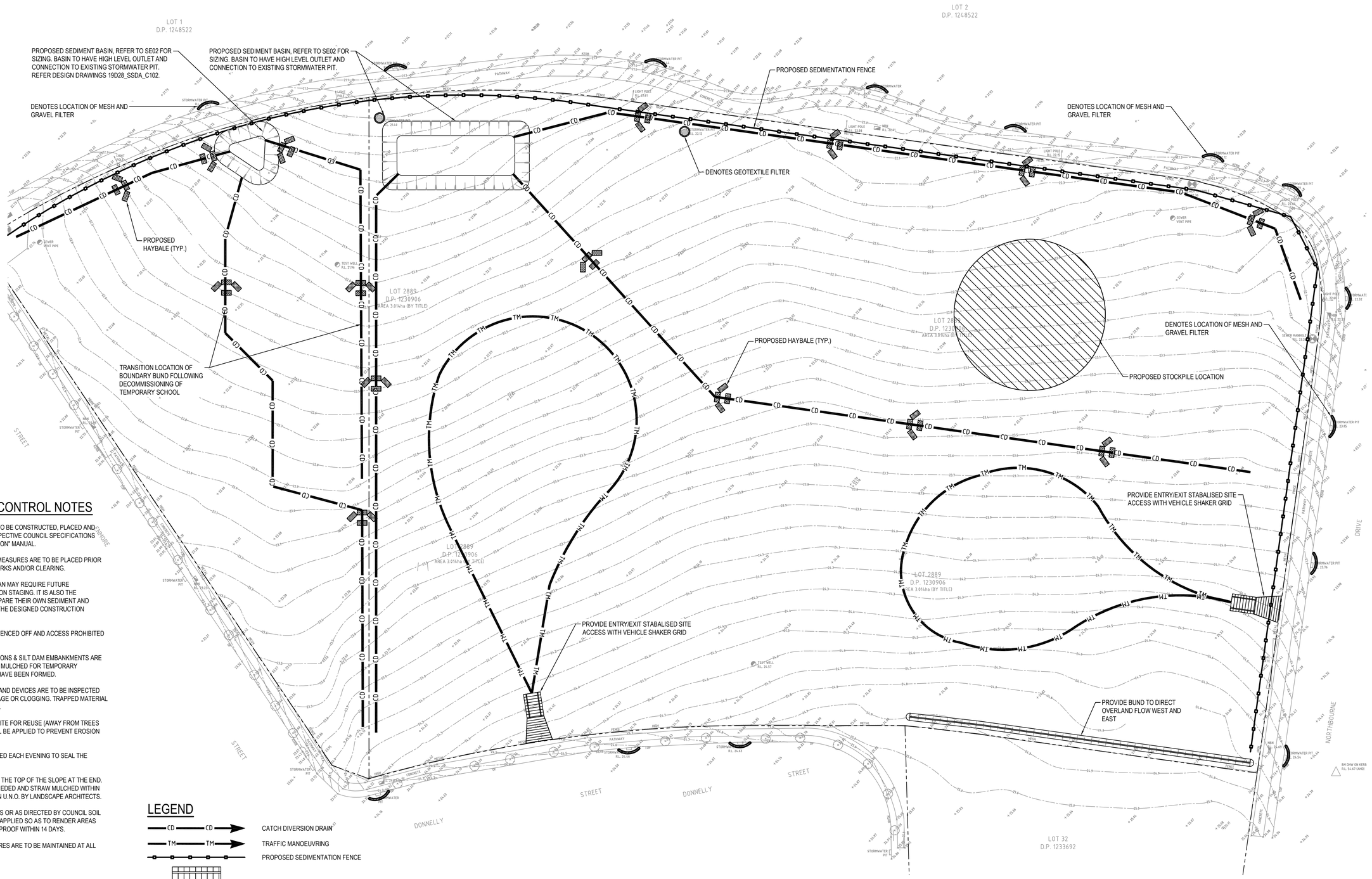
Project: MARSDEN PARK PUBLIC SCHOOL NORTHBOURNE DR MARSDEN PARK NSW
Title: RETAINING WALL DETAILS

