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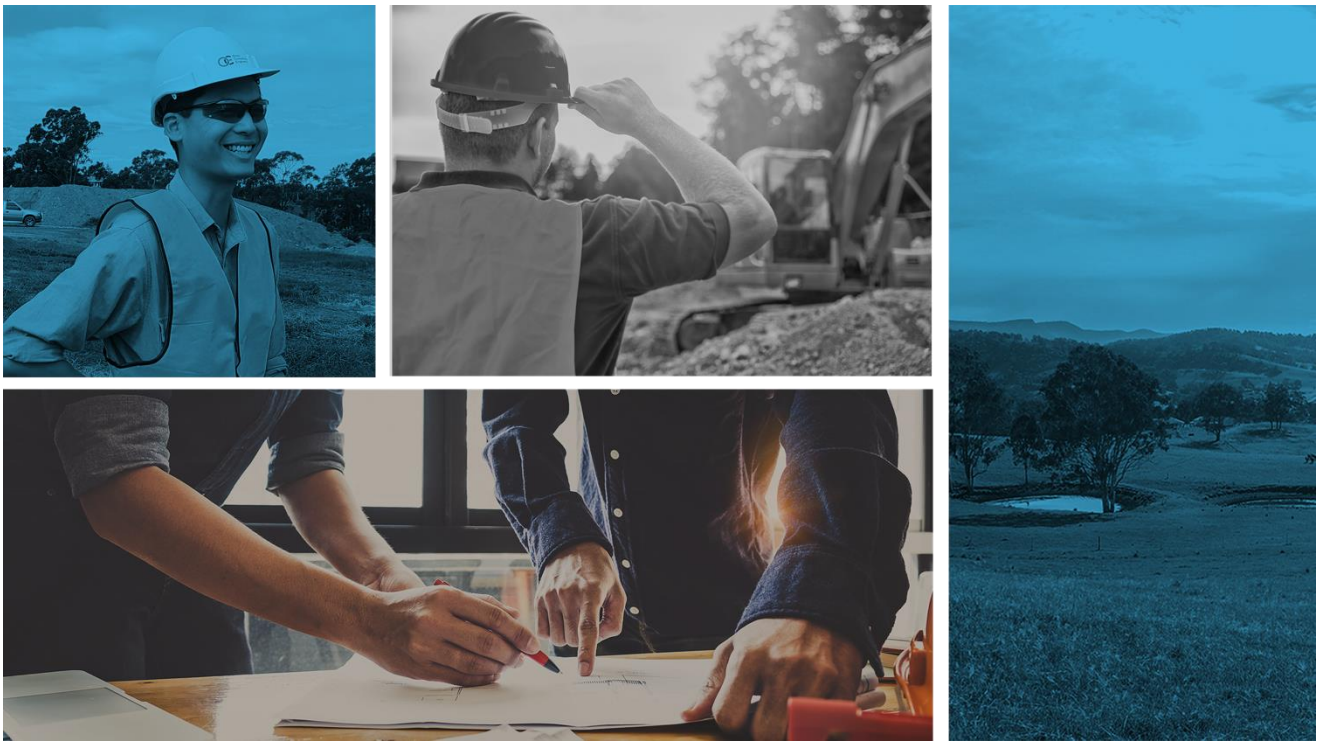
Stormwater Management Report

971 Richmond Road
Marsden Park, NSW
For Development Application



August 2021 | For iDream Property | Revision E

Commercial in Confidence

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Document Control

Revision	Prepared	Reviewed	Approved	Date	Description	Project Reference
E	Sravan Akkala	Mariano Polisciuk	Mariano Polisciuk	28.07.21	Issued to address Clients Comment	19-0035
D	Sravan Akkala	Mariano Polisciuk	Mariano Polisciuk	28.07.21	Issued to address Council Comment	19-0035
C	Sravan Akkala	Marie Crisafulli		31.05.21	Issued to address SOFAC Comment	19-0035
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A	Marie Crisafulli	Mariano Polisciuk	Mariano Polisciuk	19.08.20	Issued for Development Application	19-0035

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Executive Summary

Orion Consulting has been engaged by iDream Property through Architex to prepare Civil Engineering Plans and an accompanying Stormwater Management to support the Development Application for a mixed-use development located at 971 Richmond Road, Marsden Park NSW. The site incorporates both B4 - Mixed Use and R3 - Medium Density Residential zoning. The southern portion of the site also has a Transport Corridor overlay.

This report outlines the site-specific strategy for managing the stormwater quantity and quality to achieve the requirements and targets set out in the Marsden Park Development Control Plan.

Based on Council's initial review and comments provided on the 8 October 2020, the stormwater management strategy for the site has been amended to cater for both the interim and ultimate development scenarios.

The development is for six (6) mixed-use flat buildings to be located on the allotments on the western side of the site with a future residential subdivision proposed for the east. The amended application removes the subdivision of the individual residential lots and will remain as a superlot for the foreseeable future.

In the ultimate scenario, each superlot site is required to treat run-off generated from within its individual property boundary through water sensitive urban design. Each site will utilise a combination of water quality treatment devices in a specific treatment train. The proposed devices include rainwater tanks for non-potable water re-use, trash baskets (Ocean Protect 'OceanGuard') and a water treatment tank incorporating filter cartridges (Ocean Protect 'StormFilter'). Ultimately, the stormwater run-off from public roads in both the B4 and R3 zoned areas will be treated by a regional basin for both water quality and detention targets. Until the regional basin is established and downstream stormwater connections are in place, it is proposed that these catchments will be treated in an interim basin for both on-site detention and water quality on the eastern side of the site.

1 Introduction

Orion Consulting has been engaged by iDream Property through Architex to prepare Civil Engineering Plans and an accompanying Stormwater Management Strategy to support the Development Application for a multi-use development located at 971 Richmond Road, Marsden Park NSW.

This report outlines the site-specific strategy for managing the stormwater quantity and quality to achieve the requirements and targets set out in the Marsden Park Development Control Plan and in accordance with Blacktown City Council WSUD Developer Handbook.

1.1 Site Description

The proposed development is located over the property Lot 13 DP 1190560, 971 Richmond Road, Marsden Park, and local street is to be constructed over Lot 11 DP 193074 to provide access from Grange Avenue. The site is within the Blacktown City Council Local Government Area (LGA) and is part of the Marsden Park Precinct within the North-West Growth Centre. The existing boundary extents is shown in the figure below:

Figure 1 – Existing Boundary Extent - 971 Richmond Road, Marsden Park (Imagery courtesy of Nearmap ©)

The property is zoned B4 (Mixed Use) and R3 Medium Density Residential under the State Environmental Planning Policy (Sydney Regional Growth Centre) 2006 with a Special Provision Transport Corridor at the southern portion of the property.

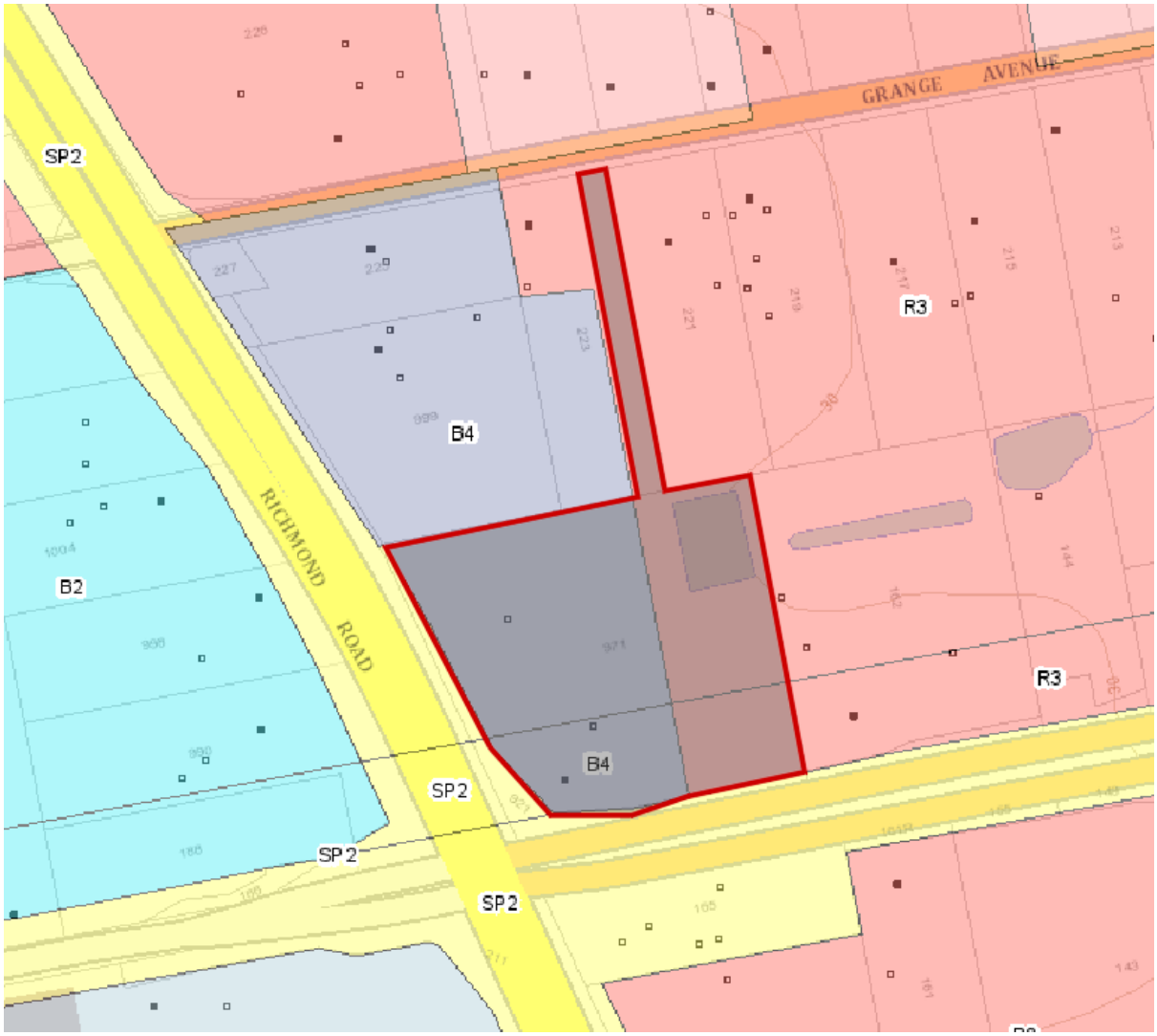


Figure 2 – Land Zoning Map, Blacktown Local Environment Plan Amendment (SRGC – North West Growth Centre)

The property is bound by Richmond Road to the west, South Street to the south and private properties to the north and east. A development consent (Council reference: DA-15-02765) over Lot 11 and 12 DP 1190560 (999 Richmond Road) to the north has been granted. Orion has amended the engineering design and stormwater strategy to include road connecting proposed development to Grange Ave and cater for the approved design over the northern property and to ensure the road design and pipe network ties in.

The existing terrain within the property consists of moderate grades of 2% to 3% and generally falls from west to north-easterly direction towards an existing farm dam located at the north-eastern property boundary. The decommissioning and filling of the existing farm dam forms part of the Development Application.

1.2 The Proposed Development

The development will involve the subdivision of the existing property and construction of:

- New public roads and stormwater drainage infrastructure
- Permanent access from Grange Avenue
- Six (6) mixed-use flat buildings compromising of a child-care facility, a gym, retail areas, residential units and basement parking over Lot 1
- A superlot development over the R3 zoned portion, eventually being subdivided (not part of this proposal)
- Associated service reticulation and augmentation
- A temporary basin to cater for on-site detention and water quality requirements in the interim scenario

A site plan over the building development is shown below.

Figure 3 – Lot 1 Ground/Level 1 Plan by Architex (Revision D dated 15 July 2021)

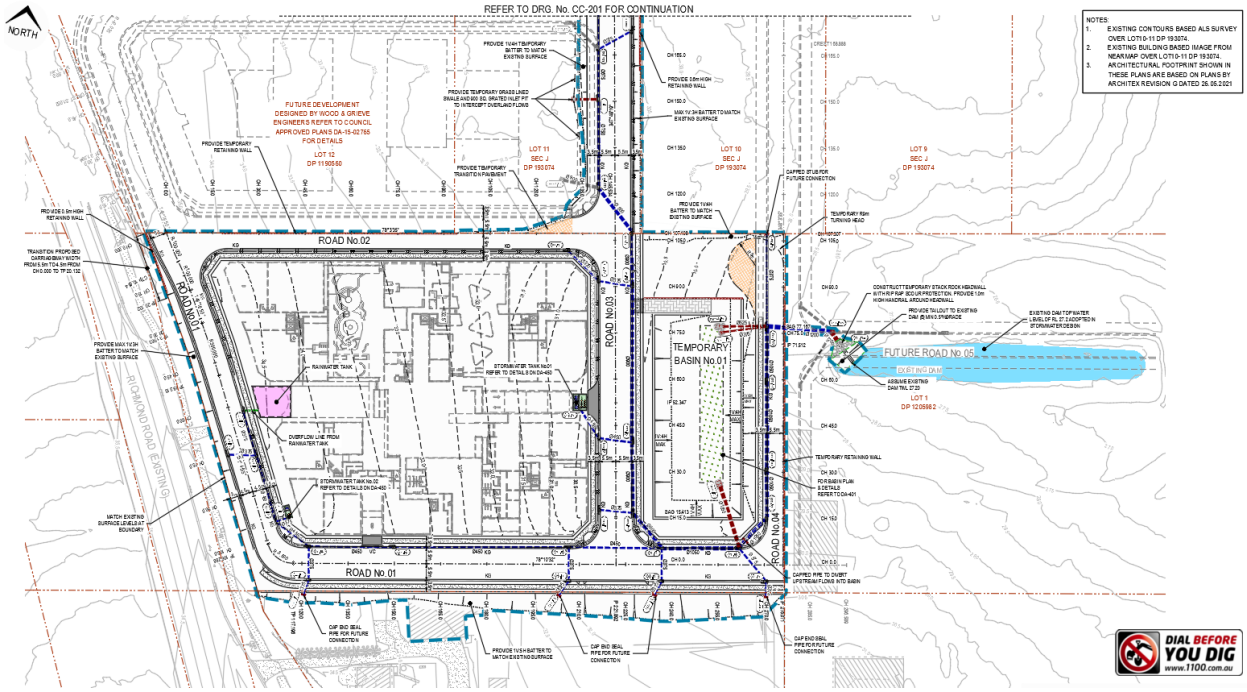


Figure 4 – Engineering Plan by Orion (Refer Sheet 200 and 201 in Revision C plans)

A portion of the site toward the southern boundary covered under the Special Provision Transport Corridor will remain undeveloped.

1.3 Stormwater Management Objectives

The Integrated Water Cycle Management (IWCM) strategy for the Marsden Park Release Area was developed by J Wyndham Prince (JWP) in 2010, with the precinct wide stormwater management objectives adopted under the Marsden Park Development Control Plan.

This stormwater strategy also considers compliance with the Blacktown City Council Water Sensitive Urban Design (WSUD) Developer Handbook (the Handbook), which further highlights the required objectives for

- Water Quality
- Stream Erosion Index and
- On-Site Detention
- Water conservation strategy

2 Water Quality Design

2.1 Water Quality Controls

Under the Marsden Park IWCM Strategy, regional basins will be constructed throughout the growth centre to manage water quantity through on-site detention. The regional basins will also incorporate some water quality treatment measures to manage pollutants generated within the public domain. Each private allotment will be required to implement on-site treatment to achieve the pollutant reduction targets set out by the development controls. These targets are shown below:

Pollutant	% Post Development Pollutant Reduction Targets
Gross Pollutants (GP)	90
Total Suspended Solids (TSS)	85
Total Phosphorous (TP)	65
Total Nitrogen (TN)	45

Table 1 - Required Pollutant Reduction Targets

2.2 Water Quality Design - Catchment Areas

2.2.1 Ultimate Scenario

Two land zonings are applicable on the development, B4 - Mixed Use and R3 - Medium Density Residential. The B4 zoning has been analysed as 100% impervious as per Council Engineering Guidelines. An overall catchment plan for the ultimate catchment breakdown is included in **Error! Reference source not found.**.

Whilst not forming part of the amended application, the R3 development has been incorporated into the ultimate water quality design and MUSIC model for completeness. The R3 superlot has separated into sub-catchments consisting of roof areas, landscaping (pervious), paving (impervious), roads/driveways.

The proportions used to split the R3 superlot into smaller sub-catchments below:

- 60% roof area
- 10% residential driveway
- 15% landscaping - pervious
- 15% landscaping - impervious only

The sub-catchment breakdown is summarised in Table 2.

Development Area (Lots Only)	Roof (m^2)	Landscaping - Pervious (m^2)	Impervious - Paving (m^2)	Driveway (m^2)	Total (m^2)
R3 - Medium Density Residential (Superlot)	2120	530	530	353	3533

Table 2 –R3 Lots Sub-Catchment breakdown

Development Area (Lots Only)	Total Roof (m^2)	Landscaping - Pervious (m^2)	Impervious - Paving (m^2)	Total (m^2)
B4 - Mixed Use	5310	1147	3229	9686

Table 3–B4 Lots Catchment breakdown

Developed catchments over the proposed public road reserve areas have been excluded from this design as these flows will be treated in the raingarden located in a downstream regional basin when the filter media is ultimately installed.

2.2.2 Interim Scenario

Until such a time the regional basin comes online, the development must still achieve the pollutant reduction targets set out under the Marsden Park DCP. The catchments considered in this scenario also include the public domain in addition to the lots above. The public road areas considered in the interim scenario are shown in the table below.

Land Zoning Area (Road Only)	Roads (m^2)	Roads Bypass (m^2)	Total (m^2)
B4 - Mixed Use	5806	0	5806
R3 - Medium Density Residential	1655	1140	2795

Table 4 – Public Domain Catchments

The R3 zoned superlot has been modelled with a 50% fraction impervious 'mixed use' in this scenario as the R3 subdivision has been excluded from the application.

2.3 MUSIC Modelling

The software program MUSIC and MUSIC link for Blacktown City Council was used to develop a site-specific water quality treatment train that would satisfy the pollutant reduction targets for both the interim and ultimate scenarios. The MUSIC model was set up in conjunction with Ocean Protect using Council approved treatment nodes.

2.4 Permanent On-lot Water Quality Treatment Devices

Three separate treatment trains to service the north and south sites in the B4 zone have been developed as per Council comment. The devices adopted in the water quality treatment trains proposed consist of a combination of rainwater re-use tanks, proprietary treatment devices such as 'OceanGuard' and tanks containing 'StormFilter' cartridges and L2 Ocean guards by Ocean Protect.

The general treatment train for the B4 zones is as follows:

- The roof area from the buildings will be directed into a rainwater tank for re-use except for buildings B and D which will be directed to Stormwater Treatment Tank No.01
- 50% of the roof area from the dwellings proposed on the R3 portion of the development will be directed into a rainwater tank for re-use
- Flows from ground areas will be directed towards stormwater treatment tanks incorporating OceanGuards and Stormfilter cartridges
- Overflow from the rainwater tank will be piped directly into the stormwater pipe network
- All flows passing through OceanGuard treatments will eventually drain into a treatment tank containing StormFilter cartridges, with outflows then directed into the public stormwater network.

A summary of devices and sizes of treatment devices for each allotment is summarised below:

	Treatment Device					
Development Area	**Rainwater tank size (kL)**	**Total No. of OceanGuards**	**Type of OceanGuards**	**StormFilter Chamber Size (m^2)**	**No. of Full ZPG StormFilters**	**Cartridge Name**
B4 - Pervious and Impervious Area to Tank 01	-	4	L2	5.8	8	690
B4 - Pervious and Impervious Area to Tank 02	-	1	L2	2.5	2	460
B4 - Roof Area	132	-	-	-	-	-

Table 5 – B4 Zone Lots Proposed Treatment Train Devices

	Treatment Device				
Development Area	**Rainwater Tank Size (kL)**	**Total No. of OceanGuards**	**StormFilter Chamber Size (m^2)**	**No. of Full ZPG StormFilters**	**Cartridge Name**
R3 - Medium Density Residential	2.25kL per lot	11	4.7	6	460

Table 6 – R3 Zone Lots Proposed Treatment Train (For information only, not for approval)

2.5 Rainwater Re-use Tanks

Blacktown City Council requires 80% non-potable water demand be met through non-potable water sources for industrial and business developments and can generally be achieved through adequate sizing of rainwater tank systems. As the proposed development incorporates commercial usage as well as residential units, non-potable water demand for the non-residential floors has been calculated using updated architectural plans by Architex Revision D (18 November 2020) and calculations detailed in section 11.14.3 of the Blacktown City Council's WSUD developer handbook. The results are tabulated below:

Development	**Toilets/Urinals**	**Daily Rainwater Re-use (0.1l/day)**	**Reuse Demand Met %**
B4 - Mixed Use	45	3.286	88.42

Table 7 – Rainwater Reuse Summary for B4 - Mixed Use Development

The daily and annual demand values were used in MUSIC to determine adequate rainwater tank sizes for both sites which meet the 80% non-potable reuse requirement. Daily Rainwater Re-use was apportioned to cater for a 5 day working week and assumed occupancy of the child care centre site.

2.6 Interim bio-retention

Prior to the commissioning of the downstream regional basin, the catchment comprising of the R3 superlot (future subdivision) along with the public roads in both the B4 and R3 zones will be treated in the temporary basin through a bio-filter media.

The water quality component for the temporary basin will consist of:

- Extended detention depth 200 mm
- Bio-retention Area 380 m2
- Filter media thickness 400 mm

A typical detail of the bio-filter media is shown on sheet DA-405 & DA-406 in the Engineering Plans by Orion Consulting.

2.7 Water Quality Design - Results

The table below contains a summary of the MUSIC model output demonstrating compliance with the water quality objectives. A copy of the electronic MUSIC models have also been included with the submission to Council for their review of the model details.

	Pollutant			
	GP	**TSS**	**TP**	**TN**
Reduction Targets (%)	90	85	65	45
Ultimate Scenario Results	100	87	71.6	53.4
Interim Scenario Results	94.3	86.4	74.6	56.9

Table 8 –MUSIC Modelling Results

2.8 Stream Erosion Index (SEI)

The SEI was calculated for the ultimate development using Method 1 from the Handbook. A summary of the results is shown in the table below:

SEI	**B4 - Mixed Use**	**R3 - Medium Density Residential**
Area (m^2)	9686	3533
Area (km^2)	0.009686	0.003533
tc (min)	7.9	5.4
IFD for 2 Year ARI (mm/hr)	84	96
C2	0.444	0.444
Q_2 (m^3/s)	0.1004	0.042
Q_{crit} (m^3/s)	0.025	0.010
Q_{pre} (ML/year)	0.244	0.0765
Q_{post} (ML/year)	0.714	0.219
SEI	2.926	2.863

Table 9 – Stream Erosion Index (SEI) Calculations

The SEI calculation for the future subdivision of the R3 superlot have been analysed separately to the B4 superlot and shown as indicative figures only.

The final SEI figure is less than 3.5, therefore achieves the requirements set out by Council.

3 On-Site Detention

The road levels and finished surface levels have been designed with consideration for the approved development over 999 Richmond Road (DA-15-02765) as well as considering the post-development catchments determined by J.Wyndham Prince used in the ultimate stormwater management strategy for the Marsden Park Precinct.

On-site detention targets for the development will be ultimately be catered for through a regional basin further downstream. In the interim scenario, until the regional basin is constructed, and the downstream stormwater network is installed, on-site detention requirements will be provided through a temporary basin that will be located at the north-eastern property boundary. The Deemed to Comply spreadsheet has been used to determine the storage requirements for the site and is shown on sheet DA-405 on the Engineering Plans by Orion Consulting.

A figure of the temporary basin configuration is shown below:

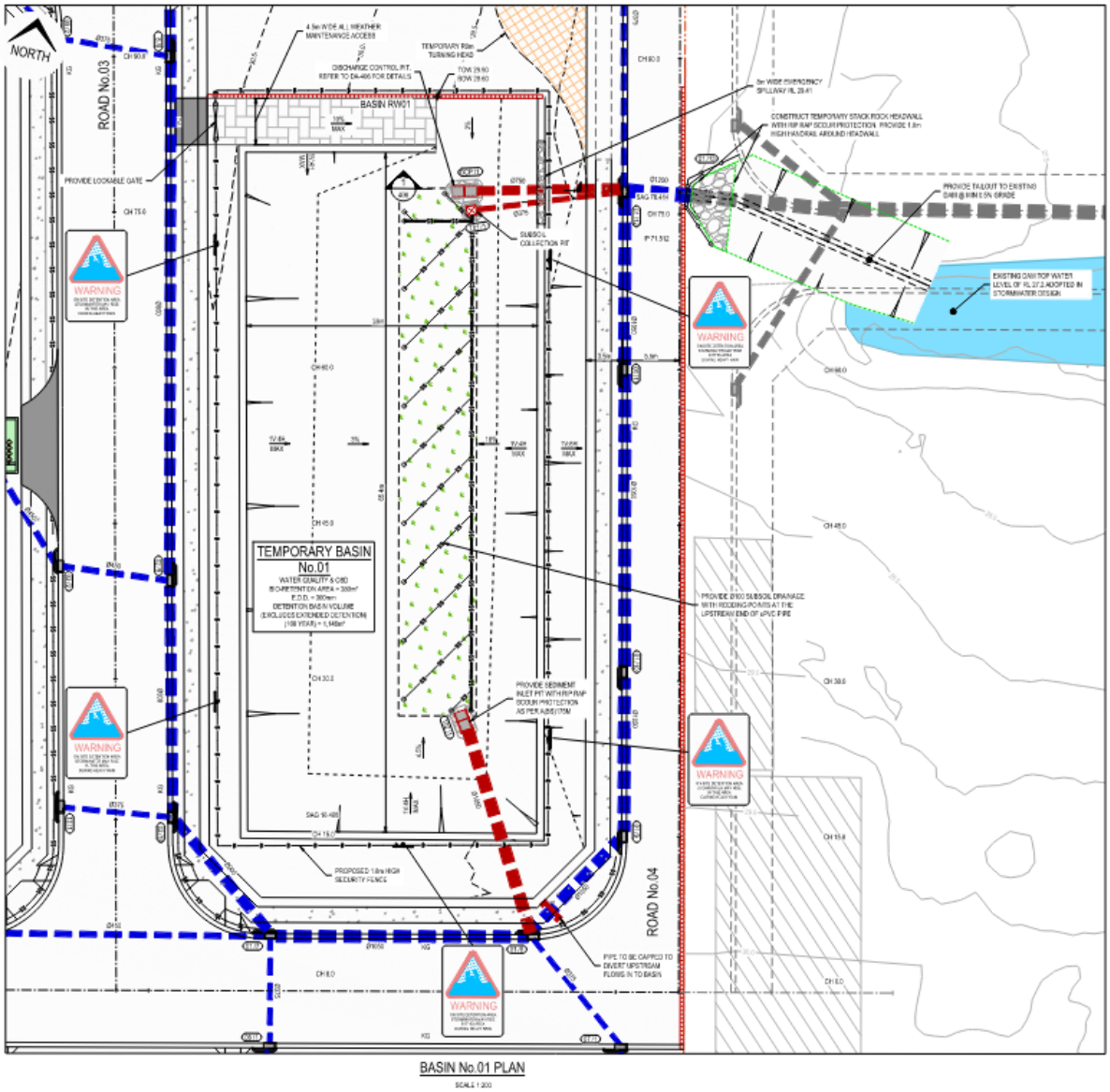


Figure 5 – Temporary Basin Configuration

4 Summary

Orion Consulting has been engaged by iDream Property through Architex to prepare Civil Engineering Plans and an accompanying Stormwater Management Strategy to support the Development Application for a multi-use development over the property located at 971 Richmond Road, Marsden Park. The site is zoned B4 and R3. The R3 portion of the site will remain as a superlot whilst the B4 zoning will incorporate a series of buildings comprising of commercial and residential floors.

Utilising Blacktown City Council nodes available through MUSIC Link, the software program MUSIC was used to determine a site-specific water quality management strategy that adheres to both Council requirements and the overall stormwater strategy for the Marsden Park Precinct in both the interim and ultimate scenarios.

As part of the proposed treatment train in the B4 zoning, each block will incorporate rainwater tanks for re-use, OceanGuards to generally capture gross pollutants and suspended solids and an end of line treatment tank fitted with a number of StormFilters for further pollutant reduction before being discharged into the public stormwater network. Whilst the R3 superlot will remain as a residue for the foreseeable future, a treatment train has been developed for it for information only and has been included in the MUSIC modelling.

The interim scenario considers not only the superlot catchments, also the mitigation of pollutants from the stormwater run-off from the public road reserve. It is proposed that a temporary basin incorporating bio-filter media will be adequate in achieving the development's pollutant reduction targets.

The MUSIC results shown demonstrate that the water quality treatment measures proposed in this submission will satisfy Council's water quality performance targets.

To fulfill the on-site detention requirements, Council's Deemed to Comply spreadsheet was used to determine the storage volume and discharge controls for the temporary basin.

The temporary basin will remain in place until the regional stormwater infrastructure is in place.

