Mildura and Irymple Stormwater Drainage Basins

Project Report

Mildura Rural City Council

Reference: 250641/354

Revision: 2

22 December 2017

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Bringing ideas to life

Document control record

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Current revision		**2**				

Approval			
Author signature		Approver signature	
Name		Name	
Title		Title	

Contents

Appendices

1 Introduction

Aurecon has been engaged by Mildura Rural City Council (MRCC) to assess the stormwater drainage basins required to service the new development areas within Irymple and Mildura South for the purpose of assisting with land acquisitions

The area and depths of the basins are established from the hydraulic modelling previously undertaken for these development areas.

The preliminary basin designs have been based on Lidar information provided by MRCC. The final basin configurations will be subject to further survey information and detailed design.

2 Inputs and Assumptions

The following models have been used to extract the information regarding the stormwater drainage basin volumes, depths and inlets and outlets

- Mildura South Model – Infoworks Modelling undertaken in 2013
- Irymple Drainage Model – Infoworks Modelling undertaken in 2013
- Benetook Avenue and Etiwanda Avenue – Drains Modelling undertaken in 2014

2.1 Infoworks Model Data

2.1.1 Rainfall Runoff Modelling

The fixed runoff model was used for runoff from impervious surfaces with a runoff coefficient of 1.0. The Horton infiltration model and SWMM routing model was used for modelling runoff from pervious areas with the following parameters:

- Soil type 3 (moderate runoff potential)
- Initial Infiltration rate = 250 mm/hr
- Ultimate Infiltration = 25.4 mm/hr
- Initial loss = 0.02m
- Runoff routing value (Manning's coefficient) for pervious areas = 0.2
- Runoff routing value (Manning's coefficient) for impervious areas = 0.012

Design storm events were developed for events with an Average Recurrence Interval (ARI) of 10, 20 and 100 years for durations varying from 0.5 hour to 72 hours, based on rainfall data derived in accordance with Australian Rainfall and Runoff guidelines

2.2 Drains Model Data

An ILSAX type hydrological model was developed for determining the rainfall runoff. The following parameters were input into the model:

- Soil type 2 (moderate infiltration potential)
- Paved (impervious) area depression storage = 2 mm
- Supplementary Area (not connected to the stormwater directly) depression storage = 5 mm
- Grassed (pervious) area depression storage = 10 mm
- Design storm events were developed for events with an ARI of 100 years, for durations ranging from 0.5 hour to 72 hours. The intensity patterns of the storms were based on Australian Rainfall and Runoff.

The design storms assessed include:

ARI	Storm Duration	Intensity
10 year	10 minute	78 mm/hr
	20 minute	55 mm/hr
	30 minute	43.8 mm/hr
	45 minute	34.4 mm/hr
	1 hour	34.4 mm/hr
	2 hours	17.5 mm/hr
	3 hour	13 mm/hr
	6 hour	7.8 mm/hr
	12 hour	4.69 mm/hr

ARI	Storm Duration	Intensity
100 year	10 minute	128.33 mm/hr
	20 minute	90 mm/hr
	30 minute	72 mm/hr
	45 minute	56 mm/hr
	1 hour	46.8 mm/hr
	2 hours	28.6 mm/hr
	3 hour	21.3 mm/hr
	6 hour	12.8 mm/hr

3 Stormwater Drainage Basins

The stormwater drainage basin layouts were modelled in Civil 3d to confirm area and depth required to achieve the necessary storage volume based on a 300mm freeboard. The 3d modelling is based on using Light Detection and Ranging (LIDAR) information provided by MRCC. It is recommended that detailed survey should be undertaken to confirm the basin levels.

Following stormwater drainage basins sites have been identified:

1. Deakin Basin – North West
2. Deakin Basin – South East
3. Etiwanda Basin
4. Delights Basin
5. Plane Tree basin
6. Calder Basin
7. Irymple Basin – South East
8. Irymple Basin – North West
9. Sandilong Basin – South East
10. Sandilong Basin – North West
11. Henderson Basin

Appendix A provides drawings showing the locality plan for all the above stormwater drainage basins.

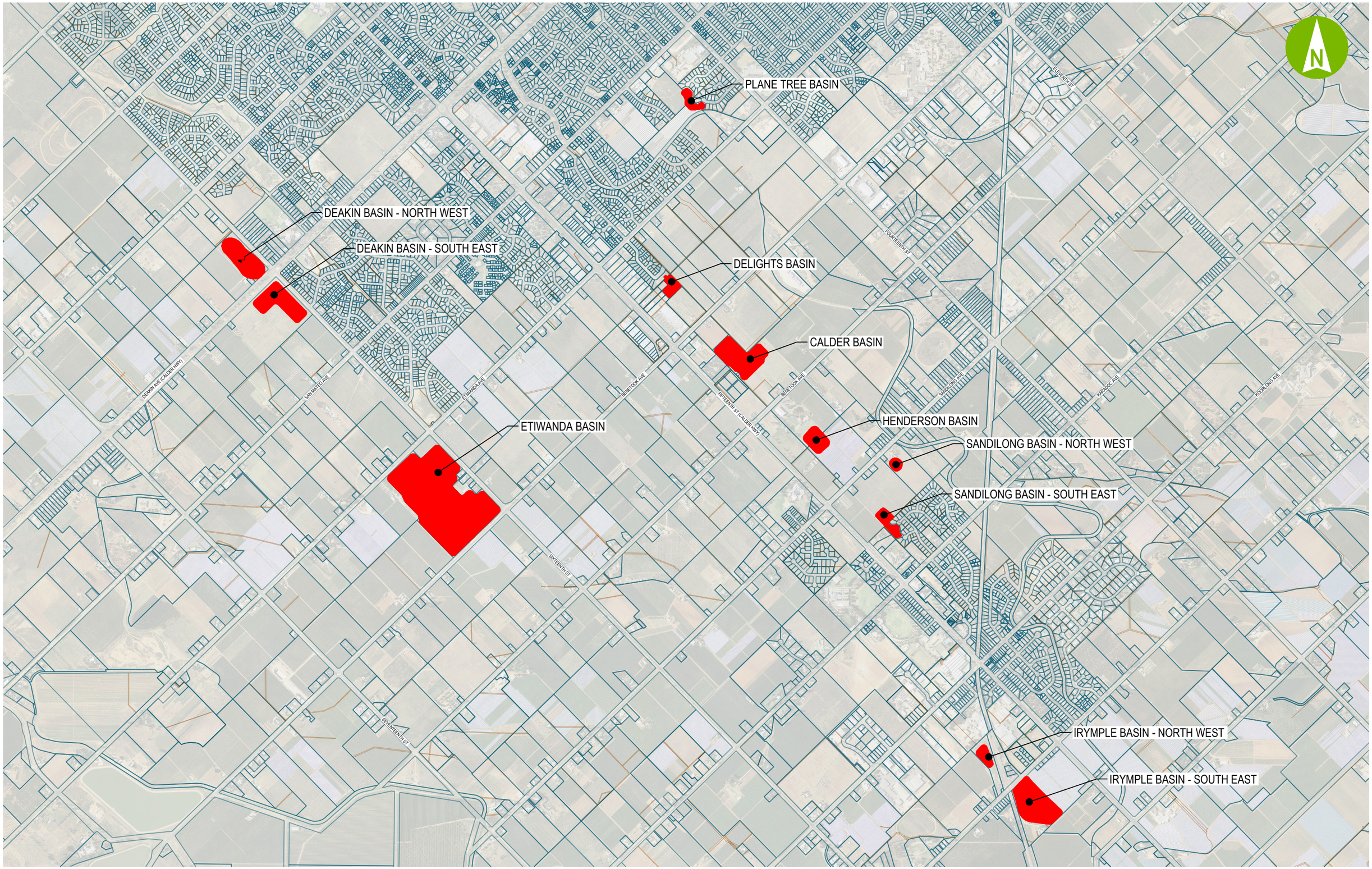
The following table summarises the area requirement for each of the above stormwater drainage basins. A site layout drawing for each basin is provided at Appendix B along with detailed design drawings for the basin and connecting pipe system for those sites where detailed designs have been previously prepared for Council.

Mildura and Irymple Stormwater Drainage Basins Summary Table

Stormwater Drainage Basin	Storage Volume (m^3)	Area (m^2)	Average Depth (m)	Inlet Pipe Diameter (mm)	Outlet Pipe Diameter (mm)	Inlet Pipe Invert Level (m)	Outlet Pipe Invert Level (m)
Deakin Basin – North West	28,000	21,650	2.5	2,100	1,050	40.800	41.000
Deakin Basin – South East	61,866	44,602	1.9	N/A (surcharge pipe)	1,050	N/A (surcharge pipe)	xxx
Etiwanda Basin	315,350	203,152	2.18	N/A	1,350	N/A	41.900
Delights Basin	32,325	7,500	3.7	2 x 1350	900	43.800	42.60
Plane Tree Basin	4,997	9,210	1.75	600	375	48.450 49.500	49.500
Calder Basin	111,500	41,613	3.85	1,650	Rising main	42.80	N/A
Irymple Basin – South East	41,520	46,765	1.92	TBC	900	TBC	42.500
Irymple Basin – North West	15,800	8,800	1.8	900,450 & 300	900	41.7	41.7
Sandilong Basin – South East	15,000	10,500	1.43	2x900	675	43.527	43.194
Sandilong Basin – North West	6,000	4,283	1.4	1200	525	46.474	46.20
Henderson Basin	30,305	14,932	3.5	2,250	1,200	42.280	42.280

A

DRAWING
LOCALITY PLAN



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REV	DATE	REVISION DETAILS	APPROVED
A	17.10.17	PRELIMINARY ISSUE	B.RIELLEY

SCALE	SIZE
NTS	A3

DRAWN: M.PENDLEBURY
DESIGNED:
REVIEWED:

PRELIMINARY
NOT FOR CONSTRUCTION

APPROVED
DATE

PROJECT: MILDURA AND IRYMPLE STORMWATER DRAINAGE BASIN

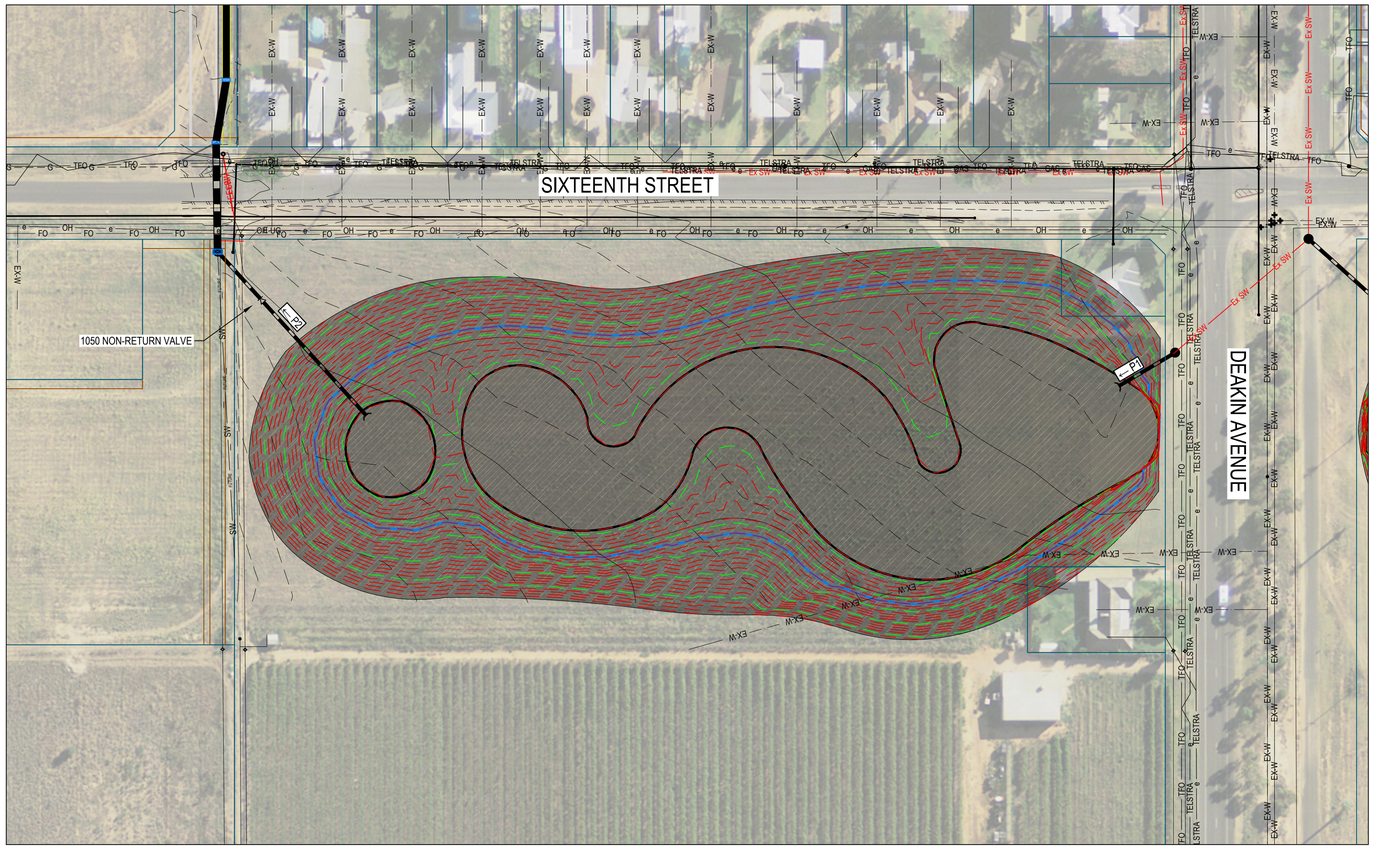
TITLE: BASIN LOCATIONS

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	250641	354	DRG	CC	000	A

B

DRAWINGS
SITE LAYOUT PLAN

Deakin Basin - North West



PLAN
1:1000

LEGEND

- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING PROPERTY PARCEL
- WATER EDGE
- Ex SW — EXISTING STORM WATER
- FUTURE SW — FUTURE STORMWATER

DEAKIN BASIN - NW	
STORAGE VOLUME	28000m3
AREA	21650m2
AVERAGE DEPTH	2.5m
INLET PIPE (P1)	2100Ø
INLET INVERT	40.800
OUTLET PIPE (P2)	1050Ø
OUTLET INVERT	41.000

Rev Date: 18/8/2017 12:16:02 PM Office: AUMOL Filename: P:\250641 MRCC\250641.354 MILDURA SOUTH DCP DRAINAGE ASSESSMENT\3 PROJECT DELIVERY\CAD\DRAWINGS\CIV\250641-351-DRG-200.DWG

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A	14.09.16	PRELIMINARY ISSUE	-

SCALE	SIZE
AS SHOWN	A1

DRAWN: C.TOTENHOFER
DESIGNED: H.SINGH
CHECKED:

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APPROVED
DATE

PROJECT: MILDURA SOUTH DCP DRAINAGE ASSESMENT

TITLE: DEAKIN BASIN - NORTH WEST

DRAWING No.: PROJECT No. 250641 – WBS 354 – TYPE DRG – DISC CC – NUMBER 200 – REV A

Deakin Basin - South East

PLAN
1:1000

LEGEND

- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING PROPERTY PARCEL
- WATER EDGE
- e — SW — EXISTING STORM WATER
- FUTURE — SW — FUTURE STORMWATER

DEAKIN BASIN - SE	
STORAGE VOLUME	61866m3
AREA	44602m2
AVERAGE DEPTH	1.9m
INLET PIPE (P1)	2100 Ø
INLET INVERT	N/A SURCHARGE BASIN
OUTLET PIPE (P2)	2100 Ø
OUTLET INVERT	N/A SURCHARGE BASIN

Plot Date: 27/10/2017 10:06:15 AM Office: AUMQL Filename: P:\250641 MRCC\250641-354 MILDURA SOUTH DCP DRAINAGE ASSESSMENT\3-PROJECT DELIVERY\CAD\DRAWING\SC\250641-351-DRG-200 DEAKIN BASINS.DWG

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SCALE	SIZE
AS SHOWN	A1

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DESIGNED: H.SINGH
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DATE

PROJECT: MILDURA SOUTH DCP DRAINAGE ASSESMENT

TITLE: DEAKIN AVE BASIN - SOUTH EAST

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
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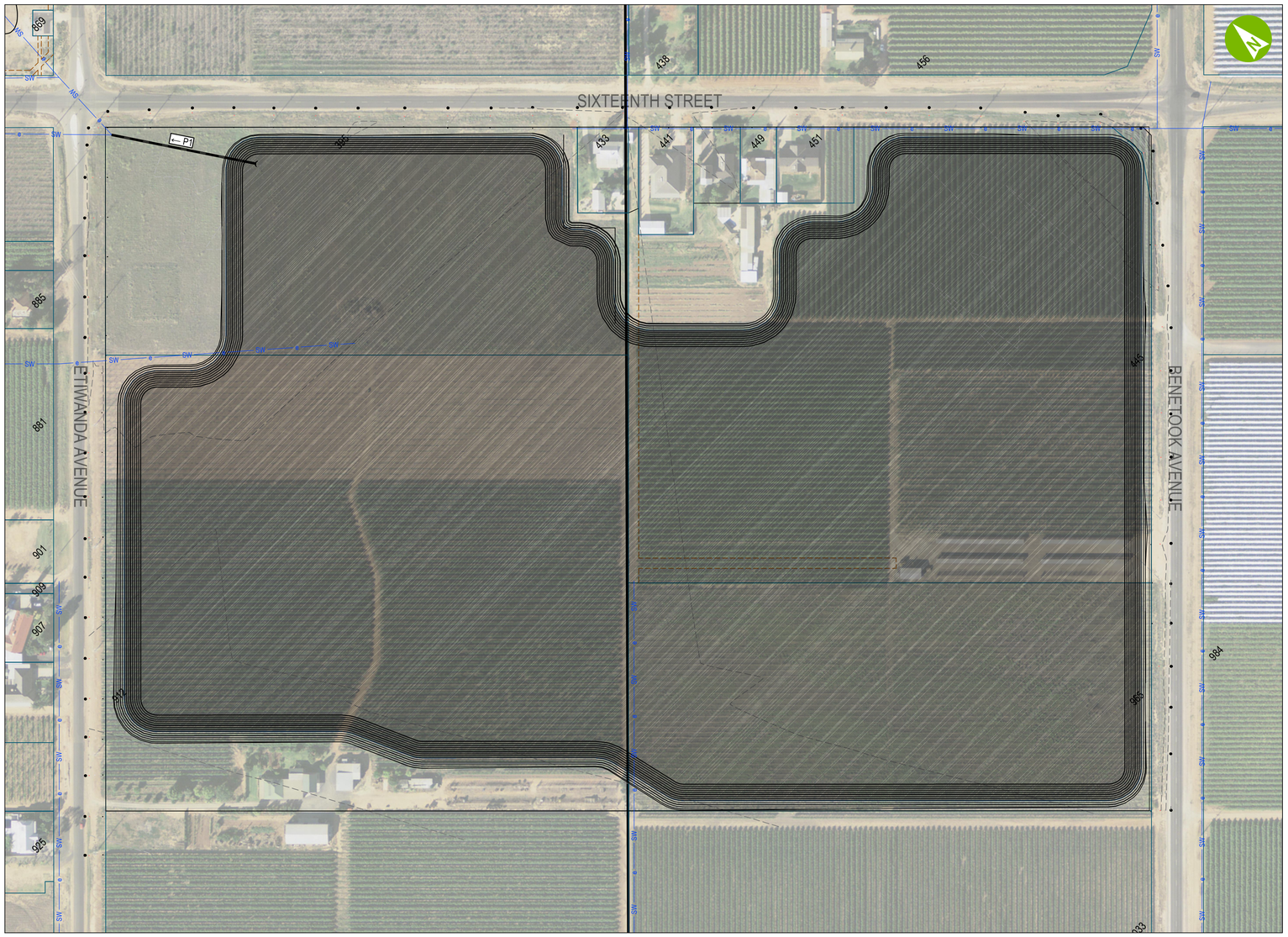
Etiwanda Basin



