CONCEPT CIVIL ENGINEERING PLANS

WOOLWORTHS, KURRI KURRI

LOT 136 DP 869710

174-178 LANG STREET, KURRI KURRI

NOTES

GENERAL

1. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE CONDITIONS STATED IN COUNCIL'S DEVELOPMENT APPROVAL AND THE APPROVED ARCHITECTURAL DRAWINGS WHERE APPLICABLE.
2. WHERE DRAWINGS ARE NOTED AS PRELIMINARY ISSUE, THEY SHOULD NOT BE USED TO OBTAIN A CONSTRUCTION CERTIFICATE NOR USED FOR CONSTRUCTION PURPOSES.
3. DRAWINGS ARE A DIAGRAMMATICAL REPRESENTATION OF THE WORK TO BE CARRIED OUT AND DIMENSIONS SHALL NOT BE OBTAINED BY SCALING.
4. ALL LOT DIMENSIONS, AREAS AND EASEMENTS ARE SUBJECT TO REGISTRATION OF DEPOSITED PLAN.
5. ALL LEVELS SHALL BE OBTAINED FROM ESTABLISHED BENCH MARKS AS DIRECTED BY THE SITE SUPERVISOR.
6. THE CONTRACTOR SHOULD CONFIRM THE INVERT LEVEL OF SPECIFIED DISCHARGE POINTS FOR GRAVITY PIPE NETWORKS (E.G. STORMWATER AND SEWER) PRIOR TO WORK, WITH ANY DISCREPANCY REPORTED TO METIRI BEFORE PROCEEDING.
7. ALL EXISTING UNDERGROUND SERVICES MUST BE LOCATED AND EXPOSED PRIOR TO EARTHWORKS COMMENCING AND IT IS THE RESPONSIBILITY OF THOSE PERSONS USING THIS PLAN TO CONFIRM BOTH POSITION AND LEVEL OF THESE UTILITIES IN CONJUNCTION WITH THE APPROPRIATE AUTHORITY. THE CONTRACTOR IS RESPONSIBLE FOR THE LOCATION, PROTECTION AND ADJUSTMENT TO ALL IN GROUND AND ABOVE GROUND SERVICES.
8. THE CONTRACTOR SHALL HAVE A REGISTERED SURVEYOR CONFIRM IF EXISTING SURVEY MARKS ARE LIKELY TO BE DISTURBED BY THE PROPOSED WORKS AND IF SO, SUBMIT A PRESERVATION OF SURVEY INFRASTRUCTURE (POSI) APPLICATION TO NSW LAND REGISTRY SERVICES (LRS) IN ACCORDANCE WITH THE SURVEYOR-GENERAL'S DIRECTIONS NO.11 PRESERVATION OF SURVEY INFRASTRUCTURE.

SHEET LIST

SHEET NO.	SHEET TITLE
01	COVER SHEET
02	DETAIL PLAN
03	EROSION & SEDIMENT CONTROL PLAN
04	EROSION & SEDIMENT CONTROL DETAILS
05	TYPICAL SECTIONS & DETAILS
06	ROAD PROFILES
07	ONSITE DETENTION CALCULATIONS
08	STORMWATER QUALITY TREATMENT CALCULATIONS
09	VEHICLE MOVEMENTS PLAN

LOCALITY PLAN

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PLOT DATE: 17/08/2023

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0	DRAFT ISSUE FOR REVIEW	JRR	MHM	JRR	08/12/22
1	UPDATED FOR DA SUBMISSION	JRR	MHM	JRR	13/12/22
2	UPDATES TO PROPOSED LANE WORKS	JRR	MHM	JRR	15/08/23

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PROJECT:
CIVIL ENGINEERING PLANS
WOOLWORTHS KURRI KURRI
LOT 136 DP 869710
174-178 LANG STREET, KURRI KURRI

SHEET TITLE: COVER SHEET

CLIENT: VOTRAINT NO 124 PTY LTD

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LEGEND

▇	PROPOSED AC AREAS
▢	PROPOSED CONCRETE AREAS
🟩	PROPOSED ROAD VERGE AREAS
——— ———	SURFACE CONTOURS (EXISTING/PROPOSED)
+10.000E +10.000	SURFACE LEVEL (EXISTING/PROPOSED)
5.00% 5.00%	SURFACE SLOPE (EXISTING/PROPOSED)
▭▭▭ ▭▭▭	RETAINING WALL (EXISTING/PROPOSED)
— S — S — — S — S —	SEWER MAINS (EXISTING/PROPOSED)
— W — W — — W — W —	WATER MAINS (EXISTING/PROPOSED)
— OHP — — OHP —	OVERHEAD POWER (EXISTING/PROPOSED)
— UGE — — UGE —	UNDERGROUND ELEC (EXISTING/PROPOSED)
— T — T — — T — T —	TELECOMMUNICATIONS (EXISTING/PROPOSED)
— G — G — — G — G —	GAS MAINS (EXISTING/PROPOSED)
▬ ▬ ▬ ▬	STORMWATER PIPE (EXISTING/PROPOSED)
	KERB INLET PIT (EXISTING/PROPOSED)
▦ ▦	GRATED PIT (EXISTING/PROPOSED)
▢ ▢	SEALED PIT (EXISTING/PROPOSED)
	HEADWALL OUTLET (EXISTING/PROPOSED)
← ← ← ←	TABLE DRAIN/SWALE (EXISTING/PROPOSED)

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SHEET TITLE
DETAIL PLAN

PROJECT NUMBER	SHEET NUMBER	TOTAL SHEETS	REVISION
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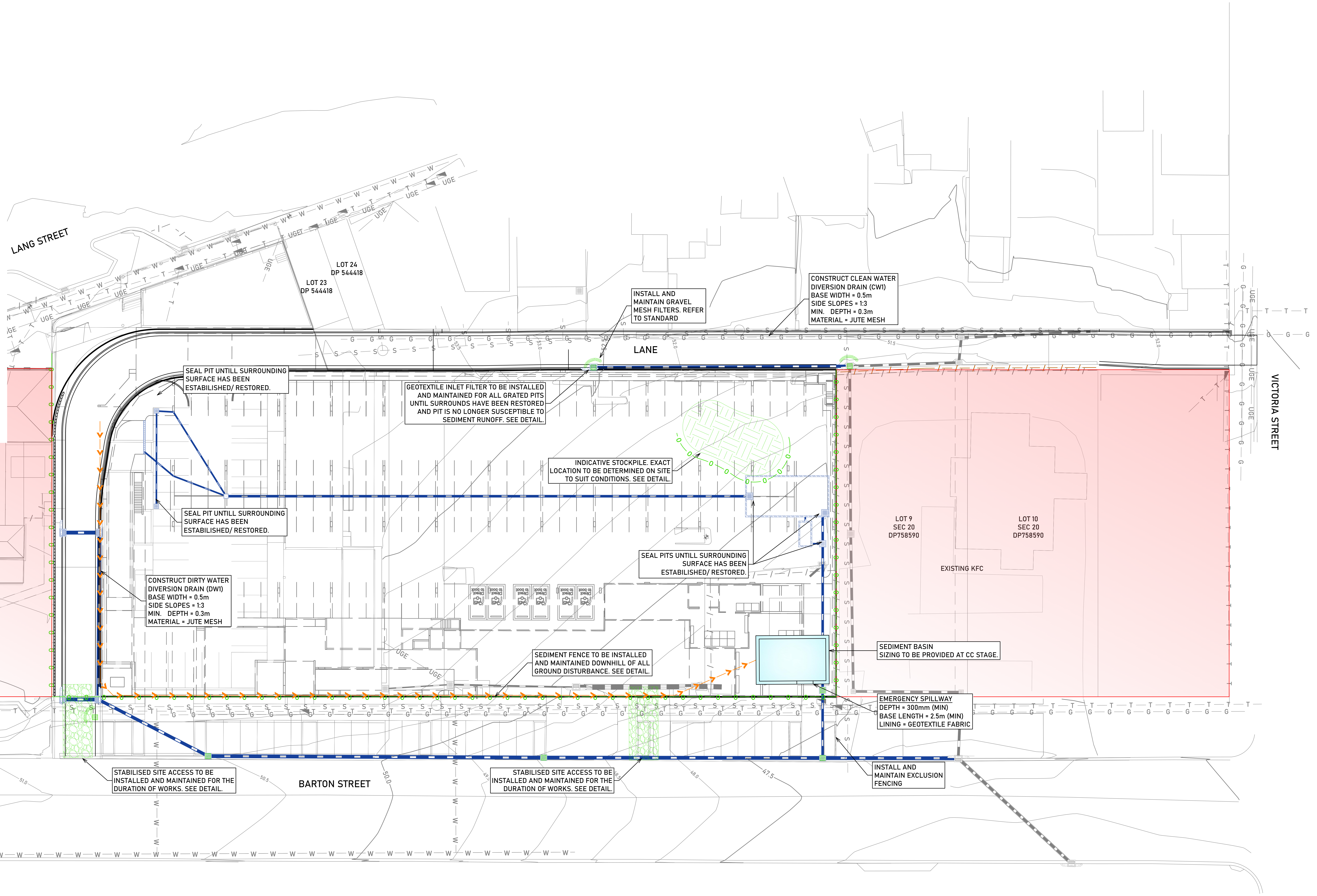
LEGEND

——	——	SURFACE CONTOURS (EXISTING/PROPOSED)
⌖10.000E	⌖10.000	SURFACE LEVEL (EXISTING/PROPOSED)
5.00% →	5.00% →	SURFACE SLOPE (EXISTING/PROPOSED)
▭▭▭	▭▭▭	RETAINING WALL (EXISTING/PROPOSED)
▬ ▬ ▬	▬ ▬ ▬	STORMWATER PIPE (EXISTING/PROPOSED)
▦	▦	KERB INLET PIT (EXISTING/PROPOSED)
▦	▦	GRATED PIT (EXISTING/PROPOSED)
▢	▢	SEALED PIT (EXISTING/PROPOSED)
⏢	⏢	HEADWALL OUTLET (EXISTING/PROPOSED)
—<—<—	—<—<—	TABLE DRAIN/SWALE (EXISTING/PROPOSED)
—0—0—0—0—		PROPOSED SEDIMENT FENCING
—X—X—X—X—		PROPOSED EXCLUSION FENCING
— >> ——	— >> ——	PROPOSED DIVERSION DRAIN (CLEAN/DIRTY)
▨		PROPOSED GEOTEXTILE INLET FILTER
▨		PROPOSED MESH & GRAVEL FILTER
▨		PROPOSED STOCKPILE
▨		PROPOSED GRAVEL SITE ACCESS

NOTES

EROSION & SEDIMENT CONTROL

1. SITE WORKS ARE NOT TO COMMENCE UNTIL THE EROSION AND SEDIMENT CONTROL MEASURES ARE INSTALLED AND FUNCTIONAL.
2. ENTRY AND DEPARTURE OF VEHICLES IS TO BE CONFINED TO THE STABILISED SITE ACCESS.
3. TOPSOIL IS TO BE STRIPPED AND STOCKPILED FOR LATER USE IN LANDSCAPING THE SITE. TOPSOIL IS TO BE RESPREAD AND ALL DISTURBED AREAS REHABILITATED (TURFED) WITHIN 20 WORKING DAYS OF COMPLETION OF WORKS.
4. THE FOOTPATH, OTHER THAN THE STABILISED SITE ACCESS IS NOT TO BE DISTURBED, INCLUDING STOCKPILING OF MATERIALS.
5. WHERE ESSENTIAL WORKS (E.G. DRAINAGE) ARE REQUIRED, THE FOOTPATH IS TO BE REHABILITATED (TURFED) AS SOON AS POSSIBLE.
6. BINS ARE TO BE PROVIDED FOR BUILDING WASTE AND ARRANGEMENTS ARE TO BE MADE FOR REGULAR COLLECTION AND DISPOSAL.
7. ROOF GUTTERING IS TO BE CONNECTED TO THE STORMWATER SYSTEM AS SOON AS PRACTICABLE.
8. ALL EROSION CONTROLS ARE TO BE CHECKED DAILY (AT A MINIMUM AND AFTER ALL RAIN EVENTS TO ENSURE THEY ARE MAINTAINED IN FULLY FUNCTIONAL CONDITION.



INSTALL AND MAINTAIN GRAVEL MESH FILTERS. REFER TO STANDARD

CONSTRUCT CLEAN WATER DIVERSION DRAIN (CWI)
BASE WIDTH = 0.5m
SIDE SLOPES = 1:3
MIN. DEPTH = 0.3m
MATERIAL = JUTE MESH

SEAL PIT UNTILL SURROUNDING SURFACE HAS BEEN ESTABILISHED/ RESTORED.

