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13/08/2024

Ryan Soh
Kuatro Build
Suite 1 / 3B Macquarie Street
SYDNEY NSW 2000

Dear Ryan,

Re: 7368002 – 8 Forest Road, Warriewood – Section 4.56

The purpose of this letter is to summarise the changes to the civil design as proposed in the submitted Section 4.56 civil drawings by WSce from the originally approved civil drawings by Martens. Refer below for a list of major changes within the WSce submitted Section 4.56 civil drawings:

Summary of Change	Revised Drawings	Description
Bioretention Surface Area	C4.01 C4.02 C6.01 C6.02 C6.11 C6.12	NW Basin area has changed from 170m^2 to 173m^2. NE Basin area has changed from 200m^2 to 127m^2. The NE basin storage has been deepened which has resulted in a reduced surface area. This is also due to updated catchments following a detailed design review, to meet Council's stormwater quality pollution reduction targets.
Bioretention basin outlet pipe sizes	C6.01 C6.02 C6.04 C6.11 C6.12	Basin 1 outlet pipe has been revised from 525mm to 225mm and Basin 2 outlet pipe has been revised from 525mm to 300mm to meet the SSD and PSD requirements.
Orifice Plate added to the north-west Basin	C6.06 C6.11	A 100mm Orifice has been added to the NW Bioretention Basin outlet. This has been added to meet PSD and SSD requirements.
Basin Volumes	C6.01 C6.02 C6.11 C6.12	NW Basin volume has changed from 830m^3 to 682m^3 and NE Basin volume has changed from 290m^3 to 255m^3. These have been revised to exclude the extended detention depth in accordance with Northern Beaches Council requirements.
Addition of diversion swales	C4.01 C4.02 C6.01 C6.02	Diversion swales have been introduced along the west and south. The swale on the south directs upstream runoff to the headwall and 1500mm pipe and the western swale directs upstream runoff to Narrabeen Creek.
Flood protection wall on the southern boundary top of wall level	C4.01 C4.02 C6.01 C6.02	The top of wall level for the retaining wall on the southern boundary is nominated to be RL30.80 for flood protection, as per the Flood Assessment Letter L260922 by GRC Hydro dated 26th September 2022.
Removal of bunds around basins	C4.01 C4.02 C6.01 C6.02 C6.11 C6.12	Bunds have been removed as the NW basin is protected by the upstream diversion swale and the level spreader swale has been aligned to direct water away from the NE basin.

Refer to Appendix A for the S4.56 civil drawings with the above changes clouded red.

These drawings are accompanied by the below documents:

- Water Management Report *7368002-WSCE-CS-RP-0001 - Water Management Report [03]*
- MUSIC model *7368002-WSCE-CS-DM-01 – Forest Lodge Warriewood [02].sqz*
- DRAINS model *7368002 – Forest Lodge Warriewood [06].drn*
- HGL analysis *7368002 – Forest Lodge Warriewood DRAINS HGL Analysis – Major 1% AEP* and *7368002 – Forest Lodge Warriewood DRAINS HGL Analysis – Minor 5% AEP*
- Diversion swale calculations *7368002 – Diversion Swale Calcs*

Minor changes to the civil design as a result of the revised architectural S4.56 site layout or detailed design review are listed below:

Stormwater:

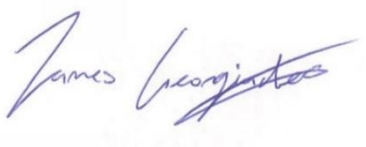
- Bioretention Basin Catchments. This change is driven by review of site levels and therefore changes to the local drainage layout.
- We note the proposed site stormwater layout has been updated to reflect the new road alignment and levels however the general intent of upstream diversion via 1500mm pipe and stormwater quality and quantity treatment via bioretention basins remains as per the original Martens drawings.

Siteworks & Grading:

- Road alignment along the western side of the site and through the apartment buildings.
- Levels and grading of the external site areas have been amended following detailed review.
- Road long Sections and cross sections. These have been updated for the new alignment and levels.

WSce confirm that the civil stormwater design and drawings are generally in accordance with the relevant sections of the Warriewood Valley Stormwater Management Specification 2001, Pittwater 21 DCP and Warringah Council On-Site Stormwater Detention Technical Specifications.

Full Name of Designer: **James Georgiades**
Qualifications: B.Eng. (Civil) Hons, Diploma Eng Practice, CPEng, NER Civil
NER No.: 5219706
Address of Peer Reviewer: Level 20, 66 Goulburn Street, SYDNEY NSW 2000
Business Telephone No: 02 9299 1312 **Mobile No:** 0406 649 228
Name of Employer: Warren Smith Consulting Engineers

Signature:  **Date:** 13/08/24

APPENDIX A – S4.56 CIVIL DRAWINGS CLOUDED

FOREST LODGE
WARRIEWOOD
CIVIL & STORMWATER

ISSUE FOR S4.56



LOCALITY AERIAL

NOT TO SCALE

SOURCE : SIXMAPS

Sheet List Table			
DWG No	DRAWING TITLE	ISSUE	
C1.00 Arrangement and Overview Plans			
C1.01	Cover Sheet	4	4
C1.02	Specification Notes	1	
C1.03	Exsiting Survey	1	
C2.00 Sediment and Erosion Control			
C2.01	Sediment & Erosion Control Plan	4	4
C2.02	Sediment & Erosion Control Details	1	
C3.00 Earthworks			
C3.01	Bulk Earthworks Levels Plan	4	4
C4.00 Siteworks Plans			
C4.01	General Arrangement Plan-Sheet 1	2	4
C4.02	General Arrangement Plan-Sheet 2	4	
C4.51	Siteworks Details	2	
C5.00 Road Longitudinal and Cross Sections			
C5.01	Road Set-Out Plan	3	4
C5.11	Road Long Sections - Access Road	1	
C5.12	Road Long Sections - Ring Road	2	4
C5.21	Road Cross Sections - Access Road	1	
C5.22	Road Cross Sections - Ring Road Sheet 1	3	4
C5.23	Road Cross Sections - Ring Road Sheet 2	3	
C6.00 Stormwater Drainage			
C6.01	Stormwater Layout Plan-Sheet 1	2	4
C6.02	Stormwater Layout Plan-Sheet 2	4	
C6.04	Stormwater Pit Schedule	4	
C6.06	Stormwater Drainage Details - Sheet 1	2	
C6.07	Stormwater Drainage Details - Sheet 2	2	
C6.11	Bioretention Basin Plan - Sheet 1	3	
C6.12	Bioretention Basin Plan - Sheet 2	2	
C6.13	Bioretention Basin Sections - Sheet 1	1	
C6.14	Bioretention Basin Sections - Sheet 2	1	
C6.21	Stormwater Catchment Plan - Sheet 1	3	
C6.22	Stormwater Catchment Plan - Sheet 2	3	4
C6.41	Trunk Drainage Longitudinal Section	3	

CLIENT KUATRO

PROJECT MANAGER KUATRO

ARCHITECT ADS ARCHITECTS

GLOBAL COMPLIANCE CERTIFICATION GCC ISO 9001 Certified

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TITLE

COVER SHEET

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	I.O.S	J.G.	J.G.

JOB No.	DRAWING No.	ISSUE
7368002	C1.01	4

DATE	STATUS
SEPTEMBER 2023	ISSUE FOR S4.56

Plot Date

Xrefs
Plot Date: 18.09.2023@14:58:00 Login Name: stewart Civil File: T:\7368002\Drawings\AutoCAD\Civil\Design\Civil 2023\4.56\C1.01 Cover Sheet.dwg

GENERAL

G1. DESIGN HEREIN HAS BEEN PREPARED BY
WARREN SMITH CONSULTING CIVIL ENGINEERS PTY LTD,
LEVEL 20, 66 GOULBURN ST, SYDNEY NSW 2000
TEL:- (02) 9299 1312, FAX:- (02) 9290 1295.

G2. THE DRAWINGS HEREIN SHALL BE READ AS
REQUIRED IN CONJUNCTION WITH ARCHITECT
DRAWINGS BY:
ADS ARCHITECTS
1/7 MURRAY ROSE AVE
SYDNEY OLYMPIC PARK NSW 2127
TEL: (02) 9648 6663

G3. ALL DIMENSIONS IN MILLIMETRES UNO. REDUCED
LEVELS AND CHAINAGES ARE IN METRES. DO NOT
SCALE DRAWINGS. USE FIGURED DIMENSIONS.

G4. THE PROPOSED WORKS DETAILED HEREIN SHALL BE
CONSTRUCTED TO THE REQUIREMENTS OF COUNCIL
GENERALLY AS DETAILED HEREUNDER.

G5. ALL EXISTING SERVICES SHALL BE VERIFIED FOR
DEPTH AND HORIZONTAL POSITION BY PHYSICAL
MEANS PRIOR TO EXCAVATION. ANY DISCREPANCIES
SHALL BE BROUGHT FORTHWITH TO THE PROJECT
MANAGER'S ATTENTION.

G6. REFERENCE SHALL BE MADE TO THE CONSTRUCTION
MANAGEMENT PLAN FOR ALL SITE WORKS DETAILED
HEREIN.

STORMWATER & SUB-SOIL DRAINAGE

MATERIALS:

STW1. PIPES AND FITTINGS FOR STORMWATER
DRAINAGE SHALL BE AS FOLLOWS UNO ON THE
DRAWINGS:
A. SEWER GRADE uPVC (SN8) WITH SOLVENT WELDED
JOINTS FOR BELOW GROUND DRAINAGE UP TO 225mm.
B. REINFORCED CONCRETE WITH RUBBER RINGS,
CLASS 3, FOR PIPE DIA'S GREATER THAN 225mm OR
WHERE REQUIRED BY AS3500 FOR EXCESSIVE DEPTH.
C. INSTALL IN ACCORDANCE WITH AUSTRALIAN
STANDARD AS3500 EXCEPT WHERE VARIED BY
THE CONTRACT DOCUMENTS.

STW2. PIPES & FITTINGS FOR SUBSOIL DRAINAGE SHALL BE
SLOTTED POLYVINYL CHLORIDE (PVC) WITH SOLVENT
WELDED JOINTS, MIN. 150mm DIAMETER.

STW3. IN GROUND DRAINAGE PIPEWORK SERVING DP's
SHALL BE MINIMUM 150mm DIA. UNO.

STW4. GRATED DRAINS SHALL BE 150mm NOM.
A. 150mm NOM. WIDTH IN NON TRAFFICABLE AREAS.
B. 225mm NOM. WIDTH IN TRAFFICABLE AREAS.

STW5. STORMWATER PITS ARE AS SHOWN & SPECIFIED ON
THE PLANS . PRECAST TYPE ACCEPTABLE WITH STEP
IRONS FOR DEPTH GREATER THAN 1200. BENCH ALL
PITS MIN. 50mm & FORM SMOOTH TRANSITION FROM
INLET TO OUTLET.

STW6. SELECT FILL SHALL BE MATERIAL OBTAINED FROM
EXCAVATION OF THE PIPE TRENCH OR IMPORTED
WITH A PARTICLE SIZE FOR ROCK NOT GREATER
THAN 75mm OR FOR OTHER THAN ROCK NOT
GREATER THAN 150mm.

STW7. IMPORTED FILL SHALL BE EITHER, AND GENERALLY
CONSIST OF SINGLE SIZED AGGREGATE WITH
PARTICLE SIZE NOT GREATER THAN 5mm WRAPPED
ALL ROUND WITH GEOTEXTILE FILTER FABRIC OR
APPROVED HIGH COMPACTION SAND OR APPROVED
CRUSHED ROAD GRAVEL CONFORMING TO RTA FORM
3051 OR SIMILAR.

STW8. STORMWATER PITS AND GRATES TO CONFORM WITH
STANDARD COUNCIL REQUIREMENTS, WHERE ON
PUBLIC LAND. GRATES TO BE SUPPLIED IN CLASS
SHOWN ON THE DRAWINGS.

INSTALLATION REQUIREMENTS:

STW9. PIPES SHALL BE TRUE TO GRADES SHOWN AND
ALIGNED SO THAT THE CENTRES OF THE INLET PIPES
INTERSECT WITH THE CENTRE OF THE OUTLET PIPE AT
THE DOWNSTREAM FACE OF THE PIT.

STW10. MINIMUM GRADES FOR GRAVITY STORMWATER
DRAINAGE SHALL CONFORM TO AS3500 PART3 AS
FOLLOWS, UNO:
1% FOR 100 AND 150 mm DIA.
0.5% FOR 225 mm DIA
0.5% FOR 300 mm DIA
0.4% FOR 375 mm DIA

STW11. MINIMUM DEPTH OF COVER SHALL BE :-
- 300mm IN PRIVATE PROPERTY (NON VEHICULAR
TRAFFIC).
- 450mm IN PUBLIC AREAS.
- 600mm IN VEHICULAR TRAFFICABLE AREAS
(FOOTWAY/ROADWAY)

STW12. BED ALL PIPES FIRMLY AND EVENLY ONTO IMPORTED
BEDDING FILL MATERIAL.

STW13. LAY AND JOINT ALL PIPES IN ACCORDANCE WITH THE
MANUFACTURERS RECOMMENDATIONS AND
AS 3725-1989 BURIED FLEXIBLE PIPELINES
AS 2566-1998 LOADS ON BURIED FLEXIBLE PIPELINES
AS 1597.2-1996 PRECAST REINFORCED CONCRETE BOX
CULVERTS.
AS 3500-1990 NATIONAL PLUMBING & DRAINAGE CODE.
PART 2, SANITARY PLUMBING AND SANITARY DRAINAGE.
SYDNEY WATER REQUIREMENTS.

STW14. ALLOW TO TEST ALL PIPES AND PITS TO
MANUFACTURERS REQUIREMENTS.

CONCRETE WORKS

C1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN
ACCORDANCE WITH AS3600, THE STANDARDS
ASSOCIATION AUSTRALIA, STANDARDS CITED IN AS3600,
THE DRAWINGS AND THE SPECIFICATION.

C2. ALL CONCRETE SHALL BE 80mm NOMINAL SLUMP, 20mm
MAXIMUM AGGREGATE WITH NO ADMIXTURES OR FLY
ASH, UNLESS OTHERWISE APPROVED. ALL CONCRETE
WORK IN CONTACT WITH SEWER TO HAVE TYPE SL
PORTLAND CEMENT, OTHERWISE TYPE A CEMENT FOR
BRIDGE WORKS, A MAXIMUM 56 DAYS SHRINKAGE OF 600
MICROSTRAIN, A MINIMUM CEMENT CONTENT 350kg/m3
AND MAXIMUM WATER:CEMENT RATIO OF 0.40.

C3. STRENGTH GRADE OF CONCRETE SHALL BE : 25 MPa
(KERBS, EDGE STRIPS & CONCRETE ENCASEMENT) AND
32 MPa ELSEWHERE.

C4. CONSTRUCTION JOINTS SHALL BE PROPERLY FORMED
AND USED ONLY WHERE SHOWN OR APPROVED.
GENERALLY FOR HAND PLACED KERB & GUTTER 6mm
THICK APPROVED BITUMINOUS MASTIC JOINTING
MATERIAL SHALL BE PROVIDED AT INTERVALS NOT
EXCEEDING 6m. FOR MACHINE PLACED KERB & GUTTER
6mm THICK APPROVED BITUMINOUS MASTIC JOINTING
MATERIAL SHALL BE PROVIDED AT INTERVALS NOT
EXCEEDING 12m & GUILLOTINED DUMMY GROOVED
JOINTS, 25mm IN DEPTH, SHALL BE FORMED EVERY 3m
OF GUTTER. JOINTS ARE ALSO REQUIRED AT EACH END
OF GUTTER CROSSING AND GULLY PITS. JOINTS SHALL
BE SET VERTICAL AND SQUARE TO THE KERB.

C5. REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY
AND IS NOT NECESSARILY SHOWN IN TRUE PROJECTION.

C6. ELDING OR SPLICES IN REINFORCEMENT SHALL BE USED
ONLY IN POSITIONS APPROVED BY THE ENGINEER.

C7. CONCRETE CURING SHALL BE IN ACCORDANCE WITH
AS3600. CURING SHALL BE COMMENCED WITHIN TWO
HOURS OF FINISHING OPERATIONS AND SHALL BE
CONTINUED FOR A MINIMUM OF SEVEN DAYS BY AN
APPROVED PROPRIETARY COMPOUND OR BY KEEPING
CONTINUOUSLY WET.

C8. FORMWORK SHALL BE DESIGNED AND CONSTRUCTED IN
ACCORDANCE WITH AS3610. FORMWORK SHALL NOT BE
STRIPPED NOR PROPS REMOVED WITHOUT APPROVAL.

C9. FABRIC LAP DETAILS SHALL BE IN ACCORDANCE WITH
FIG.13.2.4 OF AS3600.

C10. HOOKS, LAPS AND BENDS SHALL BE IN ACCORDANCE
WITH AS3600 UNO.

C11. ALL CHEMICAL ANCHORS SHALL BE EITHER 'CHEMSET'
BY 'RAMSET' WITH THE GLASS CAPSULE SYSTEM
INSTALLED IN STRICT ACCORDANCE WITH
MANUFACTURERS INSTRUCTIONS OR HILTI HVU
ADHESIVE ANCHOR WITH FOIL CAPSULE SYSTEM
INSTALLED IN STRICT ACCORDANCE WITH
MANUFACTURERS INSTRUCTION.

C12. ALL CHEMICAL ANCHORS SHALL BE HOT DIPPED
GALVANIZED AND BE MIN M16 DIA. U.N.O.

GENERAL EARTHWORKS, SITEWORKS & FILLING:

FILLING:

SGE1. THESE CLAUSES SHALL BE READ IN CONJUNCTION WITH
CARDNO REPORT OF GEOTECHNICAL ASSESSMENT,
DATED 22 DECEMBER 2021.

SGE2. THE RECOMMENDATIONS CONTAINED IN THE GEOTECH
REPORT SHALL OVERRIDE THE CLAUSES PRESENTED
HEREIN.

SGE3. STRIP ALL TOPSOIL AND UNDERLYING FILL AND
STOCKPILE TOPSOIL FOR LATER REUSE FOR
LANDSCAPING PURPOSES.

SGE4. NEW FILL REQUIRED TO REINSTATE CUT LEVELS TO
PROPOSED BENCHING LEVELS SHALL BE SOURCED
FROM OTHER PARTS OF THE EXCAVATION AS SELECT
FILL OR IMPORTED FILL AS SPECIFIED BELOW IN SGE 5
AND SGE 6.

SGE5. SELECT FILL SHALL CONSIST OF LOCALLY DERIVED OR
CUT NATURAL CLAYS.

SGE6. IMPORTED FILL SHALL CONSIST OF RIPPED SANDSTONE
OR SHALE OR SIMILAR MATERIAL WITH MAXIMUM
PARTICLE SIZE NOT GREATER THAN 120mm AND A
MOISTURE CONTENT WITHIN 2-3% OF STANDARD
OPTIMUM.

SGE7. ALL FILL (COHESIVE SOIL) SHALL BE PLACED IN LAYERS
OF 200mm MAXIMUM THICKNESS, COMPACTED BY
MACHINE ROLLING TO ACHIEVE A DRY DENSITY RATIO
OF NOT LESS THAN 98% STANDARD MAXIMUM AT A
CORRESPONDING MOISTURE CONTENT WITHIN 2-3% OF
STANDARD OPTIMUM.

SGE8. IN AREAS WHERE HIGH IMPACT ROLLING IS USED TEST
EACH FINAL LAYER OF NOT GREATER THAN 300mm TO
400mm TO ACHIEVE A DRY DENSITY SGE8. RATIO OF NOT
LESS THAN 98% STANDARD MAXIMUM AT A
CORRESPONDING MOISTURE CONTENT WITHIN 2-3% OF
STANDARD OPTIMUM.

EXCAVATION BATTERS:

SGE9. ALL TEMPORARY BATTERS CUT IN CLAY SUBSTRATE
SHALL BE 1 HORIZ : 1 VERT. ALL LONG TERM EXPOSED
BATTERS CUT IN CLAY SUBSTRATE SHALL BE 2 HORIZ : 1
VERT. ALL DETENTION BASIN BATTERS IN CLAY
SUBSTRATE SHALL BE 3 HORIZ : 1 VERT. ALL DETENTION
BASIN BATTERS IN ROCK SUBSTRATE SHALL BE NEAR
VERTICAL.

SGE10. GEOTECHNICAL TESTING IS TO BE UNDERTAKEN TO AT
LEAST LEVEL 1 CONTROL OF FILL COMPACTION
STANDARD, AS DEFINED IN AS. 3738 AS FOLLOWS

- FOR GENERAL FILL OR CUT AREAS OVER THE AREA
PROVIDE ONE (1) TEST PER 200mm LAYER, OVER AN
AREA NOT GREATER THAN 500 m^2

- FOR GENERAL FILL AREAS IN CONCENTRATED AREAS
ADJACENT TO AND BEHIND THE STRUCTURE AND
ADJACENT TO AND BEHIND RETAINING WALLS
PROVIDE ONE (1) TEST PER 200mm LAYER, OVER AN
AREA NOT GREATER THAN 50m^2

SGE11. SUBMIT ALL GEOTECHNICAL TEST RESULTS TO WARREN
SMITH CONSULTING ENGINEERS FOR REVIEW PRIOR TO
CONTINUATION WITH SUBSEQUENT SECTION OF WORK.

EARTH WORKS FOR SERVICES

E1. EXCAVATE TRENCHES AND STOCKPILE ALL MATERIAL
FOR INSPECTION WITH REGARD TO RE-USE FOR TRENCH
BACKFILL. REMAINING MATERIAL TO BE REMOVED FROM
SITE.

E2. BEDDING MATERIAL SHALL CONSIST OF IMPORTED FILL
ONLY. THICKNESS OF BEDDING LAYER SHALL BE 75mm IN
O.T.R. AND 200mm IN ROCK.

E3. EMBED ALL PIPES WITH IMPORTED FILL. PROVIDE
200mm SIDE SUPPORT AND 150mm OVERLAY ABOVE
PIPE CROWN.

E4. TRENCH FILL ABOVE THE EMBEDMENT ZONE TO THE
UNDERSIDE OF THE ROAD PAVEMENT OR FOOTWAY FILL
MATERIAL SHALL BE AS FOLLOWS :

UNDER ROADWAY

TRENCH FILL MATERIAL SHALL CONSIST OF IMPORTED
FILL AS SPECIFIED HEREIN OF EITHER HIGH GRADE
COMPACTION SAND OR APPROVED CRUSHED ROAD
GRAVEL CONFORMING TO RTA FORM 3051 OR SIMILAR.

OTHER THAN ROADWAY

TRENCH FILL MATERIAL EXCAVATED SHALL CONSIST OF
SELECT FILL AS SPECIFIED HEREIN AND SHALL NOT
CONTAIN MORE THAN 20% OF STONES OF SIZE
BETWEEN 75mm & 150mm AND NONE LARGER THAN
150mm. PRIOR TO THE USE OF THE EXCAVATED
MATERIAL IT SHALL BE INSPECTED AND APPROVED BY
THE CONSULTANT.