PLAN
1:1500

LEGEND

- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING PROPERTY PARCEL
- WATER EDGE
- EXISTING STORM WATER

ETIWANDA BASIN	
STORAGE VOLUME (WITH 0.150m FREEBOARD)	315350m3
FOOTPRINT AREA	203152m2
AVERAGE DEPTH	2.18m
INLET PIPE (P1)	1350Ø
INLET INVERT (P1)	N/A SURCHARGE BASIN
OUTLET PIPE (P1)	1350Ø
OUTLET INVERT (P1)	41.9

Rev Date: 27/10/2017 10:07:28 AM Office: AUMOL Filename: P:\250641 MRCC\250641-354 MILDURA SOUTH DCP DRAINAGE ASSESSMENT\3-PROJECT DELIVERY\CAD\DRAWINGS\CV\250641-151-DR5-600 ETIWANDA BASIN.DWG

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REV	DATE	REVISION DETAILS	APPROVED
A	07.12.16	PRELIMINARY ISSUE	-

SCALE	SIZE
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DESIGNED: H.SINGH
CHECKED:

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DATE

PROJECT: MILDURA SOUTH DCP DRAINAGE ASSESMENT

TITLE: ETIWANDA BASIN

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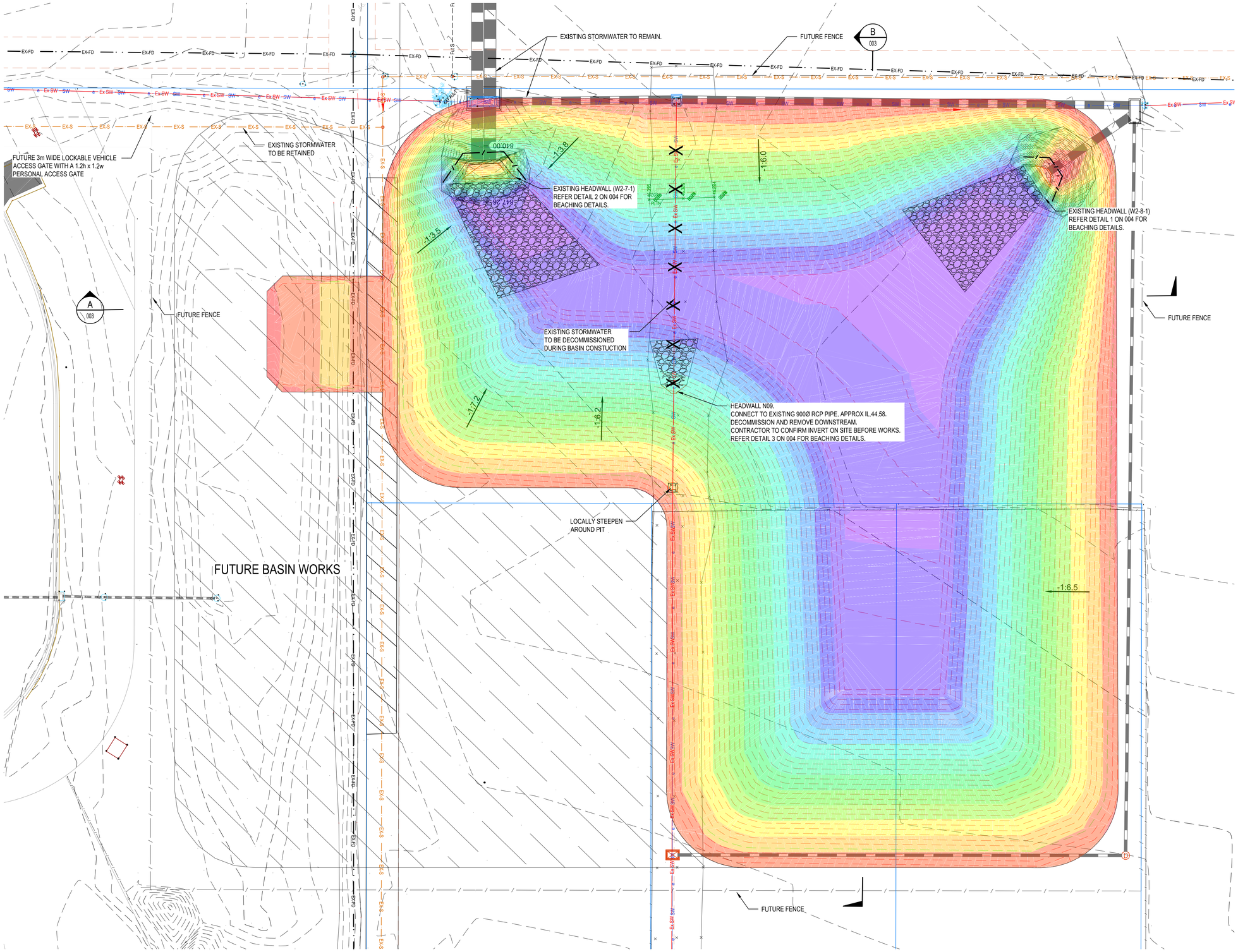
Delights Basin



LEGEND

- MAJOR DESIGN CONTOUR
- MINOR DESIGN CONTOUR
- EXTEND OF EXISTING ROCK BEACHING
- EXISTING FENCE
- PROPOSED 1.8m HIGH CYCLONE/WIRE MESH FENCE OR SIMILAR APPROVED
- PROPOSED 1.2m HIGH GALVANISED FENCE REFER TO DETAIL ON SHEET 004
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING IRRIGATION DRAINAGE
- EXISTING STORMWATER DRAINAGE TO BE DECOMMISSIONED
- PROPERTY BOUNDARY
- EXISTING STORMWATER PIPES
- AREA OF SEWER TO BE PROTECTED REFER TO DETAIL ON SHEET C06
- PROPOSED ROCK BEACHING
- EXISTING PITS
- PROPOSED HEAD WALL

DELIGHTS BASIN	
STORAGE VOLUME	32325m3
FOOTPRINT AREA	7500m2
AVERAGE DEPTH	3.7m
EXISTING INLET PIPE	2 x 1350Ø
EXISTING INLET INVERT	43.800
PROPOSED OUTLET PIPE	900Ø
PROPOSED OUTLET INVERT	42.6

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WARNING AND DISCLAIMER BEWARE OF UNDERGROUND SERVICES

The information provided in these drawings relating to the positions of underground services is intended to be only a guide for excavation works. Aurecon does not warrant or represent that the positions of those services shown on the drawings are accurate. Furthermore, services may exist of which Aurecon is unaware. The information provided should therefore not be relied upon and exact positions of services should be verified by hand excavation. Furthermore, Aurecon disclaims responsibility for damage or injury to any person caused directly or indirectly by any works affecting the services.

Dated: April 16

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D	29.01.15	FOR COMMENT	-
T0	11.02.15	TENDER ISSUE	-
T1	07.04.15	REVISED TENDER ISSUE	-
T2	15.12.15	REVISED TENDER ISSUE	-
T3	04.02.16	REVISED TENDER ISSUE	B.RIELLEY
0	19.04.16	CONSTRUCTION ISSUE	B.RIELLEY
T4	30.11.16	TENDER ISSUE	B.RIELLEY
1	12.05.17	ISSUE FOR CONSTRUCTION	B.RIELLEY

SCALE	SIZE
1:250	A1

DRAWN: C.TOTENHOFER
DESIGNED: M.MCCRANN
CHECKED: P.DePALMA

FOR CONSTRUCTION

APPROVED
DATE 07.04.16
Brett Rielley
B.RIELLEY

PROJECT: MILDURA SOUTH DCP DRAINAGE ASSESMENT

TITLE: DELIGHTS BASIN

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
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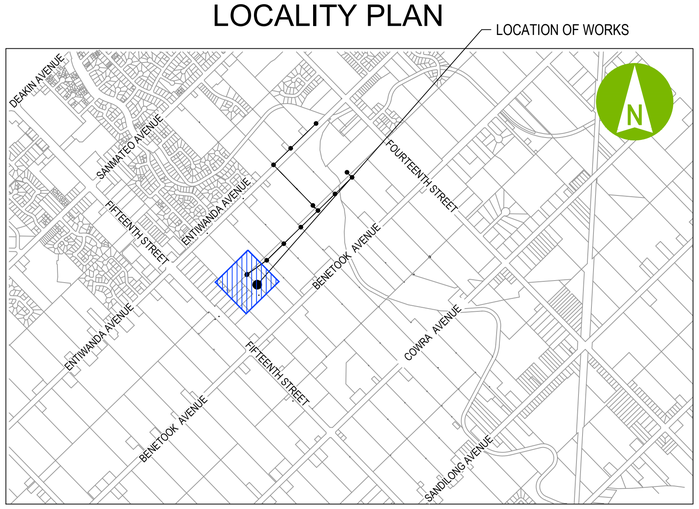
Mildura Rural City Council

ETIWANDA SPURLINE DRAINAGE BASIN

LOCALITY PLAN



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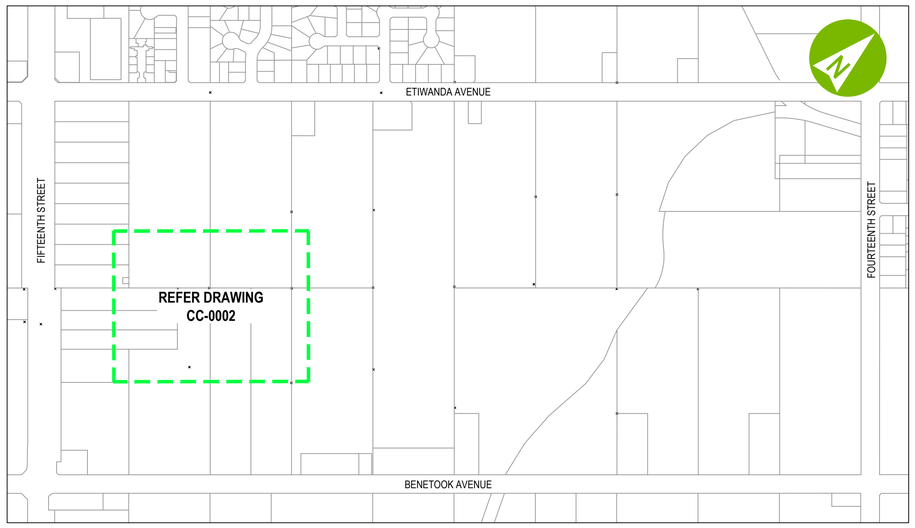

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GENERAL NOTES

1. THE CONTRACTOR SHALL CHECK ALL SERVICE LOCATIONS PRIOR TO COMMENCING WORK.

2. PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON THE SITE THE CONTRACTOR SHALL CONTACT THE RELEVANT AUTHORITIES TO ASCERTAIN THE POSSIBLE LOCATION OF FURTHER SERVICES AND DETAILED LOCATION AND DEPTH OF ALL SERVICES AND ARRANGE FOR THEIR RELOCATION WHERE NECESSARY.

3. THE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE SPECIFICATIONS ISSUED BY THE SUPERINTENDENT AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT.

4. ALL LEVELS ARE EXPRESSED IN METRES ABOVE AUSTRALIAN HEIGHT DATUM (AHD).

5. GRID COORDINATES ARE TO MAP GRID OF AUSTRALIA, ALL NORTH POINTS INDICATE TRUE NORTH.

6. THE DRAWINGS SHALL NOT BE SCALED.

7. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE (U.N.O.).

8. ALL RADII ARE EXPRESSED IN METERS (U.N.O.).

9. THE LOCATIONS OF ALL EXISTING SURFACE PITS, VALVE COVERS, ETC. SHOWN ON DRAWINGS HAVE BEEN REPRODUCED FROM SURVEY SUPPLIED BY AURECON AUSTRALIA. THE LOCATIONS OF UNDERGROUND SERVICES HAVE BEEN NOTED FROM EXISTING RECORDS. AS VARIATIONS WITH RECORDS MAY EXIST COMPLETE ACCURACY CANNOT BE GUARANTEED. ALL EXISTING SERVICES LOCATIONS SHALL BE VERIFIED ON SITE BY THE CONTRACTOR BEFORE COMMENCING WORK.

10. THE CONTRACTOR SHALL TRANSFER TBM'S OUT OF THE CONSTRUCTION AREA PRIOR TO COMMENCEMENT OF EXCAVATION WORKS.

11. REFER TO PIT SCHEDULE FOR ALL PIT DETAILS.

12. CARE SHALL BE TAKEN WHEN EXCAVATING IN THE VICINITY OF SERVICES.

13. EXCAVATION WITHIN 4.5m RADIUS OF TREES SHALL BE CARRIED OUT WITH HAND HELD EQUIPMENT. CUTTING OF TREE ROOTS GREATER THAN 25mm DIA SHALL BE CARRIED OUT UNDER THE SUPERVISION OF AN ARBORIST.

14. THE CONTRACTOR SHALL MAINTAIN ALL WORK SITES IN A SAFE STABLE, AND TRAFFICABLE CONDITION.

15. THE CONTRACTOR SHALL ERECT AND MAINTAIN ALL SHORING, PLANKING, AND STRUTTING, DEWATERING DEVICES, BARRICADES, SIGNS, LIGHTS, ETC NECESSARY TO KEEP WORKS IN A SAFE AND STABLE CONDITION AND FOR THE PROTECTION OF THE PUBLIC.

16. DISPOSAL OF EXCESS SPOIL: TRUCK ROUTE AND DISPOSAL LOCATION SHALL BE SUBMITTED TO THE SUPERINTENDENT FOR APPROVAL.

17. SEWERS THROUGH FLOOR OF BASINS TO BE EXCAVATED TO WITHIN 100mm OF TOP OF PIPE. EXISTING EMBEDMENT GRAVEL TO BE LEVELLED AND OVERLAYED WITH A34 BIDIM GEOFABRIC. TRENCH SHALL BE BACKFILLED WITH MATERIAL THAT MEETS ALL REQUIREMENTS OF CLAY LINER GRADE MATERIAL TO MINIMUM DEPTH OF 900mm.

18. THE CONTRACTOR SHALL ENSURE THAT NO POLLUTED OR SEDIMENT LADEN RUNOFF ENTERS ANY DRAIN OR WATERCOURSE. THE CONTRACTOR SHALL ENSURE THAT PRECAUTIONS ARE TAKEN TO PREVENT EMISSION OF DUST, WHETHER FROM THE OPERATION OF CONSTRUCTION EQUIPMENT OR OTHERWISE.

19. THE CONTRACTOR SHALL ADJUST ALL AFFECTED SERVICE COVERS TO MATCH NEW PAVEMENT LEVELS AS APPROVED BY THE SUPERINTENDENT AND STATUTORY AUTHORITIES.

20. WHERE OPTIC FIBRE EXISTS THE CONTRACTOR SHALL COORDINATE EXCAVATION WORKS WITH TELSTRA.

21. THE CONTRACTOR SHALL UNDERTAKE WORKS IN ACCORDANCE WITH THE RELEVANT CONFINED SPACE STANDARDS AND REGULATIONS WHERE APPROPRIATE.

22. THE CONTRACTOR SHALL TAKE EXTREME CAUTION WHEN EXCAVATING NEAR EXISTING BUILDING FOOTINGS.

23. CONTRACTOR TO ADVISE SUPERINTENDENT OF ASSOCIATED WORK PROGRAMME.

24. ALL DIMENSIONS RELEVANT TO SET OUT SHALL BE CONFIRMED AND VERIFIED BY THE CONTRACTOR BEFORE CONSTRUCTION IS COMMENCED. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO THE SUPERINTENDENT.

25. WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE RELEVANT CURRENT SAA AND VICROADS STANDARDS PLUS LOCAL STATUTORY AUTHORITIES REQUIREMENTS EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.

26. WHERE WORKS ARE IN THE VICINITY OF EXISTING SERVICES, THESE SERVICES SHALL BE LOCATED AND EXPOSED/PROVED PRIOR TO COMMENCEMENT OF WORKS AND THE RELEVANT AUTHORITIES NOTIFIED SEVEN (7) CLEAR DAYS PRIOR TO THE COMMENCEMENT OF THE WORKS. ANY CLASHES BETWEEN EXISTING ASSETS AND PROPOSED WORKS ARE TO BE REPORTED TO THE SUPERINTENDENT IMMEDIATELY. SERVICE AUTHORITIES' REQUIREMENTS FOR WORKS WITHIN THE VICINITY OF THEIR ASSETS ARE TO BE FOLLOWED AND RELEVANT PERMITS OBTAINED AT THE CONTRACTOR'S EXPENSE

27. PRIOR TO THE COMMENCEMENT OF THE WORKS, THE CONTRACTOR SHALL PROVIDE THE FOLLOWING INFORMATION :
    (A) SOURCE OF QUARRY MATERIAL
    (B) OPTIMUM MOISTURE CONTENT AND MAXIMUM DRY DENSITY OF THE FINE CRUSHED ROCK TO BE USED (FROM NATIONAL ASSOCIATION OF TESTING AUTHORITIES).
    (C) IF THE SOURCE OF THE QUARRY MATERIAL IS CHANGED DURING THE COURSE OF THE WORKS

28. ALL REDUNDANT ASSETS SHALL BE REMOVED AND DISPOSED OF OFF SITE WITH THE PERMISSION OF THE ASSET'S OWNER.

29. ALL TRENCHES TO BE BACKFILLED AS PER RELEVANT STANDARD MRCC DRAWING 010-1013 AND VICROADS STANDARD DRAWING SD-1511

30. PROPOSED RCP'S TO BE INSTALLED IN ACCORDANCE WITH RELEVANT VICROADS STANDARD DRAWINGS AND SPECIFICATIONS IN VICROADS ROADS AND IN ACCORDANCE WITH RELEVANT MRCC STANDARD DRAWINGS AND SPECIFICATIONS IN MRCC ROADS.

31. PRIOR TO COMMENCMENT OF WORKS THE CONTRACTOR IS TO LOCATE ALL EXISTING TELSTRA SERVICES WITHIN THE VICINITY OF THE PROPOSED WORKS. THE CONTRACTOR IS TO LIAISE WITH TELSTRA AND FOLLOW ALL THEIR REQUIREMENTS WHEN WORKING IN THE VICINITY OF THEIR ASSETS. PROTECTION OR RELOCATION OF TELSTRA ASSETS TO FACILITATE THE CONSTRUCTION OF THIS PROJECT IS TO BE CONDUCTED IN ACCORDANCE WITH TELSTRA REQUIREMENTS AND AT THE CONTRACTOR'S EXPENSE. ALL RELEVANT PERMITS ARE TO BE OBTAINED AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR IS TO TAKE APPROPRIATE SAFETY MEASURES AND FOLLOW ALL LEGISLATIVE AND TELSTRA REQUIREMENTS WHEN WORKING IN THE VICINITY OF EXISTING ASBESTOS CEMENT SERVICES.

ROAD CROSSINGS

32. TRAFFIC CONTROL WORKS SHALL BE IN ACCORDANCE WITH THE VICROADS ROADWORKS SIGNING CODE OF PRACTICE AS 1742.3-2002 MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, ROAD MANAGEMENT ACT 2004, WORKSITE SAFETY - TRAFFIC MANAGEMENT - CODE OF PRACTICE DECEMBER 2004.

ATTENTION TO CONTRACTOR

1. THE CONTRACTOR SHALL REINSTATE ANY AFFECTED FOOTPATH, VEHICLE CROSSINGS & NATURE STRIP TO THE REQUIREMENTS OF MRCC CONTRACTOR. ENSURE THAT ALL EXCAVATIONS ARE PROTECTED FROM UNAUTHORISED/INADVERTANT ENTRY AT ALL TIMES.

2. A GEOTECHNICAL INVESTIGATION HAS BEEN UNDERTAKEN AND THIS REPORT IS AVAILABLE UPON REQUEST.

3. THE CONTRACTOR IS REQUIRED TO UNDERTAKE A LETTER DROP IN THE IMMEDIATE AND SURROUNDING AREA ADVISING REDIENTS OF WORKS INCLUDING PROGRAM.

