SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restin
Accreditation No. BDC3367

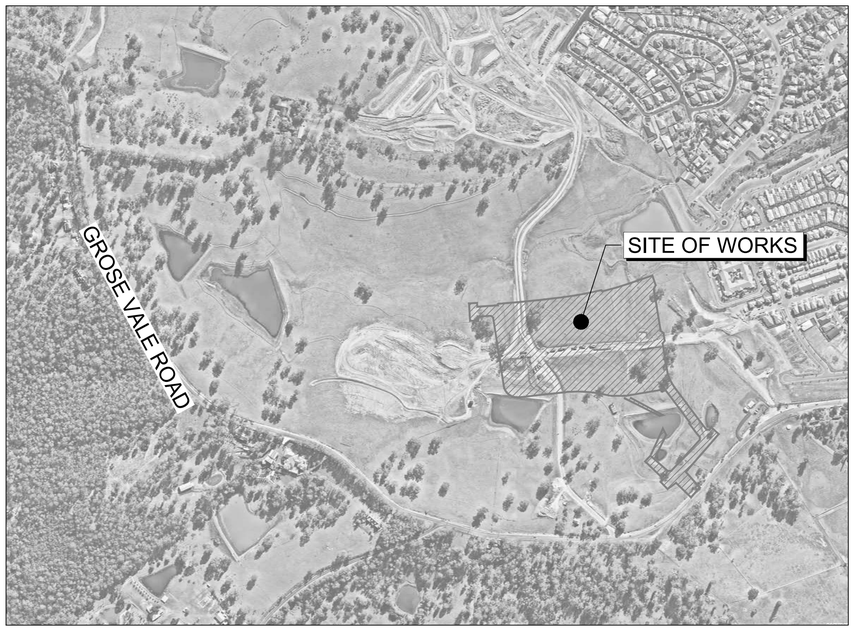
These plans/specifications form part of the certificate issued 10th of August 2021

No works are to occur outside of the property boundary unless written approval from Hawkesbury Council has been received.

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....
PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR
VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21 REF: 16800-15

REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
PROPOSED CIVIL WORKS
FOR SUBDIVISION WORKS CERTIFICATE
(HAWKESBURY CITY COUNCIL - DA0498/18)



Survey By:
VINCE MORGAN SURVEYORS
REGISTERED SURVEYORS
1/77 UNION ROAD PENRITH NSW 2750
Ph. (02) 4721 5293

REF: NORTH RICHMOND - DETAIL SURVEY UPDATE 15 MARCH 2017 & 5th MAY 2017, 11 DEC 2019

LOT LAYOUT PLAN OF SUBDIVISION REF: 22a-REDBANK-PRO-DP1266750-PLAN-DRAFT-201203

	AMENDMENT	DES	DRN	CKD	APR	DATE
D	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
C	ROAD 54 AMENDED	MP	VS	RO	RO	16/06/21
B	AMENDED EXTENT OF WORKS	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL
THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
COVER SHEET

PROJECT No: 110185-12
SHEET No: CC1000

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1000 | D

Plotted: 21 July , 2021 1:54:14 PM File Name: \\jwp.local\fs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1000.dwg

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SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

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LEGEND

DESCRIPTION	PROPOSED	EXISTING	FUTURE
EXTENT OF WORKS			
KERB & GUTTER	KG		
ROLL KERB			
KERB ONLY			
SLOTTED KERB	SK		
GUIDE POSTS			
EXTENT OF FILL			
EXTENT OF CUT			
CONTOURS	46.0	47.0	
STOCKPILE CONTOURS		46.0	
CATCH DRAIN			
STORMWATER DRAINAGE LINE AND PIT			
GROSS POLLUTANT TRAP	GPT		
1:100YR ARI FLOW PATH			
TREES TO BE PROTECTED			
TREES TO BE REMOVED			
TRANSMISSION LINE POWER POLES			
ELECTRICITY, POWER POLE		OE OE PP OE	
WATERMAIN		W W W W	
RETAINING WALLS			
STREET NAME SIGN	SP		

GENERAL NOTES

1. ALL WORKS ARE TO BE IN ACCORDANCE WITH HAWKESBURY CITY COUNCIL'S DEVELOPMENT CONTROL PLAN 2009, APPENDIX E "CIVIL WORKS SPECIFICATIONS",PART I, II & III.
2. EXISTING SURVEY MARKS SHALL BE RETAINED AT ALL TIMES. WHERE RETENTION IS NOT POSSIBLE THE SUPERINTENDENT MUST BE NOTIFIED AND CONSENT RECEIVED PRIOR TO THEIR REMOVAL.
3. THE CONTRACTOR MUST OBTAIN CURRENT DIAL BEFORE YOU DIG UTILITIES PLAN BY DIALING PH 1100, LOCATE AND LEVEL ALL EXISTING SERVICES PRIOR TO COMMENCING CONSTRUCTION, AND MAKE ARRANGEMENTS WITH THE RELEVANT AUTHORITY TO RELOCATE OR ADJUST IF NECESSARY.
4. THE CONTRACTOR SHALL NOT ENTER UPON NOR DO ANY WORK WITHIN ADJACENT LANDS WITHOUT THE WRITTEN PERMISSION OF THE OWNERS, PROVIDED BY PRINCIPAL.
5. THE CONTRACTOR SHALL MAINTAIN SERVICES AND ALL WEATHER ACCESS AT ALL TIMES TO ADJOINING PROPERTIES.
6. FILLING IS TO BE FROM A NOMINATED SOURCE, OF SOUND CLEAN MATERIAL, FREE FROM LARGE ROCK, STUMPS, CONTAMINATED MATTER, INDUSTRIAL AND BUILDING WASTE, ORGANIC MATTER AND OTHER DEBRIS. PLACING OF FILLING ON THE PREPARED AREAS SHALL NOT COMMENCE UNTIL THE APPROVAL TO DO SO HAS BEEN OBTAINED FROM THE COUNCIL.
7. SITE FILL AREAS: - THE CONTRACTOR SHALL TAKE LEVELS OF EXISTING SURFACE AFTER STRIPPING TOPSOIL AND PRIOR TO COMMENCING FILL OPERATIONS.
8. ALL SITE FILLING TO BE COMPACTED TO 98% STANDARD COMPACTION AND SHALL BE CONTROLLED BY A REGISTERED SOIL LABORATORY IN ACCORDANCE WITH COUNCILS' DEVELOPMENT CONTROL PLAN 2009, APPENDIX E "CIVIL WORKS SPECIFICATIONS" PART II
9. ALL SITE REGRADING AREAS SHALL BE GRADED AT A MINIMUM 1% TO THE ENGINEERS' REQUIREMENTS.
10. SURPLUS EXCAVATED MATERIAL SHALL BE PLACED WHERE DIRECTED BY THE SUPERINTENDENT.
11. VEHICULAR CROSSINGS SHALL BE CONSTRUCTED IN KERB AND GUTTER WHERE SHOWN.
12. PRAM CROSSINGS SHALL BE CONSTRUCTED IN KERB AND GUTTER IN ACCORDANCE WITH COUNCIL'S STANDARD DRAWING.
13. ALL NEW WORKS SHALL MAKE A SMOOTH JUNCTION WITH EXISTING CONDITIONS.
14. DIMENSIONS OF ANY DETAIL SHALL NOT BE SCALED - DIMENSIONS, IF IN DOUBT, SHALL BE VERIFIED BY THE SUPERINTENDENT.
15. ALL CONSTRUCTION AND RESTORATION WORK ON COUNCIL'S ROAD AND FOOTPATH AREA ARE TO BE CARRIED OUT IN ACCORDANCE WITH THE APPROVED DRAWINGS AND COUNCIL'S STANDARD SPECIFICATIONS.
16. NO FILL MATERIAL IS TO BE IMPORTED TO THE SITE. EXISTING STOCKPILES AND MATERIAL WITHIN THE REDBANK SITE ARE TO BE USED FOR THE EARTHWORKS.

COMPACTION SPECIFICATION

1) WITHIN FULL WIDTH OF ROAD CARRIAGEWAY PLUS 1.0m EITHER SIDE -

a) ALL SUBGRADE SHALL BE CARRIED UP IN HORIZONTAL LAYERS, OF NOT MORE THAN 300mm THICK LOOSE MEASUREMENT, IF REQUIRED, AND SHALL HAVE EACH LAYER COMPACTED TO A 100% STANDARD DRY DENSITY RATIO DETERMINED IN ACCORDANCE WITH AS 1289 5.4.1-2007 "COMPACTION CONTROL TEST - DRY DENSITY RATIO, MOISTURE VARIATION AND MOISTURE RATIO",

b) ALL SUB-BASE COURSE SHALL BE PLACED AND COMPACTED TO AT LEAST 98% MODIFIED DRY DENSITY RATIO DETERMINED IN ACCORDANCE WITH AS 1289 5.4.1-2007 "COMPACTION CONTROL TEST - DRY DENSITY RATIO, MOISTURE VARIATION AND MOISTURE RATIO".

c) ALL BASE COURSE SHALL BE PLACED AND COMPACTED TO AT LEAST 98% MODIFIED DRY DENSITY RATIO DETERMINED IN ACCORDANCE WITH AS 1289 5.4.1-2007 "COMPACTION CONTROL TEST - DRY DENSITY RATIO, MOISTURE VARIATION AND MOISTURE RATIO".

d) ALL ROAD CROSSINGS TO BE PROVIDED IN EXISTING ROADS, THE TRENCHES SHALL BE BACKFILLED AND COMPACTED WITH A SAND/CEMENT BLEND 20:1 MIX TO SUBGRADE LEVEL, THEN DGB20 TO WITHIN 50MM OF THE ROAD SURFACE, OR IF REQUIRED TO A HIGHER SPECIFICATION BY A SPECIFIC UTILITY AUTHORITY, TO THAT SPECIFICATION AS INSTRUCTED BY THE PROJECT SUPERINTENDENT.

e) ALL TESTS TO BE TAKEN EVERY 50 METRE LENGTH OF PAVEMENT, TAKEN 1.0m FROM ALTERNATE SIDES OF PAVEMENT, BY A NATA REGISTERED LABORATORY.

f) THESE AND ALL OTHER REQUIREMENTS TO BE COMPLIED WITH, TO BE READ IN CONJUNCTION WITH HAWKESBURY CITY COUNCIL DCP APPENDIX E CIVIL WORKS SPECIFICATION PART II - CONSTRUCTION SPECIFICATION.

g) ANY ERRORS, OMISSIONS OR QUERIES TO BE SUBMITTED TO THE PROJECT SUPERINTENDENT FOR INSTRUCTION,

h) ANY FILL MATERIAL SHALL COMPRISE UNCONTAMINATED VIRGIN EXCAVATED NATURAL MATERIAL (VENM) OR EXCAVATED NATURAL MATERIAL (ENM).

2) WITHIN FULL WIDTH OF ROAD FOOTPATH / VERGE EXCLUDING 1.0m BESIDE ROAD CARRIAGEWAY EITHER SIDE -

a) ALL FILL SHALL BE CARRIED OUT IN HORIZONTAL LAYERS, EXTENDING THE FULL WIDTH OF THE AREA BEING FILLED, OF NOT MORE THAN 300mm CONSOLIDATED THICKNESS EACH LAYER SHALL BE COMPACTED TO AT LEAST 98% STANDARD DRY DENSITY RATIO DETERMINED IN ACCORDANCE WITH AS1289 5.4.1-2007 "COMPACTION CONTROL TEST - DRY DENSITY RATIO, MOISTURE VARIATION AND MOISTURE RATIO".

b) ALL TESTS TO BE TAKEN EVERY 50 METRE LENGTH OF ROAD FOOTPATH / VERGE ON CENTRELINE, BY A NATA REGISTERED LABORATORY.

c) ALL TRENCHES TO BE BACKFILLED TO HAVE EQUAL COMPACTION (+2%/-0% VRAIATION) AS THE SURROUNDING ROAD FOOTPATH / VERGE.

d) ALL TRENCH TESTS TO BE TAKEN IN EACH 300mm LAYER AND EVERY 50 METRES OF TRENCH, BY A NATA REGISTERED LABORATORY.

e) THESE AND ALL OTHER REQUIREMENTS TO BE COMPLIED WITH, TO BE READ IN CONJUNCTION WITH HAWKESBURY CITY COUNCIL DCP APPENDIX E CIVIL WORKS SPECIFICATION PART II - CONSTRUCTION SPECIFICATION.

f) ANY ERRORS, OMISSIONS OR QUERIES TO BE SUBMITTED TO THE PROJECT SUPERINTENDENT FOR INSTRUCTION.

g) ANY FILL MATERIAL SHALL COMPRISE UNCONTAMINATED VIRGIN EXCAVATED NATURAL MATERIAL (VENM) OR EXCAVATED NATURAL MATERIAL (ENM).

3) WITHIN LOTS -

a) ALL FILL SHALL BE CARRIED OUT IN HORIZONTAL LAYERS, EXTENDING THE FULL WIDTH OF THE AREA BEING FILLED, OF NOT MORE THAN 300MM CONSOLIDATED THICKNESS. EACH LAYER SHALL BE COMPACTED TO A DENSITY OF AT LEAST 98% STANDARD DRY DENSITY RATIO DETERMINED IN ACCORDANCE WITH AS1289 5.4.1-2007 "COMPACTION CONTROL TEST - DRY DENSITY RATIO, MOISTURE VARIATION AND MOISTURE RATIO".

b) THE DEPTHS OF FILL AND THE COMPACTION THEREOF ARE TO BE VERIFIED BY THE SUBMISSION OF COMPACTION CERTIFICATES AND A PLAN SHOWING CONTOURED DEPTHS OF FILL IN RELATION TO LOT BOUNDARIES.

c) ALL TESTS TO BE A MINIMUM OF TWO COMPACTION TESTS PER LOT PER LAYER ARE TO BE CARRIED OUT, BY A NATA REGISTERED LABORATORY.

d) ALL TRENCHES TO BE BACKFILLED TO HAVE EQUAL COMPACTION (+2%/-0% VARIATION) AS THE SURROUNDING LOTS.

e) ALL TRENCH TESTS TO BE TAKEN IN EACH 300mm LAYER AND EVERY 50 METRES OF TRENCH, BY A NATA REGISTERED LABORATORY.

f) THESE AND ALL OTHER REQUIREMENTS TO BE COMPLIED WITH, TO BE READ IN CONJUNCTION WITH HAWKESBURY CITY COUNCIL DCP APPENDIX E CIVIL WORKS SPECIFICATION PART II - CONSTRUCTION SPECIFICATION.

g) ANY ERRORS, OMISSIONS OR QUERIES TO BE SUBMITTED TO THE PROJECT SUPERINTENDENT FOR INSTRUCTION.

4) EARTHWORKS AND SITE PREPARATION TO BE UNDERTAKEN IN ACCORDANCE WITH GEOTECHNICAL INVESTIGATION REPORT PREPARED BY GEOTECHNIQUE, REFERENCE 12261/31-AA DATED 4 DECEMBER 2020.

5) TOPSOIL

ALL TOPOSIL ON THE SITE MUST COMPLY WITH THE FOLLOWING:

a) TOPSOIL SHALL ONLY BE STRIPPED FROM APPROVED AREAS AND SHALL BE STOCKPILED FOR RE-USE DURING SITE REHABILITATION AND LANDSCAPING.

b) ALL DISTURBED AREAS ARE TO BE STABILISED/REVEGETATED AS SOON AS PRACTICABLE AFTER THE COMPLETION OF FILLING WORKS. TOPSOIL SHALL BE USED IN DISTURBED AREAS AS FOLLOWS:

(i) A MINIMUM 300mm SURFACE LAYER OF TOPSOIL IN OPEN SPACE AREAS,
(ii) A MINIMUM 100mm SURFACE LAYER OF TOPSOIL ACROSS URBAN LOTS, AND
(iii) A MINIMUM 100mm SURFACE LAYER OF TOPSOIL ACROSS ROAD VERGES.

6) BATTERS

WHERE THE MAXIMUM GRADE OF ANY FILL BATTER EXCEEDS A RATIO OF THREE HORIZONTAL TO ONE VERTICAL (3:1), RETAINING WALLS, STONE FLAGGING OR TERRACING SHALL BE CONSTRUCTED;

CIVIL PLAN INDEX

PLAN NO.	PLAN NAME	REV
110185-12-CC1000	COVER SHEET	D
110185-12-CC1001	GENERAL NOTES, INDEX & LEGEND	N
110185-12-CC1002	GENERAL LAYOUT PLAN	E
110185-12-CC1003	ROAD SETOUT PLAN	G
110185-12-CC1004	ROAD TYPICAL SECTIONS	C
110185-12-CC1021	ENGINEERING PLAN SHEET 1	G
110185-12-CC1022	ENGINEERING PLAN SHEET 2	I
110185-12-CC1023	ENGINEERING PLAN SHEET 3	G
-		
110185-12-CC1101	ROAD LONGITUDINAL SECTIONS SHEET 1	A
110185-12-CC1102	ROAD LONGITUDINAL SECTIONS SHEET 2	A
110185-12-CC1103	ROAD LONGITUDINAL SECTIONS SHEET 3	B
110185-12-CC1104	ROAD LONGITUDINAL SECTIONS SHEET 4	D
110185-12-CC1105	ROAD LONGITUDINAL SECTIONS SHEET 5	B
-		
110185-12-CC1201	ROAD CROSS SECTIONS SHEET 1	A
110185-12-CC1202	ROAD CROSS SECTIONS SHEET 2	A
110185-12-CC1203	ROAD CROSS SECTIONS SHEET 3	A
110185-12-CC1204	ROAD CROSS SECTIONS SHEET 4	B
110185-12-CC1205	ROAD CROSS SECTIONS SHEET 5	C
110185-12-CC1206	ROAD CROSS SECTIONS SHEET 6	B
110185-12-CC1207	ROAD CROSS SECTIONS SHEET 7	B
110185-12-CC1208	ROAD CROSS SECTIONS SHEET 8	B
110185-12-CC1209	ROAD CROSS SECTIONS SHEET 9	A
-		
110185-12-CC1301	KERB RETURN PLAN SHEET 1	C
110185-12-CC1302	KERB RETURN PLAN SHEET 2	D
110185-12-CC1303	KERB RETURN PLAN SHEET 3	D
110185-12-CC1304	KERB RETURN PLAN SHEET 4	C
110185-12-CC1305	KERB RETURN PLAN SHEET 5	F
110185-12-CC1306	KERB RETURN PLAN SHEET 6	A
-		
110185-12-CC1400	CATCHMENT PLAN	D
110185-12-CC1401	PIT SCHEDULE	E
110185-12-CC1402	SPECIAL PIT 10/7 DETAILS	B
110185-12-CC1402A	SPECIAL PIT 10/1 DETAILS	A
110185-12-CC1403	SPECIAL PIT 10/8 DETAILS	C
110185-12-CC1404	SPECIAL PIT 14/8 DETAILS	B
110185-12-CC1405	SPECIAL PIT 14/9 DETAILS	C
110185-12-CC1406	SPECIAL PIT 14/10 DETAILS	B
110185-12-CC1407	SPECIAL PIT 14/7 DETAILS	B
110185-12-CC1408	SPECIAL PIT 14/11 DETAILS	B
110185-12-CC1409	SPECIAL PIT DETAILS	B
110185-12-CC1410	SPECIAL PIT 14/13 DETAILS	B
110185-12-CC1411	DRAINAGE CALCULATIONS SHEET 1	D
110185-12-CC1412	DRAINAGE CALCULATIONS SHEET 2	D
110185-12-CC1413	DRAINAGE CALCULATIONS SHEET 3	C
110185-12-CC1414	DRAINAGE CALCULATIONS SHEET 4	C
110185-12-CC1415	DRAINAGE CALCULATIONS SHEET 5	E
110185-12-CC1416	DRAINAGE CALCULATIONS SHEET 6	B
110185-12-CC1417	DRAINAGE CALCULATIONS SHEET 7	B
110185-12-CC1418	DRAINAGE CALCULATIONS SHEET 8	C
110185-12-CC1419	DRAINAGE CALCULATIONS SHEET 9	B
110185-12-CC1420	DRAINAGE CALCULATIONS SHEET 10	B
110185-12-CC1421	DRAINAGE CALCULATIONS SHEET 11	C
110185-12-CC1422	DRAINAGE CALCULATIONS SHEET 12	B
110185-12-CC1423	DRAINAGE LONGITUDINAL SECTIONS SHEET 1	C
110185-12-CC1424	DRAINAGE LONGITUDINAL SECTIONS SHEET 2	D
110185-12-CC1425	DRAINAGE LONGITUDINAL SECTIONS SHEET 3	C
110185-12-CC1426	DRAINAGE LONGITUDINAL SECTIONS SHEET 4	D
110185-12-CC1427	DRAINAGE LONGITUDINAL SECTIONS SHEET 5	C

CIVIL PLAN INDEX

PLAN NO.	PLAN NAME	REV
110185-12-CC1428	DRAINAGE LONGITUDINAL SECTIONS SHEET 6	C
110185-12-CC1429	DRAINAGE LONGITUDINAL SECTIONS SHEET 7	E
110185-12-CC1430	DRAINAGE LONGITUDINAL SECTIONS SHEET 8	E
110185-12-CC1431	DRAINAGE LONGITUDINAL SECTIONS SHEET 9	C
110185-12-CC1433	DRAINAGE LONGITUDINAL SECTIONS SHEET 11	C
110185-12-CC1434	DRAINAGE LONGITUDINAL SECTIONS SHEET 12	C
-		
110185-12-CC1500	RETAINING WALL PLAN	B
110185-12-CC1501	RETAINING WALL DETAILS	A
110185-12-CC1511	RETAINING WALL LONGITUDINAL SECTIONS SHEET 1	B
110185-12-CC1512	RETAINING WALL LONGITUDINAL SECTIONS SHEET 2	B
110185-12-CC1513	RETAINING WALL LONGITUDINAL SECTIONS SHEET 3	B
-		
110185-12-CC1700	SOIL & WATER MANAGEMENT NOTES	B
110185-12-CC1701	SOIL & WATER MANAGEMENT PLAN	F
110185-12-CC1702	SOIL & WATER MANAGEMENT DETAILS	A
110185-12-CC1703	10/10 & 32/60UTLET SCOUR PROTECTION DETAILS HEADWALL 10/10	B
-		
110185-12-CC1800	SIGNAGE AND LINE MARKING PLAN SHEET 1	G
110185-12-CC1801	SIGNAGE AND LINE MARKING PLAN SHEET 2	D
110185-12-CC1802	EMERGENCY ACCESS PLAN , TYPICAL CROSS SECTION AND LONGITUDINAL SECTION	C
110185-12-CC1803	EMERGENCY ACCESS CROSS SECTION	
-		0
110185-12-CC1900	SWEPT PATH PLAN SHEET 1	B
110185-12-CC1901	SWEPT PATH PLAN SHEET 2	B
110185-12-CC1902	SWEPT PATH PLAN SHEET 3	C

STORMWATER NOTES

1. STORMWATER DESIGN CRITERIA:
   AVERAGE RECURRENCE INTERVAL:
   1:100 MAJOR SYSTEM
   1:5 MINOR SYSTEM
2. ALL INTERNAL WORKS WITHIN PROPERTY BOUNDARIES ARE TO COMPLY WITH THE REQUIREMENTS OF AS 3500 3.1 (1998) AND AS/NZS 3500 3.2 (1998).
3. CARE IS TO BE TAKEN WITH LEVELS OF STORMWATER LINES. GRADES SHOWN ARE NOT TO BE REDUCED WITHOUT APPROVAL.
4. GRATES AND COVERS SHALL CONFORM TO AS 3996.
5. AT ALL TIMES DURING CONSTRUCTION OF STORMWATER PITS, ADEQUATE SAFETY PROCEDURES SHALL BE TAKEN TO ENSURE AGAINST THE POSSIBILITY OF PERSONNEL FALLING DOWN PITS.
6. ALL DRAINAGE LINES THROUGH LOTS SHALL BE CONTAINED WITHIN THE FOLLOWING EASEMENTS: -
   a) 1.2m WIDE FOR PIPELINE < 225Ø TO BE CREATED.
   b) 2.5m WIDE FOR PIPELINE ≥ 300Ø TO BE CREATED
   c) STREET DRAINS - REFER TO COUNCILS DESIGN GUIDELINES SUBDIVISION/ DEVELOPMENTS.
8. DRAINAGE LINES UNDER ROADS SHALL BE BACKFILLED WITH NON-COHESIVE SAND AND HAVE 3m OF SUBSOIL DRAIN WRAPPED IN APPROVED FILTER SOCK, DISCHARGING INTO DOWN STREAM PITS. FOR PIPELINES GREATER THAN 525Ø, SUBSOIL DRAIN SHALL BE PROVIDED ON BOTH SIDES OF THE TRENCH.
9. ALL STORMWATER PIPES WITHIN ROADS TO BE REINFORCED CONCRETE PIPE (RRJ) CLASS 2 UNLESS OTHERWISE INDICATED.
10. ALL INTERALLOTMENT DRAINAGE LINES SHALL BE LAID AT A MINIMUM GRADE OF 1% UNLESS OTHERWISE INDICATED.
11. DRAINAGE LINES ON PLANS ARE DIAGRAMMATIC ONLY AND PIPE CENTRELINES SHALL ENTER AND EXIT PITS AT THE CENTRE OF THE RESPECTIVE PIT WALLS.
12. STEP IRONS REQUIRED WHERE THE PIT EXCEEDS 1200 IN DEPTH. REFER TO COUNCIL DRAWING SD41
13. WHERE GRADES EXCEED 14.0%, BULKHEADS TO BE PROVIDED IN ACCORDANCE WITH SECTION 5.12 OF COUNCIL'S CIVIL WORKS SPECIFICATION PART 2 CONSTRUCTION.
14. SUBSOIL DRAIN TO BE RUN BOTH SIDE OF ROAD WITH CAPPED FLUSH POINTS AND CONNECTED TO NEAREST STORMWATER PIT.
15. ALL PIT GRATES TO HAVE LOCKING CLIP.
16. ALL STORMWATER PIPES WITHIN THE ROAD RESERVE AND OPEN SPACE TO BE INSTALLED TO HS3 STANDARD IN ACCORDANCE WITH AS3725 - DESIGN FOR INSTALLATION OF BURIED CONCRETE PIPES.
17. BACKFILL OF ALL TRENCHES INCLUDING SEWER THAT IS WITHIN THE ZONE OF INFLUENCE OF THE PAVEMENT SHALL BE STABILISED SAND OR SUITABLE BACKFILL COMPACTED 98% STANDARD.

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NOTE: UTILITIES SHOWN MAY NOT INCLUDE ALL SERVICES WITHIN THE LIMIT OF WORKS

	AMENDMENT	DES	DRN	CKD	APR	DATE
N	CERTIFIER COMMENTS	MP	MP	RO	RO	04/08/21
M	DRIVEWAY LOCATIONS AMENDED	MP	MP	RO	MS	27/07/21
L	INDEX AMENDED	MP	VS	RO	RO	21/07/21
K	COUNCIL COMMENTS	MP	NA	RO	RO	23/06/21
J	ROAD 54 AMENDED	MP	VS	RO	RO	16/06/21
H	ROAD 54 ALIGNMENT REVISED	JET	JET	MP	RO	08/06/21
G	DRAINAGE REVISED FOR SEWERMAIN CROSSING	JET	JET	MP	RO	26/05/21
F	COUNCIL COMMENTS	JET	JET	MP	RO	21/05/21
E	COUNCIL COMMENTS	JET	JET	MP	RO	13/05/21
D	CERTIFIER COMMENTS	JET	JET	MP	RO	26/04/21

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
GENERAL NOTES, INDEX & LEGEND

PROJECT No: 110185-12

SHEET No: CC1001

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1001 N

Plotted: 4 August, 2021 7:52:09 PM File Name: \\jwp local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1001.dwg

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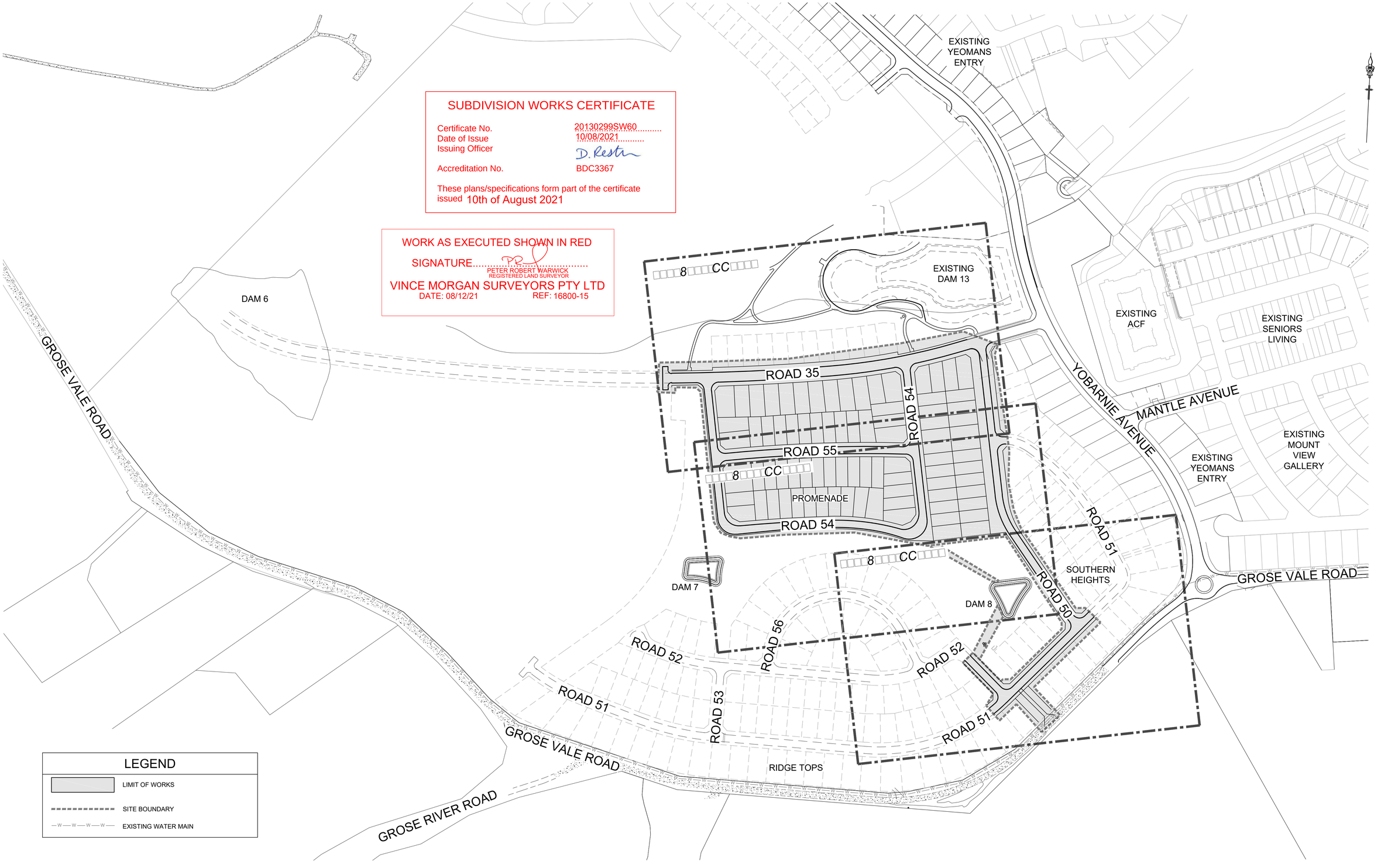

LEGEND

- LIMIT OF WORKS
- SITE BOUNDARY
- EXISTING WATER MAIN

1:2000 (AT A1)
1:4000 (AT A3)

50 0 50 100 150 200
METRES

	AMENDMENT	DES	DRN	CKD	APR	DATE
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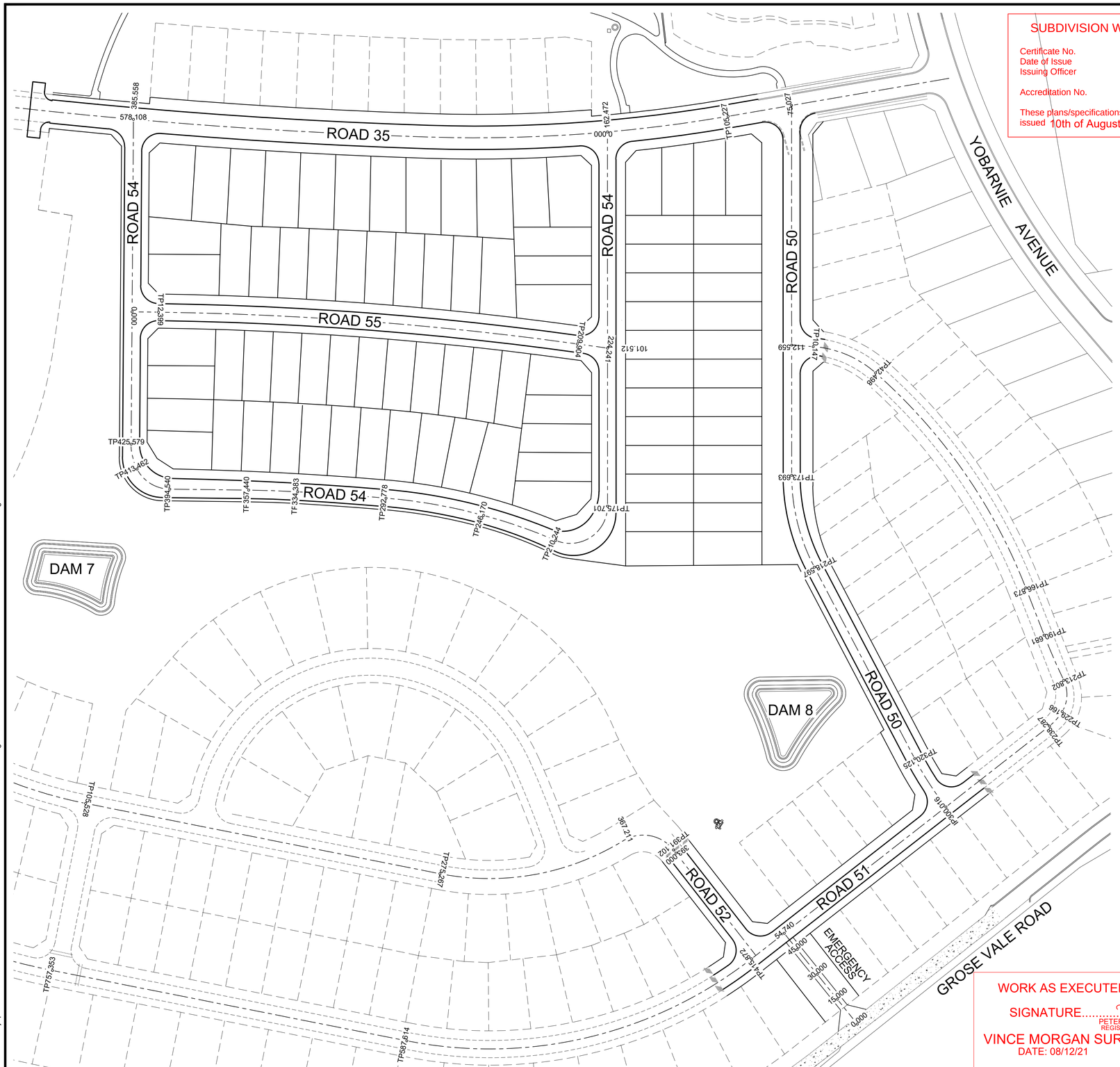
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
GENERAL LAYOUT PLAN

PROJECT No: 110185-12
SHEET No: CC1002

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1002 E

Plotted: 21 July , 2021 1:56:11 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1002.dwg



SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restin
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

ROAD 35					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286743.56	6281514.69	251°02'36.11"		
105.23	286644.04	6281480.5	251°02'36.11"		
133.85	286616.96	6281471.2		700	57.25
162.47	286589.2	6281464.14	255°43'44.35"		
204.63	286548.3	6281453.74		700	84.31
246.78	286506.45	6281448.32	262°37'46.91"		
316.17	286437.61	6281439.42		2500	138.78
385.56	286368.39	6281434.35	265°48'36.85"		
607.85	286146.1	6281418.06		2500	444.59
830.15	285924.44	6281441.36	275°59'58.56"		
879.9	285873.92	6281446.67		200	99.5
929.65	285832.05	6281475.45	304°30'11.90"		
932.32	285829.85	6281476.96	304°30'11.90"		

ROAD 50					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286672.61	6281490.31	170°46'34.49"		
173.69	286700.45	6281318.87	170°46'34.49"		
196.15	286704.12	6281296.26		-93	44.9
218.6	286717.86	6281277.95	143°06'41.88"		
320.13	286778.81	6281196.75	143°06'41.88"		
333.65	286786.95	6281185.9		-150	27.06
347.18	286796.91	6281176.69	132°46'38.06"		

ROAD 51					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286690.65	6281379.21	85°03'11.17"		
10.15	286700.76	6281380.09	85°03'11.17"		
26.32	286717.46	6281381.53		50	32.35
42.5	286731.66	6281372.62	122°07'30.80"		
104.69	286785.35	6281338.9		260	124.37
166.87	286817.5	6281284.25	149°32'00.56"		
190.68	286829.57	6281263.73	149°32'00.56"		
202.24	286835.43	6281253.76		-300	23.12
213.8	286842.05	6281244.28	145°07'04.19"		
221.48	286846.84	6281237.4		15.5	15.36
229.17	286843.71	6281229.63	201°54'40.64"		
233.73	286841.99	6281225.35		25	9.12
238.29	286838.86	6281221.97			
300.02	286796.91	6281176.69			
415.87	286718.16	6281091.7	222°48'55.65"		
501.74	286655.93	6281024.53		200	171.74
587.61	286564.42	6281027.75	272°00'57.16"		
757.35	286394.79	6281033.72	272°00'57.16"		
799.33	286352.55	6281035.21		295	83.95
841.3	286312.44	6281048.49	288°19'12.69"		
904.05	286252.87	6281068.21	288°19'12.69"		
967.73	286191.49	6281088.54		300	127.37
1031.41	286143.93	6281132.34	312°38'42.83"		

ROAD 54					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286589.2	6281464.14	170°46'34.35"		
175.7	286617.37	6281290.71	170°46'34.35"		
192.97	286621.61	6281264.57		17.5	34.54
210.24	286595.9	6281270.92	283°52'14.85"		
228.21	286578.43	6281275.23		-260	35.93
246.17	286560.54	6281277.1			
269.47	286537.3	6281279.52		-260	46.61
292.78	286514	6281277.76			
313.58	286493.25	6281276.19		-1500	41.6
334.38	286472.56	6281274.05			
345.91	286461.09	6281272.87		-505.5	23.06
357.44	286449.69	6281271.16			
394.54	286412.99	6281265.66	261°28'48.84"		
404	286402.6	6281264.11		17.5	18.92
413.46	286396.35	6281272.54	323°25'56.21"		
419.52	286392.66	6281277.51		25	12.12
425.58	286391.72	6281283.61	351°12'08.99"		
578.11	286368.39	6281434.35	351°12'08.99"		

ROAD 55					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286382.21	6281345.04	81°33'33.09"		
12.4	286394.48	6281346.86	81°33'33.09"		
111.15	286492.29	6281361.37		1585	197.5
209.9	286591.14	6281363.62	88°41'55.38"		
224.24	286605.48	6281363.94	88°41'55.38"		

ROAD 52					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286299.45	6281145.64	133°40'40.93"		
8.5	286305.6	6281139.76	133°40'40.93"		
18.84	286313.2	6281132.51		-46.69	20.67
29.17	286323.17	6281129.21	108°19'12.68"		
44.35	286337.58	6281124.44	108°19'12.68"		
74.94	286366.82	6281114.76		-215	61.18
105.53	286397.6	6281113.67	92°00'57.16"		
275.27	286567.23	6281107.7	92°00'57.16"		
320.06	286614.2	6281106.05		-120	89.58
364.85	286649.79	6281136.73	49°14'40.82"		
377.97	286661.98	6281147.23		18	26.25
391.1	286673.78	6281136.3	132°48'55.65"		
453.97	286719.9	6281093.57	132°48'55.65"		

EMERGENCY ACCESS			
CHAINAGE	EASTING	NORTHING	BEARING
0	286772.1	6281069.38	311°57'02.39"
54.74	286731.39	6281105.98	311°57'02.39"

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....
PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR
VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21 REF: 16800-15

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

G	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
F	COUNCIL COMMENTS	MP	MP	RO	RO	16/06/21
E	ROAD 54 ALIGNMENT REVISED	JET	JET	MP	RO	08/06/21
D	COUNCIL COMMENTS	JET	JET	MP	RO	13/05/21
C	CERTIFIER COMMENTS	JET	JET	MP	RO	26/04/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

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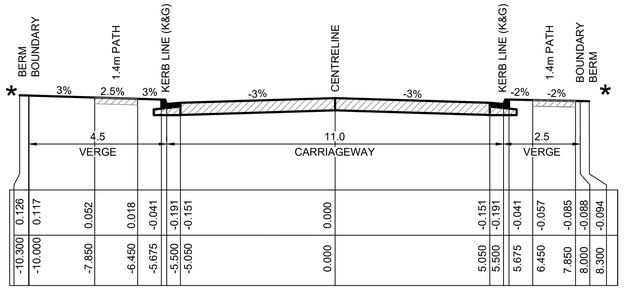
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
ROAD SETOUT PLAN

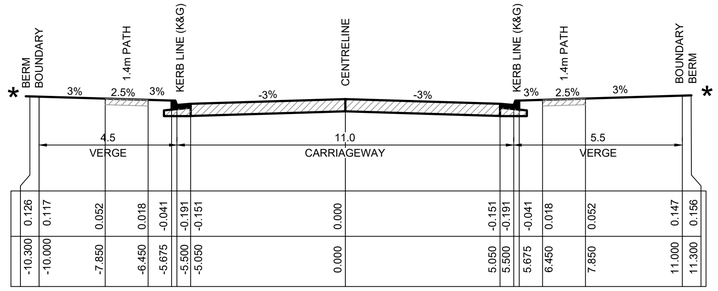
PROJECT No: 110185-12
SHEET No: CC1003

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1003 | G

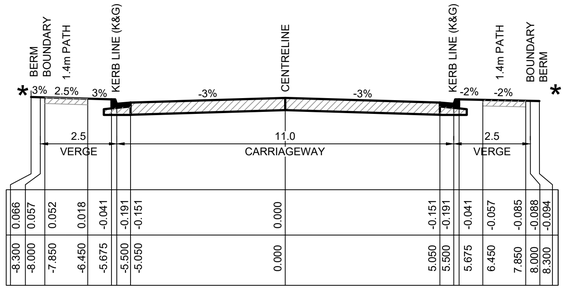
Plotted: 21 July , 2021 1:56:57 PM File Name: \\jwp.local\fs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1003.dwg



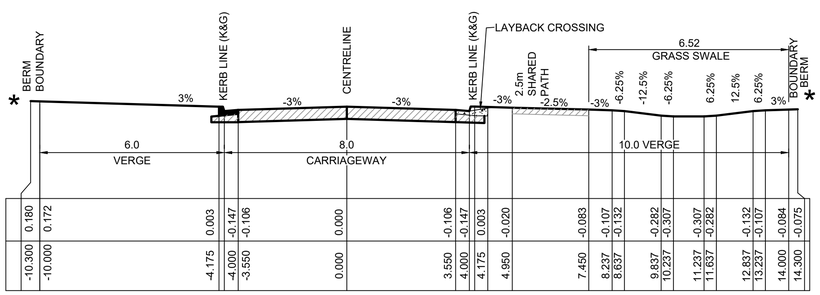
TYPICAL CROSS SECTION
ROAD No.35 (CH92.50 - CH170.00)
(18m ROAD RESERVE)
SCALE 1:100 NATURAL



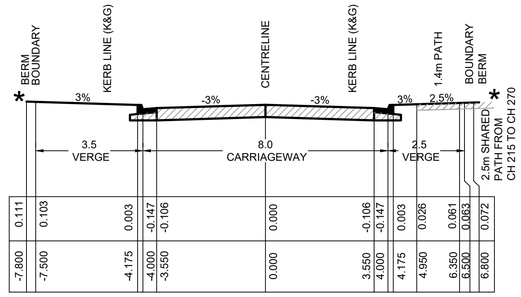
TYPICAL CROSS SECTION
ROAD No.35 (CH170.00 - CH379.00)
(21m ROAD RESERVE)
SCALE 1:100 NATURAL



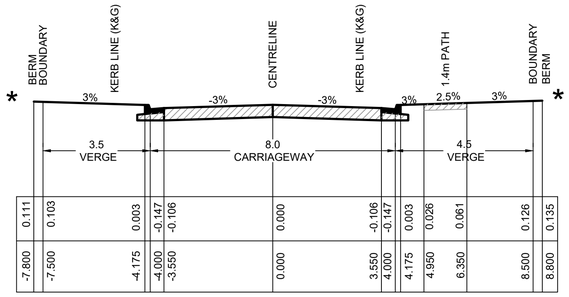
TYPICAL CROSS SECTION
ROAD No.35 (CH379.00 - END)
(16m ROAD RESERVE)
SCALE 1:100 NATURAL



TYPICAL CROSS SECTION
ROAD No.50 (START - CH215.00)
(24m ROAD RESERVE)
SCALE 1:100 NATURAL

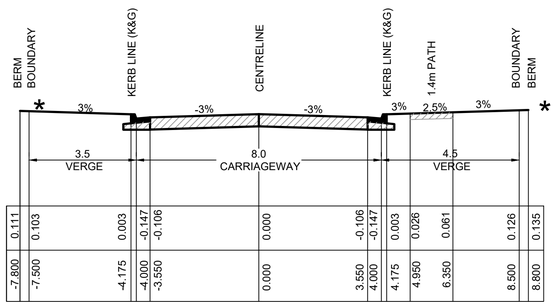


TYPICAL CROSS SECTION
ROAD No.50 (CH215.00 - 300.00)
(14m ROAD RESERVE)
SCALE 1:100 NATURAL

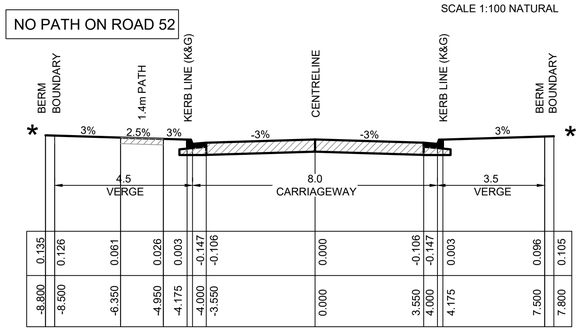


TYPICAL CROSS SECTION
ROAD No.50 (CH300.00 - END)
(16m ROAD RESERVE)
SCALE 1:100 NATURAL

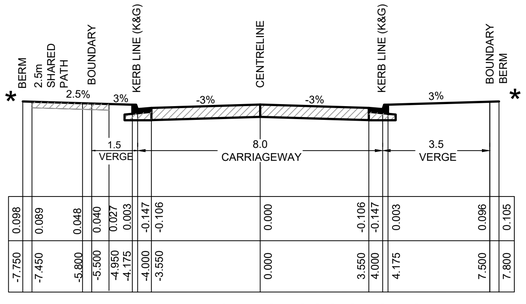
NO PATH ON ROAD 52



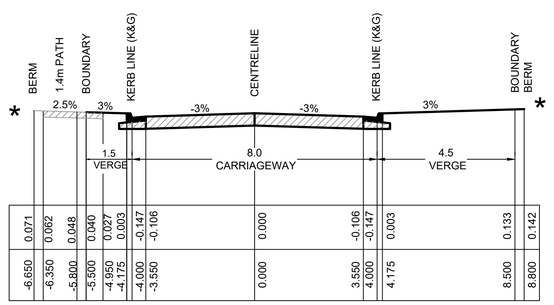
TYPICAL CROSS SECTION
ROAD No.51 (CH0 - CH15)
ROAD No.51 (CH280 - CH430)
(16m ROAD RESERVE)
SCALE 1:100 NATURAL



TYPICAL CROSS SECTION
ROAD No.52 & 55
ROAD No. 54 (START - CH168.958)
(16m ROAD RESERVE)
SCALE 1:100 NATURAL



TYPICAL CROSS SECTION
ROAD No.54 (CH370 - END)
(13m ROAD RESERVE)
SCALE 1:100 NATURAL

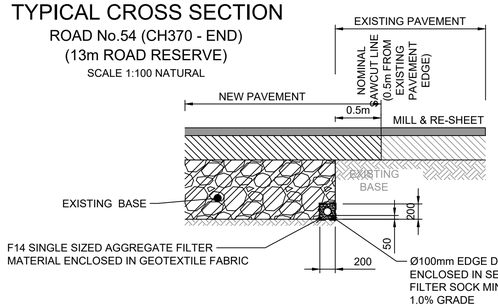


TYPICAL CROSS SECTION
ROAD No.54 (CH210.00 - CH370)
(14m ROAD RESERVE)
SCALE 1:100 NATURAL

PAVEMENT NOTES
(ROAD 35, 50 & 51)
$2x10^5$ ESA (GEOTECHNICAL REPORT BY GEOTECHNIQUE, REF: 12261/31-AA-R1 DATED 4/12/2020)
1. 50mm WEARING COURSE AC10
2. ONE COAT HOT BITUMEN FLUSH SEAL
3. 150mm DGB 20 BASE COURSE
4. 250mm SUB-BASE COURSE

PAVEMENT NOTES
(ROAD 52, 54 & 55)
$5x10^4$ ESA (GEOTECHNICAL REPORT BY GEOTECHNIQUE, REF: 12261/31-AA-R1 DATED 4/12/2020)
1. 50mm WEARING COURSE AC10
2. ONE COAT HOT BITUMEN FLUSH SEAL
3. 150mm DGB 20 BASE COURSE
4. 200mm SUB-BASE COURSE

SUBDIVISION WORKS CERTIFICATE
Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restin
Accreditation No. BDC3367
These plans/specifications form part of the certificate issued 10th of August 2021



INTERFACE BETWEEN NEW PAVEMENT AND EXISTING PAVEMENT
(LONGITUDINAL AND TRANSVERSE)
NTS

* REFER TO ENGINEERING PLANS FOR SITE REGRADING

NOTE:
SUBSOIL DRAINAGE TO BE PROVIDED UNDER KERBS ON BOTH SIDES OF THE ROAD EXCEPT WHERE STREET DRAINAGE IS PRESENT. REFER TO HCC STANDARD DRAWING No.SD3

WORK AS EXECUTED SHOWN IN RED
SIGNATURE.....
PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR
VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21 REF: 16800-15

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

AMENDMENT	DES	DRN	CKD	APR	DATE
C COUNCIL COMMENTS	MP	VS	RO	RO	16/06/21
B CERTIFIER COMMENTS	JET	JET	MP	RO	26/04/21
A ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
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CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL
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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
ROAD TYPICAL SECTIONS

PROJECT No: 110185-12
SHEET No: CC1004

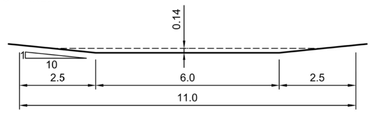
AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1004 | C

Plotted: 21 July, 2021 1:57:39 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1004.dwg

MANNINGS CALCULATION FOR SURCHARGE PIT 14/13 (3x900x900 GSIP)

Q = 2.1m³/s
n = 0.03 (*SHORT GRASS*)
S = 6%
DEPTH OF FLOW = 0.14m
WIDTH OF FLOW = 8.85m
FLOW VELOCITY = 1.98m/s

THEREFORE FLOW VELOCITY IS PERMISSIBLE FOR GRASS LINED CHANNEL



TYPICAL GRASS LINED CHANNEL
NTS

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restin
Accreditation No. BDC3367

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LEGEND

# –RW— RW	PROVIDE KERB ADAPTOR AND ROOF WATER CONNECTION TO HAWKESBURY CITY COUNCIL DRAWING SD39

WORK AS EXECUTED SHOWN IN RED
SIGNATURE.....
PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR
VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21 REF: 16800-15

EXISTING DAM 13

FUTURE SHARED CYCLEWAY/PATH.
PROVIDE SCOUR PROTECTION. OUTLET DETAIL REFER TO CC1703
PROVIDE 3.5m WIDE CDS ACCESS ALONG CYCLEWAY TO HCC STANDARD SD 66:
1. 150mm CONCRETE WITH F72 TOP & BOTTOM
2. 50mm GRANULAR BEDDING
CONCRETE STRENGTH F'c = 33MPa.
FOR LAYOUT LOCATION REFER TO LANDSCAPE ARCHITECT PLANS.
GPT CDS UNIT (CDS P3024R)
900Ø PIPE & ENDCAP FOR FUTURE CONNECTION
REINFORCED TURF - 11m LONG
SURCHARGE PIT 3X900X900 GSIP
PROVIDE VEHICULAR CROSSING TO HCC SD 68 WITH REMOVABLE BOLLARD.
EXISTING PAVEMENT TO BE MILLED & RESHEETED TO MATCH EXISTING SURFACE
LIMIT OF CONSTRUCTION CH. 92.5. MATCH EXISTING PAVEMENT
BOX CULVERT INVERT RL 37.92
PIT INVERT 38.19
PROVIDE TEMPORARY BOLLARDS @ 1.5m C/C AND TEMPORARY GATE FOR CONSTRUCTION ACCESS.
PROVIDE 2% REVERSE CROSSFALL , FOR MINIMUM 5m LONG FOR OVERLAND FLOW PATH.
RECONSTRUCT KERB RETURN
EXISTING PITS TO BE RECONSTRUCTED TO NEW KERB
750Ø ENDCAP FOR FUTURE CONNECTION
PROVIDE TEMPORARY TURNING HEAD AS PER HCC STANDARD DWG. SD7
DRAINAGE EASEMENT 1.2 WIDE
ROAD 35
ROAD 50
ROAD 54
ROAD 55
KR 31
KR 32
KR 34
KR 36
KR 37
KR 38

REFER TO DRAWING CC1022 FOR CONTINUATION

1:500 (AT A1)
1:1000 (AT A3)
10 0 10 20 30 40 50
METRES

G	CERTIFIER COMMENTS	MP	MP	RO	RO	4/08/21
F	DRIVEWAY LOCATIONS AMENDED	MP	MP	RO	RO	27/07/21
E	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
D	CERTIFIER COMMENTS	JET	JET	MP	RO	26/04/21
C	DRAINAGE REVISED	JET	JET	MP	RO	23/03/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
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P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL
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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
ENGINEERING PLAN
SHEET 1

PROJECT No: 110185-12
SHEET No: CC1021

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1021 | G

Plotted: 4 August, 2021 6:10:29 PM File Name: J:\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1021.dwg

REFER TO DRAWING CC1021 FOR CONTINUATION

ROAD 55

ROAD 54

ROAD 50

ROAD 51

RW2

RW4

RW5

RW6

DRAINAGE EASEMENT 1.2 WIDE

900Ø STUB WITH ENDCAP FOR FUTURE CONNECTION

450Ø STUB WITH ENDCAP FOR FUTURE CONNECTION

PROVIDE TEMPORARY BOLLARDS 1.5m C/C

REFER TO DRAWING CC1023 FOR CONTINUATION

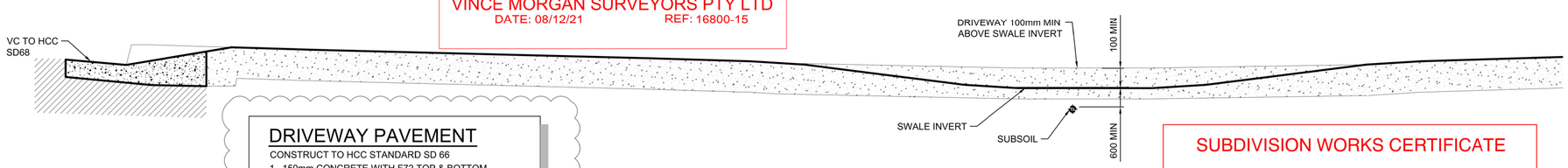
WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15



DRIVEWAY PAVEMENT

CONSTRUCT TO HCC STANDARD SD 66

1. 150mm CONCRETE WITH F72 TOP & BOTTOM
2. 50mm GRANULAR BEDDING

CONCRETE STRENGTH F'c = 33MPa

TYPICAL DRIVEWAY SECTION
VEHICULAR CROSSING (VC)
N.T.S

LEGEND

# – RW – RW	PROVIDE KERB ADAPTOR AND ROOF WATER CONNECTION TO HAWKESBURY CITY COUNCIL DRAWING SD39

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restin
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

1:500 (AT A1)
1:1000 (AT A3)

10 0 10 20 30 40 50
METRES

	AMENDMENT	DES	DRN	CKD	APR	DATE
I	CERTIFIER COMMENTS	MP	MP	RO	RO	4/08/21
H	DRIVEWAY LOCATIONS AMENDED	MP	MP	RO	RO	27/07/21
G	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
F	COUNCIL COMMENTS	MP	VS	RO	RO	16/06/21
E	COUNCIL COMMENTS	JET	JET	MP	RO	13/05/21
D	CERTIFIER COMMENTS	JET	JET	MP	RO	26/04/21
C	DRAINAGE REVISED	JET	JET	MP	RO	23/03/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
ENGINEERING PLAN
SHEET 2

PROJECT No: 110185-12
SHEET No: CC1022

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1022 I

Plotted: 4 August, 2021 5:56:54 PM File Name: J:\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1022.dwg

REFER TO DRAWING CC1022 FOR CONTINUATION

DAM 8

ROAD 50

ROAD 51

ROAD 52

ROAD 56

GROSE VALE ROAD

KR 16

KR 17

KR 18

KR 19

GSIP 5x900x900
REFER TO DETAILS
CC1402A

300Ø STUB WITH ENDCAP
FOR FUTURE CONNECTION

LIMIT OF CONSTRUCTION
CH 280.00

PROVIDE TEMPORARY
BOLLARDS 1.5m C/C

375Ø STUB WITH
ENDCAP FOR FUTURE
CONNECTION

GPT - CDS UNIT
(CDS P1015)

PROVIDE SCOUR PROTECTION.
OUTLET DETAIL REFER TO CC1703

600Ø STUB WITH
ENDCAP FOR FUTURE
CONNECTION

UNRESTRICTED 24/7 ACCESS TO
ENDEAVOUR ENERGY SUBSTATION AND
THE CDS ACCESS 3m WIDE, 28m LONG,
TO HCC STANDARD SD 66:
1. 150mm CONCRETE WITH F72 TOP &
BOTTOM
2. 50mm GRANULAR BEDDING
CONCRETE STRENGTH F'c = 33MPa

2% REVERSE
CROSSFALL
ON VERGE

PROVIDE
TEMPORARY
'F' TYPE BARRIERS

PROVIDE TEMPORARY
BOLLARDS 1.5m C/C

LIMIT OF ROAD CONSTRUCTION
CHAINAGE 393.000
MAKE SMOOTH TRANSITION TO
PROMENADE WORKS

375Ø ENDCAP FOR
FUTURE
CONNECTION

EMERGENCY ACCESS
REFER DWG CC1802

LIMIT OF CONSTRUCTION
CH 435.00

450Ø STUB WITH
ENDCAP FOR FUTURE
CONNECTION

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Reston
Accreditation No. BDC3367

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LEGEND

PROVIDE KERB ADAPTOR AND ROOF WATER CONNECTION TO HAWKESBURY CITY COUNCIL DRAWING SD39

1:500 (AT A1)
1:1000 (AT A3)

10 0 10 20 30 40 50
METRES

	AMENDMENT	DES	DRN	CKD	APR	DATE
G	CERTIFIER COMMENTS	MP	MP	RO	RO	4/08/21
F	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
E	COUNCIL COMMENTS	JET	JET	MP	RO	13/05/21
D	CERTIFIER COMMENTS	JET	JET	MP	RO	26/04/21
C	DRAINAGE REVISED	JET	JET	MP	RO	23/03/21
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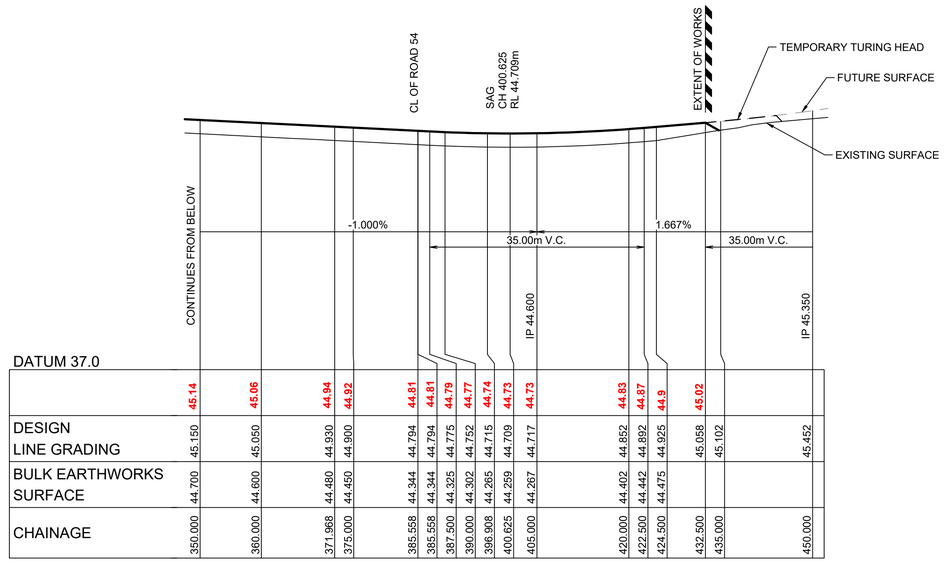
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
ENGINEERING PLAN
SHEET 3

PROJECT No: 110185-12
SHEET No: CC1023

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1023 | G

Plotted: 4 August, 2021 6:01:00 PM File Name: J:\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\C\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1023.dwg


CL OF ROAD 54
SAG
CH 400.625
RL 44.709m
EXTENT OF WORKS
TEMPORARY TURING HEAD
FUTURE SURFACE
EXISTING SURFACE
CONTINUES FROM BELOW
-1.000%
1.667%
35.00m V.C.
35.00m V.C.
IP 44.600
IP 45.350
DATUM 37.0

| | | |

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Accreditation No. BDC3367

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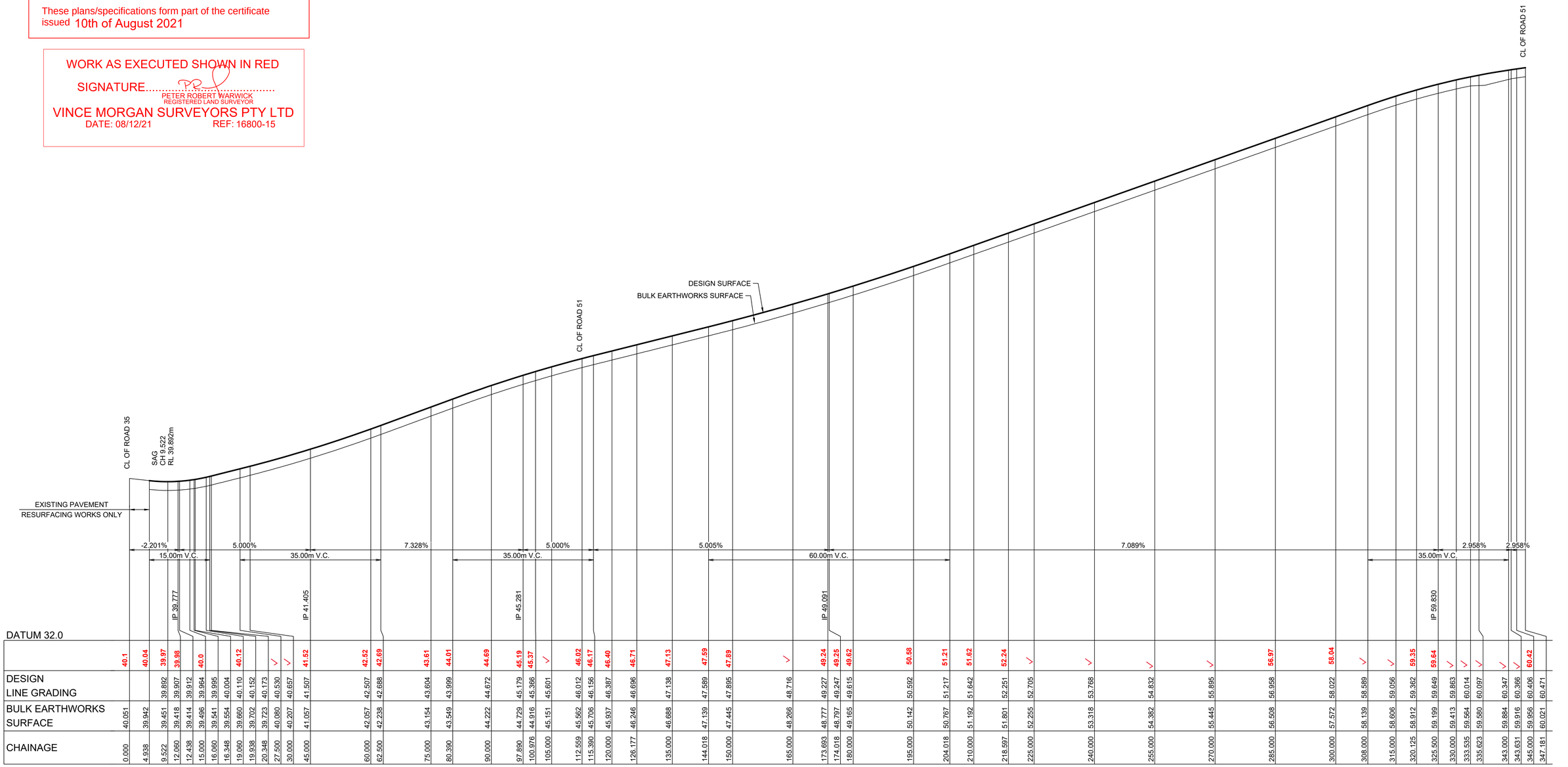
WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21 REF: 16800-15



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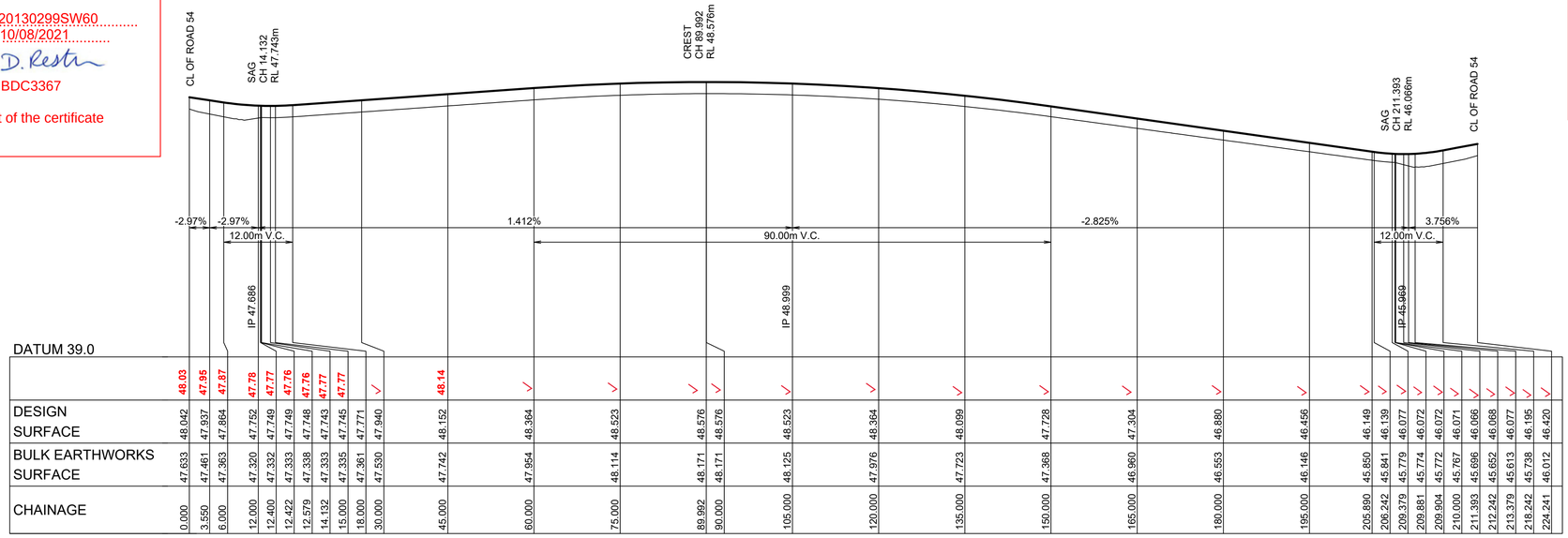

DATUM 39.0

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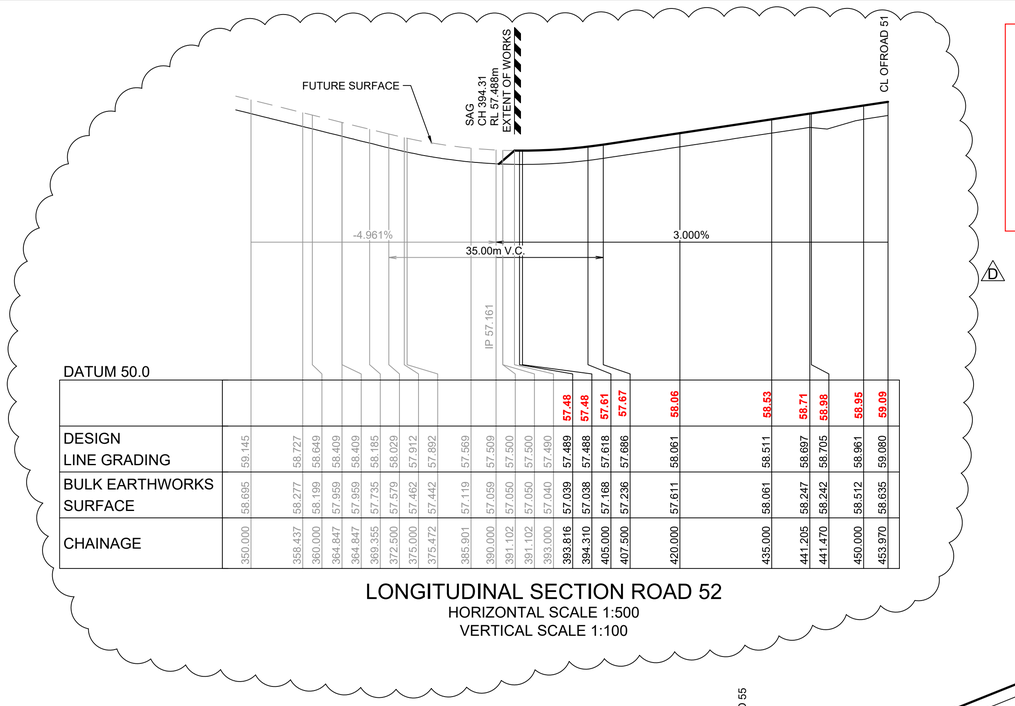
FUTURE SURFACE
SAG
CH 394.31
RL 57.488m
EXTENT OF WORKS
CL OFROAD 51
-4.961%
3.000%
35.00m V.C.
IP 57.161
D

DATUM 50.0

| | | |

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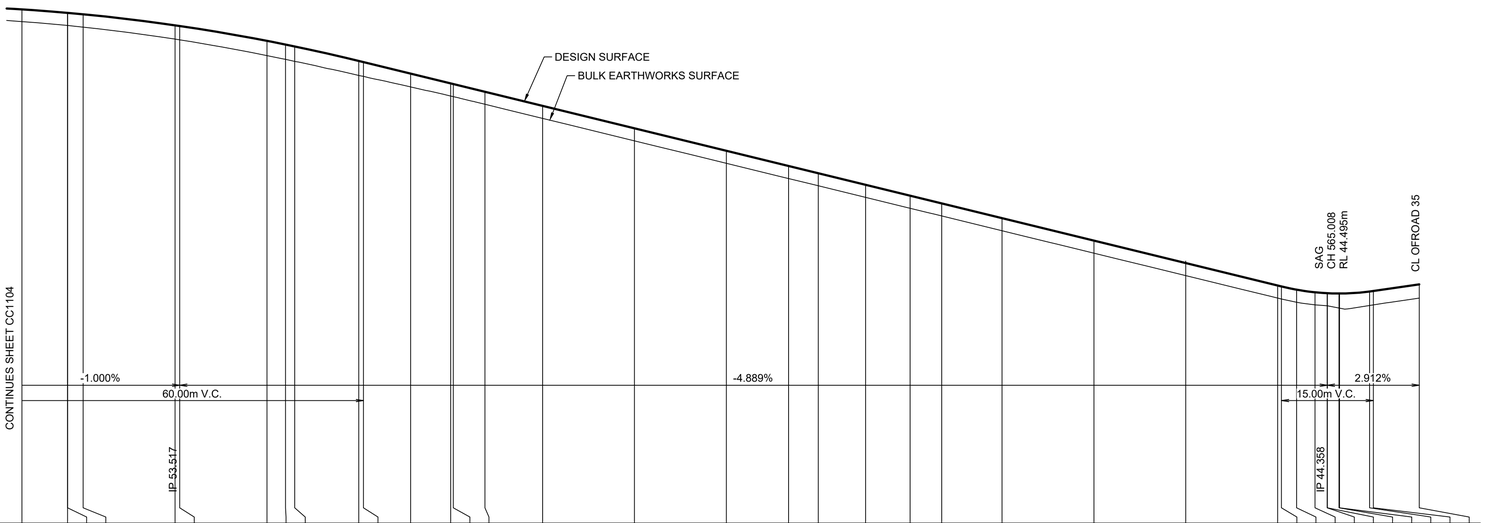

DATUM 37.0

| | | |

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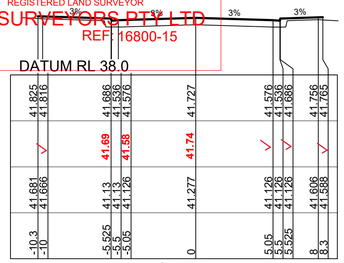

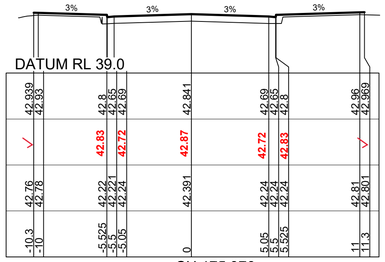

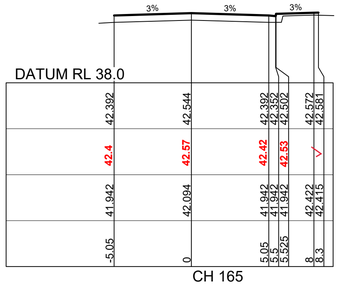

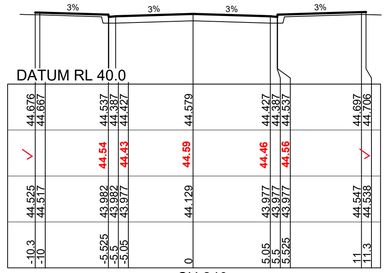

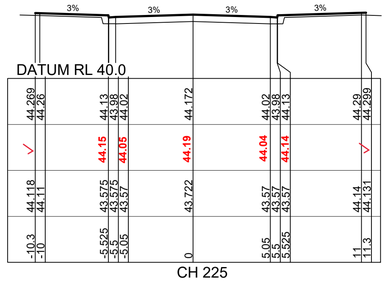

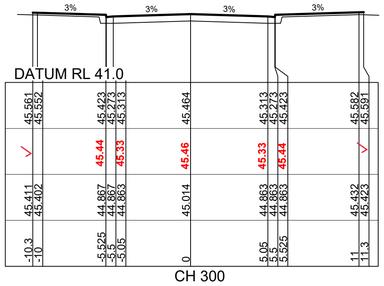

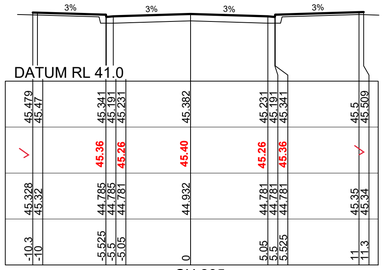

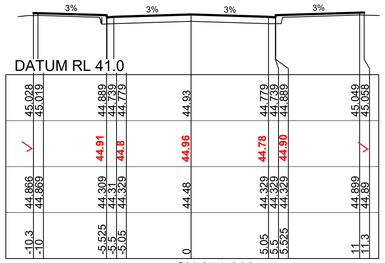

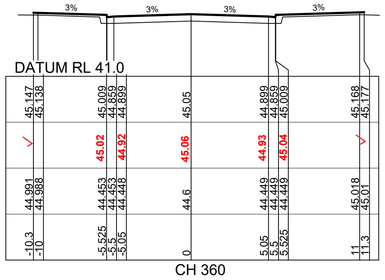

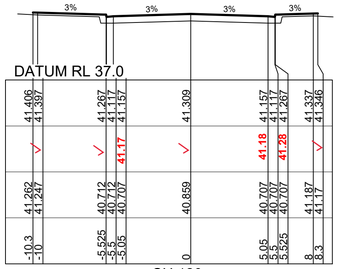

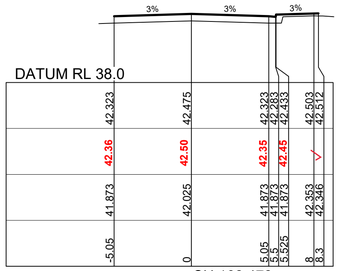

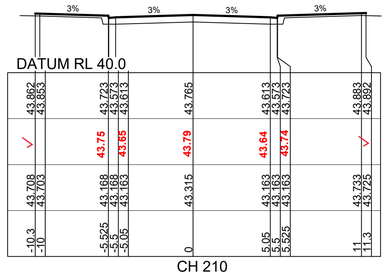

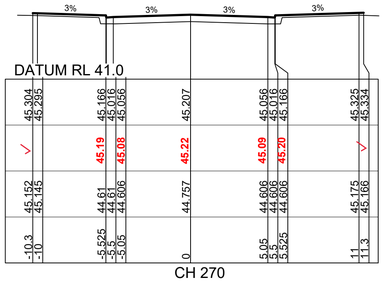

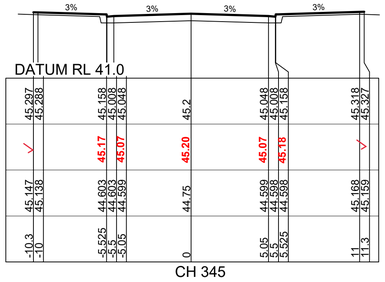

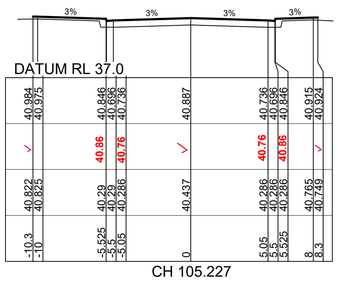

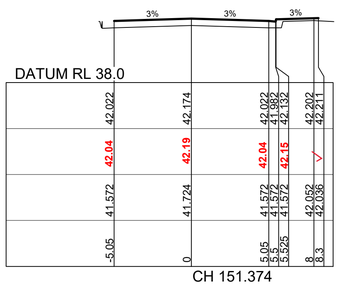

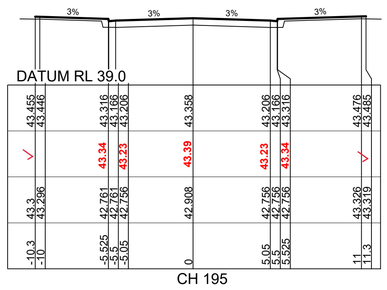

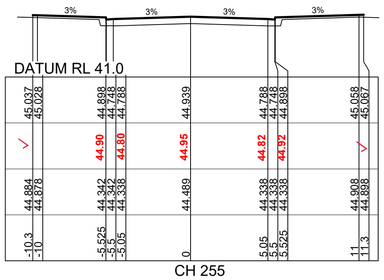

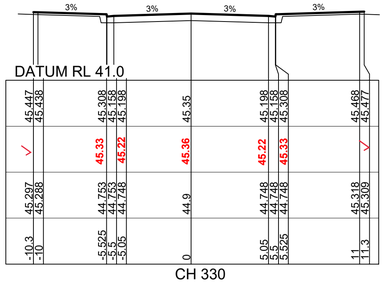

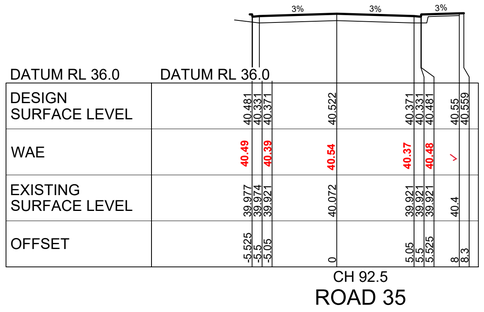

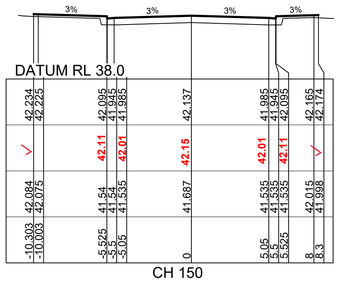

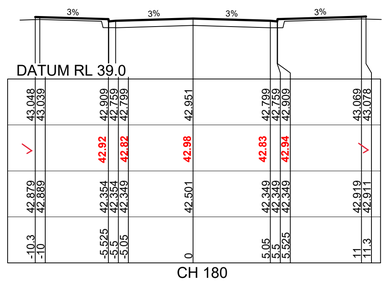

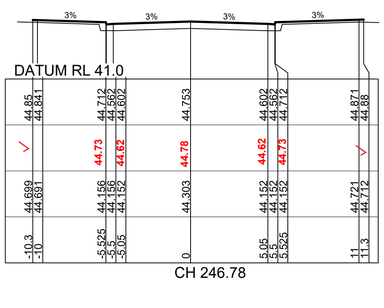

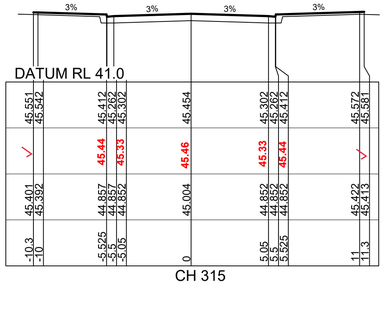

1:200 (AT A1)
1:400 (AT A3)
4 2 0 4 8 12 16 20
METRES

A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 **W** www.jwprince.com.au **E** jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL
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REDBANK, NORTH RICHMOND SOUTHERN HEIGHTS - PROMENADE
ROAD CROSS SECTIONS
SHEET 1

PROJECT No: 110185-12
SHEET No: CC1201

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1201 | A

Plotted: 21 July , 2021 2:11:47 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1201.dwg

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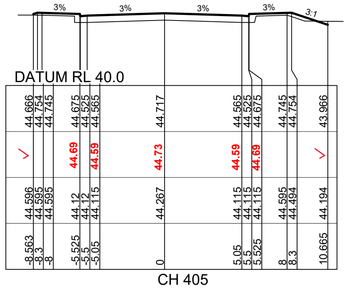
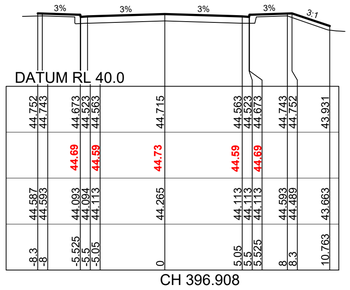
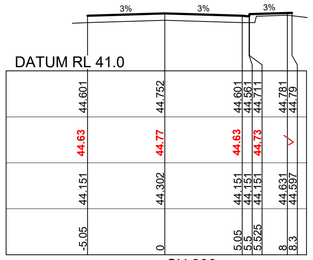
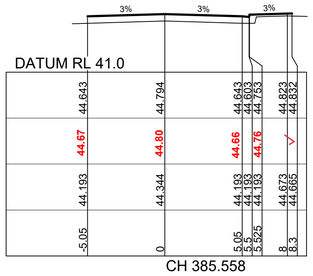
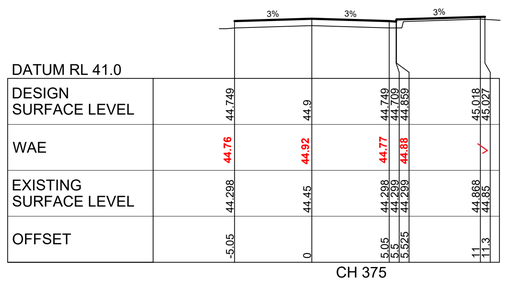
VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21 REF: 16800-15



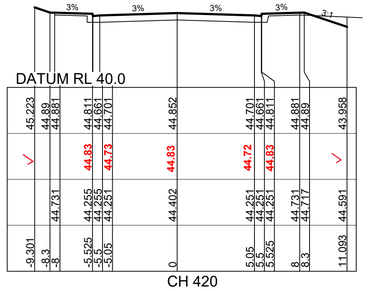


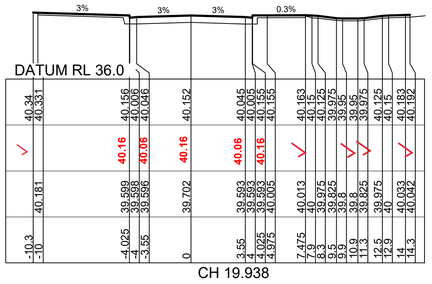


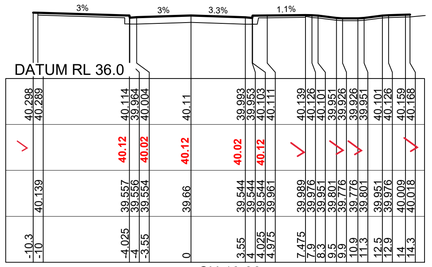


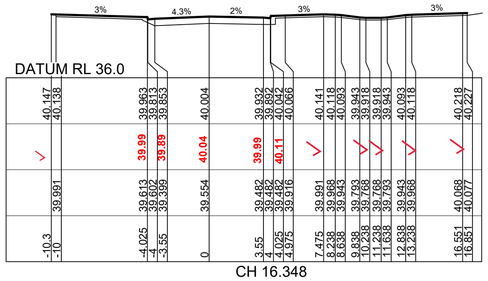


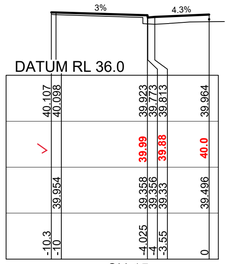
ROAD 35

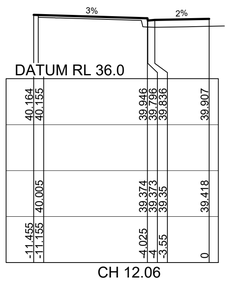




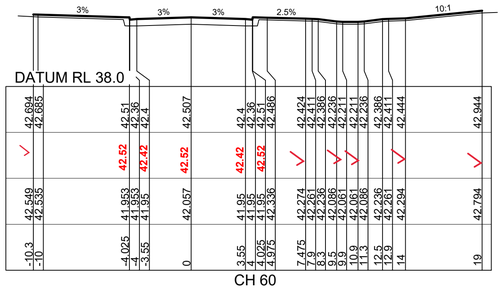


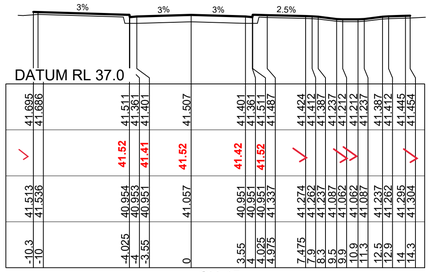


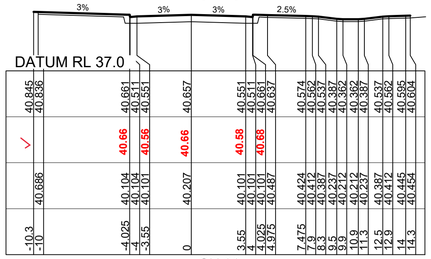


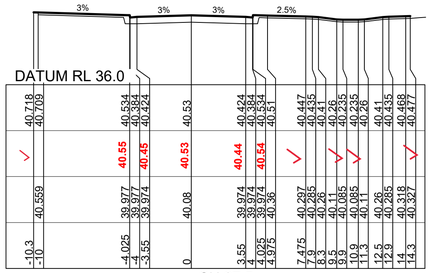


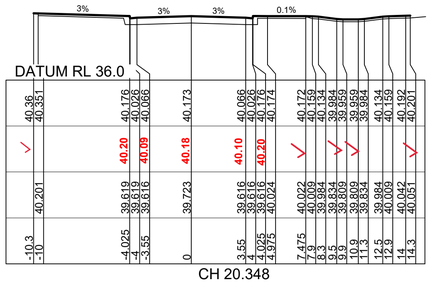
ROAD 50











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

4 2 0 4 8 12 16 20
METRES

A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS

PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

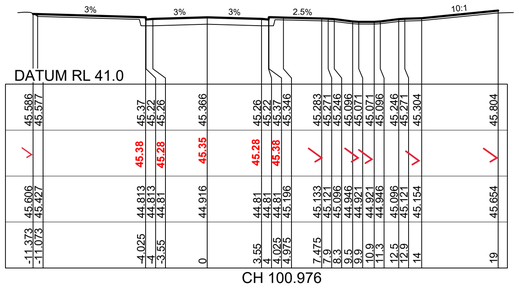
REDBANK, NORTH RICHMOND SOUTHERN HEIGHTS - PROMENADE

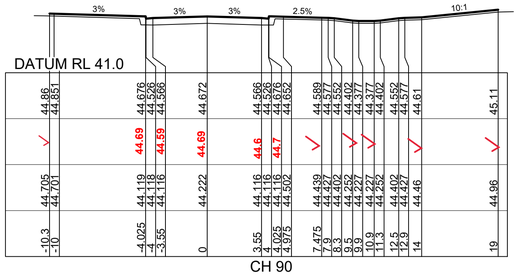
ROAD CROSS SECTIONS
SHEET 2

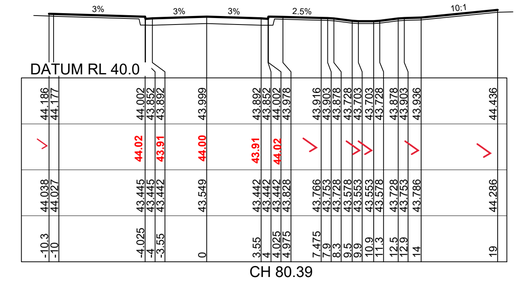
PROJECT No: 110185-12
SHEET No: CC1202

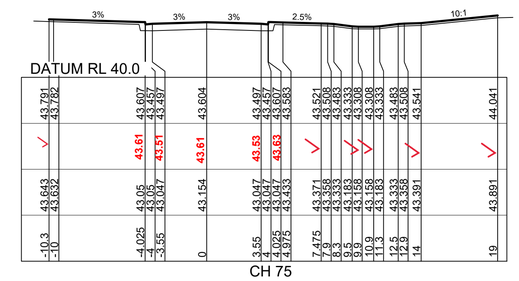
AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1202 | A

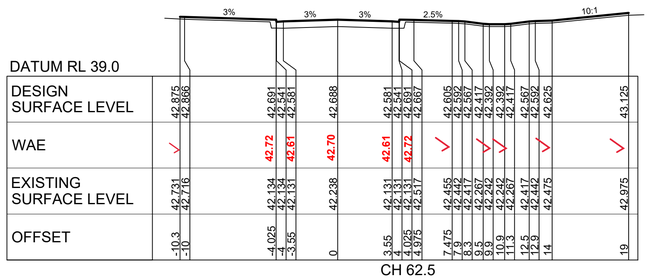
Plotted: 21 July , 2021 2:12:25 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1202.dwg











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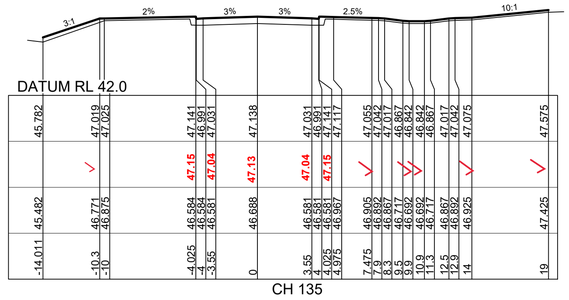

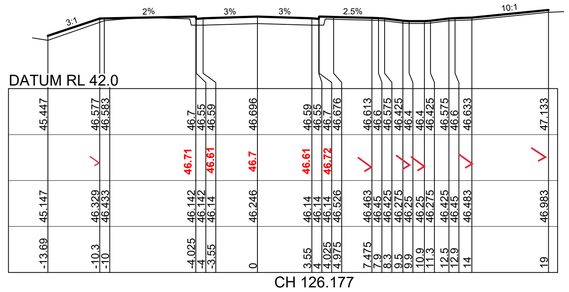

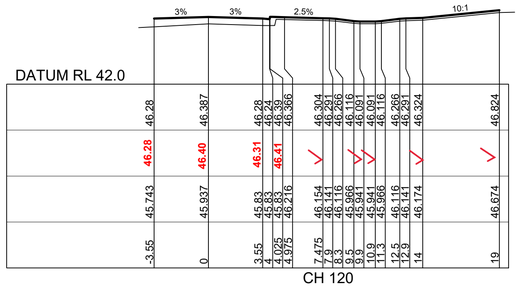

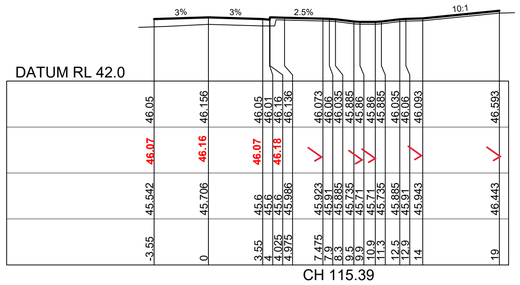

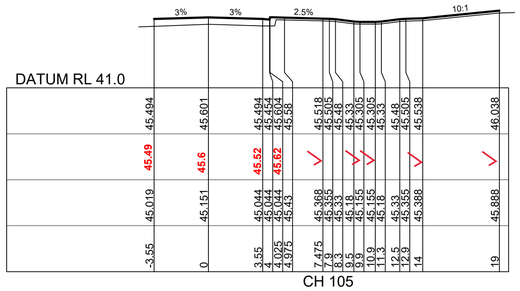

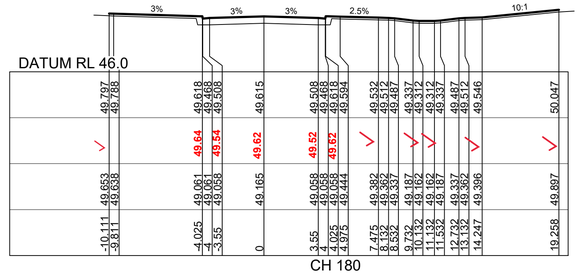

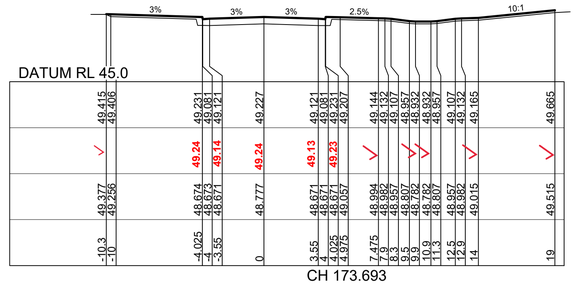

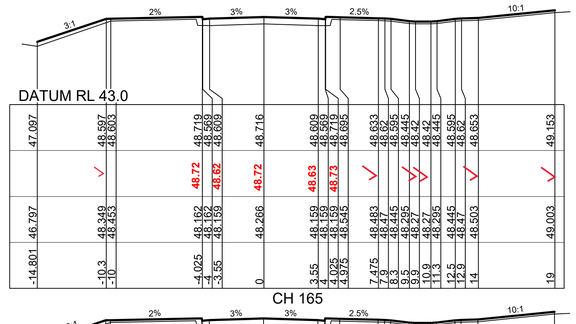

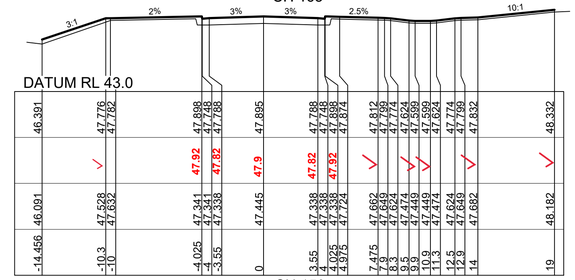

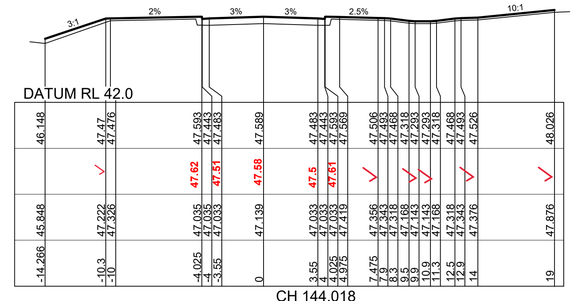

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Resta
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

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

4 2 0 4 8 12 16 20
METRES

A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

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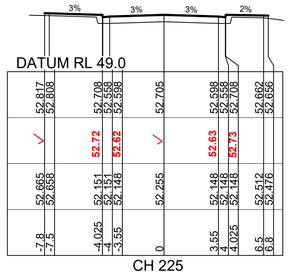
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
ROAD CROSS SECTIONS
SHEET 3

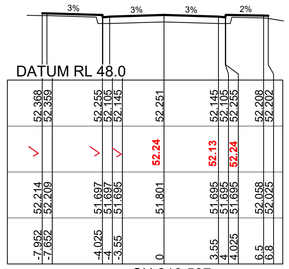
PROJECT No: 110185-12

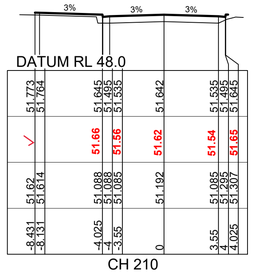
SHEET No: CC1203

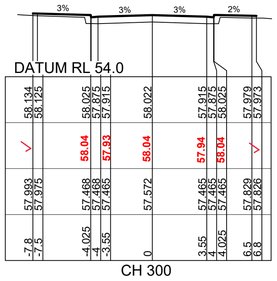
AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1203 A

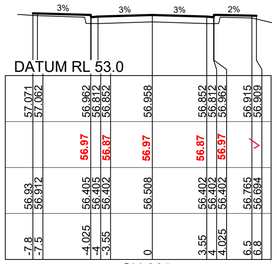
Plotted: 21 July , 2021 2:13:03 PM File Name: \\wp.local\fs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1203.dwg