E5. COMPACT BEDDING, EMBEDMENT AND TRENCH FILL
MATERIALS AS FOLLOWS:

EMBEDMENT:-
FOR GRANULAR FILL MATERIAL (NON-COHESIVE SOILS)
EG. COARSE AGGREGATE FILL, HIGH GRADE
COMPACTION SAND, THE DENSITY INDEX (ID) SHALL BE
NOT LESS THAN 70%.

TRENCH FILL:-
FOR GRANULAR MATERIAL (NON-COHESIVE SOILS), THE
DENSITY INDEX (ID) SHALL BE NOT LESS THAN 70%.

FOR NON-GRANULAR FILL MATERIAL (COHESIVE SOILS),
THE DRY DENSITY RATIO (RD) SHALL BE NOT LESS THAN
95%.

E6. MEASURE OF COMPACTION:-
THE DEGREE OF COMPACTION SHALL BE MEASURED BY
ONE OF THE FOLLOWING PARAMETERS :-

GRANULAR FILL (NON-COHESIVE SOILS). THE DENSITY
INDEX (ID) DETERMINED IN ACCORDANCE WITH AS
1289.E6.1 BASED ON THE MAXIMUM AND MINIMUM DRY
DENSITIES IN ACCORDANCE WITH AS 1289.E5.1 AND THE
FIELD DRY DENSITY IN ACCORDANCE WITH AS 1289.5.3.2,
AS 1289.E3.5 OR AS 1289.E8.1.

NON-GRANULAR FILL (COHESIVE SOILS). THE DRY
DENSITY RATION (RD) DETERMINED IN ACCORDANCE
WITH AS 1289.5.4.1 BASED ON THE FIELD DRY DENSITY IN
ACCORDANCE WITH AS 1289.5.3.2 AND THE MAXIMUM
DRY DENSITY IN ACCORDANCE WITH AS 1289.5.1.1

E7. GEOTECHNICAL TESTING IS TO BE UNDERTAKEN TO AT
LEAST LEVEL 1 CONTROL OF FILL COMPACTION
STANDARD, AS DEFINED IN AS. 3738 AS FOLLOWS:

- TEST EACH 300mm LAYER ABOVE PIPE CROWN.
- TEST BASE & SUB-BASE LAYERS WHERE APPLICABLE.
- TESTS SHALL BE REQUIRED AT EACH 50m CENTRES
WHERE THE LENGTH OF TRENCH IS WITHIN THE 50m
REQUIREMENT.

E8. SUBMIT ALL GEOTECHNICAL TEST RESULTS TO WARREN
CONSULTING ENGINEERS FOR REVIEW PRIOR TO
CONTINUATION WITH SUBSEQUENT SECTION OF WORK.

RESTORATION:

RES1. RESTORE ALL TRAFFIC AREAS TO PRE EXISTING
CONDITION.

RES2. FOR ALL SURFACES OTHER THAN IN TRAFFIC AREAS
RESTORE DISTURBED SURFACES TO PRE-EXISTING
CONDITIONS AND COMPACT AS SPECIFIED.

RES3. RESTORE ALL AUTHORITY OWNED AREAS TO COUNCIL
STANDARDS

ROAD WORKS, DRIVEWAYS & CARPARKS

R1. ALLOW FOR LEVEL 2 TESTING AND SUB-GRADE
CONDITIONS & PAVEMENT THICKNESS TO BE VERIFIED
BY GEOTECHNICAL CONSULTANT AFTER INSPECTION OF
PRELIMINARY BOXING.

R2. ALLOW FOR ANY SUB-GRADE REPLACEMENT WORK TO
BE DETERMINED AS REQUIRED BY GEOTECHNICAL
CONSULTANT AT THE TIME OF PAVEMENT
CONSTRUCTION.

R3. MINIMUM DRY DENSITY RATIOS (AS 1289 3.4.1-1993) TO
BE:

BASE COURSE:	98% MODIFIED
SUB-BASE:	95% MODIFIED
SUB-GRADE:	100% STANDARD
SUB-GRADE REPLACEMENT:	100% STANDARD

R4. PAVEMENT MATERIALS TO COMPLY WITH RMS
SPECIFICATION No. 3051 OR SIMILAR AS APPROVED BY
GEOTECHNICAL CONSULTANT.

R5. PROVIDE (1) TEST FOR EACH LAYER NOT EXCEEDING
250mm THICK BEING BASECOURSE, SUB-BASE &
SUB-GRADE OVER AN AREA NOT GREATER THAN 500m^2

R6. SUBMIT ALL GEOTECHNICAL TEST RESULTS TO WARREN
CONSULTING ENGINEERS FOR REVIEW PRIOR TO
CONTINUATION WITH SUBSEQUENT SECTION OF WORK.

APPROVALS

A1. THE AS CONSTRUCTED WORKS SHALL BE INSPECTED
BY DESIGN CONSULTANT. MINIMUM 48 HOURS NOTICE
SHALL APPLY TO ALL INSPECTIONS.

A2. THE DESIGN PLANS HEREIN ARE SUBJECT TO LOCAL
COUNCIL APPROVAL PRIOR TO CONSTRUCTION. OBTAIN
EXPRESS (WRITTEN) ADVICE TO PROCEED FROM
PROJECT MANAGER PRIOR TO COMMENCEMENT.

A3. SUBMIT WORK-AS-EXECUTED DRAWINGS IN CIVILCAD OR
DXF DIGITAL FORMAT AND HARD COPY FORMAT. VERIFY
ALL CONSTRUCTION WORKS SHOWN HEREON.

A4. CERTIFY THAT THE AS CONSTRUCTED SYSTEM HAS
BEEN BUILT IN ACCORDANCE WITH THE APPROVED
PLANS ISSUED FOR CONSTRUCTION.

SERVICES UNDER ROAD SURFACES

S1. ALL OTHER SERVICES INCLUDING BUT NOT LIMITED TO
WATER, HYDRANT, GAS, SEWER, ELECTRICAL AND
COMMUNICATIONS CONDUITS OR CABLES SHALL BE LAID
WITH MINIMUM 600mm U.N.O. COVER BELOW PROPOSED
ROAD SURFACE OR APPROVED OTHER MEANS TO
PROTECT DURING CONSTRUCTION.

ROAD SIGNS & LINE MARKING

RS1. ALL SIGNS AND LINEMARKING SHALL BE TO ROADS &
TRAFFIC AUTHORITY STANDARDS AND SPECIFICATIONS
AND AS.1742, MANUAL OF UNIFORM TRAFFIC CONTROL
DEVICES

RS2. ALL LINEMARKING SHALL BE AUGMENTED BY
RETROREFLECTIVE RAISED PAVEMENT MARKERS
(RRPMs) AND ALL SHALL BE TO AS 1742.2 - 1994 AND AS
1742.2 /AMDT 1/1997-10-05

RS3. ALL ROAD SIGNS AND POSTS SHALL BE TO AS 1742.2 -
1994 AND AS 1742.2 /AMDT 1/1997-10-05

PROTECTION OF FLORA - REFER SPECIFICATION

1. ANY TRENCHES WITHIN 3m OF TREES SHALL BE HAND
DUG TO AVOID DAMAGE TO TREE ROOTS.

2. IF IT IS CONSIDERED NECESSARY TO PERFORM ANY
WORK ON TREES, INCLUDING TRIMMING, LOPPING, ROOT
CUTTING, REPAIR AND REMOVAL, APPLICATION IN
WRITING SHALL BE MADE BY THE CONTRACTOR TO THE
SUPERINTENDENT. ANY WORK PERMITTED TO BE DONE
ON TREES TO BE RETAINED SHALL BE PERFORMED IN
ACCORDANCE WITH THE ARBORISTS REPORT.

3. MATURE TREES AND SHRUBS ARE TO BE REMOVED IN
ACCORDANCE WITH THE ARBORISTS REPORT.

AUTHORITY STANDARDS

LGA 1. THE DRAWINGS HEREIN SHALL BE READ IN
CONJUNCTION WITH NORTHERN BEACHES COUNCIL
COUNCIL STANDARDS & SPECIFICATIONS WHICH SHALL
OVERRIDE SPECIAL DETAILS SHOWN ON THE DRAWINGS.

TRAFFIC NOTE:

1. A TRAFFIC CONTROL PLAN IS TO BE PREPARED BY AN
ACCREDITED RMS 1. TRAFFIC CONTROLLER AND
SUBMITTED TO COUNCIL. THIS TRAFFIC PLAN IS TO BE
CERTIFIED BY AND IMPLEMENTED TO THE SATISFACTION
OF AN ACCREDITED RMS TRAFFIC CONTROLLER

PRIOR TO COMMENCEMENT OF WORK

2. ALL TRAFFIC CONTROL WORKS SHALL ONLY BE CARRIED
OUT BY 2. ACCREDITED RMS TRAFFIC CONTROLLERS.

CLOSED CIRCUIT COLOUR TV (CCTV)

CCTV 1. UNDERTAKE A CCTV INSPECTION OF ALL THE
COMPLETED DRAINAGE IN ACCORDANCE WITH THE
GUIDELINES OF THE AUSTRALIAN CONDUIT
CONDITION EVALUATION MANUAL (ACCEM)

CCTV 2. APPLY THE FOLLOWING REQUIREMENTS TO THE CCTV
INSPECTION:-
A. USE DATA CAPTURE SOFTWARE APPROVED BY
SYDNEY WATER

B. USE CERTIFIED CCTV OPERATORS C. THE CCTV
FOOTAGE SHALL BE OF QUALITY TO ALLOW
ACCURATE ASSESSMENT OF THE INTERNAL
CONDITION OF THE PIPE. FURNISH TO THE DESIGN
CONSULTANT:-

CCTV 3. A. VIDEOS IN MPG FORMAT
B. CCTV REPORT AND SURVEY DATA IN PDF FORMAT

PROTECTION OF TREES

T1. WHERE STORMWATER DRAINAGE IS LAID WITHIN THE
VICINITY OF TREES / CANOPIES OF TREES, WORK IS TO
BE COMPLETED TO THE PROJECT ARBORIST'S
REQUIREMENTS AND SPECIFICATIONS.

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REVISION	AMENDMENT	DATE	REVISION	AMENDMENT	DATE
1	ISSUE FOR S4.56	03/11/23			

CLIENT: KLIATRO

PROJECT: FOREST LODGE WARRIEWOOD

PREPARED BY
WSce Pty Ltd
ACN 668 655 141
ABN 75 668 655 141
info@wsce.com.au
wsce.com.au

Driven by excellence, built on experience.

TITLE: SPECIFICATION NOTES

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	I.O.	J.G.	J.G.

JOB No.	DRAWING No.	ISSUE
7368002	C1.02	1

DATE	STATUS
SEPTEMBER 2023	ISSUE FOR S4.56

Xrefs: X:7368002-TB_A1H
Plot Date: 03.11.2023@09:32:11 Login Name: mo Cad File: T:\7368002\Drawings\AutoCAD\Civil\Design\Civil 2023-4 S6\C1.02 Specification Notes.dwg

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

A1



LEGEND

- SITE BOUNDARY
- EXISTING OVERHEAD ELECTRICTY
- EXISTING WATER MAIN
- EXISTING STORMWATER MAIN
- EXISTING TELECOMMS LINE

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12.5 0 5 10 15 20 25m
PLAN SCALE 1:750 A1 SHEET

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

A1

REVISION	AMENDMENT	DATE	REVISION	AMENDMENT	DATE
1	ISSUE FOR S4.56	03/11/23			

CLIENT

KUATRO

PROJECT

FOREST LODGE
WARRIEWOOD

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GCC ISO 9001 Certified

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TITLE

EXSITING SURVEY

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	I.O.	J.G.	J.G.

JOB No.	DRAWING No.	ISSUE
7368002	C1.03	1

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Plot Date: 03.11.2023@15:56:12 Login Name: iaswart Cad File: T:\7368002\Drawings\AutoCAD\Civil\Design\Civil 2D\S4.56\Existing Survey.dwg



LEGEND

- SITE BOUNDARY
- VEHICLE ENTRY SHAKER GRID
- SPILLWAY
- PUMPOUT
- SITE GATE
- SEDIMENT FENCE
- SEDIMENT TRAP FOR KERB INLET - SAND BAGS
- SEDIMENT BASIN
- DB+C — DIVERSION BANK AND CHANNEL

NOTES:

1. GEOTEXTILE INLET FILTER BAGS TO BE FITTED IN ALL EXISTING AND PROPOSED STORMWATER GRATED PITS WITHIN THE DEVELOPMENT AREA WHICH ARE IN USE.
2. STOCKPILE LOCATION SHALL BE DETERMINED ON SITE DURING CONSTRUCTION STAGE. STOCKPILE ARE TO REMAIN CLEAR OF SITE ACCESS, DRAINS AND PAVED AREAS. HEIGHT OF STOCKPILE SHALL NOT EXCEED 2m.
3. INSTALLATION OF ALL EROSION AND SEDIMENT CONTROL MEASURES IS TO BE IN ACCORDANCE WITH THE LATEST EDITION OF THE 'BLUE BOOK - MANAGING URBAN STORMWATER'. ALL CONTROLS ARE TO BE INSTALLED PRIOR TO CONSTRUCTION COMMENCING.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE CORRECT INSTALLATION AND ONGOING MAINTENANCE OF THE CONTROLS. REFER TO DRG C2.02 FOR MAINTENANCE REQUIREMENTS.
5. SUITABLE AND APPROVED BINS SHALL BE UTILISED FOR THE CONTAINMENT OF ALL HARD WASTE, INCLUDING CONCRETE SLURRIES, BUILDING WASTE AND LITTER. IN THE CASE OF ACCIDENTAL SPILLS OF SOIL OR OTHER MATERIAL, PARTICULARLY IN THE PUBLIC RESERVE, THE MATERIAL SHALL BE SWEPT AND CONTAINED AND NOT WASHED INTO A GUTTER.

SEDIMENT BASIN NOTE:

SEDIMENT BASINS HAVE BEEN SIZED BY USING PROCEDURES DETAILED IN THE 'BLUE BOOK - MANAGING URBAN STORMWATER' FOR TYPE D BASINS. A SUMMARY OF THE CALCULATED AND PROVIDED VOLUMES IS PROVIDED BELOW.

SEDIMENT BASIN 1:

REQUIRED VOLUME	= 339 m^3
BASE AREA	= 167 m^2
TOP AREA	= 726 m^2
DEPTH	= 2.11 m
MAX SIDE SLOPE	= 1V:2.5H
VOLUME PROVIDED	= 942 m^3

PROVIDE 2m SPILLWAY TO CREEK.

SEDIMENT BASIN 2:

REQUIRED VOLUME	= 376 m^3
BASE AREA	= 157 m^2
TOP AREA	= 511 m^2
DEPTH	= 1.2 m
MAX SIDE SLOPE	= 1V:2.5H
VOLUME PROVIDED	= 400 m^3

PROVIDE 2m SPILLWAY TO CREEK.

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10.0 0 5.0 10.0 15.0 20.0m
PLAN SCALE 1:500 A1 SHEET

REVISION	AMENDMENT	DATE	REVISION	AMENDMENT	DATE
1	ISSUE FOR S4.56	03/11/23			
2	RE-ISSUE FOR S4.56	05/12/23			
3	RE-ISSUE FOR S4.56	01/02/24			
4	ISSUE FOR S4.56	14/06/24			

CLIENT
KUATRO

PROJECT
FOREST LODGE
WARRIEWOOD

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GCC ISO 9001 Certified
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TITLE
SEDIMENT & EROSION CONTROL PLAN

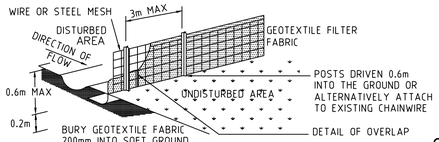
SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
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JOB No.	DRAWING No.	ISSUE
7368002	C2.01	4

DATE	STATUS
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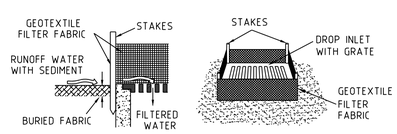
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Plot Date: 14/06/2024@13:28:41 Login Name: steviest Cad File: I:\7368002\Drawings\AutoCAD\Civil\Dwgs\Civil 2023\4.06\C2.01 Sediment & Erosion Control Plan.dwg

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
A1



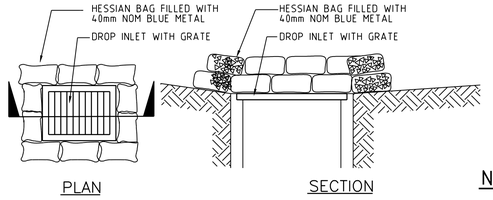
SEDIMENT CONTROL FENCE

NTS



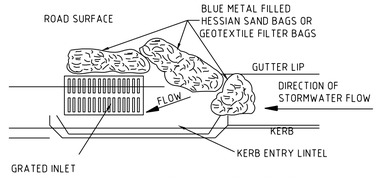
GEOTEXTILE FILTER FABRIC DROP INLET SEDIMENT TRAP

NTS



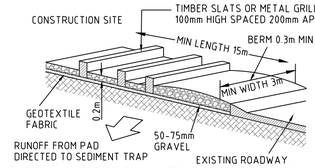
HESSIAN BAG DROP INLET SEDIMENT TRAP

NTS



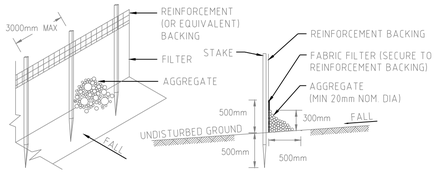
NEW/EXISTING GRATED KERB ENTRY PIT SEDIMENT CONTROL BARRIER

NTS



STABILIZED CONSTRUCTION SITE VEHICLE ENTRY/EXIT

NTS

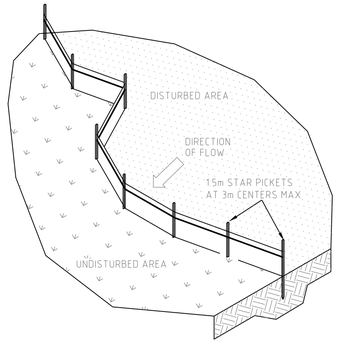


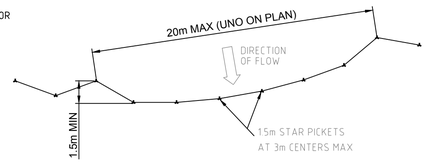
SEDIMENT FENCE DETAIL FOR ROCKY GROUND

NTS

SEDIMENT FENCE NOTES:-

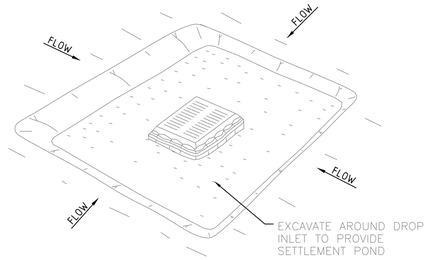
1. CONSTRUCT SEDIMENT FENCE AS CLOSE AS POSSIBLE TO PARALLEL TO THE CONTOURS OF THE SITE OR AT THE TOE OF A SLOPE.
2. DRIVE 1.5 METRE LONG STAR PICKETS INTO GROUND SUFFICIENT TO PROVIDE RIGID SUPPORT, 3 METERS APART. WHERE THERE IS INSUFFICIENT SOIL DEPTH OVER ROCK, HOLES ARE TO BE DRILLED INTO ROCK TO ACCEPT THE STAR PICKETS.
3. ON SOFT GROUND MATERIALS, DIG A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
4. BACKFILL TRENCH OVER BASE OF FABRIC & COMPACT.
5. FIX SELF-SUPPORTING GEOTEXTILE TO UPSLOPE SIDE OF POSTS WITH WIRE TIES OR AS RECOMMENDED BY THE GEOTEXTILE MANUFACTURER. USE A REINFORCEMENT BACKING WITH NON SELF-SUPPORTING GEOTEXTILE FABRIC.
6. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
7. ON HARD OR ROCKY GROUND, SMOOTH A 500mm WIDE STRIP UPSLOPE OF THE FENCE LINE. TURN THE BOTTOM 500mm OF THE FABRIC UPSLOPE AND ANCHOR IN PLACE WITH SUITABLE AGGREGATE.
8. WHERE A SEDIMENT FENCE IS CONSTRUCTED DOWN SLOPE FROM A DISTURBED BATTER THE FENCE SHOULD BE LOCATED 1.5 TO 2.0 METERS DOWN SLOPE FROM THE TOE OF THE BATTER.





SEDIMENT FENCE LAYOUT PLAN

NTS

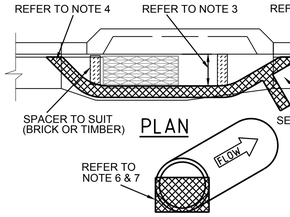


EXCAVATED SEDIMENT TRAP

NTS

EXCAVATED SEDIMENT TRAP NOTES:-

1. REMOVE THE SEDIMENT WHEN IT HAS ACCUMULATED TO HALF THE DESIGN DEPTH OF THE TRAP AND RESTORE THE TRAP TO ITS ORIGINAL DIMENSIONS.
2. PROVIDE 50 cu.m/Ha OF SEDIMENT STORAGE VOLUME.
3. REFER TO THE MAINTENANCE REQUIREMENTS.



GEOTEXTILE FILTER BAGS

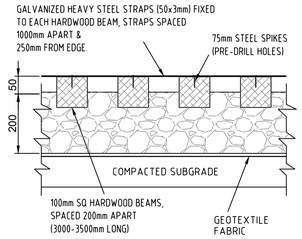
NTS

SEDIMENT BARRIER FOR PITS & PIPES, NOTES:-

1. SLEEVES ARE TO BE MADE FROM GEOTEXTILE FABRIC LONGER THEN THE LENGTH OF THE INLET PIT.
2. FILL SLEEVE WITH 5 OR 10mm CLEAN GRAVEL.
3. PLACE THE SLEEVE AT THE OPENING OF THE KERB INLET LEAVING A 100mm GAP TO ACT AS AN EMERGENCY OVERFLOW.
4. SLEEVE MUST BE PLACED AGAINST THE KERB TO PREVENT BYPASS.
5. FIT SLEEVE TO ALL INLETS DOWNSTREAM OF THE WORKS.
6. FOR DRAINAGE WORKS FIT GEOTEXTILE FABRIC OR GEO BAGS TO UPSTREAM FACE OF ALL OPEN PIPES.
7. MAINTAIN AN OPENING AT THE TOP OF THE PIPE OF 1/3 OF THE PIPE DIAMETER.
8. THE FILTERS ARE TO BE CLEANED AND MAINTAINED DAILY.
9. ALL CARE SHOULD BE TAKEN TO MINIMIZE SEDIMENT REACHING THE STORMWATER SYSTEM BY MINIMIZING EXCAVATION WORKS AND PREVENTING EXCESS WATER FLOW THROUGH WORKS.

