

CONCEPT CIVIL DESIGN

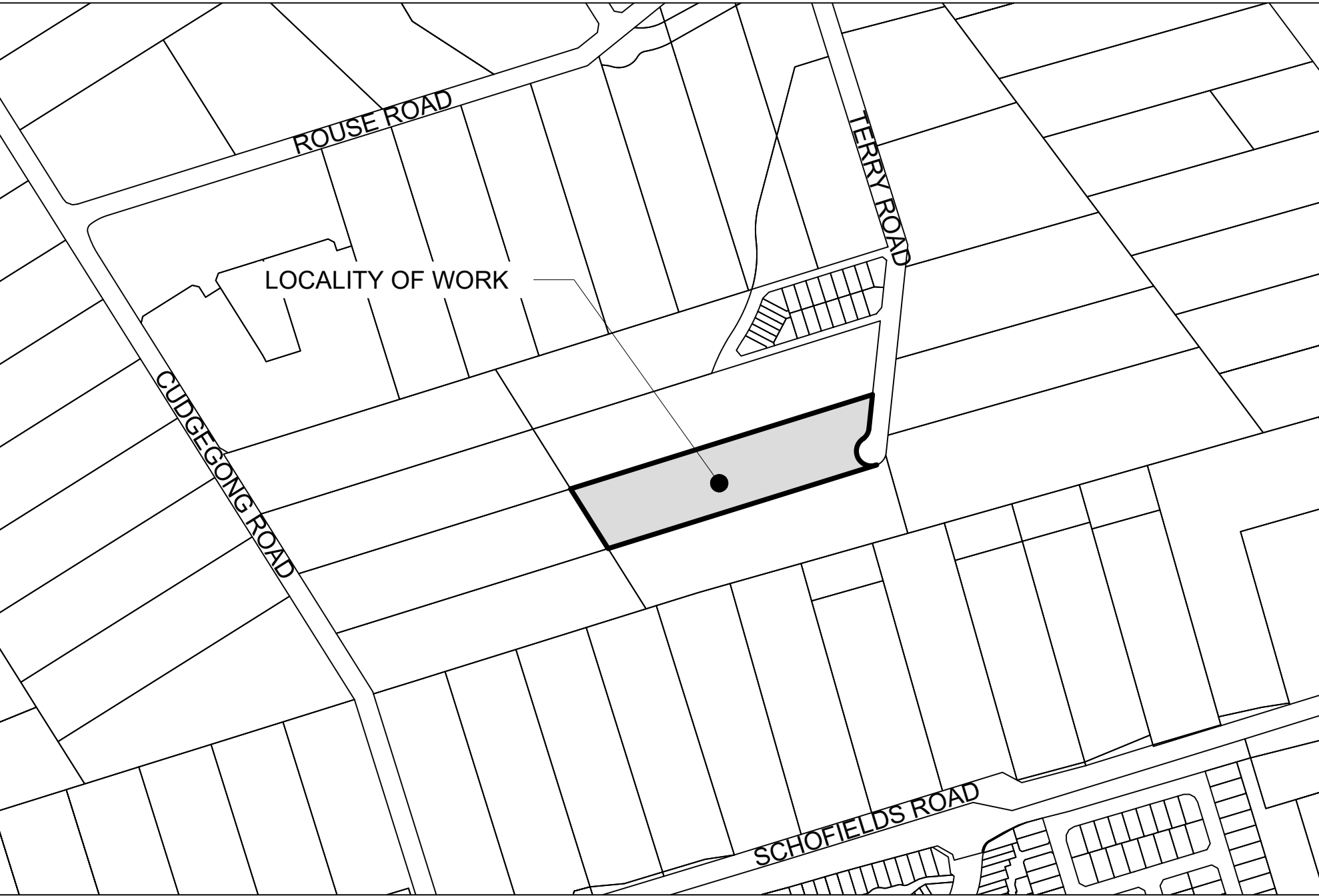
PROJECT:
RESIDENTIAL DEVELOPMENT

AT:
54 TERRY RD, ROUSE HILL NSW 2155
Lot(s): 132 DP208203

PROJECT No:
2019026

DRAWING SCHEDULE	
DRAWING No.	DRAWING TITLE
C00	LOCALITY MAP & SCHEDULE OF DRAWINGS
C01	GENERAL NOTES
C02	EXISTING SITE LAYOUT
C03	ULTIMATE - SITE LAYOUT
C04	ULTIMATE - BULK EARTHWORKS PLAN - SHEET 1 OF 2
C05	ULTIMATE - BULK EARTHWORKS PLAN - SHEET 2 OF 2
C06	ULTIMATE - ROAD NETWORK PLAN - SHEET 1 OF 4
C07	ULTIMATE - ROAD NETWORK PLAN - SHEET 2 OF 4
C08	ULTIMATE - ROAD NETWORK PLAN - SHEET 3 OF 4
C09	ULTIMATE - ROAD NETWORK PLAN - SHEET 4 OF 4
C10	ULTIMATE - ROADWORKS TYPICAL SECTIONS
C11	ULTIMATE - ROADWORKS TREE SECTIONS
C12	ULTIMATE - ROAD 1 LONGSECTION
C13	ULTIMATE - ROAD 2 LONGSECTION
C14	ULTIMATE - ROAD 2 KERB INVERT LONGSECTION
C15	ULTIMATE - ROAD 3 LONGSECTION
C16	ULTIMATE - ROAD 4 LONGSECTION
C17	ULTIMATE - STORMWATER LAYOUT - OVERALL
C18	ULTIMATE - STORMWATER LAYOUT - SHEET 1 OF 3
C19	ULTIMATE - STORMWATER LAYOUT - SHEET 2 OF 3

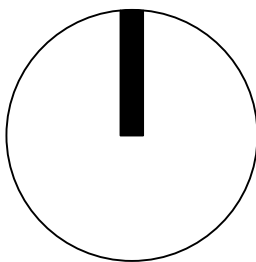
C20	ULTIMATE - STORMWATER LAYOUT - SHEET 3 OF 3
C21	ULTIMATE - STORMWATER LAYOUT - TYPICAL LOT
C22	ULTIMATE - BIO-RETENTION BASIN PLAN
C23	ULTIMATE - STORMWATER CATCHMENT PLAN
C24	ULTIMATE - STORMWATER LONGSECTIONS - SHEET 1 OF 5
C25	ULTIMATE - STORMWATER LONGSECTIONS - SHEET 2 OF 5
C26	ULTIMATE - STORMWATER LONGSECTIONS - SHEET 3 OF 5
C27	ULTIMATE - STORMWATER LONGSECTIONS - SHEET 4 OF 5
C28	ULTIMATE - STORMWATER LONGSECTIONS - SHEET 5 OF 5
C29	ULTIMATE - 18.13% AEP HYDRAULICS CALCULATIONS
C30	ULTIMATE - 18.13% AEP HYDROLOGY CALCULATIONS
C31	ULTIMATE - 9.52% AEP HYDRAULICS CALCULATIONS
C32	ULTIMATE - 9.52% AEP HYDROLOGY CALCULATIONS
C33	ULTIMATE - 1% AEP HYDRAULICS CALCULATIONS
C34	ULTIMATE - 1% AEP HYDROLOGY CALCULATIONS
C35	INTERIM - STORMWATER CATCHMENT PLAN
C36	INTERIM - SITE LAYOUT
C37	INTERIM - ROAD NETWORK PLAN - SHEET 1 OF 3
C38	INTERIM - ROAD NETWORK PLAN - SHEET 2 OF 3
C39	INTERIM - ROAD NETWORK PLAN - SHEET 3 OF 3
C40	INTERIM - STORMWATER LAYOUT PLAN



LOCALITY MAP
NOT TO SCALE

CIVIL ENGINEERING

H	SOFC ISSUE	RF	05.02.2020
G	WORK IN PROGRESS	RF	02.02.2020
F	TREE A & B UPDATE	RF	09.10.19
E	ROAD 3 TREE UPDATES	RF	04.10.19
REV	DESCRIPTION	BY	DATE



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DESIGN: RF
DRAWN: RF
DWG SIZE: A1

**LOCALITY MAP &
SCHEDULE OF
DRAWINGS**

RESIDENTIAL DEVELOPMENT
54 TERRY RD, ROUSE HILL NSW 2155

2019026 - C00 H

GENERAL NOTES

- IF IN DOUBT - ASK
- ALL WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE NOMINATED OR APPLICABLE COUNCIL SPECIFICATION.
- THE CONTRACTOR SHOULD REPORT ANY DISCREPANCIES ON THE DRAWINGS TO THE ENGINEER RESPONSIBLE FOR THE DESIGN.
- CONTRACTOR IS NOT TO ENTER UPON NOR DO ANY WORK WITHIN ADJACENT LANDS WITHOUT THE PERMISSION OF THE OWNER.
- SURPLUS EXCAVATED MATERIAL SHALL BE PLACED WHERE DIRECTED OR REMOVED FROM SITE.
- ALL NEW WORKS SHALL MAKE A SMOOTH JUNCTION WITH EXISTING
- ALL DRAINAGE LINES THOUGH ADJACENT LOTS SHALL BE CONTAINED WITHIN EASEMENTS CONFORMING TO COUNCIL'S STANDARDS.
- PRIOR TO COMMENCEMENT OF WORK, THE CONTRACTOR SHALL PROVIDE A TRAFFIC MANAGEMENT PLAN PREPARED BY AN ACCREDITED PERSON IN ACCORDANCE WITH RELEVANT REQUIREMENTS, FOR ANY WORK ON OR ADJACENT TO PUBLIC ROADS, PLAN TO BE SUBMITTED TO COUNCIL & OTHER AUTHORITIES AS REQUIRED.
- THESE PLANS SHALL BE READ IN CONJUNCTION WITH OTHER RELEVANT CONSULTANTS' PLANS, SPECIFICATIONS, CONDITIONS OF DEVELOPMENT CONSENT AND CONSTRUCTION APPROVAL REQUIREMENTS.
- THE BUILDER/CONTRACTOR SHALL LOCATE ALL EXISTING PUBLIC UTILITY SERVICES WITHIN THE SITE, FOOTPATH AREA AND ROAD RESERVE PRIOR TO THE COMMENCEMENT OF ANY WORKS. ALL LOCATIONS AND LEVELS OF SERVICES SHALL BE REPORTED TO THE SUPERVISING ENGINEER PRIOR TO THE COMMENCEMENT OF ANY WORKS TO ENSURE THERE ARE NO OBSTRUCTIONS IN THE LINE OF THE DRAINAGE DISCHARGE PIPES.
- THE BUILDER/CONTRACTOR IS TO VERIFY ALL LEVELS ON SITE PRIOR TO COMMENCING CONSTRUCTION.
- ALL THE CLEANING EYES (OR INSPECTION EYES) FOR THE UNDERGROUND PIPES HAVE TO BE TAKEN UP TO THE FINISHED GROUND LEVEL FOR EASY IDENTIFICATION AND MAINTENANCE PURPOSES
- ALL PITS HAVING AN INTERNAL DEPTH THAT EXCEEDS 1.2m SHALL BE PROVIDED WITH GALVANIZED STEP IRON'S AT 300 mm CENTRES PLACED IN A STAGGERED PATTERN AND SHALL BE IN ACCORDANCE WITH THE AUSTRALIAN STANDARDS AS4198-1994 AND COUNCIL'S STANDARDS
- PRIOR TO COMMENCING ANY WORKS ON THE SITE, THE BUILDER/CONTRACTOR SHALL ENSURE THAT THE INVERT LEVELS WHERE THE STORMWATER SYSTEM CONNECTS TO COUNCIL'S KERB/DRAINAGE SYSTEM MATCH THE DESIGN LEVELS. ANY DISCREPANCIES SHALL BE REPORTED TO THE DESIGN ENGINEER IMMEDIATELY
- THE SURVEY INFORMATION ON THIS DRAWING HAS BEEN PROVIDED BY OTHERS; THE ENGINEER IS NOT RESPONSIBLE FOR THE ACCURACY OF ANY SURVEY INFORMATION PROVIDED ON THIS DRAWING.
- ALL LEVELS SHOWN ARE EXPECTED TO BE TO A.H.D.
- ALL CHAINAGES AND LEVELS ARE IN METERS, AND DIMENSIONS IN MILLIMETRES, UNLESS NOTED OTHERWISE.
- THE BUILDER/CONTRACTORS SHALL ARRANGE FOR THE WORKS TO BE SET OUT BY A REGISTERED SURVEYOR
- CONTRUCTION DRAWINGS ARE REQUIRED PRIOR TO CERTIFICATION OF DRAINAGE.
- WHERE THESE PLANS ARE NOTED FOR DEVELOPMENT APPLICATION PURPOSES ONLY I.E. ISSUED FOR APPROVAL, THEY SHALL NOT BE USED FOR OBTAINING CONSTRUCTION LEVEL APPROVAL NOR USED FOR CONSTRUCTION PURPOSES WITHOUT WRITTEN APPROVAL.

RAINWATER REUSE SYSTEM NOTES:

- RAINWATER SUPPLY PLUMBING TO BE CONNECTED TO OUTLETS WHERE REQUIRED BY BASIX CERTIFICATE (BY OTHERS).
- NO DIRECT CONNECTION BETWEEN TOWN WATER SUPPLY AND THE RAINWATER SUPPLY.
- PROVIDE AN APPROVED STOP VALVE AND/OR PRESSURE LIMITING VALVE AT THE RAINWATER TANK.
- PROVIDE AT LEAST ONE EXTERNAL HOSE COCK ON THE TOWN WATER SUPPLY FOR FIRE FIGHTING.
- PROVIDE APPROPRIATE FLOAT VALVE AND/OR SOLENOID VALVES TO CONTROL TOWN WATER SUPPLY INLET TO TANK IN ORDER TO ACHIEVE THE TOP-UP TYPICALLY REQUIRED.
- ALL PLUMBING WORKS ARE TO BE CARRIED OUT BY LICENSED PLUMBERS IN ACCORDANCE WITH AS/NZ3500.1 NATIONAL PLUMBING AND DRAINAGE CODE.
- PRESSURE PUMP ELECTRICAL CONNECTION TO BE CARRIED OUT BY A LICENSED ELECTRICIAN.
- ONLY ROOF RUN-OFF IS TO BE DIRECTED TO THE RAINWATER TANK, SURFACE WATER INLETS ARE NOT TO BE CONNECTED.
- PIPE MATERIALS FOR RAINWATER SUPPLY PLUMBING ARE TO BE APPROVED MATERIALS TO AS/NZ3500 PART 1 SECTION 2 AND TO BE CLEARLY AND PERMANENTLY IDENTIFIED AS 'RAINWATER'. THIS MAY BE ACHIEVED FOR BELOW GROUND PIPES USING IDENTIFICATION TAPE (MADE IN ACCORDANCE WITH AS2648) OR FOR ABOVE GROUND PIPES BY USING ADHESIVE PIPE MARKERS (MADE IN ACCORDANCE WITH AS1345)
- EVERY RAINWATER SUPPLY OUTLET POINT AND THE RAINWATER TANK ARE TO BE LABELED 'RAINWATER' ON A METALLIC SIGN IN ACCORDANCE WITH AS1319
- ALL INLETS AND OUTLETS TO THE RAINWATER TANK ARE TO HAVE SUITABLE MEASURES PROVIDED TO PREVENT MOSQUITO AND VERMIN ENTRY.
- ALL DOWNPIPES CHARGED TO THE RAINWATER TANK ARE TO BE SEALED UP TO GUTTER LEVEL AND BE PRESSURE TESTED AND CERTIFIED
- TOWN WATER CONNECTION TO RAINWATER TANK TO BE TO THE SATISFACTION OF THE REGULATORY AUTHORITY. THIS MAY REQUIRE PROVISION OF:
13.1. PERMANENT AIR GAP; OR
13.2. BACKFLOW PREVENTION DEVICE

SAFETY IN DESIGN NOTES

- THERE ARE INHERENT RISKS WITH CONSTRUCTING, MAINTAINING, OPERATING, DEMOLISHING, DISMANTLING AND DISPOSING. WE NOTE THIS DESIGN IS TYPICAL OF SIMILAR DESIGNS. AS FAR AS IS REASONABLY PRACTICABLE RISKS HAVE BEEN ELIMINATED OR MINIMISED THROUGH THE DESIGN PROCESS. HAZARD CONTROLS MUST STILL BE IMPLEMENTED BY THE CONTRACTOR, OWNER OR OPERATOR TO ENSURE THE SAFETY OF WORKERS. WE DID NOT IDENTIFY ANY UNIQUE RISKS ASSOCIATED WITH THE DESIGN.

EARTHWORKS NOTES

- IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE AND LEVEL ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY EARTHWORKS
- THE CONTRACTOR SHALL CLEAR THE SITE BY REMOVING ALL RUBBISH, FENCES AND DEBRIS ETC. TO THE EXTENT OF THE PROPOSED DEVELOPED AREA.
- PROVIDE PROTECTION BARRIERS TO PROTECTED/SENSITIVE AREAS PRIOR TO ANY BULK EXCAVATION.
- OVER FULL AREA OF EARTHWORKS, CLEAR VEGETATION, RUBBISH, SLABS ETC. AND STRIP TOP SOIL. AVERAGE 200mm THICK. REMOVE FROM SITE, EXCEPT TOP SOIL FOR RE-USE.
- CUT AND FILL OVER THE SITE TO LEVELS REQUIRED.
- PRIOR TO ANY FILLING IN AREAS OF CUT OR IN EXISTING GROUND, PROOF ROLL THE EXPOSED SURFACE WITH A ROLLER OF MINIMUM WEIGHT OF 5 TONNES WITH A MINIMUM OF 10 PASSES.
- EXCAVATE AND REMOVE ANY SOFT SPOTS ENCOUNTERED DURING PROOF ROLLING AND REPLACE WITH APPROVED FILL COMPACTED IN LAYERS.
- THE WHOLE OF THE EXPOSED SUBGRADE AND FILL SHALL BE COMPACTED TO 98% STANDARD MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT ± 2%
- FOR ON SITE FILLING AREAS, THE CONTRACTOR SHALL TAKE LEVELS OF EXISTING SURFACE AFTER STRIPPING TOPSOIL AND PRIOR TO COMMENCING FILL OPERATIONS.
- WHERE HARD ROCK IS EXPOSED IN THE EXCAVATED SUB-GRADE, THIS WILL BE INSPECTED AND A DECISION MADE ON THE LEVEL TO WHICH EXCAVATION IS TAKEN.
- FILL IN 200mm MAXIMUM (LOOSE THICKNESS) LAYERS TO UNDERSIDE OF SUBBASE COURSE USING THE EXCAVATED MATERIAL AND COMPACTED TO 98% STANDARD (AS 1289 5.1.1). MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT ± 2%. SHOULD THERE BE INSUFFICIENT MATERIAL FROM SITE EXCAVATIONS, IMPORT AS NECESSARY CLEAN GRANULAR FILL TO APPROVAL.
- COMPACTION TESTING SHALL BE CARRIED OUT AT THE RATE OF 2 TESTS PER 1000SQ METRES PER LAYER BY A REGISTERED NATA LABORATORY. THE COSTS OF TESTING AND RE-TESTING ARE TO BE ALLOWED FOR BY THE BUILDER.
- BATTERS TO BE AS SHOWN, OR MAXIMUM 1 VERT : 4 HORIZ.
- ALL CONDUITS AND MAINS SHALL BE LAID PRIOR TO LAYING FINAL PAVEMENT.
- ALL BATTERS AND FOOTPATHS ADJACENT TO ROADS SHALL BE TOP SOILED WITH 150mm APPROVED LOAM AND SEEDED UNLESS OTHERWISE SPECIFIED.

DRAINAGE INSTALLATION RCP CONVENTIONAL INSTALLATIONS & ROAD CROSSINGS

- SUPPLY & INSTALLATION OF DRAINAGE WORKS TO BE IN ACCORDANCE WITH THESE DRAWINGS, THE COUNCIL SPECIFICATION AND THE CURRENT APPLICABLE AUSTRALIAN STANDARDS.
- BACKFILL SHALL BE PLACED & COMPACTED IN ACCORDANCE WITH THE SPECIFICATION. A GRANULAR GRAVEL AGGREGATE MATERIAL (<10mm) BACKFILL IS RECOMMENDED FOR THE BEDDING, HAUNCH SUPPORT AND SIDE ZONE DUE TO IT'S SELF COMPACTING ABILITY.
- A MINIMUM OF 150mm CLEARANCE IS TO BE PROVIDED BETWEEN THE OUTSIDE OF THE PIPE BARREL AND THE TRENCH WALL FOR PIPES < 600Ø. 200mm CLEARANCE FOR PIPES 600Ø TO 1200Ø AND Ø/6 CLEARANCE FOR PIPES > 1200Ø.
- BEDDING OF THE PIPELINES IS TO BE TYPE 'HS2' IN ACCORDANCE WITH AUSTRALIAN STANDARDS AND AS FOLLOWS:
a. COMPACTED GRANULAR MATERIAL IS TO COMPLY WITH THE FOLLOWING GRADINGS:

M	19	2.3600	0.6000	0.3000	0.1500	0.0750
% MASS PASSING	100	50-100	20-90	10-60	0-25	0-10

- AND ANY MATERIAL PASSING THE 0.075 SIEVE SHALL HAVE A LOW PLASTICITY AS DESCRIBED IN APPENDIX D OF AS1726.
- b. BEDDING DEPTH UNDER THE PIPE TO BE 100mm.
- c. BEDDING MATERIAL TO BE EXTENDED FROM THE TOP OF THE BEDDING ZONE UP TO 0.3 TIMES PIPE OUTSIDE DIAMETER. THIS REPRESENTS THE 'HAUNCH ZONE.'
- d. THE BEDDING & HAUNCH ZONE MATERIAL IS TO BE COMPACTED TO A MINIMUM RELATIVE COMPACTION OF 98% WITHIN ROAD RESERVES AND TRAFFICABLE AREAS AND 95% ELSEWHERE FOR COHESIVE MATERIAL OR A MINIMUM DENSITY INDEX OF 70% IN ACCORDANCE WITH THE STANDARDS FOR COHESIONLESS MATERIAL.
- e. COMPACTION TESTING SHALL BE CARRIED OUT BY AN APPROVED ORGANISATION WITH A NATA CERTIFIED LABORATORY FOR ALL DRAINAGE LINES LAID WHOLLY OR IN PART UNDER THE KERB & GUTTER OR PAVEMENT

STORMWATER DRAINAGE NOTES

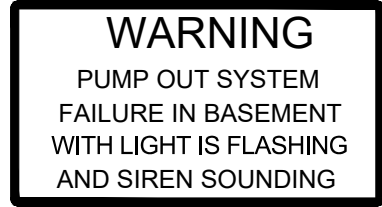
- STORMWATER DRAINAGE SHALL BE GENERALLY IN ACCORDANCE WITH CURRENT AUSTRALIAN STANDARDS INCLUDING AS3500.3, NCC AND COUNCIL'S SPECIFICATION.
- PIPES OF 225Ø AND UNDER SHALL BE UPVC
- PIPES OF 300Ø AND LARGER SHALL BE FRC OR CONCRETE CLASS 2 RUBBER RING JOINTED UNO.
- ALL FRC OR RCP STORMWATER PIPES WITHIN ROAD RESERVE AREAS TO BE CLASS 4 U.N.O. BY COUNCILS SPECIFICATION.
- PIPES SHALL GENERALLY BE LAID AT THE GRADES INDICATED ON THE DRAWINGS.
- MINIMUM COVER TO PIPES 300Ø AND OVER GENERALLY SHALL BE 600mm IN CARPARK & ROADWAY AREAS UNO.
- ALL PIPES LOCATED IN LANDSCAPE AREAS TO HAVE 300mm COVER; WHERE NOT POSSIBLE AND COVER IS BETWEEN 150mm AND 300mm USE SEWER GRADE PIPE.
- PIPES 225Ø AND OVER SHALL BE LAID AT 0.5% MINIMUM GRADE U.N.O
- PIPES UP TO 150Ø SHALL BE LAID AT 1.0% MINIMUM GRADE U.N.O
- BACKFILL TRENCHES WITH APPROVED FILL COMPACTED IN 200mm LAYERS TO 98% OF STANDARD DENSITY.
- ANY PIPES OVER 16% GRADE SHALL HAVE CONCRETE BULKHEADS AT ALL JOINTS
- THE MINIMUM SIZES OF THE STORMWATER DRAINAGE PIPES SHALL NOT BE LESS THAN 90Ø FOR CLASS 1 BUILDINGS AND 100Ø FOR OTHER CLASSES OF BUILDING OR AS REQUIRED BY THE REGULATORY AUTHORITY
- ANY DOWNPIPES SHOWN ARE INDICATIVE ONLY. REFER ARCHITECTURALS FOR FINAL LOCATIONS. ALL ROOF GUTTERING AND DOWNPIPES TO BE TO THE CURRENT AUSTRALIAN STANDARDS.
- ALL DOWNPIPES TO BE CONSTRUCTED OF ONE MATERIAL FOR AESTHETICS AND PAINTED TO PROTECT THEM AGAINST ULTRA-VIOLET LIGHT DAMAGE, UNLESS APPROVED OTHERWISE BY THE PROJECT ARCHITECT.
- BUILD INTO UPSTREAM FACE OF ALL PITS A 3.0m SUBSOIL LINE FALLING TO PITS TO MATCH PIT INVERTS.
- ALL COURTYARD & LANDSCAPED PITS TO BE 450 SQUARE UNLESS NOTED OTHERWISE.
- ALL DRIVEWAY & OSD PITS TO BE 600 SQUARE UNLESS NOTED OTHERWISE.
- ALL PLANTER BOXES AND BALCONIES TO BE CONNECTED TO THE PROPOSED STORMWATER DRAINAGE LINE.
- ALL STORMWATER DRAINAGE WORK TO AVOID TREE ROOTS. WHERE NOT POSSIBLE, ALL EXCAVATIONS IN VICINITY OF TREE ROOTS ARE TO BE HAND DUG.
- GEOTEXTILE FABRIC TO BE PLACED UNDER ANY RIP RAP SCOUR PROTECTION WHERE APPLICABLE.
- ALL BASES OF PITS TO BE BENCHED TO THE INVERT OF THE OUTLET PIPE AND PROVIDE GALVANISED ANGLE SURROUNDINGS TO GRATE.
- ANY VARIATION TO THE WORKS AS SHOWN ON THE APPROVED DRAWINGS ARE TO BE CONFIRMED BY THE ENGINEER PRIOR TO THE COMMENCEMENT.
- ALL BALCONIES AND ROOFS TO BE DRAINED AND TO HAVE SAFETY OVERFLOWS IN ACCORDANCE WITH RELEVANT AUSTRALIAN STANDARDS.
- ALL GRATES TO HAVE CHILDPROOF LOCKS
- ALL DOWNPIPES TO HAVE LEAF GUARDS
- ALL WORK WITHIN COUNCIL RESERVE AREAS TO BE INSPECTED BY COUNCIL PRIOR TO BACKFILLING. OR AS OTHERWISE STIPULATED BY COUNCIL
- WATER PROOF ALL CONCRETE BALCONIES & ROOFS TO ARCHITECTS DETAILS
- ALL BALCONIES TO HAVE FLOOR WASTE AND 1% FALL WITH SAFETY OVERFLOW.
- ALL SUBSOIL DRAINAGE SHALL BE A MINIMUM OF 65Ø AND SHALL BE PROVIDED WITH A FILTER SOCK. THE SUBSOIL DRAINAGE SHALL BE INSTALLED IN ACCORDANCE WITH DETAILS TO BE PROVIDED BY THE LANDSCAPE CONSULTANT.
- SUBSOIL DRAINAGE PIPES AND FITTINGS SHALL BE PERFORATED PLASTIC TO CURRENT AUSTRALIAN STANDARDS. LAY PIPES ON FLOOR OF TRENCH GRADED AT 1% MINIMUM AND OVERLAY WITH FILTER MATERIAL EXTENDING TO WITHIN 200mm OF SURFACE. PROVIDE FILTER FABRIC OF PERMEABLE POLYPROPYLENE BETWEEN FILTER MATERIAL AND TOPSOIL
- GRATES TO BE IN ACCORDANCE WITH TABLE BELOW:

GRATE TYPE	TRAFFIC CONDITIONS
A - EXTRA LIGHT DUTY	FOOTWAYS AND AREAS ACCESSIBLE ONLY PEDESTRUANS AND PEDAL CYCLISTS. TO
B - LIGHT DUTY	FOOTWAYS THAT CAN BE MOUNTED BY VEHICLES.
C - MEDIUM DUTY	MALLS AND PEDESTRIAN AREAS OPEN TO MOVING COMMERCIAL VEHICLES. SLOW
D - HEAVY DUTY	CARRIGEWAYS OF ROADS AND AREAS OPEN TO COMMERCIAL VEHICLES.
TABLE AS PER AS3996 - 2006. ENGINEER TO BE NOTIFIED IF LOAD CONDITIONS LISTED ABOVE ARE EXCEEDED.	