GEOTEXTILE INLET FILTER TO BE INSTALLED AND MAINTAINED FOR ALL GRATED PITS UNTIL SURROUNDS HAVE BEEN RESTORED AND PIT IS NO LONGER SUSCEPTIBLE TO SEDIMENT RUNOFF. SEE DETAIL.

INDICATIVE STOCKPILE. EXACT LOCATION TO BE DETERMINED ON SITE TO SUIT CONDITIONS. SEE DETAIL.

SEAL PIT UNTILL SURROUNDING SURFACE HAS BEEN ESTABILISHED/ RESTORED.

SEAL PITS UNTILL SURROUNDING SURFACE HAS BEEN ESTABILISHED/ RESTORED.

CONSTRUCT DIRTY WATER DIVERSION DRAIN (DWI)
BASE WIDTH = 0.5m
SIDE SLOPES = 1:3
MIN. DEPTH = 0.3m
MATERIAL = JUTE MESH

SEDIMENT BASIN
SIZING TO BE PROVIDED AT CC STAGE.

SEDIMENT FENCE TO BE INSTALLED AND MAINTAINED DOWNHILL OF ALL GROUND DISTURBANCE. SEE DETAIL.

EMERGENCY SPILLWAY
DEPTH = 300mm (MIN)
BASE LENGTH = 2.5m (MIN)
LINING = GEOTEXTILE FABRIC

STABILISED SITE ACCESS TO BE INSTALLED AND MAINTAINED FOR THE DURATION OF WORKS. SEE DETAIL.

STABILISED SITE ACCESS TO BE INSTALLED AND MAINTAINED FOR THE DURATION OF WORKS. SEE DETAIL.

INSTALL AND MAINTAIN EXCLUSION FENCING

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CLIENT
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SHEET TITLE
EROSION & SEDIMENT CONTROL PLAN

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NOTES

SEDIMENT FENCE (SD 6-8)

1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.
2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5m LONG STAR PICKETS INTO GROUND AT 2.5m INTERVALS (MAX) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.

GEOTEXTILE INLET FILTER (SD 6-12)

1. FABRICATE A SEDIMENT BARRIER MADE FROM GEOTEXTILE OR STRAW BALES.
2. FOLLOW STANDARD DRAWING 6-7 AND STANDARD DRAWING 6-8 FOR INSTALLATION PROCEDURES FOR THE STRAW BALES OR GEOFABRIC. REDUCE THE PICKET SPACING TO 1m CENTRES.
3. IN WATERWAYS, ARTIFICIAL SAG POINTS CAN BE CREATED WITH SANDBAGS OR EARTH BANKS AS SHOWN IN THE DRAWING.
4. DO NOT COVER THE INLET WITH GEOTEXTILE UNLESS THE DESIGN IS ADEQUATE TO ALLOW FOR ALL WATERS TO BYPASS IT.

STOCKPILES (SD4-1)

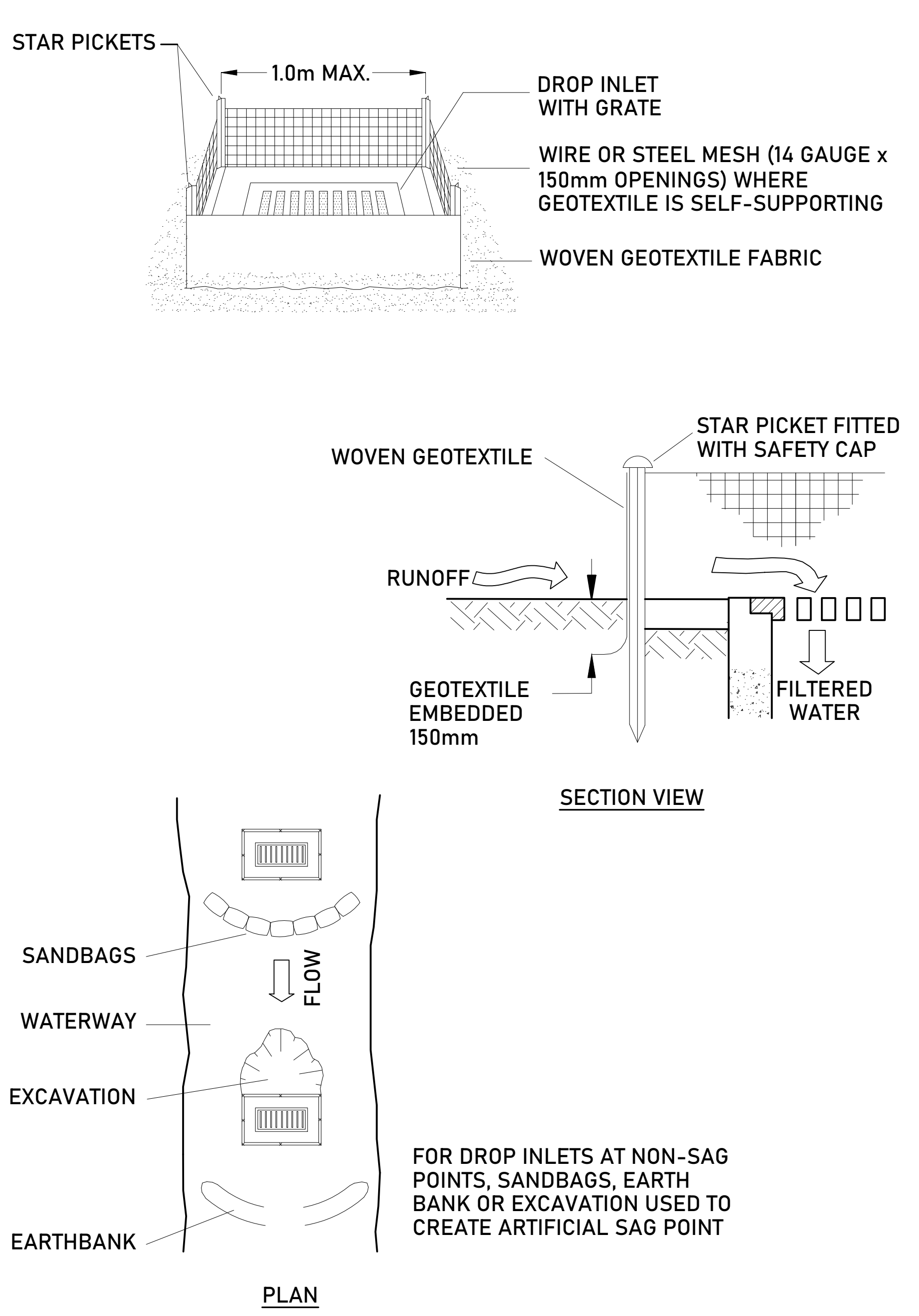
1. PLACE STOCKPILES MORE THAN 2 (PREFERABLY 5) METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2m IN HEIGHT.
4. WHERE THEY ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED ESCP OR SWMP TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS (STANDARD DRAWING 5-5) ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES (STANDARD DRAWING 6-8) 1m TO 2m DOWNSLOPE.

STABILISED SITE ACCESS (SD6-14)

1. STRIP THE TOPSOIL, LEVEL THE SITE AND COMPACT THE SUBGRADE.
2. COVER THE AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
3. CONSTRUCT A 200mm THICK PAD OVER THE GEOTEXTILE USING ROAD BASE OR 30 MM AGGREGATE.
4. ENSURE THE STRUCTURE IS AT LEAST 15 METRES LONG OR TO BUILDING ALIGNMENT AND AT LEAST 3 METRES WIDE.
5. WHERE A SEDIMENT FENCE JOINS ONTO THE STABILISED ACCESS, CONSTRUCT A HUMP IN THE STABILISED ACCESS TO DIVERT WATER TO THE SEDIMENT FENCE.

MESH AND GRAVEL INLET FILTER (SD6-11)