5 References

Australian Rainfall and Runoff: A Guide to Flood Estimation, Ball J, Babister M, Nathan R, Weeks W, Weinmann E, Retallick M, Testoni I, (Editors), Commonwealth of Australia (Geoscience Australia) 2019

WSUD Developer Handbook: MUSIC modelling and design guide DRAFT 2019

Blacktown City Council: "Engineering Guide for Development" 2005

Queensland Urban Drainage Design Manual, Third Edition, Queensland Government Department of Energy and Water Supply 2013

Using MUSIC in Sydney Drinking Water Catchment, WaterNSW 2019

Appendix A – Engineering Plans

Prepared by:

Orion Consulting

CONSULT AUSTRALIA
Member Firm

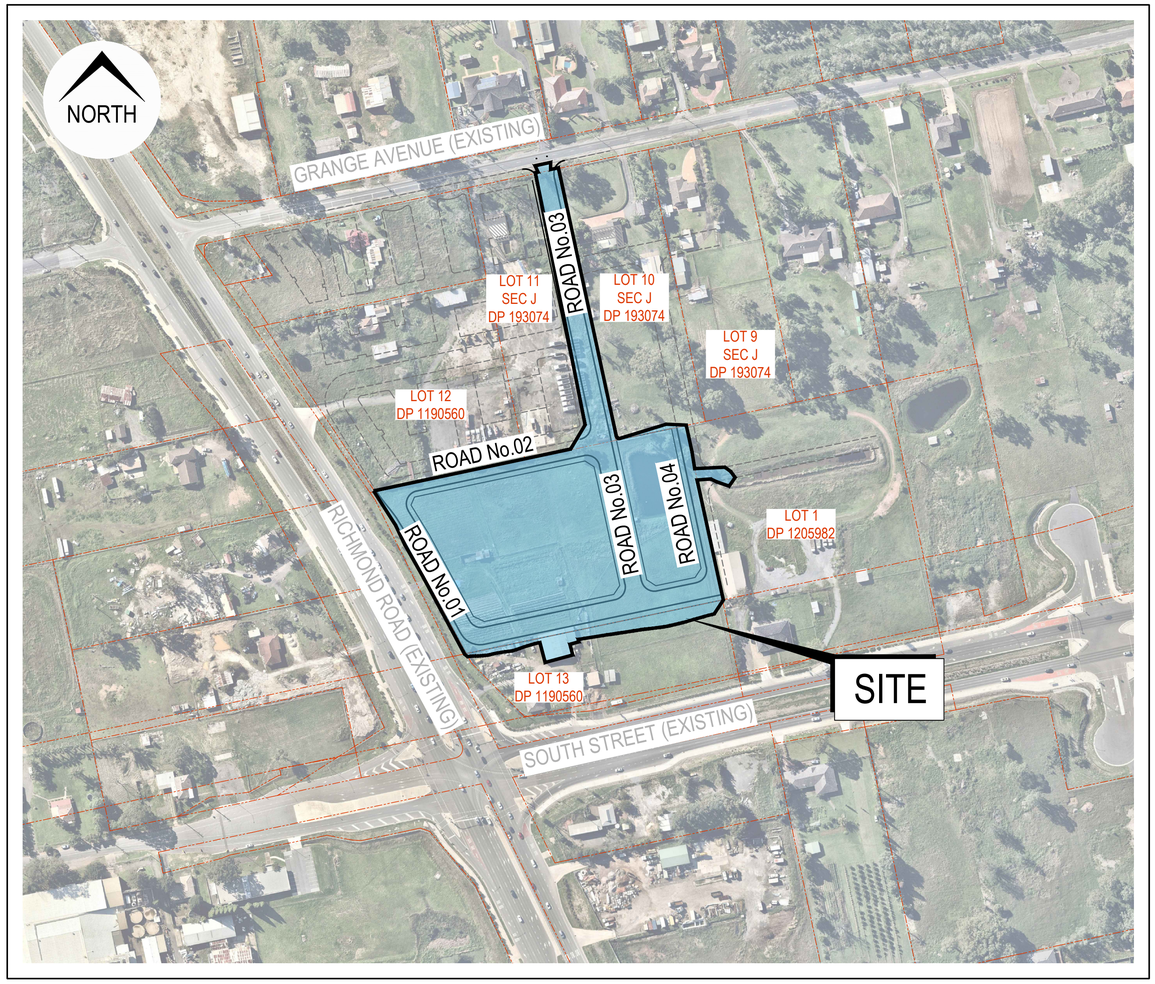
Prepared for:

architex
architects + planners

LGA:

Blacktown City Council

DA: SPP-20-00002



SITE / LOCATION (Image courtesy of Nearmap 07.04.2019)

LOT 13 D.P.1190560

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DA 402	DRAINAGE LONG SECTIONS SHEET 01 OF 03	H
DA 403	DRAINAGE LONG SECTIONS SHEET 02 OF 03	H
DA 404	DRAINAGE LONG SECTIONS SHEET 03 OF 03	H
DA 405	TEMPORARY BASIN No.01 PLAN, SECTION & DETAILS SHEET 01 OF 02	H
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DA 410	PUMP WELL DETAILS & CALCULATIONS	H
DA 450	WATER QUALITY DEVICE DETAILS	H
STREET TREES		
~~DA 600~~	~~STREET TREE PLAN~~ NOT USED	~~H~~

971 RICHMOND ROAD, MARSDEN PARK

ROAD AND DRAINAGE DESIGN

ISSUED FOR **DEVELOPMENT APPLICATION**

NOT FOR CONSTRUCTION

Project No. 19 - 35 Set No. 01 Milestone DA Plan 000 Revision H

GENERAL NOTES

G1. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH BLACKTOWN CITY COUNCIL'S WORKS SPECIFICATION CIVIL (CURRENT EDITION) AND/OR AS DIRECTED BY THEIR REPRESENTATIVE

G2. SURVEY MARKS: -
a. SURVEY MARKS SHOWN THUS ▲ SHALL BE RETAINED AT ALL TIMES. WHERE RETENTION IS NOT POSSIBLE THE SUPERINTENDENT MUST BE NOTIFIED AND CONSENT RECEIVED PRIOR TO THEIR REMOVAL.

G3. THE CONTRACTOR SHALL LOCATE AND LEVEL ALL EXISTING SERVICES PRIOR TO COMMENCING CONSTRUCTION AND MAKE ARRANGEMENTS WITH THE RELEVANT AUTHORITY TO RELOCATE OR ADJUST IF NECESSARY AT DEVELOPERS EXPENSE.

G4. THE CONTRACTOR SHALL NOT ENTER UPON NOR DO ANY WORK WITHIN ADJACENT LANDS WITHOUT THE WRITTEN PERMISSION OF THE OWNERS. TO BE PROVIDED PRIOR TO THE APPROVAL OF THE PLANS.

G5. THE CONTRACTOR SHALL MAINTAIN SERVICES AND ALL WEATHER ACCESS AT ALL TIMES TO ADJOINING PROPERTIES.

G6. COUNCIL'S TREE PRESERVATION ORDER MUST BE OBSERVED AND NO TREE SHALL BE FELLED, LOPPED OR REMOVED WITHOUT THE PRIOR APPROVAL OF COUNCIL'S ENGINEER.

G7. TREES TO BE RETAINED ON SITE SHALL BE PROTECTED BY SUITABLE STURDY APPROVED PROTECTIVE FENCING PRIOR TO COMMENCEMENT OF SITE WORKS. NO TREES TO BE REMOVED WITHOUT COUNCIL'S WRITTEN APPROVAL.

G8. THE CONTRACTOR SHALL CLEAR THE SITE BY REMOVING ALL RUBBISH, FENCES, EXISTING INFRASTRUCTURE AND DEBRIS ETC.

G9. FILLING IS TO BE FROM A NOMINATED SOURCE, OF SOUND CLEAN MATERIAL, FREE FROM LARGE ROCK, STUMPS, CONTAMINATED MATTER, INDUSTRIAL AND BUILDING WASTE, ORGANIC MATTER AND OTHER DEBRIS. PLACING OF FILLING ON THE PREPARED AREAS SHALL NOT COMMENCE UNTIL THE AUTHORITY TO DO SO HAS BEEN OBTAINED FROM THE COUNCIL.

G10. SITE FILL AREAS: - THE CONTRACTOR SHALL TAKE LEVELS OF EXISTING SURFACE AFTER STRIPPING TOPSOIL AND PRIOR TO COMMENCING FILL OPERATIONS.

G11. ALL SITE FILLING TO BE COMPACTED TO 95% STANDARD COMPACTION AND SHALL BE CONTROLLED BY A REGISTERED SOIL LABORATORY IN ACCORDANCE WITH COUNCIL'S "WORKS SPECIFICATION".

G12. ALL SITE REGRADING AREAS SHALL BE GRADED AT A MINIMUM 1% TO THE ENGINEERS REQUIREMENTS.

G13. SURPLUS EXCAVATED MATERIAL SHALL BE PLACED WHERE DIRECTED BY THE SUPERINTENDENT.

G14. ALL DRAINAGE LINES THROUGH LOTS SHALL BE CONTAINED WITHIN THEIR EASEMENTS AND CONFORM WITH COUNCIL'S STANDARDS.

G15. DRAINAGE LINES UNDER ROADS SHALL BE BACKFILLED WITH NON-COHESIVE SAND AND HAVE 3m OF SUBSOIL DRAIN WRAPPED IN APPROVED FILTER SOCK, DISCHARGING INTO DOWN STREAM PITS.

G16. VEHICULAR CROSSINGS SHALL BE CONSTRUCTED IN KERB AND GUTTER WHERE SHOWN. DRIVEWAYS & LAYBACKS ARE TO HAVE A MINIMUM 1 METRE CLEARANCE FROM POWER & LIGHT POLES & STORMWATER DRAINS AND 6 METRES CLEARANCE FROM KERB RETURN TANGENT POINTS AND TO COUNCIL STANDARD DRAWING A(BS) 102S.

G17. PRAM CROSSINGS SHALL BE CONSTRUCTED IN KERB AND GUTTER IN ACCORDANCE WITH COUNCIL'S STANDARD DRAWING A(BS) 104M.

G18. ALL NEW WORKS SHALL MAKE A SMOOTH JUNCTION WITH EXISTING CONDITIONS.

G19. DIMENSIONS OF ANY DETAIL SHALL NOT BE SCALED - DIMENSIONS, IF IN DOUBT, SHALL BE VERIFIED BY THE SUPERINTENDENT.

G20. ALL CONSTRUCTION AND RESTORATION WORK ON COUNCIL'S ROAD AND FOOTPATH AREA ARE TO BE CARRIED OUT IN ACCORDANCE WITH THE APPROVED DRAWINGS AND COUNCIL'S STANDARD SPECIFICATIONS.

G21. ALL LIGHT POLES, STREET NAME POLES AND BUS SHELTERS IN THIS SUBDIVISION WILL BE BLACK POWDER COATED TO THE SATISFACTION OF BLACKTOWN CITY COUNCIL AND COMPLY TO COUNCIL'S SPECIFICATION.

G22. CONDUITS TO BE PLACED WHERE REQUIRED BY RELEVANT AUTHORITIES.

G23. PITS ARE TO HAVE STEP IRONS IF DEEPER THAN 1.2m, REFER TO COUNCIL'S STANDARD DWG A(BS)111S.

G24. STRUCTURAL CERTIFICATION REQUIRED FOR CONSTRUCTION OF MAJOR AND NON-STANDARD STRUCTURES (PITS & RETAINING WALLS).

G25. 100 YEAR FLOW PATHS TO BE FORMED AT TIME OF CONSTRUCTION.

SURVEY SET OUT INFORMATION NOTES:

S1. ALL SITE SET OUT AND CONTROL POINTS ARE TO BE CERTIFIED BY A REGISTERED SURVEYOR.

S2. THE INFORMATION DETAILED ON THE CERTIFIED CONSTRUCTION CERTIFICATE PLANS TAKES PRECEDENCE OVER ALL ELECTRONIC INFORMATION PROVIDED. THE ORDER OF PRIORITY FOR USE OF ALL INFORMATION PROVIDED IS AS FOLLOWS:

a. CERTIFIED CONSTRUCTION CERTIFICATE DRAWINGS
b. 2D DRAFTING BASE (ELECTRONIC FILE)
c. 3D DTM (ELECTRONIC FILE)

S3. ANY DISCREPANCY BETWEEN ANY OF THE INFORMATION CONTAINED WITHIN THESE FILES IS TO BE BROUGHT TO THE ATTENTION OF THE SUPERINTENDENT PRIOR TO CONSTRUCTION WHO WILL SEEK CLARIFICATION AND ISSUE INSTRUCTIONS ON THE APPROPRIATE COURSE OF ACTION.

EARTHWORKS NOTES

E1. EARTHWORKS ARE TO BE CARRIED OUT TO THE SATISFACTION OF THE COUNCIL. UNSUITABLE MATERIALS ARE TO BE REMOVED FROM ROADS AND LOTS PRIOR TO FILLING. THE CONTRACTOR IS TO ARRANGE AND MAKE AVAILABLE COMPACTION TESTING RESULTS FOR ALL AREAS THAT CONTAIN FILL IN EXCESS OF 250mm.

E2. COMPACTION OF EARTHWORKS SHALL CONTINUE UNTIL A DRY DENSITY RATIO OF 95% FOR SITE FILLING AND 100% FOR ROAD PAVEMENT SUBGRADES HAS BEEN ACHIEVED IN ACCORDANCE WITH TEST METHOD AS1289.5.3.1 OR AS 1289.5.1.1. THE CONTROL TESTING OF EARTHWORKS SHALL BE IN ACCORDANCE WITH THE GUIDELINES IN AS3798 'GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS'. WHERE IT IS PROPOSED TO USE TEST METHOD AS1289.5.8.1 TO DETERMINE THE FIELD DENSITY, A SAND REPLACEMENT METHOD SHALL BE USED TO CONFIRM THE RESULTS.

E3. THE SUITABLE QUALIFIED GEOTECHNICAL ENGINEER, SHALL HAVE A LEVEL 1 RESPONSIBILITY FOR ALL FILLING AS DEFINED IN APPENDIX B AS3798 'GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS', AND AT THE END OF THE WORKS SHALL CONFIRM THE EARTHWORKS COMPLY WITH THE REQUIREMENTS OF THE SPECIFICATION AND DRAWINGS BY WRITTEN NOTIFICATION.

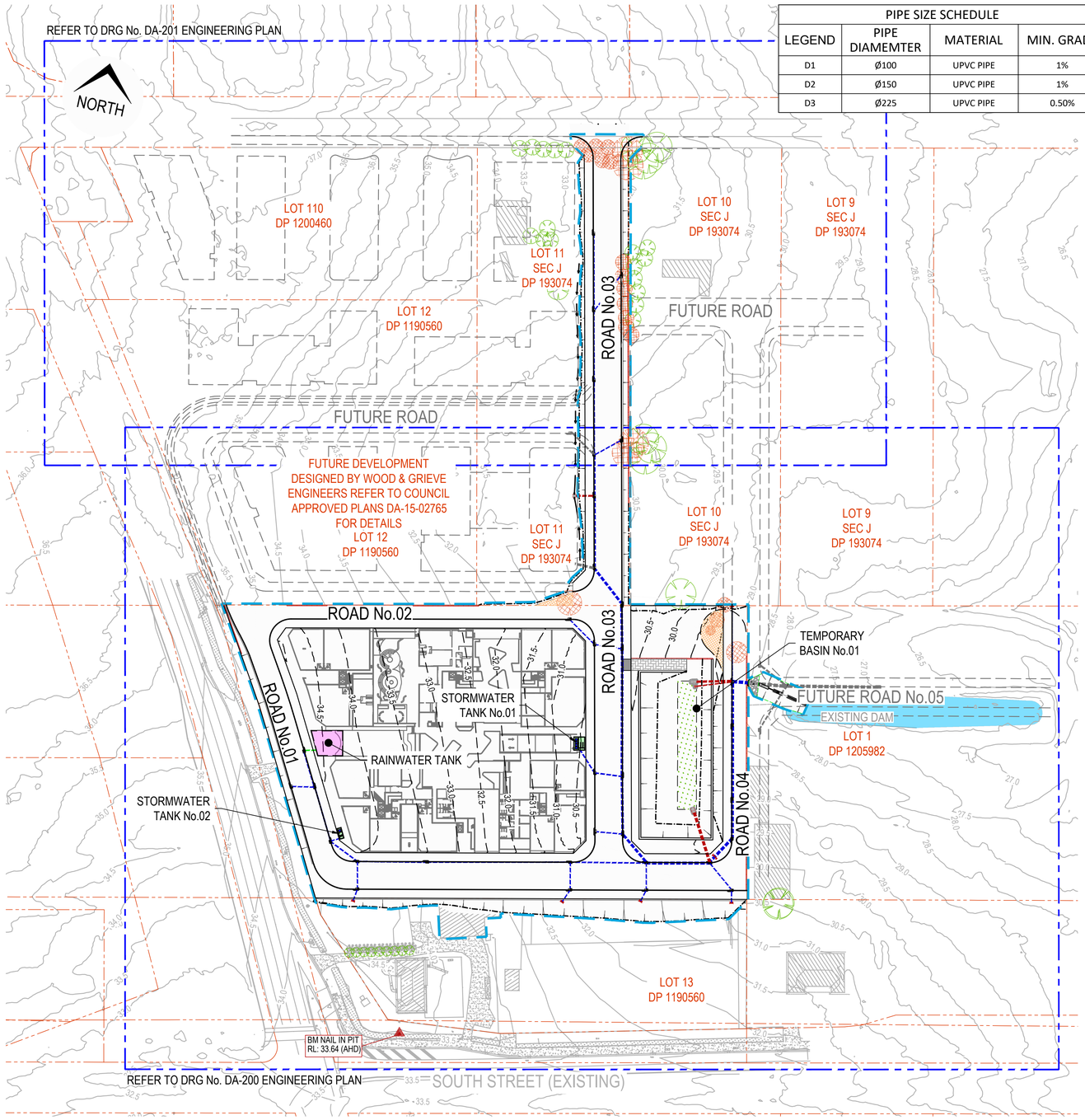
E4. IN AREAS TO BE FILLED WHERE THE SLOPE OF THE NATURAL SURFACE EXCEEDS 1(V):4(H), BENCHES ARE TO BE CUT TO PREVENT SLIPPING OF THE PLACED FILL MATERIAL AS REQUIRED BY THE COUNCIL.

E5. ALL BATTERS ARE TO BE SCARIFIED TO A DEPTH OF 50mm TO ASSIST WITH ADHESION OF TOP SOIL TO BATTER FACE.

E6. PROVIDE MINIMUM 100mm AND MAXIMUM 250mm TOPSOIL DEPTH ON FOOTPATHS, FILLED AREAS AND ALL OTHER AREAS DISTURBED DURING CONSTRUCTION. TOPSOILED AREAS TO BE STABILISED WITH APPROVED VEGETATION A MAXIMUM OF 14 DAYS AFTER TOPSOILING AND ARE TO BE WATERED TO ENSURE GERMINATION.

E7. THE CONTRACTOR SHALL CONTROL SEDIMENTATION, EROSION AND POLLUTION DURING CONSTRUCTION IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT EDITION OF 'MANAGING URBAN STORMWATER: SOILS AND CONSTRUCTION' PRODUCED BY LANDCOM.

E8. FOOTWAY AREA TO BE FULLY TURFED WITH COUCH GRASS, AND SHALL BE MAINTAINED AND REPLACED AS REQUIRED DURING THE CONSTRUCTION MAINTENANCE PERIOD, IN ACCORDANCE WITH CONDITION.



PIPE SIZE SCHEDULE			
LEGEND	PIPE DIAMEMTER	MATERIAL	MIN. GRADE
D1	Ø100	UPVC PIPE	1%
D2	Ø150	UPVC PIPE	1%
D3	Ø225	UPVC PIPE	0.50%

LEGEND

	EXISTING	PROPOSED	FUTURE
UTILITY - OVERHEAD LINE	OH	OH	OH
WATER	W	W	W
EXISTING STORM WATER	D		
CONTOUR LINE & LABEL		20.0	
LOT NUMBER & BOUNDARY	LOT #	LOT #	LOT #
APPROXIMATE LIMIT OF WORKS OR STAGE			
BUILDING / ENVELOPE			
ROAD, NUMBER, CONTROL LINE, CHAINAGE & CHAINAGE MARK	CH	CH	CH
	ROAD	ROAD	ROAD
COUNCIL STANDARD KERB & GUTTER, ROLL KERB OR DISH CROSSING		KG RK DC	
COUNCIL STANDARD DISH CROSSING		DC	
EDGE OF BITUMEN		EOB	
COUNCIL STANDARD CONCRETE FOOTPATH & KERB RAMP			
INDICATIVE DRIVEWAY AND VC LOCATION CONSTRUCTED BY OTHERS			
STORMWATER RAINWATER TANK			
RAINWATER TANK			
STORMWATER DRAINAGE PIPE AND STRUCTURE			
STORMWATER DRAINAGE PIPE AND STUB			
TEMPORARY STORMWATER DRAINAGE PIPE			
OVERFLOW LINE FROM RAINWATER TANK			
EASEMENT (REFER LEGEND)	(A) (B) (C)	(A) (B) (C)	
SUBSOIL DRAIN		SS	SS
DIVERSION SWALE			
RETAINING WALL		RW	
GUARDRAIL			
BATTER			
TREE - TO BE RETAINED			
TREE - TO BE REMOVED			
EXTERNAL BOUNDARY			
DAM			

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STORMWATER DRAINAGE NOTES

D1. STORMWATER DESIGN CRITERIA:
1:100 MAJOR SYSTEM
1:5 MINOR SYSTEM

D2. PIPES TO BE INSTALLED TO TYPE HS1 SUPPORT IN ACCORDANCE WITH AS 3725 (1989) IN ALL CASES BACKFILL TRENCH WITH SAND TO 300mm ABOVE PIPE (UNO). WHERE PIPE IS UNDER PAVEMENTS BACKFILL REMAINDER OF TRENCH TO UNDERSIDE OF PAVEMENT WITH SAND OR APPROVED GRANULAR MATERIAL COMPACTED IN 150mm LAYERS TO MINIMUM 98% STANDARD MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289 5.2.1. (OR A DENSITY INDEX OF NOT LESS THAN 75)

D3. ALL INTERNAL WORKS WITHIN PROPERTY BOUNDARIES ARE TO COMPLY WITH THE REQUIREMENTS OF AS 3500 3.1 AND AS/NZS 3500 3.2 & COUNCIL'S SPECIFICATIONS.

D4. CARE IS TO BE TAKEN WITH LEVELS OF STORMWATER LINES. GRADES SHOWN ARE NOT TO BE REDUCED WITHOUT APPROVAL.

D5. GRATES AND COVERS SHALL CONFORM TO AS 3996.

D6. AT ALL TIMES DURING CONSTRUCTION OF STORMWATER PITS, ADEQUATE SAFETY PROCEDURES SHALL BE TAKEN TO ENSURE AGAINST THE POSSIBILITY OF PERSONNEL FALLING DOWN PITS.

D7. DRAINAGE LINES UNDER ROADS SHALL BE BACKFILLED WITH NON-COHESIVE SAND AND HAVE 3.0m OF SUBSOIL DRAIN WRAPPED IN APPROVED FILTER SOCK, DISCHARGING INTO DOWN STREAM PITS.

D8. ALL STORMWATER PIPES WITHIN ROADS TO BE REINFORCED CONCRETE PIPE (RCP) CLASS 2.

D9. ALL INTERALLOTMENT DRAINAGE LINES SHALL BE LAID AT A MINIMUM GRADE OF 1% UNLESS OTHERWISE INDICATED.

D10. DRAINAGE LINES ON PLANS ARE DIAGRAMMATIC ONLY AND PIPE CENTRELINES SHALL ENTER AND EXIT PITS AT THE CENTRE OF THE RESPECTIVE PIT WALLS (UNO).

D11. PRECAST KERB INLET LINTELS SHALL BE USED ON GULLY PITS. GULLY PITS SHALL BE IN ACCORDANCE WITH A(BS)106M.

D12. PROVIDE STUB Ø100 uPVC SN4 PIPES AT INTER-ALLOTMENT DRAINAGE PITS FOR FUTURE CONNECTION. REFER TO DRAINAGE LONGSECTIONS.

ISSUED FOR **DEVELOPMENT APPLICATION**
NOT FOR CONSTRUCTION

Rev	Drawn	Design	Appd.	Date	Revision Description
H	KW/SA	SA	PB	03/08/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
G	KW/SA	SA	PB	29/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
F	KW/SA	SA	PB	28/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
E	SA	MC	MC	02/06/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
D	SA	MC	MC	31/05/2021	ISSUED TO ADDRESS SOFAC COMMENTS
C	KW/PZ	MC	MC	21/12/2020	ISSUED FOR COUNCIL'S COMMENT
B	KW/MG	CW	MP	31/03/2020	ISSUED FOR CLIENT REVIEW

Scale:
0 10 20 30 40 50 60 70 80 90 100
SCALE 1:1000 (A1) SCALE 1:2000 (A3)

For: architex architects + planners

By: Orion Consulting
CONSULT AUSTRALIA Member Firm
ABN:25 604 069 981 PO Box:7936, BAULKHAM HILLS NSW 2153 T:(02) 8660 0035 E:info@orionconsulting.com.au

Project: 971 RICHMOND ROAD, MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title: GENERAL LAYOUT PLAN, NOTES & LEGEND

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	001	H

NORTH

REFER TO DRG. No. DA-003 FOR CONTINUATION

FUTURE DEVELOPMENT
DESIGNED BY WOOD & GRIEVE
ENGINEERS REFER TO COUNCIL
APPROVED PLANS DA-15-02765
FOR DETAILS

LOT 12
DP 1190560

LOT 11
SEC J
DP 193074

LOT 10
SEC J
DP 193074

LOT 9
SEC J
DP 193074

ROAD No.01

ROAD No.02

ROAD No.03

ROAD No.04

RICHMOND ROAD (EXISTING)

FUTURE ROAD No.05

EXISTING DAM

LOT 1
DP 1205982

LOT 13
DP 1190560

LEGEND

EXISTING STRUCTURES TO BE DEMOLISHED AND MATERIALS TAKEN TO APPROVED WASTE FACILITY	
EXISTING DAM TO BE DE-WATERED, FILLED AND COMPACTED TO COUNCIL'S STANDARD	
EXISTING DAM TO BE RETAINED	
EXISTING FENCE TO BE REMOVED	
EXISTING POWER POLES TO BE REMOVED OR RELOCATED PENDING ELECTRICAL DESIGN AND APPROVALS.	
EXISTING OVERHEAD OVERHEAD CABLE TO BE REMOVED OR TRANSFERRED TO UNDERGROUND PENDING ELECTRICAL DESIGN AND APPROVALS.	
EXISTING TREES TO BE REMOVED	
EXISTING TREES TO REMAIN	
EXISTING CONTOURS	10.0

1. SURVEY PROVIDED BY BEYOND MEASURE SURVEY (DATE 26/10/2018 REF: BM293-DETAIL)
2. CONTRACTOR TO ESTABLISH EXTENT OF ALL EXISTING SERVICES WITHIN THE EXTENT OF WORKS.
3. CONTRACTOR TO GAIN ALL NECESSARY APPROVALS & PERMITS TO DEMOLISH, CAP OR REMOVE EXISTING SERVICES AS REQUIRED.
4. CONTRACTOR TO ALLOW FOR THE DEMOLITION OF ALL EXISTING STRUCTURES & FEATURES (ABOVE & BELOW GROUND) ON THE SITE REQUIRED, INCLUDING BUILDINGS, FENCES, EXISTING PAVEMENT, DRAINAGE, SIGNS ETC.
5. ALL DEMOLITION WORKS SHALL COMPLY WITH THE PROVISIONS OF AS2601:2001 THE DEMOLITION OF STRUCTURES.
6. REMOVAL OF EXISTING ELECTRICAL INFRASTRUCTURE TO BE COMPLETED IN ACCORDANCE ELECTRICAL CONSULTANTS SPECIFICATIONS & DRAWINGS.
7. EXISTING SERVICES TO BE LOCATED FROM DBYD PLANS AND ONSITE SERVICES LOCATION.
8. TREE REMOVAL SHALL BE IN ACCORDANCE WITH THE BLACKTOWN CITY COUNCIL'S REQUIREMENTS AND SPECIFICATIONS.
9. EXISTING CONTOURS BASED ALS SURVEY OVER LOT10-11 DP 193074.
10. EXISTING TREES AND EXISTING BUILDING BASED IMAGE FROM NEARMAP OVER LOT10-11 DP 193074.