Drawn	Designed	Date
I.Khachab	N.Wetzlar	JAN 2020
Checked	Approved	Scale @A1
N.Wetzlar	A.Francis	1:20

Drawing number: 19D28_SSDA_C310
Revision: 05



SEDIMENT & EROSION CONTROL NOTES

- ALL SEDIMENT CONTROL DEVICES ARE TO BE CONSTRUCTED, PLACED AND MAINTAINED IN ACCORDANCE WITH RESPECTIVE COUNCIL SPECIFICATIONS AND LANDCOM'S "SOIL AND CONSTRUCTION" MANUAL.
- ALL PERIMETER & SILTATION CONTROL MEASURES ARE TO BE PLACED PRIOR TO, OR AS THE FIRST STEP IN EARTH WORKS AND/OR CLEARING.
- THE SEDIMENT & EROSION CONTROL PLAN MAY REQUIRE FUTURE ADJUSTMENT TO REFLECT CONSTRUCTION STAGING. IT IS ALSO THE CONTRACTORS RESPONSIBILTY TO PREPARE THEIR OWN SEDIMENT AND EROSION CONTROL PLAN WHICH SUITS THE DESIGNED CONSTRUCTION STAGING.
- FILTRATION BUFFER ZONES ARE TO BE FENCED OFF AND ACCESS PROHIBITED TO ALL PLANT AND MACHINERY.
- ALL TEMPORARY EARTH BERMS, DIVERSIONS & SILT DAM EMBANKMENTS ARE TO BE MACHINE COMPACTED, SEEDED & MULCHED FOR TEMPORARY VEGETATION COVER AS SOON AS THEY HAVE BEEN FORMED.
- ALL SEDIMENT TRAPPING STRUCTURES AND DEVICES ARE TO BE INSPECTED AFTER STORMS FOR STRUCTURAL DAMAGE OR CLOGGING. TRAPPED MATERIAL IS TO BE REMOVED TO A SAFE LOCATION.
- ALL TOPSOIL IS TO BE STOCKPILED ON SITE FOR REUSE (AWAY FROM TREES AND DRAINAGE LINES). MEASURES SHALL BE APPLIED TO PREVENT EROSION OF THE STOCKPILES.
- ALL EARTHWORK AREAS SHALL BE ROLLED EACH EVENING TO SEAL THE EARTHWORKS.
- ALL FILLS ARE TO BE LEFT WITH A LIP AT THE TOP OF THE SLOPE AT THE END. ALL CUT AND FILL SLOPES ARE TO BE SEEDED AND STRAW MULCHED WITHIN 14 DAYS OF COMPLETION OF FORMATION U.N.O. BY LANDSCAPE ARCHITECTS.
- UPON COMPLETION OF ALL EARTHWORKS OR AS DIRECTED BY COUNCIL SOIL CONSERVATION TREATMENTS SHALL BE APPLIED SO AS TO RENDER AREAS THAT HAVE BEEN DISTURBED, EROSION PROOF WITHIN 14 DAYS.
- EROSION AND SILT PROTECTION MEASURES ARE TO BE MAINTAINED AT ALL TIMES.

LEGEND

- CD — CATCH DIVERSION DRAIN
- TM — TRAFFIC MANOEUVRING
- PROPOSED SEDIMENTATION FENCE
- PROPOSED VEHICLE SHAKER GRID
- PROPOSED STABILISED SITE ACCESS
- PROPOSED STOCKPILE LOCATION
- PROPOSED HAYBALE FILTER

SEDIMENT & EROSION CONTROL PLAN

SCALE 1:400

0 8 16 24 32 40m
8 6 4 2
SCALE 1:400

ISSUED FOR APPROVAL

SURVEY INFORMATION
SURVEYED BY LCG
DATUM: A.H.D.
ORIGIN OF LEVELS: SSM191370

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Client: ADCO CONSTRUCTIONS PTY LTD