- COVER TO PIPE TO BE AS PER TABLE BELOW:

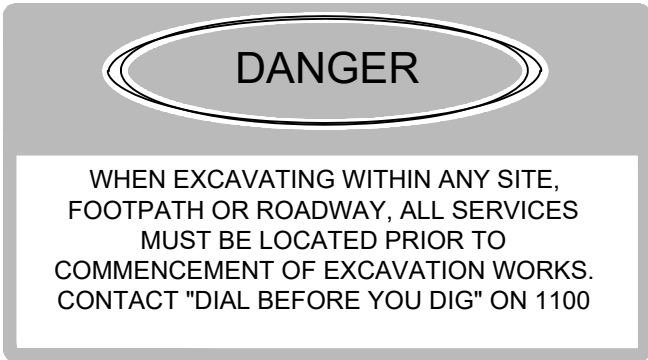
LOCATION	PIPE TYPE	COVER
LANDSCAPE	PVC	300
LANDSCAPE (SINGLE DWELLING)	PVC	100
UNDER TRAFFICABLE AREA	PVC	100 BELOW UNDERSIDE OF PAVEMENT
CONCRETE	STEEL	NIL BELOW UNDERSIDE OF PAVEMENT
ROADS	RCP	500 BELOW UNDERSIDE OF PAVEMENT

RECOMMENDED SAFETY SIGNS



BASEMENT PUMP OUT FAILURE WARNING SIGN

SIGN SHALL BE PLACED IN A CLEAR AND VISABLE LOCATION WHERE VEHICLES ENTER THE BASEMENT

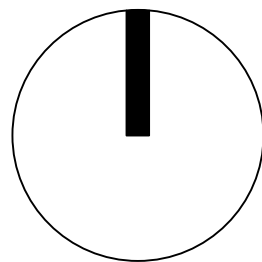


EXISTING SERVICES SIGN

SCHEDULE OF REVISION CHANGES				
REV	DATE	BY	DESCRIPTION	CHANGES
B	23/04/19	GV	ISSUED FOR APPROVAL	ORIGINAL DOCUMENT
A	19/07/19	SB	ISSUED FOR REVIEW	UPDATED TERRY RD BDY, UPDATED ROAD 2 & 3 WIDTHS, UPDATED EARTHWORKS, UPDATED RETAINING WALL LOCATIONS & HEIGHTS, ADDED LEPP 'ENV' LINE, UPDATED KERB & GUTTER TYPES, UPDATED CROSSOVER LOCATIONS, ADDED ROAD CENTRELINES & CHAINAGES, ADDED TERRY RD RECONSTRUCTION DETAILS & SECTIONS, UPDATED TYPICAL ROAD SECTIONS, UPDATED ROAD GRADES & LONGSECTIONS, ADDED ROAD 2 LONGSECTION, UPDATED STORMWATER PIT LOCATIONS & DEPTHS, UPDATED STORMWATER PIPE SIZES, REMOVAL OF BIO-BASIN & SOUTHERN STORMWATER BYPASS LINE, ADDED TYPICAL LOT STORMWATER LAYOUT AND CATCHMENT DETAILS, UPDATED WSUD PIT LOCATIONS, UPDATED STORMWATER CATCHMENTS, ADDED Q2 STORMWATER PLANS, ADDED STORMWATER LONGSECTIONS, ADDED Q2 & Q100 STORMWATER CALCULATIONS TABLES, ADDED INTERIM STORMWATER CATCHMENTS, ADDED INTERIM SITE LAYOUT, ADDED INTERIM ROAD LAYOUTS, ADDED INTERIM STORMWATER LAYOUT
B	04/09/19	SB	ISSUED FOR APPROVAL	UPDATED REVISION FOR APPROVAL ISSUE
C	19/09/19	SB	MINOR UPDATES	ADDED DIMENSIONS AND OTHER MINOR UPDATES
D	01/10/19	SB	TREE 48 UPDATE	ADDED C11 ULTIMATE - ROADWORKS RETAINED SECTIONS SHEET, ADDED TREE 48 LOCATION & TPZ AS PROVIDED, UPDATED SHEET NUMBERS PER INCLUSION
E	04/10.19	SB	RD 3 TREE UPDATES	UPDATED TREE AND TPZ LOCATIONS FROM DATA PROVIDED, UPDATED ROAD 3 RETAINING WALLS TO MINIMISE IMPACT ON ENV TREES
F	09/10/19	SB	TREE A & B UPDATE	UPDATED TREE A & B DETAILS ON C11
G	02.02.2020	SB	WORK IN PROGRESS	REDUCED ROAD 3 RESERVE TO 18m, ADDED RETAINING WALL ALONG ROAD 3 WESTERN BDY, UPDATED ROAD 3 TYPICAL SECTION, UPDATED TREE SECTIONS, ADDED TEMPORARY BIO-RETENTION BASIN & NOTES, UPDATED STORMWATER LINES FOR TEMPORARY BASIN, REMOVED ON-LOT STORMWATER TREATMENT FOR VPA ACCEPTABLE APPROACH
H	05.02.2020	SB	SOFC ISSUE	UPDATED ROADS TO 0.7% GRADIENT, UPDATED ROAD LONGSECTIONS, AMENDED ROAD 2 KERB INVERT FOR MIN 0.7% GRADES FOR DRAINAGE, ADDED ROAD 2 KERB INVERT LONGSECTION, MOVED DRAINAGE LOW POINTS OUTSIDE OF KERB RETURNS, ADDED 2.5m SHARED PATHS, UPDATED TYPICAL SECTIONS, SHIFTED TEMPORARY CUL-DE-SAC ON ROAD 3, ADDED ROAD 3 TRANSITION TO NORTH, UPDATED EARTHWORKS, UPDATED DRAINAGE TO 0.7% GRADIENT, ADDED BYPASS FLOWS AND BLOCKAGE FACTORS, RECALCULATED Q100 VALUES, PROVIDED NEW Q5 AND Q10 VALUES, UPDATED STORMWATER LONGSECTIONS AND HGLS, UPDATED STORMWATER LAYOUT AND ALIGNMENTS, ADDED 600mm CHANNEL FOR EXTERNAL FLOWS, ADDED TEMPORARY BIO-RETENTION BASIN LOCATION LEVELS AND DETAILS, UPDATED TYPICAL LOT STORMWATER LAYOUT, UPDATED ALL KERB OUTLETS TO PERPENDICULAR FROM KERB, UPDATED STORMWATER CATCHMENT PLANS, ADDED DETAIL ON ELEVATED PATH, ADDED COMMENTS TO ADDRESS SOFC, REARRANGED DRAWING NUMBERS TO SUIT

CIVIL ENGINEERING

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E	ROAD 3 TREE UPDATES	RF	04.10.19
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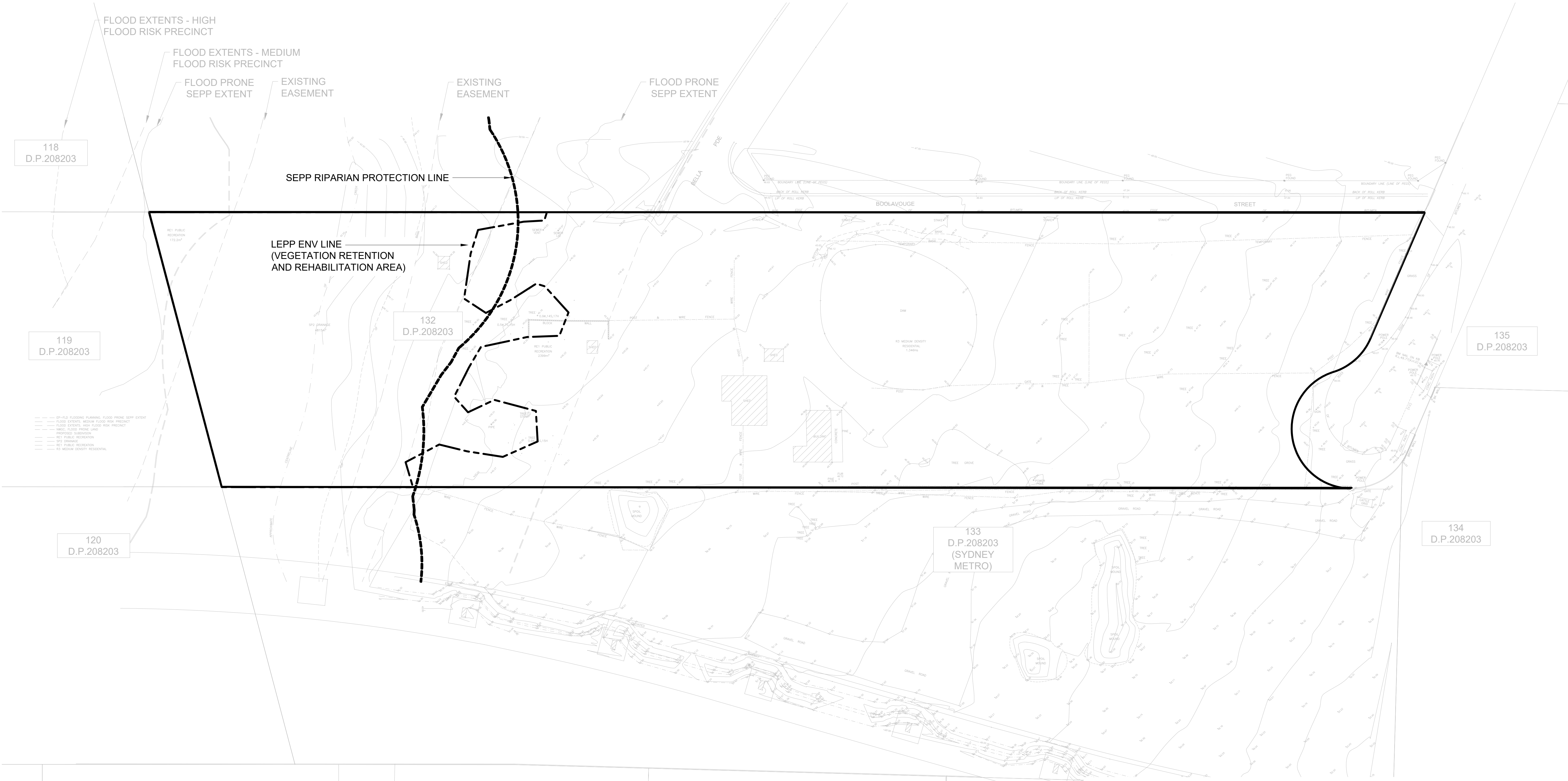
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DRAWN: RF
DWG SIZE: A1

GENERAL NOTES

RESIDENTIAL DEVELOPMENT

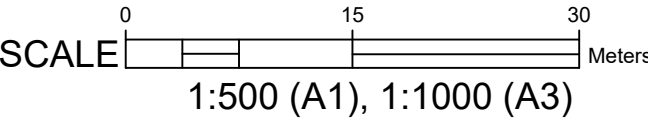
54 TERRY RD, ROUSE HILL NSW 2155

2019026 - C01 H



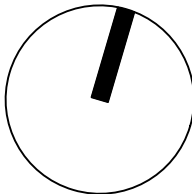
- LEGEND:
- 11.0 EXISTING CONTOURS
 - EXISTING EDGE OF BITUMEN
 - EXISTING BUILDING
 - CENTER OF CREEK
 - SITE BOUNDARY
 - LEPP 'ENV' AREA BOUNDARY

- NOTES:
- EXISTING SURVEY DATA PRESENTED AS PROVIDED BY HIGGINS SURVEYORS, PROJECT SHEETS REFERENCED "05617", DATED 15.01.2020 (REVISION D)



CIVIL ENGINEERING

H	SOFC ISSUE	RF	05.02.2020
G	WORK IN PROGRESS	RF	02.02.2020
F	TREE A & B UPDATE	RF	09.10.19
E	ROAD 3 TREE UPDATES	RF	04.10.19
REV	DESCRIPTION	BY	DATE



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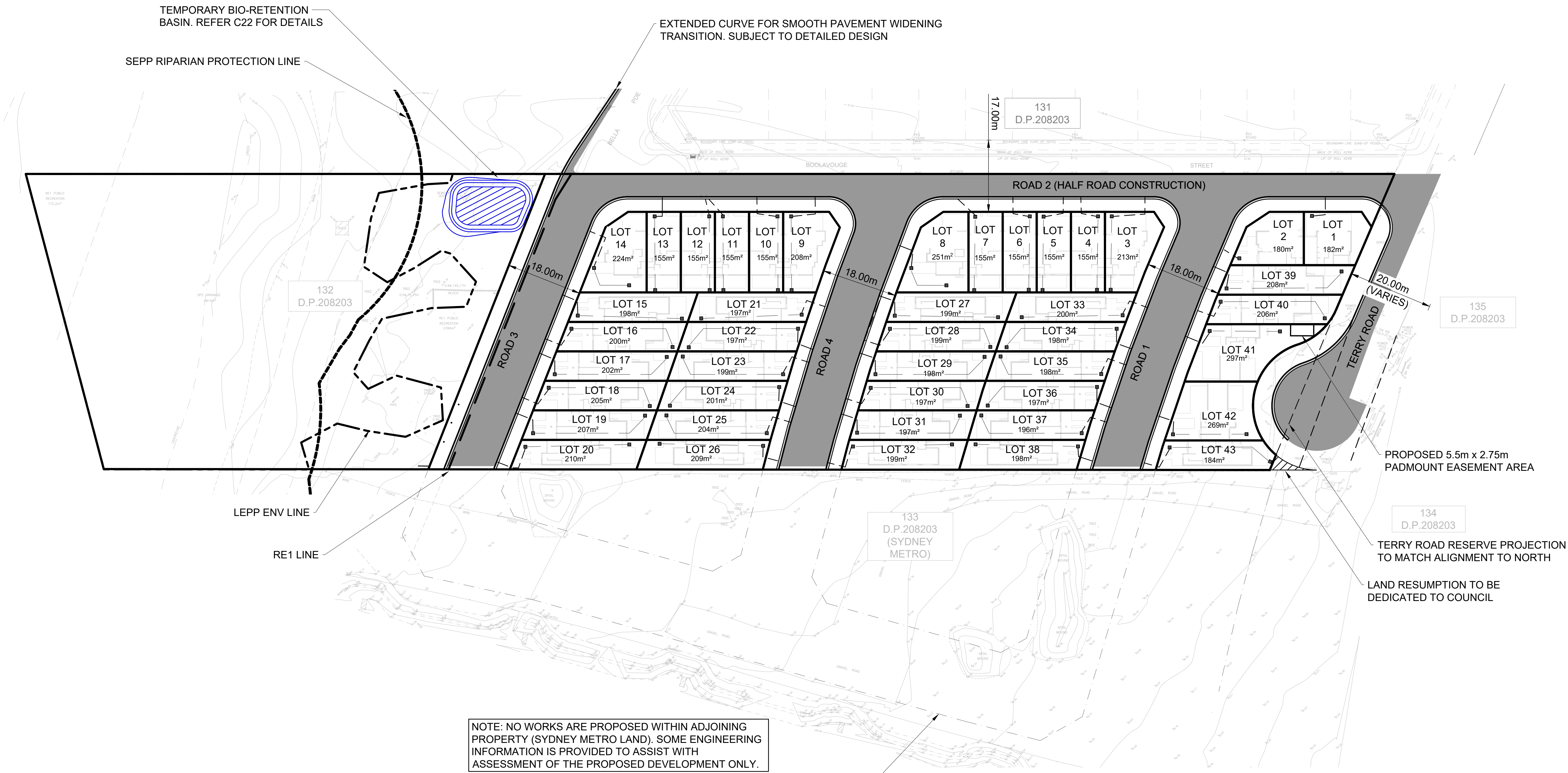
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M. +61 488 042 994
E. info@samanablue.com

DESIGN: RF
DRAWN: RF
DWG SIZE: A1

EXISTING SITE LAYOUT

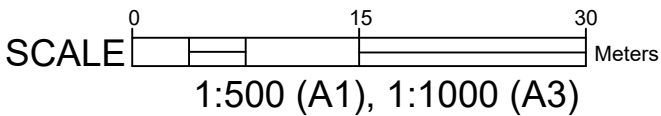
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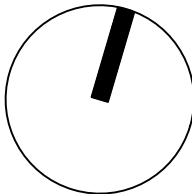
LEGEND:

- 11.0 EXISTING CONTOURS
- EXISTING EDGE OF BITUMEN
- EXISTING BUILDING
- PROPOSED CONCRETE PAVEMENT / KERB
- PROPOSED ROAD PAVEMENT
- SITE BOUNDARY
- L.E.P.P 'ENV' AREA BOUNDARY



CIVIL ENGINEERING

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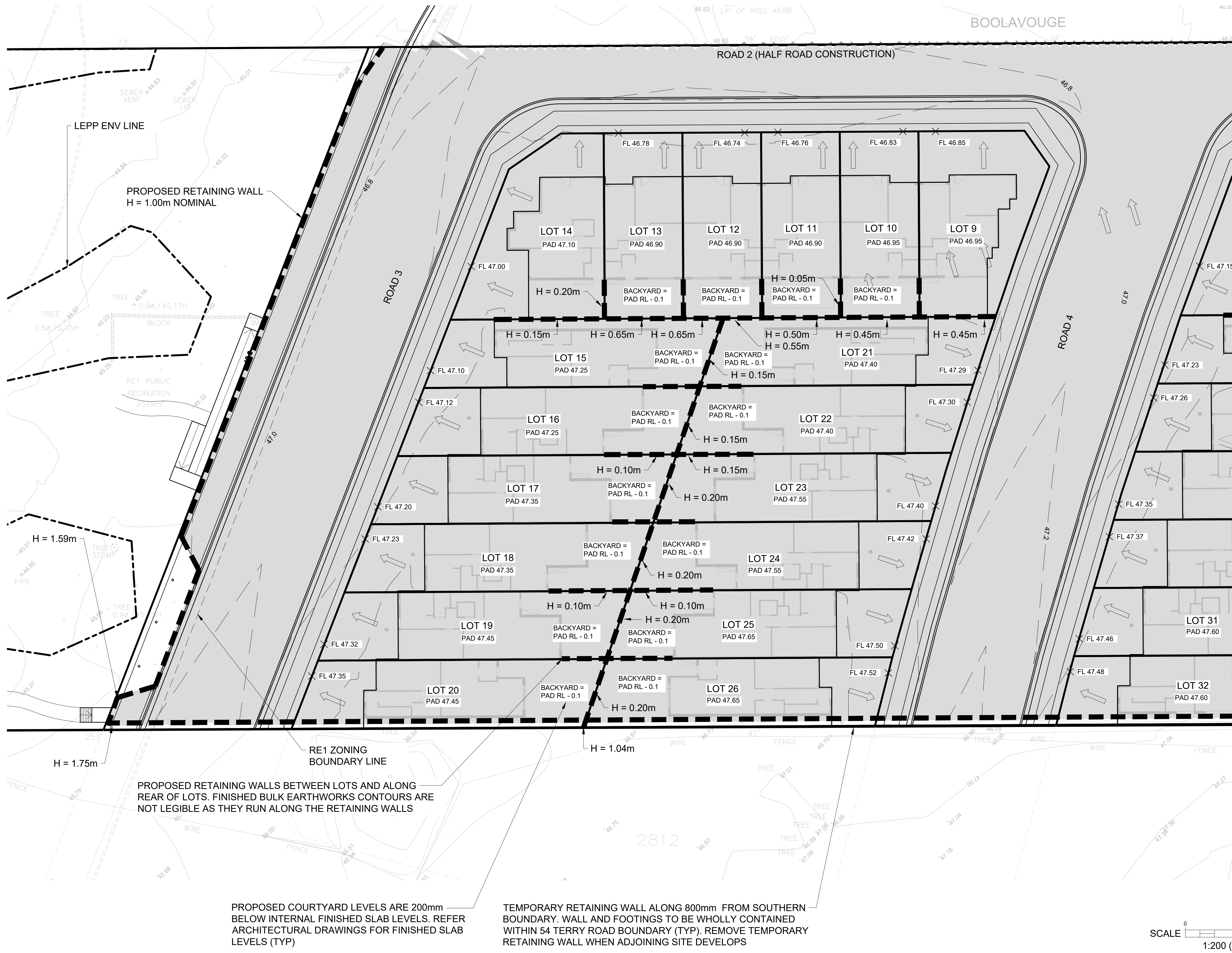
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DESIGN: RF
DRAWN: RF
DWG SIZE: A1

ULTIMATE - SITE LAYOUT

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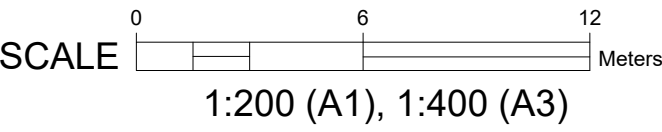


- LEGEND**
- PROPERTY BOUNDARY
 - 46.8 PROPOSED CONTOURS (C.I. = 0.2m)
 - AREA OF FILL
 - AREA OF CUT
 - PROPOSED RETAINING/BOUNDARY WALL
 - L.E.P.P 'ENV' AREA BOUNDARY
 - PAD 47.35 FINISHED PAD BULK EARTHWORKS LEVEL
 - FL 48.05 FINISHED SURFACE LEVEL AT BOUNDARY
 - DIRECTION OF FALL ARROW

- EARTHWORKS NOTES**
- LEVELS SHOWN WITHIN LOTS ARE FINISHED EARTHWORKS LEVELS. REFER C06 TO C09 FOR FINISHED FLOOR LEVELS WHICH ARE 100mm HIGHER
 - LEVELS SHOWN AT BOUNDARIES AND WITHIN ROAD RESERVE ARE FINISHED SURFACE LEVELS.
 - EARTHWORKS SHOWN ARE PRELIMINARY ONLY AND DO NOT REPRESENT FINAL VOLUMES / DISPLACEMENT
 - VOLUMES PROVIDED HAVE NOT ACCOUNTED FOR COMPACTION LOSSES OR OTHERWISE
 - VOLUMES PROVIDED HAVE NOT ACCOUNTED FOR ANY TEMPORARY WORKS
 - REFER ARCHITECTURAL DRAWINGS FOR LOCATION OF WALLS IN BACKYARDS
 - BACKYARDS TO BE 100mm BELOW PAD LEVELS, 200mm BELOW FINISHED FLOOR LEVELS

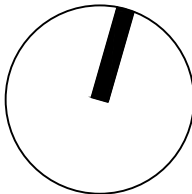
EARTHWORK QUANTITIES
CUT: - 405m³
FILL: + 13,583m³
NET: + 13,178m³ (FILL)

NOTE: THE EARTHWORKS CONTOURS & VOLUMES SHOWN REPRESENT: (NATURAL SURFACE) VS. (FINISHED ROAD SURFACE LEVELS + EARTHWORKS LEVELS ON LOTS)



CIVIL ENGINEERING

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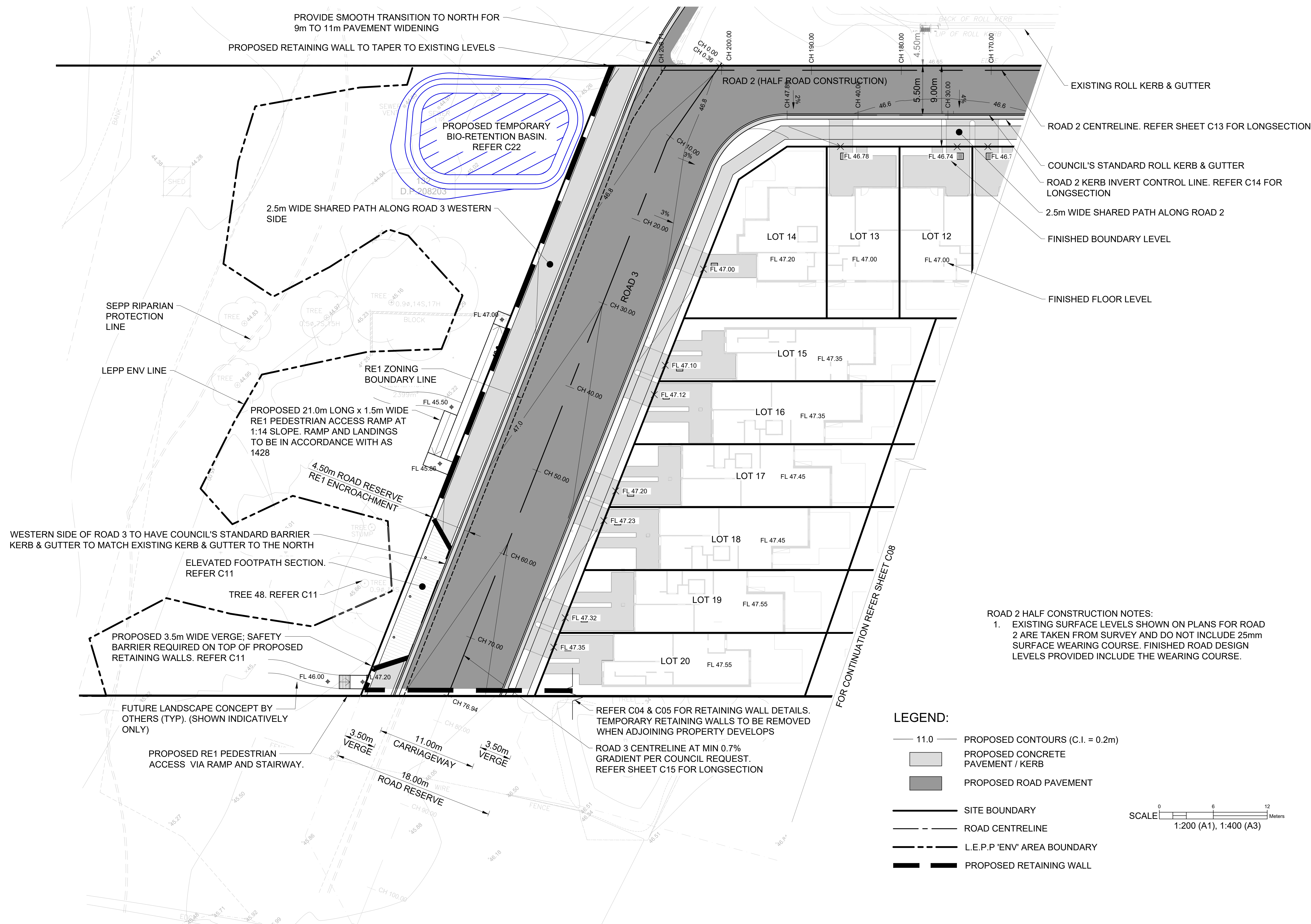
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DESIGN: RF
DRAWN: RF
DWG SIZE: A1

**ULTIMATE - BULK
EARTHWORKS PLAN -
SHEET 1 OF 2**

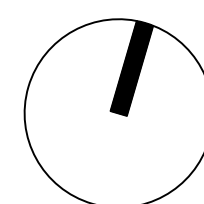
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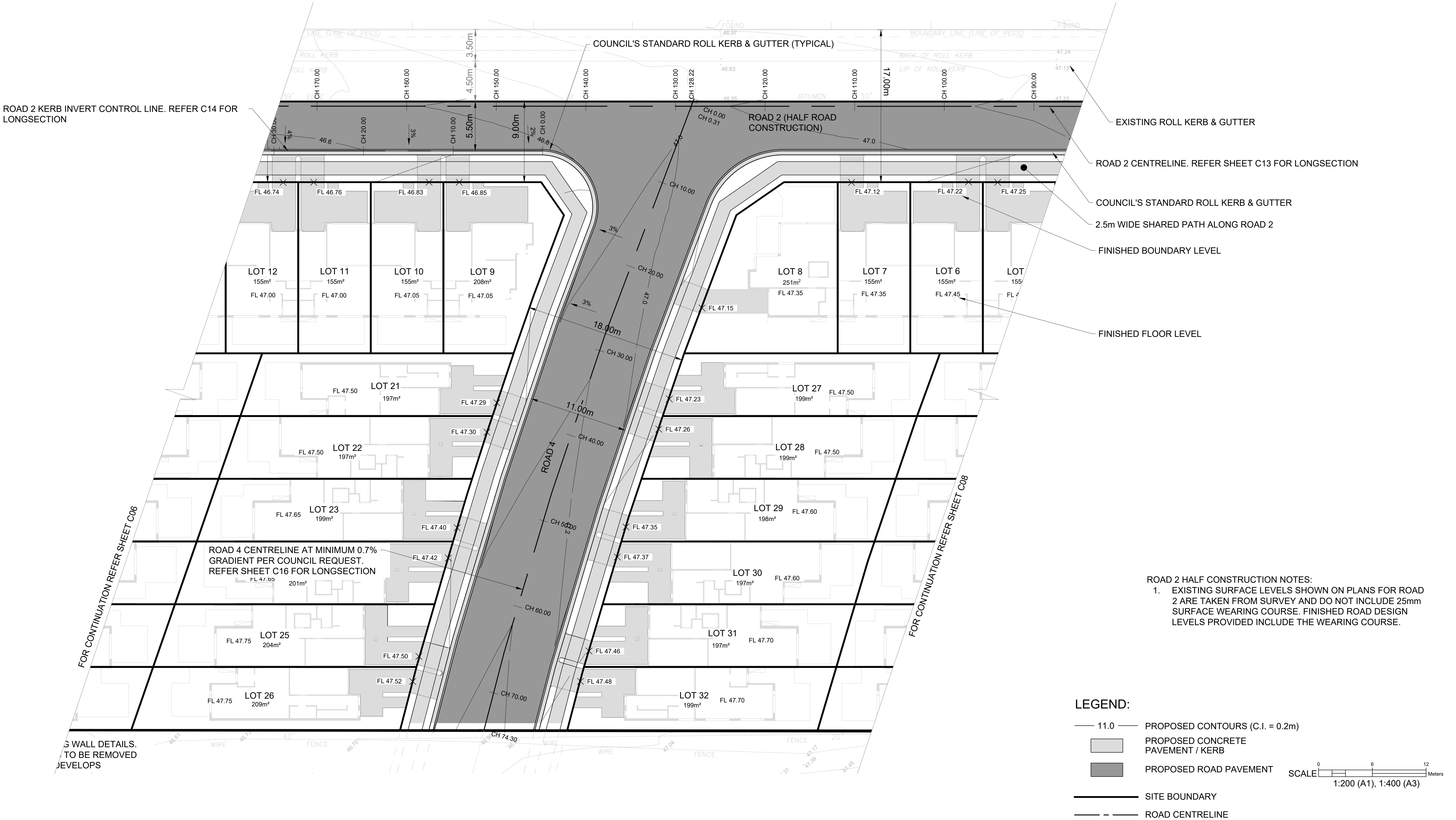
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DESIGN: RF
DRAWN: RF
DWG SIZE: A1

**ULTIMATE - ROAD
NETWORK PLAN -
SHEET 1 OF 4**

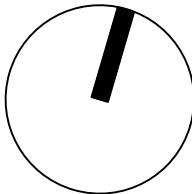
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CIVIL ENGINEERING

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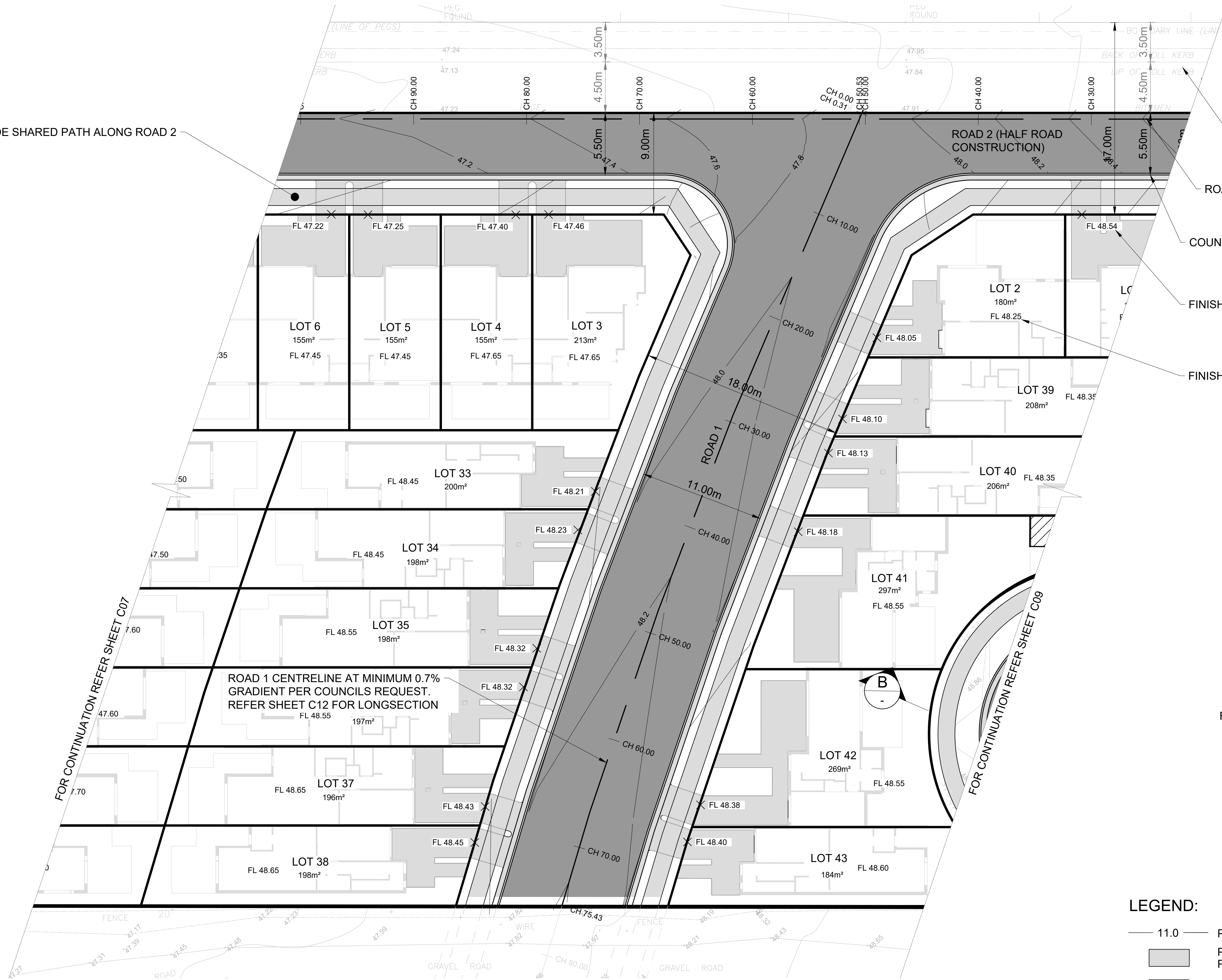
DESIGN: RF
DRAWN: RF
DWG SIZE: A1

ULTIMATE - ROAD NETWORK PLAN - SHEET 2 OF 4

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2.5m WIDE SHARED PATH ALONG ROAD 2



- EXISTING ROLL KERB & GUTTER
- ROAD 2 CENTRELINE. REFER SHEET C13 FOR LONGSECTION
- COUNCIL'S STANDARD ROLL KERB & GUTTER
- FINISHED BOUNDARY LEVEL
- FINISHED FLOOR LEVEL

ROAD 2 HALF CONSTRUCTION NOTES:
1. EXISTING SURFACE LEVELS SHOWN ON PLANS FOR ROAD 2 ARE TAKEN FROM SURVEY AND DO NOT INCLUDE 25mm SURFACE WEARING COURSE. FINISHED ROAD DESIGN LEVELS PROVIDED INCLUDE THE WEARING COURSE.