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E	SA	MC	MC	02/06/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
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C	KW/PZ	MC	MC	21/12/2020	ISSUED FOR COUNCIL'S COMMENT
B	KW/MG	CW	MP	31/03/2020	ISSUED FOR CLIENT REVIEW

Scale:
0 5 10 15 20 25 30 35 40 45 50
SCALE 1:500 (A1) SCALE 1:1000 (A3)

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Project: 971 RICHMOND ROAD, MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title: TREE REMOVAL & DEMOLITION PLAN SHEET 01 OF 02

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	002	H

Plotted:Tuesday, 3 August 2021 4:03:39 PM File Name:\\orion-dell\e01\OrionData\Projects_2019\19-35 971 Richmond Road, Marsden Park\Design\01 Residential Subdivision\DA\19-35-01-DA-002.dwg

NORTH

LEGEND

EXISTING TREES TO BE REMOVED	
EXISTING TREES TO REMAIN	
EXISTING CONTOURS	10.0

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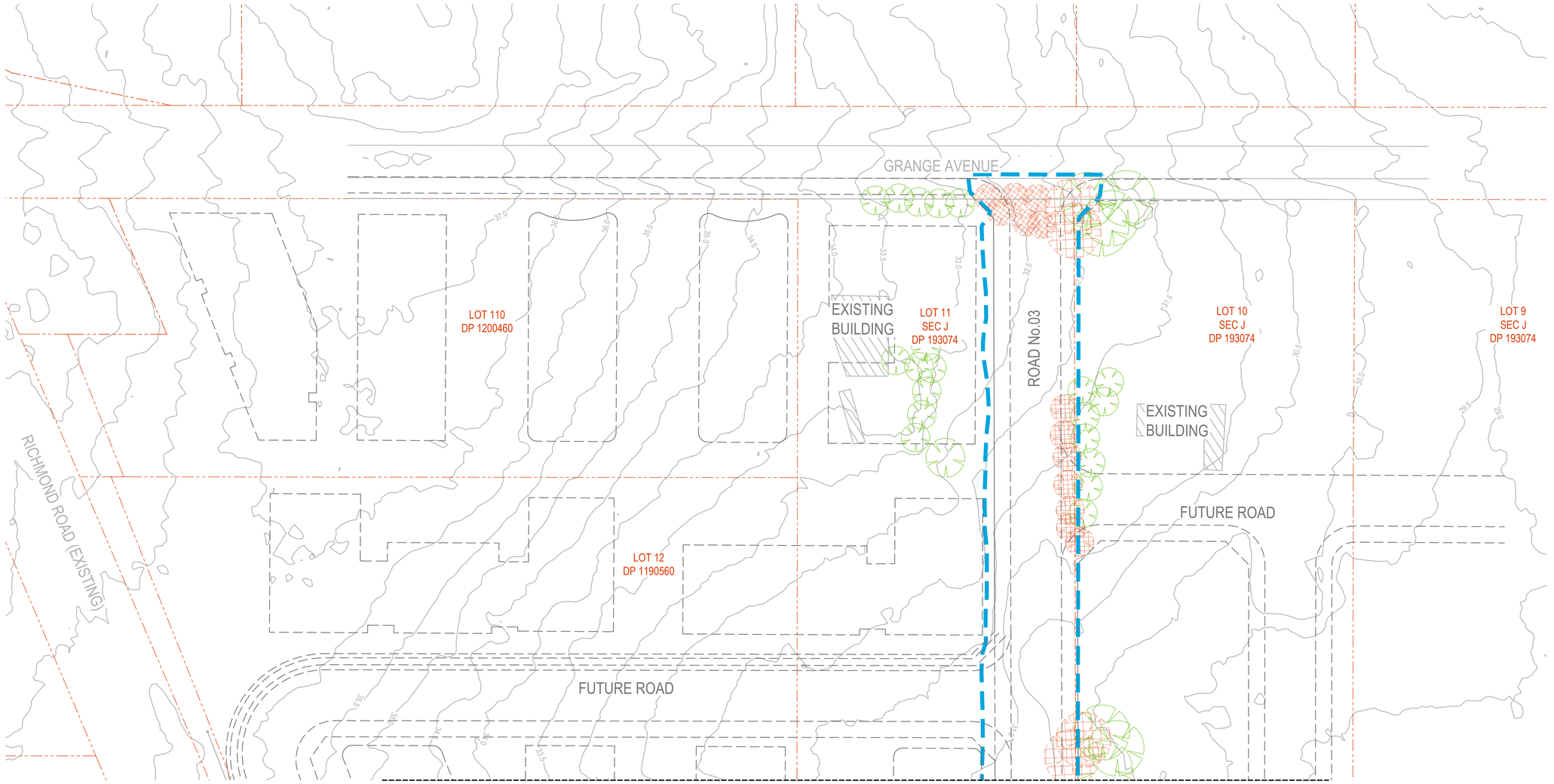

REFER TO DRG. No. DA-002 FOR CONTINUATION

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ISSUED FOR **DEVELOPMENT APPLICATION**

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F	KW/SA	SA	PB	28/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
E	SA	MC	MC	02/06/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
D	SA	MC	MC	31/05/2021	ISSUED TO ADDRESS SOFAC COMMENTS
C	KW/PZ	MC	MC	21/12/2020	ISSUED FOR COUNCIL'S COMMENT
B	KW/MG	CW	MP	31/03/2020	ISSUED FOR CLIENT REVIEW

Scale:
0 5 10 15 20 25 30 35 40 45 50
SCALE 1:500 (A1) SCALE 1:1000 (A3)

For: architex architects + planners

By: Orion Consulting — CONSULT AUSTRALIA Member Firm

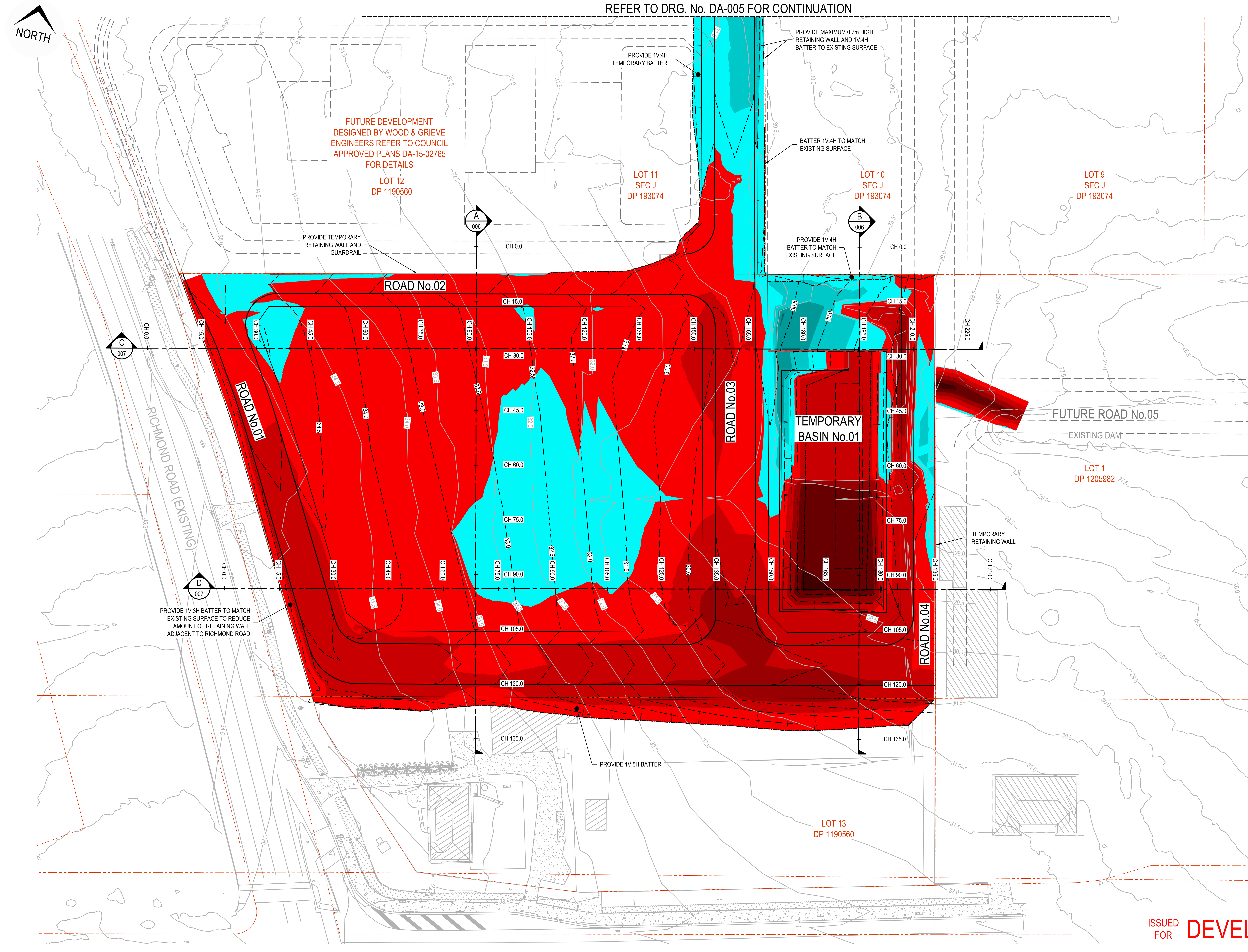
ABN:25 604 069 981 **PO Box:**7936, BAULKHAM HILLS NSW 2153 **T:**(02) 8660 0035 **E:**info@orionconsulting.com.au

Project: 971 RICHMOND ROAD, MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title: TREE REMOVAL & DEMOLITION PLAN SHEET 02 OF 02

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	003	H

Plotted:Tuesday, 3 August 2021 4:03:52 PM File Name:\orion-dell\e01\Orion\Data\Projects_2019\19-35 971 Richmond Road, Marsden Park\Design\01 Residential Subdivision\DA\19-35-01-03A-003.dwg



LEGEND

APPROXIMATE EXTENT OF FILL	0.0 - 0.5m	
	0.5 - 1.0m	
	1.0 - 1.5m	
	1.5 - 2.0m	
	2.0 - 2.5m	
	> 2.5m	
APPROXIMATE EXTENT OF CUT	0.0 - 0.5m	
	0.5 - 1.0m	
	1.0 - 1.5m	
	1.5 - 2.0m	
	2.0 - 2.5m	
	> 2.5m	

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VOLUMES

CUT -	-9,444m³
FILL -	1,884m³
BALANCE -	-7,560m³
EXPORT	7,561m³

NOTES:
- THESE VOLUMES ARE IN SITU ONLY (EXISTING SURFACE TO FINISHED DESIGN SURFACE).
- NO BULKING FACTOR HAS BEEN APPLIED.
- NO ALLOWANCE HAS BEEN MADE FOR TOPSOIL STRIPPING OR RESPREAD.
- NO ALLOWANCE HAS BEEN MADE FOR UNSUITABLE MATERIAL ASSOCIATED WITH EXISTING DAMS SUCH AS WATER, MUD, SLUDGE ETC.
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ALL WORKS OVER EXISTING EXTERNAL BOUNDARY INTO ADJOINING PROPERTIES WILL REQUIRE OWNERS CONSENT

NOTES:
1. EXISTING CONTOURS BASED ALS SURVEY OVER LOT10-11 DP 193074.
2. EXISTING BUILDING BASED IMAGE FROM NEARMAP OVER LOT10-11 DP 193074.

ISSUED FOR **DEVELOPMENT APPLICATION**
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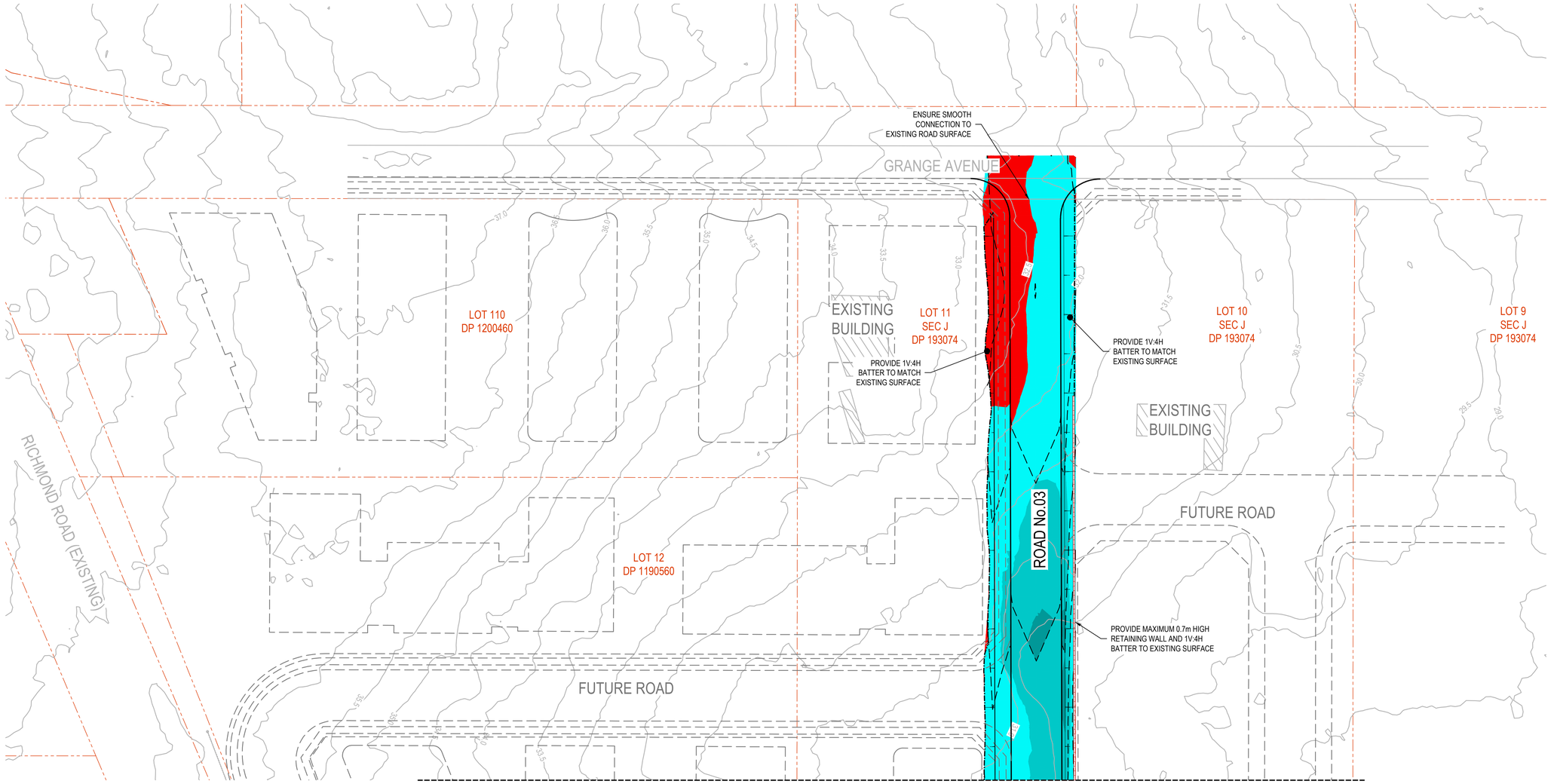
Project: 971 RICHMOND ROAD, MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title: SITE REGRADING PLAN
SHEET 01 OF 02

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	004	H

NORTH



REFER TO DRG. No. DA-004 FOR CONTINUATION

LEGEND

APPROXIMATE EXTENT OF FILL	0.0 - 0.5m	
	0.5 - 1.0m	
	1.0 - 1.5m	
	1.5 - 2.0m	
	2.0 - 2.5m	
	> 2.5m	
APPROXIMATE EXTENT OF CUT	0.0 - 0.5m	
	0.5 - 1.0m	
	1.0 - 1.5m	
	1.5 - 2.0m	
	2.0 - 2.5m	
	> 2.5m	

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NOTES:
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ISSUED FOR **DEVELOPMENT APPLICATION**
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Rev	Drawn	Design	Appd.	Date	Revision Description
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F	KW/SA	SA	PB	28/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
E	SA	MC	MC	02/06/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
D	SA	MC	MC	31/05/2021	ISSUED TO ADDRESS SOFAC COMMENTS
C	KW/PZ	MC	MC	21/12/2020	ISSUED FOR COUNCIL'S COMMENT
B	KW/MG	CW	MP	31/03/2020	ISSUED FOR CLIENT REVIEW

Scale:
0 5 10 15 20 25 30 35 40 45 50
SCALE 1:500 (A1) SCALE 1:1000 (A3)

For: architex architects + planners

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ABN:25 604 069 981 PO Box:7936, BAULKHAM HILLS NSW 2153 T:(02) 8660 0035 E:info@orionconsulting.com.au

Project: 971 RICHMOND ROAD, MARSDEN PARK
ROAD & DRAINAGE DESIGN

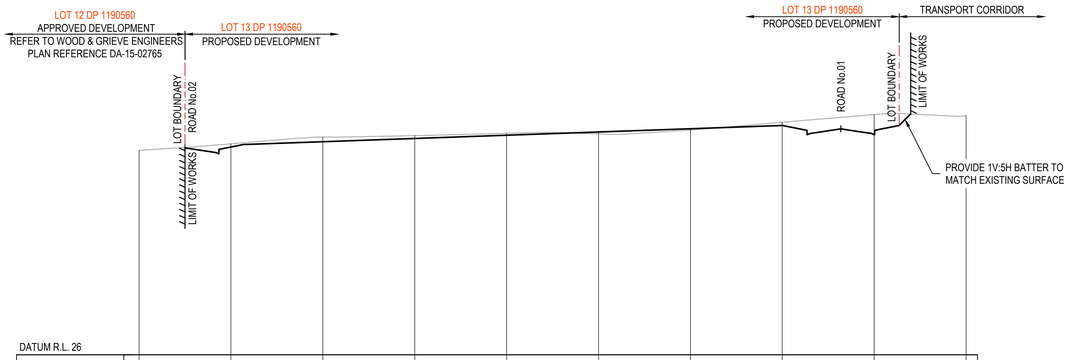
Title: SITE REGRADING PLAN
SHEET 02 OF 02

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	005	H

Plotted:Tuesday, 3 August 2021 4:04:47 PM File Name:\orion-dell\e01\Orion\Data\Projects_2019\19-35 971 Richmond Road, Marsden Park\Design\01 Residential Subdivision\DA\19-35-01-DA-005.dwg

LEGEND

- FINISHED DESIGN SURFACE LEVEL
- EXISTING SURFACE
- FUTURE SURFACE
- LOT BOUNDARY



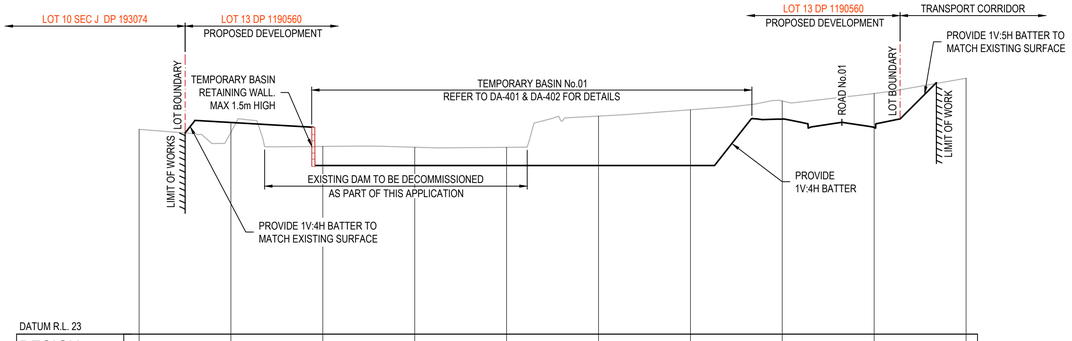
DATUM R.L. 26

DESIGN LEVEL		32.78	32.96	33.06	33.17	33.27	33.38	33.48	33.19	
EXISTING LEVEL	32.675	32.886	33.107	33.153	33.228	33.21	33.335	33.591	33.84	33.809
CHAINAGE	0	15	30	45	60	75	90	105	120	135

SITE SECTION A

SCALE: 1:500 (H)
SCALE: 1:100 (V)

004



DATUM R.L. 23

DESIGN LEVEL		29.75	28.6	28.6	28.6	28.6	28.6	30.02	29.74	
EXISTING LEVEL	29.682	29.586	29.126	29.098	29.096	30.116	30.323	30.611	30.853	31.352
CHAINAGE	0	15	30	45	60	75	90	105	120	135

SITE SECTION B

SCALE: 1:500 (H)
SCALE: 1:100 (V)

004

ISSUED FOR **DEVELOPMENT APPLICATION**
NOT FOR CONSTRUCTION

Rev	Drawn	Design	Appd.	Date	Revision Description
H	KW/SA	SA	PB	03/08/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
G	KW/SA	SA	PB	29/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
F	KW/SA	SA	PB	28/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
E	SA	MC	MC	02/06/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
D	SA	MC	MC	31/05/2021	ISSUED TO ADDRESS SOFAC COMMENTS
C	KW/PZ	MC	MC	21/12/2020	ISSUED FOR COUNCIL'S COMMENT
B	KW/MG	CW	MP	31/03/2020	ISSUED FOR CLIENT REVIEW

Scale:
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SCALE 1:500 (A1) SCALE 1:1000 (A3)
0 1 2 3 4 5 6 7 8 9 10
SCALE 1:100 (A1) SCALE 1:200 (A3)

For: architex architects + planners

By: Orion Consulting — CONSULT AUSTRALIA Member Firm

ABN:25 604 069 981 **PO Box:**7936, BAULKHAM HILLS NSW 2153 **T:**(02) 8660 0035 **E:**info@orionconsulting.com.au

Project: 971 RICHMOND ROAD, MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title: SITE REGRADING SECTIONS
SHEET 01 OF 02

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	006	H

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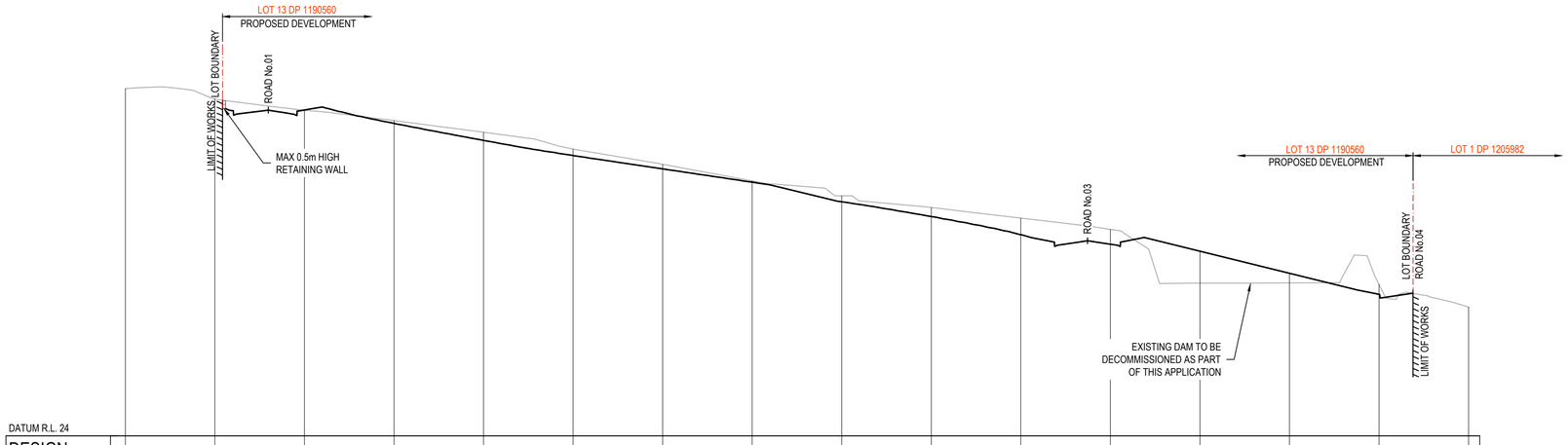
LEGEND

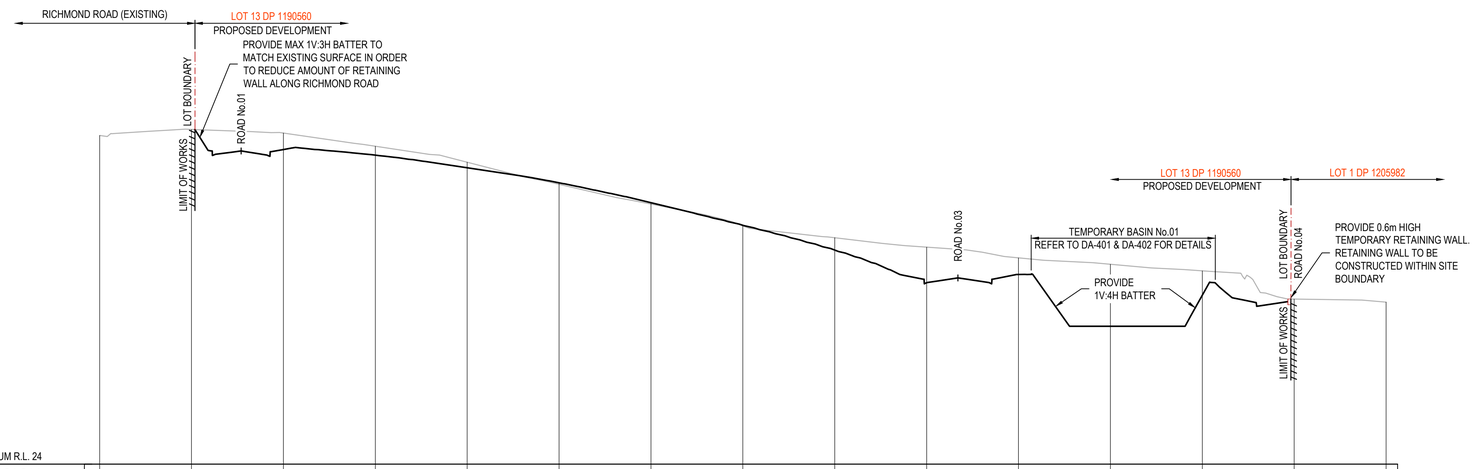
- FINISHED DESIGN SURFACE LEVEL
- EXISTING SURFACE
- FUTURE SURFACE
- LOT BOUNDARY



DATUM R.L. 24

DESIGN LEVEL			34.92	34.47	33.9	33.39	32.95	32.5	31.84	31.35	30.74	30.42	30.19	29.45	28.74	
EXISTING LEVEL	35.636	35.289	34.917	34.568	34.175	33.61	33.101	32.545	32.044	31.652	31.297	30.919	29.116	29.123	29.072	28.316
CHAINAGE	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225

SITE SECTION C
004
SCALE: 1:500 (H)
SCALE: 1:100 (V)



DATUM R.L. 24

DESIGN LEVEL			34.27	34.08	33.67	33.18	32.53	31.79	30.99	29.92	30.19	28.6	29.51		
EXISTING LEVEL	34.726	34.922	34.806	34.376	33.854	33.13	32.488	31.774	31.388	31.081	30.73	30.522	30.308	29.385	29.284
CHAINAGE	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210

SITE SECTION D
004
SCALE: 1:500 (H)
SCALE: 1:100 (V)

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0 1 2 3 4 5 6 7 8 9 10
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For: architex architects + planners

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Project: 971 RICHMOND ROAD, MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title: SITE REGRADING SECTIONS SHEET 02 OF 02

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	007	H

NORTH

REFER TO DRG. No. CC-101 FOR CONTINUATION

FUTURE DEVELOPMENT
DESIGNED BY WOOD & GRIEVE
ENGINEERS REFER TO COUNCIL
APPROVED PLANS DA-15-02765
FOR DETAILS

LOT 12
DP 1190560

LOT 11
SEC J
DP 193074

LOT 10
SEC J
DP 193074

LOT 9
SEC J
DP 193074

ROAD No.02

ROAD No.01

ROAD No.03

ROAD No.04

TEMPORARY
SEDIMENT
BASIN No.01

FUTURE ROAD No.05

EXISTING DAM

LOT 1
DP 1205982

LOT 13
DP 1190560

RICHMOND ROAD (EXISTING)

LEGEND

CONTOURS	10.0 — 20.0
STABILISED SITE ACCESS	
POSSIBLE STOCKPILE LOCATION	SP
SITE SECURITY FENCE	B B B
SEDIMENT FENCE	
DIVERSION SWALE	
PIT INLET FILTER (GEOTEXTILE OR MESH & GRAVEL)	
ROCK CHECK DAM	
GREEN WASTE BIN (1 x 2.5 x 2.5m)	
MASONRY WASTE BIN (1 x 2.5 x 2.5m)	
WASTE BINS x 4 - 1 x MIXED MATERIAL, 1 x PAPER / CARDBOARD, 1 x METAL & 1 x TREATED TIMBER	

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1. Erosion Hazard and Sediment Basins

Site Name: 36 Gordon Road

Site Location: Schofields

Precinct/Stage: Blacktown City Council

Other Details:

Site area	Sub-catchment or Name of Structure						Notes
	B1						
Total catchment area (ha)	6.457						
Disturbed catchment area (ha)	2.519						

Soil analysis (enter sediment type if known, or laboratory particle size data)

Sediment Type (C, F or D) if known:	D						From Appendix C (if known)
% sand (fraction 0.02 to 2.00 mm)							Enter the percentage of each soil fraction. E.g. enter 10 for 10%
% silt (fraction 0.002 to 0.02 mm)							
% clay (fraction finer than 0.002 mm)							
Dispersion percentage							E.g. enter 10 for dispersion of 10%
% of whole soil dispersible							See Section 6.3.3(e). Auto-calculated
Soil Texture Group	D						Automatic calculation from above

Rainfall data

Design rainfall depth (no of days)	5						See Section 6.3.4 and, particularly, Table 6.3 on pages 6-24 and 6-25.
Design rainfall depth (percentile)	75						
x-day, y-percentile rainfall event (mm)	19.8						
Rainfall R-factor (if known)							Only need to enter one or the other here
IFD, 2-year, 6-hour storm (if known)	10.1						

RUSLE Factors

Rainfall erosivity (*R*-factor)	2250						Auto-filled from above
Soil erodibility (*K*-factor)	0.041						
Slope length (m)	100						
Slope gradient (%)	4.5						RUSLE LS factor calculated for a high rill/interrill ratio.
Length/gradient (*LS*-factor)	1.19						
Erosion control practice (*P*-factor)	1.3	1.3	1.3	1.3	1.3	1.3	
Ground cover (*C*-factor)	1	1	1	1	1	1	

Sediment Basin Design Criteria (for Type D/F basins only. Leave blank for Type C basins)

Storage (soil) zone design (no of months)	2	2	2	2	2	2	Minimum is generally 2 months
Cv (Volumetric runoff coefficient)	0.5	0.5					See Table F2, page F-4 in Appendix F

Calculations and Type D/F Sediment Basin Volumes

Soil loss (t/ha/yr)	142						
Soil Loss Class	1						See Table 4.2, page 4-13
Soil loss (m^3/ha/yr)	109						Conversion to cubic metres
Sediment basin storage (soil) volume (m^3)	46						See Sections 6.3.4(i) for calculations
Sediment basin settling (water) volume (m^3)	639						See Sections 6.3.4(i) for calculations
Sediment basin total volume (m^3)	685						

NB for sizing of Type C (coarse) sediment basins, see Worksheet 3 (if required).