Architect: NBRS ARCHITECTURE

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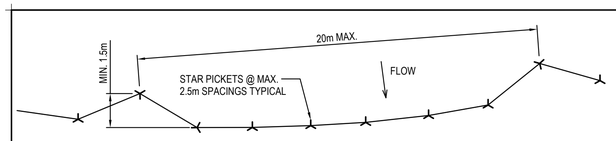
Project: MARSDEN PARK PUBLIC SCHOOL
NORTHBOURNE DR MARSDEN PARK NSW

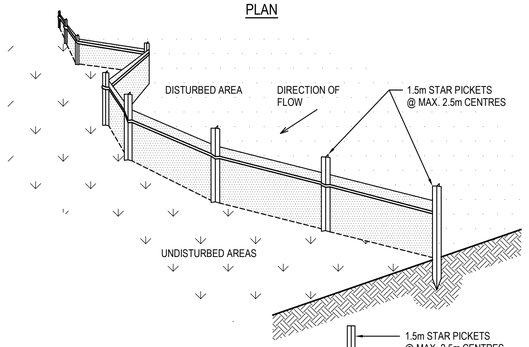
Title: SEDIMENT & EROSION CONTROL PLAN

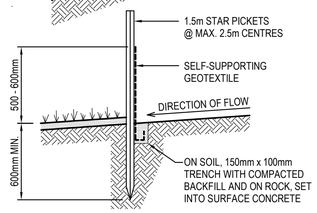
Drawn	Designed	Date
I.Khachab	N.Wetzlar	JAN 2020
Checked	Approved	Scale @A1
N.Wetzlar	A.Francis	1:400

Drawing number: 19D28_SSDA_SE01
Revision: 05



PLAN





SECTION DETAIL

SEDIMENT FENCE

N.T.S.

SEDIMENT FENCE CONSTRUCTION NOTES:

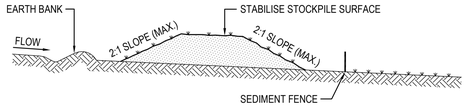
1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.

2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.

3. 3. DRIVE 1.5m LONG STAR PICKETS INTO GROUND @ 2.5m INTERVALS (MAX.) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.

4. 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. 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.



STOCKPILE CONSTRUCTION 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. WHERE THEY ARE TO BE PLACED FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED E.S.C.P. OR S.W.M.P. 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.

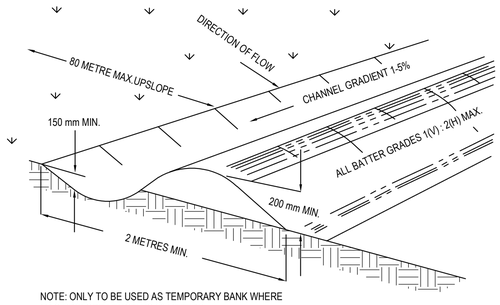
STOCKPILES

N.T.S.

CONSTRUCTION SEQUENCE

WORKS SHALL BE UNDERTAKEN IN THE FOLLOWING SEQUENCE:

1. INSTALL SEDIMENT FENCING AND CUT DRAINS TO MEET THE REQUIREMENTS OF THE SEDIMENT AND EROSION CONTROL PLAN. WASTE COLLECTION BINS SHALL BE INSTALLED ADJACENT TO SITE OFFICE.
2. CONSTRUCT STABILISED SITE ACCESS IN ACCORDANCE WITH LOCAL COUNCIL'S REQUIREMENTS.
3. REDIRECT CLEAN WATER AROUND THE CONSTRUCTION SITE.
4. INSTALL SEDIMENT CONTROL PROTECTION MEASURES AT ALL NATURAL AND MAN-MADE DRAINAGE STRUCTURES. MAINTAIN UNTIL ALL THE DISTURBED AREAS ARE STABILISED.
5. CLEAR AND STRIP THE WORK AREAS. MINIMISE THE DAMAGE TO THE GRASS AND LOW GROUND COVER OF NON-DISTURBED AREAS.
6. ANY DISTURBED AREAS, OTHER THAN BUILDING PAD AREAS, SHALL IMMEDIATELY BE COVERED WITH SITE TOPSOIL WITHIN 7 DAYS OF CLEARING. BUILDING PAD AREAS SHALL BE COVERED WITH BITUMEN EMULSION AS SPECIFIED.
7. APPLY PERMANENT STABILISATION TO SITE (LANDSCAPING).