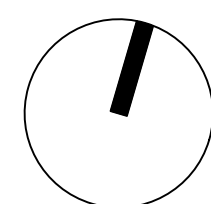
LEGEND:

- 11.0 PROPOSED CONTOURS (C.I. = 0.2m)
- PROPOSED CONCRETE PAVEMENT / KERB
- PROPOSED ROAD PAVEMENT
- SITE BOUNDARY
- ROAD CENTRELINE

SCALE 0 6 12 Meters
1:200 (A1), 1:400 (A3)

CIVIL ENGINEERING

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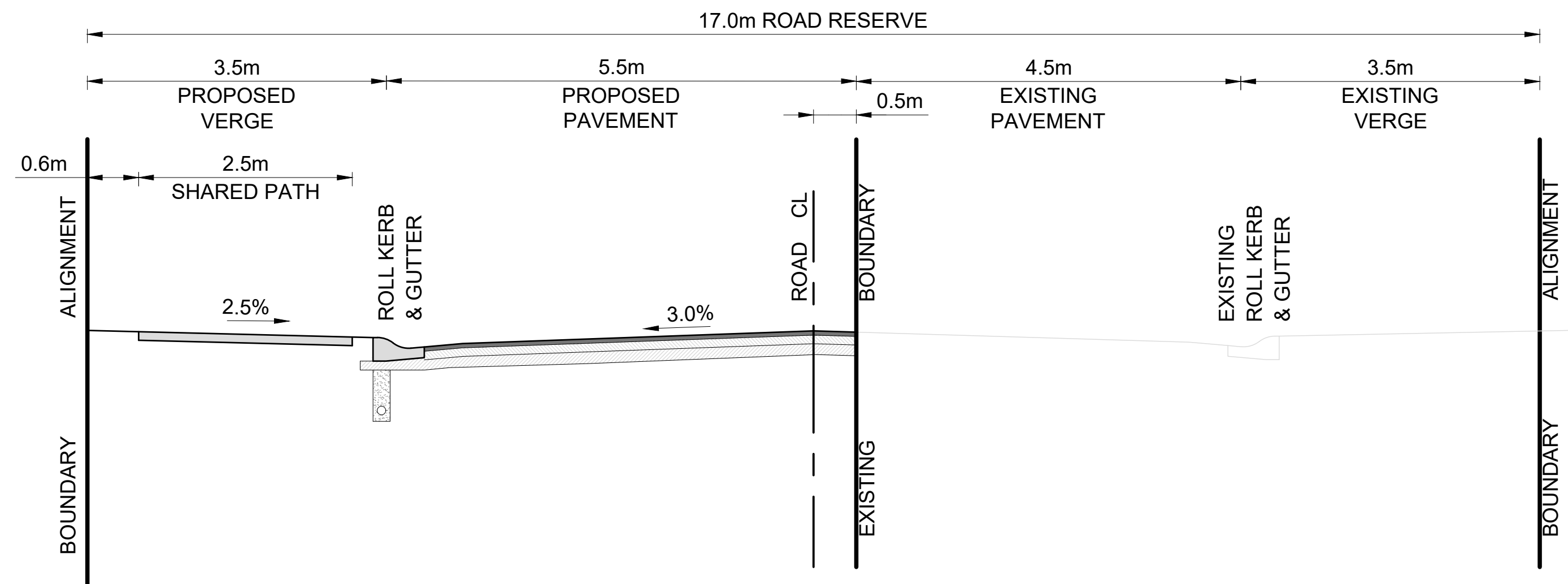
DESIGN: RF
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DWG SIZE: A1

ULTIMATE - ROAD NETWORK PLAN - SHEET 3 OF 4

RESIDENTIAL DEVELOPMENT

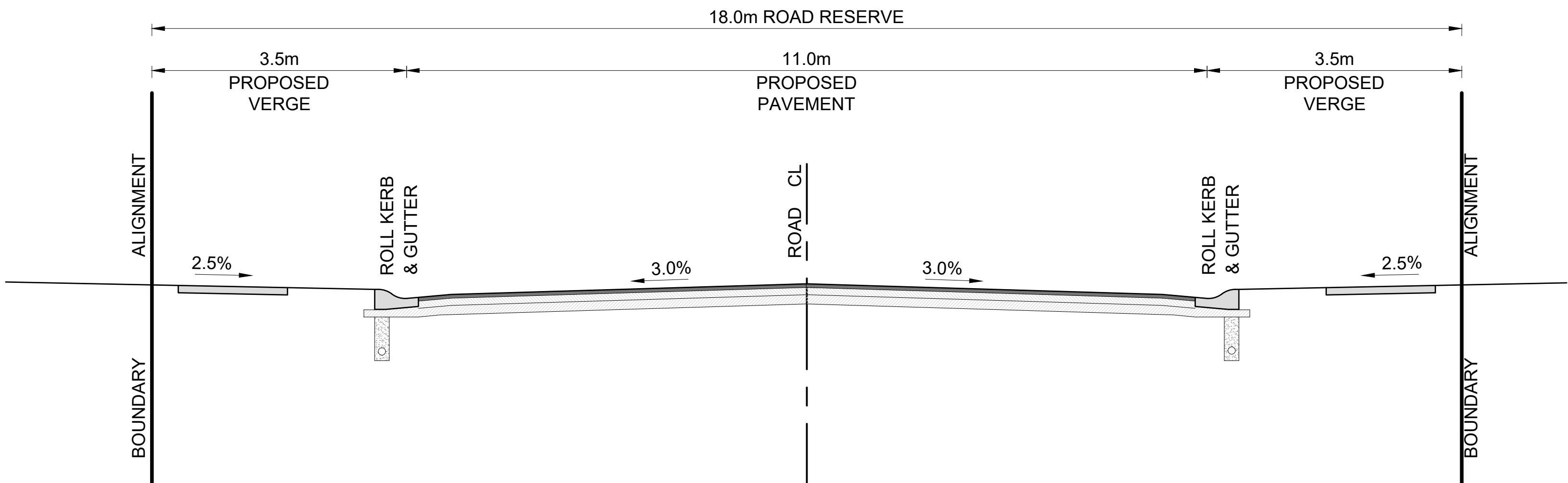
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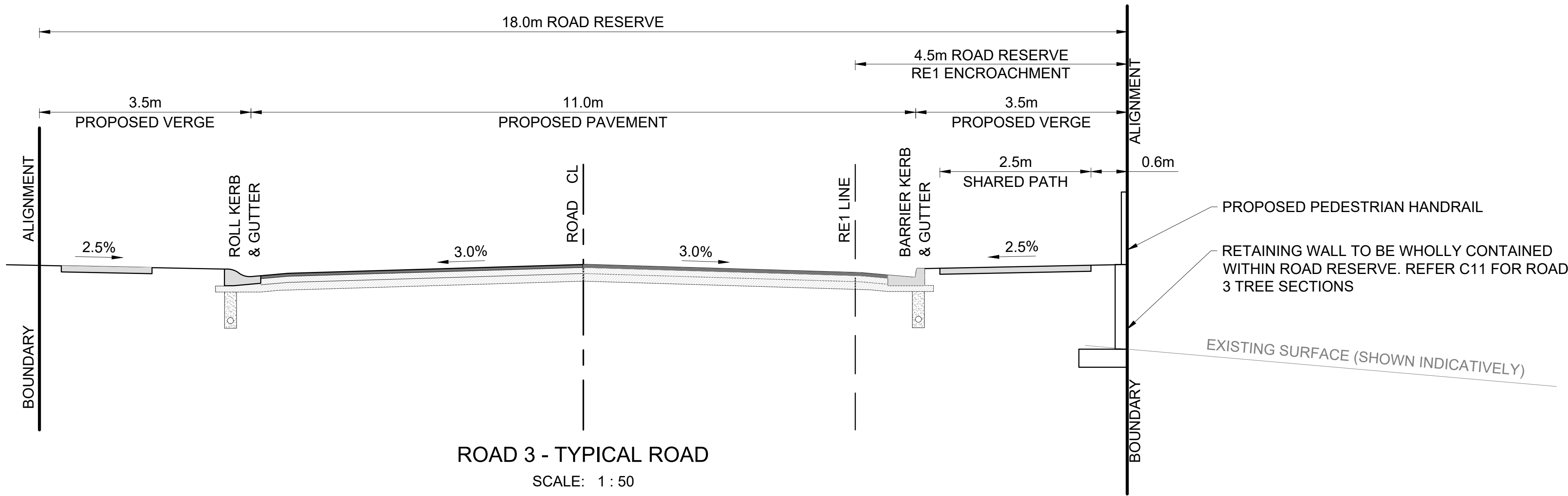


ROAD 2 - TYPICAL ROAD
SCALE: 1 : 50

ROAD 2 HALF CONSTRUCTION NOTES:
1. EXISTING SURFACE LEVELS SHOWN ON PLANS FOR ROAD 2 ARE TAKEN FROM SURVEY AND DO NOT INCLUDE 25mm SURFACE WEARING COURSE. FINISHED ROAD DESIGN LEVELS PROVIDED INCLUDE THE WEARING COURSE.



ROADS 1 AND 4 - TYPICAL ROAD
SCALE: 1 : 50



ROAD 3 - TYPICAL ROAD
SCALE: 1 : 50
NOTE: REFER C11 FOR ROAD 3 TREE SECTIONS

SCALE 0 1.5 3.0 Meters
1:50 (A1), 1:100 (A3)

CIVIL ENGINEERING

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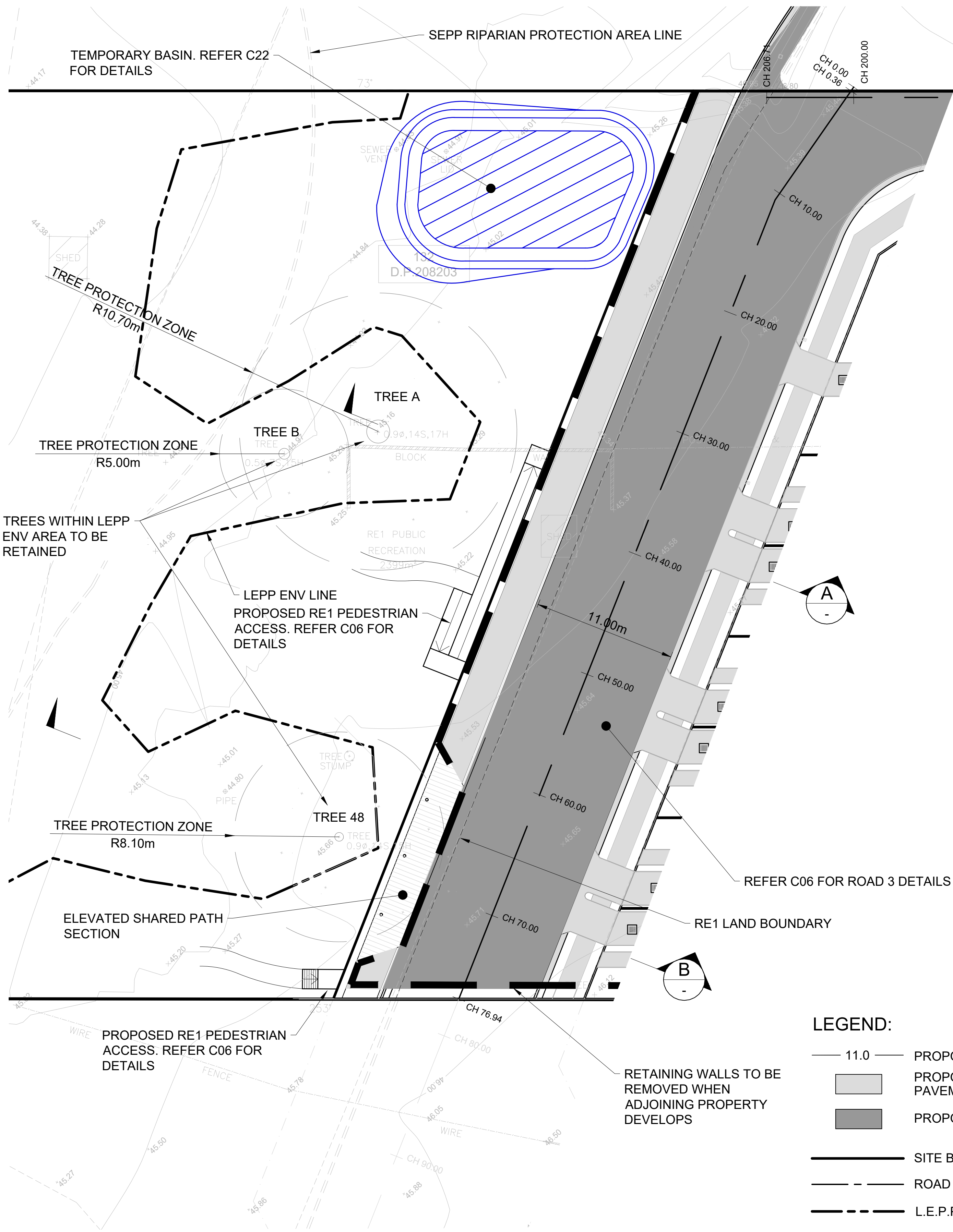
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DESIGN: RF
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DWG SIZE: A1

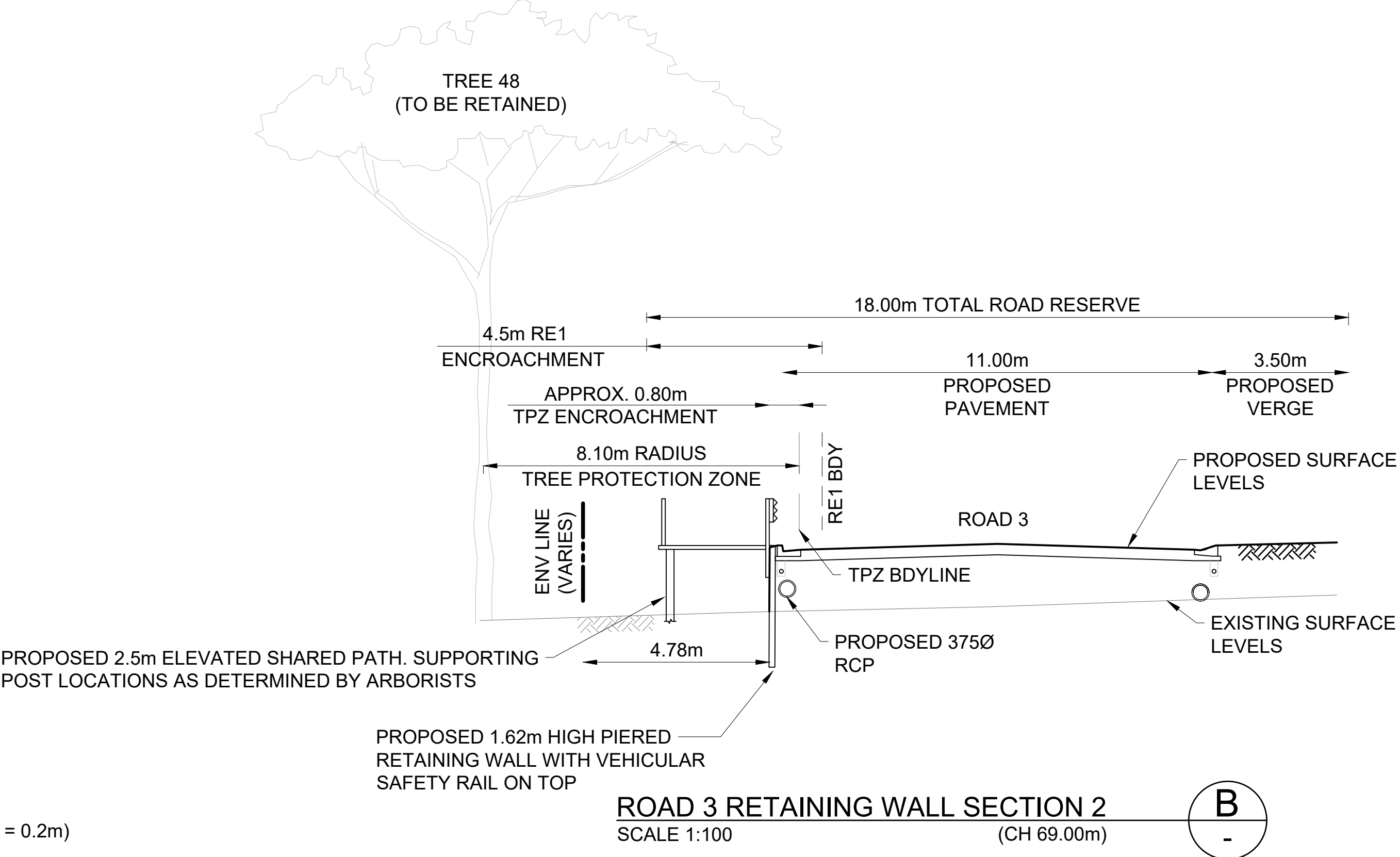
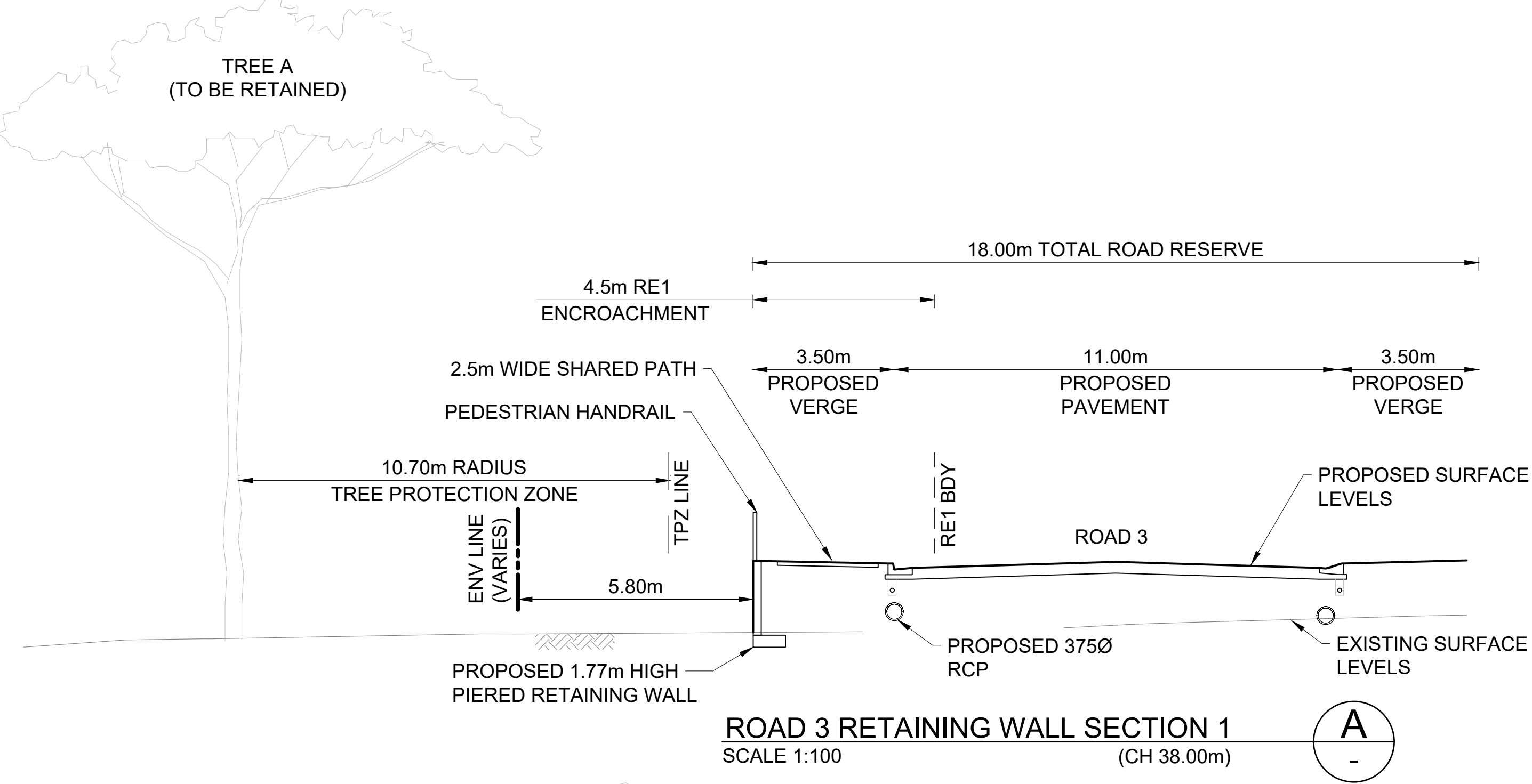
**ULTIMATE -
ROADWORKS TYPICAL
SECTIONS**

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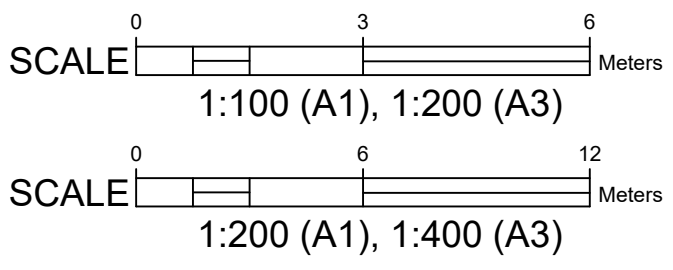
2019026 - C10 H

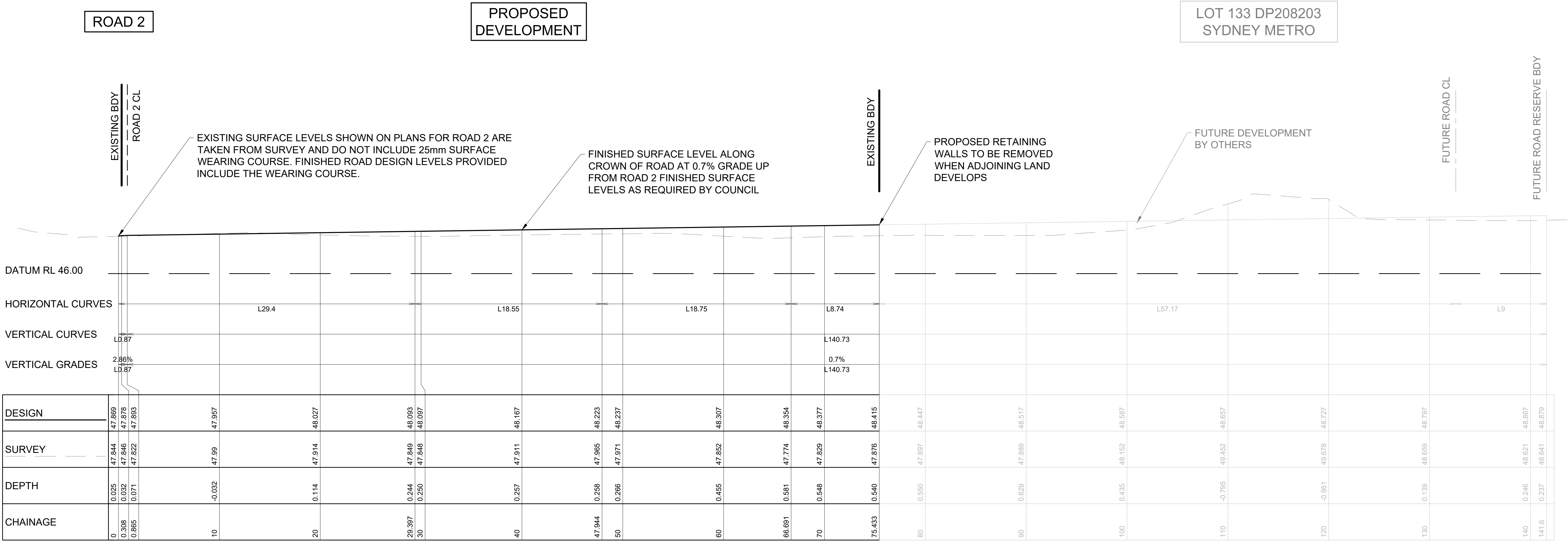


- LEGEND:
- 11.0 PROPOSED CONTOURS (C.I. = 0.2m)
 - PROPOSED CONCRETE PAVEMENT / KERB
 - PROPOSED ROAD PAVEMENT
 - SITE BOUNDARY
 - ROAD CENTRELINE
 - L.E.P.P 'ENV' AREA BOUNDARY
 - PROPOSED RETAINING WALL



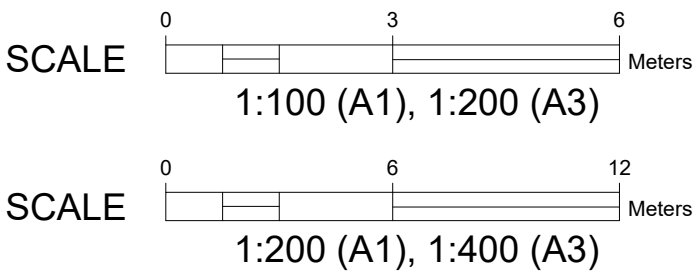
- NOTES
- ROAD 3 RETAINING WALLS SHOWN ARE TO BE ON PIERS TO MINIMISE ANY IMPACT TO TREES SHOWN ON THIS PLAN
 - PIERED RETAINING WALLS SHOWN ARE LOCATED WITHIN OUTER 15% OF TPZ AND ARE CONSIDERED ACCEPTABLE





ROAD 1 CENTRELINE - LONGITUDINAL SECTION
A1 HORZ SCALE 1:200
A1 VERT SCALE 1:100

- NOTES:
- 1. LEVELS SHOWN ARE NOT FINAL AND ARE SUBJECT TO DETAILED DESIGN
 - 2. PER COUNCIL REQUEST, MINIMUM 0.7% GRADES HAVE BEEN APPLIED TO ROADS AND DRAINAGE



CIVIL ENGINEERING			
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DESIGN:

DRAWN:

DWG SIZE:

RF

RF

A1

ULTIMATE - ROAD 1
LONGSECTION

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HALF ROAD
RECONSTRUCTION
TO JOIN IN NEATLY
WITH EXISTING
GRADES AND
LEVELS

TERRY ROAD CL

EXISTING BDY

ROAD 1 CL

ROAD 4 CL

ROAD 3 CL

FINISHED SURFACE LEVEL ALONG
CROWN OF ROAD 500mm WITHIN SITE

PER COUNCIL REQUEST, THE KERB INVERT LEVELS OF ROAD 2 HAVE
BEEN ADJUSTED TO PROVIDE MINIMUM 0.7% GRADE FOR DRAINAGE.
REFER C14 FOR ADJOINING KERB INVERT LONGSECTION

DATUM RL 44.00

HORIZONTAL CURVES

VERTICAL CURVES

VERTICAL GRADES

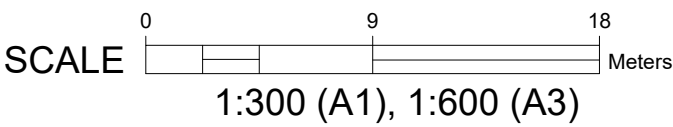
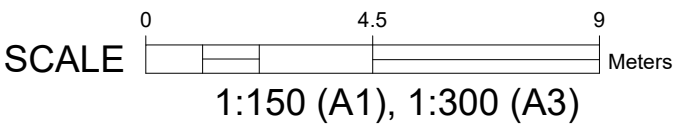
CHAINAGE	DEPTH	SURVEY	DESIGN	
0	-0.004	49.352	49.347	
10	0.017	49.05	49.066	
10.383	0.019	49.037	49.056	
10.997	0.026	49.012	49.038	
12.883	0.028	48.956	48.984	
15.383	0.026	48.883	48.909	
20	0.026	48.741	48.767	
30	0.025	48.436	48.461	
40	0.024	48.13	48.154	
45	0.051	47.972	48.023	
50	0.066	47.838	47.904	
50.531	0.071	47.822	47.893	
55	0.119	47.69	47.809	
60	0.120	47.607	47.726	
70	0.121	47.439	47.560	
80	0.123	47.271	47.394	
90	0.129	47.121	47.249	
100	0.219	46.956	47.175	
110	0.222	46.878	47.100	
120	0.203	46.822	47.026	
128.223	0.284	46.688	46.972	
130	0.297	46.683	46.961	
140	0.418	46.486	46.904	
150	0.426	46.421	46.847	
160	0.434	46.356	46.790	
170	0.442	46.292	46.734	
180	0.245	46.471	46.716	
190	0.487	46.268	46.755	
200	0.489	46.295	46.794	
200.548	0.500	46.296	46.796	
206.708	0.212	46.459	46.671	

ROAD 2 CENTRELINE - LONGITUDINAL SECTION

A1 HORZ SCALE 1:300
A1 VERT SCALE 1:150

NOTES:

- LEVELS SHOWN ARE NOT FINAL AND ARE SUBJECT TO DETAILED DESIGN
- PER COUNCIL REQUEST, MINIMUM 0.7% GRADES HAVE BEEN APPLIED TO ROADS AND DRAINAGE



CIVIL ENGINEERING

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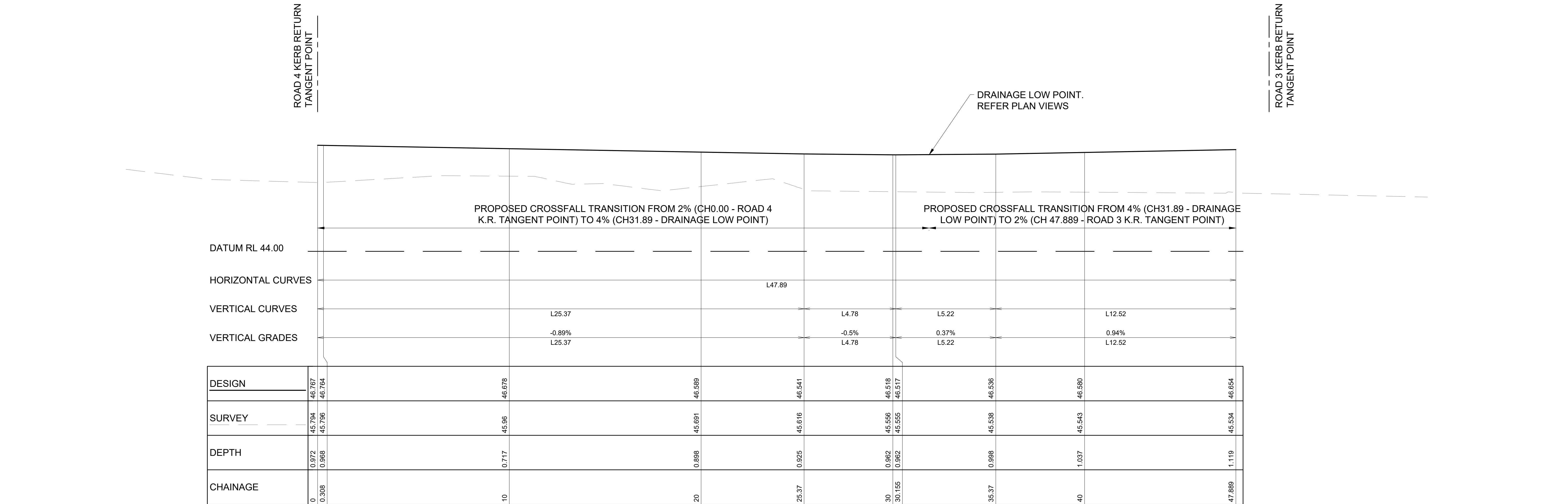
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DWG SIZE: A1