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

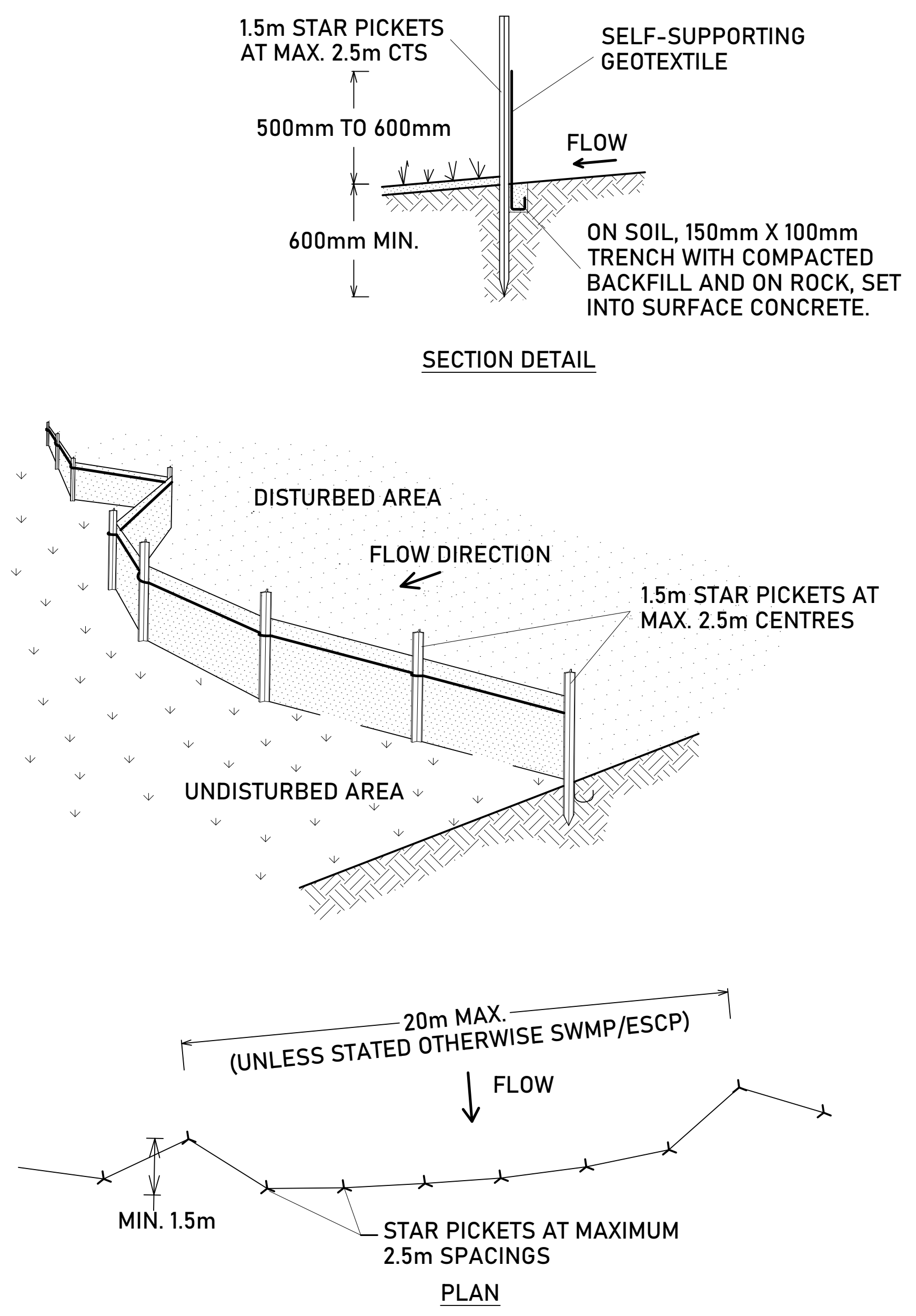


SECTION VIEW

PLAN

GEOTEXTILE INLET FILTER (SD 6-12) DETAIL

NTS

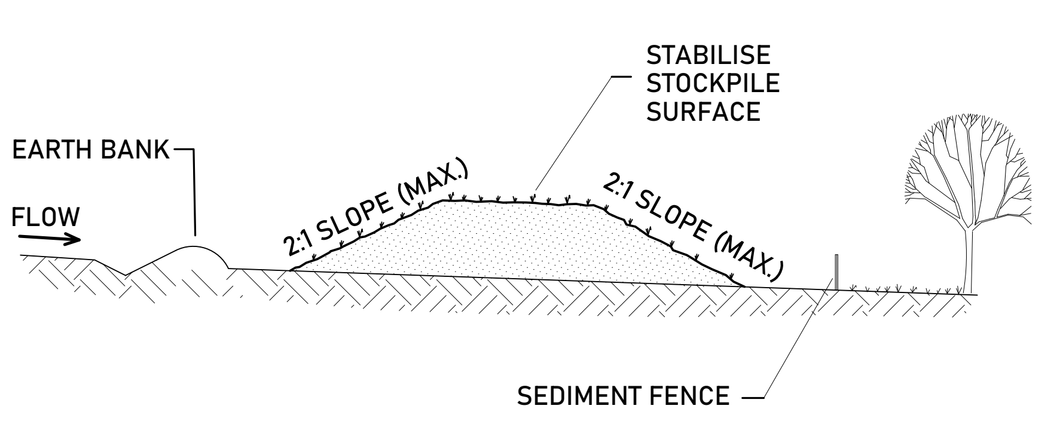


SECTION DETAIL

PLAN

SEDIMENT FENCE (SD 6-8) DETAIL

NTS



STOCKPILE (SD 4-1) DETAIL

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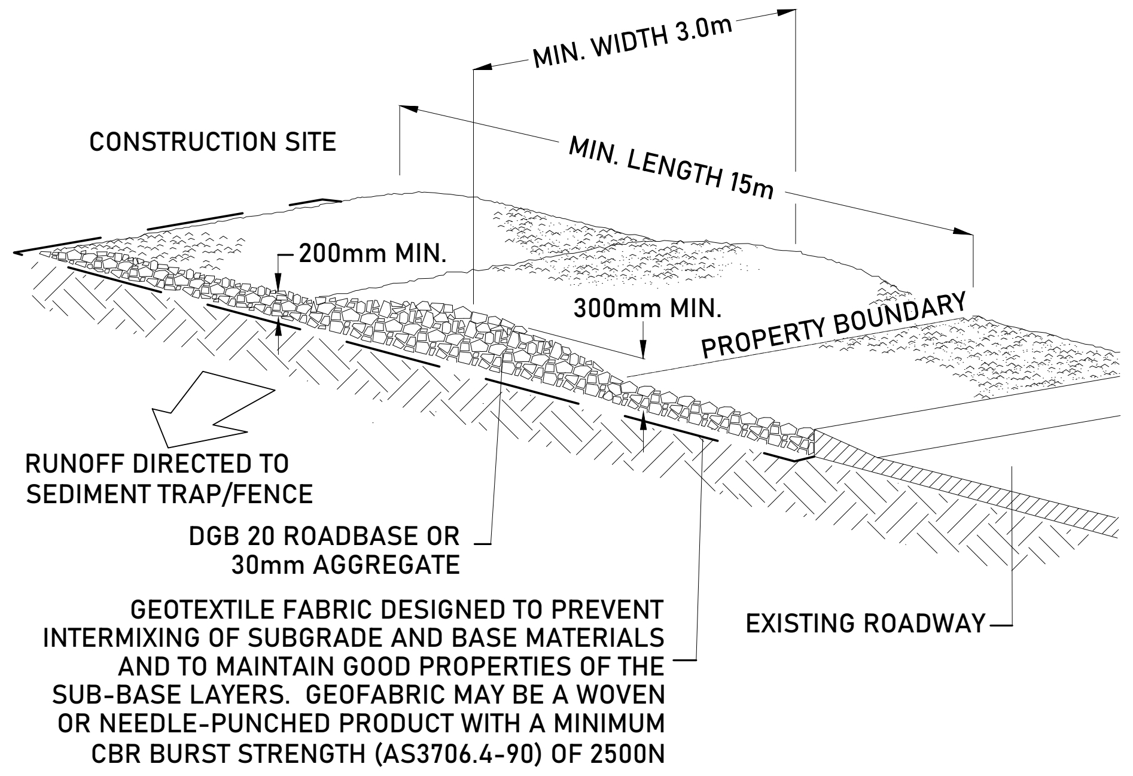

STABILISED SITE ACCESS (SD 6-14) DETAIL

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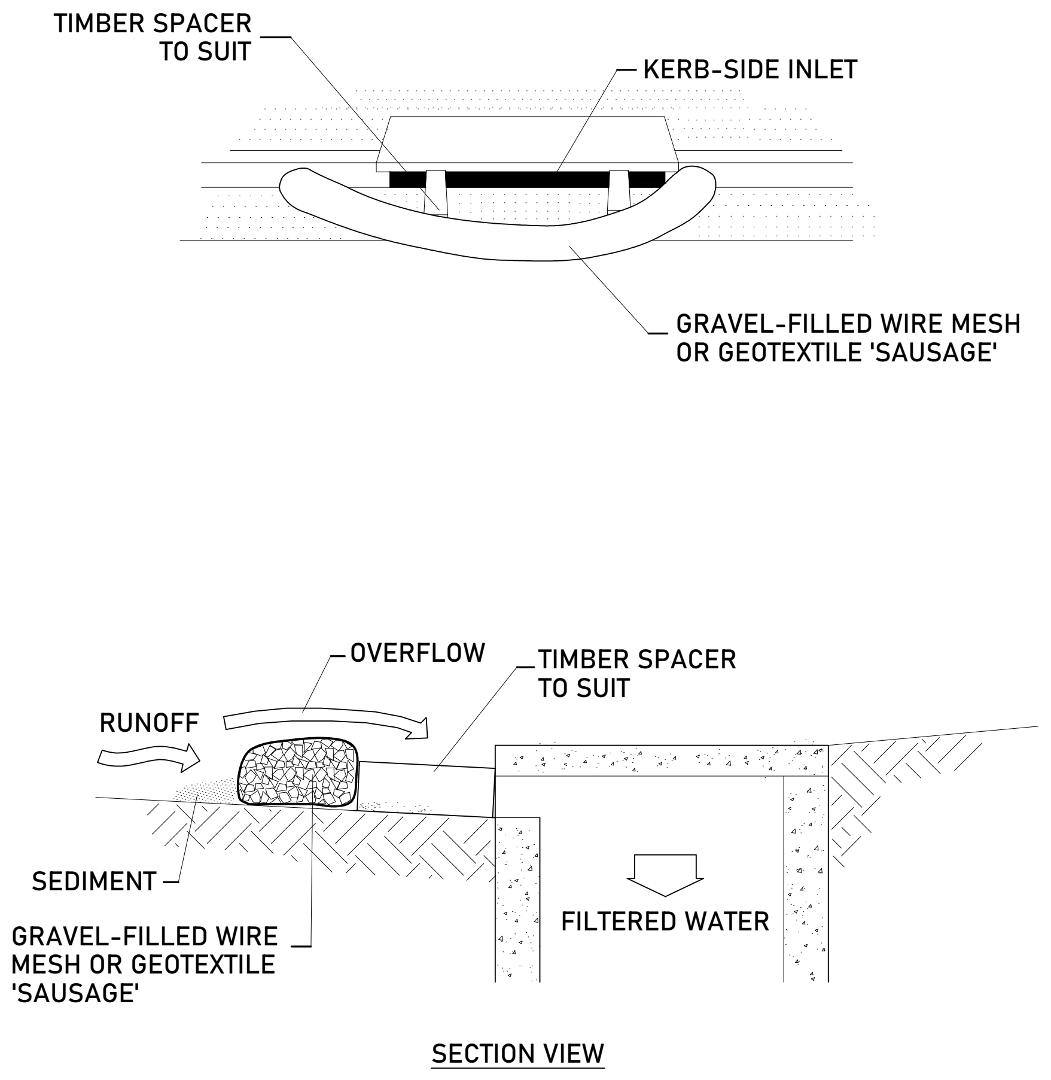

SECTION VIEW

NOTE: THIS PRACTICE IS ONLY TO BE USED WHERE SPECIFIED IN AN APPROVED SWMP/ESCP.

MESH AND GRAVEL INLET FILTER (SD 6-11) DETAIL

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NOTES

ROAD PAVEMENT

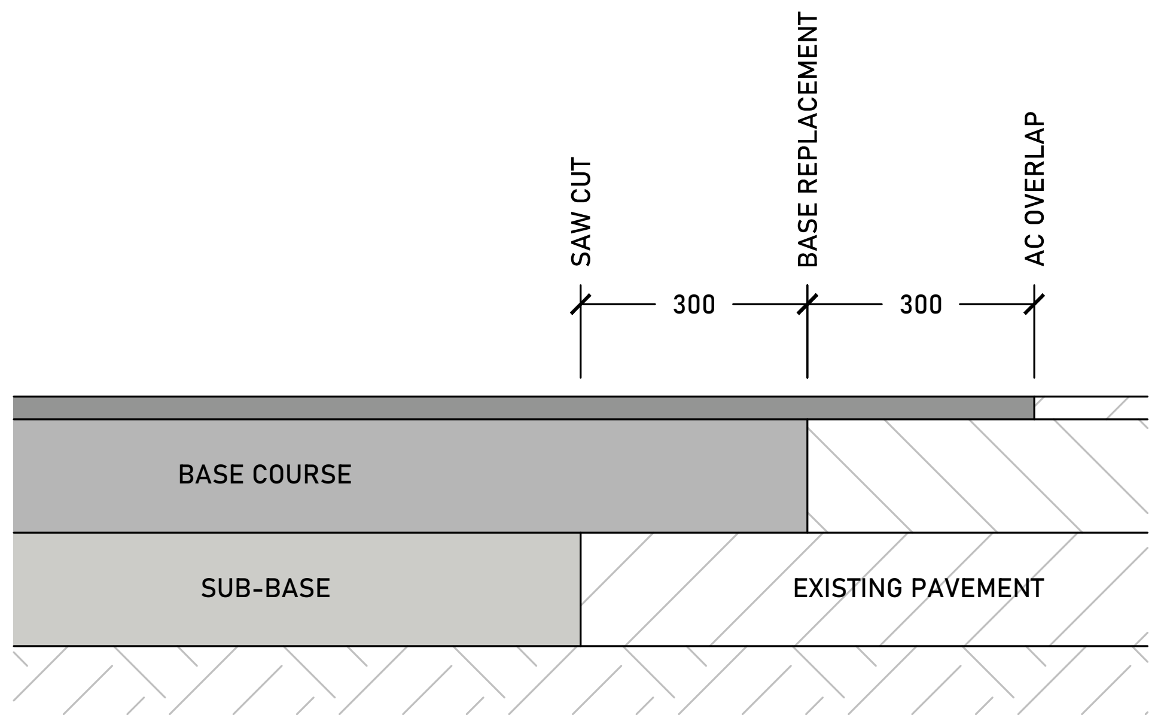
1. ROAD PAVEMENT CONSTRUCTION IS TO BE CARRIED OUT IN ACCORDANCE WITH THE APPROVED GEOTECHNICAL REPORT. IF THE STANDARD OR REQUIREMENTS FOR WORK SHOWN ON THE DRAWINGS DIFFER FROM THAT REQUIRED BY THE APPROVED GEOTECHNICAL REPORT, THE REQUIREMENTS OF THE GEOTECHNICAL REPORT WILL GENERALLY PREVAIL. CLARIFICATION SHALL BE SOUGHT FROM METIRI SHOULD DISCREPANCIES ARISE.
2. INSPECTION SHOULD BE CARRIED OUT BY A GEOTECHNICAL AUTHORITY DURING CONSTRUCTION TO VERIFY THE CONDITIONS ASSUMED IN THE GEOTECHNICAL REPORT AND IN THE DESIGN.