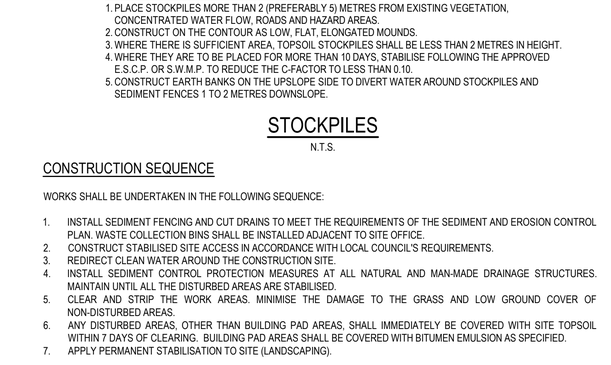
NOTE: ONLY TO BE USED AS TEMPORARY BANK WHERE MAC.UPSLOPE LENGTH IS 80 METERS.

CATCH DRAIN CONSTRUCTION NOTES:

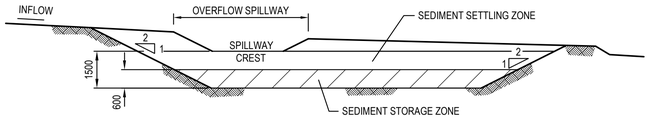
1. CONSTRUCT ALONG GRADIENT AS SPECIFIED.
2. MAXIMUM SPACING BETWEEN BANKS SHALL BE 80 METRES.
3. DRAINS TO BE OF PARABOLIC OR TRAPEZOIDAL CROSS SECTION NOT V-SHAPED.
4. EARTH BANKS TO BE ADEQUATELY COMPACTED IN ORDER TO PREVENT FAILURE.
5. CONSTRUCTION IS OF A TEMPRORARY NATURE AND SHALL BE COMPACTED AT THE END A DAYS WORK OR IMMEDIATELY PRIOR RAIN.
6. ALL OUTLETS FROM DISTURBED LANDS ARE TO FEED INTO SEDIMENT BASIN OR SIMILAR.
7. DISCHARGE RUNOFF COLLECTED FROM UNDISTURBED LANDS ONTO EITHER A STABILISED OR AN UNDISTURBED DISPOSAL AISTE WITHIN THE SAME SUBCATCHMENT AREA FROM WHICH THE WATER ORIGINATED.
8. COMPACT WITH A SUITABLE IMPLEMENT IN SITUATIONS WHERE THEY ARE REQUIRED TO FUNCTION FOR MORE THAN FIVE DAYS.
9. EARTH BANKS TO BE FREE OF PROJECTIONS OR OTHER IRREGULARITIES THAT WILL IMPEDE NORMAL FLOW.

CATCH DRAINS

N.T.S.



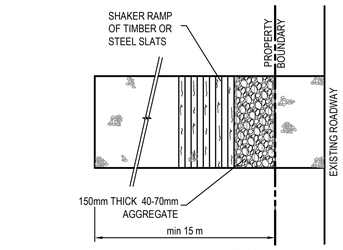
PERSPECTIVE VIEW



TYPICAL SECTION

TYPE 'D' & 'F' SEDIMENTATION BASIN

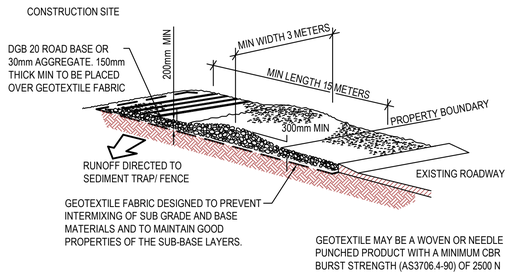
N.T.S.