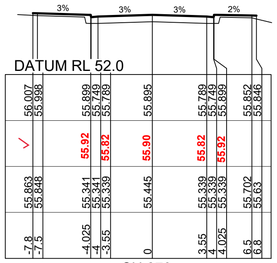


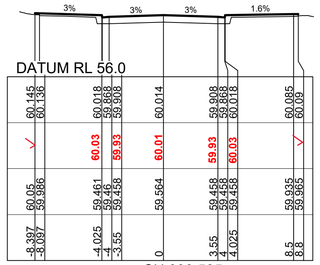


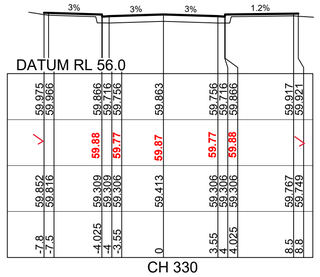


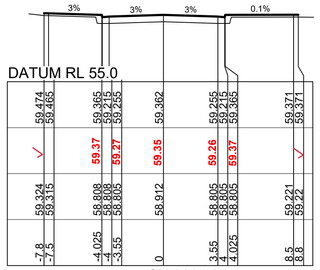


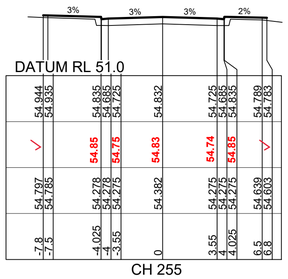


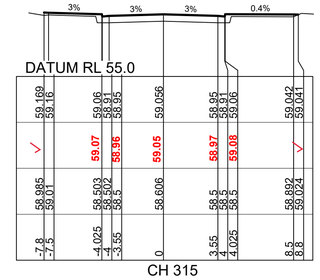


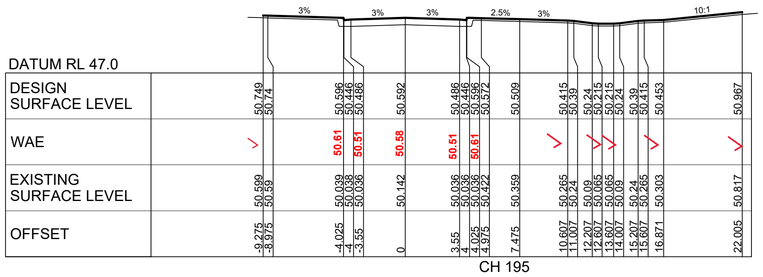




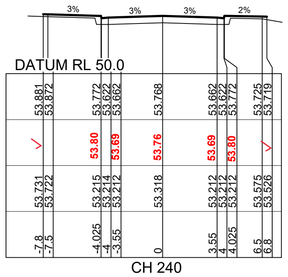


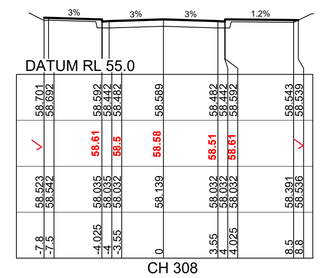


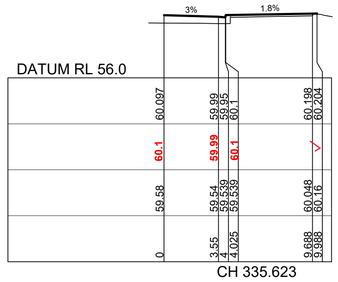




ROAD 50







SUBDIVISION WORKS CERTIFICATE

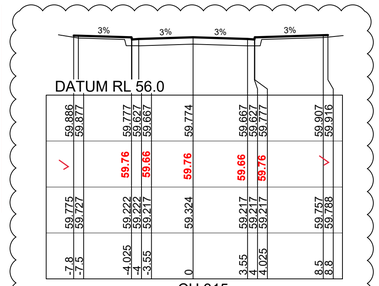
Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restin
Accreditation No. BDC3367

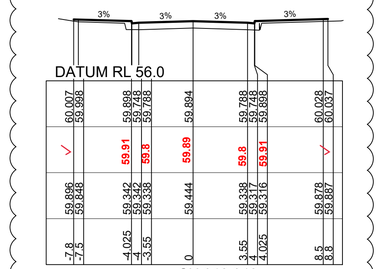
These plans/specifications form part of the certificate issued 10th of August 2021

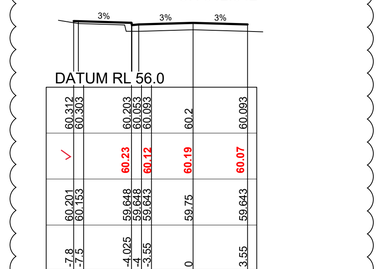
WORK AS EXECUTED SHOWN IN RED

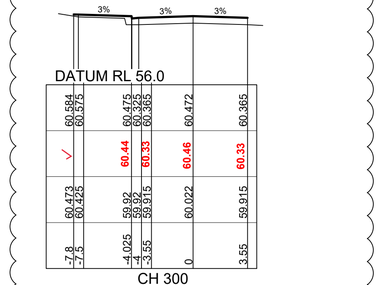
SIGNATURE.....
PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

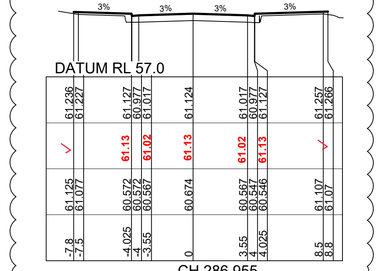
VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21 REF: 16800-15











ROAD 51 (B)

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1:400 (AT A3)

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METRES

	AMENDMENT	DES	DRN	CKD	APR	DATE
B	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
ROAD CROSS SECTIONS
SHEET 4

PROJECT No: 110185-12
SHEET No: CC1204

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1204 B

Plotted: 21 July , 2021 2:13:42 PM File Name: \\wp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1204.dwg

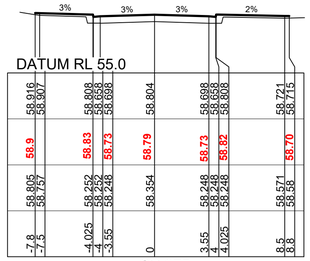
SUBDIVISION WORKS CERTIFICATE

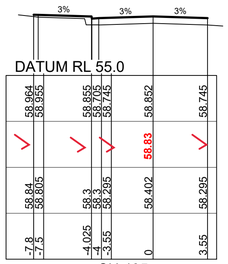
Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Resta
Accreditation No. BDC3367

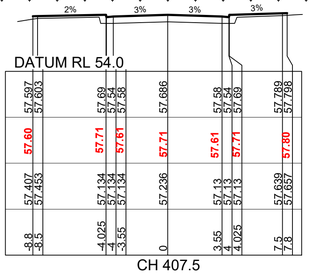
These plans/specifications form part of the certificate issued 10th of August 2021

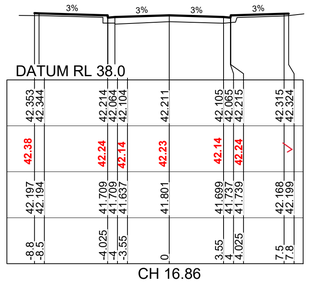
WORK AS EXECUTED SHOWN IN RED

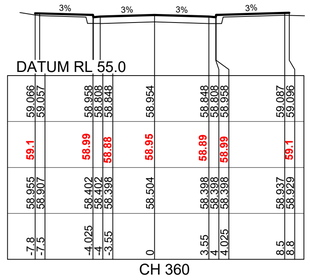
SIGNATURE.....
PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR
VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21 REF: 16800-15

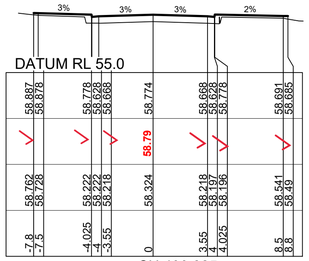


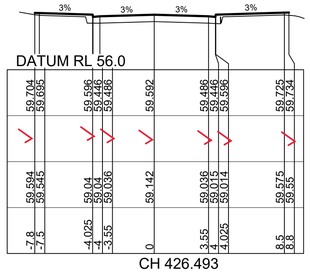


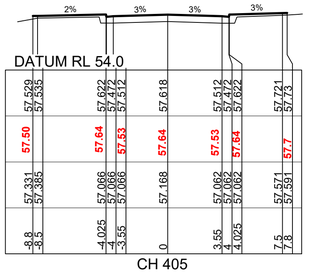


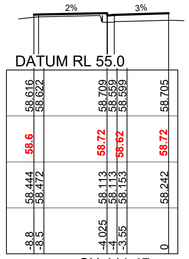


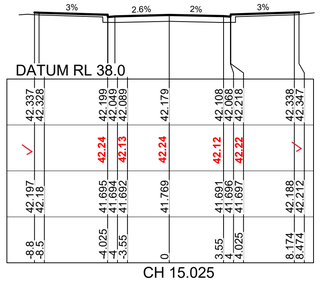


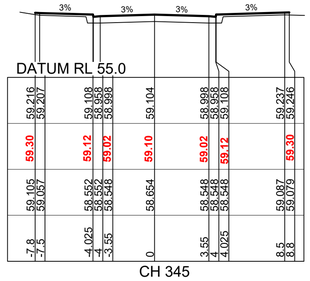


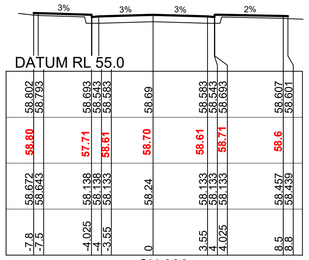


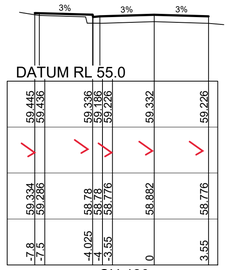


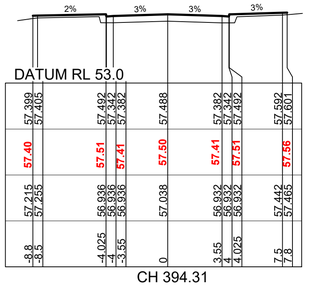


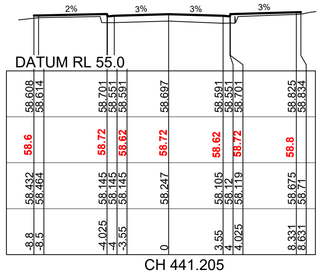


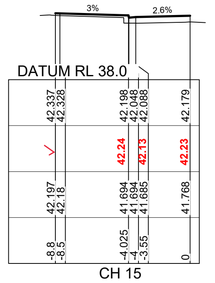


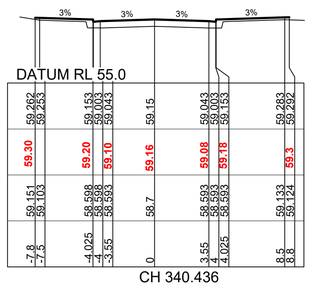


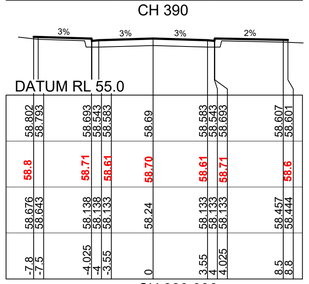


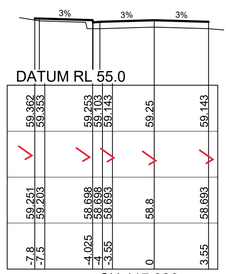


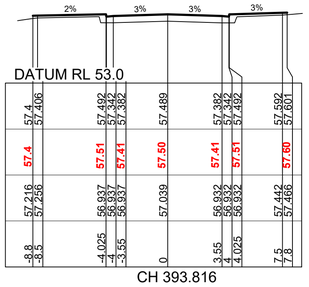


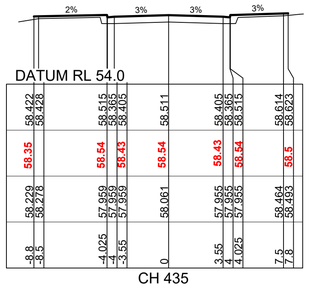


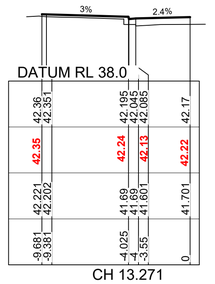


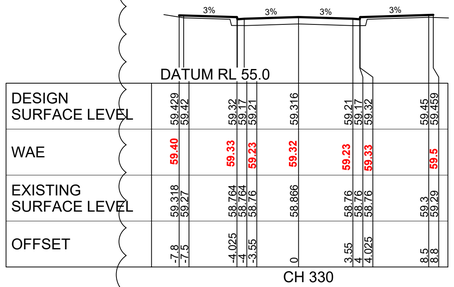


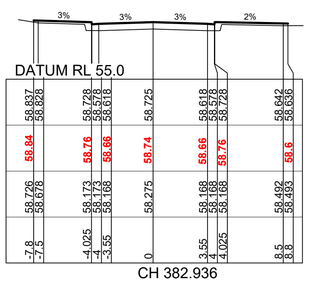


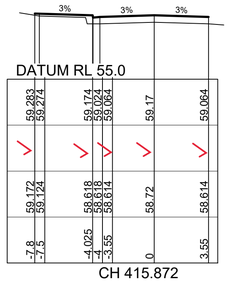


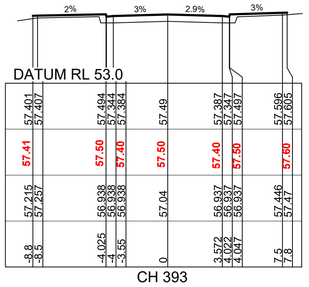


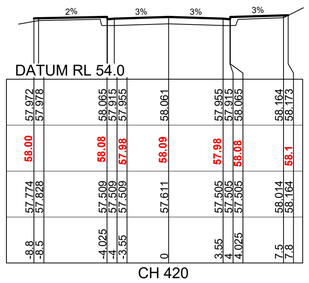


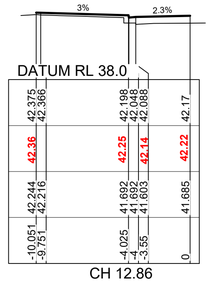












ROAD 51 ROAD 52 ROAD 54

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

METRES

C	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

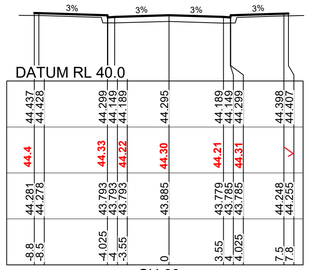
THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

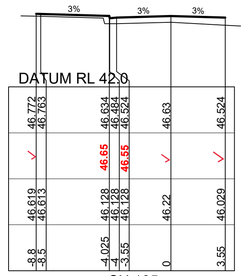
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
ROAD CROSS SECTIONS
SHEET 5

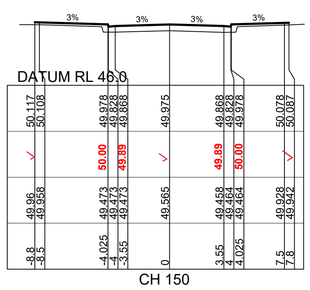
PROJECT No: 110185-12
SHEET No: CC1205

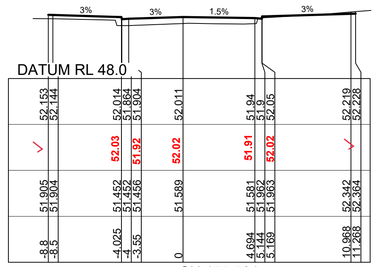
AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1205 C

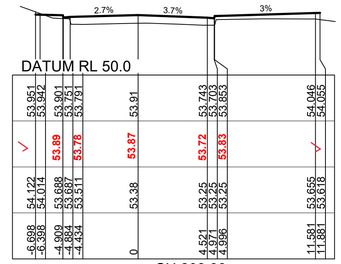
Plotted: 21 July 2021 2:14:18 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1205.dwg

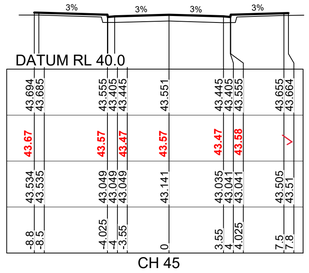


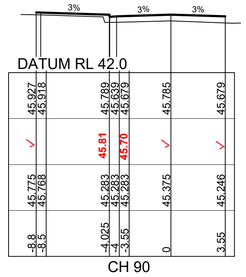


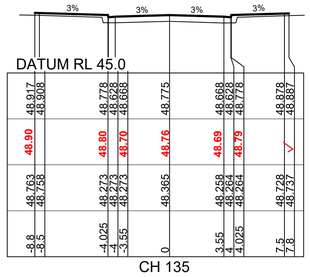


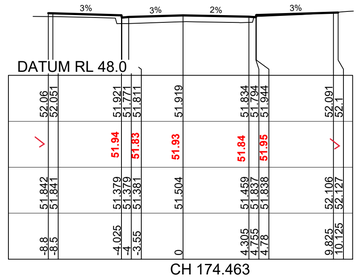


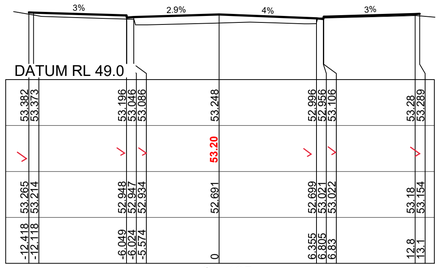


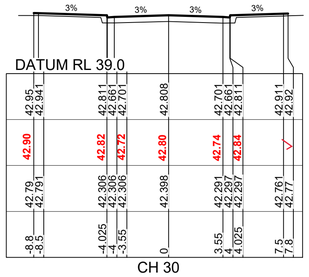


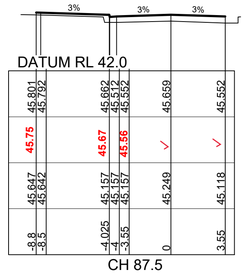


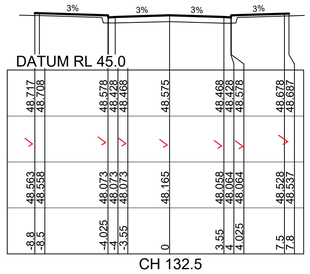


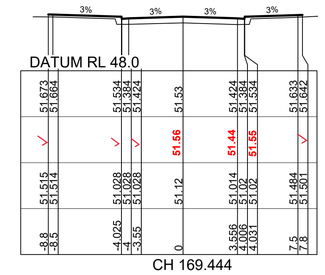


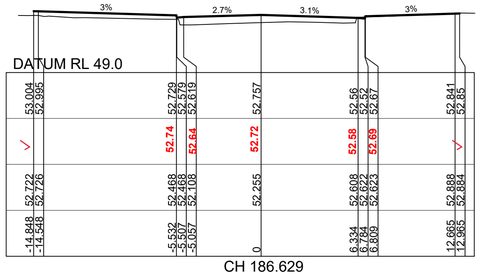


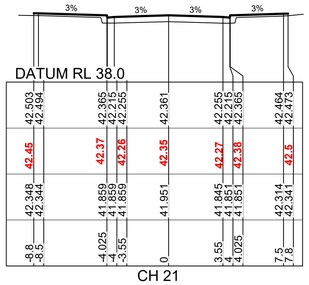


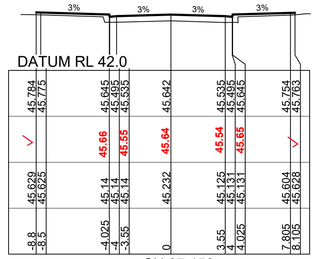


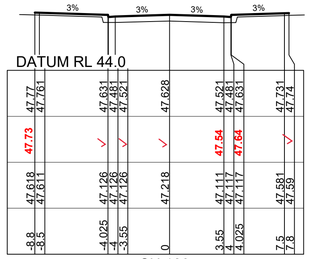


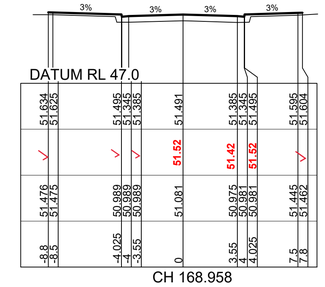


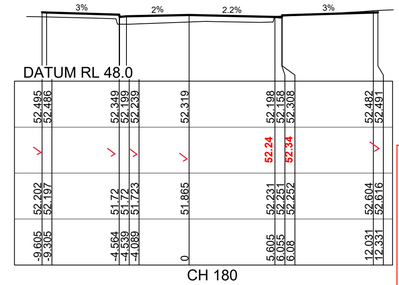


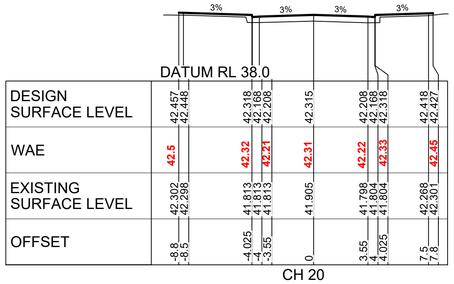




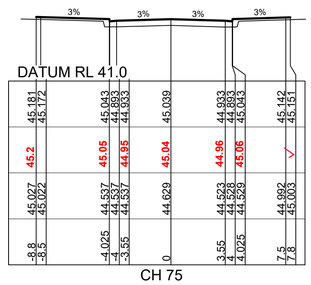


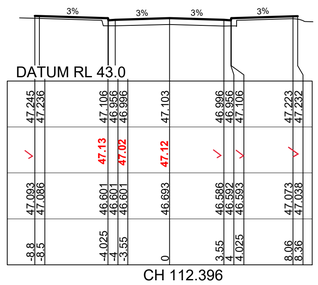


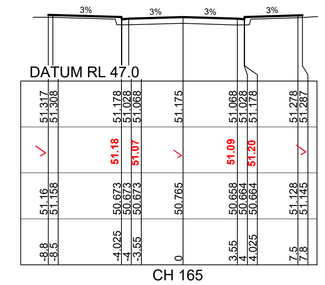


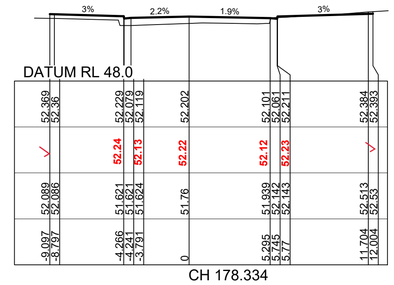


ROAD 54









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

4 2 0 4 8 12 16 20
METRES

WORK AS EXECUTED SHOWN IN RED
SIGNATURE.....
VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21
REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60.....
Date of Issue 10/08/2021.....
Issuing Officer D. Reuben
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

B	COUNCIL COMMENTS	MP	VS	RO	RO	16/06/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

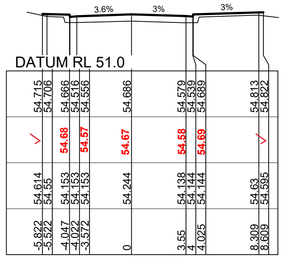
STATUS: ISSUE FOR CONSTRUCTION APPROVAL
THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

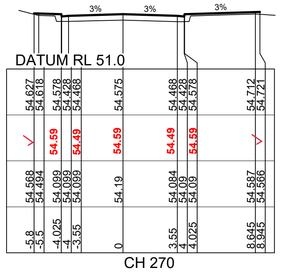
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
ROAD CROSS SECTIONS
SHEET 6

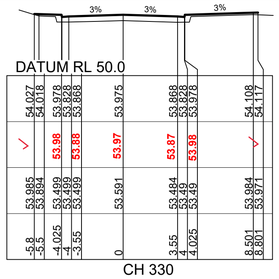
PROJECT No: 110185-12
SHEET No: CC1206

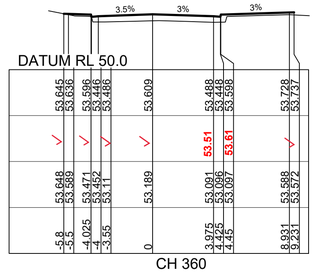
AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1206 | B

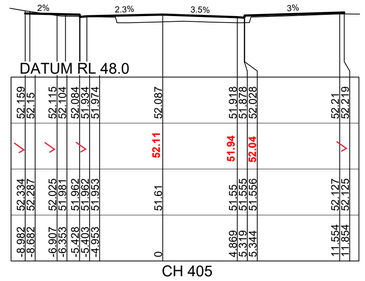
Plotted: 21 July , 2021 2:14:54 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1206.dwg

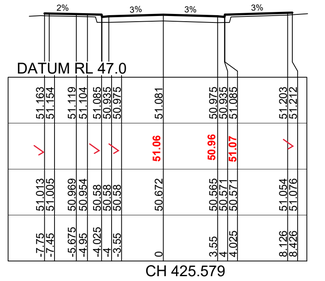


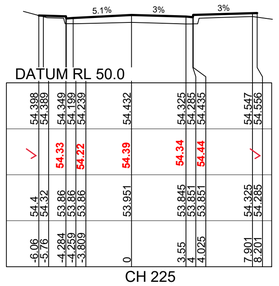


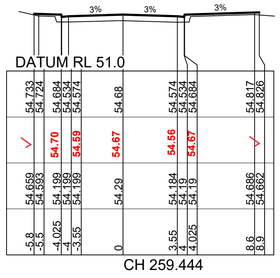


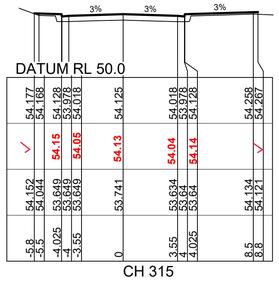


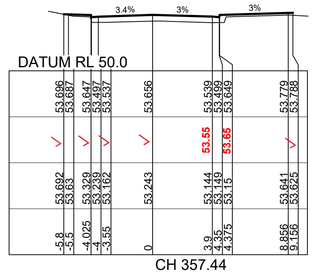


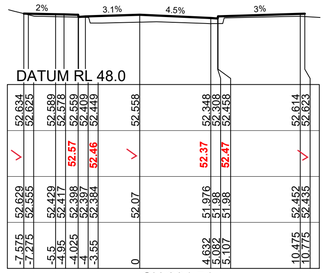


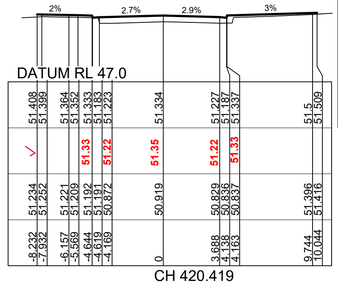


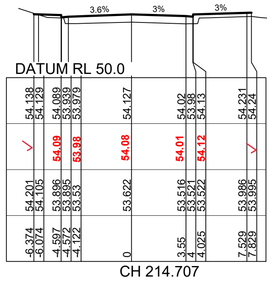


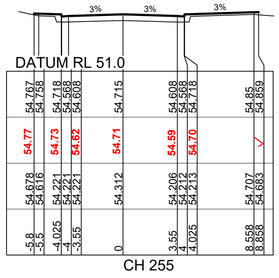


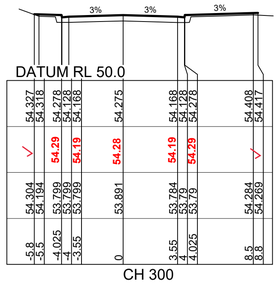


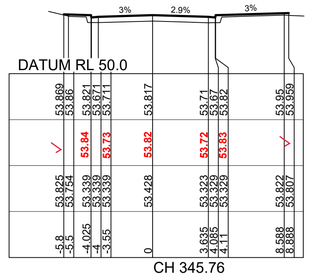


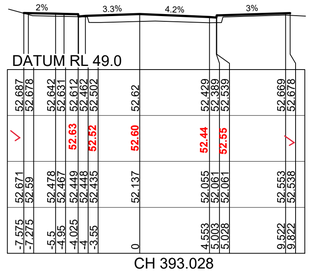


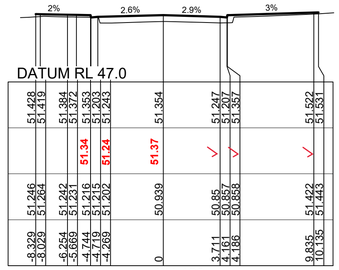


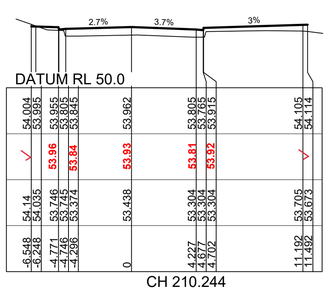


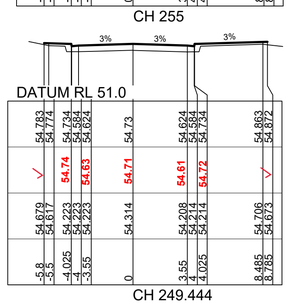


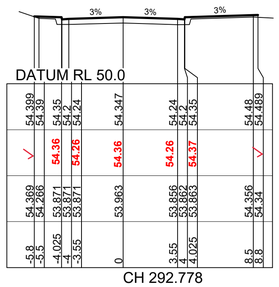


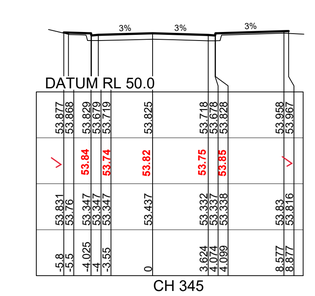


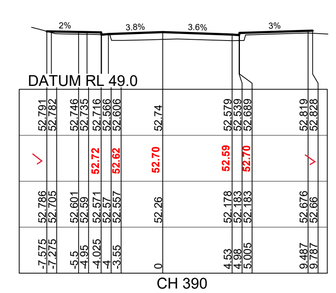


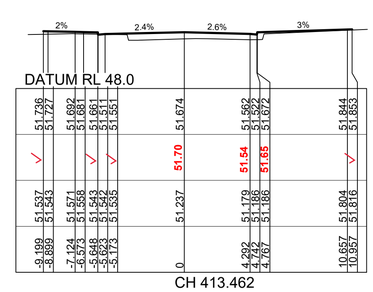


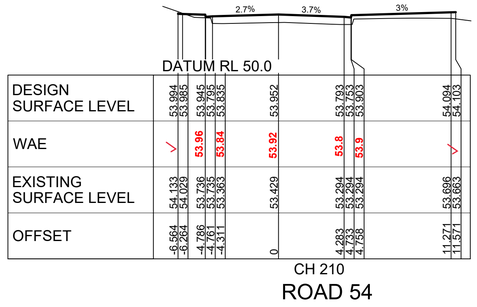


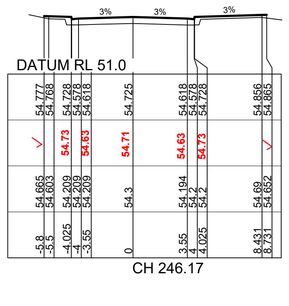


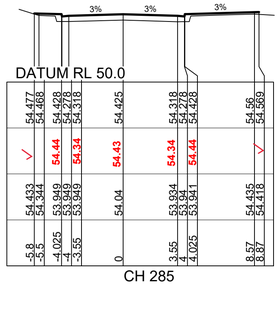


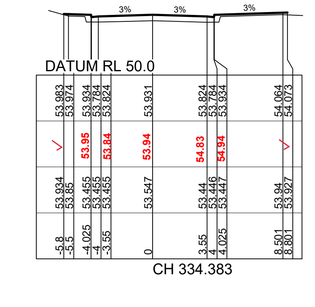


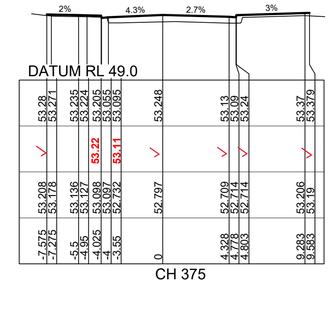


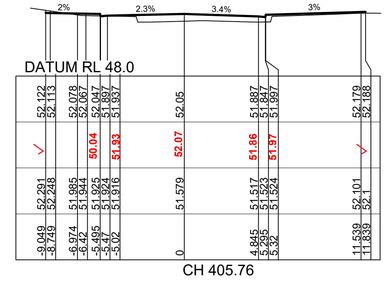












1:200 (AT A1)
1:400 (AT A3)

4 2 0 4 8 12 16 20
METRES

SUBDIVISION WORKS CERTIFICATE

Certificate No. 2013029995W60.....
Date of Issue 10/08/2021.....
Issuing Officer D. Prestwich

PETER ROBERT WARWICK
REGISTERED SURVEYOR

Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

VINCE MORGAN SURVEYORS PTY LTD
REF: 16800-15
DATE: 08/12/21

B	COUNCIL COMMENTS	MP	VS	RO	RO	16/06/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

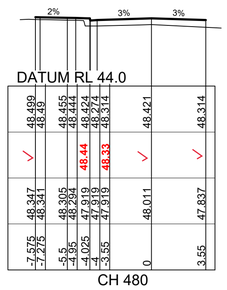
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
ROAD CROSS SECTIONS
SHEET 7

PROJECT No: 110185-12

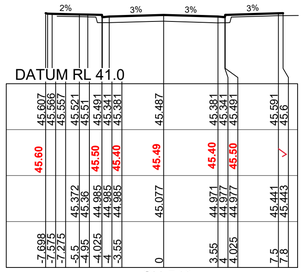
SHEET No: CC1207

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1207 | B

Plotted: 21 July, 2021 2:15:31 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DAC\DCC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1207.dwg



CH 480



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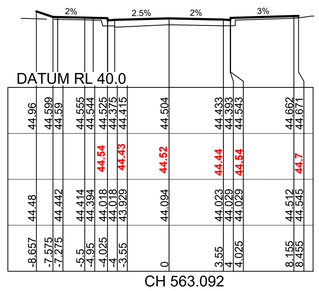
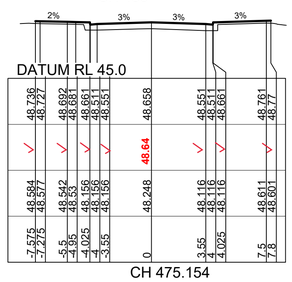


CH 563.092



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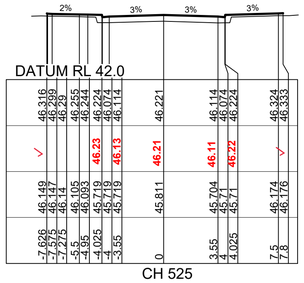

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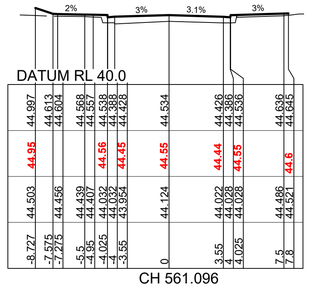
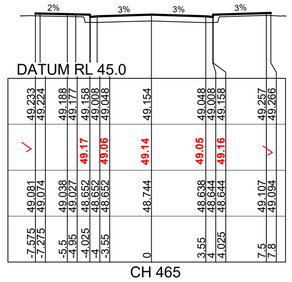
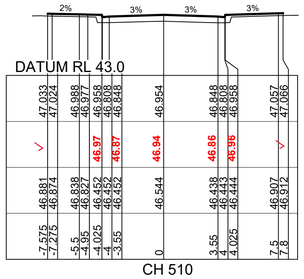


CH 561.096



CH 465



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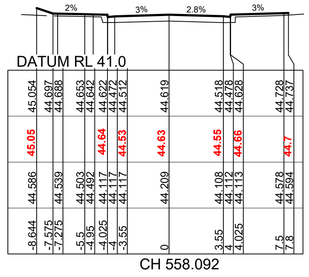

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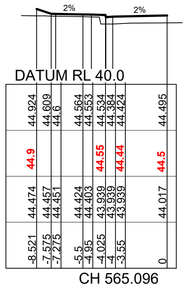

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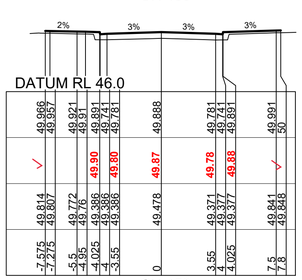

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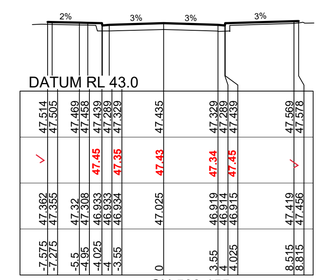

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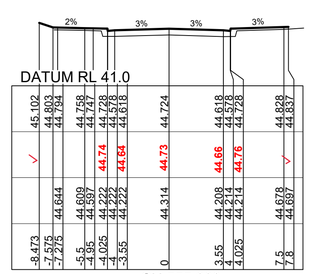

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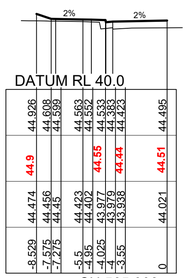

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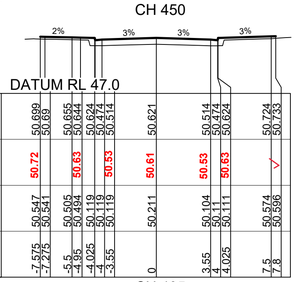
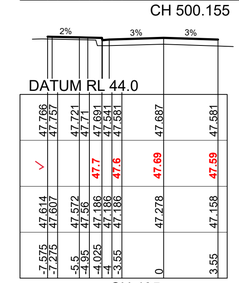


CH 435

ROAD 54



CH 495

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60

Date of Issue 10/08/2021

Issuing Officer D. Restin

Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

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

4 2 0 4 8 12 16 20

METRES

B	COUNCIL COMMENTS	MP	VS	RO	RO	16/06/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

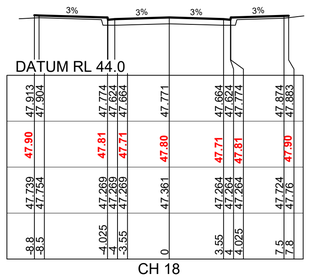
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
ROAD CROSS SECTIONS
SHEET 8

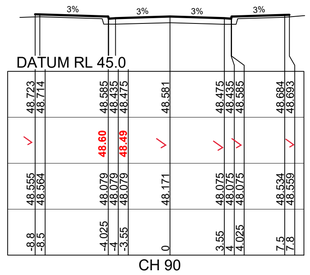
PROJECT No: 110185-12

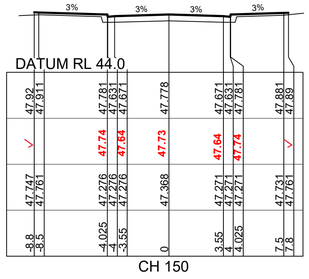
SHEET No: CC1208

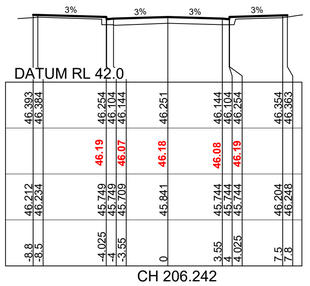
AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1208 B

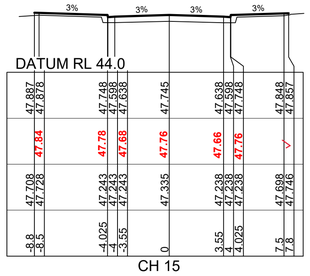
Plotted: 21 July 2021 2:16:10 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1208.dwg

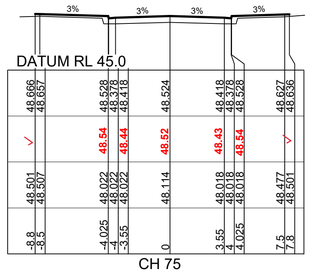


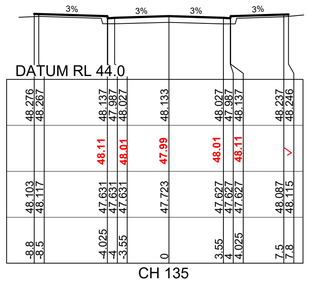


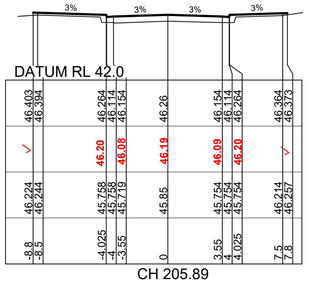


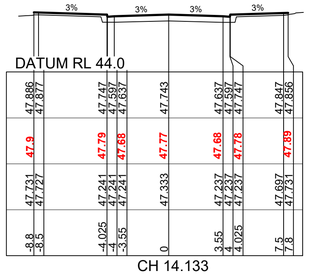


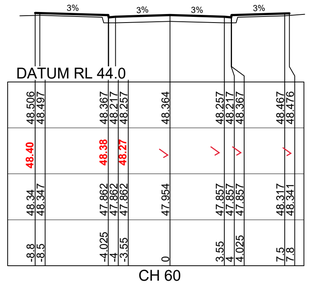


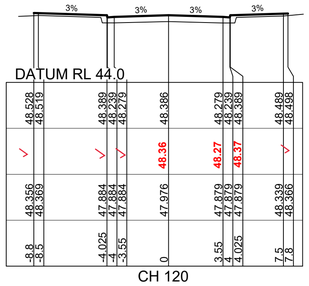


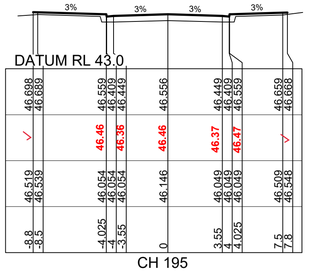


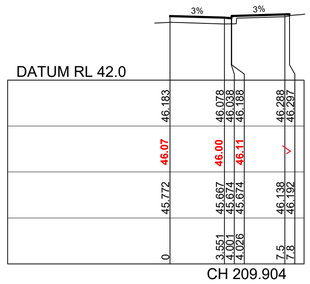


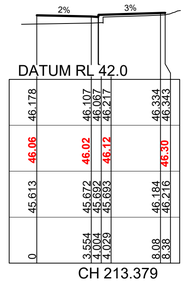


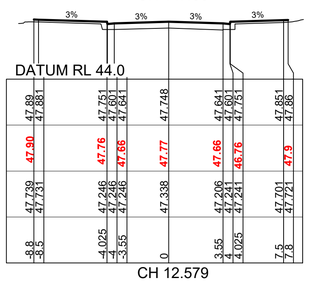


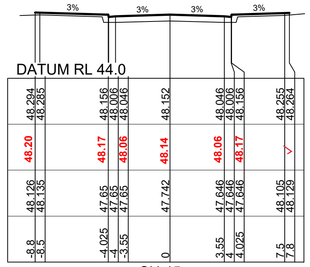


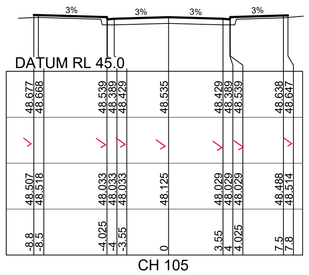


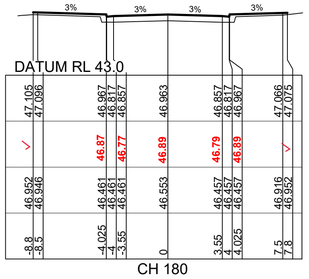


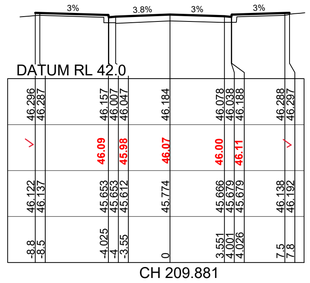


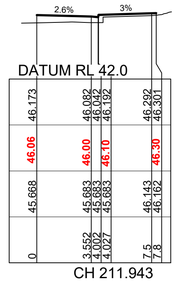


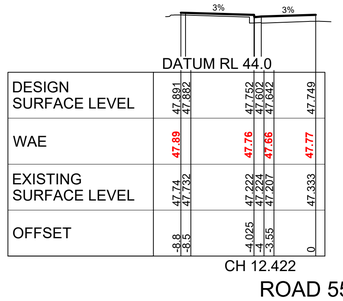




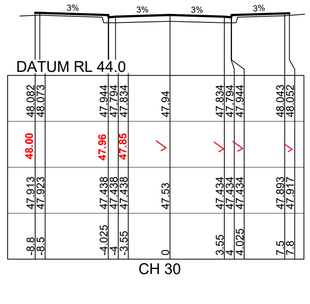


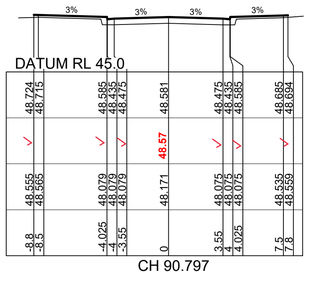


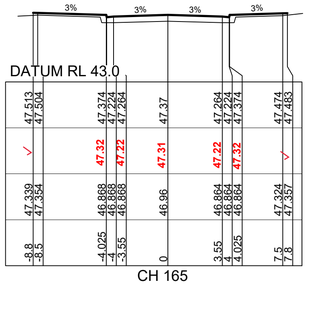


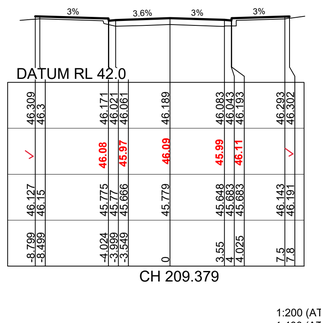


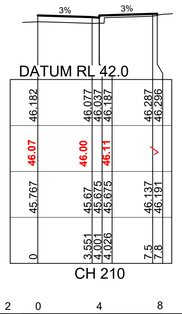
ROAD 55











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

4 2 0 4 8 12 16 20
METRES

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Reston
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

A	EXTRA SHEET ADDED	MP	VS	RO	RO	16/06/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
ROAD CROSS SECTIONS
SHEET 9

PROJECT No: 110185-12
SHEET No: CC1209

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1209 A

Plotted: 21 July, 2021 2:16:49 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1209.dwg

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60

Date of Issue 10/08/2021

Issuing Officer D. Rester

Accreditation No. BDC3367

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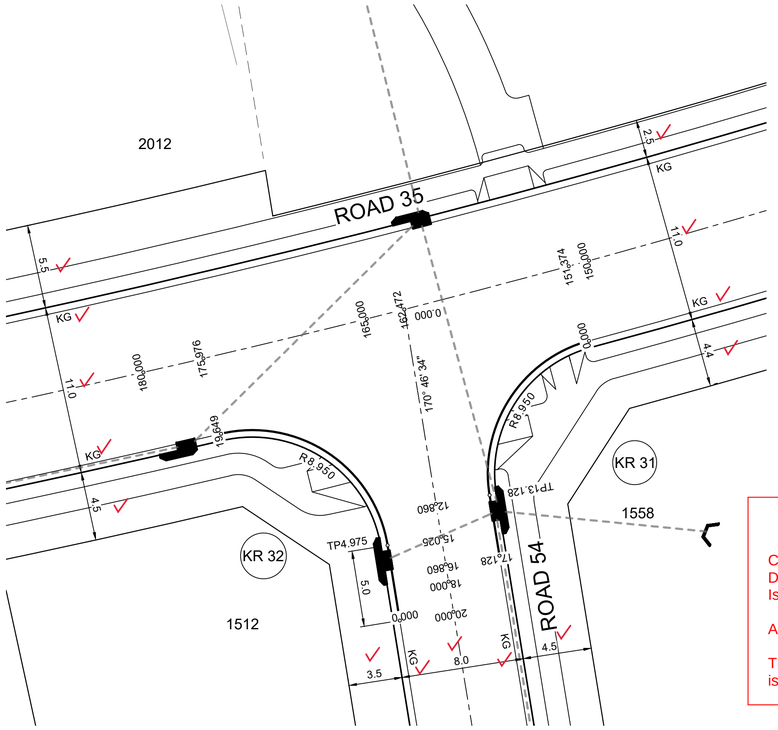
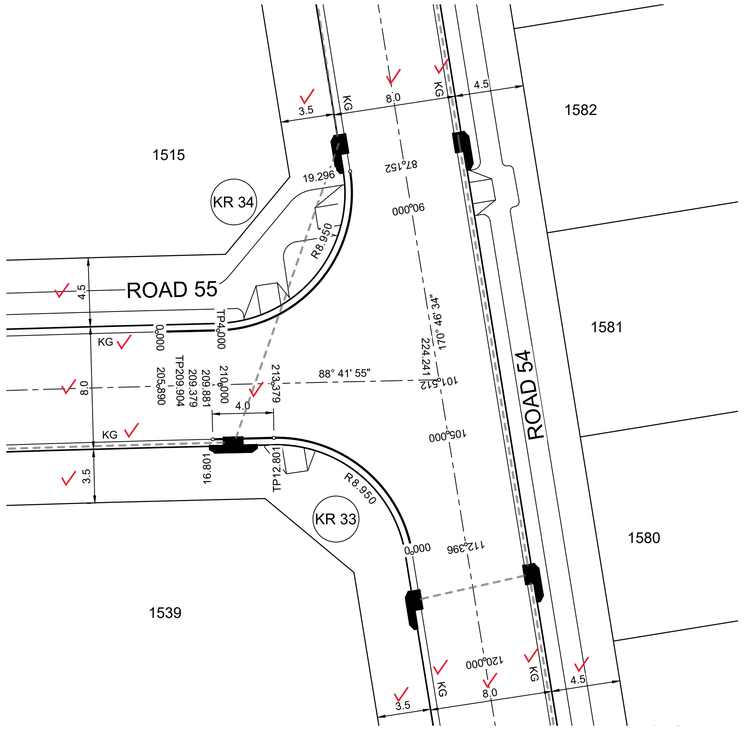
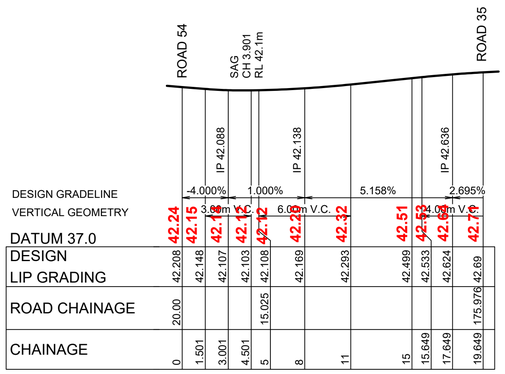
DESIGN LEVELS, RADII AND SETOUT ARE TO LIP OF GUTTER



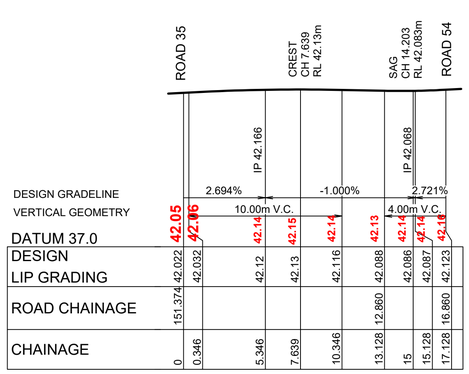




KR 32

HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:100

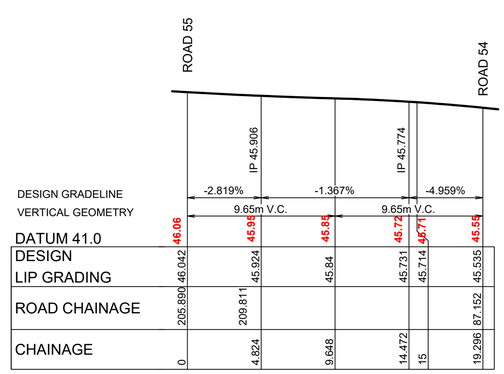
KR 32					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286588.91	6281443.83	350°46'34.35"		
4.97	286588.11	6281448.74	350°46'34.35"		
12.31	286586.57	6281458.2		-8.95	14.67
19.65	286577.24	6281456.02	256°50'03.54"		



KR 31

HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:100

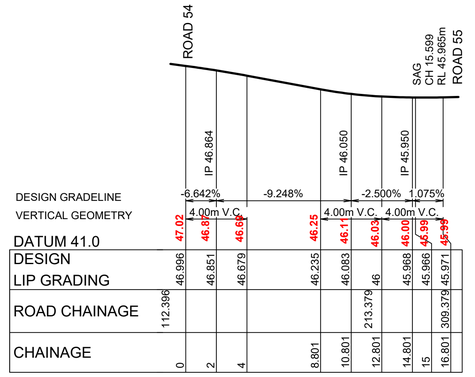
KR 31					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286601.26	6281462.09	254°49'13.98"		
6.56	286593.48	6281459.98		-8.95	13.13
13.13	286594.77	6281452.02			
17.13	286595.41	6281448.07	170°46'34.34"		



KR 34

HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:100

KR 34					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286587.04	6281367.07	88°37'32.74"		
4	286591.04	6281367.16			
11.65	286601.32	6281367.4		-8.95	15.3
19.3	286599.67	6281377.55	350°46'34.35"		



KR 33

HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:100

KR 33					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286603.72	6281352.63	350°46'34.35"		
6.4	286602.47	6281360.3		-8.95	12.8
12.8	286594.7	6281360.14			
16.8	286590.7	6281360.05	268°45'07.96"		

1:100 (AT A1)
1:200 (AT A3)

2 1 0 1 2 3 4 5 6 7 8 9 10

METRES

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

4 2 0 4 8 12 16 20

METRES

C	CERTIFIER COMMENTS	JET	JET	MP	RO	26/04/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
KERB RETURN PLAN
SHEET 1

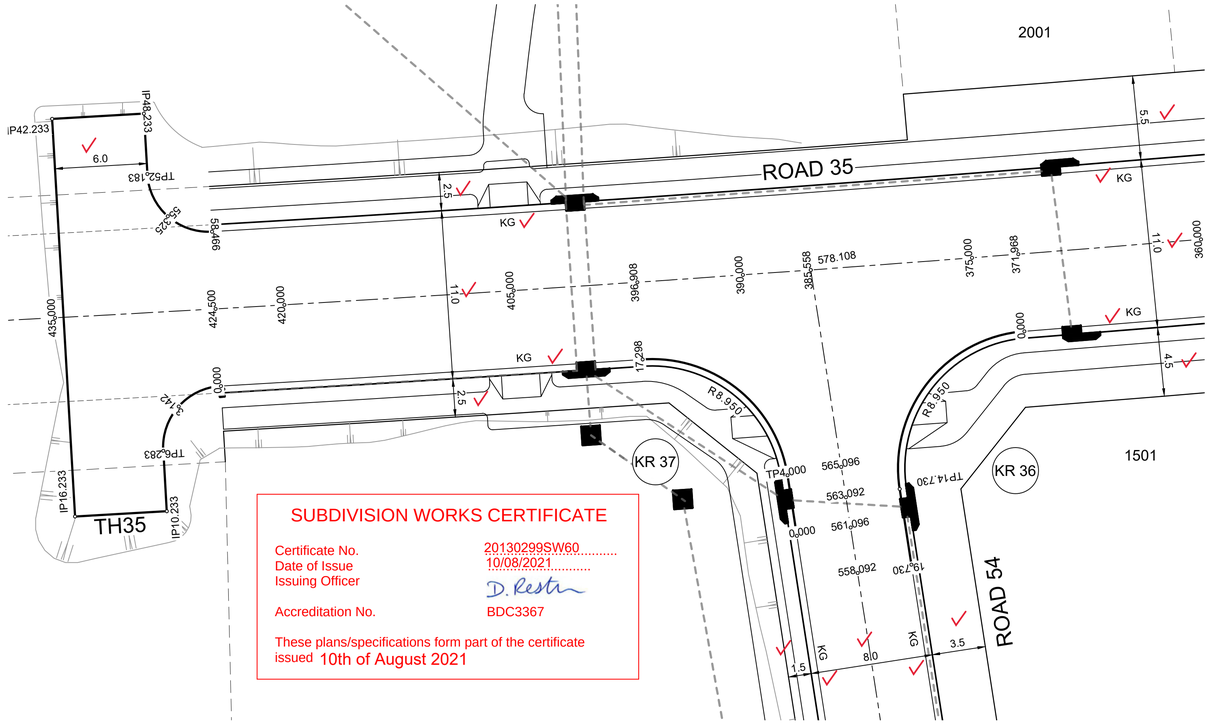
PROJECT No: 110185-12

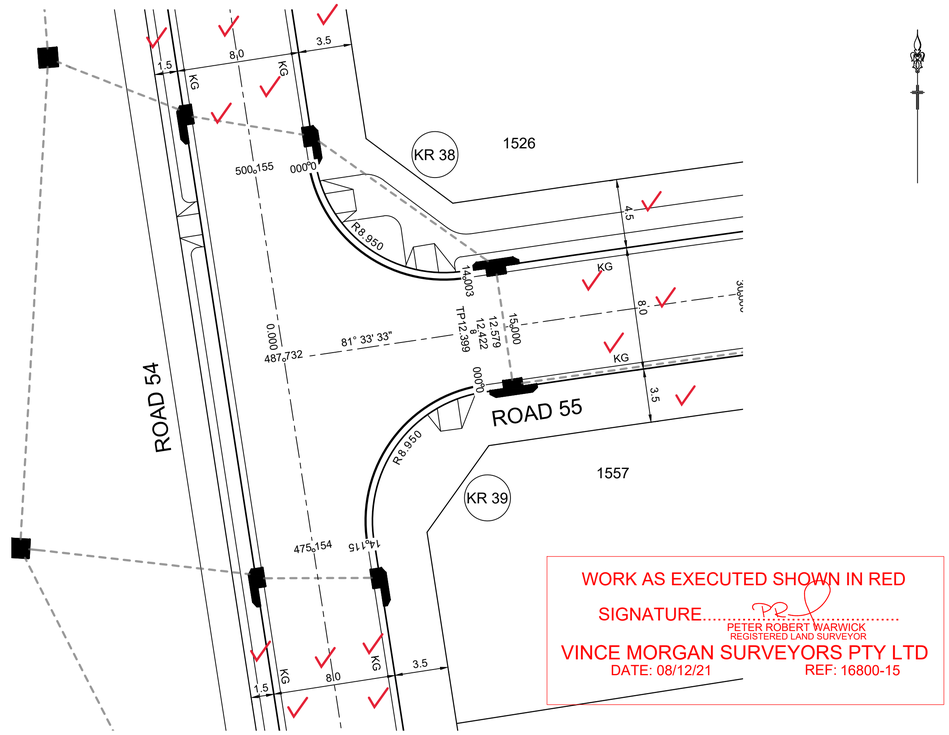
SHEET No: CC1301

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN:

PLAN No: 110185-12-CC1301 C

Plotted: 21 July , 2021 2:19:05 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1301.dwg





SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restin
Accreditation No. BDC3367

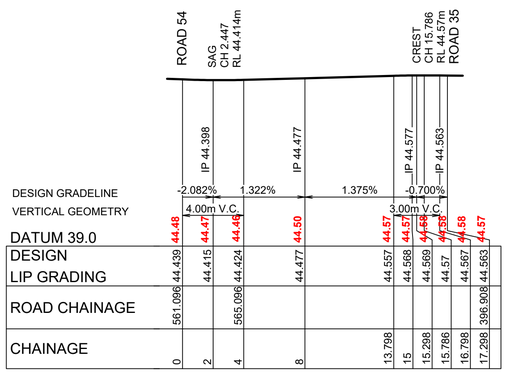
These plans/specifications form part of the certificate issued 10th of August 2021

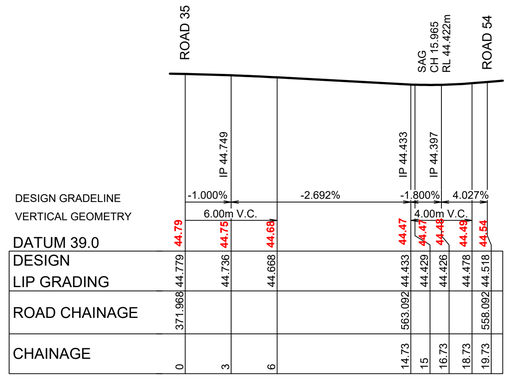
PLAN
SCALE 1:200

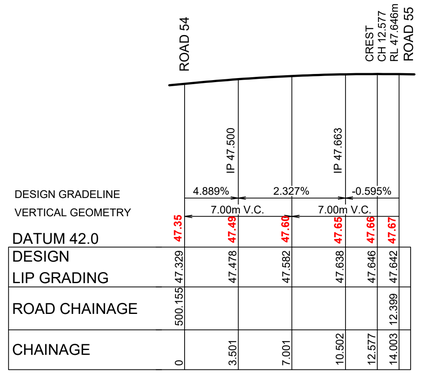
DESIGN LEVELS, RADII AND SETOUT ARE TO LIP OF GUTTER

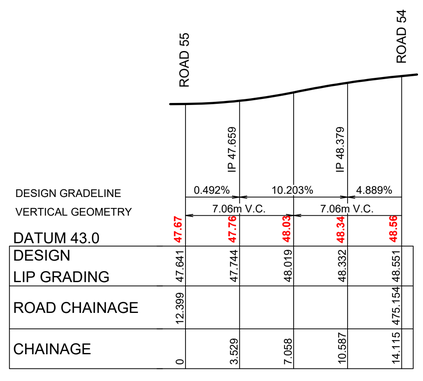
WORK AS EXECUTED SHOWN IN RED
SIGNATURE.....
PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR
VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21 REF: 16800-15

PLAN
SCALE 1:200









KR 37

HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:100

KR 37					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286367.48	6281416.99	351°12'08.99"		
4	286366.87	6281420.95	351°12'08.99"		
10.65	286365.62	6281429.07		-8.95	13.3
17.3	286357.41	6281428.51	266°04'13.36"		

KR 36

HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:100

KR 36					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286382.34	6281430.34	265°29'55.61"		
7.36	286372.72	6281429.59		-8.95	14.73
14.73	286374.2	6281420.05	171°12'09.00"		
19.73	286374.96	6281415.11	171°12'09.00"		

KR 38

HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:100

KR 38					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286383.82	6281357.86	171°12'09.00"		
7	286385.18	6281349.07		-8.95	14
14	286393.98	6281350.37	81°33'36.04"		

KR 39

HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:100

KR 39					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286395.18	6281343.37	261°33'56.50"		
7.06	286386.27	6281342.05		-8.95	14.12
14.12	286387.65	6281333.15	171°12'09.00"		

1:50 (AT A1)
1:100 (AT A3)
1 0 1 2 3 4 5
METRES

1:200 (AT A1)
1:400 (AT A3)
4 2 0 4 8 12 16 20
METRES

D	COUNCIL COMMENTS	MP	VS	RO	RO	16/06/21
C	CERTIFIER COMMENTS	JET	JET	MP	RO	26/04/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

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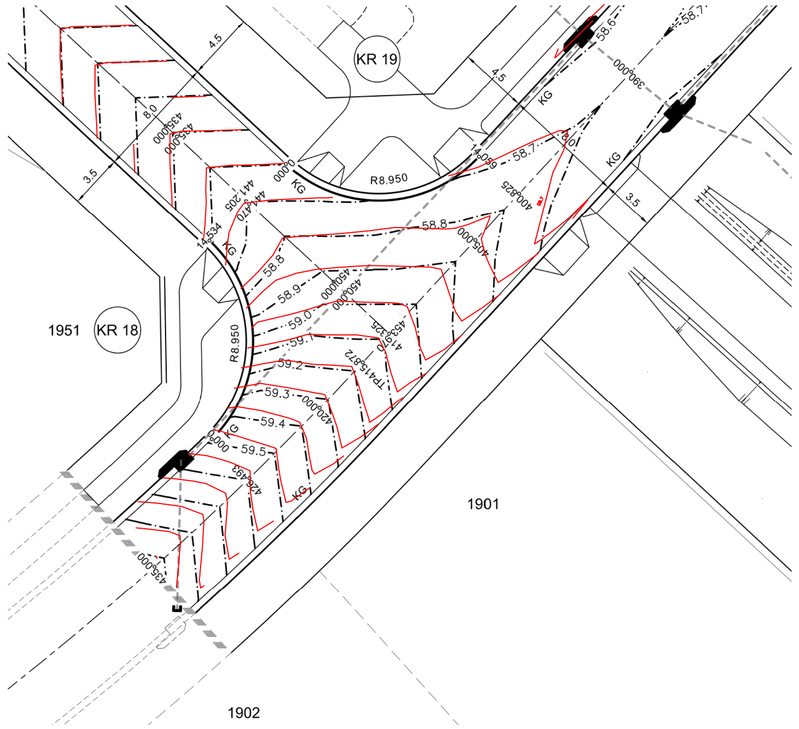
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
KERB RETURN PLAN
SHEET 2

PROJECT No: 110185-12
SHEET No: CC1302

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1302 D

Plotted: 21 July, 2021 2:20:59 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1302.dwg

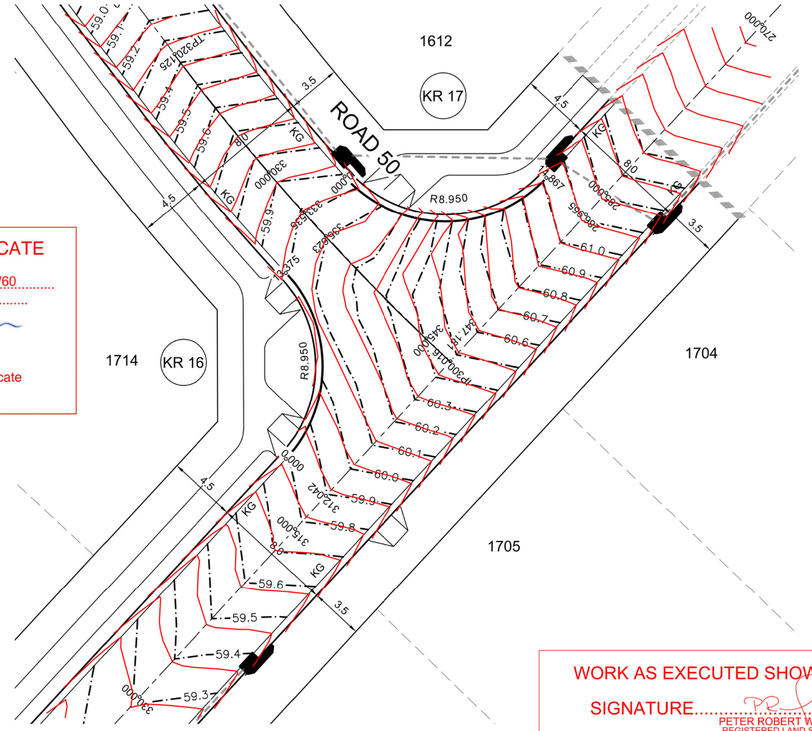


SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restin
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

DESIGN LEVELS, RADII AND SETOUT ARE TO LIP OF GUTTER

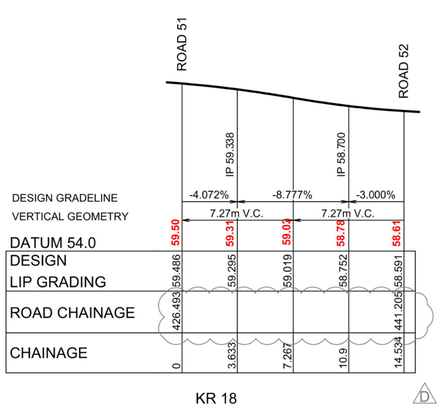


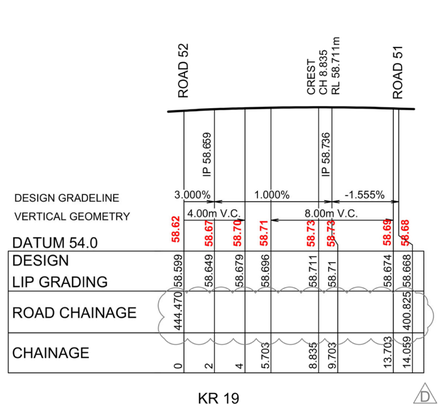
WORK AS EXECUTED SHOWN IN RED

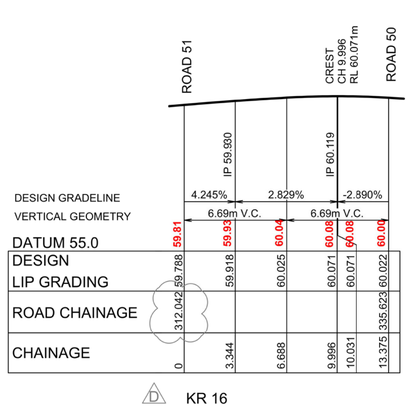
SIGNATURE.....

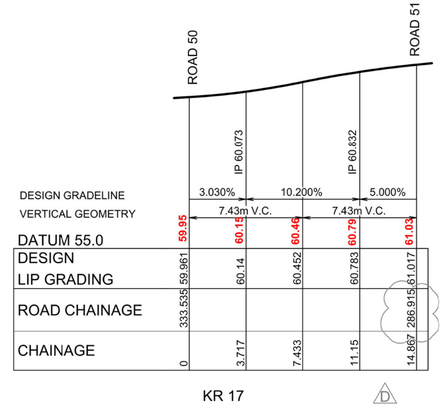
PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21 REF: 16800-15









KR 18					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286708.27	6281086.65	45°51'29.48"		
7.27	286715.04	6281093.22		-8.95	14.53
14.53	286708.12	6281099.64	312°48'55.65"		

KR 19					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286713.14	6281104.67	132°48'55.65"		
7.03	286719.7	6281098.59		-8.95	14.06
14.06	286725.79	6281105.15	42°48'55.65"		

KR 16					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286786.13	6281170.28	42°48'55.65"		
6.69	286791.76	6281176.36		-8.95	13.38
13.38	286786.13	6281182.44	317°11'30.49"		

KR 17					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286789.96	6281188.77	137°59'22.21"		
7.43	286796.52	6281181.49		-8.95	14.87
14.87	286803.18	6281188.68	42°48'55.65"		

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

1:200 (AT A1)
1:400 (AT A3)
4 2 0 4 8 12 16 20
METRES

D	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
C	CERTIFIER COMMENTS	JET	JET	MP	RO	26/04/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
KERB RETURN PLAN
SHEET 3

PROJECT No: 110185-12
SHEET No: CC1303

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1303 | D

Plotted: 21 July 2021 2:22:55 PM File Name: \\wp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1303.dwg

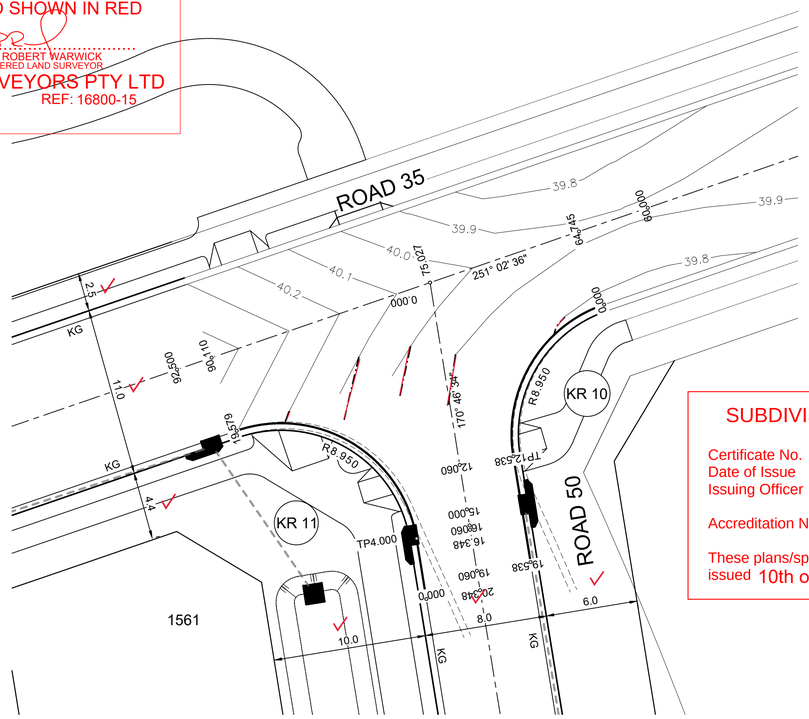
WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15



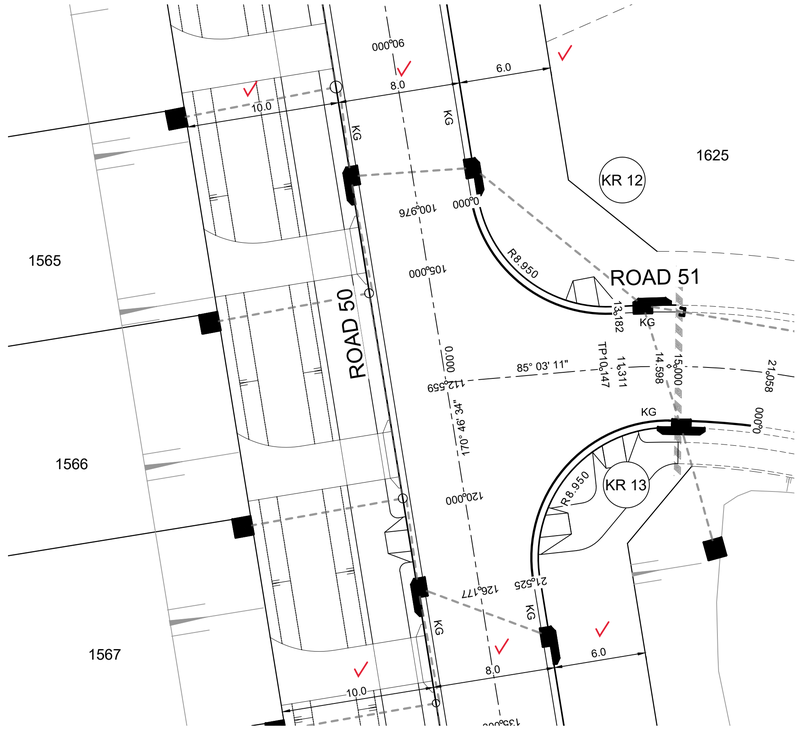
PLAN
SCALE 1:200

SUBDIVISION WORKS CERTIFICATE

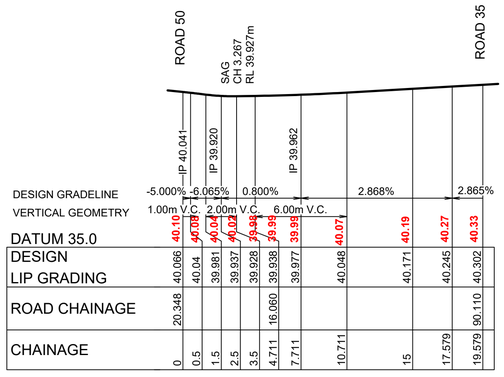
Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restin
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

DESIGN LEVELS, RADII AND SETOUT ARE TO LIP OF GUTTER



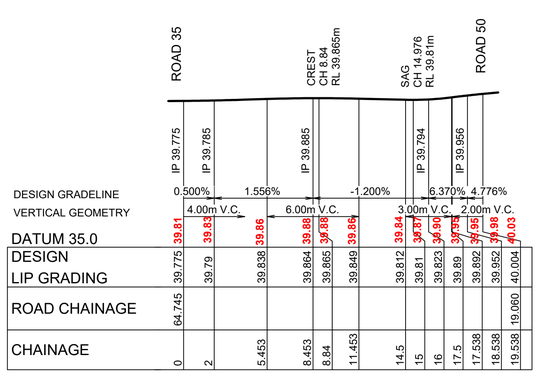
PLAN
SCALE 1:200



KR 11

HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:100

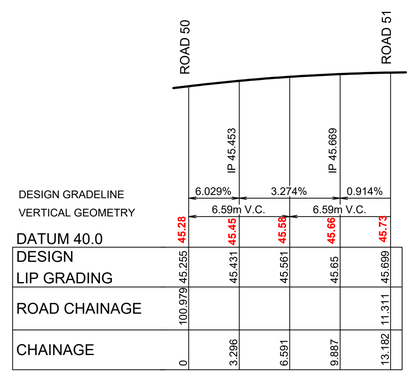
KR 11					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286672.36	6281469.66	350°46'34.49"		
4	286671.72	6281473.61	350°46'34.49"		
11.79	286670.02	6281484.09		-8.95	15.58
19.58	286659.98	6281480.64	251°02'36.11"		



KR 10

HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:100

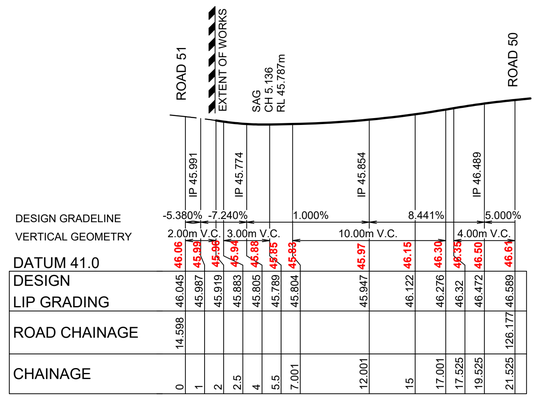
KR 10					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286683.97	6281488.88	251°02'36.11"		
6.27	286676.83	6281486.43		-8.95	12.54
12.54	286678.04	6281478.98	170°46'34.49"		
19.54	286679.17	6281472.07	170°46'34.49"		



KR 12

HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:100

KR 12					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286692.3	6281391.21	170°46'34.49"		
6.59	286693.6	6281383.2		-8.95	13.18
13.18	286701.69	6281383.72	86°23'11.77"		



KR 13

HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:100

KR 13					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286711.18	6281376.32	277°33'23.01"		
3	286708.2	6281376.71		-46.45	6
6	286705.19	6281376.72	270°09'13.37"		
13.76	286694.64	6281376.75		-8.95	15.52
21.52	286696.34	6281366.34	170°46'34.49"		

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

1:200 (AT A1)
1:400 (AT A3)
4 2 0 4 8 12 16 20
METRES

C	CERTIFIER COMMENTS	JET	JET	MP	RO	26/04/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS

PO Box 4366 PENRITH WESTFIELD NSW 2750
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CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

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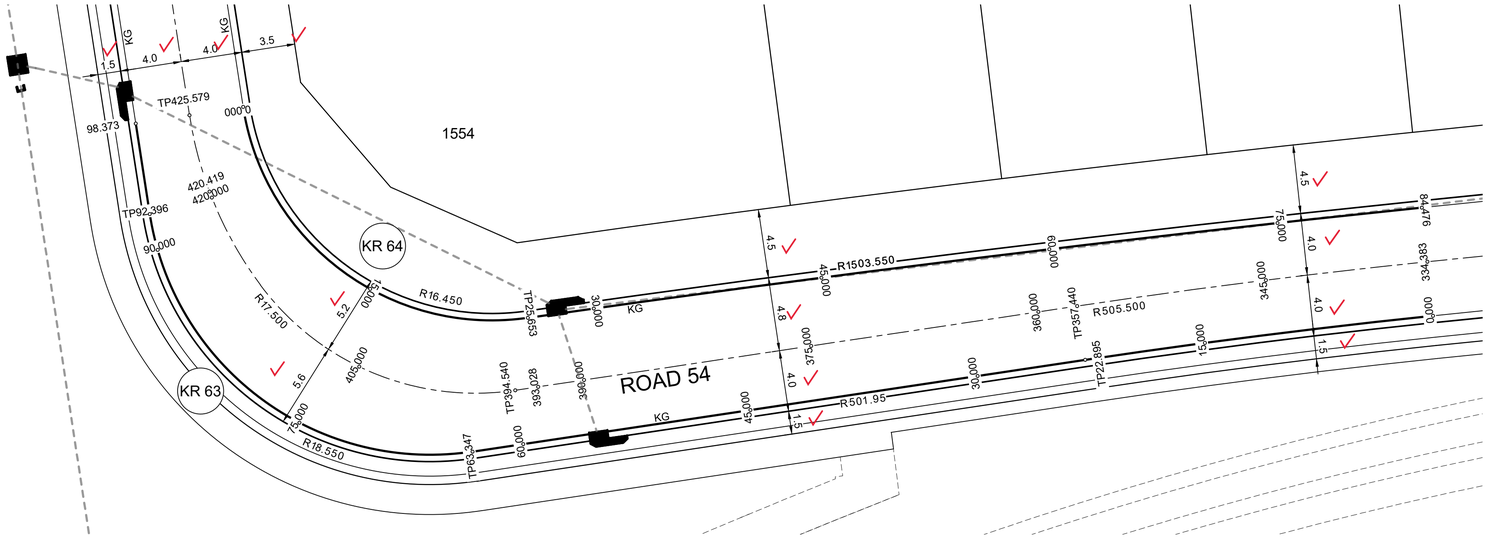
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
KERB RETURN PLAN
SHEET 4

PROJECT No: 110185-12
SHEET No: CC1304

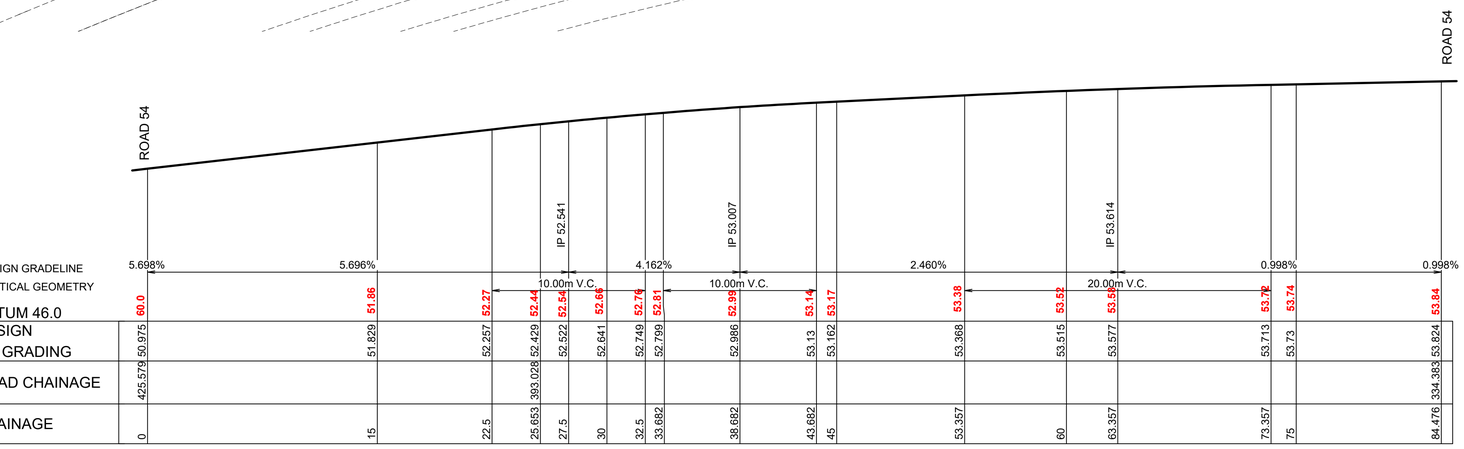
AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1304 C

Plotted: 21 July , 2021 2:24:45 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1304.dwg

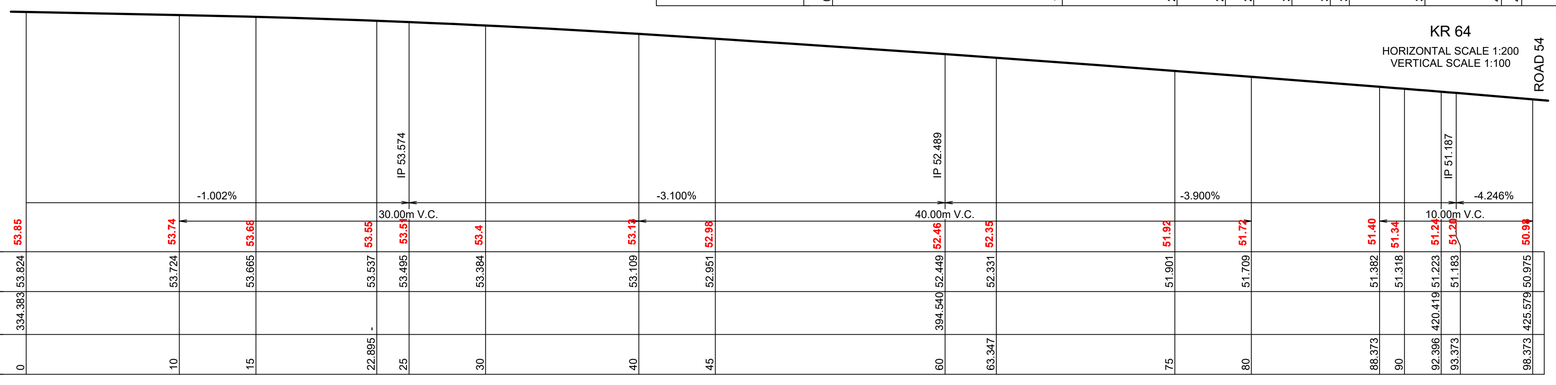


PLAN
SCALE 1:200

DESIGN LEVELS, RADII AND SETOUT ARE TO LIP OF GUTTER



DESIGN GRADELINE / VERTICAL GEOMETRY / DATUM 46.0																								
DESIGN LIP GRADING	50.975	51.829	52.257	52.429	52.522	52.641	52.749	52.799	52.986	53.13	53.162	53.368	53.515	53.577	53.713	53.73	53.824							
ROAD CHAINAGE	425.579			393.028													334.383							
CHAINAGE	0	15	22.5	25.653	27.5	30	32.5	33.682	38.682	43.682	45	53.357	60	63.357	73.357	75	84.476							
DESIGN LEVEL	60.0	51.86	52.27	52.44	52.54	52.66	52.74	52.81	52.99	53.14	53.17	53.38	53.52	53.58	53.72	53.74	53.84							



DESIGN GRADELINE / VERTICAL GEOMETRY / DATUM 46.0																								
DESIGN LIP GRADING	53.824	53.724	53.665	53.537	53.495	53.384	53.109	52.951	52.449	52.331	51.901	51.709	51.382	51.318	51.223	51.183	50.975							
ROAD CHAINAGE	334.383								394.540						420.419		425.579							
CHAINAGE	0	10	15	22.895	25	30	40	45	60	63.347	75	80	88.373	90	92.396	93.373	98.373							
DESIGN LEVEL	53.85	53.74	53.68	53.55	53.5	53.4	53.11	52.98	52.46	52.35	51.92	51.77	51.40	51.34	51.23	51.20	50.91							

KR 63
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:100

KR 63					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286472.92	6281270.52	264°05'37.08"		
11.45	286461.53	6281269.34		-501.95	22.9
22.9	286450.21	6281267.65	261°28'48.84"		
63.35	286410.21	6281261.66	261°28'48.84"		
77.87	286391.95	6281258.92		18.55	29.05
92.4	286389.13	6281277.16	351°12'08.99"		
98.37	286388.21	6281283.07	351°12'08.99"		

KR 64					
CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286395.23	6281284.16	171°12'09.00"		
12.83	286397.72	6281268.08		-16.45	25.65
25.65	286413.82	6281270.39	81°51'07.46"		
55.06	286442.93	6281274.56		1503.55	58.82
84.48	286472.19	6281277.59	84°05'37.08"		

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

1:200 (AT A1)
1:400 (AT A3)
4 2 0 4 8 12 16 20
METRES

WORK AS EXECUTED SHOWN IN RED
SIGNATURE.....
PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR
VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE
Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Reston
Accreditation No. BDC3367
These plans/specifications form part of the certificate issued 10th of August 2021

	AMENDMENT	DES	DRN	CKD	APR	DATE
F	COUNCIL COMMENTS	MP	VS	RO	RO	16/06/21
E	ROAD 54 ALIGNMENT REVISED	JET	JET	MP	RO	08/06/21
D	COUNCIL COMMENTS	JET	JET	MP	RO	13/05/21
C	CERTIFIER COMMENTS	JET	JET	MP	RO	26/04/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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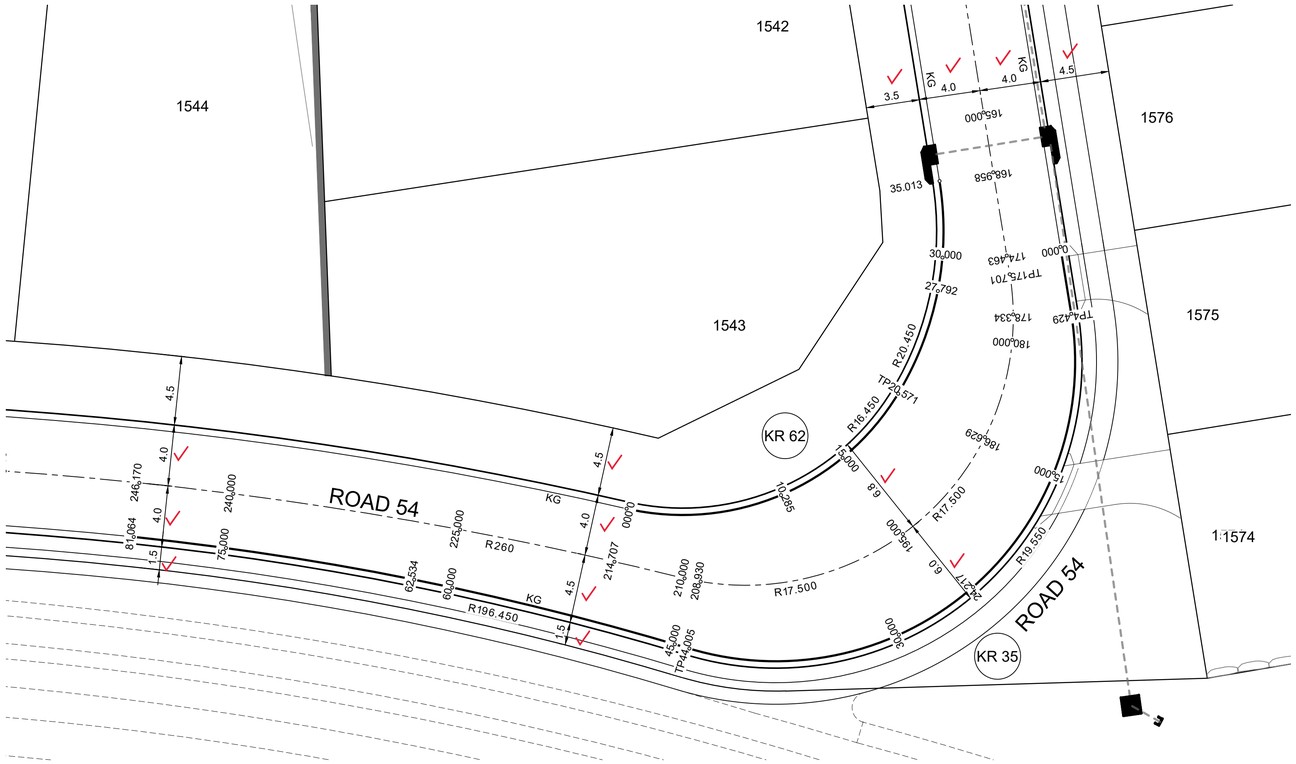
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
KERB RETURN PLAN
SHEET 5

PROJECT No: 110185-12
SHEET No: CC1305

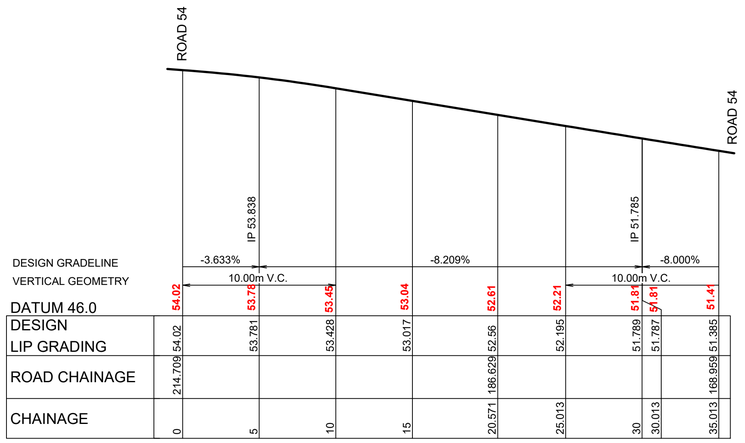
AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1305 | F

Plotted: 21 July , 2021 2:26:38 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1305.dwg



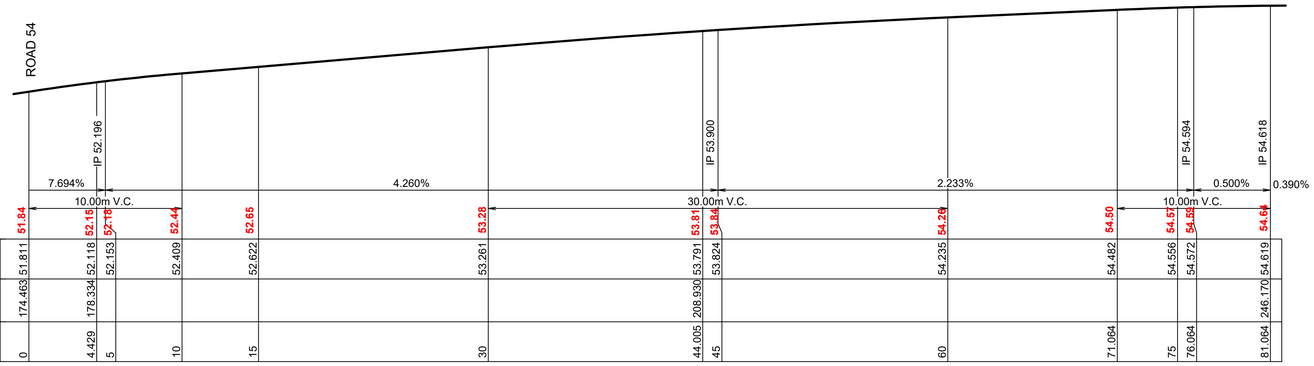
PLAN
SCALE 1:200

DESIGN LEVELS, RADII AND SETOUT ARE TO LIP OF GUTTER



DESIGN GRADELINE / VERTICAL GEOMETRY									
DATUM 46.0	54.02	53.78	53.45	53.04	52.61	52.21	51.84	51.81	51.41
DESIGN LIP GRADING	54.02	53.781	53.428	53.017	52.56	52.195	51.789	51.787	51.385
ROAD CHAINAGE	214.709				166.629				168.959
CHAINAGE	0	5	10	15	20.571	25.013	30	30.013	35.013

KR 62
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:100



DESIGN GRADELINE / VERTICAL GEOMETRY															
DATUM 47.0	51.84	52.15	52.19	52.44	52.65	53.28	53.81	53.84	54.29	54.50	54.57	54.59	54.64		
DESIGN LIP GRADING	51.811	52.118	52.153	52.409	52.622	53.261	53.791	53.824	54.235	54.482	54.556	54.572	54.619		
ROAD CHAINAGE	174.463	178.334					208.930						246.170		
CHAINAGE	0	4.429	5	10	15	30	44.005	45	60	71.064	75	76.064	81.064		

KR 35
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:100

KR 35

CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286620.67	6281292.5	170°46'34.35"		
4.43	286621.38	6281288.13	170°46'34.35"		
24.22	286626.4	6281257.26		19.55	39.58
44	286596.45	6281266.28	286°45'43.95"		
62.53	286578.65	6281271.64		-196.45	37.06
81.06	286560.17	6281273.57	275°57'13.63"		

KR 62

CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH
0	286592.35	6281275.41	102°53'14.06"		
10.29	286603.92	6281272.76		-16.45	20.57
20.57	286610.08	6281282.91	31°14'19.87"		
27.79	286613.99	6281289.36		-20.45	14.44
35.01	286612.78	6281296.8	350°46'34.35"		

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

1:200 (AT A1)
1:400 (AT A3)
4 2 0 4 8 12 16 20
METRES

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Reston
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

	AMENDMENT	DES	DRN	CKD	APR	DATE
A	EXTRA SHEET ADDED	MP	VS	RO	RO	16/06/21

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

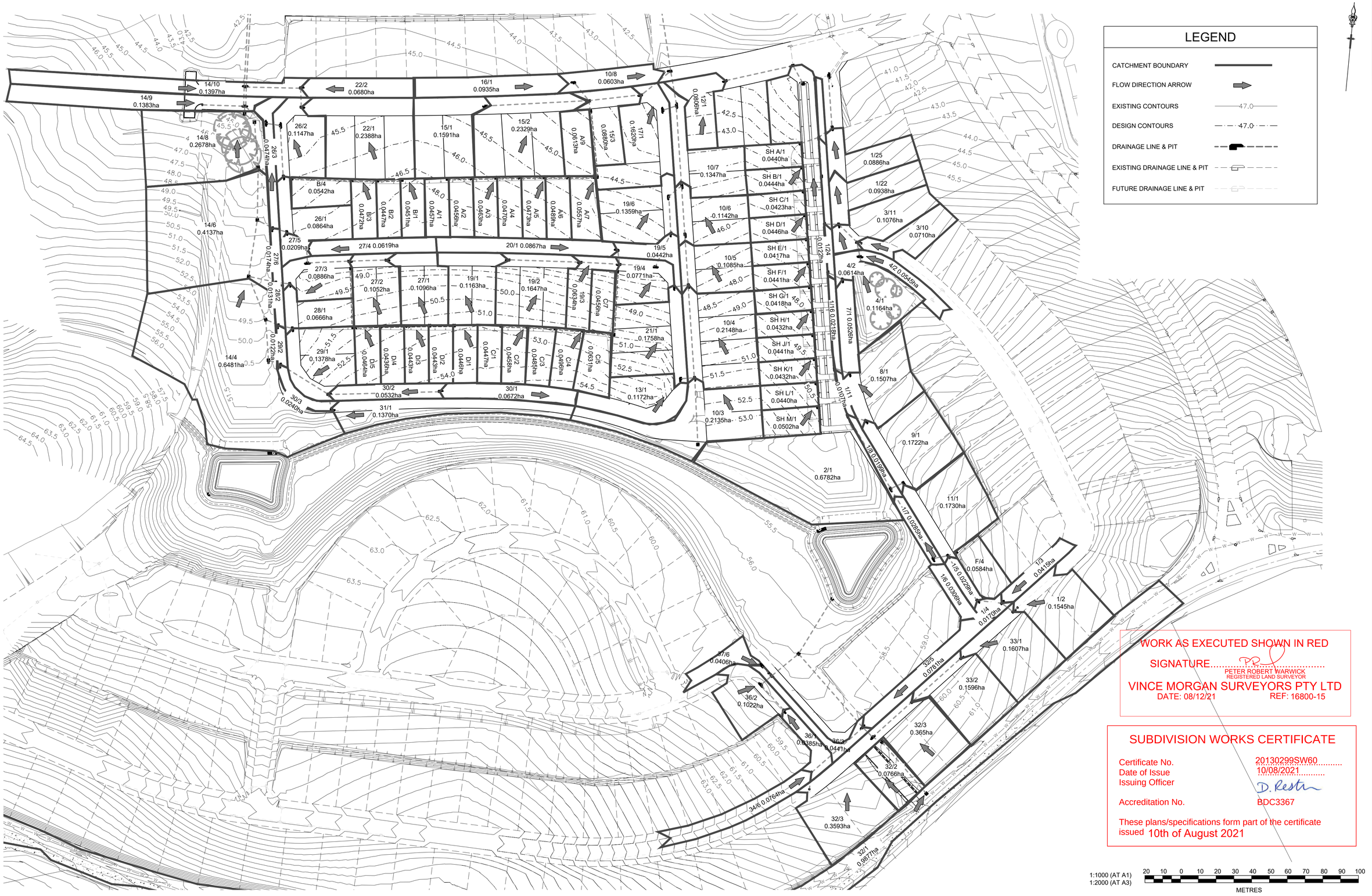
STATUS: ISSUE FOR CONSTRUCTION APPROVAL
THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
KERB RETURN PLAN
SHEET 6

PROJECT No: 110185-12
SHEET No: CC1306

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1306 | A

Plotted: 21 July , 2021 2:28:30 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1306.dwg



D	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
C	DRAINAGE REVISED	JET	JET	MP	RO	23/03/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
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CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

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REDBANK, NORTH RICHMOND SOUTHERN HEIGHTS - PROMENADE

CATCHMENT PLAN

PROJECT No: 110185-12

SHEET No: CC1400

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1400 | D

Plotted: 21 July, 2021 2:31:43 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1400.dwg

PIT SCHEDULE

PIT NAME	SURFACE FITTING TYPE AND SIZE	PIT EASTING	PIT NORTHING	PIT DEPTH	COMMENTS
(-)	(-)	(m)	(m)	(m)	
1/1	1.8 m lintel	286831.59	6281208.23	1.51	FUTURE
1/2	1.8 m lintel	286810.63	6281185.61	1.5	
1/3	1.8 m lintel	286803.71	6281189.91	1.57	
1/4	1.8 m lintel	286789.92	6281190.15	1.56	
1/5	1.8 m lintel	286771.13	6281213.64	1.48	
1/6	1.8 m lintel	286762.93	6281211.24	1.56	
1/7	1.8 m lintel	286735.31	6281248.03	1.59	
1/8	1.8 m lintel	286707.32	6281286.91	1.58	
1/9	NODE	286703.89	6281295.68	1.65	DIRECT CONNECTION
1/10	NODE	286699.89	6281306.2	1.7	DIRECT CONNECTION
1/11	1.8 m lintel	286697.61	6281312.49	1.77	
1/12	NODE	286696.54	6281318.69	1.72	DIRECT CONNECTION
1/13	NODE	286694.31	6281331.7	1.61	DIRECT CONNECTION
1/14	NODE	286692.15	6281345.01	1.56	DIRECT CONNECTION
1/15	NODE	286690	6281358.27	1.56	DIRECT CONNECTION
1/16	1.8 m lintel	286688.77	6281365.83	1.64	
1/17	NODE	286687.83	6281371.64	1.68	DIRECT CONNECTION
1/18	NODE	286685.62	6281385.04	1.91	DIRECT CONNECTION
1/19	1.8 m lintel	286684.41	6281392.7	1.91	
1/20	NODE	286683.46	6281398.5	1.94	DIRECT CONNECTION
1/21	NODE	286681.3	6281411.84	1.94	DIRECT CONNECTION
1/22	1.8 m lintel	286680.11	6281419.14	1.97	
1/23	NODE	286679.08	6281425.48	1.86	DIRECT CONNECTION
1/24	1.8 m lintel	286676.59	6281440.86	1.71	
1/25	1.8 m lintel	286683.65	6281447.24	1.89	
1/26	2.4 m lintel sag	286679.71	6281475.87	1.67	EXISTING PIT
2/1	GSIP 900x900 SAG	286665.03	6281470	0.98	
2/2	1.8 m lintel	286657.53	6281479.32	1.79	EXISTING ENDCAP
3/7	1.8 m lintel	286755.5	6281350.56	1.69	
3/8	1.8 m lintel	286753.63	6281362.24	1.63	
3/9	1.8 m lintel	286724.63	6281380.6	1.68	
3/10	1.8 m lintel	286703.49	6281384.25	1.64	
3/11	1.8 m lintel	286692.43	6281393.22	1.65	
4/1	GSIP 900x900 SAG	286708.2	6281368.35	1.07	
4/2	2.4 m lintel sag	286706	6281376.26	1.46	
7/1	1.8 m lintel	286697.39	6281362.64	1.47	
8/1	1.8 m lintel	286706.37	6281310.4	1.53	
9/1	1.8 m lintel	286717.98	6281284.73	1.52	
10/1	GSIP 5x900x900	286697.96	6281221.51	1.98	DAM 8 OUTLET
10/2	GSIP 900x900	286625.29	6281262.56	2.75	
10/3	1.8 m lintel	286619.95	6281299.75	2.16	
10/4	1.8 m lintel	286611.59	6281351.27	2.2	
10/5	1.8 m lintel	286606.87	6281380.3	2.03	
10/6	1.8 m lintel	286602.59	6281406.67	2.13	
10/7	2.4 m lintel sag	286595.39	6281451.03	2.38	
10/8	1.8 m lintel	286590.22	6281470.08	3.03	
10/9	GPT	286580.09	6281510.78	2.39	
10/10	H.W.	286581.02	6281532.03	1.2	
11/1	1.8 m lintel	286742.31	6281252.04	1.47	
12/1	1.8 m lintel	286621.65	6281467.48	1.54	
12/2	1.8 m lintel	286657.53	6281479.32	1.79	
13/1	1.8 m lintel	286612.1	6281298.19	1.45	
14/1	GSIP 5x900x900	286388.37	6281235.21	3.9	FUTURE DAM 7 OUTLET
14/2	JP GRATED 900 x 900	286380.51	6281286.9	2.31	
14/3	JP GRATED 900 x 900	286376.87	6281309.42	2.32	
14/4	GSIP 900x900	286364.98	6281332.73	2.27	SURCHARGE PIT
14/5	GSIP 900x900	286366.81	6281364.76	2.5	SURCHARGE PIT
14/6	JP GRATED 900 x 900	286364.52	6281394.38	2.79	
14/7	GSIP 900x900	286360.03	6281419.38	3.15	
14/8	GSIP 900x900 SAG	286354.05	6281423.55	3.11	
14/9	2.4 m lintel sag	286353.73	6281427.8	3.28	
14/10	2.4 m lintel sag	286352.99	6281438.78	3.45	
14/11	GSIP 900x900	286350.66	6281485.48	1.93	SURCHARGE PIT
14/12	GSIP 900x900	286407.98	6281491.84	3.04	SURCHARGE PIT
14/13	GSIP 3x900x900	286497.5	6281501.12	1.61	SURCHARGE PIT
14E/1	CAPPED STUB	286337.14	6281483.12	1.62	
15/1	1.8 m lintel	286488.79	6281440.56	1.58	
15/2	1.8 m lintel	286546.14	6281449.02	1.54	
15/3	1.8 m lintel	286575.02	6281455.05	1.51	
16/1	1.8 m lintel	286536.91	6281458.53	1.45	
17/1	2.4 m lintel sag	286587.82	6281447.71	1.47	

PIT SCHEDULE

PIT NAME	SURFACE FITTING TYPE AND SIZE	PIT EASTING	PIT NORTHING	PIT DEPTH	COMMENTS
(-)	(-)	(m)	(m)	(m)	
19/1	1.8 m lintel	286509.64	6281355.65	1.41	
19/2	1.8 m lintel	286550.07	6281358.15	1.37	
19/3	1.8 m lintel	286571.96	6281359.06	1.42	
19/4	2.4 m lintel sag	286592.04	6281359.63	1.38	
19/5	1.8 m lintel	286598.96	6281379.09	1.57	
19/6	1.8 m lintel	286595.59	6281399.85	1.58	
20/1	1.8 m lintel	286570.1	6281367	1.36	
21/1	1.8 m lintel	286603.77	6281349.51	1.45	
22/1	1.8 m lintel	286385.46	6281430.14	1.44	
22/2	1.8 m lintel	286384.05	6281441.06	1.6	
23/1	CAPPED STUB	286329.85	6281426.31	3.15	
26/1	1.8 m lintel	286379.21	6281390.59	1.36	
26/2	2.4 m lintel sag	286374.83	6281418.87	1.45	
26/3	2.4 m lintel sag	286366.67	6281419.34	1.58	
27/1	1.8 m lintel	286441.19	6281349.05	1.52	
27/2	1.8 m lintel	286420.35	6281346.44	1.49	
27/3	2.4 m lintel sag	286397.18	6281343.21	1.45	
27/4	2.4 m lintel sag	286396.02	6281351.13	1.56	
27/5	1.8 m lintel	286384	6281359.65	1.46	
27/6	1.8 m lintel	286375.7	6281361	1.47	
28/1	1.8 m lintel	286388.46	6281330.8	1.46	
28/2	1.8 m lintel	286380.37	6281330.77	1.51	
29/1	1.8 m lintel	286392.29	6281306.07	1.46	
29/2	1.8 m lintel	286384.05	6281307.02	1.55	
30/1	1.8 m lintel	286477.9	6281278.62	1.5	
30/2	1.8 m lintel	286415.65	6281271.11	1.63	
30/3	1.8 m lintel	286387.44	6281285.13	1.68	
31/1	1.8 m lintel	286418.65	6281262.46	1.48	
32/1	GSIP 900x900 SAG	286771.71	6281079.32	2.15	GROSE VALE ROAD CONNECTION
32/2	GSIP 900x900 SAG	286744.1	6281105.84	1.53	
32/3	2.4 m lintel sag	286738.73	6281108.01	1.68	
32/4	2.4 m lintel sag	286732.52	6281113.08	1.89	
32/5	GPT	286692.77	6281150.71	2.06	
32/6	H.W.	286708.41	6281182.89	0.9	OUTLET TO DAM 8
33/1	1.8 m lintel	286783.91	6281156.77	1.63	
33/2	1.8 m lintel	286758.78	6281129.65	1.61	
34/6	1.8 m lintel	286706.25	6281085.34	1.87	
35/1	1.8 m lintel	286630.89	6281040.86	1.43	
36/1	1.8 m lintel	286687.45	6281118.18	1.62	
36/2	2.4 m lintel sag	286673.41	6281131.18	1.75	
36/3	2.4 m lintel sag	286678.85	6281137.05	2.17	
A/1	IAD 450x450	286471	6281397.86	0.73	
A/2	SLOPE JUNCTION	286484.65	6281399.46	0.7	
A/3	IAD 450x450	286498.1	6281401.03	0.72	
A/4	SLOPE JUNCTION	286511.49	6281402.45	0.7	
A/5	IAD 450x450	286525.11	6281403.89	0.71	
A/6	SLOPE JUNCTION	286538.51	6281405.22	0.69	
A/7	IAD 900x900	286553.45	6281406.7	2.17	
A/8	IAD 450x450	286554.62	6281406.97	0.75	
A/9	IAD 600x900	286547.42	6281443.4	1.5	
B/1	IAD 450x450	286445.6	6281394.84	0.69	
B/2	IAD 600x900	286432.06	6281393.16	0.78	
B/3	SLOPE JUNCTION	286417.5	6281392.16	0.83	
B/4	IAD 600x900	286383.94	6281389.85	1.45	
C/1	IAD 450x450	286508.86	6281318.39	0.65	
C/2	IAD 450x450	286523.66	6281319.31	0.74	
C/3	IAD 450x450	286539.32	6281319.86	0.72	
C/4	IAD 450x450	286555.07	6281319.98	0.75	
C/5	IAD 900x900	286571.11	6281319.65	2.19	
C/6	IAD 450x450	286572.31	6281319.61	0.75	
C/7	IAD 600x900	286570.97	6281354.92	1.48	
D/1	IAD 450x450	286482.58	6281316.14	0.66	
D/2	IAD 450x450	286468.85	6281314.79	0.73	
D/3	SLOPE JUNCTION	286455.14	6281313.32	0.75	
D/4	IAD 450x450	286441.45	6281311.72	0.75	
D/5	SLOPE JUNCTION	286427.34	6281309.94	0.9	
D/6	IAD 900x900	286426.15	6281309.79	1.67	
D/7	IAD 900x900	286421.87	6281342.51	1.66	
H/13	IAD 900x900	286684.77	6281114.39	2.92	FUTURE
SH A/1	IAD 450x450	286666.57	6281436.41	0.75	

PIT SCHEDULE

PIT NAME	SURFACE FITTING TYPE AND SIZE	PIT EASTING	PIT NORTHING	PIT DEPTH	COMMENTS
(-)	(-)	(m)	(m)	(m)	
SH B/1	IAD 450x450	286668.73	6281423.08	0.75	
SH C/1	IAD 450x450	286670.9	6281409.76	0.75	
SH D/1	IAD 450x450	286673.06	6281396.43	0.75	
SH E/1	IAD 450x450	286675.22	6281383.11	0.75	
SH F/1	IAD 450x450	286677.39	6281369.78	0.75	
SH G/1	IAD 450x450	286679.55	6281356.46	0.75	
SH H/1	IAD 450x450	286681.72	6281343.13	0.75	
SH J/1	IAD 450x450	286683.88	6281329.8	0.75	
SH K/1	IAD 450x450	286686.04	6281316.48	0.75	
SH L/1	IAD 450x450	286688.21	6281303.15	0.75	
SH M/1	IAD 450x450	286690.37	6281289.83	0.75	

HYDROLOGY NOTES:
STORMWATER SYSTEM DESIGNED USING 12D RATIONAL METHOD.