KERB & GUTTER

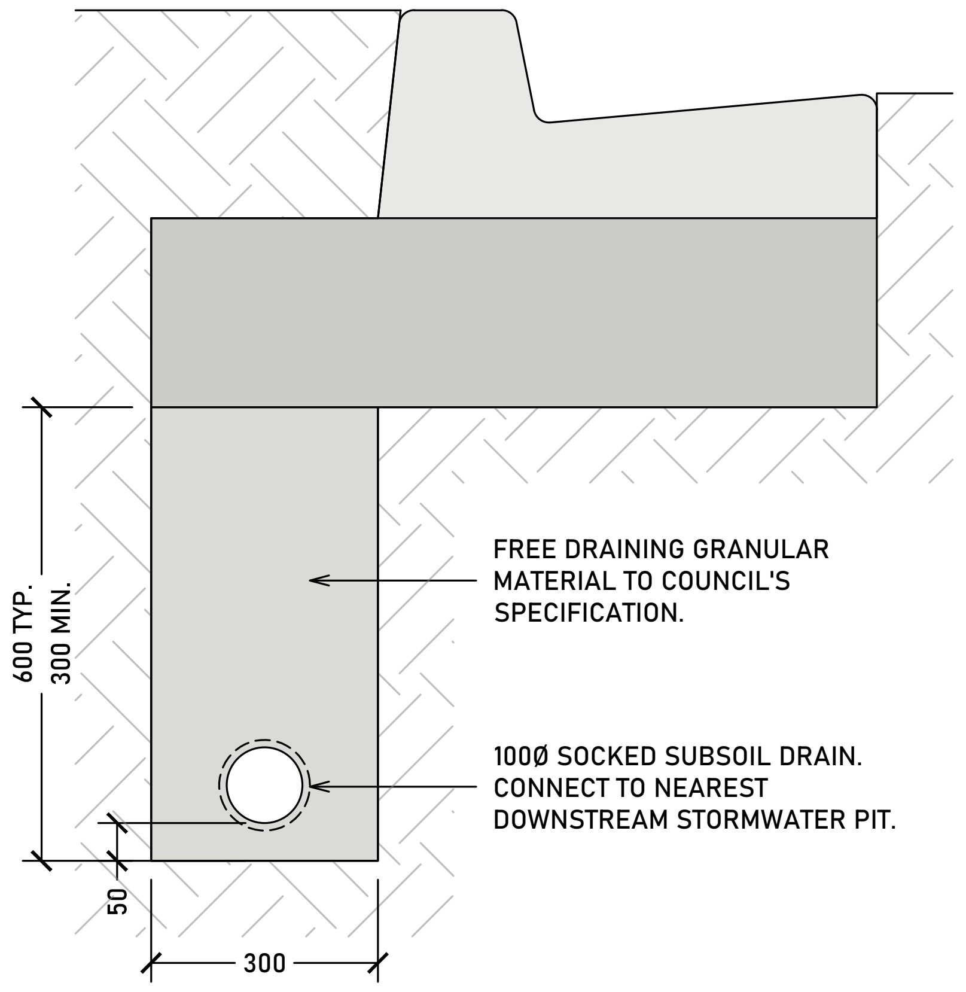
1. ALL EXPOSED KERB EDGES ARE TO BE ROUNDED TO 20mm RADIUS.
2. ALL KERB IS TO BE CONSTRUCTED WITH 25MPa CONCRETE.
3. CONTROL JOINTS ARE TO BE PROVIDED EVERY 2.5-3.0m AND EXPANSION JOINTS TO BE PROVIDED EVERY 15m AND AT EVERY LAYBACK, LINTEL AND KERB RAMP.

SUBSOIL DRAINAGE

1. MINIMUM SUBSOIL TRENCH DEPTH IS TO BE 600MM IN EARTH AND 450MM IN ROCK.
2. TRENCHES ARE TO BE LOCATED BELOW INVERT LEVEL OF ANY SERVICE CROSSINGS.
3. PAVEMENT LAYERS ARE TO EXTEND TO AT LEAST THE LINE OF THE REAR OF THE TRENCH.
4. MINIMUM LONGITUDINAL GRADE IS 1.0%. FOR NON-CORRUGATED PIPES. AN ABSOLUTE MINIMUM GRADE OF 0.5% IS ACCEPTABLE.
5. CLEANOUT POINTS ARE TO BE PROVIDED AT THE COMMENCEMENT OF EACH RUN OF SUBSOIL DRAINAGE LINE AND AT INTERVALS NOT EXCEEDING 80M.



DETAIL - TYPICAL PAVEMENT CONNECTION
NTS



DETAIL - SUBSOIL DRAINAGE
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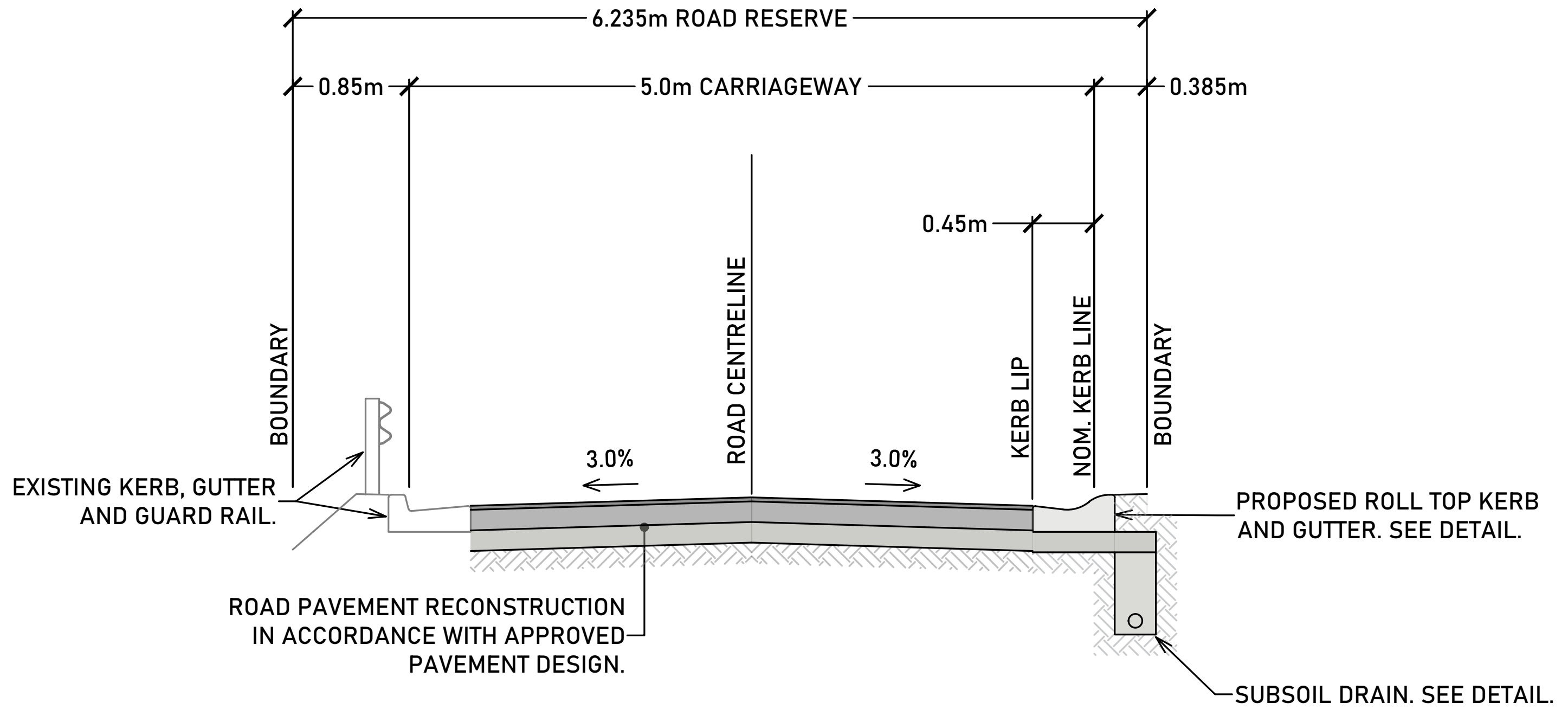

PROPOSED LANE - SECTION 1
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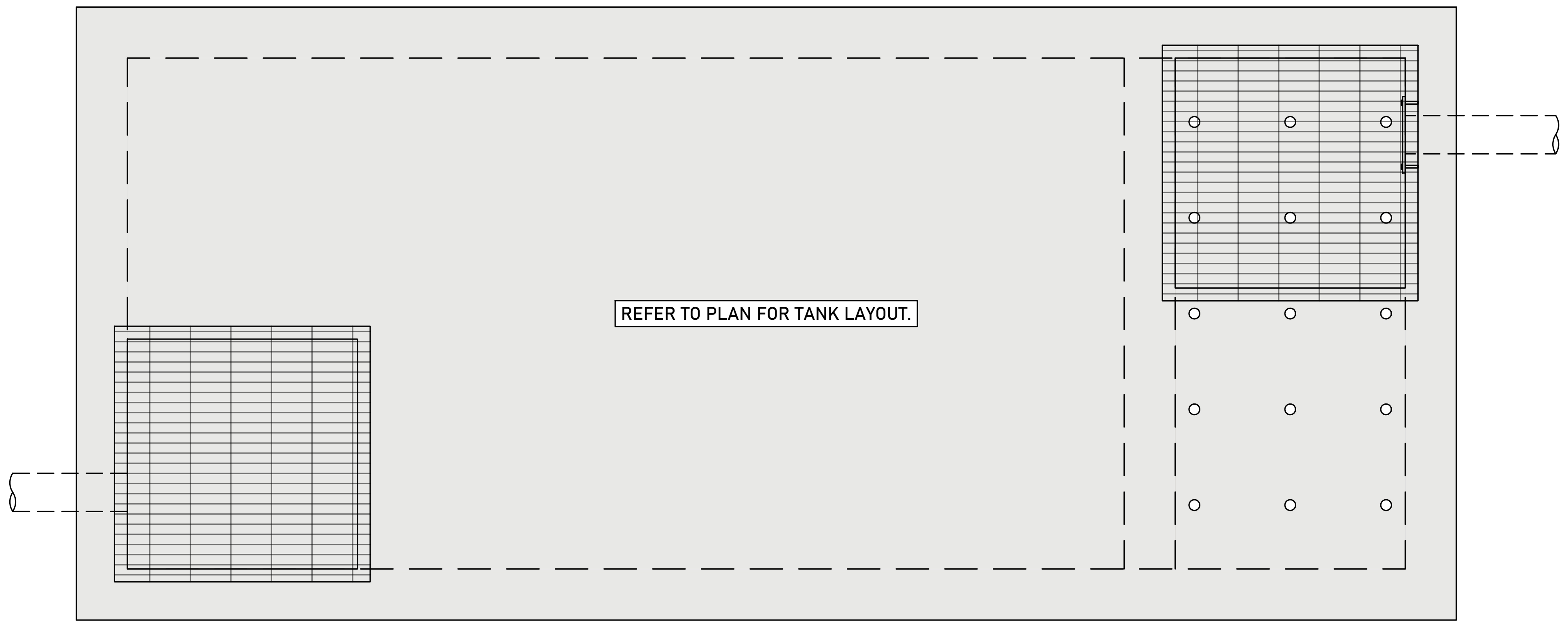