ULTIMATE - ROAD 2
LONGSECTION

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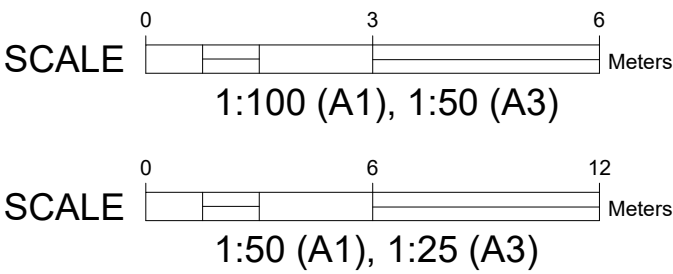
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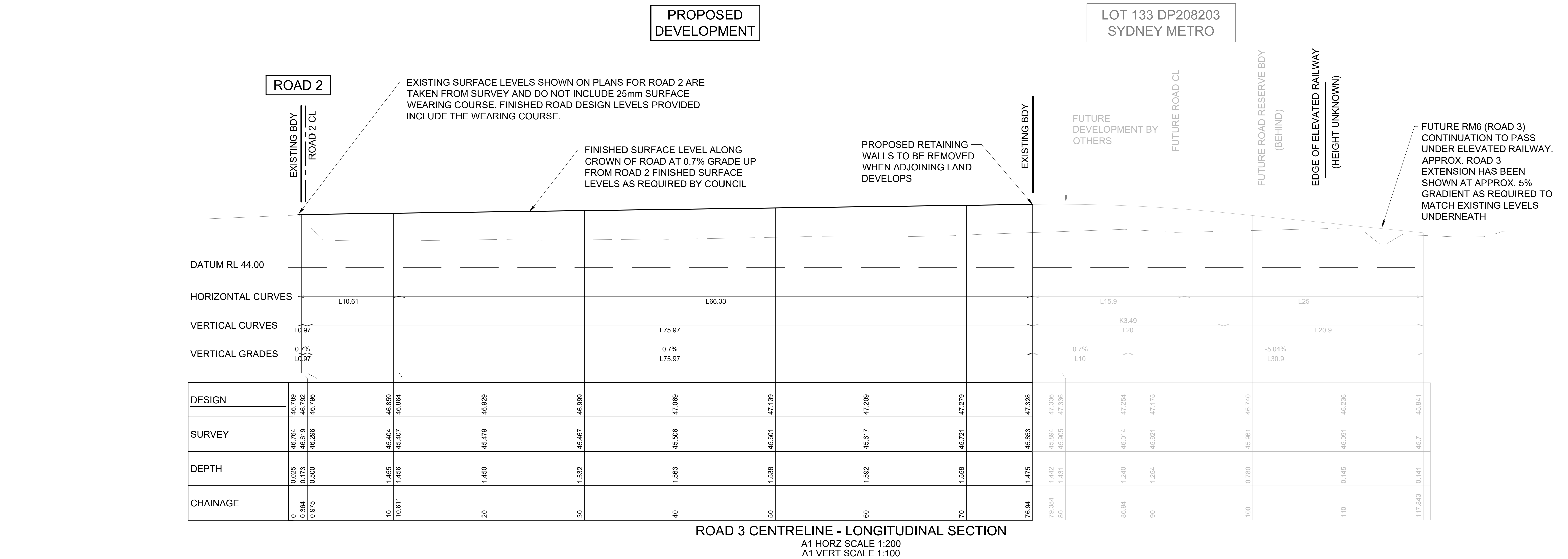
2019026 - C13 H



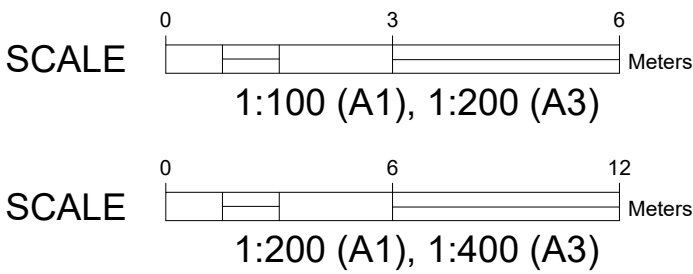
ROAD 2 KERB INVERT - LONGITUDINAL SECTION
A1 HORZ SCALE 1:100
A1 VERT SCALE 1:50

- NOTES:
1. LEVELS SHOWN ARE NOT FINAL AND ARE SUBJECT TO DETAILED DESIGN
 2. PER COUNCIL REQUEST, MINIMUM 0.7% GRADES HAVE BEEN APPLIED TO ROADS AND DRAINAGE





- NOTES:
- 1. LEVELS SHOWN ARE NOT FINAL AND ARE SUBJECT TO DETAILED DESIGN
 - 2. PER COUNCIL REQUEST, MINIMUM 0.7% GRADES HAVE BEEN APPLIED TO ROADS AND DRAINAGE



CIVIL ENGINEERING

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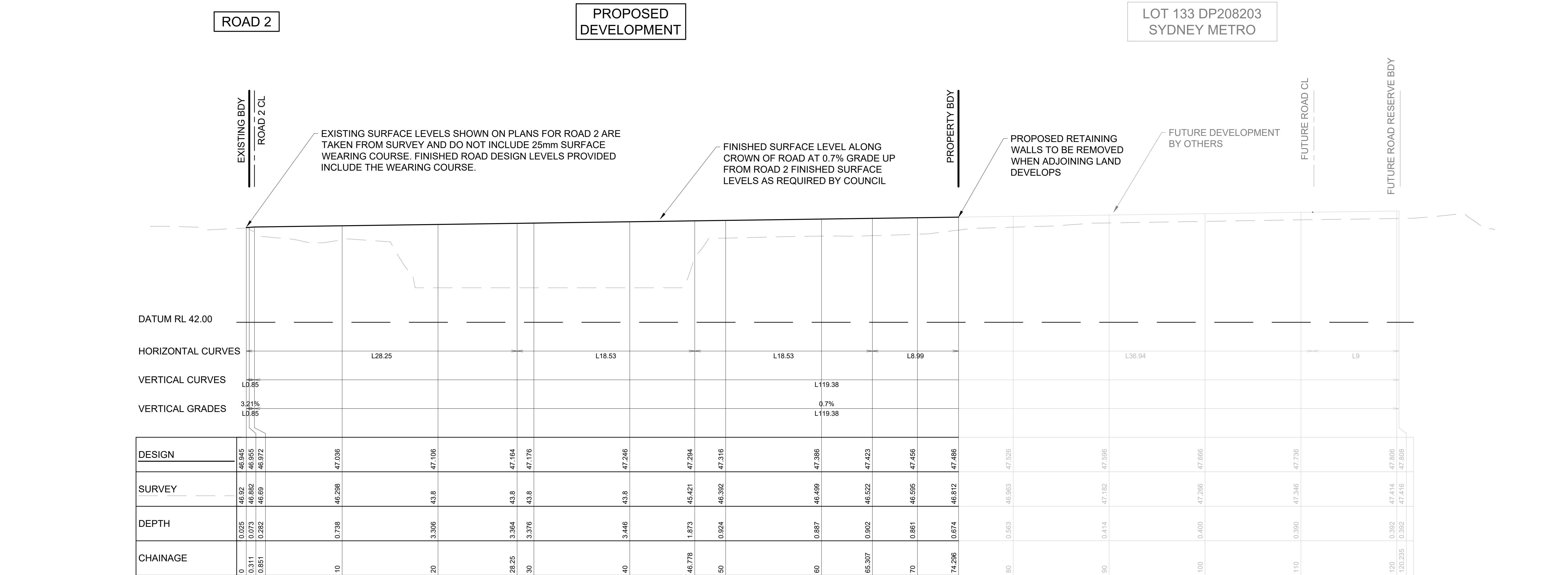
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DESIGN: RF
DRAWN: RF
DWG SIZE: A1

ULTIMATE - ROAD 3
LONGSECTION

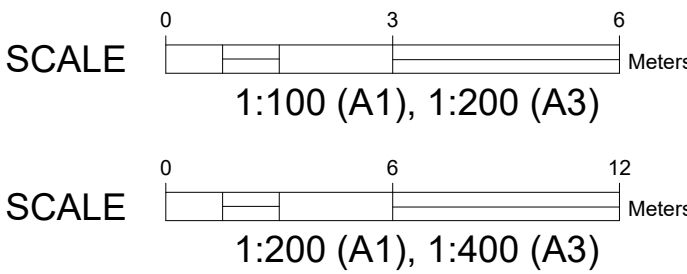
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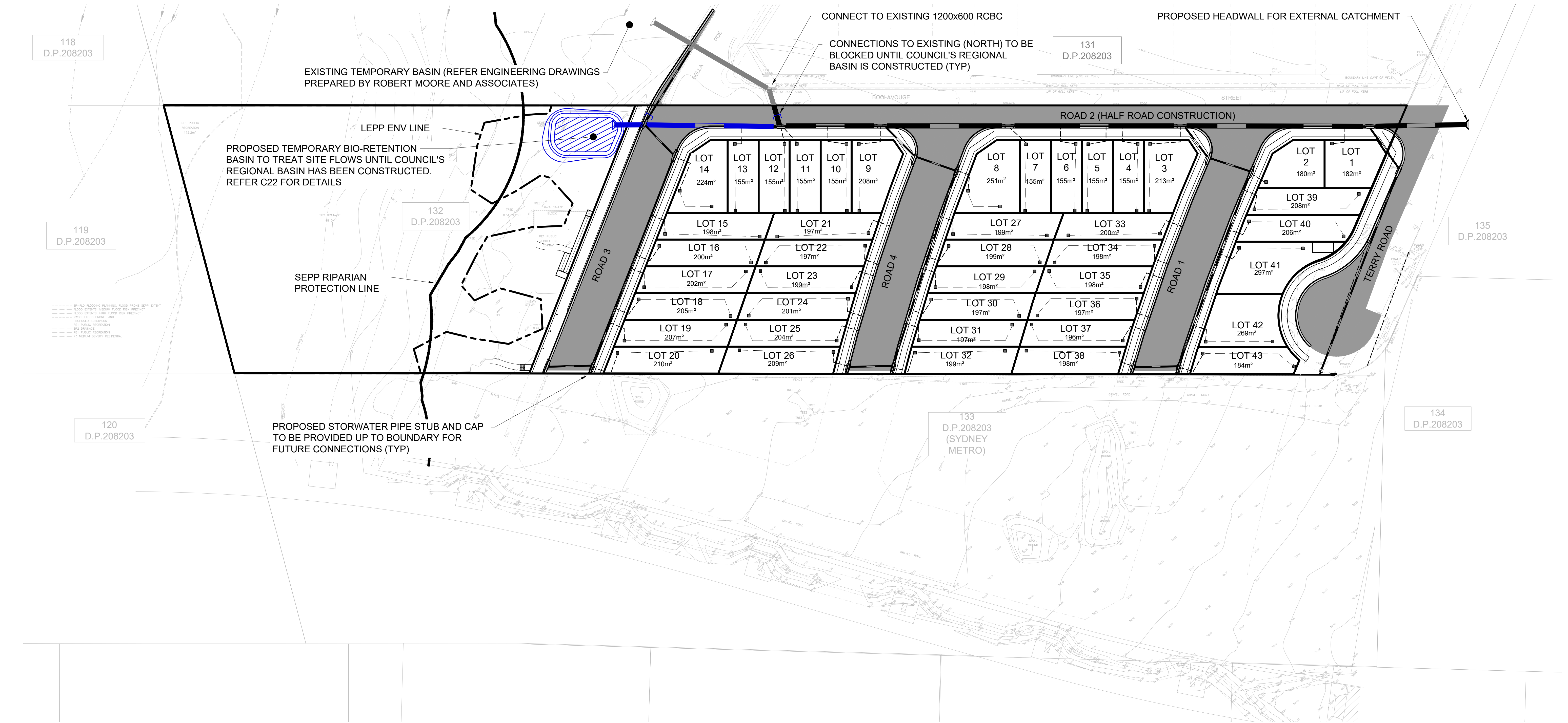
2019026 - C15 H



ROAD 4 CENTRELINE - LONGITUDINAL SECTION
A1 HORZ SCALE 1:200
A1 VERT SCALE 1:100

- NOTES:
- LEVELS SHOWN ARE NOT FINAL AND ARE SUBJECT TO DETAILED DESIGN
 - PER COUNCIL REQUEST, MINIMUM 0.7% GRADES HAVE BEEN APPLIED TO ROADS AND DRAINAGE





NOTES:

- STORMWATER FLOWS TO BE COLLECTED IN PIPE/PIT SYSTEM AND DIRECTED TO EXISTING STORMWATER NETWORK AS SHOWN.
- ALL STORMWATER PIPES SHOWN HAVE A MINIMUM GRADE OF 0.7%
- REFER C21 FOR TYPICAL ALLOTMENT PIT AND PIPE NETWORK
- COUNCIL HAVE ADVISED THE FOLLOWING DESIGN LEVELS FOR FUTURE INFRASTRUCTURE S6.1 (GROSS POLLUTANT TRAP):
 - GPT INVERT SHALL BE AT IL 44.93
 - GPT INTERNAL CDS WEIR SHALL BE NOMINATED AT 0.5m ABOVE THE INVERT AT RL 45.43

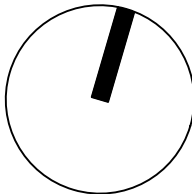
LEGEND:

- 11.0 EXISTING CONTOURS
- EXISTING EDGE OF BITUMEN
- EXISTING BUILDING
- PROPOSED STORMWATER PIPE (RCP)
- PROPOSED MINOR STORMWATER (PVC)
- PROPOSED 900 x 900 GRATED PIT WITH CARTRIDGE
- L.E.P.P 'ENV' AREA BOUNDARY

SCALE 0 15 30 Meters
1:500 (A1), 1:1000 (A3)

CIVIL ENGINEERING

H	SOFC ISSUE	RF	05.02.2020
G	WORK IN PROGRESS	RF	02.02.2020
F	TREE A & B UPDATE	RF	09.10.19
E	ROAD 3 TREE UPDATES	RF	04.10.19
REV	DESCRIPTION	BY	DATE



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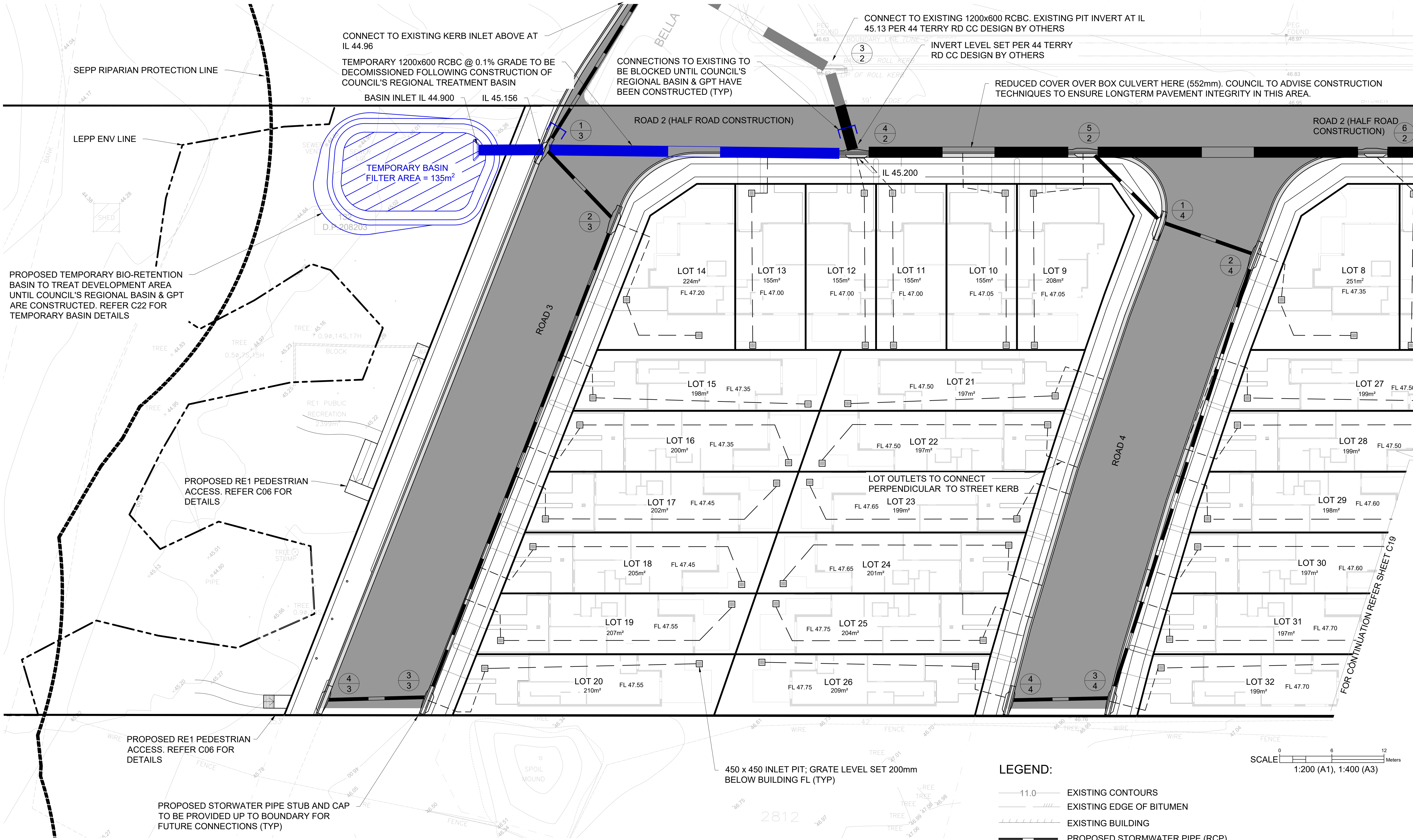
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DESIGN: RF
DRAWN: RF
DWG SIZE: A1

**ULTIMATE -
STORMWATER
LAYOUT - OVERALL**

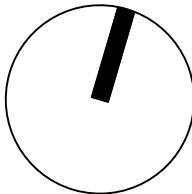
RESIDENTIAL DEVELOPMENT
54 TERRY RD, ROUSE HILL NSW 2155

2019026 - C17 H



CIVIL ENGINEERING

H	SOFC ISSUE	RF	05.02.2020
G	WORK IN PROGRESS	RF	02.02.2020
F	TREE A & B UPDATE	RF	09.10.19
E	ROAD 3 TREE UPDATES	RF	04.10.19
REV	DESCRIPTION	BY	DATE



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DWG SIZE: A1

ULTIMATE -
STORMWATER
LAYOUT - SHEET 1 OF
3

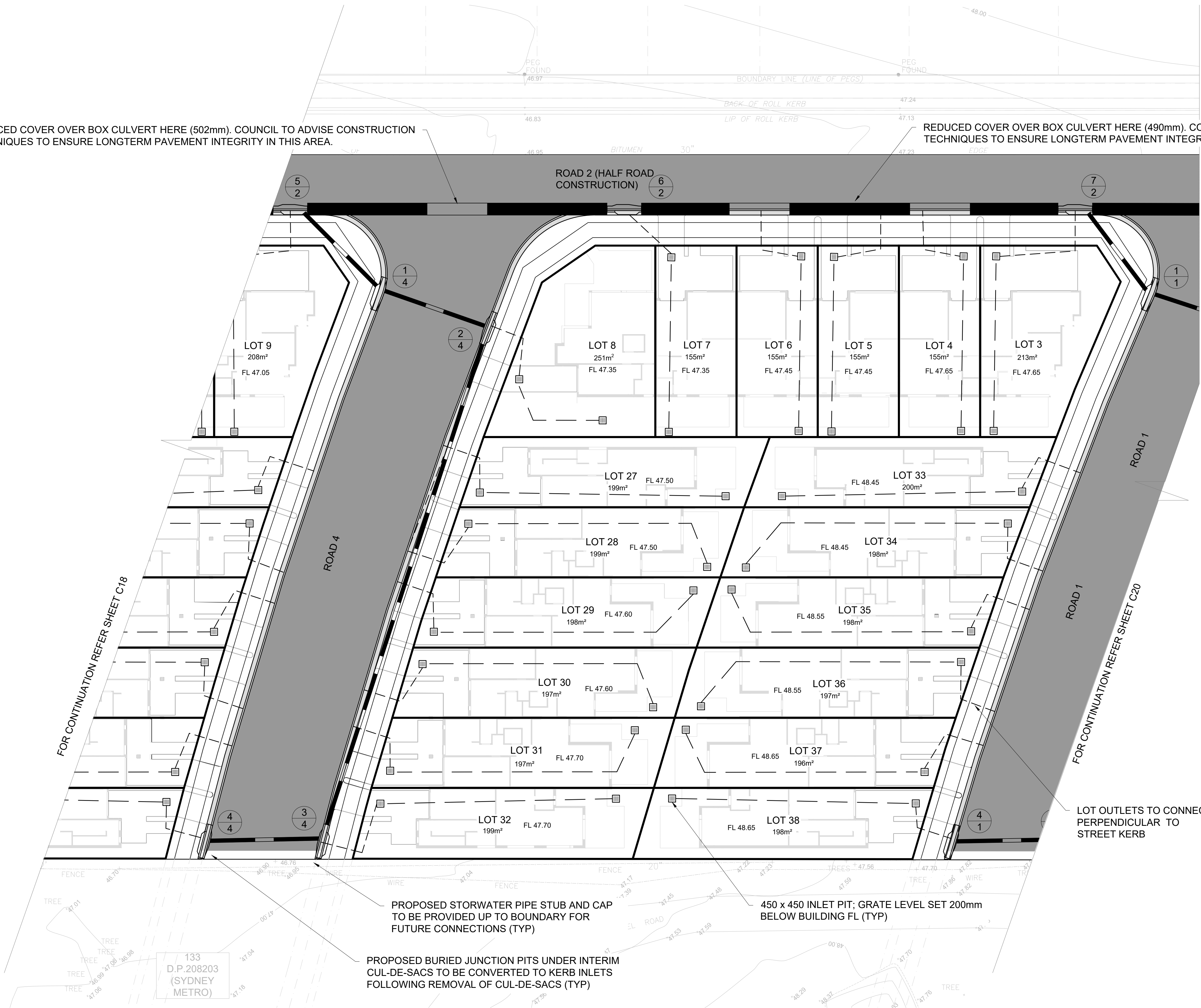
RESIDENTIAL DEVELOPMENT

54 TERRY RD, ROUSE HILL NSW 2155

2019026 - C18 H

REDUCED COVER OVER BOX CULVERT HERE (502mm). COUNCIL TO ADVISE CONSTRUCTION TECHNIQUES TO ENSURE LONGTERM PAVEMENT INTEGRITY IN THIS AREA.

REDUCED COVER OVER BOX CULVERT HERE (490mm). COUNCIL TO ADVISE CONSTRUCTION TECHNIQUES TO ENSURE LONGTERM PAVEMENT INTEGRITY IN THIS AREA.



NOTES:
1. PER COUNCIL'S REQUEST, ROADS AND DRAINAGE PIPES HAVE BEEN SET AT A MINIMUM 0.7% GRADIENT

- LEGEND:
- 11.0 EXISTING CONTOURS
 - EXISTING EDGE OF BITUMEN
 - EXISTING BUILDING
 - PROPOSED STORMWATER PIPE (RCP)
 - PROPOSED MINOR STORMWATER (PVC)
 - PROPOSED 900 x 900 GRATED PIT WITH CARTRIDGE

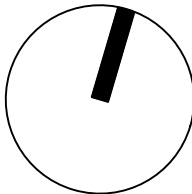
PROPOSED STORWATER PIPE STUB AND CAP TO BE PROVIDED UP TO BOUNDARY FOR FUTURE CONNECTIONS (TYP)

450 x 450 INLET PIT; GRATE LEVEL SET 200mm BELOW BUILDING FL (TYP)

PROPOSED BURIED JUNCTION PITS UNDER INTERIM CUL-DE-SACS TO BE CONVERTED TO KERB INLETS FOLLOWING REMOVAL OF CUL-DE-SACS (TYP)

CIVIL ENGINEERING

H	SOFC ISSUE	RF	05.02.2020
G	WORK IN PROGRESS	RF	02.02.2020
F	TREE A & B UPDATE	RF	09.10.19
E	ROAD 3 TREE UPDATES	RF	04.10.19
REV	DESCRIPTION	BY	DATE



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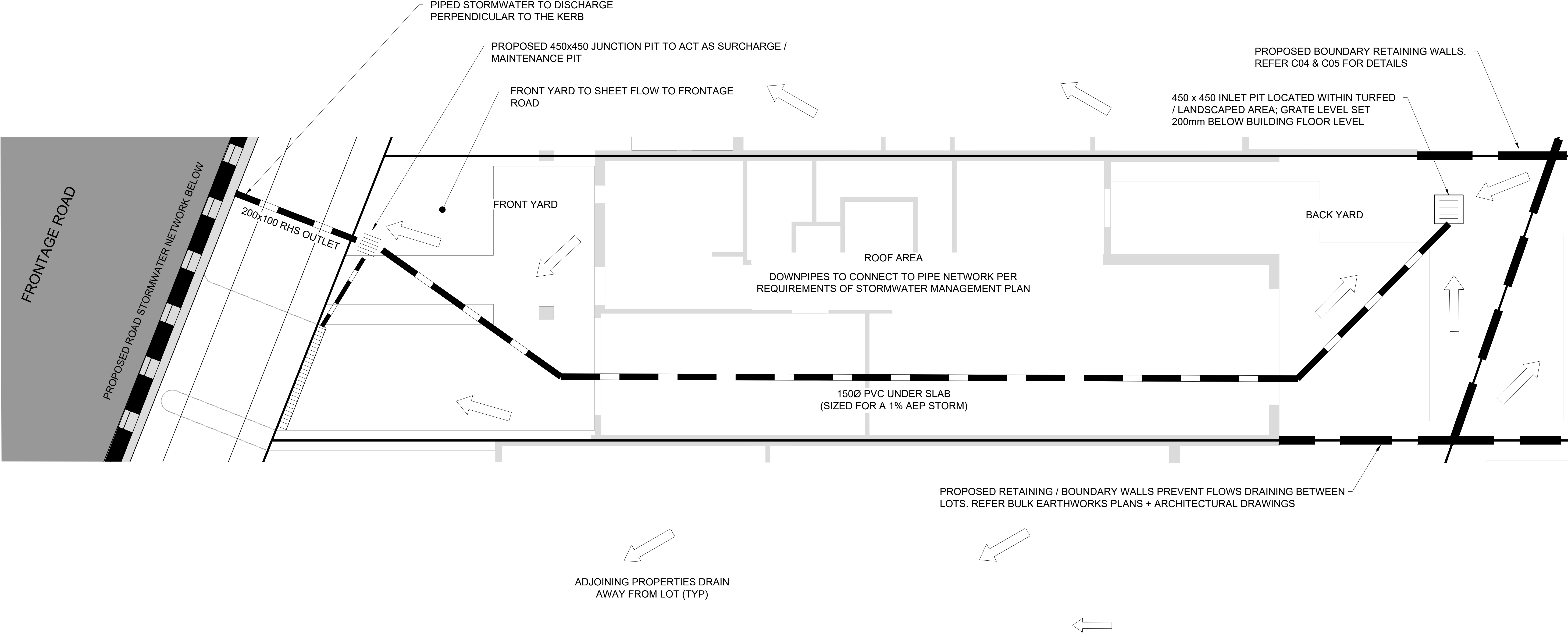
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DESIGN: RF
DRAWN: RF
DWG SIZE: A1

**ULTIMATE -
STORMWATER
LAYOUT - SHEET 2 OF
3**

RESIDENTIAL DEVELOPMENT
54 TERRY RD, ROUSE HILL NSW 2155

2019026 - C19 H



NOTES:

1.

STORMWATER DRAINAGE FROM EACH LOT IS WHOLLY CONTAINED WITHIN THE LOT BOUNDARIES AND DRAINS TO THE STREET. THERE IS NO STORMWATER FROM ADJOINING PROPERTIES CROSSING PROPERTY BOUNDARY LINES DUE TO RETAINING WALLS AND FENCES

2.

REFER ARCHITECTURAL DRAWINGS FOR ROOF GUTTERS AND DOWNPIPE LOCATIONS.
3.

TRAPPED LOW POINTS WITH SMALL YARDS ARE TO BE DRAINED VIA PIPE SIZED FOR ARI 100 TO FRONT OF LOT. NO RAINWATER TANKS ARE REQUIRED. TYPICAL LEVELS ARE:

•

FLOOR LEVELS SHOWN

•

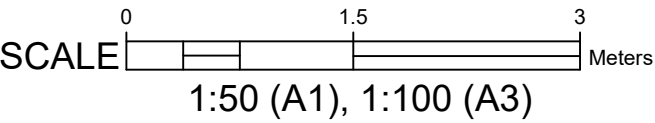
FINISHED BACK YARD TO BE 200mm BELOW HOUSE FLOOR LEVEL

•

KERB OUTLET IS ABOUT 450mm BELOW FINISEHD FLOOR LEVELS; SOME MINOR VARIATIONS TO THIS OCCUR.