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

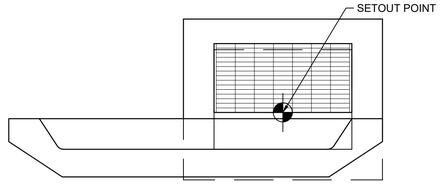
PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21 REF: 16800-15

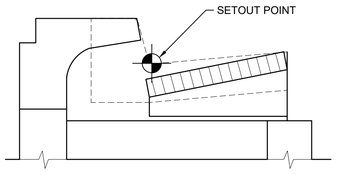
SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restin
Accreditation No. BDC3367

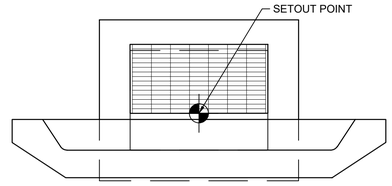
These plans/specifications form part of the certificate issued 10th of August 2021



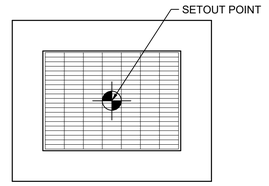
SETOUT DETAIL KERB INLET PIT (LINTEL)
SCALE 1:20



SETOUT DETAIL KERB INLET PIT (LINTEL)
SCALE 1:10



SETOUT DETAIL KERB INLET PIT (SAG)
SCALE 1:20



GRATED SURFACE INLET PIT (GSIP)
SCALE 1:20

E	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
D	COUNCIL COMMENTS	MP	VS	RO	RO	16/06/21
C	DRAINAGE REVISED	JET	JET	MP	RO	23/03/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
PIT SCHEDULE

PROJECT No: 110185-12
SHEET No: CC1401

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN:

PLAN No: 110185-12-CC1401 E

Plotted: 21 July , 2021 2:32:45 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1401.dwg

DAM OUTLET PIT DETAILS				
PIT NAME	GRATE LEVEL "A" (m)	INVERT LEVEL "B" (m)	PIT DEPTH "H" (m)	OUTLET PIPE SIZE (mm)
10/1	54.4 **54.42**	52.417 **52.44**	1.9830	Ø900 ✓

DAM 8 CALCULATIONS

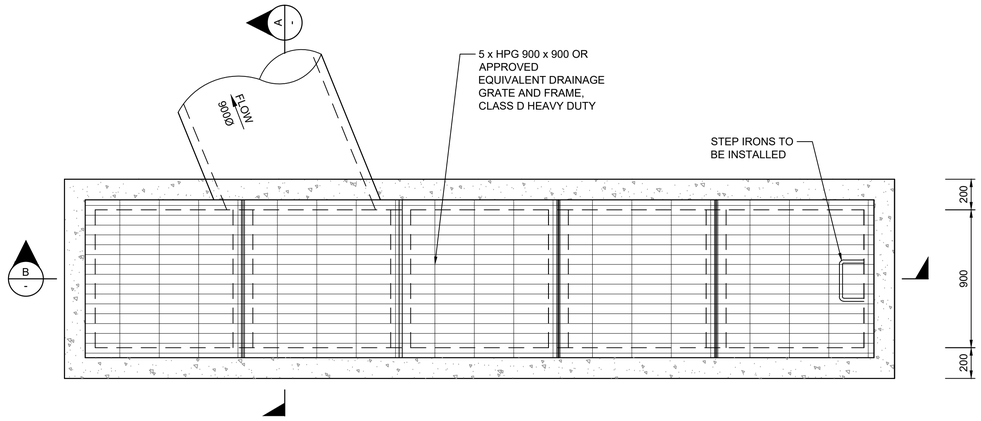
CATCHMENT AREA = 7.3ha
Q_1 = 0.99m³/s
Q_2 = 1.37m³/s
Q_5 = 2.011m³/s
Q_{100} = 4.608m³/s

DAM 8 SPILLWAY CALCULATIONS

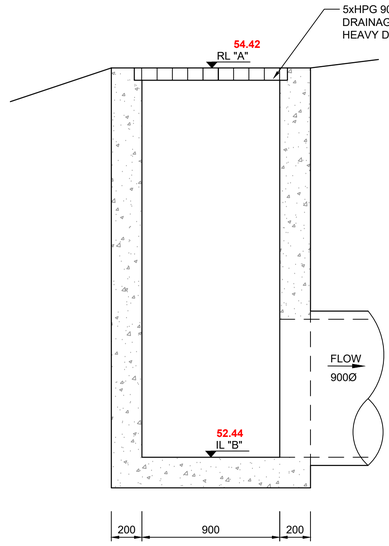
$Q_{100} - Q_5$ = 2.597m³/s
MANNINGS "n" GRASS = 0.035
SPILLWAY LENGTH "L" = 32m
DEPTH OF WATER "d" = 0.09m
EMBANKMENT SLOPE 1:5 (20%)
VELOCITY "V" = 0.5m²/s

EMBANKMENT TO BE PROTECTED WITH REINFORCED TURF

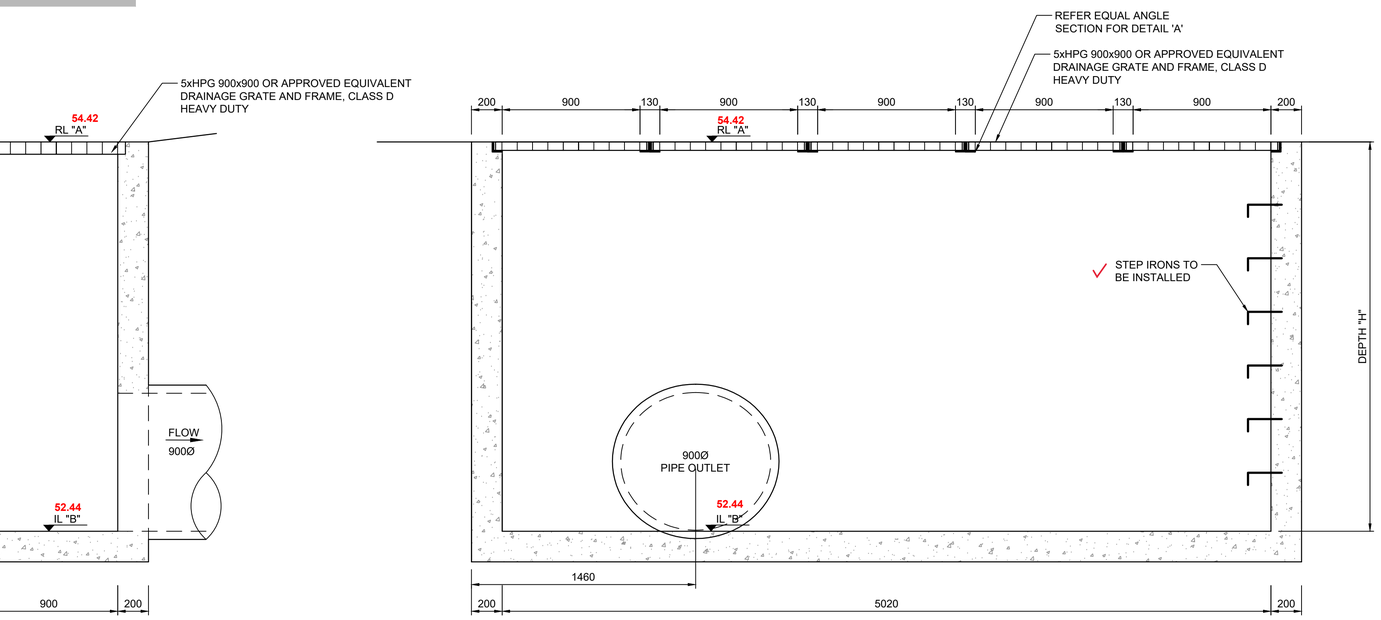
GSIP INLET CAPACITY
Q_5 = 2.011m³/s
$Q_i = 1.66xPxD^{1.5}$
D=0.3m
CAPACITY = 2.21m³/s
≥ 2.011²/s



TYPICAL DAM OUTLET PIT DETAIL
PLAN
SCALE 1:20



SECTION A
SCALE 1:20
-



SECTION B
SCALE 1:20
-

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restin
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

1:20 (AT A1)
1:40 (AT A3)
400 200 0 400 800 1200 1600 2000
MILLIMETRES

A	SHEET ADDED	MP	VS	RO	MS	21/07/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL
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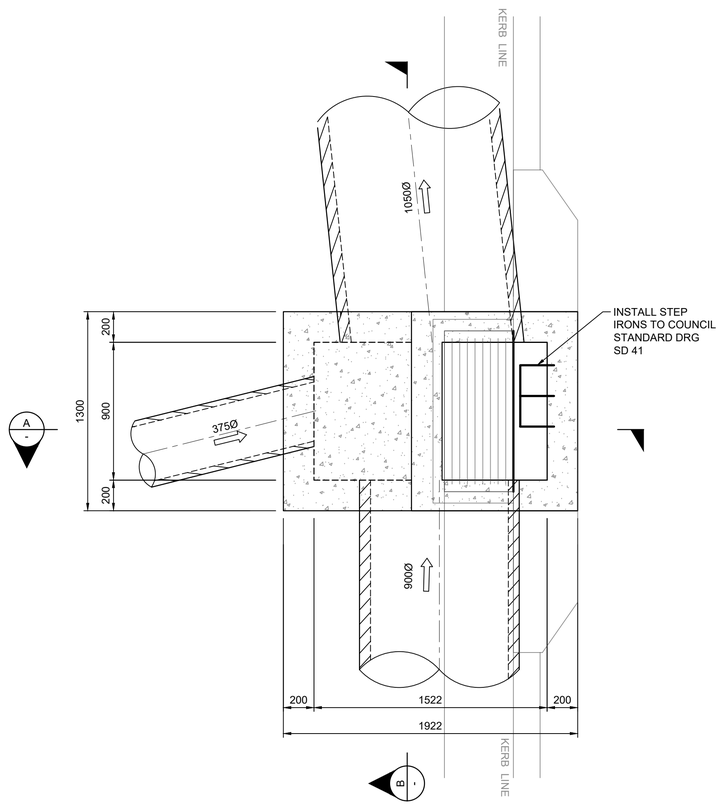
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SPECIAL PIT 10/1 DETAILS

PROJECT No: 110185-12
SHEET No: CC1402A

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1402A | A

Plotted: 21 July 2021 2:33:59 PM File Name: \\jwp.local\fs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1402A.dwg

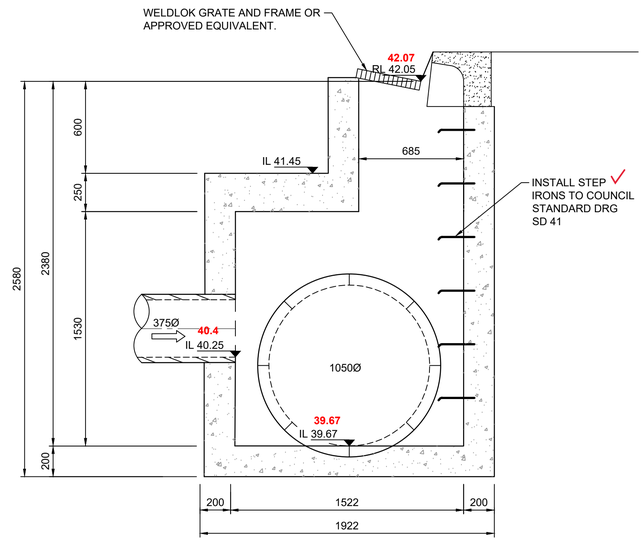


STRUCTURE 10/7

PLAN

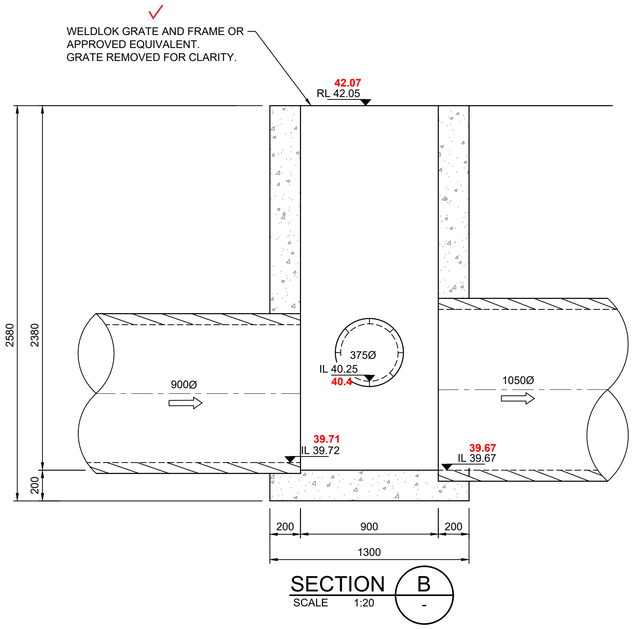
SCALE 1:20

DETAILS SHOWN SUBJECT TO STRUCTURAL CERTIFICATION



SECTION A

SCALE 1:20



SECTION B

SCALE 1:20

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60

Date of Issue 10/08/2021

Issuing Officer D. Restin

Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

1:20 (AT A1)
1:40 (AT A3)

400 200 0 400 800 1200 1600 2000

MILLIMETRES

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A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
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PO Box 4366 PENRITH WESTFIELD NSW 2750
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CLIENT: REDBANK NORTH RICHMOND

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SPECIAL PIT 10/7 DETAILS

PROJECT No: 110185-12

SHEET No: CC1402

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1402 B

Plotted: 21 July, 2021 2:33:23 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1402.dwg

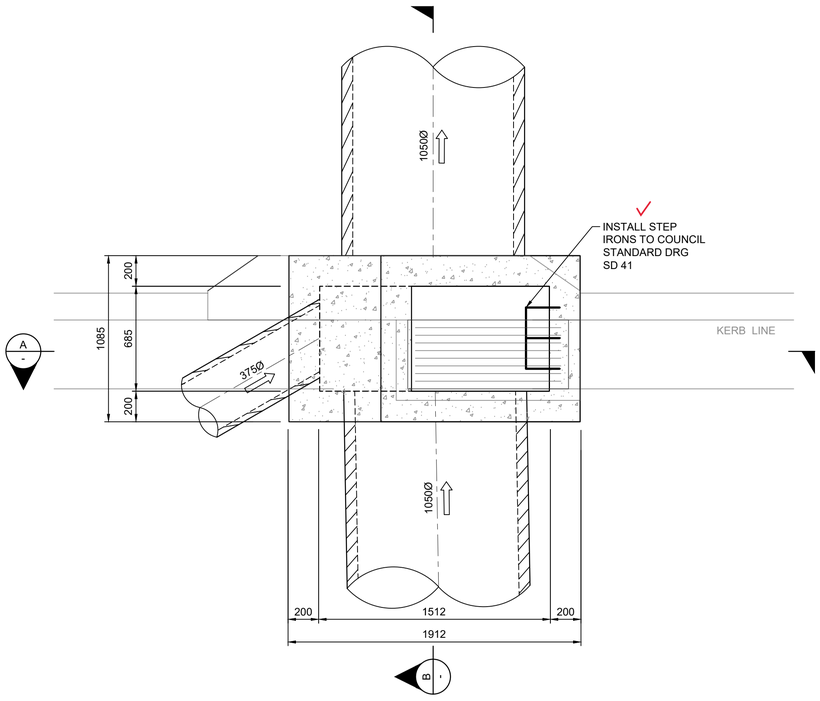
WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

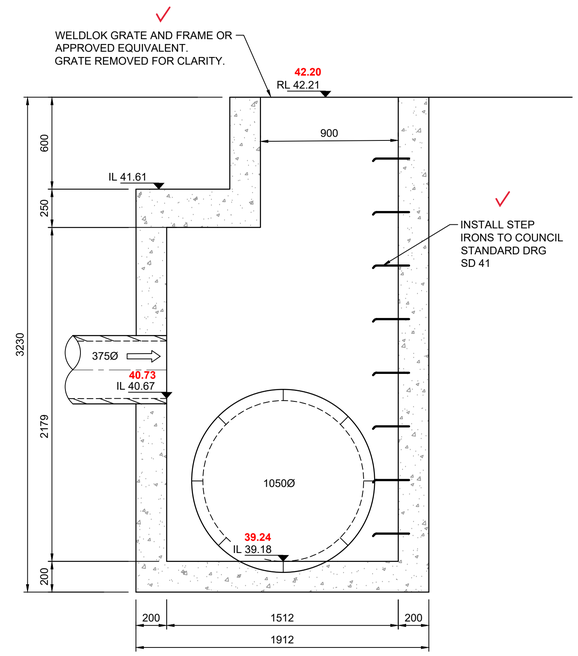


STRUCTURE 10/8

PLAN

SCALE 1:20

DETAILS SHOWN SUBJECT TO STRUCTURAL CERTIFICATION



SECTION A
SCALE 1:20
-

SECTION B
SCALE 1:20
-

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restin
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

1:20 (AT A1)
1:40 (AT A3)

400 200 0 400 800 1200 1600 2000
MILLIMETRES

C	TITLE AMENDED	MP	VS	RO	MS	21/07/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

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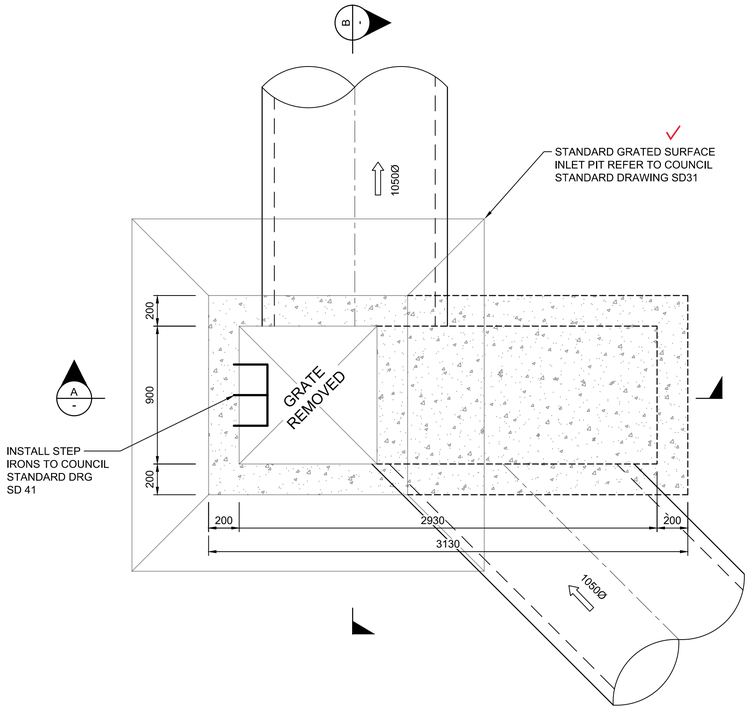
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SPECIAL PIT 10/8 DETAILS

PROJECT No: 110185-12

SHEET No: CC1403

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1403 C

Plotted: 21 July , 2021 2:34:36 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDCC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1403.dwg

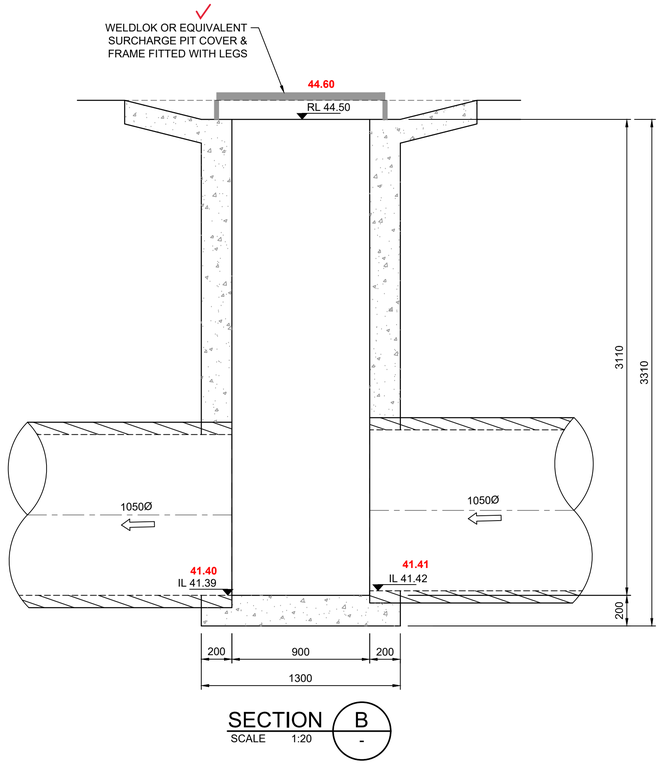


STRUCTURE 14/8

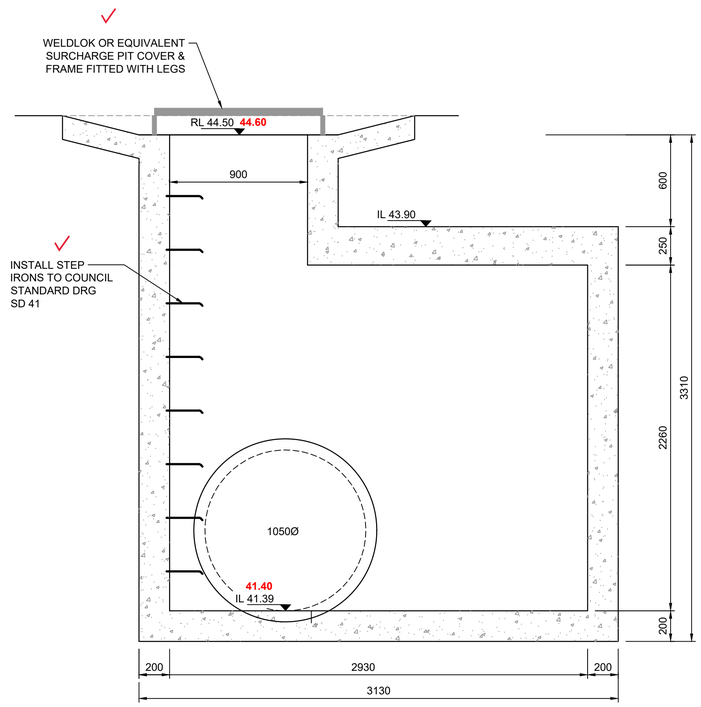
PLAN

SCALE 1:20

DETAILS SHOWN SUBJECT TO STRUCTURAL CERTIFICATION



SECTION B
SCALE 1:20



SECTION A
SCALE 1:20

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer

Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

1:20 (AT A1)
1:40 (AT A3)

400 200 0 400 800 1200 1600 2000
MILLIMETRES

B	TITLE AMENDED	MP	VS	RO	MS	21/07/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

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CLIENT: REDBANK NORTH RICHMOND

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SPECIAL PIT 14/8 DETAILS

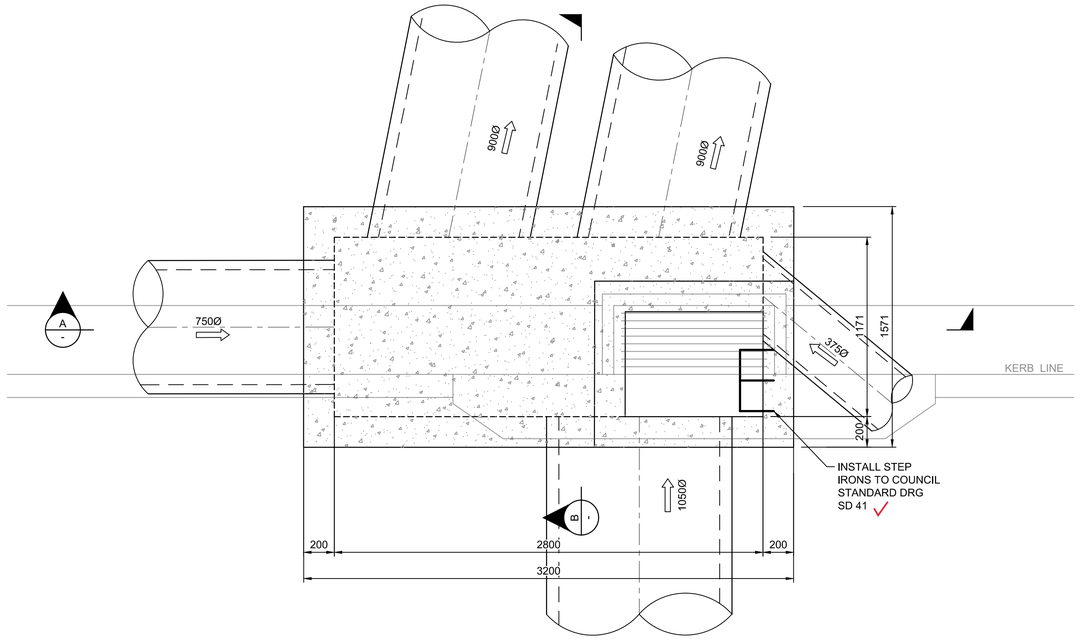
PROJECT No: 110185-12

SHEET No: CC1404

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN:

PLAN No: 110185-12-CC1404 B

Plotted: 21 July , 2021 2:35:12 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\C\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1404.dwg

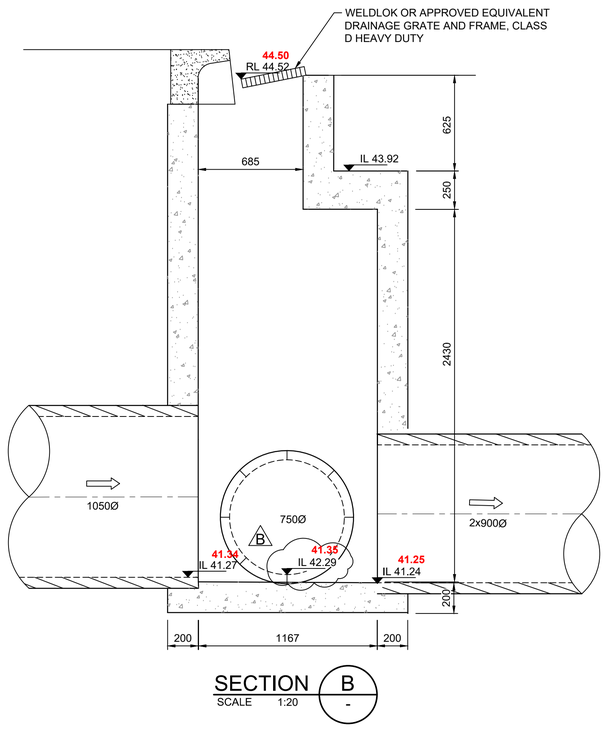


STRUCTURE 14/9

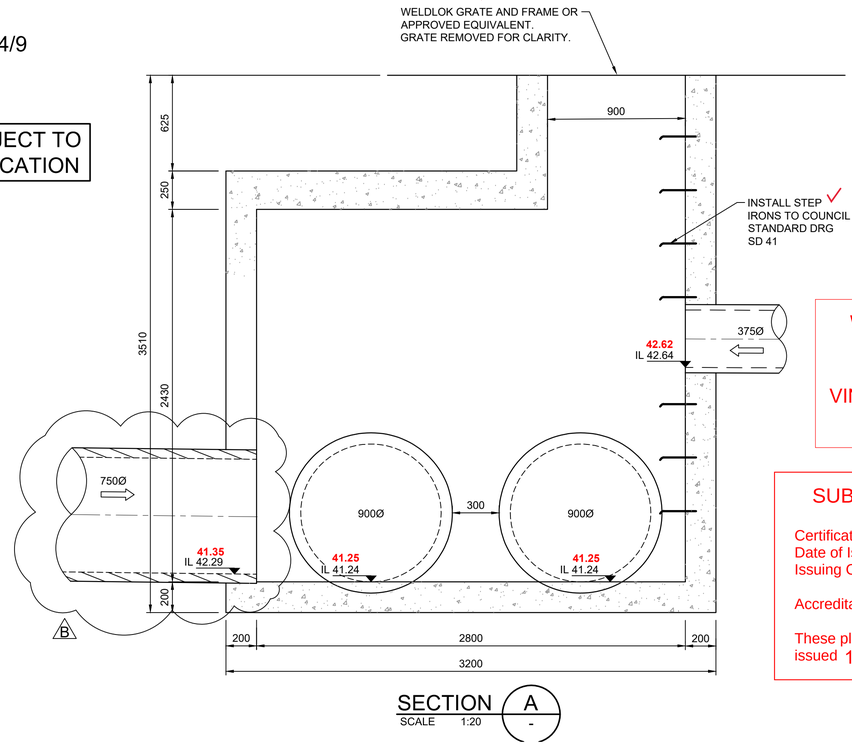
PLAN

SCALE 1:20

DETAILS SHOWN SUBJECT TO STRUCTURAL CERTIFICATION



SECTION B
SCALE 1:20



SECTION A
SCALE 1:20

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60

Date of Issue 10/08/2021

Issuing Officer

Accreditation No. BDC3367

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1:20 (AT A1)
1:40 (AT A3)

400 200 0 400 800 1200 1600 2000
MILLIMETRES

C	TITLE AMENDED	MP	VS	RO	MS	21/07/21
B	DRAINAGE REVISED FOR SEWERMAIN CROSSING	JET	JET	MP	RO	26/05/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

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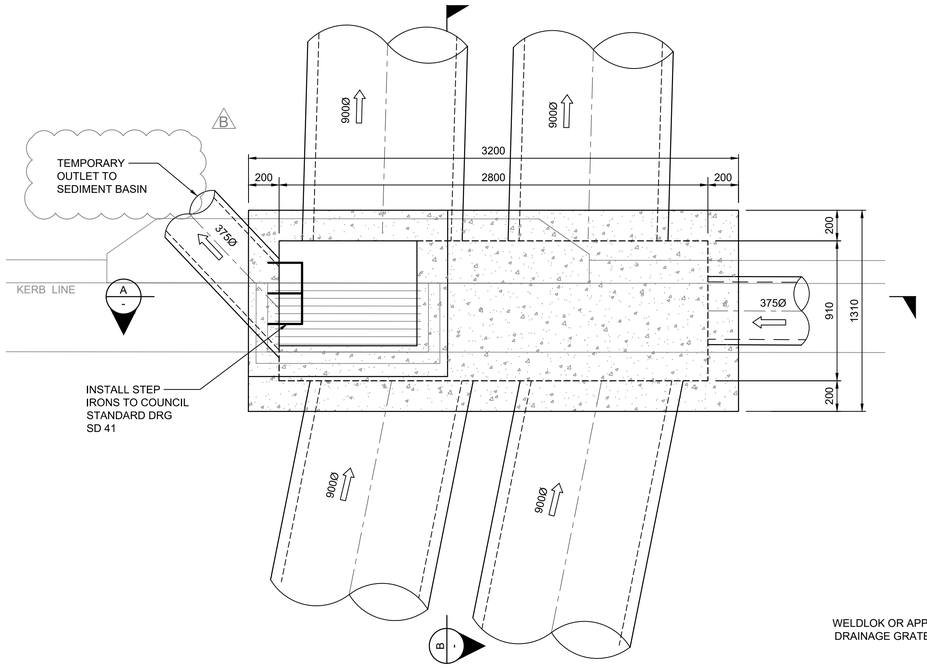
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SPECIAL PIT 14/9 DETAILS

PROJECT No: 110185-12

SHEET No: CC1405

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1405 C

Plotted: 21 July, 2021 2:35:51 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1405.dwg

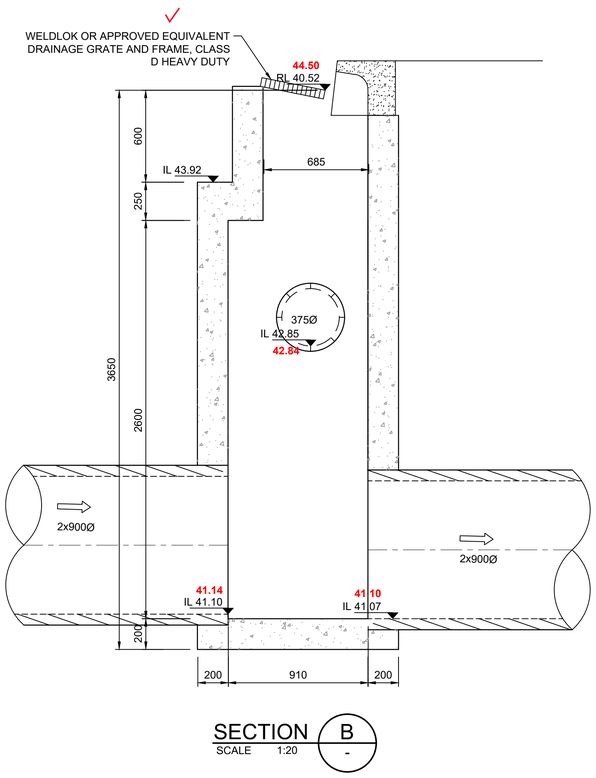


STRUCTURE 14/10

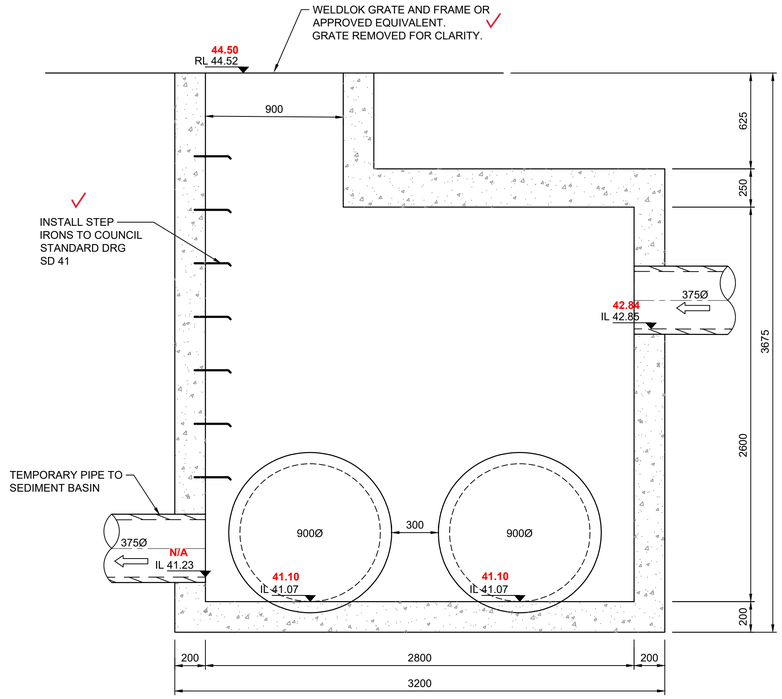
PLAN

SCALE 1:20

DETAILS SHOWN SUBJECT TO
STRUCTURAL CERTIFICATION



SECTION B
SCALE 1:20



SECTION A
SCALE 1:20

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

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Accreditation No. BDC3367

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1:20 (AT A1)
1:40 (AT A3)

400 200 0 400 800 1200 1600 2000
MILLIMETRES

	AMENDMENT	DES	DRN	CKD	APR	DATE
B	NOTE ADDED	MP	VS	RO	MS	21/07/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21

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CLIENT: REDBANK NORTH RICHMOND

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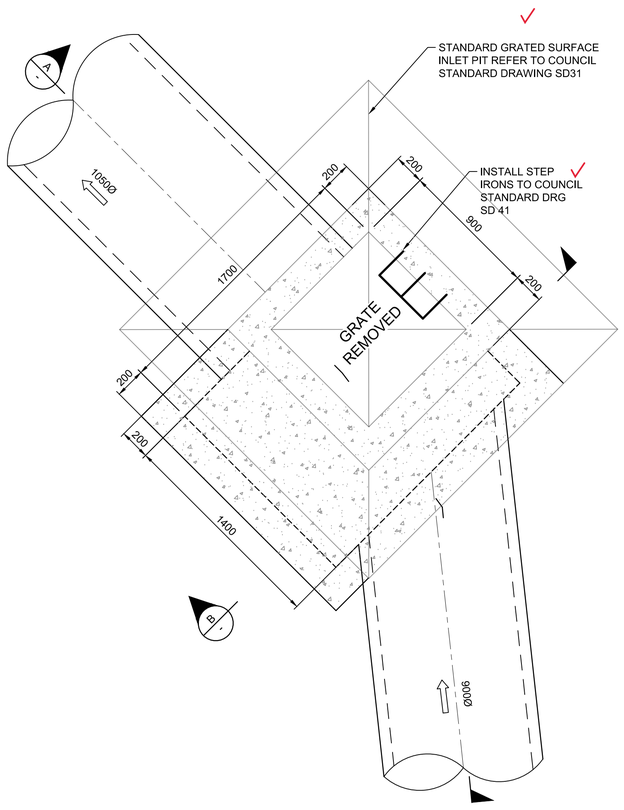
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SPECIAL PIT 14/10 DETAILS

PROJECT No: 110185-12

SHEET No: CC1406

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1406 B

Plotted: 21 July , 2021 2:36:30 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1406.dwg

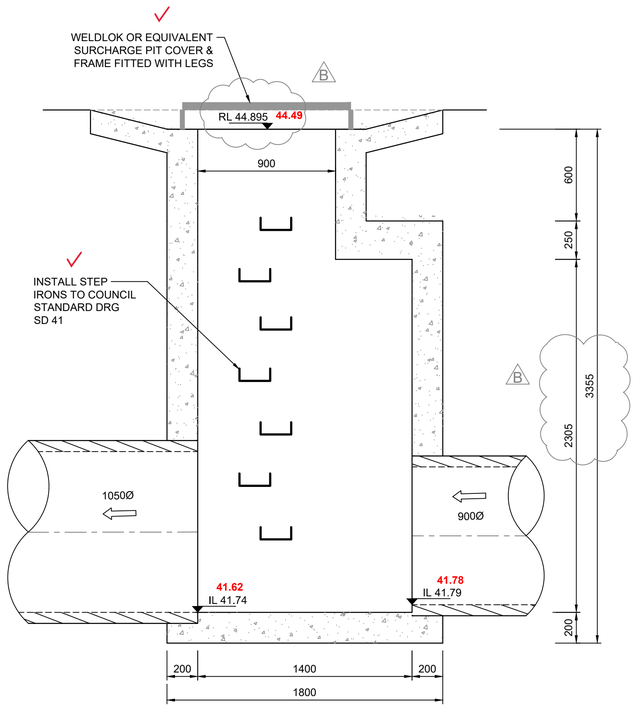


STRUCTURE 14/7

PLAN

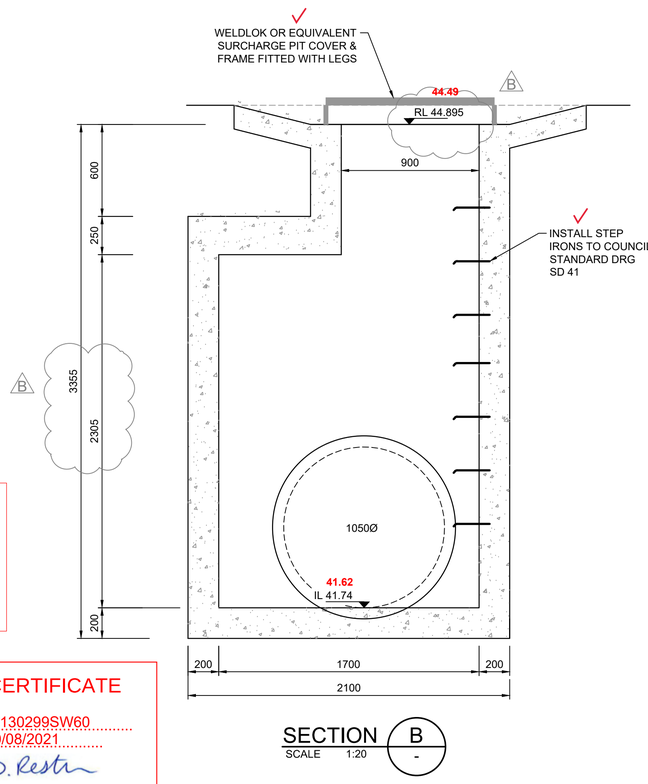
SCALE 1:20

DETAILS SHOWN SUBJECT TO STRUCTURAL CERTIFICATION



SECTION A

SCALE 1:20



SECTION B

SCALE 1:20

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60

Date of Issue 10/08/2021

Issuing Officer D. Restin

Accreditation No. BDC3367

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1:20 (AT A1)
1:40 (AT A3)

400 200 0 400 800 1200 1600 2000

MILLIMETRES

B	LEVEL CHANGED	MP	VS	RO	MS	21/07/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SPECIAL PIT 14/7 DETAILS

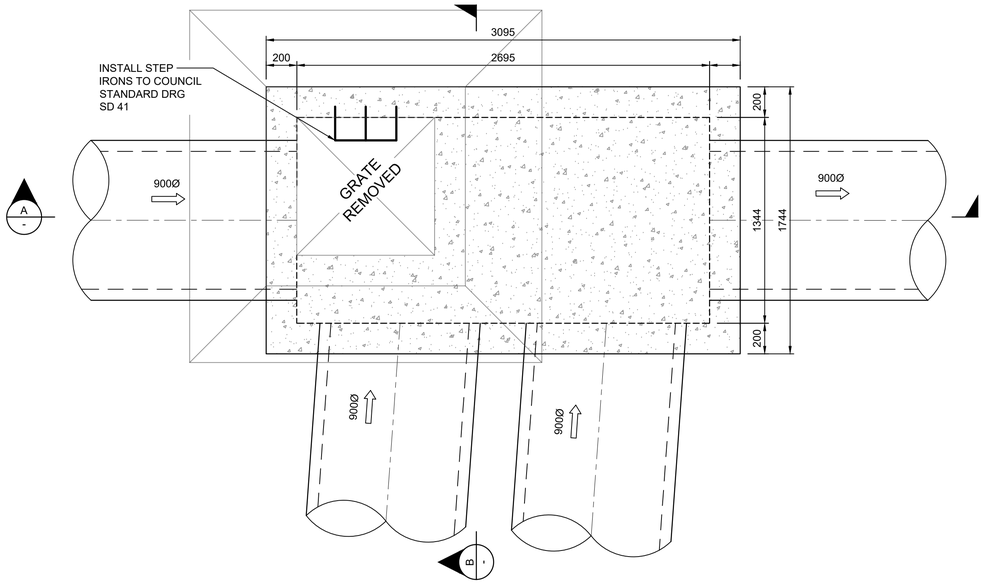
PROJECT No: 110185-12

SHEET No: CC1407

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN:

PLAN No: 110185-12-CC1407 B

Plotted: 21 July, 2021 2:37:09 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1407.dwg

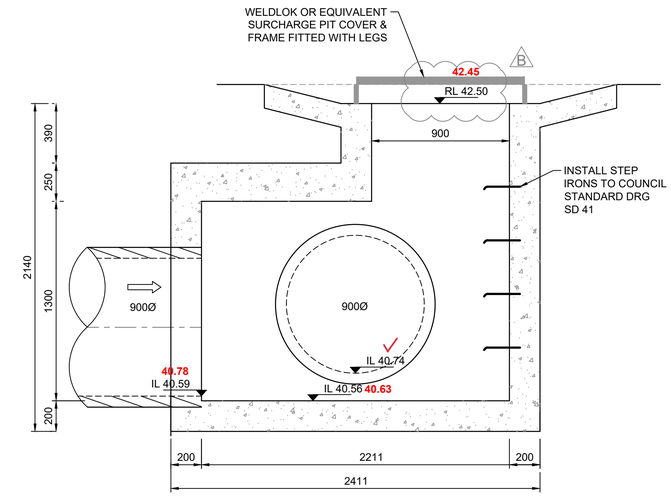


STRUCTURE 14/11

PLAN

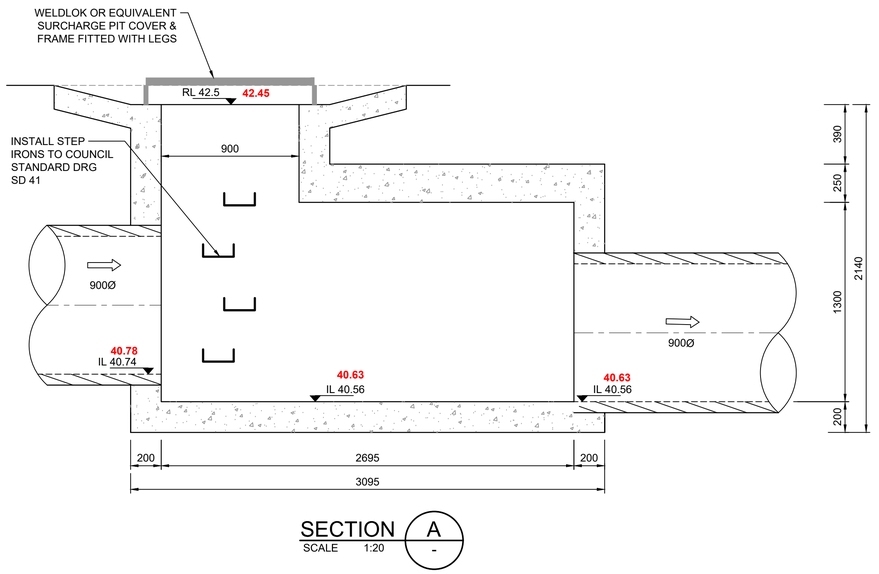
SCALE 1:20

DETAILS SHOWN SUBJECT TO STRUCTURAL CERTIFICATION



SECTION B

SCALE 1:20



SECTION A

SCALE 1:20

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60

Date of Issue 10/08/2021

Issuing Officer D. Restin

Accreditation No. BDC3367

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1:20 (AT A1)
1:40 (AT A3)

400 200 0 400 800 1200 1600 2000

MILLIMETRES

	AMENDMENT	DES	DRN	CKD	APR	DATE
B	LEVEL CHANGED	MP	VS	RO	MS	21/07/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SPECIAL PIT 14/11 DETAILS

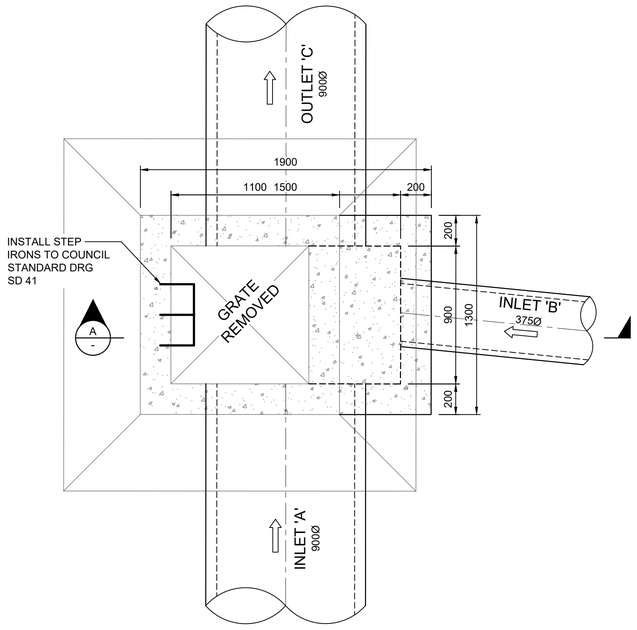
PROJECT No: 110185-12

SHEET No: CC1408

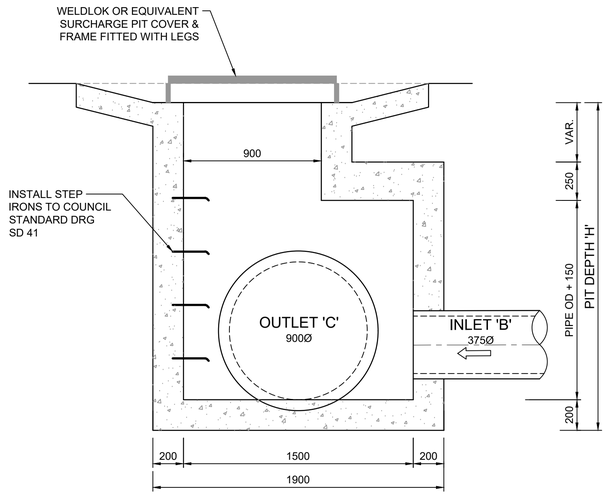
AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN:

PLAN No: 110185-12-CC1408 B

Plotted: 21 July , 2021 2:37:45 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1408.dwg



PLAN
SCALE 1:20



SECTION A
SCALE 1:20

DRAINAGE PIT TABLE

PIT No.	PIT GRATE LEVEL	PIPE INLET 'A' INVERT LEVEL	PIPE INLET 'B' INVERT LEVEL	PIPE OUTLET 'C' INVERT LEVEL	PIT DEPTH 'H'
14/2	50.944	48.667	49.078	48.637	2.31
14/3	49.916	47.629	48.039	47.599	2.32
14/4	48.578	46.333	46.908	46.303	2.27
14/5	47.008	44.538	45.509	44.508	2.50
14/6	45.684	42.928	- - -	42.898	2.79
14/12	43	39.99	- - -	39.96	3.04

DETAILS SHOWN SUBJECT TO STRUCTURAL CERTIFICATION

B

WORK AS EXECUTED SHOWN IN RED
SIGNATURE.....
PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR
VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE
Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restin
Accreditation No. BDC3367
These plans/specifications form part of the certificate issued 10th of August 2021

1:20 (AT A1)
1:40 (AT A3)
400 200 0 400 800 1200 1600 2000
MILLIMETRES

	AMENDMENT	DES	DRN	CKD	APR	DATE
B	DRAINAGE PIT TABLE AMENDED	MP	VS	RO	MS	21/07/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL
THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

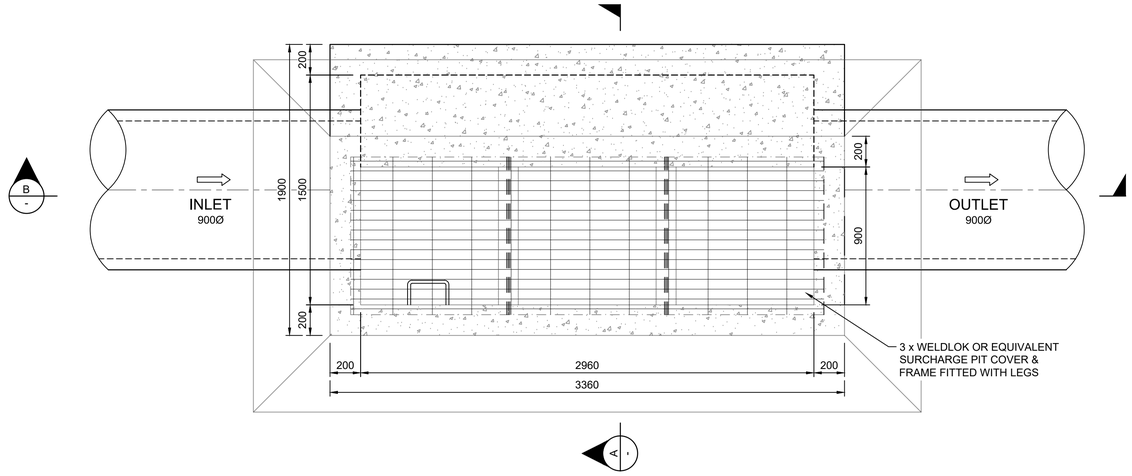
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SPECIAL PIT DETAILS

PROJECT No: 110185-12
SHEET No: CC1409

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1409 | B

Plotted: 21 July , 2021 2:38:24 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1409.dwg

SEE UPDATED PLANS DATED 3/3/2022
CERT NO 20130299SW72

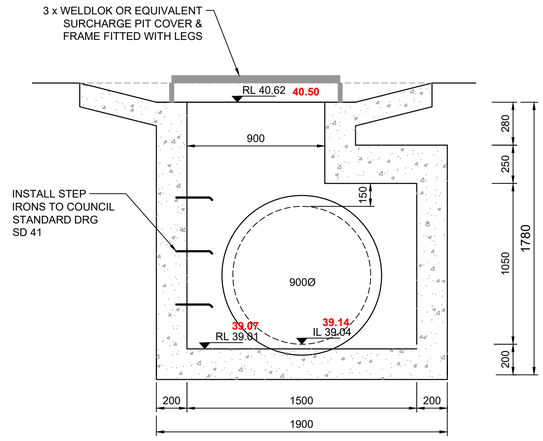


STRUCTURE 14/13

PLAN

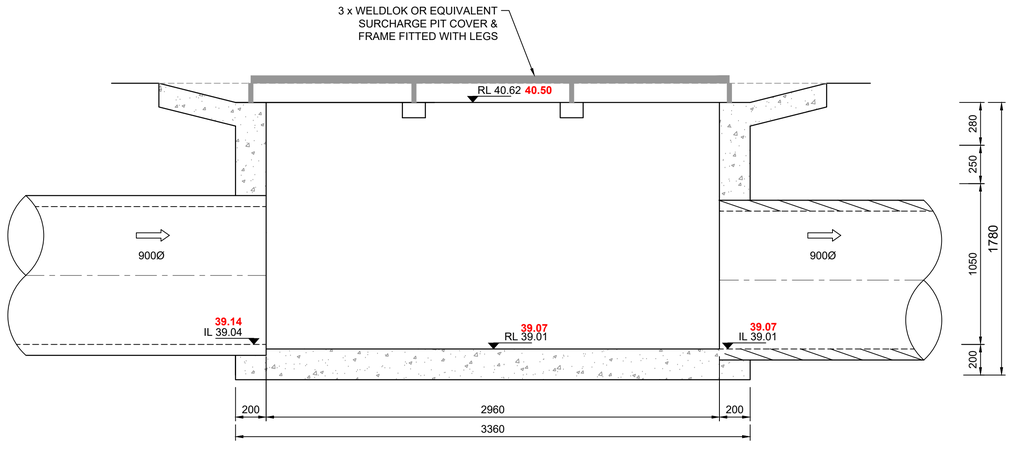
SCALE 1:20

DETAILS SHOWN SUBJECT TO STRUCTURAL CERTIFICATION



SECTION A

SCALE 1:20



SECTION B

SCALE 1:20

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

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Issuing Officer D. Restin

Accreditation No. BDC3367

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1:20 (AT A1)
1:40 (AT A3)

400 200 0 400 800 1200 1600 2000

MILLIMETRES

B	TITLE AMENDED	MP	VS	RO	MS	21/07/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SPECIAL PIT 14/13 DETAILS

PROJECT No: 110185-12

SHEET No: CC1410

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN:

PLAN No: 110185-12-CC1410 B

Plotted: 21 July, 2021 2:39:00 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1410.dwg

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60

Date of Issue 10/08/2021

Issuing Officer D. Restin

Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

DESIGN STORM 1:5yr ARI HYDROLOGIC RESULTS

PIT NAME	PIT TYPE	CATCHMENT AREA	IMPERVIOUS PERCENTAGE	RUNOFF C	IMPERVIOUS TIME Tc	IMPERVIOUS INTENSITY I	PERVIOUS TIME Tc	PERVIOUS INTENSITY I	FULL AREA TIME Tc	FULL AREA INTENSITY I	FULL AREA CATCHMENT FLOW Qc	PARTIAL AREA TIME Tc	PARTIAL AREA INTENSITY I	PARTIAL AREA CATCHMENT FLOW Qc	TOTAL CATCHMENT FLOW Qc	DIRECT FLOW Qd	APPROACH FLOW Qa	FLOODED DEPTH d	FLOODED WIDTH w	FLOODED (vxd)	ROAD GRADE	ROAD XFALL	CHOKE FACTOR	INLET FLOW Qg	BYPASS FLOW Qb	BYPASS PIT	COMMENTS
(-)	(-)	(ha)	(%)	(-)	(min)	(mm/hr)	(min)	(mm/hr)	(min)	(mm/hr)	(L/s)	(min)	(mm/hr)	(L/s)	(L/s)	(L/s)	(L/s)	(m)	(m)	(sq.m/s)	(%)	(%)	(-)	(L/s)	(L/s)	(-)	
1/1	1.8 m lintel	0.113	70	0.8	5	130.8	10	100.1	10	100.1	25	5	130.8	28	28	0	28	0.06	1.26	0.06	3.2	3	1	27	1	1/2	
1/2	1.8 m lintel	0.155	70	0.8	5	130.8	10	100.1	10	100.1	34	5	130.8	38	38	0	39	0.07	1.31	0.08	5	3	1	37	2	33/1	
1/3	1.8 m lintel	0.041	70	0.8	5	130.8	10	100.1	10	100.1	9	5	130.8	10	10	0	10	0.04	0.61	0.04	5	3	1	10	0	1/4	
1/4	1.8 m lintel	0.017	70	0.8	5	130.8	10	100.1	10	100.1	4	5	130.8	4	4	0	4	0.03	0.34	0.02	4.4	3	1	4	0	1/5	
1/5	1.8 m lintel	0.023	70	0.8	5	130.8	10	100.1	10	100.1	5	5	130.8	6	6	0	6	0.03	0.35	0.03	7.1	3	1	6	0	11/1	
1/6	1.8 m lintel	0.031	70	0.8	5	130.8	10	100.1	10	100.1	7	5	130.8	8	8	0	8	0.03	0.39	0.04	7.1	3	1	8	0	1/7	
1/7	1.8 m lintel	0.029	70	0.8	5	130.8	10	100.1	10	100.1	6	5	130.8	7	7	0	7	0.03	0.38	0.04	7.1	3	1	7	0	1/8	
1/8	1.8 m lintel	0.02	70	0.8	5	130.8	10	100.1	10	100.1	4	5	130.8	5	5	0	5	0.03	0.35	0.03	6.8	3	1	5	0	1/11	
1/9	NODE	0	0						0	0	0	0	0	0	0	0	0				6.6			0	0		DIRECT CONNECTION
1/10	NODE	0	0						0	0	0	0	0	0	0	0	0				6.2			0	0		DIRECT CONNECTION
1/11	1.8 m lintel	0.011	70	0.8	5	130.8	10	100.1	10	100.1	2	5	130.8	3	3	0	3	0.02	0.27	0.02	6	3	1	3	0	1/16	
1/12	NODE	0	0						0	0	0	0	0	0	0	0	0				5.8			0	0		DIRECT CONNECTION
1/13	NODE	0	0						0	0	0	0	0	0	0	0	0				5.6			0	0		DIRECT CONNECTION
1/14	NODE	0	0						0	0	0	0	0	0	0	0	0				5.1			0	0		DIRECT CONNECTION
1/15	NODE	0	0						0	0	0	0	0	0	0	0	0				5			0	0		DIRECT CONNECTION
1/16	1.8 m lintel	0.022	70	0.8	5	130.8	10	100.1	10	100.1	5	5	130.8	5	5	0	5	0.03	0.37	0.03	5	3	1	5	0	1/19	
1/17	NODE	0	0						0	0	0	0	0	0	0	0	0				5			0	0		DIRECT CONNECTION
1/18	NODE	0	0						0	0	0	0	0	0	0	0	0				5.5			0	0		DIRECT CONNECTION
1/19	1.8 m lintel	0	0						0	0	0	0	0	0	0	0	0				6.1	3	1	0	0	1/22	
1/20	NODE	0	0						0	0	0	0	0	0	0	0	0				6.5			0	0		DIRECT CONNECTION
1/21	NODE	0	0						0	0	0	0	0	0	0	0	0				7.3			0	0		DIRECT CONNECTION
1/22	1.8 m lintel	0.094	70	0.8	5	130.8	10	100.1	10	100.1	21	5	130.8	23	23	0	23	0.05	0.9	0.07	7.3	3	1	23	0	1/24	
1/23	NODE	0	0						0	0	0	0	0	0	0	0	0				7.3			0	0		DIRECT CONNECTION
1/24	1.8 m lintel	0.012	70	0.8	5	130.8	10	100.1	10	100.1	3	5	130.8	3	3	0	3	0.02	0.28	0.02	6.5	3	1	3	0	LOST	
1/25	1.8 m lintel	0.089	70	0.8	5	130.8	10	100.1	10	100.1	20	5	130.8	22	22	0	22	0.05	0.92	0.06	6.2	3	1	22	0	LOST	
1/26	2.4 m lintel sag																										EXISTING PIT
2/1	GSIP 900x900 SAG	0.678	40	0.8	5	130.8	10	100.1	10	100.1	151	5	130.8	138	151	0	151	0.09			5.6		1	151	0		
2/2	1.8 m lintel																										EXISTING END CAP
3/7	1.8 m lintel	0.122	70	0.8	5	130.8	10	100.1	10	100.1	27	5	130.8	30	30	0	30	0.06	1.01	0.08	8.5	2.8	1	30	0	4/2	
3/8	1.8 m lintel	0.122	70	0.8	5	130.8	10	100.1	10	100.1	27	5	130.8	30	30	0	31	0.06	1.09	0.08	7.5	3	1	31	0	3/9	
3/9	1.8 m lintel	0.125	70	0.8	5	130.8	10	100.1	10	100.1	28	5	130.8	31	31	0	31	0.06	1.32	0.07	4.6	3.2	1	30	1	3/10	
3/10	1.8 m lintel	0.071	70	0.8	5	130.8	10	100.1	10	100.1	16	5	130.8	18	18	0	19	0.03	3.2	0.02	1.6	3	1	19	0	3/11	
3/11	1.8 m lintel	0.108	70	0.8	5	130.8	10	100.1	10	100.1	24	5	130.8	27	27	0	27	0.06	1.03	0.07	6	3	1	27	0	1/25	
4/1	GSIP 900x900 SAG	0.116	20	0.8	5	130.8	10	100.1	10	100.1	26	5	130.8	20	26	0	26	0.03			6.8		1	26	0		
4/2	2.4 m lintel sag	0.061	70	0.8	5	130.8	10	100.1	10	100.1	14	5	130.8	15	15	0	15	0.03			1.8	4	1	15	0	3/10	
7/1	1.8 m lintel	0.053	70	0.8	5	130.8	10	100.1	10	100.1	12	5	130.8	13	13	0	16	0.05	0.8	0.05	5	3	1	16	0	3/11	
8/1	1.8 m lintel	0.151	70	0.8	5	130.8	10	100.1	10	100.1	34	5	130.8	37	37	0	41	0.07	1.06	0.1	6.7	2.9	1	38	3	7/1	
9/1	1.8 m lintel	0.172	70	0.8	5	130.8	10	100.1	10	100.1	38	5	130.8	43	43	0	45	0.06	1.36	0.09	7.4	2.9	1	42	4	8/1	
10/1	GSIP 5x900x900	0	0						0	0	0	0	0	0	0	0	0	0					1	0	0		DAM 8 OUTLET
10/2	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	0							0	0		
10/3	1.8 m lintel	0.213	70	0.8	5	130.8	10	100.1	10	100.1	47	5	130.8	53	53	0	53	0.07	1.37	0.1	8	3	1	49	3	10/4	
10/4	1.8 m lintel	0.215	70	0.8	5	130.8	10	100.1	10	100.1	48	5	130.8	53	53	0	57	0.07	1.46	0.11	7	3	1	51	3	10/5	
10/5	1.8 m lintel	0.109	70	0.8	5	130.8	10	100.1	10	100.1	24	5	130.8	27	27	0	33	0.06	1.22	0.07	5	3	1	32	1	10/6	
10/6	1.8 m lintel	0.114	70	0.8	5	130.8	10	100.1	10	100.1	25	5	130.8	28	28	0	30	0.06	1.15	0.07	5	3	1	29	1	10/7	
10/7	2.4 m lintel sag	0.135	70	0.8	5	130.8	10	100.1	10	100.1	30	5	130.8	33	33	0	34	0.04			1.4	2.5	1	33	2	LOST	
10/8	1.8 m lintel	0.06	70	0.8	5	130.8	10	100.1	10	100.1	13	5	130.8	15	15	0	15	0.05	0.94	0.04	2.7	3	1	15	0	LOST	
10/9	GPT	0	0						0	0	0	0	0	0	0	0	0							0	0		
10/10	H.W.																										
11/1	1.8 m lintel	0.173	70	0.8	5	130.8	10	100.1	10	100.1	38	5	130.8	43	43	0	43	0.06	1.27	0.09	7.1	3	1	40	3	9/1	
12/1	1.8 m lintel	0.081	70	0.8	5	130.8	10	100.1	10	100.1	18	5	130.8	20	20	0	20	0.06	1.09	0.05	2.8	3	1	20	0	LOST	
12/2	1.8 m lintel																										EXISTING ENDCAP
13/1	1.8 m lintel	0.117	70	0.8	5	130.8	10	100.1	10	100.1	26	5	130.8	29	29	0	29	0.06	0.96	0.08	8	11	1	29	0	21/1	
14/1	GSIP 5x900x900	0	0						0	0	0	0	0	0	0	0	0	0					1	0	0	14/2	DAM 7 OUTLET
14/2	JP GRATED 900 x 900	0	0						0	0	0	0	0	0	0	0	0					20	1	0	0	14/3	
14/3	JP GRATED 900 x 900	0	0						0	0	0	0	0	0	0	0	0					7.6	1	0	0	14/4	
14/4	GSIP 900x900	0.648	40	0.8	5	130.8	10	100.1	10	100.1	144	5	130.8	132	144	0	144	0.03	7.76	0.04			1	0	144	14/5	SURCHARGE PIT
14/5	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	144	0.02	2.81	0.1			1	0	144	14/6	
14/6	JP GRATED 900 x 900	0.414	50	0.8	5	130.8	10	100.1	10	100.1	92	5	130.8	90	92	0	236	0.01	0.03	13.7	4.9	-2.2	0.577	136	100	14/7	
14/7	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	100	0.03	5.88	0.03	0.1	-33	1	0	100	14/8	

WORK AS EXECUTED SHOWN IN RED

SIGNATURE

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21

REF: 16800-15

	AMENDMENT	DES	DRN	CKD	APR	DATE
D	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
C	DRAINAGE REVISED	JET	JET	MP	RO	23/03/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21

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STATUS: ISSUE FOR CONSTRUCTION APPROVAL

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
DRAINAGE CALCULATIONS
SHEET 1

PROJECT No: 110185-12

SHEET No: CC1411

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1411 | D

Plotted: 21 July , 2021 2:39:57 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1411.dwg

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restan
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

DESIGN STORM 1:5yr ARI HYDROLOGIC RESULTS

PIT NAME	PIT TYPE	CATCHMENT AREA	IMPERVIOUS PERCENTAGE	RUNOFF C	IMPERVIOUS TIME Tc	IMPERVIOUS INTENSITY I	PERVIOUS TIME Tc	PERVIOUS INTENSITY I	FULL AREA TIME Tc	FULL AREA INTENSITY I	FULL AREA CATCHMENT FLOW Qc	PARTIAL AREA TIME Tc	PARTIAL AREA INTENSITY I	PARTIAL AREA CATCHMENT FLOW Qc	TOTAL CATCHMENT FLOW Qc	DIRECT FLOW Qd	APPROACH FLOW Qa	FLOODED DEPTH d	FLOODED WIDTH w	FLOODED (vxd)	ROAD GRADE	ROAD XFALL	CHOKE FACTOR	INLET FLOW Qg	BYPASS FLOW Qb	BYPASS PIT	COMMENTS
(-)	(-)	(ha)	(%)	(-)	(min)	(mm/hr)	(min)	(mm/hr)	(min)	(mm/hr)	(L/s)	(min)	(mm/hr)	(L/s)	(L/s)	(L/s)	(L/s)	(m)	(m)	(sq.m/s)	(%)	(%)	(-)	(L/s)	(L/s)	(-)	
14/8	GSIP 900x900 SAG	0.268	50	0.8	5	130.8	10	100.1	10	100.1	60	5	130.8	58	60	0	160	0.09			0.1		1	160	0		
14/9	2.4 m lintel sag	0.138	70	0.8	5	130.8	10	100.1	10	100.1	31	5	130.8	34	34	0	34	0.04			0.1	3	1	34	0	14/10	
14/10	2.4 m lintel sag	0.14	70	0.8	5	130.8	10	100.1	10	100.1	31	5	130.8	35	35	0	35	0.04			0.1	3	1	35	0	14/11	
14/11	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	0						1	0	0	14/12	SURCHARGE PIT
14/12	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	0						0	-1327	1327	14/13	SURCHARGE PIT
14/13	GSIP 3x900x900	0	0						0	0	0	0	0	0	0	0	1327					25	0	-652	1979	LOST	SURCHARGE PIT
14E/1	CAPPED STUB	0	0						0	0	0	0	0	0	0	0	0							0	0		
15/1	1.8 m lintel	0.159	70	0.8	5	130.8	10	100.1	10	100.1	35	5	130.8	39	39	0	39	0.08	1.72	0.06	1.6	3	1	36	3	15/2	
15/2	1.8 m lintel	0.233	70	0.8	5	130.8	10	100.1	10	100.1	52	5	130.8	58	58	0	60	0.08	1.84	0.09	2.7	3	1	51	9	15/3	
15/3	1.8 m lintel	0.088	70	0.8	5	130.8	10	100.1	10	100.1	20	5	130.8	22	22	0	31	0.07	1.37	0.06	2.7	3	1	30	1	17/1	
16/1	1.8 m lintel	0.094	70	0.8	5	130.8	10	100.1	10	100.1	21	5	130.8	23	23	0	23	0.06	1.18	0.05	2.7	3	1	22	1	LOST	
17/1	2.4 m lintel sag	0.162	70	0.8	5	130.8	10	100.1	10	100.1	36	5	130.8	40	40	0	43	0.05			3.3	3	1	43	0	10/7	
19/1	1.8 m lintel	0.116	70	0.8	5	130.8	10	100.1	10	100.1	26	5	130.8	29	29	0	29	0.07	1.47	0.05	1.7	3	1	27	2	19/2	
19/2	1.8 m lintel	0.165	70	0.8	5	130.8	10	100.1	10	100.1	37	5	130.8	41	41	0	42	0.07	1.57	0.07	2.8	3	1	37	6	19/3	
19/3	1.8 m lintel	0.063	70	0.8	5	130.8	10	100.1	10	100.1	14	5	130.8	16	16	0	21	0.06	1.13	0.05	2.8	3	1	21	0	19/4	
19/4	2.4 m lintel sag	0.077	70	0.8	5	130.8	10	100.1	10	100.1	17	5	130.8	19	19	0	22	0.03			1	2.6	1	22	0	19/5	
19/5	1.8 m lintel	0.044	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11	0.04	0.46	0.05	5	7.6	1	11	0	19/6	
19/6	1.8 m lintel	0.136	70	0.8	5	130.8	10	100.1	10	100.1	30	5	130.8	34	34	0	34	0.06	1.23	0.07	5	3	1	32	1	17/1	
20/1	1.8 m lintel	0.087	70	0.8	5	130.8	10	100.1	10	100.1	19	5	130.8	21	21	0	21	0.06	1.13	0.05	2.8	3	1	21	0	19/5	
21/1	1.8 m lintel	0.176	70	0.8	5	130.8	10	100.1	10	100.1	39	5	130.8	43	43	0	43	0.06	1.28	0.09	7	3	1	41	3	19/4	
22/1	1.8 m lintel	0.239	70	0.8	5	130.8	10	100.1	10	100.1	53	5	130.8	59	59	0	59	0.09	2.27	0.07	1	3	1	51	8	26/2	
22/2	1.8 m lintel	0.068	70	0.8	5	130.8	10	100.1	10	100.1	15	5	130.8	17	17	0	17	0.07	1.3	0.04	1	3	1	17	0	14/10	
23/1	CAPPED STUB	1.493	70	0.8	5	130.8	10	100.1	10	100.1	332	5	130.8	369	369	0	369				1.7			369	0		FUTURE EXTENSION
26/1	1.8 m lintel	0.086	70	0.8	5	130.8	10	100.1	10	100.1	19	5	130.8	21	21	0	24	0.06	1.03	0.06	4.9	3	1	24	0	26/2	
26/2	2.4 m lintel sag	0.115	70	0.8	5	130.8	10	100.1	10	100.1	26	5	130.8	28	28	0	36	0.05			2.2	3.1	1	36	0	14/9	
26/3	2.4 m lintel sag	0.047	90	0.8	5	130.8	10	100.1	10	100.1	11	5	130.8	13	13	0	13	0.02			1.2	2.5	1	13	0	LOST	
27/1	1.8 m lintel	0.11	70	0.8	5	130.8	10	100.1	10	100.1	24	5	130.8	27	27	0	27	0.07	1.5	0.05	1.4	3	1	26	1	27/2	
27/2	1.8 m lintel	0.105	70	0.8	5	130.8	10	100.1	10	100.1	23	5	130.8	26	26	0	27	0.07	1.51	0.05	1.4	3	1	26	1	27/3	
27/3	2.4 m lintel sag	0.089	70	0.8	5	130.8	10	100.1	10	100.1	20	5	130.8	22	22	0	23	0.04			0.5	3	1	23	0	LOST	
27/4	2.4 m lintel sag	0.062	70	0.8	5	130.8	10	100.1	10	100.1	14	5	130.8	15	15	0	15	0			0.5	3	1	0	15	27/5	
27/5	1.8 m lintel	0.021	70	0.8	5	130.8	10	100.1	10	100.1	5	5	130.8	5	5	0	20	0.05	0.93	0.06	4.9	7.5	0.861	18	3	26/1	
27/6	1.8 m lintel	0.017	70	0.8	5	130.8	10	100.1	10	100.1	4	5	130.8	4	4	0	4	0.03	0.34	0.03	4.9	3	1	4	0	26/3	
28/1	1.8 m lintel	0.067	70	0.8	5	130.8	10	100.1	10	100.1	15	5	130.8	16	16	0	18	0.05	0.86	0.05	4.9	3	1	18	0	27/3	
28/2	1.8 m lintel	0.013	70	0.8	5	130.8	10	100.1	10	100.1	3	5	130.8	3	3	0	3	0.03	0.31	0.02	4.9	3	1	3	0	27/6	
29/1	1.8 m lintel	0.138	70	0.8	5	130.8	10	100.1	10	100.1	31	5	130.8	34	34	0	34	0.06	1.24	0.07	4.9	3	1	33	1	28/1	
29/2	1.8 m lintel	0.012	70	0.8	5	130.8	10	100.1	10	100.1	3	5	130.8	3	3	0	3	0.03	0.3	0.02	4.9	3	1	3	0	28/2	
30/1	1.8 m lintel	0.067	70	0.8	5	130.8	10	100.1	10	100.1	15	5	130.8	17	17	0	17	0.06	1.29	0.03	1	3	1	17	0	30/2	
30/2	1.8 m lintel	0.053	70	0.8	5	130.8	10	100.1	10	100.1	12	5	130.8	13	13	0	13	0.05	0.61	0.05	5	3.5	1	13	0	29/1	
30/3	1.8 m lintel	0.024	70	0.8	5	130.8	10	100.1	10	100.1	5	5	130.8	6	6	0	8	0.04	0.43	0.04	4.9	3	1	8	0	29/2	
31/1	1.8 m lintel	0.137	70	0.8	5	130.8	10	100.1	10	100.1	30	5	130.8	34	34	0	34	0.07	1.15	0.07	3.4	4.3	1	32	2	30/3	
32/1	GSIP 900x900 SAG	0.988	90	0.8	5	130.8	10	100.1	10	100.1	220	5	130.8	273	273	0	273	0.13				-1	1	273	0	32/2	
32/2	GSIP 900x900 SAG	0.076	70	0.8	5	130.8	10	100.1	10	100.1	17	5	130.8	19	19	0	19	0.02			0.4	-10	1	19	0	32/3	
32/3	2.4 m lintel sag	0.359	70	0.8	5	130.8	10	100.1	10	100.1	80	5	130.8	89	89	0	103	0.08			0.4	3	1	103	0	32/4	
32/4	2.4 m lintel sag	0.078	70	0.8	5	130.8	10	100.1	10	100.1	17	5	130.8	19	19	0	19	0.03			0.4	3	1	19	0	32/5	
32/5	GPT	0	0						0	0	0	0	0	0	0	0	0						1	0	0	LOST	
32/6	H.W.																										
33/1	1.8 m lintel	0.161	70	0.8	5	130.8	10	100.1	10	100.1	36	5	130.8	40	40	0	41	0.07	1.52	0.07	3	3	1	38	3	33/2	
33/2	1.8 m lintel	0.16	70	0.8	5	130.8	10	100.1	10	100.1	36	5	130.8	39	39	0	43	0.09	1.98	0.06	1	3	1	39	4	32/3	
34/1	1.8 m lintel	0.107	70	0.8	5	130.8	10	100.1	10	100.1	24	5	130.8	26	26	0	26	0.06	1.06	0.07	4.9	3	1	26	1	34/2	
34/2	1.8 m lintel	0.191	70	0.8	5	130.8	10	100.1	10	100.1	43	5	130.8	47	47	0	48	0.06	1.51	0.09	7.2	3	1	44	4	34/3	
34/3	1.8 m lintel	0.208	70	0.8	5	130.8	10	100.1	10	100.1	46	5	130.8	51	51	0	56	0.07	1.36	0.11	7.2	3.1	1	51	5	34/4	
34/4	1.8 m lintel	0.214	70	0.8	5	130.8	10	100.1	10	100.1	48	5	130.8	53	53	0	58	0.07	1.43	0.11	7.2	3	1	52	6	34/5	
34/5	1.8 m lintel	0.211	70	0.8	5	130.8	10	100.1	10	100.1	47	5	130.8	52	52	0	58	0.08	1.59	0.1	4.3	3	1	48	10	32/3	
34/6	1.8 m lintel	0.076	70	0.8	5	130.8	10	100.1	10	100.1	17	5	130.8	19	19	0	19	0.06	0.9	0.05	4.1	3	1	19	0	36/1	
35/1	1.8 m lintel	0.098	70	0.8	5	130.8	10	100.1	10	100.1	22	5	130.8	24	24	0	24	0.05	0.91	0.07	7.5	3	1	24	0	34/6	
36/1	1.8 m lintel	0.039	70	0.8	5	130.8	10	100.1	10	100.1	9	5	130.8	10	10	0	10	0.05	0.64	0.04	3	3	1	10	0	36/2	
36/2	2.4 m lintel sag	0.102	70	0.8	5	130.8	10	100.1	10	100.1	23	5	130.8	25	25	0	25	0.04			0.6	2.6	1	25	0	36/3	
36/3	2.4 m lintel sag	0.044	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11	0.02			0.3	3	1	11	0	37/6	
37/6	1.8 m lintel	0.041	70	0.8	5	130.8	10	100.1	10	100.1	9	5	130.8	10	10	0	10	0.06	1.01	0.03	0.9	3.3	1	10	0	LOST	

WORK AS EXECUTED SHOWN IN RED
SIGNATURE.....
ROBERT WARWICK
REGISTERED LAND SURVEYOR
VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21 REF: 16800-15

D	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
C	COUNCIL COMMENTS	MP	VS	RO	RO	16/06/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL
THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
DRAINAGE CALCULATIONS
SHEET 2

PROJECT No: 110185-12
SHEET No: CC1412

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1412 | D

Plotted: 21 July , 2021 2:40:53 PM File Name: \\wp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1412.dwg

DESIGN STORM 1:5yr ARI HYDROLOGIC RESULTS

PIT NAME	PIT TYPE	CATCHMENT AREA	IMPERVIOUS PERCENTAGE	RUNOFF C	IMPERVIOUS TIME Tc	IMPERVIOUS INTENSITY I	PERVIOUS TIME Tc	PERVIOUS INTENSITY I	FULL AREA TIME Tc	FULL AREA INTENSITY I	FULL AREA CATCHMENT FLOW Qc	PARTIAL AREA TIME Tc	PARTIAL AREA INTENSITY I	PARTIAL AREA CATCHMENT FLOW Qc	TOTAL CATCHMENT FLOW Qc	DIRECT FLOW Qd	APPROACH FLOW Qa	FLOODED DEPTH d	FLOODED WIDTH w	FLOODED (vxd)	ROAD GRADE	ROAD XFALL	CHOKE FACTOR	INLET FLOW Qg	BYPASS FLOW Qb	BYPASS PIT	COMMENTS
(-)	(-)	(ha)	(%)	(-)	(min)	(mm/hr)	(min)	(mm/hr)	(min)	(mm/hr)	(L/s)	(min)	(mm/hr)	(L/s)	(L/s)	(L/s)	(L/s)	(m)	(m)	(sq.m/s)	(%)	(%)	(-)	(L/s)	(L/s)	(-)	
A/1	IAD 450x450	0.046	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11							11	0		
A/2	SLOPE JUNCTION	0.046	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11							11	0		
A/3	IAD 450x450	0.046	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11							11	0		
A/4	SLOPE JUNCTION	0.047	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	12	12	0	12							12	0		
A/5	IAD 450x450	0.047	70	0.8	5	130.8	10	100.1	10	100.1	11	5	130.8	12	12	0	12							12	0		
A/6	SLOPE JUNCTION	0.049	70	0.8	5	130.8	10	100.1	10	100.1	11	5	130.8	12	12	0	12							12	0		
A/7	IAD 900x900	0.056	70	0.8	5	130.8	10	100.1	10	100.1	12	5	130.8	14	14	0	14							14	0		
A/8	IAD 450x450	0	0						0	0	0	0	0	0	0	0	0							0	0		
A/9	IAD 600x900	0.061	70	0.8	5	130.8	10	100.1	10	100.1	14	5	130.8	15	15	0	15				2.7			15	0		
B/1	IAD 450x450	0.045	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11							11	0		
B/2	IAD 600x900	0.045	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11							11	0		
B/3	SLOPE JUNCTION	0.047	70	0.8	5	130.8	10	100.1	10	100.1	11	5	130.8	12	12	0	12							12	0		
B/4	IAD 600x900	0.054	70	0.8	5	130.8	10	100.1	10	100.1	12	5	130.8	13	13	0	13				4.9			13	0		
C/1	IAD 450x450	0.045	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11							11	0		
C/2	IAD 450x450	0.046	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11							11	0		
C/3	IAD 450x450	0.048	70	0.8	5	130.8	10	100.1	10	100.1	11	5	130.8	12	12	0	12							12	0		
C/4	IAD 450x450	0.05	70	0.8	5	130.8	10	100.1	10	100.1	11	5	130.8	12	12	0	12							12	0		
C/5	IAD 900x900	0.063	70	0.8	5	130.8	10	100.1	10	100.1	14	5	130.8	16	16	0	16							16	0		
C/6	IAD 450x450	0	0						0	0	0	0	0	0	0	0	0							0	0		
C/7	IAD 600x900	0.046	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11				2.8			11	0		
D/1	IAD 450x450	0.045	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11							11	0		
D/2	IAD 450x450	0.044	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11							11	0		
D/3	SLOPE JUNCTION	0.044	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11							11	0		
D/4	IAD 450x450	0.044	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11							11	0		
D/5	SLOPE JUNCTION	0.046	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11							11	0		
D/6	IAD 900x900	0	0						0	0	0	0	0	0	0	0	0							0	0		
D/7	IAD 900x900	0	0						0	0	0	0	0	0	0	0	0				1.4			0	0		
H/13	IAD 900x900	0.068	70	0.8	5	130.8	10	100.1	10	100.1	15	5	130.8	17	17	0	17				3			17	0		
SH A/1	IAD 450x450	0.044	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11							11	0		
SH B/1	IAD 450x450	0.044	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11							11	0		
SH C/1	IAD 450x450	0.042	70	0.8	5	130.8	10	100.1	10	100.1	9	5	130.8	10	10	0	10							10	0		
SH D/1	IAD 450x450	0.045	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11							11	0		
SH E/1	IAD 450x450	0.042	70	0.8	5	130.8	10	100.1	10	100.1	9	5	130.8	10	10	0	10							10	0		
SH F/1	IAD 450x450	0.044	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11							11	0		
SH G/1	IAD 450x450	0.042	70	0.8	5	130.8	10	100.1	10	100.1	9	5	130.8	10	10	0	10							10	0		
SH H/1	IAD 450x450	0.043	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11							11	0		
SH J/1	IAD 450x450	0.044	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11							11	0		
SH K/1	IAD 450x450	0.043	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11							11	0		
SH L/1	IAD 450x450	0.044	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11							11	0		
SH M/1	IAD 450x450	0.05	70	0.8	5	130.8	10	100.1	10	100.1	11	5	130.8	12	12	0	12							12	0		

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

C	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
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PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
DRAINAGE CALCULATIONS
SHEET 3

PROJECT No: 110185-12
SHEET No: CC1413

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1413 C

Plotted: 21 July , 2021 2:41:48 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1413.dwg