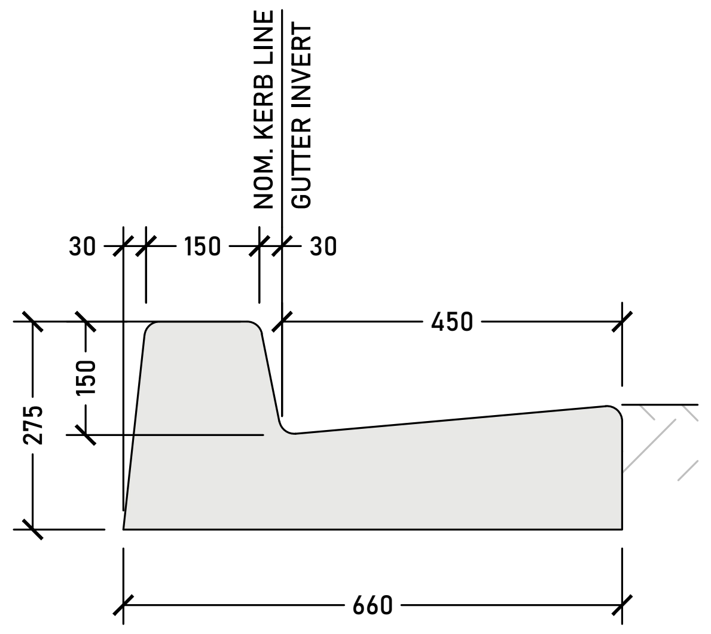

DETAIL - STANDARD KERB & GUTTER
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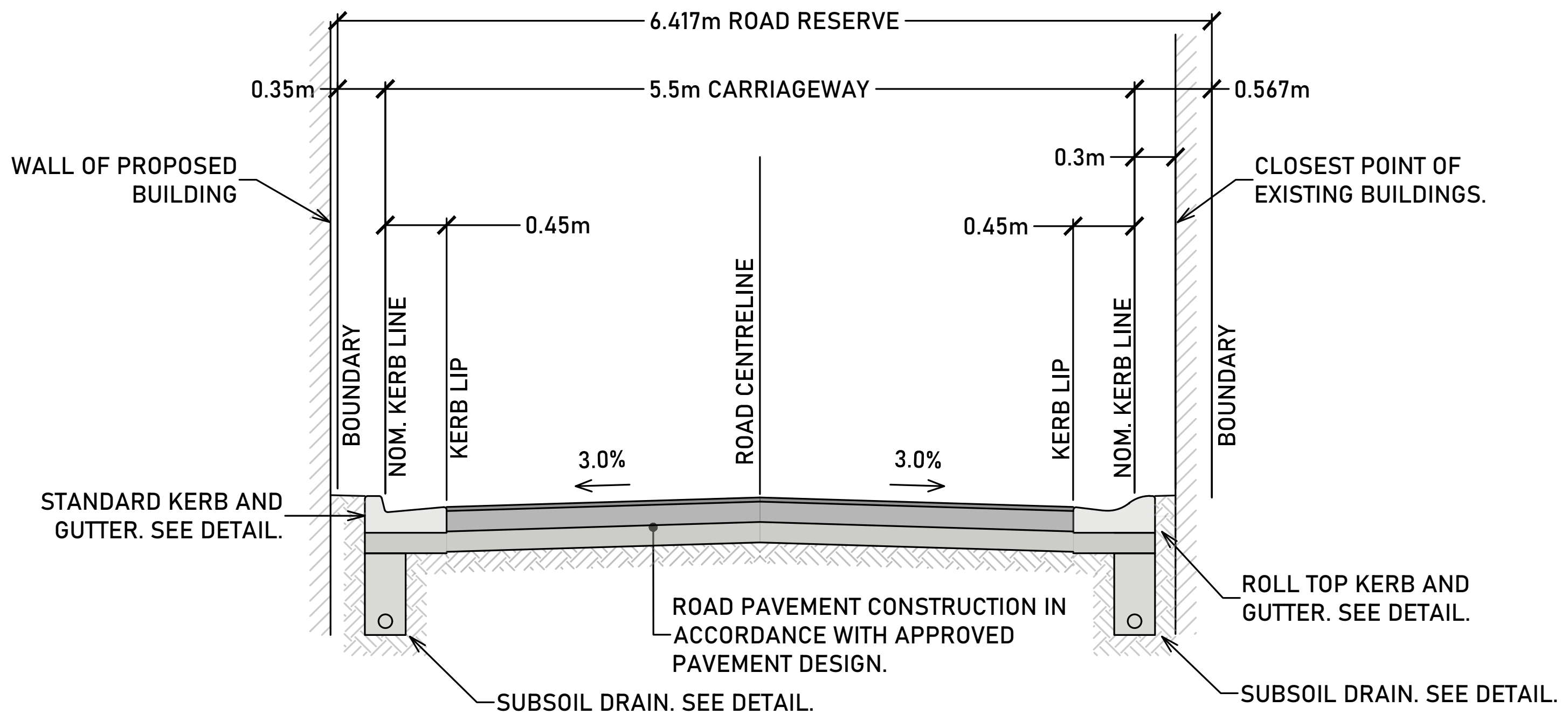

PROPOSED LANE - SECTION 2
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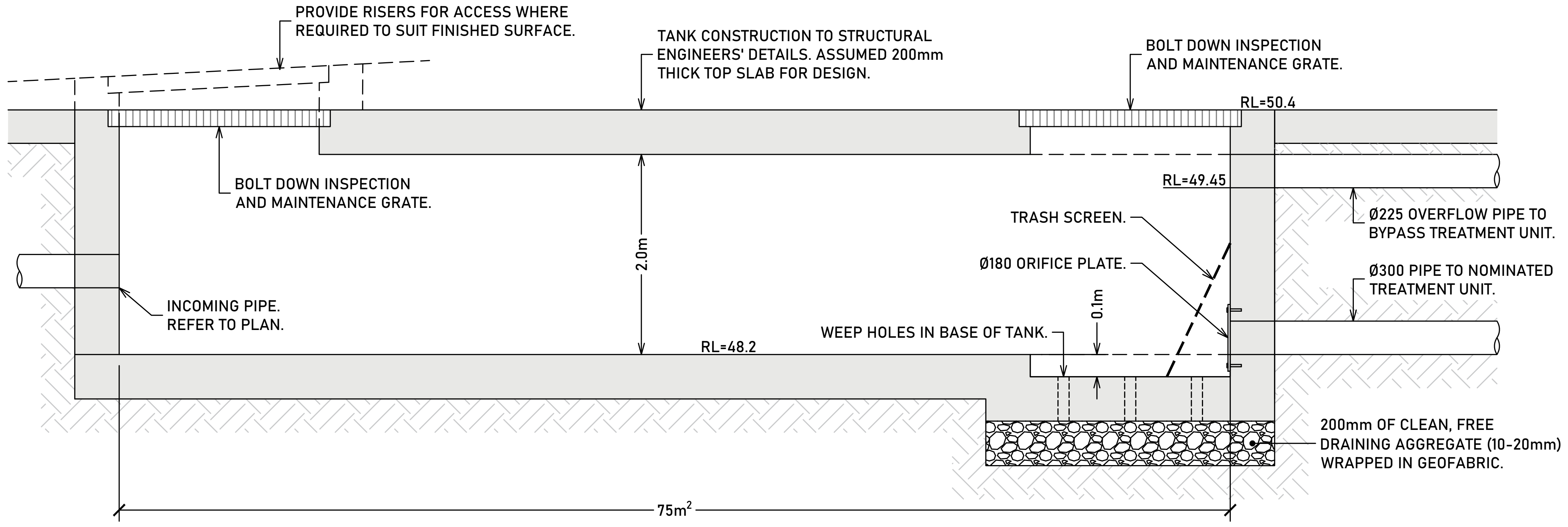

DETAIL - CONCRETE DETENTION TANK
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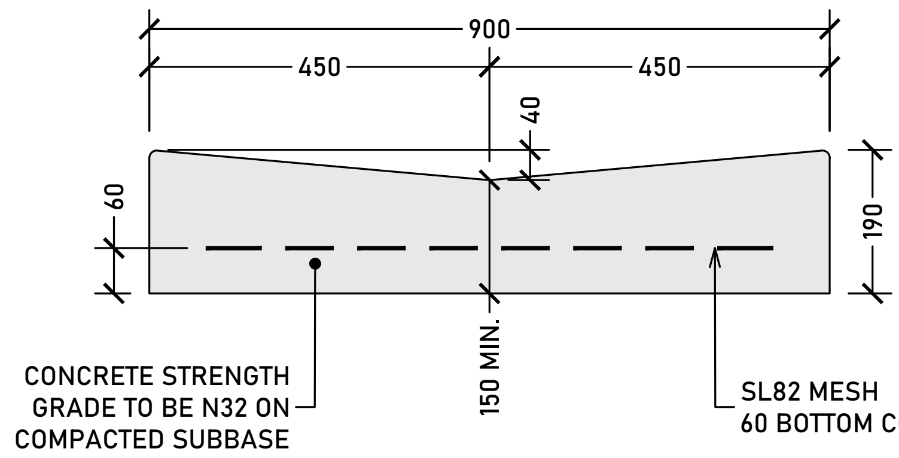
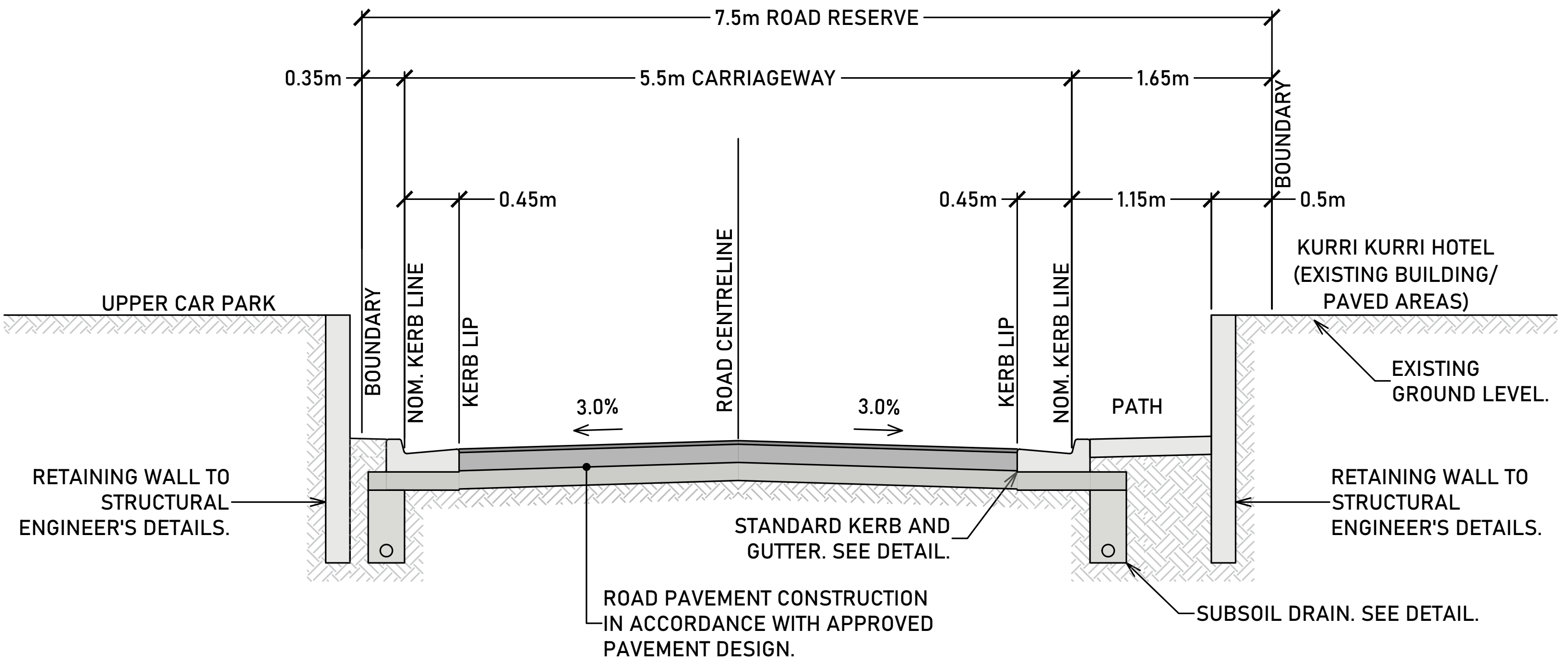


DETAIL - DISHED CROSSING (MODIFIED SB)
NTS



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REV.	REVISION DETAILS	DES	DWN	CHK	DATE
0	DRAFT ISSUE FOR REVIEW	JRR	MHM	JRR	08/12/22
1	UPDATED FOR DA SUBMISSION	JRR	MHM	JRR	13/12/22
2	UPDATES TO PROPOSED LANE WORKS	JRR	MHM	JRR	15/08/23

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PROJECT
CIVIL ENGINEERING PLANS
WOOLWORTHS KURRI KURRI
LOT 136 DP 869710
174-178 LANG STREET, KURRI KURRI

SHEET TITLE
TYPICAL SECTIONS & DETAILS

CLIENT
VOTRAINT NO 124 PTY LTD

PROJECT NUMBER	SHEET NUMBER	TOTAL SHEETS	REVISION
220265	05	09	2

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PLOT DATE: 17/08/2023

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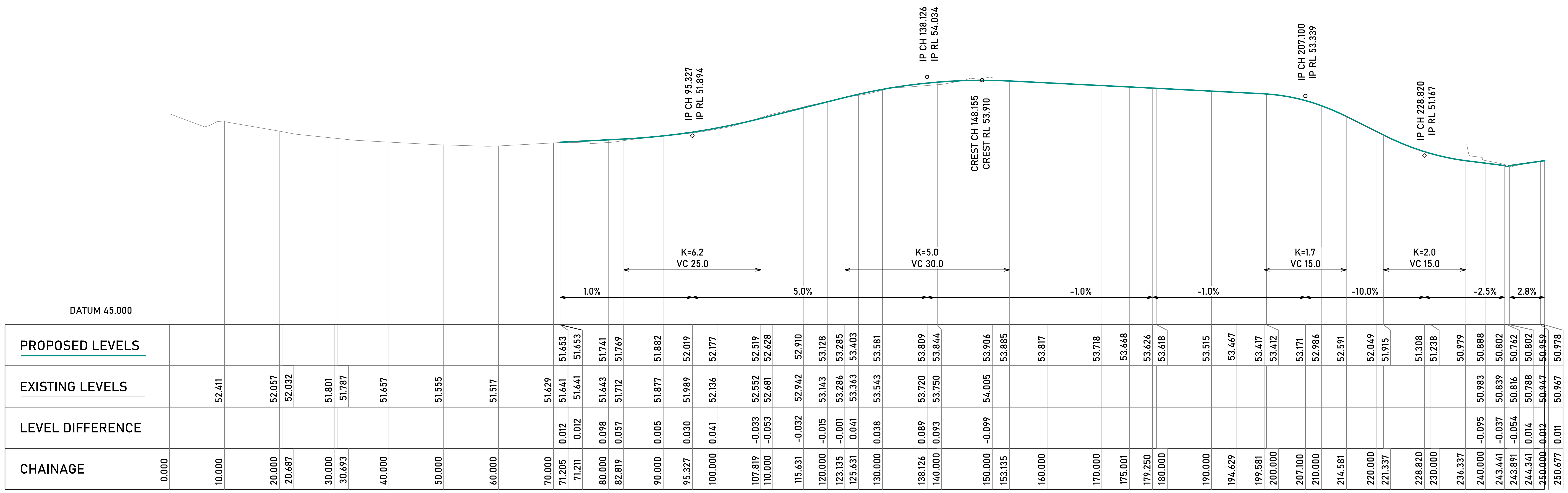
PLOT DATE: 17/08/2023