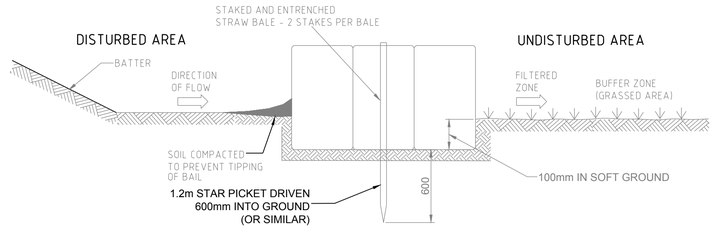
SITE ENTRY/EXIT NOTES:-

1. ALL VEHICLE ENTRANCES & EXITS TO THE CONSTRUCTION SITE MUST BE STABILIZED TO PREVENT THEM BECOMING A SOURCE OF SEDIMENT, BY PROVIDING A VEHICLE SHAKE AREA. THIS MAY CONSIST OF A TIMBER, CONCRETE OR STEEL SHAKER GRID OR RUBBLE AREA.
2. THE VEHICLE EXIT AREA IS TO BE MAINTAINED IN A CLEAN & SERVICEABLE CONDITION DURING THE TOTAL TIME OF USAGE.
3. ANY UNSEALED ROAD BETWEEN THE DEVICE AND COUNCILS ROADWAY IS TO BE TOPPED WITH 100mm THICK, 40mm NOMINAL SIZE AGGREGATE.
4. PUBLIC ROADS MUST BE KEPT FREE OF DIRT AND MUD. SEDIMENT TRACKED ONTO THE PUBLIC ROADWAY BY VEHICLES LEAVING THE CONSTRUCTION SITE IS TO BE SWEPT UP IMMEDIATELY.
5. FENCES SHOULD BE ERECTED TO ENSURE VEHICLES CAN NOT BYPASS THE STABILIZED ACCESS POINTS, UNLESS COMING FROM A STABILIZED AREA.



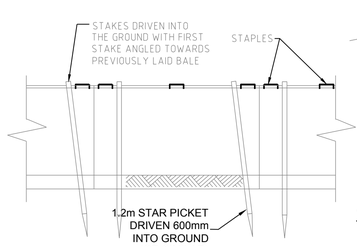
VEHICLE SHAKER GRID

NTS



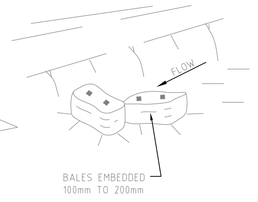
TYPICAL STRAW BALE SECTION

NTS

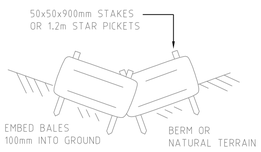


TYPICAL STRAW BALE DETAIL

NTS



VIEW OF CHECK DAM

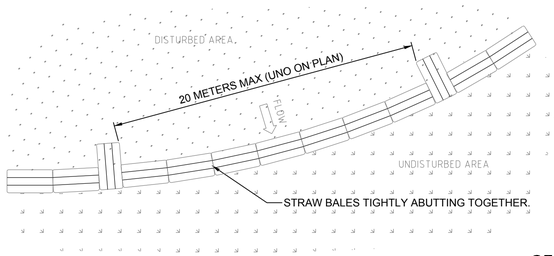


CHECK DAM SECTION

STRAW BALE NOTES:-

1. CONSTRUCT STRAW BALE FILTER AS CLOSE AS POSSIBLE TO PARALLEL TO THE CONTOURS OF THE SITE OR AT THE TOE OF A SLOPE.

   PLACE BALES LENGTHWISE IN A ROW WITH ENDS TIGHTLY ABUTTING.
2. USE STRAW TO FILL ANY GAPS BETWEEN BALES. STRAWS TO BE PLACED PARALLEL TO GROUND.
3. MAXIMUM HEIGHT OF FILTER IS ONE BALE.
4. ON SOFT MATERIALS, EMBED EACH BALE IN THE GROUND 75mm TO 100mm AND ANCHOR WITH TWO 1.2 METRE STAR PICKETS. ANGLE THE FIRST STAKE IN EACH BALE TOWARDS THE PREVIOUSLY LAID BAIL. DRIVE STAKES 600mm INTO THE GROUND AND FLUSH WITH THE TOP OF THE BALES.
5. WHERE A STRAW BALE FILTER IS CONSTRUCTED DOWN SLOPE FROM A DISTURBED BATTER THE BALES SHOULD BE LOCATED 1.5 TO 2.0 METERS DOWN SLOPE FROM THE TOE OF THE BATTER.
6. WHERE REQUIRED WRAP GEOTEXTILE FILTER FABRIC AROUND BALES AND STAPLE IN POSITION.

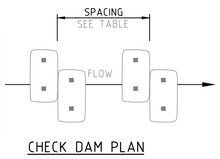


TYPICAL STRAW BALE LAYOUT PLAN

NTS

CHECK DAM SPACING TABLE

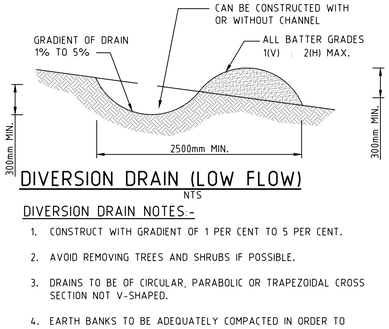
LONGITUDINAL GRADE (%)	SPACING (METERS)
0 - 5	40
5 -10	30
10 - 15	20
GREATER THAN 15	10



CHECK DAM PLAN

STRAW BALE CHECK DAM DETAILS

NTS



DIVERSION DRAIN (LOW FLOW)

NTS

DIVERSION DRAIN NOTES:-

1. CONSTRUCT WITH GRADIENT OF 1 PER CENT TO 5 PER CENT.
2. AVOID REMOVING TREES AND SHRUBS IF POSSIBLE.
3. DRAINS TO BE OF CIRCULAR, PARABOLIC OR TRAPEZOIDAL CROSS SECTION NOT V-SHAPED.
4. EARTH BANKS TO BE ADEQUATELY COMPACTED IN ORDER TO PREVENT FAILURE.
5. PERMANENT OR TEMPORARY STABILIZATION OF THE EARTH BANK TO BE COMPLETED WITHIN 10 DAYS OF CONSTRUCTION.
6. ALL OUTLETS FROM DISTURBED LANDS ARE TO FEED INTO A SEDIMENT BASIN OR SIMILAR.
7. DISCHARGE RUN OFF COLLECTED FROM UNDISTURBED LANDS ONTO EITHER A STABILIZED OR AN UNDISTURBED DISPOSAL SITE WITHIN THE SAME SUBCATCHMENT AREA FROM WHICH THE WATER ORIGINATED.
8. COMPACT BANK WITH A SUITABLE IMPLEMENT IN SITUATIONS WHERE THEY ARE REQUIRED TO FUNCTION FOR MORE THAN FIVE DAYS.
9. EARTH BANKS TO BE FREE OF PROJECTIONS OR OTHER IRREGULARITIES THAT WILL IMPEDE NORMAL FLOW.

SITE ENTRY/EXIT CONSTRUCTION NOTES:-

1. STRIP TOP SOIL & LEVEL SITE. PROVIDE CATCH DRAIN AT SIDES TO DIRECT RUNOFF WATER TO SEDIMENT TRAPS.
2. COMPACT SUBGRADE AND REMOVE ANY HIGH POINTS.
3. COVER AREA WITH GEOTEXTILE FABRIC. THIS MAY BE WOVEN OR NEEDLE PUNCHED PRODUCT WITH A MINIMUM CBR BURST STRENGTH (AS3706.4-90) OF 2500 N.
4. CONSTRUCT 200mm THICK RUBBLE PAD OVER GEOTEXTILE USING ROAD BASE OR 30-40mm AGGREGATE. MINIMUM LENGTH 15 METRES OR TO BUILDING ALIGNMENT. MINIMUM WIDTH 3 METRES. CONSTRUCT 300mm HIGH HUMP IMMEDIATELY WITHIN BOUNDARY TO DIVERT WATER TO A SEDIMENT TRAP.
5. WHERE GRIDS ARE USED FIRST CONSTRUCT A 150 THICK PAD OVER GEOTEXTILE FABRIC. LEVEL THIS IN BOTH DIRECTIONS. LOWER GRID ON TO THE PREPARED BASE AND ENSURE THAT NO PART IS SITTING ON ANY HIGH POINTS. BACKFILL THE SPACES BETWEEN THE GRIDS TO WITHIN 50mm OF THE TOP.
6. PROVIDE RAMPS AT ENDS AND SIDE OF GRIDS. IF DEPRESSIONS OCCUR IN THE RAMPS DURING USE. ADD ADDITIONAL MATERIAL.

MAINTENANCE REQUIREMENTS:-

1. ACCUMULATED SILT & SEDIMENT MUST BE REMOVED AT REGULAR INTERVALS AND AFTER EACH MAJOR STORM.
2. SILT & SEDIMENT MUST BE REMOVED FROM OFF THE SITE OR TO A COUNCIL APPROVED LOCATION WITHIN THE SITE, WHERE IT WILL NOT ERODE.
3. THE SEDIMENT FENCES, BALES & TRAPS SHALL BE REGULARLY INSPECTED, ESPECIALLY AFTER RAIN AND KEPT IN GOOD REPAIR AND FUNCTIONING CONDITION AT ALL TIMES.
4. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT SEDIMENT, EROSION & WATER POLLUTION SHALL BE MINIMIZED.
5. THE SEDIMENT TRAPS SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE CONSTRUCTION AREA HAS BEEN PROPERLY STABILIZED.

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REVISION	AMENDMENT	DATE
1	ISSUE FOR S4.56	03/11/23

CLIENT: KUATRO

PROJECT: FOREST LODGE WARRIEWOOD

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TITLE: **SEDIMENT & EROSION CONTROL DETAILS**

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	I.O.	J.G.	J.G.

JOB No.	DRAWING No.	ISSUE
7368002	C2.02	1

DATE: SEPTEMBER 2023 STATUS: ISSUE FOR S4.56

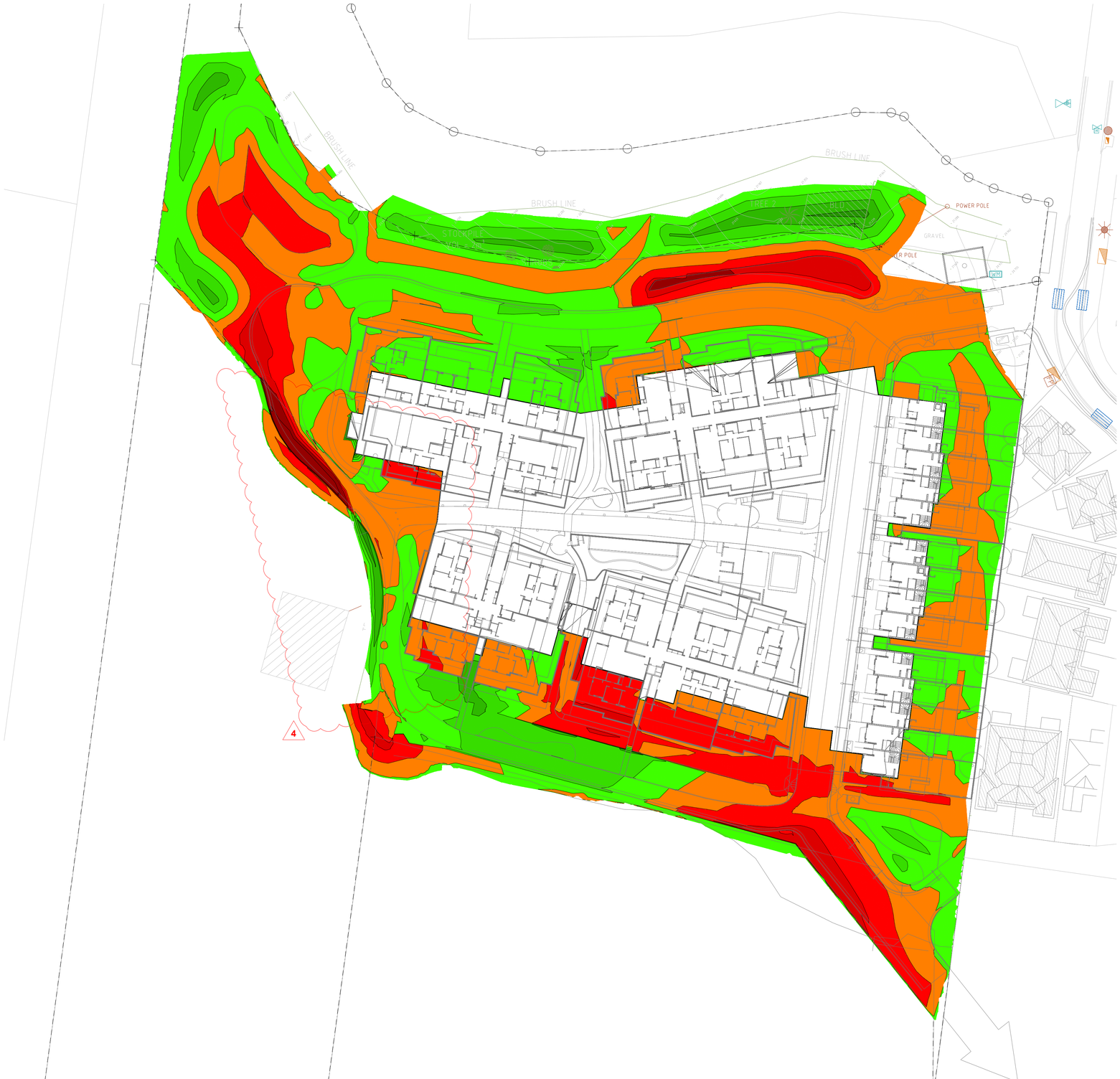
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Plot Date: 03.11.2023@09:37:17 Login Name: rho Cad File: Y:\7368002\Drawings\AutoCAD\Civil Design\Civil 2025\4.56\C2.02 Sediment & Erosion Control Details.dwg

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

A1

Levels Table

No.	From Depth	To Depth	Colour
1	-8.000	-3.000	
2	-3.000	-2.000	
3	-2.000	-1.000	
4	-1.000	0.000	
5	0.000	1.000	
6	1.000	2.000	
7	2.000	3.000	
8	3.000	5.000	



LEGEND

- SITE BOUNDARY
- 152.0 NATURAL SURFACE CONTOUR
- -2.0 DEPTH CONTOUR

NOTE:

1. VOLUMES ARE PRELIMINARY ONLY AND IS SUBJECT TO CHANGE. CONTRACTOR TO CONFIRM BULK EARTHWORKS VOLUMES AND LEVELS BASED ON THEIR OWN ASSUMPTIONS AND CALCULATIONS. THE FOLLOWING DEPTH PROFILES WERE ADOPTED FOR THE BULK EARTHWORKS. NOTE: ASSUMED LEVELS, SUBJECT TO CHANGE DURING DETAILED DESIGN STAGE.

   - ASPHALT PAVEMENT (TRAFFICABLE) = 290 mm
   - CONCRETE PAVEMENT (TRAFFICABLE) = 330mm
   - CONCRETE PAVEMENT (NON-TRAFFICABLE) = 275mm
   - CONCRETE FOOTPATH IN ROAD RESERVE = 175mm
   - CONCRETE STRUCTURAL SLABS = 200 mm
   - LANDSCAPING TOP SOIL = 200 mm

2. VOLUMES FROM PIPE TRENCH HAVE NOT BEEN INCLUDED IN THESE CALCULATIONS.
3. A TOPSOIL REMOVAL OF 300mm HAS BEEN INCLUDED FOR THE OVERALL SITE.
4. BULKING FACTORS HAVE NOT BEEN INCLUDED.
5. ALLOW A +/-15% TOLERANCE FOR THESE VOLUMES.
6. EXTENT OF VERTICAL CUTS IN ROCK TO BE CONFIRMED ON SITE BY CONTRACTOR AND GEOTECHNICAL ENGINEER.
7. EXTENT OF CUTTING/FILLING IN THE VICINITY OF EXISTING TREES SHALL BE CONFIRMED BY THE PROJECT ARBORIST.
8. TREE PROTECTION ZONES TO BE CONFIRMED BY THE PROJECT ARBORIST.
9. ALLOW A +/-15% TOLERANCE FOR THESE VOLUMES. 4
   CUT 6,700 m³
   FILL 4,900 m³
   NET 1,800 m³ EXPORT

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NORTH

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

10.0 0 5.0 10.0 15.0 20.0m
PLAN SCALE 1:500 A1 SHEET

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
A1

REVISION	AMENDMENT	DATE	REVISION	AMENDMENT	DATE
1	ISSUE FOR S4.56	03/11/23			
2	RE-ISSUE FOR S4.56	05/12/23			
3	RE-ISSUE FOR S4.56	01/02/24			
4	ISSUE FOR S4.56	17/06/24			

CLIENT
KUATRO

PROJECT
FOREST LODGE
WARRIEWOOD

PREPARED BY
WSce Pty Ltd
ACN 668 655 141
ABN 75 668 655 141
info@wsce.com.au
wsce.com.au

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TITLE
BULK EARTHWORKS LEVELS PLAN

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	I.O.	J.G.	J.G.

JOB No.	DRAWING No.	ISSUE
7368002	C3.01	4

DATE	STATUS
SEPTEMBER 2023	ISSUE FOR S4.56

Xrefs: X:7368000.TB_ATH; X:7368020.SU - Existing Survey; X:7368000.AR - Site Plan RING ROAD
Plot Date: 17/06/2024@15:59:01 Login Name: KrutiPrint Cad File: I:\7368000\Drawings\AutoCAD\Civil\Design\Civil 22\C4.56-Bulk Earthworks Levels Plan.dwg

PROVIDE SMOOTH INTERFACE WITH EXISTING ROAD STUB LEVELS. REFER TO DETAIL ON C4.51. WAE LEVELS AND EXTENT OF CONSTRUCTED ROAD STUB TO BE CONFIRMED BY DETAILED SURVEY.

MATCH EXISTING LEVELS AT TOP OF WALL. TYPICAL

PROVIDE MIN 600W x 100H SPACE BELOW FENCE TO ALLOW FOR OVERLAND FLOW. TYPICAL FOR ALL FENCES

MATCH EXISTING LEVELS ALONG BOUNDARY. TYPICAL

START OF WALL IN CUT

PROPOSED RETAINING WALL. MAX RETAINED HEIGHT = XXm

RETAINED HEIGHT = 2.2m

RETAINED HEIGHT = 1.2m

RETAINED HEIGHT = 1.2m

RETAINED HEIGHT = 1.0m

RETAINED HEIGHT = 0.4m

RETAINED HEIGHT = 1.0m

RETAINED HEIGHT = 1.4m

RETAINED HEIGHT = 1.0m

RETAINED HEIGHT = 0.8m

PROVIDE MIN 2 x 200W x 100H SLOTS IN WALL FOR EMERGENCY OVERFLOW. TYPICAL FOR COURTYARD AREAS.

RETAINED HEIGHT = 3.32m

PROVIDE MIN 2 x 200W x 100H SLOTS IN WALL FOR EMERGENCY OVERFLOW. TYPICAL FOR COURTYARD AREAS.

PROVIDE MIN 2 x 200W x 100H SLOTS IN WALL FOR EMERGENCY OVERFLOW. TYPICAL FOR COURTYARD AREAS.

PROVIDE MIN 2 x 200W x 100H SLOTS IN WALL FOR EMERGENCY OVERFLOW. TYPICAL FOR COURTYARD AREAS.

BUILDING A FFL 23.20

BUILDING B FFL 24.70

PROPOSED RETAINING WALL. MAX 3.85m RETAINED HEIGHT. STRUCTURAL DESIGN BY OTHERS

LOCAL REGRADING AT TOP OF WALL TO DIRECT UPSTRTEAM OVERLAND FLOW TOWARDS DIVERSION HEADWALL AND PIPE. TOP OF WALL TO BE 500mm ABOVE GROUND LEVEL FOR FLOOD PROTECTION

PROPOSED RETAINING WALL. MAX 3.98m RETAINED HEIGHT. STRUCTURAL DESIGN BY OTHERS

RETAINED HEIGHT = 1.5m

S4.56

S4.56

LEGEND

- EXISTING BOUNDARY
- DESIGN SURFACE CONTOUR
- EXISTING SURFACE CONTOUR
- TOP OF BATTER
- BOTTOM OF BATTER
- V.C. — VEHICULAR CROSSING (V.C.)
- K&G — KERB & GUTTER (K&G)
- K.O. — KERB ONLY (K.O.)
- KERB INLET PIT (ON GRADE)
- GRATED INLET PIT
- RL 91.86 — FINISHED SURFACE LEVEL
- GRL 91.86 — FINISHED STORMWATER PIT LID/GRATE LEVEL
- TOW 84.20 / BOW 84.00 — TOP OF WALL LEVEL / BOTTOM OF WALL LEVEL
- 2.5% — GRADE ARROW
- RETAINING WALL
- BASEMENT LINE
- UPSTREAM DIVERSION SWALE
- SWALE FLOW ARROW
- RENO MATTRESS

NOTES:
1. GEOTECHNICAL ENGINEER TO CONFIRM EXTENT OF VERTICAL CUT IN ROCK WHERE PERIMETER RETAINING WALLS ARE NOMINATED.

2. REFER STRUCTURAL ENGINEER DRAWINGS FOR RETAINING WALL AND BUILDING SLAB DETAILS.

REFER C4.02 FOR CONTINUATION

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NORTH

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

5.0 0 2.5 5.0 7.5 10.0m
PLAN SCALE 1:250 A1 SHEET

REVISION	AMENDMENT	DATE
1	ISSUE FOR S4.56	03/11/23
2	ISSUE FOR S4.56	17/06/24

CLIENT: KUATRO

PROJECT: FOREST LODGE WARRIEWOOD

PREPARED BY
WSce Pty Ltd
ACN 668 655 141
ABN 75 668 655 141
info@wsce.com.au
wsce.com.au
Driven by excellence, built on experience.

TITLE: GENERAL ARRANGEMENT PLAN-SHEET 1

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	I.O.	J.G.	J.G.

JOB No.	DRAWING No.	ISSUE
7368002	C4.01	2

DATE: SEPTEMBER 2023 STATUS: ISSUE FOR S4.56

Xrefs: X:\7368002\LTB_A1H_X:\7368002\SU - Existing Survey_7368002.WSCE-CS-MO-01 - Existing Surface X:\7368000.xlsb - Site Plan RING ROAD, 7368002.WSCE-CS-MO-02 - Design Surface RING ROAD, X:\7368002.SIM-layout
Plot Date: 17.06.2024@17:40:48 Login Name: idheart Cad File: Y:\7368000\Drawings\Auto\CAD\Civil\Design\Civil 3D\S4.5\6\General Arrangement Plan-Sheet 1.dwg

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
A1

REFER C4.01 FOR CONTINUATION

PROVIDE MIN 2 x 200W x 100H SLOTS IN WALL FOR EMERGENCY OVERFLOW. TYPICAL FOR COURTYARD AREAS.

PROVIDE MIN 2 x 200W x 100H SLOTS IN WALL FOR EMERGENCY OVERFLOW. TYPICAL FOR COURTYARD AREAS.