4. THE CONTRACTOR IS REQUIRED TO ISSUE ADDITIONAL LETTERS IN THE EVENT OF CHANGES TO PROJECT PROGRAM RESULTING FROM ANY REASON.

5. THE CONTRACTOR MUST ALSO UNDERTAKE A LETTER DROP TO THE IMMEDIATELY ADJACENT PROPERTIES ADVISING OF DIRECT IMPACTS A MINIMUM OF 72 HOURS PRIOR TO OBSTRUCTING ACCESS, ETC.

6. AS CONSTRUCTED SURVEY MUST INCLUDE TRENCH DETAILS (WIDTH, DEPTH), BACKFILL MATERIAL, COMPACTION RESULTS, SERVICES EXPOSED AS A PART OF WORKS, WEARING COURSE, REMOVED/REINSTATED/INSTALLED STREET FURNITURE, ETC. THE SURVEY IS TO BE IN ACCORDANCE WITH SPECIFICATIONS, INCLUDING QUALIFIED PERSONNEL UNDERTAKING THE WORKS.

NOTE TO OPERATOR / MAINTAINER / USER FOR SAFETY IN DESIGN

7. WORKS NEAR ROADS SHALL BE IN ACCORDANCE WITH ROAD MANAGEMENT ACT 2004 'WORKSITE SAFETY - TRAFFIC MANAGEMENT'.

8. ALL WORKS SHALL COMPLY WITH THE REQUIREMENTS AT WORKSAFE VICTORIA.

BULK EXCAVATION AND PAVEMENT NOTES

B1. TOPSOIL (NOMINAL DEPTH 150mm) SHALL BE STRIPPED WITHIN THE LIMIT OF EARTHWORKS. QUANTITIES OF SELECT TOPSOIL MATERIAL FOR FUTURE LANDSCAPE WORKS SHALL BE STOCKPILED AS DIRECTED BY THE SUPERINTENDENT.

B2. AFTER BULK EXCAVATION HAS BEEN COMPLETED THE FORMED SURFACE SHALL BE PROOF ROLLED AND TESTED IN ACCORDANCE WITH THE SPECIFICATION. AFTER TOPSOIL STRIP IN FILL ZONES HAS BEEN COMPLETED THE SURFACE SHALL BE PROOF ROLLED AND TESTED IN ACCORDANCE WITH THE SPECIFICATION.

B3. ANY SOFT, WET OR UNSUITABLE SUBGRADE MATERIALS, AS DEFINED IN THE SPECIFICATION, SHALL BE REMOVED AND REPLACED WITH AN APPROVED MATERIAL TO SATISFACTION OF SUPERINTENDENT.

B4. ALL SURPLUS EXCAVATED MATERIALS (EXCLUDING TOPSOIL) SHALL BE DISPOSED OFF AS DIRECTED BY THE SUPERINTENDENT.

B5. APPROVED FILL MATERIALS SHALL BE PLACED IN UNIFORM LAYERS, COMPACTED ,TESTED AND PROOF ROLLED IN ACCORDANCE WITH THE SPECIFICATION. THE FINISHED EARTHWORKS LEVEL SHALL BE PROOF ROLLED AND TESTED AS SPECIFIED PRIOR TO PAVEMENT CONSTRUCTION.

B6. DURING CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTING AND MAINTAINING A TEMPORARY SITE DRAINAGE SYSTEM AND TO MAINTAIN THE SITE IN A DRY AND STABLE CONDITION. DETAILS OF THE DRAINAGE SYSTEM SHALL BE SUBMITTED FOR THE APPROVAL OF THE SUPERINTENDENT.

B7. UNLESS NOTED OTHERWISE ALL BATTERS SHAPED TO FINAL PROFILE SHALL BE CONSTRUCTED AT A SLOPE OF 1 IN 2 (CUT AND FILL), TEMPORARY CONSTRUCTION BATTERS SHALL BE LIMITED TO 1 IN 1.5. STEEPER SLOPES SHALL NOT BE CONSTRUCTED UNLESS APPROVED BY THE SUPERINTENDENT. STABILIZATION AND EROSION PROTECTION SHALL BE PROVIDED AS DIRECTED BY THE SUPERINTENDENT, AT THE CONTRACTOR'S EXPENSE.THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF TEMPORARY WORKS.

B8. ALL UNDERGROUND SERVICES SHALL BE LAID PRIOR TO FINAL SEALING OF ANY PAVEMENTS.

B9. FOR THE EXTENSION OF BASIN, EXCAVATE EXISTING SURFACE AND REINSTATE GRASS WITH 50mm LOAMING TOP SOIL (FREE OF CLUMPS, SODS AND CLAY LUMPS) AND SEED (FERTILISE AND SOW WITH APPROVED SPORTSFIELD SEED MIX.

B10. BASIN SUBGRADE TO BE COMPACTED TO 97% SMDD IN RANGE -1%<OMC<+3%

OH&S NOTES

OH1. THE CONTRACTOR SHALL CHECK FOR CONTAMINANTS PRIOR TO ENTERING DRAINAGE SYSTEM.

OH2. THE CONTRACTOR SHALL INTRODUCE MANUAL HANDLING PROCEDURES PRIOR TO CONSTRUCTION AND MAINTENANCE WORKS.

OH3. THE CONTRACTOR SHALL INTRODUCE SAFE MAINTENANCE PROCEDURES PRIOR TO UNDERTAKING MAINTENANCE WORKS ON THE ASSETS.

OH4. THE CONTRACTOR SHALL UNDERTAKE WORKS IN ACCORDANCE WITH THE RELEVANT CONFINED SPACE STANDARDS AND REGULATIONS WHERE APPROPRIATE.

OH5. CONTRACTOR SHOULD EXERCISE EXTREME CARE WHEN WORKING IN THE VICINITY OF UNDERGROUND AND OVERHEAD POWER INFRASTRUCTURE IN ACCORDANCE WITH RELEVANT LEGISLATIVE REQUIREMENTS.

OH6. PRIOR TO COMMENCEMENT OF WORKS ON SITE THE CONTRACTOR SHALL ENSURE THAT ALL MATTERS RELATING TO THE OCCUPATIONAL HEALTH AND SAFETY HAVE BEEN COMPLIED WITH.

OH7. AT THE COMPLETION OF THE WORKS, ALL RUBBISH, DEBRIS AND SURPLUS MATERIALS SHALL BE REMOVED AND THE SITE SHALL BE CLEARED TO THE SATISFACTION OF THE SUPERINTENDENT.

OH8. CONTRACTOR SHALL PROVIDE FENCING TO ALL OPEN EXCAVATION.

OH9. ALL EXCAVATIONS DEEPER THAN 1.5m SHALL BE SHORED IN ACCORDANCE WITH OHS REQUIREMENTS AND LEGISLATION.

OH10. IT IS NOT GUARANTEED THAT ALL SERVICES HAVE BEEN SHOWN ON THE DRAWINGS, CONTRACTOR TO UNDERTAKE A DBYD BEFORE THE COMMENCEMENT OF WORKS

OH11. MAKE ALL NECESSARY REPAIRS TO EXISTING SERVICES AND INFRASTRUCTURE TO AN 'AS GOOD AS NEW' CONDITION AT THE CONTRACTOR'S EXPENSE.

OH12. THESE DRAWINGS ARE A SCHEMATIC REPRESENTATION OF SERVICES INFORMATION CONTAINED IN DRAWINGS ISSUED BY THE RELEVANT AUTHORITIES.
THE INFORMATION CONTAINED IN THESE DRAWINGS IS INDICATIVE ONLY, AND REFERENCE SHOULD BE MADE TO THE RELEVANT AUTHORITIES DOCUMENTATION TO CONFIRM ACCURACY AND COMPLETENESS. WHERE INFORMATION IS AVAILABLE, THE SUB-SURFACE SERVICES INSTALLED BY CONTRACTORS OTHER THAN THE AUTHORITIES HAVE BEEN SHOWN, BUT ADDITIONAL UNDOCUMENTED SERVICES MAY BE PRESENT. SHOULD THE CONTRACTOR BELIEVE THAT SUB-SURFACE SERVICES ARE AT RISK OF DAMAGE DURING CONSTRUCTION, THE CONTRACTOR SHOULD NOTIFY THE RELEVANT AUTHORITIES AND ESTABLISH THE EXACT LOCATION OF THE SERVICES.

TEMPORARY BRACING

T1 THE DOCUMENTED DESIGN IS FOR THE PERMANENT CONDITION ONLY AND DOES NOT SPECIFICALLY CATER FOR THE INTERIM ARRANGEMENTS DURING CONSTRUCTION AND ERECTION UNLESS NOTED OTHERWISE.
THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE STRUCTURE AND ANY ADJACENT STRUCTURES IN A SAFE AND STABLE CONDITION AT ALL TIMES DURING CONSTRUCTION. THE CONTRACTOR IS TO ENGAGE A QUALIFIED AND SUITABLY EXPERIENCED ERECTION ENGINEER TO REVIEW AND APPROVE THE CONTRACTORS CONSTRUCTION METHODOLOGY AND TO PROVIDE THE DESIGN OF ANY TEMPORARY WORKS (SUCH AS PROPPING AND TEMPORARY BRACING) TO SUIT THE CONTRACTORS CONSTRUCTION SEQUENCE AND METHODOLOGY.
THE CONTRACTOR SHALL SUBMIT DESIGN CALCULATIONS AND DRAWINGS TO THE SUPERINTENDENT UPON REQUEST AS EVIDENCE THAT A SAFE ERECTING METHODOLOGY HAS BEEN PUT FORWARD.

CONTAMINATED SOIL NOTES

CS1. EXCAVATED MATERIAL MUST BE ASSESSED FOR CONTAMINATION AND MANAGED ACCORDING TO THE INDUSTRIAL WASTE RESOURCE GUIDELINES IWRG621 FROM THE EPA.

CS2. CONTAMINATED SOIL LOW LEVEL AS DESCRIBED BY THE EPA PUBLICATION 448 CAN BE DISPOSED OF AT THE MILDURA LANDFILL LOCATED ON ONTARIO AVENUE, FOLLOWING THE EPA WASTE DISCHARGE LICENCE NO HS1302. HIGHER CONTAMINATED SOILS MUST BE TREATED OR STABILISED AS REQUIRED BY THE EPA.

CS3. CONTAMINATED SOIL CONTAINING ASBESTOS CAN ALSO BE DISPOSED OF AT THE MILDURA LANDFILL FOLLOWING EPA WASTE DISCHARGE LICENCE NO HS1302 AND THE CORRESPONDING HEALTH AND SAFETY CONSIDERATIONS.

CS4. VEHICLES SHALL USE A WHEEL CLEANING FACILITY TO PREVENT CONTAMINATED MATERIALS LEAVING THE SITE.

CS5. CONTAMINATED MATERIALS SHOULD BE COVERED BY APPROVED MATERIAL AFTER DEPOSITION.

CS6. CONTRACTOR TO FOLLOW BEST PRACTICE ENVIRONMENTAL MANAGEMENT SITING, DESIGN, OPERATION AND REHABILITATION OF LANDFILLS, EPA PUBLICATION 788.1, SEPTEMBER 2010 WHEN DISPOSING MATERIALS IN THE LANDFILL.

ASBESTOS

A1. ALL ASBESTOS WHICH REQUIRES REMOVAL OR DISTURBANCE AS PART OF THE CONSTRUCTION WORKS SHALL BE REMOVED BY AN ACCREDITED ASBESTOS REMOVALIST REGISTERED WITH THE OCCUPATIONAL HEALTH AND SAFETY AUTHORITIES.

A2. EXISTING CONSTRUCTION MAY CONTAIN ASBESTOS CONTAMINATED PRODUCTS. MATERIALS THOUGHT TO CONTAIN ASBESTOS MUST BE INSPECTED BY A CERTIFIED INSPECTOR CAPABLE OF SAMPLING FOR THE EXISTENCE OF ASBESTOS. WORKS SHALL BE DONE IN ACCORDANCE WITH THE MOST CURRENT WORKSAFE REGULATIONS AND DISPOSED OF IN ACCORDANCE WITH CURRENT REGULATIONS.

DRAWING INDEX

DRAWING NUMBER	DRAWING TITLE	REVISION	DATE
242814-325-DRG-CC-000	COVER SHEET	1	11.05.17
242814-325-DRG-CC-001	GENERAL NOTES AND DRAWING INDEX	1	11.05.17
242814-325-DRG-CC-002	BASIN LAYOUT	1	11.05.17
242814-325-DRG-CC-003	BASIN SECTIONS	1	11.05.17
242814-325-DRG-CC-004	BASIN DETAILS	1	11.05.17

NOTE: BEFORE COMMENCEMENT OF WORK, CONTRACTOR IS TO EXPOSE ALL EXISTING SERVICES AND PROVIDE REPORT TO SUPERINTENDENT REPORTING ALL CLASHES

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Plot Date: 12/5/2017 3:08:54 PM Office: AUMQL Filename: P:\242814 - MRCC\242814-325 ETIWANDA SP\RL\NEC\ADD\RBSSC\V3\242814-325-DRG-CC-0101[1]BASIN.DWG

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REV	DATE	REVISION DETAILS	APPROVED
D	29.01.15	FOR COMMENT	
T0	11.02.15	TENDER ISSUE	
T1	07.04.15	REVISED TENDER ISSUE	
T2	15.12.15	REVISED TENDER ISSUE	-
T3	04.02.16	REVISED TENDER ISSUE	B.RIELLEY
0	19.04.16	CONSTRUCTION ISSUE	B.RIELLEY
T4	30.11.16	REVISED TENDER ISSUE	B.RIELLEY
1	12.05.17	ISSUE FOR CONSTRUCTION	B.RIELLEY

SCALE	SIZE
AS SHOWN	A1

DRAWN: C.TOTENHOFER
DESIGNED: M.MCCRANN
CHECKED: P.DePALMA

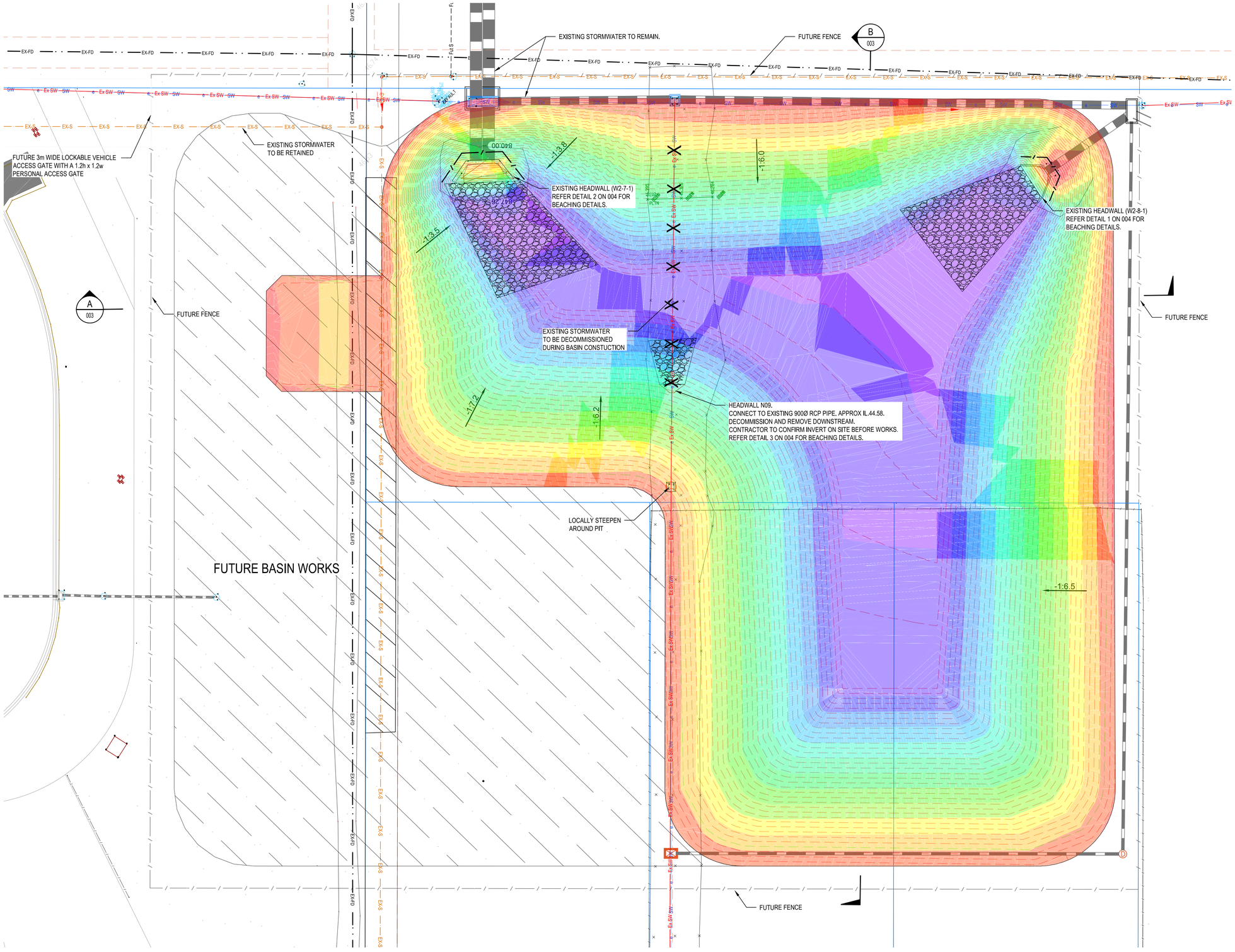
FOR CONSTRUCTION

APPROVED
DATE 07.04.16
Brett Rielley
B.RIELLEY

PROJECT: ETIWANDA SPURLINE DRAINAGE BASIN DESIGN

TITLE: GENERAL NOTES AND DRAWING INDEX

DRAWING No. PROJECT No. 242814 – WBS 325 – TYPE DRG – DISC CC – NUMBER 001 – REV 1



LEGEND

- MAJOR DESIGN CONTOUR
- MINOR DESIGN CONTOUR
- EXTEND OF EXISTING ROCK BEACHING
- EXISTING FENCE
- PROPOSED 1.8m HIGH CYCLONE/WIRE MESH FENCE OR SIMILAR APPROVED
- PROPOSED 1.2m HIGH GALVANISED FENCE REFER TO DETAIL ON SHEET 004
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING IRRIGATION DRAINAGE
- EXISTING STORMWATER DRAINAGE TO BE DECOMMISSIONED
- PROPERTY BOUNDARY
- EXISTING STORMWATER PIPES
- AREA OF SEWER TO BE PROTECTED REFER TO DETAIL ON SHEET C06
- PROPOSED ROCK BEACHING
- EXISTING PITS
- PROPOSED HEAD WALL

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WARNING AND DISCLAIMER BEWARE OF UNDERGROUND SERVICES

The information provided in these drawings relating to the positions of underground services is intended to be only a guide for excavation works. Aurecon does not warrant or represent that the positions of those services shown on the drawings are accurate. Furthermore, services may exist of which Aurecon is unaware. The information provided should therefore not be relied upon and exact positions of services should be verified by hand excavation. Furthermore, Aurecon disclaims responsibility for damage or injury to any person caused directly or indirectly by any works affecting the services.