PLAN

STABILISED SITE ACCESS WITH SHAKER RAMP

N.T.S.

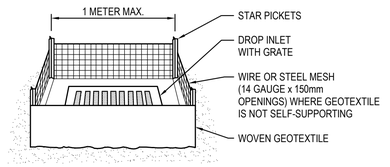


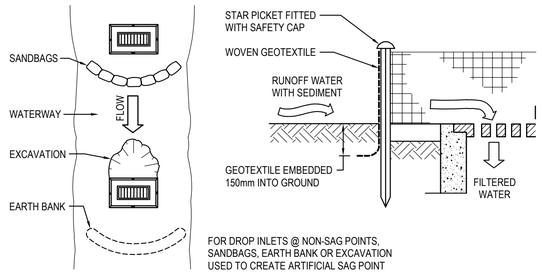
STABILISED SITE ACCESS WITH SHAKER RAMP

N.T.S.

NOTES:

1. THIS DEVICE IS TO BE LOCATED AT ALL EXITS FROM CONSTRUCTION SITE.
2. THIS DEVICE IS TO BE REGULARLY CLEANED OF DEPOSITED MATERIAL SO AS TO MAINTAIN A 50mm DEEP SPACE BETWEEN PLANKS.
3. ANY UNSEALED ROAD BETWEEN THIS DEVICE AND NEAREST ROADWAY IS TO BE TOPPED WITH 100mm THICK 40-70mm SIZE AGGREGATE.
4. ALTERNATIVELY, THREE(3) PRECAST CONCRETE CATTLE GRIDS (AS MANUFACTURED BY "HUMES CONCRETE MAY BE USED. 1, 2 & 3 ABOVE ALSO APPLY.



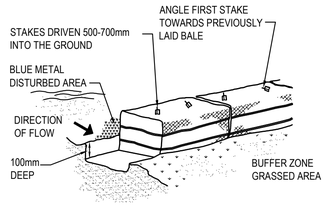


GEOTEXTILE INLET FILTER CONSTRUCTION NOTES:

1. FABRICATE A SEDIMENT BARRIER MADE FROM GEOTEXTILE.
2. PICKET SPACING TO BE MAXIMUM 1.0m.
3. IN WATERWAYS, ARTIFICIAL SAG POINTS CAN BE CREATED WITH SANDBAGS OR EARTH BANKS AS SHOWN IN THE DRAWING.
4. DO NOT COVER THE INLET WITH GEOTEXTILES UNLESS THE DESIGN IS ADEQUATE TO ALLOW FOR ALL WATERS TO BYPASS IT.

GEOTEXTILE INLET FILTER

N.T.S.



HAYBALE BARRIERS

N.T.S.

SEDIMENT BASIN SIZING

1. THE SEDIMENT BASIN SHALL BE CONSTRUCTED ON A RATE PER HECTARE BASIS AND HAS BEEN IN ACCORDANCE WITH THE REQUIREMENTS OF THE LANDCOM MANUAL "MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION", FOR SEDIMENTATION **TYPE D** SOILS. THE DISTURBED AREA WITHIN THIS CATCHMENT AT ANY ONE TIME SHOULD BE LIMITED TO AN AREA FOR WHICH EACH SEDIMENT BASIN CAN HANDLE. EACH BASIN SHALL BE SIZED IN ACCORDANCE WITH THE TABLE BELOW.