BUILDING C
FFL 27.20

BUILDING D
FFL 25.20

RETAINED
HEIGHT = 1.27m

LOCAL REGRADING AT TOP OF WALL TO DIRECT UPSTRTEAM OVERLAND FLOW TOWARDS DIVERSION HEADWALL AND PIPE. TOP OF WALL TO BE 500mm ABOVE GROUND LEVEL FOR FLOOD PROTECTION

START OF WALL IN FILL

S4.56

PROVIDE RENO MATTRESS SCOUR PROTECTION AT TOP OF WALL.

BIORETENTION BASIN 1
REFER C6.02

LOCAL 1V:1H BATTER TO EXISTING SURFACE. GEOTECHNICAL ENGINEER TO CONFIRM AND SPECIFY BATTER TREATMENT

PROPOSED RETAINING WALL BY STRUCTURAL ENGINEER WITH GEOTECHNICAL ADVICE.

LEGEND

- EXISTING BOUNDARY
- DESIGN SURFACE CONTOUR
- EXISTING SURFACE CONTOUR
- TOP OF BATTER
- BOTTOM OF BATTER
- V.C. — VEHICULAR CROSSING (V.C.)
- K&G — KERB & GUTTER (K&G)
- K.O. — KERB ONLY (K.O.)
- KERB INLET PIT (ON GRADE)
- GRATED INLET PIT
- RL91.86 — FINISHED SURFACE LEVEL
- GRL91.86 — FINISHED STORMWATER PIT LID/GRATE LEVEL
- TOW84.20 / BOW84.00 — TOP OF WALL LEVEL / BOTTOM OF WALL LEVEL
- 2.5% — GRADE ARROW
- RETAINING WALL
- BASEMENT LINE
- UPSTREAM DIVERSION SWALE
- SWALE FLOW ARROW
- RENO MATTRESS

NOTES:
1. GEOTECHNICAL ENGINEER TO CONFIRM EXTENT OF VERTICAL CUT IN ROCK WHERE PERIMETER RETAINING WALLS ARE NOMINATED.

2. REFER STRUCTURAL ENGINEER DRAWINGS FOR RETAINING WALL AND BUILDING SLAB DETAILS.

DO NOT SCALE FROM DRAWINGS, CHECK & VERIFY ALL DIMENSIONS & LEVELS BEFORE COMMENCEMENT OF ANY WORK.

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5.0 0 2.5 5.0 7.5 10.0m
PLAN SCALE 1:250 A1 SHEET

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
A1

REVISION	AMENDMENT	DATE	REVISION	AMENDMENT	DATE
1	ISSUE FOR S4.56	03/11/23			
2	RE-ISSUE FOR S4.56	05/12/23			
3	RE-ISSUE FOR S4.56	01/02/24			
4	ISSUE FOR S4.56	17/06/24			

CLIENT
KUATRO

PROJECT
FOREST LODGE
WARRIEWOOD

PREPARED BY
WSce Pty Ltd
ACN 668 655 141
ABN 75 668 655 141
info@wsce.au
wsce.com.au
GCC ISO 9001 Certified
WSce
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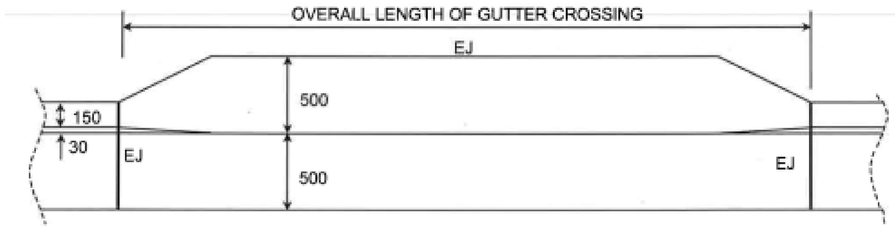
TITLE
GENERAL ARRANGEMENT PLAN-SHEET 2

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	I.O.	J.G.	J.G.

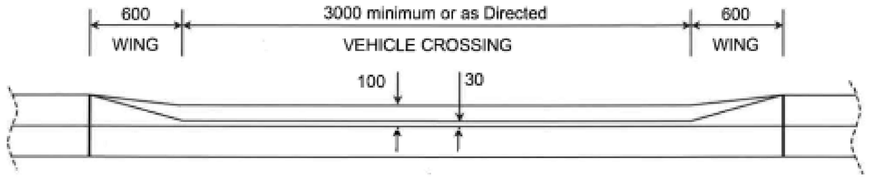
JOB No.	DRAWING No.	ISSUE
7368002	C4.02	4

DATE	STATUS
SEPTEMBER 2023	ISSUE FOR S4.56

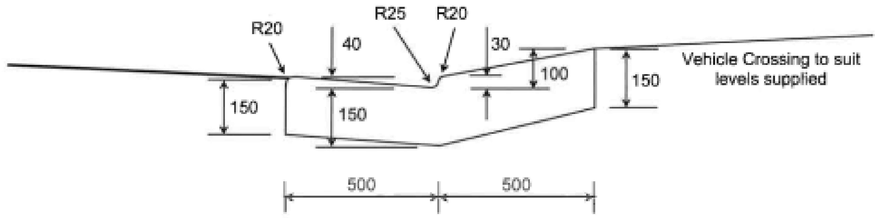
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Plot Date: 17/06/2024@17:44:24 Login Name: idrewart Cad File: I:\7368002\Drawings\AutoCAD\ctrl\Design\Oct 23\Sht 4.56\General Arrangement Plan-Sheet 1.dwg



PLAN



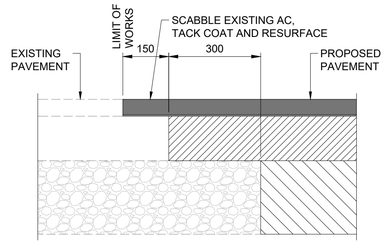
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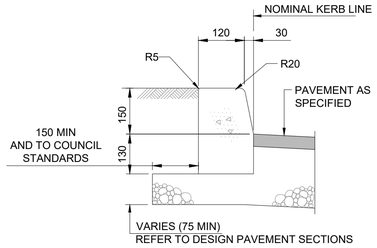
TYPICAL CROSS SECTION

NORTHERN BEACHES COUNCIL VEHICULAR CROSSING (VC)
STANDARD DETAILS (A47284)
SCALE NTS

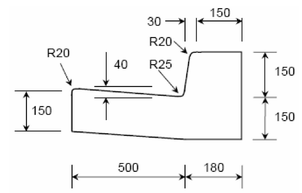
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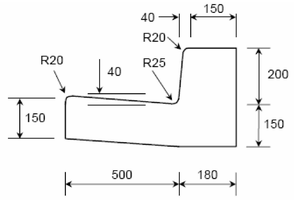
AC CONNECTION TO EXISTING PAVEMENT
SCALE 1:10



KERB ONLY (KO)
SCALE 1:10



150mm KERB & GUTTER



200mm KERB & GUTTER

NORTHERN BEACHES COUNCIL KERB AND GUTTER (K&G)
STANDARD DETAILS (A47284)
SCALE NTS

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100 0 50 100 150 200mm
PLAN SCALE 1:5 A1 SHEET
100 0 100 200 300 400 500mm
PLAN SCALE 1:10 A1 SHEET

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
A4

REVISION	AMENDMENT	DATE	REVISION	AMENDMENT	DATE
1	ISSUE FOR S4.56	03/11/23			
2	ISSUE FOR S4.56	17/06/24			

CLIENT
KLIATRO

PROJECT
FOREST LODGE
WARRIEWOOD

PREPARED BY
WSce Pty Ltd
ACN 668 655 141
ABN 75 668 655 141
info@wsce.com.au
wsce.com.au

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TITLE
SITEWORKS DETAILS

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	I.O.	J.G.	J.G.

JOB No.	DRAWING No.	ISSUE
7368002	C4.51	2

DATE	STATUS
SEPTEMBER 2023	ISSUE FOR S4.56

Xrefs: X:\7368002\TB_A1H
Plot Date: 14.06.2024@14:07:03 Login Name: stecorard Cad File: Y:\7368002\Drawings\AutoCAD\Civil\Design\Civil 3D\S4.56\C4.51 Siteworks Details.dwg



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NORTH

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10.0 0 5.0 10.0 15.0 20.0m
PLAN SCALE 1:500 A1 SHEET

REVISION	AMENDMENT	DATE	REVISION	AMENDMENT	DATE
1	ISSUE FOR S4.56	03/11/23			
2	RE-ISSUE FOR S4.56	05/12/23			
3	ISSUE FOR S4.56	17/06/24			

CLIENT
KUATRO

PROJECT
FOREST LODGE
WARRIEWOOD

PREPARED BY
WSce Pty Ltd
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info@wsce.com.au
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GCC ISO 9001 Certified
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TITLE
ROAD SET-OUT PLAN

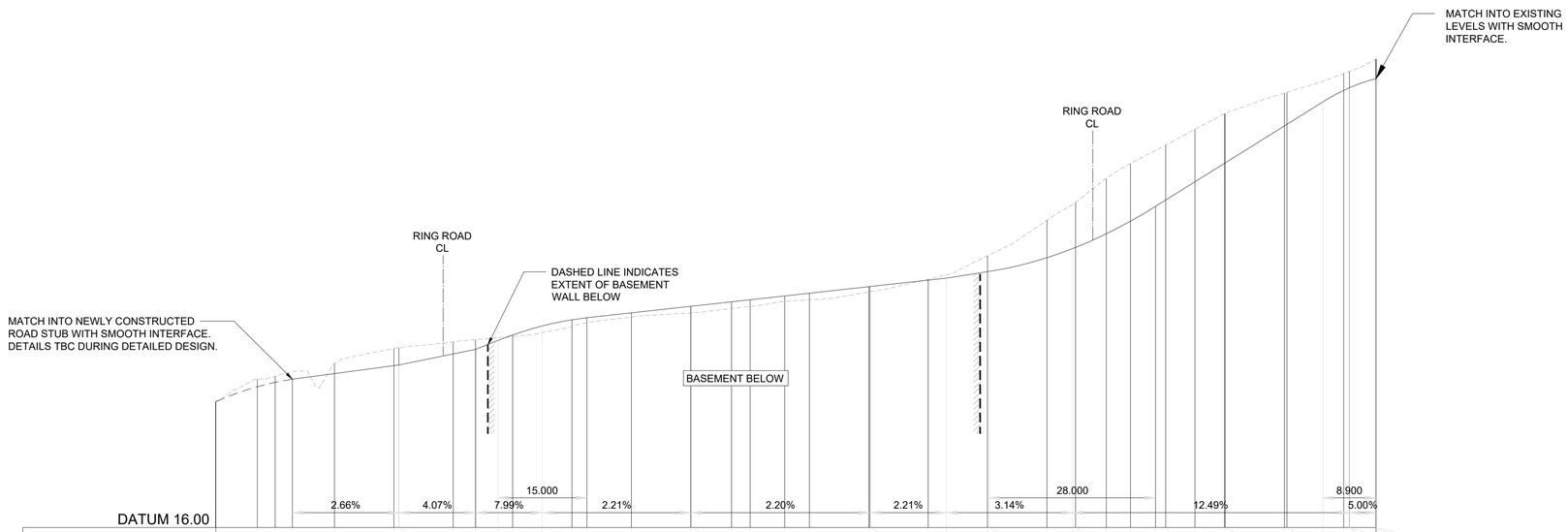
SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	I.O.	J.G.	J.G.

JOB No.	DRAWING No.	ISSUE
7368002	C5.01	3

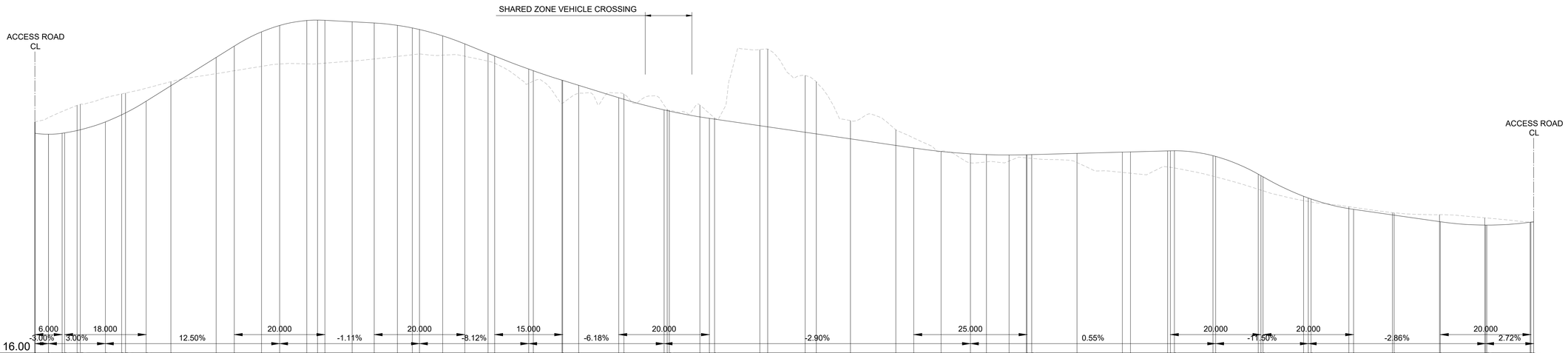
DATE	STATUS
SEPTEMBER 2023	ISSUE FOR S4.56

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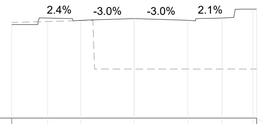
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
A1


MATCH INTO EXISTING LEVELS WITH SMOOTH INTERFACE.
RING ROAD CL
RING ROAD CL
DASHED LINE INDICATES EXTENT OF BASEMENT WALL BELOW
MATCH INTO NEWLY CONSTRUCTED ROAD STUB WITH SMOOTH INTERFACE. DETAILS TBC DURING DETAILED DESIGN.
BASEMENT BELOW
15.000
28.000
8.900
2.66%
4.07%
7.99%
2.21%
2.20%
2.21%
3.14%
12.49%
5.00%
DATUM 16.00

| | | |

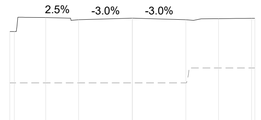


| CHAINAGE | 0.000 | 0.000 | 3.000 | 6.000 | 6.544 | 9.307 | 10.000 | 15.544 | 19.149 | 20.000 | 24.544 | 30.000 | 40.000 | 44.000 | 50.000 | 54.000 | 60.000 | 62.366 | 64.000 | 70.000 | 74.878 | 80.000 | 83.274 | 84.878 | 90.000 | 94.878 | 100.000 | 101.472 | 108.972 | 110.000 | 116.333 | 116.472 | 120.000 | 128.861 | 130.000 | 138.861 | 139.546 | 140.000 | 146.771 | 148.861 | 150.000 | 160.000 | 161.732 | 170.000 | 172.463 | 180.000 | 190.000 | 193.967 | 200.000 | 206.467 | 210.000 | 215.002 | 218.819 | 220.000 | 230.000 | 240.000 | 241.807 | 250.000 | 250.598 | 251.506 | 260.000 | 260.598 | 270.000 | 270.598 | 271.047 | 280.000 | 281.047 | 281.659 | 290.000 | 291.047 | 299.634 | 300.000 | 310.000 | 310.183 | 320.000 | 320.183 | 320.434 | 330.000 | 330.183 | 330.785 |
|---|---|---



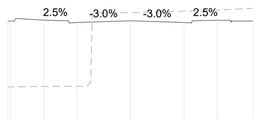
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EXISTING LEVEL	22.240	22.300	22.358	19.200	19.200	19.200	19.200	19.200
OFFSET	-8.000	-5.650	-3.500	0.000	3.500	5.735	7.745	8.000

CHAINAGE 50.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



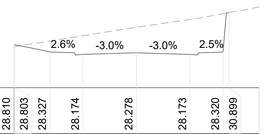
DESIGN LEVEL	22.800	22.800	23.713	23.567	23.672	23.567	23.638	23.660	23.662
EXISTING LEVEL	19.450	19.450	19.450	19.449	19.448	19.447	20.420	20.420	20.420
OFFSET	-8.000	-7.701	-5.650	-3.500	0.000	3.500	5.634	7.788	8.000

CHAINAGE 90.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



DESIGN LEVEL	24.600	24.600	24.660	24.513	24.618	24.513	24.660	24.600
EXISTING LEVEL	20.303	20.306	20.345	20.345	25.156	25.244	25.316	25.433
OFFSET	-8.000	-7.838	-5.650	-3.500	0.000	3.500	5.650	8.000

CHAINAGE 130.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



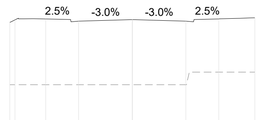
DESIGN LEVEL	28.810	28.803	28.327	28.174	28.278	28.173	28.320	30.899
EXISTING LEVEL	28.673	28.679	29.049	29.393	29.947	30.458	30.832	30.907	31.266
OFFSET	-8.000	-7.965	-5.653	-3.502	0.000	3.500	5.650	6.042	8.000

CHAINAGE 170.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



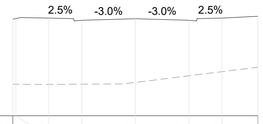
DESIGN LEVEL	22.200	21.890	21.742	21.847	21.734	21.691	21.799	21.794
EXISTING LEVEL	22.131	22.170	22.208	22.255	21.804	21.848	21.891	21.901
OFFSET	-8.000	-5.650	-3.500	0.000	3.388	5.475	7.499	8.000

CHAINAGE 40.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



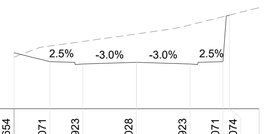
DESIGN LEVEL	23.265	23.436	23.495	23.347	23.452	23.347	23.495	23.570
EXISTING LEVEL	19.200	19.200	19.199	19.199	19.197	19.196	20.019	20.019
OFFSET	-8.000	-7.657	-5.650	-3.500	0.000	3.500	5.650	8.000

CHAINAGE 80.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



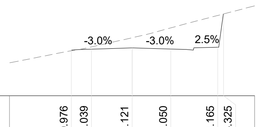
DESIGN LEVEL	24.305	24.343	24.375	24.227	24.332	24.227	24.375	24.491
EXISTING LEVEL	20.059	20.057	20.045	20.058	20.175	20.608	20.875	21.166
OFFSET	-8.000	-7.803	-5.650	-3.500	0.000	3.500	5.650	8.000

CHAINAGE 120.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



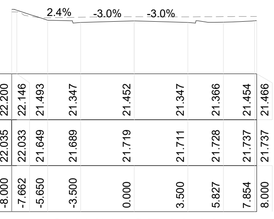
DESIGN LEVEL	27.654	27.071	26.923	27.028	26.923	27.071	30.074
EXISTING LEVEL	27.362	28.082	28.390	28.881	29.469	30.004	30.111	30.598
OFFSET	-8.000	-5.650	-3.500	0.000	3.500	5.650	6.071	8.000

CHAINAGE 160.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



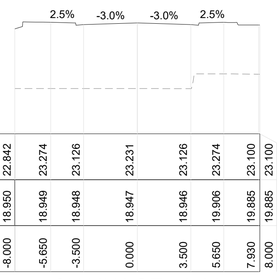
DESIGN LEVEL		30.976	31.039	31.121	31.050	31.165	33.325
EXISTING LEVEL	30.147	30.934	31.187	31.785	32.428	33.239	33.338	33.867
OFFSET	-8.000	-3.972	-2.660	0.000	2.524	5.587	5.970	8.000

CHAINAGE 195.44
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



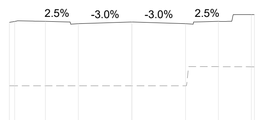
DESIGN LEVEL	22.200	22.146	21.493	21.347	21.452	21.347	21.366	21.454	21.466
EXISTING LEVEL	22.035	22.033	21.649	21.689	21.719	21.711	21.728	21.737	21.737
OFFSET	-8.000	-7.662	-5.650	-3.500	0.000	3.500	5.827	7.854	8.000

CHAINAGE 30.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



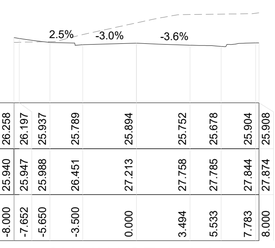
DESIGN LEVEL	22.842	23.274	23.126	23.231	23.126	23.274	23.100	23.100
EXISTING LEVEL	18.950	18.949	18.948	18.947	18.946	19.906	19.885	19.885
OFFSET	-8.000	-5.650	-3.500	0.000	3.500	5.650	7.930	8.000

CHAINAGE 70.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



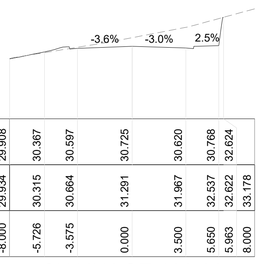
DESIGN LEVEL	24.086	24.150	24.154	24.006	24.111	24.006	24.154	24.800	24.800
EXISTING LEVEL	19.948	19.949	19.950	19.950	19.949	19.948	21.198	21.189	21.188
OFFSET	-8.000	-7.656	-5.650	-3.500	0.000	3.500	5.650	7.793	8.000

CHAINAGE 110.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



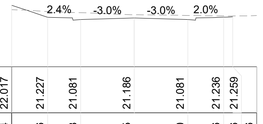
DESIGN LEVEL	26.258	26.197	25.937	25.789	25.894	25.752	25.678	25.904	25.908
EXISTING LEVEL	25.940	25.947	25.988	26.451	27.213	27.758	27.785	27.844	27.874
OFFSET	-8.000	-7.652	-5.650	-3.500	0.000	3.494	5.533	7.783	8.000

CHAINAGE 150.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



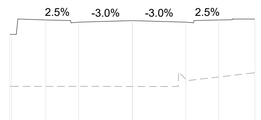
DESIGN LEVEL	29.908	30.367	30.597	30.725	30.620	30.768	32.624
EXISTING LEVEL	29.934	30.315	30.664	31.291	31.967	32.537	32.622	33.178
OFFSET	-8.000	-5.726	-3.575	0.000	3.500	5.650	5.963	8.000

CHAINAGE 190.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



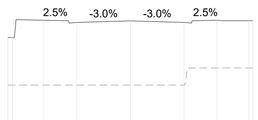
DESIGN LEVEL	22.017	21.227	21.081	21.186	21.081	21.236	21.259
EXISTING LEVEL	21.724	21.606	21.528	21.395	21.350	21.316	21.316	21.346
OFFSET	-8.000	-5.650	-3.500	0.000	3.500	5.838	6.435	8.000

CHAINAGE 20.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



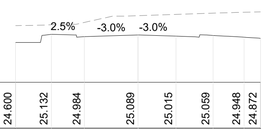
DESIGN LEVEL	22.100	22.100	23.040	22.893	22.998	22.893	23.040	23.100
EXISTING LEVEL	18.700	18.700	18.699	18.699	18.697	19.162	19.317	19.590
OFFSET	-8.000	-7.879	-5.650	-3.500	0.000	3.500	5.650	8.000

CHAINAGE 60.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



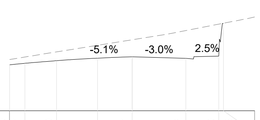
DESIGN LEVEL	22.800	22.800	23.934	23.787	23.892	23.787	23.934	23.903	23.903
EXISTING LEVEL	19.700	19.700	19.700	19.700	19.699	19.697	20.820	20.820	20.820
OFFSET	-8.000	-7.687	-5.650	-3.500	0.000	3.500	5.650	7.733	8.000

CHAINAGE 100.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



DESIGN LEVEL	24.600	25.132	24.984	25.089	25.015	25.059	24.948	24.872
EXISTING LEVEL	25.695	25.754	25.907	26.350	26.431	26.511	26.573	26.598
OFFSET	-8.000	-5.650	-3.500	0.000	2.484	4.908	6.924	8.000

CHAINAGE 140.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



DESIGN LEVEL	29.000	29.097	29.269	29.431	29.527	29.422	29.570	31.705
EXISTING LEVEL	29.346	29.508	29.844	30.272	30.634	31.236	31.654	31.713	32.119
OFFSET	-8.000	-7.002	-4.934	-2.264	0.000	3.500	5.650	5.956	8.000

CHAINAGE 180.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200

DO NOT SCALE FROM DRAWINGS, CHECK & VERIFY ALL DIMENSIONS & LEVELS BEFORE COMMENCEMENT OF ANY WORK.