Dated: April 16

Plot Date: 12/5/2017 3:11:14 PM Office: AUMQL Filename: P-242814 - MRCC242814-325 ETIWANDA SPR RUN\ECAD\DRSSC01\242814-325-DRG-CC-0002(1)BASIN.DWG

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D	29.01.15	FOR COMMENT	-
T0	11.02.15	TENDER ISSUE	-
T1	07.04.15	REVISED TENDER ISSUE	-
T2	15.12.15	REVISED TENDER ISSUE	-
T3	04.02.16	REVISED TENDER ISSUE	B.RIELLEY
0	19.04.16	CONSTRUCTION ISSUE	B.RIELLEY
T4	30.11.16	TENDER ISSUE	B.RIELLEY
1	12.05.17	ISSUE FOR CONSTRUCTION	B.RIELLEY

SCALE	SIZE
1:250	A1

DRAWN: C.TOTENHOFER
DESIGNED: M.MCCRANN
CHECKED: P.DePALMA

FOR CONSTRUCTION

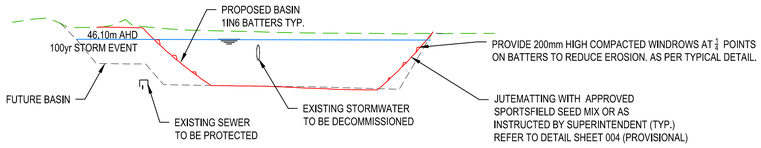
APPROVED
DATE 07.04.16
Brett Rielley
B.RIELLEY

PROJECT: ETIWANDA SPURLINE DRAINAGE BASIN DESIGN

TITLE: BASIN LAYOUT

DRAWING No.

PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
242814	325	DRG	CC	002	1

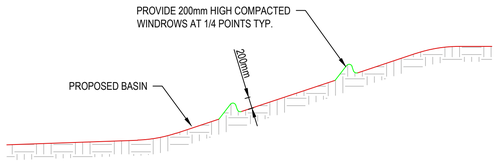


SCALE: H 1:1000 1:200
Datum 35.000

DESIGN LEVELS				46.696	46.660	45.178	43.573	42.869	42.843	42.776	42.693	42.617	42.740	44.681	46.382			
EXISTING LEVELS	47.912	47.267	46.675	46.724	46.788	46.593	46.488	46.442	46.392	46.340	46.302	46.295	46.277	46.284	46.273	46.275	46.280	46.281
DEPTH				-0.029	-0.128	-1.414	-2.916	-3.572	-3.549	-3.563	-3.609	-3.678	-3.537	-1.603	0.109			
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	137.334	140.000	150.000	157.410

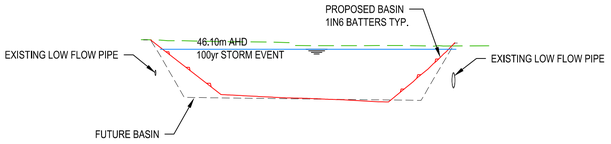
A-A LONG SECTION

BENETOOK 14TH 15TH ETIWANDA BENETOOK CONTROL TABLE				
REFERENCE	EAST	NORTH	ELEVATION	DESCRIPTION
51	606693.998	6214202.178		TPEG
1003	606066.604	6213418.214		TPEG
1031	606114.191	6213464.549		TPEG
1565	606050.331	6213262.973		TPEG
1568	606028.307	6213285.697		TPEG
PM357	606994.470	6213892.602	51.233	PSM
PM407	606668.008	6216219.236	51.629	PSM
PM746	605518.767	6211545.996	47.412	PSM
PM1094	607351.012	6211563.996	45.156	PSM
PM1103	606480.685	6212488.603	47.014	PSM
PM1104	606034.092	6212946.856	47.028	PSM



TYPICAL EMBANKMENT WINDROWS

NTS



SCALE: H 1:1000 1:200
Datum 35.000

DESIGN LEVELS		45.588	44.035	43.062	42.959	42.876	42.802	42.713	42.621	44.177	45.998	46.489		
EXISTING LEVELS	46.881	46.616	46.585	46.549	46.529	46.300	46.295	46.294	46.301	46.287	46.267	46.271	46.283	46.288
DEPTH		-1.028	-2.551	-3.487	-3.570	-3.424	-3.493	-3.581	-3.680	-2.110	-0.270	0.218		
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	102.356	110.000	113.465

B-B LONG SECTION

Plot Date: 12/5/2017 3:18:42 PM Office: AUMQL Filename: P:\242814 - MRCC\242814-325 ETIWANDA SPUR\LINE\CADD\DRGS\CV\242814-325-DRG-CC-0003[1]BASIN.DWG

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D	29.01.15	FOR COMMENT	-
T0	11.02.15	TENDER ISSUE	-
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T4	30.11.16	TENDER ISSUE	B.RIELLEY
1	12.05.17	ISSUE FOR CONSTRUCTION	B.RIELLEY

SCALE	SIZE
AS SHOWN	A1

DRAWN: C.TOTENHOFER
DESIGNED: M.MCCRANN
CHECKED: P.DePALMA

FOR CONSTRUCTION

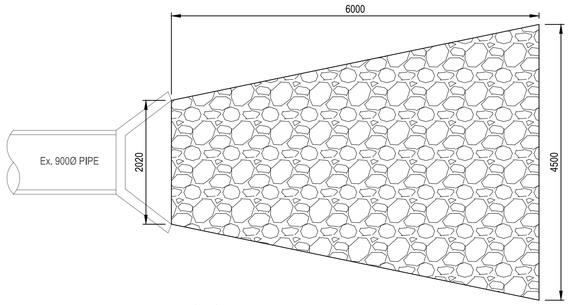
APPROVED
DATE 07.04.16
Brett Rielley
B.RIELLEY

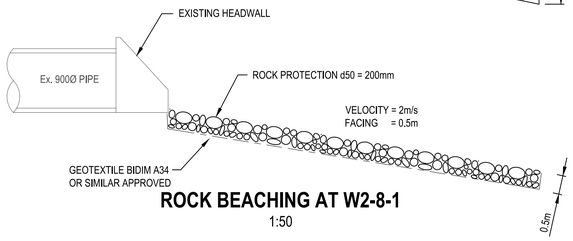
PROJECT: ETIWANDA SPURLINE DRAINAGE BASIN

TITLE: BASIN SECTIONS

DRAWING No.: 242814 – 325 – DRG – CC – 003 – 1

PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
242814	325	DRG	CC	003	1





ROCK BEACHING AT W2-8-1

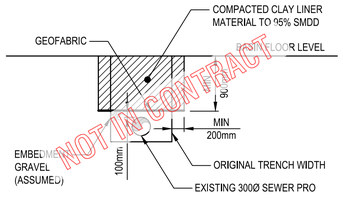
1:50

NOTE: RIP RAP PROTECTION TO BE IN ACCORDANCE WITH TABLE BELOW.

ROCK CLASS (SECTION THICKNESS)	ROCK SIZE (m)	ROCK MASS (kg)	MINIMUM % OF ROCK LARGER THAN:
	0.4	100	0
FACING 0.5m	0.3	35	50
	0.15	2.5	90

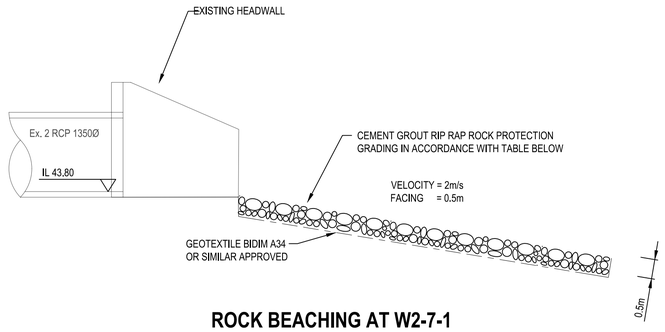
DETAIL 1 / C02

1:50



TYPICAL EXISTING SEWER PROTECTION

1:50



ROCK BEACHING AT W2-7-1

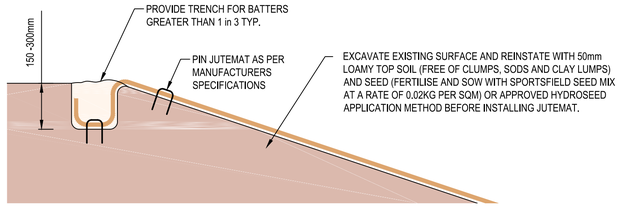
1:50

NOTE: RIP RAP PROTECTION TO BE IN ACCORDANCE WITH TABLE BELOW.

ROCK CLASS (SECTION THICKNESS)	ROCK SIZE (m)	ROCK MASS (kg)	MINIMUM % OF ROCK LARGER THAN:
	0.4	100	0
FACING 0.5m	0.3	35	50
	0.15	2.5	90

DETAIL 2 / C02

1:50

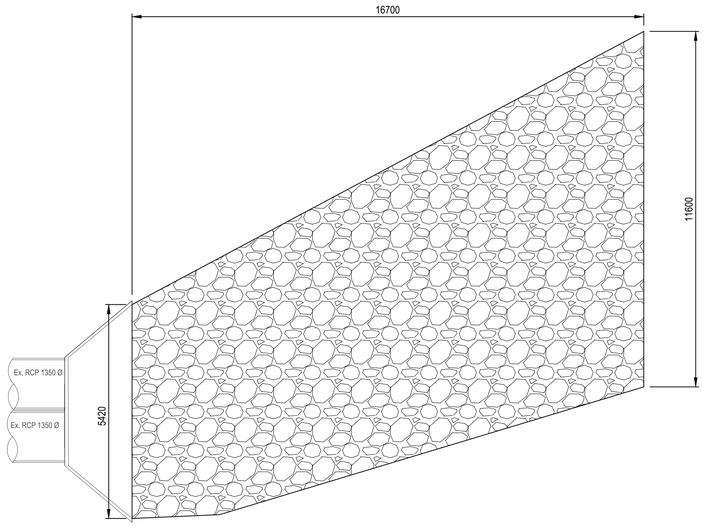


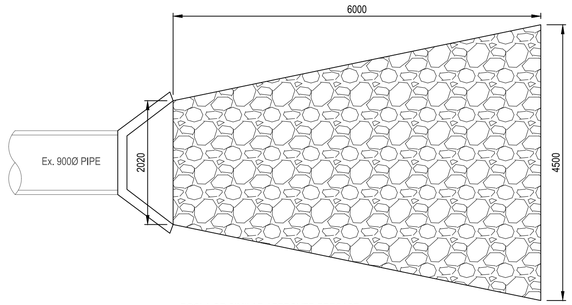
TYPICAL JUTEMAT DETAIL

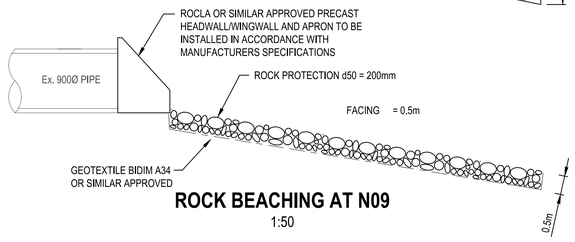
1:20

TYPICAL HEADWALL FENCE

NTS







ROCK BEACHING AT N09

1:50

NOTE: RIP RAP PROTECTION TO BE IN ACCORDANCE WITH TABLE BELOW.

ROCK CLASS (SECTION THICKNESS)	ROCK SIZE (m)	ROCK MASS (kg)	MINIMUM % OF ROCK LARGER THAN:
	0.4	100	0
FACING 0.5m	0.3	35	50
	0.15	2.5	90

DETAIL 3 / C02

1:50

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500 0 1000 2000mm
SCALE 1:50

1 0 2 4m
SCALE 1:100

Plot Date: 12/5/2017 3:14:38 PM Office: AUMQL Filename: P:\242814 - MRCC\242814-325 ETIWANDA SPR\PLINE\CADD\RDS\CIV\242814-325-DRG-CC-004-0111[1]BASIN.DWG

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REV	DATE	REVISION DETAILS	APPROVED
D	29.01.15	FOR COMMENT	
T0	11.02.15	TENDER ISSUE	
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T2	15.12.15	REVISED TENDER ISSSUE	
T3	04.02.16	REVISED TENDER ISSUE	B.RIELLEY
0	19.04.16	CONSTRUCTION ISSUE	B.RIELLEY
T4	30.11.16	TENDER ISSUE	B.RIELLEY
1	12.05.17	ISSUE FOR CONSTRUCTION	B.RIELLEY

SCALE	SIZE
AS SHOWN	A1

DRAWN: C.TOTENHOFER
DESIGNED: M.MCCRANN
CHECKED: P.DePALMA

FOR CONSTRUCTION

APPROVED — DATE 07.04.16
Brett Rielley
B.RIELLEY

PROJECT: ETIWANDA SPURLINE DRAINAGE BASIN DESIGN

TITLE: BASIN DETAILS

DRAWING No.: PROJECT No. 242814 – WBS 325 – TYPE DRG – DISC CC – NUMBER 004 – REV 1

Safe Design Risk Register – Etiwanda Spurline Basin Works

Client	Mildura Rural City Council	**Workshop Date**	-
Stakeholders	MRCC / Service authorities / Contractor	**Revision No.**	1
Meeting Attendees	M.Pendlebury	**Project No.**	242814-325
	A.Seaton-Stewart	**Project Leader**	Andrew Seaton-Stewart
		Project Director	Brett Rielley

Risk Rating Matrix

Most Likely Consequence	Likelihood of occurrence: 5 - Very likely	4 - Good chance	3 - Likely	2 - Unlikely	1 - Very unlikely
A - Disastrous	Extreme	Extreme	Extreme	Extreme	High
B - Critical	Extreme	Extreme	Extreme	High	High
C - Serious	Extreme	High	High	Moderate	Moderate
D - Significant	High	High	Moderate	Low	Low
E - Minor	Moderate	Moderate	Low	Low	Low

Notes:

1. This risk register has been prepared to document hazards and risk treatments associated with project elements designed by Aurecon, including subconsultants where applicable.
2. The full life cycle of the project has been considered including design, construction (and commissioning), operation, maintenance, modification and demolition phases.
3. The risk register is focussed on hazards resulting from atypical features specific to the design. It is expected that risks associated with generic hazards (working at heights, excavations, etc) will be addressed by other stakeholders using appropriate risk management techniques during subsequent phases of the project.
4. Residual risks which cannot reasonably be actioned by Aurecon during the design phase have been identified and require action by other stakeholders during subsequent phases of the project (eg construction, operations, maintenance, modification or demolition).
5. This risk register does not replace the need for other stakeholders to complete their own hazard identification and risk assessment for the project (including the development of safe work procedures for specific activities) in due course.

IDENTIFY HAZARD				ASSESS RISK				IMPLEMENT RISK TREATMENT					
ID	Risk Source (Hazard)	Event / Cause / Consequence	Persons Affected	Control Measure (Risk Treatment)	Likelihood	Consequence	Risk Rating	Risk Owner	Implement Control - Y/N?	Action / Comment (or justification if no action)	Action Owner(s)	Timing / Date	Status (Open / Closed)
Construction and Commissioning Phase													
1.01	Pipe collapse	Compaction over pipe and/or conduit with insufficient cover causing injury	All construction personnel	Ensure pipe is under pavement boxing area	3 - Likely	D - Significant	Moderate	Contractor	Yes	Locate pipe below boxing area and review conduit material type and class	Designer	Detailed Design Phase	Closed
1.02	Existing underground services	Machinery / construction personnel coming into contact with service, causing injury / death	Contractor	Obtain all known existing services	2 - Unlikely	B - Critical	High	Client	Yes	All known assets shown on drawing. Administrative control considered. Provide warning note on plan, with DBYD reference	Designer	Detailed Design Phase	Closed
1.03	Existing redundant pipes	Potential contamination from reduneted Asbestos water main left by Water Authority.	Contractor	1) Obtain all known existing services. 2) Keep excavation clear from the Asbestos area	3 - Likely	C - Serious	High	Contractor/client	Yes	Add note on drawings to engage a qualified asbestos removelist if encountered. Obtain redundant assets from water authority and incorporate into drawings.	Designer / Contractor	Preliminary Design Phase / Construction	Closed
1.04	Excavation	Excavating near live services causing injury / death	All construction personnel	Dial before you dig information and existing services plans	2 - Unlikely	D - Significant	Low	Contractor	Yes	Consider where practical / applicable	Contractor	Construction Phase	Open
1.05	Unidentified Asbestos	damage to existing services	All construction personnel	1) Obtain all known existing services. 2) Keep excavation clear from the Asbestos area	3 - Likely	C - Serious	High	Contractor/client	Yes	Add note on drawings to engage a qualified asbestos removelist if encountered. Obtain redundant assets from water authority and incorporate into drawings.	Designer / Contractor	Preliminary Design Phase / Construction	Closed
1.06	To steep of a grade to design surfaces	Fall due to to steep of a grade on finished suface causing injury	All construction personnel	Ensure deign is in accordance with suitable grade limits as specified with in the relevant design codes	1 - Very unlikely	D - Significant	Low	Contractor/client	Yes	Ensure deign is in accordance with suitable grade limits as specified with in the relevant design codes	Designer	Detailed Design Phase	Closed
Operations and Maintenance Phase													
2.01	Headwalls	Fall off headwall causing injury	Maintenance / public personnel	Add fencing to headwalls	2 - Unlikely	D - Significant	Low	Client	Yes	Add fencing to headwalls	Designer	Construction Design Phase	Closed
Modification, Demolition and Dismantling Phases													
3.01	Clash with existing services	Damage to existing services causing injury / death	Construction personnel	As-built drawings	1 - Very unlikely	D - Significant	Low	Client	No	Add as-built requirement outside scope of works	Client	Construction Phase	Open
3.02	Excavation	Excavating near live services causing injury / death	Construction personnel	Dial before you dig information and existing services plans	1 - Very unlikely	D - Significant	Low	Client	Yes	Consider where practical / applicable	Contractor	Detailed Design Phase	Open

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REV	DATE	REVISION DETAILS	APPROVED
D	29.01.15	FOR COMMENT	-
T0	11.02.15	TENDER ISSUE	-
T1	07.04.15	REVISED TENDER ISSUE	-
T2	15.12.15	REVISED TENDER ISSUE	-
T3	04.02.16	REVISED TENDER ISSUE	B.RIELLEY
0	19.04.16	CONSTRUCTION ISSUE	B.RIELLEY
T4	10.11.16	TENDER ISSUE	B.RIELLEY
1	12.05.17	ISSUE FOR CONSTRUCTION	B.RIELLEY

SCALE	SIZE
1:500	A1

DRAWN: M.PENDLEBURY
DESIGNED: M.MCCRANN
CHECKED: P.DePALMA

FOR CONSTRUCTION

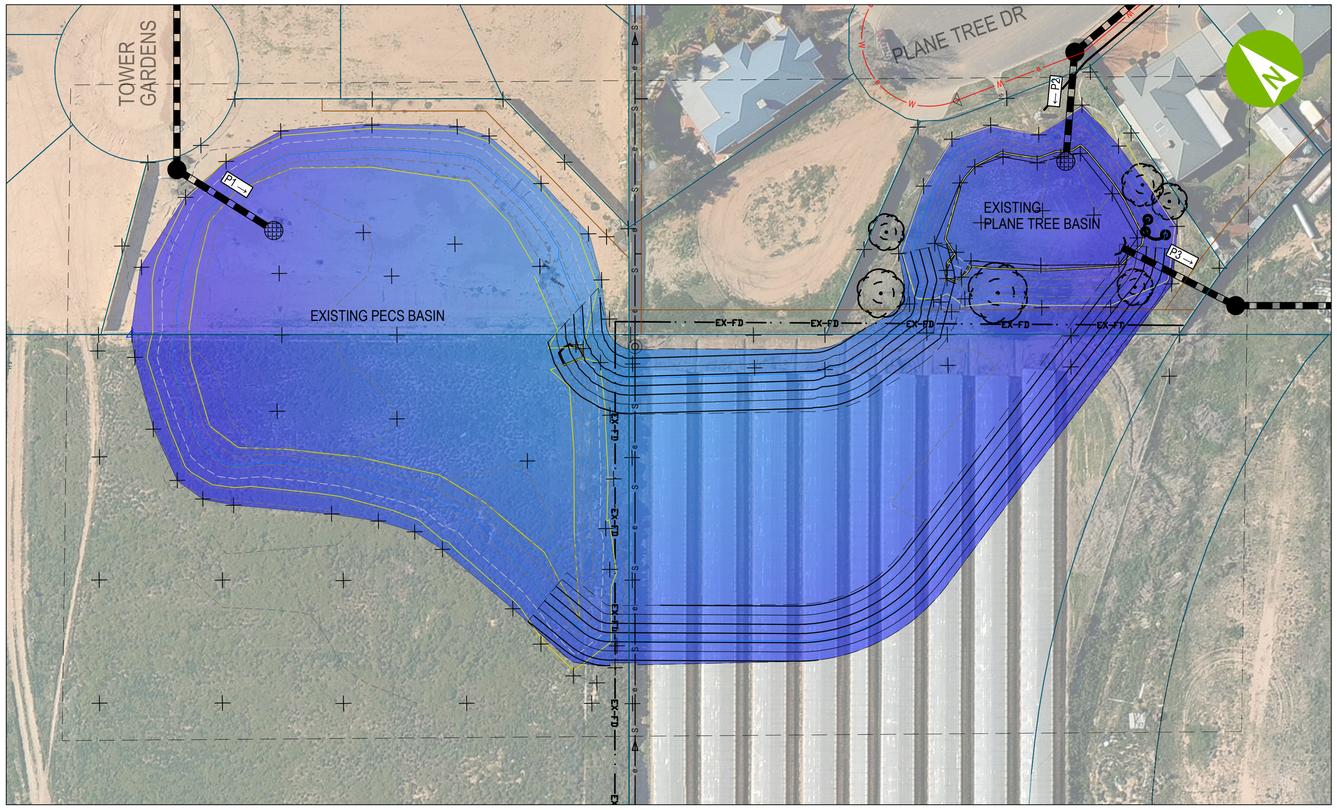
APPROVED
DATE 07.04.16
Brett Rielley
B.RIELLEY