DESIGN STORM 1:5yr ARI HYDRAULIC RESULTS

PIPE NAME	PIPE TYPE	PIPE DIAMETER	PIPE LENGTH	PIPE SLOPE	PIPE AREA Af	FULL AREA TIME Tc	FULL AREA INTENSITY I	FULL AREA SUM CA	FULL AREA FLOW Qc	PART-AREA TIME Tc	PART-AREA INTENSITY I	PART-AREA SUM CA	PART-AREA FLOW Qc	DIRECT PIPE FLOW Qp	PEAK FLOW Qrat	NET BYPASS FLOW Qb	PIPE FLOW Q	FLOW CAP. Qcap	Q/Qcap RATIO	FULL PIPE VELOCITY	NORM. DEPTH VELOCITY	CRIT. DEPTH VELOCITY	U/S PIT GRATE RL	PIPE U/S IL	PIPE D/S IL	PIPE D/S DROP	U/S PIT Ku	U/S PIT Kw	PIPE V'HEAD	PIT LOSS (Ku.V'head)	WSE LOSS (Kw.V'head)	TOTAL PIPE LOSS	U/S PIT HGL	U/S PIPE HGL	D/S PIPE HGL	HGL GRADE	MIN. COVER	U/S FREEBOARD	COMMENTS
(-)	(-)	(mm)	(m)	(%)	(sq.m)	(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)	(m)	(m)	(m)	(-)	(-)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(%)	(m)	(m)	
1/1 to 1/2	RRJ2	375	30.84	4.51	0.11	10	100.1	0.09	25	5	130.8	0.08	27.8	0	27.8	-0.8	27	403.4	0.07	0.24	2.08	0.91	62.566	61.058	59.668	0.05	4.5		0	0.01	0.01	1.36	61.447	61.433	60.069	4.42	1.06	1.12	
1/2 to 1/3	RRJ2	375	8.15	1.25	0.11	10.25	99.2	0.214	58.9	5.25	128.8	0.18	65.3	0	65.3	-1.8	63.5	212.5	0.3	0.57	1.68	1.18	61.117	59.618	59.516	0.05	4.5		0.02	0.08	0.08	0.11	60.069	59.993	59.883	1.35	1.14	1.05	
1/3 to 1/4	RRJ2	375	13.79	7.23	0.11	10.33	98.9	0.247	67.8	5.33	128.1	0.21	75.1	0	75.1	-1.8	73.3	511.1	0.14	0.66	3.28	1.24	61.04	59.466	58.469	0.051	1.85	2.29	0.02	0.04	0.05	0.99	59.893	59.841	58.848	7.21	1.13	1.15	
1/4 to 1/5	RRJ2	375	30.09	6.15	0.11	10.4	98.6	0.26	71.3	5.4	127.5	0.22	78.9	0	78.9	-1.8	77.1	471.4	0.16	0.7	3.15	1.26	59.98	58.419	56.567	0.03	2.16	2.5	0.02	0.05	0.06	1.73	58.856	58.794	57.059	5.77	1.1	1.12	
1/5 to 1/6	RRJ2	375	8.54	2.83	0.11	10.56	98	0.443	120.7	5.56	126.2	0.38	133.4	0	133.4	-1.8	131.6	319.7	0.41	1.19	2.75	1.56	58.017	56.537	56.296	0.05	2.03	2.39	0.07	0.15	0.17	0.1	57.085	56.912	56.814	1.15	1.1	0.93	
1/6 to 1/7	RRJ2	375	46	7.06	0.11	10.61	97.8	0.468	127.1	5.61	125.8	0.4	140.3	0	140.3	-1.8	138.5	504.8	0.27	1.25	3.9	1.6	57.804	56.246	53	0.05	2.41	2.73	0.08	0.19	0.22	3.08	56.839	56.621	53.539	6.7	1.06	0.96	
1/7 to 1/8	RRJ2	375	47.91	6.89	0.11	10.81	97	0.629	169.5	5.6	125.9	0.54	187.3	0	187.3	-4.3	182.9	498.9	0.37	1.66	4.17	1.86	54.543	52.95	49.647	0.031	1.53	1.83	0.14	0.21	0.26	3	53.58	53.325	50.326	6.26	1.1	0.96	
1/8 to 1/9	RRJ2	375	9.42	7	0.11	11	96.3	0.783	209.4	5.75	124.6	0.67	231.2	0	231.2	-5.3	225.9	502.7	0.45	2.05	4.43	2.15	51.192	49.617	48.958	0	1.56	1.79	0.21	0.33	0.38	0.66	50.373	49.992	49.333	7	1.09	0.82	
1/9 to 1/10	RRJ2	375	11.26	7	0.11	11.03	96.2	0.823	219.8	5.79	124.3	0.7	242.7	0	242.7	-5.3	237.4	502.7	0.47	2.15	4.49	2.24	50.603	48.958	48.17	0	0		0.24	0	0	0.78	49.333	49.333	48.553	6.92	1.23	1.27	
1/10 to 1/11	RRJ2	375	6.69	7	0.11	11.08	96	0.858	228.8	5.83	123.9	0.73	252.6	0	252.6	-5.3	247.3	502.7	0.49	2.24	4.53	2.32	49.875	48.17	47.702	0.046	0		0.26	0	0	0.11	48.553	48.553	48.44	1.69	1.29	1.32	
1/11 to 1/12	RRJ2	375	6.29	5	0.11	11.1	95.9	0.987	263	5.85	123.7	0.85	291	0	291	-5	285.9	424.9	0.67	2.59	4.13	2.63	49.431	47.657	47.342	0	1.19	1.35	0.34	0.41	0.46	0.31	48.495	48.032	47.717	5	1.29	0.94	
1/12 to 1/13	RRJ2	375	13.2	5	0.11	11.13	95.8	1.022	271.9	5.88	123.5	0.88	300.8	0	300.8	-5	295.8	424.9	0.7	2.68	4.16	2.71	49.063	47.342	46.682	0	0		0.37	0	0	0.66	47.717	47.717	47.057	5	1.2	1.35	
1/13 to 1/14	RRJ2	375	13.49	5	0.11	11.18	95.6	1.057	280.7	5.93	123.1	0.91	310.3	0	310.3	-5	305.3	424.9	0.72	2.76	4.18	2.79	48.289	46.682	46.008	0	0		0.39	0	0	0.67	47.057	47.057	46.383	5	1.15	1.23	
1/14 to 1/15	RRJ2	375	13.43	5	0.11	11.23	95.4	1.092	289.3	6.23	121.2	0.95	319.6	0	319.6	-5	314.6	424.9	0.74	2.85	4.21	2.87	47.57	46.008	45.336	0	0		0.41	0	0	0.67	46.383	46.383	45.711	5	1.15	1.19	
1/15 to 1/16	RRJ2	375	7.66	5	0.11	11.29	95.2	1.125	297.5	6.29	120.9	0.98	328.8	0	328.8	-5	323.8	424.9	0.76	2.93	4.23	2.95	46.897	45.336	44.953	0.075	0		0.44	0	0	0.27	45.711	45.711	45.439	3.55	1.15	1.19	
1/16 to 1/17	RRJ2	450	5.89	5.8	0.16	11.32	95.1	1.184	312.9	6.32	120.8	1.03	346.1	0	346.1	-1.8	344.3	744.2	0.46	2.16	4.59	2.3	46.514	44.878	44.537	0	0.47	0.51	0.24	0.11	0.12	0.34	45.451	45.328	44.986	5.8	1.08	1.06	
1/17 to 1/18	RRJ2	450	13.58	5.8	0.16	11.34	95	1.22	321.9	6.34	120.6	1.06	356.2	0	356.2	-1.8	354.4	744.2	0.48	2.23	4.62	2.35	46.219	44.536	43.749	0	0		0.25	0	0	0.43	44.986	44.986	44.559	3.15	1.19	1.23	
1/18 to 1/19	RRJ2	450	7.76	5.8	0.16	11.39	94.8	1.253	330.1	6.17	121.5	1.08	365.4	0	365.4	-1.8	363.6	744.2	0.49	2.29	4.65	2.4	45.66	43.749	43.299	0.15	0		0.27	0	0	0.11	44.559	44.559	44.452	1.38	1.36	1.1	
1/19 to 1/20	RRJ2	600	5.87	7	0.28	11.41	94.7	2.709	712.8	6.17	121.6	2.33	787.4	0	787.4	-1.8	785.6	1760.7	0.45	2.78	6.05	2.88	45.054	43.149	42.738	-0.007	1.78	1.91	0.39	0.7	0.75	0.4	44.501	43.749	43.345	6.88	1.19	0.55	
1/20 to 1/21	RRJ2	600	13.52	7	0.28	11.43	94.7	2.745	721.7	6.18	121.5	2.36	797.4	0	797.4	-1.8	795.6	1760.6	0.45	2.81	6.07	2.91	44.682	42.745	41.799	0	0		0.4	0	0	0.95	43.345	43.345	42.399	7	1.29	1.34	
1/21 to 1/22	RRJ2	600	7.39	7	0.28	11.47	94.5	2.779	729.6	6.22	121.3	2.39	806.2	0	806.2	-1.8	804.4	1760.6	0.46	2.84	6.08	2.94	43.739	41.799	41.281	0.05	0		0.41	0	0	0.42	42.399	42.399	41.977	5.7	1.29	1.34	
1/22 to 1/23	RRJ2	600	6.42	5.7	0.28	11.49	94.4	2.854	748.6	6.24	121.2	2.46	827.8	0	827.8	-1.8	826	1588.8	0.52	2.92	5.67	3.01	43.197	41.231	40.865	0	0.34		0.44	0.15	0.15	0.31	41.977	41.831	41.521	4.82	1.22	1.22	
1/23 to 1/24	RRJ2	600	15.58	5.7	0.28	11.51	94.4	2.889	757.4	6.26	121.1	2.49	837.7	0	837.7	-1.8	835.9	1588.8	0.53	2.96	5.69	3.04	42.727	40.865	39.977	0.05	0		0.45	0	0	0.25	41.521	41.521	41.276	1.58	1.1	1.21	
1/24 to 1/25	RRJ2	600	9.52	4.41	0.28	11.55	94.2	2.934	767.8	6.3	120.8	2.53	849.3	0	849.3	-1.8	847.5	1397.9	0.61	3	5.18	3.07	41.642	39.927	39.507	0.076	0.9		0.46	0.41	0.41	0.15	41.276	40.863	40.709	1.62	1.09	0.37	
1/25 to 1/26	RRJ3	675	28.9	4.32	0.36	11.58	94.1	3.005	785.3	6.33	120.6	2.59	869.2	0	869.2	-1.8	867.4	1893.8	0.46	2.42	5.17	2.64	41.317	39.432	38.183	0	2.01	2.28	0.3	0.6	0.68	0.4	40.791	40.107	39.703	1.4	1.1	0.53	
2/1 to 2/2	RRJ2	375	12.04	3.13	0.11	10	100.1	0.543	150.9	5	130.8	0.38	138	0	150.9	0	150.9	336	0.45	1.37	2.96	1.67	39.929	38.949	38.573	1.242	4.5		0.04	0.16	0.16	0.03	39.929	39.768	39.74	0.24	0.59	0	
3/7 to 3/8	RRJ2	450	11.83	5.03	0.16	10.62	97.7	0.973	264.2	5.45	127.1	0.83	293.9	0	293.9	-1.3	292.6	692.8	0.42	1.84	4.17	2.05	49.342	47.656	47.062	0.03	2.02	2.11	0.17	0.35	0.36	0.23	48.471	48.106	47.879	1.92	1.17	0.87	
3/8 to 3/9	RRJ2	450	34.32	6	0.16	10.67	97.5	1.071	290.2	5.5	126.7	0.92	322.7	0	322.7	-0.3	322.4	757	0.43	2.03	4.57	2.19	48.658	47.032	44.972	0.051	1.9	2.11	0.21	0.4	0.44	1.83	47.924	47.482	45.652	5.33	1.05	0.73	
3/9 to 3/10	RRJ2	450	21.46	3.71	0.16	10.8	97.1	1.171	315.7	5.55	126.2	1	350.4	0	350.4	-1.1	349.3	595.5	0.59	2.2	3.89	2.32	46.599	44.922	44.125	0.075	0.67		0.25	0.17	0.17	0.27	45.652	45.487	45.213	1.28	1.1	0.95	
3/10 to 3/11	RRJ2	525	14.24	3.87	0.22	10.89	96.7	1.37	368.1	5.65	125.5	1.15	400.9	0	400.9	0	400.9	916.7	0.44	1.85	4.09	2.13	45.688	44.05	43.499	0.05	1.55	1.75	0.17	0.27	0.31	0.11	45.246	44.941	44.835	0.74	1.23	0.44	
3/11 to 1/19	RRJ2	525	8.04	2.8	0.22	10.95	96.5	1.456	390.3	5.7	125	1.23	425.4	0	425.4	0	425.4	779.9	0.55	1.97	3.68	2.2	45.101	43.449	43.224	0.075	1.61	1.73	0.2	0.32	0.34	0.07	44.859	44.519	44.452	0.83	1.14	0.24	
4/1 to 4/2	RRJ2	375	8.25	1	0.11	10	100.1	0.093	25.9	5	130.8	0.06	20.3	0	25.9	0	25.9	190	0.14	0.23	1.2	0.9	45.467	44.396	44.314	0.031	4.5		0	0.01	0.01	0	45.26	45.247	45.245	0.02	0.77	0.21	
4/2 to 3/10	RRJ2	375	8.37	1	0.11	10.11	99.7	0.142	39.4	10	100.1	0.14	39.3	0	39.4	0	39.4	190	0.21	0.36	1.36	1.02	45.747	44.284	44.2	0.151	4.5		0.01	0.03	0.03	0	45.245	45.216	45.213	0.04	1.12	0.5	
7/1 to 1/16	RRJ2	375	9.2	3.45	0.11	10	100.1	0.042	11.7	5	130.8	0.04	13	0	13	3.2	16.2	352.9	0.05	0.15	1.62	0.79	46.74	45.27	44.953	0.075	4.5		0	0	0	0.21	45.65	45.645	45.439	2.24	1.09	1.09	
8/1 to 1/11	RRJ2	375	9.01	5	0.11	10	100.1	0.121	33.5	5	130.8	0.1	37.2	0	37.2	0.3	37.5	424.9	0.09	0.34	2.37	1	49.685	48.152	47.702	0.046	4.5		0.01	0.03	0.03	0.09	48.553	48.527	48.44	0.96	1.14	1.13	
9/1 to 1/8	RRJ2	375	10.88	4.93	0.11	10	100.1	0.138	38.3	5	130.8	0.12	42.5	0	42.5	-1	41.6	421.8	0.1	0.38	2.43	1.04	51.707	50.183	49.647	0.031	4.5		0.01	0.03	0.03	0.23	50.591	50.558	50.326	2.14	1.1	1.12	
10/1 to 10/2	RRJ2	900	84.15	2	0.64	5	130.8	0	0	5	130.8	0	0	2011	2011	0	2011	2772.2	0.73	3.16	4.75	3.33	54.4	52.417	50.737	0.051	4.5		0.24	1.08	1.08	0.78	54.4	53.317	52.538	0.93	0.99	0	
10/2 to 10/3	RRJ2	900	37.57	4.25	0.64	5.3	128.4	0	0	5.3	128.4	0	0	2011	2011	0	2011	4044.5	0.5	3.16	6.35	3.33	53.439	50.687	49.091	0.05	1.86	2.07	0.51	0.95	1.05	1.39	52.642	51.587	50.194	3.71	1.25	0.8	
10/3 to 10/4	RRJ2	900	52.2	7.77	0.64	10.08	99.8	0.265	73.3	5.08	130.1	0.23	81.4	2011	2092.4	-3.8	2088.6	5470.2	0.38	3.28	8.02	3.43	51.203	49.041	44.983	0.05	0.46	0.5	0.55	0.25	0.27	3.86	50.215	49.941	46.084	7.39	1.1	0.99	
10/4 to 10/5	RRJ2	900	29.41	5.08	0.64	10.19	99.4	0.577	159.3	5.11	129.9	0.49	176.7	2011	2187.7	-8.8	2179	4420.6	0.49	3.43	6.92	3.55	47.131	44.933	43.44	0.05	0.42	0.45	0.6	0.25	0.27	1.38	46.101	45.833	44.456	4.68	1.04	1.03	
10/5 to 10/6	RRJ2	900	26.71	5.14	0.64	10.26	99.1	0.664	182.7	5.18	129.3	0.56	202.6	2011	2213.6	-4	2209.6	4449	0.5	3.47	6.98	3.59	45.417	43.39	42.017	0.05	0.27		0.62	0.17	0.17	0.96	44.456	44.29	43.325	3.61	1	0.96	
10/6 to 10/7	RRJ2	900	44.94	5	0.64	11.22	95.5	1.544	409.3	5.56	126.2	1.31	458.4	2011	2469.4	-2.3	2467.1	4387.2	0.56	3.88	7.1	3.95	44.092	41.967	39.72	0.051	0.6	0.68	0.77	0.46	0.52	1.8	43.388	42.867	41.071	4	1.1	0.7	
10/7 to 10/8	RRJ2	1050	19.74	2.32	0.87	11.33	95.1	1.781	470.2	5.65	125.4	1.51	527.1	2011	2538.1	-0.3	2537.7	4507	0.56	2.93	5.36	3.22	42.046	39.67	39.212	0.031	0.55	0.65	0.44	0.24	0.28	0.15	41.114	40.831	40.686	0.74	1.27	0.93	
10/8 to 10/9	RRJ2	1050	41.96	2	0.87	11.39	94.8	2.606	686.4	5.82	124	2.23	766.5	2011	2777.5	-2.1	2775.4	4185.4	0.66	3.21	5.17	3.43	42.216	39.182	38.343	0.031	0.79	0.93	0.52	0.41	0.49	0.37	40.758	40.272	39.903	0.88	1.26	1.46	
10/9 to 10/10	RRJ2	(2x)1200	21.26	1	2.26	12.77	90.2	6.594	1652.3	7.1	116.3	5.65	1824.3	4581	6405.3	-1981.2	4424.2	8550.1	0.52	1.96	3.78	2.69	40.702	38.313	38.1		2		0.2	0.39	0.39	0.26	39.903	39.513	38.717	3.74		0.8	
11/1 to 1/7	RRJ2	375	8.06	1.25	0.11	10	100.1	0.138	38.5	5	130.8	0.12	42.7	0	42.7	-2.5	40.2	212.5	0.19	0.36	1.48	1.03	54.614	53.139	53.038	0.089	4.5		0.01	0.03	0.03	0	53.573	53.543	53.539	0.04	1.12	1.04	
12/1 to 12/2	RRJ2	375	37.78	3.43	0.11	10	100.1	0.064	17.9	5	130.8	0.05	19.9	0	19.9	0	19.9	351.8	0.06	0.18	1.72	0.84	41.411	39.868	38.573		4.5		0	0.01	0.01	0.5	40.25	40.243	39.74	1.33	1.1	1.16	
13/1 to 10/3	RRJ2	375	8	2	0.11	10	100.1	0.094	26.1	5	130.8	0.08	29	0	29	0	29	268.7	0.11	0.26	1.59	0.93	51.226	49.776	49.616	0.576	4.5		0	0.02	0.02	0	50.211	50.195	50.194	0.02	1.1	1.01	
14/1 to 14/2	RRJ2	900	52.28	3.5	0.64	5	130.8	0	0	5	130.8	0	0	2070	2070	0	2070	3670.4	0.56	3.25	5.94	3.4	54.4	50.497	48.667	0.031	4.5		0.54	2.43	2.43	1.62	53.828	51.397	49.782	3.09	1.27	0.57	
14/2 to 14/3	RRJ2	900	22.83	4.42	0.64	11	96.3	0.225	60.2	6	122.5	0.19	66.4	2070	2136.4	0	2136.4	4122.6	0.52	3.36	6.54	3.49	50.944	48.637	47.629	0.031	0.36	0.4	0.58	0.21	0.23	0.27	49.804	49.573	49.303	1.19	1.27	1.14	
14/3 to 14/4	RRJ2	900	26.23	4.83	0.64	11.06	96.1	0.345	92.1	5.41	127.4	0.29	102.1	2070	2172.1	-1.4	2170.7	4310.5	0.5	3.41	6.79	3.54	49.916	47.599	46.333	0.031	1.35	1.54	0.59	0.8	0.91	0.33	49.413	48.499	48.17	1.26	1.23	0.5	
14/4 to 14/5	RRJ2	900	32.09	5.5	0.64	11.12	95.8	0.927	246.8	10	100.1	0.92	256.3	2070	2326.3	-144.2	2182.2	4601.4	0.47	3.43	7.14	3.55	48.578	46.303	44.538	0.03	1.61	1.78	0.6	0.97	1.07	0.6	48.272	47.203	46.607	1.86	1.29	0.31	
14/5 to 14/6	RRJ2	900	29.7	5.32	0.64	11.28	95.2	1.429	378	6.28	121	1.19	400.7	2070	2470.7	-147	2323.7	4526	0.51	3.65	7.16	3.75	47.008	44.508	42.928	0.031	0.87	0.98	0.68	0.59	0.66	0.42	46.68	46.015	45.599	1.4	1.53	0.33	
14/6 to 14/7	RRJ2	900	25.4	4.36	0.64	11.35	95	1.76	464.2	6.35	120.6	1.46	490	2070	2560	-102.9	2457.2	4096.8	0.6	3.86	6.73	3.94	45.684	42.898	41.79	0.051	0.57	0.64	0.76	0.44	0.48	0.4	45.645	45.161	44.763	1.57	1.79	0.04	
14/7 to 14/8	RRJ2	1050	7.56	4.2	0.87	11.41	94.7	1.76	463.1	6.41	120.2	1.46	488.6	2070	2558.6	-102.9	2455.7	6065.1	0.4	2.84	6.63	3.16	44.895	41.74	41.423	0.031	1.51	1.6	0.41	0.62	0.66	0.05	44.799	44.143	44.091	0.69	1.93	0.1	
14/8 to 14/9	RRJ2	1050	4.27	3	0.87	11.43	94.7	1.974	519	6.43	120.1	1.64	546.9	2070	2616.9	-2.9	2614	5126.1	0.51	3.02	5.95	3.29	44.5	41.393	41.265	0.031	1.65	1.77	0.46	0.77	0.82	0.03	44.148	43.324	43.291	0.78	1.98	0.35	
14/9 to 14/10	RRJ2	(2x)900	11	1.25	1.27	11.44	94.6	3.631	954.2	5.72	124.9	2.99	1038.4	2070	3108.4	7.7	3116.1	4387.2	0.71	2.45	3.74	2.8	44.517	41.235	41.097	0.031	1	1.13	0.31	0.31	0.35	0.07	43.33	42.985	42.915	0.63	2.39	1.19	
14/10 to 14/11	RRJ2	(2x)900	47.24	1	1.27	11.49	94.4	3.988	1046	5.76	124.5	3.3	1141.8	2070	3211.8	0	3211.8	3924.7	0.82	2.52	3.44	2.85	44.517	41.067	40.595	0.029	0.44	0.47	0.33	0.14	0.15	0.32	42.926	42.772	42.456	0.67	0.93	1.59	
14/11 to 14/12	RRJ2	900	57.67	1	0.64	11.72	93.6	3.988	1036.3	6.52	119.6	3.4	1128.7	2570	3698.7	0	3698.7	1962	1.89	5.81	5.81	5.82	42.6	40.566	39.99	0.031	1.98	2.37	0.11	0.22	0.27	0.13	42.5	42.234	42.1	0.23	0.97	0.1	
14/12 to 14/13	RRJ3	900	90.9	1.01	0.64	11.89	92.9	3.988	1029.4	6.69	118.7	3.4	1119.9	2570	3689.9	-1327	2363	1968.9	1.2	3.71	3.71	3.8	42.1	39.96	39.044	0.031	0.22		0.7	0.16	0.16	1.32	42.1	41.941	40.623	1.45	0.59	0	
14/13 to 10/9	RRJ3	900	83.16	0.7	0.64	12.29	91.6	3.988	1014.9	7.09	116.4	3.4	1098.4	2570	3668.4	-1979	1689.3	1641.5	1.03	2.66	2.93	2.94	40.623	39.014	38.432	0.12	0.25	0.26	0.36	0.09	0.09	0.62	40.614	40.52	39.903	0.74	0.64	0.01	
14E/1 to 14/11	RRJ2	900	13.72	1	0.64	5	130.8	0	0	5	130.8	0	0	500	500	0	500	1962	0.25	0.79	2.58	1.76	42.5	40.882	40.745	0.179	0		0.03	0	0	0.01	42.465	42.465	42.456	0.06	0.65	0.04	
15/1 to 15/2	RRJ2	375	57.97	2.35	0.11	10	100.1	0.127	35.4	5	130.8	0.11	39.3	0	39.3	-2.9	36.5	291.5	0.13	0.33	1.8	1	44.941	43.362	41.998	0.031	4.5		0.01	0.03	0.03	1.05	43.762	43.737	42.683	1.82	1.14	1.18	
15/2 to 15/3	RRJ2	375	29.5	2.5	0.11	11	96.3	0.707	189	5.6	125.8	0.6	210.5	0	210.5	-9.8	200.7	300.5	0.67	1.82	2.91	1.97	43.511	41.968	41.23	0.03	2.02	2.34	0.17	0.34	0.39	0.4	42.737	42.343	41.941	1.36	1.1	0.77	
15/3 to 10/8	RRJ2	375	21.38	2.5	0.11	11.17	95.7	0.777	206.5	5.71	125	0.66	229.4	0	229.4	-1.8	227.6	300.5	0.76	2.06	2.99	2.16	42.713	41.2	40.666	1.484	1.69	1.9	0.22	0.37	0.41	0.43	41.988	41.575	40.91	3.11	1.12	0.73	
16/1 to 15/2	RRJ2	375	13.25	2	0.11	10	100.1	0.075	20.8	5	130.8	0.06	23.1	0	23.1	-0.6	22.5

DESIGN STORM 1:5yr ARI HYDRAULIC RESULTS

PIPE NAME	PIPE TYPE	PIPE DIAMETER	PIPE LENGTH	PIPE SLOPE	PIPE AREA Af	FULL AREA TIME Tc	FULL AREA INTENSITY I	FULL AREA SUM CA	FULL AREA FLOW Qc	PART-AREA TIME Tc	PART-AREA INTENSITY I	PART-AREA SUM CA	PART-AREA FLOW Qc	DIRECT PIPE FLOW Qp	PEAK FLOW Qrat	NET BYPASS FLOW Qb	PIPE FLOW Q	FLOW CAP. Qcap	Q/Qcap RATIO	FULL PIPE VELOCITY	NORM. DEPTH VELOCITY	CRIT. DEPTH VELOCITY	U/S PIT GRATE RL	PIPE U/S IL	PIPE D/S IL	PIPE D/S DROP	U/S PIT Ku	U/S PIT Kw	PIPE V'HEAD	PIT LOSS (Ku.V'head)	WSE LOSS (Kw.V'head)	TOTAL PIPE LOSS	U/S PIT HGL	U/S PIPE HGL	D/S PIPE HGL	HGL GRADE	MIN. COVER	U/S FREEBOARD	COMMENTS
(-)	(-)	(mm)	(m)	(%)	(sq.m)	(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)	(m)	(m)	(m)	(-)	(-)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(%)	(m)	(m)	
19/3 to 19/4	RRJ2	375	20.08	2.27	0.11	10.85	96.9	0.583	156.8	5.58	126	0.5	174.4	0	174.4	-0.4	174	286	0.61	1.58	2.71	1.8	46.434	45.049	44.594	0.051	1.92	2.22	0.13	0.24	0.28	0.19	45.705	45.424	45.238	0.93	0.99	0.73	
19/4 to 19/5	RRJ2	375	20.65	3.17	0.11	10.97	96.4	0.644	172.6	5.7	125	0.55	191.7	0	191.7	2.5	194.2	338.2	0.57	1.76	3.17	1.93	45.925	44.544	43.89	0.051	2.02	2.45	0.16	0.32	0.39	0.41	45.305	44.919	44.511	1.98	1.04	0.62	
19/5 to 19/6	RRJ2	375	21.03	4.76	0.11	11.08	96	0.68	181.3	5.81	124.1	0.58	200.9	0	200.9	2.7	203.6	414.6	0.49	1.84	3.74	1.99	45.414	43.84	42.839	0.051	1.71	1.95	0.17	0.3	0.34	0.35	44.553	44.215	43.866	1.66	1.1	0.86	
19/6 to 10/6	RRJ2	375	9.77	3.04	0.11	11.17	95.6	0.788	209.5	5.9	123.3	0.68	232.3	0	232.3	1.3	233.7	331.4	0.71	2.12	3.25	2.21	44.371	42.789	42.492	0.525	1.72	1.86	0.23	0.39	0.42	0.15	43.897	43.473	43.325	1.51	1.19	0.47	
20/1 to 19/3	RRJ2	375	8.15	1.25	0.11	10	100.1	0.069	19.3	5	130.8	0.06	21.4	0	21.4	-0.1	21.3	212.5	0.1	0.19	1.23	0.85	46.479	45.118	45.016	-0.033	4.5		0	0.01	0.01	0	45.677	45.668	45.667	0.01	1.01	0.8	
21/1 to 10/4	RRJ2	375	8.01	1.25	0.11	10	100.1	0.141	39.1	5	130.8	0.12	43.4	0	43.4	-2.7	40.7	212.5	0.19	0.37	1.48	1.03	47.165	45.71	45.61	0.677	4.5		0.01	0.03	0.03	0	46.119	46.088	46.084	0.05	1.1	1.05	
22/1 to 22/2	RRJ2	375	11.01	1.25	0.11	10	100.1	0.191	53.1	5	130.8	0.16	59	0	59	-7.7	51.3	212.5	0.24	0.46	1.58	1.11	44.771	43.331	43.193	0.031	4.5		0.01	0.05	0.05	0.12	43.756	43.706	43.582	1.13	1.09	1.02	
22/2 to 14/10	RRJ2	375	31.14	1	0.11	10.12	99.7	0.245	68	5.12	129.8	0.21	75.3	0	75.3	-7.7	67.6	190	0.36	0.61	1.57	1.21	44.764	43.163	42.852	1.785	2.26	2.68	0.02	0.04	0.05	0.42	43.59	43.538	43.007	1.71	1.22	1.17	
23/1 to 14/9	RRJ2	750	23.93	1.23	0.44	10	100.1	1.194	332	5	130.8	1.01	368.8	0	368.8	0	368.8	1339.7	0.28	0.83	2.59	1.69	44.733	41.58	41.285	0.051	2		0.04	0.07	0.07	0.02	43.384	43.313	43.291	0.09	2.34	1.35	
26/1 to 26/2	RRJ2	375	28.61	4.62	0.11	10.53	98.1	0.222	60.5	5.4	127.5	0.19	67.1	0	67.1	2.5	69.6	408.4	0.17	0.63	2.76	1.22	45.672	44.311	42.99	0.051	4.5		0.02	0.09	0.09	1.11	44.777	44.686	43.578	3.87	0.89	0.89	
26/2 to 26/3	RRJ2	375	8.18	1.43	0.11	10.71	97.4	0.314	85	5.57	126.1	0.27	94.2	0	94.2	10.6	104.8	227.1	0.46	0.95	2.01	1.42	44.388	42.94	42.823	0.031	2.25	2.58	0.05	0.1	0.12	0.02	43.594	43.475	43.45	0.3	1.1	0.79	
26/3 to 14/9	RRJ2	375	15.46	1.01	0.11	10.78	97.2	0.352	95	5.52	126.5	0.3	106.5	0	106.5	10.6	117	191.4	0.61	1.06	1.82	1.48	44.376	42.793	42.636	1.402	1.76	2.06	0.06	0.1	0.12	0.06	43.468	43.35	43.291	0.38	1.35	0.91	
27/1 to 27/2	RRJ2	375	21	1.12	0.11	10	100.1	0.088	24.4	5	130.8	0.07	27.1	0	27.1	-1.4	25.7	201.3	0.13	0.23	1.25	0.9	48.203	46.682	46.447	0.031	4.5		0	0.01	0.01	0	47.614	47.601	47.597	0.02	1.11	0.59	
27/2 to 27/3	RRJ2	375	23.4	1.01	0.11	10.73	97.3	0.351	94.8	5.53	126.4	0.3	105.2	0	105.2	-1.5	103.7	191	0.54	0.94	1.76	1.41	47.906	46.417	46.181	0.031	1.62	1.74	0.04	0.07	0.08	0.07	47.602	47.524	47.455	0.3	1.08	0.3	
27/3 to 27/4	RRJ2	375	8	1	0.11	10.95	96.5	0.421	112.9	5.62	125.6	0.36	125.1	0	125.1	0	125.1	190	0.66	1.13	1.84	1.53	47.597	46.151	46.071	0.031	1.55	1.88	0.07	0.1	0.12	0.03	47.476	47.353	47.319	0.43	1.11	0.12	
27/4 to 27/5	RRJ2	375	14.73	1.8	0.11	11.02	96.2	0.471	125.8	5.7	125	0.4	139.5	0	139.5	-15.3	124.2	254.9	0.49	1.12	2.29	1.52	47.597	46.041	45.775	0.031	1.54	1.59	0.06	0.1	0.1	0.06	47.322	47.219	47.156	0.43	1.23	0.28	
27/5 to 27/6	RRJ2	375	8.41	1.25	0.11	11.13	95.8	0.488	129.8	5.8	124.2	0.42	143.5	0	143.5	-2.9	140.7	212.5	0.66	1.27	2.06	1.61	47.203	45.745	45.64	0.031	4.5		0.08	0.37	0.37	0.05	47.156	46.784	46.738	0.55	1.09	0.05	
27/6 to 14/5	RRJ2	375	9.7	1.05	0.11	11.19	95.6	0.501	133.1	5.87	123.6	0.43	147.1	0	147.1	-2.9	144.2	194.3	0.74	1.31	1.93	1.63	47.076	45.61	45.509	1.001	0.86	1.02	0.09	0.07	0.09	0.06	46.752	46.663	46.607	0.58	1.08	0.32	
28/1 to 28/2	RRJ2	375	8.09	1	0.11	10	100.1	0.053	14.8	5	130.8	0.05	16.5	0	16.5	1.4	17.9	190.1	0.09	0.16	1.08	0.81	48.63	47.174	47.093	0.031	4.5		0	0.01	0.01	0	48.18	48.174	48.173	0.01	1.1	0.45	
28/2 to 14/4	RRJ2	375	15.52	1	0.11	10.12	99.6	0.064	17.6	5.12	129.8	0.05	19.5	0	19.5	1.4	21	190.1	0.11	0.19	1.13	0.85	48.571	47.063	46.908	0.605	0.85	0.92	0	0	0	0	48.174	48.172	48.17	0.01	1.25	0.4	
29/1 to 29/2	RRJ2	375	8.3	2.03	0.11	10	100.1	0.11	30.6	5	130.8	0.09	34	0	34	-1.4	32.6	270.8	0.12	0.3	1.65	0.96	49.854	48.39	48.222	0.03	4.5		0	0.02	0.02	0	49.332	49.312	49.31	0.03	1.1	0.52	
29/2 to 14/3	RRJ2	375	7.66	1.99	0.11	10.08	99.8	0.12	33.2	5.08	130.1	0.1	36.9	0	36.9	-1.4	35.5	268	0.13	0.32	1.68	0.99	49.746	48.192	48.039	0.441	0.79	0.9	0.01	0	0	0	49.31	49.305	49.303	0.03	1.29	0.44	
30/1 to 30/2	RRJ2	375	62.69	2.31	0.11	10	100.1	0.054	15	5	130.8	0.05	16.6	0	16.6	0	16.6	288.8	0.06	0.15	1.42	0.8	53.852	52.348	50.9	0.05	4.5		0	0.01	0.01	1.47	52.728	52.723	51.254	2.34	1.07	1.12	
30/2 to 30/3	RRJ2	375	31.51	5.3	0.11	10.74	97.3	0.206	55.7	5.74	124.7	0.18	61.7	0	61.7	-1.8	59.9	437.4	0.14	0.54	2.77	1.16	52.484	50.85	49.18	0.031	1.92	2.42	0.02	0.03	0.04	1.41	51.261	51.225	49.812	4.48	1.04	1.22	
30/3 to 14/2	RRJ2	375	7.17	1	0.11	10.93	96.6	0.225	60.4	5.93	123.1	0.19	66.7	0	66.7	0	66.7	190	0.35	0.6	1.57	1.2	50.829	49.15	49.078	0.442	1.17	1.34	0.02	0.02	0.02	0.01	49.815	49.79	49.782	0.12	1.42	1.01	
31/1 to 30/2	RRJ2	375	9.14	2.29	0.11	10	100.1	0.11	30.5	5	130.8	0.09	33.8	0	33.8	-1.8	32.1	287.7	0.11	0.29	1.72	0.96	52.585	51.11	50.9	0.05	4.5		0	0.02	0.02	0.23	51.504	51.485	51.254	2.52	1.13	1.08	
32/1 to 32/2	RRJ2	450	38.29	8.72	0.16	10	100.1	0.79	219.7	5	130.8	0.75	272.7	0	272.7	0	272.7	912.5	0.3	1.71	5.01	1.97	62.934	60.785	57.446	0.05	4.5		0.15	0.68	0.68	3.01	61.91	61.235	58.229	7.85	1.05	1.02	
32/2 to 32/3	RRJ2	450	5.83	5.3	0.16	10.13	99.6	0.851	235.5	5.13	129.8	0.8	289.2	0	289.2	0	289.2	711.1	0.41	1.82	4.24	2.04	58.925	57.396	57.087	0.226	1.64	1.89	0.17	0.28	0.32	0.05	58.271	57.952	57.901	0.88	0.94	0.65	
32/3 to 32/4	RRJ2	675	8.02	2	0.36	10.72	97.4	1.395	377.2	5.15	129.6	1.25	450	0	450	11.9	461.8	1288.4	0.36	1.29	3.3	1.91	58.543	56.862	56.702	0.05	1.94	2.21	0.08	0.17	0.19	0.02	57.923	57.736	57.715	0.26	1.03	0.62	
32/4 to 32/5	RRJ2	675	54.74	3.19	0.36	11.11	95.9	2.341	623.6	5.6	125.8	2.07	722	0	722	1.8	723.8	1626.1	0.45	2.02	4.41	2.36	58.544	56.652	54.908	0.151	1.86	2.16	0.21	0.39	0.45	1.08	57.777	57.327	56.25	1.97	1.08	0.77	
32/5 to 32/6	RRJ2	825	35.77	1	0.53	11.72	93.5	4.607	1197.1	6.19	121.5	4.04	1364.8	0	1364.8	1.8	1366.6	1555.7	0.88	2.56	3.28	2.83	56.815	54.758	54.4	0.076	2		0.33	0.67	0.67	0.37	56.25	55.583	55	1.63	-0.26	0.57	
33/1 to 33/2	RRJ2	375	36.98	1.32	0.11	10	100.1	0.129	35.7	5	130.8	0.11	39.7	0	39.7	-1.5	38.2	218.5	0.17	0.35	1.49	1.01	59.34	57.709	57.22	0.031	4.5		0.01	0.03	0.03	0.1	58.111	58.084	57.987	0.26	1.1	1.23	
33/2 to 32/3	RRJ2	375	29.5	1	0.11	10.41	98.5	0.256	70.1	5.41	127.4	0.22	77.6	0	77.6	-2	75.6	190	0.4	0.68	1.62	1.26	58.803	57.19	56.895	0.034	1.67		0.02	0.04	0.04	0.05	57.987	57.948	57.901	0.16	1.19	0.82	
34/1 to 34/2	RRJ2	375	39.89	6.46	0.11	10	100.1	0.086	23.8	5	130.8	0.07	26.4	0	26.4	-0.6	25.8	483.2	0.05	0.23	2.32	0.9	71.198	69.624	67.045	0.05	4.5		0	0.01	0.01	2.57	70.012	69.999	67.433	6.43	1.1	1.19	
34/2 to 34/3	RRJ2	375	42.8	7.07	0.11	10.29	99	0.239	65.6	5.29	128.4	0.2	72.8	0	72.8	-4.4	68.4	505.3	0.14	0.62	3.19	1.21	68.493	66.995	63.969	0.051	3.22	3.43	0.02	0.06	0.07	2.92	67.437	67.37	64.446	6.83	0.98	1.06	
34/3 to 34/4	RRJ2	375	40.51	7.66	0.11	10.51	98.2	0.483	131.8	5.22	129	0.41	146.2	0	146.2	-5.2	141.1	526.1	0.27	1.28	4.04	1.61	65.464	63.919	60.814	0.05	1.83	2.37	0.08	0.15	0.2	2.92	64.491	64.294	61.37	7.22	0.98	0.97	
34/4 to 34/5	RRJ2	375	42.86	5.77	0.11	10.68	97.5	0.654	177.3	5.39	127.6	0.56	196.8	0	196.8	-5.6	191.2	456.4	0.42	1.73	3.95	1.91	62.544	60.764	58.291	0.076	1.51	1.72	0.15	0.23	0.26	2.22	61.403	61.139	58.924	5.17	1.1	1.14	
34/5 to 34/6	RRJ2	450	11.07	4.25	0.16	10.86	96.8	0.823	221.4	5.57	126.1	0.7	245.8	0	245.8	-10.1	235.7	636.7	0.37	1.48	3.7	1.82	59.939	58.216	57.746	0.076	2.3	2.46	0.11	0.26	0.28	0.31	58.942	58.666	58.354	2.82	1.17	1	
34/6 to 32/4	RRJ2	525	38.2	2.6	0.22	10.91	96.6	0.884	237.4	5.62	125.7	0.75	263.5	0	263.5	-10.1	253.4	751.5	0.34	1.17	3.13	1.7	59.542	57.671	56.678	0.027	2.26	2.39	0.07	0.16	0.17	0.48	58.363	58.196	57.715	1.26	1.1	1.18	
35/1 to 34/3	RRJ2	375	8.02	1.25	0.11	10	100.1	0.079	21.8	5	130.8	0.07	24.3	0	24.3	0	24.3	212.5	0.11	0.22	1.28	0.89	65.42	63.988	63.888	-0.031	4.5		0	0.01	0.01	0	64.458	64.447	64.446	0.02	1.08	0.96	
36/1 to 36/2	RRJ2	375	19.14	2.37	0.11	10.89	96.7	0.546	146.7	5.61	125.8	0.47	162.7	0	162.7	0	162.7	292.7	0.56	1.47	2.72	1.74	57.717	56.1	55.646	0.051	2		0.11	0.22	0.22	0.14	57.346	57.125	56.985	0.73	1.16	0.37	
36/2 to 36/3	RRJ2	375	8	1.56	0.11	11	96.3	0.628	167.9	5.73	124.8	0.54	186.2	0	186.2	0	186.2	237.5	0.78	1.69	2.38	1.88	57.341	55.596	55.471	0.3	1.51	1.86	0.14	0.22	0.27	0.08	57.035	56.765	56.689	0.96	1.41	0.31	
36/3 to 32/5	RRJ2	675	19.51	1.35	0.36	11.62	93.9	2.266	591.2	6.46	119.9	1.99	661.5	0	661.5	0	661.5	1058.4	0.62	1.85	3.12	2.25	57.341	55.171	54.908	0.15	1.93	2.2	0.17	0.34	0.38	0.1	56.735	56.352	56.25	0.53	1.2	0.61	
37/5 to 37/6	RRJ2	600	18.54	2.5	0.28	11.5	94.4	1.57	411.7	6.33	120.6	1.37	459.9	0	459.9	0	459.9	1052.2	0.44	1.63	3.6	2.05	57.877	55.913	55.449	0.051	0.32	0.36	0.13	0.04	0.05	0.09	57.132	57.083	56.994	0.48	1.21	0.75	
37/6 to 36/3	RRJ2	600	7.66	2	0.28	11.58	94.1	1.602	418.8	6.42	120.2	1.4	467.8	0	467.8	0	467.8	941.1	0.5	1.65	3.32	2.06	57.379	55.399	55.246	0.075	1.92	2.14	0.14	0.27	0.3	0.04	57.026	56.726	56.689	0.49	1.33	0.35	
A/1 to A/2	uPVC	225	13.74	2	0.04	10	100.1	0.037	10.2	5	130.8	0.03	11.3	0	11.3	0	11.3	82.6	0.14	0.28	1.45	0.8	47.638	46.908	46.633	0	7		0	0.03	0.03	0.27	47.162	47.133	46.862	1.98	0.48	0.48	
A/2 to A/3	uPVC	225	13.54	2	0.04	10.16	99.5	0.073	20.2	5.16	129.5	0.06	22.4	0	22.4	0	22.4	82.6	0.27	0.56	1.77	0.99	47.335	46.633	46.362	0.05	0.2		0.02	0	0	0.26	46.862	46.858	46.595	1.95	0.45	0.47	
A/3 to A/4	uPVC	225	13.47	2	0.04	10.29	99	0.11	30.3	5.29	128.4	0.09	33.5	0	33.5	0	33.5	82.6	0.41	0.84	1.97	1.16	47.035	46.312	46.043	0	1.58	1.6	0.04	0.06	0.06	0.26	46.595	46.537	46.281	1.9	0.47	0.44	
A/4 to A/5	uPVC	225	13.69	2	0.04	10.4	98.6	0.148	40.4	5.4	127.5	0.13	44.8	0	44.8	0	44.8	82.6	0.54	1.13	2.12	1.34	46.738	46.043	45.769	0.051	0.2		0.06	0.01	0.01	0.21	46.281	46.268	46.057	1.54	0.45	0.46	
A/5 to A/6	uPVC	225	13.47	2	0.04	10.51	98.2	0.185	50.6	5.51	126.6	0.16	56	0	56	0	56	82.6	0.68	1.41	2.23	1.53	46.434	45.719	45.449	0	1.12	1.13	0.1	0.11	0.11	0.24	46.058	45.944	45.704	1.78	0.46	0.38	
A/6 to A/7	uPVC	225	15.27	1.97	0.04	10.61	97.8	0.225	61	5.45	127.1	0.19	67.5	0	67.5	0	67.5	81.9	0.82	1.7	2.3	1.76	46.137	45.449	45.149	1.313	0.2		0.15	0.03	0.03	0.25	45.704	45.674	45.305	2.42	0.46	0.43	
A/7 to A/8	uPVC	225	1.54	1.6	0.04	10.72	97.4	0.269	72.8	5.56	126.2	0.23	80.6	0	80.6	0	80.6	73.8	1.09	2.03	2.03	2.06	46.011	43.836	43.812	0.031	1.48	1.81	0.21	0.31	0.38	0.03	44.75	44.37	44.341	1.9	0.5	1.26	
A/8 to A/9	uPVC	225	37.14	2.49	0.04	10.73	97.3	0.269	72.8	5.57	126.1	0.23	80.5	0	80.5	0	80.5	92.1	0.87	2.02	2.61	2.05	44.529	43.782	42.858	0.553	1.6	1.72	0.21	0.33	0.36	0.85	44.366	44.007	43.021	2.66	0.42	0.16	
A/9 to 15/2	RRJ2	300	5.77	4.55	0.07	10.97	96.4	0.318	85.2	5.81	124.1	0.27	94	0	94	0	94	223.5	0.42	1.33	3.02	1.56	43.805	42.305	42.043	0.075	1.89	2.43	0.09	0.17	0.22	0.05	42.949	42.729	42.683	0.8	1.16	0.86	
B/1 to B/2	uPVC	150	13.64	2.74	0.02	10	100.1	0.036	10	5	130.8	0.03	11.1	0	11.1	0	11.1	32.8	0.34	0.63	1.68	0.91	47.89	47.2	46.827	0.075	5.77		0.02	0.12	0.12	0.35	47.467	47.35	47	2.57	0.53	0.42	
B/2 to B/3	uPVC	225	14.6	3	0.04	10.14	99.6	0.072	19.9	5.14	129.7	0.06	22.1	0	22.1	0	22.1	101.2	0.22	0.55	2.03	0.99	47.536	46.752	46.314	0	1.46	1.51	0.02	0.02	0.02	0.43	47	46.977	46.546	2.95	0.54	0.54	
B/3 to B/4	uPVC	225	33.64	3	0.04	10.26	99.1	0.11	30.2	5.26	128.7	0.09	33.5	0	33.5	0	33.5	101.1	0.33	0.84	2.28	1.16	47.144	46.314	45.305	0.724	0.2		0.04	0.01	0.01	0.92	46.546	46.539	45.394	3.4	0.52	0.6	
B/4 to 26/1	RRJ2	300	4.82	4	0.07	10.5	98.2	0.153	41.7	5.5	126.7	0.13	46.2	0	46.2	0	46.2	209.6	0.22	0.65	2.38	1.15	46.032	44.581	44.388	0.077	2.22	2.75	0.02	0.05	0.06	0.1	44.941	44.881	44.777	2.15	1.1	1.09	
C/1 to C/2	uPVC	150	14.83	1.5	0.02	10	100.1	0.036	9.9	5	130.8	0.03	11	0	11	0	11	24.2	0.46	0.62	1.34	0.91	52.819	52.173	51.951	0.075	5.81		0.02	0.12	0.12	0.2	52.439	52.323	52.125	1.34	0.49	0.38	
C/2 to C/3	uPVC	225	15.67	1.1	0.04	10.18	99.4	0.072	20	5.18	129.3	0.06	22.2	0	22.2	0	22.2	61.1	0.36	0.56	1.41	0.99	52.611	51.876	51.704	0.03	1.5	1.53	0.02	0.02	0.02	0.14	52.125	52.101	51.959	0.9	0.47	0.49	
C/3 to C/4	uPVC	225	15.75	1.45	0.04	10.37	98.7	0.111	30.5	5.37	127.7	0.1	33.8	0	33.8	0	33.8	70.4	0.48	0.85	1.75	1.16	52.391	51.674	51.445	0.031	1.63	1.67	0.04	0.06	0.06	0.17	51.961	51.899	51.733	1.05	0.49	0.43	
C/4 to C/5	uPVC	225	16.19	1.49	0.04	10.52	98.1	0.151	41.1	5.52	126.5	0.13	45.5	0	45.5	0	45.5	71.2	0.64	1.14	1.9	1.35	52.17	51.415	51.175	1.505	1.39	1.46	0.07	0.09	0.1	0.22	51.738	51.64	51.305	2.07	0.49	0.43	
C/5 to C/6	uPVC	225	1.55	1.66	0.04	10.66	97.6	0.201	54.6	5.48	126.9	0.17	60.4	0	60.4	0	60.4	75.3	0.8	1.52	2.1	1.61	51.858	49.67	49.644	0.05	1.65	1.99	0.12	0.19	0.23	0.02	50.299	50.065	50.049	1.07	0.43	1.56	
C/6 to C/7	uPVC	225	35.34	9.7	0.04	10.67	97.5	0.201	54.5	5.49	126.8	0.17	60.3	0	60.3	0	60.3	181.9	0.33	1.52	4.11	1.61	50.344	49.594	46.165	0.842	1.96	2.27	0.12	0.23	0.27	2.82	50.085	49.819	46.254	10.09	0.44	0.26	
C/7 to 19/3	RRJ2	300	4.28	3.45	0.07	10.82	97	0.238	64.1	5.63	125.6	0.2	70.8	0	70.8	0	70.8	194.7	0.36	1	2.54	1.36	46.8	45.324	45.176	0.127	2.1	2.67	0.05	0.11	0.14	0.02	45.823	45.686	45.667	0.46	1.06	0.98	
D/1 to D/2	uPVC	150	13.79	1	0.02	10	100.1	0.036	9.9	5	130.8	0.03	11	0	11	0	11	19.8	0.56	0.62	1.15	0.91	52.872

DESIGN STORM 1:5yr ARI HYDRAULIC RESULTS

PIPE NAME	PIPE TYPE	PIPE DIAMETER	PIPE LENGTH	PIPE SLOPE	PIPE AREA Af	FULL AREA TIME Tc	FULL AREA INTENSITY I	FULL AREA SUM CA	FULL AREA FLOW Qc	PART-AREA TIME Tc	PART-AREA INTENSITY I	PART-AREA SUM CA	PART-AREA FLOW Qc	DIRECT PIPE FLOW Qp	PEAK FLOW Qrat	NET BYPASS FLOW Qb	PIPE FLOW Q	FLOW CAP. Qcap	Q/Qcap RATIO	FULL PIPE VELOCITY	NORM. DEPTH VELOCITY	CRIT. DEPTH VELOCITY	U/S PIT GRATE RL	PIPE U/S IL	PIPE D/S IL	PIPE D/S DROP	U/S PIT Ku	U/S PIT Kw	PIPE V'HEAD	PIT LOSS (Ku.V'head)	WSE LOSS (Kw.V'head)	TOTAL PIPE LOSS	U/S PIT HGL	U/S PIPE HGL	D/S PIPE HGL	HGL GRADE	MIN. COVER	U/S FREEBOARD	COMMENTS
(-)	(-)	(mm)	(m)	(%)	(sq.m)	(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)	(m)	(m)	(m)	(-)	(-)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(%)	(m)	(m)	
D/5 to D/6	uPVC	225	1.2	3.94	0.04	10.53	98.1	0.179	48.7	5.53	126.4	0.15	53.9	0	53.9	0	53.9	115.9	0.47	1.36	2.86	1.49	51.709	50.813	50.766	0.766	0.2		0.09	0.02	0.02	0	51.057	51.038	50.874	13.7	0.67	0.65	
D/6 to D/7	uPVC	225	33	7.34	0.04	10.54	98.1	0.179	48.7	5.54	126.4	0.15	53.9	0	53.9	0	53.9	158.2	0.34	1.35	3.6	1.49	51.671	50	47.578	1.013	2.03	2.45	0.09	0.19	0.23	1.99	50.454	50.225	47.668	7.75	0.52	1.22	
D/7 to 27/2	RRJ2	375	4.24	2	0.11	10.69	97.5	0.179	48.4	5.69	125.1	0.15	53.3	0	53.3	0	53.3	268.5	0.2	0.48	1.89	1.12	48.229	46.565	46.48	0.064	1.16	2.77	0.01	0.01	0.03	0	47.634	47.601	47.597	0.08	1.2	0.6	
H/13 to 36/1	RRJ2	375	4.65	2.79	0.11	10.86	96.8	0.515	138.6	5.58	126	0.44	153.6	0	153.6	0	153.6	317.2	0.48	1.39	2.85	1.68	59.391	56.468	56.338	0.239	1.76	2.11	0.1	0.17	0.21	0.03	57.585	57.377	57.346	0.65	1.13	1.81	
SH A/1 to 1/24	uPVC	150	10.96	7.22	0.02	10	100.1	0.035	9.8	5	130.8	0.03	10.9	0	10.9	0	10.9	53.2	0.2	0.61	2.36	0.9	41.968	41.218	40.427	0.5	2		0.02	0.04	0.04	0.09	41.407	41.368	41.276	0.84	0.53	0.56	
SH B/1 to 1/23	uPVC	150	10.62	8.07	0.02	10	100.1	0.036	9.9	5	130.8	0.03	11	0	11	0	11	56.2	0.2	0.62	2.47	0.91	42.922	42.172	41.315	0.45	2		0.02	0.04	0.04	0.8	42.361	42.322	41.521	7.54	0.55	0.56	
SH C/1 to 1/21	uPVC	150	10.61	8.6	0.02	10	100.1	0.034	9.4	5	130.8	0.03	10.5	0	10.5	0	10.5	58.1	0.18	0.59	2.49	0.89	43.911	43.161	42.249	0.451	2		0.02	0.04	0.04	0.91	43.347	43.311	42.399	8.6	0.56	0.56	
SH D/1 to 1/20	uPVC	150	10.61	8.53	0.02	10	100.1	0.036	9.9	5	130.8	0.03	11	0	11	0	11	57.8	0.19	0.62	2.52	0.91	44.85	44.1	43.195	0.451	2		0.02	0.04	0.04	0.9	44.29	44.25	43.345	8.53	0.56	0.56	
SH E/1 to 1/18	uPVC	150	10.58	8.22	0.02	10	100.1	0.033	9.3	5	130.8	0.03	10.3	0	10.3	0	10.3	56.8	0.18	0.58	2.44	0.89	45.668	44.918	44.049	0.3	6.09		0.02	0.11	0.11	0.51	45.174	45.068	44.559	4.81	0.56	0.49	
SH F/1 to 1/17	uPVC	150	10.6	7.4	0.02	10	100.1	0.035	9.8	5	130.8	0.03	10.9	0	10.9	0	10.9	53.9	0.2	0.62	2.39	0.91	46.371	45.621	44.837	0.301	5.86		0.02	0.11	0.11	0.78	45.885	45.771	44.986	7.4	0.55	0.49	
SH G/1 to 1/15	uPVC	150	10.6	6.93	0.02	10	100.1	0.033	9.3	5	130.8	0.03	10.3	0	10.3	0	10.3	52.2	0.2	0.58	2.3	0.89	47.046	46.296	45.561	0.226	6.09		0.02	0.11	0.11	0.74	46.552	46.446	45.711	6.93	0.54	0.49	
SH H/1 to 1/14	uPVC	150	10.6	6.89	0.02	10	100.1	0.035	9.6	5	130.8	0.03	10.7	0	10.7	0	10.7	52	0.21	0.6	2.31	0.9	47.723	46.973	46.242	0.235	5.95		0.02	0.11	0.11	0.74	47.234	47.123	46.383	6.98	0.54	0.49	
SH J/1 to 1/13	uPVC	150	10.6	7.42	0.02	10	100.1	0.035	9.8	5	130.8	0.03	10.9	0	10.9	0	10.9	54	0.2	0.62	2.39	0.91	48.444	47.694	46.907	0.225	5.87		0.02	0.11	0.11	0.79	47.958	47.844	47.057	7.42	0.55	0.49	
SH K/1 to 1/12	uPVC	150	10.72	8.48	0.02	10	100.1	0.035	9.6	5	130.8	0.03	10.7	0	10.7	0	10.7	57.7	0.19	0.6	2.49	0.9	49.226	48.476	47.567	0.226	5.95		0.02	0.11	0.11	0.91	48.737	48.626	47.717	8.48	0.56	0.49	
SH L/1 to 1/10	uPVC	150	12.07	6.49	0.02	10	100.1	0.035	9.8	5	130.8	0.03	10.9	0	10.9	0	10.9	50.5	0.22	0.62	2.28	0.91	49.929	49.179	48.395	0.225	5.87		0.02	0.11	0.11	0.78	49.442	49.329	48.553	6.42	0.53	0.49	
SH M/1 to 1/9	uPVC	150	14.73	4.6	0.02	10	100.1	0.04	11.2	5	130.8	0.03	12.4	0	12.4	0	12.4	42.5	0.29	0.7	2.09	0.96	50.611	49.861	49.183	0.226	5.29		0.03	0.13	0.13	0.68	50.144	50.011	49.333	4.6	0.47	0.47	

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60

Date of Issue 10/08/2021

Issuing Officer D. Restin

Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

	AMENDMENT	DES	DRN	CKD	APR	DATE
B	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
A	ISSUE FOR CLIENT REVIEW	MP	NA	MP	RO	26/04/21

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
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CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
DRAINAGE CALCULATIONS
SHEET 6

PROJECT No: 110185-12

SHEET No: CC1416

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1416 | B

Plotted: 21 July, 2021 2:44:37 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1416.dwg

DESIGN STORM 1:100yr ARI HYDROLOGIC RESULTS

PIT NAME	PIT TYPE	CATCHMENT AREA	IMPERVIOUS PERCENTAGE	RUNOFF C	IMPERVIOUS TIME Tc	IMPERVIOUS INTENSITY I	PERVIOUS TIME Tc	PERVIOUS INTENSITY I	FULL AREA TIME Tc	FULL AREA INTENSITY I	FULL AREA CATCHMENT FLOW Qc	PARTIAL AREA TIME Tc	PARTIAL AREA INTENSITY I	PARTIAL AREA CATCHMENT FLOW Qc	TOTAL CATCHMENT FLOW Qc	DIRECT FLOW Qd	APPROACH FLOW Qa	FLOODED DEPTH d	FLOODED WIDTH w	FLOODED (vxd)	ROAD GRADE	ROAD XFALL	CHOKE FACTOR	INLET FLOW Qg	BYPASS FLOW Qb	BYPASS PIT	COMMENTS
(-)	(-)	(ha)	(%)	(-)	(min)	(mm/hr)	(min)	(mm/hr)	(min)	(mm/hr)	(L/s)	(min)	(mm/hr)	(L/s)	(L/s)	(L/s)	(L/s)	(m)	(m)	(sq.m/s)	(%)	(%)	(-)	(L/s)	(L/s)	(-)	
1/1	1.8 m lintel	0.113	70	0.95	5	219.1	10	167.3	10	167.3	50	5	219.1	55	55	0	55	0.08	1.74	0.08	3.2	3	0.8	39	17	1/2	
1/2	1.8 m lintel	0.155	70	0.95	5	219.1	10	167.3	10	167.3	68	5	219.1	76	76	0	93	0.08	1.94	0.13	5	3	0.8	58	35	33/1	
1/3	1.8 m lintel	0.041	70	0.95	5	219.1	10	167.3	10	167.3	18	5	219.1	20	20	0	20	0.05	1.06	0.05	5	3	0.8	16	4	1/4	
1/4	1.8 m lintel	0.017	70	0.95	5	219.1	10	167.3	10	167.3	8	5	219.1	8	8	0	12	0.05	0.68	0.04	4.4	3	0.8	10	2	1/5	
1/5	1.8 m lintel	0.023	70	0.95	5	219.1	10	167.3	10	167.3	10	5	219.1	11	11	0	14	0.04	0.6	0.05	7.1	3	0.8	11	3	11/1	
1/6	1.8 m lintel	0.031	70	0.95	5	219.1	10	167.3	10	167.3	14	5	219.1	15	15	0	15	0.05	0.65	0.06	7.1	3	0.8	12	3	1/7	
1/7	1.8 m lintel	0.029	70	0.95	5	219.1	10	167.3	10	167.3	13	5	219.1	14	14	0	17	0.05	0.74	0.06	7.1	3	0.8	14	3	1/8	
1/8	1.8 m lintel	0.02	70	0.95	5	219.1	10	167.3	10	167.3	9	5	219.1	10	10	0	13	0.04	0.69	0.05	6.8	3	0	0	14	1/11	
1/9	NODE	0	0						0	0	0	0	0	0	0	0	0				6.6			0	0		DIRECT CONNECTION
1/10	NODE	0	0						0	0	0	0	0	0	0	0	0				6.2			0	0		DIRECT CONNECTION
1/11	1.8 m lintel	0.011	70	0.95	5	219.1	10	167.3	10	167.3	5	5	219.1	5	5	0	19	0.05	0.76	0.06	6	3	0	-150	169	1/16	
1/12	NODE	0	0						0	0	0	0	0	0	0	0	0				5.8			0	0		DIRECT CONNECTION
1/13	NODE	0	0						0	0	0	0	0	0	0	0	0				5.6			0	0		DIRECT CONNECTION
1/14	NODE	0	0						0	0	0	0	0	0	0	0	0				5.1			0	0		DIRECT CONNECTION
1/15	NODE	0	0						0	0	0	0	0	0	0	0	0				5			0	0		DIRECT CONNECTION
1/16	1.8 m lintel	0.022	70	0.95	5	219.1	10	167.3	10	167.3	10	5	219.1	11	11	0	180	0.1	2.57	0.18	5	3	0.8	91	89	1/19	
1/17	NODE	0	0						0	0	0	0	0	0	0	0	0				5			0	0		DIRECT CONNECTION
1/18	NODE	0	0						0	0	0	0	0	0	0	0	0				5.5			0	0		DIRECT CONNECTION
1/19	1.8 m lintel	0	0						0	0	0	0	0	0	0	0	89	0.08	1.84	0.13	6.1	3	0.8	57	32	1/22	
1/20	NODE	0	0						0	0	0	0	0	0	0	0	0				6.5			0	0		DIRECT CONNECTION
1/21	NODE	0	0						0	0	0	0	0	0	0	0	0				7.3			0	0		DIRECT CONNECTION
1/22	1.8 m lintel	0.094	70	0.95	5	219.1	10	167.3	10	167.3	41	5	219.1	46	46	0	78	0.08	1.67	0.12	7.3	3	0.8	52	25	1/24	
1/23	NODE	0	0						0	0	0	0	0	0	0	0	0				7.3			0	0		DIRECT CONNECTION
1/24	1.8 m lintel	0.012	70	0.95	5	219.1	10	167.3	10	167.3	5	5	219.1	6	6	0	31	0.06	1.11	0.08	6.5	3	0	-275	307	LOST	
1/25	1.8 m lintel	0.089	70	0.95	5	219.1	10	167.3	10	167.3	39	5	219.1	44	44	0	540	0.14	3.84	0.34	6.2	3	0.8	187	353	LOST	
1/26	2.4 m lintel sag																										EXISTING PIT
2/1	GSIP 900x900 SAG	0.678	40	0.95	5	219.1	10	167.3	10	167.3	299	5	219.1	274	299	0	299	0.22			5.6		0.5	299	0		
2/2	1.8 m lintel																										EXISTING END CAP
3/7	1.8 m lintel	0.122	70	0.95	5	219.1	10	167.3	10	167.3	54	5	219.1	60	60	0	90	0.08	1.73	0.14	8.5	2.8	0	-34	124	4/2	
3/8	1.8 m lintel	0.122	70	0.95	5	219.1	10	167.3	10	167.3	54	5	219.1	60	60	0	108	0.08	1.96	0.15	7.5	3	0.8	61	48	3/9	
3/9	1.8 m lintel	0.125	70	0.95	5	219.1	10	167.3	10	167.3	55	5	219.1	61	61	0	109	0.09	2.32	0.12	4.6	3.2	0.8	64	45	3/10	
3/10	1.8 m lintel	0.071	70	0.95	5	219.1	10	167.3	10	167.3	31	5	219.1	35	35	0	206	0.06	4.78	0.09	1.6	3	0.8	100	107	3/11	
3/11	1.8 m lintel	0.108	70	0.95	5	219.1	10	167.3	10	167.3	48	5	219.1	53	53	0	191	0.1	2.53	0.19	6	3	0	-305	496	1/25	
4/1	GSIP 900x900 SAG	0.116	20	0.95	5	219.1	10	167.3	10	167.3	51	5	219.1	40	51	0	51	0.07			6.8		0.5	51	0		
4/2	2.4 m lintel sag	0.061	70	0.95	5	219.1	10	167.3	10	167.3	27	5	219.1	30	30	0	155	0.06			1.8	4	0.5	28	127	3/10	
7/1	1.8 m lintel	0.053	70	0.95	5	219.1	10	167.3	10	167.3	23	5	219.1	26	26	0	86	0.08	1.89	0.12	5	3	0.8	55	31	3/11	
8/1	1.8 m lintel	0.151	70	0.95	5	219.1	10	167.3	10	167.3	67	5	219.1	74	74	0	126	0.09	1.78	0.18	6.7	2.9	0.8	66	60	7/1	
9/1	1.8 m lintel	0.172	70	0.95	5	219.1	10	167.3	10	167.3	76	5	219.1	85	85	0	115	0.08	2.07	0.15	7.4	2.9	0.8	63	52	8/1	
10/1	GSIP 5x900x900	0	0						0	0	0	0	0	0	0	0	0	0					0.5	0	0		DAM 8 OUTLET
10/2	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	0							0	0		
10/3	1.8 m lintel	0.213	70	0.95	5	219.1	10	167.3	10	167.3	94	5	219.1	105	105	0	105	0.08	1.86	0.15	8	3	0.8	65	40	10/4	
10/4	1.8 m lintel	0.215	70	0.95	5	219.1	10	167.3	10	167.3	95	5	219.1	106	106	0	145	0.09	2.2	0.17	7	3	0	-753	898	10/5	
10/5	1.8 m lintel	0.109	70	0.95	5	219.1	10	167.3	10	167.3	48	5	219.1	53	53	0	951	0.15	4.02	0.56	5	3	0	-256	1207	10/6	
10/6	1.8 m lintel	0.114	70	0.95	5	219.1	10	167.3	10	167.3	50	5	219.1	56	56	0	1263	0.15	4.02	0.75	5	3	0	-329	1592	10/7	
10/7	2.4 m lintel sag	0.135	70	0.95	5	219.1	10	167.3	10	167.3	59	5	219.1	66	66	0	2253	0.04			1.4	2.5	0	-616	2870	LOST	
10/8	1.8 m lintel	0.06	70	0.95	5	219.1	10	167.3	10	167.3	27	5	219.1	30	30	0	30	0.07	1.37	0.06	2.7	3	0.8	22	7	LOST	
10/9	GPT	0	0						0	0	0	0	0	0	0	0	0							0	0		
10/10	H.W.																										
11/1	1.8 m lintel	0.173	70	0.95	5	219.1	10	167.3	10	167.3	76	5	219.1	85	85	0	88	0.08	1.77	0.13	7.1	3	0.8	57	30	9/1	
12/1	1.8 m lintel	0.081	70	0.95	5	219.1	10	167.3	10	167.3	36	5	219.1	40	40	0	40	0.07	1.53	0.07	2.8	3	0.8	29	10	LOST	
12/2	1.8 m lintel																										EXISTING ENDCAP
13/1	1.8 m lintel	0.117	70	0.95	5	219.1	10	167.3	10	167.3	52	5	219.1	58	58	0	58	0.07	1.37	0.11	8	10.6	0.8	42	16	21/1	
14/1	GSIP 5x900x900	0	0						0	0	0	0	0	0	0	0	0						0	-2239	2239	14/2	DAM 7 OUTLET
14/2	JP GRATED 900 x 900	0	0						0	0	0	0	0	0	0	0	2239	0.01	5.2	0.82		20	0.8	1791	448	14/3	
14/3	JP GRATED 900 x 900	0	0						0	0	0	0	0	0	0	0	448	0.04	7.81	0.1		7.6	0.8	358	90	14/4	
14/4	GSIP 900x900	0.648	40	0.95	5	219.1	10	167.3	10	167.3	286	5	219.1	262	286	0	376	0.05	8.57	0.07			0.8	0	376	14/5	SURCHARGE PIT
14/5	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	376	0.02	2.81	0.27			0	-1878	2253	14/6	
14/6	JP GRATED 900 x 900	0.414	50	0.95	5	219.1	10	167.3	10	167.3	183	5	219.1	179	183	0	2436	0.01	0.03	141.2	4.9	-2.2	0	-341	2777	14/7	
14/7	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	2777	0.07	8.6	0.5	0.1	-33.3	0	-602	3378	14/8	
14/8	GSIP 900x900 SAG	0.268	50	0.95	5	219.1	10	167.3	10	167.3	118	5	219.1	116	118	0	3497	0.6			0.1		0.5	3497	0		
14/9	2.4 m lintel sag	0.138	70	0.95	5	219.1	10	167.3	10	167.3	61	5	219.1	68	68	0	352	0.1			0.1	3	0.5	76	276	14/10	
14/10	2.4 m lintel sag	0.14	70	0.95	5	219.1	10	167.3	10	167.3	62	5	219.1	69	69	0	354	0.19			0.1	3	0.5	207	147	14/11	
14/11	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	147						0.8	0	147	14/12	SURCHARGE PIT
14/12	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	147	0.01	0.47	0.63			0	-5068	5215	14/13	SURCHARGE PIT
14/13	GSIP 3x900x900	0	0						0	0	0	0	0	0	0	0	5215					25	0	-700	5915	LOST	SURCHARGE PIT
14E/1	CAPPED STUB	0	0						0	0	0	0	0	0	0	0	0							0	0		

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restin
~~Accreditation No. BDC3267~~

These plans/specifications form part of the certificate issued 10th of August 2021

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD
~~DATE: 08/12/21~~ ~~REF: 16899-15~~

	AMENDMENT	DES	DRN	CKD	APR	DATE
B	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
A	ISSUE FOR CLIENT REVIEW	MP	NA	MP	RO	26/04/21

J. WYNDHAM PRINCE
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CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
DRAINAGE CALCULATIONS
SHEET 7

PROJECT No: 110185-12
SHEET No: CC1417

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1417 | B

Plotted: 21 July, 2021 2:45:32 PM File Name: \\jwp.local\fs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1417.dwg

DESIGN STORM 1:100yr ARI HYDROLOGIC RESULTS

PIT NAME	PIT TYPE	CATCHMENT AREA	IMPERVIOUS PERCENTAGE	RUNOFF C	IMPERVIOUS TIME Tc	IMPERVIOUS INTENSITY I	PERVIOUS TIME Tc	PERVIOUS INTENSITY I	FULL AREA TIME Tc	FULL AREA INTENSITY I	FULL AREA CATCHMENT FLOW Qc	PARTIAL AREA TIME Tc	PARTIAL AREA INTENSITY I	PARTIAL AREA CATCHMENT FLOW Qc	TOTAL CATCHMENT FLOW Qc	DIRECT FLOW Qd	APPROACH FLOW Qa	FLOODED DEPTH d	FLOODED WIDTH w	FLOODED (vxd)	ROAD GRADE	ROAD XFALL	CHOKE FACTOR	INLET FLOW Qg	BYPASS FLOW Qb	BYPASS PIT	COMMENTS
(-)	(-)	(ha)	(%)	(-)	(min)	(mm/hr)	(min)	(mm/hr)	(min)	(mm/hr)	(L/s)	(min)	(mm/hr)	(L/s)	(L/s)	(L/s)	(L/s)	(m)	(m)	(sq.m/s)	(%)	(%)	(-)	(L/s)	(L/s)	(-)	
15/1	1.8 m lintel	0.159	70	0.95	5	219.1	10	167.3	10	167.3	70	5	219.1	78	78	0	78	0.1	2.3	0.09	1.6	3	0.8	50	29	15/2	
15/2	1.8 m lintel	0.233	70	0.95	5	219.1	10	167.3	10	167.3	103	5	219.1	114	114	0	143	0.11	2.63	0.14	2.7	3	0	-41	184	15/3	
15/3	1.8 m lintel	0.088	70	0.95	5	219.1	10	167.3	10	167.3	39	5	219.1	43	43	0	228	0.12	3.19	0.18	2.7	3	0.303	39	188	17/1	
16/1	1.8 m lintel	0.094	70	0.95	5	219.1	10	167.3	10	167.3	41	5	219.1	46	46	0	46	0.08	1.63	0.08	2.7	3	0.8	31	15	LOST	
17/1	2.4 m lintel sag	0.162	70	0.95	5	219.1	10	167.3	10	167.3	72	5	219.1	80	80	0	626	0.1			3.3	3	0.214	31	595	10/7	
19/1	1.8 m lintel	0.116	70	0.95	5	219.1	10	167.3	10	167.3	51	5	219.1	57	57	0	57	0.09	1.99	0.08	1.7	3	0.8	36	21	19/2	
19/2	1.8 m lintel	0.165	70	0.95	5	219.1	10	167.3	10	167.3	73	5	219.1	81	81	0	102	0.09	2.28	0.11	2.8	3	0.8	54	48	19/3	
19/3	1.8 m lintel	0.063	70	0.95	5	219.1	10	167.3	10	167.3	28	5	219.1	31	31	0	79	0.09	2.06	0.1	2.8	3	0	-54	133	19/4	
19/4	2.4 m lintel sag	0.077	70	0.95	5	219.1	10	167.3	10	167.3	34	5	219.1	38	38	0	232	0.14			1	2.6	0	-4	236	19/5	
19/5	1.8 m lintel	0.044	70	0.95	5	219.1	10	167.3	10	167.3	20	5	219.1	22	22	0	269	0.12	2.62	0.25	5	7.6	0.698	103	167	19/6	
19/6	1.8 m lintel	0.136	70	0.95	5	219.1	10	167.3	10	167.3	60	5	219.1	67	67	0	233	0.11	2.85	0.2	5	3	0	-124	358	17/1	
20/1	1.8 m lintel	0.087	70	0.95	5	219.1	10	167.3	10	167.3	38	5	219.1	43	43	0	43	0.07	1.58	0.07	2.8	3	0.8	31	12	19/5	
21/1	1.8 m lintel	0.176	70	0.95	5	219.1	10	167.3	10	167.3	78	5	219.1	86	86	0	102	0.08	1.9	0.14	7	3	0.515	40	62	19/4	
22/1	1.8 m lintel	0.239	70	0.95	5	219.1	10	167.3	10	167.3	105	5	219.1	117	117	0	117	0.12	2.99	0.1	1	3	0.8	69	48	26/2	
22/2	1.8 m lintel	0.068	70	0.95	5	219.1	10	167.3	10	167.3	30	5	219.1	33	33	0	33	0.08	1.78	0.05	1	3	0.8	24	9	14/10	
23/1	CAPPED STUB	1.493	70	0.95	5	219.1	10	167.3	10	167.3	659	5	219.1	733	733	0	733				1.7			733	0		FUTURE EXTENSION
26/1	1.8 m lintel	0.086	70	0.95	5	219.1	10	167.3	10	167.3	38	5	219.1	42	42	0	124	0.09	2.2	0.15	4.9	3	0.8	70	54	26/2	
26/2	2.4 m lintel sag	0.115	70	0.95	5	219.1	10	167.3	10	167.3	51	5	219.1	56	56	0	158	0.11			2.2	3.1	0	-125	284	14/9	
26/3	2.4 m lintel sag	0.047	90	0.95	5	219.1	10	167.3	10	167.3	21	5	219.1	26	26	0	29	0.12			1.2	2.5	0.028	5	24	LOST	
27/1	1.8 m lintel	0.11	70	0.95	5	219.1	10	167.3	10	167.3	48	5	219.1	54	54	0	54	0.09	2.03	0.07	1.4	3	0.8	35	19	27/2	
27/2	1.8 m lintel	0.105	70	0.95	5	219.1	10	167.3	10	167.3	46	5	219.1	52	52	0	71	0.09	2.27	0.08	1.4	3	0.221	12	59	27/3	
27/3	2.4 m lintel sag	0.089	70	0.95	5	219.1	10	167.3	10	167.3	39	5	219.1	44	44	0	121	0.1			0.5	3	0	-22	143	LOST	
27/4	2.4 m lintel sag	0.062	70	0.95	5	219.1	10	167.3	10	167.3	27	5	219.1	30	30	0	30	0			0.5	3	0.5	0	30	27/5	
27/5	1.8 m lintel	0.021	70	0.95	5	219.1	10	167.3	10	167.3	9	5	219.1	10	10	0	41	0.07	1.35	0.08	4.9	7.5	0	-41	82	26/1	
27/6	1.8 m lintel	0.017	70	0.95	5	219.1	10	167.3	10	167.3	8	5	219.1	9	9	0	17	0.05	0.82	0.05	4.9	3	0.8	13	3	26/3	
28/1	1.8 m lintel	0.067	70	0.95	5	219.1	10	167.3	10	167.3	29	5	219.1	33	33	0	59	0.07	1.62	0.1	4.9	3	0.8	41	18	27/3	
28/2	1.8 m lintel	0.013	70	0.95	5	219.1	10	167.3	10	167.3	6	5	219.1	6	6	0	35	0.06	1.26	0.08	4.9	3	0.8	27	8	27/6	
29/1	1.8 m lintel	0.138	70	0.95	5	219.1	10	167.3	10	167.3	61	5	219.1	68	68	0	76	0.08	1.8	0.11	4.9	3	0.8	49	27	28/1	
29/2	1.8 m lintel	0.012	70	0.95	5	219.1	10	167.3	10	167.3	5	5	219.1	6	6	0	79	0.08	1.82	0.11	4.9	3	0.8	51	28	28/2	
30/1	1.8 m lintel	0.067	70	0.95	5	219.1	10	167.3	10	167.3	30	5	219.1	33	33	0	33	0.08	1.77	0.05	1	3	0.8	24	9	30/2	
30/2	1.8 m lintel	0.053	70	0.95	5	219.1	10	167.3	10	167.3	24	5	219.1	26	26	0	35	0.06	1.05	0.08	5	3.5	0.8	27	8	29/1	
30/3	1.8 m lintel	0.024	70	0.95	5	219.1	10	167.3	10	167.3	11	5	219.1	12	12	0	34	0.06	1.36	0.07	4.9	3	0	-39	73	29/2	
31/1	1.8 m lintel	0.137	70	0.95	5	219.1	10	167.3	10	167.3	60	5	219.1	67	67	0	67	0.08	1.58	0.11	3.4	4.3	0.8	45	22	30/3	
32/1	GSIP 900x900 SAG	0.988	90	0.95	5	219.1	10	167.3	10	167.3	436	5	219.1	542	542	0	542	0.2				-1	0.5	268	275	32/2	
32/2	GSIP 900x900 SAG	0.076	70	0.95	5	219.1	10	167.3	10	167.3	34	5	219.1	37	37	0	312	0.15			0.4	-10.2	0.212	73	239	32/3	
32/3	2.4 m lintel sag	0.359	70	0.95	5	219.1	10	167.3	10	167.3	159	5	219.1	177	177	0	575	0.1			0.4	3	0.5	72	503	32/4	
32/4	2.4 m lintel sag	0.078	70	0.95	5	219.1	10	167.3	10	167.3	34	5	219.1	38	38	0	541	0.15			0.4	3	0.5	140	401	32/5	
32/5	GPT	0	0						0	0	0	0	0	0	0	0	401						0.8	0	401	LOST	
32/6	H.W.																										
33/1	1.8 m lintel	0.161	70	0.95	5	219.1	10	167.3	10	167.3	71	5	219.1	79	79	0	114	0.1	2.34	0.12	3	3	0.8	65	48	33/2	
33/2	1.8 m lintel	0.16	70	0.95	5	219.1	10	167.3	10	167.3	70	5	219.1	78	78	0	127	0.12	3.08	0.1	1	3	0.8	71	56	32/3	
34/1	1.8 m lintel	0.107	70	0.95	5	219.1	10	167.3	10	167.3	47	5	219.1	53	53	0	53	0.07	1.5	0.09	4.9	3	0.8	37	15	34/2	
34/2	1.8 m lintel	0.191	70	0.95	5	219.1	10	167.3	10	167.3	84	5	219.1	94	94	0	109	0.08	2.18	0.14	7.2	3	0.8	61	48	34/3	
34/3	1.8 m lintel	0.208	70	0.95	5	219.1	10	167.3	10	167.3	92	5	219.1	102	102	0	150	0.09	2.08	0.18	7.2	3.1	0.8	83	67	34/4	
34/4	1.8 m lintel	0.214	70	0.95	5	219.1	10	167.3	10	167.3	94	5	219.1	105	105	0	172	0.1	2.29	0.19	7.2	3	0.8	91	81	34/5	
34/5	1.8 m lintel	0.211	70	0.95	5	219.1	10	167.3	10	167.3	93	5	219.1	104	104	0	185	0.11	2.59	0.18	4.3	3	0.8	81	104	32/3	
34/6	1.8 m lintel	0.076	70	0.95	5	219.1	10	167.3	10	167.3	34	5	219.1	38	38	0	51	0.07	1.5	0.09	4.1	3	0.8	36	14	36/1	
35/1	1.8 m lintel	0.098	70	0.95	5	219.1	10	167.3	10	167.3	43	5	219.1	48	48	0	48	0.07	1.32	0.1	7.5	3	0.8	35	13	34/6	
36/1	1.8 m lintel	0.039	70	0.95	5	219.1	10	167.3	10	167.3	17	5	219.1	19	19	0	33	0.07	1.38	0.07	3	3	0	-140	174	36/2	
36/2	2.4 m lintel sag	0.102	70	0.95	5	219.1	10	167.3	10	167.3	45	5	219.1	50	50	0	248	0.15			0.6	2.6	0	-65	313	36/3	
36/3	2.4 m lintel sag	0.044	70	0.95	5	219.1	10	167.3	10	167.3	19	5	219.1	22	22	0	335	0.04			0.3	3	0.5	17	317	37/6	
37/5	1.8 m lintel	0.075	70	0.95	5	219.1	10	167.3	10	167.3	33	5	219.1	37	37	0	75	0.08	1.35	0.13	8.1	3.2	0.8	51	24	36/2	
37/6	1.8 m lintel	0.041	70	0.95	5	219.1	10	167.3	10	167.3	18	5	219.1	20	20	0	599	0.15	3.8	0.37	0.9	3.3	0	-117	716	LOST	
A/1	IAD 450x450	0.046	70	0.95	5	219.1	10	167.3	10	167.3	20	5	219.1	22	22	0	22							22	0		
A/2	SLOPE JUNCTION	0.046	70	0.95	5	219.1	10	167.3	10	167.3	20	5	219.1	22	22	0	22							22	0		
A/3	IAD 450x450	0.046	70	0.95	5	219.1	10	167.3	10	167.3	20	5	219.1	23	23	0	23							23	0		
A/4	SLOPE JUNCTION	0.047	70	0.95	5	219.1	10	167.3	10	167.3	21	5	219.1	23	23	0	23							23	0		
A/5	IAD 450x450	0.047	70	0.95	5	219.1	10	167.3	10	167.3	21	5	219.1	23	23	0	23							23	0		
A/6	SLOPE JUNCTION	0.049	70	0.95	5	219.1	10	167.3	10	167.3	22	5	219.1	24	24	0	24							24	0		
A/7	IAD 900x900	0.056	70	0.95	5	219.1	10	167.3	10	167.3	25	5	219.1	27	27	0	27							27	0		
A/8	IAD 450x450	0	0						0	0	0	0	0	0	0	0	0							0	0		
A/9	IAD 600x900	0.061	70	0.95	5	219.1	10	167.3	10	167.3	27	5	219.1	30	30	0	30				2.7			30	0		
B/1	IAD 450x450	0.045	70	0.95	5	219.1	10	167.3	10	167.3	20	5	219.1	22	22	0	22							22	0		
B/2	IAD 600x900	0.045	70	0.95	5	219.1	10	167.3	10	167.3	20	5	219.1	22	22	0	22							22	0		
B/3	SLOPE JUNCTION	0.047	70	0.95	5	219.1	10	167.3	10	167.3	21	5	219.1	23	23	0	23							23	0		
B/4	IAD 600x900	0.054	70	0.95	5	219.1	10	167.3	10	167.3	24	5	219.1	27	27	0	27				4.9			27	0		

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restin
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....
PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR
VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21
REF: 16800-15

	AMENDMENT	DES	DRN	CKD	APR	DATE
C	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
B	COUNCIL COMMENTS	MP	VS	RO	RO	16/06/21
A	ISSUE FOR CLIENT REVIEW	MP	NA	MP	RO	26/04/21

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
DRAINAGE CALCULATIONS
SHEET 8

PROJECT No: 110185-12
SHEET No: CC1418

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1418 | C

Plotted: 21 July, 2021 2:46:29 PM File Name: \\jwp.local\fs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1418.dwg

DESIGN STORM 1:100yr ARI HYDROLOGIC RESULTS

PIT NAME	PIT TYPE	CATCHMENT AREA	IMPERVIOUS PERCENTAGE	RUNOFF C	IMPERVIOUS TIME Tc	IMPERVIOUS INTENSITY I	PERVIOUS TIME Tc	PERVIOUS INTENSITY I	FULL AREA TIME Tc	FULL AREA INTENSITY I	FULL AREA CATCHMENT FLOW Qc	PARTIAL AREA TIME Tc	PARTIAL AREA INTENSITY I	PARTIAL AREA CATCHMENT FLOW Qc	TOTAL CATCHMENT FLOW Qc	DIRECT FLOW Qd	APPROACH FLOW Qa	FLOODED DEPTH d	FLOODED WIDTH w	FLOODED (vxd)	ROAD GRADE	ROAD XFALL	CHOKE FACTOR	INLET FLOW Qg	BYPASS FLOW Qb	BYPASS PIT	COMMENTS
(-)	(-)	(ha)	(%)	(-)	(min)	(mm/hr)	(min)	(mm/hr)	(min)	(mm/hr)	(L/s)	(min)	(mm/hr)	(L/s)	(L/s)	(L/s)	(L/s)	(m)	(m)	(sq.m/s)	(%)	(%)	(-)	(L/s)	(L/s)	(-)	
C/1	IAD 450x450	0.045	70	0.95	5	219.1	10	167.3	10	167.3	20	5	219.1	22	22	0	22							22	0		
C/2	IAD 450x450	0.046	70	0.95	5	219.1	10	167.3	10	167.3	20	5	219.1	22	22	0	22							22	0		
C/3	IAD 450x450	0.048	70	0.95	5	219.1	10	167.3	10	167.3	21	5	219.1	24	24	0	24							24	0		
C/4	IAD 450x450	0.05	70	0.95	5	219.1	10	167.3	10	167.3	22	5	219.1	24	24	0	24							24	0		
C/5	IAD 900x900	0.063	70	0.95	5	219.1	10	167.3	10	167.3	28	5	219.1	31	31	0	31							31	0		
C/6	IAD 450x450	0	0						0	0	0	0	0	0	0	0	0							0	0		
C/7	IAD 600x900	0.046	70	0.95	5	219.1	10	167.3	10	167.3	20	5	219.1	22	22	0	22				2.8			22	0		
D/1	IAD 450x450	0.045	70	0.95	5	219.1	10	167.3	10	167.3	20	5	219.1	22	22	0	22							22	0		
D/2	IAD 450x450	0.044	70	0.95	5	219.1	10	167.3	10	167.3	20	5	219.1	22	22	0	22							22	0		
D/3	SLOPE JUNCTION	0.044	70	0.95	5	219.1	10	167.3	10	167.3	20	5	219.1	22	22	0	22							22	0		
D/4	IAD 450x450	0.044	70	0.95	5	219.1	10	167.3	10	167.3	19	5	219.1	21	21	0	21							21	0		
D/5	SLOPE JUNCTION	0.046	70	0.95	5	219.1	10	167.3	10	167.3	20	5	219.1	23	23	0	23							23	0		
D/6	IAD 900x900	0	0						0	0	0	0	0	0	0	0	0							0	0		
D/7	IAD 900x900	0	0						0	0	0	0	0	0	0	0	0				1.4			0	0		
H/13	IAD 900x900	0.068	70	0.95	5	219.1	10	167.3	10	167.3	30	5	219.1	33	33	0	33				3			33	0		
SH A/1	IAD 450x450	0.044	70	0.95	5	219.1	10	167.3	10	167.3	19	5	219.1	22	22	0	22							22	0		
SH B/1	IAD 450x450	0.044	70	0.95	5	219.1	10	167.3	10	167.3	20	5	219.1	22	22	0	22							22	0		
SH C/1	IAD 450x450	0.042	70	0.95	5	219.1	10	167.3	10	167.3	19	5	219.1	21	21	0	21							21	0		
SH D/1	IAD 450x450	0.045	70	0.95	5	219.1	10	167.3	10	167.3	20	5	219.1	22	22	0	22							22	0		
SH E/1	IAD 450x450	0.042	70	0.95	5	219.1	10	167.3	10	167.3	18	5	219.1	21	21	0	21							21	0		
SH F/1	IAD 450x450	0.044	70	0.95	5	219.1	10	167.3	10	167.3	19	5	219.1	22	22	0	22							22	0		
SH G/1	IAD 450x450	0.042	70	0.95	5	219.1	10	167.3	10	167.3	18	5	219.1	21	21	0	21							21	0		
SH H/1	IAD 450x450	0.043	70	0.95	5	219.1	10	167.3	10	167.3	19	5	219.1	21	21	0	21							21	0		
SH J/1	IAD 450x450	0.044	70	0.95	5	219.1	10	167.3	10	167.3	19	5	219.1	22	22	0	22							22	0		
SH K/1	IAD 450x450	0.043	70	0.95	5	219.1	10	167.3	10	167.3	19	5	219.1	21	21	0	21							21	0		
SH L/1	IAD 450x450	0.044	70	0.95	5	219.1	10	167.3	10	167.3	19	5	219.1	22	22	0	22							22	0		
SH M/1	IAD 450x450	0.05	70	0.95	5	219.1	10	167.3	10	167.3	22	5	219.1	25	25	0	25							25	0		

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Reston
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

B	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
A	ISSUE FOR CLIENT REVIEW	MP	NA	MP	RO	26/04/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
DRAINAGE CALCULATIONS
SHEET 9

PROJECT No: 110185-12

SHEET No: CC1419

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1419 | B

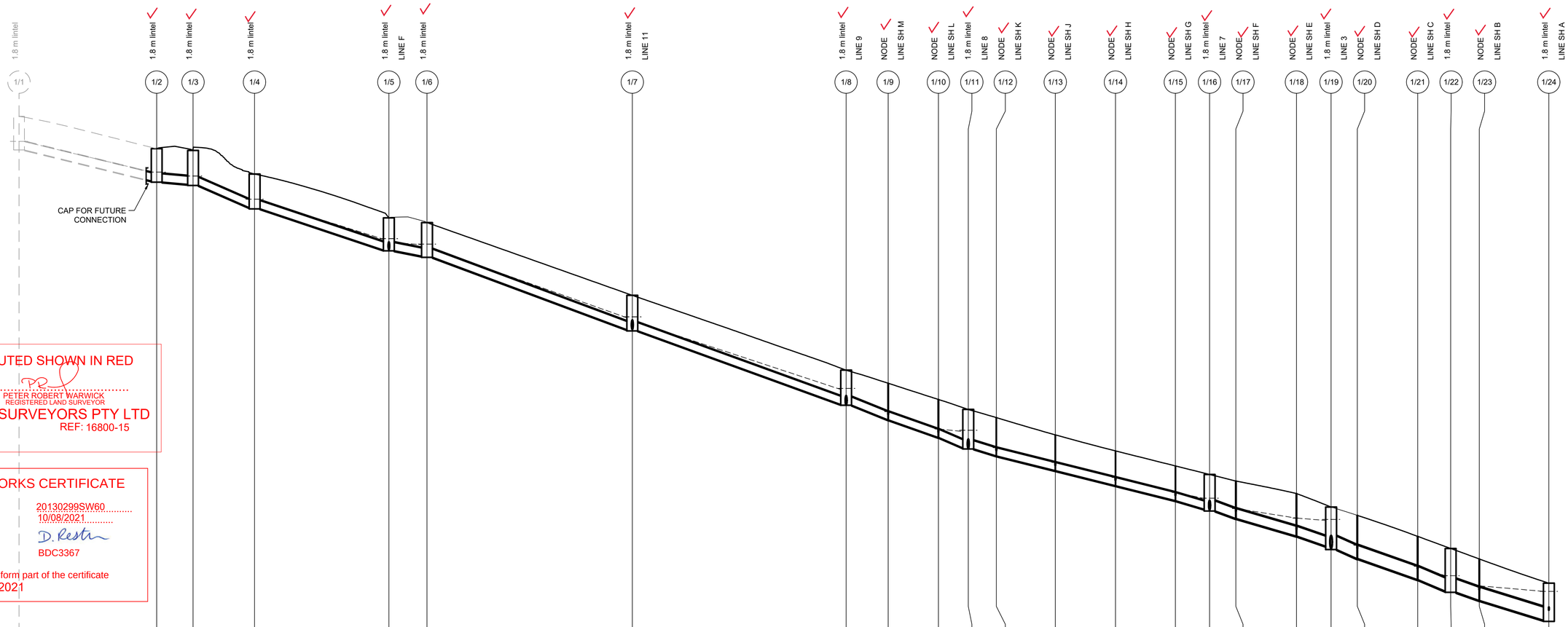
Plotted: 21 July, 2021 2:47:24 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1419.dwg