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Project: 971 RICHMOND ROAD, MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title: SEDIMENT & EROSION CONTROL CONCEPT PLAN SHEET 01 OF 02

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	100	H

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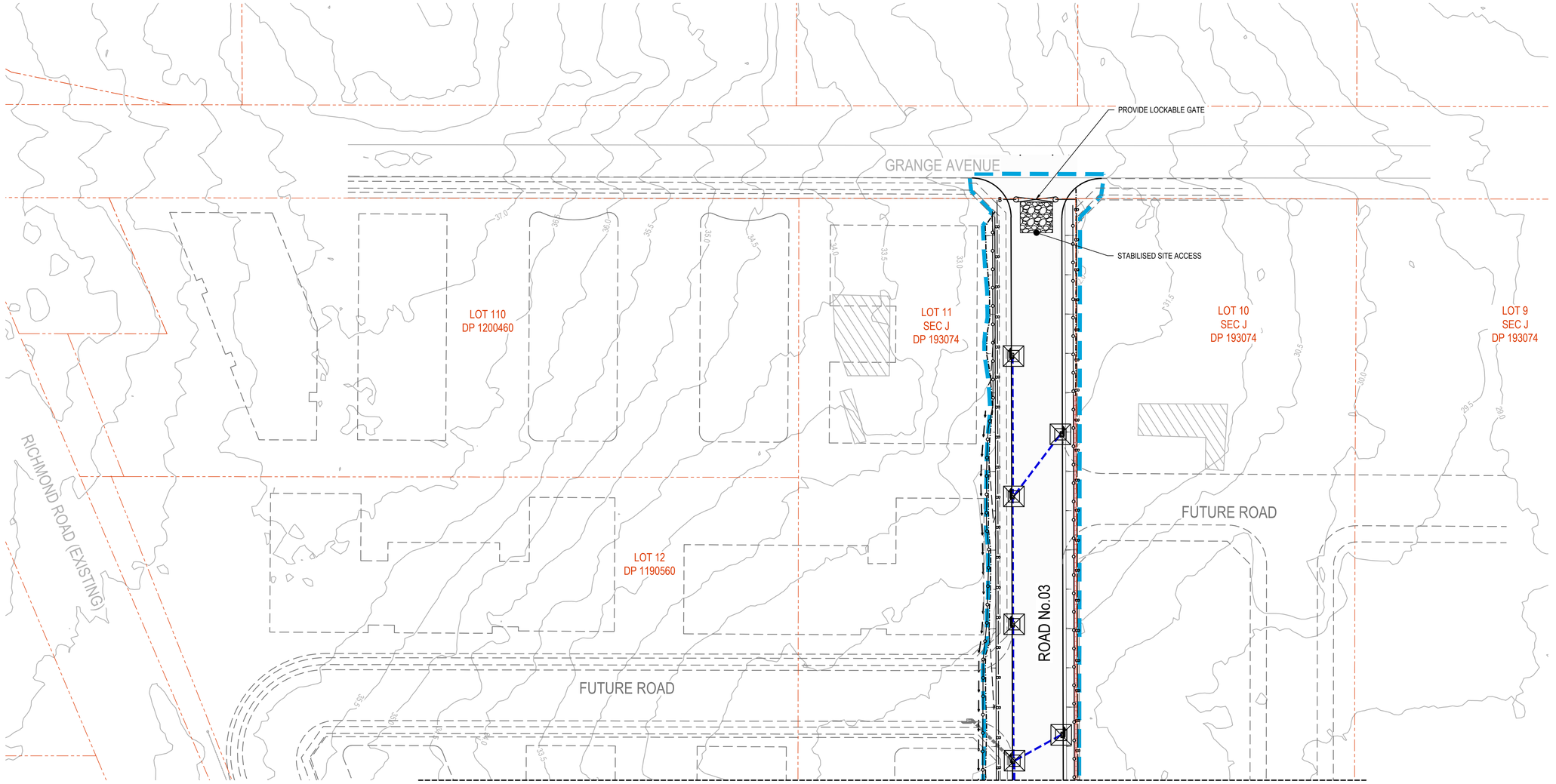
NORTH

LEGEND

CONTOURS	10.0 — 20.0
STABILISED SITE ACCESS	
POSSIBLE STOCKPILE LOCATION	SP
SITE SECURITY FENCE	B B B
SEDIMENT FENCE	
DIVERSION SWALE	
PIT INLET FILTER (GEOTEXTILE OR MESH & GRAVEL)	
ROCK CHECK DAM	
GREEN WASTE BIN (1 x 2.5 x 2.5m)	
MASONRY WASTE BIN (1 x 2.5 x 2.5m)	
WASTE BINS x 4 - 1 x MIXED MATERIAL, 1 x PAPER / CARDBOARD, 1 x METAL & 1 x TREATED TIMBER	



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Project: 971 RICHMOND ROAD, MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title: SEDIMENT & EROSION CONTROL CONCEPT PLAN SHEET 02 OF 02

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	101	H

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GENERAL NOTES

1. ALL EROSION AND SEDIMENT CONTROL MEASURES, INCLUDING REVEGETATION AND STORAGE OF SOIL AND TOPSOIL, SHALL BE IMPLEMENTED TO THE REQUIREMENTS OF THE "ENVIRONMENT PROTECTION AUTHORITY".AND "DEPT OF LAND AND WATER CONSERVATION". MEASURES OUTLINED IN THE SEDIMENT & EROSION CONTROL PLAN MUST BE IMPLEMENTED PRIOR TO AND MAINTAINED DURING AND AFTER THE CONSTRUCTION WORKS.
2. TOPSOIL FROM ALL AREAS TO BE DISTURBED SHALL BE STOCKPILED AND LATER RESPREAD TO AID REVEGETATION IN THOSE AREAS.
3. ALL DRAINAGE WORKS SHALL BE CONSTRUCTED AND STABILIZED AS EARLY AS POSSIBLE DURING DEVELOPMENT.
4. ALL TAIL-OUT DRAINS SHALL BE GRASSED AND TRAPEZOIDAL IN SECTION. STRAW BALES SHALL BE PLACED AS A SEDIMENT CONTROL DEVICE WHERE REQUIRED.
5. VEHICULAR TRAFFIC SHALL BE CONTROLLED DURING DEVELOPMENT CONFINING ACCESS WHERE POSSIBLE TO PROPOSED OR EXISTING ROAD ALIGNMENTS. AREAS TO BE LEFT UNDISTURBED SHALL BE MARKED OFF.
6. DISTURBANCE OF VEGETATION SHALL BE LIMITED TO FILL AREAS, ROADWAYS AND DRAINAGE LINES. NO LOT GRADING SHALL BE CARRIED OUT IN UNDISTURBED AREAS WITHOUT CONSULTATION WITH COUNCIL'S ENGINEER.
7. ALL DISTURBED AREAS SHALL BE REVEGETATED WITHIN 14 WORKING DAYS FROM THE CONCLUSION OF LAND SHAPING.
8. MINIMISE DUST BY WATERING WHEN REQUIRED.

STOCKPILE NOTES

9. SPOIL AND TOPSOIL STOCKPILES SHALL BE LOCATED AWAY FROM DRAINAGE LINES AND AREAS WHERE WATER MAY CONCENTRATE.
10. IF STOCKPILES ARE TO BE IN PLACE FOR LONGER THAN 14 DAYS THEN THEY SHALL BE STABILIZED BY COVERING WITH A MULCH OR WITH TEMPORARY VEGETATION.
11. FOLLOWING CONSTRUCTION, TOPSOIL SHALL BE RESPREAD TO A MINIMUM DEPTH OF 100mm ON THE BARE SOIL SURFACES AND REVEGETATE.
12. ALL STOCKPILES TO BE (MAX) 2m HIGH AND PROTECTED WITH SILT FENCE.

SPECIAL NOTES

13. LOCATION AND EXTENT OF SOIL AND WATER MANAGEMENT DEVICES IS DIAGRAMMATIC ONLY AND THE ACTUAL REQUIREMENTS SHALL BE CONFIRMED ON SITE.
14. THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE GUIDELINES SET OUT IN "MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION " -4TH EDITION AND THE ACCOMPANYING ROAD AND DRAINAGE PLANS.
15. CONFORMITY WITH THIS PLAN SHALL IN NO WAY REDUCE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT AGAINST WATER DAMAGE DURING THE COURSE OF THE CONTRACT.
16. MANAGEMENT DEVICES SHALL BE MAINTAINED ON A REGULAR BASIS. WHERE CLEANING IS REQUIRED, THE SEDIMENT SHALL BE REMOVED TO A POINT NOMINATED BY THE ENGINEER.
17. PRIOR TO THE COMMENCEMENT OF ANY EARTHWORKS, AND AFTER THE ROAD CENTRELINES HAVE BEEN PEGGED AND/OR PERMANENTLY MARKED, THE SITE MUST BE INSPECTED BY COUNCIL'S REPRESENTATIVE AND THE APPLICANT'S REPRESENTATIVE TO IDENTIFY AND APPROPRIATELY MARK:-
    a) THE TREES TO BE RETAINED.
    b) ALL TREES TO BE LEFT UNDISTURBED AND TO BE CORDONED OFF.
18. NO TREES SHALL BE REMOVED WITHOUT COUNCIL'S CLEARANCE.
19. MANAGEMENT DEVICES TO REMAIN UNTIL THE END OF THE MAINTENANCE PERIOD.

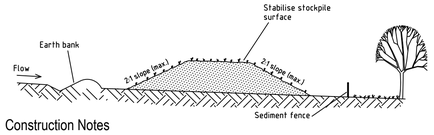
SEDIMENTATION CONTROL DEVICES

20. ALL STRAW BALES SHALL BE BOUND WITH WIRE. STRAW BALES SHALL BE PLACED END TO END IN A SINGLE ROW AND EMBEDDED INTO THE SOIL TO A DEPTH OF 100mm. EACH BALE SHALL BE SECURELY ANCHORED WITH TWO STEEL STAKES DRIVEN 450mm INTO THE GROUND AND LOCATED ON THE BALE CENTRE LINE.
21. SILT FENCES SHALL BE CONSTRUCTED BY STRETCHING A FILTER FABRIC (PROPEX OR SIMILAR) BETWEEN POSTS AT 2m (3m MAX) CENTRES. FABRIC SHALL BE BURIED 150mm ALONG ITS LOWER EDGE.

NOTE:
ALL SEDIMENT AND EROSION CONTROL MEASURES ARE TO BE PLACED WHOLLY WITHIN THE SUBJECT SITES AND NOT EXTEND INTO ADJACENT PROPERTY WITHOUT LANDOWNER CONSENT.

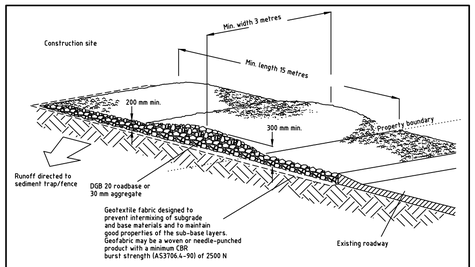
FOR CLARITY PURPOSES SOME FENCES HAVE BEEN SHOWN OUTSIDE THE SITE BOUNDARY. IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE THAT THESE FENCES ARE CONTAINED WITHIN THE SITE AND NOT ENCROACH INTO ANY ADJACENT LAND.

ADJOINING OWNER'S CONSENT REQUIRED FOR ANY SEDIMENT & EROSION CONTROL DEVICES ON THEIR LAND.



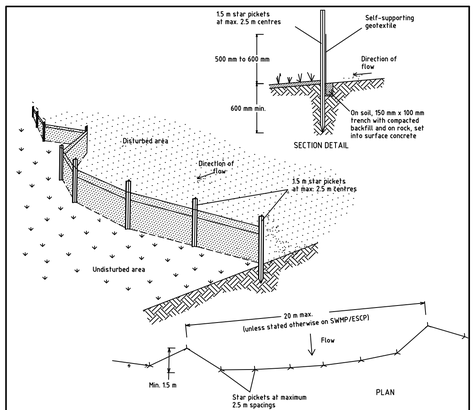
Construction Notes
1. Place stockpiles more than 2 (preferably 5) metres from existing vegetation, concentrated water flow, roads and hazard areas.
2. Construct on the contour as low, flat, elongated mounds.
3. Where there is sufficient area, topsoil stockpiles shall be less than 2 metres in height.
4. Where they are to be in place for more than 10 days, stabilise following the approved ESCP or SWMP to reduce the C-factor to less than 0.10.
5. Construct earth banks (Standard Drawing 5-5) on the upslope side to divert water around stockpiles and sediment fences (Standard Drawing 6-8) 1 to 2 metres downslope.

STOCKPILES — SD 4-1



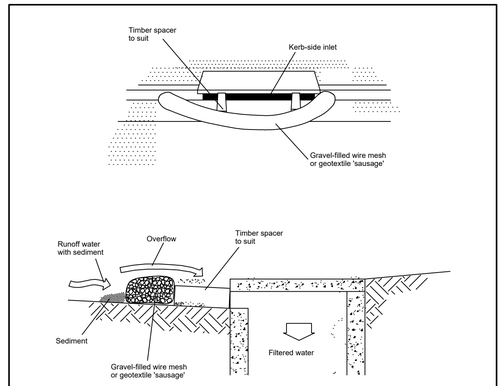
Construction Notes
1. Strip the topsoil, level the site and compact the subgrade.
2. Cover the area with needle-punched geotextile.
3. Construct a 200 mm thick pad over the geotextile using road base or 30 mm aggregate.
4. Ensure the structure is at least 15 metres long or to building alignment and at least 3 metres wide.
5. Where a sediment fence joins onto the stabilised access, construct a hump in the stabilised access to divert water to the sediment fence

STABILISED SITE ACCESS — SD 6-14



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 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
5. Join sections of fabric at a support post with a 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

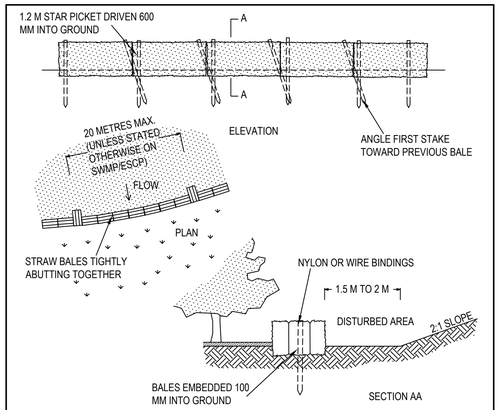
SEDIMENT FENCE — SD 6-8



NOTE: This practice only to be used where specified in an approved SWMP/ESCP.

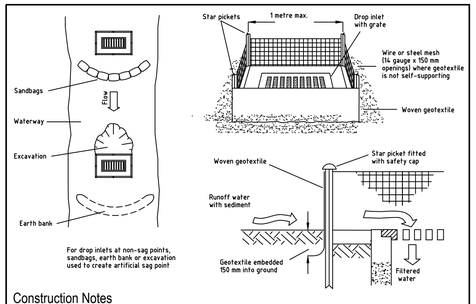
Construction Notes
1. Install filters to kerb inlets only at sag points.
2. Fabricate a sleeve made from geotextile or wire mesh longer than the length of the inlet pit and fill it with 25 mm to 50 mm gravel.
3. Form an elliptical cross-section about 150 mm high x 400 mm wide.
4. Place the filter at the opening leaving at least a 100-mm space between it and the kerb inlet. Maintain the opening with spacer blocks.
5. Form a seal with the kerb to prevent sediment bypassing the filter.
6. Sandbags filled with gravel can substitute for the mesh or geotextile providing they are placed so that they firmly abut each other and sediment-laden waters cannot pass between.

MESH AND GRAVEL INLET FILTER — SD 6-11



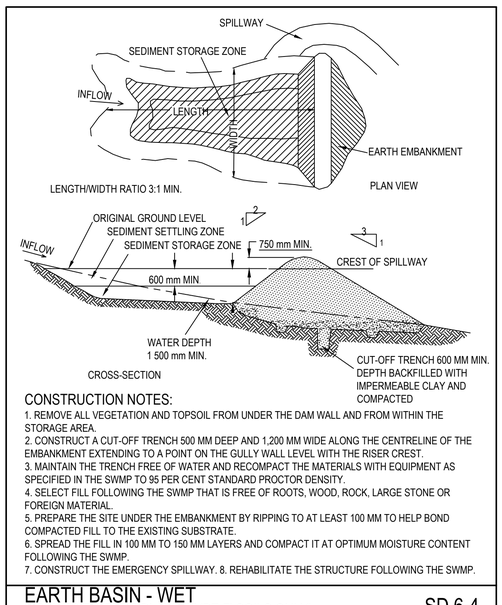
CONSTRUCTION NOTES:
1. CONSTRUCT THE STRAW BALE FILTER AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE.
2. PLACE BALES LENGTHWISE IN A ROW WITH ENDS TIGHTLY ABUTTING. USE STRAW TO FILL ANY GAPS BETWEEN BALES. STRAWS ARE TO BE PLACED PARALLEL TO GROUND.
3. ENSURE THAT THE MAXIMUM HEIGHT OF THE FILTER IS ONE BALE.
4. EMBED EACH BALE IN THE GROUND 75 mm TO 100 mm AND ANCHOR WITH TWO 1.2 METRE STAR PICKETS OR STAKES. ANGLE THE FIRST STAR PICKET OR STAKE IN EACH BALE TOWARDS THE PREVIOUSLY LAID BALE.DRIVE THEM 600 mm INTO THE GROUND AND, IF POSSIBLE, FLUSH WITH THE TOP OF THE BALES. WHERE STAR PICKETS ARE USED AND THEY PROTRUDE ABOVE THE BALES, ENSURE THEY ARE FITTED WITH SAFETY CAPS.
5. WHERE A STRAW BALE FILTER IS CONSTRUCTED DOWNSLOPE FROM A DISTURBED BATTER, ENSURE THE BALES ARE PLACED 1 TO 2 METRES DOWNSLOPE FROM THE TOE.
6. ESTABLISH A MAINTENANCE PROGRAM THAT ENSURES THE INTEGRITY OF THE BALES IS RETAINED - THEY COULD REQUIRE REPLACEMENT EACH TWO TO FOUR MONTHS.

STRAW BALE FILTER — SD 6-7



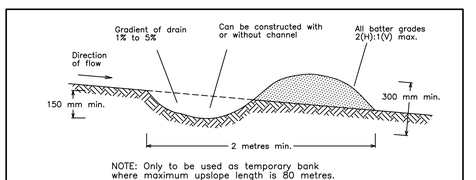
Construction Notes
1. Fabricate a sediment barrier made from geotextile or straw bales.
2. Follow Standard Drawing 6-8 for installation procedures for geofabric. Reduce the picket spacing to 1 metre centres.
3. In waterways, artificial sag points can be created with sandbags or earth banks as shown in the drawing.
4. Do not cover the inlet with geotextile unless the design is adequate to allow for all waters to bypass it.

GEOTEXTILE INLET FILTER — SD 6-12



CONSTRUCTION NOTES:
1. REMOVE ALL VEGETATION AND TOPSOIL FROM UNDER THE DAM WALL AND FROM WITHIN THE STORAGE AREA.
2. CONSTRUCT A CUT-OFF TRENCH 500 MM DEEP AND 1,200 MM WIDE ALONG THE CENTRELINE OF THE EMBANKMENT EXTENDING TO A POINT ON THE GULLY WALL LEVEL WITH THE RISER CREST.
3. MAINTAIN THE TRENCH FREE OF WATER AND RECOMPACT THE MATERIALS WITH EQUIPMENT AS SPECIFIED IN THE SWMP TO 95 PER CENT STANDARD PROCTOR DENSITY.
4. SELECT FILL FOLLOWING THE SWMP THAT IS FREE OF ROOTS, WOOD, ROCK, LARGE STONE OR FOREIGN MATERIAL.
5. PREPARE THE SITE UNDER THE EMBANKMENT BY RIPPING TO AT LEAST 100 MM TO HELP BOND COMPACTED FILL TO THE EXISTING SUBSTRATE.
6. SPREAD THE FILL IN 100 MM TO 150 MM LAYERS AND COMPACT IT AT OPTIMUM MOISTURE CONTENT FOLLOWING THE SWMP.
7. CONSTRUCT THE EMERGENCY SPILLWAY. 8. REHABILITATE THE STRUCTURE FOLLOWING THE SWMP.

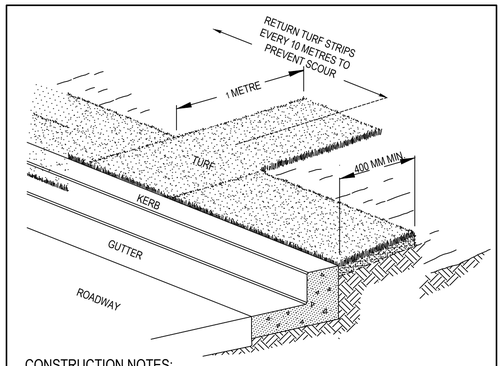
EARTH BASIN - WET
(APPLIES TO 'TYPE D' AND 'TYPE F' SOILS ONLY) — SD 6-4



NOTE: Only to be used as temporary bank where maximum upslope length is 80 metres.

Construction Notes
1. Build with gradients between 1 percent and 5 percent.
2. Avoid removing trees and shrubs if possible - work around them.
3. Ensure the structures are free of projections or other irregularities that could impede water flow.
4. Build the drains with circular, parabolic or trapezoidal cross sections, not V shaped.
5. Ensure the banks are properly compacted to prevent failure.
6. Complete permanent or temporary stabilisation within 10 days of construction.

EARTH BANK (LOW FLOW) — SD 5-5



CONSTRUCTION NOTES:
1. INSTALL A 400mm MINIMUM WIDE ROLL OF TURF ON THE FOOTPATH NEXT TO THE KERB AND AT THE SAME LEVEL AS THE TOP OF THE KERB.
2. LAY 1.4 METRE LONG TURF STRIPS NORMAL TO THE KERB EVERY 10m.
3. REHABILITATE DISTURBED SOIL BEHIND THE TURF STRIP FOLLOWING THE ESCP/SWMP.

KERBSIDE TURF STRIP — SD 6-13

ISSUED FOR **DEVELOPMENT APPLICATION**
NOT FOR CONSTRUCTION

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H	KW/SA	SA	PB	03/08/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
G	KW/SA	SA	PB	29/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
F	KW/SA	SA	PB	28/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
E	SA	MC	MC	02/06/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
D	SA	MC	MC	31/05/2021	ISSUED TO ADDRESS SOFAC COMMENTS
C	KW/PZ	MC	MC	21/12/2020	ISSUED FOR COUNCIL'S COMMENT
B	KW/MG	CW	MP	31/03/2020	ISSUED FOR CLIENT REVIEW

Scale:

For: Harchitex architects + planners

By: Orion Consulting
CONSULT AUSTRALIA Member Firm
ABN:25 604 069 981 PO Box:7936, BAULKHAM HILLS NSW 2153 T:(02) 8660 0035 E:info@orionconsulting.au

Project: 971 RICHMOND ROAD, MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title: SEDIMENT & EROSION CONTROL NOTES & ETAILS

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	102	H

REFER TO DRG. No. CC-201 FOR CONTINUATION

NORTH
FUTURE DEVELOPMENT DESIGNED BY WOOD & GRIEVE ENGINEERS REFER TO COUNCIL APPROVED PLANS DA-15-02765 FOR DETAILS
LOT 12 DP 1190560
LOT 11 SEC J DP 193074
LOT 10 SEC J DP 193074
LOT 9 SEC J DP 193074
LOT 1 DP 1205982
LOT 13 DP 1190560
PROVIDE 1V:4H TEMPORARY BATTER TO MATCH EXISTING SURFACE
PROVIDE TEMPORARY GRASS LINED SWALE AND 900 SQ. GRATED INLET PIT TO INTERCEPT OVERLAND FLOWS
PROVIDE MAXIMUM 0.7m HIGH RETAINING WALL AND 1V:4H BATTER TO EXISTING SURFACE
MAX 1V:4H BATTER TO MATCH EXISTING SURFACE
PROVIDE TEMPORARY RETAINING WALL
PROVIDE TEMPORARY TRANSITION PAVEMENT
CAPPED STUB FOR FUTURE CONNECTION
PROVIDE 1V:4H BATTER TO MATCH EXISTING SURFACE
TEMPORARY R9m TURNING HEAD
PROVIDE 0.5m HIGH RETAINING WALL
TRANSITION PROPOSED CARRIAGEWAY WIDTH FROM 5.5m TO 4.5m FROM CH 0.000 TO TP 20.132
PROVIDE 1V:3H BATTER TO MATCH EXISTING SURFACE TO REDUCE AMOUNT OF RETAINING WALL ADJACENT TO RICHMOND ROAD
ROAD No.02
ROAD No.01
ROAD No.03
ROAD No.04
RICHMOND ROAD (EXISTING)
RAINWATER TANK
STORMWATER TANK No.01 REFER TO DETAILS ON DA-450
OVERFLOW LINE FROM RAINWATER TANK
STORMWATER TANK No.02 REFER TO DETAILS ON DA-450
TEMPORARY BASIN No.01
CONSTRUCT TEMPORARY STACK ROCK HEADWALL WITH RIP RAP SCOUR PROTECTION. PROVIDE 1.0m HIGH HANDRAIL AROUND HEADWALL
PROVIDE TAILOUT TO EXISTING DAM @ MIN 0.5% GRADE
EXISTING DAM TOP WATER LEVEL OF RL 27.2 ADOPTED IN STORMWATER DESIGN
FUTURE ROAD No.05
EXISTING DAM
TEMPORARY RETAINING WALL
FOR BASIN PLAN & DETAILS REFER TO DA-401
CAPPED PIPE TO DIVERT UPSTREAM FLOWS INTO BASIN
MATCH EXISTING SURFACE LEVELS AT BOUNDARY
CAP END SEAL PIPE FOR FUTURE CONNECTION
PROVIDE 1V:5H BATTER TO MATCH EXISTING SURFACE
CAP END SEAL PIPE FOR FUTURE CONNECTION
CAP END SEAL PIPE FOR FUTURE CONNECTION
CREST 168.888
SAG 76.414
SAG 16.468

NOTES:

1. EXISTING CONTOURS BASED ALS SURVEY OVER LOT10-11 DP 193074.
2. EXISTING BUILDING BASED IMAGE FROM NEARMAP OVER LOT10-11 DP 193074.
3. ARCHITECTURAL FOOTPRINT SHOWN IN THESE PLANS ARE BASED ON PLANS BY ARCHITEX REVISION H DATED 15.07.2021

DIAL BEFORE YOU DIG www.1100.com.au

UTILITIES SHOWN ARE DIAGRAMMATIC ONLY AND MAY NOT INCLUDE ALL SERVICES WITHIN THE LIMIT OF WORKS.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY, LOCATE AND AVOID DAMAGE TO THEM AS SPECIFIED BY EACH UTILITIES EXCAVATION GUIDE LINES/STANDARDS.

ISSUED FOR **DEVELOPMENT APPLICATION**

NOT FOR CONSTRUCTION

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Scale: 0 5 10 15 20 25 30 35 40 45 50
SCALE 1:500 (A1) SCALE 1:1000 (A3)

For: architex architects + planners

By: Orion Consulting
CONSULT AUSTRALIA Member Firm
ABN:25 604 069 981 PO Box:7936, BAULKHAM HILLS NSW 2153 T:(02) 8660 0035 E:info@orionconsulting.com.au

Project: 971 RICHMOND ROAD, MARSDEN PARK ROAD & DRAINAGE DESIGN

Title: ENGINEERING PLAN SHEET 01 OF 02

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	200	H

NORTH

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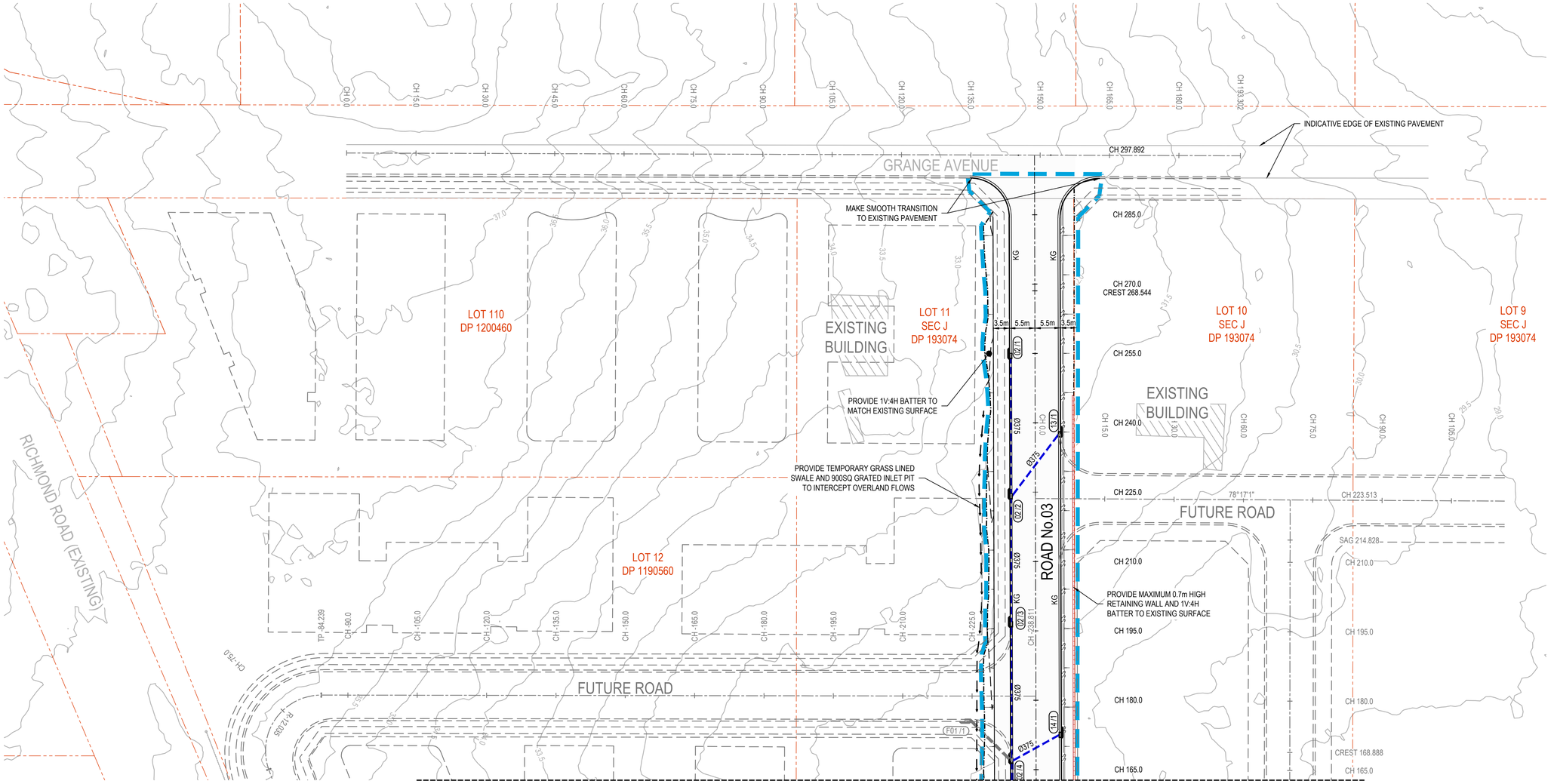

REFER TO DRG. No. DA-200 FOR CONTINUATION

NOTES:
1. EXISTING CONTOURS BASED ALS SURVEY OVER LOT10-11 DP 193074.
2. EXISTING BUILDING BASED IMAGE FROM NEARMAP OVER LOT10-11 DP 193074.