PROJECT: ETIWANDA SPURLINE DRAINAGE BASIN DESIGN

TITLE: SAFETY IN DESIGN

DRAWING No. PROJECT No. 242814 – WBS 325 – TYPE DRG – DISC CC – NUMBER 005 – REV 1

Plane Tree Basin



PLAN
1:500

LEGEND

- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING PROPERTY PARCEL
- WATER EDGE
- EX-FD — EXISTING IRRIGATION DRAINAGE
- e W — EXISTING WATER

PLANE TREE BASIN	
STORAGE VOLUME (WITH 0.300m FREEBOARD)	4997m3
FOOTPRINT AREA	9210m2
AVERAGE DEPTH	1.75m
EXISTING INLET PIPE (P1)	600Ø
EXISTING INLET INVERT (P1)	48.450
EXISTING INLET PIPE (P2)	-
EXISTING INLET INVERT (P2)	49.500
PROPOSED OUTLET PIPE (P3)	375Ø
PROPOSED OUTLET INVERT (P3)	49.500

Plot Date: 17/10/2017 3:52:39 PM Office: AUMCL Filename: P:\250641 MRCC\250641-354 MILDURA SOUTH DCP DRAINAGE ASSESSMENT\3 PROJECT DELIVERY\CAD\DRAWING\SCIV\250641-351-DRG-400 PLANE TREE BASIN.DWG

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REV	DATE	REVISION DETAILS	APPROVED
A	02.12.16	PRELIMINARY ISSUE	-

SCALE	SIZE
AS SHOWN	A1

DRAWN: C.TOTENHOFER
DESIGNED: H.SINGH
CHECKED:

PRELIMINARY
NOT FOR CONSTRUCTION

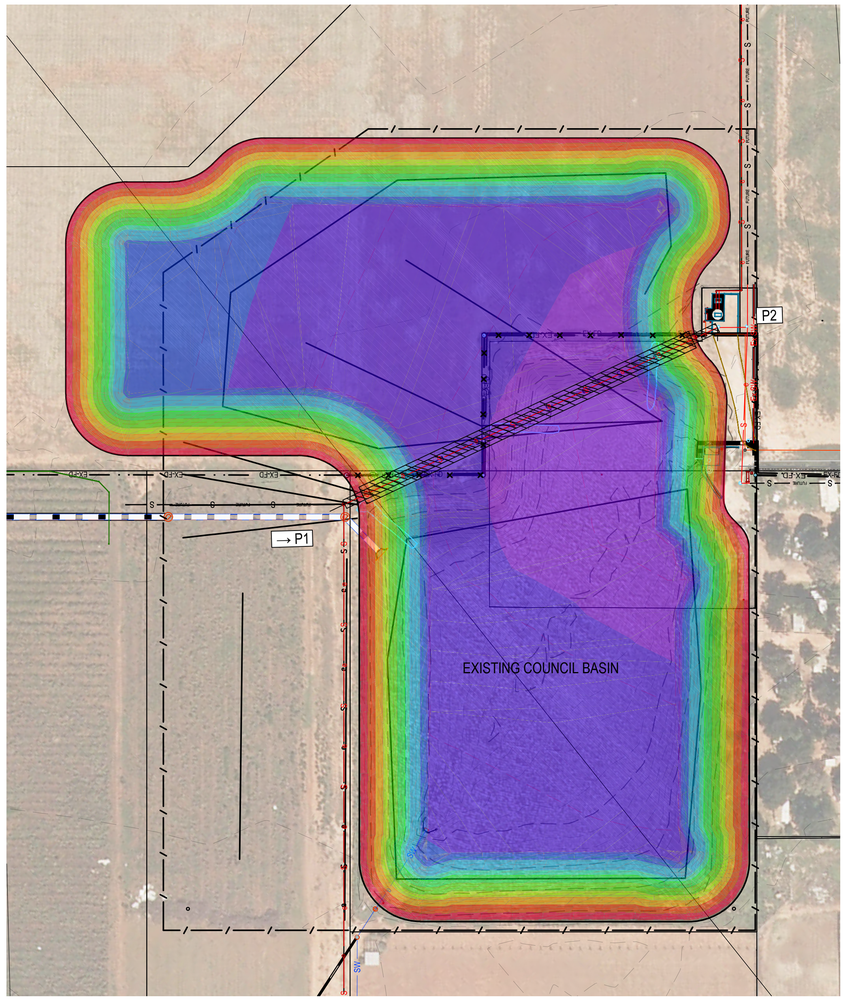
APPROVED
DATE

PROJECT: MILDURA SOUTH DCP DRAINAGE ASSESMENT

TITLE: PLANE TREE BASIN

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	250641	354	DRG	CC	400	A

Calder Basin

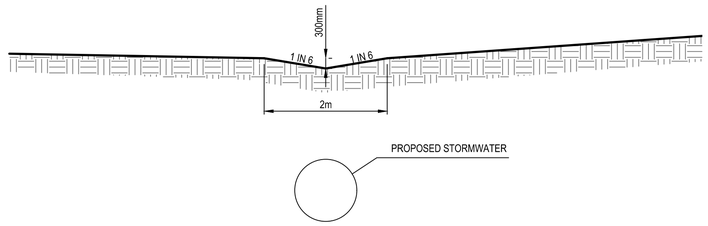


CALDER BASIN PLAN

1:1000

LEGEND

	FUTURE MAJOR DESIGN CONTOUR
	FUTURE MINOR DESIGN CONTOUR
	EXISTING FENCE
	PROPOSED 1.8m HIGH CYCLONE/WIRE MESH FENCE OR SIMILAR APPROVED
Ex SW	EXISTING STORMWATER
e S	EXISTING SEWER
FUTURE S	FUTURE SEWER
EX-FD	EXISTING IRRIGATION DRAINAGE
e E	EXISTING POWER
	PROPERTY BOUNDARY
	PROPOSED STORM WATER PIPE
	FUTURE STORMWATER PIPE
	PROPOSED ROCK BEACHING
	EXISTING PIT
D	PROPOSED PIT
	PROPOSED HEAD WALL
42.5	DESIGN LEVEL



TYPICAL SWALE DETAIL

NOT TO SCALE

CALDER BASIN	
STORAGE VOLUME	111500m^3
AREA	41613m^2
AVERAGE DEPTH	3.85m
INLET PIPE (P1)	1650Ø
INLET INVERT (P1)	42.80
OUTLET PIPE (P2)	N/A RISING MAIN
INLET INVERT (P2)	N/A RISING MAIN

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WARNING AND DISCLAIMER BEWARE OF UNDERGROUND SERVICES

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Dated: March 15

Plot Date: 22/12/2017 9:01:10 AM Office: AUMOL Filename: P:\250641 MBCC\250641-354 MILDURA SOUTH DCP\DRAINAGE ASSESSMENTS\PROJECT FILE\INTERWOVEN\SOV\250641-355-DRG-800 CALDER BASIN.DWG

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REV	DATE	REVISION DETAILS	APPROVED
A	05.08.14	PRELIMINARY	
B	22.08.14	COUNCIL AND LMW COMMENTS INCLUDED	
C	11.09.14	PRELIMINARY ISSUE	
D	14.11.14	PRELIMINARY ISSUE	
E	20.11.14	ISSUED FOR TENDER	
F	11.03.15	ISSUE FOR TENDER	

SCALE	SIZE
AS SHOWN	A1

DRAWN: C.TOTENHOFER
DESIGNED: M.MCCRANN
CHECKED:

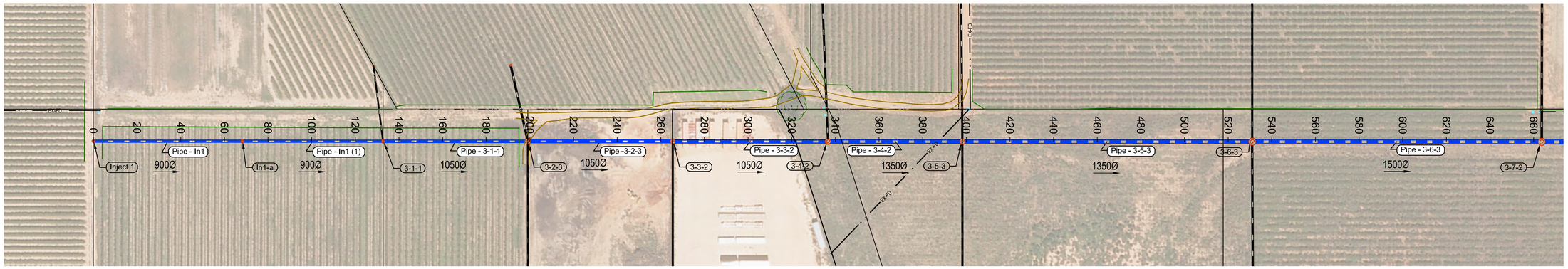
TENDER
NOT FOR CONSTRUCTION

APPROVED
DATE

PROJECT: BENETOOK SPURLINE ADDITIONAL WORKS

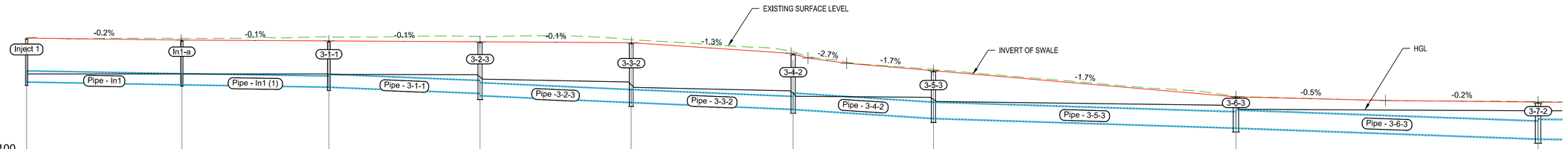
TITLE: CALDER BASIN

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	240134	306	DRG	CC	0005	F



BENETOOK SPURLINE PLAN

1:1000



SCALE: H 1:500 1:100
Datum 40.000

		30L/S		40L/S		645L/S		2032L/S		2242L/S		2492L/S		3207L/S		3887L/S								
GRADE %		0.36%		0.32%		0.82%		0.90%		0.84%		1.30%		0.63%		0.72%								
PIPE DETAILS (CL to CL LENGTHS)		900 NB RCRRJ CLASS 3 3D LENGTH: 68.195 2D LENGTH: 68.195		900 NB RCRRJ CLASS 3 3D LENGTH: 64.540 2D LENGTH: 64.540		1050 NB RCRRJ CLASS 3 3D LENGTH: 66.374 2D LENGTH: 66.372		1050 NB RCRRJ CLASS 3 3D LENGTH: 66.399 2D LENGTH: 66.397		1050 NB RCRRJ CLASS 3 3D LENGTH: 71.118 2D LENGTH: 71.116		1350 NB RCRRJ CLASS 3 3D LENGTH: 61.616 2D LENGTH: 61.611		1350 NB RCRRJ CLASS 3 3D LENGTH: 132.816 2D LENGTH: 132.813		1500 NB RCRRJ CLASS 3 3D LENGTH: 132.694 2D LENGTH: 132.690								
HGL		48.9	48.9	48.9	48.9	48.8	48.8	48.4	48.2	47.7	47.4	46.9	46.8	46.5	46.1	45.8	45.6	45.6						
INVERT LEVEL		48.195	47.950	47.950	47.745	47.745	47.200	47.000	46.400	46.400	45.800	45.800	45.000	45.000	44.160	44.160	43.200	43.200						
DESIGN LEVEL AT MH CL	52.012		51.843		51.767		51.689		51.610		50.628		49.156		46.870		46.405							
COVER		2.839	2.915	2.915	3.044	2.879	3.346	3.546	4.067	4.067	3.685	3.386	2.714	2.827	1.308	1.120	1.615	1.456						
CHAINAGE	0.000		68.195		132.734		199.106		265.503		336.619		398.230		531.043		663.733							

PIPE (BENETOOK SPURLINE MAIN) LONG SECTION

LEGEND

- MAJOR DESIGN CONTOUR
- MINOR DESIGN CONTOUR
- EXISTING FENCE
- PROPOSED 1.8m HIGH CYCLONE/WIRE MESH FENCE OR SIMILAR APPROVED
- EXISTING STORMWATER
- EXISTING SEWER
- FUTURE SEWER
- EXISTING IRRIGATION DRAINAGE
- EXISTING POWER
- PROPERTY BOUNDARY
- PROPOSED STORM WATER PIPE
- FUTURE STORMWATER PIPE
- PROPOSED ROCK BEACHING
- EXISTING PIT
- PROPOSED PIT
- PROPOSED HEAD WALL
- 42.5 DESIGN LEVEL
- 1:6 DESIGN GRADE

PIPE SCHEDULE FOR: Benetook Spurline Main

NAME	PIPE INNER Ø [mm]	3D LENGTH	SLOPE	U/S PIT	D/S PIT	U/S INV	D/S INV	PIPE DROP	MATERIAL	COMMENTS
Pipe - 3-1-1	Ø 1067	66.374	1:122	3-1-1	3-2-3	47.745	47.20	0.54	Class 2 RRJ RCP	
Pipe - 3-3-2	Ø 1067	71.118	1:119	3-3-2	3-4-2	46.400	45.80	0.60	Class 2 RRJ RCP	
Pipe - 3-4-2	Ø 1360	61.616	1:77	3-4-2	3-5-3	45.800	45.00	0.80	Class 2 RRJ RCP	
Pipe - 3-5-3	Ø 1360	132.816	1:158	3-5-3	3-6-3	45.000	44.16	0.84	Class 2 RRJ RCP	
Pipe - 3-6-3	Ø 1504	132.694	1:138	3-6-3	3-7-2	44.160	43.20	0.96	Class 2 RRJ RCP	
Pipe - 3-7-2	Ø 1656	73.450	1:367	3-7-2	3-7-2a	43.200	43.00	0.20	Class 2 RRJ RCP	
Pipe - 3-8-1	Ø 1656	57.756	1:340	3-7-2a	3-3-1	43.000	42.83	0.17	Class 2 RRJ RCP	
Pipe - 3-9-1	Ø 1656	15.320	1:511	3-3-1	W3-9-2	42.830	42.80	0.03	Class 2 RRJ RCP	
Pipe - In1	Ø 914	68.195	1:278	Inject 1	In1-a	48.195	47.95	0.24	Class 2 RRJ RCP	
Pipe - In1 (1)	Ø 914	64.540	1:315	In1-a	3-1-1	47.950	47.74	0.21	Class 2 RRJ RCP	
Pipe -3-2-3	Ø 1067	66.399	1:111	3-2-3	3-3-2	47.000	46.40	0.60	Class 2 RRJ RCP	

PIT SCHEDULE FOR: Benetook Spurline Main

PIT NAME	SETOUT COORDS	INLET INNER Ø [mm]	INLET INV [m]	OUTLET INNER Ø [mm]	OUTLET INV [m]	PIT FIN RL	PIT DEPTH [m]	COMMENTS
3-1-1	E: 606930.355 N: 6213386.391	Ø 914	47.745	Ø 1067	47.745	51.767	4.197	1,500 dia Concrete Manhole
3-2-3	E: 606882.732 N: 6213340.160	Ø 1067	47.200	Ø 1067	47.000	51.689	4.914	2,300 dia Concrete Manhole
3-3-1	E: 606455.255 N: 6212925.094	Ø 1656	42.830	Ø 1656	42.830	46.099	3.362	2,550 dia Concrete Manhole
3-3-2	E: 606835.092 N: 6213293.911	Ø 1067	46.400	Ø 1067	46.400	51.610	5.435	2,050 dia Concrete Manhole
3-4-2	E: 606784.066 N: 6213244.376	Ø 1067	45.800	Ø 1360	45.800	50.628	5.053	2,300 dia Concrete Manhole
3-5-3	E: 606739.859 N: 6213201.461	Ø 1360	45.000	Ø 1360	45.000	49.156	4.381	2,300 dia Concrete Manhole
3-6-3	E: 606644.565 N: 6213108.950	Ø 1360	44.160	Ø 1504	44.160	46.870	2.935	3,000 dia Concrete Manhole
3-7-2	E: 606549.358 N: 6213016.524	Ø 1504	43.200	Ø 1656	43.200	46.405	3.455	3,000 dia Concrete Manhole
3-7-2a	E: 606496.691 N: 6212965.329	Ø 1656	43.000	Ø 1656	43.000	46.296	3.296	2,550 dia Concrete Manhole
In1-a	E: 606976.662 N: 6213431.346	Ø 914	47.950	Ø 914	47.950	51.843	3.893	1,200 dia Concrete Manhole
Inject 1	E: 607025.593 N: 6213478.847			Ø 914	48.195	52.012	3.992	1,200 dia Concrete Manhole
W3-9-2	E: 606439.940 N: 6212925.476	Ø 1656	42.800			44.999		5,800 x 1,890 x 2,350 mm Series 1650 Wingwall

Plot Date: 31/8/2016 11:07:19 AM Office: AUMDL Filename: P:\240134 MBRCC\240134-306 BENETOOK SPURLINE ADD WORKS\CAD\DWGS\CIV\240134-306-DRG-CC-0003.DWG

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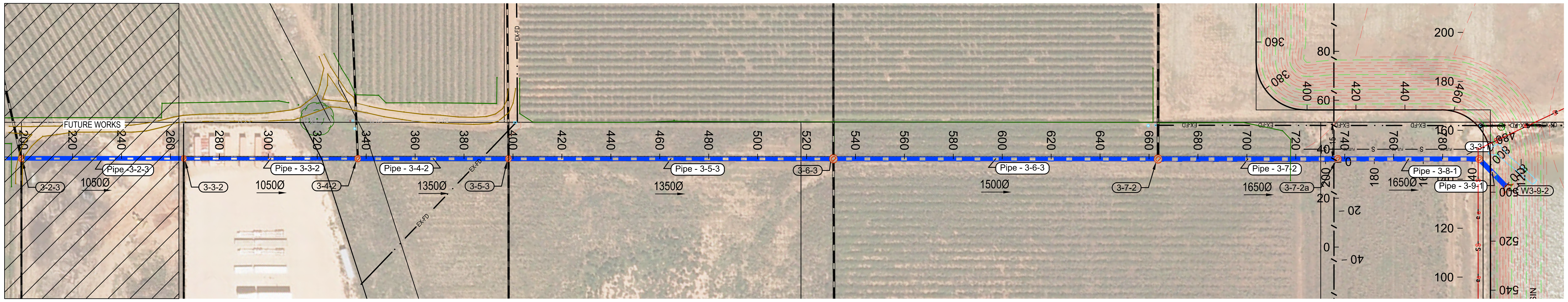
REV	DATE	REVISION DETAILS	APPROVED
A	05.08.14	PRELIMINARY	
B	22.08.14	COUNCIL AND LMW COMMENTS INCLUDED	
C	11.09.14	PRELIMINARY ISSUE	
D	14.11.14	PRELIMINARY ISSUE	
E	20.11.14	ISSUED FOR TENDER	
F	11.03.15	ISSUE FOR TENDER	
G	01.05.15	ISSUE FOR TENDER	