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2.5 0 2.5 5.0 7.5 10.0m
PLAN SCALE 1:200 A1 SHEET

REVISION	AMENDMENT	DATE	REVISION	AMENDMENT	DATE
1	ISSUE FOR S4.56	03/11/23			

CLIENT
KUATRO

PROJECT
FOREST LODGE
WARRIEWOOD

PREPARED BY
WSce Pty Ltd
ACN 668 655 141
ABN 76 668 655 141
info@wsce.com.au
wsce.com.au
GCC ISO 9001 Certified
WSce
Driven by excellence, built on experience.

TITLE
ROAD CROSS SECTIONS - ACCESS ROAD

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	I.O.	J.G.	J.G.

JOB No.	DRAWING No.	ISSUE
7368002	C5.21	1

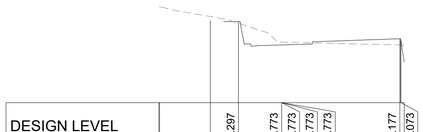
DATE	STATUS
SEPTEMBER 2023	ISSUE FOR S4.56

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Login Name: idewart
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Plot Date: 03.11.2023@15:28:56

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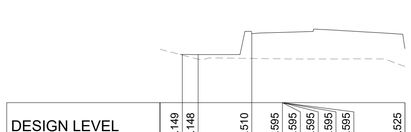
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3



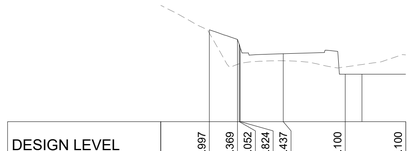
DESIGN LEVEL			29.297	27.773	27.773	27.773			28.177	28.073
EXISTING LEVEL	30.279	29.628	29.192	27.954	27.954	27.954	27.954		27.779	27.766
OFFSET	-8.000	-4.663	-2.829	0.000	0.000	0.000	0.000		7.717	7.780

CHAINAGE 30.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



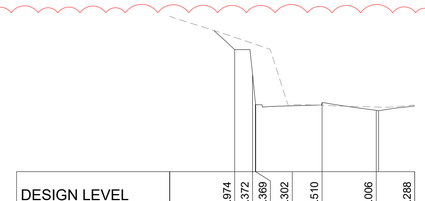
DESIGN LEVEL		29.149	29.148	30.510	30.595	30.595	30.595	30.595		29.525
EXISTING LEVEL	29.499	29.111	28.842	28.890	28.864	28.864	28.864	28.864		28.368
OFFSET	-8.000	-6.540	-5.503	-2.000	0.000	0.000	0.000	0.000		8.000

CHAINAGE 70.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



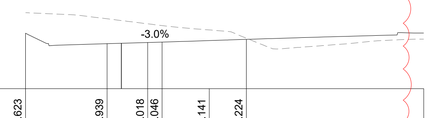
DESIGN LEVEL		29.997	29.369	29.052	28.824	28.437		27.100		27.100
EXISTING LEVEL	31.601	29.790	27.744	27.787	27.809	27.982		27.580		28.366
OFFSET	-8.000	-4.823	-2.987	-2.873	-2.800	0.000		4.049		8.000

CHAINAGE 110.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



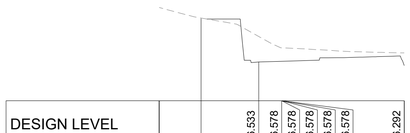
DESIGN LEVEL			29.974	28.372	26.369	26.302	26.510		26.006	26.288
EXISTING LEVEL	32.151		30.776	30.383	30.315	26.358	26.341		26.225	26.355
OFFSET	-8.000		-3.754	-2.589	-2.389	0.000	1.948		5.491	8.000

CHAINAGE 150.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



DESIGN LEVEL	25.623		24.939		25.018	25.046	25.141		25.224	
EXISTING LEVEL	26.967		26.567		26.237	26.121	25.839		25.296	
OFFSET	-12.000		-6.677		-4.019	-3.083	0.000		2.423	

CHAINAGE 190.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



DESIGN LEVEL			26.533	26.578	26.578	26.578	26.578			26.292
EXISTING LEVEL	30.090	29.402	28.196	27.453	27.453	27.453	27.453			27.122
OFFSET	-8.000	-5.271	-1.501	0.000	0.000	0.000	0.000			8.000

CHAINAGE 20.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



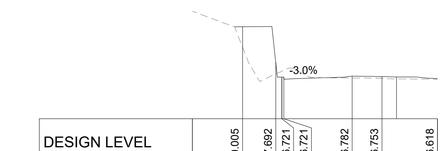
DESIGN LEVEL			29.679	30.652	30.652	30.652			30.547	30.532
EXISTING LEVEL	29.674	29.189	28.785	28.739	28.739	28.739			28.325	28.239
OFFSET	-8.000	-5.922	-2.657	0.000	0.000	0.000			7.611	7.839

CHAINAGE 60.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



DESIGN LEVEL	28.268	28.440	28.722	29.252	29.142	29.202			29.874	29.896	29.521
EXISTING LEVEL	30.120	30.034	29.161	28.991	28.963	28.858			28.455	28.421	28.323
OFFSET	-8.000	-7.163	-5.674	-2.532	-2.002	0.000			4.966	5.649	8.000

CHAINAGE 100.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



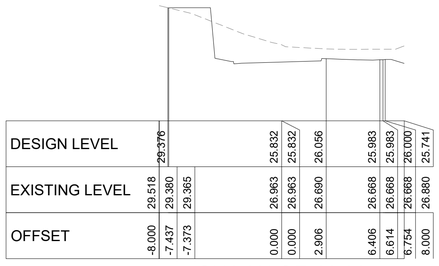
DESIGN LEVEL		30.005	27.692	26.721	26.782	26.753			26.618	
EXISTING LEVEL	31.020	28.659	26.931	27.104	27.166	26.663	26.636		26.581	
OFFSET	-8.000	-4.727	-2.562	-2.158	-2.038	2.430	4.370		8.000	

CHAINAGE 140.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



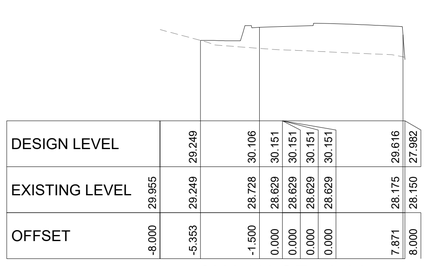
DESIGN LEVEL			28.570	25.285	25.365	25.432	25.432	25.483	25.517	25.562	25.615	25.628
EXISTING LEVEL	29.635	29.489	28.875	28.445	27.459	26.238	26.238	25.948	25.887	25.826	25.610	25.371
OFFSET	-9.000	-7.716	-4.854	-4.047	-2.195	0.000	0.000	1.581	2.666	4.158	5.941	6.415

CHAINAGE 180.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



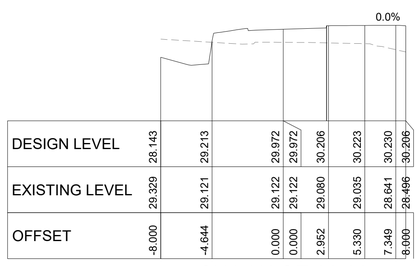
DESIGN LEVEL	29.376			25.832	25.832	26.056	25.983	25.983	26.000	25.741
EXISTING LEVEL	29.518	29.380	29.365	26.963	26.963	26.690	26.668	26.668	26.668	26.880
OFFSET	-8.000	-7.437	-7.373	0.000	0.000	2.906	6.406	6.614	6.754	8.000

CHAINAGE 10.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



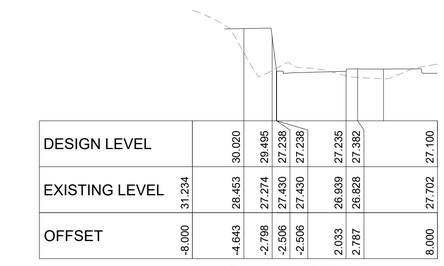
DESIGN LEVEL		29.249		30.106	30.151	30.151	30.151	30.151		29.616	27.982
EXISTING LEVEL	29.955	29.249		29.728	28.629	28.629	28.629	28.629		28.175	28.150
OFFSET	-8.000	-5.353		-1.500	0.000	0.000	0.000	0.000		7.871	8.000

CHAINAGE 50.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



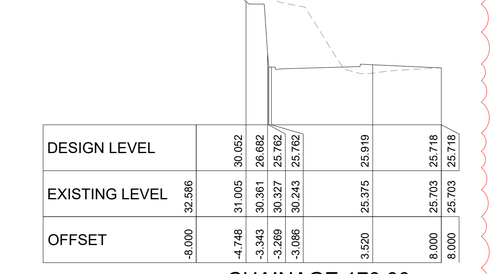
DESIGN LEVEL	28.143	29.213		29.972	29.972	30.206	30.223		30.230	30.206
EXISTING LEVEL	29.329	29.121		29.122	29.122	29.080	29.035		28.641	28.496
OFFSET	-8.000	-4.644		0.000	0.000	2.952	5.330		7.349	8.000

CHAINAGE 90.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



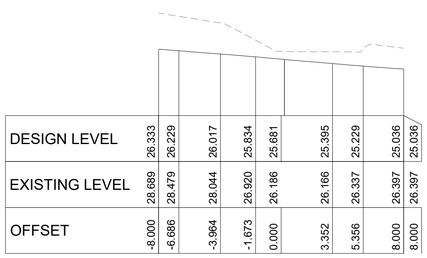
DESIGN LEVEL		30.020	29.495	27.238	27.238	27.235	27.382			27.100
EXISTING LEVEL	31.234	28.453	27.274	27.430	27.430	26.939	26.828			27.702
OFFSET	-8.000	-4.643	-2.798	-2.506	-2.506	2.033	2.787			8.000

CHAINAGE 130.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



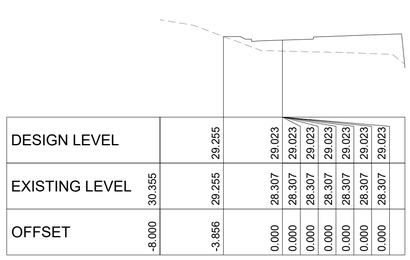
DESIGN LEVEL		30.052	26.682	25.762	25.762		25.919		25.718	25.718
EXISTING LEVEL	32.586	31.005	30.361	30.327	30.243		25.375		25.703	25.703
OFFSET	-8.000	-4.748	-3.343	-3.269	-3.086		3.520		8.000	8.000

CHAINAGE 170.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



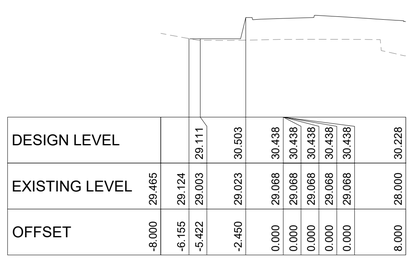
DESIGN LEVEL	26.333	26.229	26.017	25.834	25.681		25.395	25.229	25.036	25.036
EXISTING LEVEL	28.689	28.479	28.044	26.920	26.186		26.166	26.337	26.397	26.397
OFFSET	-8.000	-6.686	-3.964	-1.673	0.000		3.352	5.356	8.000	8.000

CHAINAGE 0.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



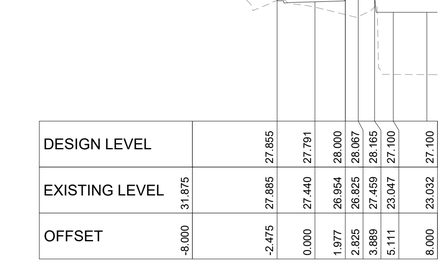
DESIGN LEVEL		29.255		29.023	29.023	29.023	29.023	29.023		
EXISTING LEVEL	30.355	29.255		28.307	28.307	28.307	28.307	28.307		
OFFSET	-8.000	-3.856		0.000	0.000	0.000	0.000	0.000		

CHAINAGE 40.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



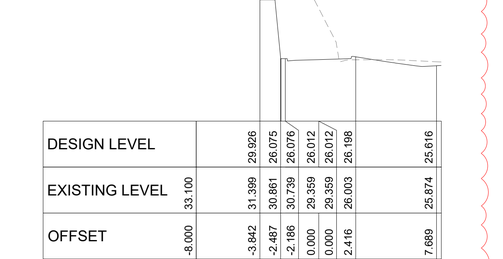
DESIGN LEVEL			29.111	30.503	30.438	30.438	30.438	30.438		30.228
EXISTING LEVEL	29.465	29.124	29.003	29.023	29.068	29.068	29.068	29.068		28.000
OFFSET	-8.000	-6.155	-5.422	-2.450	0.000	0.000	0.000	0.000		8.000

CHAINAGE 80.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



DESIGN LEVEL		27.855	27.791	28.000	28.067	28.165	27.100			27.100
EXISTING LEVEL	31.875	27.885	27.440	26.954	26.825	27.459	23.047			23.032
OFFSET	-8.000	-2.475	0.000	1.977	2.825	3.889	5.111			8.000

CHAINAGE 120.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



DESIGN LEVEL		29.926	26.075	26.076	26.012	26.012	26.198			25.616
EXISTING LEVEL	33.100	31.399	30.861	30.739	29.359	29.359	26.003			25.874
OFFSET	-8.000	-3.842	-2.487	-2.186	0.000	0.000	2.416			7.689

CHAINAGE 160.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200

Cad File: T:\7368002\Drawings\AutoCAD\Civil\Design\Civil 2015\4.5\RC5.21 Road Cross Sections.dwg
Login Name: skeorad
Xrefs: X:7368002\5.78_A1H
Plot Date: 14.06.2024@14:56:31

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2.5 0 2.5 5.0 7.5 10.0m
PLAN SCALE 1:200 A1 SHEET

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

A1

REVISION	AMENDMENT	DATE	REVISION	AMENDMENT	DATE
1	ISSUE FOR S4.56	03/11/23			
2	RE-ISSUE FOR S4.56	05/12/23			
3	ISSUE FOR S4.56	17/06/24			

CLIENT
KUATRO

PROJECT
FOREST LODGE
WARRIEWOOD

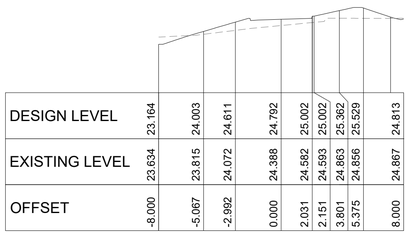
PREPARED BY
WSce Pty Ltd
ACN 668 655 141
ABN 76 668 655 141
info@wsce.com.au
wsce.com.au
GCC ISO 9001 Certified
WSce
Driven by excellence, built on experience.

TITLE
ROAD CROSS SECTIONS - RING ROAD SHEET 1

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	I.O.	J.G.	J.G.

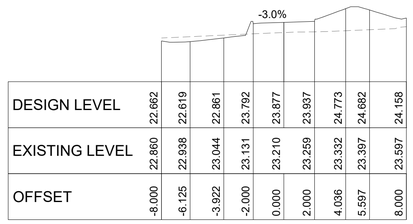
JOB No.	DRAWING No.	ISSUE
7368002	C5.22	3

DATE	STATUS
SEPTEMBER 2023	ISSUE FOR S4.56



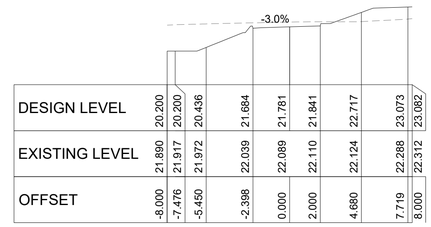
DESIGN LEVEL	23.164		24.003	24.611	24.792	25.002	25.002	25.362	25.529		24.813
EXISTING LEVEL	23.634		23.815	24.072	24.388	24.582	24.593	24.863	24.856		24.867
OFFSET	-8.000		-5.067	-2.992	0.000	2.031	2.151	3.801	5.375		8.000

CHAINAGE 230.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



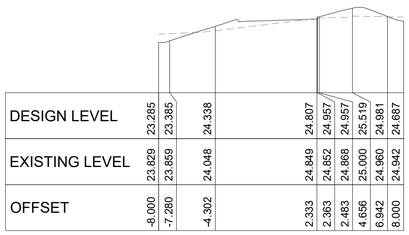
DESIGN LEVEL	22.662	22.619	22.861	23.792	23.877	23.937	24.773	24.682		24.158
EXISTING LEVEL	22.860	22.938	23.044	23.131	23.210	23.259	23.332	23.397		23.597
OFFSET	-8.000	-6.125	-3.922	-2.000	0.000	2.000	4.036	5.597		8.000

CHAINAGE 270.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



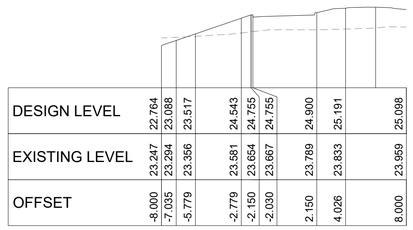
DESIGN LEVEL	20.200	20.200	20.436	21.684	21.781	21.841	22.717		23.073	23.082
EXISTING LEVEL	21.890	21.917	21.972	22.039	22.089	22.110	22.124		22.288	22.312
OFFSET	-8.000	-7.476	-5.450	-2.398	0.000	2.000	4.680		7.719	8.000

CHAINAGE 310.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



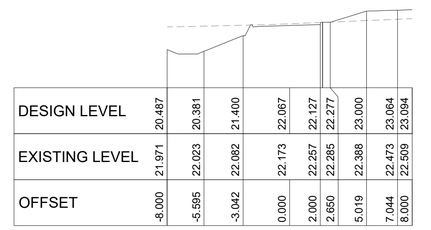
DESIGN LEVEL	23.285	23.385	24.338			24.807	24.957	24.957	25.519	24.981	24.687
EXISTING LEVEL	23.829	23.859	24.048			24.849	24.852	24.868	25.000	24.960	24.942
OFFSET	-8.000	-7.280	-4.302			2.333	2.363	2.483	4.656	6.942	8.000

CHAINAGE 220.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



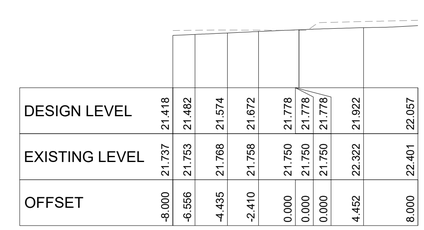
DESIGN LEVEL	22.764	23.088	23.517	24.543	24.755	24.755	24.900	25.191			25.098
EXISTING LEVEL	23.247	23.294	23.356	23.581	23.654	23.667	23.789	23.833			23.959
OFFSET	-8.000	-7.035	-5.779	-2.779	-2.150	-2.030	2.150	4.026			8.000

CHAINAGE 260.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



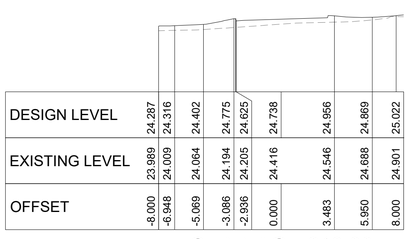
DESIGN LEVEL	20.487	20.381	21.400	22.067	22.127	22.277	23.000	23.064	23.094		
EXISTING LEVEL	21.971	22.023	22.082	22.173	22.257	22.285	22.388	22.473	22.509		
OFFSET	-8.000	-5.595	-3.042	0.000	2.000	2.650	5.019	7.044	8.000		

CHAINAGE 300.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



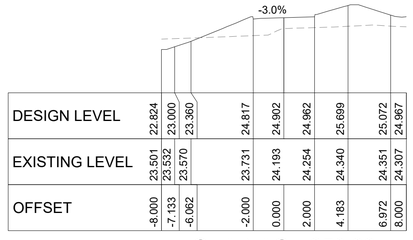
DESIGN LEVEL	21.418	21.482	21.574	21.672	21.778	21.778	21.778	21.922			22.057
EXISTING LEVEL	21.737	21.753	21.768	21.758	21.750	21.750	21.750	22.322			22.401
OFFSET	-8.000	-6.556	-4.435	-2.410	0.000	0.000	0.000	4.452			8.000

CHAINAGE 330.79
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



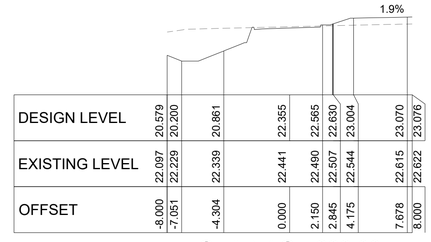
DESIGN LEVEL	24.287	24.316	24.402	24.775	24.625	24.738		24.956	24.869		25.022
EXISTING LEVEL	23.989	24.009	24.064	24.194	24.205	24.416		24.546	24.688		24.901
OFFSET	-8.000	-6.948	-5.069	-3.086	-2.936	0.000		3.483	5.950		8.000

CHAINAGE 210.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



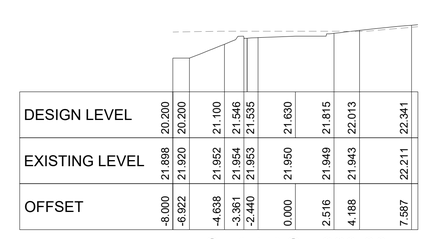
DESIGN LEVEL	22.824	23.000	23.360		24.817	24.902	24.962	25.699			25.072	24.967
EXISTING LEVEL	23.501	23.532	23.570		23.731	24.193	24.254	24.340			24.351	24.307
OFFSET	-8.000	-7.133	-6.062		-2.000	0.000	2.000	4.183			6.972	8.000