DESIGN STORM 1:100yr ARI HYDRAULIC RESULTS

PIPE NAME	PIPE TYPE	PIPE DIAMETER	PIPE LENGTH	PIPE SLOPE	PIPE AREA Af	FULL AREA TIME Tc	FULL AREA INTENSITY I	FULL AREA SUM CA	FULL AREA FLOW Qc	PART-AREA TIME Tc	PART-AREA INTENSITY I	PART-AREA SUM CA	PART-AREA FLOW Qc	DIRECT PIPE FLOW Qp	PEAK FLOW Qrat	NET BYPASS FLOW Qb	PIPE FLOW Q	FLOW CAP. Qcap	Q/Qcap RATIO	FULL PIPE VELOCITY	NORM. DEPTH VELOCITY	CRIT. DEPTH VELOCITY	U/S PIT GRATE RL	PIPE U/S IL	PIPE D/S IL	PIPE D/S DROP	U/S PIT Ku	U/S PIT Kw	PIPE V'HEAD	PIT LOSS (Ku.V'head)	WSE LOSS (Kw.V'head)	TOTAL PIPE LOSS	U/S PIT HGL	U/S PIPE HGL	D/S PIPE HGL	HGL GRADE	MIN. COVER	U/S FREEBOARD	COMMENTS
(-)	(-)	(mm)	(m)	(%)	(sq.m)	(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)	(m)	(m)	(m)	(-)	(-)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(%)	(m)	(m)	
1/1 to 1/2	RRJ2	375	30.84	4.51	0.11	10	167.3	0.107	49.7	5	219.1	0.09	55.3	0	55.3	-16.8	38.6	403.4	0.1	0.35	2.3	1.01	62.566	61.058	59.668	0.05	4.5		0.01	0.03	0.03	1.27	61.461	61.433	60.163	4.12	1.06	1.11	
1/2 to 1/3	RRJ2	375	8.15	1.25	0.11	10.22	165.9	0.254	116.9	5.22	215.9	0.22	130	0	130	-34.8	95.2	212.5	0.45	0.86	1.87	1.36	61.117	59.618	59.516	0.05	4.5		0.04	0.17	0.17	0.06	60.163	59.993	59.936	0.7	1.14	0.95	
1/3 to 1/4	RRJ2	375	13.79	7.23	0.11	10.3	165.4	0.293	134.7	5.3	214.9	0.25	149.6	0	149.6	-38.9	110.7	511.1	0.22	1	3.69	1.45	61.04	59.466	58.469	0.051	1.85	2.3	0.05	0.09	0.12	0.92	59.959	59.841	58.923	6.66	1.13	1.08	
1/4 to 1/5	RRJ2	375	30.09	6.15	0.11	10.36	165	0.309	141.8	5.36	214.1	0.26	157.2	0	157.2	-37.3	119.9	471.4	0.25	1.09	3.56	1.5	59.98	58.419	56.567	0.03	2.15	2.51	0.06	0.13	0.15	1.25	58.945	58.794	57.547	4.14	1.1	1.04	
1/5 to 1/6	RRJ2	375	8.54	2.83	0.11	10.5	164.1	0.526	240	5.5	212.1	0.45	266	0	266	-37.6	228.4	319.7	0.71	2.07	3.14	2.17	58.017	56.537	56.296	0.05	1.54	1.66	0.22	0.34	0.36	0.12	57.574	57.212	57.089	1.44	1.1	0.44	
1/6 to 1/7	RRJ2	375	46	7.06	0.11	10.54	163.8	0.556	252.9	5.54	211.5	0.48	280	0	280	-40.6	239.4	504.8	0.47	2.17	4.51	2.25	57.804	56.246	53	0.05	1.95	2.18	0.24	0.47	0.52	2.84	57.144	56.621	53.777	6.18	1.06	0.66	
1/7 to 1/8	RRJ2	375	47.91	6.89	0.11	10.71	162.8	0.747	337.7	5.5	212.1	0.64	374.1	0	374.1	-68.6	305.4	498.9	0.61	2.77	4.74	2.8	54.543	52.95	49.647	0.031	1.16	1.32	0.39	0.45	0.51	2.13	53.839	53.325	51.192	4.45	1.1	0.7	
1/8 to 1/9	RRJ2	375	9.42	7	0.11	10.88	161.7	0.929	417.4	5.66	209.9	0.79	462.2	0	462.2	-100.6	361.7	502.7	0.72	3.27	4.95	3.29	51.192	49.617	48.958	0	0.97	1.17	0.55	0.53	0.64	0.34	51.18	50.537	50.196	3.62	1.09	0.01	
1/9 to 1/10	RRJ2	375	11.26	7	0.11	10.91	161.5	0.977	438.3	5.69	209.4	0.83	485.4	0	485.4	-100.6	384.8	502.7	0.77	3.48	5.01	3.49	50.603	48.958	48.17	0	0		0.62	0	0	0.46	50.196	50.196	49.734	4.1	1.23	0.41	
1/10 to 1/11	RRJ2	375	6.69	7	0.11	10.95	161.2	1.019	456.4	5.73	208.9	0.87	505.3	0	505.3	-100.6	404.7	502.7	0.8	3.66	5.06	3.67	49.875	48.17	47.702	0.046	0		0.69	0	0	0.3	49.734	49.734	49.431	4.54	1.29	0.14	
1/11 to 1/12	RRJ2	375	6.29	5	0.11	10.97	161.1	1.172	524.6	5.75	208.6	1	581.9	0	581.9	-264.2	317.7	424.9	0.75	2.88	4.22	2.9	49.431	47.657	47.342	0	1.13	1.28	0.42	0.48	0.54	0.19	48.572	48.032	47.843	2.99	1.29	0.86	
1/12 to 1/13	RRJ2	375	13.2	5	0.11	11	160.9	1.213	542.4	5.78	208.2	1.04	601.6	0	601.6	-264.2	337.4	424.9	0.79	3.05	4.27	3.07	49.063	47.342	46.682	0	0		0.48	0	0	0.42	47.843	47.843	47.427	3.15	1.2	1.22	
1/13 to 1/14	RRJ2	375	13.49	5	0.11	11.05	160.6	1.255	560	5.83	207.5	1.08	620.6	0	620.6	-264.2	356.4	424.9	0.84	3.23	4.31	3.24	48.289	46.682	46.008	0	0		0.53	0	0	0.47	47.427	47.427	46.953	3.52	1.15	0.86	
1/14 to 1/15	RRJ2	375	13.43	5	0.11	11.1	160.3	1.296	577.1	5.88	206.8	1.11	639	0	639	-264.2	374.8	424.9	0.88	3.39	4.34	3.4	47.57	46.008	45.336	0	0		0.59	0	0	0.52	46.953	46.953	46.43	3.89	1.15	0.62	
1/15 to 1/16	RRJ2	375	7.66	5	0.11	11.15	159.9	1.336	593.5	5.93	206.1	1.15	656.7	0	656.7	-264.2	392.5	424.9	0.92	3.55	4.36	3.56	46.897	45.336	44.953	0.075	0		0.64	0	0	0.33	46.43	46.43	46.104	4.27	1.15	0.47	
1/16 to 1/17	RRJ2	450	5.89	5.8	0.16	11.18	159.8	1.407	624.2	5.96	205.7	1.21	690.8	0	690.8	-154.7	536.1	744.2	0.72	3.37	5.09	3.39	46.514	44.878	44.537	0	0.9	0.97	0.58	0.52	0.56	0.18	46.145	45.581	45.404	3.01	1.08	0.37	
1/17 to 1/18	RRJ2	450	13.58	5.8	0.16	11.2	159.6	1.448	642.3	5.98	205.4	1.25	710.9	0	710.9	-154.7	556.2	744.2	0.75	3.5	5.13	3.51	46.219	44.536	43.749	0	0		0.62	0	0	0.44	45.404	45.404	44.964	3.24	1.19	0.82	
1/18 to 1/19	RRJ2	450	7.76	5.8	0.16	11.25	159.4	1.488	658.7	6.03	204.8	1.28	729	0	729	-154.7	574.3	744.2	0.77	3.61	5.16	3.63	45.66	43.749	43.299	0.15	0		0.67	0	0	0.27	44.964	44.964	44.696	3.45	1.36	0.7	
1/19 to 1/20	RRJ2	600	5.87	7	0.28	11.27	159.2	3.217	1422.6	5.88	206.8	2.74	1572.2	0	1572.2	-562.7	1009.4	1760.7	0.57	3.57	6.44	3.6	45.054	43.149	42.738	-0.007	1.46	1.61	0.65	0.95	1.05	0.4	44.796	43.749	43.345	6.88	1.19	0.26	
1/20 to 1/21	RRJ2	600	13.52	7	0.28	11.29	159.1	3.259	1440.5	5.89	206.6	2.77	1591.8	0	1591.8	-562.7	1029.1	1760.6	0.58	3.64	6.47	3.67	44.682	42.745	41.799	0	0		0.68	0	0	0.62	43.345	43.345	42.723	4.6	1.29	1.34	
1/21 to 1/22	RRJ2	600	7.39	7	0.28	11.32	158.9	3.3	1456.2	5.85	207.1	2.8	1608.3	0	1608.3	-562.7	1045.5	1760.6	0.59	3.7	6.49	3.73	43.739	41.799	41.281	0.05	0		0.7	0	0	0.18	42.723	42.723	42.54	2.47	1.29	1.02	
1/22 to 1/23	RRJ2	600	6.42	5.7	0.28	11.34	158.8	3.389	1494.4	6.12	204	2.91	1651.2	0	1651.2	-556.5	1094.7	1588.8	0.69	3.87	6.06	3.9	43.197	41.231	40.865	0	0.38		0.76	0.29	0.29	0.17	42.54	42.253	42.079	2.71	1.22	0.66	
1/23 to 1/24	RRJ2	600	15.58	5.7	0.28	11.36	158.6	3.431	1511.9	6.13	203.8	2.95	1670.9	0	1670.9	-556.5	1114.5	1588.8	0.7	3.94	6.08	3.96	42.727	40.865	39.977	0.05	0		0.79	0	0	0.44	42.079	42.079	41.642	2.8	1.1	0.65	
1/24 to 1/25	RRJ2	600	9.52	4.41	0.28	11.4	158.4	3.484	1532.8	6.18	203.4	3	1694.2	0	1694.2	-837.5	856.7	1397.9	0.61	3.03	5.19	3.1	41.642	39.927	39.507	0.076	0.9		0.47	0.42	0.42	0.16	41.632	41.211	41.053	1.66	1.09	0.01	
1/25 to 1/26	RRJ3	675	28.9	4.32	0.36	11.43	158.2	3.568	1567.8	6.21	203.1	3.07	1733.9	0	1733.9	-694	1039.8	1893.8	0.55	2.91	5.41	3.02	41.317	39.432	38.183	0	1.8	1.95	0.43	0.78	0.84	0.38	41.115	40.276	39.9	1.3	1.1	0.2	
2/1 to 2/2	RRJ2	375	12.04	3.13	0.11	10	167.3	0.644	299.5	5	219.1	0.45	274.5	0	299.5	0	299.5	336	0.89	2.71	3.44	2.74	39.929	38.949	38.573	1.242	4.5		0	0	0	0	40	40	40	0	0.59	-0.07	
3/6 to 3/7	RRJ2	375	21.87	9.73	0.11	10.49	164.2	1.039	474	5.34	214.4	0.89	528.8	0	528.8	-78.7	450.2	592.8	0.76	4.08	5.9	4.08	51.346	49.86	47.731	0.076	1	1.16	0.77	0.76	0.88	1.11	51.336	50.451	49.342	5.07	1.1	0.01	
3/7 to 3/8	RRJ2	450	11.83	5.03	0.16	10.55	163.8	1.156	525.8	5.4	213.5	0.99	586.1	0	586.1	-172.8	413.4	692.8	0.6	2.6	4.55	2.66	49.342	47.656	47.062	0.03	1.5	1.59	0.34	0.52	0.55	0.21	48.99	48.441	48.23	1.79	1.17	0.35	
3/8 to 3/9	RRJ2	450	34.32	6	0.16	10.6	163.5	1.272	577.7	5.44	212.9	1.09	643.8	0	643.8	-172.3	471.5	757	0.62	2.96	5.02	3	48.658	47.032	44.972	0.051	1.67	1.79	0.45	0.75	0.8	1.06	48.284	47.482	46.424	3.08	1.05	0.37	
3/9 to 3/10	RRJ2	450	21.46	3.71	0.16	10.71	162.8	1.39	628.7	5.49	212.2	1.19	699.4	0	699.4	-169.3	530.1	595.5	0.89	3.33	4.23	3.35	46.599	44.922	44.125	0.075	0.63		0.57	0.36	0.36	0.63	46.424	46.066	45.435	2.94	1.1	0.18	
3/10 to 3/11	RRJ2	525	14.24	3.87	0.22	10.79	162.2	1.627	733.2	5.58	211	1.37	800.3	0	800.3	-106.8	693.4	916.7	0.76	3.2	4.65	3.24	45.688	44.05	43.499	0.05	1.43	1.63	0.16	0.24	0.27	0.1	45.467	45.2	45.101	0.69	1.23	0.22	
3/11 to 1/19	RRJ2	525	8.04	2.8	0.22	10.85	161.9	1.729	777.7	5.63	210.3	1.45	849.5	0	849.5	-465	384.4	779.9	0.49	1.78	3.59	2.08	45.101	43.449	43.224	0.075	1.57	1.61	0.16	0.25	0.26	0.05	45.01	44.75	44.696	0.68	1.14	0.09	
4/1 to 4/2	RRJ2	375	8.25	1	0.11	10	167.3	0.111	51.4	5	219.1	0.07	40.4	0	51.4	0	51.4	190	0.27	0.47	1.46	1.11	45.467	44.396	44.314	0.031	4.5		0	0	0	0	45.467	45.467	45.467	0	0.77	0	
4/2 to 3/10	RRJ2	375	8.37	1	0.11	10.09	166.7	0.169	78.2	10	167.3	0.17	78.1	0	78.2	-2.2	76	190	0.4	0.69	1.62	1.26	45.747	44.284	44.2	0.151	4.5		0.01	0.03	0.03	0	45.467	45.439	45.435	0.04	1.12	0.28	
7/1 to 1/16	RRJ2	375	9.2	3.45	0.11	10	167.3	0.05	23.2	5	219.1	0.04	25.8	0	25.8	29.1	54.9	352.9	0.16	0.5	2.32	1.13	46.74	45.27	44.953	0.075	4.5		0.01	0.06	0.06	0.01	46.168	46.111	46.104	0.08	1.09	0.57	
8/1 to 1/11	RRJ2	375	9.01	5	0.11	10	167.3	0.143	66.5	5	219.1	0.12	74	0	74	-8.1	66	424.9	0.16	0.6	2.79	1.2	49.685	48.152	47.702	0.046	4.5		0.02	0.08	0.08	0.01	49.524	49.442	49.431	0.12	1.14	0.16	
9/1 to 1/8	RRJ2	375	10.88	4.93	0.11	10	167.3	0.164	76	5	219.1	0.14	84.6	0	84.6	-21.7	62.9	421.8	0.15	0.57	2.74	1.18	51.707	50.183	49.647	0.031	4.5		0.02	0.07	0.07	0.01	51.278	51.204	51.192	0.11	1.1	0.43	
10/1 to 10/2	RRJ2	900	84.15	2	0.64	5	219.1	0	0	5	219.1	0	0	4608	4608	0	4608	2772.2	1.66	7.24	7.24	7.25	54.4	52.417	50.737	0.051	4.5		0.17	0.76	0.76	0.29	54.4	53.637	53.343	0.35	0.99	0	
10/2 to 10/3	RRJ2	900	37.57	4.25	0.64	5.19	216.4	0	0	5.19	216.4	0	0	4608	4608	0	4608	4044.5	1.14	7.24	7.24	7.25	53.439	50.687	49.091	0.05	1.68	1.79	0.91	1.53	1.63	0.7	53.439	51.814	51.109	1.88	1.25	0	
10/3 to 10/4	RRJ2	900	52.2	7.77	0.64	10.08	166.8	0.314	145.6	5.08	218	0.27	162	4608	4770	-55.4	4714.6	5470.2	0.86	7.41	9.67	7.41	51.203	49.041	44.983	0.05	0.34	0.36	2.8	0.96	1.01	3.01	51.154	50.145	47.131	5.77	1.1	0.05	
10/4 to 10/5	RRJ2	900	29.41	5.08	0.64	10.17	166.3	0.685	316.5	5.09	217.8	0.58	351.8	4608	4959.8	-959.8	4000	4420.6	0.9	6.29	7.87	6.29	47.131	44.933	43.44	0.05	0.24	0.24	2.02	0.48	0.49	1.22	47.131	46.639	45.417	4.16	1.04	0	
10/5 to 10/6	RRJ2	900	26.71	5.14	0.64	10.23	165.9	0.788	363.2	5.15	216.9	0.67	403.5	4608	5011.5	-1269.2	3742.3	4449	0.84	5.88	7.83	5.89	45.417	43.39	42.017	0.05	0.2		1.77	0.35	0.35	0.97	45.417	45.064	44.092	3.64	1	0	
10/6 to 10/7	RRJ2	900	44.94	5	0.64	11.08	160.4	1.833	816.7	5.52	211.8	1.55	914.5	4608	5522.5	-1950.1	3572.4	4387.2	0.81	5.62	7.68	5.63	44.092	41.967	39.72	0.051	0.33	0.35	1.61	0.52	0.56	1.49	44.092	43.536	42.046	3.32	1.1	0	
10/7 to 10/8	RRJ2	1050	19.74	2.32	0.87	11.18	159.8	2.115	938.6	5.62	210.5	1.8	1051.5	4608	5659.5	-2681.5	2978	4507	0.66	3.44	5.56	3.62	42.046	39.67	39.212	0.031	0.42	0.49	0.6	0.25	0.3	0.2	41.5	41.203	41.003	1.01	1.27	0.55	
10/8 to 10/9	RRJ2	1050	41.96	2	0.87	11.24	159.4	3.095	1370.2	5.72	208.9	2.64	1531.6	4608	6139.6	-2891.9	3247.7	4185.4	0.78	3.75	5.34	3.88	42.216	39.182	38.343	0.031	0.74	0.84	0.72	0.53	0.6	0.51	41.075	40.475	39.969	1.2	1.26	1.14	
10/9 to 10/10	RRJ2	(2x)1200	21.26	1	2.26	12.5	152	7.83	3307	7.02	195.4	6.73	3652.5	10106	13758.5	-8973.2	4785.3	8550.1	0.56	2.12	3.85	2.78	40.702	38.313	38.1		2		0.23	0.46	0.46	0.24	39.969	39.513	38.747	3.6		0.73	
11/1 to 1/7	RRJ2	375	8.06	1.25	0.11	10	167.3	0.164	76.4	5	219.1	0.14	85	0	85	-27.7	57.3	212.5	0.27	0.52	1.63	1.15	54.614	53.139	53.038	0.089	4.5		0.01	0.06	0.06	0.01	53.846	53.785	53.777	0.09	1.12	0.77	
12/1 to 12/2	RRJ2	375	37.78	3.43	0.11	10	167.3	0.077	35.6	5	219.1	0.07	39.6	0	39.6	-10.3	29.3	351.8	0.08	0.27	1.93	0.93	41.411	39.868	38.573		4.5		0	0.02	0.02	0.24	40.259	40.243	40	0.64	1.1	1.15	
13/1 to 10/3	RRJ2	375	8	2	0.11	10	167.3	0.111	51.8	5	219.1	0.09	57.6	0	57.6	-15.7	41.9	268.7	0.16	0.38	1.77	1.04	51.226	49.776	49.616	0.576	4.5		0.01	0.03	0.03	0	51.146	51.113	51.109	0.05	1.1	0.08	
14/1 to 14/2	RRJ2	900	52.28	3.5	0.64	5	219.1	0	0	5	219.1	0	0	4498	4498	-2239.2	2258.8	3670.4	0.62	3.55	6.06	3.66	54.4	50.497	48.667	0.031	4.5		0.64	2.89	2.89	0.69	54.4	51.506	50.813	1.33	1.27	0	
14/2 to 14/3	RRJ2	900	22.83	4.42	0.64	10.91	161.5	0.267	120	5.91	206.4	0.23	132.5	4498	4630.5	-529.2	4101.3	4122.6	0.99	6.45	7.38	6.45	50.944	48.637	47.629	0.031	1.41	1.43	0.63	0.89	0.91	0.3	50.829	49.923	49.626	1.3	1.27	0.12	
14/3 to 14/4	RRJ2	900	26.23	4.83	0.64	10.96	161.2	0.41	183.5	5.38	213.7	0.34	203.9	4498	4701.9	-144.6	4557.3	4310.5	1.06	7.16	7.65	7.17	49.916	47.599	46.333	0.031	1.28	1.47	0.64	0.82	0.94	0.35	49.746	48.807	48.462	1.32	1.23	0.17	
14/4 to 14/5	RRJ2	900	32.09	5.5	0.64	11.02	160.8	1.101	491.9	10	167.3	1.1	509.2	4498	5007.2	-402	4605.2	4601.4	1	7.24	8.24	7.24	48.578	46.303	44.538	0.03	1.46	1.62	0.68	1	1.11	0.45	48.571	47.46	47.008	1.41	1.29	0.01	
14/5 to 14/6	RRJ2	900	29.7	5.32	0.64	11.18	159.8	1.697	752.9	6.18	203.4	1.41	797.3	4498	5295.3	-2480.9	2814.4	4526	0.62	4.42	7.5	4.46	47.008	44.508	42.928	0.031	0.62	0.71	1	0.62	0.71	0.61	47.008	46.295	45.684	2.06	1.53	0	
14/6 to 14/7	RRJ2	900	25.4	4.36	0.64	11.25	159.3	2.09	924.9	6.25	202.8	1.73	974.6	4498	5472.6	-3004.1	2468.6	4096.8	0.6	3.88	6.74	3.95	45.684	42.898	41.79	0.051	0.44	0.5	0.77	0.34	0.39	0.4	45.684	45.297	44.895	1.58	1.79	0	
14/7 to 14/8	RRJ2	1050	7.56	4.2	0.87	11.31	158.9	2.09	922.6	6.31	202.2	1.73	971.8	4498	5469.8	-3606	1863.8	6065.1	0.31	2.15	6.16	2.71	44.895	41.74	41.423	0.031	1.48	1.57	0.24	0.35	0.37	0.03	44.895	44.523	44.494	0.4	1.93	0	
14/8 to 14/9	RRJ2	1050	4.27	3	0.87	11.33	158.8	2.344	1034	6.33	202	1.94	1087.4	4498	5585.4	-227.5	5357.9	5126.1	1.05	6.19	6.71	6.2	44.5	41.393	41.265	0.031	2.29	2.41	0.06	0.13	0.13	0	44.5	44.365	44.361	0.09	1.98	0	
14/9 to 14/10	RRJ2	(2x)900	11	1.25	1.27	11.34	158.7	4.311	1901	5.71	209.1	3.56	2068.2	4498	6566.2	-394.7	6171.5	4387.2	1.41	4.85	4.85	4.88	44.517	41.235	41.097	0.031	0.67	0.79	0.12	0.08	0.1	0.03	44.376	44.279	44.251	0.25	2.39	0.14	
14/10 to 14/11	RRJ2	(2x)900	47.24	1	1.27	11.38	158.5	4.735	2084.9	5.7	209.3	3.91	2275.8	4498	6773.8	-313.5	6460.2	3924.7	1.65	5.08	5.08	5.1	44.517	41.067	40.595	0.029	0.39	0.42	1.32	0.51	0.55	1.28	44.288	43.736	42.456	2.71	0.93	0.23	
14/11 to 14/12	RRJ2	900	57.67	1	0.64	11.54	157.5	4.735	2071.8	6.35	201.8	4.02	2254.9	5498	7752.9	-313.5	7439.3	1962	3.79	11.69	11.69	11.69	42.6	40.566	39.99	0.031	1.98	2.37	0.11	0.22	0.27	0.13	42.5	42.234	42.1	0.23	0.97	0.1	
14/12 to 14/13	RRJ3	900	90.9	1.01	0.64	11.62	157	4.735	2064.9	6.43	201	4.02	2246.2	5498	7744.2	-5381.3	2362.9	1968.9	1.2	3.71	3.71	3.8	42.1	39.96	39.044	0.031	0.22		0.7	0.16	0.16	1.32	42.1	41.941	40.623	1.45	0.59	0	
14/13 to 10/9	RRJ3	900	83.16	0.7	0.64	12.03	154.4	4.735	2031	6.84	197.2	4.02	2203.2	5498	7701.2	-6081.3	1619.8	1641.5	0.99	2.55	2.94	2.87	40.623	39.014	38.432	0.12	0.25	0.26	0.33	0.08	0.09	0.57	40.623	40.536	39.969	0.68	0.64	0	
14E/1 to 14/11	RRJ2	900	13.72	1	0.64	5	219.1	0	0	5	219.1	0	0	1000	1000	0	1000	1962	0.51	1.57	3.1	2.26	42.5	40.882	40.745	0.179	0		0.13	0	0	0.04	42.491	42.491	42.456	0.26	0.65	0.01	
15/1 to 15/2	RRJ2	375	57.97	2.35	0.11	10	167.3	0.151	70.3	5	219.1	0.13	78.2	0	78.2	-28.7	49.5	291.5	0.17	0.45	1.97	1.09	44.941	43.362	41.998	0.031	4.5		0.01	0.05	0.05	0.23	43.783	43.737	43.511	0.39	1.14	1.16	
15/2 to 15/3	RRJ2	375	29.5	2.5	0.11	10.78	162.4	0.839	378.4	5.49	212.2	0.72	421.9	0	421.9	-199	222.9	300.5	0.74	2.02	2.98	2.13	43.511	41.968	41.23	0.03	1.95	2.18	0.21	0.41	0.45	0.41	42.874	42.42	42.014	1.38	1.1	0.64	
15/3 to 10/8	RRJ2	375	21.38	2.5	0.11	10.94	161.3	0.923	413.4

DESIGN STORM 1:100yr ARI HYDRAULIC RESULTS

PIPE NAME	PIPE TYPE	PIPE DIAMETER	PIPE LENGTH	PIPE SLOPE	PIPE AREA Af	FULL AREA TIME Tc	FULL AREA INTENSITY I	FULL AREA SUM CA	FULL AREA FLOW Qc	PART-AREA TIME Tc	PART-AREA INTENSITY I	PART-AREA SUM CA	PART-AREA FLOW Qc	DIRECT PIPE FLOW Qp	PEAK FLOW Qrat	NET BYPASS FLOW Qb	PIPE FLOW Q	FLOW CAP. Qcap	Q/Qcap RATIO	FULL PIPE VELOCITY	NORM. DEPTH VELOCITY	CRIT. DEPTH VELOCITY	U/S PIT GRATE RL	PIPE U/S IL	PIPE D/S IL	PIPE D/S DROP	U/S PIT Ku	U/S PIT Kw	PIPE V'HEAD	PIT LOSS (Ku.V'head)	WSE LOSS (Kw.V'head)	TOTAL PIPE LOSS	U/S PIT HGL	U/S PIPE HGL	D/S PIPE HGL	HGL GRADE	MIN. COVER	U/S FREEBOARD	COMMENTS
(-)	(-)	(mm)	(m)	(%)	(sq.m)	(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)	(m)	(m)	(m)	(-)	(-)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(%)	(m)	(m)	
19/1 to 19/2	RRJ2	375	40.51	2.33	0.11	10	167.3	0.111	51.4	5	219.1	0.09	57.2	0	57.2	-20.9	36.2	289.8	0.13	0.33	1.79	0.99	48.089	46.681	45.739	0.05	4.5		0.01	0.02	0.02	0.51	47.081	47.056	46.549	1.25	1.03	1.01	
19/2 to 19/3	RRJ2	375	21.91	2.69	0.11	10.38	164.9	0.267	122.3	5.38	213.8	0.23	135.8	0	135.8	-47.6	88.2	311.8	0.28	0.8	2.43	1.33	47.055	45.689	45.099	0.05	2.09	2.11	0.03	0.07	0.07	0.05	46.55	46.481	46.434	0.22	0.97	0.51	
19/3 to 19/4	RRJ2	375	20.08	2.27	0.11	10.72	162.7	0.692	312.8	5.53	211.7	0.59	348.2	0	348.2	-144.1	204.2	286	0.71	1.85	2.81	2	46.434	45.049	44.594	0.051	1.51	1.59	0.17	0.26	0.28	0.23	46.434	46.157	45.925	1.15	0.99	0	
19/4 to 19/5	RRJ2	375	20.65	3.17	0.11	10.84	162	0.765	344.3	5.65	210	0.66	382.7	0	382.7	-185.7	196.9	338.2	0.58	1.78	3.18	1.95	45.925	44.544	43.89	0.051	1.78	2.08	0.16	0.29	0.34	0.22	45.924	45.586	45.365	1.07	1.04	0	
19/5 to 19/6	RRJ2	375	21.03	4.76	0.11	10.94	161.3	0.807	361.7	5.75	208.5	0.69	401.2	0	401.2	-104.9	296.3	414.6	0.71	2.68	4.08	2.72	45.414	43.84	42.839	0.051	1.31	1.45	0.37	0.48	0.53	0.51	45.413	44.882	44.371	2.43	1.1	0	
19/6 to 10/6	RRJ2	375	9.77	3.04	0.11	11.03	160.7	0.936	418.1	5.84	207.3	0.81	463.9	0	463.9	-295.9	168	331.4	0.51	1.52	3.01	1.77	44.371	42.789	42.492	0.525	1.55	1.72	0.12	0.18	0.2	0.08	44.371	44.168	44.092	0.78	1.19	0	
20/1 to 19/3	RRJ2	375	8.15	1.25	0.11	10	167.3	0.082	38.3	5	219.1	0.07	42.6	0	42.6	-11.6	31.1	212.5	0.15	0.28	1.37	0.95	46.479	45.118	45.016	-0.033	4.5		0	0.02	0.02	0	46.454	46.436	46.434	0.03	1.01	0.02	
21/1 to 10/4	RRJ2	375	8.01	1.25	0.11	10	167.3	0.167	77.6	5	219.1	0.14	86.4	0	86.4	-46.1	40.2	212.5	0.19	0.36	1.48	1.03	47.165	45.71	45.61	0.677	4.5		0.01	0.03	0.03	0	47.165	47.135	47.131	0.04	1.1	0	
22/1 to 22/2	RRJ2	375	11.01	1.25	0.11	10	167.3	0.227	105.5	5	219.1	0.19	117.4	0	117.4	-48	69.4	212.5	0.33	0.63	1.72	1.22	44.771	43.331	43.193	0.031	4.5		0.02	0.09	0.09	0.01	44.488	44.397	44.382	0.13	1.09	0.28	
22/2 to 14/10	RRJ2	375	31.14	1	0.11	10.11	166.6	0.292	134.9	5.11	217.6	0.25	149.9	0	149.9	-57.1	92.8	190	0.49	0.84	1.71	1.35	44.764	43.163	42.852	1.785	1.59	1.91	0.04	0.06	0.07	0.07	44.394	44.325	44.251	0.24	1.22	0.37	
23/1 to 14/9	RRJ2	750	23.93	1.23	0.44	10	167.3	1.418	659.1	5	219.1	1.21	733.4	0	733.4	0	733.4	1339.7	0.55	1.66	3.1	2.19	44.733	41.58	41.285	0.051	2		0.14	0.28	0.28	0.09	44.731	44.45	44.361	0.37	2.34	0	
26/1 to 26/2	RRJ2	375	28.61	4.62	0.11	10.45	164.5	0.264	120.5	5.33	214.4	0.22	133.9	0	133.9	27.6	161.5	408.4	0.4	1.46	3.48	1.73	45.672	44.311	42.99	0.051	4.5		0.11	0.49	0.49	0.3	45.177	44.686	44.388	1.04	0.89	0.49	
26/2 to 26/3	RRJ2	375	8.18	1.43	0.11	10.58	163.6	0.373	169.4	5.47	212.5	0.32	188.3	0	188.3	-154	34.3	227.1	0.15	0.31	1.48	0.98	44.388	42.94	42.823	0.031	1.67	2.01	0	0.01	0.01	0	44.387	44.377	44.375	0.03	1.1	0	
26/3 to 14/9	RRJ2	375	15.46	1.01	0.11	10.68	163	0.418	189.2	5.46	212.6	0.36	212.4	0	212.4	-174.8	37.7	191.4	0.2	0.34	1.35	1.01	44.376	42.793	42.636	1.402	1.22	1.36	0.01	0.01	0.01	0.01	44.375	44.367	44.361	0.04	1.35	0	
27/1 to 27/2	RRJ2	375	21	1.12	0.11	10	167.3	0.104	48.4	5	219.1	0.09	53.9	0	53.9	-19.2	34.7	201.3	0.17	0.31	1.36	0.98	48.203	46.682	46.447	0.031	4.5		0.01	0.02	0.02	0.01	47.922	47.899	47.892	0.03	1.11	0.28	
27/2 to 27/3	RRJ2	375	23.4	1.01	0.11	10.63	163.3	0.416	188.8	5.44	212.9	0.36	210	0	210	-59.1	150.9	191	0.79	1.37	1.92	1.67	47.906	46.417	46.181	0.031	1.57	1.71	0.09	0.15	0.16	0.15	47.906	47.744	47.597	0.63	1.08	0	
27/3 to 27/4	RRJ2	375	8	1	0.11	10.83	162	0.5	225.2	5.54	211.5	0.43	250	0	250	-124.4	125.6	190	0.66	1.14	1.84	1.53	47.597	46.151	46.071	0.031	1.59	1.96	0.07	0.1	0.13	0.03	47.527	47.398	47.363	0.44	1.11	0.07	
27/4 to 27/5	RRJ2	375	14.73	1.8	0.11	10.9	161.5	0.559	250.9	5.61	210.5	0.48	278.6	0	278.6	-154.8	123.8	254.9	0.49	1.12	2.29	1.52	47.597	46.041	45.775	0.031	1.52	1.57	0.06	0.1	0.1	0.06	47.366	47.266	47.203	0.42	1.23	0.23	
27/5 to 27/6	RRJ2	375	8.41	1.25	0.11	11.01	160.9	0.579	258.7	5.72	209	0.49	286.7	0	286.7	-206	80.6	212.5	0.38	0.73	1.79	1.28	47.203	45.745	45.64	0.031	4.5		0.03	0.12	0.12	0.02	47.202	47.08	47.064	0.18	1.09	0	
27/6 to 14/5	RRJ2	375	9.7	1.05	0.11	11.09	160.4	0.595	265.3	5.8	207.9	0.51	293.5	0	293.5	-201.2	92.3	194.3	0.47	0.84	1.74	1.35	47.076	45.61	45.509	1.001	0.94	1.07	0.04	0.03	0.04	0.02	47.069	47.031	47.008	0.24	1.08	0.01	
28/1 to 28/2	RRJ2	375	8.09	1	0.11	10	167.3	0.063	29.4	5	219.1	0.05	32.7	0	32.7	8.5	41.3	190.1	0.22	0.37	1.37	1.03	48.63	47.174	47.093	0.031	4.5		0.01	0.03	0.03	0	48.54	48.508	48.504	0.05	1.1	0.09	
28/2 to 14/4	RRJ2	375	15.52	1	0.11	10.1	166.7	0.076	35.1	5.1	217.7	0.06	38.9	0	38.9	28.7	67.7	190.1	0.36	0.61	1.58	1.21	48.571	47.063	46.908	0.605	1.16	1.21	0.02	0.02	0.02	0.02	48.505	48.482	48.462	0.13	1.25	0.07	
29/1 to 29/2	RRJ2	375	8.3	2.03	0.11	10	167.3	0.131	60.8	5	219.1	0.11	67.7	0	67.7	-18.5	49.2	270.8	0.18	0.45	1.86	1.09	49.854	48.39	48.222	0.03	4.5		0.01	0.05	0.05	0.01	49.753	49.707	49.701	0.07	1.1	0.1	
29/2 to 14/3	RRJ2	375	7.66	1.99	0.11	10.07	166.9	0.142	66	5.07	218	0.12	73.3	0	73.3	26.3	99.7	268	0.37	0.9	2.25	1.39	49.746	48.192	48.039	0.441	1.3	1.37	0.04	0.05	0.06	0.02	49.704	49.647	49.626	0.28	1.29	0.04	
30/1 to 30/2	RRJ2	375	62.69	2.31	0.11	10	167.3	0.064	29.7	5	219.1	0.05	33	0	33	-8.9	24.1	288.8	0.08	0.22	1.58	0.88	53.852	52.348	50.9	0.05	4.5		0	0.01	0.01	1.43	52.734	52.723	51.293	2.28	1.07	1.12	
30/2 to 30/3	RRJ2	375	31.51	5.3	0.11	10.66	163.1	0.245	110.8	5.66	209.9	0.21	123.1	0	123.1	-30.6	92.4	437.4	0.21	0.84	3.14	1.35	52.484	50.85	49.18	0.031	1.9	2.43	0.04	0.07	0.09	0.4	51.312	51.225	50.829	1.26	1.04	1.17	
30/3 to 14/2	RRJ2	375	7.17	1	0.11	10.83	162	0.267	120.3	5.83	207.5	0.23	133.2	0	133.2	-81.3	51.9	190	0.27	0.47	1.47	1.11	50.829	49.15	49.078	0.442	0.6	0.7	0.01	0.01	0.01	0.01	50.826	50.818	50.813	0.07	1.42	0	
31/1 to 30/2	RRJ2	375	9.14	2.29	0.11	10	167.3	0.13	60.5	5	219.1	0.11	67.3	0	67.3	-22.4	44.9	287.7	0.16	0.41	1.89	1.06	52.585	51.11	50.9	0.05	4.5		0.01	0.04	0.04	0.19	51.523	51.485	51.293	2.1	1.13	1.06	
32/1 to 32/2	RRJ2	450	38.29	8.72	0.16	10	167.3	0.938	436.1	5	219.1	0.89	542.4	0	542.4	-274.9	267.5	912.5	0.29	1.68	4.98	1.95	62.934	60.785	57.446	0.05	4.5		0.14	0.65	0.65	2.54	61.884	61.235	58.7	6.62	1.05	1.05	
32/2 to 32/3	RRJ2	450	5.83	5.3	0.16	10.13	166.5	1.01	467.4	5.13	217.3	0.95	575.2	0	575.2	-238.7	336.4	711.1	0.47	2.12	4.41	2.26	58.925	57.396	57.087	0.226	1.34	1.52	0.23	0.31	0.35	0.07	58.74	58.394	58.325	1.19	0.94	0.18	
32/3 to 32/4	RRJ2	675	8.02	2	0.36	10.62	163.4	1.656	751.5	5.15	217	1.49	896.9	0	896.9	-364.5	532.4	1288.4	0.41	1.49	3.43	2.03	58.543	56.862	56.702	0.05	1.79	1.89	0.11	0.2	0.21	0.03	58.335	58.122	58.095	0.34	1.03	0.21	
32/4 to 32/5	RRJ2	675	54.74	3.19	0.36	10.99	161	2.78	1243.2	5.54	211.6	2.45	1441.9	0	1441.9	-380.8	1061.1	1626.1	0.65	2.97	4.84	3.07	58.544	56.652	54.908	0.151	1.71	1.9	0.45	0.77	0.85	0.78	58.178	57.327	56.544	1.43	1.08	0.37	
32/5 to 32/6	RRJ2	825	35.77	1	0.53	11.64	156.8	5.471	2383.4	5.85	207.2	4.73	2722.7	0	2722.7	-1082.1	1640.6	1555.7	1.05	3.07	3.29	3.22	56.815	54.758	54.4	0.076	2		0.48	0.96	0.96	0.38	56.544	55.583	55.127	1.27	-0.26	0.27	
33/1 to 33/2	RRJ2	375	36.98	1.32	0.11	10	167.3	0.153	70.9	5	219.1	0.13	78.9	0	78.9	-13.7	65.3	218.5	0.3	0.59	1.73	1.19	59.34	57.709	57.22	0.031	4.5		0.02	0.08	0.08	0.04	58.695	58.614	58.571	0.12	1.1	0.65	
33/2 to 32/3	RRJ2	375	29.5	1	0.11	10.36	165	0.304	139.5	5.36	214.1	0.26	154.8	0	154.8	-21	133.8	190	0.7	1.21	1.86	1.57	58.803	57.19	56.895	0.034	1.33		0.07	0.1	0.1	0.15	58.571	58.471	58.325	0.5	1.19	0.23	
34/1 to 34/2	RRJ2	375	39.89	6.46	0.11	10	167.3	0.102	47.2	5	219.1	0.09	52.6	0	52.6	-15.1	37.4	483.2	0.08	0.34	2.59	1	71.198	69.624	67.045	0.05	4.5		0.01	0.03	0.03	2.51	70.025	69.999	67.492	6.28	1.1	1.17	
34/2 to 34/3	RRJ2	375	42.8	7.07	0.11	10.26	165.7	0.283	130.4	5.26	215.5	0.24	144.9	0	144.9	-48.3	96.7	505.3	0.19	0.88	3.53	1.37	68.493	66.995	63.969	0.051	3.12	3.34	0.04	0.12	0.13	2.75	67.501	67.37	64.621	6.42	0.98	0.99	
34/3 to 34/4	RRJ2	375	40.51	7.66	0.11	10.46	164.4	0.574	262.2	5.2	216.2	0.49	291.3	0	291.3	-80.3	211	526.1	0.4	1.91	4.5	2.05	65.464	63.919	60.814	0.05	1.76	2.05	0.19	0.33	0.38	2.67	64.675	64.294	61.622	6.6	0.98	0.79	
34/4 to 34/5	RRJ2	375	42.86	5.77	0.11	10.61	163.4	0.777	352.8	5.35	214.1	0.66	392.4	0	392.4	-94.3	298.1	456.4	0.65	2.7	4.4	2.73	62.544	60.764	58.291	0.076	1.3	1.45	0.37	0.48	0.54	1.75	61.679	61.139	59.393	4.07	1.1	0.87	
34/5 to 34/6	RRJ2	450	11.07	4.25	0.16	10.77	162.4	0.978	441	5.51	211.9	0.83	490.4	0	490.4	-116.8	373.6	636.7	0.59	2.35	4.16	2.45	59.939	58.216	57.746	0.076	1.75	1.9	0.28	0.49	0.53	0.16	59.434	58.9	58.739	1.46	1.17	0.5	
34/6 to 32/4	RRJ2	525	38.2	2.6	0.22	10.82	162.1	1.05	472.9	5.56	211.3	0.9	525.9	0	525.9	-117.9	408	751.5	0.54	1.88	3.54	2.15	59.542	57.671	56.678	0.027	1.94	1.99	0.18	0.35	0.36	0.29	58.749	58.388	58.095	0.77	1.1	0.79	
35/1 to 34/3	RRJ2	375	8.02	1.25	0.11	10	167.3	0.093	43.3	5	219.1	0.08	48.2	0	48.2	-13.2	35	212.5	0.16	0.32	1.42	0.98	65.42	63.988	63.888	-0.031	4.5		0.01	0.02	0.02	0	64.647	64.624	64.621	0.03	1.08	0.77	
36/1 to 36/2	RRJ2	375	19.14	2.37	0.11	10.75	162.5	0.649	292.8	5.52	211.8	0.55	325.3	0	325.3	-159.4	165.9	292.7	0.57	1.5	2.73	1.75	57.717	56.1	55.646	0.051	2		0.12	0.23	0.23	0.15	57.717	57.487	57.341	0.76	1.16	0	
36/2 to 36/3	RRJ2	375	8	1.56	0.11	10.87	161.8	0.746	335.1	5.64	210.1	0.64	372	0	372	-274.9	97.1	237.5	0.41	0.88	2.04	1.38	57.341	55.596	55.471	0.3	1.56	1.94	0.04	0.06	0.08	0.02	57.017	56.94	56.919	0.26	1.41	0.32	
36/3 to 32/5	RRJ2	675	19.51	1.35	0.36	11.53	157.5	2.69	1177.1	6.39	201.4	2.36	1317.6	0	1317.6	-701.2	616.4	1058.4	0.58	1.72	3.07	2.17	57.341	55.171	54.908	0.15	1.89	2.09	0.15	0.29	0.32	0.09	56.949	56.633	56.544	0.46	1.2	0.39	
37/5 to 37/6	RRJ2	600	18.54	2.5	0.28	11.42	158.3	1.864	819.5	6.27	202.5	1.63	916	0	916	-285	631	1052.2	0.6	2.23	3.89	2.45	57.877	55.913	55.449	0.051	0.32	0.37	0.25	0.08	0.09	0.17	57.639	57.546	57.379	0.9	1.21	0.24	
37/6 to 36/3	RRJ2	600	7.66	2	0.28	11.5	157.8	1.903	833.8	6.35	201.8	1.66	931.8	0	931.8	-421.7	510.1	941.1	0.54	1.8	3.39	2.16	57.379	55.399	55.246	0.075	1.85	2.15	0.17	0.31	0.36	0.05	57.321	56.964	56.919	0.59	1.33	0.06	
A/1 to A/2	uPVC	225	13.74	2	0.04	10	167.3	0.043	20.2	5	219.1	0.04	22.4	0	22.4	0	22.4	82.6	0.27	0.56	1.77	0.99	47.638	46.908	46.633	0	6.79		0.02	0.11	0.11	0.02	47.257	47.146	47.126	0.15	0.48	0.38	
A/2 to A/3	uPVC	225	13.54	2	0.04	10.13	166.5	0.087	40.1	5.13	217.3	0.07	44.6	0	44.6	0	44.6	82.6	0.54	1.12	2.12	1.33	47.335	46.633	46.362	0.05	0.2		0.06	0.01	0.01	0.08	47.126	47.113	47.034	0.58	0.45	0.21	
A/3 to A/4	uPVC	225	13.47	2	0.04	10.24	165.8	0.131	60.2	5.24	215.8	0.11	66.8	0	66.8	0	66.8	82.6	0.81	1.68	2.31	1.75	47.035	46.312	46.043	0	1.05		0.13	0.14	0.14	0.16	47.035	46.898	46.738	1.19	0.47	0	
A/4 to A/5	uPVC	225	13.69	2	0.04	10.33	165.2	0.175	80.5	5.33	214.4	0.15	89.3	0	89.3	0	89.3	82.6	1.08	2.25	2.25	2.26	46.738	46.043	45.769	0.051	0.2		0.21	0.04	0.04	0.26	46.738	46.696	46.434	1.91	0.45	0	
A/5 to A/6	uPVC	225	13.47	2	0.04	10.43	164.5	0.22	100.7	5.43	213	0.19	111.6	0	111.6	0	111.6	82.6	1.35	2.81	2.81	2.81	46.434	45.719	45.449	0	0.76		0.15	0.11	0.11	0.18	46.434	46.32	46.137	1.36	0.46	0	
A/6 to A/7	uPVC	225	15.27	1.97	0.04	10.51	164	0.267	121.5	5.39	213.7	0.23	134.8	0	134.8	0	134.8	81.9	1.65	3.39	3.39	3.39	46.137	45.449	45.149	1.313	0.2		0.24	0.05	0.05	0.33	46.137	46.089	45.756	2.18	0.46	0	
A/7 to A/8	uPVC	225	1.54	1.6	0.04	10.59	163.6	0.32	145.2	5.46	212.6	0.27	161.1	0	161.1	0	161.1	73.8	2.18	4.05	4.05	4.05	46.011	43.836	43.812	0.031	1.48	1.81	0.76	1.13	1.38	0.11	46.011	44.626	44.519	6.94	0.5	0	
A/8 to A/9	uPVC	225	37.14	2.49	0.04	10.6	163.5	0.32	145.2	5.47	212.5	0.27	161.1	0	161.1	0	161.1	92.1	1.75	4.05	4.05	4.05	44.529	43.782	42.858	0.553	1.47	1.53	0.16	0.23	0.24	0.53	44.529	44.291	43.765	1.42	0.42	0	
A/9 to 15/2	RRJ2	300	5.77	4.55	0.07	10.75	162.5	0.378	170.6	5.62	210.4	0.32	189	0	189	0	189	223.5	0.85	2.67	3.54	2.69	43.805	42.305	42.043	0.075	1.64	1.98	0.12	0.19	0.23	0.06	43.805	43.572	43.511	1.05	1.16	0	
B/1 to B/2	uPVC	150	13.64	2.74	0.02	10	167.3	0.043	19.9	5	219.1	0.04	22.2	0	22.2	0	22.2	32.8	0.68	1.25	1.99	1.33	47.89	47.2	46.827	0.075	3.38		0.08	0.27	0.27	0.28	47.621	47.35	47.067	2.07	0.53	0.27	
B/2 to B/3	uPVC	225	14.6	3	0.04	10.11	166.6	0.085	39.5	5.11	217.5	0.07	43.9	0	43.9	0	43.9	101.2	0.43	1.1	2.45	1.32	47.536	46.752	46.314	0	1.46	1.51	0.06	0.09	0.09	0.41	47.071	46.977	46.568	2.8	0.54	0.47	
B/3 to B/4	uPVC	225	33.64	3	0.04	10.21	166	0.13	60	5.21	216.1	0.11	66.7	0	66.7	0	66.7	101.1	0.66	1.68	2.72	1.74	47.144	46.314	45.305	0.724	0.2		0.14	0.03	0.03	0.87	46.568	46.539	45.438	3.27	0.52	0.58	
B/4 to 26/1	RRJ2	300	4.82	4	0.07	10.42	164.6	0.182	83.1	5.42	213.2	0.16	92.1	0	92.1	0	92.1	209.6	0.44	1.3	2.87	1.54	46.032	44.581	44.388	0.077	1.83	2.18	0.09	0.16	0.19	0.04	45.404	45.215	45.177	0.77	1.1	0.63	
C/1 to C/2	uPVC	150	14.83	1.5	0.02	10	167.3	0.042	19.7	5	219.1	0.04	22	0	22	0	22	24.2	0.91	1.24	1.55	1.32	52.819	52.173	51.951	0.075	2.34		0.08	0.18	0.18	0.18	52.819	52.636	52.456	1.22	0.49	0	
C/2 to C/3	uPVC	225	15.67	1.1	0.04	10.16	166.3	0.086	39.7	5.16	216.8	0.07	44.1	0	44.1	0	44.1	61.1	0.72	1.11	1.67	1.32	52.611	51.876	51.704	0.03	0.92	0.93	0.06	0.06	0.06	0.09	52.456	52.398	52.308	0.57	0.47	0.15	
C/3 to C/4	uPVC	225	15.75	1.45	0.04	10.32	165.3	0.132	60.6	5.32	214.7	0.11	67.3	0	67.3	0	67.3	70.4	0.96	1.69	2.01	1.76	52.391	51.674	51.445	0.031	1.14	1.15	0.15	0.17	0.17	0.21	52.31	52.142	51.932	1.33	0.49	0.08	
C/4 to C/5	uPVC	225	16.19	1.49	0.04	10.45	164.5	0.179	81.8	5.45	212.8	0.15	90.8	0	90.8	0	90.8	71.2	1.28	2.28	2.28	2.3	52.17	51.415	51.175	1.505	1.1	1.14	0.27	0.29	0.3	0.24	51.943	51.64	51.394	1.52	0.49	0.23	
C/5 to C/6	uPVC	225	1.55	1.66	0.04	10.56	163.7	0.239	108.7	5.4	213.4	0.2	120.6	0	120.6	0	120.6	75.3	1.6	3.03	3.03	3.04	51.858	49.67	49.644	0.05	1.46	1.77	0.47	0.69	0.83	0.07	51.15	50.322	50.256	4.26	0.43	0.71	
C/6 to C/7	uPVC	225	35.34	9.7	0.04	10.57	163.7	0.239	108.7	5.41	213.3	0.2	120.5	0	120.5	0	120.5	181.9	0.66



WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

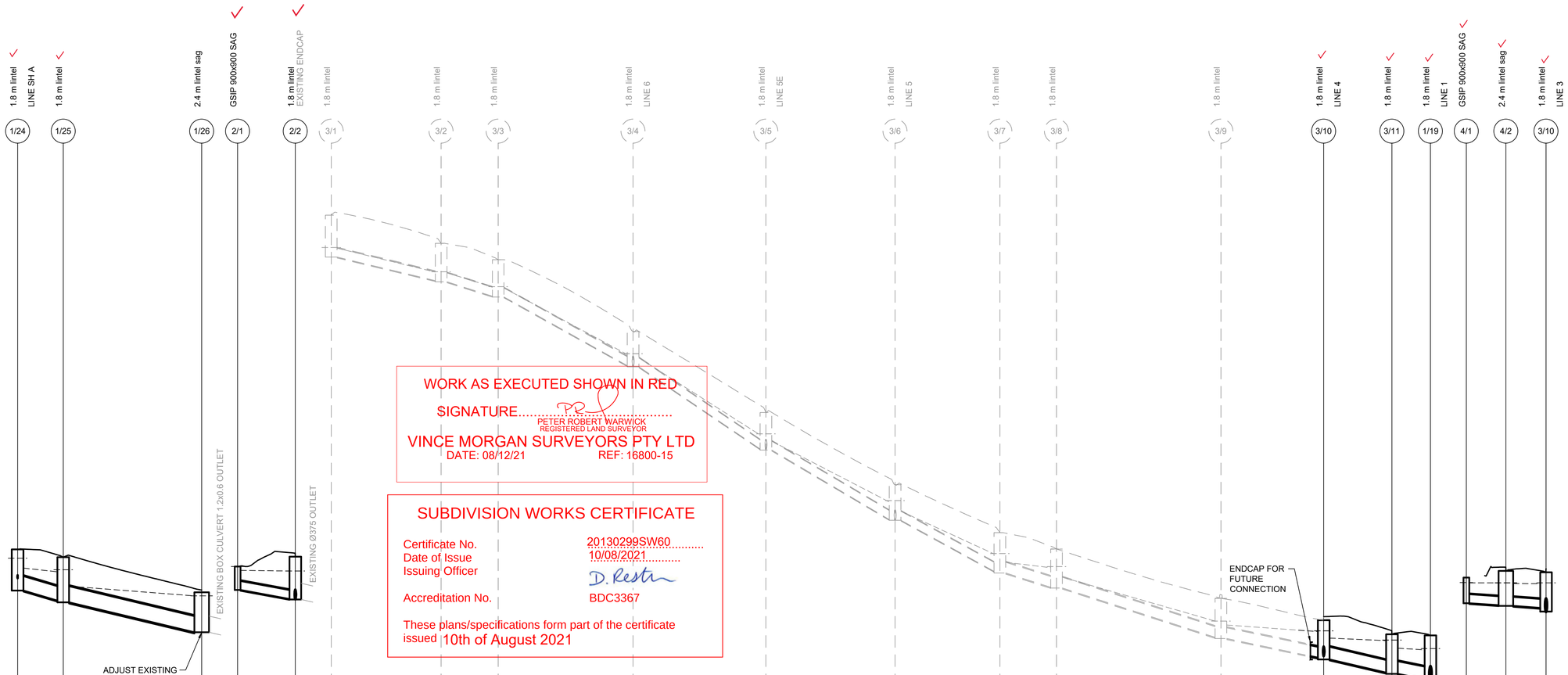
DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restn
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

| | | |



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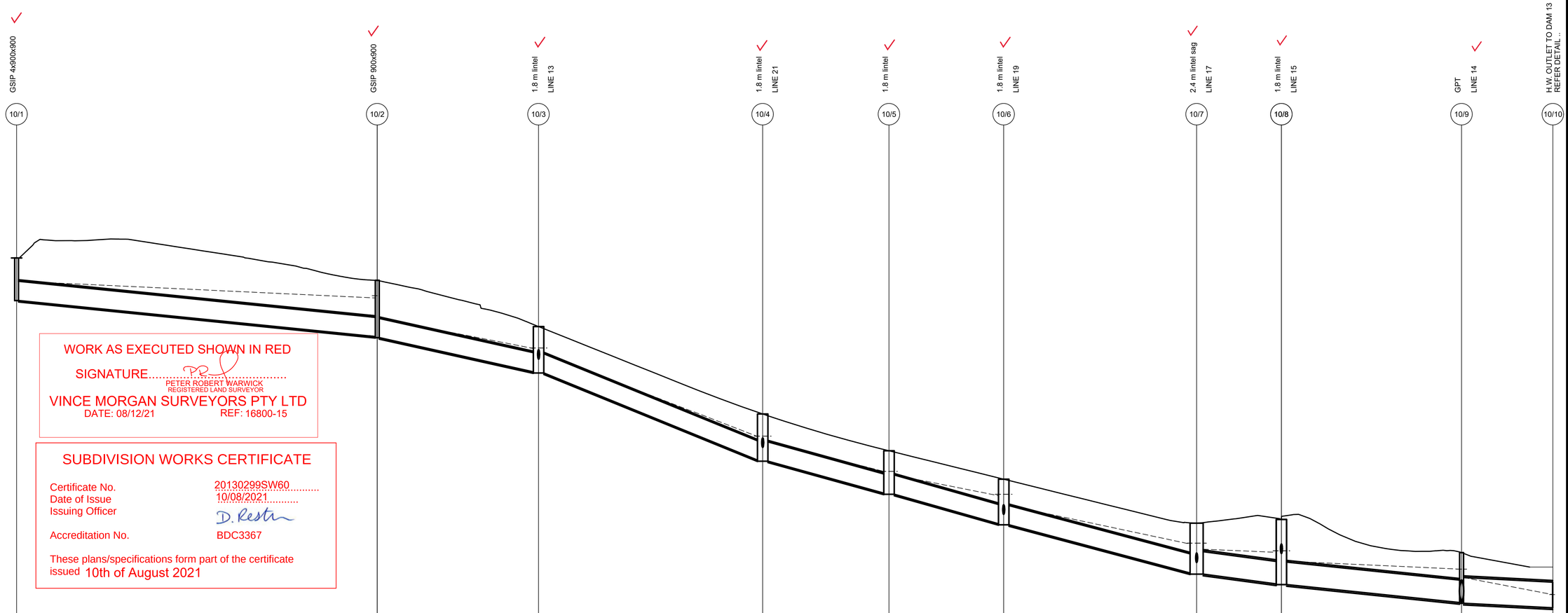

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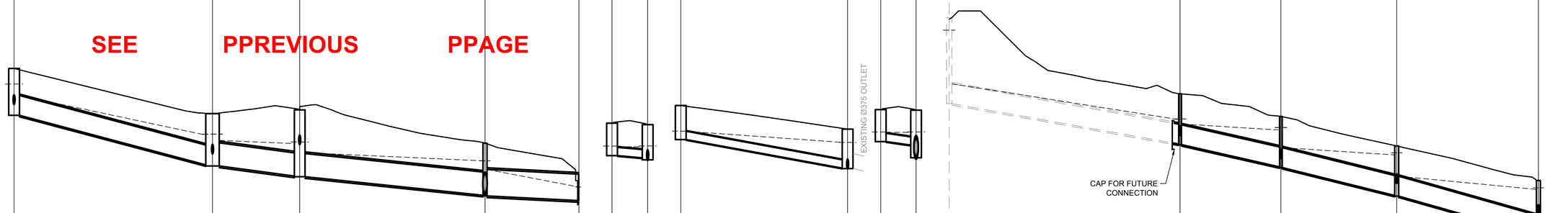
SEE PPREVIOUS PPAGE



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SEE UPDATED PLANS
DATED 3/3/2022
CERT NO 20130299SW72

SUBDIVISION WORKS CERTIFICATE

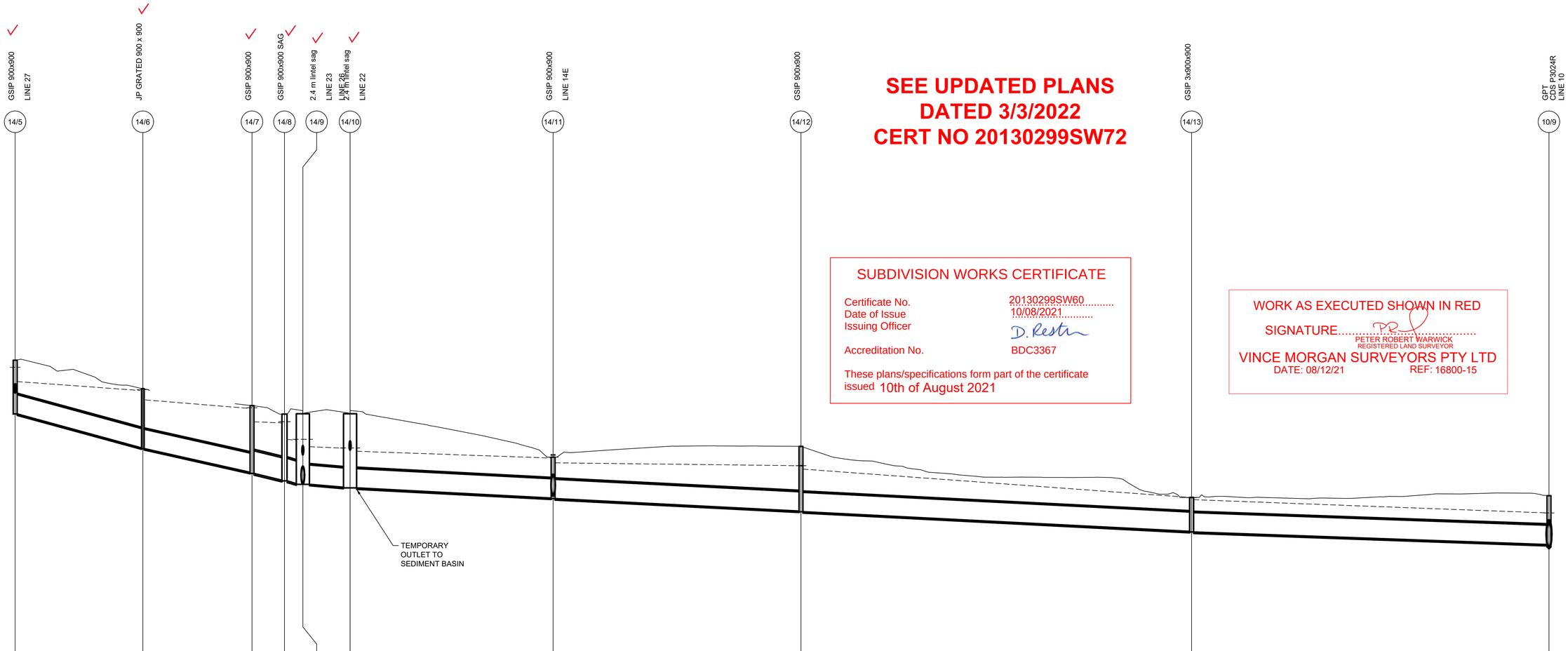
Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restin
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

WORK AS EXECUTED SHOWN IN RED

SIGNATURE..... PETER ROBERT WARWICK REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21 REF: 16800-15



DATUM (m)	33.00												
PEAK FLOW (L/s)	2324		2457		2456	2614	3116	3212	3699		2363		1689
PIPE SIZE (mm)	900 ✓		900 ✓		1050 ✓	1050 ✓	(2x)900 ✓	(2x)900	900		900		900
PIPE CLASS	RRJ2		RRJ2		RRJ2	RRJ2	RRJ2	RRJ2	RRJ2		RRJ3		RRJ3
PIPE GRADE (%)	5.3 5.2		4.4 ✓		4.2 3.4	3.0 1.5	1.2 1.1	1.0	1.0		1.0		0.7
PIPE COVER MINIMUM	1.53		1.79		1.93	1.98	2.39	0.93	0.97		0.59		0.64
FULL PIPE VELOCITY (m/s)	3.65		3.86		2.84	3.02	2.45	2.52	5.81		3.71		2.66
HGL GRADE (%)	1.4		1.57		0.69	0.78	0.63	0.67	0.23		1.45		0.74
WAE													
HYDRAULIC GRADE LINE	46.607	46.015	45.599	45.161	44.763	44.143	44.091	43.324	43.291	42.985	42.915	42.772	42.456	42.234	42.1	41.941	40.623	40.52	39.903	39.513
INVERT LEVEL	44.57	44.538	44.508	44.49	42.97	42.928	42.898	42.85	41.78	41.74	41.62	41.41	41.383	41.423	41.33	41.265	41.235	41.25	41.14	41.097	41.067	41.10	40.78	40.595	40.566	40.63	39.99	39.96	39.15	39.044	39.014	39.07	38.48	38.432	38.313
DESIGN SURFACE LEVEL	✓	47.008	45.55	45.684	44.62	44.895	44.60	44.5	✓	44.517	✓	44.517	42.57	42.5	43	40.5	40.623	✓	40.702
ROAD CHAINAGE			539.20		564.59	400.59	400.62	400.63									248.92		
PIPE CHAINAGE	133.432		163.133		188.536	196.096	200.363	211.363	258.605		316.277		407.177				490.335		

LINE 14

1:500 (AT A1)
1:1000 (AT A3)
10 0 10 20 30 40 50
METRES

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

	AMENDMENT	DES	DRN	CKD	APR	DATE
C	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL
THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
DRAINAGE LONGITUDINAL SECTIONS
SHEET 5

PROJECT No: 110185-12
SHEET No: CC1427

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1427 | C

Plotted: 21 July 2021 2:53:48 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1427.dwg

SEE UPDATED PPLANS
DATED 3/3/2022
CERT NO 20130299SW72

	CAPPED STUB	GSIP 900x900	1.8 m lintel	1.8 m lintel	1.8 m lintel	1.8 m lintel	1.8 m lintel	1.8 m lintel	2.4 m lintel sag	2.4 m lintel sag	1.8 m lintel	1.8 m lintel	1.8 m lintel	1.8 m lintel	2.4 m lintel sag	1.8 m lintel	1.8 m lintel	1.8 m lintel	1.8 m lintel	1.8 m lintel	1.8 m lintel	1.8 m lintel	1.8 m lintel	1.8 m lintel	1.8 m lintel	1.8 m lintel
		LINE 14		LINE 16 LINE A		LINE 10		LINE 15			LINE 10			LINE 20 LINE C					LINE 10		LINE 19			LINE 10	
	14E/1	14/11	15/1	15/2	15/3	10/8	16/1	15/2	17/1	10/7	19/1	19/2	19/3	19/4	19/5	19/6	10/6	20/1	19/3	21/1	10/4				
DATUM (m)	35.00		36.00					37.00		35.00		38.00							40.00		40.00				
PEAK FLOW (L/s)	500		36		201		228	22		43		27	62	174	194	204	234		21		41				
PIPE SIZE (mm)	900		375		375		375	375		375		375	375	375	375	375	375		375		375				
PIPE CLASS	RRJ2		RRJ2		RRJ2		RRJ2	RRJ2		RRJ2		RRJ2	RRJ2	RRJ2	RRJ2	RRJ2	RRJ2		RRJ2		RRJ2				
PIPE GRADE (%)	1.0		2.4		2.5		2.5	2.0 2.2		4.2 3.1		2.3	2.7 2.8	2.3	3.2 3.4	4.8 5.0	3.0 7.0		1.3 1.2		1.3 1.8				
PIPE COVER MINIMUM	0.65		1.14		1.10		1.12	1.07		1.13		1.03	0.97	0.99	1.04	1.10	1.19		1.01		1.10				
FULL PIPE VELOCITY (m/s)	0.79		0.33		1.82		2.06	0.20		0.39		0.24	0.57	1.58	1.76	1.84	2.12		0.19		0.37				
HGL GRADE (%)	0.06		1.82		1.36		3.11	0.01		0.05		2.34	1.81	0.93	1.98	1.66	1.51		0.01		0.05				
WAE																									
HYDRAULIC GRADE LINE	42.465	42.456	43.737	42.683	42.343	41.941	41.575	40.91	40.272	42.685	42.683	42.343	41.075	41.071	40.831	47.056	46.109	46.084	45.667	45.424	45.238	44.919	44.511	44.215	43.866	43.473	43.325	42.867	45.668	45.667	45.424	46.088	46.084	45.833
INVERT LEVEL	40.882	40.745	43.362	41.998	41.968	41.23	41.2	40.666	39.182	42.263	41.998	41.968	40.591	40.245	39.67	46.681	45.739	45.689	45.099	45.049	44.594	44.544	43.89	43.84	42.839	42.789	42.492	41.967	45.118	45.109	45.049	45.74	45.61	44.933	
		40.566	43.39	41.95		41.21		40.68	39.22	42.27		41.95	40.63		39.67	46.64	45.72	45.71	45.10	45.03	44.57	44.55	43.86		42.81	42.80	42.34	41.84	45.16	45.10	45.03	45.74	45.61	44.96
DESIGN SURFACE LEVEL	42.5	42.5	44.941	43.511	42.713	42.216	42.216			43.708	43.511	42.066	42.046			48.089	47.055	46.434	45.925	45.414	44.371	44.092							46.479	46.434		47.165	47.131	
			44.93	43.51	42.70	42.20	42.20			43.70		42.08	42.07			48.07	47.05	46.42	45.93	45.43	44.39	44.08							46.48	46.42		47.19	47.16	
ROAD CHAINAGE			265.25	207.61	178.33	160.00	160.00	215.00	207.61	4.00	14.20	128.00	168.61	190.58	15.47	19.30	64.48	133.955	58.88	189.00	190.58	115.48	115.00												
PIPE CHAINAGE	0	13.722	0	57.973	87.478	108.857	160.00	0	13.252	0	8.262	0	40.507	62.417	82.501	103.15	124.184	133.955	58.88	0	8.154	0	8.015	115.00										
	LINE 14E		LINE 15					LINE 16		LINE 17		LINE 19								LINE 20		LINE 21				

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restin

Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....
PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR
VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21 REF: 16800-15

1:500 (AT A1)
1:1000 (AT A3)
10 0 10 20 30 40 50
METRES

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

C	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

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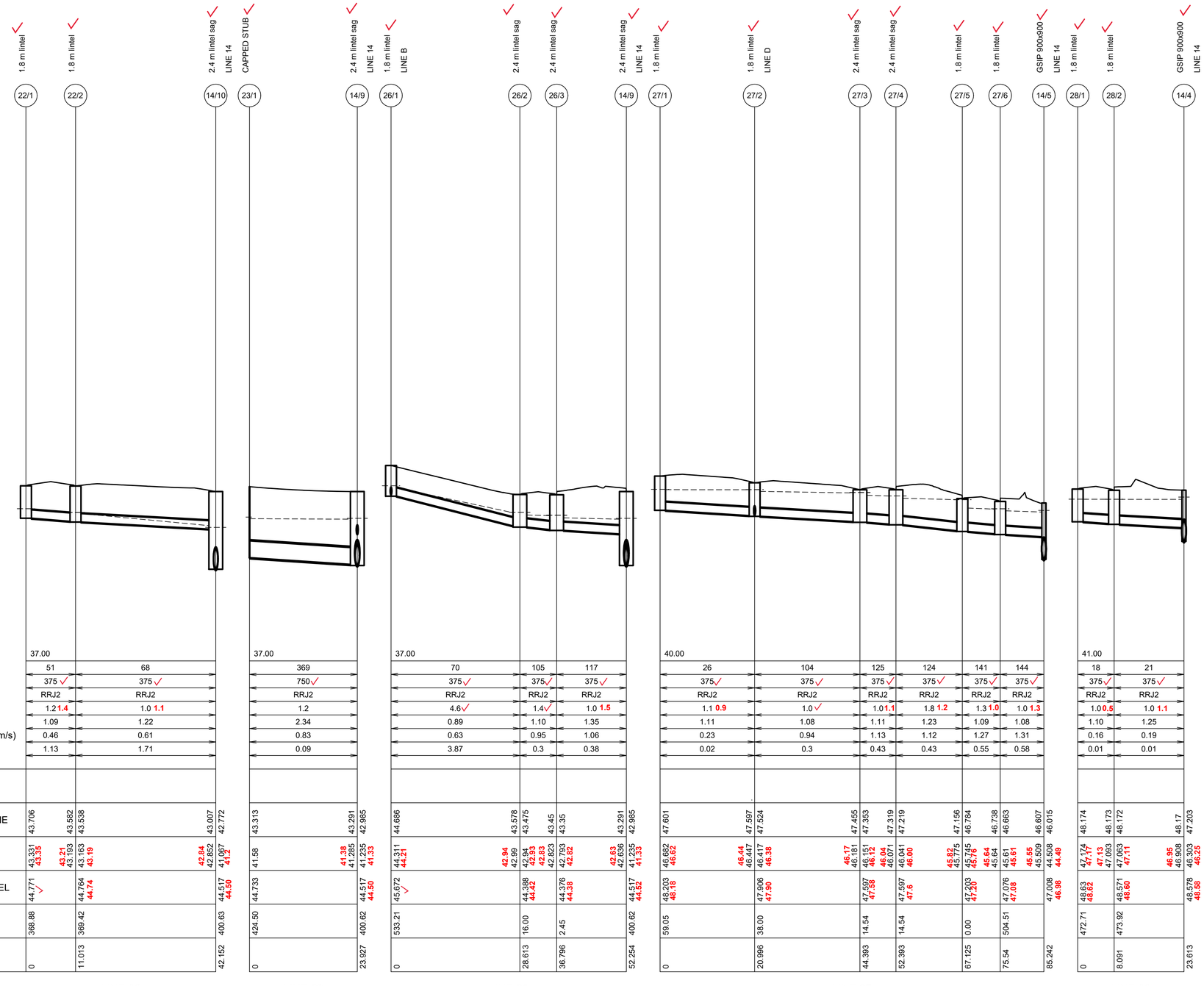
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
DRAINAGE LONGITUDINAL SECTIONS
SHEET 6

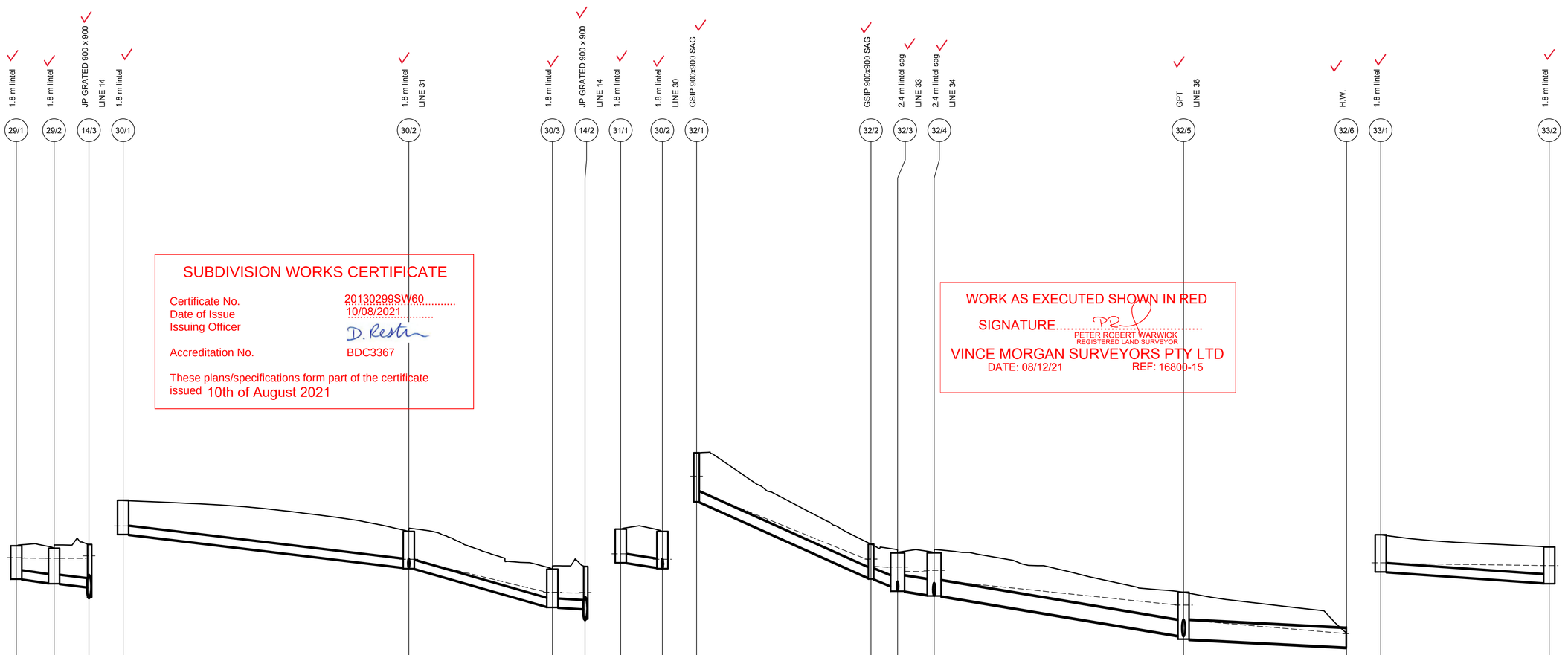
PROJECT No: 110185-12
SHEET No: CC1428

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1428 | C

Plotted: 21 July , 2021 2:54:41 PM File Name: \\jwp.local\fs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1428.dwg


1.8 m lintel
1.8 m lintel
2.4 m lintel sag
LINE 14
CAPPED STUB
2.4 m lintel sag
LINE 14
1.8 m lintel
LINE B
2.4 m lintel sag
2.4 m lintel sag
2.4 m lintel sag
LINE 14
1.8 m lintel
1.8 m lintel
LINE D
2.4 m lintel sag
2.4 m lintel sag
1.8 m lintel
1.8 m lintel
GSIP 900x900
LINE 14
1.8 m lintel
1.8 m lintel
GSIP 900x900
LINE 14
22/1
22/2
14/10
23/1
14/9
26/1
26/2
26/3
14/9
27/1
27/2
27/3
27/4
27/5
27/6
14/5
28/1
28/2
14/4

| | LINE 22 | | |



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REGISTERED LAND SURVEYOR
VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21 REF: 16800-15

	LINE 29			LINE 30					LINE 31		LINE 32						LINE 33		
DATUM (m)	43.00			45.00					45.00		52.00						52.00		
PEAK FLOW (L/s)	33	35		17		60	67		32		273	289	462	724		1367	38		
PIPE SIZE (mm)	375✓	375✓		375✓		375✓	375✓		375✓		450✓	450✓	675✓	675✓		825✓	375✓		
PIPE CLASS	RRJ2	RRJ2		RRJ2		RRJ2	RRJ2		RRJ2		RRJ2	RRJ2	RRJ2	RRJ2		RRJ2	RRJ2		
PIPE GRADE (%)	2.0 2.1	2.0 2.7		2.3✓		5.3✓	1.0 2.0		2.3 3.1		8.7 8.8	5.3 7.1	2.0 2.5	3.2✓		1.0 1.2	1.3 1.2		
PIPE COVER MINIMUM	1.10	1.29		1.07		1.04	1.42		1.13		1.05	0.94	1.03	1.08		-0.26	1.10		
FULL PIPE VELOCITY (m/s)	0.30	0.32		0.15		0.54	0.60		0.29		1.71	1.82	1.29	2.02		2.56	0.35		
HGL GRADE (%)	0.03	0.03		2.34		4.48	0.12		2.52		7.85	0.88	0.26	1.97		1.63	0.26		
WAE																			
HYDRAULIC GRADE LINE	49.312	49.31	49.305	49.303	48.499	52.723	51.254	51.225	49.812	49.79	49.782	49.573	51.485	51.254	51.225	61.235	58.229	57.952	57.901	57.736	57.715	57.327	56.25	55.583	55	58.084	57.987
INVERT LEVEL	48.39	48.23 48.222	48.192 48.20	48.04 48.039	47.599	52.348	50.85 50.9	50.85 50.80	49.17 49.18	49.15 49.14	49.00 49.078	48.637 48.58	51.11 51.13	50.86 50.9	50.85 50.80	60.785 60.78	57.48 57.446	57.386 57.43	57.07 57.087	56.862 56.87	56.89 56.702	56.652 56.68	54.94 54.908	54.758 54.77	54.38 54.4	54.4	57.709 57.70	57.22 57.22
DESIGN SURFACE LEVEL ↘	49.854	49.75 49.746	↘	49.916	53.852 53.83		52.484 52.49	50.944 50.95	52.585 52.56		52.484 52.49		62.934	↘	58.925	58.543 58.54	58.544 58.63	56.72 56.815		55.5	55.3	59.34 59.34	58.80	58.803				
ROAD CHAINAGE	447.68	449.88		453.35	328.62		27.57	430.54	54.88		27.57		222.00	387.87	389.94	390.44	106.876			323.46	360.44							
PIPE CHAINAGE	0	8.297		15.959	0		62.694	101.381	0		9.144		0	38.288	44.122	52.137				142.647		0	36.979					

1:500 (AT A1)
1:1000 (AT A3)
10 0 10 20 30 40 50
METRES

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

E	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
D	COUNCIL COMMENTS	MP	VS	RO	RO	16/06/21
C	DRAINAGE REVISED	JET	JET	MP	RO	23/03/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
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P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
DRAINAGE LONGITUDINAL SECTIONS
SHEET 8

PROJECT No: 110185-12
SHEET No: CC1430

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1430 | E

Plotted: 21 July, 2021 2:56:32 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1430.dwg

NOT CONSTRUCTED AT TIME OF SURVEYY; TO BE INCLUDED IN FUTURE STAGE WAE

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restin
Accreditation No. BDC3367

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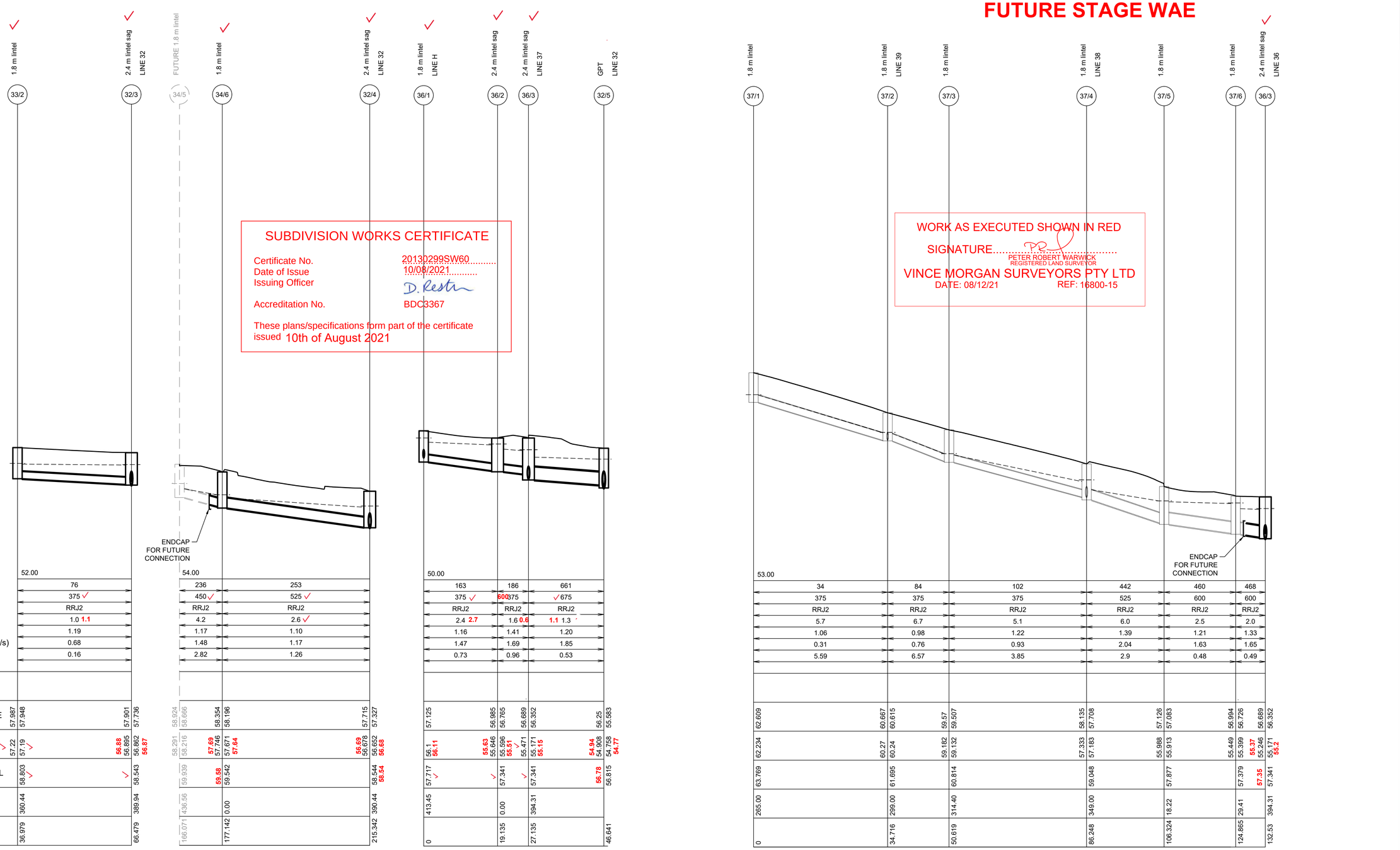
WORK AS EXECUTED SHOWN IN RED

SIGNATURE..... PR .....
PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR
VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21 REF: 16800-15



	LINE 33			LINE 34				LINE 36			LINE 37					
DATUM (m)	52.00			54.00				50.00			53.00					
PEAK FLOW (L/s)	76			236		253		163	186	661	34	84	102	442	460	468
PIPE SIZE (mm)	375 ✓			450 ✓		525 ✓		375 ✓	600 375	✓675	375	375	375	525	600	600
PIPE CLASS	RRJ2			RRJ2		RRJ2		RRJ2	RRJ2	RRJ2	RRJ2	RRJ2	RRJ2	RRJ2	RRJ2	RRJ2
PIPE GRADE (%)	1.0 1.1			4.2		2.6 ✓		2.4 2.7	1.6 0.6	1.1 1.3	5.7	6.7	5.1	6.0	2.5	2.0
PIPE COVER MINIMUM	1.19			1.17		1.10		1.16	1.41	1.20	1.06	0.98	1.22	1.39	1.21	1.33
FULL PIPE VELOCITY (m/s)	0.68			1.48		1.17		1.47	1.69	1.85	0.31	0.76	0.93	2.04	1.63	1.65
HGL GRADE (%)	0.16			2.82		1.26		0.73	0.96	0.53	5.59	6.57	3.85	2.9	0.48	0.49
WAE																
HYDRAULIC GRADE LINE	57.987	57.948	57.901	58.924	58.666	58.354	58.196	57.715	57.327	57.125	56.985	56.765	56.689	56.352	56.25	55.583
INVERT LEVEL	57.22 ✓	57.19 ✓	56.88 56.895	58.291	58.216	57.69 57.746	57.671	56.69 56.678	56.652	56.1 56.11	56.63 55.646	55.596 55.51 ✓	55.471	55.171 55.15	54.94 54.908	54.758 54.77
DESIGN SURFACE LEVEL	58.803 ✓		✓ 58.543	59.939	59.58 ✓	59.542		58.544	58.54	57.717 ✓	✓	57.341 ✓	57.341		56.78	56.815
ROAD CHAINAGE	360.44		389.94	436.56		0.00		390.44		413.45		0.00	394.31			
PIPE CHAINAGE	36.979		66.479	166.071		177.142		215.342		0		19.135	27.135			46.641

1:500 (AT A1)
1:1000 (AT A3)
10 0 10 20 30 40 50
METRES

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

C	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

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P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
DRAINAGE LONGITUDINAL SECTIONS
SHEET 9

PROJECT No: 110185-12
SHEET No: CC1431

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1431 C

Plotted: 21 July, 2021 2:57:22 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1431.dwg

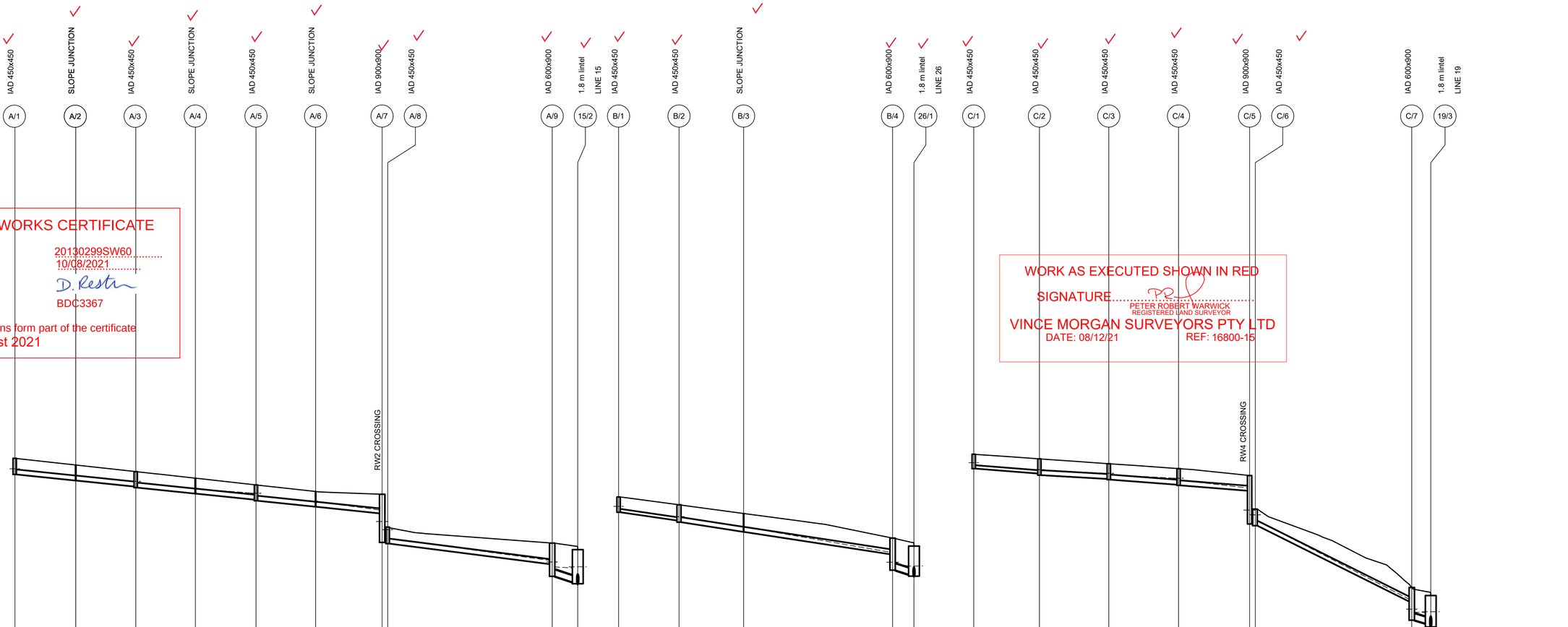
SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restin
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

WORK AS EXECUTED SHOWN IN RED

SIGNATURE .....
PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR
VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21 REF: 16800-15



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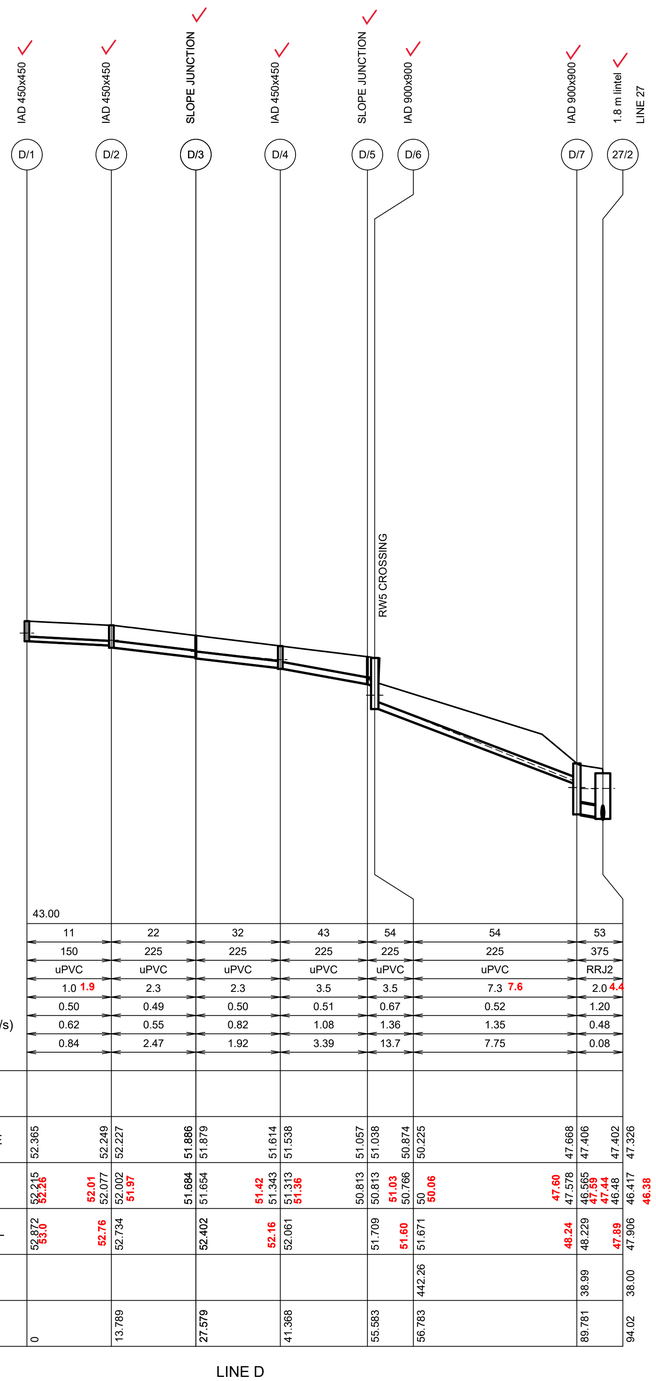
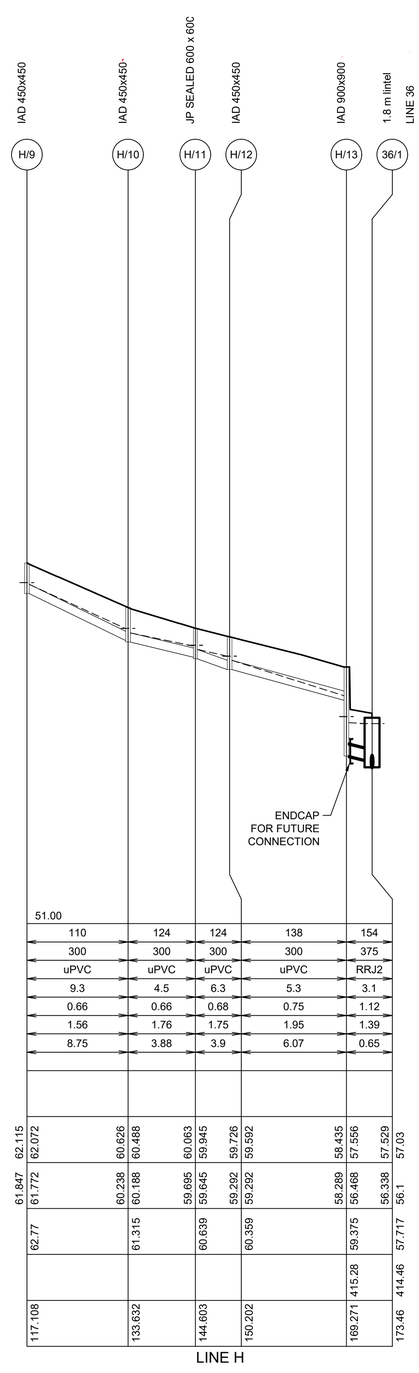


DATUM (m)	43.00								
PEAK FLOW (L/s)	11	22	32	43	54	54	53		
PIPE SIZE (mm)	150	225	225	225	225	225	375		
PIPE CLASS	uPVC	uPVC	uPVC	uPVC	uPVC	uPVC	RRJ2		
PIPE GRADE (%)	1.0 1.9	2.3	2.3	3.5	3.5	7.3 7.6	2.0 4.4		
PIPE COVER MINIMUM	0.50	0.49	0.50	0.51	0.67	0.52	1.20		
FULL PIPE VELOCITY (m/s)	0.62	0.55	0.82	1.08	1.36	1.35	0.48		
HGL GRADE (%)	0.84	2.47	1.92	3.39	13.7	7.75	0.08		
WAE									
HYDRAULIC GRADE LINE	52.365	52.249	52.227	51.886	51.879	51.614	51.538	51.057	51.038
	50.225	47.668	47.406	47.402	47.326				
INVERT LEVEL	52.215	52.01	52.077	52.002	51.97	51.684	51.654	51.42	51.343
	51.313	51.36	50.813	50.813	51.03	50.766	50	50.06	47.60
	47.578	46.565	47.44	46.48	46.38	46.417			
DESIGN SURFACE LEVEL	52.872	53.0	52.76	52.734	52.402	52.16	52.061	51.709	51.60
	51.671	48.24	48.229	47.89	47.906				
ROAD CHAINAGE	0	13.789	27.579	41.368	55.583	56.783	442.26	88.781	38.99
	38.00								
PIPE CHAINAGE	0	13.789	27.579	41.368	55.583	56.783	94.02		

LINE D



	51.00				
	110	124	124	138	154
	300	300	300	300	375
	uPVC	uPVC	uPVC	uPVC	RRJ2
	9.3	4.5	6.3	5.3	3.1
	0.66	0.66	0.68	0.75	1.12
	1.56	1.76	1.75	1.95	1.39
	8.75	3.88	3.9	6.07	0.65
HYDRAULIC GRADE LINE	62.115	60.626	60.063	59.726	57.03
	62.072	60.488	59.945	59.592	58.435	57.556	57.529
INVERT LEVEL	61.847	60.238	59.695	59.292	56.338	56.1
	61.772	60.188	59.645	59.292	58.289	56.468
DESIGN SURFACE LEVEL	62.77	61.315	60.639	60.359	59.375	57.717
ROAD CHAINAGE	414.46					
	415.28					
PIPE CHAINAGE	117.108	133.632	144.603	150.202	169.271	173.46

LINE H

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

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Certificate No. 20130299SW60

Date of Issue 10/08/2021

Issuing Officer D. Restin

Accreditation No. BDC3367

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1:500 (AT A1)
1:1000 (AT A3)

10 0 10 20 30 40 50
METRES

1:100 (AT A1)
1:200 (AT A3)

2 1 0 1 2 3 4 5 6 7 8 9 10
METRES

C	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

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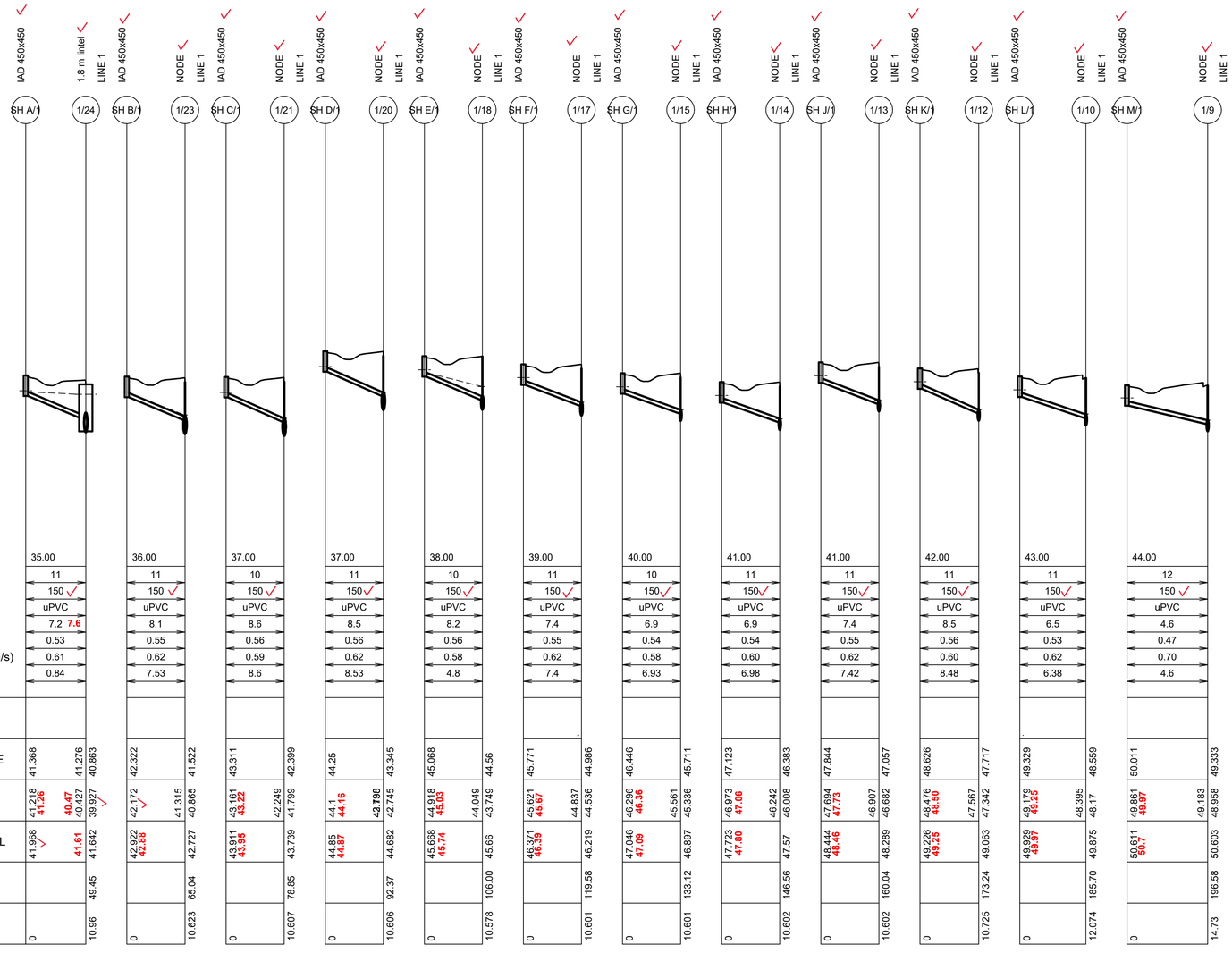
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
DRAINAGE LONGITUDINAL SECTIONS
SHEET 11

PROJECT No: 110185-12

SHEET No: CC1433

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1433 C

Plotted: 21 July, 2021 2:59:12 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1433.dwg



	LINE SH A	LINE SH B	LINE SH C	LINE SH D	LINE SH E	LINE SH F	LINE SH G	LINE SH H	LINE SH J	LINE SH K	LINE SH L	LINE SH M
DATUM (m)	35.00	36.00	37.00	37.00	38.00	39.00	40.00	41.00	41.00	42.00	43.00	44.00
PEAK FLOW (L/s)	11	11	10	11	10	11	10	11	11	11	11	12
PIPE SIZE (mm)	150 ✓	150 ✓	150 ✓	150 ✓	150 ✓	150 ✓	150 ✓	150 ✓	150 ✓	150 ✓	150 ✓	150 ✓
PIPE CLASS	uPVC	uPVC	uPVC	uPVC	uPVC	uPVC	uPVC	uPVC	uPVC	uPVC	uPVC	uPVC
PIPE GRADE (%)	7.2 **7.6**	8.1	8.6	8.5	8.2	7.4	6.9	6.9	7.4	8.5	6.5	4.6
PIPE COVER MINIMUM	0.53	0.55	0.56	0.56	0.56	0.55	0.54	0.54	0.55	0.56	0.53	0.47
FULL PIPE VELOCITY (m/s)	0.61	0.62	0.59	0.62	0.58	0.62	0.58	0.60	0.62	0.60	0.62	0.70
HGL GRADE (%)	0.84	7.53	8.6	8.53	4.8	7.4	6.93	6.98	7.42	8.48	6.38	4.6
WAE												
HYDRAULIC GRADE LINE	41.368 41.276 40.863	42.322 41.522	43.311 42.399	44.25 43.345	45.068 44.56	45.771 44.986	46.446 45.711	47.123 46.383	47.844 47.057	48.626 47.717	49.329 48.559	50.011 49.333
INVERT LEVEL	41.218 **41.26** 40.427 39.927	42.172 41.315 40.865	43.161 **43.22** 42.249 41.799	44.1 **44.16** **42.798** 42.745	44.918 **45.03** 44.049 43.749	45.621 **45.67** 44.837 44.536	46.296 **46.36** 45.561 45.336	46.973 **47.06** 46.242 46.008	47.694 **47.73** 46.907 46.682	48.476 **48.50** 47.567 47.342	49.179 **49.25** 48.395 48.177	49.861 **49.97** 49.183 48.958
DESIGN SURFACE LEVEL	41.968 **41.61** 41.642	42.922 **42.88** 42.727	43.911 **43.95** 43.739	44.85 **44.87** 44.682	45.668 **45.74** 45.66	46.371 **46.39** 46.219	47.046 **47.09** 46.897	47.723 **47.80** 47.57	48.444 **48.46** 48.289	49.226 **49.25** 49.063	49.929 **49.97** 49.875	50.611 **50.7** 50.603
ROAD CHAINAGE	49.45	65.04	78.85	92.37	106.00	119.58	133.12	146.56	160.04	173.24	185.70	196.58
PIPE CHAINAGE	0 10.96	0 10.623	0 10.607	0 10.606	0 10.578	0 10.601	0 10.601	0 10.602	0 10.602	0 10.725	0 12.074	0 14.73

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60

Date of Issue 10/08/2021

Issuing Officer D. Restin

Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

1:500 (AT A1)
1:1000 (AT A3)

10 0 10 20 30 40 50
METRES

1:100 (AT A1)
1:200 (AT A3)

2 1 0 1 2 3 4 5 6 7 8 9 10
METRES

	AMENDMENT	DES	DRN	CKD	APR	DATE
C	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
DRAINAGE LONGITUDINAL SECTIONS
SHEET 12

PROJECT No: 110185-12

SHEET No: CC1434

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1434 C

Plotted: 21 July, 2021 3:00:06 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DAICD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1434.dwg

WORK AS EXECUTED SHOWN IN RED

SIGNATURE .....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60

Date of Issue 10/08/2021

Issuing Officer D. Restin

Accreditation No. BDC2367

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B	COUNCIL COMMENTS	JET	JET	MP	RO	13/05/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
RETAINING WALL PLAN

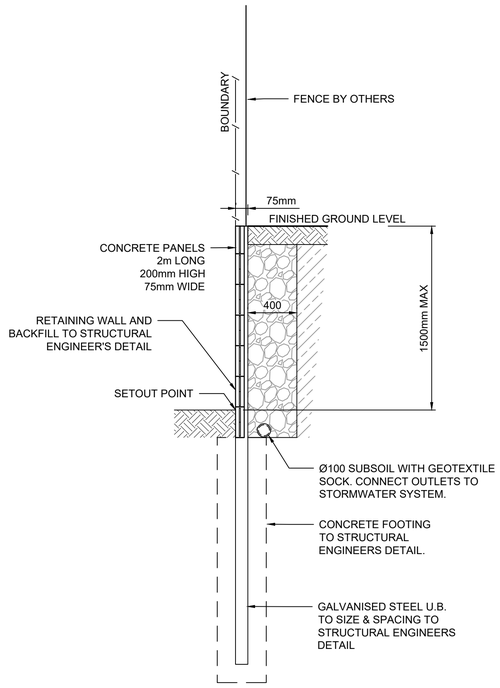
PROJECT No: 110185-12

SHEET No: CC1500

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN:

PLAN No: 110185-12-CC1500 B

Plotted: 21 July, 2021 3:02:47 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1500.dwg



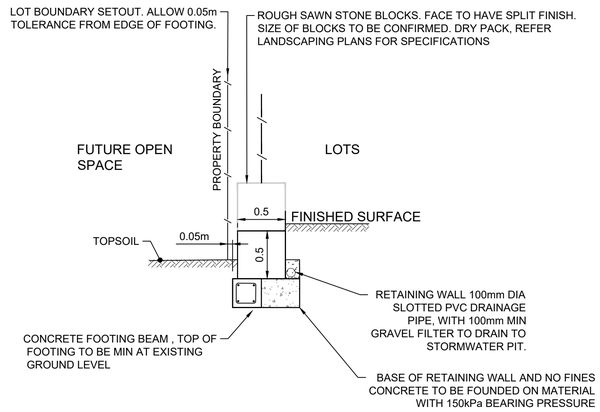
RETAINING WALL STANDARD DETAIL

CONCRETE I-BEAM
FOR RW2, RW3, RW4 AND RW5

SCALE 1:25

NOTE:

I BEAMS INCLUDE BRACKETS FOR FENCES TO BE INSTALLED



RETAINING WALL 6
SANDSTONE LOGS RETAINING WALL DETAIL

2 BLOCK ARRANGEMENT (1.0m MAX HEIGHT)

N.T.S

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restin
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

SUBJECT TO
STRUCTURAL DESIGN
AND CERTIFICATION

1:25(AT A1)
1:50(AT A3)

500 0 500 1000 1500 2000 2500
MILLIMETRES

A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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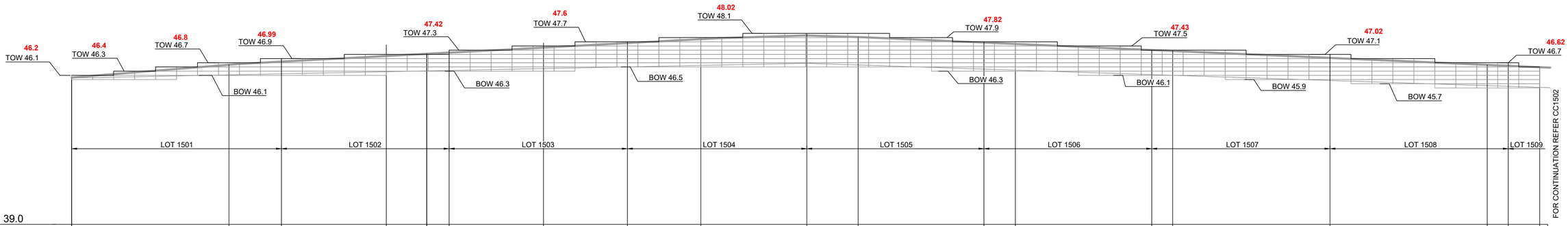
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
RETAINING WALL DETAILS

PROJECT No: 110185-12
SHEET No: CC1501

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1501 A

Plotted: 21 July , 2021 3:03:29 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1501.dwg

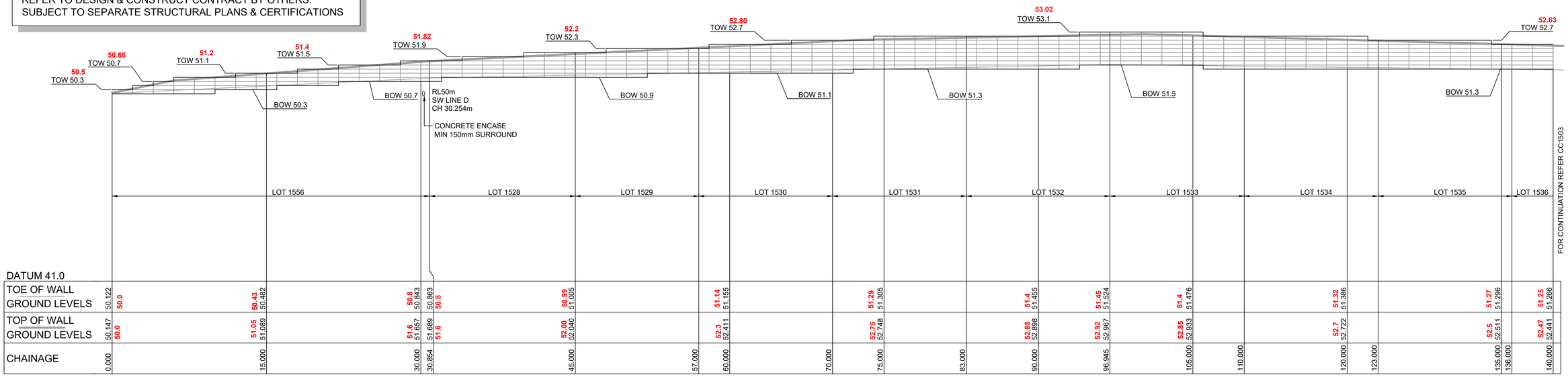
RETAINING WALL PROFILES SHOWN ARE INDICATIVE ONLY.
REFER TO DESIGN & CONSTRUCT CONTRACT BY OTHERS.
SUBJECT TO SEPARATE STRUCTURAL PLANS & CERTIFICATIONS



DATUM 39.0

| | | |

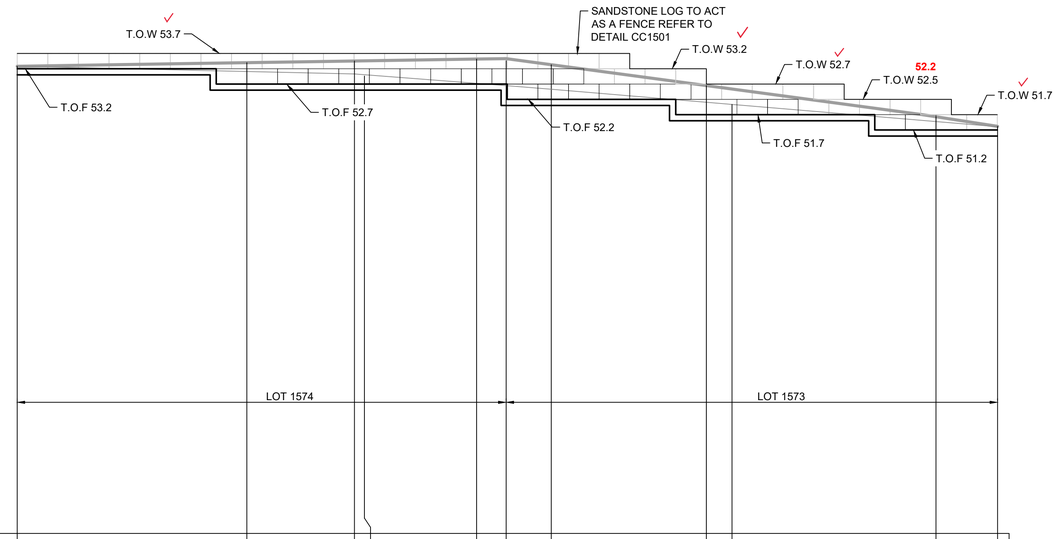
RETAINING WALL PROFILES SHOWN ARE INDICATIVE ONLY.
REFER TO DESIGN & CONSTRUCT CONTRACT BY OTHERS.
SUBJECT TO SEPARATE STRUCTURAL PLANS & CERTIFICATIONS



DATUM 41.0

| | | |

RETAINING WALL PROFILES SHOWN ARE INDICATIVE ONLY.
REFER TO DESIGN & CONSTRUCT CONTRACT BY OTHERS.
SUBJECT TO SEPARATE STRUCTURAL PLANS & CERTIFICATIONS

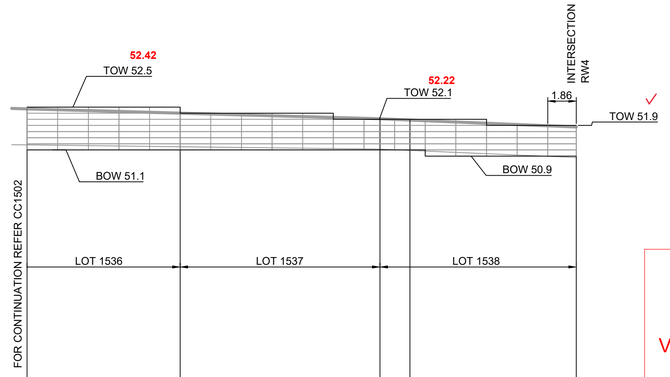


DATUM 38.0

TOE OF WALL	53.250			53.01		52.85		52.55	52.618	52.500		51.9		51.3	51.2
GROUND LEVELS		53.3		53.080		53.000		52.692		52.55	52.4	52.074		51.444	51.275
TOP OF WALL	53.250			53.31		53.35		53.25	53.500	53.301		52.5		51.45	51.2
GROUND LEVELS		53.3		53.367		53.422		53.465		53.3	53.2	52.620		51.601	51.291
CHAINAGE	0.000		15.000		22.023	22.675	30.000		31.926	34.875		45.000	46.675	60.000	64.021

LONGITUDINAL SECTION RW6

HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:100



DATUM 43.0

TOE OF WALL	51.286		51.22				51.1	51.128	51.086		50.8	50.850			
GROUND LEVELS		51.25		51.206						51.05					
TOP OF WALL	52.441		52.2				52.1	52.117	52.076		51.77	51.851			
GROUND LEVELS		52.3		52.300						52.05					
CHAINAGE	140.000		150.000				163.045		165.000		175.865				

LONGITUDINAL SECTION RW5

HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:100

SUBJECT TO STRUCTURAL DESIGN AND CERTIFICATION

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Rester
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

LEGEND

CONCRETE I-BEAM RETAINING WALL

SANDSTONE LOG RETAINING WALL

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

1:200 (AT A1) 1:400 (AT A3) 4 2 0 4 8 12 16 20 METRES

B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
RETAINING WALL LONGITUDINAL SECTIONS
SHEET 3

PROJECT No: 110185-12
SHEET No: CC1513

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1513 B

Plotted: 21 July , 2021 3:05:25 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1513.dwg

SOIL AND WATER MANAGEMENT NOTES

GENERAL NOTES:

1. ALL EROSION AND SEDIMENT CONTROL MEASURES, INCLUDING REVEGETATION AND STORAGE OF SOIL AND TOPSOIL, SHALL BE IMPLEMENTED TO THE REQUIREMENTS OF THE " SOILS AND CONSTRUCTION - VOLUME 1, 4TH EDITION, MARCH 2004 ".