CHAINAGE	PROPOSED LEVELS	EXISTING LEVELS	LEVEL DIFFERENCE
0.000			
10.000		52.411	
20.000		52.057	
20.687		52.032	
30.000		51.801	
30.693		51.787	
40.000		51.657	
50.000		51.555	
60.000		51.517	
70.000		51.629	
71.205	51.653	51.641	0.012
71.211	51.653	51.641	0.012
80.000	51.741	51.643	0.098
82.819	51.769	51.712	0.057
90.000	51.882	51.877	0.005
95.327	52.019	51.989	0.030
100.000	52.177	52.136	0.041
107.819	52.519	52.552	-0.033
110.000	52.628	52.681	-0.053
115.631	52.910	52.942	-0.032
120.000	53.128	53.143	-0.015
123.135	53.285	53.286	-0.001
125.631	53.403	53.363	0.041
130.000	53.581	53.543	0.038
138.126	53.809	53.720	0.089
140.000	53.844	53.750	0.093
150.000	53.906	54.005	-0.099
153.135	53.885		
160.000	53.817		
170.000	53.718		
175.001	53.668		
179.250	53.626		
180.000	53.618		
190.000	53.515		
194.629	53.467		
199.581	53.417		
200.000	53.412		
207.100	53.171		
210.000	52.986		
214.581	52.591		
220.000	52.049		
221.337	51.915		
228.820	51.308		
230.000	51.238		
236.337	50.979		
240.000	50.888	50.983	-0.095
243.441	50.802	50.839	-0.037
243.891	50.762	50.816	-0.054
244.341	50.802	50.788	0.014
250.000	50.959	50.947	0.012
250.677	50.978	50.967	0.011

LANE-CL PROFILE
(5x VERTICAL EXAGGERATION)

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2	UPDATES TO PROPOSED LANE WORKS	JRR	MHM	JRR	15/08/23

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PROJECT
CIVIL ENGINEERING PLANS
WOOLWORTHS KURRI KURRI
LOT 136 DP 869710
174-178 LANG STREET, KURRI KURRI

CLIENT
VOTRAINT NO 124 PTY LTD

SHEET TITLE
ROAD PROFILES

PROJECT NUMBER	SHEET NUMBER	TOTAL SHEETS	REVISION
220265	06	09	2

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NOTES

CATCHMENTS

THE PRE-DEVELOPED SITE CONSISTS OF A SINGLE CATCHMENT CONTRIBUTING STORMWATER RUNOFF IN A SOUTH-EASTERLY DIRECTION TOWARDS BARTON STREET. PRE-DEVELOPED CATCHMENT PROPERTIES ARE PROVIDED IN THE TABLE BELOW.

PRE-DEVELOPED CATCHMENT PROPERTIES

CATCHMENT	SITE
AREA - TOTAL (ha)	0.570
AREA - IMPERVIOUS (ha)	0.000
AREA - PERVIOUS (ha)	0.570
% IMPERVIOUS	0.0
AVERAGE SLOPE (%)	5.0

ONCE DEVELOPED AS PROPOSED, THE SITE WILL GENERALLY RETAIN THE PRE-DEVELOPED CATCHMENTS ALTHOUGH WITH ALTERED PROPERTIES.

POST-DEVELOPED CATCHMENT PROPERTIES ARE PROVIDED IN THE TABLE BELOW.

POST-DEVELOPED CATCHMENT PROPERTIES

CATCHMENT	TO OSD
AREA - TOTAL (ha)	0.570
AREA - IMPERVIOUS (ha)	0.557
AREA - PERVIOUS (ha)	0.013
% IMPERVIOUS	97.7
AVERAGE SLOPE (%)	1.0

HYDROLOGICAL ANALYSIS

A PRELIMINARY HYDROLOGICAL MODEL WAS DEVELOPED USING INFOWORKS ICM SOFTWARE. STORM ENSEMBLES, TYPICALLY CONSISTING OF 10 STORMS FOR EACH AEP FOR EACH NOMINATED DURATION, WERE PRODUCED USING THE ARR STORM GENERATOR. FROM HERE, THE ENSEMBLE STATISTICS TOOL WAS USED TO DETERMINE THE STATISTICAL MEAN AND MEDIAN STORM EVENTS, ALONG WITH ANY OUTLIERS. THE LARGEST MEDIAN STORM EVENT FOR EACH AEP IS THEN USED AS THE DESIGN STORM FOR THAT AEP.

AEP'S SELECTED FOR THE ANALYSIS WERE THE 20%, 10%, 5% AND 1%. THESE ARE CONSIDERED A SUITABLE RANGE OF EVENTS FOR SIZING OF MINOR AND MAJOR HYDRAULIC STRUCTURES INCLUDING STORMWATER DETENTION FACILITIES.

THE BOX AND WHISKER PLOTS PRODUCED USING THE ENSEMBLE STATISTICS TOOL ARE PROVIDED TO THE RIGHT. THE VALUES IN GREEN ARE THE PEAK DISCHARGE VALUES ASSOCIATED WITH THE LARGEST MEDIAN STORM EVENT FOR EACH AEP.

ONSITE DETENTION (OSD)

THE PROPOSED DEVELOPMENT IS REQUIRED TO ATTENUATE PEAK POST-DEVELOPED FLOW RATES TO LESS THAN OR EQUAL TO PRE-DEVELOPED RATES. IT IS PROPOSED TO ACHIEVE THIS BY ROUTING STORMWATER THROUGH AN UNDERGROUND DETENTION TANK LOCATED NEAR THE LOW POINT ON THE SITE, WITHIN THE LOWER CAR PARK.

A SIMPLIFIED HYDRAULIC MODEL WAS CREATED IN ICM TO DETERMINE THE REQUIRED STORAGE VOLUME AND OUTLET CONFIGURATION. A SCREENSHOT OF THE MODEL IS SHOWN TO THE RIGHT. THE MODEL ON THE LEFT REPRESENTS THE PRE-DEVELOPED SCENARIO WITH THE MODEL ON THE RIGHT REPRESENTING THE POST-DEVELOPED SCENARIO.

SEVERAL CONFIGURATIONS OF THE OSD SYSTEM WERE TESTED, WITH THE OPTIMAL CONFIGURATION TO MEET THE REQUIRED FLOW ATTENUATION DETAILED ON THE PREVIOUS SHEET(S).

RESULTS FROM THE OSD MODEL ARE SUMMARISED IN THE TABLE BELOW.

OSD MODEL RESULTS.

AEP	PEAK FLOW (L/s)	
	PRE-DEVELOPED	POST-DEVELOPED
20%	68.5	60.6
10%	96.4	95.1
5%	130.3	102.2
1%	206.8	181.8

RESULTS FROM THE MODEL SHOW THAT BY ROUTING STORMWATER RUNOFF THROUGH THE PROPOSED OSD SYSTEM, PEAK FLOWS ASSOCIATED WITH THE POST-DEVELOPED SITE ARE LESS THAN OR EQUAL TO THE PEAK FLOWS ASSOCIATED WITH THE PRE-DEVELOPED SITE.

THE PRE-DEVELOPED VS. POST-DEVELOPED SITE OUTFLOW HYDROGRAPHS FOR THE CRITICAL 20%, 10%, 5% AND 1% AEP STORM EVENTS ARE PROVIDED TO THE RIGHT. THE GREEN CURVE INDICATES THE PRE-DEVELOPED SCENARIO WITH THE RED CURVE INDICATING THE DEVELOPED SCENARIO.


Box and Whisker Plot

Selected AEP: 20% Display: Median

Comparison of Storm Ensembles of different durations for AEP = 20%

Box and Whisker Plot

Selected AEP: 10% Display: Median

Comparison of Storm Ensembles of different durations for AEP = 10%

Box and Whisker Plot

Selected AEP: 5% Display: Median

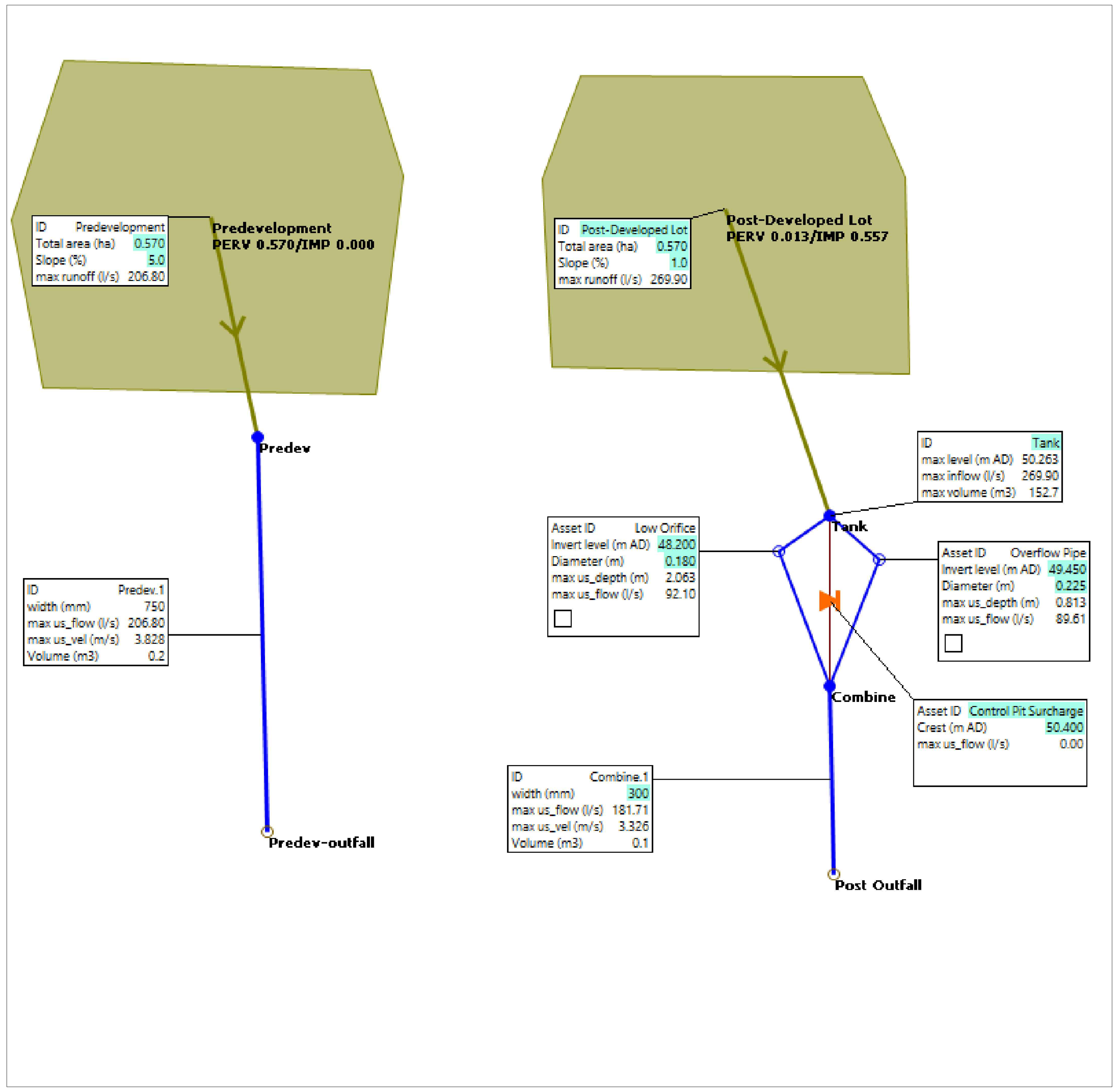
Comparison of Storm Ensembles of different durations for AEP = 5%

Box and Whisker Plot

Selected AEP: 1% Display: Median

Comparison of Storm Ensembles of different durations for AEP = 1%

STORM ENSEMBLES


ID Predevelopment
Total area (ha) 0.570
Slope (%) 5.0
max runoff (l/s) 206.80

ID Predev.1
width (mm) 750
max us_flow (l/s) 206.80
max us_vel (m/s) 3.828
Volume (m3) 0.2