CHAINAGE 250.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



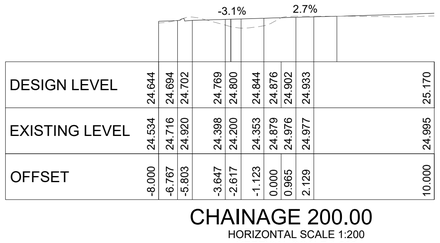
DESIGN LEVEL	20.579	20.200	20.861		22.355	22.565	22.630	23.004			23.070	23.076
EXISTING LEVEL	22.097	22.229	22.339		22.441	22.490	22.507	22.544			22.615	22.622
OFFSET	-8.000	-7.051	-4.304		0.000	2.150	2.845	4.175			7.678	8.000

CHAINAGE 290.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



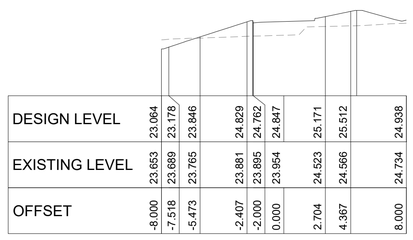
DESIGN LEVEL	20.200	20.200	21.100	21.546	21.535	21.630		21.815	22.013		22.341
EXISTING LEVEL	21.898	21.920	21.952	21.954	21.953	21.950		21.949	21.943		22.211
OFFSET	-8.000	-6.922	-4.638	-3.361	-2.440	0.000		2.516	4.188		7.587

CHAINAGE 320.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



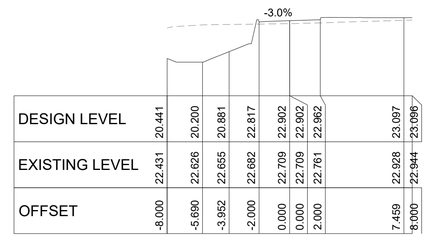
DESIGN LEVEL	24.644	24.694	24.702	24.769	24.800	24.844	24.876	24.902	24.933		25.170
EXISTING LEVEL	24.534	24.716	24.920	24.398	24.200	24.353	24.879	24.976	24.977		24.995
OFFSET	-8.000	-6.767	-5.803	-3.647	-2.617	-1.123	0.000	0.965	2.129		10.000

CHAINAGE 200.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



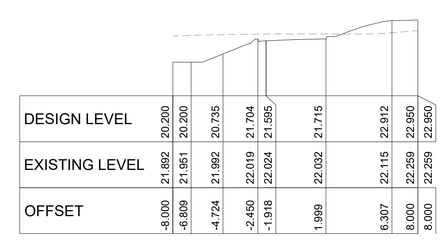
DESIGN LEVEL	23.064	23.178	23.846		24.829	24.762	24.847	25.171	25.512		24.938
EXISTING LEVEL	23.653	23.689	23.765		23.881	23.895	23.954	24.523	24.566		24.734
OFFSET	-8.000	-7.518	-5.473		-2.407	-2.000	0.000	2.704	4.367		8.000

CHAINAGE 240.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



DESIGN LEVEL	20.441	20.200	20.881	22.817	22.902	22.902	22.962			23.097	23.096
EXISTING LEVEL	22.431	22.626	22.655	22.682	22.709	22.709	22.761			22.928	22.944
OFFSET	-8.000	-5.690	-3.952	-2.000	0.000	0.000	2.000			7.459	8.000

CHAINAGE 280.00
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200



DESIGN LEVEL	20.200	20.200	20.735	21.704	21.595		21.715		22.912	22.950	22.950
EXISTING LEVEL	21.892	21.951	21.992	22.019	22.024		22.032		22.115	22.259	22.259
OFFSET	-8.000	-6.809	-4.724	-2.450	-1.918		1.999		6.307	8.000	8.000

CHAINAGE 315.21
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:200

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2.5 0 2.5 5.0 7.5 10.0m
PLAN SCALE 1:200 A1 SHEET

REVISION	AMENDMENT	DATE	REVISION	AMENDMENT	DATE
1	ISSUE FOR S4.56	03/11/23			
2	RE-ISSUE FOR S4.56	05/12/23			
3	ISSUE FOR S4.56	17/06/24			

CLIENT
KLIATRO

PROJECT
FOREST LODGE
WARRIEWOOD

PREPARED BY
WSce Pty Ltd
ACN 668 655 141
ABN 75 668 655 141
info@wsce.com.au
wsce.com.au
GCC ISO 9001 Certified
WSce
Driven by excellence, built on experience.

TITLE
ROAD CROSS SECTIONS - RING ROAD SHEET 2

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	I.O.S.	J.G.	J.G.

JOB No.	DRAWING No.	ISSUE
7368002	C5.23	3

DATE: SEPTEMBER 2023
STATUS: ISSUE FOR S4.56

Xrefs: X:\7368002\TB_A1H
Plot Date: 14.06.2024@14:58:01 Login Name: skovard Cad File: I:\7368002\Drawings\AutoCAD\Civil\Design\Civil 2025\4.56\C5.21 Road Cross Sections.dwg

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

A4

PROVIDE SLOT UNDER FENCE 600mm W x 100mm HIGH FOR OVERLAND FLOW. TYPICAL.

PROVIDE SLOT UNDER FENCE 600mm W x 100mm HIGH FOR OVERLAND FLOW. TYPICAL.

PROVIDE SLOT UNDER FENCE 600mm W x 100mm HIGH FOR OVERLAND FLOW. TYPICAL.

SWALE TYPE 1
DEPTH = 0.2m
TOP WIDTH = 1.2m

SCOUR PROTECTION TO BE PROVIDED AT HEADWALL DISCHARGE LOCATION.

5m WIDE OVERFLOW WEIR TO NARRABEEN CREEK

CONNECTION COURTYARD DRAINAGE BY HYDRAULIC ENGINEER

PROVIDE MIN 2 x 200W x 100H SLOTS IN WALL FOR EMERGENCY OVERFLOW. TYPICAL FOR COURTYARD AREAS.

TOP OF WALL TO BE RL30.80 FOR FLOOD PROTECTION.

S4.56

BIORETENTION BASIN 2

FILTER AREA	= 127m²
FILTER MEDIA DEPTH	= 600mm
RETENTION BASE RL	= RL 20.20
RETENTION DEPTH	= 300mm
OSD VOLUME PROVIDED	= 255 m³

REFER TO C6.12 AND C6.14 FOR BASIN PLAN AND SECTIONS.

PROVIDE MIN 2 x 200W x 100H SLOTS IN WALL FOR EMERGENCY OVERFLOW. TYPICAL FOR COURTYARD AREAS.

7.5m LONG ACO KERB DRAIN

18m LONG ACO KERB DRAIN

INDICATIVE BASEMENT RISING MAIN CONNECTION. TBC BY HYDRAULIC ENGINEER

COURTYARD DRAINAGE CONNECTION BY HYDRAULIC ENGINEER.

PROVIDE MIN 2 x 200W x 100H SLOTS IN WALL FOR EMERGENCY OVERFLOW. TYPICAL FOR COURTYARD AREAS.

SWALE TYPE 1
DEPTH = 0.2m
TOP WIDTH = 1.2m

CONNECTION OF RAINWATER TANK OVERFLOW PIPE. HYDRAULIC ENGINEER TO CONFIRM LOCATION AND DETAILS

LOCATION OF 10kL RAINWATER TANK IN BASEMENT

TOP OF WALL LEVEL TO BE 500mm ABOVE PROBABLE MAXIMUM FLOOD WATER LEVEL

PROVIDE MIN 2 x 200W x 100H SLOTS IN WALL FOR EMERGENCY OVERFLOW. TYPICAL FOR COURTYARD AREAS.

COURTYARD DRAINAGE CONNECTION BY HYDRAULIC ENGINEER

LEGEND

- EXISTING BOUNDARY
- EXISTING STORMWATER PIPE
- EXISTING STORMWATER PIPE TO BE REMOVED
- INDICATIVE OVERLAND FLOW ROUTE
- PIPE DIAMETER AND DIRECTION OF FLOW
- STORMWATER PIPE (SIZE <Ø1050)
- KERB DRAIN
- KERB INLET PIT (SAG) (900 x 450 GRATE WITH 1.8m WIDE LINTEL)
- GRATED INLET PIT
- PIT STRUCTURE NUMBER
- STORMWATER LINE NUMBER
- SWALE FLOW ARROW
- UPDREAM DIVERSION SWALE FLOW ARROW
- DRAINAGE BY OTHERS REFER HYDRAULIC ENGINEER DRAWINGS

NOTES:

1. STORMWATER DRAINAGE ASSOCIATED WITH ALL SUSPENDED AREAS AND COURTYARDS ARE TO BE UNDERTAKEN BY THE HYDRAULIC ENGINEER.
2. COORDINATION WITH THE HYDRAULIC ENGINEER IS REQUIRED.

REFER C6.02 FOR CONTINUATION

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NORTH

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

5.0 0 2.5 5.0 7.5 10.0m
PLAN SCALE 1:250 A1 SHEET

REVISION	AMENDMENT	DATE	REVISION	AMENDMENT	DATE
1	ISSUE FOR S4.56	03/11/23			
2	ISSUE FOR S4.56	17/06/24			

CLIENT: KUATRO

PROJECT: FOREST LODGE WARRIEWOOD

PREPARED BY
WSce Pty Ltd
ACN 668 655 141
ABN 76 668 655 141
info@wsce.com.au
wsce.com.au
Driven by excellence, built on experience.

TITLE: STORMWATER LAYOUT PLAN-SHEET 1

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	I.O.	J.G.	J.G.

JOB No.	DRAWING No.	ISSUE
7368002	C6.01	2

DATE	STATUS
SEPTEMBER 2023	ISSUE FOR S4.56

Xrefs: X:\7368000\SU - Existing Survey\7368002-SU - Existing Survey.dwg, X:\7368000\SU - Existing Surface.dwg, X:\7368000\7B_ATH.dwg, X:\7368000\4B - Site Plan RING ROAD\7368000-4B - Site Plan RING ROAD.dwg, X:\7368000\WSCE-CS-MO-01 - Design Surface RING ROAD\7368002-WSCE-CS-MO-02 - Design Surface RING ROAD.dwg, X:\7368000\WSCE-CS-MO-02 - Design Surface RING ROAD\7368002-SW-Layout Plot Date: 17/06/2024@17:52:56 Login Name: stewart Cad File: Y:\7368000\Drawings\AutoCAD\Civil\Design\Civil\7354-SW-Stormwater Layout Plan-Sheet 1.dwg

REFER C6.01 FOR CONTINUATION

CONNECTION COURTYARD DRAINAGE BY HYDRAULIC ENGINEER

PROVIDE MIN 2 x 200W x 100H SLOTS IN WALL FOR EMERGENCY OVERFLOW. TYPICAL FOR COURTYARD AREAS.

SWALE TYPE 2
DEPTH = 0.125m
TOP WIDTH = 1.0m

PROVIDE MIN 2 x 200W x 100H SLOTS IN WALL FOR EMERGENCY OVERFLOW. TYPICAL FOR COURTYARD AREAS.

COURTYARD DRAINAGE CONNECTION BY HYDRAULIC ENGINEER

PROVIDE MIN 2 x 200W x 100H SLOTS IN WALL FOR EMERGENCY OVERFLOW. TYPICAL FOR COURTYARD AREAS.

COURTYARD DRAINAGE CONNECTION BY HYDRAULIC ENGINEER

SWALE TYPE 2
DEPTH = 0.125m
TOP WIDTH = 1.0m

TOP OF WALL TO BE RL30.80
FOR FLOOD PROTECTION.

S4.56

KOPPERS LOGS (ø150MM, 500MM SPACING)

PROVIDE RENO MATTRESS SCOUR PROTECTION

S4.56

SCOUR PROTECTION TO BE PROVIDED AT HEADWALL DISCHARGE LOCATION.

3m WIDE OVERFLOW WEIR TO NARRABEEN CREEK

BIORETENTION BASIN 1

FILTER AREA	= 173m^2
FILTER MEDIA DEPTH	= 600mm
RETENTION BASE RL	= RL 22.19
RETENTION DEPTH	= 300mm
OSD VOLUME PROVIDED	= 682 m^3

REFER TO C6.11 AND C6.13 FOR BASIN PLAN AND SECTIONS.

PROVIDE FENCE AROUND TOP OF BASIN.

S4.56

LEGEND

- EXISTING BOUNDARY
- Ø450 ESW — EXISTING STORMWATER PIPE
- X ESW X — EXISTING STORMWATER PIPE TO BE REMOVED
- INDICATIVE OVERLAND FLOW ROUTE
- Ø450 — PIPE DIAMETER AND DIRECTION OF FLOW
- SW — STORMWATER PIPE (SIZE <Ø1050)
- KERB DRAIN
- KERB INLET PIT (SAG) (900 x 450 GRATE WITH 1.8m WIDE LINTEL)
- GRATED INLET PIT
- PIT STRUCTURE NUMBER / STORMWATER LINE NUMBER
- SWALE FLOW ARROW
- UPDREAM DIVERSION SWALE FLOW ARROW
- DRAINAGE BY OTHERS REFER HYDRAULIC ENGINEER DRAWINGS

NOTES:

1. STORMWATER DRAINAGE ASSOCIATED WITH ALL SUSPENDED AREAS AND COURTYARDS ARE TO BE UNDERTAKEN BY THE HYDRAULIC ENGINEER.
2. COORDINATION WITH THE HYDRAULIC ENGINEER IS REQUIRED.

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NORTH

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

5.0 0 2.5 5.0 7.5 10.0m
PLAN SCALE 1:250 A1 SHEET

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

A1

REVISION	AMENDMENT	DATE	REVISION	AMENDMENT	DATE
1	ISSUE FOR S4.56	03/11/23			
2	RE-ISSUE FOR S4.56	05/12/23			
3	RE-ISSUE FOR S4.56	01/02/24			
4	ISSUE FOR S4.56	17/06/24			

CLIENT
KUATRO

PROJECT
FOREST LODGE
WARRIEWOOD

PREPARED BY
WSce Pty Ltd
ACN 668 655 141
ABN 75 668 655 141
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wsce.com.au

Driven by excellence, built on experience.

TITLE
STORMWATER LAYOUT PLAN-SHEET 2

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	I.O.	J.G.	J.G.

JOB No.	DRAWING No.	ISSUE
7368002	C6.02	4

DATE SEPTEMBER 2023
STATUS ISSUE FOR S4.56

Xref: X:\7368000.SU - Existing Survey\X-7368002-SU - Existing Survey 7368002.HSCS.CS.MOD1 - Existing Surface.X-7368002.TB_A1N.X-7368002R.dwt - Site Plan RING ROAD, 7368002 HSCS.CS.MOD.02 - Design Surface RING ROAD, X-7368002.SW Layout
Plot Date: 17.06.2024@17:54:33 Login Name: stewart Cad File: I:\7368000\Drawings\AutoCAD\Civil\Design\Civil 2024-56\Stormwater Layout Plan-Sheet 2.dwg

NAME	SURFACE ELEV. (m)	PIT DEPTH (m)	PIT SIZE AND TYPE	FROM	TO	LENGTH (m)	U/S IL (m)	D/S IL (m)	SLOPE (%)	PIPE TYPE	DIA (mm)	No. PIPES
Pit 1/1	24.41	0.67	900SQ PIT WITH CLASS B GRATE	Pit 1/1	Pit 2/1	13.20	23.74	23.61	0.98	uPVC	225	1
Pit 2/1	24.50	1.73	900SQ PIT WITH CLASS B GRATE	Pit 2/1	Pit 3/1	17.80	22.77	22.59	1.01	uPVC	225	1
Pit 3/1	23.48	1.49	900SQ PIT WITH CLASS B GRATE	Pit 3/1	Pit 4/1	12.40	21.99	21.87	0.97	uPVC	225	1
Pit 4/1	22.69	0.87	600SQ PIT WITH CLASS B GRATE	Pit 4/1	Pit 5/1	12.00	21.82	21.70	1.00	uPVC	300	1
Pit 5/1	22.64	1.43	900SQ PIT WITH CLASS B GRATE	Pit 5/1	Pit 6/1	18.20	21.21	21.03	0.99	uPVC	300	1
Pit 6/1	21.97	0.99	600SQ PIT WITH CLASS B GRATE	Pit 6/1	Pit 7/1	13.70	20.98	20.84	1.02	uPVC	300	1
Pit 7/1	21.90	1.11	600SQ PIT WITH CLASS B GRATE	Pit 7/1	Pit 8/1	11.90	20.79	20.67	1.01	uPVC	300	1
Pit 8/1	22.09	1.47	900SQ PIT WITH CLASS B COVER	Pit 8/1	Pit 9/1	17.50	20.62	20.45	0.97	uPVC	300	1
Pit 9/1	21.31	1.01	900SQ PIT WITH 600 x 900 CLASS D SINGLE GRATE WITH 1.8m LINTEL OPENING	Pit 9/1	Pit 10/1	7.10	20.30	20.26	0.56	RCP	375	2
Pit 10/1	21.33	1.09	900SQ PIT WITH 600 x 900 CLASS D SINGLE GRATE WITH 1.8m LINTEL OPENING	Pit 10/1	Basin 2	7.20	20.24	20.20	0.56	RCP	375	2
Basin 2	21.40		OSD BASIN 2	Basin 2	HW4	28.20	19.25	18.00	4.43	uPVC	300	1
Pit 13/1	21.49	1.00	900SQ PIT WITH 600 x 900 CLASS D SINGLE GRATE WITH 1.8m LINTEL OPENING	Pit 13/1	Basin 2	2.90	20.49	20.20	10	uPVC	225	1
Pit 1/2	25.80	1.27	900SQ PIT WITH 600 x 900 CLASS D SINGLE GRATE WITH 1.8m LINTEL OPENING	Pit 1/2	Pit 2/2	9.60	24.53	24.01	5.42	uPVC	225	1
Pit 2/2	24.85	0.75	900SQ PIT WITH CLASS B GRATE	Pit 2/2	Pit 3/2	4.20	24.10	24.05	1.19	uPVC	225	1
Pit 3/2	24.86	0.96	900SQ PIT WITH 600 x 900 CLASS D SINGLE GRATE WITH 1.8m LINTEL OPENING	Pit 3/2	Pit 4/2	7.00	23.90	23.83	1.00	uPVC	225	1
Pit 4/2	24.85	1.12	900SQ PIT WITH 600 x 900 CLASS D SINGLE GRATE WITH 1.8m LINTEL OPENING	Pit 4/2	Pit 5/2	44.70	23.73	22.76	2.17	uPVC	225	1
Pit 5/2	23.61	1.01	900SQ PIT WITH 600 x 900 CLASS D SINGLE GRATE WITH 1.8m LINTEL OPENING	Pit 5/2	Pit 6/2	15.40	22.60	22.19	2.66	uPVC	300	1
Pit 6/2	23.24	1.07	900SQ PIT WITH 600 x 900 CLASS D SINGLE GRATE WITH 1.8m LINTEL OPENING	Pit 6/2	Pit 7/2	32.00	22.17	20.94	3.84	uPVC	300	2
Pit 7/2	21.85	0.97	900SQ PIT WITH 600 x 900 CLASS D SINGLE GRATE WITH 1.8m LINTEL OPENING	Pit 7/2	Pit 9/1	7.70	20.88	20.40	6.23	uPVC	300	2
Pit 1/3	23.60	0.90	18m LENGTH ACO TRENCH DRAIN WITH CLASS D GRATE	Pit 1/3	Pit 5/2	7.40	22.70	22.62	1.08	uPVC	150	2
Pit 2/4	23.66	0.90	3.8m LENGTH ACO TRENCH DRAIN WITH CLASS D GRATE	Pit 2/4	Pit 4/4	10.70	22.76	22.34	3.93	uPVC	150	2
Pit 4/4	23.25	0.91	7.2m LENGTH ACO TRENCH DRAIN WITH CLASS D GRATE	Pit 4/4	Pit 6/2	7.40	22.34	22.26	1.08	uPVC	150	2
Pit 1/5	21.85	0.91	900SQ PIT WITH CLASS D GRATE	Pit 1/5	Pit 7/2	7.00	20.94	20.90	0.57	uPVC	300	2
Pit 1/6	26.10	1.10	900SQ PIT WITH CLASS B GRATE	Pit 1/6	Pit 2/6	1.80	25.00	24.85	8.33	uPVC	225	1
Pit 2/6	25.70	1.00	900SQ PIT WITH CLASS B GRATE	Pit 2/6	Pit 3/6	22.50	24.70	24.50	0.89	uPVC	225	1
Pit 3/6	25.46	1.01	900SQ PIT WITH 600 x 900 CLASS B SINGLE GRATE WITH 1.2m LENGTH ACO TRENCH DRAIN	Pit 3/6	Pit 4/6	18.80	24.45	24.27	0.96	uPVC	225	1
Pit 4/6	25.13	1.48	900SQ PIT WITH CLASS B GRATE WITH 2.8m LENGTH ACO TRENCH DRAIN	Pit 4/6	Pit 5/6	23.80	23.65	23.53	0.50	uPVC	300	1
Pit 5/6	25.19	1.69	900SQ PIT WITH 600 x 900 CLASS B SINGLE GRATE WITH 1.2m LENGTH ACO TRENCH DRAIN	Pit 5/6	Pit 6/6	10.20	23.50	23.44	0.59	uPVC	300	1
Pit 6/6	24.87	1.46	900SQ PIT WITH 600 x 900 CLASS B SINGLE GRATE WITH 1.2m LENGTH ACO TRENCH DRAIN	Pit 6/6	Pit 7/6	10.50	23.41	23.35	0.57	uPVC	300	1
Pit 7/6	24.63	1.31	900SQ PIT WITH 600 x 900 CLASS D SINGLE GRATE WITH 1.8m LINTEL OPENING	Pit 7/6	Pit 8/6	17.80	23.32	23.23	0.51	uPVC	300	1
Pit 8/6	24.78	1.58	900SQ PIT WITH 600 x 900 CLASS D SINGLE GRATE WITH 1.8m LINTEL OPENING	Pit 8/6	Pit 8/7	29.90	23.20	23.01	0.64	uPVC	300	1
Pit 1/7	28.80	0.85	900SQ PIT WITH 600 x 900 CLASS D SINGLE GRATE WITH 1.8m LINTEL OPENING	Pit 1/7	Pit 2/7	6.40	27.95	27.70	3.91	uPVC	225	1
Pit 2/7	28.56	0.91	900SQ PIT WITH 600 x 900 CLASS D SINGLE GRATE WITH 1.8m LINTEL OPENING	Pit 2/7	Pit 3/7	16.70	27.65	26.55	6.59	uPVC	225	1
Pit 3/7	27.43	0.93	900SQ PIT WITH 600 x 900 CLASS D SINGLE GRATE WITH 1.8m LINTEL OPENING	Pit 3/7	Pit 4/7	20.40	26.50	25.45	5.15	uPVC	225	1
Pit 4/7	26.31	1.11	900SQ PIT WITH 600 x 900 CLASS D SINGLE GRATE WITH 1.8m LINTEL OPENING	Pit 4/7	Pit 5/7	14.00	25.20	25.00	1.43	uPVC	225	1
Pit 5/7	25.87	0.92	900SQ PIT WITH 600 x 900 CLASS D SINGLE GRATE WITH 1.8m LINTEL OPENING	Pit 5/7	Pit 6/7	19.80	24.95	24.40	2.78	uPVC	225	1
Pit 6/7	25.26	0.91	900SQ PIT WITH 600 x 900 CLASS D SINGLE GRATE WITH 1.8m LINTEL OPENING	Pit 6/7	Pit 7/7	22.40	24.35	23.40	4.24	uPVC	300	1
Pit 7/7	24.66	1.76	900SQ PIT WITH 600 x 900 CLASS D SINGLE GRATE WITH 1.8m LINTEL OPENING	Pit 7/7	Basin 1	7.00	22.90	22.43	6.71	RCP	375	1
Pit 8/7	24.63	1.68	900SQ PIT WITH 600 x 900 CLASS D SINGLE GRATE WITH 1.8m LINTEL OPENING	Pit 8/7	Pit 7/7	13.00	23.03	22.95	0.54	uPVC	200	1
Basin 1	24.30	2.81	OSD BASIN 1	Basin 1	HW5	21.10	21.49	21.00	2.32	uPVC	150	1
Pit 1/8	28.62	1.55	900SQ PIT WITH 600 x 900 CLASS D SINGLE GRATE WITH 1.8m LINTEL OPENING	Pit1/8	Pit2/8	24.30	27.07	24.64	10.00	uPVC	225	1
Pit 2/8	25.49	0.88	900SQ PIT WITH 600 x 900 CLASS D SINGLE GRATE WITH 1.8m LINTEL OPENING	Pit2/8	Pit 1/2	4.80	24.61	24.56	1.04	uPVC	225	1
Pit 3/8	26.14	0.89	900SQ PIT WITH 600 x 900 CLASS D SINGLE GRATE WITH 1.8m LINTEL OPENING	Pit 3/8	Pit2/8	7.20	25.25	24.64	8.47	uPVC	225	1
Pit 1/9	22.99	0.96	900SQ PIT WITH CLASS B GRATE	Pit 1/9	Pit 2/9	8.70	22.03	21.70	3.79	uPVC	300	1
Pit 2/9	22.63	2.13	900SQ PIT WITH 600 x 900 CLASS D SINGLE GRATE WITH 1.8m LINTEL OPENING	Pit 2/9	Basin 2	3.00	20.50	20.20	10.00	uPVC	300	1
Pit 1/11	25.46	0.71	900SQ PIT WITH CLASS B GRATE	Pit 1/11	Pit 2/6	2.90	24.75	24.72	1.03	uPVC	225	1
Pit 1/12	23.05	0.95	900SQ PIT WITH CLASS B GRATE	Pit 1/12	Pit 1/9	3.70	22.10	22.06	1.08	uPVC	225	1
Pit 1/14	26.72	0.87	600SQ PIT WITH CLASS B GRATE	Pit 1/14	Pit 2/14	7.70	25.85	25.45	5.19	uPVC	225	1
Pit 2/14	26.29	0.89	900SQ PIT WITH CLASS B GRATE & 3.8m LENGTH ACO TRENCH DRAIN	Pit 2/14	Pit 4/7	17.90	25.40	25.25	0.84	uPVC	225	1
Pit 3/14	25.66	0.96	900SQ PIT WITH CLASS B GRATE & 1.5m LENGTH ACO TRENCH DRAIN	Pit 3/14	Pit 6/7	18.20	24.70	24.40	1.65	uPVC	225	1
Pit 1/15	24.60	0.93	900SQ PIT WITH CLASS B COVER	Pit 1/15	Pit 8/7	7.10	23.67	23.05	8.73	uPVC	150	1