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For: Architex architects + planners

By: Orion Consulting — CONSULT AUSTRALIA Member Firm

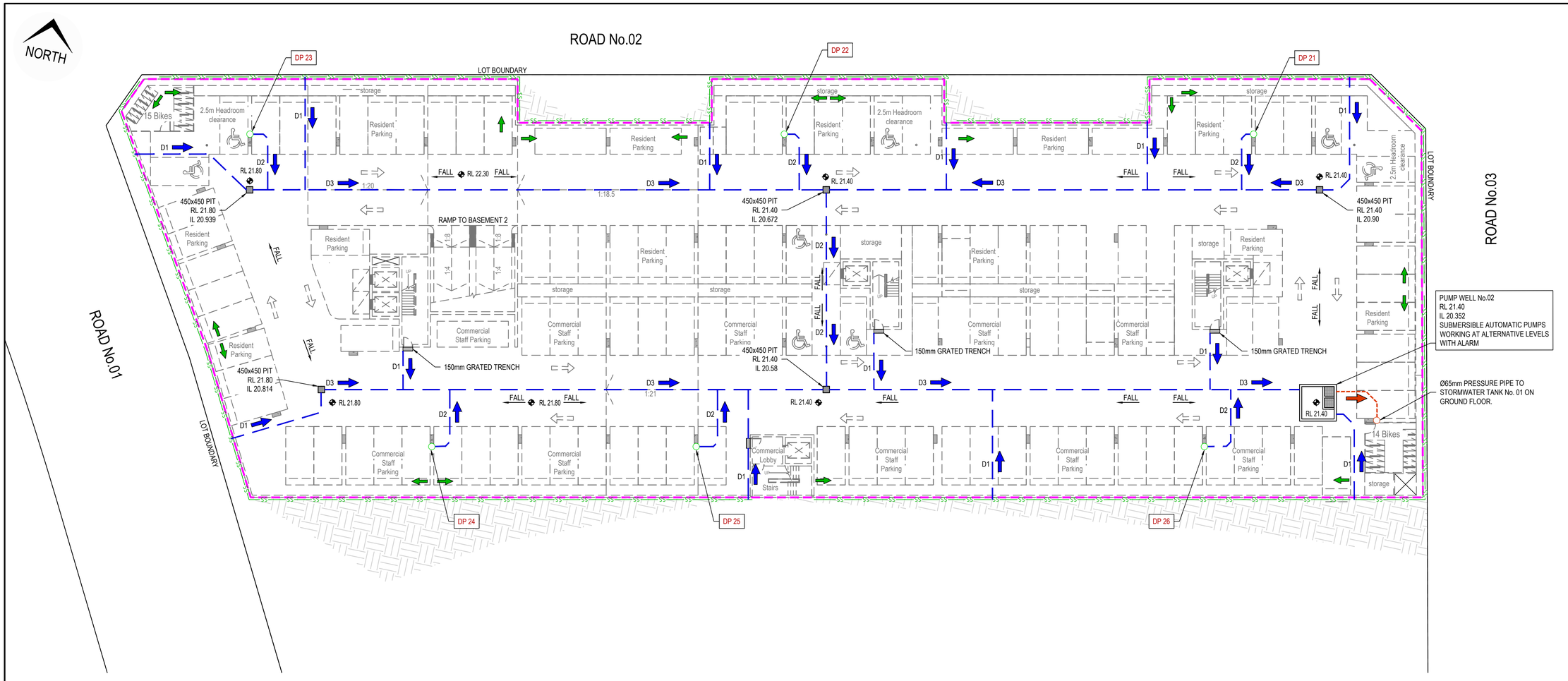
ABN:25 604 069 981 **PO Box:**7936, BAULKHAM HILLS NSW 2153 **T:**(02) 8660 0035 **E:**info@orionconsulting.com.au

Project: 971 RICHMOND ROAD, MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title: ENGINEERING PLAN SHEET 02 OF 02

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	201	H

Plotted:Tuesday, 3 August 2021-4:05:48 PM File Name:\orion-data\01Orion Data\Projects_20\19-35 971 Richmond Road, Marsden Park\Design\01 Residential Subdivision\DA\19-35-01-DA-201.dwg



NOTE :

1. FINAL BASEMENT FLOOR LEVEL TO ENSURE ADEQUATE FALL TO STORMWATER PITS
2. CONCEPT STORMWATER LAYOUT SHOWN ONLY. FINAL DESIGN TO BE COORDINATED WITH BUILDING SERVICE AT DETAIL DESIGN

LEGEND

INDICATIVE BASEMENT SUBSOIL DRAIN. REFER TO STRUCTURAL ENGINEER'S DESIGN FOR DETAILS	SS
PROPOSED BASEMENT SUBSOIL DRAIN FALL DIRECTION	
PROPOSED STORMWATER DRAINAGE PIPE AND PIT	
PROPOSED BUCKET TRAP SURFACE OUTLET	
DENOTES PIPE SIZE & GRADE. REFER TO DRG. No. DA 001 PIPE SIZE SCHEDULE	D1
BASEMENT STORMWATER DRAINAGE FALL DIRECTION	
PROPOSED FLOOR FALL DIRECTION	FALL
PROPOSED RISING MAIN WITH VERTICAL PIPE PROTECTOR TO OSD TANK	
PROPOSED DOWN PIPE WITH VERTICAL PIPE PROTECTOR TO PUMP WELL	DP
PROPOSED 150mm GRATED TRENCH	150mm GT
PROPOSED DOWN PIPE TAG	DP1
PROPOSED PUMP WELL	
PROPOSED ARCHITECTURAL FLOOR LEVEL	RL 33.0
PROPOSED BASEMENT WALL OUTLINE	

ISSUED FOR **DEVELOPMENT APPLICATION**

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B	KW/MG	CW	MP	31/03/2020	ISSUED FOR CLIENT REVIEW

Scale:

0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0

SCALE 1:200 (A1) SCALE 1:400 (A3)

For: architex architects + planners

By: Orion Consulting — CONSULT AUSTRALIA Member Firm

ABN:25 604 069 981 **PO Box:**7936, BAULKHAM HILLS NSW 2153 **T:**(02) 8660 0035 **E:**info@orionconsulting.com.au

Project: 971 RICHMOND ROAD, MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title: STORMWATER MANAGEMENT PLAN - BASEMENT 3

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	210	H

Plotted:Tuesday, 3 August 2021 4:07:01 PM File Name:\orion-sbfile01\Orion\Data\Projects_2019\19-35 971 Richmond Road, Marsden Park\Design\01 Residential Subdivision\DA\19-35-01-DA-210.dwg

NOTE :

1. FINAL BASEMENT FLOOR LEVEL TO ENSURE ADEQUATE FALL TO STORMWATER PITS
2. CONCEPT STORMWATER LAYOUT SHOWN ONLY. FINAL DESIGN TO BE COORDINATED WITH BUILDING SERVICE AT DETAIL DESIGN

LEGEND

INDICATIVE BASEMENT SUBSOIL DRAIN. REFER TO STRUCTURAL ENGINEER'S DESIGN FOR DETAILS	SS
PROPOSED BASEMENT SUBSOIL DRAIN FALL DIRECTION	
PROPOSED STORMWATER DRAINAGE PIPE AND PIT	
PROPOSED BUCKET TRAP SURFACE OUTLET	
DENOTES PIPE SIZE & GRADE. REFER TO DRG. No. DA 001 PIPE SIZE SCHEDULE	D1
BASEMENT STORMWATER DRAINAGE FALL DIRECTION	
PROPOSED FLOOR FALL DIRECTION	FALL
PROPOSED RISING MAIN WITH VERTICAL PIPE PROTECTOR TO OSD TANK	
PROPOSED DOWN PIPE WITH VERTICAL PIPE PROTECTOR TO PUMP WELL	DP
PROPOSED 150mm GRATED TRENCH	150mm GT
PROPOSED DOWN PIPE TAG	DP1
PROPOSED PUMP WELL	
PROPOSED ARCHITECTURAL FLOOR LEVEL	RL 33.0
PROPOSED BASEMENT WALL OUTLINE	

ISSUED FOR **DEVELOPMENT APPLICATION**
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B	KW/MG	CW	MP	31/03/2020	ISSUED FOR CLIENT REVIEW

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0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0
SCALE 1:200 (A1) SCALE 1:400 (A3)

For: architex architects + planners

By: Orion Consulting
CONSULT AUSTRALIA Member Firm
ABN:25 604 069 981 PO Box:7936, BAULKHAM HILLS NSW 2153 T:(02) 8660 0035 E:info@orionconsulting.com.au

Project:
971 RICHMOND ROAD,
MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title:
STORMWATER MANAGEMENT PLAN
- BASEMENT 2

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	211	H

NORTH

ROAD No.02

ROAD No.03

ROAD No.01

LOT BOUNDARY

113.78m

5.755m

7.085m

22.865m

60.405m

8.010m

7.05m

86.31m

Exhaust Fan Room

Electric Charging Station

Commercial Parking

Deep Soil

Childcare Staff

Childcare Parent Parking

CCC Lobby

Motorbike Parking

Block D Recycle Bins 15 Bins

Block D Waste Bins 3 Bins

Block E Recycle Bins 16 Bins

Block E Waste Bins 3 Bins

Block F Recycle Bins 16 Bins

Block F Waste Bins 3 Bins

g-chute

RAMP TO BASEMENT 1

RAMP TO BASEMENT 3

Pedestrian Path

150mm GATED TRENCH

Line of Building Above

Courier Parking

Commercial Lobby

Stairs

Retail Bins 6 Bins

CCC Bins 3 Bins

Resident Waste Collection 9 Bins

Resident Recycle Collection 40 Bins

Turning Bay

Bin Tug

MRV Truck Loading Bay

300mm HEAVY DUTY GRATED TRENCH

Rainwater Tank Over

RAINWATER TANK

STORMWATER TANK No.01

STORMWATER TANK No.02

22 Bikes

Visitor Parking

Resident Waste Collection 10 Bins

Resident Recycle Collection 40 Bins

Bulky Waste Area 11 m²

Supply Air

Carwash Bay

Resident Parking

Block A Waste Bins 3 Bins

Block A Recycle Bins 14 Bins

Plant Room

150mm GRATED TRENCH

RAMP TO GROUND FLOOR

Block B Recycle Bins 12 Bins

Block B Waste Bins 3 Bins

storage

Hydrant Pump Room

Block C Waste Bins 3 Bins

Block C Recycle Bins 14 Bins

DP 11 DP 12 DP 13 DP 14 DP 15 DP 16 DP 17 DP 21 DP 22 DP 23 DP 24 DP 25 DP 26

Ø65mm PRESSURE PIPE FROM PUMP WELL No.02 TO STORMWATER TANK No.01 ON GROUND FLOOR.

PRESSURE PIPE RUN ALONG CEILING TO BE CONNECTED TO STORMWATER TANK No.01

PROVIDE VERTICAL PIPE TO SUIT STORMWATER TANK No.01 LEVEL

Ø65mm PRESSURE PIPE FROM PUMP WELL No.01 TO STORMWATER THANK No.01 ON GROUND FLOOR.

LEGEND

PROPOSED STORMWATER DRAINAGE PIPE AND PIT	
PROPOSED BUCKET TRAP SURFACE OUTLET	
DENOTES PIPE SIZE & GRADE. REFER TO DRG. No. DA 001 PIPE SIZE SCHEDULE	D1
BASEMENT STORMWATER DRAINAGE FALL DIRECTION	
PROPOSED FLOOR FALL DIRECTION	FALL
PROPOSED RISING MAIN WITH VERTICAL PIPE PROTECTOR TO OSD TANK	
PROPOSED DOWN PIPE WITH VERTICAL PIPE PROTECTOR TO PUMP WELL	DP
PROPOSED DOWN PIPE TAG	DP1
PROPOSED 150mm GRATED TRENCH	150mm GT
PROPOSED ARCHITECTURAL FLOOR LEVEL	RL 33.0
PROPOSED STORMWATER TANK	
PROPOSED RAINWATER TANK	
PROPOSED BASEMENT WALL OUTLINE	

NOTE :

1. FINAL BASEMENT FLOOR LEVEL TO ENSURE ADEQUATE FALL TO STORMWATER PITS
2. CONCEPT STORMWATER LAYOUT SHOWN ONLY. FINAL DESIGN TO BE COORDINATED WITH BUILDING SERVICE AT DETAIL DESIGN

ISSUED FOR **DEVELOPMENT APPLICATION**

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Scale: 0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0
SCALE 1:200 (A1) SCALE 1:400 (A3)

For: architex architects + planners

By: Orion Consulting — CONSULT AUSTRALIA Member Firm

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Project: 971 RICHMOND ROAD, MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title: STORMWATER MANAGEMENT PLAN - BASEMENT 1

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	212	H

ROAD No.02

NORTH

600x600 PIT
RL 34.80
IL 34.30

600x600 PIT
RL 34.90
IL 34.354

600x600 PIT
RL 34.70
IL 34.16

600x600 PIT
RL 34.60
IL 33.78

600x600 PIT
RL 34.35
IL 33.391

ROAD No.01

ROAD No.03

R111
RETAIL
RL 35.00

R112
RETAIL
RL 34.20

R110
RETAIL
RL 34.60

R102
RETAIL
RL 34.40

R101
RETAIL
RL 34.45

R109
RETAIL
RL 34.00

R108
RETAIL

R107
GYM
RL 32.35

R103
RETAIL
RL 31.25

R104
RETAIL
RL 30.25

R105
RETAIL
RL 30.60

R106
RETAIL
RL 31.40

R113
RETAIL
RL 31.80

R114
RETAIL
RL 30.60

R115
RETAIL
RL 30.40

CCC
CHILD CARE CENTRE

Playroom #1
Playroom #2
Playroom #3
Playroom #4
Playroom #5
Outdoor Play Area
Reception
Office
Ldry
WC
Staff
Kitchen
Cot Room
Nappy Change
Bottle Prep
Commercial Lobby
Hydrant Pump Room
Plant Room
Common Open Space
Common Room
Supply Air
Plant
Store
Lobby
Cleaner store
Female
Male
Parents
Comms
MSB
Substation
Bicyle Parking
PERGOLA STRUCTURE
Kids Climbing Logs
Rainwater Tank Below
RAINWATER TANK
STORMWATER TANK No.01
STORMWATER TANK No.02

DOWN PIPE FOR BLOCK D ROOF STORMWATER DRAINAGE, REFER TO DRG. No. DA-214 FOR ROOF STORMWATER DRAINAGE LAYOUT
DP41

DOWN PIPE FOR BLOCK B ROOF STORMWATER DRAINAGE, REFER TO DRG. No. DA-214 FOR ROOF STORMWATER DRAINAGE LAYOUT
DP31

PROVIDE DOWN PIPE TO MATCH STORMWATER TANK DESIGN LEVEL

PROVIDE DOWN PIPE TO MATCH STORMWATER TANK DESIGN LEVEL

PROVIDE DOWN PIPE TO MATCH STORMWATER TANK DESIGN LEVEL

Ø65mm PRESSURE PIPE FROM PUMP WELL No.02 TO STORMWATER TANK No.01 ON GROUND FLOOR. REFER TO DRG. No. DA-210 TO 212 FOR DETAIL OF PUMP WELL ARRANGEMENT

Ø65mm PRESSURE PIPE FROM PUMP WELL No.01 TO STORMWATER TANK No.01 ON GROUND FLOOR REFER TO DRG. No. DA-210 TO 212 FOR DETAIL OF PUMP WELL ARRANGEMENT.

150mm GT
300mm HEAVY DUTY GT
Ø375
Ø450
Ø600

NOTE :
1. FINAL BASEMENT FLOOR LEVEL TO ENSURE ADEQUATE FALL TO STORMWATER PITS
2. CONCEPT STORMWATER DRAINAGE LAYOUT SHOWN ONLY. FINAL DESIGN TO BE COORDINATED WITH BUILDING SERVICE AT DETAIL DESIGN

LEGEND

PROPOSED BURIED STORMWATER DRAINAGE PIPE AND PIT	
PROPOSED STORMWATER DRAINAGE PIPE TO BE CONSTRUCTED UNDER BASEMENT CEILING	
PROPOSED PRESSURE PIPE TO OSD TANK	
LANDSCAPE AREA SUBSOIL DRAIN	SS
PROPOSED DOWN PIPE TAG	DP1
DENOTES PIPE SIZE & GRADE. REFER TO DRG. No. DA 001 PIPE SIZE SCHEDULE	D1
DENOTES PIPE FLOW DIRECTION	
PROPOSED 150mm GRATED TRENCH	150mm GT
DENOTES FLOOR WASTE Ø150	FW
DENOTES DOWN PIPE	DP
DENOTES LANDSCAPE AREA	
PROPOSED STORMWATER TANK	
PROPOSED RAINWATER TANK	
PROPOSED ARCHITECTURAL FLOOR LEVEL	RL 33.55
PROPOSED BASEMENT WALL OUTLINE	

ISSUED FOR DEVELOPMENT APPLICATION
NOT FOR CONSTRUCTION

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B	KW/MG	CW	MP	31/03/2020	ISSUED FOR CLIENT REVIEW

Scale:
0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0
SCALE 1:200 (A1) SCALE 1:400 (A3)

For: architex architects + planners

By: Orion Consulting
CONSULT AUSTRALIA Member Firm
ABN:25 604 069 981 PO Box:7936, BAULKHAM HILLS NSW 2153 T:(02) 8660 0035 E:info@orionconsulting.com.au

Project: 971 RICHMOND ROAD, MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title: STORMWATER MANAGEMENT PLAN - GROUND FLOOR

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	213	H

ROAD No.02

NORTH

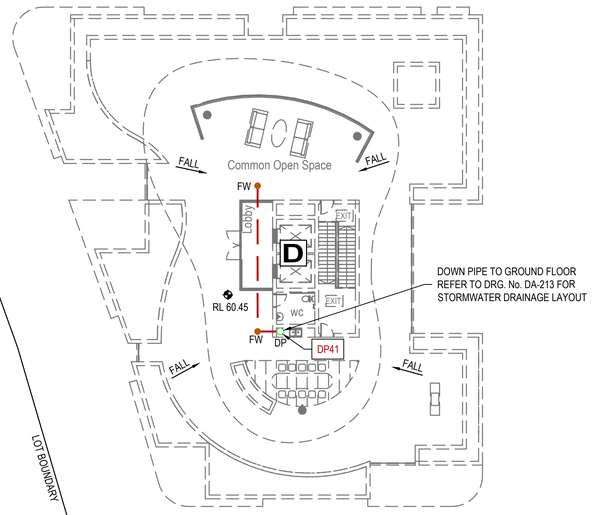
LOT BOUNDARY

ROAD No.01

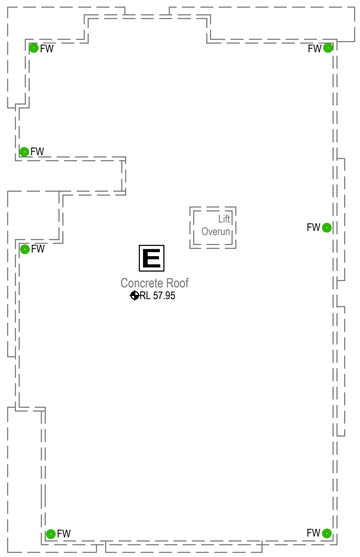
LOT BOUNDARY

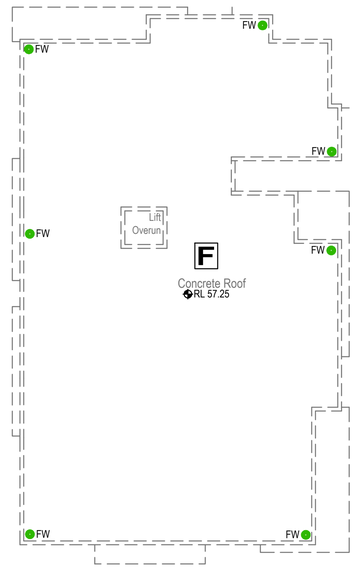
ROAD No.03

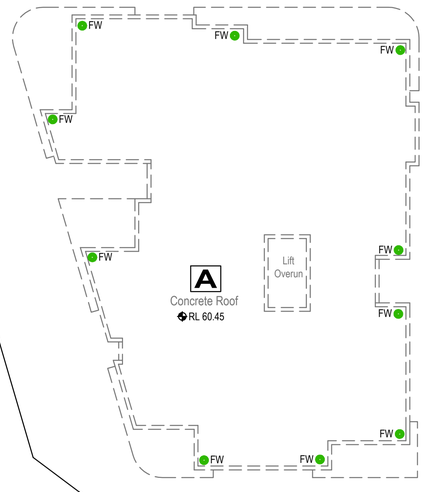
LOT BOUNDARY



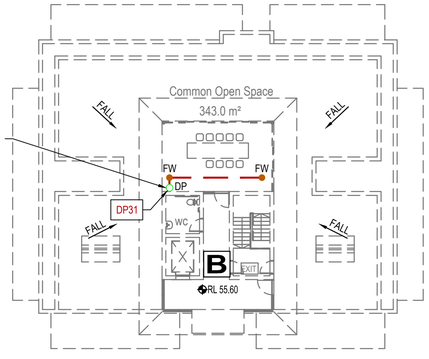
DOWN PIPE TO GROUND FLOOR
REFER TO DRG. No. DA-213 FOR
STORMWATER DRAINAGE LAYOUT

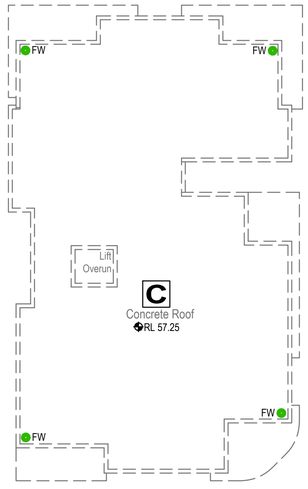






DOWN PIPE TO GROUND FLOOR
REFER TO DRG. No. DA-213 FOR
STORMWATER DRAINAGE LAYOUT





LOT BOUNDARY

NOTE :

1. FINAL BASEMENT FLOOR LEVEL TO ENSURE ADEQUATE FALL TO STORMWATER PITS
2. CONCEPT STORMWATER LAYOUT SHOWN ONLY. FINAL DESIGN TO BE COORDINATED WITH BUILDING SERVICE AT DETAIL DESIGN

LEGEND

PROPOSED STORMWATER DRAINAGE PIPE TO BE CONSTRUCTED UNDER CEILING	
PROPOSED DOWN PIPE TAG	DP1
INDICATIVE FLOOR WASTE TO BE CONNECTED TO RAINWATER TANK. DETAILS TO BE PROVIDED IN CC STAGE	FW
DENOTES FLOOR WASTE Ø150	FW
DENOTES DOWN PIPE	DP
PROPOSED ARCHITECTURAL FLOOR LEVEL	RL 33.55

ISSUED FOR **DEVELOPMENT APPLICATION**

NOT FOR CONSTRUCTION

Rev	Drawn	Design	Appd.	Date	Revision Description
H	KW/SA	SA	PB	03/08/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
G	KW/SA	SA	PB	29/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
F	KW/SA	SA	PB	28/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
E	SA	MC	MC	02/06/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
D	SA	MC	MC	31/05/2021	ISSUED TO ADDRESS SOFAC COMMENTS
C	KW/PZ	MC	MC	21/12/2020	ISSUED FOR COUNCIL'S COMMENT
B	KW/MG	CW	MP	31/03/2020	ISSUED FOR CLIENT REVIEW

Scale:
0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0
SCALE 1:200 (A1) SCALE 1:400 (A3)

For: architex architects + planners

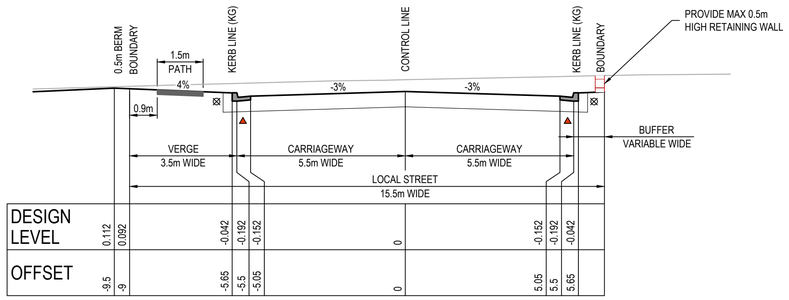
By: Orion Consulting — CONSULT AUSTRALIA Member Firm

ABN:25 604 069 981 PO Box:7936, BAULKHAM HILLS NSW 2153 T:(02) 8660 0035 E:info@orionconsulting.com.au

Project: 971 RICHMOND ROAD, MARSDEN PARK
ROAD & DRAINAGE DESIGN

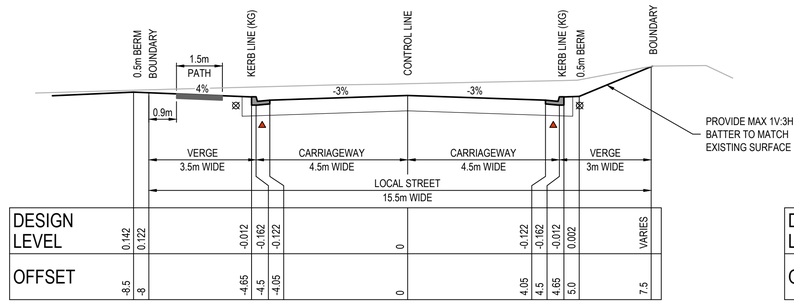
Title: STORMWATER MANAGEMENT PLAN - ROOF

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	214	H



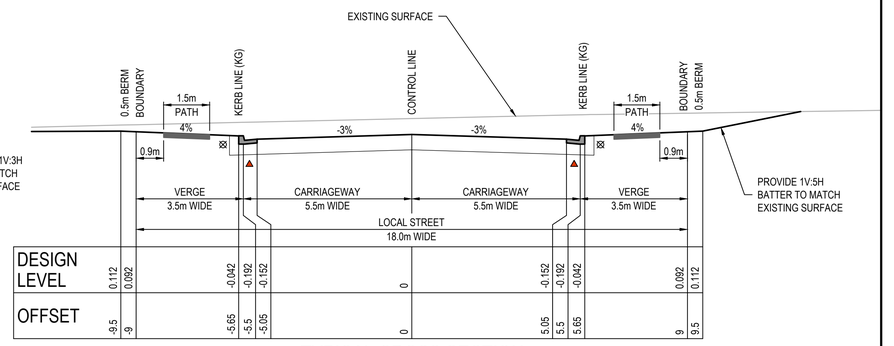
TYPICAL CROSS SECTION
ROAD No.01 - CH 0 T0 CH 20.132

FULL ROAD CONSTRUCTION
SCALE 1:100



TYPICAL CROSS SECTION
ROAD No.01 - CH 20.132 T0 CH 117.196

FULL ROAD CONSTRUCTION
SCALE 1:100



TYPICAL CROSS SECTION
ROAD No.01 - CH 117.196 TO CH 275.556

FULL ROAD CONSTRUCTION
SCALE 1:100

TYPICAL CROSS SECTION
ROAD No.02 - CH 0 TO CH 145.534

HALF ROAD CONSTRUCTION
SCALE 1:100

TYPICAL CROSS SECTION
ROAD No.03 - CH 0 TO CH 107.198

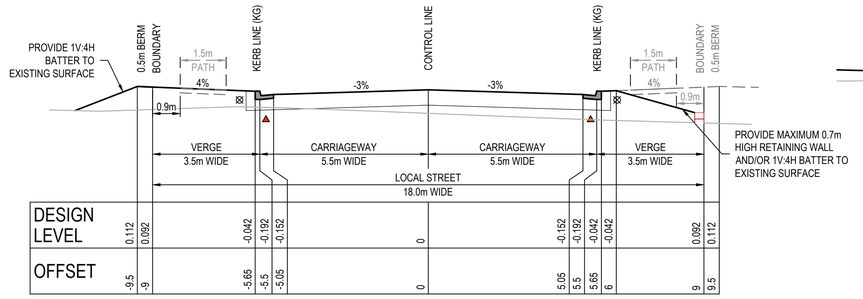
FULL ROAD CONSTRUCTION
SCALE 1:100

NOTE

FOOTPATH & KERBS TO BE CONSTRUCTED TO BLACKTOWN CITY COUNCIL STANDARDS.