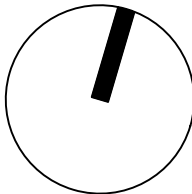
LEGEND:

- PROPOSED BOUNDARY
- PROPOSED STORMWATER INLET
- PROPOSED STORMWATER INLET
- DIRECTION OF FLOW



CIVIL ENGINEERING

H	SOFC ISSUE	RF	05.02.2020
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REV	DESCRIPTION	BY	DATE



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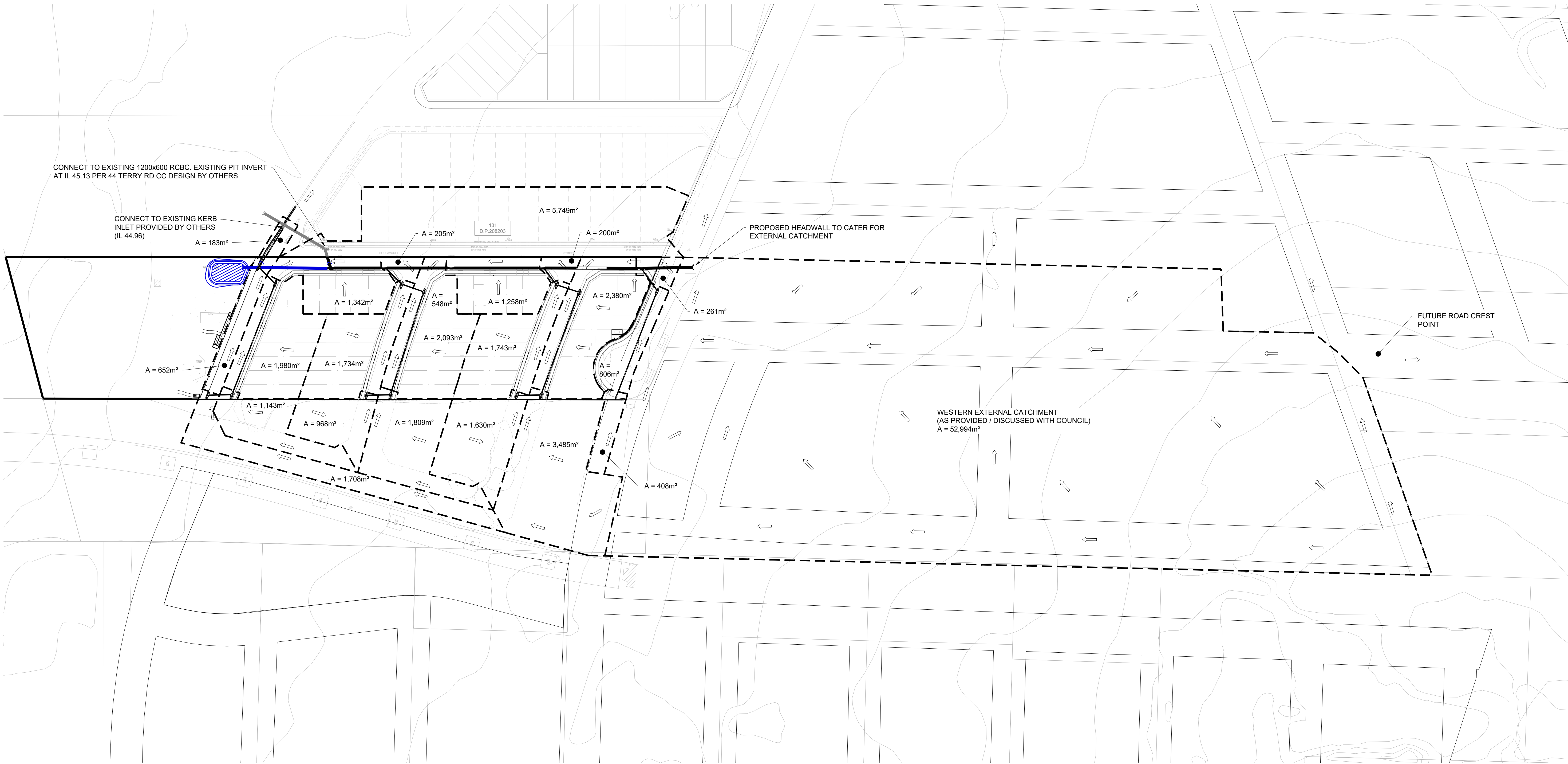
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DESIGN: RF
DRAWN: RF
DWG SIZE: A1

**ULTIMATE -
STORMWATER
LAYOUT - TYPICAL
LOT**

RESIDENTIAL DEVELOPMENT
54 TERRY RD, ROUSE HILL NSW 2155

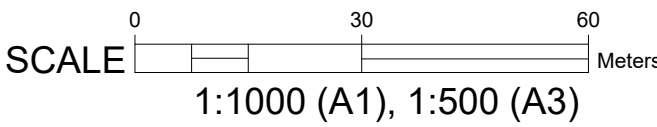
2019026 - C21 H



NOTES:
1. EXTERNAL CATCHMENT CONTOURS AS PROVIDED FROM GEOSCIENCE AUSTRALIA LIDAR DATA

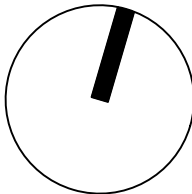
LEGEND:

- 11.0 EXISTING CONTOURS
- EXISTING EDGE OF BITUMEN
- EXISTING BUILDING
- PROPOSED STORMWATER PIPE (RCP)
- CATCHMENT BOUNDARIES
- DEVELOPED DIRECTION OF FLOW ARROW



CIVIL ENGINEERING

H	SOFC ISSUE	RF	05.02.2020
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F	TREE A & B UPDATE	RF	09.10.19
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REV	DESCRIPTION	BY	DATE



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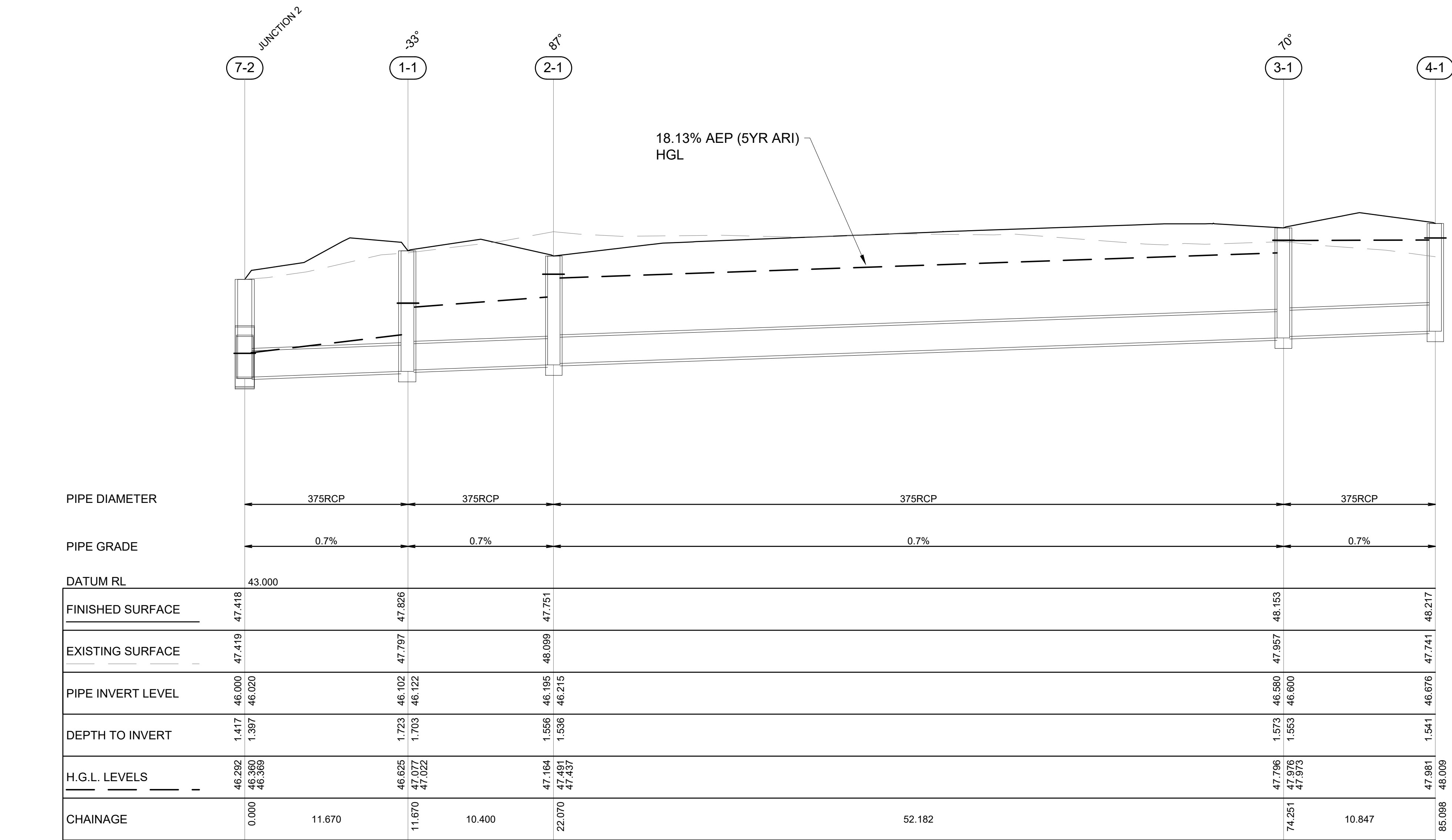
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DESIGN: RF
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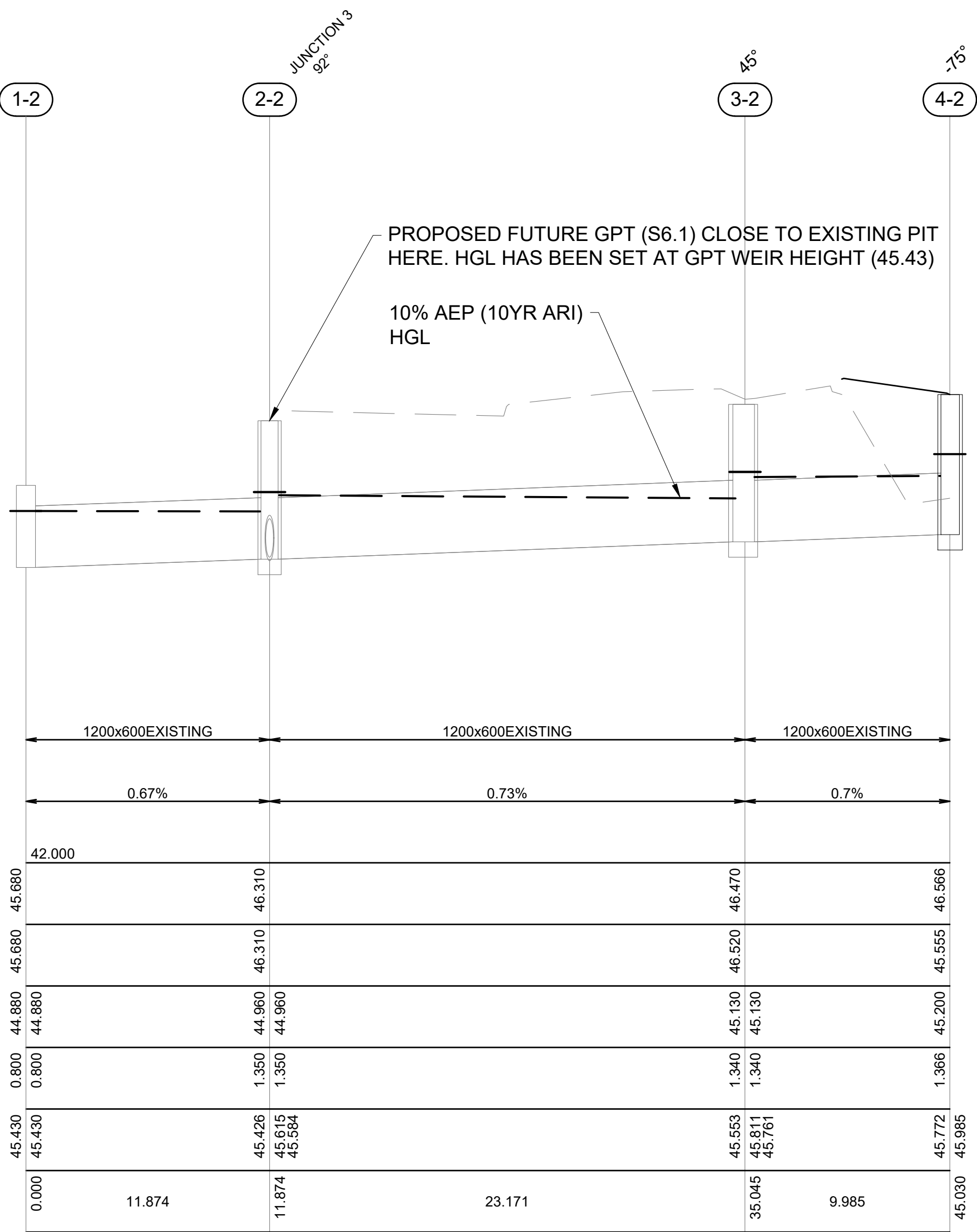
ULTIMATE -
STORMWATER
CATCHMENT PLAN

RESIDENTIAL DEVELOPMENT
54 TERRY RD, ROUSE HILL NSW 2155

2019026 - C23 H

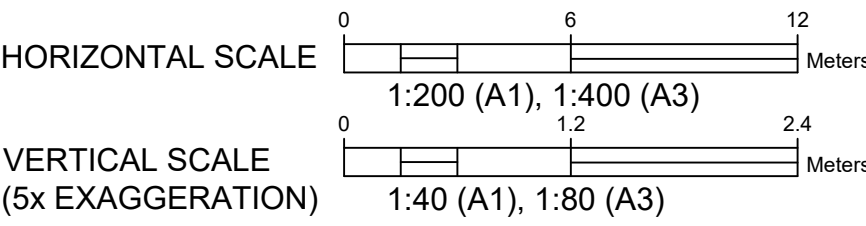


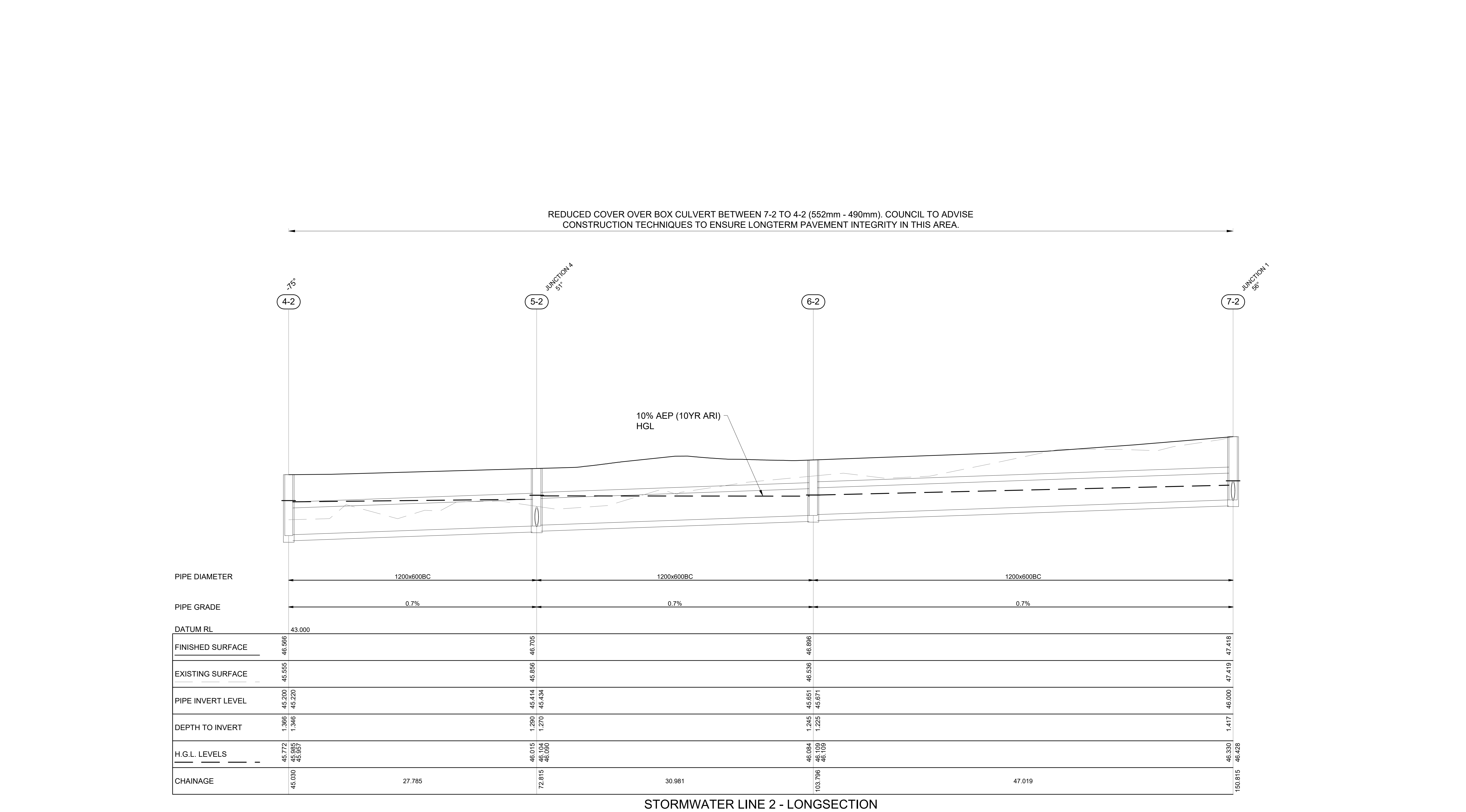
STORMWATER LINE 1 - LONGSECTION



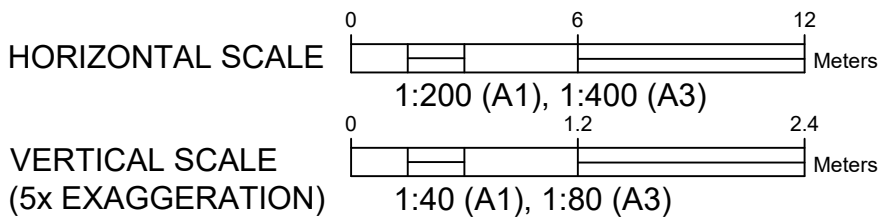
STORMWATER LINE 2 - LONGSECTION

NOTES:
1. PER COUNCIL'S REQUEST, ROADS
AND DRAINAGE PIPES HAVE BEEN SET
AT A MINIMUM 0.7% GRADIENT





NOTES:
1. PER COUNCIL'S REQUEST, ROADS
AND DRAINAGE PIPES HAVE BEEN SET
AT A MINIMUM 0.7% GRADIENT



CIVIL ENGINEERING

H	SOFC ISSUE	RF	05.02.2020
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REV	DESCRIPTION	BY	DATE

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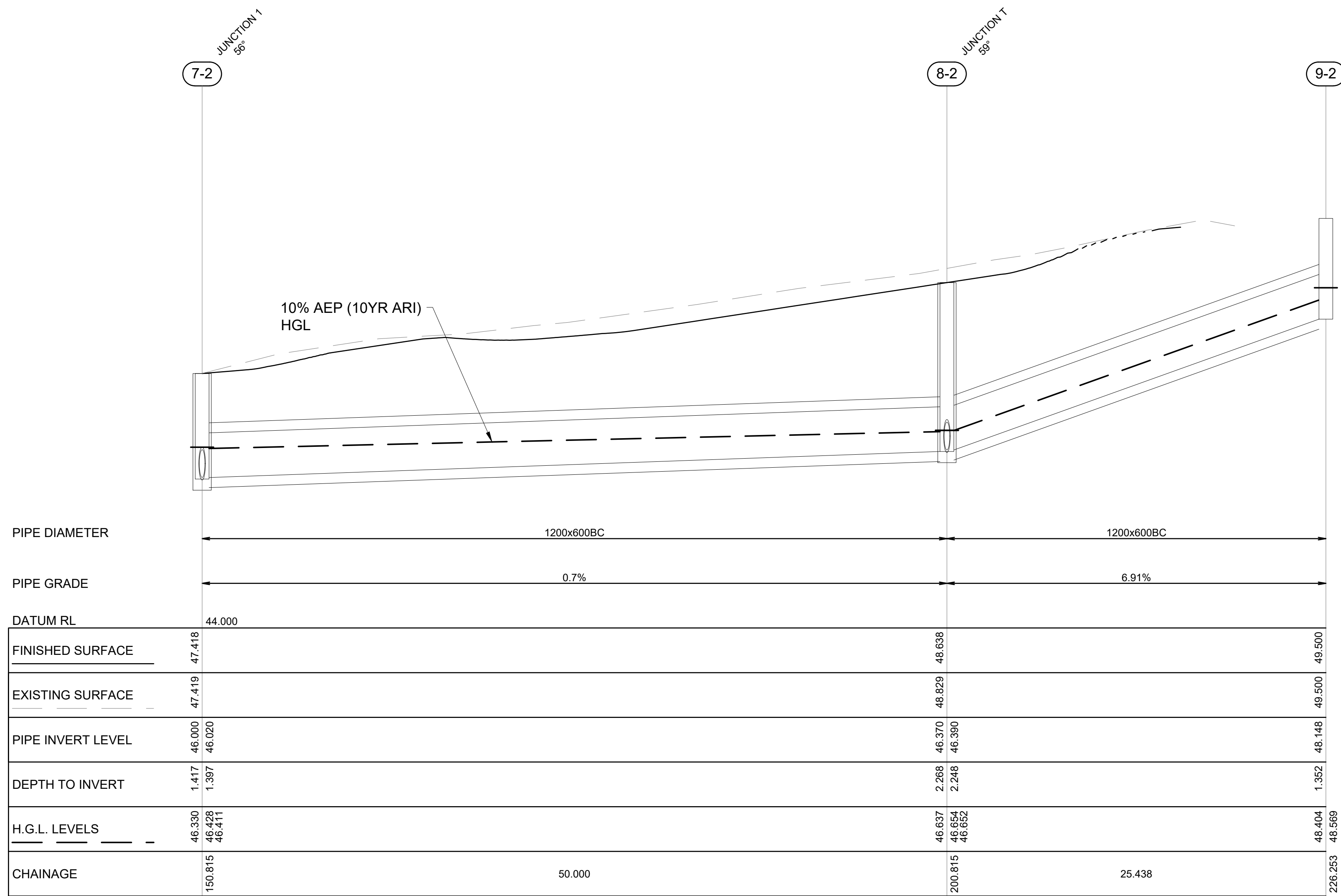
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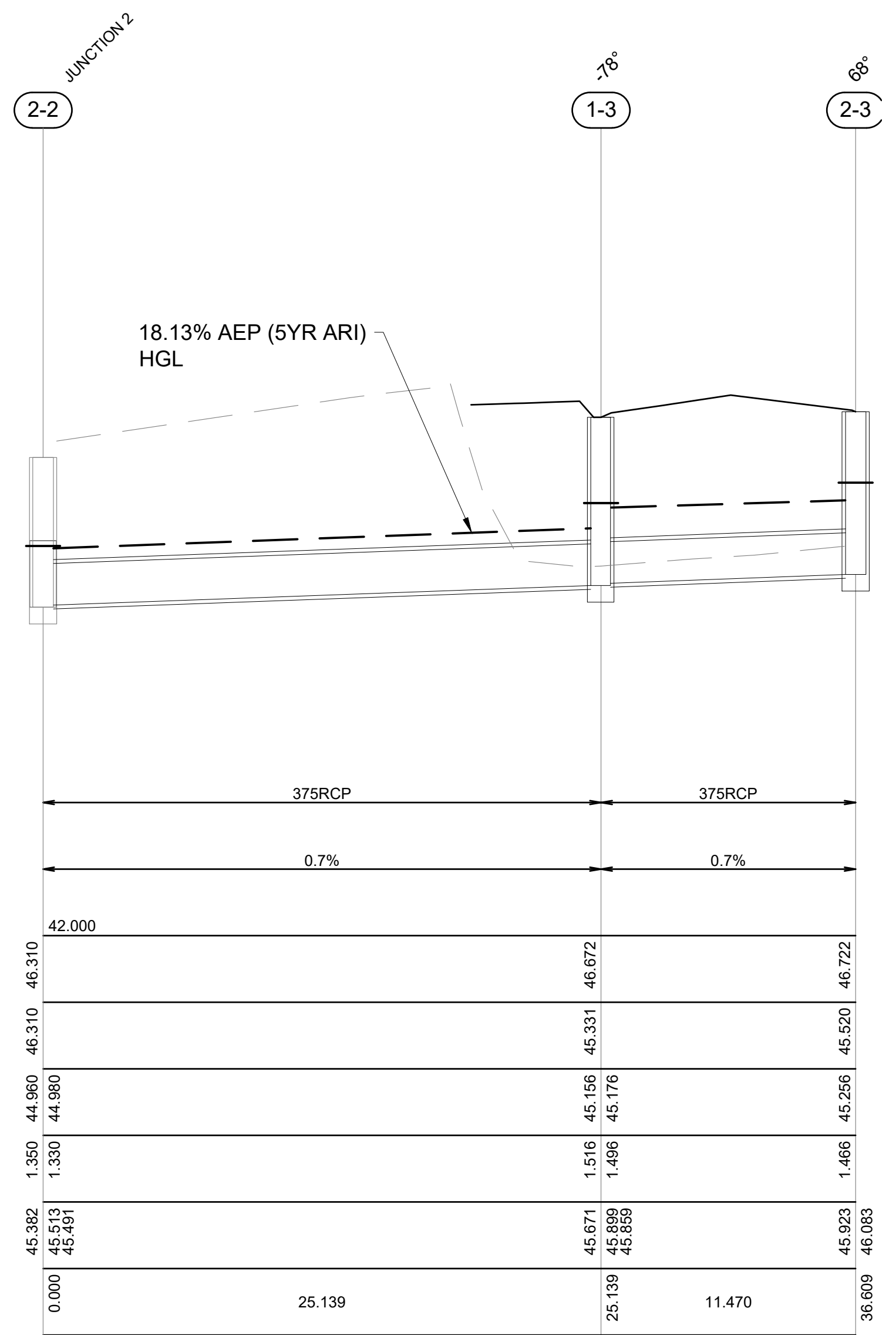
ULTIMATE -
STORMWATER
LONGSECTIONS -
SHEET 2 OF 5

RESIDENTIAL DEVELOPMENT
54 TERRY RD, ROUSE HILL NSW 2155

2019026 - C25 H

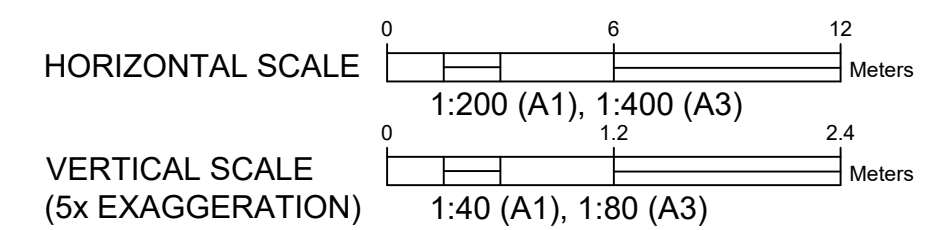


STORMWATER LINE 2 - LONGSECTION



STORMWATER LINE 3 - LONGSECTION

NOTES:
1. PER COUNCIL'S REQUEST, ROADS
AND DRAINAGE PIPES HAVE BEEN SET
AT A MINIMUM 0.7% GRADIENT



CIVIL ENGINEERING

H	SOFC ISSUE	RF	05.02.2020
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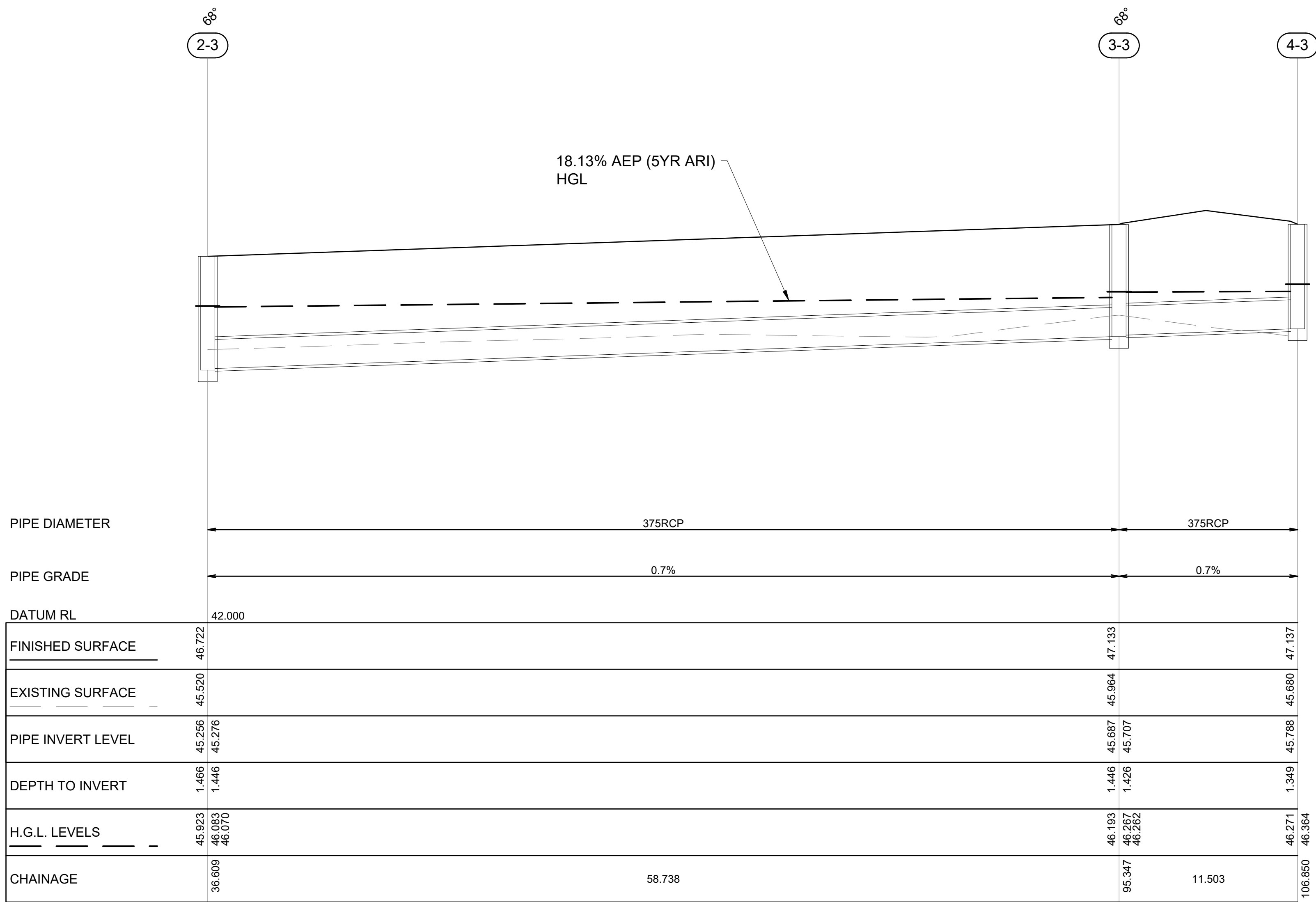
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DWG SIZE: A1

ULTIMATE -
STORMWATER
LONGSECTIONS -
SHEET 3 OF 5

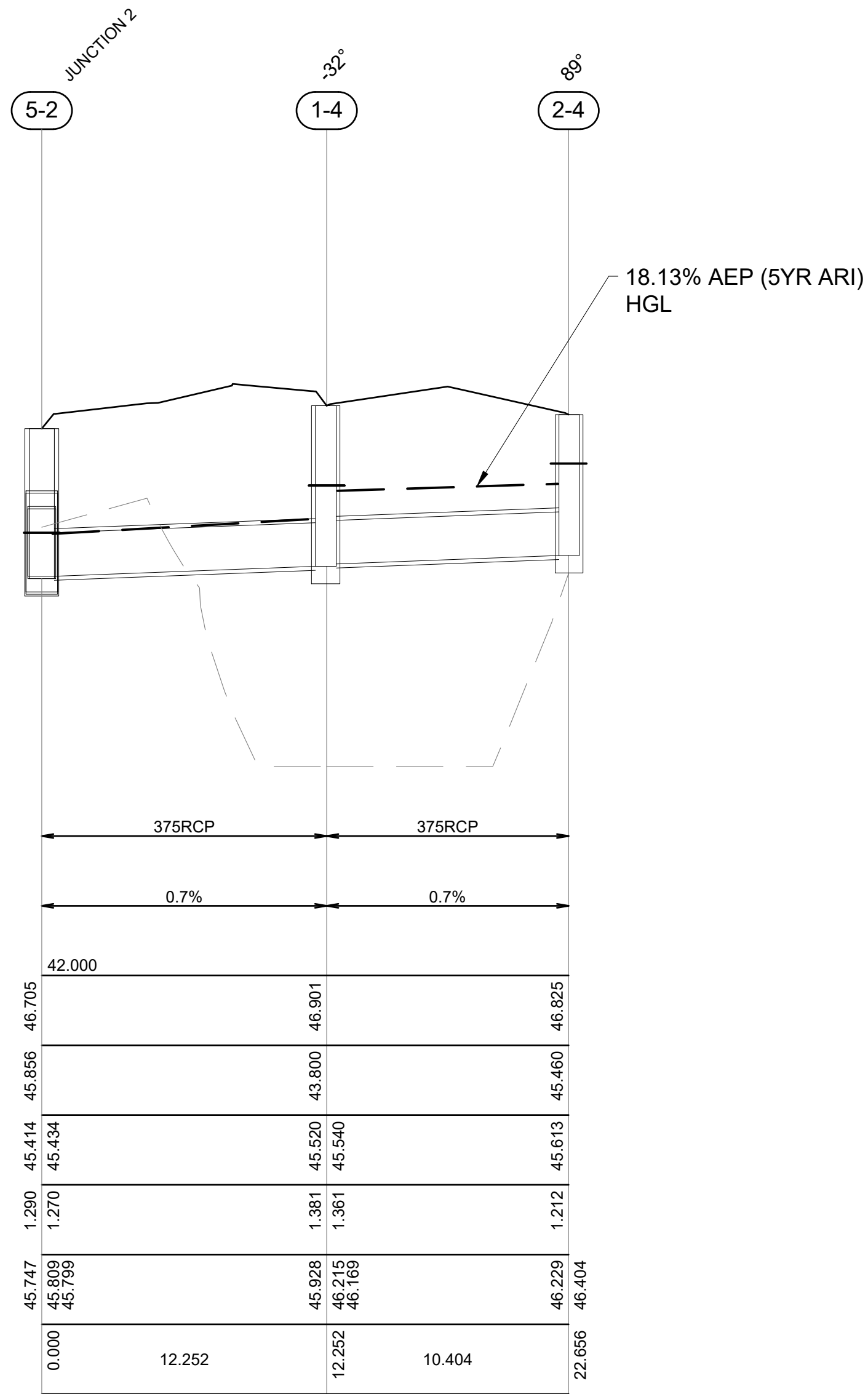
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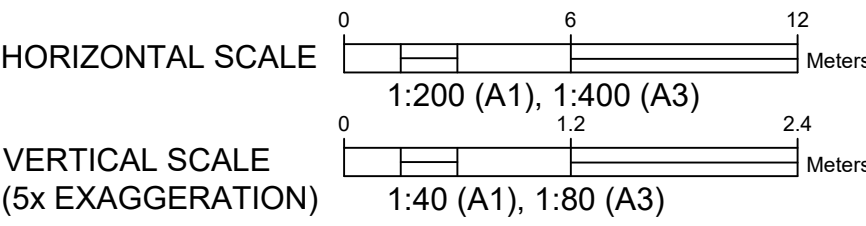