ID Post-Developed Lot
Total area (ha) 0.570
Slope (%) 1.0
max runoff (l/s) 269.90

ID Tank
max level (m AD) 50.263
max inflow (l/s) 269.90
max volume (m3) 152.7

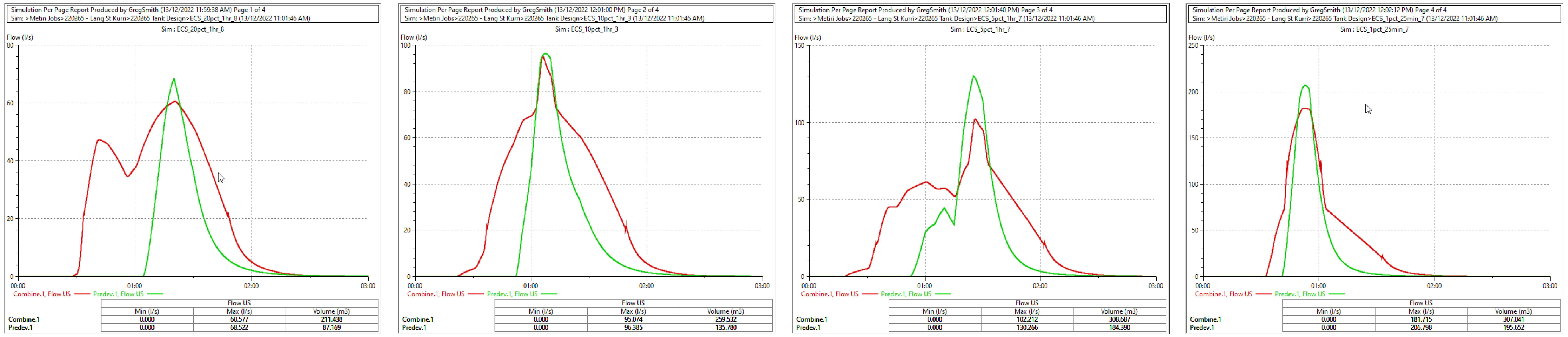
Asset ID Low Orifice
Invert level (m AD) 48.200
Diameter (m) 0.180
max us_depth (m) 2.063
max us_flow (l/s) 92.10

Asset ID Overflow Pipe
Invert level (m AD) 49.450
Diameter (m) 0.225
max us_depth (m) 0.813
max us_flow (l/s) 89.61

Asset ID Control Pit Surcharge
Crest (m AD) 50.400
max us_flow (l/s) 0.00

ID Combine.1
width (mm) 300
max us_flow (l/s) 181.71
max us_vel (m/s) 3.326
Volume (m3) 0.1

ICM MODEL (20% RESULTS DISPLAYED)


Simulation Per Page Report Produced by GregSmith (13/12/2022 11:59:38 AM) Page 1 of 4
Sim: >Metiri Jobs>220265 - Lang St Kurri>220265 Tank Design>ECS_20pct_1hr_8 (13/12/2022 11:01:46 AM)
Sim : ECS_20pct_1hr_8

	Flow US		
	Min (l/s)	Max (l/s)	Volume (m3)
Combine.1	0.000	60.577	211.438
Predev.1	0.000	68.522	87.169

Simulation Per Page Report Produced by GregSmith (13/12/2022 12:01:00 PM) Page 2 of 4
Sim: >Metiri Jobs>220265 - Lang St Kurri>220265 Tank Design>ECS_10pct_1hr_3 (13/12/2022 11:01:46 AM)
Sim : ECS_10pct_1hr_3

	Flow US		
	Min (l/s)	Max (l/s)	Volume (m3)
Combine.1	0.000	95.074	259.532
Predev.1	0.000	96.385	135.780

Simulation Per Page Report Produced by GregSmith (13/12/2022 12:01:40 PM) Page 3 of 4
Sim: >Metiri Jobs>220265 - Lang St Kurri>220265 Tank Design>ECS_5pct_1hr_7 (13/12/2022 11:01:46 AM)
Sim : ECS_5pct_1hr_7

	Flow US		
	Min (l/s)	Max (l/s)	Volume (m3)
Combine.1	0.000	102.212	308.687
Predev.1	0.000	130.266	184.390

Simulation Per Page Report Produced by GregSmith (13/12/2022 12:02:12 PM) Page 4 of 4
Sim: >Metiri Jobs>220265 - Lang St Kurri>220265 Tank Design>ECS_1pct_25min_7 (13/12/2022 11:01:46 AM)
Sim : ECS_1pct_25min_7

	Flow US		
	Min (l/s)	Max (l/s)	Volume (m3)
Combine.1	0.000	181.715	307.041
Predev.1	0.000	206.798	195.652

HYDROGRAPHS

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0	DRAFT ISSUE FOR REVIEW	JRR	MHM	JRR	08/12/22
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PROJECT
CIVIL ENGINEERING PLANS
WOOLWORTHS KURRI KURRI
LOT 136 DP 869710
174-178 LANG STREET, KURRI KURRI

SHEET TITLE
ONSITE DETENTION CALCULATIONS

CLIENT
VOTRAINT NO 124 PTY LTD

PROJECT NUMBER	SHEET NUMBER	TOTAL SHEETS	REVISION
220265	07	09	2

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NOTES

STORMWATER QUALITY TREATEMENT

A MUSIC MODEL WAS DEVELOPED TO ESTIMATE EXPECTED POLLUTANT LOADINGS AND SPECIFY STORMWATER QUALITY TREATMENT DEVICES.

SOURCE NODES WERE CREATED FOR ROOFS, ROADS, HARDSTANDS, AND LANDSCAPED AREAS; POLLUTANT CONCENTRATION PARAMETERS FOR THE SOURCE NODES WERE ADOPTED FROM THE NSW MUSIC MODELLING GUIDELINES.

INPUT PARAMETERS FOR THE MUSIC MODEL ARE PROVIDED IN THE TABLE BELOW.

MUSIC MODEL INPUT PARAMETERS.

	AREA (ha)	% IMPERVIOUS
SITE	0.570	98
ROOF	0.439	100
CAR PARK	0.094	100
BALANCE	0.037	64

THE PROPOSED DEVELOPMENT IS REQUIRED TO TREAT STORMWATER PRIOR TO DISCHARGING FROM THE SITE. COUNCIL'S TREATMENT TARGETS, REPRESENTED BY REDUCTION %, ARE OUTLINED BELOW:

- GROSS POLLUTANTS (GP) - 70%.
- TOTAL SUSPENDED SOLIDS (TSS) - 80%
- TOTAL PHOSPHORUS (TP) - 45%
- TOTAL NITROGEN (TN) - 45%

IT IS PROPOSED TO ACHIEVE THESE TREATMENT TARGETS BY ROUTING STORMWATER THROUGH A SERIES OF WATER QUALITY TREATMENT DEVICES CONSISTING OF:

- PROPRIETARY PIT INSERTS WITHIN SURFACE ENTRY STORMWATER PITS.
- UNDERGROUND DETENTION TANK.
- ECOSOL STORM PIT CLASS 2 (OR APPROVED EQUIVALENT) STORMWATER TREATMENT DEVICE.

A MUSIC MODEL WAS CREATED TO DETERMINE THE SIZING AND CONFIGURATION OF THE WATER QUALITY TREATMENT DEVICES. A SCREENSHOT OF THE MODEL IS SHOWN TO THE RIGHT.

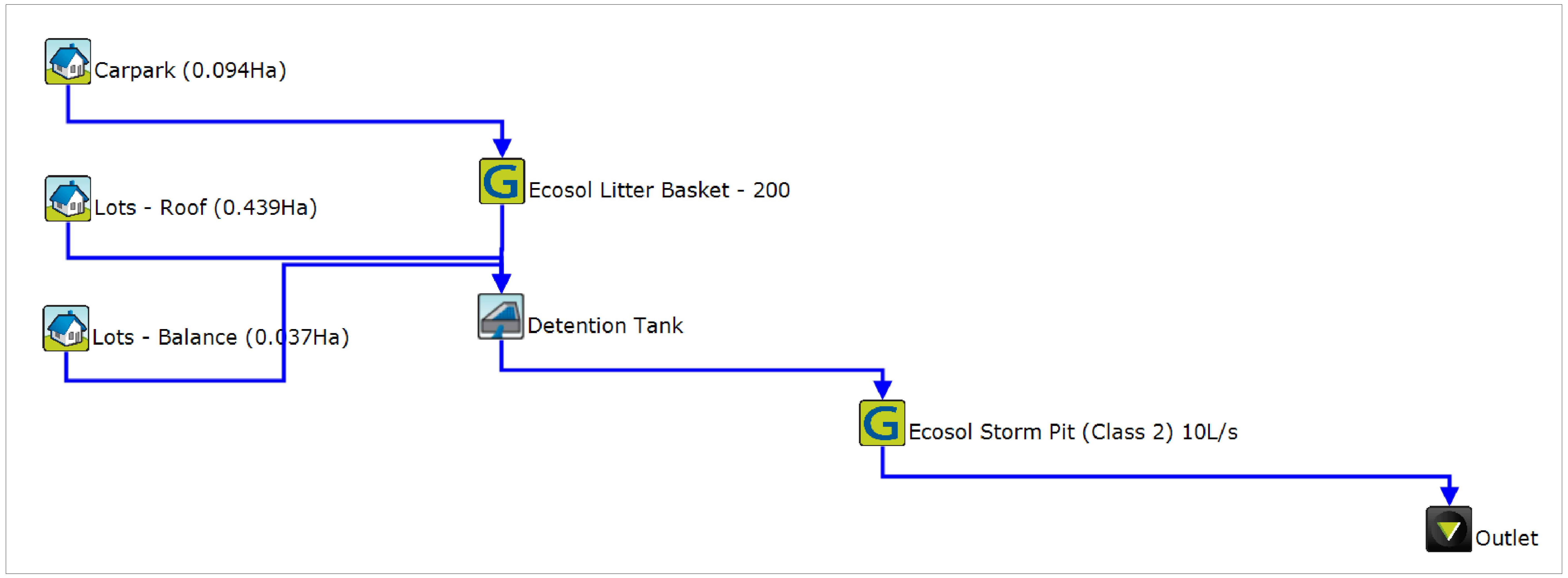
SEVERAL CONFIGURATIONS OF THE TREATMENT DEVICES WERE TESTED WITH THE OPTIMAL CONFIGURATION TO MEET THE REQUIRED TREATMENT TARGETS DETAILED ON THE PREVIOUS SHEETS.

RESULTS OF THE MUSIC MODEL DEMONSTRATES THE PROPOSED TREATMENT TRAIN EXCEEDS THE POLLUTANT REMOVAL TARGETS REQUIRED BY COUNCIL. A SUMMARY OF THE MUSIC MODEL RESULTS ARE PROVIDED IN THE TABLE BELOW.

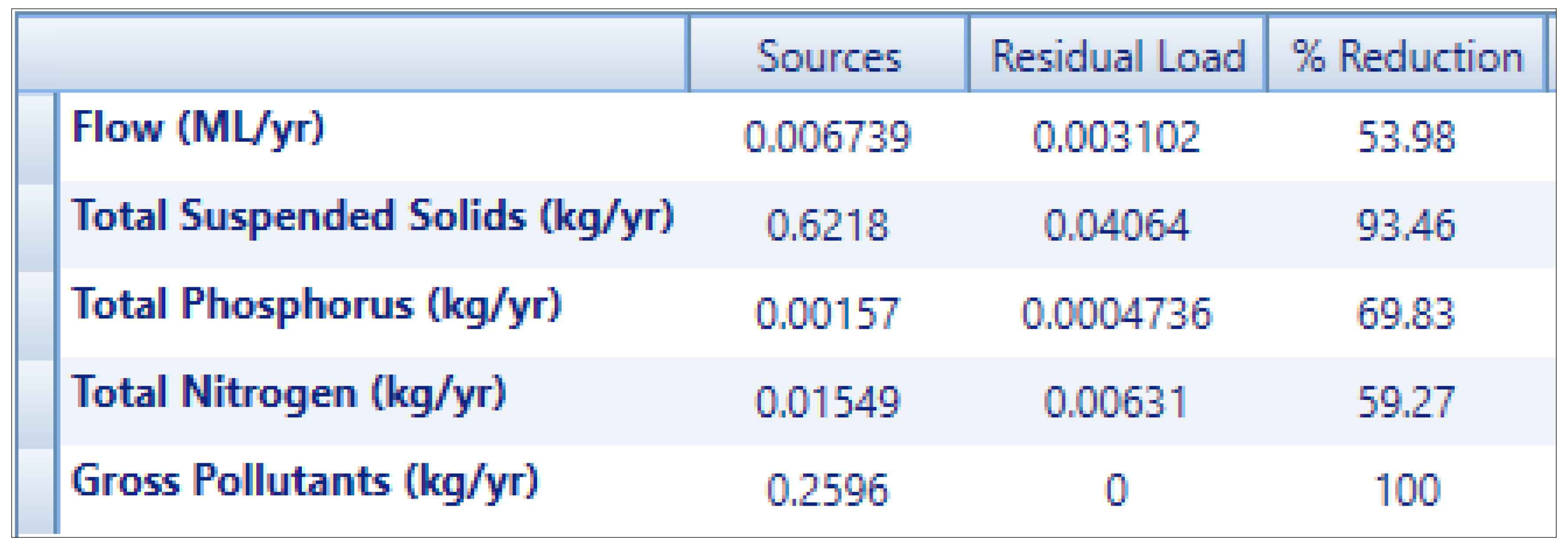
MUSIC MODEL RESULTS

POLLUTANT	REDUCTION (%)	
	MINIMUM	ACHIEVED
GROSS POLLUTANTS (GP)	70.0	100
TOTAL SUSPENDED SOLIDS (TSS)	80.0	93.46
TOTAL PHOSPHORUS (TP)	45.0	69.83
TOTAL NITROGEN (TN)	45.0	59.27

A SCREENSHOT OF THE TREATMENT TRAIN EFFECTIVENESS REPORT FOR THE RECEIVING NODE IS SHOWN TO THE RIGHT.