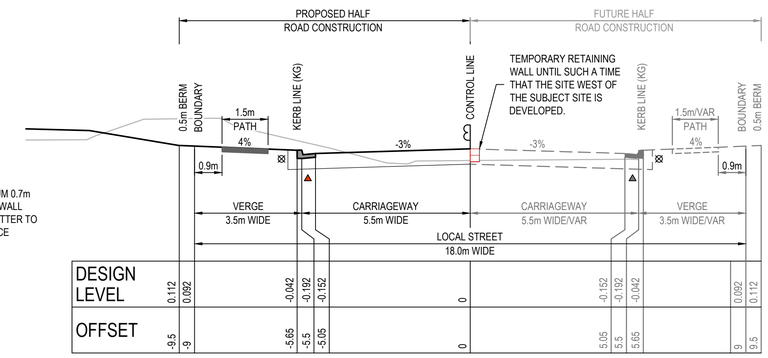
LEGEND

- ⊠ SUBGRADE TO EXTEND 300mm BEHIND BACK OF KERB
- ▲ SUBSOIL DRAIN TO BE LAID BELOW ALL KERBS WHERE NO STORMWATER PIPE IS BELOW



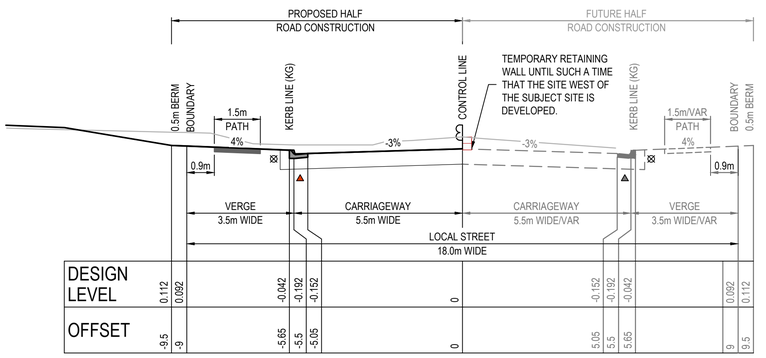
TYPICAL CROSS SECTION
ROAD No.03 - CH 107.198 TO CH 297.892

FULL ROAD CONSTRUCTION
SCALE 1:100



TYPICAL CROSS SECTION
ROAD No.04 - CH 0 TO CH 30

HALF ROAD CONSTRUCTION
SCALE 1:100



TYPICAL CROSS SECTION
ROAD No.04 - CH 30 TO CH 107.307

HALF ROAD CONSTRUCTION
SCALE 1:100

ISSUED FOR **DEVELOPMENT APPLICATION**
NOT FOR CONSTRUCTION

Rev	Drawn	Design	Appd.	Date	Revision Description
H	KW/SA	SA	PB	03/08/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
G	KW/SA	SA	PB	29/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
F	KW/SA	SA	PB	28/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
E	SA	MC	MC	02/06/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
D	SA	MC	MC	31/05/2021	ISSUED TO ADDRESS SOFAC COMMENTS
C	KW/PZ	MC	MC	21/12/2020	ISSUED FOR COUNCIL'S COMMENT
B	KW/MG	CW	MP	31/03/2020	ISSUED FOR CLIENT REVIEW

Scale:
0 1 2 3 4 5 6 7 8 9 10
SCALE 1:100 (A1) SCALE 1:200 (A3)

For: Architex architects + planners

By: Orion Consulting — CONSULT AUSTRALIA Member Firm

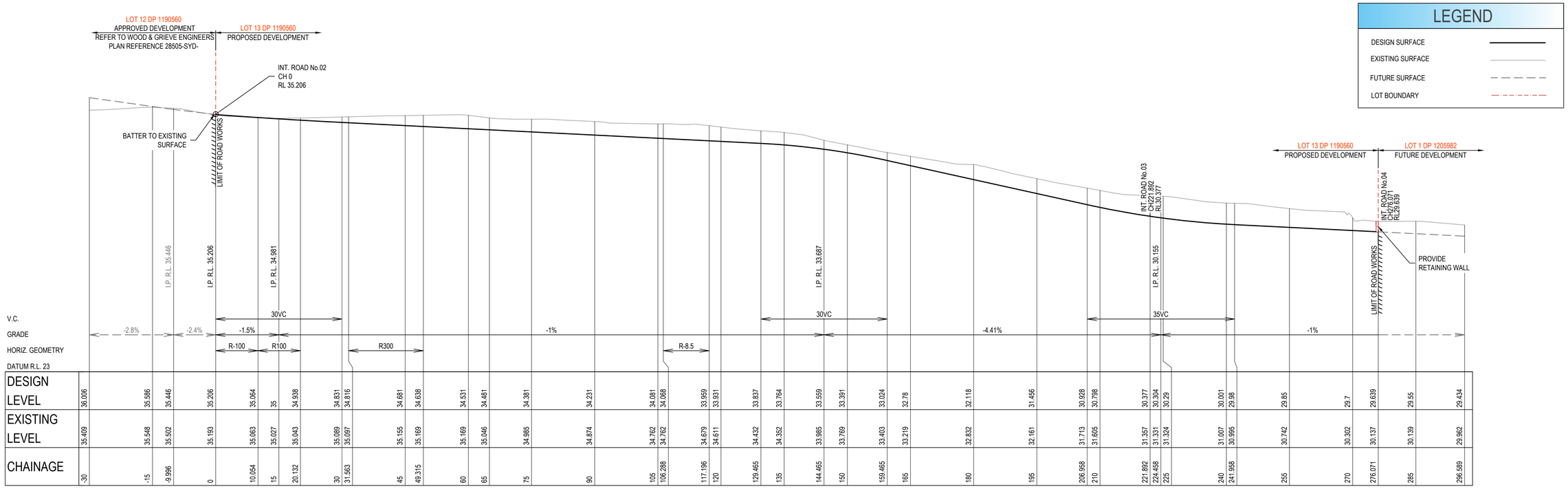
ABN:25 604 069 981 PO Box:7936, BAULKHAM HILLS NSW 2153 T:(02) 8660 0035 E:info@orionconsulting.com.au

Project:
971 RICHMOND ROAD,
MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title: TYPICAL ROAD CROSS SECTIONS

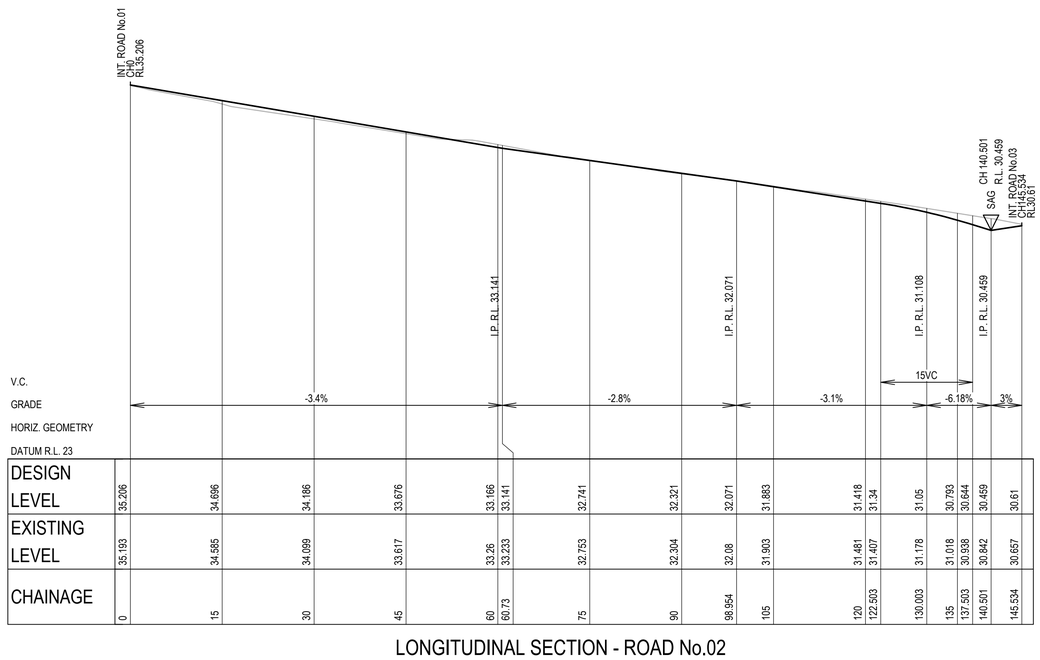
Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	300	H

Plotted Tuesday, 3 August 2021 4:08:23 PM File Name:\orion-data\01OrionData\Projects_20\19\19-35 971 Richmond Road, Marsden Park\Design\01 Residential\Submission\DA\19-35-01-DA-300.dwg



LONGITUDINAL SECTION - ROAD No.01

SCALE 1:500 (H)
SCALE 1:100 (V)



LONGITUDINAL SECTION - ROAD No.02

SCALE 1:500 (H)
SCALE 1:100 (V)

ISSUED FOR **DEVELOPMENT APPLICATION**
NOT FOR CONSTRUCTION

Rev	Drawn	Design	Appd.	Date	Revision Description
H	KW/SA	SA	PB	03/08/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
G	KW/SA	SA	PB	29/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
F	KW/SA	SA	PB	28/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
E	SA	MC	MC	02/06/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
D	SA	MC	MC	31/05/2021	ISSUED TO ADDRESS SOFAC COMMENTS
C	KW/PZ	MC	MC	21/12/2020	ISSUED FOR COUNCIL'S COMMENT
B	KW/MG	CW	MP	31/03/2020	ISSUED FOR CLIENT REVIEW

Scale:
0 5 10 15 20 25 30 35 40 45 50
SCALE 1:500 (A1) SCALE 1:1000 (A3)
0 1 2 3 4 5 6 7 8 9 10
SCALE 1:100 (A1) SCALE 1:200 (A3)

For: architex architects + planners

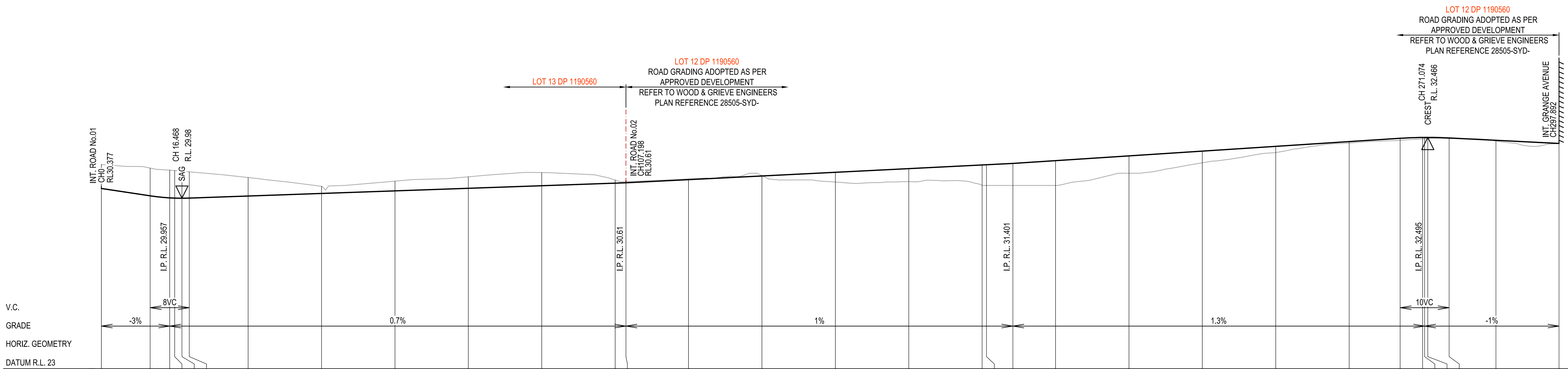
By: Orion Consulting
CONSULT AUSTRALIA Member Firm
ABN:25 604 069 981 PO Box:7936, BAULKHAM HILLS NSW 2153 T:(02) 8660 0035 E:info@orionconsulting.com.au

Project: 971 RICHMOND ROAD, MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title: ROAD LONGITUDINAL SECTIONS SHEET 01 OF 02

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	301	H

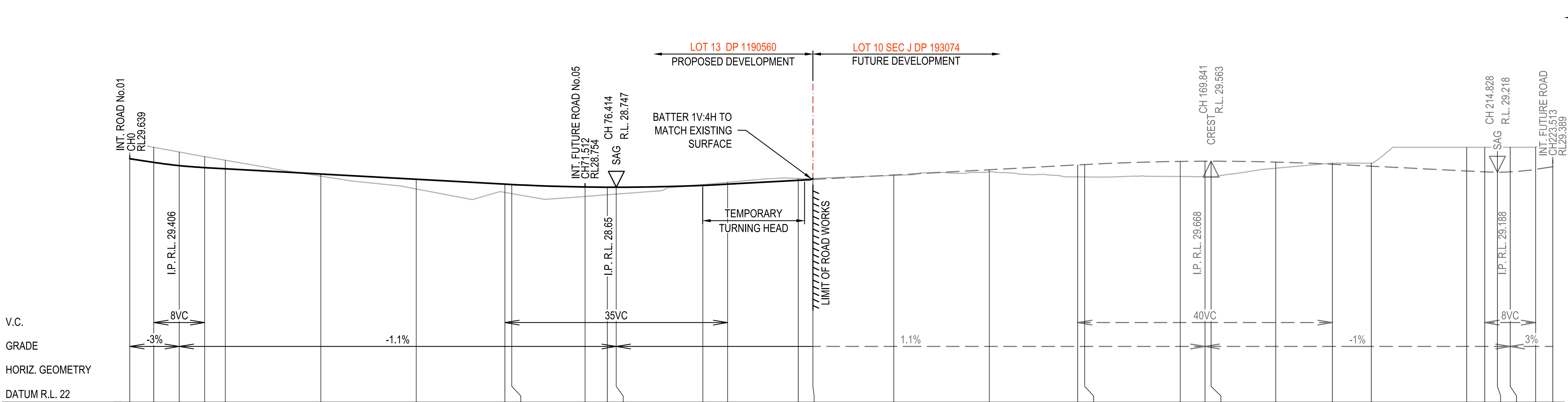
LEGEND	
DESIGN SURFACE	(solid black line)
EXISTING SURFACE	(solid grey line)
FUTURE SURFACE	(dashed line)
LOT BOUNDARY	(red dash-dot line)



CHAINAGE	DESIGN LEVEL	EXISTING LEVEL
0	30.377	31.357
9.981	30.077	31.213
13.981	29.994	31.129
15	29.985	31.112
16.468	29.98	31.086
17.981	29.985	31.06
30	30.07	30.827
45	30.175	30.467
60	30.28	30.678
75	30.385	30.856
90	30.49	31.028
105	30.595	30.721
107.198	30.61	30.657
120	30.738	30.769
135	30.888	30.904
150	31.038	30.642
165	31.188	30.657
180	31.338	30.505
180.889	31.347	30.5
186.27	31.401	30.5
195	31.514	30.5
210	31.709	31
225	31.904	31.427
240	32.099	31.849
255	32.294	32.235
265.422	32.43	32.348
270	32.465	32.408
270.422	32.466	32.414
271.074	32.466	32.424
275.422	32.445	32.421
285	32.349	32.32
297.892	32.22	32.22

LONGITUDINAL SECTION - ROAD No.03

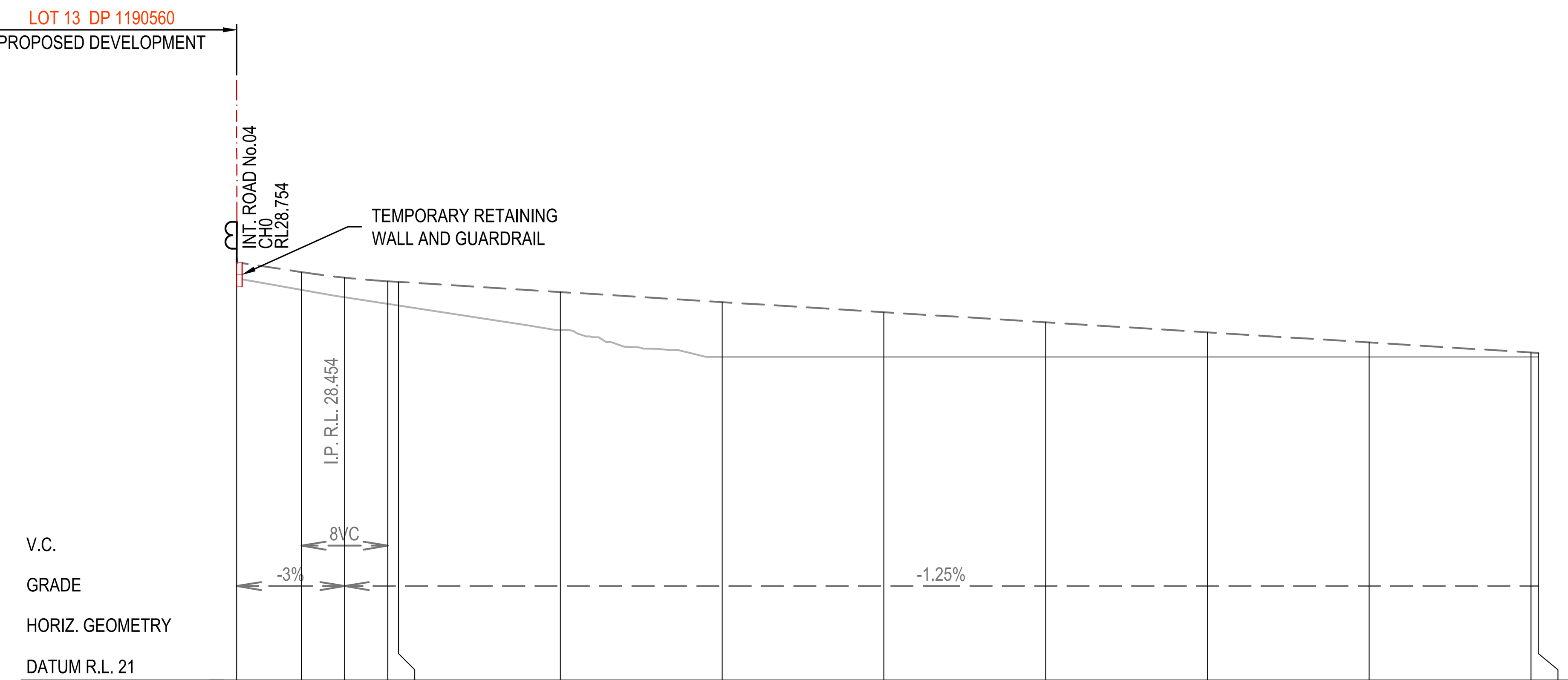
SCALE 1:500 (H)
SCALE 1:100 (V)



CHAINAGE	DESIGN LEVEL	EXISTING LEVEL
0	29.639	30.137
3.77	29.526	29.998
7.77	29.425	29.85
11.77	29.362	29.706
15	29.326	29.593
30	29.161	29.094
45	28.996	28.693
58.906	28.843	28.585
60	28.831	28.547
71.512	28.754	28.459
75	28.747	28.511
76.406	28.747	28.532
90	28.805	28.828
93.906	28.843	28.9
105	28.965	29.021
107.307	28.99	29.023
120	29.13	29.118
135	29.295	29.229
148.888	29.448	29.07
150	29.459	29.068
165	29.557	29.084
168.888	29.563	29.083
169.841	29.563	29.082
180	29.536	29.342
188.888	29.468	29.5
195	29.406	29.5
210	29.256	30
212.828	29.228	30
214.828	29.218	30
216.828	29.228	30
220.828	29.308	30.005
223.513	29.389	30.102

LONGITUDINAL SECTION - ROAD No.04

SCALE 1:100 (V)
SCALE 1:100 (V)



CHAINAGE	DESIGN LEVEL	EXISTING LEVEL
0	28.754	28.459
6	28.574	28.245
10	28.472	28.107
14	28.404	27.984
15	28.392	27.954
30	28.205	27.5
45	28.018	27
60	27.83	27
75	27.643	27
90	27.456	27
105	27.269	27
120	27.082	27
120.679	27.074	27

LONGITUDINAL SECTION - FUTURE ROAD No.05

SCALE 1:500 (H)
SCALE 1:100 (V)

ISSUED FOR **DEVELOPMENT APPLICATION**
NOT FOR CONSTRUCTION

Rev	Drawn	Design	Appd.	Date	Revision Description
H	KW/SA	SA	PB	03/08/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
G	KW/SA	SA	PB	29/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
F	KW/SA	SA	PB	28/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
E	SA	MC	MC	02/06/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
D	SA	MC	MC	31/05/2021	ISSUED TO ADDRESS SOFAC COMMENTS
C	KW/PZ	MC	MC	21/12/2020	ISSUED FOR COUNCIL'S COMMENT
B	KW/MG	CW	MP	31/03/2020	ISSUED FOR CLIENT REVIEW

Scale:
0 5 10 15 20 25 30 35 40 45 50
SCALE 1:500 (A1) SCALE 1:1000 (A3)
0 1 2 3 4 5 6 7 8 9 10
SCALE 1:100 (A1) SCALE 1:200 (A3)

For: architex architects + planners

By: Orion Consulting
CONSULT AUSTRALIA Member Firm
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Project:
971 RICHMOND ROAD,
MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title:
ROAD LONGITUDINAL SECTIONS
SHEET 02 OF 02

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	302	H

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REFER TO 'INSET A' FOR CONTINUATION

NORTH

FUTURE ROAD

FUTURE DEVELOPMENT
DESIGNED BY WOOD & GRIEVE
ENGINEERS REFER TO COUNCIL
APPROVED PLANS DA-15-02765
FOR DETAILS

LOT 12
DP 1190560

EXT 1 (DA-15-02765)
3.1688ha

LOT 11
SEC J
DP 193074

ROAD No.03

LOT 10
SEC J
DP 193074

LOT 9
SEC J
DP 193074

EXT 2
0.26ha

ROAD No.02

ROAD No.01

RICHMOND ROAD (EXISTING)

TEMPORARY
BASIN No.01

FUTURE ROAD No.05

EXISTING DAM

LOT 1
DP 1205982

DESIGN
2.4052ha

BYPASS
0.1140ha

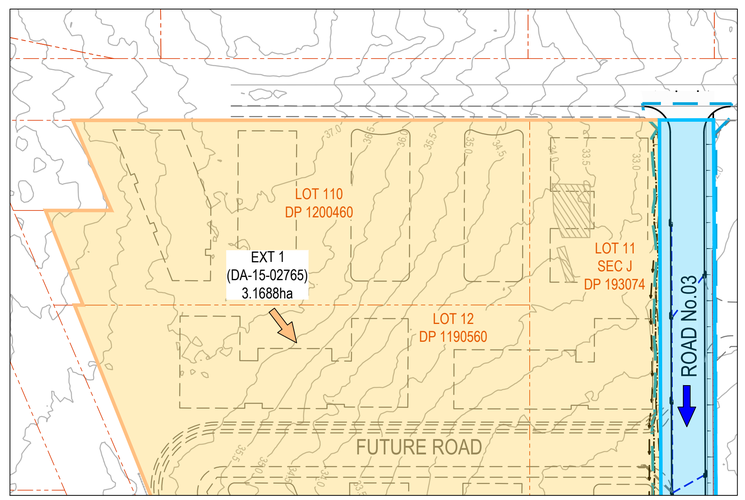
ROAD No.04

EXT 3
0.769ha

LOT 13
DP 1190560

LEGEND

CONTOURS (EXISTING & DESIGN)	10.0 — -20.0-
DRAINAGE (EXISTING, FUTURE & DESIGN)	
TEMPORARY DRAINAGE	
PROPOSED / DESIGN CATCHMENT, BOUNDARY AND DIRECTION	DESIGN
APPROXIMATE EXTERNAL CATCHMENT AND BOUNDARY	EXT #
APPROXIMATE EXTENT OF BYPASS CATCHMENT, DIRECTION OF FALL & AREA	BYPASS



INSET A
SCALE 1:1000

ISSUED FOR DEVELOPMENT APPLICATION
NOT FOR CONSTRUCTION

Rev	Drawn	Design	Appd.	Date	Revision Description
H	KW/SA	SA	PB	03/08/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
G	KW/SA	SA	PB	29/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
F	KW/SA	SA	PB	28/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
E	SA	MC	MC	02/06/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
D	SA	MC	MC	31/05/2021	ISSUED TO ADDRESS SOFAC COMMENTS
C	KW/PZ	MC	MC	21/12/2020	ISSUED FOR COUNCIL'S COMMENT
B	KW/MG	CW	MP	31/03/2020	ISSUED FOR CLIENT REVIEW

Scale:
0 5 10 15 20 25 30 35 40 45 50
SCALE 1:500 (A1) SCALE 1:1000 (A3)
0 10 20 30 40 50 60 70 80 90 100
SCALE 1:1000 (A1) SCALE 1:2000 (A3)

For: architex architects + planners

By: Orion Consulting
CONSULT AUSTRALIA Member Firm
ABN:25 604 069 981 PO Box:7936, BAULKHAM HILLS NSW 2153 T:(02) 8660 0035 E:info@orionconsulting.com.au

Project:
971 RICHMOND ROAD,
MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title:
TEMPORARY BASIN
CATCHMENT PLAN

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	400	H

NORTH

FUTURE ROAD

FUTURE DEVELOPMENT
DESIGNED BY WOOD & GRIEVE
ENGINEERS REFER TO COUNCIL
APPROVED PLANS DA-15-02765
FOR DETAILS

LOT 12
DP 1190560

LOT 11
SEC J
DP 193074

LOT 10
SEC J
DP 193074

LOT 9
SEC J
DP 193074

ROAD No.02

ROAD No.01

ROAD No.03

ROAD No.04

RICHMOND ROAD (EXISTING)

RAINWATER
TANK

STORMWATER
TREATMENT
TANK No.02

STORMWATER
TREATMENT
TANK No.01

TEMPORARY
BASIN No.01

FUTURE ROAD No.05

EXISTING DAM

LOT 1
DP 1205982

LOT 13
DP 1190560

LEGEND

1. R3 ROADS = 0.1655ha
   TO BE TREATED BY TEMPORARY
   BASIN No.01
2. R3 LOTS = 0.3533ha
   TO BE TREATED BY TEMPORARY
   BASIN No.01
3. B4 ROADS = 0.5806ha
   TO BE TREATED BY TEMPORARY
   BASIN No.01
4. B4 ROOF AREA = 0.4143ha
   TO BE TREATED BY RAINWATER
   TANK
5. B4 ROOF AREA = 0.1167ha
   TO BE TREATED BY STORMWATER
   TREATMENT TANK No.01
5. B4 PERVIOUS LANDSCAPING
   AREA = 0.1147ha
   TO BE TREATED BY OSD/WSUD
   TANK No.01
6. B4 IMPERVIOUS AREA = 0.2723ha
   TO BE TREATED BY STORMWATER
   TREATMENT TANK No.01
7. B4 IMPERVIOUS AREA = 0.0506ha
   TO BE TREATED BY STORMWATER
   TREATMENT TANK No.02
8. BYPASS CATCHMENT AREA= 0.1140ha
   (NOT ABLE TO BE COLLECTED AND
   TREATED)
9. SP2 METRO CORRIDOR AREA = 0.811ha
   TO BE EXCLUDED FROM MUSIC MODEL

ISSUED FOR **DEVELOPMENT APPLICATION**
NOT FOR CONSTRUCTION

Rev	Drawn	Design	Appd.	Date	Revision Description
H	KW/SA	SA	PB	03/08/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
G	KW/SA	SA	PB	29/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
F	KW/SA	SA	PB	28/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
E	SA	MC	MC	02/06/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
D	SA	MC	MC	31/05/2021	ISSUED TO ADDRESS SOFAC COMMENTS
C	KW/PZ	MC	MC	21/12/2020	ISSUED FOR COUNCIL'S COMMENT
B	KW/MG	CW	MP	31/03/2020	ISSUED FOR CLIENT REVIEW

Scale:
0 5 10 15 20 25 30 35 40 45 50
SCALE 1:500 (A1) SCALE 1:1000 (A3)

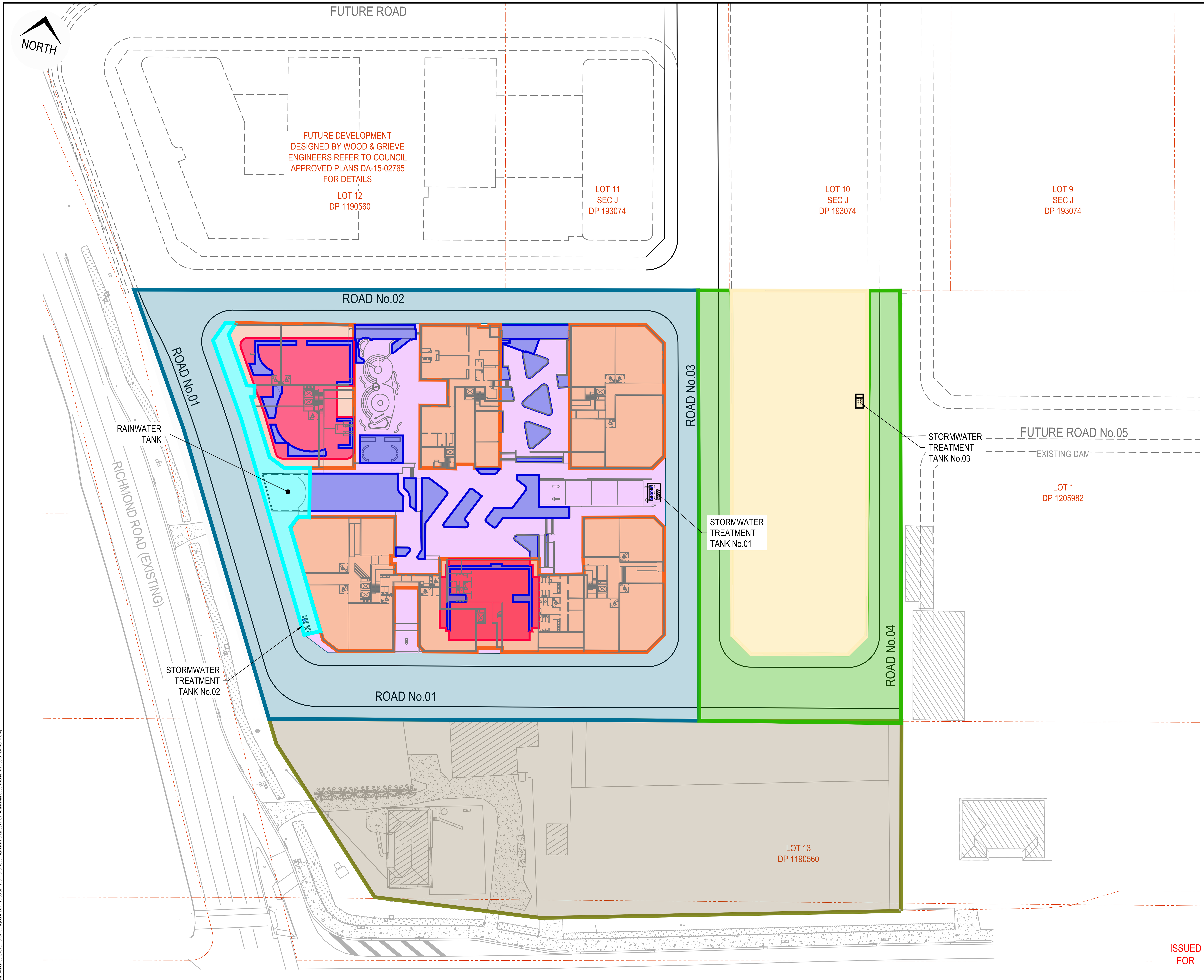
For: architex architects + planners

By: Orion Consulting
CONSULT AUSTRALIA Member Firm
ABN:25 604 069 981 **PO Box:**7936, BAULKHAM HILLS NSW 2153 **T:**(02) 8660 0035 **E:**info@orionconsulting.com.au

Project: 971 RICHMOND ROAD,
MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title: INTERIM WATER QUALITY
CATCHMENT PLAN

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	401	H



LEGEND

1.	R3 ROADS = 0.2825ha TO BE TREATED BY REGIONAL DRAINAGE INFRASTRUCTURE
2.	R3 LOTS = 0.3533ha TO BE TREATED BY STORMWATER TREATMENT TANK No.03
3.	B4 ROADS = 0.5806ha TO BE TREATED BY REGIONAL DRAINAGE INFRASTRUCTURE
4.	B4 ROOF AREA = 0.4143ha TO BE TREATED BY RAINWATER TANK
5.	B4 ROOF AREA = 0.1167ha TO BE TREATED BY STORMWATER TREATMENT TANK No.01
5.	B4 PERVIOUS LANDSCAPING AREA = 0.1147ha TO BE TREATED BY OSD/WSUD TANK No.01
6.	B4 IMPERVIOUS AREA = 0.2723ha TO BE TREATED BY STORMWATER TREATMENT TANK No.01
7.	B4 IMPERVIOUS AREA = 0.0506ha TO BE TREATED BY STORMWATER TREATMENT TANK No.02
8.	BYPASS CATCHMENT AREA= 0.1140ha (NOT ABLE TO BE COLLECTED AND TREATED)
9.	SP2 METRO CORRIDOR AREA = 0.811ha TO BE EXCLUDED FROM MUSIC MODEL

ISSUED FOR **DEVELOPMENT APPLICATION**

NOT FOR CONSTRUCTION

Plotted:Tuesday, 3 August 2021 4:27:48 PM File Name:\\orion-deltek01\OrionData\Projects\...