STORMWATER LINE 3 - LONGSECTION



STORMWATER LINE 4 - LONGSECTION

NOTES:
1. PER COUNCIL'S REQUEST, ROADS
AND DRAINAGE PIPES HAVE BEEN SET
AT A MINIMUM 0.7% GRADIENT



CIVIL ENGINEERING

H	SOFC ISSUE	RF	05.02.2020
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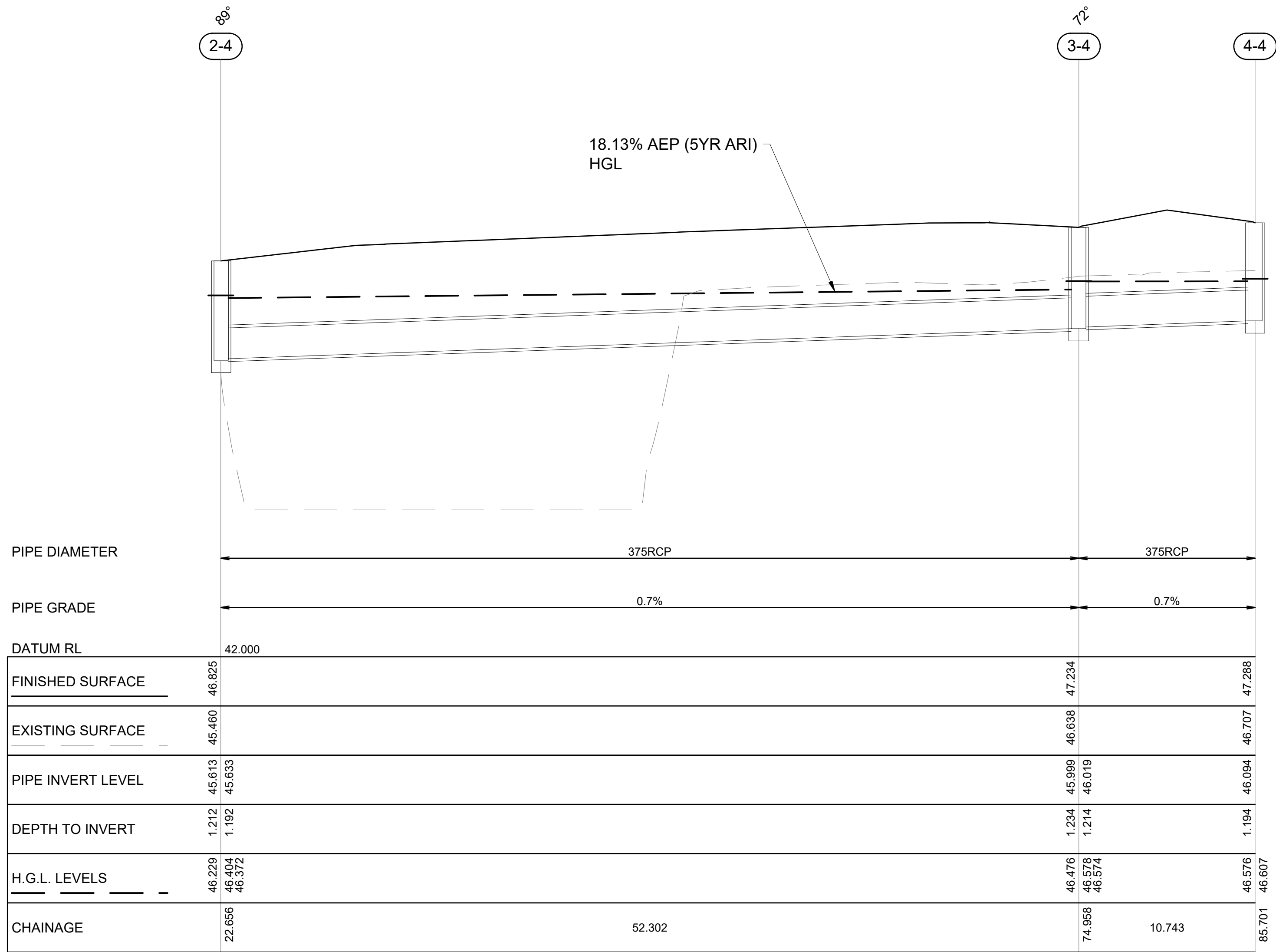
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DRAWN: RF
DWG SIZE: A1

ULTIMATE -
STORMWATER
LONGSECTIONS -
SHEET 4 OF 5

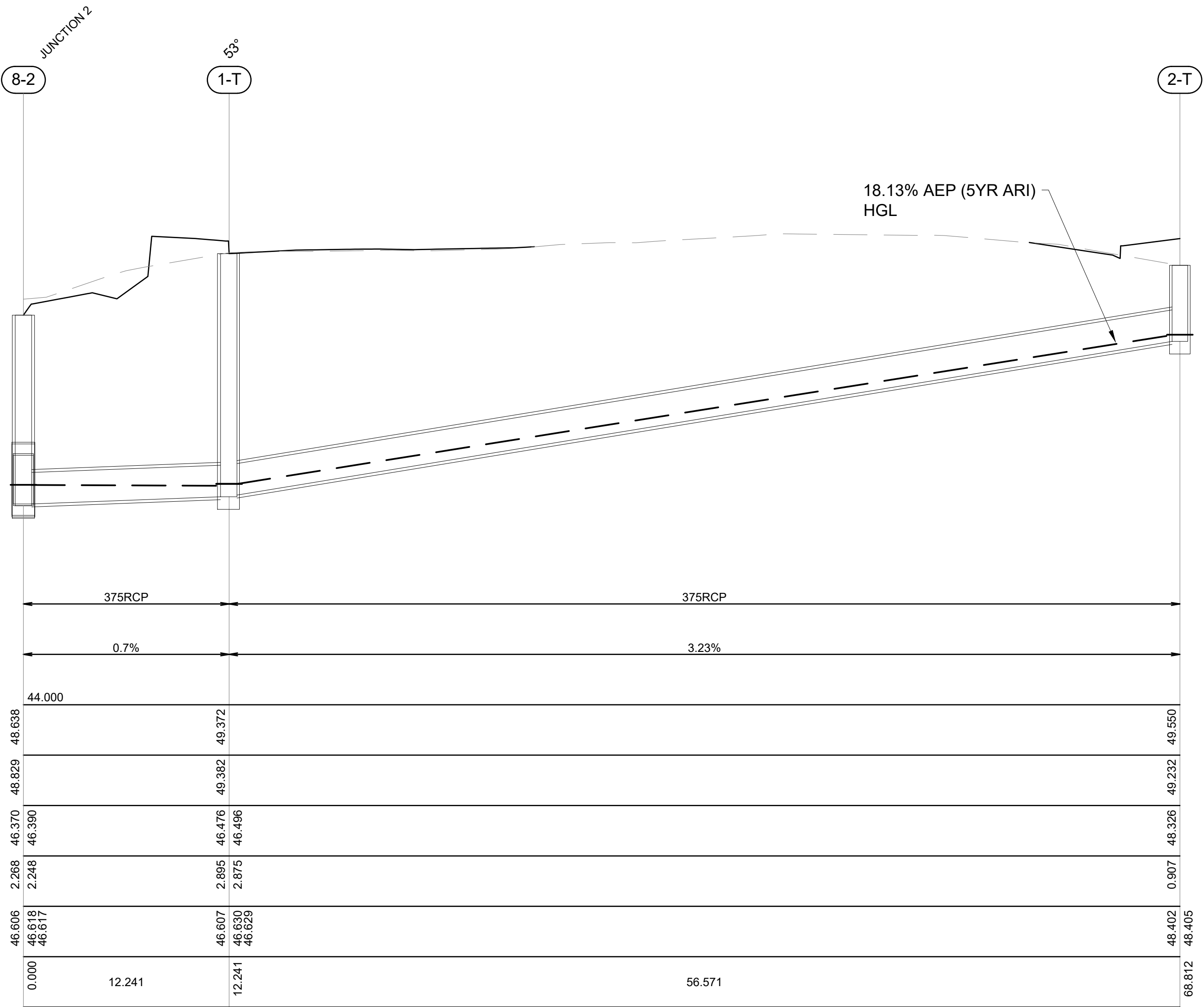
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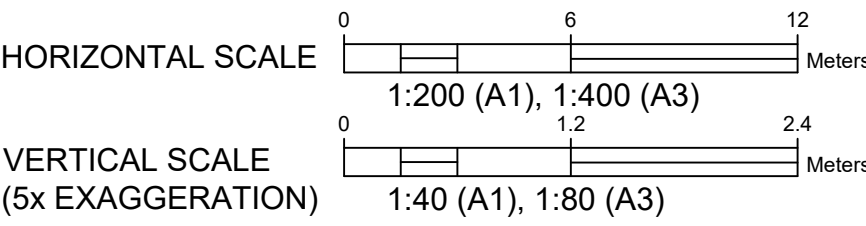


STORMWATER LINE 4 - LONGSECTION



STORMWATER LINE T - LONGSECTION

NOTES:
1. PER COUNCIL'S REQUEST, ROADS
AND DRAINAGE PIPES HAVE BEEN SET
AT A MINIMUM 0.7% GRADIENT



CIVIL ENGINEERING

H	SOFC ISSUE	RF	05.02.2020
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**ULTIMATE -
STORMWATER
LONGSECTIONS -
SHEET 5 OF 5**

RESIDENTIAL DEVELOPMENT
54 TERRY RD, ROUSE HILL NSW 2155

2019026 - C28 H

18.13% AEP (5YR ARI) HYDRAULICS CALCULATION TABLE																																									
Pipe	Pipe	Pipe	Pipe	Full Pipe	Pipe	Pipe	Full-area	Full-area	Full-area	Full-area	Part-area	Part-area	Part-area	Part-area	Pipe	Capacity	Q/Qcap	Full Pipe	Norm Depth	Crit Depth	Capacity Vel	US Node	Pipe	Pipe	DS Node	Cover	Pipe	Pipe	US Node	US Node	Pipe	P'head Loss	WSE Loss	Pipe	US Node	Pipe	Pipe	DS Node	HGL	HGL	F'board
ID	Type	Length	Size	Area Af	Grade	Grade	Tct	I	Sum CA	Qc=CIA	Tct	I	Sum CA	Qc=CIA	Flow Q	Flow Qcap	Ratio	Vel Vf=Q/Af	Vel Vn=Q/An	Vel Vc=Q/Ac	Vcap=Qcap/Af	Grate RL	US IL	DS IL	Grate RL	Min	DS Bend	DS Drop	Ku	Kw	V'head	(Ku.V'head)	(Kw.V'head)	T'head Loss	HGL	US HGL	DS HGL	HGL	Grade	Grade	US
(-)	(-)	(m)	(mm)	(sq.m)	(%)	(1 in)	(min)	(mm/hr)	(ha)	(L/s)	(min)	(mm/hr)	(ha)	(L/s)	(L/s)	(L/s)	(-)	(m/s)	(m/s)	(m/s)	(m/s)	(m)	(m)	(m)	(m)	(m)	(deg)	(m)	(-)	(-)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(%)	(1 in)	(m)
1-1 to 7-2	RCP	11.67	375	0.110	0.70	142.9	5.61	123.20	0.7323	250.6	5.52	123.93	0.7300	251.3	251.3	146.8	1.71	2.28	2.28	2.35	1.33	47.83	46.10	46.02	47.42	1.12	55.7	0.020	1.50	1.71	0.26	0.40	0.45	0.24	47.08	46.62	46.37	46.36	2.19	45.7	0.75
2-1 to 1-1	RCP	10.40	375	0.110	0.70	142.9	5.53	123.90	0.5959	205.1	5.43	124.64	0.5935	205.5	205.5	146.8	1.40	1.86	1.86	2.01	1.33	47.75	46.19	46.12	47.83	1.17	-32.6	0.020	1.55	1.85	0.18	0.27	0.33	0.14	47.49	47.16	47.02	47.08	1.37	72.9	0.26
3-1 to 2-1	RCP	52.18	375	0.110	0.70	142.9	5.09	127.58	0.4101	145.3	5.00	128.38	0.4078	145.4	145.4	146.8	0.99	1.32	1.51	1.64	1.33	48.15	46.58	46.21	47.75	1.14	87.1	0.020	2.00	2.04	0.09	0.18	0.18	0.36	47.98	47.80	47.44	47.49	0.69	145.5	0.18
4-1 to 3-1	RCP	10.85	375	0.110	0.70	142.9	5.00	128.38	0.1295	46.2	5.00	128.38	0.1295	46.2	46.2	146.8	0.31	0.42	1.18	1.07	1.33	48.22	46.68	46.60	48.15	1.15	69.9	0.020	3.20		0.01	0.03		0.01	48.01	47.98	47.97	47.98	0.07	1442.7	0.21
2-2 to 1-2	EXISTING	11.87	1200x600	0.720	0.67	148.4	16.79	77.58	4.3100	928.9	6.78	114.84	3.1174	994.4	994.4	1554.7	0.64	1.38	2.33	2.01	2.16	46.31	44.96	44.88	45.68	0.20	0.0		1.12	1.34	0.10	0.11	0.13	0.03	45.51	45.38	45.43	45.43	-0.40	-247.6	0.80
3-2 to 2-2	EXISTING	23.17	1200x600	0.720	0.73	136.3	16.59	78.02	3.8598	836.5	6.58	116.11	2.6671	860.2	860.2	1622.4	0.53	1.19	2.29	1.92	2.25	46.47	45.13	44.96	46.31	0.74	-0.0	0.000	1.98	2.45	0.07	0.14	0.18	0.11	45.68	45.50	45.49	45.51	0.06	1789.8	0.79
4-2 to 3-2	EXISTING	9.98	1200x600	0.720	0.70	142.6	16.51	78.21	3.4030	739.3	11.51	92.33	2.8192	723.1	739.3	1585.9	0.47	1.03	2.16	1.82	2.20	46.57	45.20	45.13	46.47	0.77	45.2	0.000	2.38	2.74	0.05	0.13	0.15	0.02	45.78	45.63	45.65	45.68	-0.14	-727.4	0.78
5-2 to 4-2	BC	27.78	1200x600	0.720	0.70	142.9	16.28	78.74	3.2964	721.0	11.28	93.16	2.7126	702.0	721.0	1584.7	0.45	1.00	2.14	1.81	2.20	46.70	45.41	45.22	46.57	0.55	-75.3	0.020	1.02	1.21	0.05	0.05	0.06	0.09	45.81	45.75	45.76	45.78	-0.06	-1782.6	0.90
6-2 to 5-2	BC	30.98	1200x600	0.720	0.70	142.9	16.02	79.34	2.7552	607.2	11.02	94.11	2.1714	567.6	607.2	1584.7	0.38	0.84	2.02	1.71	2.20	46.90	45.65	45.43	46.70	0.51	0.0	0.020	0.47		0.04	0.02		0.20	45.97	45.95	45.80	45.81	0.48	208.2	0.93
7-2 to 6-2	BC	47.02	1200x600	0.720	0.70	142.9	15.63	80.28	2.6552	592.1	10.63	95.60	2.0714	550.1	592.1	1584.7	0.37	0.82	2.01	1.69	2.20	47.42	46.00	45.67	46.90	0.49	0.0	0.020	1.62	1.96	0.03	0.06	0.07	0.33	46.36	46.29	45.97	45.97	0.70	143.7	1.06
8-2 to 7-2	BC	50.00	1200x600	0.720	0.70	142.9	15.21	81.31	1.9070	430.7	10.21	97.26	1.3232	357.5	430.7	1584.7	0.27	0.60	1.81	1.52	2.20	48.64	46.37	46.02	47.42	0.66	0.0	0.020	0.57	0.65	0.02	0.01	0.01	0.32	46.62	46.61	46.35	46.36	0.52	193.5	2.02
9-2 to 8-2	BC	25.44	1200x600	0.720	6.91	14.5	15.00	81.85	1.7897	406.9	10.00	98.13	1.2059	328.7	406.9	4978.2	0.08	0.57	3.72	1.49	6.91	49.50	48.15	46.39	48.64	1.14	0.0	0.020	7.00		0.02	0.11		1.76	48.49	48.37	46.62	46.62	6.91	14.5	1.01
1-3 to 2-2	RCP	25.14	375	0.110	0.70	142.9	5.68	122.65	0.4357	148.4	5.59	123.41	0.4331	148.5	148.5	146.8	1.01	1.34	1.51	1.65	1.33	46.67	45.16	44.98	46.31	1.14	92.0	0.020	2.03	2.47	0.09	0.19	0.23	0.18	45.90	45.67	45.49	45.51	0.72	139.6	0.77
2-3 to 1-3	RCP	11.47	375	0.110	0.70	142.9	5.59	123.41	0.3838	131.6	5.49	124.19	0.3812	131.5	131.6	146.8	0.90	1.19	1.50	1.56	1.33	46.72	45.26	45.18	46.67	1.08	-78.1	0.020	2.02	2.20	0.07	0.15	0.16	0.06	46.08	45.92	45.86	45.90	0.56	177.8	0.64
3-3 to 2-3	RCP	58.74	375	0.110	0.70	142.9	5.10	127.53	0.2264	80.2	5.00	128.38	0.2238	79.8	80.2	146.8	0.55	0.73	1.36	1.28	1.33	47.13	45.69	45.28	46.72	1.03	67.5	0.020	2.57	2.77	0.03	0.07	0.07	0.12	46.27	46.19	46.07	46.08	0.21	478.1	0.87
4-3 to 3-3	RCP	11.50	375	0.110	0.70	142.9	5.00	128.38	0.1357	48.4	5.00	128.38	0.1357	48.4	48.4	146.8	0.33	0.44	1.19	1.09	1.33	47.14	45.79	45.71	47.13	0.97	68.5	0.020	9.51		0.01	0.09		0.01	46.36	46.27	46.26	46.27	0.08	1314.5	0.77
1-4 to 5-2	RCP	12.25	375	0.110	0.70	142.9	5.61	123.20	0.5249	179.6	5.52	123.92	0.5236	180.2	180.2	146.8	1.23	1.63	1.63	1.84	1.33	46.90	45.52	45.43	46.70	0.99	50.7	0.020	1.77	2.11	0.14	0.24	0.29	0.13	46.21	45.93	45.80	45.81	1.05	95.0	0.69
2-4 to 1-4	RCP	10.40	375	0.110	0.70	142.9	5.53	123.90	0.3872	133.3	5.44	124.63	0.3858	133.6	133.6	146.8	0.91	1.21	1.51	1.57	1.33	46.82	45.61	45.54	46.90	0.83	-31.7	0.020	1.91	2.34	0.07	0.14	0.17	0.06	46.40	46.23	46.17	46.21	0.58	172.4	0.42
3-4 to 2-4	RCP	52.30	375	0.110	0.70	142.9	5.09	127.58	0.2206	78.2	5.00	128.38	0.2192	78.2	78.2	146.8	0.53	0.71	1.35	1.27	1.33	47.23	46.00	45.63	46.82	0.79	88.8	0.020	3.83	3.98	0.03	0.10	0.10	0.10	46.58	46.48	46.37	46.40	0.20	503.5	0.66
4-4 to 3-4	RCP	10.74	375	0.110	0.70	142.9	5.00	128.38	0.0769	27.4	5.00	128.38	0.0769	27.4	27.4	146.8	0.19	0.25	1.02	0.92	1.33	47.29	46.09	46.02	47.23	0.81	72.2	0.020	9.70		0.00	0.03		0.00	46.61	46.58	46.57	46.58	0.02	4090.8	0.68
1-T to 8-2	RCP	12.24	375	0.110	0.70	142.9	5.47	124.34	0.0965	33.3	5.00	128.38	0.0935	33.3	33.3	146.8	0.23	0.30	1.08	0.97	1.33	49.37	46.48	46.39	48.64	1.97	58.7	0.020	4.65	4.98	0.00	0.02	0.02	0.03	46.63	46.61	46.62	46.62	-0.08	-1255.9	2.74
2-T to 1-T	RCP	56.57	375	0.110	3.23	30.9	5.00	128.38	0.0322	11.5	5.00	128.38	0.0322	11.5	11.5	315.5	0.04	0.10	1.35	0.72	2.86	49.23	48.33	46.50	49.37	0.68	52.5	0.020	7.00		0.00	0.00		1.79	48.41	48.40	46.63	46.63	3.13	31.9	0.83

18.13% AEP (5YR ARI) HYDROLOGY CALCULATIONS TABLE																		
Node	Node	Setout	Grate	Road	Road	Road	Catch	Time	Intensity	Runoff	Area	Full	Full	Full	Partial	Partial	Partial	Approach
Name	Type	RL	RL	Name	Chainage	Offset	ID	Tc	I	C	A	CA	Sum CA	Qc=CA	CA	Sum CA	Qc=CA	Flow Qa
(-)	(-)	(m)	(m)	(-)	(m)	(m)	(-)	(min)	(mm/hr)	(-)	(ha)	(ha)	(ha)	(L/s)	(ha)	(ha)	(L/s)	(L/s)
1-1	RD PIT	47.85	47.83	R1 CL	8.30	5.20	1P	5.00	128.38	0.33	0.0172	0.0057	0.1364	48.7	0.0057	0.1364	48.7	48.7
							1I	5.00	128.38	0.85	0.1546	0.1307			0.1307			
2-1	SAG RD PIT	47.78	47.75	R1 CL	8.30	-5.20	1P	5.00	128.38	0.33	0.0234	0.0078	0.1858	66.2	0.0078	0.1858	66.2	66.2
							1I	5.00	128.38	0.85	0.2104	0.1780			0.1780			
3-1	RD PIT	48.18	48.15	R1 CL	61.11	-5.20	1P	5.00	128.38	0.33	0.0353	0.0117	0.2806	100.1	0.0117	0.2806	100.1	100.1
							1I	5.00	128.38	0.85	0.3179	0.2689			0.2689			
4-1	RD PIT	48.25	48.22	R1 CL	64.19	5.20	1P	5.00	128.38	0.33	0.0163	0.0054	0.1295	46.2	0.0054	0.1295	46.2	46.2
							1I	5.00	128.38	0.85	0.1467	0.1241			0.1241			
1-2	HW OUT	45.68	45.68															
2-2	RD PIT	46.31	46.31				1P	5.00	128.38	0.33	0.0018	0.0006	0.0146	5.2	0.0006	0.0146	5.2	5.2
							1I	5.00	128.38	0.85	0.0165	0.0140			0.0140			
3-2	RD PIT	46.47	46.47	R2 CL	177.31	4.66	1P	5.00	128.38	0.33	0.0575	0.0191	0.4568	162.9	0.0191	0.4568	162.9	162.9
							1I	5.00	128.38	0.85	0.5174	0.4377			0.4377			
4-2	SAG RD PIT	46.53	46.57	R2 CL	174.78	-4.85	1P	5.00	128.38	0.33	0.0134	0.0045	0.1066	38.0	0.0045	0.1066	38.0	38.0
							1I	5.00	128.38	0.85	0.1208	0.1022			0.1022			
5-2	RD PIT	46.75	46.70	R2 CL	147.00	-5.00	1P	5.00	128.38	0.33	0.0021	0.0007	0.0163	5.8	0.0007	0.0163	5.8	5.8
							1I	5.00	128.38	0.85	0.0185	0.0156			0.0156			
6-2	RD PIT	46.94	46.90	R2 CL	116.02	-5.00	1P	5.00	128.38	0.33	0.0126	0.0042	0.1000	35.6	0.0042	0.1000	35.6	35.6
							1I	5.00	128.38	0.85	0.1132	0.0958			0.0958			
7-2	RD PIT	47.42	47.42	R2 CL	69.00	-5.00	1P	5.00	128.38	0.33	0.0020	0.0007	0.0160	5.7	0.0007	0.0160	5.7	5.7
							1I	5.00	128.38	0.85	0.0181	0.0153			0.0153			
8-2	RD PIT	48.64	48.64	R2 CL	19.00	-5.00	1P	5.00	128.38	0.33	0.0026	0.0009	0.0208	7.4	0.0009	0.0208	7.4	7.4
							1I	5.00	128.38	0.85	0.0235	0.0199			0.0199			
9-2	HW IN	49.50	49.50				1P	15.00	81.85	0.33	5.2745	1.7514	1.7897	406.9	1.1676	1.2059	328.7	406.9
							1I	10.00	98.13	0.85	0.0452	0.0382			0.0382			
1-3	RD PIT	46.67	46.67	R3 CL	10.61	-5.49	1P	5.00	128.38	0.33	0.0065	0.0022	0.0519	18.5	0.0022	0.0519	18.5	18.5
							1I	5.00	128.38	0.85	0.0588	0.0497			0.0497			
2-3	RD PIT	46.72	46.72	R3 CL	14.00	-5.20	1P	5.00	128.38	0.33	0.0198	0.0066	0.1573	56.1	0.0066	0.1573	56.1	56.1
							1I	5.00	128.38	0.85	0.1782	0.1507			0.1507			
3-3	RD PIT	47.13	47.13		72.74	-5.20	1P	5.00	128.38	0.33	0.0114	0.0038	0.0908	32.4	0.0038	0.0908	32.4	32.4
							1I	5.00	128.38	0.85	0.1029	0.0870			0.0870			
4-3	RD PIT	47.14	47.14	R3 CL	76.96	5.50	1P	5.00	128.38	0.33	0.0171	0.0057	0.1357	48.4	0.0057	0.1357	48.4	48.4
							1I	5.00	128.38	0.85	0.1537	0.1300			0.1300			
1-4	RD PIT	46.93	46.90	R4 CL	7.14	5.20	1P	5.00	128.38	0.33	0.0173	0.0058	0.1377	49.1	0.0058	0.1377	49.1	49.1
							1I	5.00	128.38	0.85	0.1560	0.1320			0.1320			
2-4	SAG RD PIT	46.85	46.82	R4 CL	6.85	-5.20	1P	5.00	128.38	0.33	0.0210	0.0070	0.1666	59.4	0.0070	0.1666	59.4	59.4
							1I	5.00	128.38	0.85	0.1888	0.1597			0.1597			
3-4	RD PIT	47.26	47.23	R4 CL	59.73	-5.20	1P	5.00	128.38	0.33	0.0181	0.0060	0.1437	51.2	0.0060	0.1437	51.2	51.2
							1I	5.00	128.38	0.85	0.1628	0.1377			0.1377			
4-4	RD PIT	47.32	47.29	R4 CL	62.42	5.20	1P	5.00	128.38	0.33	0.0097	0.0032	0.0769	27.4	0.0032	0.0769	27.4	27.4
							1I	5.00	128.38	0.85	0.0871	0.0737			0.0737			
1-T	RD PIT	49.42	49.37				1P	5.00	128.38	0.33	0.0081	0.0027	0.0644	23.0	0.0027	0.0644	23.0	23.0
							1I	5.00	128.38	0.85	0.0729	0.0617			0.0617			
2-T	RD PIT	49.55	49.23	TERRY RD CL			1P	5.00	128.38	0.33	0.0040	0.0013	0.0322	11.5	0.0013	0.0322	11.5	11.5
							1I	5.00	128.38	0.85	0.0364	0.0308			0.0308			

CIVIL ENGINEERING

H	SOFC ISSUE	RF	05.02.2020
G	WORK IN PROGRESS	RF	02.02.2020
F	TREE A & B UPDATE	RF	09.10.19
E	ROAD 3 TREE UPDATES	RF	04.10.19
REV	DESCRIPTION	BY	DATE

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DESIGN: RF
DRAWN: RF
DWG SIZE: A1