MUSIC MODEL



	Sources	Residual Load	% Reduction
Flow (ML/yr)	0.006739	0.003102	53.98
Total Suspended Solids (kg/yr)	0.6218	0.04064	93.46
Total Phosphorus (kg/yr)	0.00157	0.0004736	69.83
Total Nitrogen (kg/yr)	0.01549	0.00631	59.27
Gross Pollutants (kg/yr)	0.2596	0	100

TREATMENT TRAIN EFFECTIVENESS REPORT (RECEIVING NODE).

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PROJECT
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174-178 LANG STREET, KURRI KURRI

CLIENT
VOTRAINT NO 124 PTY LTD

SHEET TITLE
STORMWATER QUALITY TREATMENT
CALCULATIONS

PROJECT NUMBER	SHEET NUMBER	TOTAL SHEETS	REVISION
220265	08	09	2

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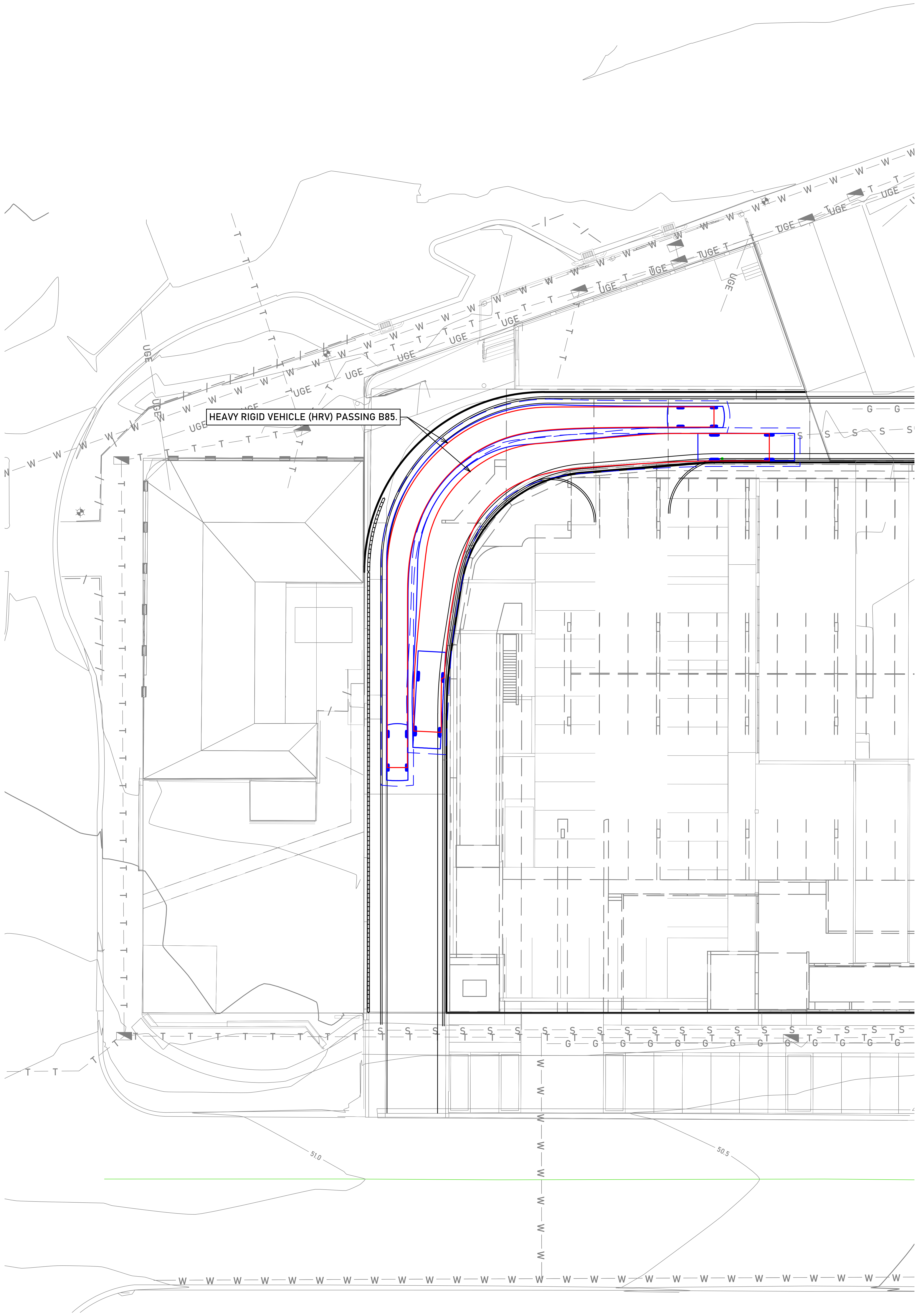
LEGEND

▨	PROPOSED CONCRETE AREAS
■	PROPOSED AC AREAS
🟩	PROPOSED LANDSCAPED/UNDEVELOPED AREAS
—— ——	SURFACE CONTOURS (EXISTING/PROPOSED)
+10.000E +10.000	SURFACE LEVEL (EXISTING/PROPOSED)
5.00%E 5.00%	SURFACE SLOPE (EXISTING/PROPOSED)
▭▭▭ ▭▭▭	RETAINING WALL (EXISTING/PROPOSED)
— S — S — S — S —	EXISTING SEWER MAINS
— W — W — W — W —	EXISTING WATER MAINS
— OHP — OHP —	EXISTING OVERHEAD ELECTRICITY
— UGE — UGE —	EXISTING UNDERGROUND ELECTRICITY
— T — T — T — T —	EXISTING TELECOMMUNICATIONS
— G — G — G — G —	EXISTING GAS MAINS
▬ ▬ ▬ ▬	STORMWATER PIPE (EXISTING/PROPOSED)
▣ ▣	KERB INLET PIT (EXISTING/PROPOSED)
▦ ▦	GRATED PIT (EXISTING/PROPOSED)
▢ ▢	SEALED PIT (EXISTING/PROPOSED)
⏢ ⏢	HEADWALL OUTLET (EXISTING/PROPOSED)
—<—<— —<—<—	TABLE DRAIN/SWALE (EXISTING/PROPOSED)
🟥 ——	FORWARD MOVEMENT - WHEEL PATH
🟦 ——	FORWARD MOVEMENT - BODY PATH
🟦 — — —	FORWARD MOVEMENT - BODY PATH 0.5m BUFFER
🟩 ——	REVERSE MOVEMENT - WHEEL PATH
🟨 ——	REVERSE MOVEMENT - BODY PATH
🟨 — — —	REVERSE MOVEMENT - BODY PATH 0.5m BUFFER

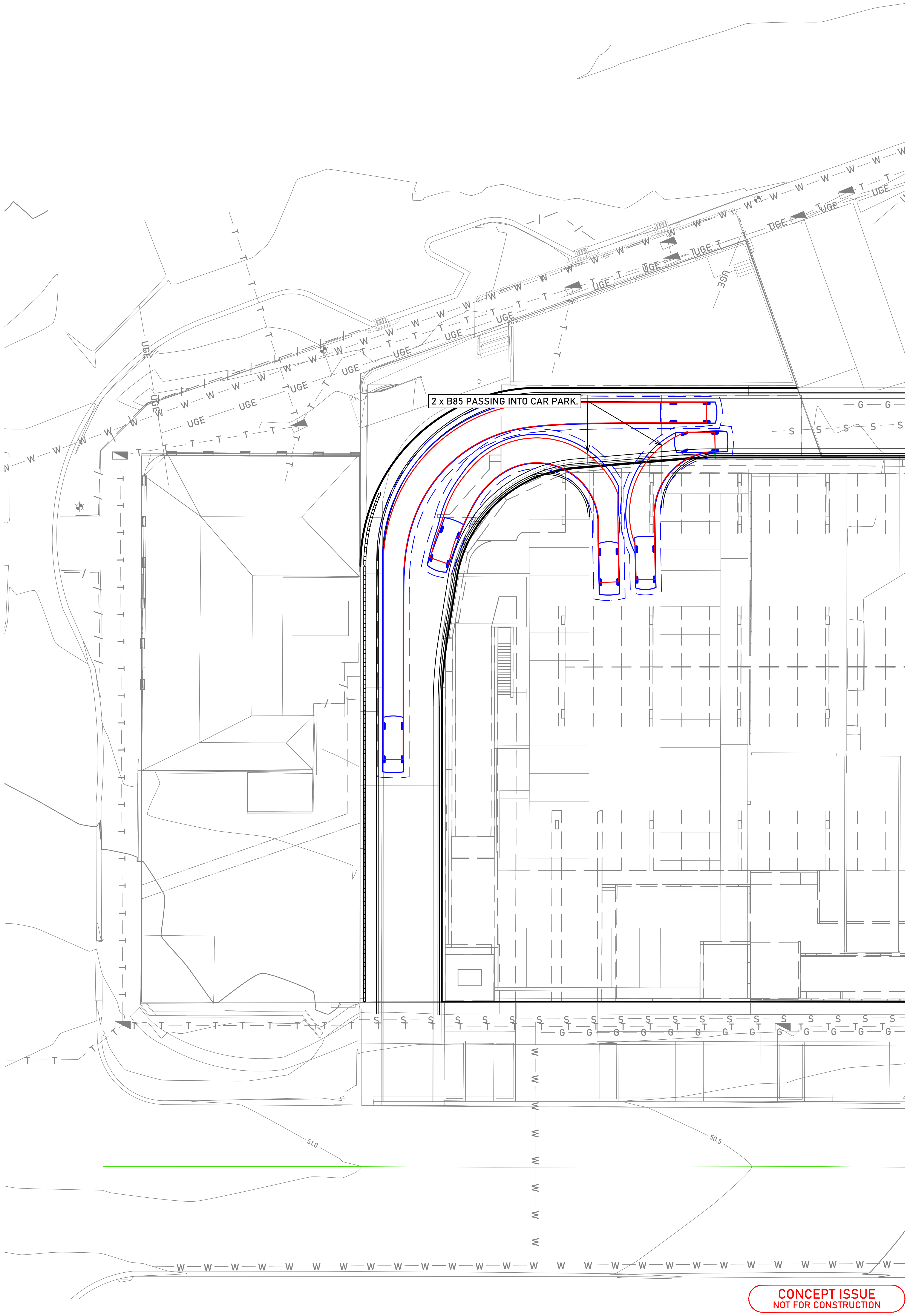
NOTES

VEHICLE MOVEMENTS

1. VEHICLE MOVEMENTS ILLUSTRATED ON PLANS HAVE BEEN MODELLED USING AUTODESK VEHICLE TRACKER AND REPRESENT THE:
   - B85 TEMPLATE IN ACCORDANCE WITH AS2890.1.
   - HEAVY RIGID VEHICLE (HRV) TEMPLATE IN ACCORDANCE WITH AS2890.2.



HEAVY RIGID VEHICLE (HRV) PASSING B85.



2 x B85 PASSING INTO CAR PARK.

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12.50 0 6.25 12.50
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PROJECT
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CLIENT
VOTRAINT NO 124 PTY LTD

SHEET TITLE
VEHICLE MOVEMENTS PLAN

PROJECT NUMBER	SHEET NUMBER	TOTAL SHEETS	REVISION
220265	09	09	2

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