2. TOPSOIL FROM ALL AREAS TO BE DISTURBED SHALL BE STOCKPILED AND LATER RESPREAD TO AID REVEGETATION IN THOSE AREAS.

3. ALL DRAINAGE WORKS SHALL BE CONSTRUCTED AND STABILISED AS EARLY AS POSSIBLE DURING DEVELOPMENT.

4. ALL TAIL-OUT DRAINS SHALL BE COUCH GRASSED AND TRAPEZOIDAL IN SECTION. STRAW BALES SHALL BE PLACED AS A SEDIMENT CONTROL DEVICE WHERE REQUIRED.

5. VEHICULAR TRAFFIC SHALL BE CONTROLLED DURING DEVELOPMENT CONFINING ACCESS WHERE POSSIBLE TO PROPOSED OR EXISTING ROAD ALIGNMENTS. AREAS TO BE LEFT UNDISTURBED SHALL BE MARKED OFF.

6. ROADS SHALL BE PAVED AS EARLY AS POSSIBLE AFTER FORMATION.

7. DISTURBANCE OF VEGETATION SHALL BE LIMITED TO FILL AREAS, ROADWAYS AND DRAINAGE LINES. NO LOT GRADING SHALL BE CARRIED OUT IN UNDISTURBED AREAS WITHOUT CONSULTATION WITH COUNCIL'S ENGINEER.

8. ALL DISTURBED AREAS SHALL BE REVEGETATED AS SOON AS THE RELEVANT WORKS ARE COMPLETED.

9. ALL SEDIMENT BASINS AND TRAPS SHALL BE CLEANED WHEN THE STRUCTURES ARE A MAXIMUM 60% FULL OF SOLID MATERIALS, INCLUDING DURING THE MAINTENANCE PERIOD.

10. THE SOIL AND WATER MANAGEMENT PLAN IS TO BE READ IN CONJUNCTION WITH THE ENGINEERING PLANS, AND COUNCIL'S WRITTEN GUIDELINES FOR THE DEVELOPMENT OF LAND.

11. CONTRACTORS SHALL ENSURE THAT ALL SOIL AND WATER MANAGEMENT WORKS ARE UNDERTAKEN AS SPECIFIED ON THE PLAN AND IN ACCORDANCE WITH THE GUIDELINES SHOWN IN "MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION 4TH EDITION" ("THE BLUE BOOK").

12. ALL CONTRACTORS AND SUBCONTRACTORS ARE RESPONSIBLE FOR REDUCING THE SOIL EROSION AND POLLUTION OF DOWNSLOPE AREAS.

13. THE SOIL EROSION HAZARD ON THE SITE IS TO BE KEPT AS LOW AS POSSIBLE AND GENERALLY IN ACCORDANCE WITH THE FOLLOWING SCHEDULE:

LAND USE	LIMITATION	COMMENTS
CONSTRUCTION AREAS	DISTURBANCE TO BE NO FURTHER THAN 5m (PREF 2m) FROM THE EDGE OF ANY ESSENTIAL ENGINEERING ACTIVITY AS SHOWN ON THESE PLANS	ALL SITE WORKERS WILL CLEARLY RECOGNISE THESE ZONES - WHERE APPROPRIATE THE CONSTRUCTION AREAS ARE TO BE IDENTIFIED WITH BARRIER FENCING (DOWNSLOPE) OR SIMILAR MATERIAL.
ACCESS AREAS	LIMITED TO A MAXIMUM WIDTH OF 10m	THE SITE MANAGER SHALL DETERMINE AND MARK THE LOCATION OF THESE ZONES ONSITE. THEY CAN VARY IN POSITION TO BEST CONSERVE THE EXISTING VEGETATION AND PROTECT DOWNSTREAM AREAS WHILE BEING CONSIDERATE OF THE NEEDS OF EFFICIENT WORKS ACTIVITIES. ALL SITE WORKERS SHALL CLEARLY RECOGNISE THEIR BOUNDARIES. WHERE APPROPRIATE THE ACCESS AREAS ARE TO BE MARKED WITH BARRIER MESH, SEDIMENT FENCING OR SIMILAR MATERIALS.
REMAINING LANDS	ENTRY PROHIBITED EXCEPT FOR ESSENTIAL THINNING OF PLANT GROWTH	THINNING OF GROWTH MAY BE REQUIRED FOR FIRE HAZARD REDUCTION.

NOTE:
WORKS WITHIN WATERWAYS AND CREEKS SHALL BE RESTRICTED AS DIRECTED - ALL LANDS WITHIN CREEKS AND WATERWAYS SHALL HAVE A GROUNDCOVER MORE THAN 70%, USING MATERIALS THAT CAN CATER FOR CONCENTRATED FLOWS.

14. WORKS ARE TO BE UNDERTAKEN IN THE FOLLOWING SEQUENCE. EACH SUBSEQUENT STAGE IS NOT TO COMMENCE UNTIL THE PREVIOUS ONE IS COMPLETE:-

    a. INSTALL ALL BARRIER AND SEDIMENT FENCING WHERE SHOWN ON THE PLAN AND TO DETAIL(SD) 6-8.
    b. CONSTRUCT STABILISED SITE ACCESS AS SHOWN ON THE PLAN AND TO DETAIL (SD) 6-14.
    c. CONSTRUCT LOW FLOW EARTH BANKS WHERE SHOWN ON THE PLAN AND TO DETAIL (SD) 5-5.
    d. PROVIDE TEMP. ACCESS TO THE SEDIMENT BASIN(S)AND PROTECT THIS WITH SEDIMENT FENCING (SD) 6-8 OR BARRIER FENCING AND EARTH BANKS (SD) 5-5.
    e. PLACE SEDIMENT FENCING (SD) 6-8 DOWNSLOPE OF LANDS TO BE DISTURBED FOR CONSTRUCTION OF THE SEDIMENT BASINS.
    f. CONSTRUCT SEDIMENT BASIN(S) GENERALLY IN ACCORDANCE WITH (SD) 6-4
    g. STABILISE LAND SURFACES DISTURBED BY CONSTRUCTION OF THE SEDIMENT BASIN(S) AS SOON AS FINAL LEVELS ARE ESTABLISHED
    h. CLEAR THE SITE AND STRIP AND STOCKPILE THE TOPSOIL IN THE LOCATIONS SHOWN ON THE PLAN OR AS DIRECTED BY THE SITE SUPERINTENDENT TO DETAIL (SD) 4-1.
    i. UNDERTAKE ALL ESSENTIAL CONSTRUCTION WORKS.
    j. GRADE LOT AREAS TO FINAL GRADES AND APPLY PERMANENT STABILISATION (LANDSCAPING) WITHIN 14 DAYS OF COMPLETION OF CONSTRUCTION WORKS.
    k. REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER THE PERMANENT LANDSCAPING HAS BEEN COMPLETED.

15. CLEARLY VISIBLE BARRIER FENCING SHALL BE INSTALLED WHERE DIRECTED BY THE SITE SUPERINTENDENT TO CONTROL AND PROHIBIT UNNECESSARY SITE DISTURBANCE

16. EARTH BATTERS SHALL BE CONSTRUCTED WITH AS LOW A GRADIENT AS PRACTICABLE BUT NO STEEPER THAN:-

    a. 2(h) - 1(v) WHERE SLOPE LENGTH IS LESS THAN 7m
    b. 2.5(h) - 1(v) WHERE SLOPE LENGTH IS BETWEEN 7m AND 10m
    c. 3(h) - 1(v) WHERE SLOPE LENGTH IS BETWEEN 10m AND 12m
    d. 4(h) - 1(v) WHERE SLOPE LENGTH IS BETWEEN 12m AND 18m
    e. 5(h) - 1(v) WHERE SLOPE LENGTH IS BETWEEN 18m AND 27m
    f. 6(h) - 1(v) WHERE SLOPE LENGTH IS GREATER THAN 27m

    SLOPE LENGTHS CAN BE SHORTENED BY USING LOW FLOW EARTH BANKS AS CATCH DRAINS ABOVE THE EARTH BATTER AREA.

17. PROTECTION FROM EROSIVE FORCES SHALL BE UNDERTAKEN ON ALL LANDS. GROUND COVER TO BE IN PLACE WITHIN 10 WORKING DAYS FROM COMPLETION OF FORMATION AND BEFORE THEY ARE ALLOWED TO CARRY ANY CONCENTRATED FLOWS.

18. TEMPORARY GROUND COVER SHOULD BE MINIMUM 70%. FOOT AND VEHICULAR TRAFFIC SHALL BE KEPT AWAY FROM REHABILITATED AREAS.

19. WHERE POSSIBLE THE CONSTRUCTION PROGRAM IS TO SCHEDULE WORKS SUCH THAT LAND DISTURBANCE ACTIVITIES ARE COMPLETED IN LESS THAN 6 MONTHS. REVEGETATION WORKS MUST BE CARRIED OUT AS STIPULATED IN THE RELEVANT COUNCIL GUIDELINES / SPECIFICATIONS SUCH THAT A SATISFACTORY GROUND COVER IS PROVIDED TO AT LEAST 60% OF THE DISTURBED AREA WITHIN 10 DAYS AND AT LEAST 70% OF THE DISTURBED AREA WITHIN A FURTHER 60 DAYS..

20. SEDIMENT FENCES (SD) 6-8 SHALL:-

    a. BE INSTALLED WHERE SHOWN ON THE PLAN AND AS DIRECTED AT THE DISCRETION OF THE SITE SUPERINTENDENT DURING THE COURSE OF CONSTRUCTION TO CONTAIN THE COARSER SEDIMENT FRACTIONS AS NEAR AS POSSIBLE TO THEIR SOURCE.
    b. HAVE A CATCHMENT AREA NOT EXCEEDING 720sq.m, AND A STORAGE DEPTH OF AT LEAST 0.6m.
    c. PROVIDE AN UPSLOPE RETURN OF 1m AT INTERVALS ALONG THE FENCE WHERE THE CATCHMENT AREA EXCEEDS 720sq.m. TO LIMIT THE DISCHARGE REACHING EACH SECTION TO 50litres/sec IN A MAX. 10yr Tc DISCHARGE.

21. STOCKPILES (SD) 4-1 SHALL BE LOCATED AS SHOWN ON THE PLANS AND AT THE DISCRETION OF THE SITE SUPERINTENDENT.

22. DURING WINDY WEATHER LARGE UNPROTECTED AREAS ARE TO BE KEPT MOIST (NOT WET) BY SPRINKLING WITH WATER TO KEEP DUST UNDER CONTROL. IN THE EVENT WATER IS NOT AVAILABLE IN SUFFICIENT QUANTITIES SOIL BINDERS AND/OR DUST RETARDANTS SHALL BE USED OR THE SURFACE SHALL BE LEFT IN A CLODDY STATE THAT RESISTS REMOVAL BY WIND.

23. STOCKPILES SHALL NOT BE LOCATED WITHIN 5m OF HAZARD AREAS, INCLUDING LIKELY AREAS OF HIGH VELOCITY FLOWS SUCH AS WATERWAYS, PAVED AREAS OR DRIVEWAYS.

24. THE SEDIMENT RETENTION BASINS (SD) 6-4 SHALL:-

    a. BE CONSTRUCTED WHERE SHOWN ON THE PLANS.
    b. BE FLOCCULATED (APPENDIX E MANAGING URBAN STORMWATER SOILS & CONSTRUCTION 4TH ED.) BEFORE DISCHARGE OCCURS (UNLESS THE DESIGN STORM EVENT IS EXCEEDED)
    c. HAVE ONE OR MORE PEGS PLACED ON THE FLOOR TO CLEARLY INDICATE THE LEVEL AT WHICH DESIGN CAPACITY OCCURS AND WHEN SEDIMENT SHALL BE REMOVED.

25. STORED CONTENTS OF THE BASINS SHALL BE TREATED WITH GYPSUM (APPENDIX E MANAGING URBAN STORMWATER SOILS & CONSTRUCTION 4TH ED.) OR OTHER FLOCCULATING AGENTS WHERE THEY CONTAIN MORE THAN 50mg/litre OF SUSPENDED SOLIDS. TREATMENT SHALL BE AS FOLLOWS:-

    a. LOWER SUSPENDED SOLIDS TO LESS THAN 50mg/litre WITHIN 24hrs OF FILLING
    b. THE BASINS SHALL THEN BE ALLOWED TO STAND 36 TO 48hrs FOR FLOCCULATED PARTICLES TO SETTLE
    c. THE BASINS SHALL THEN BE DRAINED SO THAT FULL STORAGE CAPACITY IS REGAINED WITHOUT DISCHARGING SEDIMENT FROM THE SITE.

26. SEDIMENT REMOVED FROM ANY TRAPPING DEVICE SHALL BE DISPOSED IN LOCATIONS WHERE FURTHER EROSION AND CONSEQUENT POLLUTION TO DOWNSLOPE LANDS AND WATERWAYS SHALL NOT OCCUR.

27. WATER SHALL BE PREVENTED FROM DIRECTLY ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS IT IS RELATIVELY SEDIMENT FREE (ie THE CATCHMENT HAS BEEN LANDSCAPED AND/OR ANY LIKELY SEDIMENT HAS BEEN TREATED IN AN APPROVED DEVICE) NEVERTHELESS STORMWATER INLETS SHALL BE PROTECTED (SD) 6-11 & 6-12.

28. TEMPORARY SOIL AND WATER MANAGEMENT STRUCTURES SHALL BE REMOVED ONLY AFTER THE LANDS THEY ARE PROTECTING ARE STABILISED.

29. ACCEPTABLE BINS SHALL BE PROVIDED FOR ANY CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHTWEIGHT WASTE MATERIALS AND LITTER. CLEARANCE SERVICES SHALL BE PROVIDED AT LEAST ONCE A WEEK.

STOCKPILE NOTES:

1. SPOIL AND TOPSOIL STOCKPILES SHALL BE LOCATED AWAY FROM DRAINAGE LINES AND AREAS WHERE WATER MAY CONCENTRATE.

2. IF STOCKPILES ARE TO BE IN PLACE FOR LONGER THAN 14 DAYS THEN THEY SHALL BE STABILIZED BY COVERING WITH A MULCH OR WITH TEMPORARY VEGETATION.

3. FOLLOWING CONSTRUCTION, TOPSOIL SHALL BE RESPREAD TO A MINIMUM DEPTH OF 100mm ON THE BARE SOIL SURFACES AND REVEGETATED.

SEDIMENTATION CONTROL DEVICES:

1. ALL STRAW BALES SHALL BE BOUND WITH WIRE. STRAW BALES SHALL BE PLACED END TO END IN A SINGLE ROW AND EMBEDDED INTO THE SOIL TO A DEPTH OF 100mm. EACH BALE SHALL BE SECURELY ANCHORED WITH TWO STEEL STAKES DRIVEN 600mm INTO THE GROUND AND LOCKED ON THE BALE CENTRELINE.

2. SILT FENCES SHALL BE CONSTRUCTED BY STRETCHING A FILTER FABRIC (PROPEX OR SIMILAR) BETWEEN POSTS AT 2.5m CENTRES. FABRIC SHALL BE BURIED 150mm ALONG IT'S LOWER EDGE.

3. PROVIDE STRIP OF TURF (COUCH OR BUFFALO VARIETY) WITHIN ROAD VERGE BEHIND KERB + 1m WIDE AROUND ALL SURFACE INLET PITS

SITE INSPECTION AND MAINTENANCE:

1. A SELF-AUDITING PROGRAM SHALL BE ESTABLISHED BASED ON A INSPECTION TEST PLAN (ITP) OR LOG BOOK. A SITE INSPECTION USING THE ITP SHALL BE MADE BY THE SITE MANAGER-:

    a. AT LEAST WEEKLY
    b. IMMEDIATELY BEFORE SITE CLOSURE
    c. IMMEDIATELY FOLLOWING RAINFALL EVENTS IN EXCESS OF 5mm IN ANY 24hr PERIOD.

    THE SELF AUDIT SHALL INCLUDE:-

    a. RECORDING THE CONDITION OF EVERY 'BEST MANAGEMENT PRACTICE' EMPLOYED
    b. RECORDING MAINTENANCE REQUIREMENTS (IF ANY) FOR EACH 'BEST MANAGEMENT PRACTICE'
    c. RECORDING THE VOLUMES OF SEDIMENT REMOVED FROM SEDIMENT RETENTION SYSTEMS WHERE APPLICABLE
    d. RECORDING THE SITE WHERE SEDIMENT IS DISPOSED
    e. FORWARDING A SIGNED DUPLICATE OF THE COMPLETED CHECK SHEET TO THE PROJECT MANAGER/DEVELOPER FOR THEIR INFORMATION.

2. IN ADDITION A SUITABLY QUALIFIED PERSON SHALL BE RESPONSIBLE FOR OVERSEEING THE INSTALLATION AND MAINTENANCE OF ALL SOIL AND WATER MANAGEMENT WORKS ON THE SITE. THE PERSON SHALL BE REQUIRED TO SPEND A MINIMUM OF:-

    a. 2hrs ONSITE EACH FORTNIGHT UP UNTIL COMPLETION OF ROAD AND DRAINAGE WORKS AND/OR THE COMMISSIONING OF SEDIMENT BASIN(S)/WATER QUALITY CONTROL FACILITIES, AND DURING THE DECOMMISSIONING OF SAME AND/OR FINAL SITE STABILISATION. TO PROVIDE A SHORT MONTHLY WRITTEN REPORT.
    b. ONE HOUR ONSITE EACH 2 MONTHS DURING THAT PHASE WHERE THE DEVELOPERS RESPONSIBILITIES ARE LIMITED TO MAINTENANCE OF THE SDS DEVICES AND/OR SEDIMENT BASINS (ie DURING THE STAGE WHEN BUILDING WORKS CAN BE UNDERTAKEN) TO PROVIDE A SHORT WRITTEN REPORT EACH 4 MONTHS

    THE RESPONSIBLE PERSON SHALL ENSURE THAT:-

    a. THIS PLAN IS BEING IMPLEMENTED CORRECTLY
    b. REPAIRS ARE BEING UNDERTAKEN AS REQUIRED
    c. ESSENTIAL MODIFICATIONS TO THIS PLAN ARE BEING MADE IF AND WHEN NECESSARY. EACH REPORT SHALL CERTIFY THAT WORKS HAVE BEEN CARRIED OUT ACCORDING TO THE APPROVED PLANS.

3. WASTE BINS SHALL BE EMPTIED AS NECESSARY, DISPOSAL OF WASTE SHALL BE IN A MANNER APPROVED BY THE SITE SUPERINTENDENT

4. PROPER DRAINAGE OF THE SITE SHALL BE MAINTAINED. DRAINS (INCLUDING INLET AND OUTLET WORKS) SHALL BE CHECKED TO ENSURE THAT THEY ARE OPERATING AS INTENDED,ESPECIALLY THAT:-

    a. NO LOW POINTS EXIST WHICH CAN OVERTOP IN A LARGE STORM EVENT.
    b. AREAS OF EROSION ARE REPAIRED (e.g LINED WITH SUITABLE MATERIAL) AND/OR VELOCITY OF FLOW IS REDUCED APPROPRIATELY THROUGH CONSTRUCTION OF SMALL CHECK DAMS OR INSTALLING ADDITIONAL DIVERSIONS UPSLOPE
    c. BLOCKAGES ARE CLEARED (THESE MIGHT OCCUR BECAUSE OF SEDIMENT POLLUTION, SAND/SOIL/SPOIL BEING DEPOSITED IN OR TOO CLOSE TO THEM, BREACHED BY VEHICLE WHEELS etc)

5. SAND/SOIL/SPOIL MATERIALS PLACED CLOSER THAN 2m FROM HAZARD AREAS SHALL BE REMOVED SUCH HAZARD AREAS INCLUDE ANY AREAS OF HIGH VELOCITY WATER FLOWS (eg WATERWAYS AND GUTTERS) PAVED AREAS AND DRIVEWAYS.

6. RECENTLY STABILISED LANDS SHALL BE CHECKED TO ENSURE THAT THE EROSION HAZARD HAS BEEN EFFECTIVELY REDUCED. ANY REPAIRS SHALL BE INITIATED AS APPROPRIATE.

7. EXCESSIVE VEGETATIVE GROWTH SHALL BE CONTROLLED THROUGH MOWING OR SLASHING.

8. ALL SEDIMENT DETENTION SYSTEMS SHALL BE KEPT IN GOOD WORKING CONDITION. IN PARTICULAR ATTENTION SHALL BE GIVEN TO:-

    a. RECENT WORKS TO ENSURE THAT THEY HAVE NOT RESULTED IN DIVERSION OF SEDIMENT LADEN WATER AWAY FROM THEM.
    b. DEGRADABLE PRODUCTS TO ENSURE THAT THEY ARE REPLACED AS REQUIRED
    c. SEDIMENT REMOVAL TO ENSURE THE DESIGN CAPACITY OR LESS REMAINS IN THE SETTLING ZONE.

9. ADDITIONAL EROSION AND/OR SEDIMENT CONTROL WORKS SHALL BE CONSTRUCTED AS MIGHT BECOME NECESSARY TO ENSURE THE DESIRED PROTECTION IS GIVEN TO DOWNSLOPE LANDS AND WATERWAYS (ie MAKE ONGOING CHANGES TO THIS PLAN WHERE IT PROVES INADEQUATE IN PRACTICE OR IS SUBJECTED TO CHANGES IN CONDITIONS AT THE WORKS SITE OR ELSEWHERE IN THE CATCHMENT.

10. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED IN A FUNCTIONING CONDITION UNTIL ALL EARTHWORKS ACTIVITIES ARE COMPLETED AND THE SITE STABILISED.

11. WATERS IN SEDIMENT RETENTION BASIN(S) THAT OCCUPY MORE THAN 1/4 OF THE DESIGN CAPACITY DURING THAT STAGE OF THE WORKS UP UNTIL COMMISSIONING OF THE BASIN(s) SHALL BE:-

    a. TREATED WITH A FLOCCULATING AGENT (APPENDIX E MANAGING URBAN STORMWATER SOILS & CONSTRUCTION 4TH ED.)
    b. DISCHARGED WITHIN 5 days FROM THE CONCLUSION OF ANY STORM EVENT LARGE ENOUGH TO FILL THE BASIN TO THAT LEVEL.

12. LITTER, DEBRIS AND COARSE SEDIMENT SHALL BE REMOVED FROM THE GROSS POLLUTANT TRAPS AND TRASH RACKS AS REQUIRED.

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60.....
Date of Issue 10/08/2021.....
Issuing Officer

Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

B	CERTIFIER COMMENTS	JET	JET	MP	RO	26/04/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SOIL & WATER MANAGEMENT NOTES

PROJECT No: 110185-12

SHEET No: CC1700

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1700 | B

Plotted: 21 July , 2021 3:06:00 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1700.dwg

EXISTING SEDIMENT BASIN A

BLOCK OUTLET AND CONSTRUCT TEMPORARY OUTLET TO SEDIMENT BASIN

BLOCK OUTLET AND PROVIDE TEMPORARY OUTLET Ø375 TO SEDIMENT BASIN

PROVIDE OUTLET WITH RISER

AREA NOT TO BE DISTURBED. REFER LANDSCAPE ARCHITECT PLANS FOR TREE PROTECTION ZONE DETAILS

PROVIDE OUTLET WITH RISER

BLOCK OUTLET AND CONSTRUCT TEMPORARY OUTLET TO SEDIMENT BASIN

YOBARNIE AVE

HAUL ROAD

PROPOSED NEW SITE ENTRY FROM GROSE VALE ROAD.

ROAD 35

PROVIDE TEMPORARY OUTLET TO SEDIMENT BASIN

EXISTING SEDIMENT BASIN 4

EXISTING SEDIMENT BASIN 3

BLOCK OUTLET AND CONSTRUCT TEMPORARY OUTLET TO SEDIMENT BASIN

ROAD 50

ROAD 55

ROAD 54

AREA NOT TO BE DISTURBED. REFER LANDSCAPE ARCHITECT PLANS FOR TREE PROTECTION ZONE DETAILS

DAM 7

DAM 7 OPERATES AS TEMPORARY SEDIMENT BASIN.

ROAD 56

DAM 8 OPERATES AS TEMPORARY SEDIMENT BASIN.

DAM 8

ROAD 50

ROAD 51

ROAD 52

GROSE VALE ROAD

WORK AS EXECUTED SHOWN IN RED

SIGNATURE:

RE R.R. ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21

REF: 16800-15

SEDIMENT BASIN DETAILS

SEDIMENT BASIN A
INVERT RL 40.5
TOP RL 44.0
STORAGE VOLUME = 2,850m³
TEMPORARY 43m LONG Ø900 PIPELINE FROM PIT 14/10
MIN: *SLOPE*: OUTLET IL 40.8

SEDIMENT BASIN 3
INVERT RL 38.0
TOP RL 40.8
STORAGE VOLUME = 2,500m³
TEMPORARY 17m LONG Ø375 PIPELINE INLET FROM PIT 10/7
MIN: *SLOPE*: OUTLET IL 40.0
TEMPORARY 22m LONG Ø375 PIPELINE INLET FROM PIT 1/24
MIN: *SLOPE*: OUTLET IL 39.5
TEMPORARY 9m LONG Ø375 PIPELINE OUTLET WITH RISER TO PIT 2/2 *MIN*: *SLOPE*: OUTLET IL 38.573
RISER RL 40.7

SEDIMENT BASIN 4
INVERT RL 40.0
TOP RL 42.5
STORAGE VOLUME = 7,96m³
TEMPORARY 17m LONG Ø375 PIPELINE INLET FROM PIT 15/2
MIN: *SLOPE*: OUTLET IL 41.5
TEMPORARY 9m LONG Ø375 PIPELINE OUTLET WITH RISER TO PIT 15/3 *MIN*: *SLOPE*: OUTLET IL 41.25
RISER RL 42.4

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Rusin
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

SEDIMENT BASIN VOLUME CALCULATIONS

SEDIMENT BASIN	TOTAL AREA OF CATCHMENT (ha)	DISTURBED AREA OF CATCHMENT(ha)	SETTLING ZONE VOLUME (m³)	SEDIMENT STORAGE = 50% SETTLING ZONE VOLUME (m³)	SEDIMENT BASIN VOLUME REQUIRED (m³)	SEDIMENT BASIN VOLUME PROVIDED
BASIN A	11.054	11.054	1,630	815	2,445	2,851
BASIN 3	11.36	11.36	1,676	838	2,513	2,500
BASIN 4	3.29	3.29	485	243	728	780

NOTES:

1. MAINTAIN ATF AS INSTALLED WITH BULK EARTHWORKS.
2. MAINTAIN SEDIMENT FENCE.
3. MAINTAIN SEDIMENT BASINS.
4. MAINTAIN PROTECTIVE FENCING TO SEDIMENT BASINS AND AROUND THE TREES TO BE RETAINED.
.
5. DAM 7 AND DAM 8 AND OPERATES AS SEDIMENT BASINS.

LEGEND

- GEOTEXTILE INLET FILTER
- FILTER ROLLS
- STRAW BALE FILTER
- SEDIMENT FENCE
- STRAW BALE BARRIER
- TREES TO BE RETAINED AND PROTECTED BY ATF TO PERIMETER AS PER LANDSCAPE DETAILS
- ATF FENCE
- PROTECTIVE FENCE TO SEDIMENT BASIN AND UNDISTURBED LAND
- UNDISTURBED AREA
- POSSIBLE STOCKPILE LOCATION

1:1000 (AT A1)
1:2000 (AT A3)

20 10 0 10 20 30 40 50 60 70 80 90 100
METRES

F	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
E	COUNCIL COMMENTS	MP	VS	RO	RO	16/06/21
D	CERTIFIER COMMENTS	JET	JET	MP	RO	26/04/21
C	DRAINAGE REVISED	JET	JET	MP	RO	23/03/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

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CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

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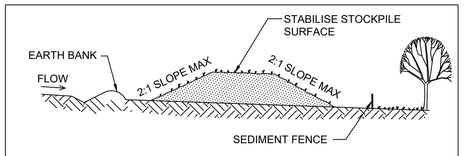
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SOIL & WATER MANAGEMENT PLAN

PROJECT No: 110185-12
SHEET No: CC1701

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1701 | F

Plotted: 21 July , 2021 3:08:06 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1701.dwg

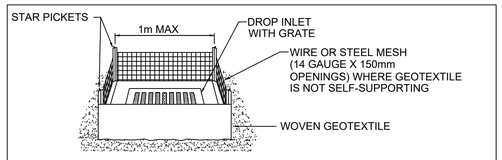


CONSTRUCTION NOTES

1. PLACE STOCKPILES MORE THAN 2 (PREFERABLY 5) METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METRES IN HEIGHT.
4. WHERE THEY ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED ESCP OR SWMP TO REDUCE THE C-FACTOR TO LESS THAN 0.10 EQUALS 60% GROUND COVER.
5. CONSTRUCT EARTH BANKS (STANDARD DRAWING 5-5) ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES (STANDARD DRAWING 6-8) 1 TO 2 METRES DOWNSLOPE.

STOCKPILE SD4-1

N.T.S.

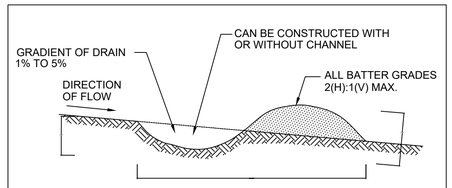


CONSTRUCTION NOTES

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.

GEOTEXTILE INLET FILTER SD6-12

N.T.S.

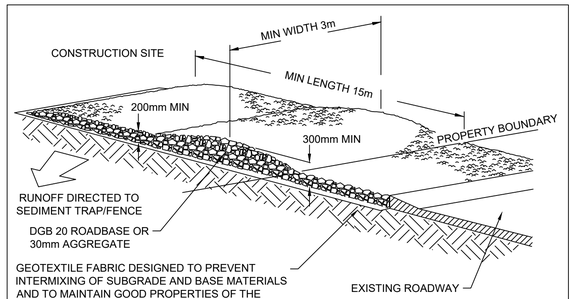


CONSTRUCTION NOTES

1. BUILD WITH GRADIENTS BETWEEN 1 PERCENT AND 5 PERCENT.
2. AVOID REMOVING TREES AND SHRUBS IF POSSIBLE - WORK AROUND THEM.
3. ENSURE THE STRUCTURES ARE FREE OF PROJECTIONS OR OTHER IRREGULARITIES THAT COULD IMPEDE WATER FLOW.
4. BUILD THE DRAINS WITH CIRCULAR, PARABOLIC OR TRAPEZOIDAL CROSS SECTIONS, NOT V SHAPED.
5. ENSURE THE BANKS ARE PROPERLY COMPACTED TO PREVENT FAILURE. COMPLETE PERMANENT OR TEMPORARY STABILISATION WITHIN 10 DAYS OF CONSTRUCTION OR LINE WITH GEOFABRIC.

EARTH BANK (LOW FLOW) SD5-5

N.T.S.

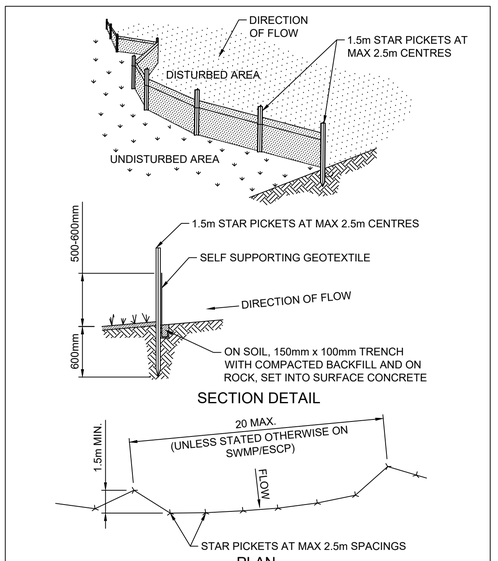


CONSTRUCTION NOTES

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 30mm AGGREGATE.
4. ENSURE THE STRUCTURE IS AT LEAST 15m LONG OR TO BUILDING ALIGNMENT AND AT LEAST 3m WIDE
5. WHERE A SEDIMENT FENCE JOINS ONTO THE STABILISED ACCESS, CONSTRUCT A HUMP IN THE STABILISED ACCESS TO DIVERT WATER TO THE SEDIMENT FENCE

STABILISED SITE ACCESS SD6-14

N.T.S.



SECTION DETAIL

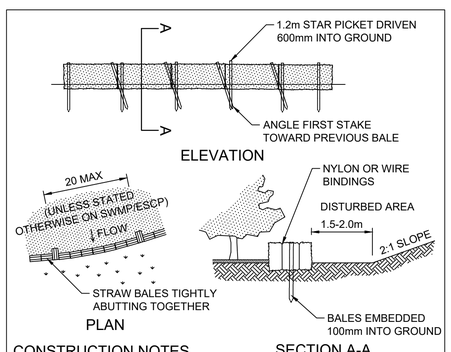
PLAN

CONSTRUCTION NOTES

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

SEDIMENT FENCE SD6-8

SCALE: N.T.S.

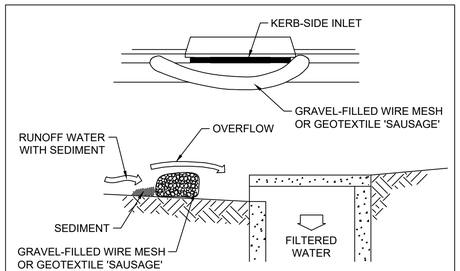


CONSTRUCTION NOTES

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

STRAW BALE FILTER SD6-7

SCALE N.T.S.



CONSTRUCTION NOTES

1. INSTALL FILTERS TO KERB INLETS ONLY AT SAG POINTS.
2. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT AND FILL IT WITH 25mm-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 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
5. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BY-PASSING THE FILTER.
6. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY FIRMLY ABUT EACH OTHER AND SEDIMENT-LADEN WATERS CANNOT PASS BETWEEN.

MESH & GRAVEL INLET FILTER SD6-11

SCALE N.T.S.

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restin
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	RO	16/06/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
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CLIENT: REDBANK NORTH RICHMOND

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SOIL & WATER MANAGEMENT DETAILS

PROJECT No: 110185-12

SHEET No: CC1702

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1702 | A

Plotted: 21 July , 2021 3:09:03 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1702.dwg

NOTES

- DESIGN BASED ON FLOW VELOCITIES FROM 12D DRAINAGE OUTPUTS FOR 5 YEAR ARI STORM EVENT
- RIP-RAP SCOUR PROTECTION DIMENSIONS CALCULATED FROM "ROCK SIZING FOR PIPE OUTLETS - STORMWATER MANAGEMENT PRACTICES" BY CATCHMENTS AND CREEKS, VERSION 2 DATED NOVEMBER 2014
- ROCK HEADWALL ARRANGEMENT SHOWN ON PLANS, PRECAST CONCRETE OUTLET ARRANGEMENT CAN BE ADOPTED, HOWEVER RIP-RAP LENGTH SHALL COMMENCE AT THE END OF THE PRECAST CONCRETE APRON SLAB
- ALL RIP-RAP TO CONSIST OF ANGULAR DURABLE QUARRY ROCK PLACED OVER A LAYER OF ANGULAR COBBLES (D50=500mm)
- RIP-RAP IS TO BE PLACED BY HAND AND PACKED INTO PLACE WITH A CROW-BAR TO ENSURE UNIFORM FIT WITH MINIMUM VOIDS

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

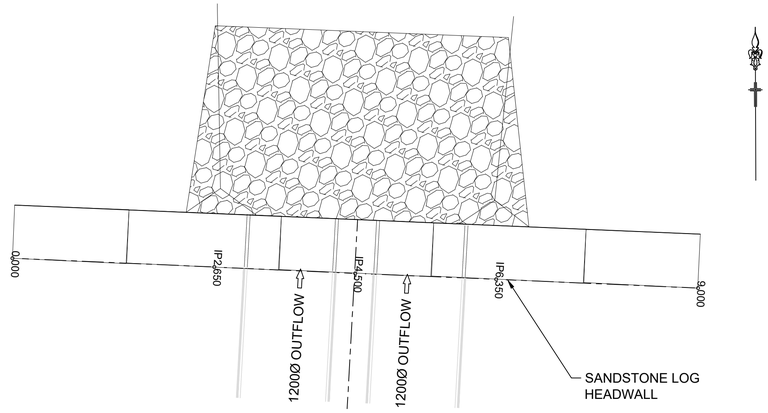
DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

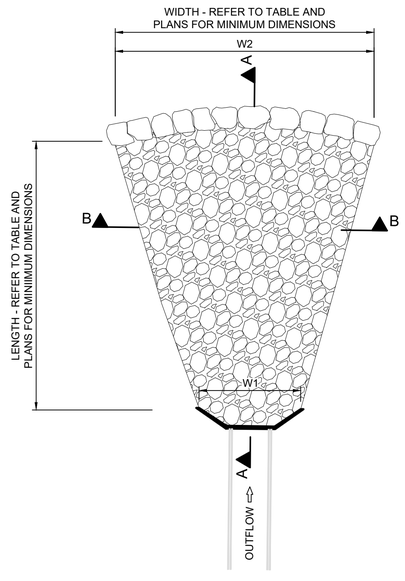
Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restin

Accreditation No. BDC3367

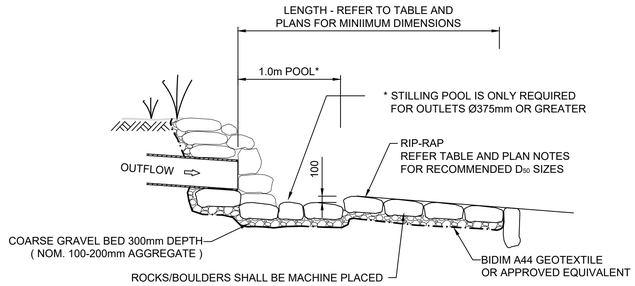
These plans/specifications form part of the certificate issued 10th of August 2021



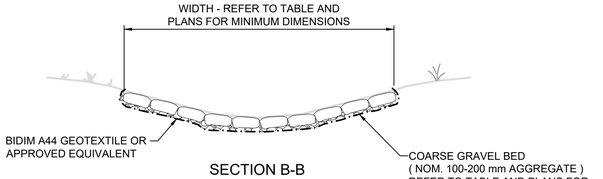
HEADWALL 10/10
PLAN
SCALE 1:50



TYPICAL OUTLET SCOUR PROTECTION PLAN
SCALE 1:50



TYPICAL OUTLET DETAIL
SECTION A-A
1:50



SECTION B-B
1:50

DATUM 31.0				
TOE OF HEADWALL GROUND LEVELS	38.900	38.000	38.000	38.900
TOP OF HEADWALL GROUND LEVELS	38.900	39.800	39.800	38.900
CHAINAGE	0.000	2.650	6.350	9.000

HEADWALL 10/10
LONGITUDINAL SECTION
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:100

HEADWALL 10/10 SETOUT

CHAINAGE	EASTING	NORTHING	BEARING
0	286576.52	6281532.18	92°29'33.46"
2.65	286579.17	6281532.06	
4.5	286581.01	6281531.98	
6.35	286582.86	6281531.9	
9	286585.51	6281531.78	92°29'33.46"

Outlet	Culvert Diameter (mm)	No Off.	Velocity (m/s)	Design Velocity (m/s)	Mean Rock Size (d_{50} mm)	Apron Length L (mm)	Apron Width W_1 (mm)	Apron Width W_2 (mm)	Bed Thickness T (mm)
10/10	1200	2	3.84	4	500	5000	3600	4200	900
32/6	825	1	2.56	2.75	200	2500	1500	1900	360

B

1:200 (AT A1) 1:400 (AT A3) 4 2 0 4 8 12 16 20 METRES

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

1:50 (AT A1) 1:100 (AT A3) 1 0 1 2 3 4 5 METRES

B	CERTIFIER COMMENTS	MP	MP	RO	RO	4/08/21
A	CERTIFIER COMMENTS	JET	JET	MP	RO	26/04/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

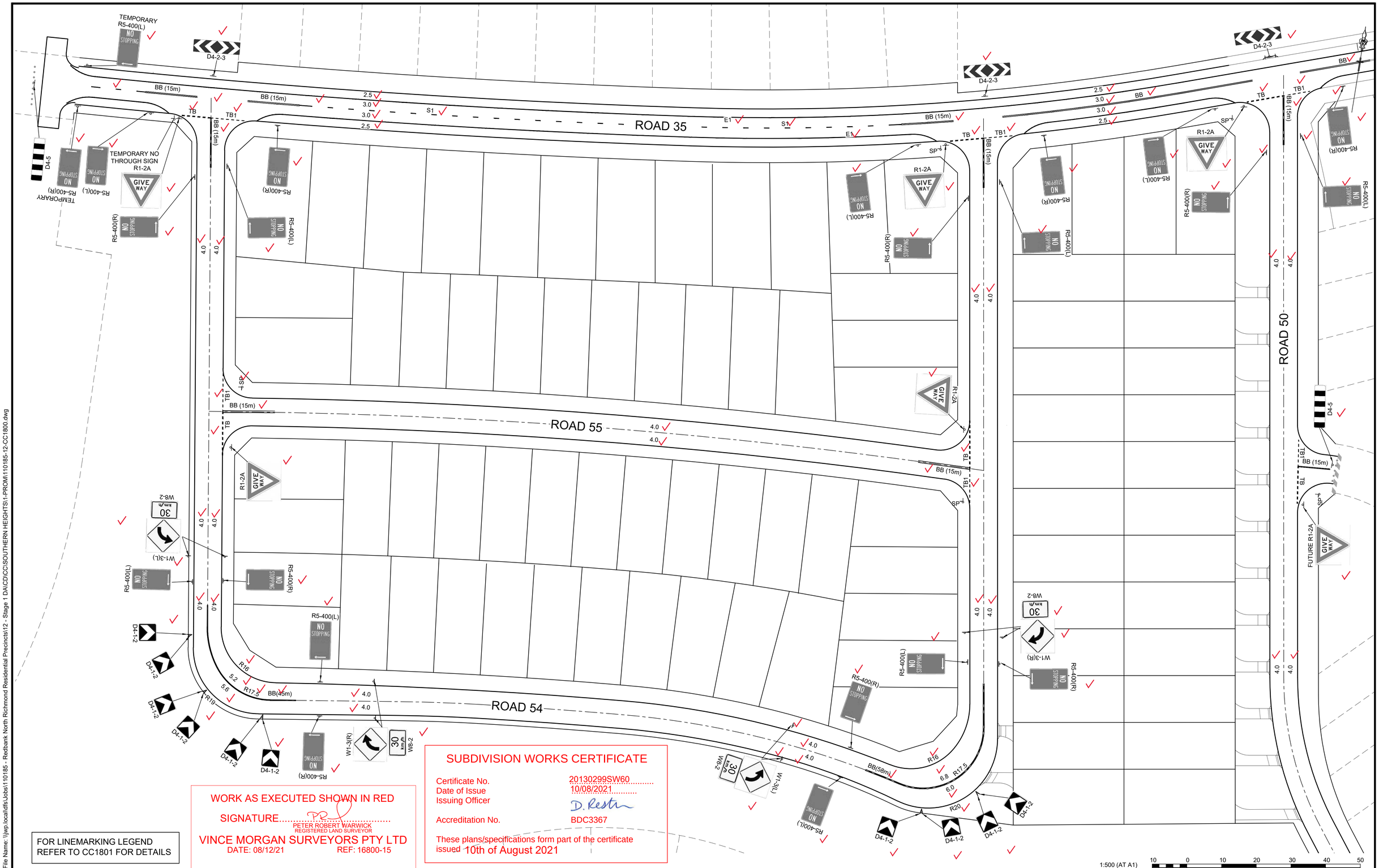
THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
10/10 & 32/6 OUTLET SCOUR PROTECTION DETAILS
HEADWALL 10/10

PROJECT No: 110185-12
SHEET No: CC1703

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1703 B

Plotted: 4 August, 2021 4:04:57 PM File Name: J:\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\CSOUTHERN HEIGHTS\1-PROM\110185-12-CC1703.dwg



FOR LINEMARKING LEGEND
REFER TO CC1801 FOR DETAILS

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD
DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restan
Accreditation No. BDC3367

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	AMENDMENT	DES	DRN	CKD	APR	DATE
G	COUNCIL COMMENTS	MP	NA	RO	RO	23/06/21
F	COUNCIL COMMENTS	MP	JT	RO	RO	16/06/21
E	ROAD 54 ALIGNMENT REVISED	JET	JET	MP	RO	08/06/21
D	COUNCIL COMMENTS	JET	JET	MP	RO	21/05/21
C	COUNCIL COMMENTS	JET	JET	MP	RO	13/05/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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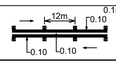
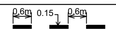
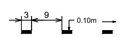
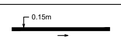
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SIGNAGE AND LINE MARKING PLAN
SHEET 1

PROJECT No: 110185-12
SHEET No: CC1800

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1800 G

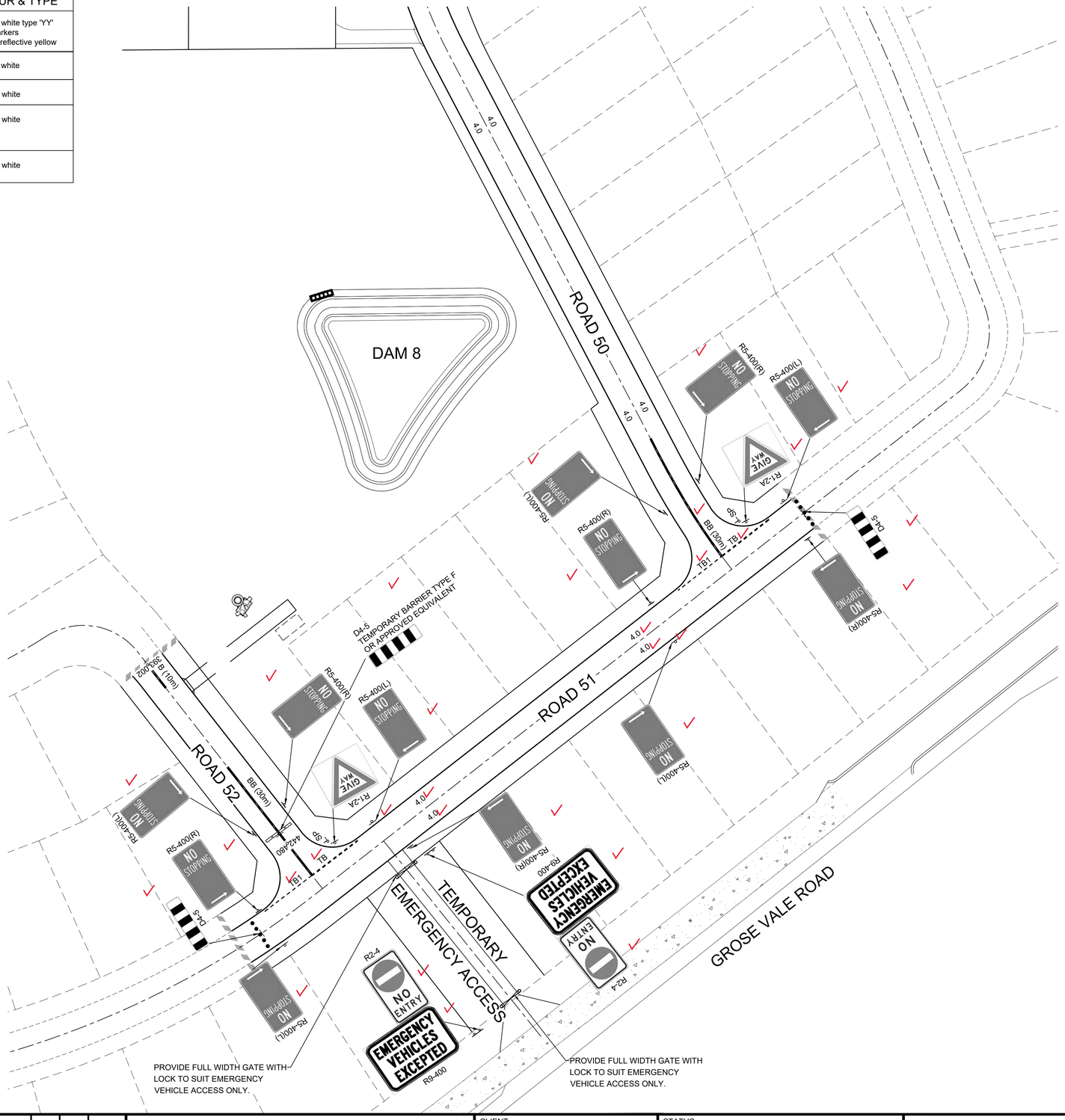
Plotted: 21 July, 2021 3:10:44 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1800.dwg

PAVEMENT MARKING SCHEDULE

CODE	USE	STYLE	COLOUR & TYPE
BB	Barrier line where sight is restricted in both directions or approach to median island		Reflectorised white type 'YY' pavement markers bi-directional reflective yellow
TB	Give way line (Used with Signs)		Reflectorised white
TB1	Give way line (Used on right side of side)		Reflectorised white
S1	Dividing (separation) line in 2 lane road		Reflectorised white
E1	left hand Edge Line on general purpose road		Reflectorised white

NOTES

1. ALL PAVEMENT MARKINGS, CHEVRONS AND REFLECTORS ARE TO BE IN ACCORDANCE WITH AUSTROADS GUIDE TO TRAFFIC MANAGEMENT PART 6 AND AUSTRALIAN STANDARDS. AS1742-9, AS1743 AND RMS DELINEATION MANUAL.
2. ALL SIGNS TO BE IN ACCORDANCE WITH CURRENT AUSTRALIAN STANDARD; AS 1743 - ROAD SIGNS AND COUNCIL'S SPECIFICATION UNLESS OTHERWISE SHOWN.
3. ROAD SIGNS ARE SIZE 'B', UNLESS OTHERWISE SHOWN. LOCATE OUTSIDE OF CLEAR ZONES.
4. ALL NEW PAVEMENT MARKINGS ARE TO BE INSTALLED IN WHITE, REFLECTIVE, THERMOPLASTIC PAINT.
5. KERBSIDE LANE WIDTHS INCLUDE THE WIDTH OF THE GUTTER.
6. RE-MARK EXISTING PAVEMENT MARKINGS AS DIRECTED BY THE COUNCIL'S ENGINEER.
7. PAVEMENT MARKINGS THAT FORM NO PART OF THE FINAL WORKS ARE TO BE REMOVED BY SAND BLASTING OR OTHER METHOD AS APPROVED BY THE PROJECT MANAGER.
8. ALL MEASUREMENTS ARE IN METRES UNLESS OTHERWISE SHOWN.



WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60

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Issuing Officer D. Restin

Accreditation No. BDC3367

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1:500 (AT A1)
1:1000 (AT A3)

10 0 10 20 30 40 50
METRES

	AMENDMENT	DES	DRN	CKD	APR	DATE
D	COUNCIL COMMENTS	MP	NA	RO	RO	16/06/21
C	COUNCIL COMMENTS	JET	JET	MP	RO	13/05/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SIGNAGE AND LINE MARKING PLAN
SHEET 2

PROJECT No: 110185-12

SHEET No: CC1801

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN:

PLAN No: 110185-12-CC1801 D

Plotted: 21 July, 2021 3:11:35 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\CS\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1801.dwg

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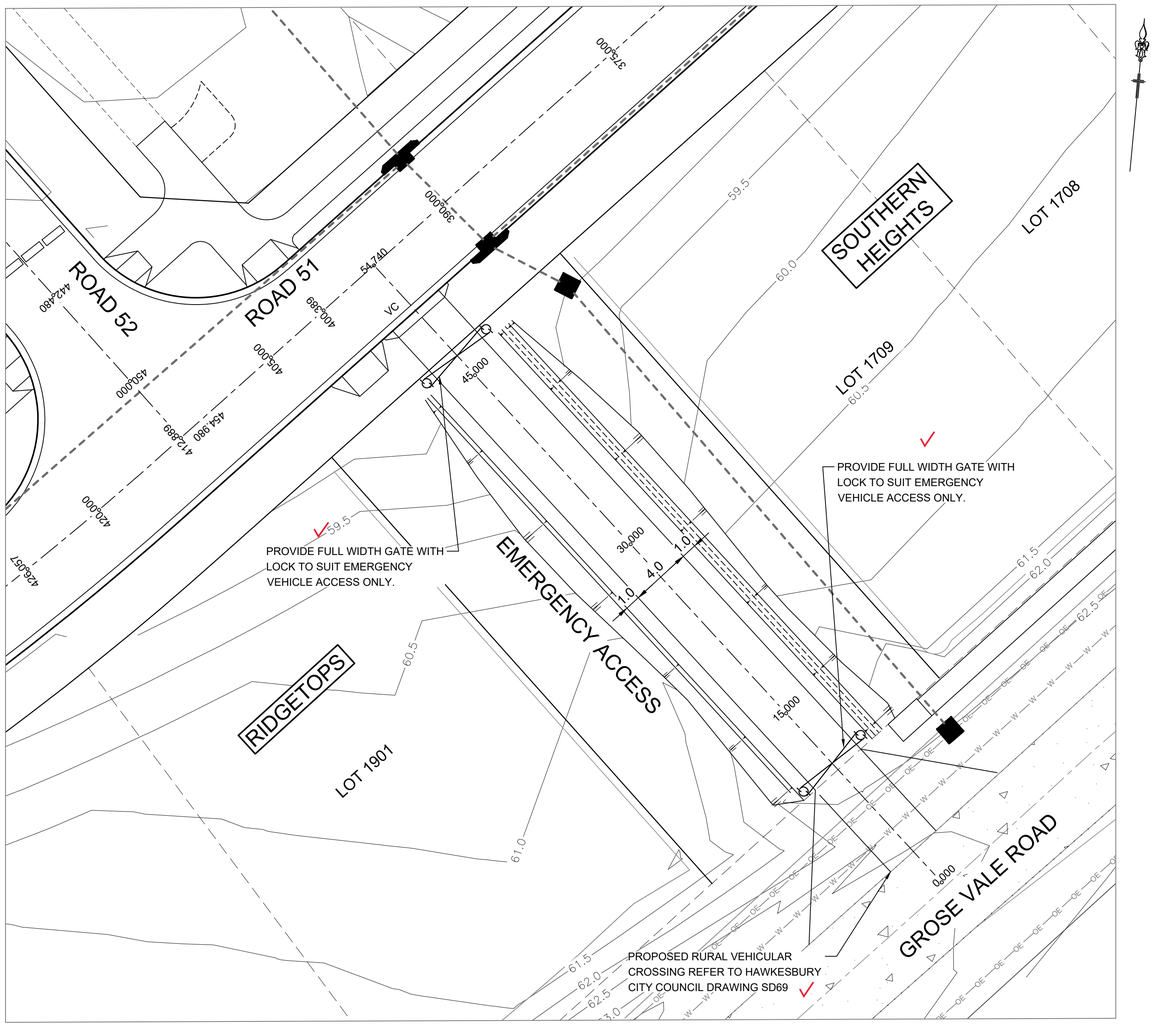
SIGNATURE..... PB .....

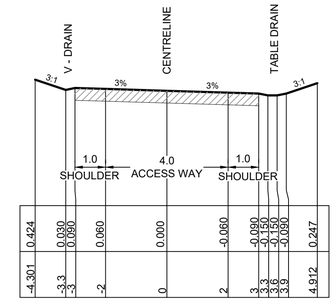
PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15



EMERGENCY ACCESS PLAN
SCALE 1:200



TYPICAL CROSS SECTION
EMERGENCY ACCES
SCALE 1:100 NATURAL

PAVEMENT NOTES
(EMERGENCY ACCESS)

1. 50mm WEARING COURSE AC10
2. ONE COAT HOT BITUMEN FLUSH SEAL
3. 150mm DGB 20 BASE COURSE
4. 200mm SUB-BASE COURSE

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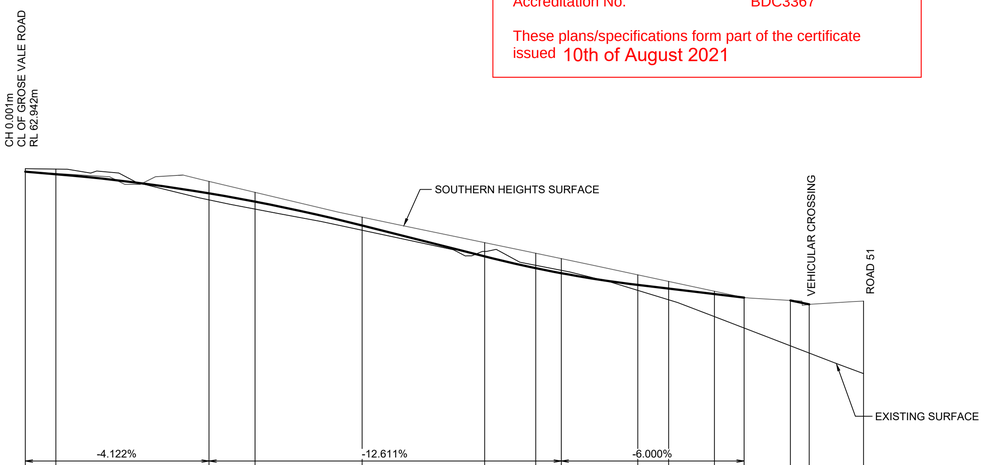

DATUM 49.0

	62.95	62.85	62.22	61.95	61.18	60.27	59.9	59.74	59.28	59.1	58.93	58.85	58.76	58.63	58.68
DESIGN LINE GRADING	62.945	62.862	62.238	61.968	61.189	60.180	59.797	59.632	59.250	59.129	58.950	58.833	58.743	58.615	58.723
SH DESIGN SURFACE			62.629	62.273	61.463	60.630	60.284	60.108	59.577	59.362	59.043	58.833	58.743	58.615	58.723
EXISTING SURFACE	63.042	63.031	62.026	61.724	61.034	60.341	59.890	59.728	59.071	58.766	58.215	57.843	57.261	57.025	56.355
CHAINAGE	0.000	2.000	12.000	15.000	22.000	30.000	33.330	35.000	40.000	42.011	45.000	46.939	49.964	51.189	54.740

LONGITUDINAL SECTION EMERGENCY ACCESS
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:100

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

1:200 (AT A1)
1:400 (AT A3)
4 2 0 4 8 12 16 20
METRES

C	COUNCIL COMMENTS	MP	NA	RO	RO	16/05/21
B	COUNCIL COMMENTS	JET	JET	MP	RO	13/05/21
A	CERTIFIER COMMENTS	JET	JET	MP	RO	26/04/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

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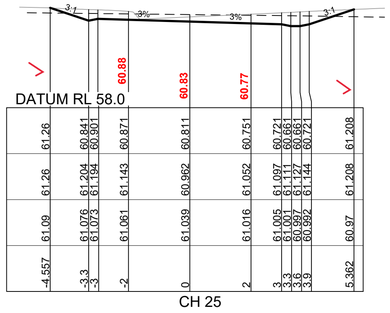
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
EMERGENCY ACCESS PLAN , TYPICAL CROSS SECTION AND LONGITUDINAL SECTION

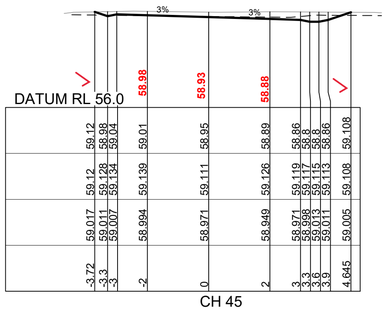
PROJECT No: 110185-12

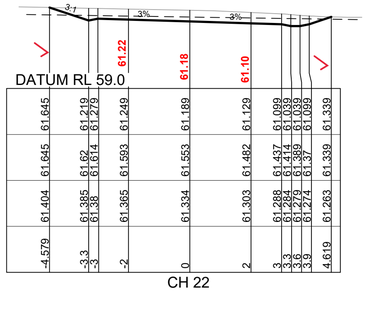
SHEET No: CC1802

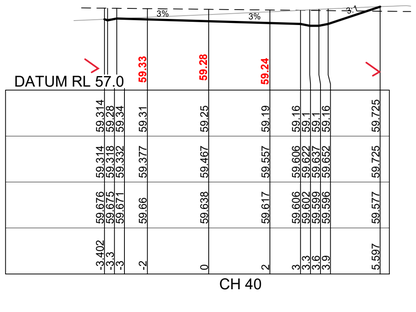
AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1802 | C

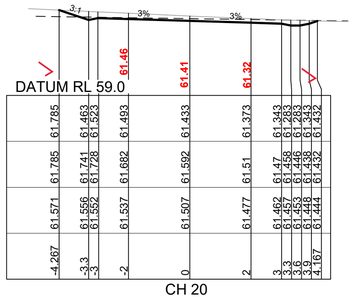
Plotted: 21 July , 2021 3:14:24 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\CS\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1802.dwg

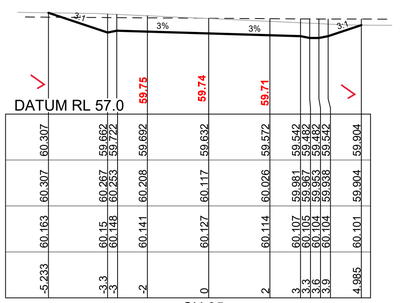


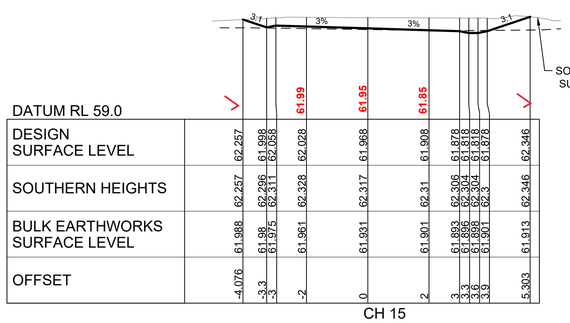


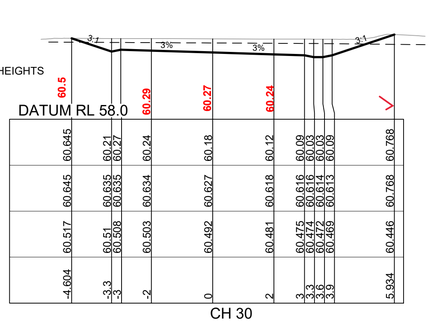












WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60

Date of Issue 10/08/2021

Issuing Officer D. Restin

Accreditation No. BDC3367

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1:100 (AT A1)
1:200 (AT A3)

2 1 0 1 2 3 4 5 6 7 8 9 10

METRES

A	CERTIFIER COMMENTS	JET	JET	MP	RO	26/04/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
EMERGENCY ACCESS CROSS SECTION

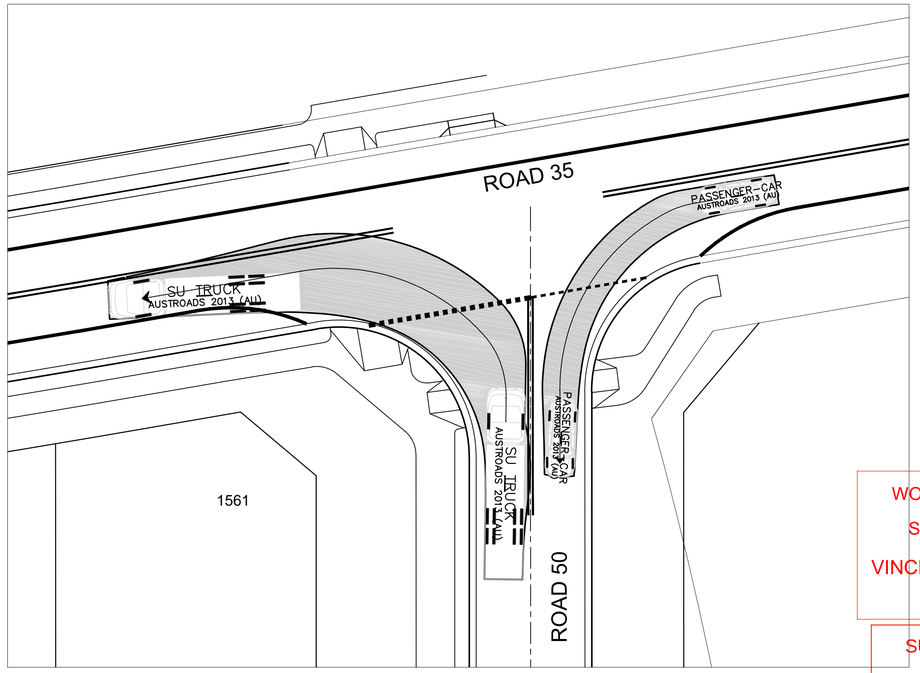
PROJECT No: 110185-12

SHEET No: CC1803

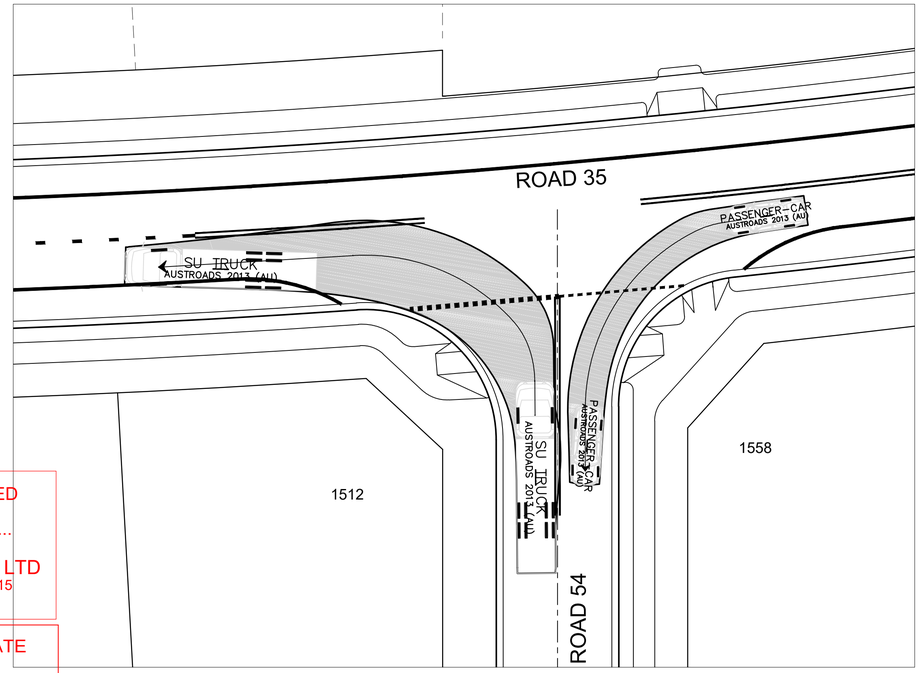
AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN:

PLAN No: 110185-12-CC1803 A

Plotted: 21 July , 2021 3:15:13 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DAICD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1803.dwg



PLAN
SCALE 1:500



PLAN
SCALE 1:500

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

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VINCE MORGAN SURVEYORS PTY LTD
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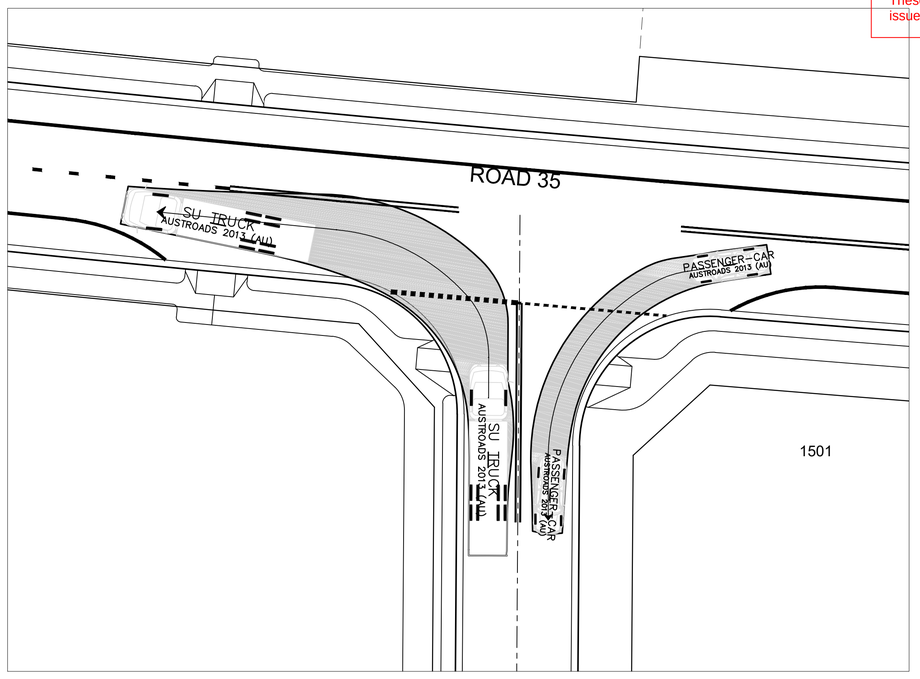
Date of Issue 10/08/2021
Issuing Officer D. Restin
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021



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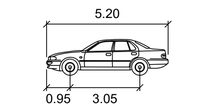
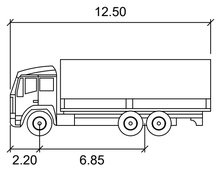


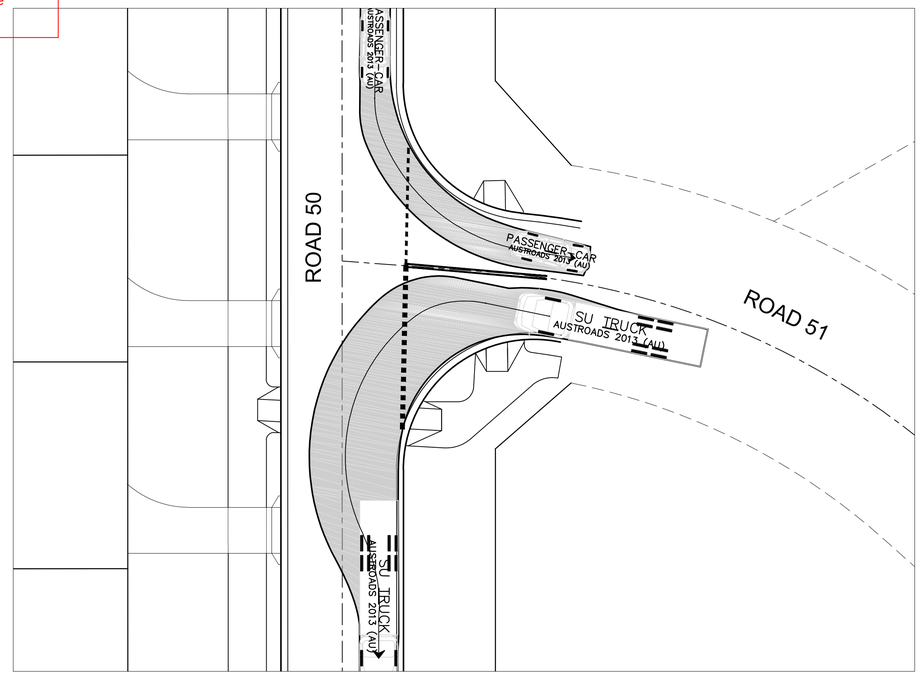
PASSENGER-CAR

		meters
Width	:	1.94
Track	:	1.84
Lock to Lock Time	:	6.0
Steering Angle	:	33.6



SU TRUCK

		meters
Width	:	2.50
Track	:	2.50
Lock to Lock Time	:	6.0
Steering Angle	:	36.6



PLAN
SCALE 1:500

1:500 (AT A1)
1:1000 (AT A3)

10 0 10 20 30 40 50
METRES

B	SWEPT PATH REVISED	JET	JET	MP	RO	08/06/21
A	COUNCIL COMMENTS	JET	JET	MP	RO	13/05/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

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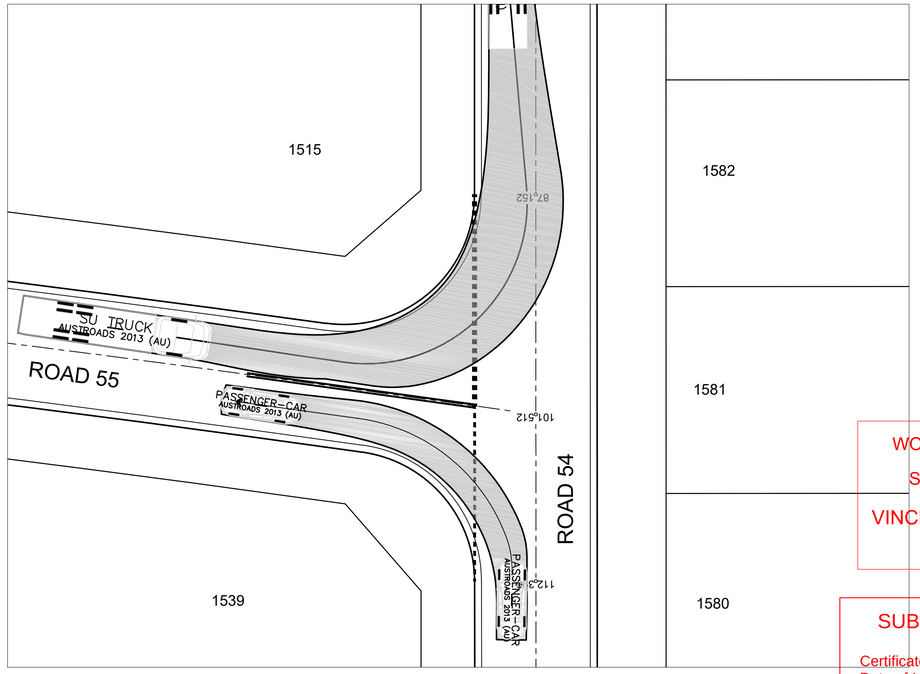
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SWEPT PATH PLAN
SHEET 1

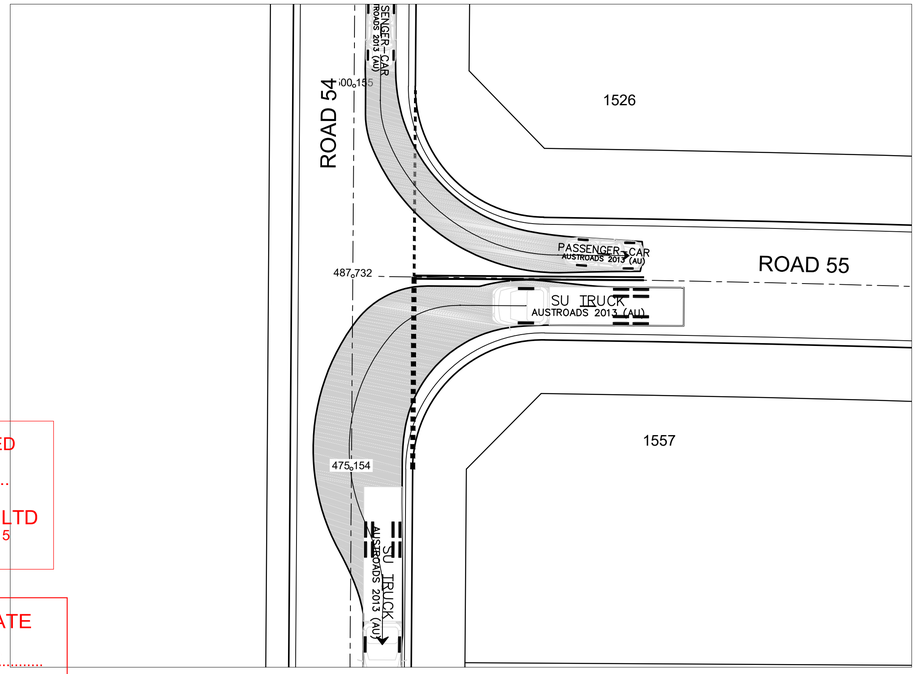
PROJECT No: 110185-12
SHEET No: CC1900

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1900 B

Plotted: 21 July , 2021 3:16:01 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1900.dwg



PLAN
SCALE 1:500



PLAN
SCALE 1:500

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

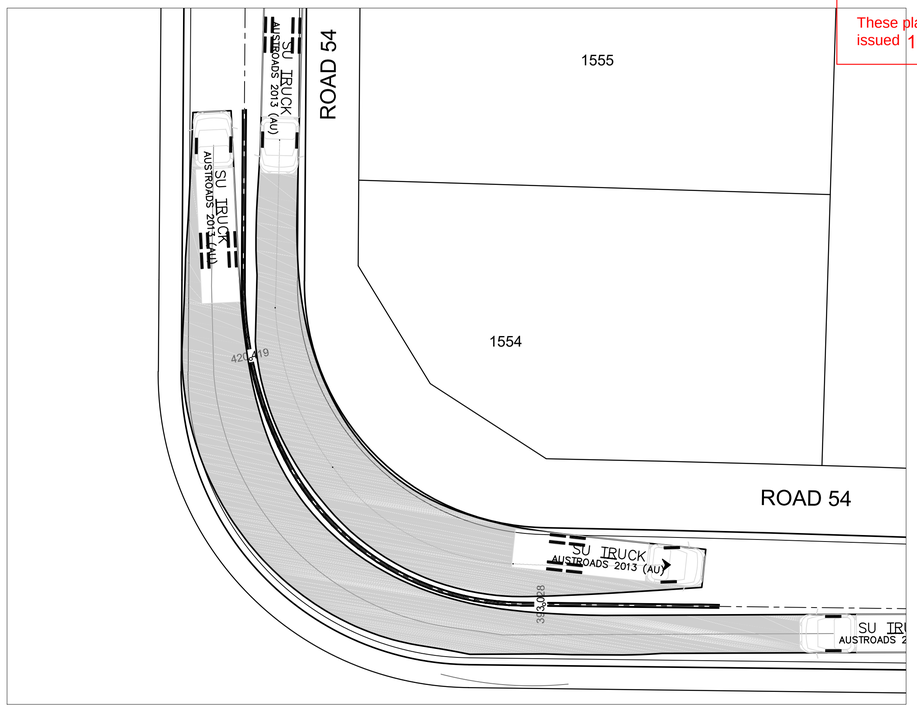
DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Restin

Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021



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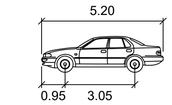
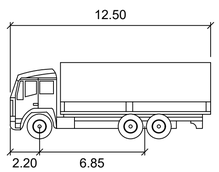


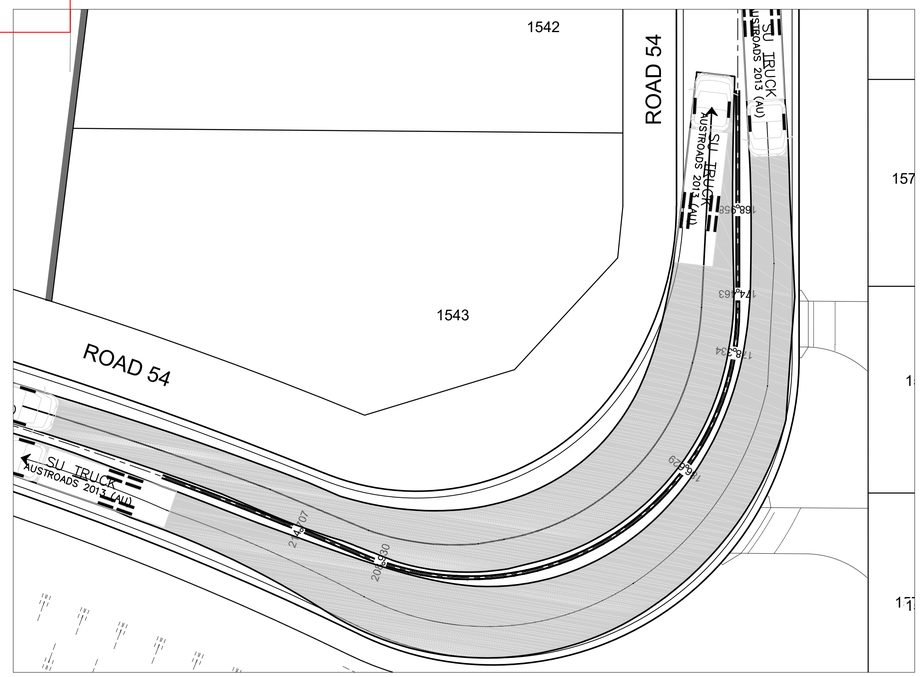
PASSENGER-CAR

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.6



SU TRUCK

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.6



PLAN
SCALE 1:500

1:500 (AT A1)
1:1000 (AT A3)

10 0 10 20 30 40 50
METRES

B	SWEPT PATH REVISED	JET	JET	MP	RO	08/06/21
A	COUNCIL COMMENTS	JET	JET	MP	RO	13/05/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
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P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SWEPT PATH PLAN
SHEET 2

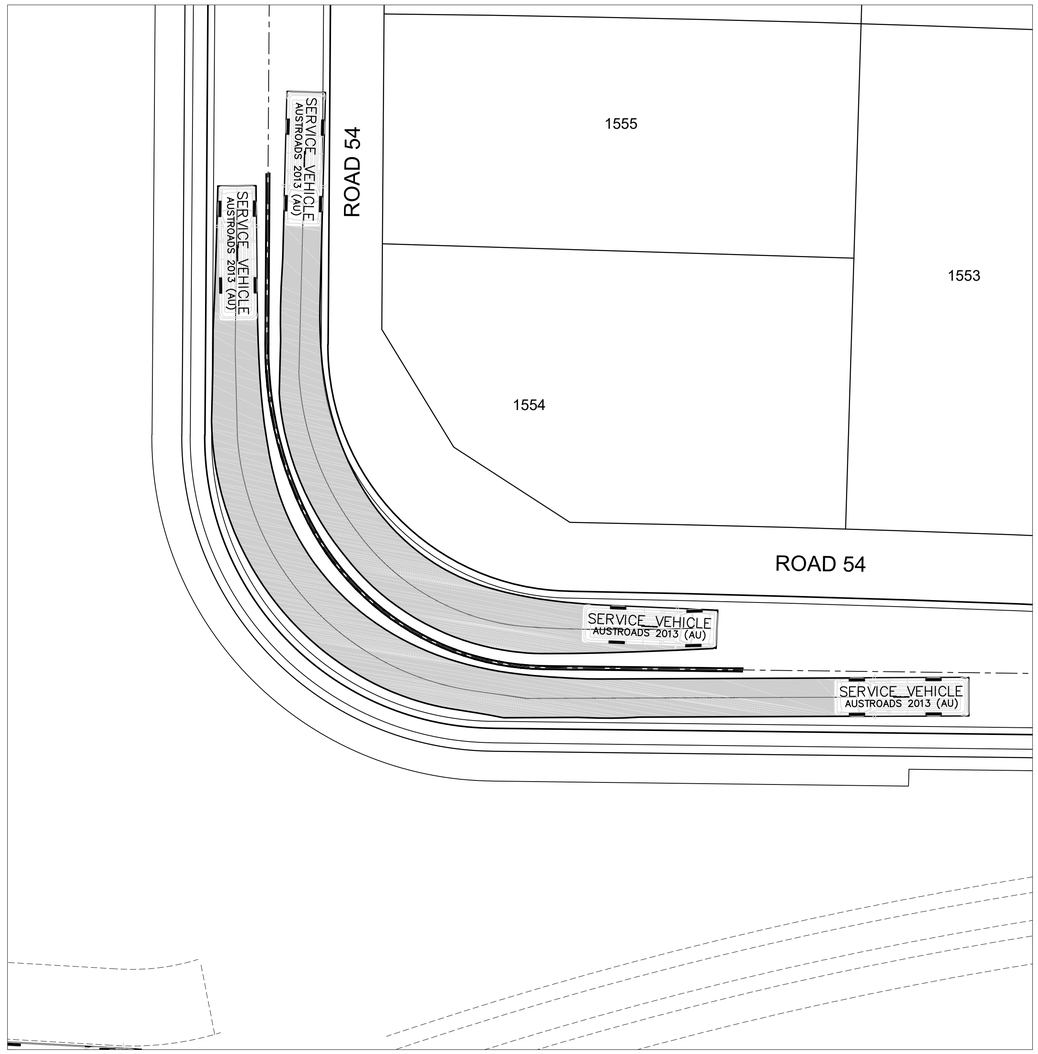
PROJECT No: 110185-12

SHEET No: CC1901

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN:

PLAN No: 110185-12-CC1901 B

Plotted: 21 July , 2021 3:16:57 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DAICD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1901.dwg



PLAN
SCALE 1:500

PLAN
SCALE 1:500

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....
PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW60
Date of Issue 10/08/2021
Issuing Officer D. Rester
Accreditation No. BDC3367

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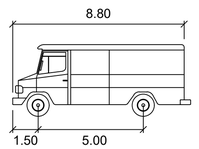

SERVICE VEHICLE

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 38.7

1:500 (AT A1)
1:1000 (AT A3)

10 0 10 20 30 40 50
METRES

C	SWEPT PATH REVISED	JET	JET	MP	RO	08/06/21
B	COUNCIL COMMENTS	JET	JET	MP	RO	21/05/21
A	COUNCIL COMMENTS	JET	JET	MP	RO	13/05/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS

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P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

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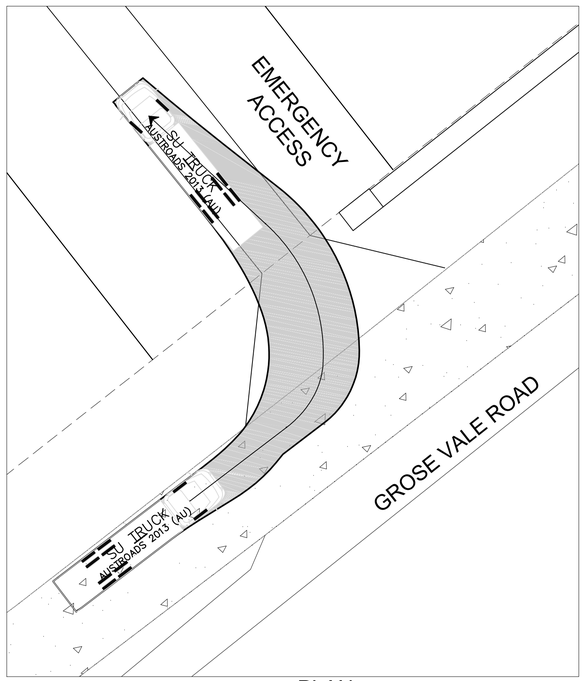
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SWEPT PATH PLAN
SHEET 3

PROJECT No: 110185-12
SHEET No: CC1902

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1902 C

Plotted: 21 July , 2021 3:17:53 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDCC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1902.dwg



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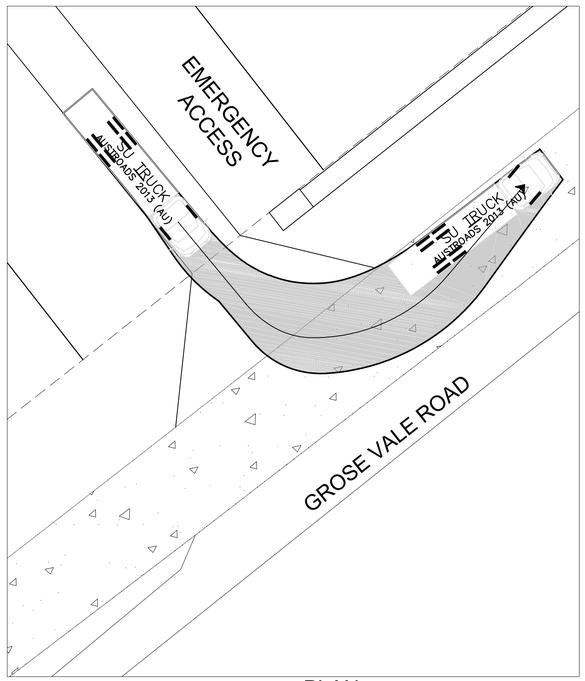

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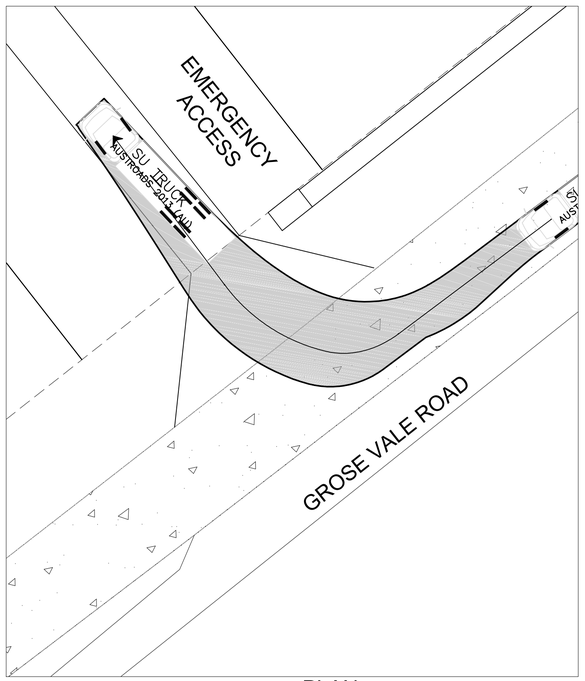

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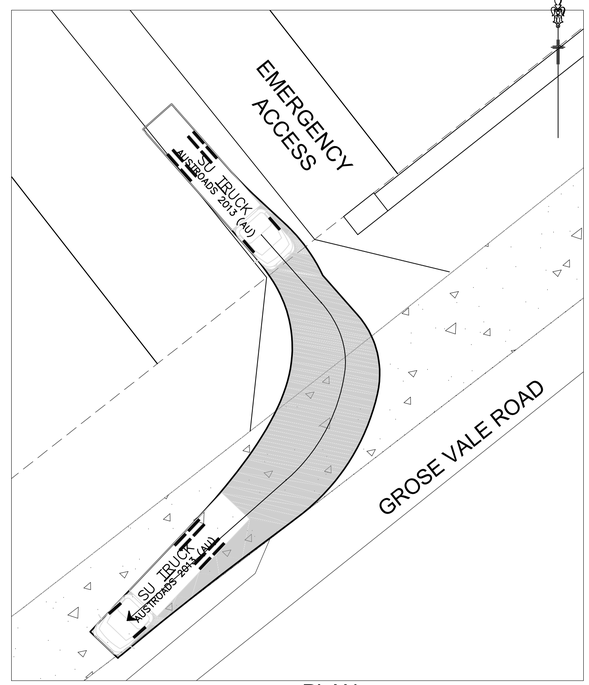
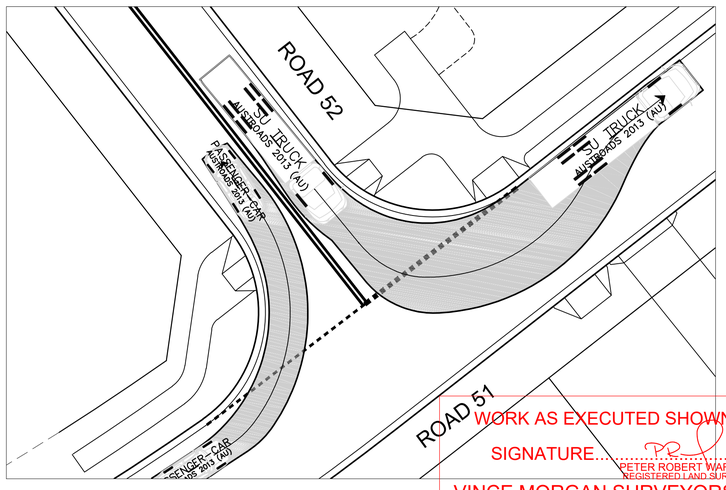


PLAN
SCALE 1:500



PLAN
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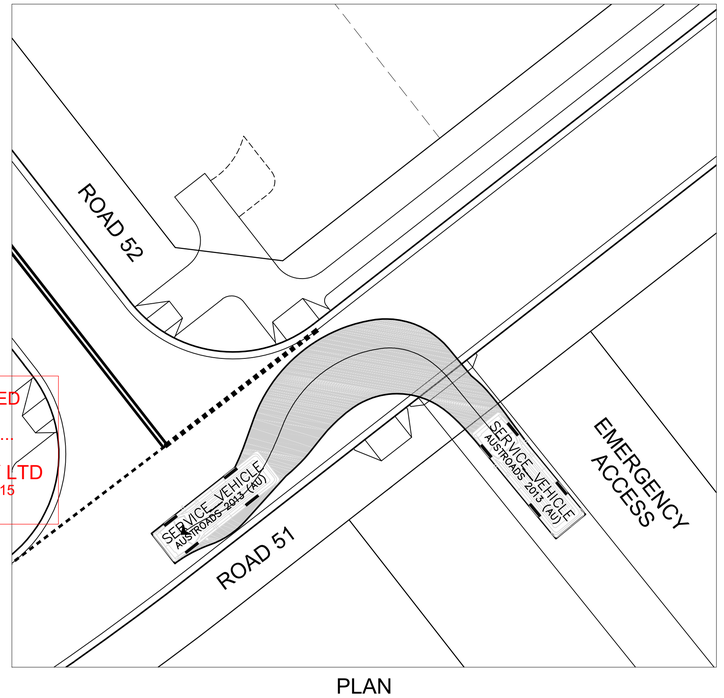

PLAN
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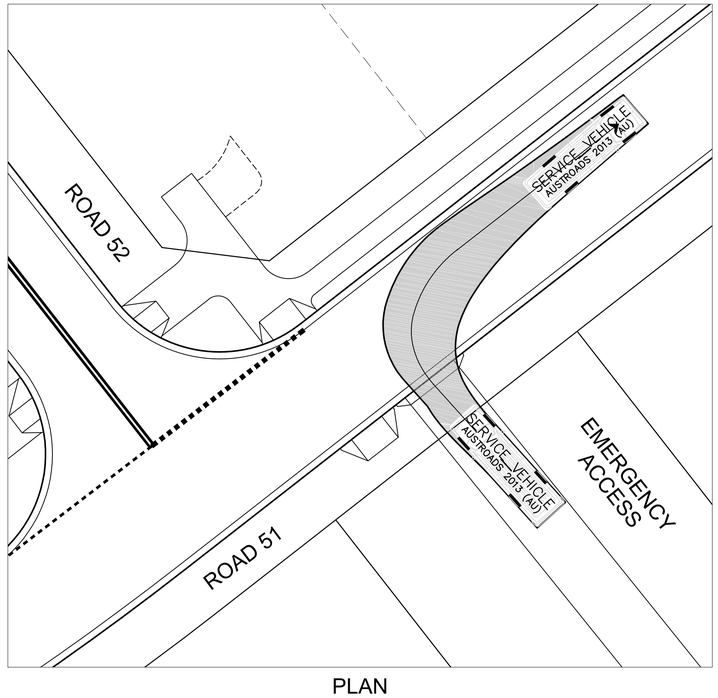

PLAN
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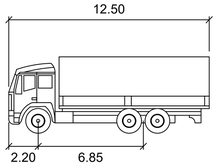
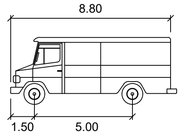


SU TRUCK

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.6



SERVICE VEHICLE

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 38.7

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

PETER ROBERT WARWICK
REGISTERED LAND SURVEYOR

VINCE MORGAN SURVEYORS PTY LTD

DATE: 08/12/21 REF: 16800-15

SUBDIVISION WORKS CERTIFICATE

Certificate No.	20130299SW60
Date of Issue	10/08/2021
Issuing Officer	D. Restin
Accreditation No.	BDC3367

These plans/specifications form part of the certificate issued 10th of August 2021

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

4 2 0 4 8 12 16 20
METRES

C	SWEPT PATH REVISED	JET	JET	MP	RO	08/06/21
B	COUNCIL COMMENTS	JET	JET	MP	RO	21/05/21
A	COUNCIL COMMENTS	JET	JET	MP	RO	13/05/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SWEPT PATH PLAN
SHEET 4

PROJECT No: 110185-12

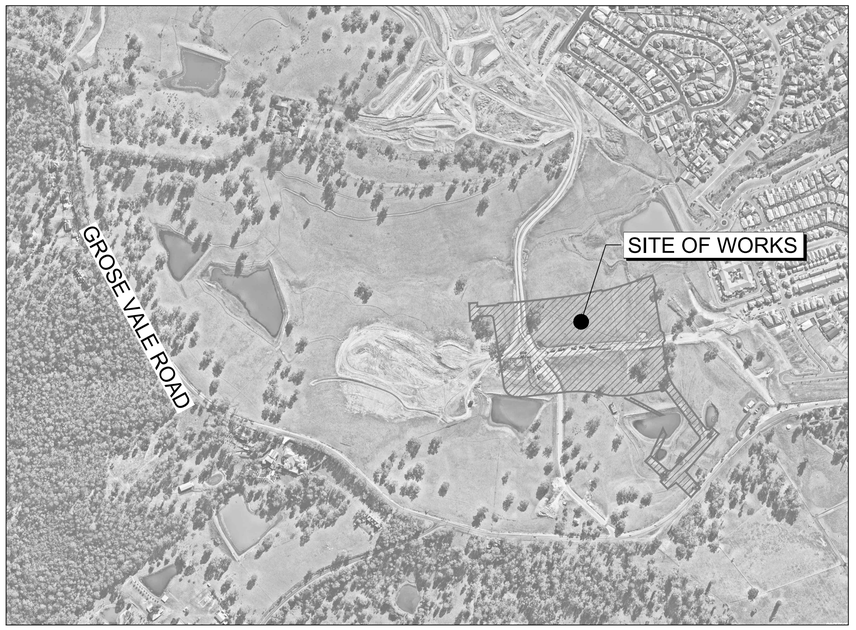
SHEET No: CC1903

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1903 C

Plotted: 21 July, 2021 3:18:51 PM File Name: \\jwp.local\dfs\Jobs\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1903.dwg

REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
PROPOSED CIVIL WORKS
FOR SUBDIVISION WORKS CERTIFICATE

(HAWKESBURY CITY COUNCIL - DA0498/18)



Note: No works are to occur outside of the property boundary unless written approval from Hawkesbury City Council has been received.