ULTIMATE - 18.13%
AEP HYDROLOGY
CALCULATIONS

RESIDENTIAL DEVELOPMENT
54 TERRY RD, ROUSE HILL NSW 2155

2019026 - C30 H

9.52% AEP (10YR ARI) HYDRAULICS CALCULATIONS TABLE																																										
Pipe	Pipe	Pipe	Pipe	Full Pipe	Pipe	Pipe	Full-area	Full-area	Full-area	Full-area	Part-area	Part-area	Part-area	Part-area	Pipe	Excess Pipe	Capacity	Q/Qcap	Full Pipe	Norm Depth	Crit Depth	Capacity Vel	US Node	Pipe	Pipe	DS Node	Cover	Pipe	Pipe	US Node	US Node	Pipe	P'head Loss	WSE Loss	Pipe	US Node	Pipe	Pipe	DS Node	HGL	HGL	F'board
ID	Type	Length	Size	Area Af	Grade	Grade	Tct	I	Sum CA	Qc=CIA	Tct	I	Sum CA	Qc=CIA	Flow Q	Flow Qx	Flow Qcap	Ratio	Vel Vf=Q/Af	Vel Vn=Q/An	Vel Vc=Q/Ac	Vcap=Qcap/ Af	Grate RL	US IL	DS IL	Grate RL	Min	DS Bend	DS Drop	Ku	Kw	V'head	(Ku,V'head d)	(Kw,V'head d)	T'head Loss	HGL	US HGL	DS HGL	HGL	Grade	Grade	US
(-)	(-)	(m)	(mm)	(sq.m)	(%)	(1 in)	(min)	(mm/hr)	(ha)	(L/s)	(min)	(mm/hr)	(ha)	(L/s)	(L/s)	(L/s)	(L/s)	(-)	(m/s)	(m/s)	(m/s)	(m/s)	(m)	(m)	(m)	(m)	(m)	(deg)	(m)	(-)	(-)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(%)	(1 in)	(m)	
1-1 to 7-2	RCP	11.67	375	0.110	0.70	142.9	5.61	139.19	0.7792	301.3	5.52	140.01	0.7767	302.1	302.1		146.8	2.06	2.74	2.74	2.77	1.33	47.83	46.10	46.02	47.42	1.12	55.7	0.020	1.39	1.53	0.38	0.53	0.58	0.35	47.34	46.76	46.41	46.43	2.97	33.7	0.49
2-1 to 1-1	RCP	10.40	375	0.110	0.70	142.9	5.53	139.98	0.6340	246.5	5.43	140.81	0.6316	247.0	247.0	38.1	146.8	1.68	2.24	2.24	2.31	1.33	47.75	46.19	46.12	47.83	1.17	-32.6	0.020	1.48	1.74	0.18	0.27	0.32	0.15	47.75	47.43	47.29	47.34	1.42	70.5	0.00
3-1 to 2-1	RCP	52.18	375	0.110	0.70	142.9	5.09	144.14	0.4364	174.7	5.00	145.06	0.4339	174.8	174.8	40.4	146.8	1.19	1.58	1.58	1.81	1.33	48.15	46.58	46.21	47.75	1.14	87.1	0.020	1.88	1.89	0.08	0.14	0.14	0.31	48.15	48.01	47.70	47.75	0.59	170.3	0.00
4-1 to 3-1	RCP	10.85	375	0.110	0.70	142.9	5.00	145.06	0.1378	55.5	5.00	145.06	0.1378	55.5	55.5		146.8	0.38	0.50	1.24	1.13	1.33	48.22	46.68	46.60	48.15	1.15	69.9	0.020	2.69		0.01	0.03		0.01	48.20	48.16	48.15	48.15	0.10	998.1	0.02
2-2 to 1-2	EXISTING	11.87	1200x600	0.720	0.67	148.4	16.79	87.55	4.5861	1115.3	6.78	129.72	3.3171	1195.2	1195.2		1554.7	0.77	1.66	2.45	2.14	2.16	46.31	44.96	44.88	45.68	0.20	0.0		1.12	1.34	0.14	0.16	0.19	0.06	45.61	45.43	45.43	45.43	-0.03	-3007.8	0.70
3-2 to 2-2	EXISTING	23.17	1200x600	0.720	0.73	136.3	16.59	88.04	4.1071	1004.4	6.58	131.16	2.8380	1034.0	1034.0		1622.4	0.64	1.44	2.42	2.04	2.25	46.47	45.13	44.96	46.31	0.74	-0.0	0.000	1.98	2.45	0.11	0.21	0.26	0.08	45.81	45.55	45.58	45.61	-0.13	-751.0	0.66
4-2 to 3-2	EXISTING	9.98	1200x600	0.720	0.70	142.6	16.51	88.25	3.6211	887.6	11.51	104.23	2.9998	868.6	887.6		1585.9	0.56	1.23	2.28	1.94	2.20	46.57	45.20	45.13	46.47	0.77	45.2	0.000	2.38	2.74	0.08	0.18	0.21	0.02	45.99	45.77	45.76	45.81	0.11	908.9	0.58
5-2 to 4-2	BC	27.78	1200x600	0.720	0.70	142.9	16.28	88.85	3.5076	865.7	11.28	105.17	2.8864	843.2	865.7		1584.7	0.55	1.20	2.26	1.92	2.20	46.70	45.41	45.22	46.57	0.55	-75.3	0.020	1.02	1.21	0.07	0.08	0.09	0.06	46.10	46.02	45.96	45.99	0.21	478.7	0.60
6-2 to 5-2	BC	30.98	1200x600	0.720	0.70	142.9	16.02	89.53	2.9317	729.1	11.02	106.25	2.3105	681.9	729.1		1584.7	0.46	1.01	2.15	1.81	2.20	46.90	45.65	45.43	46.70	0.51	0.0	0.020	0.47		0.05	0.02	0.04	46.11	46.08	46.09	46.10	-0.02	-5449.1	0.79	
7-2 to 6-2	BC	47.02	1200x600	0.720	0.70	142.9	15.63	90.59	2.8253	711.0	10.63	107.93	2.2041	660.8	711.0		1584.7	0.45	0.99	2.13	1.80	2.20	47.42	46.00	45.67	46.90	0.49	0.0	0.020	1.62	1.96	0.05	0.08	0.10	0.29	46.43	46.33	46.11	46.11	0.47	212.7	0.99
8-2 to 7-2	BC	50.00	1200x600	0.720	0.70	142.9	15.21	91.76	2.0291	517.2	10.21	109.81	1.4079	429.5	517.2		1584.7	0.33	0.72	1.92	1.62	2.20	48.64	46.37	46.02	47.42	0.66	0.0	0.020	0.57	0.65	0.03	0.02	0.02	0.30	46.65	46.64	46.41	46.43	0.45	220.8	1.98
9-2 to 8-2	BC	25.44	1200x600	0.720	6.91	14.5	15.00	92.37	1.9043	488.6	10.00	110.80	1.2831	394.9	488.6		4978.2	0.10	0.68	3.98	1.59	6.91	49.50	48.15	46.39	48.64	1.14	0.0	0.020	7.00		0.02	0.16		1.76	48.57	48.40	46.65	46.65	6.89	14.5	0.93
1-3 to 2-2	RCP	25.14	375	0.110	0.70	142.9	5.68	138.57	0.4636	178.4	5.59	139.43	0.4608	178.5	178.5		146.8	1.22	1.62	1.62	1.83	1.33	46.67	45.16	44.98	46.31	1.14	92.0	0.020	1.85	2.03	0.13	0.25	0.27	0.26	46.11	45.84	45.58	45.61	1.04	96.6	0.56
2-3 to 1-3	RCP	11.47	375	0.110	0.70	142.9	5.59	139.43	0.4084	158.2	5.49	140.31	0.4056	158.1	158.2		146.8	1.08	1.43	1.43	1.71	1.33	46.72	45.26	45.18	46.67	1.08	-78.1	0.020	1.80	1.92	0.10	0.19	0.20	0.09	46.38	46.18	46.09	46.11	0.81	123.0	0.34
3-3 to 2-3	RCP	58.74	375	0.110	0.70	142.9	5.10	144.09	0.2410	96.4	5.00	145.06	0.2382	96.0	96.4		146.8	0.66	0.87	1.42	1.37	1.33	47.13	45.69	45.28	46.72	1.03	67.5	0.020	1.89	1.93	0.04	0.07	0.08	0.18	46.62	46.55	46.37	46.38	0.30	330.8	0.51
4-3 to 3-3	RCP	11.50	375	0.110	0.70	142.9	5.00	145.06	0.1444	58.2	5.00	145.06	0.1444	58.2	58.2		146.8	0.40	0.53	1.25	1.15	1.33	47.14	45.79	45.71	47.13	0.97	68.5	0.020	5.10		0.01	0.07		0.01	46.71	46.64	46.62	46.62	0.11	909.4	0.43
1-4 to 5-2	RCP	12.25	375	0.110	0.70	142.9	5.61	139.19	0.5586	216.0	5.52	140.00	0.5571	216.7	216.7		146.8	1.48	1.96	1.96	2.09	1.33	46.90	45.52	45.43	46.70	0.99	50.7	0.020	1.47	1.64	0.20	0.29	0.32	0.19	46.60	46.28	46.09	46.10	1.53	65.5	0.30
2-4 to 1-4	RCP	10.40	375	0.110	0.70	142.9	5.53	139.98	0.4120	160.2	5.44	140.80	0.4106	160.6	160.6	8.4	146.8	1.09	1.45	1.45	1.72	1.33	46.82	45.61	45.54	46.90	0.83	-31.7	0.020	1.52	1.87	0.10	0.15	0.18	0.08	46.82	46.64	46.57	46.60	0.75	132.8	0.00
3-4 to 2-4	RCP	52.30	375	0.110	0.70	142.9	5.09	144.15	0.2347	94.0	5.00	145.06	0.2332	94.0	94.0		146.8	0.64	0.85	1.41	1.36	1.33	47.23	46.00	45.63	46.82	0.79	88.8	0.020	2.29	2.38	0.04	0.08	0.09	0.15	47.03	46.94	46.79	46.82	0.29	348.3	0.20
4-4 to 3-4	RCP	10.74	375	0.110	0.70	142.9	5.00	145.06	0.0818	33.0	5.00	145.06	0.0818	33.0	33.0		146.8	0.22	0.30	1.07	0.97	1.33	47.29	46.09	46.02	47.23	0.81	72.2	0.020	4.78		0.00	0.02		0.00	47.05	47.03	47.03	47.03	0.04	2830.1	0.24
1-T to 8-2	RCP	12.24	375	0.110	0.70	142.9	5.47	140.47	0.1027	40.1	5.00	145.06	0.0995	40.1	40.1		146.8	0.27	0.36	1.13	1.02	1.33	49.37	46.48	46.39	48.64	1.97	58.7	0.020	4.65	4.98	0.01	0.03	0.03	0.02	46.68	46.65	46.65	46.65	-0.03	-3087.5	2.69
2-T to 1-T	RCP	56.57	375	0.110	3.23	30.9	5.00	145.06	0.0342	13.8	5.00	145.06	0.0342	13.8	13.8		315.5	0.04	0.12	1.43	0.76	2.86	49.23	48.33	46.50	49.37	0.68	52.5	0.020	7.00		0.00	0.01		1.76	48.41	48.41	46.68	46.68	3.06	32.7	0.82

- NOTE:
- 9.52% AEP FLOWS (10 YEAR ARI) HAVE BEEN PROVIDED FOR STORMWATER LINE 2 WHERE THE SUM OF UPSTREAM CATCHMENTS SHALL EXCEED 6 Ha.
 - ALL OTHER STORMWATER LINES (1, 3, AND 4) SHALL HAVE TOTAL CATCHMENTS LESS THAN 6 Ha

9.52% AEP (10YR ARI) HYDROLOGY CALCULATIONS TABLE																		
Node	Node	Setout	Grate	Road	Road	Road	Catch	Time	Intensity	Runoff	Area	Full	Full	Full	Partial	Partial	Partial	Approach
Name	Type	RL	RL	Name	Chainage	Offset	ID	Tc	I	C	A	CA	Sum CA	Qc=CA	CA	Sum CA	Qc=CA	Flow Qa
(-)	(-)	(m)	(m)	(-)	(m)	(m)	(-)	(min)	(mm/hr)	(-)	(ha)	(ha)	(ha)	(L/s)	(ha)	(ha)	(L/s)	(L/s)
1-1	RD PIT	47.85	47.83	R1 CL	8.30	5.20	1P	5.00	145.06	0.35	0.0172	0.0061	0.1452	58.5	0.0061	0.1452	58.5	58.5
							1I	5.00	145.06	0.90	0.1546	0.1391			0.1391			
2-1	SAG RD PIT	47.78	47.75	R1 CL	8.30	-5.20	1P	5.00	145.06	0.35	0.0234	0.0083	0.1977	79.6	0.0083	0.1977	79.6	79.6
							1I	5.00	145.06	0.90	0.2104	0.1894			0.1894			
3-1	RD PIT	48.18	48.15	R1 CL	61.11	-5.20	1P	5.00	145.06	0.35	0.0353	0.0125	0.2986	120.3	0.0125	0.2986	120.3	120.3
							1I	5.00	145.06	0.90	0.3179	0.2861			0.2861			
4-1	RD PIT	48.25	48.22	R1 CL	64.19	5.20	1P	5.00	145.06	0.35	0.0163	0.0058	0.1378	55.5	0.0058	0.1378	55.5	55.5
							1I	5.00	145.06	0.90	0.1467	0.1320			0.1320			
1-2	HW OUT	45.68	45.68															
2-2	RD PIT	46.31	46.31				1P	5.00	145.06	0.35	0.0018	0.0006	0.0155	6.2	0.0006	0.0155	6.2	6.2
							1I	5.00	145.06	0.90	0.0165	0.0148			0.0148			
3-2	RD PIT	46.47	46.47	R2 CL	177.31	4.66	1P	5.00	145.06	0.35	0.0575	0.0203	0.4860	195.8	0.0203	0.4860	195.8	195.8
							1I	5.00	145.06	0.90	0.5174	0.4657			0.4657			
4-2	SAG RD PIT	46.53	46.57	R2 CL	174.78	-4.85	1P	5.00	145.06	0.35	0.0134	0.0047	0.1134	45.7	0.0047	0.1134	45.7	45.7
							1I	5.00	145.06	0.90	0.1208	0.1087			0.1087			
5-2	RD PIT	46.75	46.70	R2 CL	147.00	-5.00	1P	5.00	145.06	0.35	0.0021	0.0007	0.0174	7.0	0.0007	0.0174	7.0	7.0
							1I	5.00	145.06	0.90	0.0185	0.0166			0.0166			
6-2	RD PIT	46.94	46.90	R2 CL	116.02	-5.00	1P	5.00	145.06	0.35	0.0126	0.0044	0.1064	42.9	0.0044	0.1064	42.9	42.9
							1I	5.00	145.06	0.90	0.1132	0.1019			0.1019			
7-2	RD PIT	47.42	47.42	R2 CL	69.00	-5.00	1P	5.00	145.06	0.35	0.0020	0.0007	0.0170	6.8	0.0007	0.0170	6.8	6.8
							1I	5.00	145.06	0.90	0.0181	0.0163			0.0163			
8-2	RD PIT	48.64	48.64	R2 CL	19.00	-5.00	1P	5.00	145.06	0.35	0.0026	0.0009	0.0221	8.9	0.0009	0.0221	8.9	8.9
							1I	5.00	145.06	0.90	0.0235	0.0212			0.0212			
9-2	HW IN	49.50	49.50				1P	15.00	92.37	0.35	5.2745	1.8636	1.9043	488.6	1.2424	1.2831	394.9	488.6
							1I	10.00	110.80	0.90	0.0452	0.0407			0.0407			
1-3	RD PIT	46.67	46.67	R3 CL	10.61	-5.49	1P	5.00	145.06	0.35	0.0065	0.0023	0.0552	22.3	0.0023	0.0552	22.3	22.3
							1I	5.00	145.06	0.90	0.0588	0.0529			0.0529			
2-3	RD PIT	46.72	46.72	R3 CL	14.00	-5.20	1P	5.00	145.06	0.35	0.0198	0.0070	0.1674	67.5	0.0070	0.1674	67.5	67.5
							1I	5.00	145.06	0.90	0.1782	0.1604			0.1604			
3-3	RD PIT	47.13	47.13	R3 CL	72.74	-5.20	1P	5.00	145.06	0.35	0.0114	0.0040	0.0966	38.9	0.0040	0.0966	38.9	38.9
							1I	5.00	145.06	0.90	0.1029	0.0926			0.0926			
4-3	RD PIT	47.14	47.14	R3 CL	76.96	5.50	1P	5.00	145.06	0.35	0.0171	0.0060	0.1444	58.2	0.0060	0.1444	58.2	58.2
							1I	5.00	145.06	0.90	0.1537	0.1383			0.1383			
1-4	RD PIT	46.93	46.90	R4 CL	7.14	5.20	1P	5.00	145.06	0.35	0.0173	0.0061	0.1465	59.0	0.0061	0.1465	59.0	59.0
							1I	5.00	145.06	0.90	0.1560	0.1404			0.1404			
2-4	SAG RD PIT	46.85	46.82	R4 CL	6.85	-5.20	1P	5.00	145.06	0.35	0.0210	0.0074	0.1773	71.5	0.0074	0.1773	71.5	71.5
							1I	5.00	145.06	0.90	0.1888	0.1699			0.1699			
3-4	RD PIT	47.26	47.23	R4 CL	59.73	-5.20	1P	5.00	145.06	0.35	0.0181	0.0064	0.1529	61.6	0.0064	0.1529	61.6	61.6
							1I	5.00	145.06	0.90	0.1628	0.1465			0.1465			
4-4	RD PIT	47.32	47.29	R4 CL	62.42	5.20	1P	5.00	145.06	0.35	0.0097	0.0034	0.0818	33.0	0.0034	0.0818	33.0	33.0
							1I	5.00	145.06	0.90	0.0871	0.0784			0.0784			
1-T	RD PIT	49.42	49.37				1P	5.00	145.06	0.35	0.0081	0.0029	0.0685	27.6	0.0029	0.0685	27.6	27.6
							1I	5.00	145.06	0.90	0.0729	0.0656			0.0656			
2-T	RD PIT	49.55	49.23	TERRY RD CL	183.03	3.43	1P	5.00	145.06	0.35	0.0040	0.0014	0.0342	13.8	0.0014	0.0342	13.8	13.8
							1I	5.00	145.06	0.90	0.0364	0.0328			0.0328			

CIVIL ENGINEERING

H	SOFC ISSUE	RF	05.02.2020
G	WORK IN PROGRESS	RF	02.02.2020
F	TREE A & B UPDATE	RF	09.10.19
E	ROAD 3 TREE UPDATES	RF	04.10.19
REV	DESCRIPTION	BY	DATE

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SAMANA BLUE ENGINEERING

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DESIGN: RF
DRAWN: RF
DWG SIZE: A1

ULTIMATE - 9.52% AEP
HYDROLOGY
CALCULATIONS

RESIDENTIAL DEVELOPMENT

54 TERRY RD, ROUSE HILL NSW 2155

2019026 - C32 H

1% AEP (100YR ARI) HYDRAULICS CALCULATIONS TABLE																																													
Pipe	Pipe	Pipe	Pipe	Full Pipe	Pipe	Pipe	Full-area	Full-area	Full-area	Full-area	Part-area	Part-area	Part-area	Part-area	Peak	Net Bypass	Pipe	Excess Pipe	Capacity	Q/Qcap	Full Pipe	Norm Depth	Crit Depth	Capacity Vel	US Node	Pipe	Pipe	DS Node	Cover	Pipe	Pipe	US Node	US Node	Pipe	P'head Loss	WSE Loss	Pipe	US Node	Pipe	Pipe	DS Node	HGL	HGL	F'board	
ID	Type	Length	Size	Area Af	Grade	Grade	Tct	I	Sum CA	Qc=ClA	Tct	I	Sum CA	Qc=ClA	Flow Qrat	Flow Qb	Flow Q	Flow Qx	Flow Qcap	Ratio	Vel Vf=Q/Af	Vel Vn=Q/An	Vel Vc=Q/Ac	Vcap=Qcap/ Af	Grate RL	US IL	DS IL	Grate RL	Min	DS Bend	DS Drop	Ku	Kw	V'head	(Ku.V'head)	(Kw.V'head)	T'head Loss	HGL	US HGL	DS HGL	HGL	Grade	Grade	US	
(-)	(-)	(m)	(mm)	(sq.m)	(%)	(1 in)	(min)	(mm/hr)	(ha)	(L/s)	(min)	(mm/hr)	(ha)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(-)	(m/s)	(m/s)	(m/s)	(m/s)	(m)	(m)	(m)	(m)	(m)	(deg)	(m)	(-)	(-)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(%)	(1 in)	(m)	
1-1 to 7-2	RCP	11.67	375	0.110	0.70	142.9	5.61	209.01	0.8687	504.3	5.52	210.25	0.8659	505.7	505.7	-288.5	217.2		146.8	1.48	1.97	1.97	2.09	1.33	47.83	46.10	46.02	47.42	1.12	55.7	0.020	2.08	2.12	0.20	0.41	0.42	0.18	47.73	47.31	47.13	47.15	1.53	65.2	0.09	
2-1 to 1-1	RCP	10.40	375	0.110	0.70	142.9	5.53	210.20	0.7069	412.7	5.43	211.46	0.7041	413.6	413.6	-368.1	45.5		146.8	0.31	0.41	1.17	1.07	1.33	47.75	46.19	46.12	47.83	1.17	-32.6	0.020	1.55	1.94	0.01	0.01	0.02	0.01	47.75	47.73	47.72	47.73	0.07	1485.9	0.00	
3-1 to 2-1	RCP	52.18	375	0.110	0.70	142.9	5.09	216.50	0.4865	292.6	5.00	217.88	0.4837	292.8	292.8	-163.7	129.1		146.8	0.88	1.17	1.50	1.55	1.33	48.15	46.58	46.21	47.75	1.14	87.1	0.020	1.72	1.74	0.07	0.12	0.12	0.28	48.15	48.03	47.75	47.75	0.54	185.6	0.00	
4-1 to 3-1	RCP	10.85	375	0.110	0.70	142.9	5.00	217.88	0.1536	93.0	5.00	217.88	0.1536	93.0	93.0	-38.7	54.2		146.8	0.37	0.49	1.23	1.13	1.33	48.22	46.68	46.60	48.15	1.15	69.9	0.020	2.69		0.01	0.03		0.01	48.19	48.16	48.15	48.15	0.10	1045.6	0.02	
2-2 to 1-2	EXISTING	11.87	1200x600	0.720	0.67	148.4	16.79	131.08	5.2713	1919.4	6.78	194.70	3.7507	2028.5	2028.5	-668.1	1360.4		1554.7	0.88	1.89	2.54	2.23	2.16	46.31	44.96	44.88	45.68	0.20	0.0		1.00	1.19	0.18	0.18	0.22	0.08	45.68	45.47	45.43	45.43	0.32	312.0	0.63	
3-2 to 2-2	EXISTING	23.17	1200x600	0.720	0.73	136.3	16.59	131.82	4.7373	1734.6	6.67	195.85	3.2340	1759.3	1759.3	-539.4	1219.9		1622.4	0.75	1.69	2.54	2.15	2.25	46.47	45.13	44.96	46.31	0.74	-0.0	0.000	2.05	2.33	0.15	0.30	0.34	0.10	46.09	45.75	45.65	45.68	0.41	241.1	0.38	
4-2 to 3-2	EXISTING	9.98	1200x600	0.720	0.70	142.6	16.51	132.14	4.1954	1540.0	11.51	156.24	3.4500	1497.3	1540.0	-211.5	1328.5		1585.9	0.84	1.85	2.56	2.21	2.20	46.57	45.20	45.13	46.47	0.77	45.2	0.000	1.98	2.33	0.17	0.34	0.41	0.05	46.50	46.10	46.05	46.09	0.49	203.3	0.07	
5-2 to 4-2	BC	27.78	1200x600	0.720	0.70	142.9	16.28	133.04	4.0690	1503.7	11.28	157.65	3.3235	1455.4	1503.7	-238.8	1264.9		1584.7	0.80	1.76	2.53	2.18	2.20	46.70	45.41	45.22	46.57	0.55	-75.3	0.020	0.81	0.88	0.16	0.13	0.14	0.12	46.70	46.56	46.44	46.50	0.45	224.2	0.00	
6-2 to 5-2	BC	30.98	1200x600	0.720	0.70	142.9	16.02	134.07	3.4269	1276.2	11.02	159.27	2.6814	1186.3	1276.2	-153.0	1123.3		1584.7	0.71	1.56	2.44	2.09	2.20	46.90	45.65	45.43	46.70	0.51	0.0	0.020	0.60		0.12	0.07		0.11	46.87	46.80	46.69	46.70	0.35	284.3	0.02	
7-2 to 6-2	BC	47.02	1200x600	0.720	0.70	142.9	15.63	135.67	3.3083	1246.8	10.63	161.82	2.5629	1152.0	1246.8	-204.9	1041.9		1584.7	0.66	1.45	2.39	2.04	2.20	47.42	46.00	45.67	46.90	0.49	0.0	0.020	1.11	1.25	0.11	0.12	0.13	0.14	47.15	47.02	46.87	46.87	0.30	330.5	0.27	
8-2 to 7-2	BC	50.00	1200x600	0.720	0.70	142.9	15.21	137.43	2.4207	924.1	10.21	164.65	1.6753	766.2	924.1	-33.7	890.4		1584.7	0.56	1.24	2.28	1.94	2.20	48.64	46.37	46.02	47.42	0.66	0.0	0.020	0.46		0.08	0.04		0.11	47.28	47.24	47.13	47.15	0.22	452.5	1.36	
9-2 to 8-2	BC	25.44	1200x600	0.720	6.91	14.5	15.00	138.35	2.2816	876.8	10.00	166.14	1.5361	708.9	876.8		876.8		4978.2	0.18	1.22	4.90	1.93	6.91	49.50	48.15	46.39	48.64	1.14	0.0	0.020	5.92		0.08	0.45		1.36	48.97	48.53	47.28	47.28	4.90	20.4	0.53	
1-3 to 2-2	RCP	25.14	375	0.110	0.70	142.9	5.68	208.07	0.5168	298.7	5.59	209.37	0.5137	298.8	298.8	-118.2	180.6		146.8	1.23	1.64	1.64	1.84	1.33	46.67	45.16	44.98	46.31	1.14	92.0	0.020	1.74	1.96	0.14	0.24	0.27	0.27	46.18	45.92	45.65	45.68	1.06	94.3	0.49	
2-3 to 1-3	RCP	11.47	375	0.110	0.70	142.9	5.59	209.37	0.4552	264.8	5.49	210.70	0.4522	264.6	264.8	-156.4	108.4		146.8	0.74	0.98	1.45	1.44	1.33	46.72	45.26	45.18	46.67	1.08	-78.1	0.020	2.46	2.51	0.05	0.12	0.12	0.04	46.32	46.20	46.15	46.18	0.38	261.9	0.40	
3-3 to 2-3	RCP	58.74	375	0.110	0.70	142.9	5.10	216.41	0.2686	161.5	5.00	217.88	0.2655	160.7	161.5	-118.7	42.7		146.8	0.29	0.39	1.15	1.04	1.33	47.13	45.69	45.28	46.72	1.03	67.5	0.020	5.30		0.01	0.04		0.03	46.39	46.35	46.32	46.32	0.06	1684.6	0.74	
4-3 to 3-3	RCP	11.50	375	0.110	0.70	142.9	5.00	217.88	0.1609	97.4	5.00	217.88	0.1609	97.4	97.4	-97.4	0.0		146.8	0.00	0.00	0.00	0.00	1.33	47.14	45.79	45.71	47.13	0.97	68.5	0.020			0.00			0.00	46.39	46.39	46.39	46.39	0.00	100000	0.0	0.74
1-4 to 5-2	RCP	12.25	375	0.110	0.70	142.9	5.61	209.00	0.6227	361.5	5.52	210.23	0.6211	362.7	362.7	-188.2	174.5	86.8	146.8	1.19	1.58	1.58	1.81	1.33	46.90	45.52	45.43	46.70	0.99	50.7	0.020	3.24		0.03	0.10		0.03	46.82	46.72	46.69	46.70	0.25	400.4	0.08	
2-4 to 1-4	RCP	10.40	375	0.110	0.70	142.9	5.53	210.20	0.4593	268.2	5.44	211.45	0.4577	268.8	268.8	-267.0	1.9		146.8	0.01	0.02	0.46	0.45	1.33	46.82	45.61	45.54	46.90	0.83	-31.7	0.020	1.68	2.00	0.00	0.00	0.00	0.00	46.82	46.82	46.82	46.82	0.00	879485.1	0.00	
3-4 to 2-4	RCP	52.30	375	0.110	0.70	142.9	5.09	216.51	0.2617	157.4	5.00	217.88	0.2600	157.4	157.4	-59.3	98.0		146.8	0.67	0.89	1.42	1.38	1.33	47.23	46.00	45.63	46.82	0.79	88.8	0.020	2.10	2.21	0.04	0.08	0.09	0.16	47.08	46.99	46.82	46.82	0.31	320.1	0.16	
4-4 to 3-4	RCP	10.74	375	0.110	0.70	142.9	5.00	217.88	0.0912	55.2	5.00	217.88	0.0912	55.2	55.2	-16.7	38.5		146.8	0.26	0.35	1.12	1.01	1.33	47.29	46.09	46.02	47.23	0.81	72.2	0.020	4.47		0.01	0.03		0.01	47.11	47.08	47.07	47.08	0.05	2074.4	0.18	
1-T to 8-2	RCP	12.24	375	0.110	0.70	142.9	5.47	210.95	0.1145	67.1	5.00	217.88	0.1109	67.1	67.1	-69.3	0.0		146.8	0.00	0.00	0.00	0.00	1.33	49.37	46.48	46.39	48.64	1.97	58.7	0.020			0.00			0.00	47.28	47.28	47.28	47.28	0.00	100000	0.0	2.09
2-T to 1-T	RCP	56.57	375	0.110	3.23	30.9	5.00	217.88	0.0382	23.1	5.00	217.88	0.0382	23.1	23.1	-23.1	0.0		315.5	0.00	0.00	0.00	0.00	2.86	49.23	48.33	46.50	49.37	0.68	52.5	0.020			0.00			1.05	48.33	48.33	47.28	47.28	1.85	54.1	0.91	

CIVIL ENGINEERING

H	SOFC ISSUE	RF	05.02.2020
G	WORK IN PROGRESS	RF	02.02.2020
F	TREE A & B UPDATE	RF	09.10.19
E	ROAD 3 TREE UPDATES	RF	04.10.19
REV	DESCRIPTION	BY	DATE

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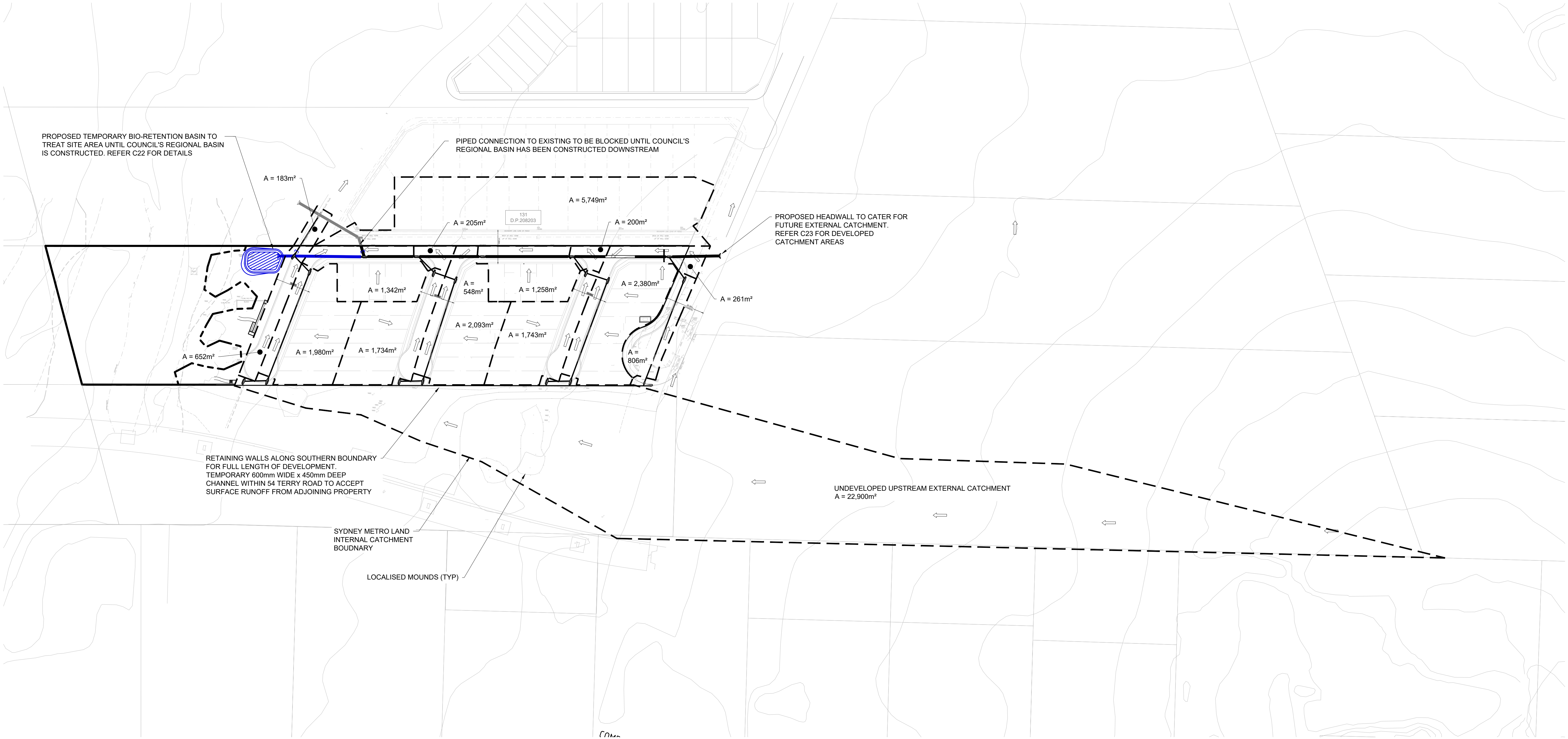
ULTIMATE - 1% AEP
HYDRAULICS
CALCULATIONS