Rev	Drawn	Design	Appd.	Date	Revision Description
H	KW/SA	SA	PB	03/08/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
G	KW/SA	SA	PB	29/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
F	KW/SA	SA	PB	28/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
E	SA	MC	MC	02/06/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
D	SA	MC	MC	31/05/2021	ISSUED TO ADDRESS SOFAC COMMENTS
C	KW/PZ	MC	MC	21/12/2020	ISSUED FOR COUNCIL'S COMMENT
B	KW/MG	CW	MP	31/03/2020	ISSUED FOR CLIENT REVIEW

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For: architex architects + planners

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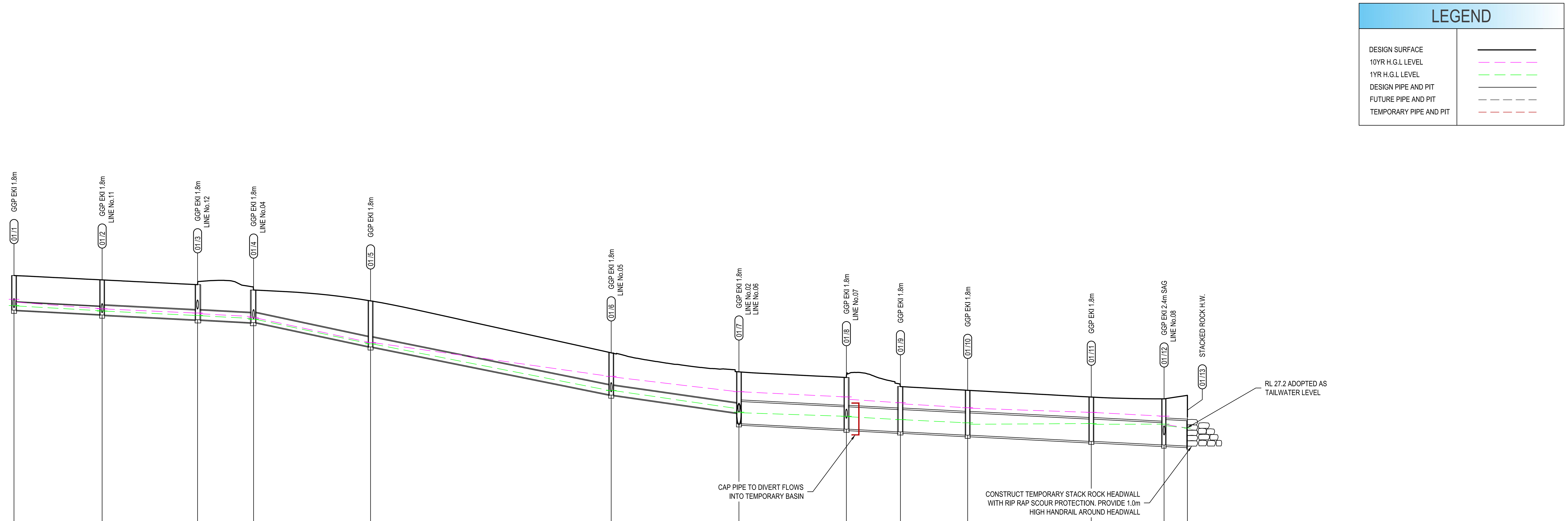
Project:
971 RICHMOND ROAD,
MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title:
ULTIMATE WATER QUALITY CATCHMENT PLAN

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	401A	H



DATUM R.L 11.0

Pipe (pit to pit)	PIPE MAX. VELOCITY (m/s)	DISCHARGE (cu.m/s)	PIPE SIZE (mm) & CLASS	DESIGN GRADE	DEPTH TO INVERT (start / end)	10YR ARI HGL LEVEL (start / end)	1YR ARI HGL LEVEL (start / end)	INVERT LEVEL (start / end)	SURFACE LEVEL	ROAD CHAINAGE	PIPE CHAINAGE	Length
01/1 – 01/2	1.68	0.17	375RRJ2	1%	1.64 / 1.64	33.14 / 32.84	32.97 / 32.74	32.77 / 32.56	34.4	56.81	0	20.78
01/2 – 01/3	1.73	0.2	450RRJ2	1%	1.66 / 1.66	32.83 / 32.63	32.72 / 32.52	32.54 / 32.31	34.19	77.59	20.78	22.5
01/3 – 01/4	2.28	0.23	450RRJ2	1%	1.66 / 1.54, 1.54	32.6 / 32.47	32.51 / 32.37	32.31 / 32.18, 32.18	33.97	100.09	43.28	13.2
01/4 – 01/5	3.6	0.25	450RRJ2	4.13%	1.52 / 2.15	32.4 / 31.25	32.34 / 31.19	32.19 / 31.05	33.72	122.24	56.47	27.59
01/5 – 01/6	2.65	0.26	450RRJ2	3.97%	2.17 / 1.97	31.24 / 29.64	31.18 /	31.03 / 28.78	33.21	149.84	84.07	56.75
01/6 – 01/7	3.25	0.42	450RRJ2	2.79%	1.99 / 1.94	29.61 /	28.97 / 28.12	28.76 / 27.92	30.75	206.58	140.81	30.12
01/7 – 01/8	2.36	1.93	1050RRJ2	1%	2.45 / 2.44	28.91 / 28.68	27.93 / 27.76	27.41 / 27.15	29.85	236.7	170.94	25.34
01/8 – 01/9	2.52	2.02	1050RRJ2	1%	2.44 / 2.13	28.56 / 28.4	27.74 /	27.15 / 27.02	29.59	262.04	196.27	12.74
01/9 – 01/10	2.59	2.03	1050RRJ2	1%	2.13 / 2.12	28.35 / 28.16	27.6 / 27.45	27.02 / 26.87	29.16	15	209.01	15.85
01/10 – 01/11	2.38	2.06	1050RRJ2	1%	2.12 / 2.09	28.14 /	27.38 / 27.41	26.87 / 26.57	28.99	30.85	224.86	29.15
01/11 – 01/12	2.42	2.1	1050RRJ2	1%	2.09 / 2.18	27.94 / 27.77	27.38 / 27.39	26.57 / 26.4	28.66	60	254.01	17.17
01/12 – 01/13	2.21	2.27	1200RRJ2	1%	2.18 / 1.2	27.37 /	27.32 /	26.4 / 26.35	28.58	77.17	271.18	5.5
01/13					1.2	27.2	27.2	26.35	27.55	77.11	276.68	

LINE 01

ISSUED FOR DEVELOPMENT APPLICATION
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G	KW/SA	SA	PB	29/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
F	KW/SA	SA	PB	28/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
E	SA	MC	MC	02/06/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
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0 5 10 15 20 25 30 35 40 45 50
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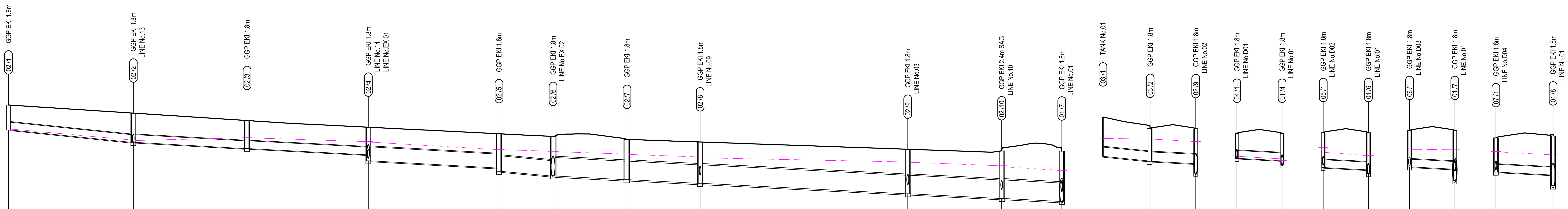
Project:
971 RICHMOND ROAD,
MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title:
DRAINAGE LONG SECTIONS
SHEET 1 OF 3

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	402	H



LEGEND

DESIGN SURFACE	solid thick line
10YR H.G.L LEVEL	magenta dashed line
DESIGN PIPE AND PIT	solid line
FUTURE PIPE AND PIT	grey dashed line
TEMPORARY PIPE AND PIT	red dashed line

LINE 02

	Seg 1	Seg 2	Seg 3	Seg 4	Seg 5	Seg 6	Seg 7	Seg 8	Seg 9	Seg 10	End
PIPE MAX. VELOCITY (m/s)	0.55	1.08	1.2	2.76	2.33	2.46	2.63	2.34	2.3	2.28	
DISCHARGE (cu.m/s)	0.01	0.04	0.1	0.88	0.88	1.21	1.2	1.22	1.41	1.44	
PIPE SIZE (mm) & CLASS	375RRJ2	375RRJ2	375RRJ2	675RRJ2	750RRJ2	900RRJ2	900RRJ2	900RRJ2	900RRJ2	900RRJ2	
DESIGN GRADE	1.99%	1.09%	1.02%	1.1%	1.75%	1%	1%	1%	1%	1%	
DATUM R.L	10.0										
DEPTH TO INVERT	1.21 / 1.42	1.42 / 1.36	1.36 / 1.34	1.63 / 1.67	1.83 / 1.92	1.92 / 1.96	1.96 / 2.01	2.01 / 2.16	2.16 / 2.32	2.32 / 2.45	2.45
10YR ARI HGL LEVEL	30.93 / 30.4	30.37	30.5 / 30.32	30.29	29.93 / 29.85	29.83 / 29.71	29.69 / 29.57	29.53 / 29.33	29.31 / 29.14	29.09	28.91
INVERT LEVEL	30.88 / 30.28	30.28 / 29.98	29.98 / 29.68	29.38 / 29.03	28.87 / 28.64	28.64 / 28.46	28.46 / 28.29	28.29 / 27.78	27.78 / 27.55	27.55 / 27.41	27.41
SURFACE LEVEL	32.1	31.7	31.34	31.02	30.7	30.57	30.42	30.3	29.94	29.87	29.85
ROAD CHAINAGE	254.46	171.33	196.45	166.94	135.18	122.02	107.8	90	39.5	16.67	236.7
PIPE CHAINAGE	0 (30.36)	30.36 (27.65)	58 (29.51)	87.51 (31.77)	119.28 (13.16)	132.44 (17.98)	150.42 (17.8)	168.21 (50.5)	218.71 (22.83)	241.54 (14.64)	256.18

LINE 03

	Seg 1	Seg 2	End
PIPE MAX. VELOCITY (m/s)	1.82	1.78	
DISCHARGE (cu.m/s)	0.19	0.21	
PIPE SIZE (mm) & CLASS	450RRJ2	450RRJ2	
DESIGN GRADE	1.92%	1%	
DATUM R.L	9.0		
DEPTH TO INVERT	1.91 / 1.57	1.59 / 1.7	2.16
10YR ARI HGL LEVEL	29.47	29.44 / 29.33	29.31
INVERT LEVEL	28.6 / 28.38	28.36 / 28.25	27.78
SURFACE LEVEL	30.51	29.95	29.94
ROAD CHAINAGE		40.87	39.5
PIPE CHAINAGE	0 (11.49)	11.49 (11.08)	22.57

LINE 04

	Seg 1	End
PIPE MAX. VELOCITY (m/s)	0.88	
DISCHARGE (cu.m/s)	0.02	
PIPE SIZE (mm) & CLASS	375RRJ2	
DESIGN GRADE	1%	
DATUM R.L	13.0	
DEPTH TO INVERT	1.21 / 1.32 / 1.54	1.52
10YR ARI HGL LEVEL	32.6 / 32.48	32.4
INVERT LEVEL	32.5 / 32.39 / 32.18	32.19
SURFACE LEVEL	33.72	33.72
ROAD CHAINAGE	122.24	122.24
PIPE CHAINAGE	0 (11)	11

LINE 05

	Seg 1	End
PIPE MAX. VELOCITY (m/s)	1.44	
DISCHARGE (cu.m/s)	0.14	
PIPE SIZE (mm) & CLASS	375RRJ2	
DESIGN GRADE	1%	
DATUM R.L	10.0	
DEPTH TO INVERT	1.7 / 1.81	1.99
10YR ARI HGL LEVEL	29.79 / 29.64	29.61
INVERT LEVEL	29.05 / 28.94	28.76
SURFACE LEVEL	30.75	30.75
ROAD CHAINAGE	206.58	206.58
PIPE CHAINAGE	0 (11)	11

LINE 06

	Seg 1	End
PIPE MAX. VELOCITY (m/s)	1.49	
DISCHARGE (cu.m/s)	0.09	
PIPE SIZE (mm) & CLASS	375RRJ2	
DESIGN GRADE	1%	
DATUM R.L	9.0	
DEPTH TO INVERT	1.77 / 1.88	2.45
10YR ARI HGL LEVEL	28.94	28.91
INVERT LEVEL	28.09 / 27.98	27.41
SURFACE LEVEL	29.85	29.85
ROAD CHAINAGE	236.7	236.7
PIPE CHAINAGE	0 (11)	11

LINE 07

	Seg 1	End
PIPE MAX. VELOCITY (m/s)	1.11	
DISCHARGE (cu.m/s)	0.09	
PIPE SIZE (mm) & CLASS	375RRJ2	
DESIGN GRADE	1%	
DATUM R.L	9.0	
DEPTH TO INVERT	1.67 / 1.89	2.44
10YR ARI HGL LEVEL	28.82 / 28.68	28.56
INVERT LEVEL	27.83 / 27.69	27.15
SURFACE LEVEL	29.5	29.59
ROAD CHAINAGE	270.54	262.04
PIPE CHAINAGE	0 (13.9)	13.9

ISSUED FOR **DEVELOPMENT APPLICATION**
NOT FOR CONSTRUCTION

Rev	Drawn	Design	Appd.	Date	Revision Description
H	KW/SA	SA	PB	03/08/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
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Scale:
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SCALE 1:500 (A1) SCALE 1:1000 (A3)
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For: Architex architects + planners

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CONSULT AUSTRALIA Member Firm

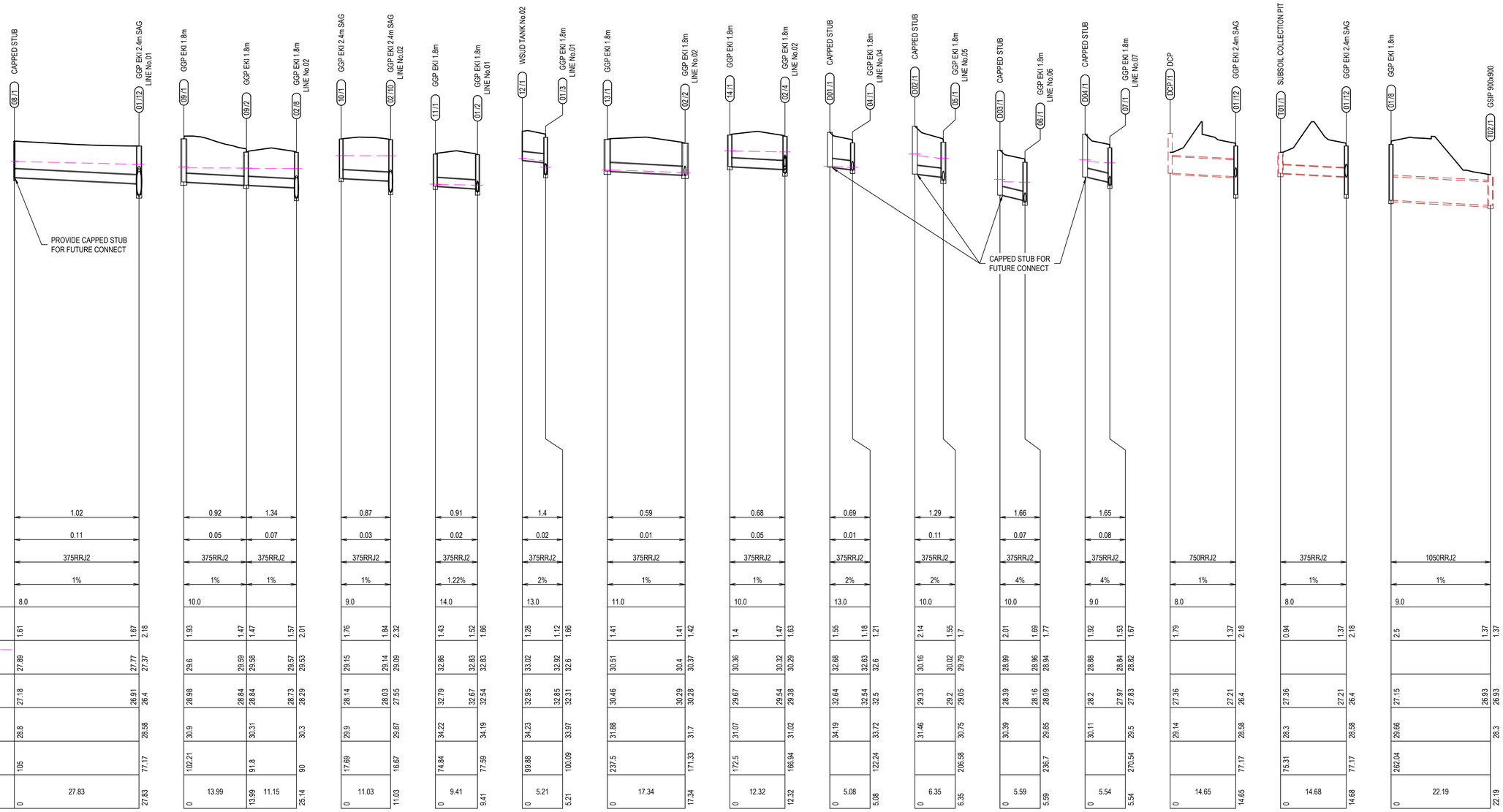
Project:
971 RICHMOND ROAD,
MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title:
DRAINAGE LONG SECTIONS
SHEET 2 OF 3

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	403	H

LEGEND

- DESIGN SURFACE
- 10YR H.G.L LEVEL
- DESIGN PIPE AND PIT
- FUTURE PIPE AND PIT
- TEMPORARY PIPE AND PIT



	LINE 08	LINE 09	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE D01	LINE D02	LINE D03	LINE D04	LINE DCP	LINE T01	LINE T02
PIPE MAX. VELOCITY (m/s)	1.02	0.92 / 1.34	0.87	0.91	1.4	0.59	0.68	0.69	1.29	1.66	1.65			
DISCHARGE (cu.m/s)	0.11	0.05 / 0.07	0.03	0.02	0.02	0.01	0.05	0.01	0.11	0.07	0.08			
PIPE SIZE (mm) & CLASS	375RRJ2	375RRJ2 / 375RRJ2	375RRJ2	375RRJ2	375RRJ2	375RRJ2	375RRJ2	375RRJ2	375RRJ2	375RRJ2	375RRJ2	750RRJ2	375RRJ2	1050RRJ2
DESIGN GRADE	1%	1% / 1%	1%	1.22%	2%	1%	1%	2%	2%	4%	4%	1%	1%	1%
DATUM R.L	8.0	10.0	9.0	14.0	13.0	11.0	10.0	13.0	10.0	10.0	9.0	8.0	8.0	9.0
DEPTH TO INVERT	1.61 / 1.67 / 2.18	1.93 / 1.47 / 1.47 / 1.57 / 2.01	1.76 / 1.84 / 2.32	1.43 / 1.52 / 1.66	1.28 / 1.12 / 1.66	1.41 / 1.41 / 1.42	1.4 / 1.47 / 1.63	1.55 / 1.18 / 1.21	2.14 / 1.55 / 1.7	2.01 / 1.69 / 1.77	1.92 / 1.53 / 1.67	1.79 / 1.37 / 2.18	0.94 / 1.37 / 2.16	2.5 / 1.37 / 1.37
10YR ARI HGL LEVEL	27.89 / 27.77 / 27.37	29.6 / 29.59 / 29.58 / 29.57 / 29.53	29.15 / 29.14 / 29.09	32.86 / 32.83 / 32.83	33.02 / 32.92 / 32.6	30.51 / 30.4 / 30.37	30.36 / 30.32 / 30.29	32.68 / 32.63 / 32.6	30.16 / 30.02 / 29.79	28.99 / 28.96 / 28.94	28.88 / 28.84 / 28.82			
INVERT LEVEL	27.18 / 26.91 / 26.4	28.98 / 28.84 / 28.84 / 28.73 / 28.29	28.14 / 28.03 / 27.55	32.79 / 32.67 / 32.54	32.95 / 32.85 / 32.31	30.46 / 30.29 / 30.28	29.67 / 29.54 / 29.38	32.64 / 32.54 / 32.5	29.33 / 29.2 / 29.05	28.39 / 28.16 / 28.09	28.2 / 27.97 / 27.83	27.36 / 27.21 / 26.4	27.36 / 27.21 / 26.4	27.15 / 26.93 / 26.93
SURFACE LEVEL	28.8 / 28.58	30.9 / 30.31 / 30.3	29.9 / 29.87	34.22 / 34.19	34.23 / 33.97	31.88 / 31.7	31.07 / 31.02	34.19 / 33.72	31.46 / 30.75	30.39 / 29.85	30.11 / 29.5	29.14 / 28.58	28.3 / 28.58	29.66 / 28.3
ROAD CHAINAGE	105 / 77.17	102.21 / 91.8 / 90	17.69 / 16.67	74.84 / 77.59	99.88 / 100.09	237.5 / 171.33	172.5 / 166.94	0 / 122.24	0 / 206.58	0 / 236.7	0 / 270.54	0 / 77.17	75.31 / 77.17	262.04
PIPE CHAINAGE	0 / 27.83 / 27.83	0 / 13.99 / 13.99 / 11.15 / 25.14	0 / 11.03 / 11.03	0 / 9.41 / 9.41	0 / 5.21 / 5.21	0 / 17.34 / 17.34	0 / 12.32 / 12.32	0 / 5.08 / 5.08	0 / 6.35 / 6.35	0 / 5.59 / 5.59	0 / 5.54 / 5.54	0 / 14.65 / 14.65	0 / 14.68 / 14.68	0 / 22.19 / 22.19

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For: architex architects + planners

By: Orion Consulting — CONSULT AUSTRALIA Member Firm

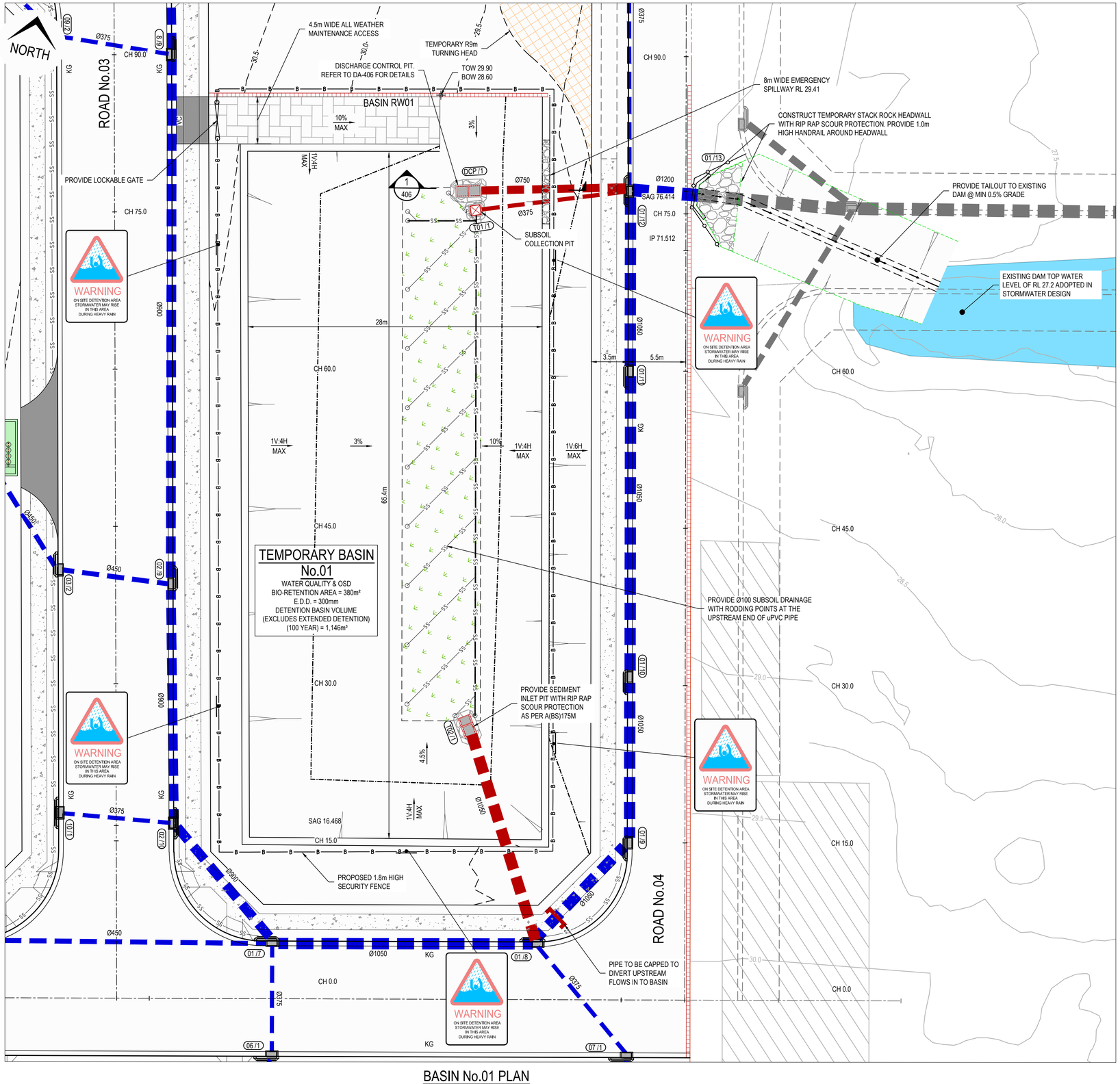
ABN:25 604 069 981 **PO Box:**7936, BAULKHAM HILLS NSW 2153 **T:**(02) 8660 0035 **E:**info@orionconsulting.com.au

Project: 971 RICHMOND ROAD, MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title: DRAINAGE LONG SECTIONS SHEET 3 OF 3

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	404	H

Plotted:Tuesday, 3 August 2021 4:10:15 PM File Name:\\orion-dell\e$\01OrionData\Projects_2019\19-35 971 Richmond Road, Marsden Park\Design\01 Residential Subdivision\DA\19-35-01-DA-404.dwg



BASIN No.01 PLAN

SCALE 1:200

SIGNS:

STANDARD FLOODWAY WARNING SIGN AND MOUNTING BRACKET IN ACCORDANCE WITH COUNCIL STANDARD DRAWING A(BS)114S

LEGEND

- PROPOSED STORMWATER PIPE
- PROPOSED TEMPORARY STORMWATER PIPE
- FUTURE STORMWATER PIPE
- PROPOSED DISCHARGE CONTROL PIT
- PROPOSED BATTER
- PROPOSED BIO-BASIN
- PROPOSED 1.8m HIGH SECURITY FENCE WITH VEHICLE ACCESS GATES
- Ø100 SUBSOIL LINES AT 3.0m CENTRES END OF SUBSOIL DRAINAGE LINE WITH FLUSHING POINT.
- PROPOSED SCOUR PROTECTION

Above Ground OSD Summary with calculated values

Site:	
Site Area	25186 m²
Site Area NOT draining to OSD	1140 m²
Reduced Levels (AHD):	
RL of Top of Tank	29.590
RL of Bottom of OSD Tank	28.600
RL of 1.5 Year ARI Overflow Weir	29.135
RL of Emergency Overflow Weir	29.41
RL of 1.5 Year ARI Orifice Centerline	27.605
RL of 100 Year ARI Orifice Centreline	27.605
RL of Invert of Discharge to Council Drainage Pit	27.360
RL of obvert of Pit outlet pipe	27.200
Minium RL of Garage Floor	29.680
Minium RL of House Floor	29.780
OSD Volume:	
Required Storage BELOW 1.5 Year ARI Overflow Weir	755.6 m³
Required Storage BELOW Emergency Overflow Weir	1146.0 m³
Discharge Details:	
Using Filter Cartridges to manage Water Quality	No
Discharge Location	Council Drainage Pit
Length of Emergency Overflow Weir	8.00 m
Maximum 1.5 Year ARI Site Discharge	93.90 L/s
1.5 Year ARI Orifice Discharge	93.90 L/s
Maximum 100 Year ARI Site Discharge	414.69 L/s
100 Year ARI Orifice Discharge	414.69 L/s
Orifice Details:	
Number of 1.5 Year ARI Orifices	1
Number of 100 Year ARI Orifices	1
1.5 Year ARI Orifice Size (mm)	189.0 mm
100 Year ARI Orifice Size (mm)	381.5 mm
Notifications:	

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H	KW/SA	SA	PB	03/08/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
G	KW/SA	SA	PB	29/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
F	KW/SA	SA	PB	28/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
E	SA	MC	MC	02/06/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
D	SA	MC	MC	31/05/2021	ISSUED TO ADDRESS SOFAC COMMENTS
C	KW/PZ	MC	MC	21/12/2020	ISSUED FOR COUNCIL'S COMMENT
B	KW/MG	CW	MP	31/03/2020	ISSUED FOR CLIENT REVIEW

Scale:
0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0
SCALE 1:200 (A1) SCALE 1:400 (A3)
0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0
SCALE 1:20 (A1) SCALE 1:40 (A3)