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW72
Date of Issue 03/03/2022
Issuing Officer D. Restin
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 03/03/2022

WORK AS EXECUTED SHOWN IN RED
SIGNATURE.....
VINCE MORGAN SURVEYORS PTY LTD
DATE: 05/03/22 REF:16800

Survey By:

VINCE MORGAN SURVEYORS

REGISTERED SURVEYORS
1/77 UNION ROAD PENRITH NSW 2750
Ph. (02) 4721 5293

REF: NORTH RICHMOND - DETAIL SURVEY UPDATE 15 MARCH 2017 & 5th MAY 2017, 11 DEC 2019

LOT LAYOUT PLAN OF SUBDIVISION REF: 22a-REDBANK-PRO-DP1266750-PLAN-DRAFT-201203

	AMENDMENT	DES	DRN	CKD	APR	DATE
D	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
C	ROAD 54 AMENDED	MP	VS	RO	RO	16/06/21
B	AMENDED EXTENT OF WORKS	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
COVER SHEET

PROJECT No: 110185-12
SHEET No: CC1000

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1000 | D

Plotted: 25 February, 2022 1:09:32 PM File Name: J:\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDI\CS\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1000.dwg

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

VINCE MORGAN SURVEYORS PTY LTD

DATE: 05/03/22 REF:16800

LEGEND

DESCRIPTION	PROPOSED	EXISTING	FUTURE
EXTENT OF WORKS			
KERB & GUTTER	KG		
ROLL KERB			
KERB ONLY			
SLOTTED KERB	SK		
GUIDE POSTS			
EXTENT OF FILL			
EXTENT OF CUT			
CONTOURS	46.0	47.0	
STOCKPILE CONTOURS		46.0	
CATCH DRAIN			
STORMWATER DRAINAGE LINE AND PIT			
GROSS POLLUTANT TRAP	GPT		
1:100YR ARI FLOW PATH			
TREES TO BE PROTECTED			
TREES TO BE REMOVED			
TRANSMISSION LINE POWER POLES			
ELECTRICITY, POWER POLE		OE OE OE	
WATERMAIN		W W W W	
RETAINING WALLS			
STREET NAME SIGN	SP		

GENERAL NOTES

1. ALL WORKS ARE TO BE IN ACCORDANCE WITH HAWKESBURY CITY COUNCIL'S DEVELOPMENT CONTROL PLAN 2009, APPENDIX E "CIVIL WORKS SPECIFICATIONS",PART I, II & III.
2. EXISTING SURVEY MARKS SHALL BE RETAINED AT ALL TIMES. WHERE RETENTION IS NOT POSSIBLE THE SUPERINTENDENT MUST BE NOTIFIED AND CONSENT RECEIVED PRIOR TO THEIR REMOVAL.
3. THE CONTRACTOR MUST OBTAIN CURRENT DIAL BEFORE YOU DIG UTILITIES PLAN BY DIALING PH 1100, LOCATE AND LEVEL ALL EXISTING SERVICES PRIOR TO COMMENCING CONSTRUCTION, AND MAKE ARRANGEMENTS WITH THE RELEVANT AUTHORITY TO RELOCATE OR ADJUST IF NECESSARY.
4. THE CONTRACTOR SHALL NOT ENTER UPON NOR DO ANY WORK WITHIN ADJACENT LANDS WITHOUT THE WRITTEN PERMISSION OF THE OWNERS, PROVIDED BY PRINCIPAL.
5. THE CONTRACTOR SHALL MAINTAIN SERVICES AND ALL WEATHER ACCESS AT ALL TIMES TO ADJOINING PROPERTIES.
6. FILLING IS TO BE FROM A NOMINATED SOURCE, OF SOUND CLEAN MATERIAL, FREE FROM LARGE ROCK, STUMPS, CONTAMINATED MATTER, INDUSTRIAL AND BUILDING WASTE, ORGANIC MATTER AND OTHER DEBRIS. PLACING OF FILLING ON THE PREPARED AREAS SHALL NOT COMMENCE UNTIL THE APPROVAL TO DO SO HAS BEEN OBTAINED FROM THE COUNCIL.
7. SITE FILL AREAS: - THE CONTRACTOR SHALL TAKE LEVELS OF EXISTING SURFACE AFTER STRIPPING TOPSOIL AND PRIOR TO COMMENCING FILL OPERATIONS.
8. ALL SITE FILLING TO BE COMPACTED TO 98% STANDARD COMPACTION AND SHALL BE CONTROLLED BY A REGISTERED SOIL LABORATORY IN ACCORDANCE WITH COUNCILS' DEVELOPMENT CONTROL PLAN 2009, APPENDIX E "CIVIL WORKS SPECIFICATIONS" PART II
9. ALL SITE REGRADING AREAS SHALL BE GRADED AT A MINIMUM 1% TO THE ENGINEERS' REQUIREMENTS.
10. SURPLUS EXCAVATED MATERIAL SHALL BE PLACED WHERE DIRECTED BY THE SUPERINTENDENT.
11. VEHICULAR CROSSINGS SHALL BE CONSTRUCTED IN KERB AND GUTTER WHERE SHOWN.
12. PRAM CROSSINGS SHALL BE CONSTRUCTED IN KERB AND GUTTER IN ACCORDANCE WITH COUNCIL'S STANDARD DRAWING.
13. ALL NEW WORKS SHALL MAKE A SMOOTH JUNCTION WITH EXISTING CONDITIONS.
14. DIMENSIONS OF ANY DETAIL SHALL NOT BE SCALED - DIMENSIONS, IF IN DOUBT, SHALL BE VERIFIED BY THE SUPERINTENDENT.
15. ALL CONSTRUCTION AND RESTORATION WORK ON COUNCIL'S ROAD AND FOOTPATH AREA ARE TO BE CARRIED OUT IN ACCORDANCE WITH THE APPROVED DRAWINGS AND COUNCIL'S STANDARD SPECIFICATIONS.
16. NO FILL MATERIAL IS TO BE IMPORTED TO THE SITE. EXISTING STOCKPILES AND MATERIAL WITHIN THE REDBANK SITE ARE TO BE USED FOR THE EARTHWORKS.

COMPACTION SPECIFICATION

1) WITHIN FULL WIDTH OF ROAD CARRIAGEWAY PLUS 1.0m EITHER SIDE -

a) ALL SUBGRADE SHALL BE CARRIED UP IN HORIZONTAL LAYERS, OF NOT MORE THAN 300mm THICK LOOSE MEASUREMENT, IF REQUIRED, AND SHALL HAVE EACH LAYER COMPACTED TO A 100% STANDARD DRY DENSITY RATIO DETERMINED IN ACCORDANCE WITH AS 1289 5.4.1-2007 "COMPACTION CONTROL TEST - DRY DENSITY RATIO, MOISTURE VARIATION AND MOISTURE RATIO",

b) ALL SUB-BASE COURSE SHALL BE PLACED AND COMPACTED TO AT LEAST 98% MODIFIED DRY DENSITY RATIO DETERMINED IN ACCORDANCE WITH AS 1289 5.4.1-2007 "COMPACTION CONTROL TEST - DRY DENSITY RATIO, MOISTURE VARIATION AND MOISTURE RATIO".

c) ALL BASE COURSE SHALL BE PLACED AND COMPACTED TO AT LEAST 98% MODIFIED DRY DENSITY RATIO DETERMINED IN ACCORDANCE WITH AS 1289 5.4.1-2007 "COMPACTION CONTROL TEST - DRY DENSITY RATIO, MOISTURE VARIATION AND MOISTURE RATIO".

d) ALL ROAD CROSSINGS TO BE PROVIDED IN EXISTING ROADS, THE TRENCHES SHALL BE BACKFILLED AND COMPACTED WITH A SAND/CEMENT BLEND 20:1 MIX TO SUBGRADE LEVEL, THEN DGB20 TO WITHIN 50MM OF THE ROAD SURFACE, OR IF REQUIRED TO A HIGHER SPECIFICATION BY A SPECIFIC UTILITY AUTHORITY, TO THAT SPECIFICATION AS INSTRUCTED BY THE PROJECT SUPERINTENDENT.

e) ALL TESTS TO BE TAKEN EVERY 50 METRE LENGTH OF PAVEMENT, TAKEN 1.0m FROM ALTERNATE SIDES OF PAVEMENT, BY A NATA REGISTERED LABORATORY.

f) THESE AND ALL OTHER REQUIREMENTS TO BE COMPLIED WITH, TO BE READ IN CONJUNCTION WITH HAWKESBURY CITY COUNCIL DCP APPENDIX E CIVIL WORKS SPECIFICATION PART II - CONSTRUCTION SPECIFICATION.

g) ANY ERRORS, OMISSIONS OR QUERIES TO BE SUBMITTED TO THE PROJECT SUPERINTENDENT FOR INSTRUCTION,

h) ANY FILL MATERIAL SHALL COMPRISE UNCONTAMINATED VIRGIN EXCAVATED NATURAL MATERIAL (VENM) OR EXCAVATED NATURAL MATERIAL (ENM).

2) WITHIN FULL WIDTH OF ROAD FOOTPATH / VERGE EXCLUDING 1.0m BESIDE ROAD CARRIAGEWAY EITHER SIDE -

a) ALL FILL SHALL BE CARRIED OUT IN HORIZONTAL LAYERS, EXTENDING THE FULL WIDTH OF THE AREA BEING FILLED, OF NOT MORE THAN 300mm CONSOLIDATED THICKNESS EACH LAYER SHALL BE COMPACTED TO AT LEAST 98% STANDARD DRY DENSITY RATIO DETERMINED IN ACCORDANCE WITH AS1289 5.4.1-2007 "COMPACTION CONTROL TEST - DRY DENSITY RATIO, MOISTURE VARIATION AND MOISTURE RATIO".

b) ALL TESTS TO BE TAKEN EVERY 50 METRE LENGTH OF ROAD FOOTPATH / VERGE ON CENTRELINE, BY A NATA REGISTERED LABORATORY.

c) ALL TRENCHES TO BE BACKFILLED TO HAVE EQUAL COMPACTION (+2%/-0% VRAIATION) AS THE SURROUNDING ROAD FOOTPATH / VERGE.

d) ALL TRENCH TESTS TO BE TAKEN IN EACH 300mm LAYER AND EVERY 50 METRES OF TRENCH, BY A NATA REGISTERED LABORATORY.

e) THESE AND ALL OTHER REQUIREMENTS TO BE COMPLIED WITH, TO BE READ IN CONJUNCTION WITH HAWKESBURY CITY COUNCIL DCP APPENDIX E CIVIL WORKS SPECIFICATION PART II - CONSTRUCTION SPECIFICATION.

f) ANY ERRORS, OMISSIONS OR QUERIES TO BE SUBMITTED TO THE PROJECT SUPERINTENDENT FOR INSTRUCTION.

g) ANY FILL MATERIAL SHALL COMPRISE UNCONTAMINATED VIRGIN EXCAVATED NATURAL MATERIAL (VENM) OR EXCAVATED NATURAL MATERIAL (ENM).

3) WITHIN LOTS -

a) ALL FILL SHALL BE CARRIED OUT IN HORIZONTAL LAYERS, EXTENDING THE FULL WIDTH OF THE AREA BEING FILLED, OF NOT MORE THAN 300MM CONSOLIDATED THICKNESS. EACH LAYER SHALL BE COMPACTED TO A DENSITY OF AT LEAST 98% STANDARD DRY DENSITY RATIO DETERMINED IN ACCORDANCE WITH AS1289 5.4.1-2007 "COMPACTION CONTROL TEST - DRY DENSITY RATIO, MOISTURE VARIATION AND MOISTURE RATIO".

b) THE DEPTHS OF FILL AND THE COMPACTION THEREOF ARE TO BE VERIFIED BY THE SUBMISSION OF COMPACTION CERTIFICATES AND A PLAN SHOWING CONTOURED DEPTHS OF FILL IN RELATION TO LOT BOUNDARIES.

c) ALL TESTS TO BE A MINIMUM OF TWO COMPACTION TESTS PER LOT PER LAYER ARE TO BE CARRIED OUT, BY A NATA REGISTERED LABORATORY.

d) ALL TRENCHES TO BE BACKFILLED TO HAVE EQUAL COMPACTION (+2%/-0% VARIATION) AS THE SURROUNDING LOTS.

e) ALL TRENCH TESTS TO BE TAKEN IN EACH 300mm LAYER AND EVERY 50 METRES OF TRENCH, BY A NATA REGISTERED LABORATORY.

f) THESE AND ALL OTHER REQUIREMENTS TO BE COMPLIED WITH, TO BE READ IN CONJUNCTION WITH HAWKESBURY CITY COUNCIL DCP APPENDIX E CIVIL WORKS SPECIFICATION PART II - CONSTRUCTION SPECIFICATION.

g) ANY ERRORS, OMISSIONS OR QUERIES TO BE SUBMITTED TO THE PROJECT SUPERINTENDENT FOR INSTRUCTION.

4) EARTHWORKS AND SITE PREPARATION TO BE UNDERTAKEN IN ACCORDANCE WITH GEOTECHNICAL INVESTIGATION REPORT PREPARED BY GEOTECHNIQUE, REFERENCE 12261/31-AA DATED 4 DECEMBER 2020.

5) TOPSOIL

ALL TOPOSIL ON THE SITE MUST COMPLY WITH THE FOLLOWING:

a) TOPSOIL SHALL ONLY BE STRIPPED FROM APPROVED AREAS AND SHALL BE STOCKPILED FOR RE-USE DURING SITE REHABILITATION AND LANDSCAPING.

b) ALL DISTURBED AREAS ARE TO BE STABILISED/REVEGETATED AS SOON AS PRACTICABLE AFTER THE COMPLETION OF FILLING WORKS. TOPSOIL SHALL BE USED IN DISTURBED AREAS AS FOLLOWS:

(i) A MINIMUM 300mm SURFACE LAYER OF TOPSOIL IN OPEN SPACE AREAS,
(ii) A MINIMUM 100mm SURFACE LAYER OF TOPSOIL ACROSS URBAN LOTS, AND
(iii) A MINIMUM 100mm SURFACE LAYER OF TOPSOIL ACROSS ROAD VERGES.

6) BATTERS

WHERE THE MAXIMUM GRADE OF ANY FILL BATTER EXCEEDS A RATIO OF THREE HORIZONTAL TO ONE VERTICAL (3:1), RETAINING WALLS, STONE FLAGGING OR TERRACING SHALL BE CONSTRUCTED;

CIVIL PLAN INDEX

PLAN NO.	PLAN NAME	REV
110185-12-CC1000	COVER SHEET	D
110185-12-CC1001	GENERAL NOTES, INDEX & LEGEND	O
110185-12-CC1002	GENERAL LAYOUT PLAN	E
110185-12-CC1003	ROAD SETOUT PLAN	G
110185-12-CC1004	ROAD TYPICAL SECTIONS	C
-		
110185-12-CC1021	ENGINEERING PLAN SHEET 1	H
110185-12-CC1022	ENGINEERING PLAN SHEET 2	I
110185-12-CC1023	ENGINEERING PLAN SHEET 3	G
-		
110185-12-CC1101	ROAD LONGITUDINAL SECTIONS SHEET 1	A
110185-12-CC1102	ROAD LONGITUDINAL SECTIONS SHEET 2	A
110185-12-CC1103	ROAD LONGITUDINAL SECTIONS SHEET 3	B
110185-12-CC1104	ROAD LONGITUDINAL SECTIONS SHEET 4	D
110185-12-CC1105	ROAD LONGITUDINAL SECTIONS SHEET 5	B
-		
110185-12-CC1201	ROAD CROSS SECTIONS SHEET 1	A
110185-12-CC1202	ROAD CROSS SECTIONS SHEET 2	A
110185-12-CC1203	ROAD CROSS SECTIONS SHEET 3	A
110185-12-CC1204	ROAD CROSS SECTIONS SHEET 4	B
110185-12-CC1205	ROAD CROSS SECTIONS SHEET 5	C
110185-12-CC1206	ROAD CROSS SECTIONS SHEET 6	B
110185-12-CC1207	ROAD CROSS SECTIONS SHEET 7	B
110185-12-CC1208	ROAD CROSS SECTIONS SHEET 8	B
110185-12-CC1209	ROAD CROSS SECTIONS SHEET 9	A
-		
110185-12-CC1301	KERB RETURN PLAN SHEET 1	C
110185-12-CC1302	KERB RETURN PLAN SHEET 2	D
110185-12-CC1303	KERB RETURN PLAN SHEET 3	D
110185-12-CC1304	KERB RETURN PLAN SHEET 4	C
110185-12-CC1305	KERB RETURN PLAN SHEET 5	F
110185-12-CC1306	KERB RETURN PLAN SHEET 6	A
-		
110185-12-CC1400	CATCHMENT PLAN	D
110185-12-CC1401	PIT SCHEDULE	F
110185-12-CC1402	SPECIAL PIT 10/7 DETAILS	B
110185-12-CC1402A	SPECIAL PIT 10/1 DETAILS	A
110185-12-CC1403	SPECIAL PIT 10/8 DETAILS	C
110185-12-CC1404	SPECIAL PIT 14/8 DETAILS	B
110185-12-CC1405	SPECIAL PIT 14/9 DETAILS	C
110185-12-CC1406	SPECIAL PIT 14/10 DETAILS	B
110185-12-CC1407	SPECIAL PIT 14/7 DETAILS	B
110185-12-CC1408	SPECIAL PIT 14/11 DETAILS	C
110185-12-CC1409	SPECIAL PIT DETAILS	C
110185-12-CC1410	NOT USED	C
110185-12-CC1411	DRAINAGE CALCULATIONS SHEET 1	D
110185-12-CC1412	DRAINAGE CALCULATIONS SHEET 2	E
110185-12-CC1413	DRAINAGE CALCULATIONS SHEET 3	C
110185-12-CC1414	DRAINAGE CALCULATIONS SHEET 4	D
110185-12-CC1415	DRAINAGE CALCULATIONS SHEET 5	E
110185-12-CC1416	DRAINAGE CALCULATIONS SHEET 6	B
110185-12-CC1417	DRAINAGE CALCULATIONS SHEET 7	C
110185-12-CC1418	DRAINAGE CALCULATIONS SHEET 8	C
110185-12-CC1419	DRAINAGE CALCULATIONS SHEET 9	B
110185-12-CC1420	DRAINAGE CALCULATIONS SHEET 10	C
110185-12-CC1421	DRAINAGE CALCULATIONS SHEET 11	C
110185-12-CC1422	DRAINAGE CALCULATIONS SHEET 12	B
110185-12-CC1423	DRAINAGE LONGITUDINAL SECTIONS SHEET 1	C
110185-12-CC1424	DRAINAGE LONGITUDINAL SECTIONS SHEET 2	E
110185-12-CC1425	DRAINAGE LONGITUDINAL SECTIONS SHEET 3	C
110185-12-CC1426	DRAINAGE LONGITUDINAL SECTIONS SHEET 4	D
110185-12-CC1427	DRAINAGE LONGITUDINAL SECTIONS SHEET 5	D

CIVIL PLAN INDEX

PLAN NO.	PLAN NAME	REV
110185-12-CC1427A	DRAINAGE LONGITUDINAL SECTIONS SHEET 6	A
110185-12-CC1428	DRAINAGE LONGITUDINAL SECTIONS SHEET 7	C
110185-12-CC1429	DRAINAGE LONGITUDINAL SECTIONS SHEET 8	E
110185-12-CC1430	DRAINAGE LONGITUDINAL SECTIONS SHEET 9	E
110185-12-CC1431	DRAINAGE LONGITUDINAL SECTIONS SHEET 10	C
110185-12-CC1433	DRAINAGE LONGITUDINAL SECTIONS SHEET 11	C
110185-12-CC1434	DRAINAGE LONGITUDINAL SECTIONS SHEET 12	C
-		
110185-12-CC1500	RETAINING WALL PLAN	B
110185-12-CC1501	RETAINING WALL DETAILS	A
110185-12-CC1511	RETAINING WALL LONGITUDINAL SECTIONS SHEET 1	B
110185-12-CC1512	RETAINING WALL LONGITUDINAL SECTIONS SHEET 2	B
110185-12-CC1513	RETAINING WALL LONGITUDINAL SECTIONS SHEET 3	B
-		
110185-12-CC1700	SOIL & WATER MANAGEMENT NOTES	B
110185-12-CC1701	SOIL & WATER MANAGEMENT PLAN	F
110185-12-CC1702	SOIL & WATER MANAGEMENT DETAILS	A
110185-12-CC1703	10/10 & 32/6OUTLET SCOUR PROTECTION DETAILS HEADWALL 10/10	B
-		
110185-12-CC1800	SIGNAGE AND LINE MARKING PLAN SHEET 1	G
110185-12-CC1801	SIGNAGE AND LINE MARKING PLAN SHEET 2	D
110185-12-CC1802	EMERGENCY ACCESS PLAN , TYPICAL CROSS SECTION AND LONGITUDINAL SECTION	C
110185-12-CC1803	EMERGENCY ACCESS CROSS SECTION	A
-		0
110185-12-CC1900	SWEPT PATH PLAN SHEET 1	B

STORMWATER NOTES

1. STORMWATER DESIGN CRITERIA:
   AVERAGE RECURRENCE INTERVAL:
   1:100 MAJOR SYSTEM
   1:5 MINOR SYSTEM
2. ALL INTERNAL WORKS WITHIN PROPERTY BOUNDARIES ARE TO COMPLY WITH THE REQUIREMENTS OF AS 3500 3.1 (1998) AND AS/NZS 3500 3.2 (1998).
3. CARE IS TO BE TAKEN WITH LEVELS OF STORMWATER LINES. GRADES SHOWN ARE NOT TO BE REDUCED WITHOUT APPROVAL.
4. GRATES AND COVERS SHALL CONFORM TO AS 3996.
5. AT ALL TIMES DURING CONSTRUCTION OF STORMWATER PITS, ADEQUATE SAFETY PROCEDURES SHALL BE TAKEN TO ENSURE AGAINST THE POSSIBILITY OF PERSONNEL FALLING DOWN PITS.
6. ALL DRAINAGE LINES THROUGH LOTS SHALL BE CONTAINED WITHIN THE FOLLOWING EASEMENTS: -
   a) 1.2m WIDE FOR PIPELINE < 225Ø TO BE CREATED.
   b) 2.5m WIDE FOR PIPELINE ≥ 300Ø TO BE CREATED
   c) STREET DRAINS - REFER TO COUNCILS DESIGN GUIDELINES SUBDIVISION/ DEVELOPMENTS.
8. DRAINAGE LINES UNDER ROADS SHALL BE BACKFILLED WITH NON-COHESIVE SAND AND HAVE 3m OF SUBSOIL DRAIN WRAPPED IN APPROVED FILTER SOCK, DISCHARGING INTO DOWN STREAM PITS. FOR PIPELINES GREATER THAN 525Ø, SUBSOIL DRAIN SHALL BE PROVIDED ON BOTH SIDES OF THE TRENCH.
9. ALL STORMWATER PIPES WITHIN ROADS TO BE REINFORCED CONCRETE PIPE (RRJ) CLASS 2 UNLESS OTHERWISE INDICATED.
10. ALL INTERALLOTMENT DRAINAGE LINES SHALL BE LAID AT A MINIMUM GRADE OF 1% UNLESS OTHERWISE INDICATED.
11. DRAINAGE LINES ON PLANS ARE DIAGRAMMATIC ONLY AND PIPE CENTRELINES SHALL ENTER AND EXIT PITS AT THE CENTRE OF THE RESPECTIVE PIT WALLS.
12. STEP IRONS REQUIRED WHERE THE PIT EXCEEDS 1200 IN DEPTH. REFER TO COUNCIL DRAWING SD41
13. WHERE GRADES EXCEED 14.0%, BULKHEADS TO BE PROVIDED IN ACCORDANCE WITH SECTION 5.12 OF COUNCIL'S CIVIL WORKS SPECIFICATION PART 2 CONSTRUCTION.
14. SUBSOIL DRAIN TO BE RUN BOTH SIDE OF ROAD WITH CAPPED FLUSH POINTS AND CONNECTED TO NEAREST STORMWATER PIT.
15. ALL PIT GRATES TO HAVE LOCKING CLIP.
16. ALL STORMWATER PIPES WITHIN THE ROAD RESERVE AND OPEN SPACE TO BE INSTALLED TO HS3 STANDARD IN ACCORDANCE WITH AS3725 - DESIGN FOR INSTALLATION OF BURIED CONCRETE PIPES.
17. BACKFILL OF ALL TRENCHES INCLUDING SEWER THAT IS WITHIN THE ZONE OF INFLUENCE OF THE PAVEMENT SHALL BE STABILISED SAND OR SUITABLE BACKFILL COMPACTED 98% STANDARD.

www.dialbeforeyoudig.com.au DIAL 1100 BEFORE YOU DIG

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW72
Date of Issue 03/03/2022
Issuing Officer D. Reshi
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 03/03/2022

NOTE: UTILITIES SHOWN MAY NOT INCLUDE ALL SERVICES WITHIN THE LIMIT OF WORKS

	AMENDMENT	DES	DRN	CKD	APR	DATE
O	DRAINAGE LINE 14 REDESIGN	MP	MP	JB	MS	25/02/22
N	CERTIFIER COMMENTS	MP	MP	RO		04/08/21
M	DRIVEWAY LOCATIONS AMENDED	MP	MP	RO	RO	27/07/21
L	INDEX AMENDED	MP	VS	RO	MS	21/07/21
K	COUNCIL COMMENTS	MP	NA	RO	RO	23/06/21
J	ROAD 54 AMENDED	MP	VS	RO	RO	16/06/21
H	ROAD 54 ALIGNMENT REVISED	JET	JET	MP	RO	08/06/21
G	DRAINAGE REVISED FOR SEWERMAIN CROSSING	JET	JET	MP	RO	26/05/21
F	COUNCIL COMMENTS	JET	JET	MP	RO	21/05/21
E	COUNCIL COMMENTS	JET	JET	MP	RO	13/05/21

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
GENERAL NOTES, INDEX & LEGEND

PROJECT No: 110185-12

SHEET No: CC1001

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1001 | O

Plotted: 25 February , 2022 2:49:57 PM File Name: J:\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CS\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1001.dwg

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

VINCE MORGAN SURVEYORS PTY LTD
DATE: 05/03/22 REF:16800

EXISTING YEOMANS ENTRY

EXISTING DAM 13

8 CC

DAM 6

GROSE VALE ROAD

ROAD 35

ROAD 54

ROAD 55

8 CC

PROMENADE

ROAD 54

YOBARNIE AVENUE

MANTLE AVENUE

EXISTING ACF

EXISTING SENIORS LIVING

EXISTING MOUNT VIEW GALLERY

EXISTING YEOMANS ENTRY

ROAD 51

SOUTHERN HEIGHTS

GROSE VALE ROAD

8 CC

DAM 7

DAM 8

ROAD 50

ROAD 52

ROAD 56

ROAD 52

ROAD 51

ROAD 53

ROAD 51

GROSE VALE ROAD

RIDGE TOPS

GROSE RIVER ROAD

LEGEND

- LIMIT OF WORKS
- SITE BOUNDARY
- —W—W—W—W— EXISTING WATER MAIN

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW72
Date of Issue 03/03/2022
Issuing Officer D. Restin
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 03/03/2022

1:2000 (AT A1)
1:4000 (AT A3)

50 0 50 100 150 200
METRES

E	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
D	COUNCIL COMMENTS	MP	MP	RO	RO	16/06/21
C	COUNCIL COMMENTS	JET	JET	MP	RO	13/05/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
GENERAL LAYOUT PLAN

PROJECT No: 110185-12
SHEET No: CC1002

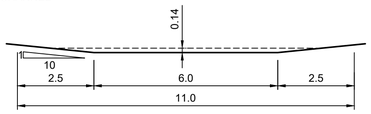
AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1002 E

Plotted: 25 February 2022 1:10:29 PM File Name: J:\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1002.dwg

MANNINGS CALCULATION FOR SURCHARGE PIT 14/13 (3x900x900 GSIP)

Q = 2.1m³/s
n = 0.03 (SHORT GRASS)
S = 6%
DEPTH OF FLOW = 0.14m
WIDTH OF FLOW = 8.85m
FLOW VELOCITY = 1.98m/s

THEREFORE FLOW VELOCITY IS PERMISSIBLE FOR GRASS LINED CHANNEL



TYPICAL GRASS LINED CHANNEL
NTS

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Date of Issue 03/03/2022
Issuing Officer D. Kestin
Accreditation No. BDC3367

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LEGEND

# – RW — RW	PROVIDE KERB ADAPTOR AND ROOF WATER CONNECTION TO HAWKESBURY CITY COUNCIL DRAWING SD39

WORK AS EXECUTED SHOWN IN RED
SIGNATURE.....
VINCE MORGAN SURVEYORS PTY LTD
DATE: 05/03/22 REF:16800

20130299SW72 - Scour Protection is to be placed on surface at headwall discharge. Ensure area is locally graded to ensure water does not pond

20130299SW72 - Scour Protection is to be placed on surface downstream of surcharge pit

EXISTING DAM 13

FUTURE SHARED CYCLEWAY/PATH.

PROVIDE SCOUR PROTECTION. OUTLET DETAIL REFER TO CC1703

PROVIDE 375Ø ORIFICE TO CONTROL DISCHARGE FORM FUTURE BASIN

ENDCAP FOR FUTURE CONNECTION

DISCHARGE CONTROL PIT FORM FUTURE OSD BASIN

900Ø PIPE & HEADWALL OUTLET

GPT CDS UNIT (CDS P3024R)

PROVIDE 3.5m WIDE CDS ACCESS ALONG CYCLEWAY TO HCC STANDARD SD 66:
1. 150mm CONCRETE WITH F72 TOP & BOTTOM
2. 50mm GRANULAR BEDDING
CONCRETE STRENGTH F'c = 33MPa.
FOR LAYOUT LOCATION REFER TO LANDSCAPE ARCHITECT PLANS.

PROVIDE VEHICULAR CROSSING TO HCC SD 68 WITH REMOVABLE BOLLARD.

EXISTING PAVEMENT TO BE MILLED & RESHEETED TO MATCH EXISTING SURFACE

LIMIT OF CONSTRUCTION CH. 92.5. MATCH EXISTING PAVEMENT

PROVIDE TEMPORARY BOLLARDS @ 1.5m C/C AND TEMPORARY GATE FOR CONSTRUCTION ACCESS.

PROVIDE 2% REVERSE CROSSFALL , FOR MINIMUM 5m LONG FOR OVERLAND FLOW PATH.

ROAD 35

RECONSTRUCT KERB RETURN

EXISTING PITS TO BE RECONSTRUCTED TO NEW KERB

7500Ø ENDCAP FOR FUTURE CONNECTION

PROVIDE TEMPORARY TURNING HEAD AS PER HCC STANDARD DWG. SD7

DRAINAGE EASEMENT 1.2 WIDE

ROAD 55

ROAD 54

ROAD 50

KR 31 KR 32 KR 34 KR 36 KR 37 KR 38

1501 1502 1503 1504 1505 1506 1507 1508 1509 1510 1511 1512 1513 1514 1515 1516 1517 1518 1519 1520 1521 1522 1523 1524 1525 1526 1527 1558 1559 1560 1561 1562 1563 1564 1565 1566 1567 1581 1582 1583 1584 1585

REFER TO DRAWING CC1022 FOR CONTINUATION

1:500 (AT A1)
1:1000 (AT A3)
10 0 10 20 30 40 50
METRES

G	CERTIFIER COMMENTS	MP	MP	RO	RO	04/08/21
F	DRIVEWAY LOCATIONS AMENDED	MP	MP	RO	RO	27/07/21
E	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
D	CERTIFIER COMMENTS	JET	JET	MP	RO	26/04/21
C	DRAINAGE REVISED	JET	JET	MP	RO	23/03/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
ENGINEERING PLAN
SHEET 1

PROJECT No: 110185-12
SHEET No: CC1021

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1021 | H

Plotted: 25 February , 2022 1:13:02 PM File Name: J:\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1021.dwg

12d PIT SCHEDULE

PIT NAME	SURFACE FITTING TYPE AND SIZE	PIT EASTING	PIT NORTHING	PIT DEPTH	COMMENTS
(-)	(-)	(m)	(m)	(m)	
1/1	1.8 m lintel	286831.6	6281208.2	1.51	FUTURE PIT
1/2	1.8 m lintel	286810.6	6281185.6	1.5	
1/3	1.8 m lintel	286803.7	6281189.9	1.57	
1/4	1.8 m lintel	286789.9	6281190.2	1.56	
1/5	1.8 m lintel	286771.1	6281213.6	1.48	
1/6	1.8 m lintel	286762.9	6281211.2	1.56	
1/7	1.8 m lintel	286735.3	6281248	1.59	
1/8	1.8 m lintel	286707.3	6281286.9	1.58	
1/9	NODE	286703.9	6281295.7	1.65	DIRECT CONNECTION
1/10	NODE	286699.9	6281306.2	1.7	DIRECT CONNECTION
1/11	1.8 m lintel	286697.6	6281312.5	1.77	
1/12	NODE	286696.5	6281318.7	1.72	DIRECT CONNECTION
1/13	NODE	286694.3	6281331.7	1.61	DIRECT CONNECTION
1/14	NODE	286692.2	6281345	1.56	DIRECT CONNECTION
1/15	NODE	286690	6281358.3	1.56	DIRECT CONNECTION
1/16	1.8 m lintel	286688.8	6281365.8	1.64	
1/17	NODE	286687.8	6281371.6	1.68	DIRECT CONNECTION
1/18	NODE	286685.6	6281385	1.91	DIRECT CONNECTION
1/19	1.8 m lintel	286684.4	6281392.7	1.91	
1/20	NODE	286683.5	6281398.5	1.94	DIRECT CONNECTION
1/21	NODE	286681.3	6281411.8	1.94	DIRECT CONNECTION
1/22	1.8 m lintel	286680.1	6281419.1	1.97	
1/23	NODE	286679.1	6281425.5	1.86	DIRECT CONNECTION
1/24	1.8 m lintel	286676.6	6281440.9	1.71	
1/25	1.8 m lintel	286683.7	6281447.2	1.89	
1/26	2.4 m lintel sag	286679.7	6281475.9	1.67	EXISTING PIT
2/1	GSIP 900x900 SAG	286665	6281470	0.98	
2/2	1.8 m lintel	286657.5	6281479.3	1.79	EXISTING END CAP
3/10	1.8 m lintel	286703.5	6281384.3	1.79	
3/11	1.8 m lintel	286692.4	6281393.2	1.65	
4/1	GSIP 900x900 SAG	286708.2	6281368.4	1.07	
4/2	2.4 m lintel sag	286706	6281376.3	1.46	
7/1	1.8 m lintel	286697.4	6281362.6	1.47	
8/1	1.8 m lintel	286706.4	6281310.4	1.53	
9/1	1.8 m lintel	286718	6281284.7	1.52	
10/1	GSIP 5x900x900	286698	6281221.5	1.98	DAM 8 OUTLET
10/2	GSIP 900x900	286625.3	6281262.6	2.75	
10/3	1.8 m lintel	286620	6281299.8	2.16	
10/4	1.8 m lintel	286611.6	6281351.3	2.2	
10/5	1.8 m lintel	286606.9	6281380.3	2.03	
10/6	1.8 m lintel	286602.6	6281406.7	2.13	
10/7	2.4 m lintel sag	286595.4	6281451	2.38	
10/8	1.8 m lintel	286590.2	6281470.1	3.03	
10/9	GPT	286580.1	6281510.8	2.4	
10/10	H.W.	286581	6281532	1.2	
11/1	1.8 m lintel	286742.3	6281252	1.47	
12/1	1.8 m lintel	286621.7	6281467.5	1.54	
13/1	1.8 m lintel	286612.1	6281298.2	1.45	
14/1	GSIP 5x900x900	286388.4	6281235.2	3.9	DAM 7 OUTLET RIDGETOPS STAGE
14/2	JP GRATED 900 x 900	286380.5	6281286.9	2.31	
14/3	JP GRATED 900 x 900	286376.9	6281309.4	2.32	
14/4	GSIP 900x900	286365	6281332.7	2.27	SURCHARGE PIT
14/5	GSIP 900x900	286366.8	6281364.8	2.5	
14/6	JP GRATED 900 x 900	286364.5	6281394.4	2.79	
14/7	GSIP 900x900	286360	6281419.4	3.25	
14/8	GSIP 900x900 SAG	286354.1	6281423.6	3.11	
14/9	2.4 m lintel sag	286353.7	6281427.8	3.28	
14/10	2.4 m lintel sag	286353	6281438.8	3.45	
14/11	GSIP 900x900	286350.7	6281485.5	1.94	SPLITTER PIT
14E/1	H.W.	286342.1	6281484.3	0.97	
14D/1	GSIP 900x900	286368.1	6281487.4	2.57	
14D/2	GSIP 900x900	286440.1	6281495.2	2.24	SURCHARGE PIT
14D/3	GSIP 900x900	286497.5	6281501.1	1.61	SURCHARGE PIT
14L/1	JP GRATED 600 x 900	286434.3	6281504.1	1.67	
14X/1	JP SEALED 900 x 900	286364.1	6281493.3	2.29	
15/1	1.8 m lintel	286488.8	6281440.6	1.58	
15/2	1.8 m lintel	286546.1	6281449	1.54	
15/3	1.8 m lintel	286575	6281455.1	1.51	
16/1	1.8 m lintel	286536.9	6281458.5	1.45	
17/1	2.4 m lintel sag	286587.8	6281447.7	1.47	
19/1	1.8 m lintel	286509.6	6281355.7	1.41	
19/2	1.8 m lintel	286550.1	6281358.2	1.37	
19/3	1.8 m lintel	286572	6281359.1	1.42	
19/4	2.4 m lintel sag	286592	6281359.6	1.38	
19/5	1.8 m lintel	286599	6281379.1	1.57	
19/6	1.8 m lintel	286595.6	6281399.9	1.58	
20/1	1.8 m lintel	286570.1	6281367	1.36	
21/1	1.8 m lintel	286603.8	6281349.5	1.45	
22/1	1.8 m lintel	286385.5	6281430.1	1.44	
22/2	1.8 m lintel	286384.1	6281441.1	1.6	
23/1	CAPPED STUB	286329.9	6281426.3	3.15	FUTURE EXTENSION
26/1	1.8 m lintel	286379.2	6281390.6	1.36	

12d PIT SCHEDULE

PIT NAME	SURFACE FITTING TYPE AND SIZE	PIT EASTING	PIT NORTHING	PIT DEPTH	COMMENTS
(-)	(-)	(m)	(m)	(m)	
26/2	2.4 m lintel sag	286374.8	6281418.9	1.45	
26/3	2.4 m lintel sag	286366.7	6281419.3	1.58	
27/1	1.8 m lintel	286441.2	6281349.1	1.52	
27/2	1.8 m lintel	286420.4	6281346.4	1.49	
27/3	2.4 m lintel sag	286397.2	6281343.2	1.45	
27/4	2.4 m lintel sag	286396	6281351.1	1.56	
27/5	1.8 m lintel	286384	6281359.7	1.46	
27/6	1.8 m lintel	286375.7	6281361	1.47	
28/1	1.8 m lintel	286388.5	6281330.8	1.46	
28/2	1.8 m lintel	286380.4	6281330.8	1.51	
29/1	1.8 m lintel	286392.3	6281306.1	1.46	
29/2	1.8 m lintel	286384.1	6281307	1.55	
30/1	1.8 m lintel	286477.9	6281278.6	1.5	
30/2	1.8 m lintel	286415.7	6281271.1	1.63	
30/3	1.8 m lintel	286387.4	6281285.1	1.68	
31/1	1.8 m lintel	286418.7	6281262.5	1.48	
32/1	GSIP 900x900 SAG	286771.7	6281079.3	1.99	
32/2	GSIP 900x900 SAG	286744.1	6281105.8	1.53	
32/3	2.4 m lintel sag	286738.7	6281108	1.68	
32/4	2.4 m lintel sag	286732.5	6281113.1	1.89	
32/5	GPT	286692.8	6281150.7	2.06	
32/6	H.W.	286708.4	6281182.9	0.9	
33/1	1.8 m lintel	286783.9	6281156.8	1.63	
33/2	1.8 m lintel	286758.8	6281129.7	1.61	
34/6	1.8 m lintel	286706.3	6281085.3	1.87	
36/1	1.8 m lintel	286687.5	6281118.2	1.62	
36/2	2.4 m lintel sag	286673.4	6281131.2	1.75	
36/3	2.4 m lintel sag	286678.9	6281137.1	2.17	
37/6	1.8 m lintel	286673.2	6281142.3	1.98	
A/1	IAD 450x450	286471.1	6281397.8	0.73	
A/2	SLOPE JUNCTION	286484.6	6281399.4	0.7	
A/3	IAD 450x450	286498.1	6281401	0.72	
A/4	SLOPE JUNCTION	286511.6	6281402.5	0.69	
A/5	IAD 450x450	286525.2	6281403.8	0.71	
A/6	SLOPE JUNCTION	286538.7	6281405.2	0.69	
A/7	IAD 900x900	286553.2	6281406.7	2.18	
A/8	IAD 450x450	286554.6	6281407	0.75	
A/9	IAD 600x900	286547.4	6281443.4	1.5	
B/1	IAD 450x450	286445.3	6281394.8	0.69	
B/2	IAD 600x900	286431.8	6281393.3	0.53	
B/3	SLOPE JUNCTION	286417.5	6281392.1	0.82	
B/4	IAD 600x900	286383.8	6281389.8	1.45	
C/1	IAD 450x450	286508.9	6281318.3	0.65	
C/2	IAD 450x450	286523.7	6281319.1	0.75	
C/3	IAD 450x450	286539.4	6281319.7	0.73	
C/4	IAD 450x450	286555.1	6281319.8	0.77	
C/5	IAD 900x900	286570.8	6281319.6	2.2	
C/6	IAD 450x450	286572.3	6281319.6	0.75	
C/7	IAD 600x900	286571	6281354.9	1.48	
D/1	IAD 450x450	286482.6	6281316	0.66	
D/2	IAD 450x450	286468.9	6281314.7	0.73	
D/3	SLOPE JUNCTION	286455.2	6281313.2	0.72	
D/4	IAD 450x450	286441.5	6281311.6	0.75	
D/5	SLOPE JUNCTION	286427.3	6281310	0.89	
D/6	IAD 900x900	286426.1	6281309.9	1.67	
D/7	IAD 900x900	286421.9	6281342.5	1.66	
F/4	IAD 900x900	286776.1	6281215.8	2.77	FUTURE PIT
H/13	IAD 900x900	286684.8	6281114.4	2.92	FUTURE PIT
SH A/1	IAD 450x450	286666.6	6281436.4	0.75	
SH B/1	IAD 450x450	286668.7	6281423.1	0.75	
SH C/1	IAD 450x450	286670.9	6281409.8	0.75	
SH D/1	IAD 450x450	286673.1	6281396.4	0.75	
SH E/1	IAD 450x450	286675.2	6281383.1	0.75	
SH F/1	IAD 450x450	286677.4	6281369.8	0.75	
SH G/1	IAD 450x450	286679.6	6281356.5	0.75	
SH H/1	IAD 450x450	286681.7	6281343.1	0.75	
SH J/1	IAD 450x450	286683.9	6281329.8	0.75	
SH K/1	IAD 450x450	286686	6281316.5	0.75	
SH L/1	IAD 450x450	286688.2	6281303.2	0.75	
SH M/1	IAD 450x450	286690.4	6281289.8	0.75	

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW72
Date of Issue 03/03/2022
Issuing Officer D. Restin
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 03/03/2022

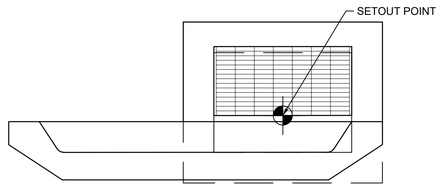
WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

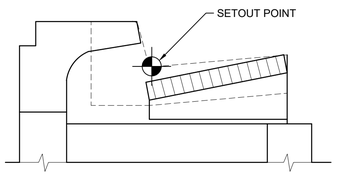
VINCE MORGAN SURVEYORS PTY LTD
DATE: 05/03/22 REF:16800

HYDROLOGY NOTES:

STORMWATER SYSTEM DESIGNED USING 12D RATIONAL METHOD.



SETOUT DETAIL KERB INLET PIT (LINTEL)
SCALE 1:20



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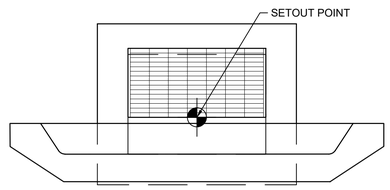
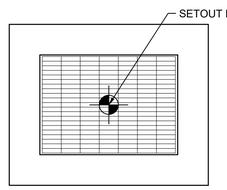
SCALE 1:10



SETOUT DETAIL KERB INLET PIT (SAG)
SCALE 1:20



GRATED SURFACE INLET PIT (GSIP)
SCALE 1:20

F	DRAINAGE LINE 14 REDESIGN	MP	MP	JB	MS	25/02/22
E	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
D	COUNCIL COMMENTS	MP	VS	RO	RO	16/06/21
C	DRAINAGE REVISED	JET	JET	MP	RO	23/03/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
PIT SCHEDULE

PROJECT No: 110185-12
SHEET No: CC1401

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1401 F

Plotted: 25 February, 2022 1:36:05 PM File Name: J:\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1401.dwg

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DATE: 05/03/22 REF:16800

DAM OUTLET PIT DETAILS				
PIT NAME	GRATE LEVEL "A" (m)	INVERT LEVEL "B" (m)	PIT DEPTH "H" (m)	OUTLET PIPE SIZE (mm)
10/1	54.4	52.417	1.9830	Ø900
	54.42	52.44	✓	✓

DAM 8 CALCULATIONS

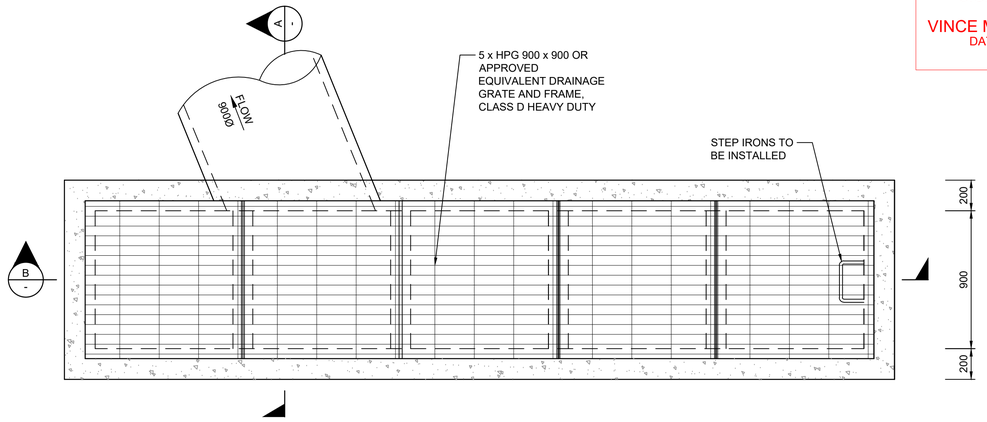
CATCHMENT AREA = 7.3ha
Q_1 = 0.99m³/s
Q_2 = 1.37m³/s
Q_5 = 2.011m³/s
Q_{100} = 4.608m³/s

DAM 8 SPILLWAY CALCULATIONS

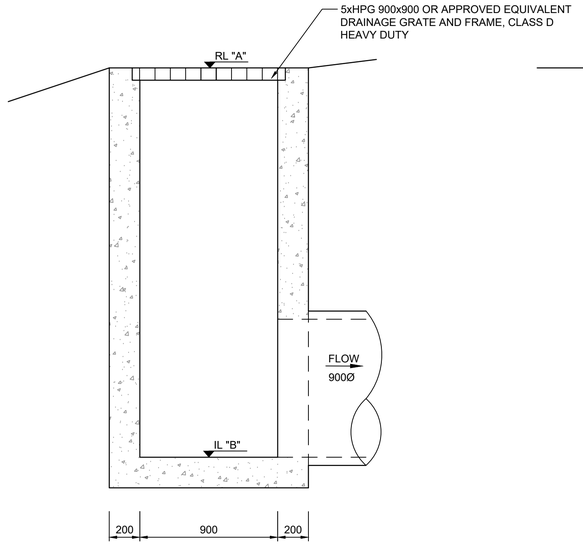
$Q_{100} - Q_5$ = 2.597m³/s
MANNINGS "n" GRASS = 0.035
SPILLWAY LENGTH "L" = 32m
DEPTH OF WATER "d" = 0.09m
EMBANKMENT SLOPE 1:5 (20%)
VELOCITY "V" = 0.5m²/s

EMBANKMENT TO BE PROTECTED WITH REINFORCED TURF

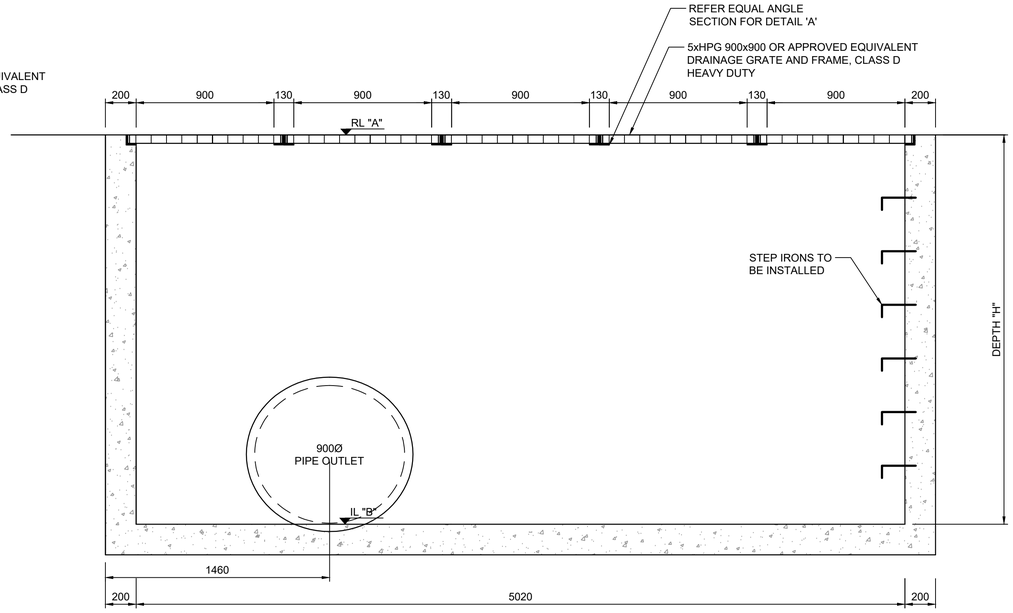
GSIP INLET CAPACITY
Q_e = 2.011m³/s
$Q_s = 1.66xPxD^{2.5}$
D=0.3m
CAPACITY = 2.21m³/s
≥ 2.011³/s



TYPICAL DAM OUTLET PIT DETAIL
PLAN
SCALE 1:20



SECTION A
SCALE 1:20
-



SECTION B
SCALE 1:20
-

1:20 (AT A1)
1:40 (AT A3)
400 200 0 400 800 1200 1600 2000
MILLIMETRES

A	SHEET ADDED	MP	VS	RO	MS	21/07/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SPECIAL PIT 10/1 DETAILS

PROJECT No: 110185-12
SHEET No: CC1402A

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1402A | A

Plotted: 25 February , 2022 1:37:10 PM File Name: J:\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1402A.dwg

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Accreditation No. BDC3367

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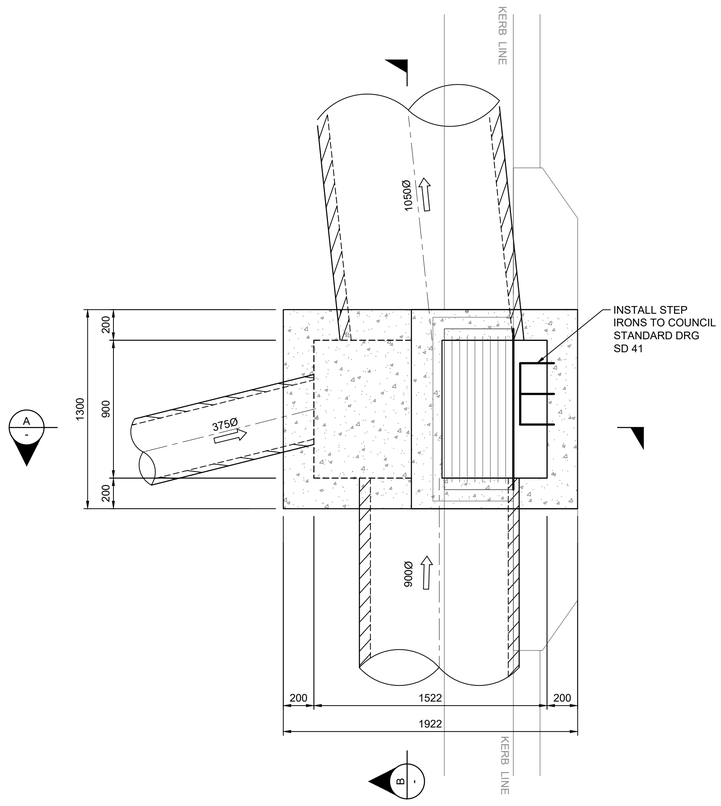
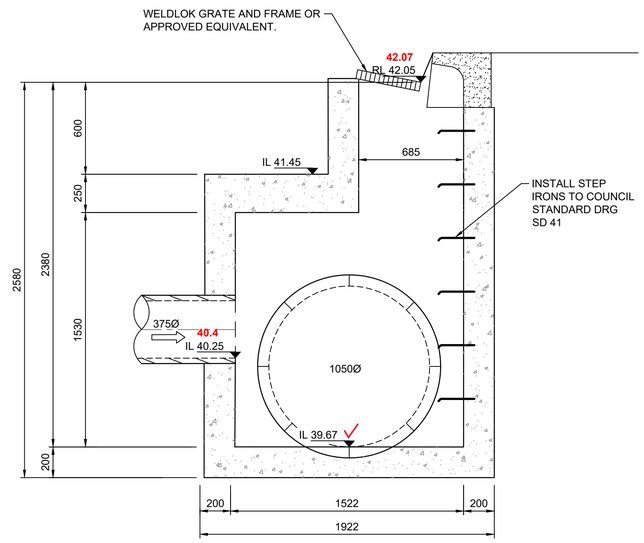
DATE: 05/03/22 REF:16800

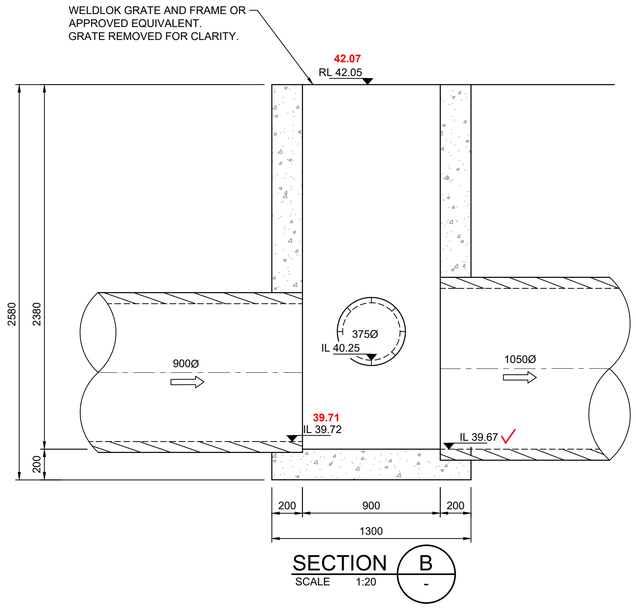


STRUCTURE 10/7
PLAN
SCALE 1:20

DETAILS SHOWN SUBJECT TO STRUCTURAL CERTIFICATION



SECTION A
SCALE 1:20



SECTION B
SCALE 1:20

1:20 (AT A1)
1:40 (AT A3)
400 200 0 400 800 1200 1600 2000
MILLIMETRES

B	TITLE AMENDED	MP	VS	RO	MS	21/07/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SPECIAL PIT 10/7 DETAILS

PROJECT No: 110185-12
SHEET No: CC1402

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1402 B

Plotted: 25 February , 2022 1:36:39 PM File Name: J:\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1402.dwg

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Accreditation No. BDC3367

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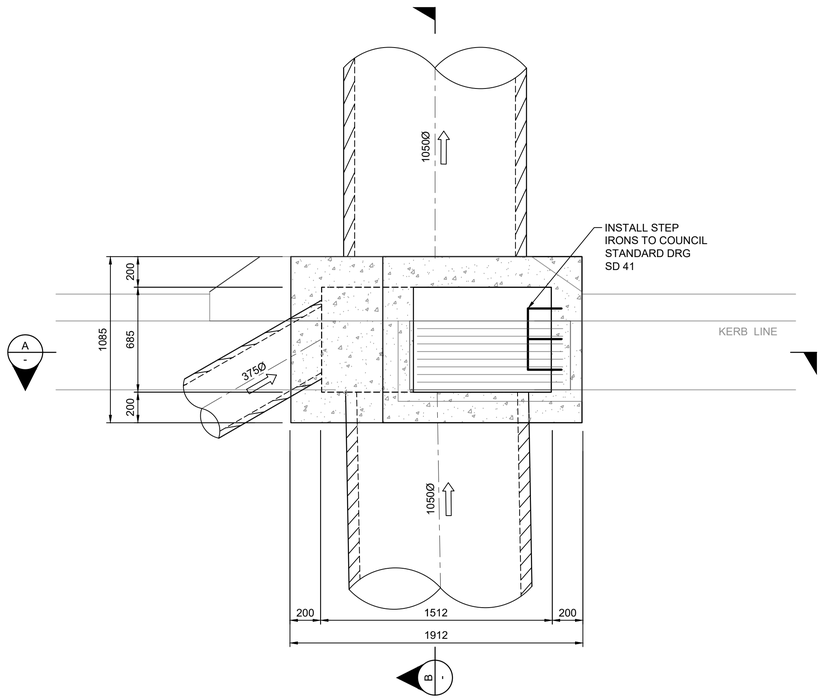
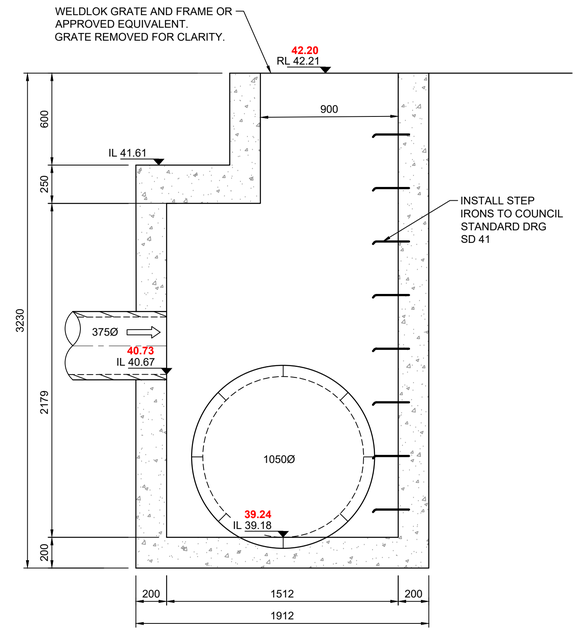
DATE: 05/03/22 REF:16800



STRUCTURE 10/8
PLAN
SCALE 1:20

DETAILS SHOWN SUBJECT TO STRUCTURAL CERTIFICATION



SECTION A
SCALE 1:20
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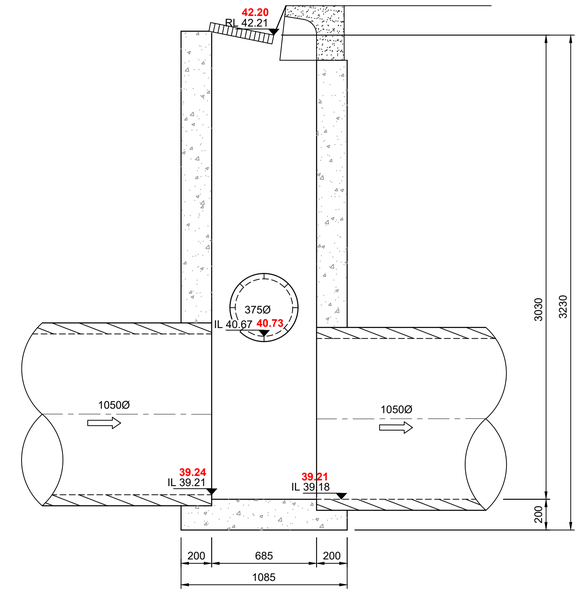

SECTION B
SCALE 1:20
-

1:20 (AT A1)
1:40 (AT A3)
400 200 0 400 800 1200 1600 2000
MILLIMETRES

C	TITLE AMENDED	MP	VS	RO	MS	21/07/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

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CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL
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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SPECIAL PIT 10/8 DETAILS

PROJECT No: 110185-12
SHEET No: CC1403

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1403 | C

Plotted: 25 February , 2022 1:37:43 PM File Name: J:\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1403.dwg

SUBDIVISION WORKS CERTIFICATE

Certificate No. 2013029SW72
Date of Issue 03/03/2022
Issuing Officer D. Restin
Accreditation No. BDC3367

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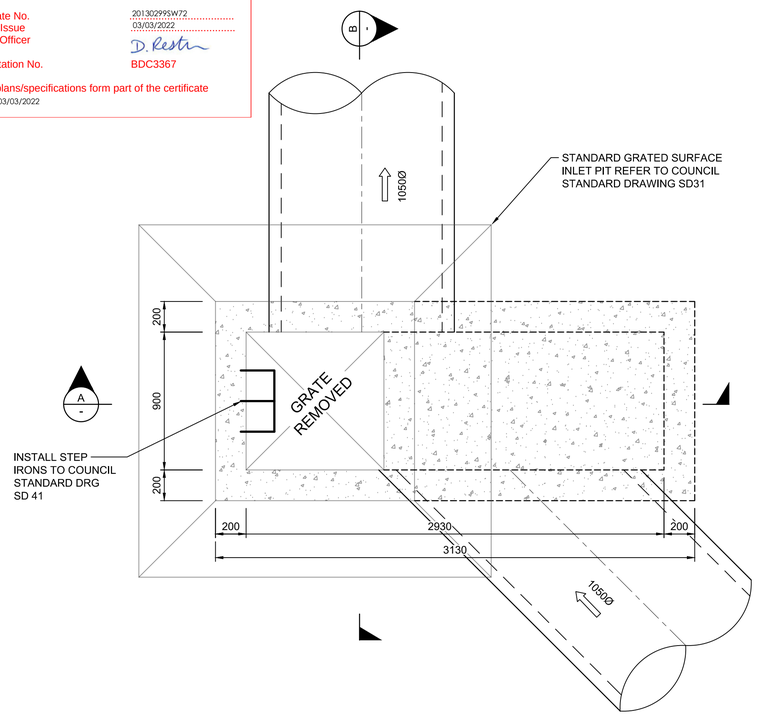
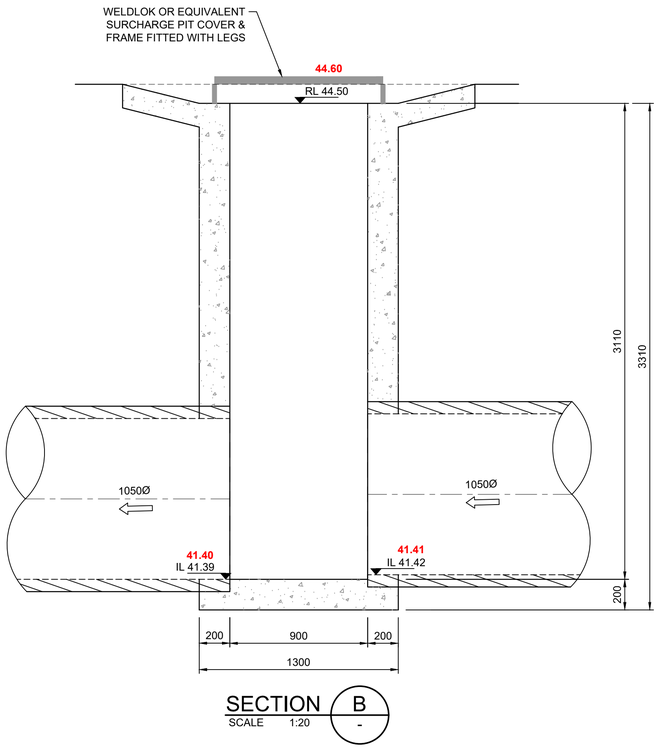


STRUCTURE 14/8

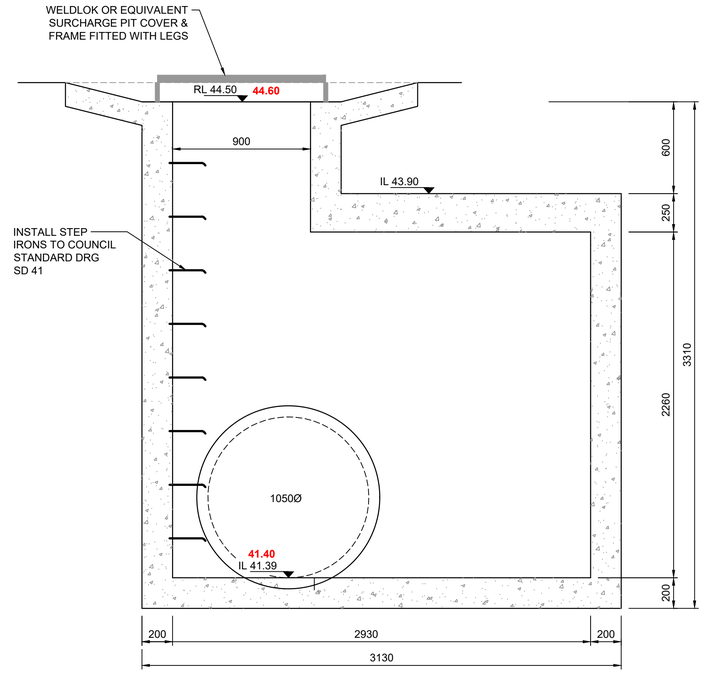
PLAN

SCALE 1:20

DETAILS SHOWN SUBJECT TO STRUCTURAL CERTIFICATION



SECTION B
SCALE 1:20



SECTION A
SCALE 1:20

WORK AS EXECUTED SHOWN IN RED
SIGNATURE.....
VINCE MORGAN SURVEYORS PTY LTD
DATE: 05/03/22 REF:16800

1:20 (AT A1)
1:40 (AT A3)

400 200 0 400 800 1200 1600 2000
MILLIMETRES

B	TITLE AMENDED	MP	VS	RO	MS	21/07/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

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CLIENT: REDBANK NORTH RICHMOND

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SPECIAL PIT 14/8 DETAILS

PROJECT No: 110185-12
SHEET No: CC1404

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1404 | B

Plotted: 25 February , 2022 1:38:16 PM File Name: J:\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1404.dwg

SUBDIVISION WORKS CERTIFICATE

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Date of Issue 03/03/2022
Issuing Officer D. Restin
Accreditation No. BDC3367

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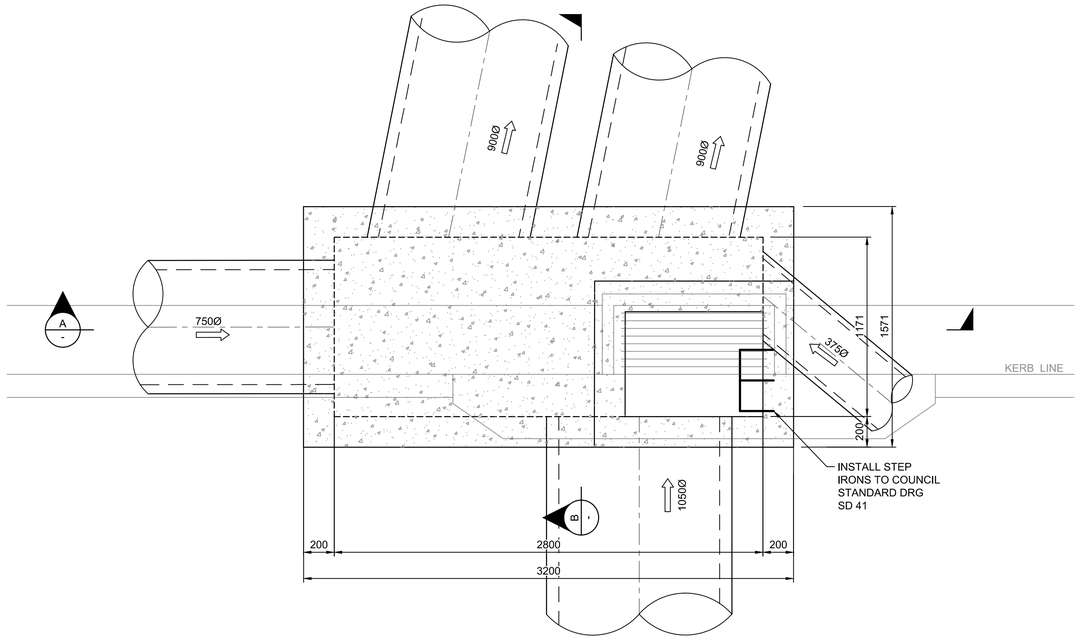
SIGNATURE.....

VINCE MORGAN SURVEYORS PTY LTD
DATE: 05/03/22 REF:16800

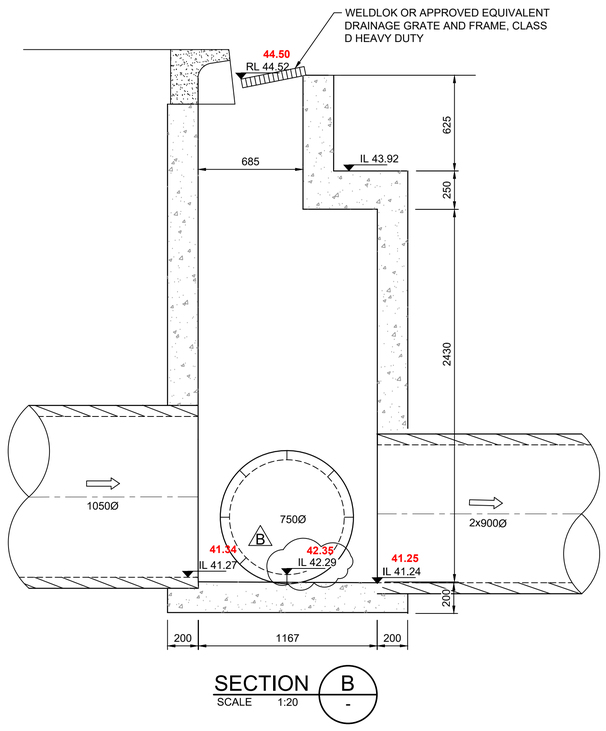


STRUCTURE 14/9

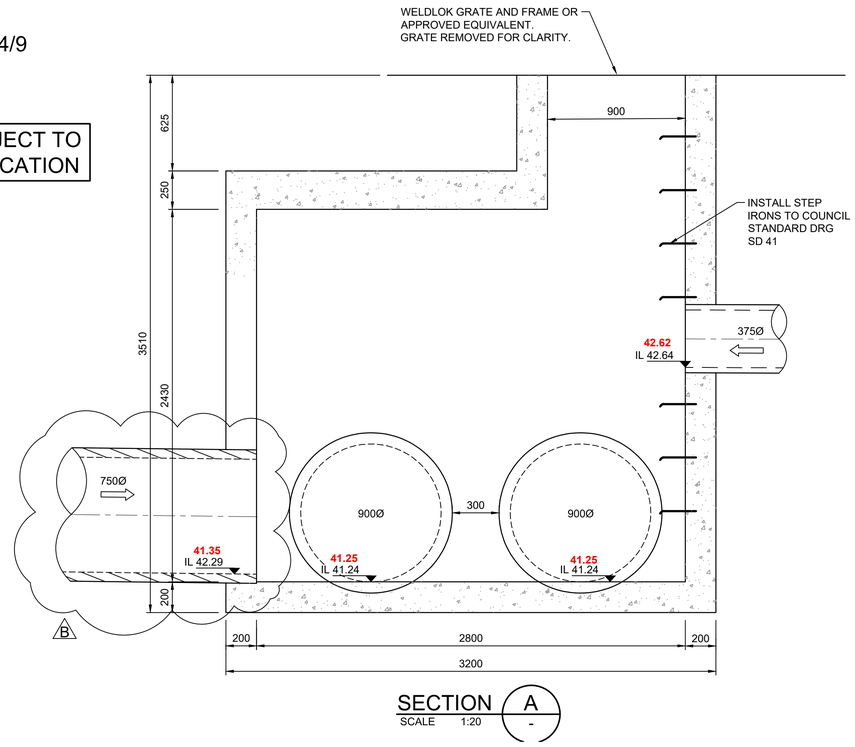
PLAN

SCALE 1:20

DETAILS SHOWN SUBJECT TO STRUCTURAL CERTIFICATION



SECTION B
SCALE 1:20



SECTION A
SCALE 1:20

1:20 (AT A1)
1:40 (AT A3)

400 200 0 400 800 1200 1600 2000
MILLIMETRES

C	TITLE AMENDED	MP	VS	RO	MS	21/07/21
B	DRAINAGE REVISED FOR SEWERMAIN CROSSING	JET	JET	MP	RO	26/05/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

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CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SPECIAL PIT 14/9 DETAILS

PROJECT No: 110185-12
SHEET No: CC1405

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1405 | C

Plotted: 25 February, 2022 1:38:50 PM File Name: J:\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\CS\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1405.dwg

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Certificate No. 201302995W72
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Issuing Officer D. Restin
Accreditation No. BDC3367

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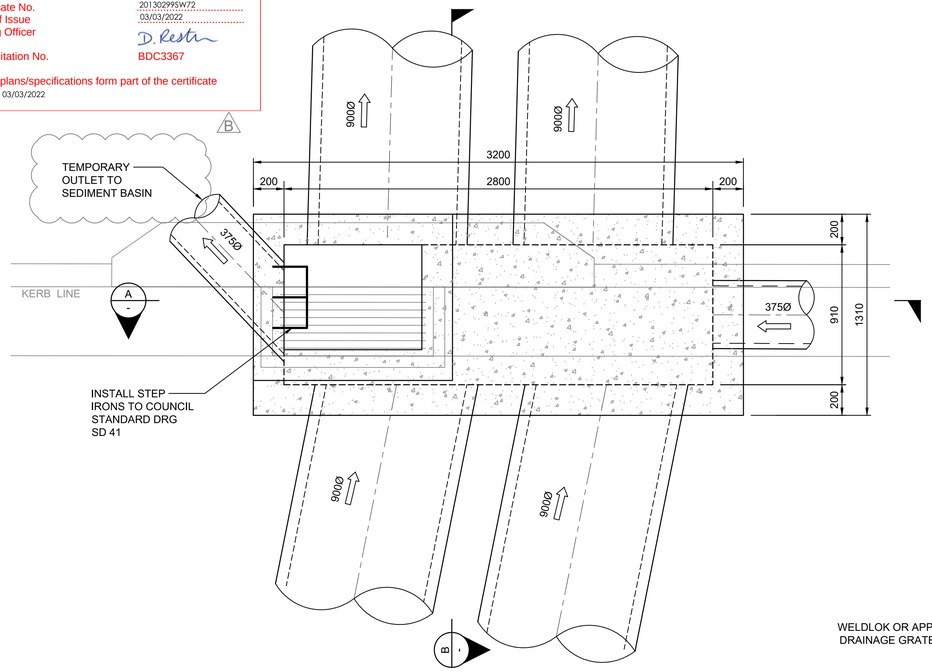
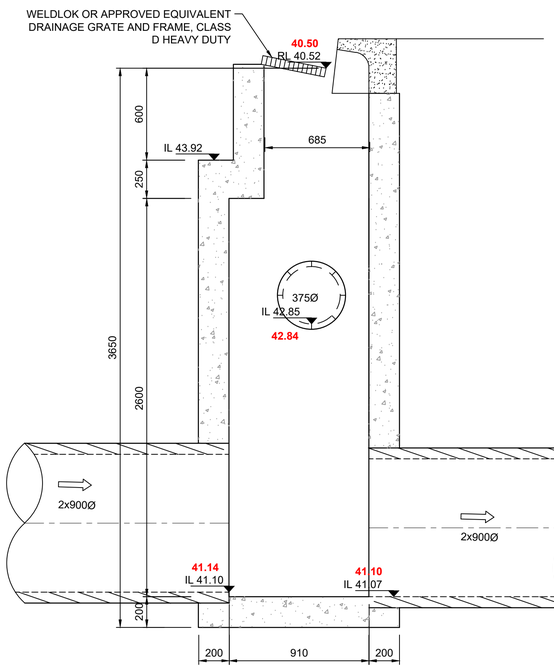


STRUCTURE 14/10

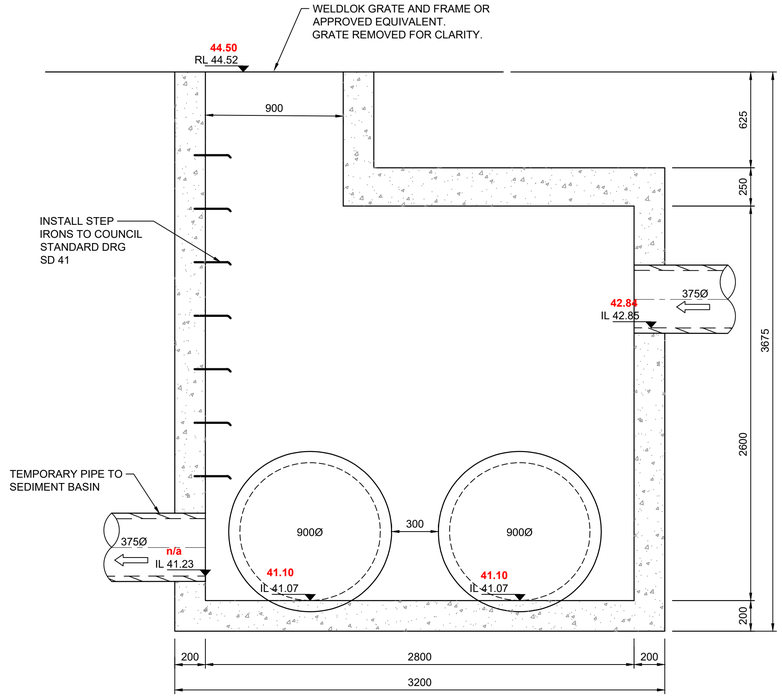
PLAN

SCALE 1:20

DETAILS SHOWN SUBJECT TO STRUCTURAL CERTIFICATION



SECTION B
SCALE 1:20



SECTION A
SCALE 1:20

WORK AS EXECUTED SHOWN IN RED
SIGNATURE.....
VINCE MORGAN SURVEYORS PTY LTD
DATE: 05/03/22 REF:16800

1:20 (AT A1)
1:40 (AT A3)
400 200 0 400 800 1200 1600 2000
MILLIMETRES

B	NOTE ADDED	MP	VS	RO	MS	21/07/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
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CLIENT: REDBANK NORTH RICHMOND

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SPECIAL PIT 14/10 DETAILS

PROJECT No: 110185-12
SHEET No: CC1406

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1406 | B

Plotted: 25 February, 2022 1:39:23 PM File Name: J:\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1406.dwg

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Date of Issue 03/03/2022
Issuing Officer D. Restin
Accreditation No. BDC3367

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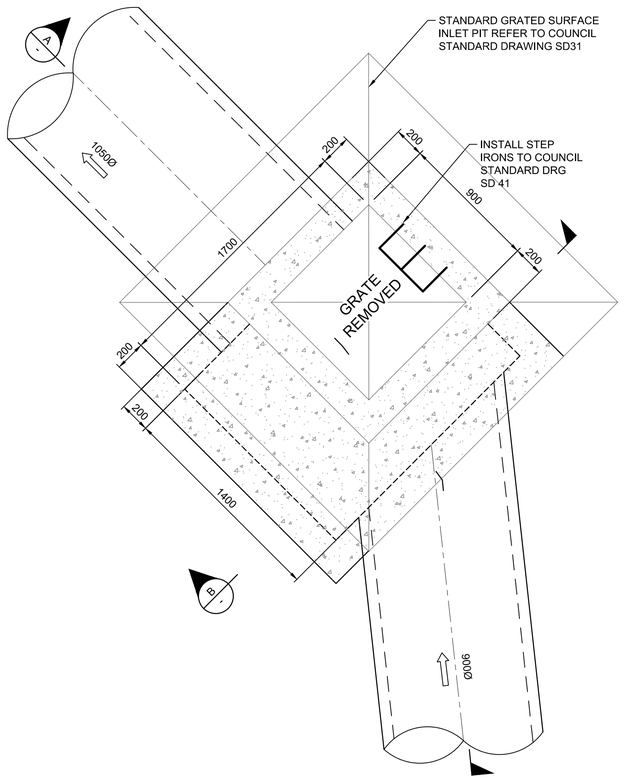
WORK AS EXECUTED SHOWN IN RED
SIGNATURE.....
VINCE MORGAN SURVEYORS PTY LTD
DATE: 05/03/22 REF:16800

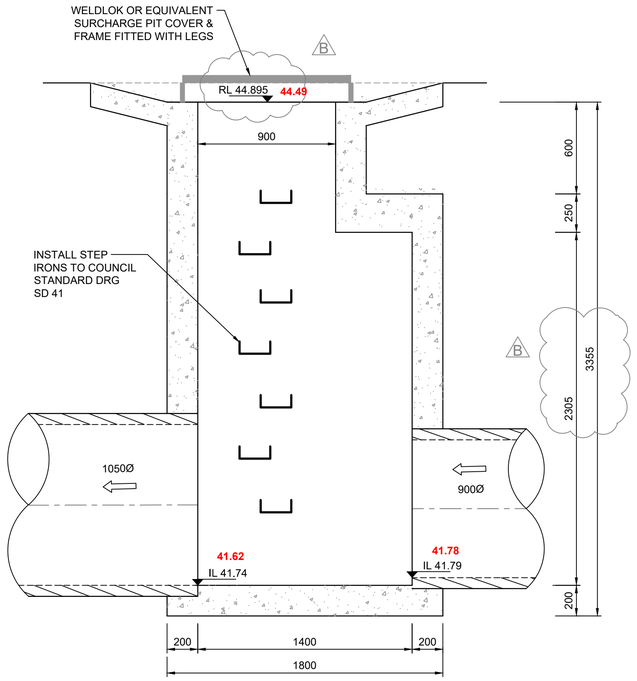


STRUCTURE 14/7

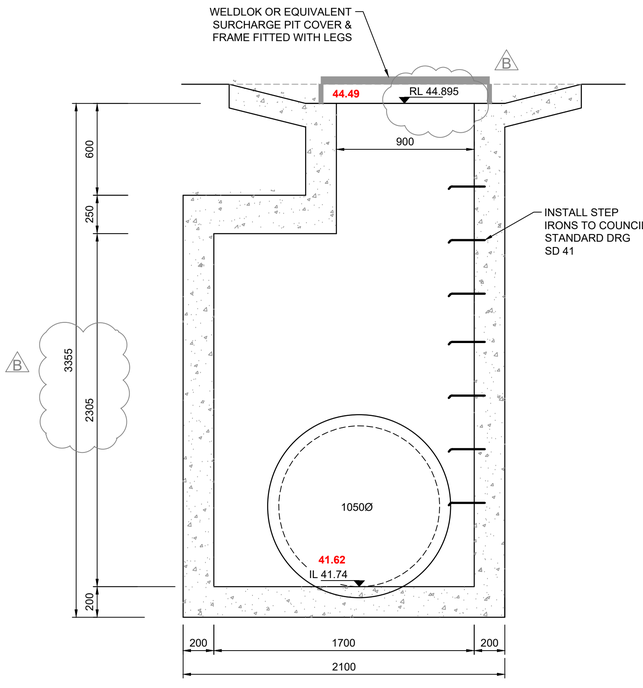
PLAN

SCALE 1:20

DETAILS SHOWN SUBJECT TO STRUCTURAL CERTIFICATION



SECTION A
SCALE 1:20



SECTION B
SCALE 1:20

1:20 (AT A1)
1:40 (AT A3)
400 200 0 400 800 1200 1600 2000
MILLIMETRES

B	LEVEL CHANGED	MP	VS	RO	MS	21/07/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
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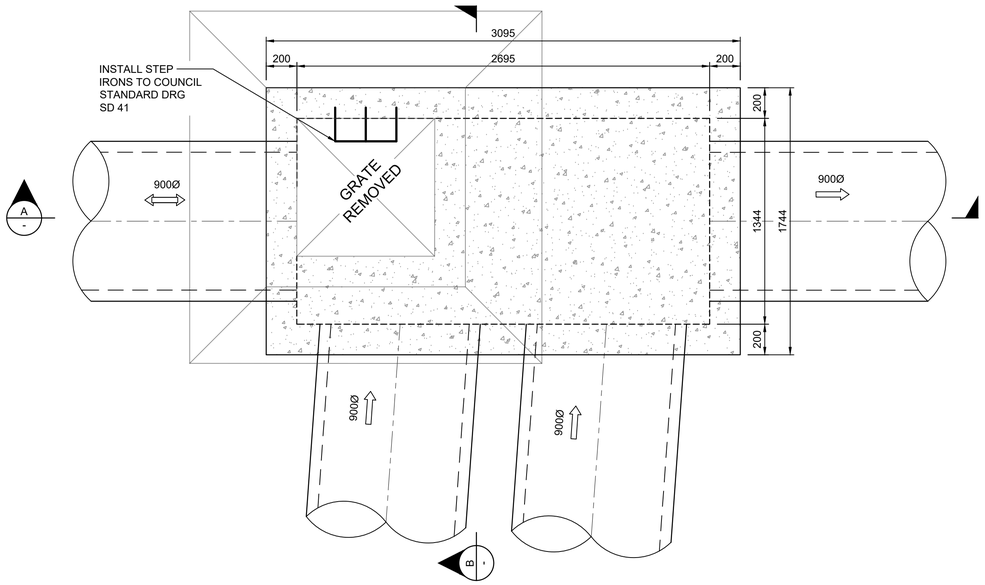
REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SPECIAL PIT 14/7 DETAILS

PROJECT No: 110185-12
SHEET No: CC1407

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1407 | B

Plotted: 25 February , 2022 1:39:55 PM File Name: J:\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1407.dwg

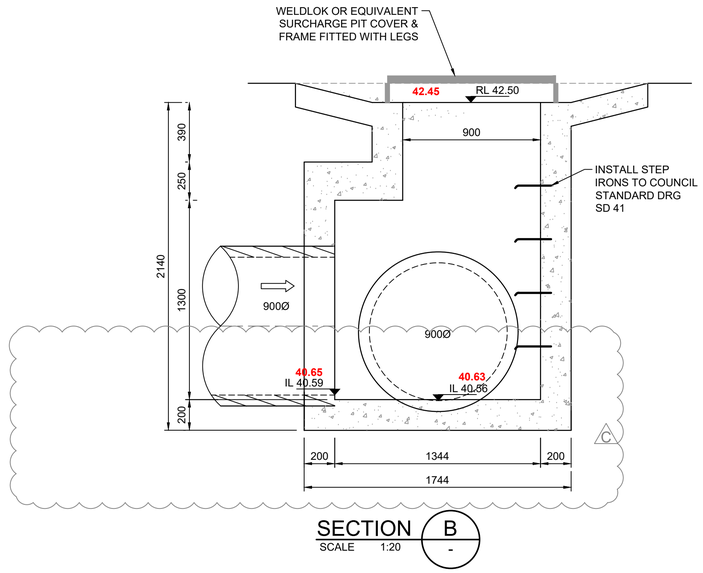


STRUCTURE 14/11

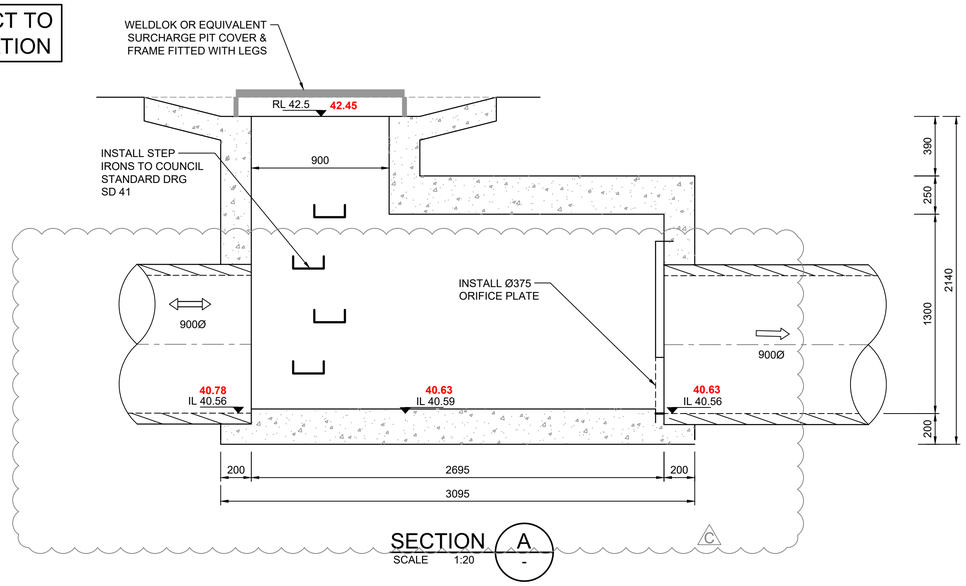
PLAN

SCALE 1:20

DETAILS SHOWN SUBJECT TO STRUCTURAL CERTIFICATION



SECTION B
SCALE 1:20



SECTION A
SCALE 1:20

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW72
Date of Issue 03/03/2022
Issuing Officer D. Restin
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 03/03/2022

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

VINCE MORGAN SURVEYORS PTY LTD
DATE: 05/03/22 REF:16800

1:20 (AT A1)
1:40 (AT A3)

400 200 0 400 800 1200 1600 2000
MILLIMETRES

	AMENDMENT	DES	DRN	CKD	APR	DATE
C	DRAINAGE LINE 14 REDESIGN	MP	MP	JB	MS	25/02/22
B	LEVEL CHANGED	MP	VS	RO	MS	21/07/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21

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CLIENT: REDBANK NORTH RICHMOND

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SPECIAL PIT 14/11 DETAILS

PROJECT No: 110185-12
SHEET No: CC1408

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1408 | C

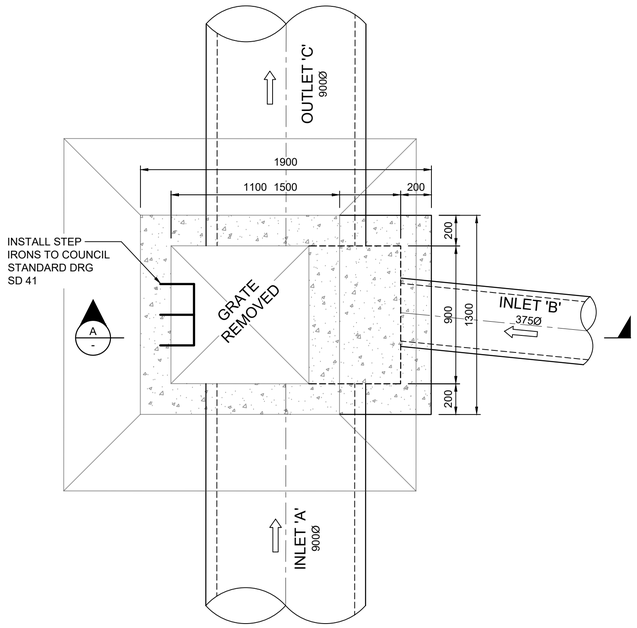
Plotted: 25 February , 2022 1:40:27 PM File Name: J:\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CD\CC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1408.dwg

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

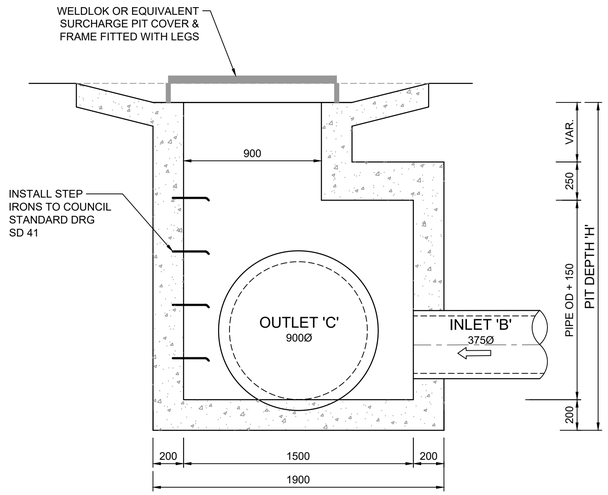
VINCE MORGAN SURVEYORS PTY LTD

DATE: 05/03/22 REF:16800



PLAN

SCALE 1:20



SECTION A

SCALE 1:20

DRAINAGE PIT TABLE

PIT No.	PIT GRATE LEVEL	PIPE INLET 'A' INVERT LEVEL	PIPE INLET 'B' INVERT LEVEL	PIPE OUTLET 'C' INVERT LEVEL	PIT DEPTH 'H'
14/2	50.944	48.667	49.078	48.637	2.31
14/3	49.916	47.629	48.039	47.599	2.32
14/4	48.578	46.333	46.908	46.303	2.27
14/5	47.008	44.538	45.509	44.508	2.50
14/6	45.684	42.928	- - -	42.898	2.79
14D/1	42.96642.72	40.39540.47	40.42540.43	40.39540.47	2.57
14D/2	41.87241.76	39.66639.73	40.161	39.63639.71	2.24
14D/3	40.62340.62	39.05139.12	----	39.01439.05	1.61