S4.56

S4.56

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REVISION	AMENDMENT	DATE	REVISION	AMENDMENT	DATE
1	ISSUE FOR S4.56	03/11/23			
2	RE-ISSUE FOR S4.56	05/12/23			
3	RE-ISSUE FOR S4.56	01/02/24			
4	ISSUE FOR S4.56	17/06/24			

CLIENT: KUATRO

PROJECT: FOREST LODGE WARRIEWOOD

PREPARED BY
WSce Pty Ltd
ACN 668 655 141
ABN 76 668 655 141
info@wsce.com.au
wsce.com.au

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TITLE: STORMWATER PIT SCHEDULE

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	I.O.	J.G.	J.G.

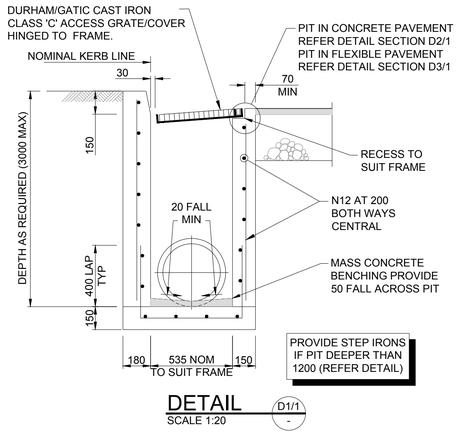
JOB No.	DRAWING No.	ISSUE
7368002	C6.04	4

DATE	STATUS
SEPTEMBER 2023	ISSUE FOR S4.56

Cad File: T:\7368002\Drawings\AutoCAD\Civil\Design\Civil 2025\4.56\C6.05 Stormwater Pit Schedule.dwg
Login Name: idewart
Xrefs: X:7368002_TB_A1H
Plot Date: 17/06/2024@10:20:43

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

A1

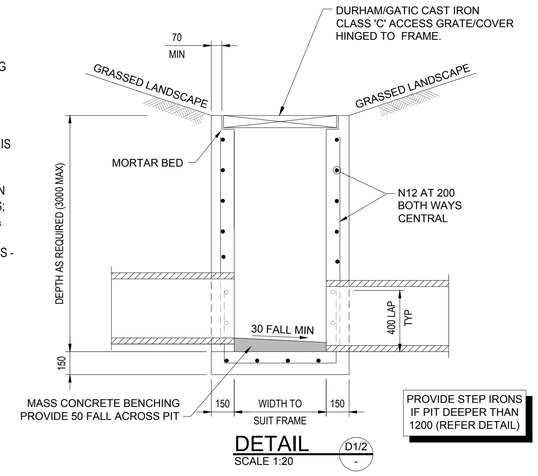


DETAIL D1/1
SCALE 1:20

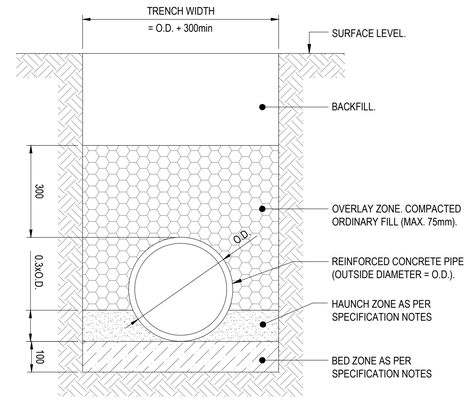
NOTES:

1. TRENCH WIDTH MAY NEED TO BE INCREASED SUBJECT TO ACHIEVING ADEQUATE COMPACTION.
2. MINIMUM PIPE COVER NOT UNDER ROADS = 450mm UNO.
3. THE CONTRACTOR SHALL ENSURE THAT THE SHORING OF TRENCHES IS INSTALLED AS REQUIRED BY STATUTORY REQUIREMENTS.
4. ENSURE BACKFILLING COMPACTION MEETS THE RELEVANT STANDARDS;

A) TRENCHES UNDER PAVED AREAS & BUILDINGS - 100% SMDD.
B) TRENCHES NOT UNDER PAVEMENTS - 95% SMDD.



DETAIL D1/2
SCALE 1:20



GENERAL AREAS

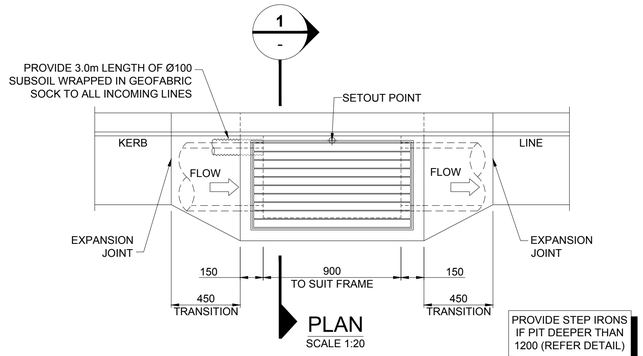
TYPICAL PIPE TRENCH

NOT TO SCALE

NOTES:

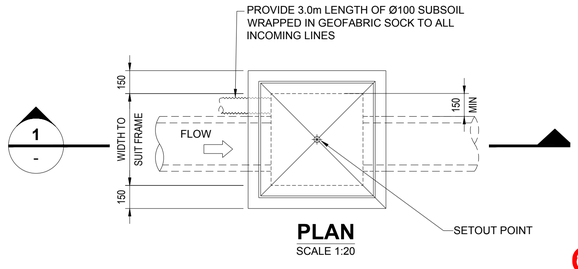
1. TRENCH WIDTH MAY NEED TO BE INCREASED SUBJECT TO ACHIEVING ADEQUATE COMPACTION.
2. MINIMUM PIPE COVER NOT UNDER ROADS = 450mm UNO. MINIMUM PIPE COVER UNDER ROADS = 600mm UNO.
3. THE CONTRACTOR SHALL ENSURE THAT THE SHORING OF TRENCHES IS INSTALLED AS REQUIRED BY STATUTORY REQUIREMENTS.
4. ENSURE BACKFILLING COMPACTION MEETS THE FOLLOWING STANDARDS;

A) TRENCHES UNDER PAVED AREAS & BUILDINGS - 100% SMDD.
B) TRENCHES NOT UNDER PAVEMENTS - 90% SMDD.



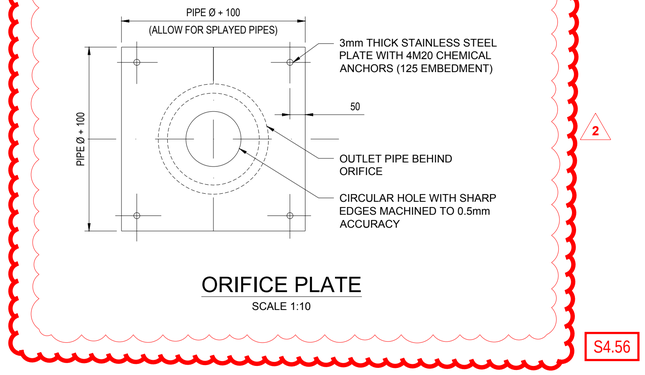
GRATED GULLY PIT

(PIPE SIZES ≤ Ø375)



PLAN
SCALE 1:20

600 - 900SQ SURFACE INLET PITS



2

ORIFICE PLATE

SCALE 1:10

S4.56

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100 0 100 200 300 400 500mm
PLAN SCALE 1:10 A1 SHEET
200 0 200 400 600 800 1000mm
PLAN SCALE 1:20 A1 SHEET

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

A1

REVISION	AMENDMENT	DATE	REVISION	AMENDMENT	DATE
1	ISSUE FOR S4.56	03/11/23			
2	ISSUE FOR S4.56	17/06/24			

CLIENT: KUATRO

PROJECT: FOREST LODGE WARRIEWOOD

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GCC ISO 9001 Certified
WSce
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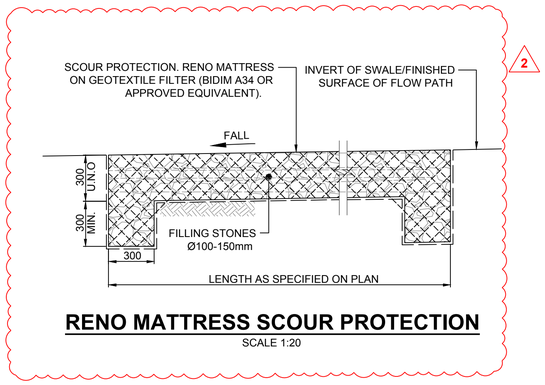
TITLE: STORMWATER DRAINAGE DETAILS - SHEET 1

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	I.O.	J.G.	J.G.

JOB No.	DRAWING No.	ISSUE
7368002	C6.06	2

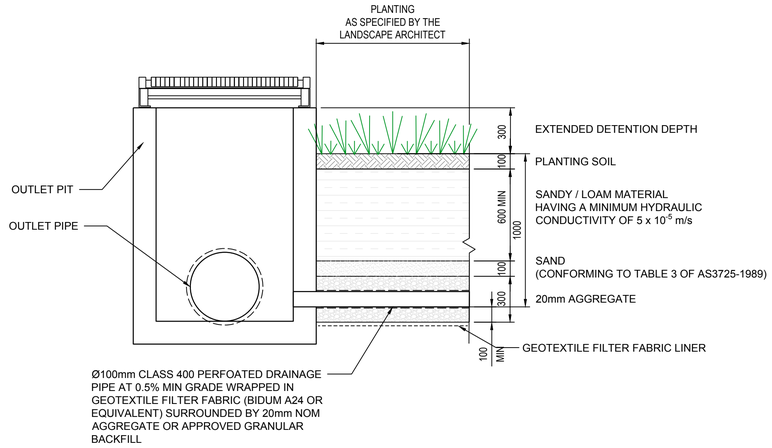
DATE	STATUS
SEPTEMBER 2023	ISSUE FOR S4.56

Xrefs: X:\7368002\TB_A1H
Plot Date: 17/06/2024@16:22:27
Login Name: kkuhnr
Cad File: T:\7368002\Drawings\AutoCAD\Civil\Design\Civil 2025\4.56\Stormwater Drainage Details - Sheet 2.dwg



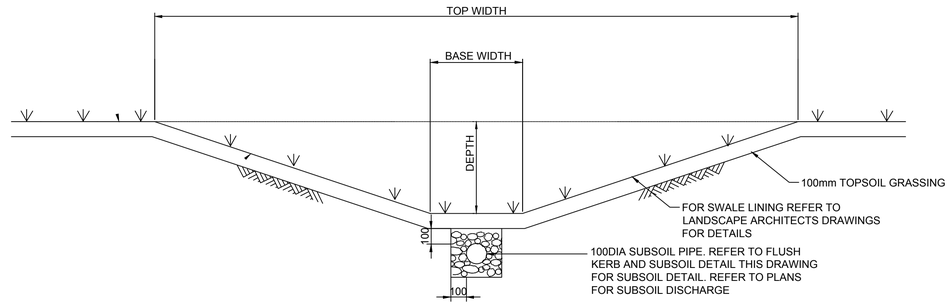
RENO MATTRESS SCOUR PROTECTION

SCALE 1:20



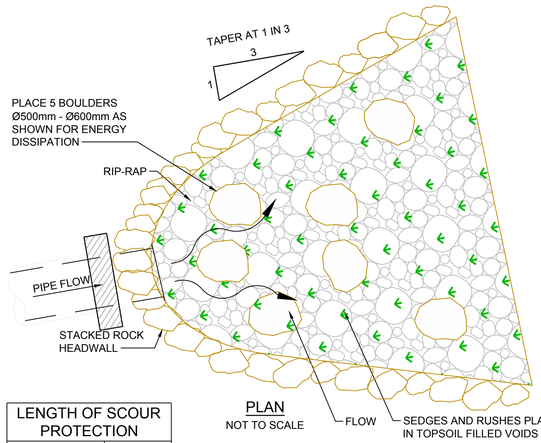
BIORETENTION DETAIL

SCALE 1:20



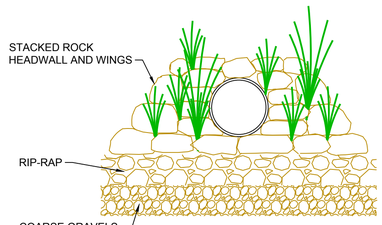
TYPICAL SECTION THROUGH SWALE

1. REFER TO PLAN FOR SWALE DIMENSIONS
2. SWALE INVERT LEVELS AS SPECIFIED ON PLAN. MIN LONGITUDINAL GRADE 0.5% (UNO)



PLAN

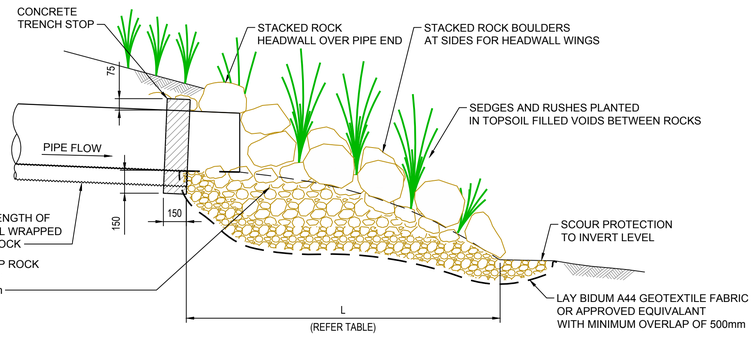
NOT TO SCALE



CROSS SECTION

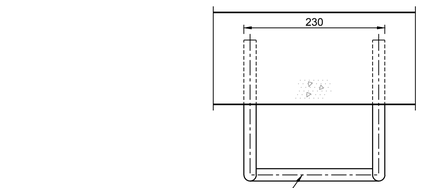
NOT TO SCALE

LENGTH OF SCOUR PROTECTION	
OUTLET PIPE SIZE	L (mm)
375 - 750	4000
900 - 1350	6000
1500 - 1800	8000

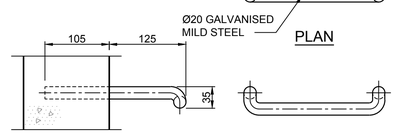


ROCK HEADWALL - TYPICAL ARRANGEMENT

NOT TO SCALE



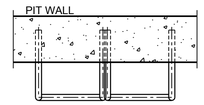
PLAN



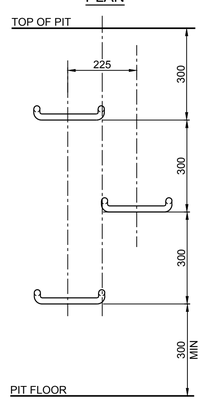
SIDE ELEVATION FRONT ELEVATION

STEP IRON DETAIL

SCALE 1:5



PLAN



NOTE:
1. STEP IRONS SHALL BE PROVIDED TO ALL PITS AND TANKS WITH A DEPTH OF 1.2m OR GREATER

ELEVATION

STEP IRON PLACEMENT TO PIT WALL

SCALE NTS

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100 0 50 100 150 200mm PLAN SCALE 1:5 A1 SHEET
100 0 100 200 300 400 500mm PLAN SCALE 1:10 A1 SHEET
200 0 200 400 600 800 1000mm PLAN SCALE 1:20 A1 SHEET

REVISION	AMENDMENT	DATE	REVISION	AMENDMENT	DATE
1	ISSUE FOR S4.56	03/11/23			
2	RE-ISSUE FOR S4.56	01/02/24			

CLIENT: KUATRO

PROJECT: FOREST LODGE WARRIEWOOD

PREPARED BY
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TITLE: STORMWATER DRAINAGE DETAILS - SHEET 2

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	I.O.	J.G.	J.G.

JOB No.	DRAWING No.	ISSUE
7368002	C6.07	2

DATE: SEPTEMBER 2023 STATUS: ISSUE FOR S4.56

Cad File: T:\7368002\Drawings\AutoCAD\Civil\Design\Civil 2025\4.5fs\Stormwater Drainage Details - Sheet 2.dwg
Login Name: kushmir
Xrefs: X:7368002-TB_A1H
Plot Date: 01.02.2024@08:34:16

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 A1

MAX BATTER 1V:2.5H

BIORETENTION BASIN 1

FILTER AREA	= 173m²
FILTER MEDIA DEPTH	= 600mm
RETENTION BASE RL	= RL 22.19
RETENTION DEPTH	= 300mm
OSD VOLUME	= 682 m³

PROVIDE SCOUR PROTECTION DOWNSTREAM OF OVERFLOW WEIR

Ø225 OUTLET PIPE

OUTLET PIT GRATE = RL 22.49
OUTLET PIT IL= RL 21.49
Ø100 ORIFICE IL = RL 21.29

Ø375 INLET PIPE AND HEADWALL

2000mm WIDE FLAT BERM AT TOP OF BASIN

S4.56

S4.56

S4.56

Ø225

Ø375

Ø300

Ø300

Ø1

HW 3

MH 5

HW2 SD

5 SD

1 11

7 7

8 7

2 6.13

RL 24.30

RL 24.15

RL 22.19

RL 24.31

RL 24.62

GRL 24.66

GRL 24.71

RL 24.30

GRL 23.47

GRL 24.62

RL 24.30

RL 25.70

RL 27.55

RL 28.64

RL 30.05

CH 210.00

CH 218.09

CH 220.09

0.5%

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1.0 0 1.0 2.0 3.0 4.0 5.0m
PLAN SCALE 1:100 A1 SHEET

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
SHEET SIZE: A1

REVISION	AMENDMENT	DATE	REVISION	AMENDMENT	DATE
1	ISSUE FOR S4.56	03/11/23			
2	RE-ISSUE FOR S4.56	05/12/23			
3	ISSUE FOR S4.56	17/06/24			

CLIENT
KUATRO

PROJECT
FOREST LODGE
WARRIEWOOD

PREPARED BY
WSce Pty Ltd
ACN 648 655 141
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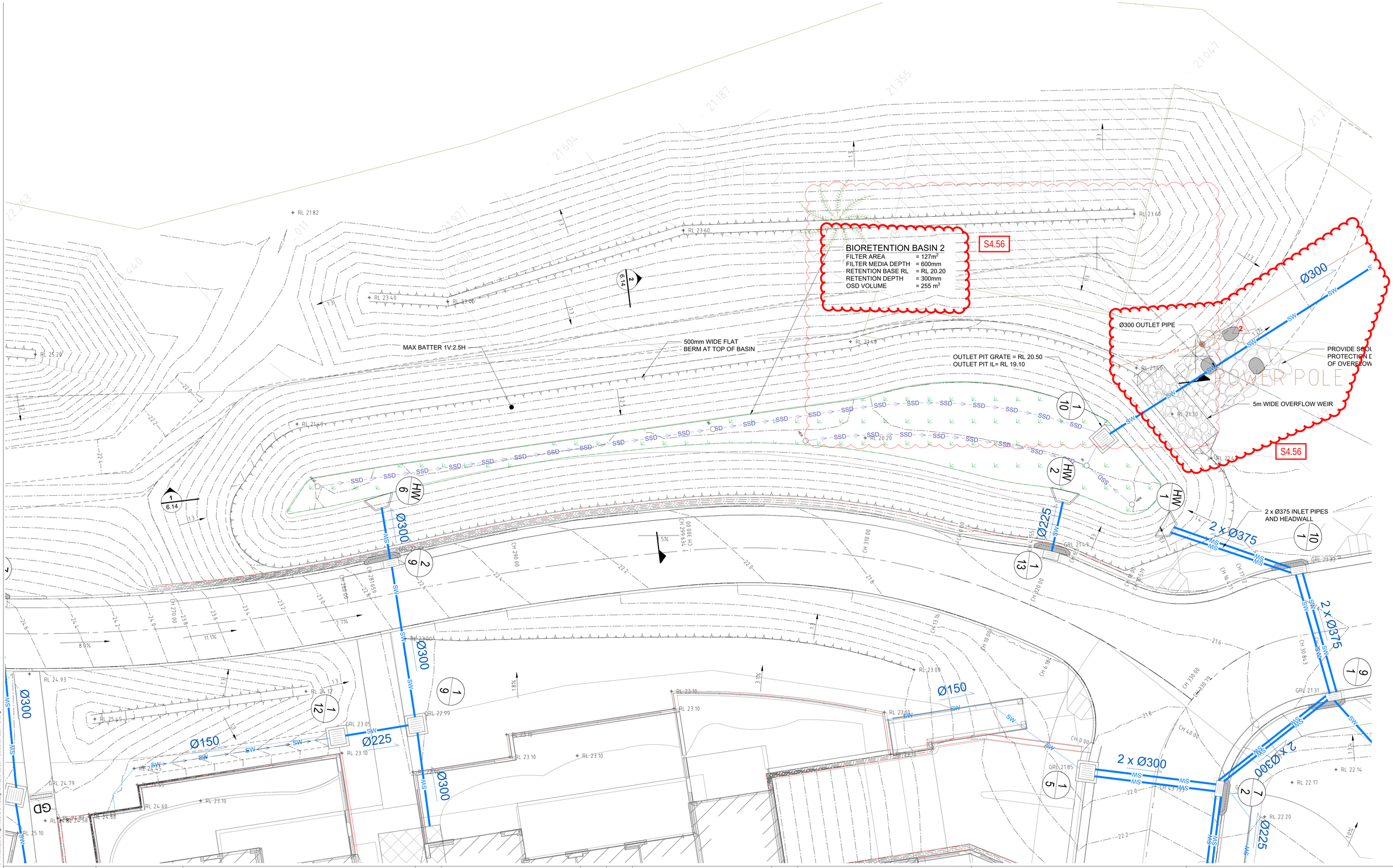
TITLE
BIORETENTION BASIN PLAN - SHEET 1

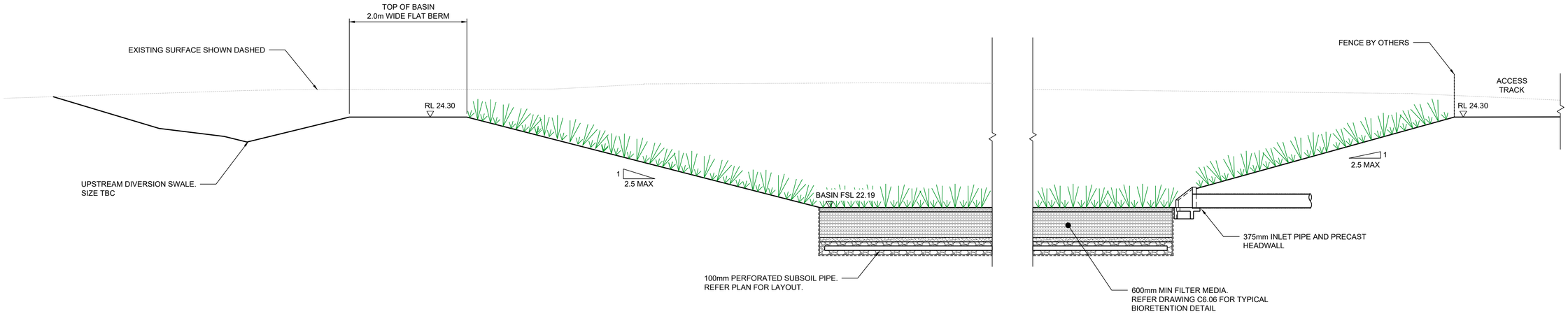
SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	I.O.	J.G.	J.G.