SEDIMENT BASIN SIZING TYPE D SOILS	
VOLUMETRIC RUNOFF COEFFICIENT, CV	0.25 (APPENDIX F - TABLE F2)
75TH PERCENTILE 5 DAY TOTAL RAINFALL DEPTH, R	19.00 mm
CATCHMENT AREA, A	1 Ha (UNIT AREA)
SETTLING ZONE VOLUME (PER HECTARE) 10 CV A R	47.50 m^3
DISTURBED CATCHMENT AREA	1 Ha (UNIT AREA)
R K LS P C	110.87 m^3
SEDIMENT ZONE VOLUME (0.17 A (R K LS P C)/1.3	14.5m^3 < 50% SETTLING VOL.ADOPT 48.3 m^3 PER HECTARE
TOTAL SEDIMENT BASIN VOLUME REQUIRED :	71.25 m^3/Ha

* (LANDCOM MANAGING URBAN STORMWATER MANUAL REFERENCE)

2. THE FOLLOWING DESIGN PARAMETERS HAVE BEEN ASSESSED FOR THE SITE:

CONSTRAINT	VALUE	(SOURCE)*
RAINFALL EROSIVITY (R-FACTOR)	2350	APPENDIX B
LENGTH/SLOPE GRADIENT FACTOR, LS	0.955	APPENDIX A - TABLE A1
SOIL ERODIBILITY (K-FACTOR)	0.038	(ASSUMED BASED ON SOIL TYPE)
EROSION CONTROL PRACTICE FACTOR (P-FACTOR)	1.3 (COMPACTED)	APPENDIX A - TABLE A2
COVER FACTOR (C-FACTOR)	1.0 (DURING EARTHWORKS)	APPENDIX A - FIGURE A5
CALCULATED SOIL LOSS, A (RUSLE EQUATION)	110.87 t/Ha/YR	A = R K LS P C
SOIL HYDROLOGIC GROUP	GROUP C	(ASSUMED BASED ON SOIL TYPE)
SEDIMENT TYPE	TYPE D	(ASSUMED BASED ON SOIL TYPE)
75TH PERCENTILE 5-DAY RAINFALL EVENT	19.0 mm (BLACKTOWN)	TABLE 6.3A

* (LANDCOM MANAGING URBAN STORMWATER MANUAL REFERENCE)

BASIN MANAGEMENT

1. THE CAPTURED STORMWATER IN THE SETTLING ZONE SHOULD BE DRAINED TO MEET THE MINIMUM STORAGE CAPACITY REQUIRED WITHIN A FIVE (5) DAY PERIOD FOLLOWING RAINFALL, PROVIDED THE ACCEPTABLE WATER QUALITY (NFR) AND TURBIDITY HAVE BEEN ACHIEVED.

2. CHEMICAL FLOCCULENT SUCH AS GYPSUM MAY BE DOSED TO AID SETTLING WITHIN 24 HOURS OF CONCLUSION OF EACH STORM. THE APPLIED DOSING RATES SHOULD ACHIEVE THE TARGET QUALITY WITHIN 36 TO 72 HOURS OF THE STORM EVENT.

3. INSPECT THE SEDIMENT BASINS AFTER EACH RAINFALL EVENT AND/OR WEEKLY. ENSURE THAT ALL SEDIMENT IS REMOVED ONCE THE SEDIMENT STORAGE ZONE IS FULL (REFER TO PEGS INSTALLED IN BASINS IN ACCORDANCE WITH THE SWMP). ENSURE THAT OUTLET AND EMERGENCY SPILLWAY WORKS ARE MAINTAINED IN A FULLY OPERATIONAL CONDITION AT ALL TIMES.