INLET 'B'
900Ø

C

DETAILS SHOWN SUBJECT TO STRUCTURAL CERTIFICATION

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW72

Date of Issue 03/03/2022

Issuing Officer D. Restin

Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 03/03/2022

1:20 (AT A1)
1:40 (AT A3)

400 200 0 400 800 1200 1600 2000

MILLIMETRES

C	DRAINAGE LINE 14 REDESIGN	MP	MP	JB	MS	25/02/22
B	DRAINAGE PIT TABLE AMENDED	MP	VS	RO	MS	21/07/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
SPECIAL PIT DETAILS

PROJECT No: 110185-12

SHEET No: CC1409

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1409 C

Plotted: 25 February, 2022 1:40:59 PM File Name: J:\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\CS\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1409.dwg

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Certificate No. 2013029SW72
Date of Issue 03/03/2022
Issuing Officer D. Restin
Accreditation No. BDC3367
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WORK AS EXECUTED SHOWN IN RED
SIGNATURE.....
VINCE MORGAN SURVEYORS PTY LTD
DATE: 05/03/22 REF:16800

DESIGN STORM 1:5yr ARI HYDROLOGIC RESULTS

PIT NAME	PIT TYPE	CATCHMENT AREA	IMPERVIOUS PERCENTAGE	RUNOFF C	IMPERVIOUS TIME Tc	IMPERVIOUS INTENSITY I	PERVIOUS TIME Tc	PERVIOUS INTENSITY I	FULL AREA TIME Tc	FULL AREA INTENSITY I	FULL AREA CATCHMENT FLOW Qc	PARTIAL AREA TIME Tc	PARTIAL AREA INTENSITY I	PARTIAL AREA CATCHMENT FLOW Qc	TOTAL CATCHMENT FLOW Qc	DIRECT FLOW Qd	APPROACH FLOW Qa	FLOODED DEPTH d	FLOODED WIDTH w	FLOODED (vxd)	ROAD GRADE	ROAD XFALL	CHOKE FACTOR	INLET FLOW Qg	BYPASS FLOW Qb	BYPASS PIT	COMMENTS
(-)	(-)	(ha)	(%)	(-)	(min)	(mm/hr)	(min)	(mm/hr)	(min)	(mm/hr)	(L/s)	(min)	(mm/hr)	(L/s)	(L/s)	(L/s)	(L/s)	(m)	(m)	(sq.m/s)	(%)	(%)	(-)	(L/s)	(L/s)	(-)	
1/1	1.8 m lintel	0.113	70	0.8	5	130.8	10	100.1	10	100.1	25	5	130.8	28	28	0	28	0.06	1.26	0.06	3.2	3	1	27	1	1/2	
1/2	1.8 m lintel	0.155	70	0.8	5	130.8	10	100.1	10	100.1	34	5	130.8	38	38	0	39	0.07	1.31	0.08	5	3	1	37	2	33/1	
1/3	1.8 m lintel	0.041	70	0.8	5	130.8	10	100.1	10	100.1	9	5	130.8	10	10	0	10	0.04	0.61	0.04	5	3	1	10	0	1/4	
1/4	1.8 m lintel	0.017	70	0.8	5	130.8	10	100.1	10	100.1	4	5	130.8	4	4	0	4	0.03	0.34	0.02	4.4	3	1	4	0	1/5	
1/5	1.8 m lintel	0.023	70	0.8	5	130.8	10	100.1	10	100.1	5	5	130.8	6	6	0	6	0.03	0.35	0.03	7.1	3	1	6	0	11/1	
1/6	1.8 m lintel	0.031	70	0.8	5	130.8	10	100.1	10	100.1	7	5	130.8	8	8	0	8	0.03	0.39	0.04	7.1	3	1	8	0	1/7	
1/7	1.8 m lintel	0.029	70	0.8	5	130.8	10	100.1	10	100.1	6	5	130.8	7	7	0	7	0.03	0.38	0.04	7.1	3	1	7	0	1/8	
1/8	1.8 m lintel	0.02	70	0.8	5	130.8	10	100.1	10	100.1	4	5	130.8	5	5	0	5	0.03	0.35	0.03	6.8	3	1	5	0	1/11	
1/9	NODE	0	0						0	0	0	0	0	0	0	0	0				6.6			0	0		DIRECT CONNECTION
1/10	NODE	0	0						0	0	0	0	0	0	0	0	0				6.2			0	0		DIRECT CONNECTION
1/11	1.8 m lintel	0.011	70	0.8	5	130.8	10	100.1	10	100.1	2	5	130.8	3	3	0	3	0.02	0.27	0.02	6	3	1	3	0	1/16	
1/12	NODE	0	0						0	0	0	0	0	0	0	0	0				5.8			0	0		DIRECT CONNECTION
1/13	NODE	0	0						0	0	0	0	0	0	0	0	0				5.6			0	0		DIRECT CONNECTION
1/14	NODE	0	0						0	0	0	0	0	0	0	0	0				5.1			0	0		DIRECT CONNECTION
1/15	NODE	0	0						0	0	0	0	0	0	0	0	0				5			0	0		DIRECT CONNECTION
1/16	1.8 m lintel	0.022	70	0.8	5	130.8	10	100.1	10	100.1	5	5	130.8	5	5	0	5	0.03	0.37	0.03	5	3	1	5	0	1/19	
1/17	NODE	0	0						0	0	0	0	0	0	0	0	0				5			0	0		DIRECT CONNECTION
1/18	NODE	0	0						0	0	0	0	0	0	0	0	0				5.5			0	0		DIRECT CONNECTION
1/19	1.8 m lintel	0	0						0	0	0	0	0	0	0	0	0				6.1	3	1	0	0	1/22	
1/20	NODE	0	0						0	0	0	0	0	0	0	0	0				6.5			0	0		DIRECT CONNECTION
1/21	NODE	0	0						0	0	0	0	0	0	0	0	0				7.3			0	0		DIRECT CONNECTION
1/22	1.8 m lintel	0.094	70	0.8	5	130.8	10	100.1	10	100.1	21	5	130.8	23	23	0	23	0.05	0.9	0.07	7.3	3	1	23	0	1/24	
1/23	NODE	0	0						0	0	0	0	0	0	0	0	0				7.3			0	0		DIRECT CONNECTION
1/24	1.8 m lintel	0.012	70	0.8	5	130.8	10	100.1	10	100.1	3	5	130.8	3	3	0	3	0.02	0.28	0.02	6.5	3	1	3	0	LOST	
1/25	1.8 m lintel	0.089	70	0.8	5	130.8	10	100.1	10	100.1	20	5	130.8	22	22	0	22	0.05	0.92	0.06	6.2	3	1	22	0	LOST	
1/26	2.4 m lintel sag																										EXISTING PIT
2/1	GSIP 900x900 SAG	0.678	40	0.8	5	130.8	10	100.1	10	100.1	151	5	130.8	138	151	0	151	0.09			5.6		1	151	0		
2/2	1.8 m lintel																										EXISTING END CAP
3/10	1.8 m lintel	0.071	70	0.8	5	130.8	10	100.1	10	100.1	16	5	130.8	18	18	0	19	0.03	3.2	0.02	1.6	3	1	19	0	3/11	
3/11	1.8 m lintel	0.108	70	0.8	5	130.8	10	100.1	10	100.1	24	5	130.8	27	27	0	27	0.06	1.03	0.07	6	3	1	27	0	1/25	
4/1	GSIP 900x900 SAG	0.116	20	0.8	5	130.8	10	100.1	10	100.1	26	5	130.8	20	26	0	26	0.03			6.8		1	26	0		
4/2	2.4 m lintel sag	0.061	70	0.8	5	130.8	10	100.1	10	100.1	14	5	130.8	15	15	0	15	0.03			1.8	4	1	15	0	3/10	
7/1	1.8 m lintel	0.053	70	0.8	5	130.8	10	100.1	10	100.1	12	5	130.8	13	13	0	16	0.05	0.8	0.05	5	3	1	16	0	3/11	
8/1	1.8 m lintel	0.151	70	0.8	5	130.8	10	100.1	10	100.1	34	5	130.8	37	37	0	41	0.07	1.06	0.1	6.7	2.9	1	38	3	7/1	
9/1	1.8 m lintel	0.172	70	0.8	5	130.8	10	100.1	10	100.1	38	5	130.8	43	43	0	45	0.06	1.36	0.09	7.4	2.9	1	42	4	8/1	
10/1	GSIP 5x900x900	0	0						0	0	0	0	0	0	0	0	0	0					1	0	0		DAM 8 OUTLET
10/2	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	0							0	0		
10/3	1.8 m lintel	0.213	70	0.8	5	130.8	10	100.1	10	100.1	47	5	130.8	53	53	0	53	0.07	1.37	0.1	8	3	1	49	4	10/4	
10/4	1.8 m lintel	0.215	70	0.8	5	130.8	10	100.1	10	100.1	48	5	130.8	53	53	0	57	0.07	1.46	0.11	7	3	1	51	6	10/5	
10/5	1.8 m lintel	0.109	70	0.8	5	130.8	10	100.1	10	100.1	24	5	130.8	27	27	0	33	0.06	1.22	0.07	5	3	1	32	1	10/6	
10/6	1.8 m lintel	0.114	70	0.8	5	130.8	10	100.1	10	100.1	25	5	130.8	28	28	0	30	0.06	1.15	0.07	5	3	1	29	1	10/7	
10/7	2.4 m lintel sag	0.135	70	0.8	5	130.8	10	100.1	10	100.1	30	5	130.8	33	33	0	34	0.04			1.4	2.5	1	33	2	LOST	
10/8	1.8 m lintel	0.06	70	0.8	5	130.8	10	100.1	10	100.1	13	5	130.8	15	15	0	16	0.05	0.97	0.04	2.7	3	1	16	0	LOST	
10/9	GPT	0	0						0	0	0	0	0	0	0	0	0							0	0		
10/10	H.W.																										
11/1	1.8 m lintel	0.173	70	0.8	5	130.8	10	100.1	10	100.1	38	5	130.8	43	43	0	43	0.06	1.27	0.09	7.1	3	1	40	3	9/1	
12/1	1.8 m lintel	0.081	70	0.8	5	130.8	10	100.1	10	100.1	18	5	130.8	20	20	0	20	0.06	1.09	0.05	2.8	3	1	20	0	LOST	
13/1	1.8 m lintel	0.117	70	0.8	5	130.8	10	100.1	10	100.1	26	5	130.8	29	29	0	29	0.06	0.96	0.08	8	11	1	29	0	21/1	
14/1	GSIP 5x900x900	0	0						0	0	0	0	0	0	0	0	0	0					1	0	0	14/2	DAM 7 OUTLET
14/2	JP GRATED 900 x 900	0	0						0	0	0	0	0	0	0	0	0					20	1	0	0	14/3	
14/3	JP GRATED 900 x 900	0	0						0	0	0	0	0	0	0	0	0					7.6	1	0	0	14/4	
14/4	GSIP 900x900	0.648	40	0.8	5	130.8	10	100.1	10	100.1	144	5	130.8	132	144	0	144	0	0.19	1.41			1	0	144	14/5	SURCHARGE PIT
14/5	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	144	0.03	8.37	0.03			1	0	144	14/6	
14/6	JP GRATED 900 x 900	0.414	50	0.8	5	130.8	10	100.1	10	100.1	92	5	130.8	90	92	0	236	0.01	0.03	13.7	4.9	-2.2	1	236	0	14/7	
14/7	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	0				0.1	-33	1	0	0	14/8	
14/8	GSIP 900x900 SAG	0.268	50	0.8	5	130.8	10	100.1	10	100.1	60	5	130.8	58	60	0	60	0.05			0.1		1	60	0		
14/9	2.4 m lintel sag	0.138	70	0.8	5	130.8	10	100.1	10	100.1	31	5	130.8	34	34	0	34	0.04			0.1	3	1	34	0	14/10	
14/10	2.4 m lintel sag	0.14	70	0.8	5	130.8	10	100.1	10	100.1	31	5	130.8	35	35	0	35	0.04			0.1	3	1	35	0	14/11	
14/11	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	0							0	0	14E/1	DISCHARGE CONTROL PIT WITH 375 ORIFICE

	AMENDMENT	DES	DRN	CKD	APR	DATE
D	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
C	DRAINAGE REVISED	JET	JET	MP	RO	23/03/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21

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CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL
THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
DRAINAGE CALCULATIONS
SHEET 1

PROJECT No: 110185-12
SHEET No: CC1411

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1411 | D

Plotted: 25 February , 2022 1:42:17 PM File Name: J:\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1411.dwg

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW72
Date of Issue 03/03/2022
Issuing Officer D. Restin
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 03/03/2022

WORK AS EXECUTED SHOWN IN RED
SIGNATURE.....
VINCE MORGAN SURVEYORS PTY LTD
DATE: 05/03/22 REF:16800

DESIGN STORM 1:5yr ARI HYDROLOGIC RESULTS

PIT NAME	PIT TYPE	CATCHMENT AREA	IMPERVIOUS PERCENTAGE	RUNOFF C	IMPERVIOUS TIME Tc	IMPERVIOUS INTENSITY I	PERVIOUS TIME Tc	PERVIOUS INTENSITY I	FULL AREA TIME Tc	FULL AREA INTENSITY I	FULL AREA CATCHMENT FLOW Qc	PARTIAL AREA TIME Tc	PARTIAL AREA INTENSITY I	PARTIAL AREA CATCHMENT FLOW Qc	TOTAL CATCHMENT FLOW Qc	DIRECT FLOW Qd	APPROACH FLOW Qa	FLOODED DEPTH d	FLOODED WIDTH w	FLOODED (vxd)	ROAD GRADE	ROAD XFALL	CHOKE FACTOR	INLET FLOW Qg	BYPASS FLOW Qb	BYPASS PIT	COMMENTS
(-)	(-)	(ha)	(%)	(-)	(min)	(mm/hr)	(min)	(mm/hr)	(min)	(mm/hr)	(L/s)	(min)	(mm/hr)	(L/s)	(L/s)	(L/s)	(L/s)	(m)	(m)	(sq.m/s)	(%)	(%)	(-)	(L/s)	(L/s)	(-)	
14E/1	H.W.																										
14D/1	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	0							0	0		
14D/2	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	0						1	0	0	14D/3	~~SURCHARGE PIT~~ 20130299SW72
14D/3	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	0					25	1	0	0	LOST	~~SURCHARGE PIT~~ 20130299SW72
14L/1	JP GRATED 600 x 900	0	0						0	0	0	0	0	0	0	0	0						1	0	0	14D/2	
14X/1	JP SEALED 900 x 900	0	0						0	0	0	0	0	0	0	0	0							0	0		
15/1	1.8 m lintel	0.159	70	0.8	5	130.8	10	100.1	10	100.1	35	5	130.8	39	39	0	39	0.08	1.72	0.06	1.6	3	1	36	3	15/2	
15/2	1.8 m lintel	0.233	70	0.8	5	130.8	10	100.1	10	100.1	52	5	130.8	58	58	0	60	0.08	1.84	0.09	2.7	3	1	51	9	15/3	
15/3	1.8 m lintel	0.088	70	0.8	5	130.8	10	100.1	10	100.1	20	5	130.8	22	22	0	31	0.07	1.37	0.06	2.7	3	1	30	1	17/1	
16/1	1.8 m lintel	0.094	70	0.8	5	130.8	10	100.1	10	100.1	21	5	130.8	23	23	0	23	0.06	1.18	0.05	2.7	3	1	22	1	10/8	
17/1	2.4 m lintel sag	0.162	70	0.8	5	130.8	10	100.1	10	100.1	36	5	130.8	40	40	0	43	0.05			3.3	3	1	43	0	10/7	
19/1	1.8 m lintel	0.116	70	0.8	5	130.8	10	100.1	10	100.1	26	5	130.8	29	29	0	29	0.07	1.47	0.05	1.7	3	1	27	2	19/2	
19/2	1.8 m lintel	0.165	70	0.8	5	130.8	10	100.1	10	100.1	37	5	130.8	41	41	0	42	0.07	1.57	0.07	2.8	3	1	37	6	19/3	
19/3	1.8 m lintel	0.063	70	0.8	5	130.8	10	100.1	10	100.1	14	5	130.8	16	16	0	21	0.06	1.13	0.05	2.8	3	1	21	0	19/4	
19/4	2.4 m lintel sag	0.077	70	0.8	5	130.8	10	100.1	10	100.1	17	5	130.8	19	19	0	22	0.03			1	2.6	1	22	0	19/5	
19/5	1.8 m lintel	0.044	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11	0.04	0.46	0.05	5	7.6	1	11	0	19/6	
19/6	1.8 m lintel	0.136	70	0.8	5	130.8	10	100.1	10	100.1	30	5	130.8	34	34	0	34	0.06	1.23	0.07	5	3	1	32	1	17/1	
20/1	1.8 m lintel	0.087	70	0.8	5	130.8	10	100.1	10	100.1	19	5	130.8	21	21	0	21	0.06	1.13	0.05	2.8	3	1	21	0	19/5	
21/1	1.8 m lintel	0.176	70	0.8	5	130.8	10	100.1	10	100.1	39	5	130.8	43	43	0	43	0.06	1.28	0.09	7	3	1	41	3	19/4	
22/1	1.8 m lintel	0.239	70	0.8	5	130.8	10	100.1	10	100.1	53	5	130.8	59	59	0	59	0.09	2.27	0.07	1	3	1	51	8	26/2	
22/2	1.8 m lintel	0.068	70	0.8	5	130.8	10	100.1	10	100.1	15	5	130.8	17	17	0	17	0.07	1.3	0.04	1	3	1	17	0	14/10	
23/1	CAPPED STUB	1.493	70	0.8	5	130.8	10	100.1	10	100.1	332	5	130.8	369	369	0	369				1.7			369	0		FUTURE EXTENSION
26/1	1.8 m lintel	0.086	70	0.8	5	130.8	10	100.1	10	100.1	19	5	130.8	21	21	0	21	0.06	0.96	0.06	4.9	3	1	21	0	26/2	
26/2	2.4 m lintel sag	0.115	70	0.8	5	130.8	10	100.1	10	100.1	26	5	130.8	28	28	0	36	0.05			2.2	3.1	1	36	0	14/9	
26/3	2.4 m lintel sag	0.047	90	0.8	5	130.8	10	100.1	10	100.1	11	5	130.8	13	13	0	13	0.02			1.2	2.5	1	13	0	LOST	
27/1	1.8 m lintel	0.11	70	0.8	5	130.8	10	100.1	10	100.1	24	5	130.8	27	27	0	27	0.07	1.5	0.05	1.4	3	1	26	1	27/2	
27/2	1.8 m lintel	0.105	70	0.8	5	130.8	10	100.1	10	100.1	23	5	130.8	26	26	0	27	0.07	1.51	0.05	1.4	3	1	26	1	27/3	
27/3	2.4 m lintel sag	0.089	70	0.8	5	130.8	10	100.1	10	100.1	20	5	130.8	22	22	0	23	0.04			0.5	3	1	23	0	LOST	
27/4	2.4 m lintel sag	0.062	70	0.8	5	130.8	10	100.1	10	100.1	14	5	130.8	15	15	0	15	0			0.5	3	1	0	15	27/5	
27/5	1.8 m lintel	0.021	70	0.8	5	130.8	10	100.1	10	100.1	5	5	130.8	5	5	0	20	0.05	0.93	0.06	4.9	7.5	1	20	0	26/1	
27/6	1.8 m lintel	0.017	70	0.8	5	130.8	10	100.1	10	100.1	4	5	130.8	4	4	0	4	0.03	0.34	0.03	4.9	3	1	4	0	26/3	
28/1	1.8 m lintel	0.067	70	0.8	5	130.8	10	100.1	10	100.1	15	5	130.8	16	16	0	18	0.05	0.86	0.05	4.9	3	1	18	0	27/3	
28/2	1.8 m lintel	0.013	70	0.8	5	130.8	10	100.1	10	100.1	3	5	130.8	3	3	0	3	0.03	0.31	0.02	4.9	3	1	3	0	27/6	
29/1	1.8 m lintel	0.138	70	0.8	5	130.8	10	100.1	10	100.1	31	5	130.8	34	34	0	34	0.06	1.24	0.07	4.9	3	1	33	1	28/1	
29/2	1.8 m lintel	0.012	70	0.8	5	130.8	10	100.1	10	100.1	3	5	130.8	3	3	0	3	0.03	0.3	0.02	4.9	3	1	3	0	28/2	
30/1	1.8 m lintel	0.067	70	0.8	5	130.8	10	100.1	10	100.1	15	5	130.8	17	17	0	17	0.06	1.29	0.03	1	3	1	17	0	30/2	
30/2	1.8 m lintel	0.053	70	0.8	5	130.8	10	100.1	10	100.1	12	5	130.8	13	13	0	13	0.05	0.61	0.05	5	3.5	1	13	0	29/1	
30/3	1.8 m lintel	0.024	70	0.8	5	130.8	10	100.1	10	100.1	5	5	130.8	6	6	0	8	0.04	0.43	0.04	4.9	3	1	8	0	29/2	
31/1	1.8 m lintel	0.137	70	0.8	5	130.8	10	100.1	10	100.1	30	5	130.8	34	34	0	34	0.07	1.15	0.07	3.4	4.3	1	32	2	30/3	
32/1	GSIP 900x900 SAG	0.988	90	0.8	5	130.8	10	100.1	10	100.1	220	5	130.8	273	273	0	273	0.13				-2	1	273	0	32/2	
32/2	GSIP 900x900 SAG	0.076	70	0.8	5	130.8	10	100.1	10	100.1	17	5	130.8	19	19	0	19	0.02			0.4	-10	1	19	0	32/3	
32/3	2.4 m lintel sag	0.359	70	0.8	5	130.8	10	100.1	10	100.1	80	5	130.8	89	89	0	103	0.08			0.4	3	1	103	0	32/4	
32/4	2.4 m lintel sag	0.078	70	0.8	5	130.8	10	100.1	10	100.1	17	5	130.8	19	19	0	19	0.03			0.4	3	1	19	0	32/5	
32/5	GPT	0	0						0	0	0	0	0	0	0	0	0						1	0	0	LOST	
32/6	H.W.																										
33/1	1.8 m lintel	0.161	70	0.8	5	130.8	10	100.1	10	100.1	36	5	130.8	40	40	0	41	0.07	1.52	0.07	3	3	1	38	3	33/2	
33/2	1.8 m lintel	0.16	70	0.8	5	130.8	10	100.1	10	100.1	36	5	130.8	39	39	0	43	0.09	1.98	0.06	1	3	1	39	4	32/3	
34/6	1.8 m lintel	0.076	70	0.8	5	130.8	10	100.1	10	100.1	17	5	130.8	19	19	0	19	0.06	0.9	0.05	4.1	3	1	19	0	36/1	
36/1	1.8 m lintel	0.039	70	0.8	5	130.8	10	100.1	10	100.1	9	5	130.8	10	10	0	10	0.05	0.64	0.04	3	3	1	10	0	36/2	
36/2	2.4 m lintel sag	0.102	70	0.8	5	130.8	10	100.1	10	100.1	23	5	130.8	25	25	0	25	0.04			0.6	2.6	1	25	0	36/3	
36/3	2.4 m lintel sag	0.044	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11	0.02			0.3	3	1	11	0	37/6	
37/6	1.8 m lintel	0.041	70	0.8	5	130.8	10	100.1	10	100.1	9	5	130.8	10	10	0	10	0.06	1.01	0.03	0.9	3.3	1	10	0	LOST	
A/1	IAD 450x450	0.046	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11							11	0		
A/2	SLOPE JUNCTION	0.046	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11							11	0		
A/3	IAD 450x450	0.046	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	11	11	0	11							11	0		
A/4	SLOPE JUNCTION	0.047	70	0.8	5	130.8	10	100.1	10	100.1	10	5	130.8	12	12	0	12							12	0		
A/5	IAD 450x450	0.047	70	0.8	5	130.8	10	100.1	10	100.1	11	5	130.8	12	12	0	12							12	0		
A/6	SLOPE JUNCTION	0.049	70	0.8	5	130.8	10	100.1	10	100.1	11	5	130.8	12	12	0	12							12	0		
A/7	IAD 900x900	0.056	70	0.8	5	130.8	10	100.1	10	100.1	12	5	130.8	14	14	0	14							14	0		

	AMENDMENT	DES	DRN	CKD	APR	DATE
D	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
C	COUNCIL COMMENTS	MP	VS	RO	RO	16/06/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21

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CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL
THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
DRAINAGE CALCULATIONS
SHEET 2

PROJECT No: 110185-12
SHEET No: CC1412

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1412 | E

Plotted: 25 February, 2022 1:43:04 PM File Name: J:\110185 -Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1412.dwg

WORK AS EXECUTED SHOWN IN RED

SIGNATURE.....

VINCE MORGAN SURVEYORS PTY LTD

DATE: 05/03/22 REF:16800

DESIGN STORM 1:5yr ARI HYDRAULIC RESULTS

PIPE NAME	PIPE TYPE	PIPE DIAMETER	PIPE LENGTH	PIPE SLOPE	PIPE AREA Af	FULL AREA TIME Tc	FULL AREA INTENSITY I	FULL AREA SUM CA	FULL AREA FLOW Qc	PART-AREA TIME Tc	PART-AREA INTENSITY I	PART-AREA SUM CA	PART-AREA FLOW Qc	DIRECT PIPE FLOW Qp	PEAK FLOW Qrat	NET BYPASS FLOW Qb	PIPE FLOW Q	FLOW CAP. Qcap	Q/Qcap RATIO	FULL PIPE VELOCITY	NORM. DEPTH VELOCITY	CRIT. DEPTH VELOCITY	U/S PIT GRATE RL	PIPE U/S IL	PIPE D/S IL	PIPE D/S DROP	U/S PIT Ku	U/S PIT Kw	PIPE V'HEAD	PIT LOSS (Ku.V'head)	WSE LOSS (Kw.V'head)	TOTAL PIPE LOSS	U/S PIT HGL	U/S PIPE HGL	D/S PIPE HGL	HGL GRADE	MIN. COVER	U/S FREEBOARD	COMMENTS
(-)	(-)	(mm)	(m)	(%)	(sq.m)	(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)	(m)	(m)	(m)	(-)	(-)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(%)	(m)	(m)	
1/1 to 1/2	RRJ2	375	30.8	4.51	0.11	10	100.1	0.09	25	5	130.8	0.08	27.8	0	27.8	-0.8	27	403.4	0.07	0.24	2.08	0.91	62.566	61.058	59.668	0.05	4.5		0	0.01	0.01	1.36	61.45	61.433	60.069	4.42	1.06	1.12	
1/2 to 1/3	RRJ2	375	8.15	1.25	0.11	10.25	99.2	0.214	58.9	5.25	128.8	0.18	65.3	0	65.3	-1.8	63.5	212.5	0.3	0.57	1.68	1.18	61.117	59.618	59.516	0.05	4.5		0.02	0.08	0.08	0.11	60.07	59.993	59.883	1.35	1.14	1.05	
1/3 to 1/4	RRJ2	375	13.8	7.23	0.11	10.33	98.9	0.247	67.8	5.33	128.1	0.21	75.1	0	75.1	-1.8	73.3	511.1	0.14	0.66	3.28	1.24	61.04	59.466	58.469	0.051	1.85	2.29	0.02	0.04	0.05	0.99	59.89	59.841	58.848	7.21	1.13	1.15	
1/4 to 1/5	RRJ2	375	30.1	6.15	0.11	10.4	98.6	0.26	71.3	5.4	127.5	0.22	78.9	0	78.9	-1.8	77.1	471.4	0.16	0.7	3.15	1.26	59.98	58.419	56.567	0.03	2.16	2.5	0.02	0.05	0.06	1.73	58.86	58.794	57.059	5.77	1.1	1.12	
1/5 to 1/6	RRJ2	375	8.54	2.83	0.11	10.56	98	0.443	120.7	5.56	126.2	0.38	133.4	0	133.4	-1.8	131.6	319.7	0.41	1.19	2.75	1.56	58.017	56.537	56.296	0.05	2.03	2.39	0.07	0.15	0.17	0.1	57.09	56.912	56.814	1.15	1.1	0.93	
1/6 to 1/7	RRJ2	375	46	7.06	0.11	10.61	97.8	0.468	127.1	5.61	125.8	0.4	140.3	0	140.3	-1.8	138.5	504.8	0.27	1.25	3.9	1.6	57.804	56.246	53	0.05	2.41	2.73	0.08	0.19	0.22	3.08	56.84	56.621	53.539	6.7	1.06	0.96	
1/7 to 1/8	RRJ2	375	47.9	6.89	0.11	10.81	97	0.629	169.5	5.6	125.9	0.54	187.3	0	187.3	-4.3	182.9	498.9	0.37	1.66	4.17	1.86	54.543	52.95	49.647	0.031	1.53	1.83	0.14	0.21	0.26	3	53.58	53.325	50.326	6.26	1.1	0.96	
1/8 to 1/9	RRJ2	375	9.42	7	0.11	11	96.3	0.783	209.4	5.75	124.6	0.67	231.2	0	231.2	-5.3	225.9	502.7	0.45	2.05	4.43	2.15	51.192	49.617	48.958	0	1.56	1.79	0.21	0.33	0.38	0.66	50.37	49.992	49.333	7	1.09	0.82	
1/9 to 1/10	RRJ2	375	11.3	7	0.11	11.03	96.2	0.823	219.8	5.79	124.3	0.7	242.7	0	242.7	-5.3	237.4	502.7	0.47	2.15	4.49	2.24	50.603	48.958	48.17	0	0		0.24	0	0	0.78	49.33	49.333	48.553	6.92	1.23	1.27	
1/10 to 1/11	RRJ2	375	6.69	7	0.11	11.08	96	0.858	228.8	5.83	123.9	0.73	252.6	0	252.6	-5.3	247.3	502.7	0.49	2.24	4.53	2.32	49.875	48.17	47.702	0.046	0		0.26	0	0	0.11	48.55	48.553	48.44	1.69	1.29	1.32	
1/11 to 1/12	RRJ2	375	6.29	5	0.11	11.1	95.9	0.987	263	5.85	123.7	0.85	291	0	291	-5	285.9	424.9	0.67	2.59	4.13	2.63	49.431	47.657	47.342	0	1.19	1.35	0.34	0.41	0.46	0.31	48.5	48.032	47.717	5	1.29	0.94	
1/12 to 1/13	RRJ2	375	13.2	5	0.11	11.13	95.8	1.022	271.9	5.88	123.5	0.88	300.8	0	300.8	-5	295.8	424.9	0.7	2.68	4.16	2.71	49.063	47.342	46.682	0	0		0.37	0	0	0.66	47.72	47.717	47.057	5	1.2	1.35	
1/13 to 1/14	RRJ2	375	13.5	5	0.11	11.18	95.6	1.057	280.7	5.93	123.1	0.91	310.3	0	310.3	-5	305.3	424.9	0.72	2.76	4.18	2.79	48.289	46.682	46.008	0	0		0.39	0	0	0.67	47.06	47.057	46.383	5	1.15	1.23	
1/14 to 1/15	RRJ2	375	13.4	5	0.11	11.23	95.4	1.092	289.3	6.23	121.2	0.95	319.6	0	319.6	-5	314.6	424.9	0.74	2.85	4.21	2.87	47.57	46.008	45.336	0	0		0.41	0	0	0.67	46.38	46.383	45.711	5	1.15	1.19	
1/15 to 1/16	RRJ2	375	7.66	5	0.11	11.29	95.2	1.125	297.5	6.29	120.9	0.98	328.8	0	328.8	-5	323.8	424.9	0.76	2.93	4.23	2.95	46.897	45.336	44.953	0.075	0		0.44	0	0	0.27	45.71	45.711	45.439	3.55	1.15	1.19	
1/16 to 1/17	RRJ2	450	5.89	5.8	0.16	11.32	95.1	1.184	312.9	6.32	120.8	1.03	346.1	0	346.1	-1.8	344.3	744.2	0.46	2.16	4.59	2.3	46.514	44.878	44.537	0	0.47	0.51	0.24	0.11	0.12	0.34	45.45	45.328	44.986	5.8	1.08	1.06	
1/17 to 1/18	RRJ2	450	13.6	5.8	0.16	11.34	95	1.22	321.9	6.34	120.6	1.06	356.2	0	356.2	-1.8	354.4	744.2	0.48	2.23	4.62	2.35	46.219	44.536	43.749	0	0		0.25	0	0	0.43	44.99	44.986	44.559	3.15	1.19	1.23	
1/18 to 1/19	RRJ2	450	7.76	5.8	0.16	11.39	94.8	1.253	330.1	6.17	121.5	1.08	365.4	0	365.4	-1.8	363.6	744.2	0.49	2.29	4.65	2.4	45.66	43.749	43.299	0.15	0		0.27	0	0	0.11	44.56	44.559	44.452	1.38	1.36	1.1	
1/19 to 1/20	RRJ2	600	5.87	7	0.28	11.41	94.7	2.709	712.8	6.17	121.6	2.33	787.4	0	787.4	-1.8	785.6	1760.7	0.45	2.78	6.05	2.88	45.054	43.149	42.738	-0.007	1.78	1.91	0.39	0.7	0.75	0.4	44.5	43.749	43.345	6.88	1.19	0.55	
1/20 to 1/21	RRJ2	600	13.5	7	0.28	11.43	94.7	2.745	721.7	6.18	121.5	2.36	797.4	0	797.4	-1.8	795.6	1760.6	0.45	2.81	6.07	2.91	44.682	42.745	41.799	0	0		0.4	0	0	0.95	43.35	43.345	42.399	7	1.29	1.34	
1/21 to 1/22	RRJ2	600	7.39	7	0.28	11.47	94.5	2.779	729.6	6.22	121.3	2.39	806.2	0	806.2	-1.8	804.4	1760.6	0.46	2.84	6.08	2.94	43.739	41.799	41.281	0.05	0		0.41	0	0	0.42	42.4	42.399	41.977	5.7	1.29	1.34	
1/22 to 1/23	RRJ2	600	6.42	5.7	0.28	11.49	94.4	2.854	748.6	6.24	121.2	2.46	827.8	0	827.8	-1.8	826	1588.8	0.52	2.92	5.67	3.01	43.197	41.231	40.865	0	0.34		0.44	0.15	0.15	0.31	41.98	41.831	41.521	4.82	1.22	1.22	
1/23 to 1/24	RRJ2	600	15.6	5.7	0.28	11.51	94.4	2.889	757.4	6.26	121.1	2.49	837.7	0	837.7	-1.8	835.9	1588.8	0.53	2.96	5.69	3.04	42.727	40.865	39.977	0.05	0		0.45	0	0	0.25	41.52	41.521	41.276	1.58	1.1	1.21	
1/24 to 1/25	RRJ2	600	9.52	4.41	0.28	11.55	94.2	2.934	767.8	6.3	120.8	2.53	849.3	0	849.3	-1.8	847.5	1397.9	0.61	3	5.18	3.07	41.642	39.927	39.507	0.076	0.9		0.46	0.41	0.41	0.15	41.28	40.863	40.709	1.62	1.09	0.37	
1/25 to 1/26	RRJ3	675	28.9	4.32	0.36	11.58	94.1	3.005	785.3	6.33	120.6	2.59	869.2	0	869.2	-1.8	867.4	1893.8	0.46	2.42	5.17	2.64	41.317	39.432	38.183	0	2.01	2.28	0.3	0.6	0.68	0.4	40.79	40.107	39.703	1.4	1.1	0.53	
2/1 to 2/2	RRJ2	375	12	3.13	0.11	10	100.1	0.543	150.9	5	130.8	0.38	138	0	150.9	0	150.9	335.9	0.45	1.37	2.96	1.67	39.929	38.949	38.573	1.242	4.5		0.04	0.16	0.16	0.03	39.93	39.768	39.74	0.24	0.59	0	
3/9 to 3/10	RRJ2	450	21.5	3.71	0.16	10.8	97.1	1.171	315.7	5.55	126.2	1	350.4	0	350.4	-1.1	349.3	595.5	0.59	2.2	3.89	2.32	46.752	44.922	44.125	0.075	0.69		0.25	0.17	0.17	0.33	45.54	45.372	45.046	1.52	1.1	1.21	
3/10 to 3/11	RRJ2	525	14.2	3.87	0.22	10.89	96.7	1.37	368.1	5.65	125.5	1.15	400.9	0	400.9	0	400.9	916.7	0.44	1.85	4.09	2.13	45.838	44.05	43.499	0.05	0.6		0.17	0.11	0.11	0.11	45.05	44.941	44.835	0.74	1.23	0.79	
3/11 to 1/19	RRJ2	525	8.04	2.8	0.22	10.95	96.5	1.456	390.3	5.7	125	1.23	425.4	0	425.4	0	425.4	779.9	0.55	1.97	3.68	2.2	45.101	43.449	43.224	0.075	1.61	1.73	0.2	0.32	0.34	0.07	44.86	44.519	44.452	0.83	1.14	0.24	
4/1 to 4/2	RRJ2	375	8.25	1	0.11	10	100.1	0.093	25.9	5	130.8	0.06	20.3	0	25.9	0	25.9	190	0.14	0.23	1.2	0.9	45.467	44.396	44.314	0.031	4.5		0	0.01	0.01	0	45.09	45.08	45.079	0.02	0.77	0.37	
4/2 to 3/10	RRJ2	375	8.37	1	0.11	10.11	99.7	0.142	39.4	10	100.1	0.14	39.3	0	39.4	0	39.4	190	0.21	0.36	1.36	1.02	45.747	44.284	44.2	0.151	4.5		0.01	0.03	0.03	0	45.08	45.049	45.046	0.04	1.12	0.67	
7/1 to 1/16	RRJ2	375	9.2	3.45	0.11	10	100.1	0.042	11.7	5	130.8	0.04	13	0	13	3.2	16.2	352.9	0.05	0.15	1.62	0.79	46.74	45.27	44.953	0.075	4.5		0	0	0	0.21	45.65	45.645	45.439	2.24	1.09	1.09	
8/1 to 1/11	RRJ2	375	9.01	5	0.11	10	100.1	0.121	33.5	5	130.8	0.1	37.2	0	37.2	0.3	37.5	424.9	0.09	0.34	2.37	1	49.685	48.152	47.702	0.046	4.5		0.01	0.03	0.03	0.09	48.55	48.527	48.44	0.96	1.14	1.13	
9/1 to 1/8	RRJ2	375	10.9	4.93	0.11	10	100.1	0.138	38.3	5	130.8	0.12	42.5	0	42.5	-1	41.6	421.8	0.1	0.38	2.43	1.04	51.707	50.183	49.647	0.031	4.5		0.01	0.03	0.03	0.23	50.59	50.558	50.326	2.14	1.1	1.12	
10/1 to 10/2	RRJ2	900	84.2	2	0.64	5	130.8	0	0	5	130.8	0	0	2011	2011	0	2011	4387.2	0.73	3.16	4.75	3.33	54.4	52.417	50.737	0.051	4.5		0.24	1.08	1.08	0.78	54.4	53.317	52.538	0.93	0.99	0	
10/2 to 10/3	RRJ2	900	37.6	4.25	0.64	5.3	128.4	0	0	5.3	128.4	0	0	2011	2011	0	2011	4044.5	0.5	3.16	6.35	3.33	53.439	50.687	49.091	0.05	1.86	2.07	0.51	0.95	1.05	1.39	52.64	51.587	50.194	3.71	1.25	0.8	
10/3 to 10/4	RRJ2	900	52.2	7.77	0.64	10.08	99.8	0.265	73.3	5.08	130.1	0.23	81.4	2011	2092.4	-3.8	2088.6	5470.2	0.38	3.28	8.02	3.43	51.203	49.041	44.983	0.05	0.46	0.5	0.55	0.25	0.27	3.86	50.22	49.941	46.084	7.39	1.1	0.99	
10/4 to 10/5	RRJ2	900	29.4	5.08	0.64	10.19	99.4	0.577	159.3	5.11	129.9	0.49	176.7	2011	2187.7	-8.8	2179	4420.6	0.49	3.43	6.92	3.55	47.131	44.933	43.44	0.05	0.42	0.45	0.6	0.25	0.27	1.38	46.1	45.833	44.456	4.68	1.04	1.03	
10/5 to 10/6	RRJ2	900	26.7	5.14	0.64	10.26	99.1	0.664	182.7	5.18	129.3	0.56	202.6	2011	2213.6	-4	2209.6	4449	0.5	3.47	6.98	3.59	45.417	43.39	42.017	0.05	0.27		0.62	0.17	0.17	0.96	44.46	44.29	43.325	3.61	1	0.96	
10/6 to 10/7	RRJ2	900	44.9	5	0.64	11.22	95.5	1.544	409.4	5.56	126.2	1.31	458.5	2011	2469.5	-2.3	2467.2	4387.2	0.56	3.88	7.1	3.95	44.092	41.967	39.72	0.051	0.6	0.68	0.77	0.46	0.52	1.84	43.39	42.867	41.031	4.08	1.1	0.7	
10/7 to 10/8	RRJ2	1050	19.7	2.32	0.87	11.32	95.1	1.781	470.3	5.65	125.4	1.51	527.1	2011	2538.1	-0.3	2537.8	4507	0.56	2.93	5.36	3.22	42.046	39.67	39.212	0.031	0.55	0.65	0.44	0.24	0.28	0.15	41.08	40.792	40.647	0.74	1.27	0.97	
10/8 to 10/9	RRJ2	1050	42	2	0.87	11.38	94.8	2.606	686.6	5.82	124	2.23	766.6	2011	2777.6	-1.5	2776.1	4185.4	0.66	3.21	5.17	3.43	42.216	39.182	38.343	0.031	0.79	0.93	0.52	0.41	0.49	0.51	40.72	40.232	39.718	1.22	1.27	1.5	
10/9 to 10/10	RRJ2	(2x)1200	21.3	1	2.26	11.52	94.3	2.606	682.8	6.25	121.1	2.26	760.7	2453	3213.7	-1.5	3212.2	8550.1	0.38	1.42	3.48	2.37	40.71	38.313	38.1		2		0.1	0.21	0.21	0.45	39.72	39.513	38.65	4.06		0.99	
11/1 to 1/7	RRJ2	375	8.06	1.25	0.11	10	100.1	0.138	38.5	5	130.8	0.12	42.7	0	42.7	-2.5	40.2	212.5	0.19	0.36	1.48	1.03	54.614	53.139	53.038	0.089	4.5		0.01	0.03	0.03	0	53.57	53.543	53.539	0.04	1.12	1.04	
12/1 to 12/2	RRJ2	375	37.8	3.43	0.11	10	100.1	0.064	17.9	5	130.8	0.05	19.9	0	19.9	0	19.9	351.8	0.06	0.18	1.72	0.84	41.411	39.868	38.573		4.5		0	0.01	0.01	0.5	40.25	40.243	39.74	1.33	1.1	1.16	
13/1 to 10/3	RRJ2	375	8	2	0.11	10	100.1	0.094	26.1	5	130.8	0.08	29	0	29	0	29	268.7	0.11	0.26	1.59	0.93	51.226	49.776	49.616	0.576	4.5		0	0.02	0.02	0	50.21	50.195	50.194	0.02	1.1	1.01	
14/1 to 14/2	RRJ2	900	52.3	3.5	0.64	5	130.8	0	0	5	130.8	0	0	2070	2070	0	2070	3670.4	0.56	3.25	5.94	3.4	54.4	50.497	48.667	0.031	4.5		0.54	2.43	2.43	1.62	53.83	51.397	49.782	3.09	1.27	0.57	
14/2 to 14/3	RRJ2	900	22.8	4.42	0.64	11	96.3	0.225	60.2	6	122.5	0.19	66.4	2070	2136.4	0	2136.4	4122.6	0.52	3.36	6.54	3.49	50.944	48.637	47.629	0.031	0.36	0.4	0.58	0.21	0.23	0.27	49.8	49.573	49.303	1.19	1.23	1.14	
14/3 to 14/4	RRJ2	900	26.2	4.83	0.64	11.06	96.1	0.345	92.1	5.41	127.4	0.29	102.1	2070	2172.1	-1.4	2170.7	4310.5	0.5	3.41	6.79	3.54	49.916	47.599	46.333	0.031	1.35	1.54	0.59	0.8	0.91	0.33	49.41	48.499	48.17	1.26	1.21	0.5	
14/4 to 14/5	RRJ2	900	32.1	5.5	0.64	11.12	95.8	0.927	246.8	10	100.1	0.92	256.3	2070	2326.3	-144.2	2182.2	4601.4	0.47	3.43	7.14	3.55	48.578	46.303	44.538	0.03	1.61	1.78	0.6	0.97	1.07	1.1	48.27	47.203	46.1	3.44	1.29	0.31	
14/5 to 14/6	RRJ2	900	29.7	5.32	0.64	11.28	95.2	1.429	378	6.28	121	1.19	400.7	2070	2470.7	-144.2	2326.6	4526	0.51	3.66	7.16	3.75	47.008	44.508	42.928	0.031	1.01	1.16	0.68	0.69	0.79	0.5	46.2	45.408	44.908	1.69	1.5	0.81	
14/6 to 14/7	RRJ2	900	25.4	4.36	0.64	11.35	95	1.76	464.3	6.35	120.6	1.46	490	2070	2560	0	2560	4096.8	0.62	4.02	6.79	4.09	45.684	42.898	41.79	0.151	0.3		0.83	0.25	0.25	0.43	44.91	44.66	44.227	1.7	1.79	0.78	
14/7 to 14/8	RRJ2	1050	7.56	2.88	0.87	11.41	94.7	1.76	463.1	6.41	120.2	1.46	488.6	2070	2558.6	0	2558.6	5020	0.51	2.95	5.82	3.24	44.895	41.64	41.423	0.031	0.13		0.45	0.06	0.06	0.06	44.23	44.169	44.113	0.75	1.94	0.67	
14/8 to 14/9	RRJ2	1050	4.27	3	0.87	11.43	94.7	1.974	519	6.43	120.1	1.64	546.9	2070	2616.9	0	2616.9	5126.1	0.51	3.02	5.95	3.29	44.5	41.393	41.265	0.031	1.65	1.76	0.47	0.77	0.82	0.03	44.16	43.344	43.311	0.78	1.98	0.34	
14/9 to 14/10	RRJ2	(2x)900	11	1.25	1.27	11.44	94.6	3.631	954.2	5.72	124.9	2.99	1038.3	2070	3108.3	7.7	3116	4387.2	0.71	2.45	3.74	2.8	44.517	41.235	41.097	0.031	0.99	1.12	0.31	0.3	0.34	0.07	43.35	43.007	42.938	0.63	2.39	1.17	
14/10 to 14/11	RRJ2	(2x)900	47.2	1.01	1.27	11.49	94.4	3.988	1046	5.77	124.5	3.3	1141.7	2070	3211.7	0	3211.7	3944	0.81	2.52	3.45	2.85	44.517	41.067	40.591	0.03	0.37	0.4	0.33	0.12	0.13	0.32	42.95	42.816	42.5	0.67	0.79	1.57	
14/11 to 14E/1	RRJ2	900	8.66	0.5	0.64	11.72	93.6	3.988	1036.4	6.52	119.6	3.4	1128.7	1870	2998.7	0	2998.7	1396.3	2.15	4.71	4.71	4.74	42.5	40.561	40.517		1.97	2.3	0	0	0	0	42.5	42.5	42.5	0	-0.48	0	
14/11 to 14D/2	RRJ2	900	17.1	1	0.64	5	130.8	0	0	5	130.8	0	0	200	200	0	200	1962	0.1	0.31	1.98	1.34	42.5	40.566	40.395	0	2		0.01	0.01	0.01	0.13	41.48	41.466	41.333	0.78	0.97	1.02	
14D/2 to 14D/3	RRJ3	900	58.6	1	0.64	5.65	125.4	0	0	5.65	125.4	0	0	442	442	0	442	1962	0.23	0.69	2.49	1.69	42.1	39.636	39.051	0.037	0.61	0.71	0.02	0.01	0.02	0.62	40.55	40.536	39.921	1.05	0.54	1.55	
14D/3 to 10/9	RRJ3	900	83.2	0.7	0.64	6.04	122.3	0	0	6.04	122.3	0	0	442	442	0	442	1641.5	0.27	0.69	2.19	1.69	40.623	39.014	38.432	0.12	0.26	0.27	0.02	0.01	0.01	0.2	39.92	39.914	39.718	0.24	0.62	0.7	
14L/1 to 14D/2	RRJ2	375	11	0.99	0.11	5	130.8	0	0	5	130.8	0	0	42	42	0	42	188.6	0.22	0.38	1.37	1.04	41.63	40.27	40.161	0.526	0		0.01	0	0	0.09	40.65	40.645	40.551	0.85	1.02	0.98	
14X/1 to 14D/1	RRJ2	900	7.2	1	0.64	5	130.8	0	0	5	130.8	0	0	200	200	0	200	1964	0.1	0.31	1.98	1.34	42.786	40.498	40.425	0.031	0		0.01	0	0	0.06	41.4	41.398	41.333	0.9	1.34	1.39	
15/1 to 15/2	RRJ2	375	58	2.35	0.11	10	100.1	0.127	35.4	5	130.8	0.11	39.3	0	39.3	-2.9	36.5	291.5	0.13	0.33	1.8	1	44.941	43.362	41.998	0.031	4.5		0.01	0.03	0.03	1.05	43.76	43.737	42.683	1.82	1.14	1.18	
15/2 to 15/3	RRJ2	375	29.5	2.5	0.11	10.99	96.3	0.707	189.1	5.59	125.9	0.6	210.5	0	210.5	-9.8	200.7	300.5	0.67	1.82	2.91	1.97	43.511	41.968	41.23	0.03	2.02	2.34	0.17	0.34	0.39	0.4	42.74	42.343	41.942	1.36	1.1	0.77	
15/3 to 10/8	RRJ2	375	21.4	2.5	0.11	11.16	95.7	0.777	206.5	5.71	125	0.66	229.4	0	229.4	-1.8	227.6	300.5	0.76	2.06	2.99	2.17	42.713	41.2	40.666	1.484	1.69	1.9	0.22	0.37	0.41	0.43	41.99	41.575	40.91	3.11	1.12	0.73	
16/1 to 15/2	RRJ2	375	13.3	2	0.11	10	100.1	0.075	20.8	5	130.8	0.06	23.1	0	23.1	-0.6	22.5	268.7	0.08	0.2	1.48	0.87	43.708	42.263	41

DESIGN STORM 1:100yr ARI HYDROLOGIC RESULTS

PIT NAME	PIT TYPE	CATCHMENT AREA	IMPERVIOUS PERCENTAGE	RUNOFF C	IMPERVIOUS TIME Tc	IMPERVIOUS INTENSITY I	PERVIOUS TIME Tc	PERVIOUS INTENSITY I	FULL AREA TIME Tc	FULL AREA INTENSITY I	FULL AREA CATCHMENT FLOW Qc	PARTIAL AREA TIME Tc	PARTIAL AREA INTENSITY I	PARTIAL AREA CATCHMENT FLOW Qc	TOTAL CATCHMENT FLOW Qc	DIRECT FLOW Qd	APPROACH FLOW Qa	FLOODED DEPTH d	FLOODED WIDTH w	FLOODED (vxd)	ROAD GRADE	ROAD XFALL	CHOKE FACTOR	INLET FLOW Qg	BYPASS FLOW Qb	BYPASS PIT	COMMENTS
(-)	(-)	(ha)	(%)	(-)	(min)	(mm/hr)	(min)	(mm/hr)	(min)	(mm/hr)	(L/s)	(min)	(mm/hr)	(L/s)	(L/s)	(L/s)	(L/s)	(m)	(m)	(sq.m/s)	(%)	(%)	(-)	(L/s)	(L/s)	(-)	
1/1	1.8 m lintel	0.113	70	0.95	5	219.1	10	167.3	10	167.3	50	5	219.1	55	55	0	55	0.08	1.74	0.08	3.2	3	0.8	39	17	1/2	
1/2	1.8 m lintel	0.155	70	0.95	5	219.1	10	167.3	10	167.3	68	5	219.1	76	76	0	93	0.08	1.94	0.13	5	3	0.8	58	35	33/1	
1/3	1.8 m lintel	0.041	70	0.95	5	219.1	10	167.3	10	167.3	18	5	219.1	20	20	0	20	0.05	1.06	0.05	5	3	0.8	16	4	1/4	
1/4	1.8 m lintel	0.017	70	0.95	5	219.1	10	167.3	10	167.3	8	5	219.1	8	8	0	12	0.05	0.68	0.04	4.4	3	0.8	10	2	1/5	
1/5	1.8 m lintel	0.023	70	0.95	5	219.1	10	167.3	10	167.3	10	5	219.1	11	11	0	14	0.04	0.6	0.05	7.1	3	0.8	11	3	11/1	
1/6	1.8 m lintel	0.031	70	0.95	5	219.1	10	167.3	10	167.3	14	5	219.1	15	15	0	15	0.05	0.65	0.06	7.1	3	0.8	12	3	1/7	
1/7	1.8 m lintel	0.029	70	0.95	5	219.1	10	167.3	10	167.3	13	5	219.1	14	14	0	17	0.05	0.74	0.06	7.1	3	0.8	14	3	1/8	
1/8	1.8 m lintel	0.02	70	0.95	5	219.1	10	167.3	10	167.3	9	5	219.1	10	10	0	13	0.04	0.69	0.05	6.8	3	0	0	14	1/11	
1/9	NODE	0	0						0	0	0	0	0	0	0	0	0				6.6			0	0		DIRECT CONNECTION
1/10	NODE	0	0						0	0	0	0	0	0	0	0	0				6.2			0	0		DIRECT CONNECTION
1/11	1.8 m lintel	0.011	70	0.95	5	219.1	10	167.3	10	167.3	5	5	219.1	5	5	0	19	0.05	0.76	0.06	6	3	0	-150	169	1/16	
1/12	NODE	0	0						0	0	0	0	0	0	0	0	0				5.8			0	0		DIRECT CONNECTION
1/13	NODE	0	0						0	0	0	0	0	0	0	0	0				5.6			0	0		DIRECT CONNECTION
1/14	NODE	0	0						0	0	0	0	0	0	0	0	0				5.1			0	0		DIRECT CONNECTION
1/15	NODE	0	0						0	0	0	0	0	0	0	0	0				5			0	0		DIRECT CONNECTION
1/16	1.8 m lintel	0.022	70	0.95	5	219.1	10	167.3	10	167.3	10	5	219.1	11	11	0	180	0.1	2.57	0.18	5	3	0.8	91	89	1/19	
1/17	NODE	0	0						0	0	0	0	0	0	0	0	0				5			0	0		DIRECT CONNECTION
1/18	NODE	0	0						0	0	0	0	0	0	0	0	0				5.5			0	0		DIRECT CONNECTION
1/19	1.8 m lintel	0	0						0	0	0	0	0	0	0	0	89	0.08	1.84	0.13	6.1	3	0.8	57	32	1/22	
1/20	NODE	0	0						0	0	0	0	0	0	0	0	0				6.5			0	0		DIRECT CONNECTION
1/21	NODE	0	0						0	0	0	0	0	0	0	0	0				7.3			0	0		DIRECT CONNECTION
1/22	1.8 m lintel	0.094	70	0.95	5	219.1	10	167.3	10	167.3	41	5	219.1	46	46	0	78	0.08	1.67	0.12	7.3	3	0.8	52	25	1/24	
1/23	NODE	0	0						0	0	0	0	0	0	0	0	0				7.3			0	0		DIRECT CONNECTION
1/24	1.8 m lintel	0.012	70	0.95	5	219.1	10	167.3	10	167.3	5	5	219.1	6	6	0	31	0.06	1.11	0.08	6.5	3	0	-275	307	LOST	
1/25	1.8 m lintel	0.089	70	0.95	5	219.1	10	167.3	10	167.3	39	5	219.1	44	44	0	548	0.14	3.86	0.34	6.2	3	0.8	189	359	LOST	
1/26	2.4 m lintel sag																										EXISTING PIT
2/1	GSIP 900x900 SAG	0.678	40	0.95	5	219.1	10	167.3	10	167.3	299	5	219.1	274	299	0	299	0.22			5.6		0.5	299	0		
2/2	1.8 m lintel																										EXISTING END CAP
3/10	1.8 m lintel	0.071	70	0.95	5	219.1	10	167.3	10	167.3	31	5	219.1	35	35	0	224	0.06	4.83	0.09	1.6	3	0.8	105	119	3/11	
3/11	1.8 m lintel	0.108	70	0.95	5	219.1	10	167.3	10	167.3	48	5	219.1	53	53	0	203	0.1	2.59	0.2	6	3	0	-302	504	1/25	
4/1	GSIP 900x900 SAG	0.116	20	0.95	5	219.1	10	167.3	10	167.3	51	5	219.1	40	51	0	51	0.07			6.8		0.5	51	0		
4/2	2.4 m lintel sag	0.061	70	0.95	5	219.1	10	167.3	10	167.3	27	5	219.1	30	30	0	172	0.06			1.8	4	0.5	28	144	3/10	
7/1	1.8 m lintel	0.053	70	0.95	5	219.1	10	167.3	10	167.3	23	5	219.1	26	26	0	86	0.08	1.89	0.12	5	3	0.8	55	31	3/11	
8/1	1.8 m lintel	0.151	70	0.95	5	219.1	10	167.3	10	167.3	67	5	219.1	74	74	0	126	0.09	1.78	0.18	6.7	2.9	0.8	66	60	7/1	
9/1	1.8 m lintel	0.172	70	0.95	5	219.1	10	167.3	10	167.3	76	5	219.1	85	85	0	115	0.08	2.07	0.15	7.4	2.9	0.8	63	52	8/1	
10/1	GSIP 5x900x900	0	0						0	0	0	0	0	0	0	0	0	0					0.5	0	0		DAM 8 OUTLET
10/2	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	0							0	0		
10/3	1.8 m lintel	0.213	70	0.95	5	219.1	10	167.3	10	167.3	94	5	219.1	105	105	0	105	0.08	1.86	0.15	8	3	0.8	65	40	10/4	
10/4	1.8 m lintel	0.215	70	0.95	5	219.1	10	167.3	10	167.3	95	5	219.1	106	106	0	145	0.09	2.2	0.17	7	3	0	-752	898	10/5	
10/5	1.8 m lintel	0.109	70	0.95	5	219.1	10	167.3	10	167.3	48	5	219.1	53	53	0	951	0.15	4.02	0.56	5	3	0	-256	1207	10/6	
10/6	1.8 m lintel	0.114	70	0.95	5	219.1	10	167.3	10	167.3	50	5	219.1	56	56	0	1263	0.15	4.02	0.75	5	3	0	-329	1592	10/7	
10/7	2.4 m lintel sag	0.135	70	0.95	5	219.1	10	167.3	10	167.3	59	5	219.1	66	66	0	2189	0.04			1.4	2.5	0	-84	2272	LOST	
10/8	1.8 m lintel	0.06	70	0.95	5	219.1	10	167.3	10	167.3	27	5	219.1	30	30	0	44	0.07	1.65	0.07	2.7	3	0.8	30	14	LOST	
10/9	GPT	0	0						0	0	0	0	0	0	0	0	0							0	0		
10/10	H.W.																										
11/1	1.8 m lintel	0.173	70	0.95	5	219.1	10	167.3	10	167.3	76	5	219.1	85	85	0	88	0.08	1.77	0.13	7.1	3	0.8	57	30	9/1	
12/1	1.8 m lintel	0.081	70	0.95	5	219.1	10	167.3	10	167.3	36	5	219.1	40	40	0	40	0.07	1.53	0.07	2.8	3	0.8	29	10	LOST	
13/1	1.8 m lintel	0.117	70	0.95	5	219.1	10	167.3	10	167.3	52	5	219.1	58	58	0	58	0.07	1.37	0.11	8	10.6	0.8	42	16	21/1	
14/1	GSIP 5x900x900	0	0						0	0	0	0	0	0	0	0	0	0.03					0	-2239	2239	14/2	DAM 7 OUTLET
14/2	JP GRATED 900 x 900	0	0						0	0	0	0	0	0	0	0	2239	0.01	5.2	0.82		20	0.8	1791	448	14/3	
14/3	JP GRATED 900 x 900	0	0						0	0	0	0	0	0	0	0	448	0.04	7.81	0.1		7.6	0.8	358	90	14/4	
14/4	GSIP 900x900	0.648	40	0.95	5	219.1	10	167.3	10	167.3	286	5	219.1	262	286	0	376	0	0.19	3.68			0.8	0	376	14/5	SURCHARGE PIT
14/5	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	376	0.03	9.72	0.06			0	-1877	2253	14/6	
14/6	JP GRATED 900 x 900	0.414	50	0.95	5	219.1	10	167.3	10	167.3	183	5	219.1	179	183	0	2436	0.01	0.03	141.1	4.9	-2.2	0.134	326	2110	14/7	
14/7	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	2110	0.07	8.6	0.38	0.1	-33.3	0.8	0	2110	14/8	
14/8	GSIP 900x900 SAG	0.268	50	0.95	5	219.1	10	167.3	10	167.3	118	5	219.1	116	118	0	2229	0.6			0.1		0.5	2229	0		
14/9	2.4 m lintel sag	0.138	70	0.95	5	219.1	10	167.3	10	167.3	61	5	219.1	68	68	0	352	0.2			0.1	3	0.5	231	121	14/10	
14/10	2.4 m lintel sag	0.14	70	0.95	5	219.1	10	167.3	10	167.3	62	5	219.1	69	69	0	199	0.15			0.1	3	0.5	140	59	14/11	
14/11	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	59	0.05	0.96	0.12				59	0	14E/1	DISCHARGE CONTROL PIT WITH 375 ORIFICE
14E/1	H.W.																										
14D/1	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	0							0	0		
14D/2	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	0						0.8	0	0	14D/3	~~SURCHARGE PIT~~ 20130299SW72
14D/3	GSIP 900x900	0	0						0	0	0	0	0	0	0	0	0					25	0.8	0	0	LOST	~~SURCHARGE PIT~~ 20130299SW72
14L/1	JP GRATED 600 x 900	0	0						0	0	0	0	0	0	0	0	0						0.8	0	0	14D/2	
14X/1	JP SEALED 900 x 900	0	0						0	0	0	0	0	0	0	0	0							0	0		

C

SUBDIVISION WORKS CERTIFICATE

Certificate No. 20130299SW72
Date of Issue 03/03/2022
Issuing Officer D Reshi

Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 03/03/2022

WORK AS EXECUTED SHOWN IN RED
SIGNATURE..... PR .....
VINCE MORGAN SURVEYORS PTY LTD
DATE: 05/03/22 REF:16800

	AMENDMENT	DES	DRN	CKD	APR	DATE
C	DRAINAGE LINE 14 REDESIGN	MP	MP	JB	MS	25/02/22
B	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
A	ISSUE FOR CLIENT REVIEW	MP	NA	MP	RO	26/04/21

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
DRAINAGE CALCULATIONS
SHEET 7

PROJECT No: 110185-12
SHEET No: CC1417

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1417 | C

Plotted: 25 February, 2022 1:47:00 PM File Name: J:\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1417.dwg

WORK AS EXECUTED SHOWN IN RED

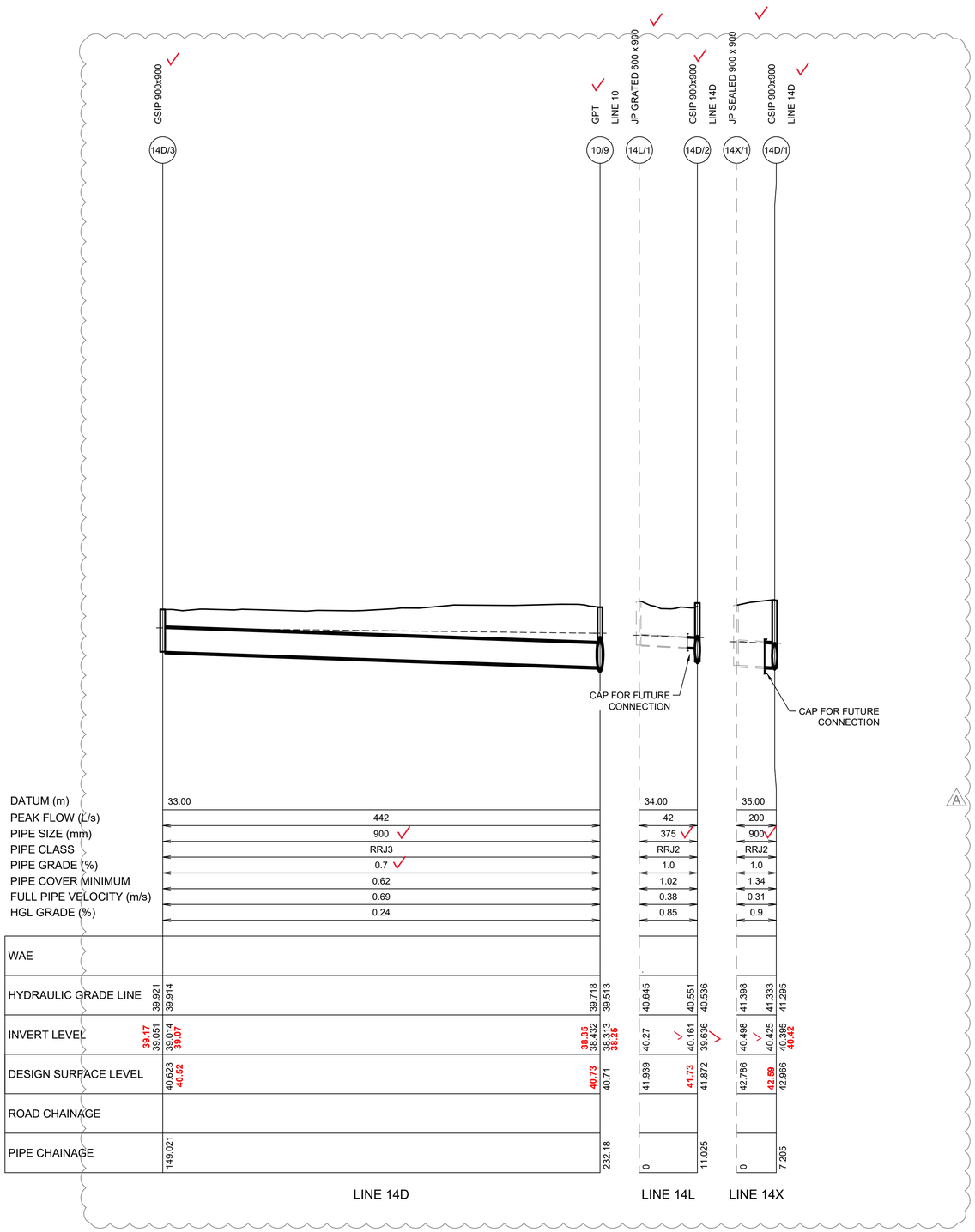
SIGNATURE.....

VINCE MORGAN SURVEYORS PTY LTD

DATE: 05/03/22 REF:16800

DESIGN STORM 1:100yr ARI HYDRAULIC RESULTS

PIPE NAME	PIPE TYPE	PIPE DIAMETER	PIPE LENGTH	PIPE SLOPE	PIPE AREA Af	FULL AREA TIME Tc	FULL AREA INTENSITY I	FULL AREA SUM CA	FULL AREA FLOW Qc	PART-AREA TIME Tc	PART-AREA INTENSITY I	PART-AREA SUM CA	PART-AREA FLOW Qc	DIRECT PIPE FLOW Qp	PEAK FLOW Qrat	NET BYPASS FLOW Qb	PIPE FLOW Q	FLOW CAP. Qcap	Q/Qcap RATIO	FULL PIPE VELOCITY	NORM. DEPTH VELOCITY	CRIT. DEPTH VELOCITY	U/S PIT GRATE RL	PIPE U/S IL	PIPE D/S IL	PIPE D/S DROP	U/S PIT Ku	U/S PIT Kw	PIPE V'HEAD	PIT LOSS (Ku.V'head)	WSE LOSS (Kw.V'head)	TOTAL PIPE LOSS	U/S PIT HGL	U/S PIPE HGL	D/S PIPE HGL	HGL GRADE	MIN. COVER	U/S FREEBOARD	COMMENTS
(-)	(-)	(mm)	(m)	(%)	(sq.m)	(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)	(m)	(m)	(m)	(-)	(-)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(%)	(m)	(m)	
1/1 to 1/2	RRJ2	375	30.84	4.51	0.11	10	167.3	0.107	49.7	5	219.1	0.09	55.3	0	55.3	-16.8	38.6	403.4	0.1	0.35	2.3	1.01	62.566	61.058	59.668	0.05	4.5		0.01	0.03	0.03	1.27	61.461	61.433	60.163	4.12	1.06	1.11	
1/2 to 1/3	RRJ2	375	8.15	1.25	0.11	10.22	165.9	0.254	116.9	5.22	215.9	0.22	130	0	130	-34.8	95.2	212.5	0.45	0.86	1.87	1.36	61.117	59.618	59.516	0.05	4.5		0.04	0.17	0.17	0.06	60.163	59.993	59.936	0.7	1.14	0.95	
1/3 to 1/4	RRJ2	375	13.79	7.23	0.11	10.3	165.4	0.293	134.7	5.3	214.9	0.25	149.6	0	149.6	-38.9	110.7	511.1	0.22	1	3.69	1.45	61.04	59.466	58.469	0.051	1.85	2.3	0.05	0.09	0.12	0.92	59.959	59.841	58.923	6.66	1.13	1.08	
1/4 to 1/5	RRJ2	375	30.09	6.15	0.11	10.36	165	0.309	141.8	5.36	214.1	0.26	157.2	0	157.2	-37.3	119.9	471.4	0.25	1.09	3.56	1.5	59.98	58.419	56.567	0.03	2.15	2.51	0.06	0.13	0.15	1.25	58.945	58.794	57.547	4.14	1.1	1.04	
1/5 to 1/6	RRJ2	375	8.54	2.83	0.11	10.5	164.1	0.526	240	5.5	212.1	0.45	266	0	266	-37.6	228.4	319.7	0.71	2.07	3.14	2.17	58.017	56.537	56.296	0.05	1.54	1.66	0.22	0.34	0.36	0.12	57.574	57.212	57.089	1.44	1.1	0.44	
1/6 to 1/7	RRJ2	375	46	7.06	0.11	10.54	163.8	0.556	252.9	5.54	211.5	0.48	280	0	280	-40.6	239.4	504.8	0.47	2.17	4.51	2.25	57.804	56.246	53	0.05	1.95	2.18	0.24	0.47	0.52	2.84	57.144	56.621	53.777	6.18	1.06	0.66	
1/7 to 1/8	RRJ2	375	47.91	6.89	0.11	10.71	162.8	0.747	337.7	5.5	212.1	0.64	374.1	0	374.1	-68.6	305.4	498.9	0.61	2.77	4.74	2.8	54.543	52.95	49.647	0.031	1.16	1.32	0.39	0.45	0.51	2.13	53.839	53.325	51.192	4.45	1.1	0.7	
1/8 to 1/9	RRJ2	375	9.42	7	0.11	10.88	161.7	0.929	417.4	5.66	209.9	0.79	462.2	0	462.2	-100.6	361.7	502.7	0.72	3.27	4.95	3.29	51.192	49.617	48.958	0	0.97	1.17	0.55	0.53	0.64	0.34	51.18	50.537	50.196	3.62	1.09	0.01	
1/9 to 1/10	RRJ2	375	11.26	7	0.11	10.91	161.5	0.977	438.3	5.69	209.4	0.83	485.4	0	485.4	-100.6	384.8	502.7	0.77	3.48	5.01	3.49	50.603	48.958	48.17	0	0		0.62	0	0	0.46	50.196	50.196	49.734	4.1	1.23	0.41	
1/10 to 1/11	RRJ2	375	6.69	7	0.11	10.95	161.2	1.019	456.4	5.73	208.9	0.87	505.3	0	505.3	-100.6	404.7	502.7	0.8	3.66	5.06	3.67	49.875	48.17	47.702	0.046	0		0.69	0	0	0.3	49.734	49.734	49.431	4.54	1.29	0.14	
1/11 to 1/12	RRJ2	375	6.29	5	0.11	10.97	161.1	1.172	524.6	5.75	208.6	1	581.9	0	581.9	-264.2	317.7	424.9	0.75	2.88	4.22	2.9	49.431	47.657	47.342	0	1.13	1.28	0.42	0.48	0.54	0.2	48.572	48.032	47.83	3.2	1.29	0.86	
1/12 to 1/13	RRJ2	375	13.2	5	0.11	11	160.9	1.213	542.4	5.78	208.2	1.04	601.6	0	601.6	-264.2	337.4	424.9	0.79	3.05	4.27	3.07	49.063	47.342	46.682	0	0		0.48	0	0	0.42	47.83	47.83	47.414	3.15	1.2	1.23	
1/13 to 1/14	RRJ2	375	13.49	5	0.11	11.05	160.6	1.255	560	5.83	207.5	1.08	620.6	0	620.6	-264.2	356.4	424.9	0.84	3.23	4.31	3.24	48.289	46.682	46.008	0	0		0.53	0	0	0.47	47.414	47.414	46.939	3.52	1.15	0.88	
1/14 to 1/15	RRJ2	375	13.43	5	0.11	11.1	160.3	1.296	577.1	5.88	206.8	1.11	639	0	639	-264.2	374.8	424.9	0.88	3.39	4.34	3.4	47.57	46.008	45.336	0	0		0.59	0	0	0.52	46.939	46.939	46.417	3.89	1.15	0.63	
1/15 to 1/16	RRJ2	375	7.66	5	0.11	11.15	159.9	1.336	593.5	5.93	206.1	1.15	656.7	0	656.7	-264.2	392.5	424.9	0.92	3.55	4.36	3.56	46.897	45.336	44.953	0.075	0		0.64	0	0	0.33	46.417	46.417	46.09	4.27	1.15	0.48	
1/16 to 1/17	RRJ2	450	5.89	5.8	0.16	11.18	159.8	1.407	624.2	5.96	205.7	1.21	690.8	0	690.8	-154.7	536.1	744.2	0.72	3.37	5.09	3.39	46.514	44.878	44.537	0	0.91	0.98	0.58	0.53	0.57	0.18	46.132	45.565	45.387	3.01	1.08	0.38	
1/17 to 1/18	RRJ2	450	13.58	5.8	0.16	11.2	159.6	1.448	642.3	5.98	205.4	1.25	710.9	0	710.9	-154.7	556.2	744.2	0.75	3.5	5.13	3.51	46.219	44.536	43.749	0	0		0.62	0	0	0.44	45.387	45.387	44.948	3.24	1.19	0.83	
1/18 to 1/19	RRJ2	450	7.76	5.8	0.16	11.25	159.4	1.488	658.7	6.03	204.8	1.28	729	0	729	-154.7	574.3	744.2	0.77	3.61	5.16	3.63	45.66	43.749	43.299	0.15	0		0.67	0	0	0.27	44.948	44.948	44.68	3.45	1.36	0.71	
1/19 to 1/20	RRJ2	600	5.87	7	0.28	11.27	159.2	3.217	1422.6	5.88	206.8	2.74	1572.1	0	1572.1	-570.9	1001.2	1760.7	0.57	3.54	6.42	3.58	45.054	43.149	42.738	-0.007	1.45	1.61	0.64	0.93	1.03	0.4	44.782	43.749	43.345	6.88	1.19	0.27	
1/20 to 1/21	RRJ2	600	13.52	7	0.28	11.29	159.1	3.259	1440.5	5.89	206.6	2.77	1591.7	0	1591.7	-570.9	1020.9	1760.6	0.58	3.61	6.45	3.64	44.682	42.745	41.799	0	0		0.67	0	0	0.64	43.345	43.345	42.708	4.71	1.29	1.34	
1/21 to 1/22	RRJ2	600	7.39	7	0.28	11.32	158.9	3.3	1456.2	5.85	207.1	2.8	1608.2	0	1608.2	-570.9	1037.3	1760.6	0.59	3.67	6.48	3.7	43.739	41.799	41.281	0.05	0		0.69	0	0	0.18	42.708	42.708	42.529	2.43	1.29	1.03	
1/22 to 1/23	RRJ2	600	6.42	5.7	0.28	11.34	158.8	3.389	1494.4	6.12	204	2.91	1651.1	0	1651.1	-564.6	1086.5	1588.8	0.68	3.84	6.05	3.87	43.197	41.231	40.865	0	0.38		0.75	0.29	0.29	0.17	42.529	42.244	42.073	2.67	1.22	0.67	
1/23 to 1/24	RRJ2	600	15.58	5.7	0.28	11.36	158.6	3.431	1511.9	6.14	203.8	2.95	1670.8	0	1670.8	-564.6	1106.3	1588.8	0.7	3.91	6.07	3.93	42.727	40.865	39.977	0.05	0		0.78	0	0	0.43	42.073	42.073	41.642	2.76	1.1	0.65	
1/24 to 1/25	RRJ2	600	9.52	4.41	0.28	11.4	158.4	3.484	1532.8	6.18	203.4	3	1694.2	0	1694.2	-845.6	848.5	1397.9	0.61	3	5.18	3.08	41.642	39.927	39.507	0.076	0.9		0.46	0.41	0.41	0.15	41.609	41.196	41.041	1.63	1.09	0.03	
1/25 to 1/26	RRJ3	675	28.9	4.32	0.36	11.43	158.2	3.568	1567.8	6.21	203.1	3.07	1733.8	0	1733.8	-700.4	1033.4	1893.8	0.55	2.89	5.41	3.01	41.317	39.432	38.183	0	1.81	1.95	0.43	0.77	0.83	0.37	41.103	40.272	39.9	1.29	1.1	0.21	
2/1 to 2/2	RRJ2	375	12.04	3.13	0.11	10	167.3	0.644	299.5	5	219.1	0.45	274.5	0	299.5	0	299.5	335.9	0.89	2.71	3.44	2.74	39.929	38.949	38.573	1.242	4.5		0	0	0	0	40	40	40	0	0.59	-0.07	
3/9 to 3/10	RRJ2	450	21.46	3.71	0.16	10.71	162.8	1.39	628.7	5.49	212.2	1.19	699.3	0	699.3	-186.5	512.8	595.5	0.86	3.22	4.21	3.25	46.752	44.922	44.125	0.075	0.64		0.53	0.34	0.34	0.59	46.399	46.058	45.467	2.75	1.1	0.35	
3/10 to 3/11	RRJ2	525	14.24	3.87	0.22	10.8	162.2	1.627	733.1	5.58	211	1.37	800.2	0	800.2	-118.8	681.4	916.7	0.74	3.15	4.64	3.19	45.838	44.05	43.499	0.05	0.86		0.25	0.21	0.21	0.15	45.467	45.252	45.101	1.06	1.23	0.37	
3/11 to 1/19	RRJ2	525	8.04	2.8	0.22	10.85	161.9	1.729	777.6	5.63	210.3	1.45	849.3	0	849.3	-473.2	376.2	779.9	0.48	1.74	3.57	2.05	45.101	43.449	43.224	0.075	1.57	1.63	0.15	0.24	0.25	0.05	44.983	44.732	44.68	0.65	1.14	0.12	
4/1 to 4/2	RRJ2	375	8.25	1	0.11	10	167.3	0.111	51.4	5	219.1	0.07	40.4	0	51.4	0	51.4	190	0.27	0.47	1.46	1.11	45.467	44.396	44.314	0.031	4.5		0	0	0	0	45.467	45.467	45.467	0	0.77	0	
4/2 to 3/10	RRJ2	375	8.37	1	0.11	10.09	166.7	0.169	78.2	10	167.3	0.17	78.1	0	78.2	-2.2	76	190	0.4	0.69	1.62	1.26	45.747	44.284	44.2	0.151	4.5		0	0	0	0	45.467	45.467	45.467	0	1.12	0.28	
7/1 to 1/16	RRJ2	375	9.2	3.45	0.11	10	167.3	0.05	23.2	5	219.1	0.04	25.8	0	25.8	29.1	54.9	352.9	0.16	0.5	2.32	1.13	46.74	45.27	44.953	0.075	4.5		0.01	0.06	0.06	0.01	46.155	46.098	46.09	0.08	1.09	0.59	
8/1 to 1/11	RRJ2	375	9.01	5	0.11	10	167.3	0.143	66.5	5	219.1	0.12	74	0	74	-8.1	66	424.9	0.16	0.6	2.79	1.2	49.685	48.152	47.702	0.046	4.5		0.02	0.08	0.08	0.01	49.524	49.442	49.431	0.12	1.14	0.16	
9/1 to 1/8	RRJ2	375	10.88	4.93	0.11	10	167.3	0.164	76	5	219.1	0.14	84.6	0	84.6	-21.7	62.9	421.8	0.15	0.57	2.74	1.18	51.707	50.183	49.647	0.031	4.5		0.02	0.07	0.07	0.01	51.278	51.204	51.192	0.11	1.1	0.43	
10/1 to 10/2	RRJ2	900	84.15	2	0.64	5	219.1	0	0	5	219.1	0	0	4608	4608	0	4608	2772.2	1.66	7.24	7.24	7.25	54.4	52.417	50.737	0.051	4.5		0.17	0.76	0.76	0.29	54.4	53.637	53.343	0.35	0.99	0	
10/2 to 10/3	RRJ2	900	37.57	4.25	0.64	5.19	216.4	0	0	5.19	216.4	0	0	4608	4608	0	4608	4044.5	1.14	7.24	7.24	7.25	53.439	50.687	49.091	0.05	1.68	1.79	0.91	1.53	1.63	0.7	53.439	51.814	51.109	1.88	1.25	0	
10/3 to 10/4	RRJ2	900	52.2	7.77	0.64	10.08	166.8	0.314	145.6	5.08	218	0.27	162	4608	4770	-55.4	4714.6	5470.2	0.86	7.41	9.67	7.41	51.203	49.041	44.983	0.05	0.34	0.36	2.8	0.96	1.01	3.01	51.154	50.145	47.131	5.77	1.1	0.05	
10/4 to 10/5	RRJ2	900	29.41	5.08	0.64	10.17	166.3	0.685	316.5	5.09	217.8	0.58	351.8	4608	4959.8	-959.6	4000.3	4420.6	0.9	6.29	7.87	6.3	47.131	44.933	43.44	0.05	0.24	0.24	2.02	0.48	0.49	1.22	47.131	46.639	45.417	4.16	1.04	0	
10/5 to 10/6	RRJ2	900	26.71	5.14	0.64	10.23	165.9	0.788	363.2	5.15	216.9	0.67	403.5	4608	5011.5	-1269.2	3742.3	4449	0.84	5.88	7.83	5.89	45.417	43.39	42.017	0.05	0.2		1.77	0.35	0.35	0.97	45.417	45.064	44.092	3.64	1	0	
10/6 to 10/7	RRJ2	900	44.94	5	0.64	11.08	160.4	1.833	816.8	5.52	211.8	1.55	914.6	4608	5522.6	-1950.2	3572.4	4387.2	0.81	5.62	7.68	5.63	44.092	41.967	39.72	0.051	0.33	0.35	1.61	0.52	0.56	1.49	44.092	43.536	42.046	3.32	1.1	0	
10/7 to 10/8	RRJ2	1050	19.74	2.32	0.87	11.18	159.8	2.115	938.7	5.62	210.5	1.8	1051.6	4608	5659.6	-2148.8	3510.8	4507	0.78	4.05	5.75	4.15	42.046	39.67	39.212	0.031	0.37	0.42	0.84	0.31	0.35	0.28	41.974	41.625	41.347	1.41	1.27	0.07	
10/8 to 10/9	RRJ2	1050	41.96	2	0.87	11.24	159.4	3.095	1370.5	5.72	209	2.64	1531.8	4608	6139.8	-2286.1	3853.7	4185.4	0.92	4.45	5.48	4.51	42.216	39.182	38.343	0.031	0.71	0.79	1.01	0.72	0.8	0.71	41.427	40.629	39.917	1.7	1.27	0.79	
10/9 to 10/10	RRJ2	(2x)1200	21.26	1	2.26	11.36	158.6	3.095	1363.5	5.85	207.2	2.64	1518.8	5270	6788.8	-2286.1	4502.7	8550.1	0.53	1.99	3.79	2.71	40.71	38.313	38.1		2		0.2	0.4	0.4	0.26	39.917	39.513	38.723	3.71		0.79	
11/1 to 1/7	RRJ2	375	8.06	1.25	0.11	10	167.3	0.164	76.4	5	219.1	0.14	85	0	85	-27.7	57.3	212.5	0.27	0.52	1.63	1.15	54.614	53.139	53.038	0.089	4.5		0.01	0.06	0.06	0.01	53.846	53.785	53.777	0.09	1.12	0.77	
12/1 to 12/2	RRJ2	375	37.78	3.43	0.11	10	167.3	0.077	35.6	5	219.1	0.07	39.6	0	39.6	-10.3	29.3	351.8	0.08	0.27	1.93	0.93	41.411	39.868	38.573		4.5		0	0.02	0.02	0.24	40.259	40.243	40	0.64	1.1	1.15	
13/1 to 10/3	RRJ2	375	8	2	0.11	10	167.3	0.111	51.8	5	219.1	0.09	57.6	0	57.6	-15.7	41.9	268.7	0.16	0.38	1.77	1.04	51.226	49.776	49.616	0.576	4.5		0.01	0.03	0.03	0	51.146	51.113	51.109	0.05	1.1	0.08	
14/1 to 14/2	RRJ2	900	52.28	3.5	0.64	5	219.1	0	0	5	219.1	0	0	4498	4498	-2239.3	2258.7	3670.4	0.62	3.55	6.06	3.66	54.4	50.497	48.667	0.031	4.5		0.64	2.89	2.89	0.69	54.4	51.505	50.812	1.33	1.27	0	
14/2 to 14/3	RRJ2	900	22.83	4.42	0.64	10.91	161.5	0.267	120	5.91	206.4	0.23	132.5	4498	4630.5	-529.2	4101.3	4122.6	0.99	6.45	7.38	6.45	50.944	48.637	47.629	0.031	1.41	1.43	0.63	0.89	0.91	0.3	50.829	49.923	49.626	1.3	1.23	0.12	
14/3 to 14/4	RRJ2	900	26.23	4.83	0.64	10.96	161.2	0.41	183.5	5.38	213.7	0.34	203.9	4498	4701.9	-144.6	4557.3	4310.5	1.06	7.16	7.65	7.17	49.916	47.599	46.333	0.031	1.28	1.47	0.64	0.82	0.94	0.35	49.746	48.807	48.462	1.32	1.21	0.17	
14/4 to 14/5	RRJ2	900	32.09	5.5	0.64	11.02	160.8	1.101	491.9	10	167.3	1.1	509.2	4498	5007.2	-402	4605.2	4601.4	1	7.24	8.24	7.24	48.578	46.303	44.538	0.03	1.46	1.62	0.68	1	1.11	0.45	48.571	47.46	47.008	1.41	1.29	0.01	
14/5 to 14/6	RRJ2	900	29.7	5.32	0.64	11.18	159.8	1.697	753	6.18	203.4	1.41	797.3	4498	5295.3	-2480.8	2814.5	4526	0.62	4.42	7.5	4.46	47.008	44.508	42.928	0.031	0.62	0.71	1	0.62	0.71	0.61	47.006	46.293	45.681	2.06	1.5	0	
14/6 to 14/7	RRJ2	900	25.4	4.36	0.64	11.25	159.3	2.09	924.9	6.25	202.8	1.73	974.6	4498	5472.6	-2337.9	3134.8	4096.8	0.77	4.93	7.09	4.95	45.684	42.898	41.79	0.151	0.3		1.24	0.37	0.37	0.65	45.681	45.31	44.661	2.55	1.79	0	
14/7 to 14/8	RRJ2	1050	7.56	2.88	0.87	11.31	159	2.09	922.7	6.31	202.2	1.73	971.9	4498	5469.9	-2337.9	3132.1	5020	0.62	3.62	6.11	3.76	44.895	41.64	41.423	0.031	0.13		0.67	0.09	0.09	0.08	44.661	44.574	44.49	1.12	1.94	0.23	
14/8 to 14/9	RRJ2	1050	4.27	3	0.87	11.33	158.8	2.344	1034.2	6.33	202	1.94	1087.6	4498	5585.6	-227.6	5358	5126.1	1.05	6.19	6.71	6.2	44.5	41.393	41.265	0.031	1.6	1.75	0.07	0.11	0.12	0	44.5	44.379	44.374	0.12	1.98	0	
14/9 to 14/10	RRJ2	(2x)900	11	1.25	1.27	11.34	158.8	4.311	1901.3	5.71	209.1	3.56	2067.5	4498	6565.5	-263.8	6301.7	4387.2	1.44	4.95	4.95	4.98	44.517	41.235	41.097	0.031	0.71	0.82	0.02	0.01	0.01	0	44.376	44.362	44.359	0.03	2.39	0.14	
14/10 to 14/11	RRJ2	(2x)900	47.17	1.01	1.27	11.38	158.5	4.735	2085.3	5.7	209.3	3.91	2275.1	4498	6773.1	-249.6	6523.5	3944	1.65	5.13	5.13	5.15	44.517	41.067	40.591	0.03	0.32	0.34	1.05	0.34	0.36	1.02	44.376	44.021	43	2.16	0.79	0.14	
14/11 to 14E/1	RRJ2	900	8.66	0.5	0.64	11.53	157.5	4.735	2072.4	6.34	201.9	4.02	2254.9	4278	6532.9	-190.4	6342.5	1396.3	4.54	9.97	9.97	9.97	42.5	40.561	40.517		0		0	0	0	0	43	43	43	0	-0.48	-0.5	
14/11 to 14D/2	RRJ2	900	17.1	1	0.64	5	219.1	0	0	5	219.1	0	0	220	220	0	220	1962	0.11	0.35	2.04	1.38	42.5	40.566	40.395	0	2		0.01	0.01	0.01	0.07	41.479	41.466	41.392	0.44	0.97	1.02	
14D/2 to 14D/3	RRJ3	900	58.57	1	0.64	5.59	210.9	0	0	5.59	210.9	0	0	662	662	0	662	1962	0.34	1.04	2.78	1.93	42.1	39.636	39.051	0.037	0.48	0.54	0.06	0.03	0.03	0.51	40.566	40.536	40.026	0.87	0.54	1.53	
14D/3 to 10/9	RRJ3	900	83.16	0.7	0.64	5.94	206	0	0	5.94	206	0	0	662	662	0	662	1641.5	0.4	1.04	2.44	1.93	40.623	39.014	38.432	0.12	0.26	0.27	0.06	0.01	0.01	0.09	40.027	40.012	39.917	0.11	0.62	0.6	
14L/1 to 14D/2	RRJ2	375	11.03	0.99	0.11	5	219.1	0	0	5	219.1	0	0	42	42	0	42	188.6	0.22	0.38	1.37	1.04	41.63	40.27	40.161	0.526	0		0.01	0	0	0.08	40.645	40.645	40.563	0.75	1.02	0.98	
14X/1 to 14D/1	RRJ2	900	7.2	1	0.64	5	219.1	0	0	5	219.1	0	0	400	400	0	400	1964	0.2	0.63	2.42	1.64	42.786	40.498	40.425	0.031	0		0.02	0	0	0.01	41.398	41.398	41.392	0.08	1.34	1.39	
15/1 to 15/2	RRJ2	375	57.97	2.35	0.11	10	167.3	0.151	70.3	5	219.1	0.13	78.2	0	78.2	-28.7	49.5	291.5	0.17	0.45	1.97	1.09	44.941	43.362	41.998	0.031	4.5		0.01	0.05	0.05	0.23	43.783	43.737	43.511	0.39	1.14	1.16	
15/2 to 15/3	RRJ2	375	29.5	2.5	0.11	10.77	162.4	0.839	378.5	5.49	212.2	0.72	421.9	0	421.9	-198.2	223.7	300.5	0.74	2.03	2.98	2.14	43.511	41.968	41.23	0.03	1.75	2.06	0.21	0.37	0.43	0.41	43.395	42.964	42.556	1.39	1.1	0.12	
15/3 to 10/8	RRJ2	375	21.38	2.5	0.11	10.94	161.3	0.923	413.5	5.66	209.9	0.79	459.7	0	459.7	-138.1	321.6	300.5	1.07	2.91	3.04	2.94	42.713	41.2	40.666	1.484	1.38	1.5	0.43	0.6	0.65	0.61	42.609	41.959	41.347	2.87	1.12	0.1	
16/1 to 15/2	RRJ2	375	13.25	2	0.11	10	167.3	0.089	41.3	5	219.1	0.08	46	0	46	-14.6	31.3	268.7



SUBDIVISION WORKS CERTIFICATE

Certificate No. 201302995W72
Date of Issue 03/03/2022
Issuing Officer D. Restin
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 03/03/2022

WORK AS EXECUTED SHOWN IN RED
SIGNATURE.....
VINCE MORGAN SURVEYORS PTY LTD
DATE: 05/03/22 REF:16800

1:500 (AT A1)
1:1000 (AT A3)
10 0 10 20 30 40 50
METRES

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

A	DRAINAGE LINE 14 AMENDED	MP	MP	JB	MS	25/02/22
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL
THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
DRAINAGE LONGITUDINAL SECTIONS
SHEET 6

PROJECT No: 110185-12
SHEET No: C1427A

AZIMUTH: M.G.A. | DATUM: A.H.D. | ORIGIN: | PLAN No: 110185-12-CC1427A | A

Plotted: 25 February, 2022 1:55:04 PM File Name: J:\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1427A.dwg

SUBDIVISION WORKS CERTIFICATE

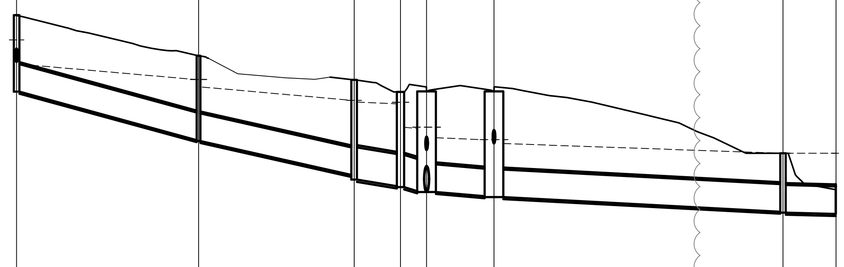
Certificate No. 20130299SW72
Date of Issue 03/03/2022
Issuing Officer D. Reshi
Accreditation No. BDC3367

These plans/specifications form part of the certificate issued 03/03/2022

WORK AS EXECUTED SHOWN IN RED

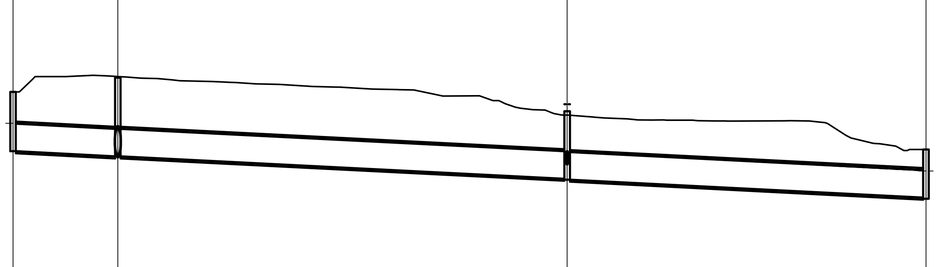
SIGNATURE.....

VINCE MORGAN SURVEYORS PTY LTD
DATE: 05/03/22 REF:16800



DATUM (m)	37.00						
PEAK FLOW (L/s)	2327	2560	2559	2617	3116	3212	2999
PIPE SIZE (mm)	900 ✓	900 ✓	1050 ✓	1050 ✓	(2x)900 ✓	(2x)900 ✓	900
PIPE CLASS	RRJ2	RRJ2	RRJ2	RRJ2	RRJ2	RRJ2	RRJ2
PIPE GRADE (%)	5.3 **5.2**	4.4 ✓	2.9 **3.4**	3.0 **1.4**	1.2 **1.0**	1.0 **0.8**	0.5
PIPE COVER MINIMUM	1.50	1.79	1.94	1.98	2.39	0.79	0.00
FULL PIPE VELOCITY (m/s)	3.66	4.02	2.95	3.02	2.45	2.52	4.71
HGL GRADE (%)	1.69	1.7	0.75	0.78	0.63	0.67	0
WAE							
HYDRAULIC GRADE LINE	46.1 45.408	44.908 44.66	44.227 44.169	44.113 43.344	43.311 43.007	42.938 42.816	42.5 42.5
INVERT LEVEL	**44.55** 44.538 **44.49** 44.508	**42.97** 42.928 **42.84** 42.898	**41.78** 41.79 **41.62** 41.64	41.423 41.393	**41.30** 41.265 **41.33** 41.235	**41.14** 41.097 **41.10** 41.067	**40.78** 40.591 **40.63** 40.631 40.517 40.517
DESIGN SURFACE LEVEL	**46.92** 47.008	**45.44** 45.684	**44.67** 44.895	44.5 **44.80**	44.517 **44.50**	44.517 **44.50**	42.5 **42.45** 41.49
ROAD CHAINAGE		539.20	564.59	400.59	400.63	400.63	
PIPE CHAINAGE	133.432	163.133	188.536	196.096	200.363	211.363	258.538 267.196

LINE 14



DATUM (m)	35.00		
PEAK FLOW (L/s)	200	400	442
PIPE SIZE (mm)	900 ✓	900 ✓	900 ✓
PIPE CLASS	RRJ2	RRJ2	RRJ3
PIPE GRADE (%)	1.0 **0.9**	1.0 ✓	1.0 **0.9**
PIPE COVER MINIMUM	0.97	1.11	0.54
FULL PIPE VELOCITY (m/s)	0.31	0.63	0.69
HGL GRADE (%)	0.78	1.01	1.05
WAE			
HYDRAULIC GRADE LINE	41.466 41.333	41.295 40.551	40.536 39.921
INVERT LEVEL	40.566 **40.63** **40.47** 40.395	40.395 **39.73** 39.666	39.638 **39.45** 39.051
DESIGN SURFACE LEVEL	42.5 **42.45**	42.966 **42.59**	41.872 **41.73** **40.52** 40.623
ROAD CHAINAGE			
PIPE CHAINAGE	0	17.101	90.45 149.021

LINE 14D

1:500 (AT A1)
1:1000 (AT A3)
10 0 10 20 30 40 50
METRES

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

	AMENDMENT	DES	DRN	CKD	APR	DATE
D	DRAINAGE LINE 14 AMENDED	MP	MP	JB	MS	25/02/22
C	AMENDMENTS TO DRAINAGE AND ROADS 51 & 52	MP	VS	RO	MS	21/07/21
B	ISSUE FOR CLIENT REVIEW	MP	NM	RO	MS	28/01/21
A	ISSUE FOR CLIENT REVIEW	MP	VS	RO	MS	13/01/21

J. WYNDHAM PRINCE
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PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 W www.jwprince.com.au E jwp@jwprince.com.au

CLIENT: REDBANK NORTH RICHMOND

STATUS: ISSUE FOR CONSTRUCTION APPROVAL

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REDBANK, NORTH RICHMOND
SOUTHERN HEIGHTS - PROMENADE
DRAINAGE LONGITUDINAL SECTIONS
SHEET 5

PROJECT No: 110185-12
SHEET No: CC1427

AZIMUTH: M.G.A. DATUM: A.H.D. ORIGIN: PLAN No: 110185-12-CC1427 D

Plotted: 25 February, 2022 1:54:16 PM File Name: J:\110185 - Redbank North Richmond Residential Precincts\12 - Stage 1 DA\CDC\CS\SOUTHERN HEIGHTS\1-PROM\110185-12-CC1427.dwg