JOB No.	DRAWING No.	ISSUE
7368002	C6.11	3

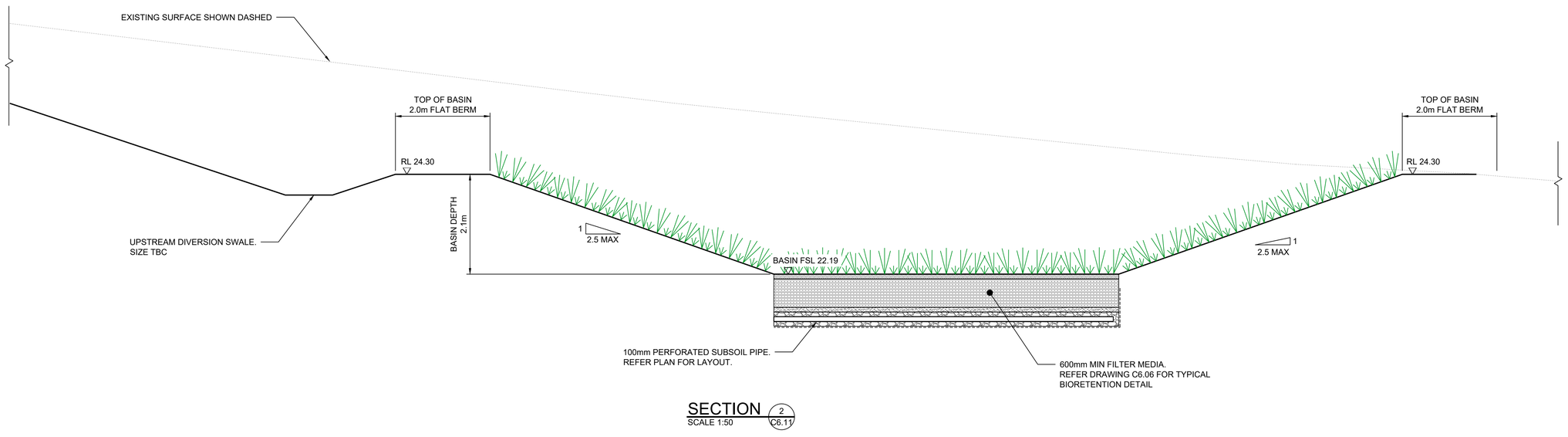
DATE	STATUS
SEPTEMBER 2023	ISSUE FOR S4.56

Xrefs: X-7368002-TB, ATH; X-7368002-SW Layout; X-7368002-SU - Existing Survey; X-7368003-A1 - Site Plan RING ROAD - 7368003-WSCE-CS-MOD-02 - Design Surface RING ROAD
Plot Date: 11/06/2024@16:01:49 Login Name: iolawrel Cad File: I:\7368002\Drawings\AutoCAD Civil\Design\Cad\7368-345-03.11 Bioretention Basin Plan.dwg


BIORETENTION BASIN 2
FILTER AREA = 127m²
FILTER MEDIA DEPTH = 600mm
RETENTION BASE RL = RL 20.20
RETENTION DEPTH = 300mm
OSD VOLUME = 255 m³
S4.56
MAX BATTER 1V:2.5H
500mm WIDE FLAT BERM AT TOP OF BASIN
OUTLET PIT GRATE = RL 20.50
OUTLET PIT IL= RL 19.10
Ø300 OUTLET PIPE
5m WIDE OVERFLOW WEIR
POWER POLE
2 x Ø375 INLET PIPES AND HEADWALL
2 x Ø375
2 x Ø300
Ø300
Ø225
Ø150
2 x Ø300
SSD
SW
MS
OSD
HW
GD
GRL 21.31
GRL 21.85
GRL 22.99
GRL 23.05
GRL 24.79
RL 20.20
RL 21.40
RL 21.30
RL 22.14
RL 22.17
RL 22.20
RL 23.00
RL 23.10
RL 24.12
RL 24.45
RL 24.60
RL 24.93
RL 25.10
RL 25.20
RL 23.60
RL 23.40
RL 21.82
CH 270.00
CH 280.00
CH 290.00
CH 300.00
CH 310.00
CH 320.00
CH 330.00
CH 340.00
CH 350.00
CH 360.00
CH 370.00
CH 380.00
CH 390.00
CH 400.00
CH 410.00
CH 420.00
CH 430.00
CH 440.00
CH 450.00
CH 460.00
CH



SECTION 1 / C6.11
SCALE 1:50



SECTION 2 / C6.11
SCALE 1:50

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1000 0 500 1000 1500 2000mm
PLAN SCALE 1:50 A1 SHEET

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
A4

REVISION	AMENDMENT	DATE	REVISION	AMENDMENT	DATE
1	ISSUE FOR S4.56	03/11/23			

CLIENT
KUATRO

PROJECT
FOREST LODGE
WARRIEWOOD

PREPARED BY
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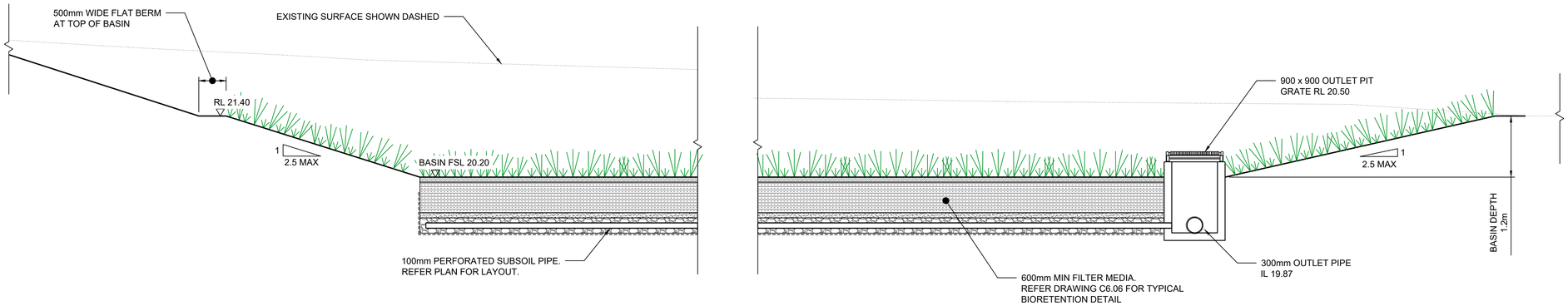
TITLE
BIORETENTION BASIN SECTIONS - SHEET 1

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	I.O.	J.G.	J.G.

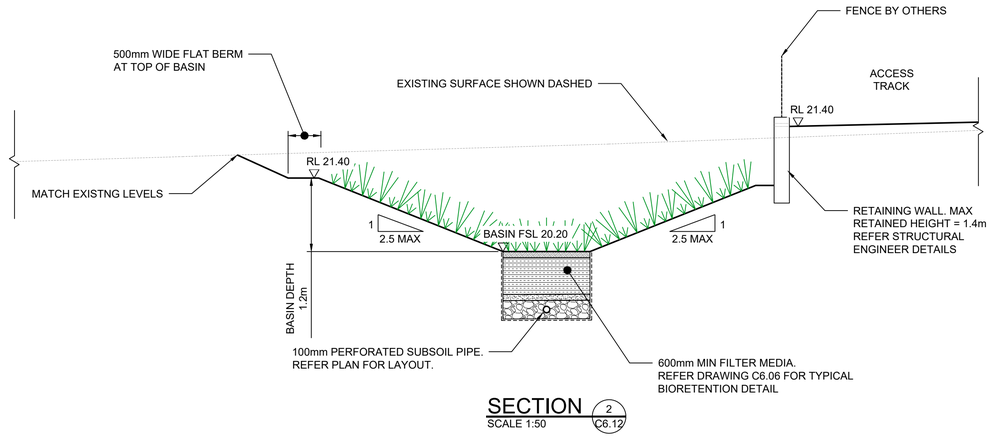
JOB No.	DRAWING No.	ISSUE
7368002	C6.13	1

DATE	STATUS
SEPTEMBER 2023	ISSUE FOR S4.56

Xrefs: X:\7368002\18_ATH_X:\7368002\SHU\Layout_X:\7368002\SHU\Layout_X:\7368002\SHU - Existing Survey_7368002-WSCE-CS-MO-02 - Design Surface DA APPROVED_X:\7368002\30 - Site Plan RING ROAD
Plot Date: 03.11.2023@09:23:06 Login Name: mtaylor Civil File: 11\7368002\Drawings\AutoCAD\Civil\Design\Civil 2023\4.5\C6.11 Bioretention Basin Plan.dwg



SECTION 1
SCALE 1:50 C6.12



SECTION 2
SCALE 1:50 C6.12

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1000 0 500 1000 1500 2000mm
PLAN SCALE 1:50 A1 SHEET

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
A4

REVISION	AMENDMENT	DATE	REVISION	AMENDMENT	DATE
1	ISSUE FOR S4.56	03/11/23			

CLIENT
KUATRO

PROJECT
FOREST LODGE
WARRIEWOOD

PREPARED BY
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TITLE
BIORETENTION BASIN SECTIONS - SHEET 2

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	I.O.	J.G.	J.G.

JOB No.	DRAWING No.	ISSUE
7368002	C6.14	1

DATE	STATUS
SEPTEMBER 2023	ISSUE FOR S4.56

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Plot Date: 03.11.2023@09:23:25 Login Name: mtaylor Civil File: 1:\7368002\Drawings\AutoCAD\Civil\Design\Civil 2023\4.5\C6.11 Bioretention Basin Plan.dwg

CAT 7/1
160m² 35% IMP.

CAT 6/1
220m² 25% IMP.

CAT 5/1
140m2 25% IMP.

CAT 4/1
170m² 20% IMP.

CAT 3/1
200m² 25% IMP.

CAT 2/1
150m² 35% IMP.

CAT 1/1
550m² 30% IMP.

CAT BYPASS
470m² 40% IMP.

CAT 7/1R
210m² 100% IMP.

CAT 6/1R
260m² 100% IMP.

CAT 5/1R
180m² 100% IMP.

CAT 4/1R
180m² 100% IMP.

CAT 3/1R
260m² 100% IMP.

CAT 2/1R
190m² 100% IMP.

CAT 3/8
230m² 100% IMP.

CAT 4/2
430m² 60% IMP.

CAT HYD - 130m² - 50% IMP.

CAT HYD - 70m² - 50% IMP.

CAT HYD - 120m² - 50% IMP.

CAT 9/1
100m² 50% IMP.

CAT 7/2
220m² 90% IMP.

CAT 6/2
120m² 90% IMP.

CAT 5/2
340m² 90% IMP.

CAT 10/1
70m² 100% IMP.

CAT 1/5
320m² 90% IMP.

CAT 4/4
250m² 70% IMP.

CAT 1/3
330m² 90% IMP.

CAT 3/2
120m² 80% IMP.

CAT 1/5H
25m² 100% IMP.

CAT 2/8
190m² 95% IMP.

CAT HYD BASEMENT (TOTAL)
90m2 100% IMP.

CAT BASIN 2
900m² 0% IMP.

CAT 1/13
480m² 50% IMP.

CAT TO BASIN 2
1.168Ha
80% IMP.

CAT 1/3H
510m² 100% IMP.

CAT 7/2H
270m² 100% IMP.

CAT 2/2
390m² 10% IMP.

CAT 2/2H
610m² 100% IMP.

CAT 1/5H
100m² 100% IMP.

CAT RWT
1020m² 100% IMP.

CAT 2/4
1000m² 70% IMP.

CAT 1/8
150m² 95% IMP.

CAT 1/12
100 m2 40% IMP.

CAT 6/6H(1)
270m² 100% IMP.

CAT 1/11
210m² 5% IMP.

CAT 2/9
180 m2 60% IMP.

CAT 5/6
130 m2 30% IMP.

CAT 2/6
250m² 75% IMP.

CAT 4/6H
490m² 100% IMP.

CAT 3/6
10m² 40% IMP.

CATCHMENT LEGEND

- ROOF CATCHMENT
- ROAD CATCHMENT
- LANDSCAPED CATCHMENT
- MIXED CATCHMENT
- CATCHMENT TO HYDRAULIC

REFER C6.22 FOR CONTINUATION

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PLAN SCALE 1:250 A1 SHEET

REVISION	AMENDMENT	DATE	REVISION	AMENDMENT	DATE
1	ISSUE FOR S4.56	03/11/23			
2	RE-ISSUE FOR S4.56	05/12/23			
3	ISSUE FOR S4.56	17/06/24			

CLIENT: KUATRO

PROJECT: FOREST LODGE WARRIEWOOD

PREPARED BY
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ACN 668 655 141
ABN 75 668 655 141
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wsce.com.au

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TITLE: STORMWATER CATCHMENT PLAN - SHEET 1

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	I.O.	J.G.	J.G.

JOB No.	DRAWING No.	ISSUE
7368002	C6.21	3

DATE: SEPTEMBER 2023
STATUS: ISSUE FOR S4.56

Xref: X:\7368002-SU - Existing Survey\X-7368002-SW-Catchment_X-7368002-TB_ATH_X-7368003-AR - Site Plan RING ROAD_7368002.WSCE-CSA-MO-01 - Design Surface RING ROAD
Plot Date: 17.06.2024@17:05:56 Login Name: kkuhnz Cad File: Y:\7368002\Drawings\AutoCAD\Civil\Design\Civil 2025\4-SW\Stormwater Catchment Plan - Sheet 2.dwg

REFER C6.01 FOR CONTINUATION

CAT 5/6
130 m2
30% IMP.

CAT 2/6
250m²
75% IMP.

CAT 3/6
10m²
40% IMP.

CAT 4/6
460m²
60% IMP.

CAT 7/6
60 m2
60% IMP.

CAT 6/6H(2)
970m²
100% IMP.

CAT HYD
530m²
100% IMP.

CAT 1/6
300m²
10% IMP.

CAT 6/6
130 m2
30% IMP.

CAT 8/6
130 m2
70% IMP.

CAT 1/14H
520m²
100% IMP.

CAT 1/7
80m2
10% IMP.

CAT 2/7
270m²
70% IMP.

CAT 1/15
530m²
100% IMP.

CAT TO BASIN 1
0.844Ha
80% IMP.

CAT 8/7 - 410m² - 80% IMP.

CAT 1/15 - 140m² - 0% IMP.

CAT 2/14
160m²
40% IMP.

CAT 4/7
150m²
80% IMP.

CAT 3/7
100m²
80% IMP.

CAT 3/14
340m²
20% IMP.

CAT 5/7
70m²
100% IMP.

CAT 7/7
400m²
85% IMP.

CAT 6/7
110m²
100% IMP.

CAT BASIN 1
1470m²
0% IMP.

BRUSH LINE

CATCHMENT LEGEND

- ROOF CATCHMENT
- ROAD CATCHMENT
- LANDSCAPED CATCHMENT
- MIXED CATCHMENT
- CATCHMENT TO HYDRAULIC

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PLAN SCALE 1:250 A1 SHEET

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

A1

REVISION	AMENDMENT	DATE
1	ISSUE FOR S4.56	03/11/23
2	RE-ISSUE FOR S4.56	05/12/23
3	ISSUE FOR S4.56	17/06/24

REVISION	AMENDMENT	DATE

CLIENT

KUATRO

PROJECT

FOREST LODGE
WARRIEWOOD

PREPARED BY

WSce Pty Ltd
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ABN 75 668 655 141
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Driven by excellence, built on experience.

TITLE

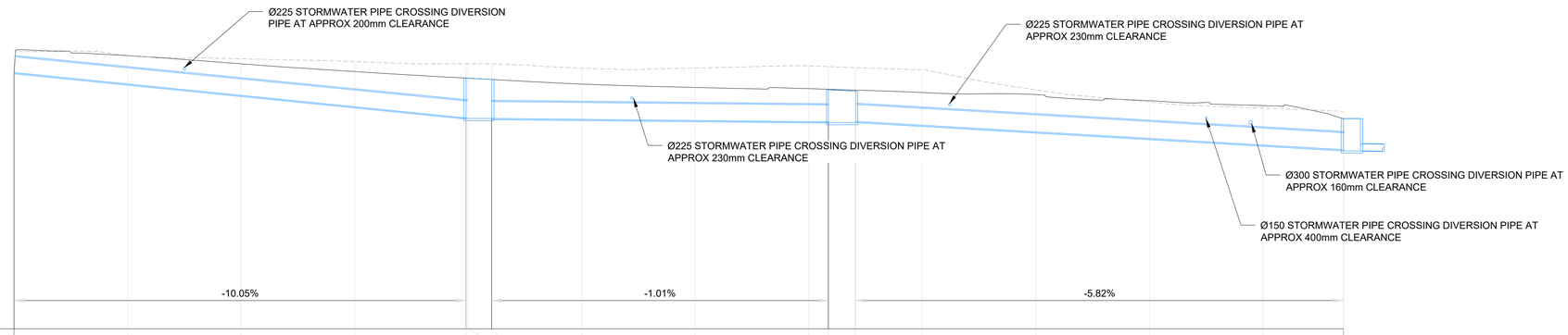
STORMWATER CATCHMENT PLAN - SHEET 2

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	I.O.	J.G.	J.G.

JOB No.	DRAWING No.	ISSUE
7368002	C6.22	3

DATE	STATUS
SEPTEMBER 2023	ISSUE FOR S4.56

Xrefs: X:\7368002\SU - Existing Survey.X:\7368002\SW-Catchment.X:\7368002\TB_A1H.X:\7368000-AR - Site Plan RING ROAD.7368002\WSCE-CS-MO-02 - Design Surface RING ROAD
Plot Date: 17/06/2024@17:03:39 Login Name: ikuhnl Cad File: I:\7368002\Drawings\AutoCAD\Civil\Design\Civil 3D\C4-5\Stormwater Catchment Plan - Sheet 2.dwg



DESIGN LEVEL	27.600	29.096	28.372	27.689	27.117	27.106	26.996	26.589	26.288	26.183	26.128	26.051	25.841	25.663	25.125	24.690	23.515
INVERT LEVEL	27.600	26.595	25.591	24.586	23.600	23.596	23.550	23.470	23.369	23.267	23.250	23.200	22.858	22.276	21.694	21.112	20.700
DEPTH TO INVERT	0.000	2.501	2.781	3.102	3.516	3.510	3.446	3.120	2.920	2.916	2.878	2.851	2.983	3.387	3.431	3.578	2.815
CHAINAGE	0.000	10.000	20.000	30.000	39.816	40.000	42.070	50.000	60.000	70.000	71.719	74.114	80.000	90.000	100.000	110.000	117.087

UPSTREAM DIVERSION PIPE DRAINAGE LONG SECTION

HORIZONTAL SCALE 1:250
VERTICAL SCALE 1:250

3

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DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

5.0 0 2.5 5.0 7.5 10.0m
PLAN SCALE 1:250 A1 SHEET

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
A1

REVISION	AMENDMENT	DATE	REVISION	AMENDMENT	DATE
1	ISSUE FOR S4.56	03/11/23			
2	RE-ISSUE FOR S4.56	01/02/24			
3	ISSUE FOR S4.56	17/06/24			

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TITLE
TRUNK DRAINAGE LONGITUDINAL SECTION

SCALE	DRAWN	DESIGNED	CHECKED	APPROVED
AS SHOWN	I.K.	I.O.	J.G.	J.G.

JOB No.	DRAWING No.	ISSUE
7368002	C6.41	3

DATE	STATUS
SEPTEMBER 2023	ISSUE FOR S4.56

Xrefs: X:\7368002\13_A1\H_7368002-WSCE-CS-MD-02 - Design Surface RING ROAD
Plot Date: 17.06.2024@16:54:10 Login Name: stewart Cad File: Y:\7368002\Drawings\AutoCAD\Civil\Design\Civil 2D\S4.56\C6.11 Trunk Drainage Longitudinal Section.dwg