RESIDENTIAL DEVELOPMENT

54 TERRY RD, ROUSE HILL NSW 2155

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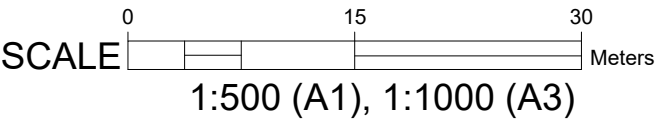
1% AEP (100YR ARI) HYDROLOGY CALCULATIONS TABLE																											
Node	Node	Setout	Grate	Road	Road	Road	Catch	Time	Intensity	Runoff	Area	Full	Full	Full	Partial	Partial	Partial	Catchment	Approach	Road	Road	Max Pond	Choke	Inlet	Inlet	Bypass	Bypass
Name	Type	RL	RL	Name	Chainage	Offset	ID	Tc	I	C	A	CA	Sum CA	Qc=ClA	CA	Sum CA	Qc=ClA	Flow Qc	Flow Qa	Grade	Xfall	Depth	Factor	Curve Name	Flow Qg	Flow Qb	Node
(-)	(-)	(m)	(m)	(-)	(m)	(m)	(-)	(min)	(mm/hr)	(-)	(ha)	(ha)	(ha)	(L/s)	(ha)	(ha)	(L/s)	(L/s)	(L/s)	(%)	(%)	(m)	(-)	(-)	(L/s)	(L/s)	(-)
1-1	RD PIT	47.85	47.83	R1 CL	8.30	5.20	1P	5.00	217.88	0.42	0.0172	0.0073	0.1618	97.9	0.0073	0.1618	97.9	97.9	499.7	0.7	3.0		0.80	0.5G,3.3X	177.5	322.2	7-2
							1I	5.00	217.88	1.00	0.1546	0.1546			0.1546												
2-1	SAG RD PIT	47.78	47.75	R1 CL	8.30	-5.20	1P	5.00	217.88	0.42	0.0234	0.0099	0.2204	133.4	0.0099	0.2204	133.4	133.4	292.1			0.150	0.00	SAG	-71.0	363.1	1-1
							1I	5.00	217.88	1.00	0.2104	0.2104			0.2104												
3-1	RD PIT	48.18	48.15	R1 CL	61.11	-5.20	1P	5.00	217.88	0.42	0.0353	0.0150	0.3329	201.5	0.0150	0.3329	201.5	201.5	201.5	1.5	3.8		0.63	1G,3.3X	76.5	125.0	2-1
							1I	5.00	217.88	1.00	0.3179	0.3179			0.3179												
4-1	RD PIT	48.25	48.22	R1 CL	64.19	5.20	1P	5.00	217.88	0.42	0.0163	0.0069	0.1536	93.0	0.0069	0.1536	93.0	93.0	93.0	7.0	3.0		0.80	2-8G,3.3X	54.2	38.7	1-1
							1I	5.00	217.88	1.00	0.1467	0.1467			0.1467												
1-2	HW OUT	45.68	45.68																							-	
2-2	RD PIT	46.31	46.31				1P	5.00	217.88	0.42	0.0018	0.0008	0.0173	10.5	0.0008	0.0173	10.5	10.5	668.1				0.80		0.0	668.1	LOST
							1I	5.00	217.88	1.00	0.0165	0.0165			0.0165												
3-2	RD PIT	46.47	46.47	R2 CL	177.31	4.66	1P	5.00	217.88	0.42	0.0575	0.0244	0.5418	327.9	0.0244	0.5418	327.9	327.9	598.4				0.80		0.0	598.4	2-2
							1I	5.00	217.88	1.00	0.5174	0.5174			0.5174												
4-2	SAG RD PIT	46.53	46.57	R2 CL	174.78	-4.85	1P	5.00	217.88	0.42	0.0134	0.0057	0.1265	76.5	0.0057	0.1265	76.5	76.5	374.4			0.123	0.50	SAG	103.9	270.5	3-2
							1I	5.00	217.88	1.00	0.1208	0.1208			0.1208												
5-2	RD PIT	46.75	46.70	R2 CL	147.00	-5.00	1P	5.00	217.88	0.42	0.0021	0.0009	0.0193	11.7	0.0009	0.0193	11.7	11.7	352.9	0.6	3.0		0.63	0.5G,3.3X	114.1	238.8	4-2
							1I	5.00	217.88	1.00	0.0185	0.0185			0.0185												
6-2	RD PIT	46.94	46.90	R2 CL	116.02	-5.00	1P	5.00	217.88	0.42	0.0126	0.0053	0.1186	71.8	0.0053	0.1186	71.8	71.8	276.6	0.7	3.0		0.80	0.5G,3.3X	123.7	153.0	2-4
							1I	5.00	217.88	1.00	0.1132	0.1132			0.1132												
7-2	RD PIT	47.42	47.42	R2 CL	69.00	-5.00	1P	5.00	217.88	0.42	0.0020	0.0009	0.0189	11.5	0.0009	0.0189	11.5	11.5	333.6	1.7	3.0		0.80	2-8G,3.3X	128.8	204.9	6-2
							1I	5.00	217.88	1.00	0.0181	0.0181			0.0181												
8-2	RD PIT	48.64	48.64	R2 CL	19.00	-5.00	1P	5.00	217.88	0.42	0.0026	0.0011	0.0246	14.9	0.0011	0.0246	14.9	14.9	84.2	3.1	3.0		0.80	2-8G,3.3X	50.5	33.7	2-1
							1I	5.00	217.88	1.00	0.0235	0.0235			0.0235												
9-2	HW IN	49.50	49.50				1P	15.00	138.35	0.42	5.2745	2.2364	2.2816	876.8	1.4909	1.5361	708.9	876.8	876.8						876.8	-	
							1I	10.00	166.14	1.00	0.0452	0.0452			0.0452												
1-3	RD PIT	46.67	46.67	R3 CL	10.61	-5.49	1P	5.00	217.88	0.42	0.0065	0.0028	0.0616	37.3	0.0028	0.0616	37.3	37.3	134.7	0.7	3.1		0.80	0.5G,3.3X	75.4	59.2	2-2
							1I	5.00	217.88	1.00	0.0588	0.0588			0.0588												
2-3	RD PIT	46.72	46.72	R3 CL	14.00	-5.20	1P	5.00	217.88	0.42	0.0198	0.0084	0.1866	112.9	0.0084	0.1866	112.9	112.9	134.3	0.7	3.0		0.80	0.5G,3.3X	75.3	59.0	4-2
							1I	5.00	217.88	1.00	0.1782	0.1782			0.1782												
3-3	RD PIT	47.13	47.13	R3 CL	72.74	-5.20	1P	5.00	217.88	0.42	0.0114	0.0048	0.1077	65.2	0.0048	0.1077	65.2	65.2	65.2	0.7	3.0		0.80	0.5G,3.3X	43.8	21.4	2-3
							1I	5.00	217.88	1.00	0.1029	0.1029			0.1029												
4-3	RD PIT	47.14	47.14	R3 CL	76.96	5.50	1P	5.00	217.88	0.42	0.0171	0.0072	0.1609	97.4	0.0072	0.1609	97.4	97.4	97.4	0.7			0.80		0.0	97.4	1-3
							1I	5.00	217.88	1.00	0.1537	0.1537			0.1537												
1-4	RD PIT	46.93	46.90	R4 CL	7.14	5.20	1P	5.00	217.88	0.42	0.0173	0.0073	0.1634	98.9	0.0073	0.1634	98.9	98.9	518.8	0.7	3.0		0.80	0.5G,3.3X	177.6	341.2	5-2
							1I	5.00	217.88	1.00	0.1560	0.1560			0.1560												
2-4	SAG RD PIT	46.85	46.82	R4 CL	6.85	-5.20	1P	5.00	217.88	0.42	0.0210	0.0089	0.1977	119.6	0.0089	0.1977	119.6	119.6	315.3			0.150	0.00	SAG	-88.0	403.2	1-4
							1I	5.00	217.88	1.00	0.1888	0.1888			0.1888												
3-4	RD PIT	47.26	47.23	R4 CL	59.73	-5.20	1P	5.00	217.88	0.42	0.0181	0.0077	0.1704	103.2	0.0077	0.1704	103.2	103.2	103.2	1.5	3.7		0.80	1G,3.3X	60.5	42.6	2-4
							1I	5.00	217.88	1.00	0.1628	0.1628			0.1628												
4-4	RD PIT	47.32	47.29	R4 CL	62.42	5.20	1P	5.00	217.88	0.42	0.0097	0.0041	0.0912	55.2	0.0041	0.0912	55.2	55.2	55.2	0.7	3.0		0.80	0.5G,3.3X	38.5	16.7	1-4
							1I	5.00	217.88	1.00	0.0871	0.0871			0.0871												
1-T	RD PIT	49.42	49.37				1P	5.00	217.88	0.42	0.0081	0.0034	0.0764	46.2	0.0034	0.0764	46.2	46.2	69.3	0.7			0.80		0.0	69.3	8-2
							1I	5.00	217.88	1.00	0.0729	0.0729			0.0729												
2-T	RD PIT	49.55	49.23	TERRY RD CL	183.03	3.43	1P	5.00	217.88	0.42	0.0040	0.0017	0.0382	23.1	0.0017	0.0382	23.1	23.1	23.1	0.7			0.80		0.0	23.1	1-T
							1I	5.00	217.88	1.00	0.0364	0.0364			0.0364												



- NOTES:
1. THE UNDEVELOPED UPSTREAM CATCHMENT SHOWN REPRESENTS THE LARGEST POSSIBLE AREA DIRECTED TO THE SUBJECT SITE'S SOUTHERN BOUNDARY. ONCE DEVELOPED THE EXTERNAL CATCHMENT WEST OF TERRY RD IT SHALL BE DIRECTED TO THE NORTH BY TERRY RD.
 2. REFER C23 FOR ULTIMATE / DEVELOPED CATCHMENT PLAN
 3. NO WORKS ARE PROPOSED WITHIN ADJOINING PROPERTY (SYDNEY METRO LAND). SOME ENGINEERING INFORMATION IS PROVIDED TO ASSIST WITH ASSESSMENT OF THE PROPOSED DEVELOPMENT ONLY.
 4. ALL CATCHMENT AREAS SHOWN ARE SUBJECT TO CHANGE AT CONSTRUCTION CERTIFICATE STAGE DESIGN.

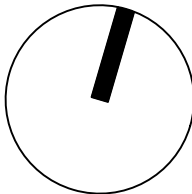
LEGEND:

- EXISTING CONTOURS
- EXISTING EDGE OF BITUMEN
- EXISTING BUILDING
- PROPOSED STORMWATER PIPE (RCP)
- PROPOSED MINOR STORMWATER (PVC)
- PROPOSED 900 x 900 GRATED PIT WITH CARTRIDGE
- CATCHMENT BOUNDARIES
- DIRECTION OF FLOW ARROW



CIVIL ENGINEERING

H	SOFC ISSUE	RF	05.02.2020
G	WORK IN PROGRESS	RF	02.02.2020
F	TREE A & B UPDATE	RF	09.10.19
E	ROAD 3 TREE UPDATES	RF	04.10.19
REV	DESCRIPTION	BY	DATE



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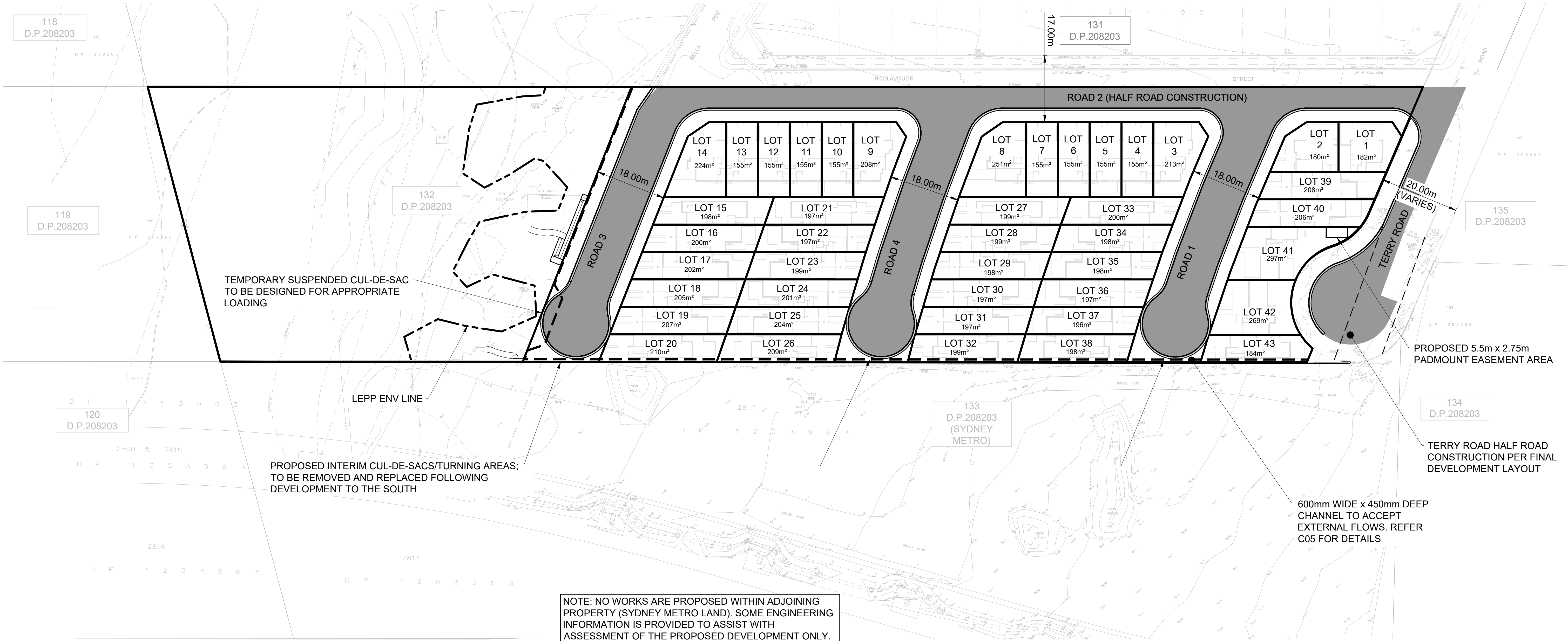
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DESIGN: RF
DRAWN: RF
DWG SIZE: A1

**INTERIM -
STORMWATER
CATCHMENT PLAN**

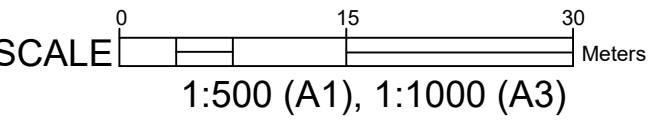
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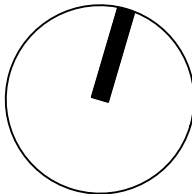
LEGEND:

- 11.0 EXISTING CONTOURS
- EXISTING EDGE OF BITUMEN
- EXISTING BUILDING
- PROPOSED CONCRETE PAVEMENT / KERB
- PROPOSED ROAD PAVEMENT
- SITE BOUNDARY
- L.E.P.P 'ENV' AREA BOUNDARY



CIVIL ENGINEERING

H	SOFC ISSUE	RF	05.02.2020
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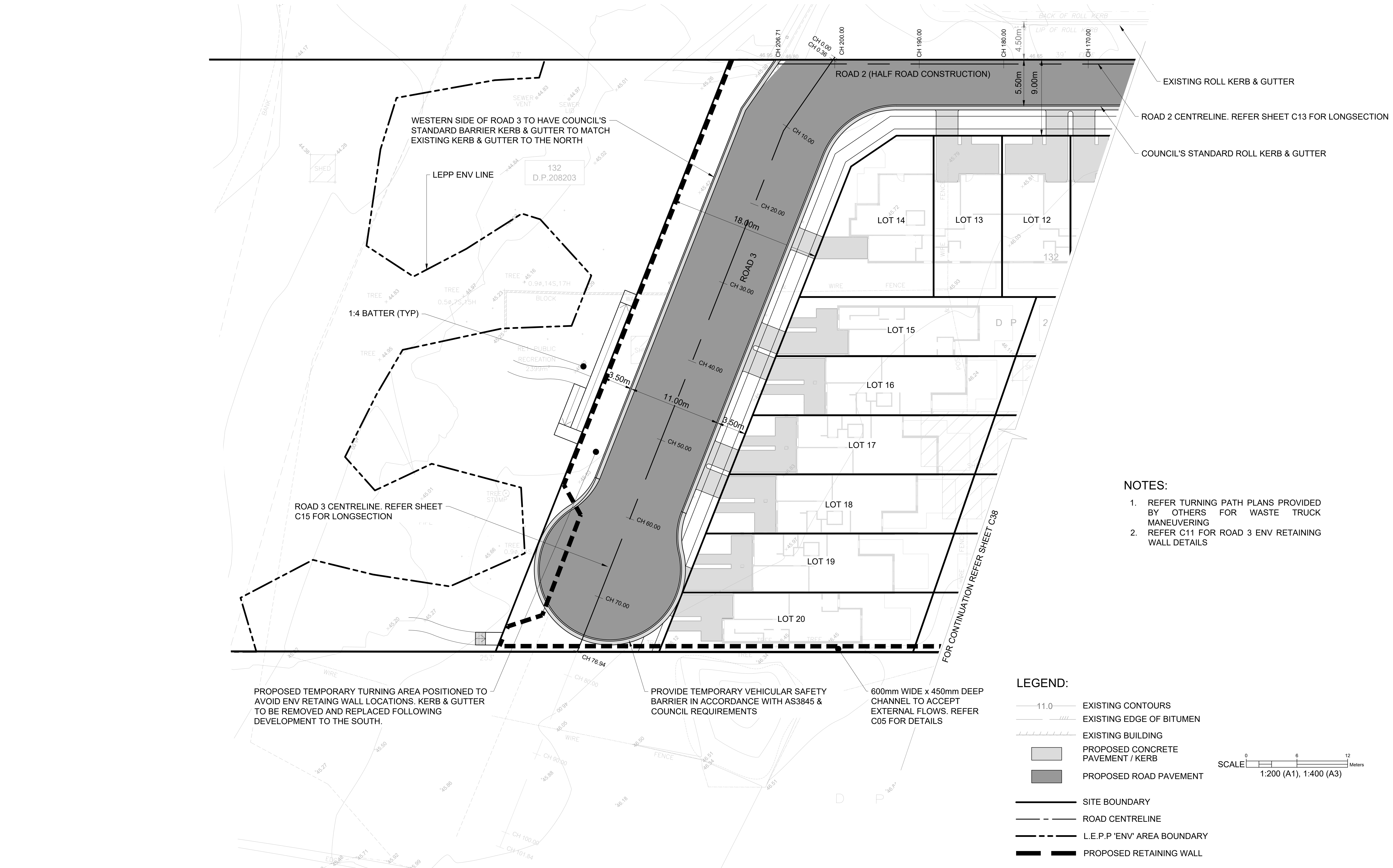
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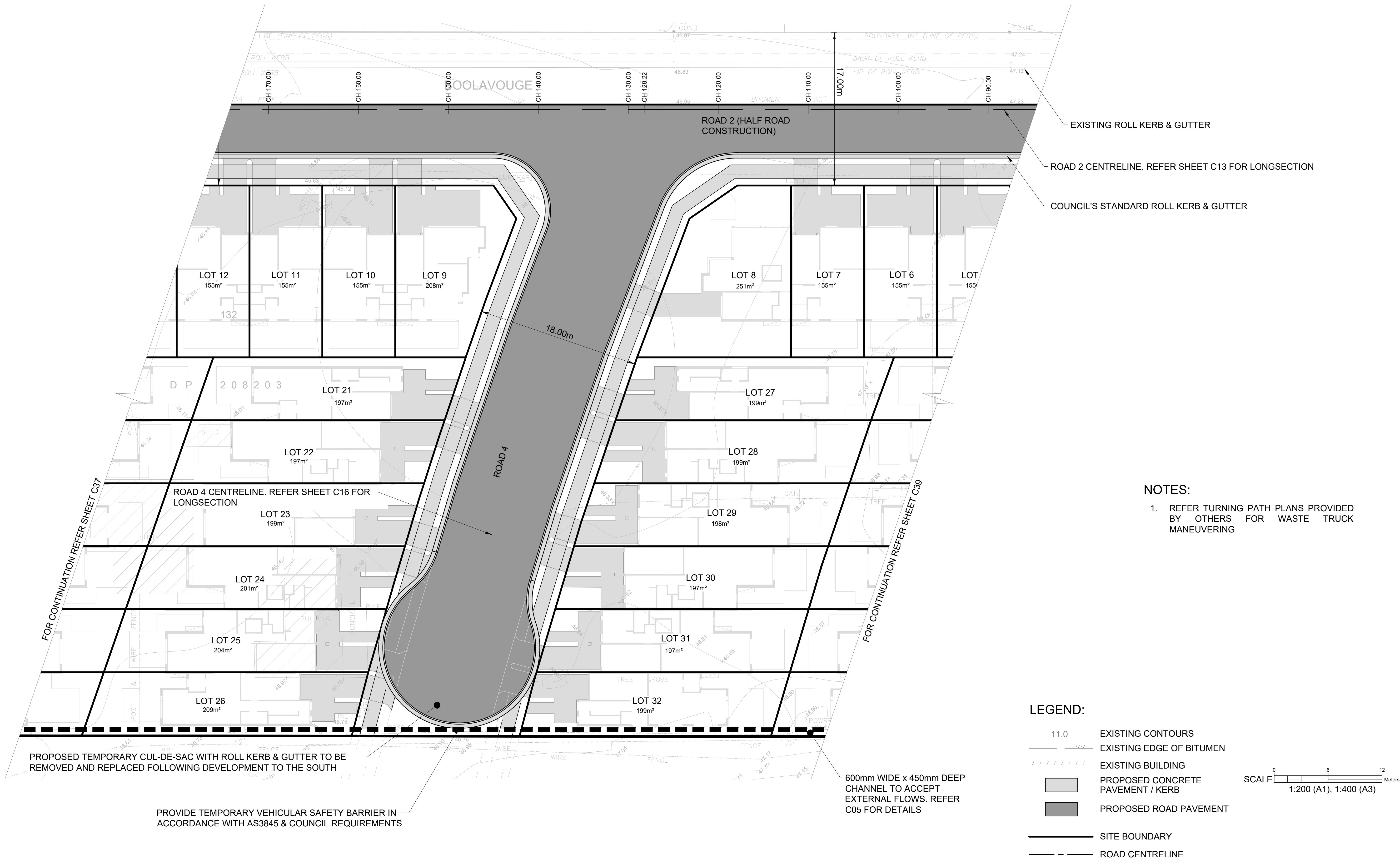
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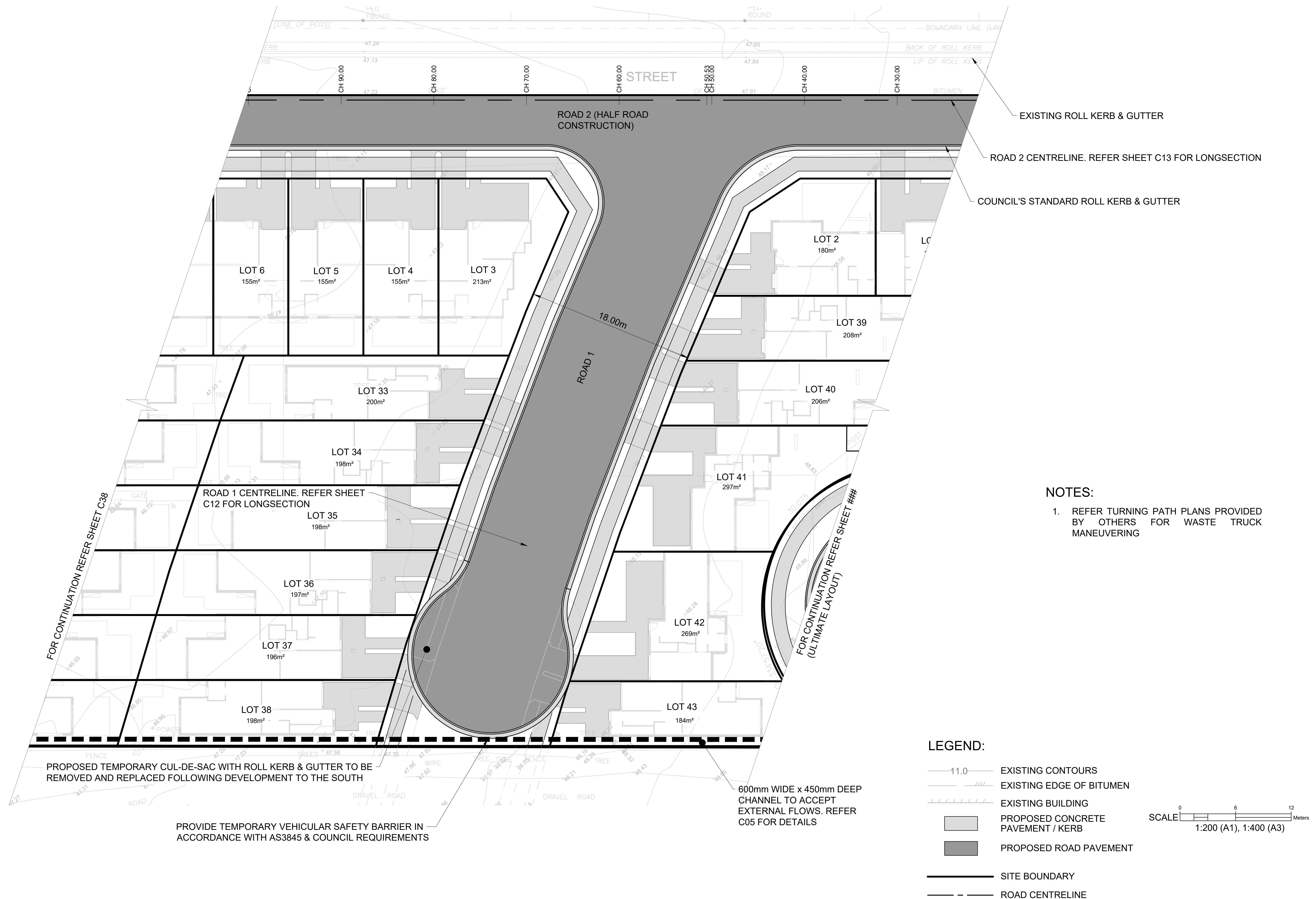
INTERIM - SITE LAYOUT

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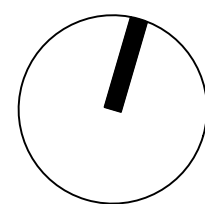




- NOTES:
- REFER TURNING PATH PLANS PROVIDED BY OTHERS FOR WASTE TRUCK MANEUVERING

CIVIL ENGINEERING

H	SOFC ISSUE	RF	05.02.2020
G	WORK IN PROGRESS	RF	02.02.2020
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REV	DESCRIPTION	BY	DATE



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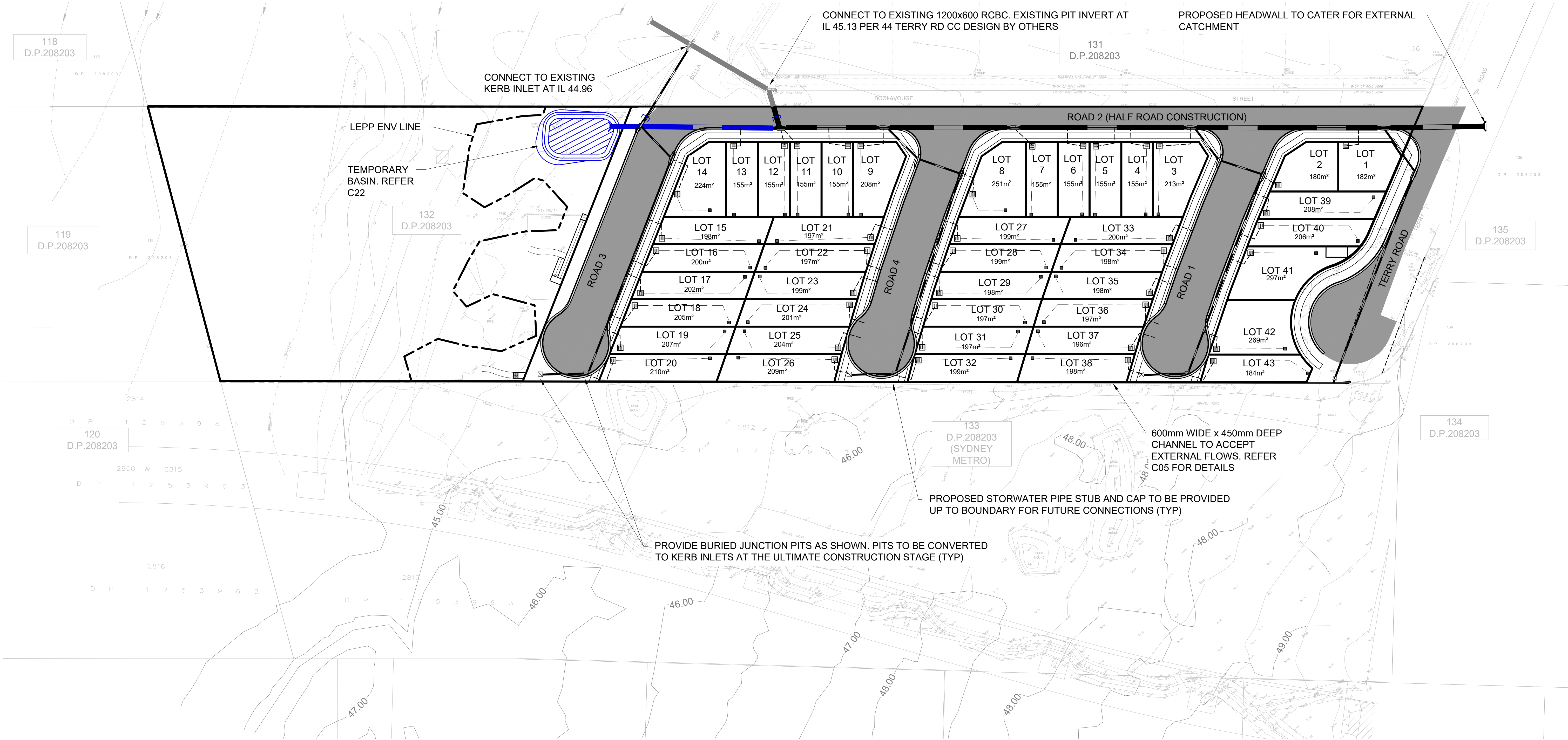
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DESIGN: RF
DRAWN: RF
DWG SIZE: A1

**INTERIM - ROAD
NETWORK PLAN -
SHEET 3 OF 3**

RESIDENTIAL DEVELOPMENT
54 TERRY RD, ROUSE HILL NSW 2155

2019026 - C39 H



NOTES:

- 1. REFER ULTIMATE STORMWATER LAYOUT PLANS FOR FURTHER DETAILS
- 2. STORMWATER FLOWS TO BE COLLECTED IN PIPE/PIT SYSTEM AND DIRECTED TO EXISTING STORMWATER NETWORK AS SHOWN
- 3. ALL STORMWATER PIPES SHOWN HAVE A MINIMUM GRADE OF 0.7%

LEGEND:

- 11.0 — EXISTING CONTOURS
- — — EXISTING EDGE OF BITUMEN
- — — EXISTING BUILDING
- — — PROPOSED STORMWATER PIPE (RCP)
- — — PROPOSED MINOR STORMWATER (PVC)
- — — PROPOSED 900 x 900 GRATED PIT WITH CARTRIDGE
- — — LEPP 'ENV' AREA BOUNDARY

SCALE 0 15 30 Meters
1:500 (A1), 1:1000 (A3)