For: architex architects + planners

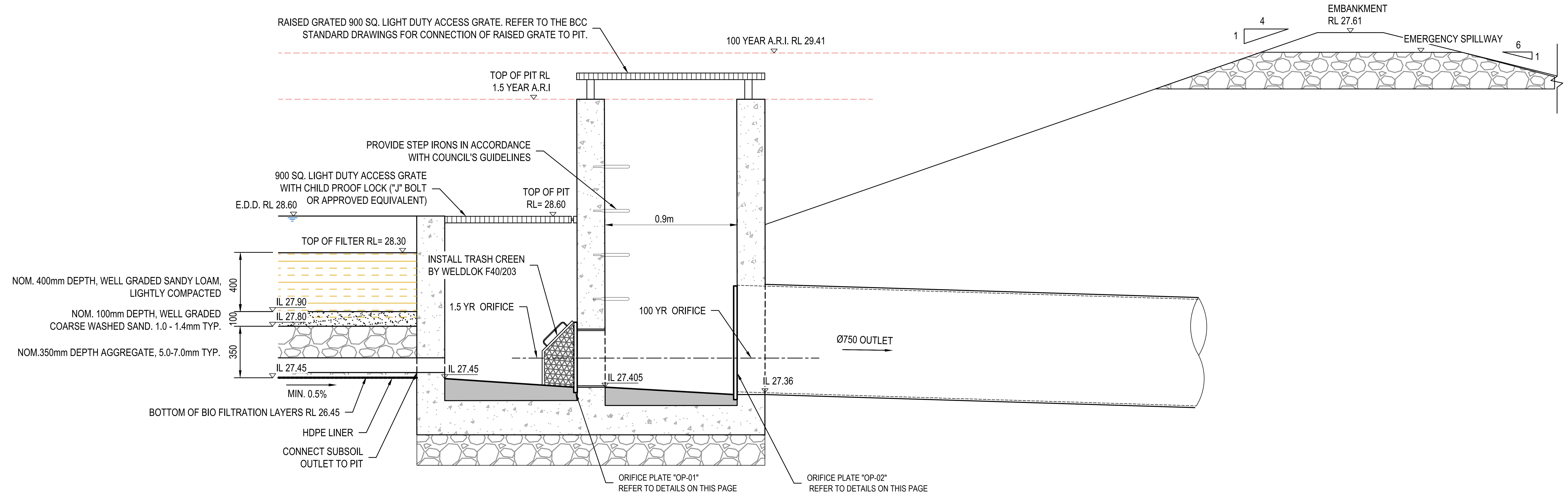
By: Orion Consulting — CONSULT AUSTRALIA Member Firm

ABN:25 604 069 981 **PO Box:**7936, BAULKHAM HILLS NSW 2153 **T:**(02) 8660 0035 **E:**info@orionconsulting.com.au

Project: 971 RICHMOND ROAD, MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title: TEMPORARY BASIN No.01 PLAN, SECTIONS & DETAILS SHEET 1 OF 2

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	405	H



SECTION 1/405

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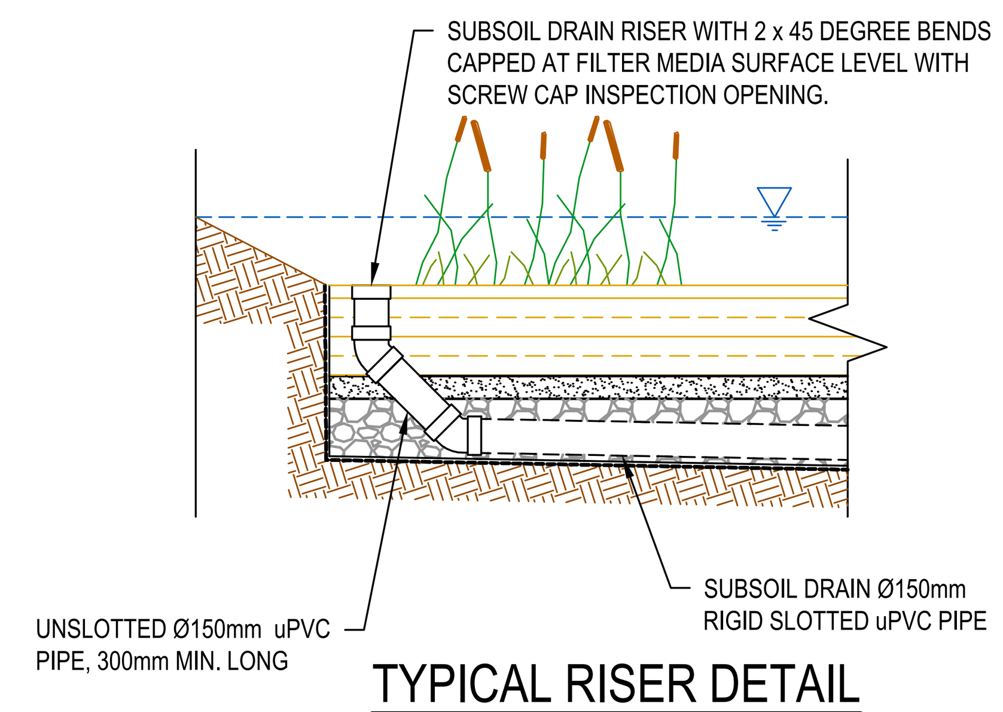
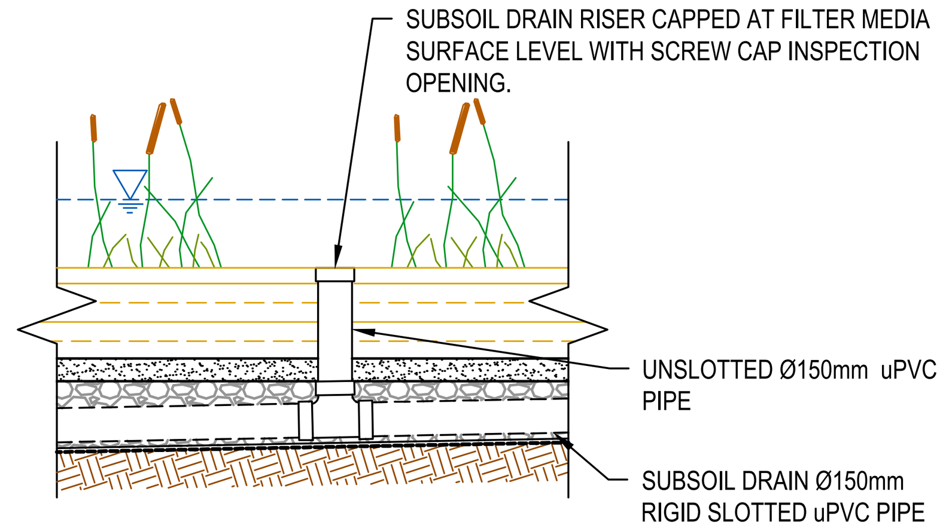


TYPICAL RISER DETAIL

NOT TO SCALE

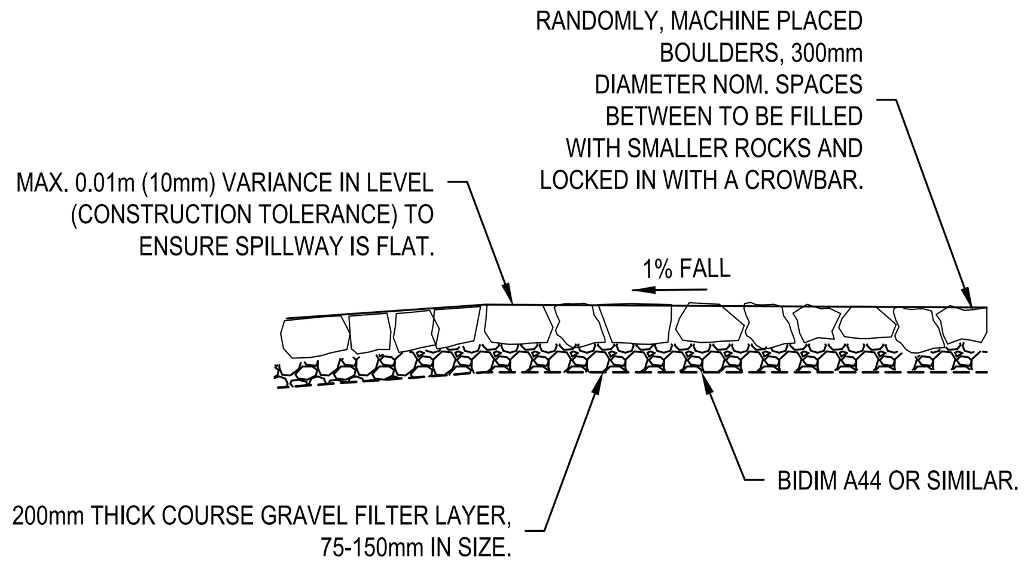


INTERMEDIATE RISER DETAIL

NOT TO SCALE

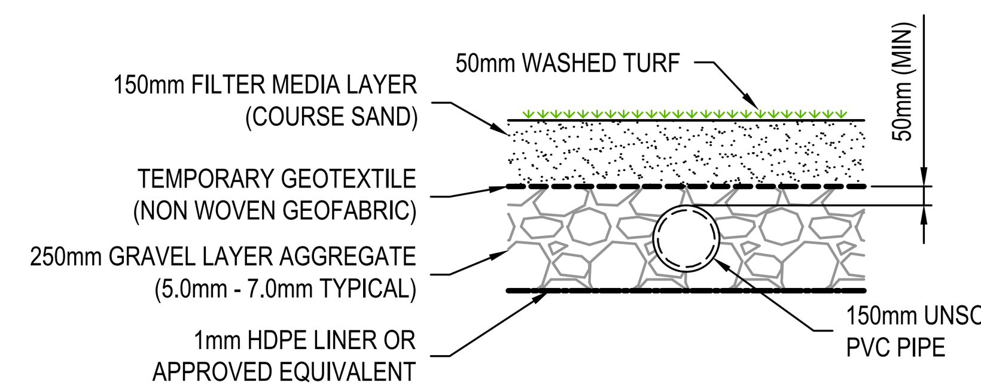
NOTE:

THE FINAL FILTER MEDIA IS NOT TO BE INSTALLED AND AN INTERMEDIATE BIO-RETENTION ARRANGEMENT IS TO BE ADOPTED UNTIL A MINIMUM OF 90% OF THE UPSTREAM CATCHMENT DRAINING TO THE BASIN IS FULLY DEVELOPED, INCLUDING LANDSCAPING



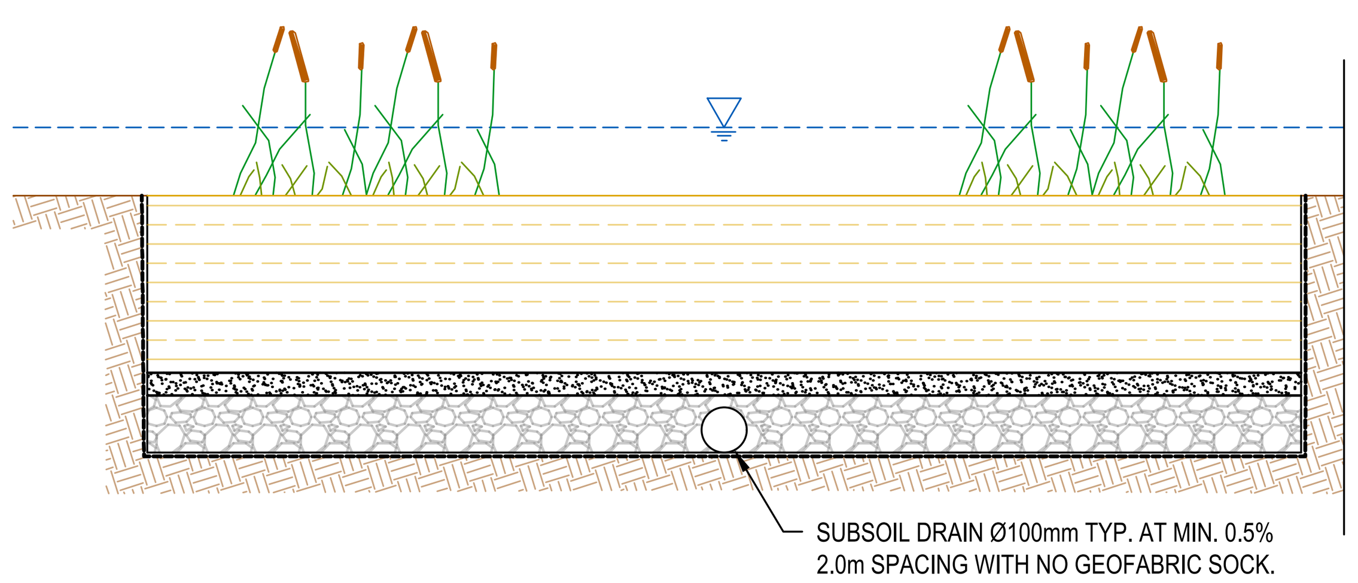
OVERFLOW WEIR DETAIL

N.T.S.



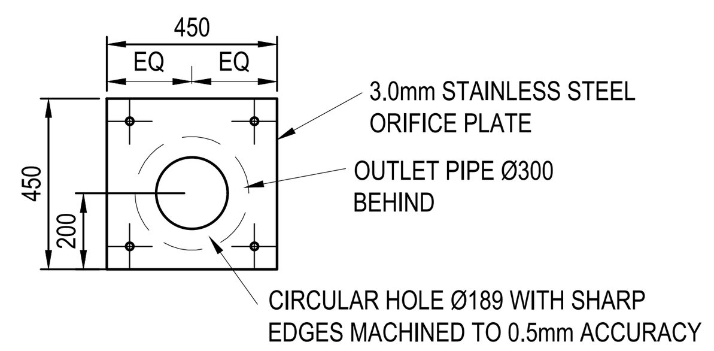
INTERMEDIATE BIO-RETENTION DESIGN

SCALE 1:20

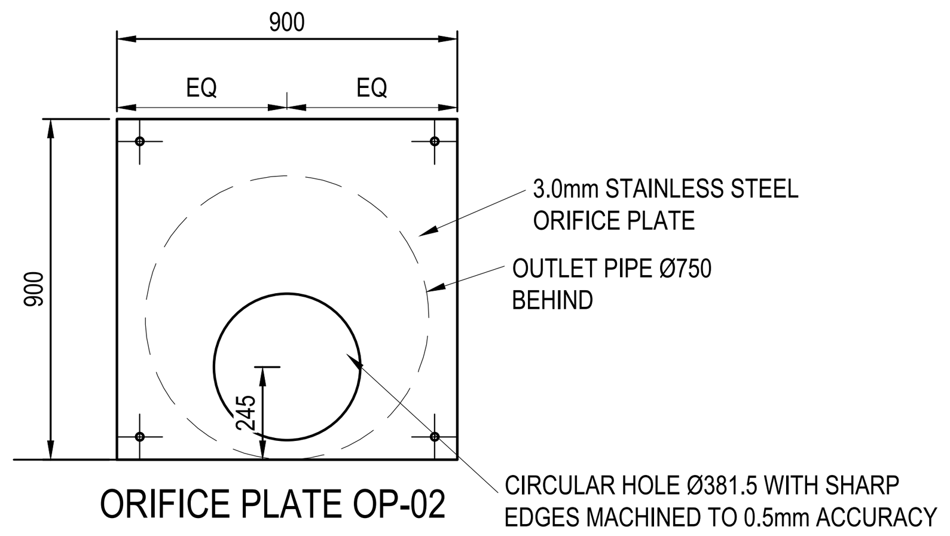


FILTER MEDIA BED TYPICAL DETAIL

NOT TO SCALE



ORIFICE PLATE OP-01



ORIFICE PLATE OP-02

ORIFICE PLATE DETAIL

NTS

ISSUED FOR **DEVELOPMENT APPLICATION**

NOT FOR CONSTRUCTION

Rev	Drawn	Design	Appd.	Date	Revision Description
H	KW/SA	SA	PB	03/08/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
G	KW/SA	SA	PB	29/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
F	KW/SA	SA	PB	28/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
E	SA	MC	MC	02/06/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
D	SA	MC	MC	31/05/2021	ISSUED TO ADDRESS SOFAC COMMENTS
C	KW/PZ	MC	MC	21/12/2020	ISSUED FOR COUNCIL'S COMMENT
B	KW/MG	CW	MP	31/03/2020	ISSUED FOR CLIENT REVIEW

Scale:
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SCALE 1:20 (A1) SCALE 1:40 (A3)

For: Architex architects + planners

By: Orion Consulting

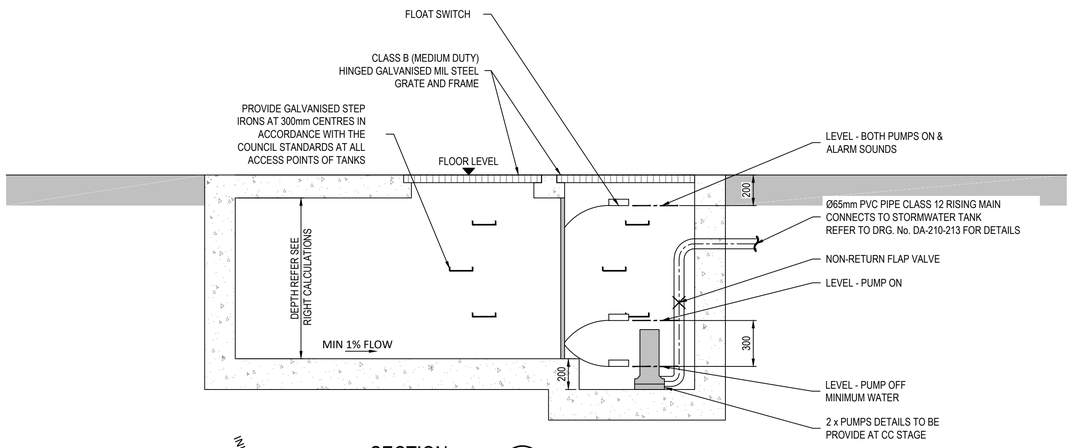
CONSULT AUSTRALIA Member Firm

ABN:25 604 069 981 PO Box:7936, BAULKHAM HILLS NSW 2153 T:(02) 8660 0035 E:info@orionconsulting.com.au

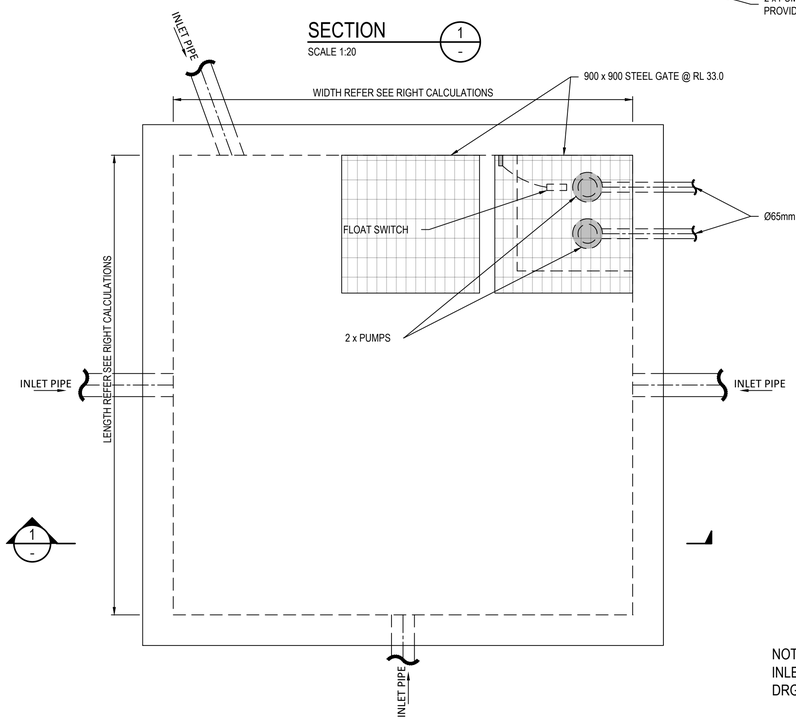
Project:
971 RICHMOND ROAD,
MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title:
TEMPORARY BASIN No.01 PLAN, SECTIONS & DETAILS SHEET 2 OF 2

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	406	H



SECTION 1/-
SCALE 1:20



PLAN VIEW

TYPICAL BASEMENT PUMP WELL DETAIL
SCALE 1:20

NOTE:
INLET PIPE LOCATION REFER TO
DRG. No. DA-210 & 211 FOR DETAILS

PUMP WELL No.01							
BASEMENT 3	0	m^2		C=	1		
BASEMENT 2	3477	m^2		I=	66.3	mm/hr	
BASEMENT 1	3596	m^2	HR FOR STORM =		1	HR	
TOTAL (METRE SQUARE)	7073	m^2					
1% OF TOTAL AREA	71	m^2					
PUMP WELL STAGE 2							
SUMP SIZE AND PUMP BASE ON 100 YEAR 1 HR STORM							
INTENSITY IS 66.3 mm/hr, AREA DRAINING TO TOWARDS SUMP IS 70.73 m2							
Q=CIA/3600 =	1	L/s					
VOLUME REQUIRED IS	4689	L/s			L	W	D
STORAGE PROVIDED	=2000X2000X1342=	5368	L	PUMP WELL STAGE 2 DIMENSION	2000	2000	1342

PUMP WELL No.02							
BASEMENT 3	4270	m^2		C=	1		
BASEMENT 2	4270	m^2		I=	66.3	mm/hr	
BASEMENT 1	4968	m^2	HR FOR STORM =		1	HR	
TOTAL (METRE SQUARE)	13508	m^2					
1% OF TOTAL AREA	135	m^2					
PUMP WELL STAGE 1							
SUMP SIZE AND PUMP BASE ON 100 YEAR 1 HR STORM							
INTENSITY IS 66.3 mm/hr, AREA DRAINING TO TOWARDS SUMP IS 135.08 m2							
Q=CIA/3600 =	2	L/s					
VOLUME REQUIRED IS	8956	L/s			L	W	D
STORAGE PROVIDED	=3000X3000X1000=	9000	L	PUMP WELL STAGE 1 DIMENSION	3000	3000	1000

ISSUED FOR **DEVELOPMENT APPLICATION**
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Rev	Drawn	Design	Appd.	Date	Revision Description
H	KW/SA	SA	PB	03/08/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
G	KW/SA	SA	PB	29/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
F	KW/SA	SA	PB	28/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
E	SA	MC	MC	02/06/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
D	SA	MC	MC	31/05/2021	ISSUED TO ADDRESS SOFAC COMMENTS
C	KW/PZ	MC	MC	21/12/2020	ISSUED FOR COUNCIL'S COMMENT
B	KW/MG	CW	MP	31/03/2020	ISSUED FOR CLIENT REVIEW

Scale:
0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0
SCALE 1:20 (A1) SCALE 1:40 (A3)

For: Architex architects + planners

By: Orion Consulting — CONSULT AUSTRALIA Member Firm
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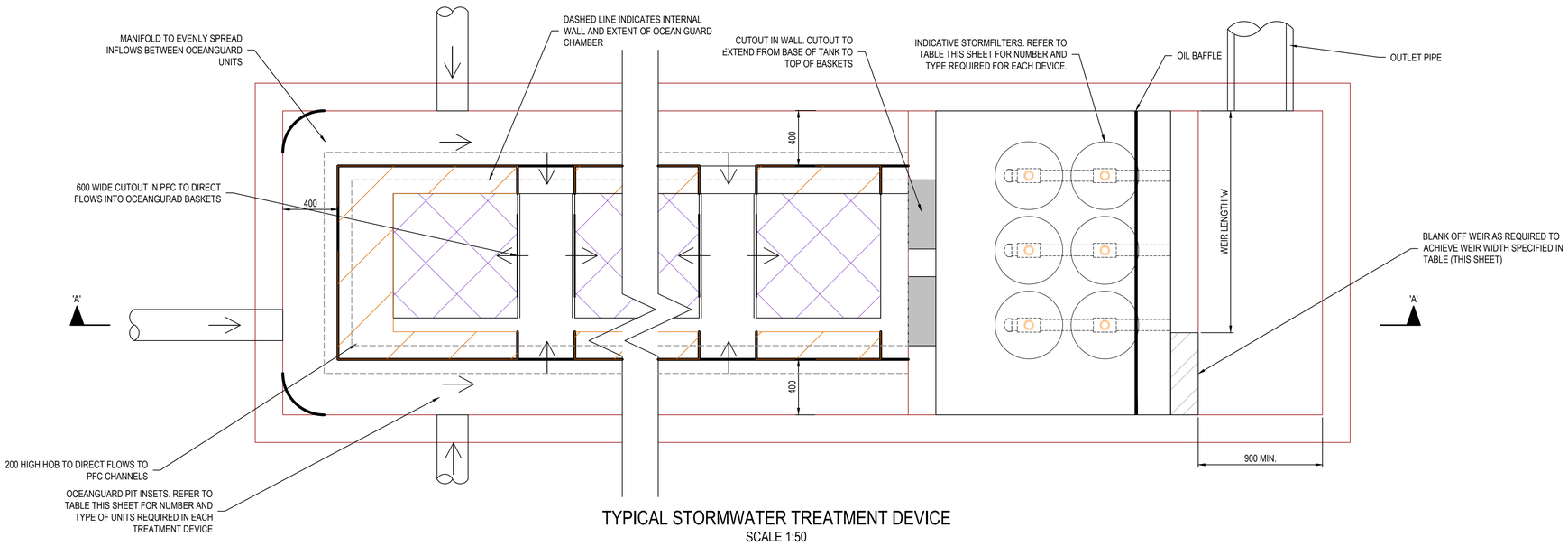
Project:
971 RICHMOND ROAD,
MARSDEN PARK
ROAD & DRAINAGE DESIGN

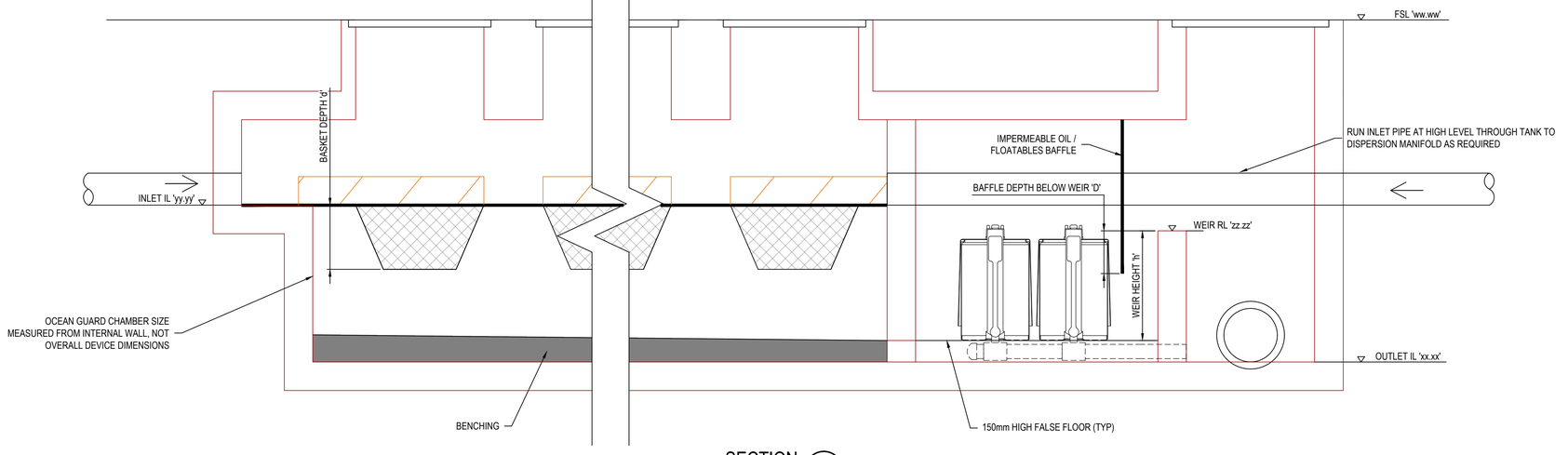
Title:
PUMP WELL DETAILS & CALCULATIONS

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	410	H

Printed:Tuesday, 3 August 2021 4:10:55 PM File Name:\orion-data\410\Work\Data\Projects_2019\19-35 911 Richmond Road, Marsden Park\Design\01 Residential Subdivision\DA\19-35-01-DA-410.dwg



TYPICAL STORMWATER TREATMENT DEVICE
SCALE 1:50



SECTION A
SCALE 1:50

STORMWATER WATER TREATMENT DEVICE SUMMARY TABLE

DEVICE	CATCHMENT	LEVELS										OCEAN GUARD				STORMFILTERS					OVERALL PLAN DIMENSIOS	
NAME	AREA	OUTLET	FALSE FLOOR	DS 1EY HGL	INLET	WEIR	TANK SOFFIT	F.S.L.	WEIR HEIGHT	LENGTH	OIL BAFFLE DEPTH	NO.	TYPE	BASKET DEPTH	CHAMBER	NO.	TYPE	TOTAL CARTRIDGE	CARTRIDGE CHAMBER	HYDRAULIC LOADING	LENGTH	WIDTH
		'xx.xx'			'yy.yy'	'zz.zz'		'ww.ww'	'h'		'D'			'd'	AREA	CARTRIDGES		AREA	AREA	RATE (TSS)	'a'	'b'
(-)	(Ha)	(mAHD)	(mAHD)	(mAHD)	(mAHD)	(mAHD)	(mAHD)	(mAHD)	(m)	(m)	(m)	(-)	(-)	(m)	(m2)	(-)	(-)	(m2)	(m2)	(kg/yr/CARTRIDGE)	(m)	(m)
TANK No.01	0.504	28.60	28.80	28.56	29.50	29.14	30.00	30.30	0.77	2.3	0.40	4	L2	0.45	8.2	8	Tall	5.80	6.20	23.5	5.0	4.1
TANK No.02	0.053	29.95	33.15	29.90	33.70	30.49	34.20	34.30	0.54	0.3	0.40	1	L2	0.45	2.1	2	Standard	2.50	2.50	15.8	4.0	1.35

ISSUED FOR **DEVELOPMENT APPLICATION**
NOT FOR CONSTRUCTION

Rev	Drawn	Design	Appd.	Date	Revision Description
H	KW/SA	SA	PB	03/08/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
G	KW/SA	SA	PB	29/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
F	KW/SA	SA	PB	28/07/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
E	SA	MC	MC	02/06/2021	ISSUED TO ADDRESS CLIENT'S COMMENTS
D	SA	MC	MC	31/05/2021	ISSUED TO ADDRESS SOFAC COMMENTS
C	KW/PZ	MC	MC	21/12/2020	ISSUED FOR COUNCIL'S COMMENT
B	KW/MG	CW	MP	31/03/2020	ISSUED FOR CLIENT REVIEW

Scale:
0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0
SCALE 1:50 (A1) SCALE 1:100 (A3)

For: Architex architects + planners

By: Orion Consulting — Consult Australia Member Firm
ABN:25 604 069 981 PO Box:7936, BAULKHAM HILLS NSW 2153 T:(02) 8660 0035 E:info@orionconsulting.com.au

Project: 971 RICHMOND ROAD, MARSDEN PARK
ROAD & DRAINAGE DESIGN

Title: WATER QUALITY DEVICE DETAILS

Project No.	Set No.	Milestone	Plan	Revision
19-35	01	DA	450	H

Plotted:Tuesday, 3 August 2021 4:11:16 PM File Name:\orion-dell4610\Orion\Data\Projects_2019\19-35 971 Richmond Road, Marsden Park\Design\01 Residential Subdivision\DA\19-35-01-DA-450.dwg