SCALE: AS SHOWN
SIZE: A1
DRAWN: C.TOTENHOFER
DESIGNED: M.MCCRANN
CHECKED:

TENDER
NOT FOR CONSTRUCTION
APPROVED
DATE

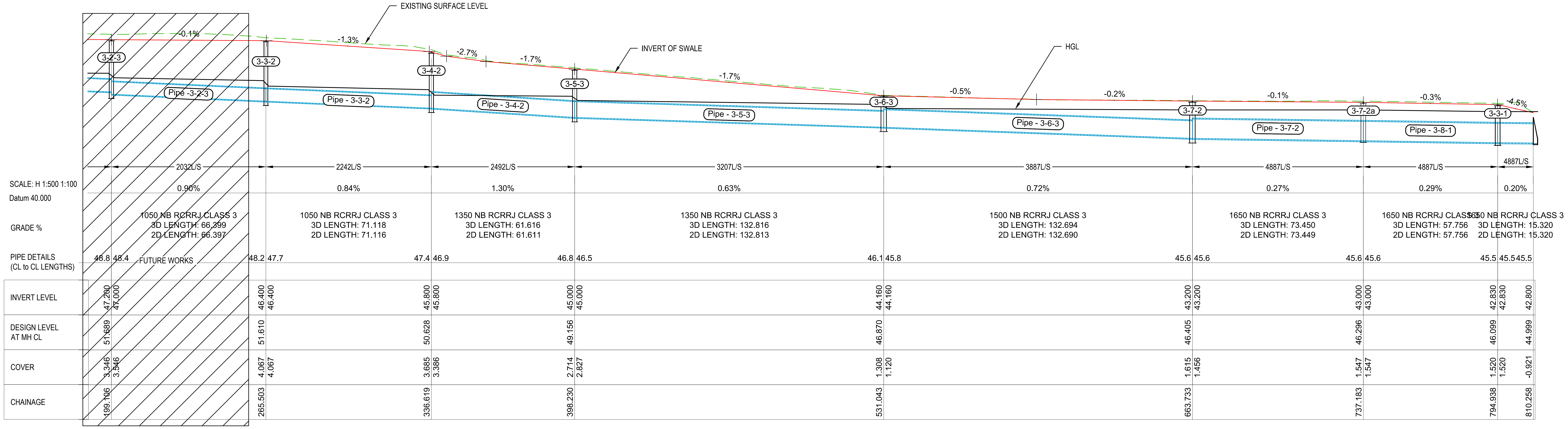
PROJECT: BENETOOK SPURLINE ADDITIONAL WORKS
TITLE: BENETOOK SPURLINE PLAN & LONGITUDINAL SECTION

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	240134	306	DRG	CC	0003	G



BENETOOK SPURLINE PLAN

1:1000



LEGEND

— — — —	MAJOR DESIGN CONTOUR
— — — —	MINOR DESIGN CONTOUR
—/—/—/—	EXISTING FENCE
—/——/—	PROPOSED 1.8m HIGH CYCLONE/WIRE MESH FENCE OR SIMILAR APPROVED
—— Ex SW ——	EXISTING STORMWATER
— e —— S —	EXISTING SEWER
— FUTURE — S —	FUTURE SEWER
—·· — EX-FD —	EXISTING IRRIGATION DRAINAGE
— e —— E —	EXISTING POWER
———	PROPERTY BOUNDARY
▬ ▬ ▬	PROPOSED STORM WATER PIPE
▬ ▬ ▬	FUTURE STORMWATER PIPE
▨	PROPOSED ROCK BEACHING
○	EXISTING PIT
Ⓓ	PROPOSED PIT
▽	PROPOSED HEAD WALL
42.5	DESIGN LEVEL
1:6 →	DESIGN GRADE

PIPE SCHEDULE FOR: Benetook Spurline Main

NAME	PIPE INNER Ø [mm]	3D LENGTH	SLOPE	U/S PIT	D/S PIT	U/S INV	D/S INV	PIPE DROP	MATERIAL	COMMENTS
Pipe - 3-1-1	Ø 1067	66.374	1:122	3-1-1	3-2-3	47.745	47.20	0.54	Class 2 RRJ RCP	
Pipe - 3-3-2	Ø 1067	71.118	1:119	3-3-2	3-4-2	46.400	45.80	0.60	Class 2 RRJ RCP	
Pipe - 3-4-2	Ø 1360	61.616	1:77	3-4-2	3-5-3	45.800	45.00	0.80	Class 2 RRJ RCP	
Pipe - 3-5-3	Ø 1360	132.816	1:158	3-5-3	3-6-3	45.000	44.16	0.84	Class 2 RRJ RCP	
Pipe - 3-6-3	Ø 1504	132.694	1:138	3-6-3	3-7-2	44.160	43.20	0.96	Class 2 RRJ RCP	
Pipe - 3-7-2	Ø 1656	73.450	1:367	3-7-2	3-7-2a	43.200	43.00	0.20	Class 2 RRJ RCP	
Pipe - 3-8-1	Ø 1656	57.756	1:340	3-7-2a	3-3-1	43.000	42.83	0.17	Class 2 RRJ RCP	
Pipe - 3-9-1	Ø 1656	15.320	1:511	3-3-1	W3-9-2	42.830	42.80	0.03	Class 2 RRJ RCP	
Pipe - In1	Ø 914	68.195	1:278	Inject 1	In1-a	48.195	47.95	0.24	Class 2 RRJ RCP	
Pipe - In1 (1)	Ø 914	64.540	1:315	In1-a	3-1-1	47.950	47.74	0.21	Class 2 RRJ RCP	
Pipe -3-2-3	Ø 1067	66.399	1:111	3-2-3	3-3-2	47.000	46.40	0.60	Class 2 RRJ RCP	

PIT SCHEDULE FOR: Benetook Spurline Main

PIT NAME	SETOUT COORDS	INLET INNER Ø [mm]	INLET INV [m]	OUTLET INNER Ø [mm]	OUTLET INV [m]	PIT FIN RL	PIT DEPTH [m]	COMMENTS
3-1-1	E: 606930.355 N: 6213386.391	Ø 914	47.745	Ø 1067	47.745	51.767	4.197	1,500 dia Concrete Manhole
3-2-3	E: 606882.732 N: 6213340.160	Ø 1067	47.200	Ø 1067	47.000	51.689	4.914	2,300 dia Concrete Manhole
3-3-1	E: 606455.255 N: 6212925.094	Ø 1656	42.830	Ø 1656	42.830	46.099	3.362	2,550 dia Concrete Manhole
3-3-2	E: 606835.092 N: 6213293.911	Ø 1067	46.400	Ø 1067	46.400	51.610	5.435	2,050 dia Concrete Manhole
3-4-2	E: 606784.066 N: 6213244.376	Ø 1067	45.800	Ø 1360	45.800	50.628	5.053	2,300 dia Concrete Manhole
3-5-3	E: 606739.859 N: 6213201.461	Ø 1360	45.000	Ø 1360	45.000	49.156	4.381	2,300 dia Concrete Manhole
3-6-3	E: 606644.565 N: 6213108.950	Ø 1360	44.160	Ø 1504	44.160	46.870	2.935	3,000 dia Concrete Manhole
3-7-2	E: 606549.358 N: 6213016.524	Ø 1504	43.200	Ø 1656	43.200	46.405	3.455	3,000 dia Concrete Manhole
3-7-2a	E: 606496.691 N: 6212965.329	Ø 1656	43.000	Ø 1656	43.000	46.296	3.296	2,550 dia Concrete Manhole
In1-a	E: 606976.662 N: 6213431.346	Ø 914	47.950	Ø 914	47.950	51.843	3.893	1,200 dia Concrete Manhole
Inject 1	E: 607025.593 N: 6213478.847			Ø 914	48.195	52.012	3.992	1,200 dia Concrete Manhole
W3-9-2	E: 606439.940 N: 6212925.476	Ø 1656	42.800			44.999		5,800 x 1,890 x 2,350 mm Series 1650 Wingwall

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Dated: May 15

Plot Date: 23/3/2016 12:45:46 PM Office: AUMQL Filename: P:\240134 MRCC\240134-306 BENETOOK SPURLINE ADD WORKS\CADD\DRGS\CIV\240134-306-DRG-CC-[G].DWG

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REV	DATE	REVISION DETAILS	APPROVED
A	05.08.14	PRELIMINARY	
B	22.08.14	COUNCIL AND LMW COMMENTS INCLUDED	
C	11.09.14	PRELIMINARY ISSUE	
D	14.11.14	PRELIMINARY ISSUE	
E	20.11.14	ISSUED FOR TENDER	
F	11.03.15	ISSUE FOR TENDER	
G	01.05.15	ISSUE FOR TENDER	

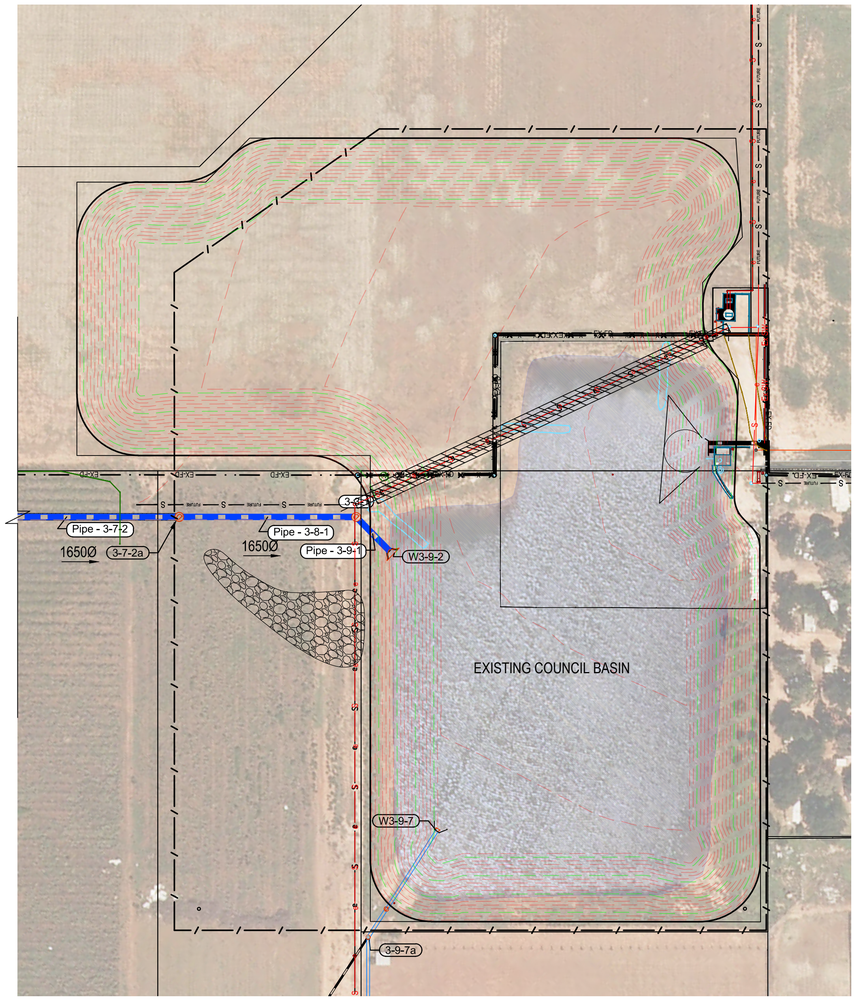
SCALE: AS SHOWN
SIZE: A1
DRAWN: C.TOTENHOFER
DESIGNED: M.MCCRANN
CHECKED

TENDER
NOT FOR CONSTRUCTION
APPROVED
DATE

PROJECT: BENETOOK SPURLINE ADDITIONAL WORKS
TITLE: BENETOOK SPURLINE PLAN & LONGITUDINAL SECTION

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	240134	306	DRG	CC	0004	G

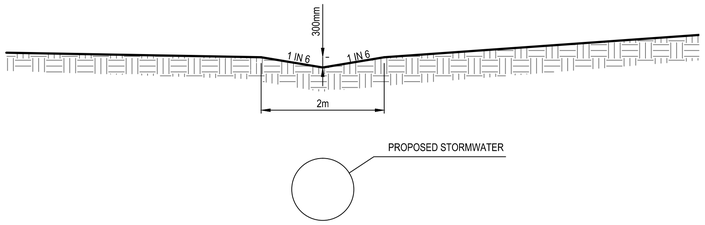
FOR CONTINUATION SEE SHEET C-0004



BENETOOK SPURLINE PLAN
1:1000

LEGEND

	FUTURE MAJOR DESIGN CONTOUR
	FUTURE MINOR DESIGN CONTOUR
	EXISTING FENCE
	PROPOSED 1.8m HIGH CYCLONE/WIRE MESH FENCE OR SIMILAR APPROVED
Ex SW	EXISTING STORMWATER
e S	EXISTING SEWER
FUTURE S	FUTURE SEWER
EX-FD	EXISTING IRRIGATION DRAINAGE
e E	EXISTING POWER
	PROPERTY BOUNDARY
	PROPOSED STORM WATER PIPE
	FUTURE STORMWATER PIPE
	PROPOSED ROCK BEACHING
	EXISTING PIT
D	PROPOSED PIT
	PROPOSED HEAD WALL
42.5	DESIGN LEVEL



TYPICAL SWALE DETAIL
NOT TO SCALE

WARNING AND DISCLAIMER BEWARE OF UNDERGROUND SERVICES

The information provided in these drawings relating to the positions of underground services is intended to be only a guide for excavation works. Aurecon does not warrant or represent that the positions of those services shown on the drawings are accurate. Furthermore, services may exist of which Aurecon is unaware. The information provided should therefore not be relied upon and exact positions of services should be verified by hand excavation. Furthermore, Aurecon disclaims responsibility for damage or injury to any person caused directly or indirectly by any works affecting the services.

Dated: March 15

DIAL BEFORE YOU DIG www.1100.com.au

Plot Date: 23/3/2016 12:46:39 PM Office: AUMOL Filename: P:\240134 MRCC\240134-306 BENETOOK SPURLINE ADD WORKS\CADD\DRGS\CIV\240134-306-DRG-CC-0\0.DWG

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REV	DATE	REVISION DETAILS	APPROVED
A	05.08.14	PRELIMINARY	
B	22.08.14	COUNCIL AND LMW COMMENTS INCLUDED	
C	11.09.14	PRELIMINARY ISSUE	
D	14.11.14	PRELIMINARY ISSUE	
E	20.11.14	ISSUED FOR TENDER	
F	11.03.15	ISSUE FOR TENDER	

SCALE	SIZE
AS SHOWN	A1

DRAWN: C.TOTENHOFER
DESIGNED: M.MCCRANN
CHECKED:

TENDER
NOT FOR CONSTRUCTION

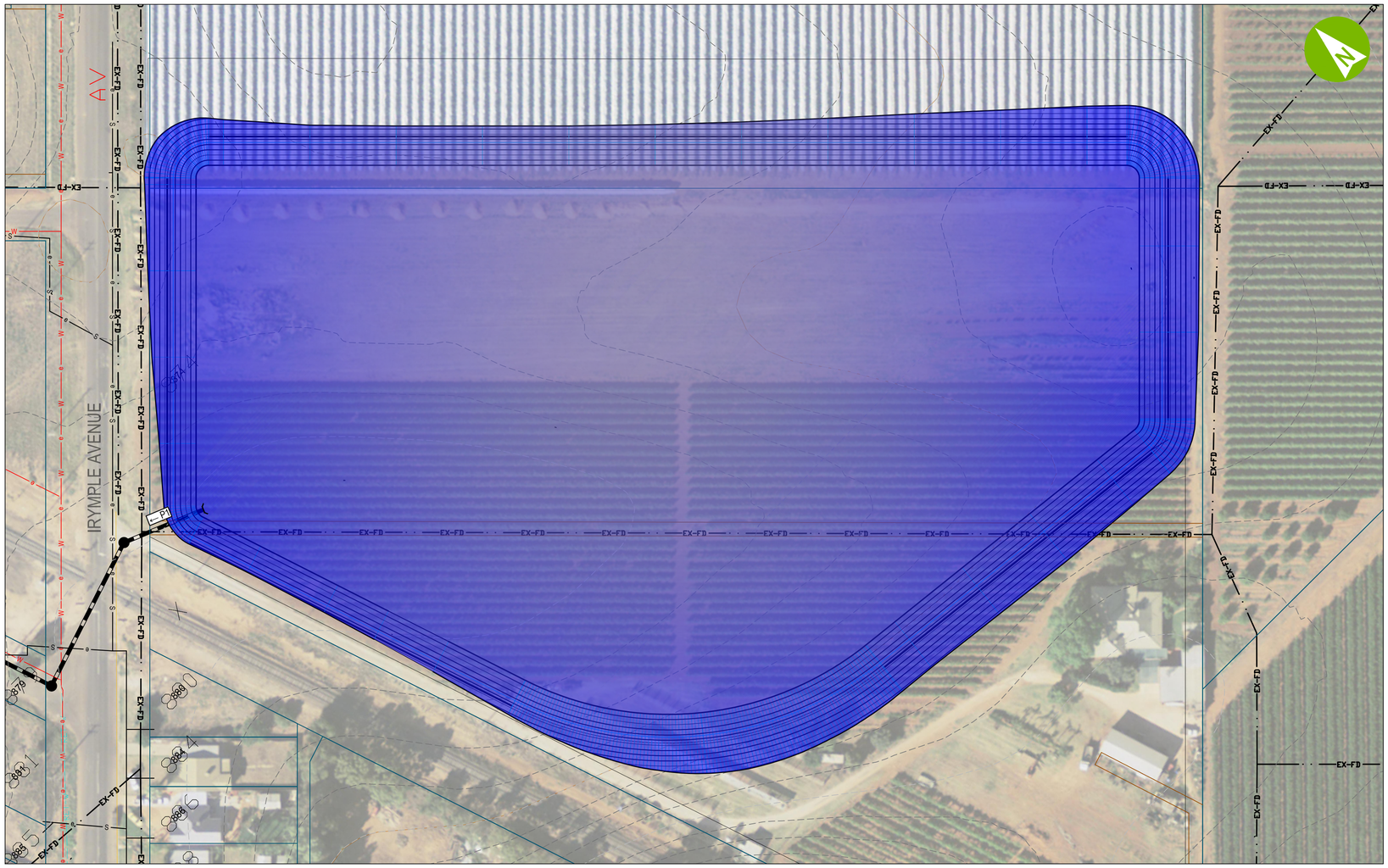
APPROVED
DATE

PROJECT: BENETOOK SPURLINE ADDITIONAL WORKS

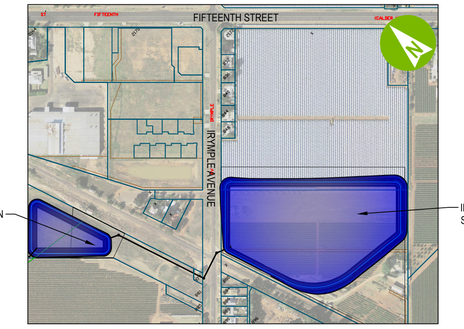
TITLE: BENETOOK SPURLINE PLAN & LONGITUDINAL SECTION

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	240134	306	DRG	CC	0005	F

Irymple Basin - South East



PLAN
1:750



LOCALITY PLAN
NTS

LEGEND

- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING PROPERTY PARCEL
- WATER EDGE
- EXISTING IRRIGATION DRAINAGE
- EXISTING WATER
- EXISTING SEWER