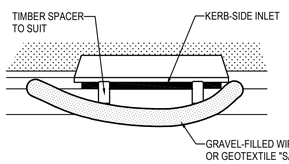
SOWING SEASON	SEED MIX
AUTUMN/WINTER	OATS@40KG/Ha + JAPANESE MILLET@10kg/Ha
SPRING/SUMMER	OATS@20kg/Ha + JAPANESE MILLET@20kg/Ha

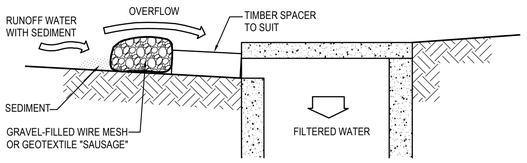
NOTE : THESE PLANT SPECIES ARE FOR TEMPORARY REVEGETATION ONLY. THEY WILL ONLY PROVIDE PROTECTION FROM EROSION FOR SIX MONTHS. WHERE THE LOTS ARE TO BE LEFT UNDEVELOPED FOR A LONGER PERIOD, THE CONTRACTOR SHALL SEEK ADVICE FROM THE SITE SUPERINTENDENT AS TO MORE APPROPRIATE REVEGETATION METHODS.

REVEGETATION IN ACCORDANCE WITH THE ABOVE TABLE WILL BE ENHANCED BY ADDING LIME AT A RATE OF 4kg/TONNE OF TOPSOIL AND 7.5kg/TONNE OF SUBSOIL.

4. THE LONG TERM GROUND COVER FACTORS FOR THE CONSTRUCTION WORKS IS NOT TO EXCEED THE FOLLOWING LIMITS:

LAND	MAXIMUM C-FACTOR	REMARKS
WATERWAYS AND OTHER AREAS OF CONCENTRATED FLOWS, POST CONSTRUCTION	0.05	APPLIES AFTER TEN WORKING DAYS OF COMPLETION OF FORMATION AND BEFORE CONCENTRATED FLOWS ARE APPLIED. FOOT AND VEHICULAR TRAFFIC IS PROHIBITED IN THIS AREA AND 70% GROUND COVER IS REQUIRED.
STOCKPILES, POST CONSTRUCTION	0.10	APPLIES AFTER TEN WORKING DAYS FROM COMPLETION OF FORMATION. 60% GROUND COVER IS REQUIRED.
ALL LANDS, INCLUDING WATERWAYS AND STOCKPILES, DURING CONSTRUCTION.	0.15	APPLIES AFTER 20 DAYS OF INACTIVITY, EVEN THOUGH WORKS MAY BE INCOMPLETE. 50% GROUND COVER IS REQUIRED.





MESH & GRAVEL INLET FILTER CONSTRUCTION NOTES:

1. 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.
2. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH x 400mm WIDE.
3. PLACE THE FILTER AT THE OPENING LEAVING AT LEAST A 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
4. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
5. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY CAN FIRMLY ABUT EACH OTHER AND SEDIMENT / LADEN WATERS CANNOT PASS BETWEEN.

MESH & GRAVEL INLET FILTER

N.T.S.

ISSUED FOR APPROVAL

SURVEY INFORMATION
SURVEYED BY LCG
DATUM: A.H.D.
ORIGIN OF LEVELS: SSM191370

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
05	ISSUED FOR SSDA APPROVAL ONLY	IK	NW	15.05.2020					
04	ISSUED FOR COORDINATION	IK	NW	08.05.2020					
03	ISSUED FOR SSDA APPROVAL ONLY	KR	NW	24.03.2020					
02	ISSUED FOR TENDER ONLY	KR	NW	24.02.2020					
01	PRELIMINARY	IK	NW	13.02.2020					

Client: ADCO CONSTRUCTIONS PTY LTD

Architect: NBRS ARCHITECTURE

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Project: MARSDEN PARK PUBLIC SCHOOL
NORTHBOURNE DR MARSDEN PARK NSW

Title: SEDIMENT & EROSION CONTROL TYPICAL SECTIONS & DETAILS

Drawn	Designed	Date
I.Khachab	N.Wetzlar	JAN 2020
Checked	Approved	Scale @A1
N.Wetzlar	A.Francis	N.T.S.

Drawing number: 19D28_SSDA_SE02
Revision: 05