IRYMPLE SOUTH EAST BASIN	
STORAGE VOLUME (WITH 0.300m FREEBOARD)	41520m3
FOOTPRINT AREA	46765m2
AVERAGE DEPTH	1.92m
INLET PIPE (P1)	TBC
INLET INVERT (P1)	TBC
OUTLET PIPE (P1)	900Ø
OUTLET INVERT (P1)	42.500

Plot Date: 20/12/2017 8:49:31 AM Office: AUMOL Filename: P:\250641 MRCC\250641-354 MILDURA SOUTH DCP DRAINAGE ASSESSMENT\3 PROJECT DELIVERY\CAD\DRAWINGS\CIV\250641-351-DRG-500 IRYMPLE BASINS.DWG

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Mildura Rural City Council

REV	DATE	REVISION DETAILS	APPROVED
A	11.12.17	PRELIMINARY ISSUE	-

SCALE	SIZE
AS SHOWN	A1

DRAWN: C.TOTENHOFER
DESIGNED: H.SINGH
CHECKED:

PRELIMINARY
NOT FOR CONSTRUCTION

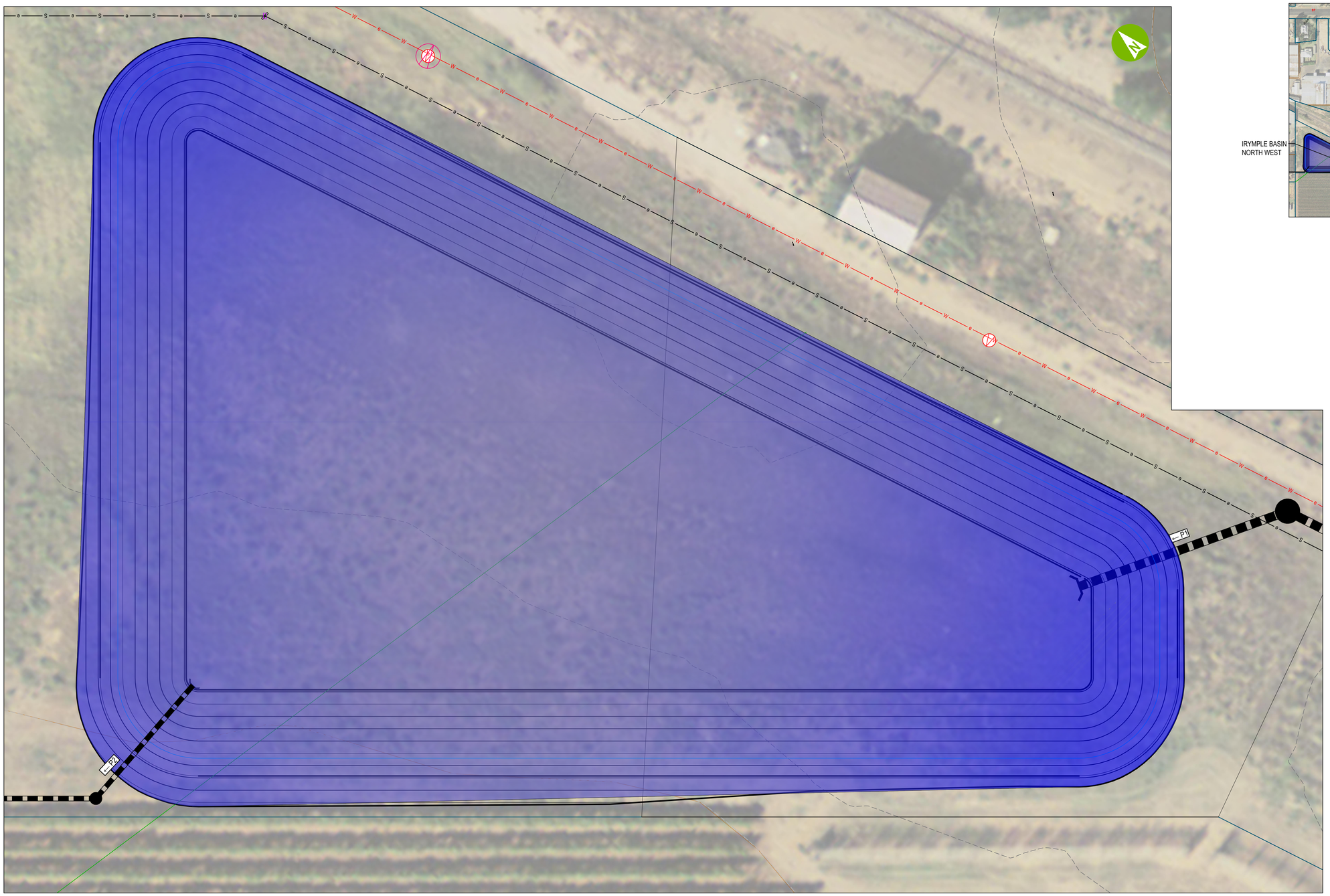
APPROVED
DATE

PROJECT: MILDURA SOUTH DCP DRAINAGE ASSESMENT

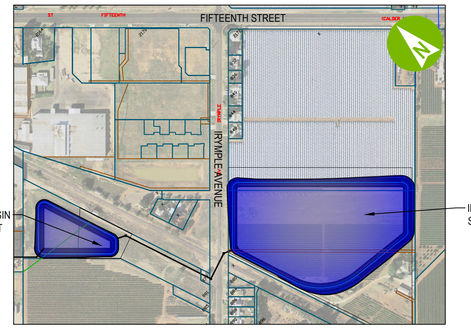
TITLE: IRYMPLE BASIN SOUTH EAST

DRAWING No.: PROJECT No. 250641 – WBS 354 – TYPE DRG – DISC CC – NUMBER 500 – REV A

Irymple Basin - North West



PLAN
1:250



LOCALITY PLAN
NTS

LEGEND

- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING PROPERTY PARCEL
- WATER EDGE
- EXISTING WATER
- EXISTING SEWER

IRYMPLE NORTH WEST	
STORAGE VOLUME (WITH 0.300m FREEBOARD)	15800m3
FOOTPRINT AREA	8800m2
AVERAGE DEPTH	1.80m
INLET PIPE (P1)	900Ø
INLET INVERT (P1)	41.700
OUTLET PIPE (P2)	900Ø
OUTLET INVERT (P2)	41.700

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REV	DATE	REVISION DETAILS	APPROVED
A	11.12.17	PRELIMINARY ISSUE	-

SCALE	SIZE
AS SHOWN	A1

DRAWN: C.TOTENHOFER
DESIGNED: H.SINGH
CHECKED:

PRELIMINARY
NOT FOR CONSTRUCTION

APPROVED
DATE

PROJECT: MILDURA SOUTH DCP DRAINAGE ASSESMENT

TITLE: IRYMPLE BASIN NORTH WEST

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	250641	354	DRG	CC	400	A

Plot Date: 22/12/2017 8:56:02 AM Office: AUMOL Filename: P:\250641 MBCC\250641-354 MILDURA SOUTH DCP DRAINAGE ASSESSMENT\3.PROJECT DELIVERY\CADD\DRAWINGS\CIV\250641-354-DRG-400 IRYMPLE BASINS.DWG

Sandilong Basin - South East

Legend

- Ex SW — EXISTING STORMWATER PIPE
- Ex S — EXISTING SEWER
- GAS — EXISTING GAS
- E-UG — EXISTING ELECTRICAL CONDUIT
- OH — EXISTING OVERHEAD POWER
- TELSTRA — EXISTING TELSTRA
- TFO — EXISTING TELSTRA FIBRE-OPTIC LINE
- Ex FO — EXISTING NEXTGEN FIBRE-OPTIC LINE
- EX–W — EXISTING LMW WATER MAIN - HYDRANTS & VALVES
- RET–W — RETIRED LMW WATER MAIN
- EX–WI — EXISTING LMW IRRIGATION WATER MAIN
- EX–FD — EXISTING LMW IRRIGATION DRAINAGE MAIN

SANDILONG BASIN - NORTH WEST	
STORAGE VOLUME	6000m3
FOOTPRINT AREA	4283m2
AVERAGE DEPTH	1.4m
INLET PIPE (P1)	1200Ø
INLET INVERT (P1)	46.474
OUTLET PIPE (P2)	525Ø
OUTLET INVERT (P2)	46.20

SANDILONG BASIN - SOUTH EAST	
STORAGE VOLUME	15000m3
FOOTPRINT AREA	10500m2
AVERAGE DEPTH	1.43m
INLET PIPE (P1)	2 x 900Ø
INLET INVERT (P1)	43.527
OUTLET PIPE (P2)	675Ø
OUTLET INVERT (P2)	43.194

Ref Date: 22/12/2017 9:09:37 AM Office: AUMDL Filename: P:\242814 - MRCC\242814-328-IRYMPLE DRAINAGE DESIGN\PROJECT DELIVERY\4 DESIGN\STORMWATER\STAGE 5 - SANDILONG BASIN\STAGE 5 - SANDILONG\242814-328-DWG-CC-STS-0100(C).DWG

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REV	DATE	REVISION DETAILS	APPROVED
A	13.05.16	PRELIMINARY ISSUE	-

SCALE	SIZE
1:750	A1

DRAWN: M.PENDLEBURY
DESIGNED: H.SINGH
CHECKED:

PRELIMINARY
NOT FOR CONSTRUCTION

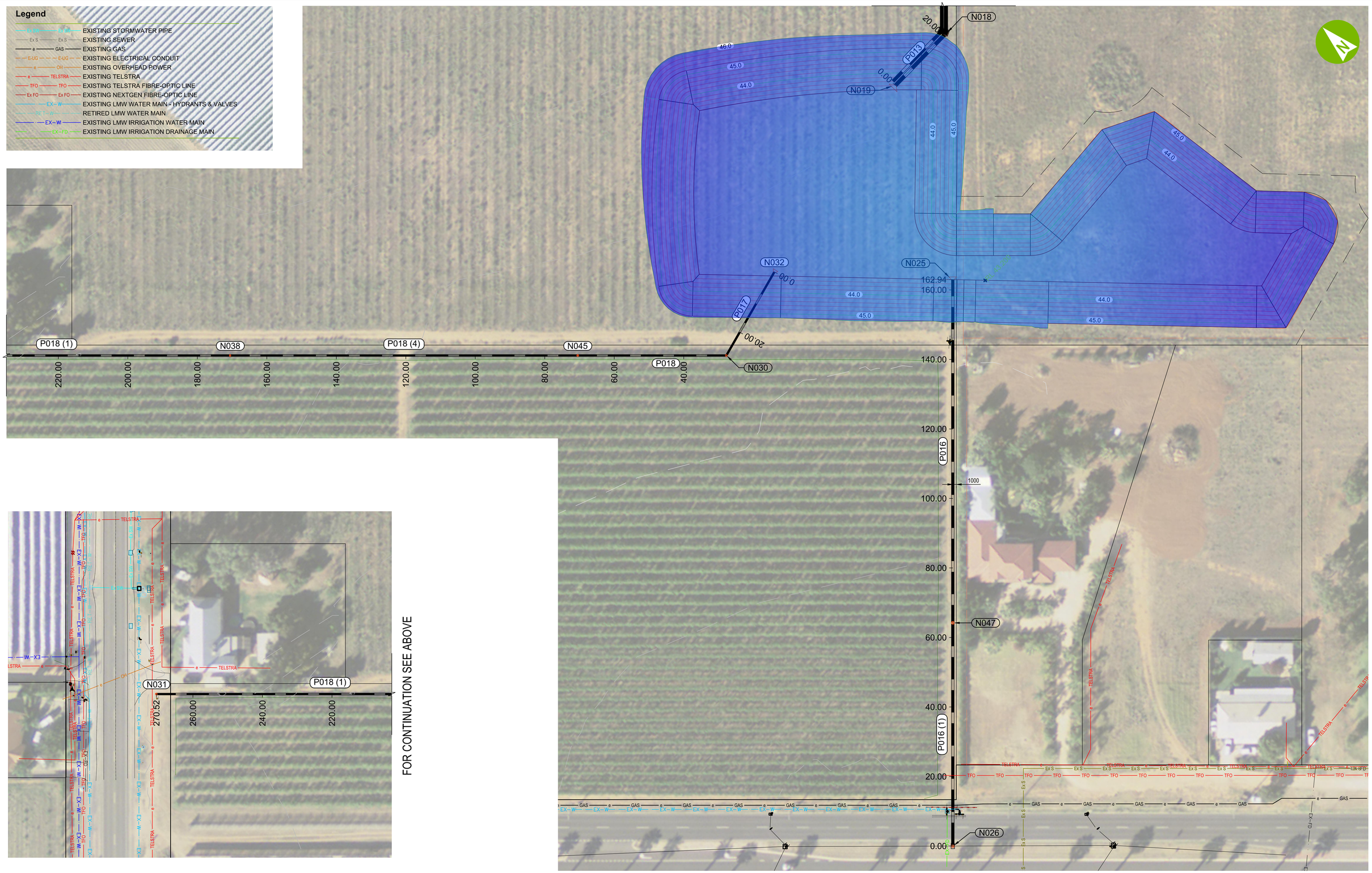
APPROVED
DATE

PROJECT: IRYMPLE DRAINAGE

TITLE: SANDILONG BASINS SOUTH EAST & NORTH WEST

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	242814	328	DRG	CC	050	A

Sandilong Basin - North West



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CLIENT	REV	DATE	REVISION DETAILS	APPROVED
	A	13.05.16	PRELIMINARY ISSUE	-

SCALE	SIZE
AS SHOWN	A1

DRAWN: M.PENDLEBURY
DESIGNED: H.SINGH
CHECKED:

PRELIMINARY
NOT FOR CONSTRUCTION

APPROVED
DATE

PROJECT: IRYMPLE DRAINAGE

TITLE: SANDILONG BASIN

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
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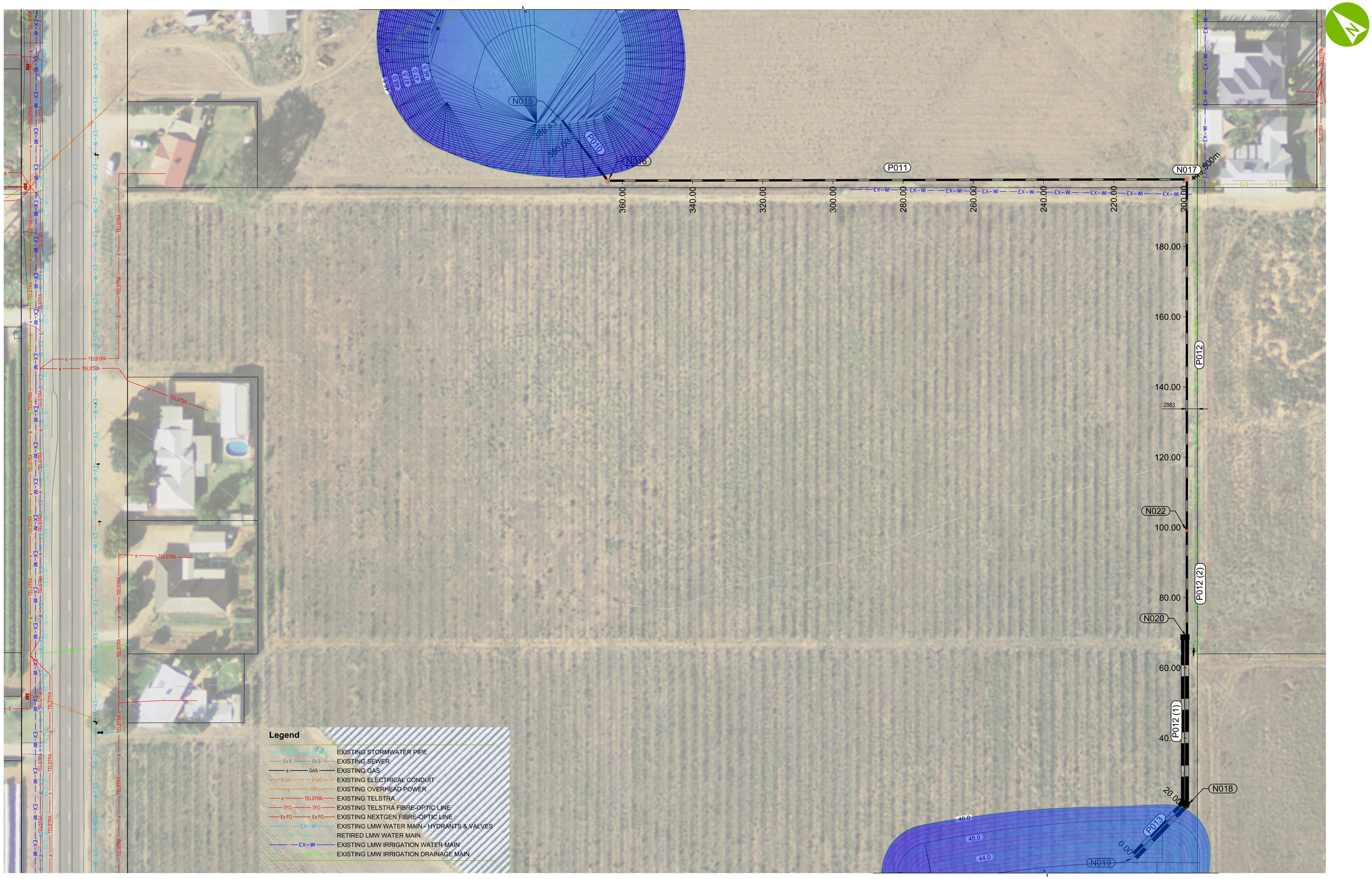
Rev Date: 27/10/2017 2:48:46 PM Office: ALMOL Filename: P:\242814 - MRCC\242814-328 RVWR E DRAINAGE DESIGN\PROJECT DELIVERY\4 DESIGN\STORMWATER\STAGE 5 SANDILONG BASIN\STAGE 5 SANDILONG\242814-328-DWG-CC-ST5-A100\[C].DWG



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REV	DATE	REVISION DETAILS	APPROVED
A	13.05.16	PRELIMINARY ISSUE	-

SCALE	SIZE
AS SHOWN	A1

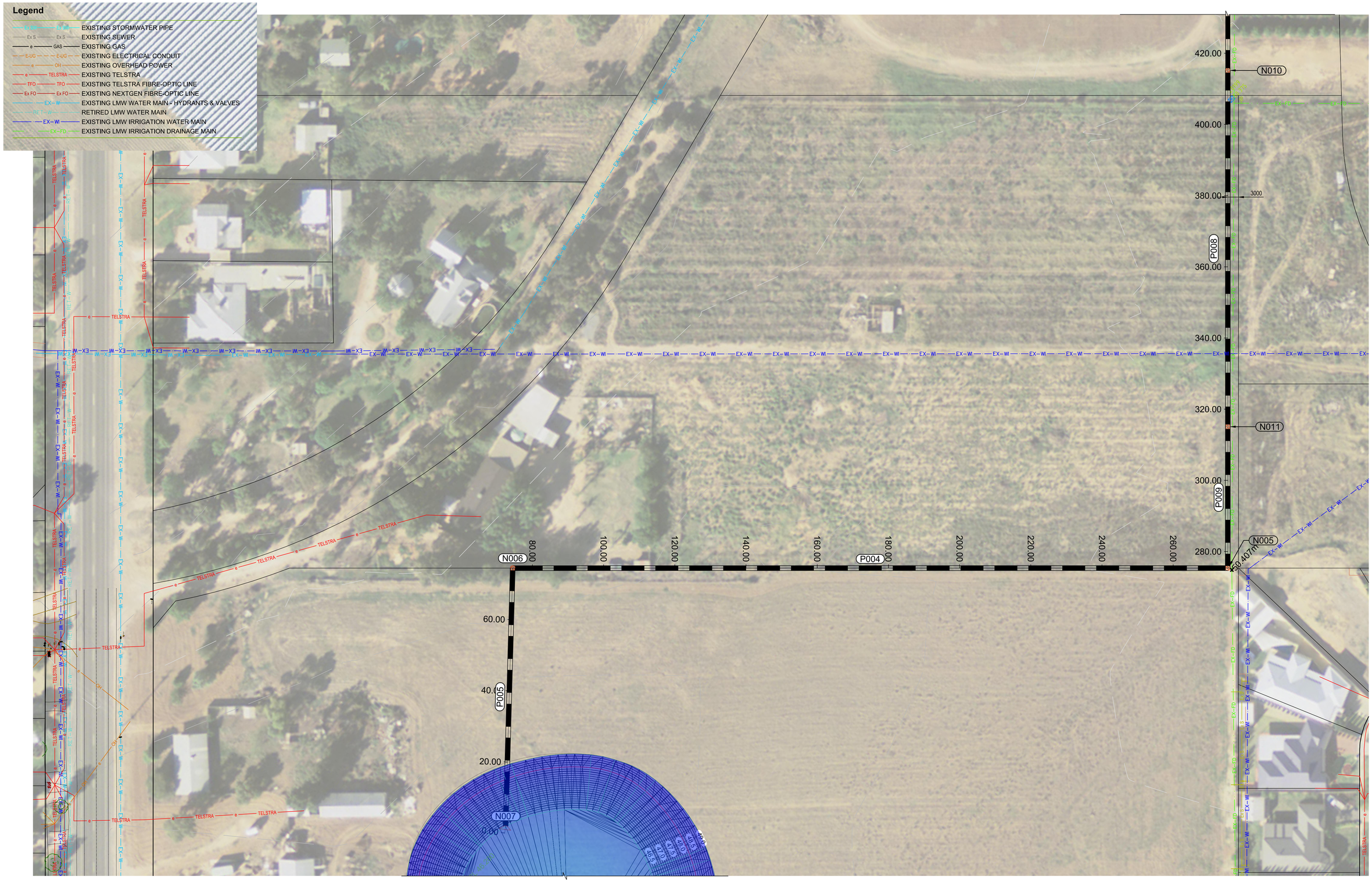
DRAWN: M.PENDLEBURY
DESIGNED: H.SINGH
CHECKED:

PRELIMINARY
NOT FOR CONSTRUCTION

APPROVED
DATE

PROJECT: IRYMPLE DRAINAGE
TITLE: SANDILONG BASIN

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	242814	328	DRG	CC	101	A



Rev Date: 27/10/2017 2:52:41 PM Office: AUMQL Filename: P:\242814 - MRCC\242814-328-IRYMPLE DRAINAGE DESIGN\3 PROJECT DELIVERY\6 DESIGN\STORM\WATER\STAGE 5 - SANDILONG BASIN\STAGE 5 - SANDILONG BASIN-DWG-CC-STS-0100(C).DWG

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CLIENT	REV	DATE	REVISION DETAILS	APPROVED
	A	13.05.16	PRELIMINARY ISSUE	-

SCALE	SIZE
AS SHOWN	A1

DRAWN: M.PENDLEBURY
DESIGNED: H.SINGH
CHECKED:

PRELIMINARY
NOT FOR CONSTRUCTION

APPROVED
DATE

PROJECT: IRYMPLE DRAINAGE

TITLE: SANDILONG BASIN

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
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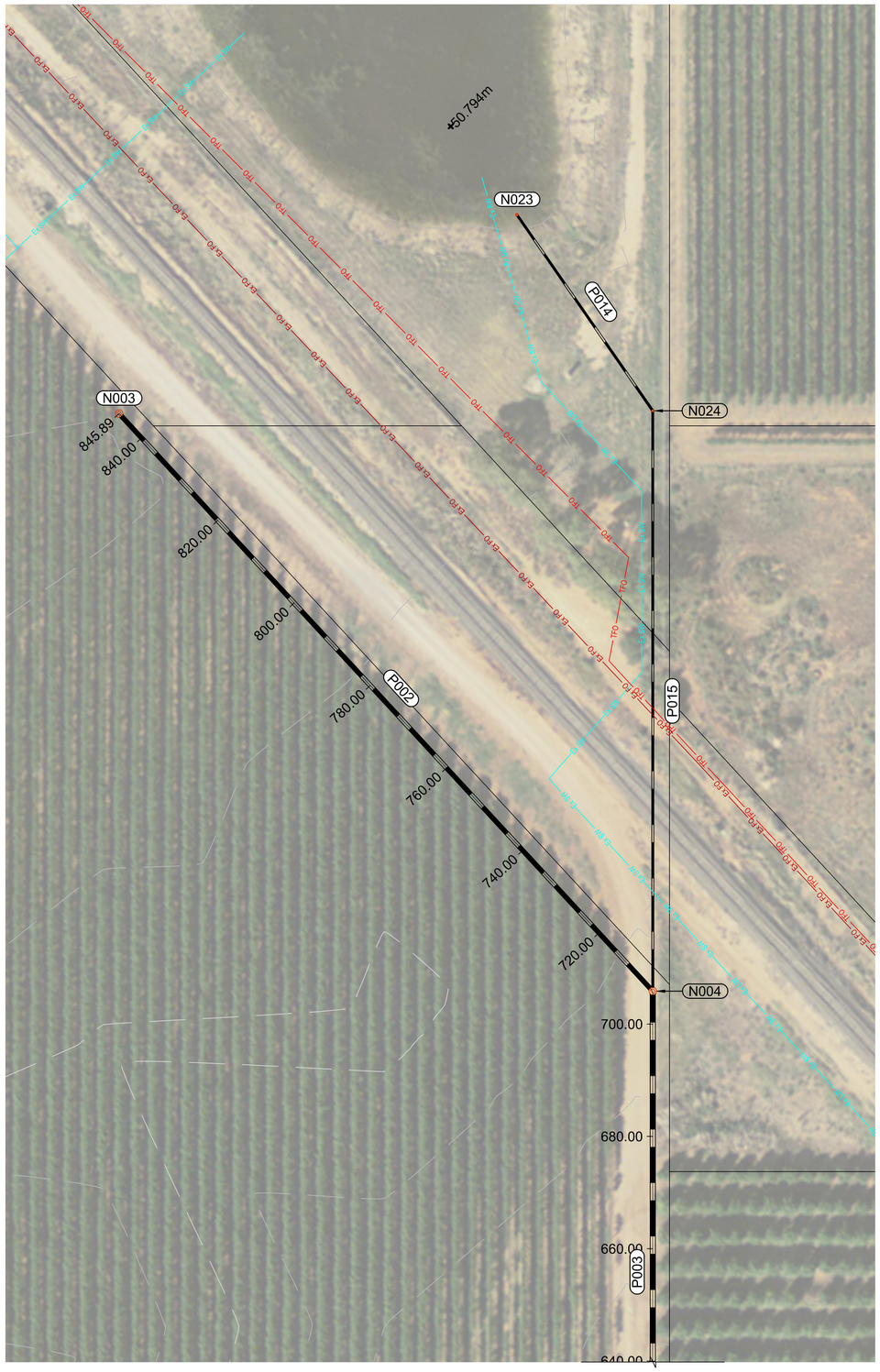

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REV	DATE	REVISION DETAILS	APPROVED
A	13.05.16	PRELIMINARY ISSUE	-

SCALE	SIZE
AS SHOWN	A1

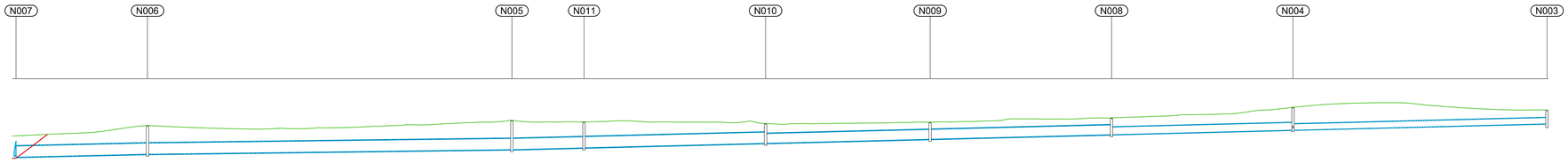
DRAWN: M.PENDLEBURY
DESIGNED: H.SINGH
CHECKED:

PRELIMINARY
NOT FOR CONSTRUCTION
APPROVED
DATE

PROJECT: IRYMPLE DRAINAGE
TITLE: SANDILONG BASIN

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	242814	328	DRG	CC	103	A

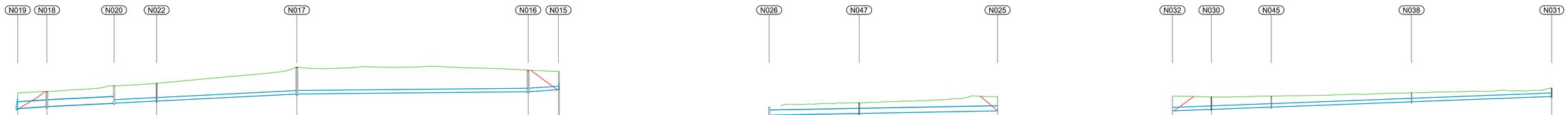
Rev Date: 27/10/2017 2:54:07 PM Office: AUMOL Filename: P:\242814 - MRCC\328\14-328-IRYMPLE\DRAINAGE DESIGN\3 PROJECT DELIVERY\6 DESIGN\STORMWATER\STAGE 5 - SANDILONG BASIN\STAGE 5 - SANDILONG BASIN-328-DWG-CC-ST5-A100(C).DWG



SCALE: H 1:250 1:50
Datum 45.000

GRADE %	0.45%		0.25%		0.50%		-0.50%		0.50%		0.50%		0.50%		0.50%		0.50%			
PIPE DETAILS (CL to CL LENGTHS)	1,219 mm Concrete Pipe ANZ CONCRETE PIPE RCRRJ 72.475m		1,219 mm Concrete Pipe ANZ CONCRETE PIPE RCRRJ 200.865m		1,219 mm Concrete Pipe ANZ CONCRETE PIPE RCRRJ 39.732m		1,219 mm Concrete Pipe ANZ CONCRETE PIPE RCRRJ 100.093m		1,067 mm Concrete Pipe ANZ CONCRETE PIPE RCRRJ 90.723m		1,067 mm Concrete Pipe ANZ CONCRETE PIPE RCRRJ 100.001m		838 mm Concrete Pipe ANZ CONCRETE PIPE RCRRJ 99.979m		686 mm Concrete Pipe ANZ CONCRETE PIPE RCRRJ 140.031m					
DESIGN LEVEL AT MH CL	48.065	49.815		50.379	50.208			50.038		50.182		50.660		51.832		51.531				
INVERT LEVEL	46.320	46.647	46.650	47.151	47.151	47.350	47.349	47.850	47.850	48.304	48.303	48.803	48.802	49.303	49.303	50.000				
COVER	1.056	1.872	1.870	1.932	1.933	1.563	1.564	0.893	1.045	0.737	0.737	0.713	0.965	1.637	1.795	0.797				
CHAINAGE	1.999	74.473		275.347		315.079		415.170		505.892		605.892		705.870		845.895				

ALIGN1-R02 LONG SECTION



SCALE: H 1:250 1:50
Datum 35.000

GRADE %	1.33%		1.00%		1.00%		1.00%		0.20%								1.30%			
PIPE DETAILS (CL to CL LENGTHS)	914 mm Concrete Pipe ANZ CONCRETE PIPE RCRRJ 20.843m		914 mm Concrete Pipe ANZ CONCRETE PIPE RCRRJ 47.929m		457 mm Concrete Pipe ANZ CONCRETE PIPE RCRRJ 30.347m		457 mm Concrete Pipe ANZ CONCRETE PIPE RCRRJ 100.042m		457 mm Concrete Pipe ANZ CONCRETE PIPE RCRRJ 164.992m								457 mm Concrete Pipe ANZ CONCRETE PIPE RCRRJ 21.641m			
DESIGN LEVEL AT MH CL	44.955	45.935		46.743	47.103			49.400								48.957		47.145		
INVERT LEVEL	43.527	43.804	43.804	44.283	44.286	44.590	44.587		45.588							45.918	45.918	46.200		
COVER	1.219	1.153	1.153	1.482	1.962	2.019	2.021	3.316	3.317							2.546	2.546	2.083		
CHAINAGE	0.000	20.842		68.768		99.114		199.150								364.142		385.781		

ALIGN2-R03 LONG SECTION

SCALE: H 1:250 1:50
Datum 35.000

GRADE %	0.37%		0.38%				
PIPE DETAILS (CL to CL LENGTHS)	686 mm Concrete Pipe ANZ CONCRETE PIPE RCRRJ 64.203m		686 mm Concrete Pipe ANZ CONCRETE PIPE RCRRJ 98.735m				
DESIGN LEVEL AT MH CL	43.723		44.326				
INVERT LEVEL	42.569		42.828	42.828			43.200
COVER	-0.391		0.764	0.764			1.263
CHAINAGE	0.000		64.203				162.938

ALIGN3-R07 LONG SECTION

SCALE: H 1:250 1:50
Datum 35.000

GRADE %	-0.76%		-0.76%		-0.75%		-0.76%
PIPE DETAILS (CL to CL LENGTHS)	457 mm Concrete Pipe ANZ CONCRETE PIPE RCRRJ 27.746m		457 mm Concrete Pipe ANZ CONCRETE PIPE RCRRJ 42.776m		457 mm Concrete Pipe ANZ CONCRETE PIPE RCRRJ 100.003m		457 mm Concrete Pipe ANZ CONCRETE PIPE RCRRJ 100.003m
DESIGN LEVEL AT MH CL	44.139	45.163		45.266		45.744	46.435
INVERT LEVEL	43.194	43.404	43.404	43.727	43.727	44.482	44.482	45.238
COVER	1.584	1.265	1.265	1.044	1.044	0.767	0.767	0.699
CHAINAGE	0.000	27.746		???		170.520		270.520

ALIGN4-R08 LONG SECTION

Plot Date: 27/10/2017 3:04:31 PM Office: AUMOL Filename: P:\242814 - MRCC\242814-328 IRYMPLE DRAINAGE DESIGN\5.PROJECT DELIVERY\6.DESIGN\STORMWATER\STAGE 5 - SANDLONG BASIN\STAGE 5 - SANDLONG\242814-328-DWG-CC-STS-A100\[C].DWG

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REV	DATE	REVISION DETAILS	APPROVED
A	13.05.16	PRELIMINARY ISSUE	-

SCALE	SIZE
AS SHOWN	A1

DRAWN: M.PENDLEBURY
DESIGNED: H.SINGH
CHECKED:

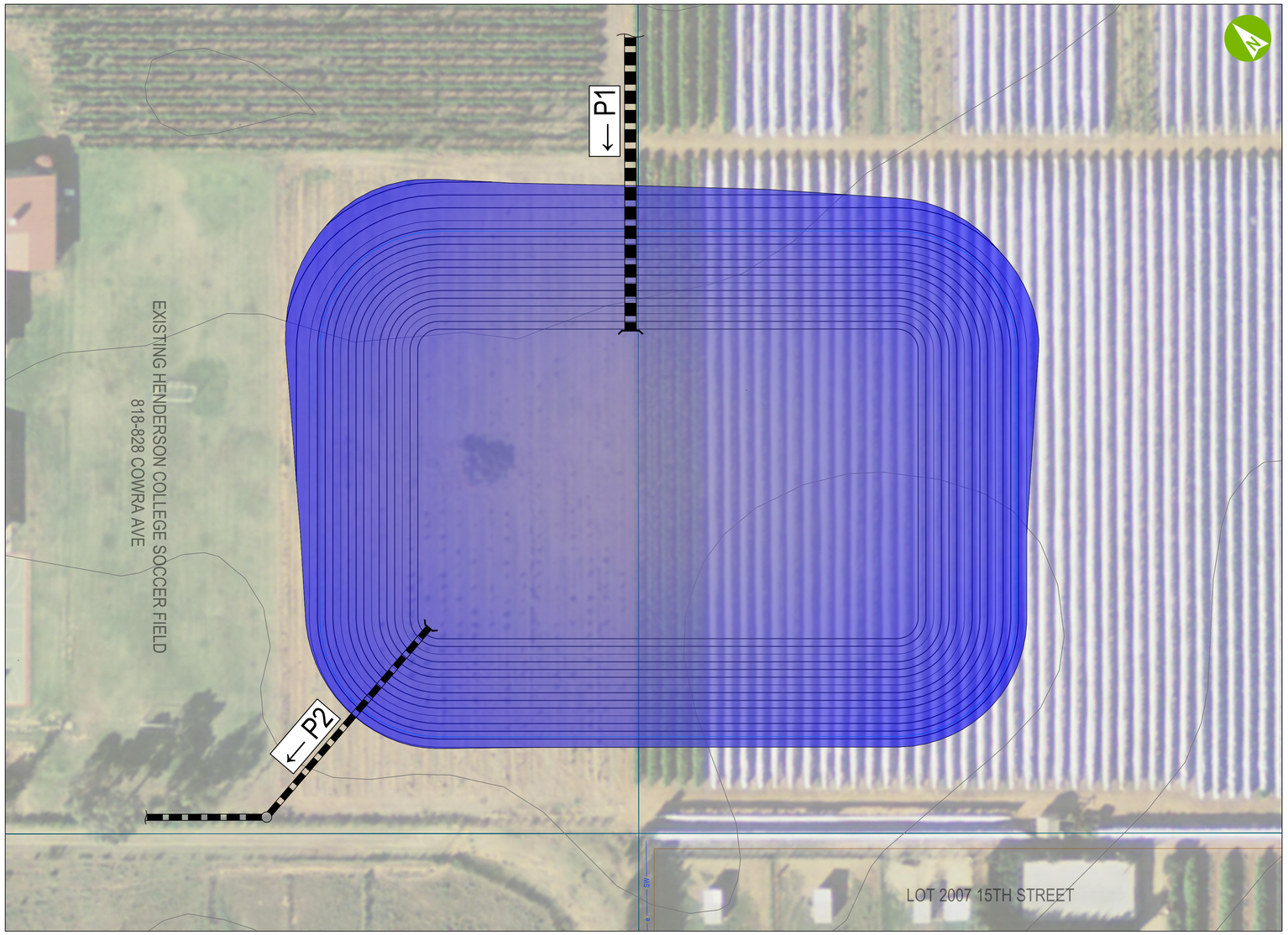
PRELIMINARY
NOT FOR CONSTRUCTION

APPROVED
DATE

PROJECT: IRYMPLE DRAINAGE
TITLE: PIPE LONG SECTIONS

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	242814	328	DRG	CC	200	A

Henderson Basin



PLAN
1:500

LEGEND

- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING PROPERTY PARCEL
- WATER EDGE
- e — SW — EXISTING STORM WATER

HENDERSON BASIN	
STORAGE VOLUME (WITH 0.300m FREEBOARD)	30305m3
FOOTPRINT AREA	14932m2
AVERAGE DEPTH	3.5m
INLET PIPE (P1)	2250Ø
INLET INVERT (P1)	42.280
OUTLET PIPE (P1)	1200Ø
OUTLET INVERT (P1)	42.280

Plot Date: 17/10/2017 1:45:38 PM Office: AUMQL Filename: P:\250641 MRCC\250641-354 MILDURA SOUTH DCP DRAINAGE ASSESSMENT\3 PROJECT DELIVERY\CADD\DRAWINGS\DV\250641-351 DRG-700 HENDERSON BASIN.DWG

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REV	DATE	REVISION DETAILS	APPROVED
A	07.12.16	PRELIMINARY ISSUE	-

SCALE	SIZE
AS SHOWN	A1

DRAWN: C.TOTENHOFER
DESIGNED: H.SINGH
CHECKED:

PRELIMINARY
NOT FOR CONSTRUCTION

APPROVED
DATE

PROJECT: MILDURA SOUTH DCP DRAINAGE ASSESMENT

TITLE: HENDERSON BASIN

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	250641	354	DRG	CC	700	A